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Trasmital

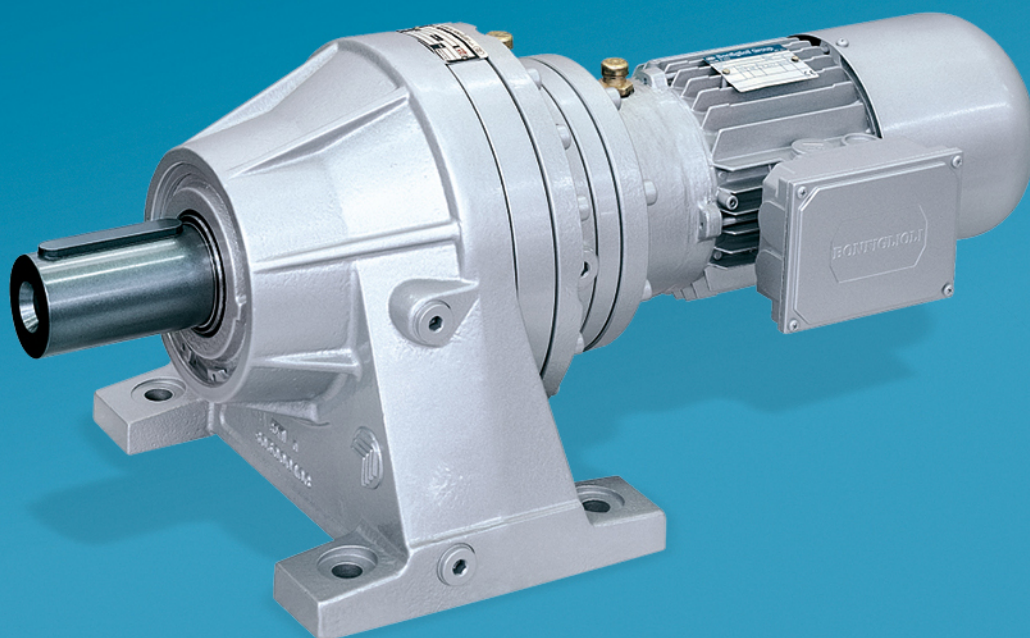
300 series

Riduttori epicicloidali modulari

Modular planetary gearboxes

Planetengetrieben

Réducteurs épicycloïdaux modulaire



Bonfiglioli

power, control and green solutions



INFORMAZIONI GENERALI GENERAL INFORMATION ALLGEMEINE INFORMATIONEN INFORMATIONS GENERALES

Paragrafo Chapter Abschnitt Paragraphe	Descrizione	Description	Beschreibung	Description	Pagina Page Seite Page
1.0	Caratteristiche	Specifications	Konstruktions-Merkmale	Caractéristiques	2
2.0	Forme costruttive	Versions	Bauformen	Formes de construction	4
3.0	Simbologia e unità di misura	Symbols and units of measure	Symbole und Maßeinheiten	Symboles et unités de mesure	6
4.0	Coppia in uscita	Output torque	Abtriebsmoment	Couple en sortie	8
5.0	Potenza	Power	Leistung	Puissance	8
6.0	Potenza termica	Thermal capacity	Wärmeleistung	Puissance thermique	9
7.0	Rendimento	Efficiency	Wirkungsgrad	Rendement	11
8.0	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction	11
9.0	Velocità	Operating speed	Drehzahl	Vitesse angulaire	11
10.0	Fattore di servizio	Service factor	Betriebsfaktor	Facteur de service	12
11.0	Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité	12
12.0	Selezione prodotto	Product selection	AntriebsAuswahl	Sélection	12
13.0	Verifiche	Verifications	Prüfungen	Vérifications	16
14.0	Scelta del motore	Selecting the motor	Wahl des Motors	Choix du moteur	19
15.0	Installazione	Installation	Installation	Installation	20
16.0	Manutenzione	Maintenance	Wartung	Entretien	22
17.0	Stoccaggio	Storage	Lagerung	Stockage	22
18.0	Condizioni di fornitura	Supply conditions	Lieferbedingungen	Conditions de livraison	23

RIDUTTORI EPICICLOIDALI MODULARI SERIE 300 SERIES 300 MODULAR PLANETARY GEARBOXES PLANETENGETRIEBEN DER SERIE 300 REDUCTEURS EPICYCLOIDALUX MODULAIRE SERIE 300

19.0	Designazione	Designation	Bezeichnung	Désignation	24
20.0	Posizione di montaggio	Mounting position	Montageposition	Position de montage	31
21.0	Lubrificazione	Lubrication	Schmierung	Lubrification	35
22.0	Dati tecnici motoriduttori 300 L - R	300 L - R gearmotor rating charts	300 L - R technischen daten der getriebemotoren	Donnees techniques motoréducteurs 300 L - R	45
23.0	Dati tecnici riduttori 300 L	Rating charts for in-line units 300 L	Technischen daten der getriebe 300 L	Donnees techniques réducteurs 300 L	117
24.0	Dati tecnici riduttori angolari 300 R	Rating charts for right-angle units 300 R	Technischen daten der getriebe 300 R	Donnees techniques réducteurs angulaires 300 R	155
25.0	Dati tecnici motoriduttori 3/V - 3/A	Planetaryworm rating charts 3/V - 3/A	Technischen daten der getriebemotoren 3/V - 3/A	Donnees techniques motoréducteurs 3/V - 3/A	181
26.0	Dati tecnici riduttori combinati 3/V	Combined units rating charts 3/V	Technischen daten der getriebe 3/V	Donnees techniques réducteurs combiné 3/V	213
27.0	Dati tecnici riduttori combinati 3/A	Gearbox rating charts 3/A	Technischen daten der getriebe 3/A	Donnees techniques réducteurs combiné 3/A	223
28.0	Dimensioni	Dimensions	Abmessungen	Dimensions	228
29.0	Sistemi ausiliari di raffreddamento	Supplementary cooling systems	Hilfskühlsysteme	Systemes auxiliaires de refroidissement	394

MOTORI ELETTRICI ELECTRIC MOTORS ELEKTROMOTOREN MOTEURS ELECTRIQUES

M1	Simbologia e unità di misura	Symbols and units of measure	Symbole und Maßeinheiten	Symboles et unités de mesure	396
M2	Caratteristiche generali	General characteristics	Allgemeine Eigenschaften	Caractéristiques générales	397
M3	Caratteristiche meccaniche	Mechanical features	Mechanische Eigenschaften	Caractéristiques mécaniques	400
M4	Caratteristiche elettriche	Electrical characteristics	Elektrische Eigenschaften	Caractéristiques électriques	405
M5	Motori asincroni autofrenanti	Asynchronous brake motors	Drehstrombremsmotoren	Moteurs frein asynchrones	412
M6	Motori autofrenanti in c.c., tipo BN_FD	DC brake motors type BN_FD	Drehstrombremsmotoren mit Gleichstrombremse: typ BN_FD	Moteurs frein en c.c. type BN_FD	413
M7	Motori autofrenanti in c.a., tipo BN_FA	AC brake motors type BN_FA	Wechselstrombremsmotoren: typ BN_FA	Moteurs frein en c.a. type BN_FA	418
M8	Motori autofrenanti in c.a., tipo BN_BA	AC brake motors type BN_BA	Drehstrombremsmotoren mit Wechselstrombremse: typ BN_BA	Moteurs frein en c.a. type BN_BA	422
M9	Sistemi di sblocco freno	Brake release systems	Brenslüfthebel	Systemes de déblocage frein	426
M10	Opzioni	Options	Optionen	Options	428
M11	Dati tecnici motori	Motor rating charts	Motorenauswahl tabellen	Données techniques des moteurs	435
M12	Dimensioni motori	Motors dimensions	Motorenabmessungen	Dimensions moteurs	451

Revisioni
L'indice di revisione del catalogo è riportato a pag. 464.
Al sito www.bonfiglioli.com sono disponibili i cataloghi con le revisioni aggiornate.

Revisions
Refer to page 464 for the catalogue revision index.
Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.

Änderungen
Das Revisionsverzeichnis des Katalogs wird auf Seite 464 wiedergegeben. Auf unserer Website www.bonfiglioli.com werden die Kataloge in ihrer letzten, überarbeiteten Version angeboten.

Révisions
Le sommaire de révision du catalogue est indiqué à la page 464.
Sur le site www.bonfiglioli.com des catalogues avec les dernières révisions sont disponibles.



1.0 - CARATTERISTICHE

La serie 300 è una gamma di riduttori epicicloidali multimpiego.

Caratteristiche salienti sono:

- 18 grandezze di costruzione modulare
- configurazione:
 - in linea, da 1 a 4 stadi di riduzione
 - angolare (primo stadio con coppia conica Gleason) da 2 a 4 stadi
- combinazioni con:
 - riduttori a vite senza fine
 - riduttori ad assi ortogonali
- esecuzioni per montaggio con flangia, con piede, pendolare
- alberi lenti: con linguetta, scanalati, scanalati femmina, cavi per montaggio tramite giunto calettatore
- predisposizioni motore per:
 - motori elettrici normalizzati IEC
 - motori compatti per le esecuzioni in linea fino alla grandezza 307
- albero cilindrico in entrata
- motoriduttori
- accessori per albero lento:
 - flangie
 - pignoni
 - barre scanalate
 - giunti ad attrito

1.0 - SPECIFICATIONS

The 300 series consists of a range of multi-purpose planetary gearboxes.

Key features are:

- 18 frame sizes of modular design
- versions:
 - in-line with 1 to 4 reductions
 - right angle (spiral bevel gear set into first stage) with 2 to 4 reductions
- combinations with:
 - worm gear units
 - bevel-helical gear units
- flange, foot and shaft mounting arrangements
- keyed output shaft, splined male shaft, splined hollow shaft, hollow shaft with shrink disc
- input adaptors for:
 - IEC-normalised electric motors
 - integral motor for in-line units up to size 307 and for units combined with bevel helical and worm gears
- parallel input shafts
- gearmotors
- mounting accessories:
 - flanges
 - pinions
 - splined bars
 - shrink discs

1.0 - KONSTRUKTIONS-MERKMALE

Die Serie 300 ist eine Reihe an vielseitig einsetzbaren Planetengetrieben.

Ihre Grundmerkmale sind:

- 18 Baugrößen Modularbauweise
- Ausführung:
 - In Reihenordnung mit 1 bis 4 Stufen
 - auf Winkel (erste Stufe mit Kegelradpaarung realisiert) In Winkelordnung (erste Stufe mit Kegelradpaar) mit 2 bis 4 Stufen
- Kombiniert mit:
 - Schneckengetrieben
 - Kegelradgetrieben
- Abtriebsversionen für Montage mit Flansch, mit Fuß, in Aufsteckversion
- Abtriebswellen: mit Passfeder, Vielkeil, Vielkeilhohlwelle, zylindrischer Hohlwelle für Schrumpfscheibenmontage
- Vorbereitet für:
 - Elektromotoren, gemäß IEC Form B5
 - kompakte Elektromotoren für Reihenordnung bis zur Größe 307 und für mit Kegelradgetrieben kombinierte Ausführungen
- Schnelle Wellen am Antrieb
- Getriebemotoren
- Zubehör für Abtriebswellen:
 - Flanschen
 - Ritzel
 - Keilstäbe
 - Schrumpfscheiben

1.0 - CARACTERISTIQUES

La série 300 est une gamme de réducteurs épicycloïdaux polyvalents.

Ses principales caractéristiques sont :

- 18 tailles de construction modulaire
- exécutions:
 - en ligne de 1 à 4 étages de réduction
 - angulaire (premier étage réalisé avec un couple conique Gleason) de 2 à 4 étages de réduction
- Associés à :
 - réducteurs à vis sans fin
 - réducteurs à axes orthogonaux
- versions pour assemblage par bride, à pattes, ou pendulaire
- arbres de sortie clavetés; mâles cannelés; femelles cannelés; creux cylindriques pour assemblage avec frette de serrage
- prédispositions d'entrée pour:
 - moteurs électriques, selon CEI
 - moteurs électriques compacts pour les exécutions en ligne jusqu'à la taille 307
- arbres rapides d'entrée
- motoréducteurs
- accessoires pour arbre de sortie:
 - brides
 - pignons
 - barres cannelées
 - frettes de serrage

ESECUZIONI

CONFIGURATIONS

AUSFÜHRUNGEN

EXECUTIONS

Esecuzione / Configuration Ausführung / Execution	Potenza Power Leistung Puissance	Coppia Torque Drehmomente Couple	Rapporti Ratios Übersetzungen Rapports	Rendimento Efficiency Wirkungsgrad Rendement	Rumorosità Noise level Geräuschpegel Niveau de bruit
 In linea In line Linear Coaxiale	$0.25 \leq P_n \text{ [kW]} \leq 20$	$M_n \leq 520000 \text{ Nm}$	$3.4 \leq i \leq 290$	Elevato High Hoch Elevé	Media Medium Mittel Moyen
 Angolare Right-angle Rechtwinklig A renvoi d'angle	$0.25 \leq P_n \text{ [kW]} \leq 7$	$M_n \leq 400000 \text{ Nm}$	$7 \leq i \leq 95$	Elevato High Hoch Elevé	Media Medium Mittel Moyen
 Combinato con riduttore vite senza fine Combined with worm gear unit Kombiniert mit Schneckengetriebe Combinée avec réducteur à vis sans fin	$0.12 \leq P_n \text{ [kW]} \leq 7$	$M_n \leq 520000 \text{ Nm}$	$370 \leq i \leq 5150$	Media Medium Mittel Moyen	Bassa Low Niedrig Faible
 Combinato con riduttore ad assi ortogonali Combined with helical bevel gear unit Kombiniert mit Kegelradgetriebe Combinée avec réducteur à axes orthogonaux	$0.12 \leq P_n \text{ [kW]} \leq 3$	$M_n \leq 11100 \text{ Nm}$	$19 \leq i \leq 73$	Elevato High Hoch Elevé	Bassa Low Niedrig Faible



Altre caratteristiche costruttive sono:

- elevata densità di coppia – *high torque density*
- elevata supportazione radiale e assiale grazie all'utilizzo, sulle versioni H e P, di cuscinetti a rulli conici – *high overhung and axial load capacity due to heavy duty tapered roller bearings featured on H and P versions*
- rendimento elevato – *high efficiency*
- collegamenti fra gli organi interni tramite profili scanalati, non tramite linguette – *inner parts are coupled through splined connections rather than keys*
- stadi di riduzione con porta-planetari flottanti per la ottimale ripartizione dei carichi fra gli ingranaggi planetari – *planetary gears mounted onto self-centering carriers to ensure the most even load distribution among planetary gears*
- carcasse in ghisa sferoidale. – *housing from ductile cast iron.*

Altre costruttive Merkmale lassen sich folgendermaßen zusammenfassen:

- hohes übertragbares Drehmoment/ Verhältnis zu den Aussenmaßen
- hohe Belastungskapazität für Radial- und Axialkräfte an den Abtriebswellen, dank des Einsatzes von Kegelrollenlager bei den Versionen H und P.
- hohe Wirkungsgrade
- Verbindungen zwischen den inneren Organen mittels Nutprofilen, es werden keine Passfedern verwendet
- Untersetzungsstufen mit schwimmenden Planetenradträgern zur Belastungsverteilung auf die Planetenräder
- Gehäuse aus Sphäroguss.

D'autres caractéristiques de construction sont :

- *apport de couple transmissible/dimensions d'encombrement, élevé*
- *capacité élevée à supporter les charges radiales et axiales, grâce à l'utilisation, sur les versions H et P, de roulements à rouleaux coniques*
- *rendement élevé*
- *raccordements entre les organes intérieurs par le biais de profils cannelés, et non pas de clavettes*
- *étages de réduction avec porte-planétaires flottants pour obtenir une meilleure répartition des charges dans le train d'engrenages épicycloïdaux*
- *carter en fonte G.S.*



2.0 - FORME COSTRUTTIVE

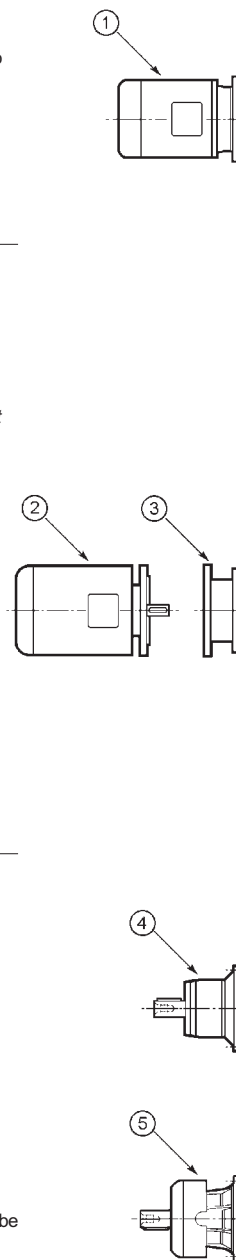
2.0 - VERSIONS

2.0 - BAUFORMEN

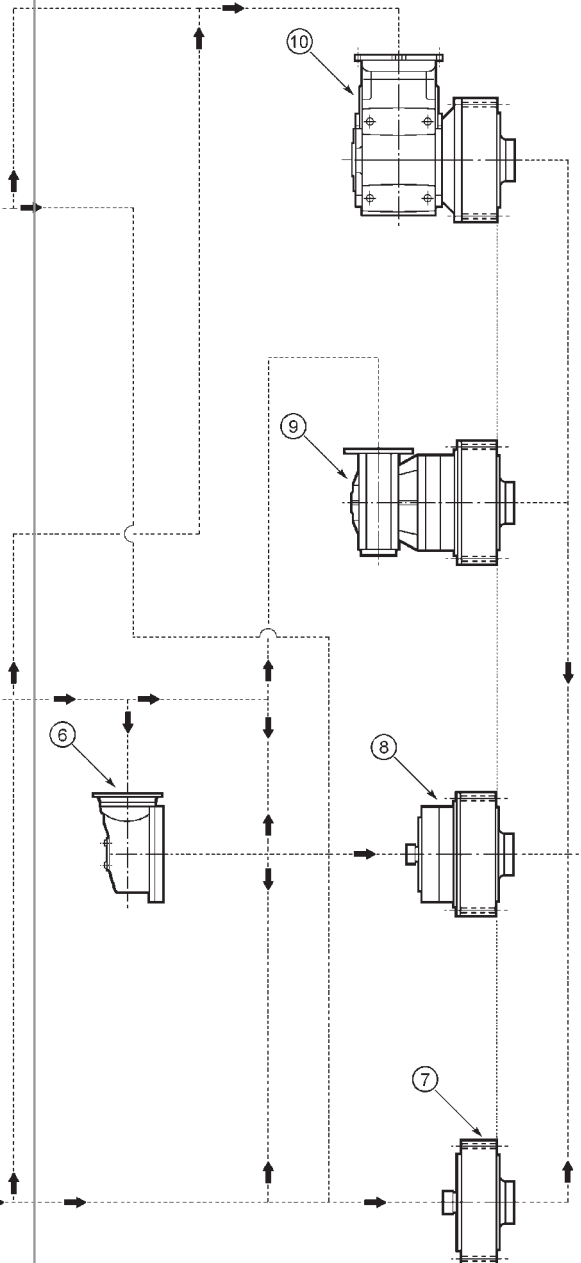
2.0 - FORMES DE CONSTRUCTION

- A**
- 1 Motore elettrico compatto
 - 2 Motore elettrico IEC
 - 3 Predisposizione motore elettrico
 - 4 Albero veloce
 - 5 Albero veloce con ventola
- B**
- 6 Stadio riduzione angolare
 - 7 Uno stadio di riduzione epicicloidale
 - 8 Due o più stadi di riduzione epicicloidale
 - 9 Stadio di riduzione epicicloidale combinato con riduttore a vite senza fine
 - 10 Stadio di riduzione epicicloidale combinato con riduttore ad assi ortogonali
- C**
- 11 MC/MZ - Uscita albero maschio cilindrico o scanalato
 - 12 HC/HZ - Uscita rinforzata albero maschio cilindrico o scanalato
 - 13 PC/PZ - Uscita con piede di supporto ed albero maschio cilindrico o scanalato
 - 14 FZ - Uscita albero femmina scanalato
 - 15 FP - Uscita albero femmina per giunto ad attrito
 - 16 HC - Uscita albero maschio cilindrico
 - 17 HZ - Uscita albero maschio scanalato
 - 18 FZ - Uscita albero femmina scanalato
 - 19 FP - Uscita albero femmina per giunto ad attrito
 - 20 PC - Piede di supporto
 - 21 VK - Uscita rinforzata con albero cilindrico per agitatori / miscelatori
- D**
- 22 W0A - Flangia
 - 23 P - Pignone
 - 24 M0A - Manicotto liscio
 - 25 Fondello d'arresto
 - 26 B0A - Barra scanalata
 - 27 G0A - Giunto ad attrito
- A**
- 1 Compact electric motor
 - 2 IEC electric motor
 - 3 Adapter for electric motor
 - 4 Solid input shaft
 - 5 Solid input shaft with fan
- B**
- 6 Right-angle reduction stage
 - 7 Single planetary reduction stage
 - 8 Two or more planetary reduction stages
 - 9 Planetary reduction combined with worm gear unit
 - 10 Planetary reduction stage combined with helical bevel gear unit
- C**
- 11 MC/MZ - Keyed or splined solid shaft output
 - 12 HC/HZ - Keyed or splined heavy duty solid output shaft
 - 13 PC/PZ - Output with support bracket and keyed or splined solid shaft
 - 14 FZ - Splined hollow output shaft
 - 15 FP - Hollow output shaft for shrink disc
 - 16 HC - Parallel solid output shaft
 - 17 HZ - Splined solid output shaft
 - 18 FZ - Splined hollow output shaft
 - 19 FP - Hollow output shaft for shrink disc
 - 20 PC - Foot mount
 - 21 VK - Reinforced output with parallel shaft for stirrers and mixers
- D**
- 22 W0A - Flange
 - 23 P - Pinion
 - 24 M0A - Sleeve coupling
 - 25 End plate
 - 26 B0A - Splined bar
 - 27 G0A - Shrink disc
- A**
- 1 Kompakter Elektromotor
 - 2 IEC-Elektromotor
 - 3 Vorbereitung für Elektromotor
 - 4 Zylindrische Antriebswelle
 - 5 Lüftergekühlte Antriebswelle
- B**
- 6 Winkelübersetzungsstufe
 - 7 Eine Planetenübersetzungsstufe
 - 8 Zwei oder mehr Planetenübersetzungsstufen
 - 9 Planetenübersetzungsstufe kombiniert mit Schneckengetriebe
 - 10 Planetenübersetzungsstufe kombiniert mit Kegelradgetriebe
- C**
- 11 MC/MZ - Abtrieb an Einsteckwelle oder Keilwelle
 - 12 HC/HZ - Abtrieb an Einsteckwelle oder Verstärkter Abtrieb
 - 13 PC/PZ - Abtrieb mit Stützfuß und Einsteckwelle oder Keilwelle
 - 14 FZ - Abtrieb mit Keilaufsteckwelle
 - 15 FP - Abtrieb mit Aufsteckwelle für Schrumpfscheibe
 - 16 HC - Abtrieb mit zylindrischer Einsteckwelle
 - 17 HZ - Abtrieb mit Keileinsteckwelle
 - 18 FZ - Abtrieb mit Keilaufsteckwelle
 - 19 FP - Abtrieb mit Aufsteckwelle für Schrumpfscheibe
 - 20 PC - Stützfuß
 - 21 VK - Verstärkter Abtrieb mit zylindrischer Welle für Rührwerke und Mischer
- D**
- 22 W0A - Flansch
 - 23 P - Ritzel
 - 24 M0A - Nabe
 - 25 Bodenklemmscheibe
 - 26 B0A - Keilvollwelle
 - 27 G0A - Schrumpfscheibe

A ENTRATE / INPUT EINGÄNGE / ENTREES



B RIDUZIONI / REDUCTIONS UNTERSETZUNGEN TRAINS EPICICLOIDaux



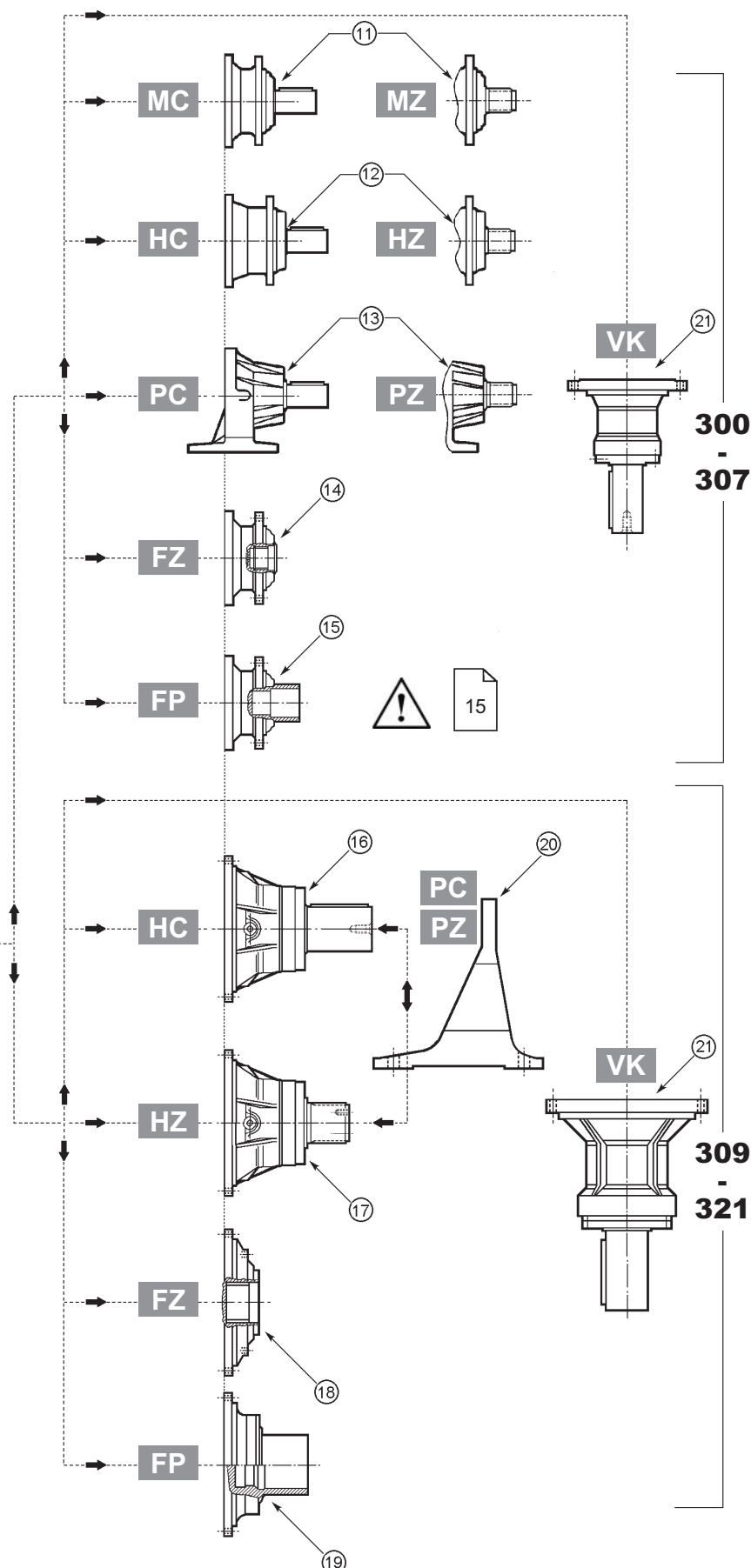
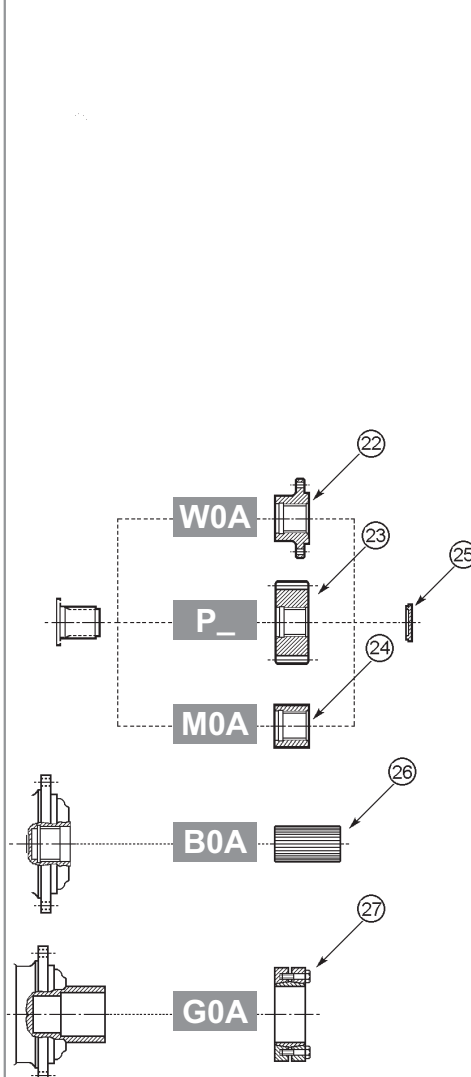


2.0 - FORME COSTRUTTIVE

2.0 - VERSIONS

2.0 - BAUFORMEN

2.0 - FORMES DE CONSTRUCTION

C USCITE / OUTPUT
ABTRIEB / SORTIES**D** ACCESSORI / FITTINGS
ZUBEHÖR / ACCESSOIRES

- A**
- 1 Motore elettrico compact
 - 2 Motore elettrico IEC
 - 3 Preriduzione motore elettrico
 - 4 Arbre rapide
 - 5 Arbre rapide équipé de ventilateur
 - 6 Etage de réduction angulaire
 - 7 Un étage de réduction épicycloïdal
 - 8 Deux ou plusieurs étages de réduction épicycloïdaux
 - 9 Etage de réduction épicycloïdal combiné avec réducteur à vis sans fin
 - 10 Etage de réduction épicycloïdal combiné avec réducteur à axes orthogonaux
 - 11 MC/MZ - Sortie arbre mâle cylindrique ou cannelé
 - 12 HC/HZ - Sortie renforcée arbre mâle cylindrique ou cannelé
 - 13 PC/PZ - Sortie avec pied de support et arbre mâle cylindrique ou cannelé
 - 14 FZ - Sortie arbre femelle cannelé
 - 15 FP - Sortie arbre femelle joint à frottement
 - 16 HC - Sortie arbre mâle cylindrique
 - 17 HZ - Sortie arbre mâle cannelé
 - 18 FZ - Sortie arbre femelle cannelé
 - 19 FP - Sortie arbre femelle joint à frottement
 - 20 PC - Patte de support
 - 21 VK - Sortie renforcée avec arbre cylindrique pour agitateurs et mélangeurs
- D**
- 22 W0A - Bride
 - 23 P - Pignon
 - 24 M0A - Manchon lisse
 - 25 Fond de butée
 - 26 B0A - Barre cannelée
 - 27 G0A - Joint à frottement



3.0 - SIMBOLOGIA E UNITÀ DI MISURA

3.0 - SYMBOLS AND UNITS OF MEASURE

3.0 - SYMBOLE UND MAßEINHEITEN

3.0 - SYMBOLES ET UNITES DE MESURE

Simb. Symb.		Descrizione	Description	Beschreibung	Description
A_{c2}	[N]	Carico assiale di calcolo in uscita riduttore	Calculated thrust load at gearbox output shaft	Soll-Axialkraft am Getriebeabtrieb	Charge axiale de calcul à la sortie du réducteur
A_{r2}	[N]	Carico assiale in uscita riduttore	Thrust load at gearbox output shaft	Axialkräfte am Getriebeabtrieb	Charge axiale à la sortie du réducteur
A_{n2}	[N]	Carico assiale nominale in uscita riduttore	Rated thrust load at gearbox output shaft	Nenn-Axialkraft am Getriebeabtrieb	Charge axiale nominale à la sortie du réducteur
f_{a2}		Fattore di carico assiale	Thrust load factor	Axialkraftfaktor	Facteur de charge axiale
f_l		Fattore di durata	Lifetime factor	Lebensdauerfaktor	Facteur de durée
f_m		Fattore di maggiorazione	Adjusting factor	Überdimensionierungsfaktor	Facteur de majoration
f_{n1}, f_{n2}		Fattore di velocità per carichi su alberi entrata, uscita	Speed factor referred to input and output shaft loading	Drehzahlfaktor für auf Antriebs-/Abtriebswellen einwirkende Kräfte	Facteur de vitesse pour charges sur arbres d'entrée, sortie
f_s		Fattore di servizio	Service factor	Betriebsfaktor	Facteur de service
f_t		Fattore termico	Thermal factor	Wärmefaktor	Facteur thermique
f_{x1}, f_{x2}		Fattore di posizione carichi radiali su alberi entrata, uscita	Load location factor for radial loading on input and output shaft	Positionsfaktor für auf Antriebs-/Abtriebswellen einwirkende Radialkräfte	Facteur de position charges radiales sur arbres d'entrée, sortie
h	[h]	Durata in ore	Lifetime in hours	Dauer in Stunden	Durée en heures
i		Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
K_a		Fattore di sollecitazione carico assiale	Axial load duty factor	Belastungsfaktor der Axialkraft	Facteur de service de charge axiale
K_r		Fattore di sollecitazione del carico radiale	Radial load factor	Belastungsfaktor der Radialkraft	Facteur de sollicitation de la charge radiale
l		Rapporto di intermittenza	Intermittence factor	Einschaltdauer	Rapport d'intermittence
M_b	[Nm]	Coppia nominale del freno	Rated brake torque	Nenn-Drehmoment der Bremse	Couple nominal du frein
M_{c2}	[Nm]	Coppia di calcolo in uscita riduttore	Calculated output torque	Soll-Drehmoment am Getriebeabtrieb	Couple de calcul de sortie réducteur
M_2	[Nm]	Coppia trasmessa in uscita riduttore	Torque delivered to output shaft	Übertragenes Drehmoment am Getriebeabtrieb	Couple transmis en sortie réducteur
M_{n2}	[Nm]	Coppia nominale in uscita riduttore	Gearbox rated output torque	Nenn-Drehmoment am Getriebeabtrieb	Couple nominal de sortie réducteur
M_{2max}	[Nm]	Coppia massima in uscita riduttore	Gearbox max. output torque	Max. Drehmoment am Getriebeabtrieb	Couple max. de sortie réducteur
M_{r1}	[Nm]	Coppia richiesta in entrata al riduttore	Required torque at input shaft	Erforderliches Drehmoment am Getriebeantrieb	Couple nécessaire à l'entrée du réducteur
M_{r2}	[Nm]	Coppia richiesta in uscita al riduttore	Required torque at output shaft	Erforderliches Drehmoment am Getriebeabtrieb	Couple requis à la sortie du réducteur
n_1	[min ⁻¹]	Velocità angolare in entrata riduttore	Speed of input shaft	Winkeldrehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
n_2	[min ⁻¹]	Velocità angolare in uscita riduttore	Speed of output shaft	Winkeldrehzahl an Getriebeabtrieb	Vitesse angulaire à la sortie du réducteur
P_1	[kW]	Potenza max. trasmissibile in entrata riduttore	Max. power that can be applied to input shaft	Max. übertragbare Leistung an Getriebeantrieb	Puissance maximum transmissible à l'entrée du réducteur
P_2	[kW]	Potenza trasmessa in uscita riduttore	Power delivered to output shaft	Übertragene Leistung am Getriebeabtrieb	Puissance transmise à la sortie du réducteur
P_n	[kW]	Potenza nominale motore	Motor rated power	Nennleistung des Motors	Puissance nominale moteur
P_1	[kW]	Potenza richiesta in entrata	Required input power	Erforderliche Leistung am Antrieb	Puissance requise en entrée
P_{r2}	[kW]	Potenza in uscita a n_2 max	Output power at n_2 max	Abtriebsleistung bei n_2 max	Puissance en sortie à n_2 max
P_s	[kW]	Potenza da smaltire	Power to be dissipated	Überleistung	Puissance à éliminer
P_t	[kW]	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
R_{c1}	[N]	Carico radiale (di calcolo) in entrata riduttore	Calculated radial load at gearbox input shaft	Radialkraft (Sollwert) am Getriebeantrieb	Charge radiale de calcul à l'entrée du réducteur
R_{c2}	[N]	Carico radiale (di calcolo) in uscita riduttore	Calculated radial load at gearbox output shaft	Radialkraft (Sollwert) am Getriebeabtrieb	Charge radiale de calcul à la sortie du réducteur
R_{n1}, R_{n2}	[N]	Carico radiale nominale in mezziera alberi entrata, uscita	Rated radial load at shaft mid-point, input and output	Nenn-Radialkraft auf Mitte der Antriebs-/Abtriebswellen	Charge radiale nominale à la moitié des arbres d'entrée, sortie
R_{x2}	[N]	Carico radiale nominale in uscita riduttore ricalcolato rispetto a diversi punti di applicazione del carico	Admissible overhung load for forces applying off the shaft midpoint	Nachberechnete Nenn-Radialkraft am Getriebeabtrieb in Bezug auf verschiedene Kraftangriffspunkte	Charge radiale nominale à la sortie du réducteur recalculée par rapport à différents points d'application de la charge
S		Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité
t_a	[°C]	Temperatura ambiente	Ambient temperature	Umgebungstemperatur	Température ambiante
X	[mm]	Distanza di applicazione del carico dallo spallamento albero	Load application distance from shaft shoulder	Abstand des Kraftangriffspunkte vom Wellenansatz	Distance d'application de la charge par rapport à l'épaulement de l'arbre
η_d		Rendimento dinamico	Dynamic efficiency	Dynamischer Wirkungsgrad	Rendement dynamique
Z		Frequenza di avviamento	Starts per hour	Anlaßfrequenz	Frequence de démarrage



Il simbolo identifica il peso.

Icon symbolises the weight.

Symbol für das Gewicht der Getriebe.

Symbole se référant aux poids du réducteur.



Le colonne contrassegnate da questo simbolo indicano i numeri di pagina dove sono riportate le dimensioni.

Columns marked with this symbol indicate the page installation drawings can be sorted from.

In den mit diesem Symbol gekennzeichneten Spalten werden die Seiten mit den entsprechenden Maßangaben aufgeführt.

Les colonnes portant ce symbole indiquent les numéros de page où sont mentionnées les dimensions.

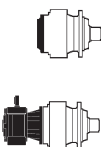


Questo simbolo indica la pagina alla quale è rimandata l'informazione.

This symbol identifies the page the information is available at.

In diesem Symbol wird eine Nummer angegeben, die für die entsprechende Bezugsseite steht.

Cette image comporte un chiffre représentant le numéro de page de référence.



Le parti in nero evidenziano la collocazione delle entrate dei riduttori.

Areas marked in black show the input component parts.

Die schwarz hervorgehobenen Teile stellen die Seite des Getriebeantriebs dar.

Les parties noires montrent l'emplacement des entrées des réducteurs.



Il numero associato al simbolo indica la coppia da applicare per il serraggio delle viti.

The number associated with the wrench indicates the rated tightening torque.

Das an eine Nummer gebundene Schlüsselsymbol steht für den Anzugsmoment der Schrupfscheibenschraube.

Le nombre associée a l'image de la clé indique le couple de serrage des vis.



Esecuzione in linea.

In-line unit.

Reihenordnung

Exécution coaxiale.



Esecuzione angolare.

Right-angle unit.

Winkelanordnung

Exécution angulaire.



Esecuzione combinata con vite senza fine.

Worm-planetary combined design.

Mit Schneckengetriebe kombinierte Ausführung.

Exécution combinée avec vis sans fin.



Esecuzione combinata con riduttore ad assi ortogonali.

Bevel helical-planetary combined design.

Mit Kegelradgetriebe kombinierte Ausführung.

Exécution combinée avec réducteur à axes orthogonaux.



4.0 - COPPIA IN USCITA

4.1 Coppia motoriduttore M_2 [Nm]

È la coppia trasmessa in uscita dal motoriduttore con carico continuo uniforme e fattore di sicurezza S risultante dalle tabelle dati tecnici per una durata di 10000 h.

4.2 Coppia nominale riduttore M_{n2} [Nm]

È la coppia nominale trasmissibile dal riduttore con:

- carico uniforme e fattore di sicurezza $S=1$
 - durata di calcolo di 10000 ore.
- I valori di M_{n2} sono verificati secondo i seguenti standard:
ISO DP 6336 per gli ingranaggi
ISO 281 per i cuscinetti.

4.3 Coppia massima M_{2max} [Nm]

È il valore di coppia in uscita sopportabile dal riduttore in condizioni statiche o fortemente intermittenti. È inteso come carico istantaneo o come coppia di spunto sotto carico.

4.4 Coppia richiesta M_{r2} [Nm]

Rappresenta la coppia richiesta dall'applicazione. Il suo valore dovrà sempre essere uguale, o inferiore, alla coppia nominale M_{n2} del riduttore.

4.5 Coppia di calcolo M_{c2} [Nm]

È il valore di coppia da utilizzare nella selezione del riduttore. L'espressione è fornita dall'equazione seguente, in funzione della coppia richiesta M_{r2} e del fattore di servizio f_s :

4.0 - OUTPUT TORQUE

4.1 Gearmotor delivered torque M_2 [Nm]

This is the net torque delivered to the output shaft, with installed power P_n , safety factor S , which will yield a theoretical lifetime of 10000 hours. This torque value takes gearbox efficiency into consideration.

4.2 Rated output torque M_{n2} [Nm]

This is the torque output the gearbox can deliver safely, based on:

- uniform loading and safety factor $S=1$
 - 10000 hours theoretical lifetime
- M_{n2} values are in compliance with following standards:
ISO DP 6336 for gears
ISO 281 for bearings.

4.3 Maximum torque M_{2max} [Nm]

The output torque the gear unit will withstand in a static condition or a highly intermittent operation. It is generally meant as a momentary peak load or start-up torque under load.

4.4 Required torque M_{r2} [Nm]

The torque drawn by the application. It must always be equal to or less than rated output torque M_{n2} for the gearbox under study.

4.5 Calculated torque M_{c2} [Nm]

Computational torque value to be used when selecting the gearbox, considering required torque M_{r2} and service factor f_s . It is obtained through the equation:

4.0 - ABTRIEBSMOMENT

4.1 Drehmoment des Getriebemotors M_2 [Nm]

Ist das an der Abtriebswelle des Getriebemotors übertragene Drehmoment bei gleichmäßiger Dauerbelastung und einem, aus den Tabellen der technischen Daten in bezug auf eine Dauer von 10000 Std. resultierenden Sicherheitsfaktor S .

4.2 Nenn-Drehmoment des Getriebes M_{n2} [Nm]

Ist das vom Getriebe am Abtrieb übertragene Drehmoment mit gleichmäßiger Dauerbelastung und Sicherheitsfaktor $S=1$ für eine Dauer von 10000 Std. Die Werte M_{n2} werden den folgenden Normen gemäß geprüft:

ISO DP 6336 für Zahnräder
ISO 281 für Lager.

4.3 Maximales Drehmoment M_{2max} [Nm]

Stellt den Wert des Abtriebsdrehmoments dar, mit dem das Getriebe in statischen oder Bedingungen mit häufigen Schaltungen belastet werden kann. (Wird als augenblicklicher Spitzendrehmoment oder als Anlaßdrehmoment unter Last verstanden).

4.4 Erforderliches Drehmoment M_{r2} [Nm]

Dies ist das von der Anwendung verlangte Drehmoment, das stets kleiner oder gleich dem Nenn- Abtriebsmoment M_{n2} des gewählten Getriebes sein muß.

4.5 Soll-Drehmoment M_{c2} [Nm]

Ist der Wert des Drehmoments, der für die Getriebewahl, unter Berücksichtigung des erforderlichen Drehmoments M_{r2} und des Betriebsfaktors f_s , zu verwenden ist und ergibt sich aus folgender Formel:

4.0 - COUPLE EN SORTIE

4.1 Couple motoréducteur M_2 [Nm]

C'est le couple transmis à la sortie du motoréducteur avec charge continue uniforme et facteur de sécurité S , voir tableaux données techniques, pour une durée de 10000 h.

4.2 Couple motoréducteur M_{n2} [Nm]

C'est le couple nominal transmis à la sortie du réducteur avec :

- charge continue uniforme
 - facteur de sécurité $S=1$ pendant une durée de 10000 h.
- Les valeurs de M_{n2} sont vérifiées conformément aux normes suivantes:
ISO DP 6336 pour les engrenages
ISO 281 pour les roulements.

4.3 Couple maximal M_{2max} [Nm]

C'est la valeur de couple en sortie que le réducteur peut supporter dans des conditions statiques ou de forte intermittence (considérée en tant que couple de pointe de charge instantanée ou couple de démarrage en charge).

4.4 Couple requis M_{r2} [Nm]

Il représente le couple requis par l'application et devra toujours être inférieur ou égal au couple en sortie nominal M_{n2} du réducteur choisi.

4.5 Couple de calcul M_{c2} [Nm]

C'est la valeur de couple à utiliser pour la sélection du réducteur en considérant le couple requis M_{r2} et le facteur de service f_s (tab. A3); elle résulte de la formule suivante:

$$M_{c2} = M_{r2} \times f_s \leq M_{n2}$$

(1)

5.0 - POTENZA

5.1 Potenza in entrata P_{n1} [kW]

La grandezza P_{n1} rappresenta la potenza massima applicabile al riduttore nelle condizioni di:

- azionamento alla velocità di comando n_1
- fattore di sicurezza $S=1$
- durata teorica di 10000 ore.

5.0 - POWER

5.1 Rated input power P_{n1} [kW]

P_{n1} is the maximum power that can be safely applied to the gearbox when the same is operated:

- at a n_1 drive speed
- under a safety factor $S=1$
- yielding a theoretical lifetime of 10000 hours.

5.0 - LEISTUNG

5.1 Leistung am Antrieb P_{n1} [kW]

In den Auswahltabellen der Getriebegrößen wird die maximal im Antrieb übertragbare Leistung in bezug auf:

- Drehzahl n_1 angegeben
- Sicherheitsfaktor $S=1$
- theoretische Dauer von 10000 Stunden berücksichtigt.

5.0 - PUISSANCE

5.1 Puissance en entrée P_{n1} [kW]

Le tableau de sélection de chaque taille de réducteur indique la puissance maximum transmissible en entrée en fonction de :

- vitesse n_1
- facteur de sécurité $S=1$
- pendant une durée théorique de 10000 heures.



5.2 Potenza in uscita P_2 [kW]

Il parametro rappresenta la potenza netta trasmessa all'albero lento del riduttore.
Il suo valore si può calcolare con le seguenti formule:

5.2 Output power P_2 [kW]

This value is the net power delivered to the output shaft. It can be calculated through the following formulas:

5.2 Leistung am Abtrieb P_2 [kW]

Dieser Wert stellt die an den Getriebeabtrieb übertragene Leistung dar.
Er ergibt sich aus folgenden Formeln:

5.2 Puissance en sortie P_2 [kW]

Cette valeur représente la puissance transmise à la sortie du réducteur. On peut la calculer avec les formules suivantes :

$$P_2 = P_1 \times \eta_d \quad (2)$$

$$P_2 = \frac{M_{r2} \times n_2}{9550} \quad (3)$$

Per i valori del rendimento η_d vedi tabella (A3).

Efficiency values are listed in table (A3).

In bezug auf den Wirkungsgrad η_d verweisen wir der tabelle (A3).

En ce qui concerne les valeurs du rendement η_d voir le tableau (A3).

6.0 - POTENZA TERMICA P_t [kW]

È il parametro che indica il limite termico del riduttore. Il valore è reperibile nelle tabelle dati tecnici riduttori e motoriduttori e rappresenta la potenza trasmissibile in servizio continuo in corrispondenza della velocità di azionamento n_1 e alla temperatura ambiente di 20°C senza che la temperatura del lubrificante superi la temperatura di 85-90°C e conseguentemente la superficie del riduttore i 75-80°C, in assenza di un sistema di raffreddamento ausiliario.

Per un tipo di servizio caratterizzato da una breve durata di funzionamento e da un tempo di sosta sufficientemente lungo da consentire il raffreddamento del gruppo, la potenza termica acquista scarsa rilevanza e si può rivelare trascurabile.

Se la temperatura ambiente è diversa da 20°C e/o il servizio è diverso da quello continuo è opportuno correggere il valore di potenza termica P_t introducendo il fattore correttivo f_t risultante dalla tabella (A1).

Verificare infine che sia sempre soddisfatta la relazione:

6.0 - THERMAL CAPACITY P_t [kW]

This parameter is linked to the gearbox thermal limit.

Values for the thermal capacity are listed within the rating charts of gearboxes and gearmotors and represent the mechanical power that can be transmitted continuously at an input speed n_1 and at an ambient temperature of 20°C, without the lubricant exceeding the temperature of 85-90°C and the gear case the temperature of 75-80°C, without the use a supplementary cooling system.

When the duty cycle is formed by short operating periods and rest time is long enough for the unit to cool down, the thermal capacity is hardly significant and it may be omitted from calculation.

Should the ambient temperature be different from 20°C and/or duty be intermittent, the thermal capacity P_t is to be adjusted through thermal factor f_t as listed in table (A1).

Finally, make sure that the following condition is always satisfied:

6.0 - WÄRMELEISTUNG P_t [kW]

Dieser Wert steht für die Wärmegrenzleistung des Getriebes. Angaben zur thermischen Grenzleistung werden in den Auswahltabellen der Getriebe und Getriebemotoren aufgeführt. Die Werte repräsentieren die mechanische Leistung die bei einer Eingangs-drehzahl n_1 und bei einer Umgebungstemperatur von 20°C dauerhaft übertragen werden kann, ohne dass die Schmiermitteltemperatur 85°C-90°C und die Gehäuse-temperatur 75°C-80°C ohne zusätzliche Kühlsysteme überschritten wird. Bei einem Betrieb, der sich durch eine kurzzeitige Betriebsdauer und eine für die Abkühlung der Gruppe ausreichend lang andauernde Aussetzzeit kennzeichnet, ist die Wärmeleistung von geringer Bedeutung und braucht daher nicht unbedingt berücksichtigt zu werden.

Wenn die Umgebungstemperatur von 20°C abweicht und/oder im Aussetzbetrieb gefahren wird, dann muss die Thermische Grenzleistung P_t mit dem Temperaturfaktor f_t gemäß Tabelle (A1) korrigiert werden.

Überprüfen Sie weiterhin ob immer folgenden Gegebenheiten eingehalten werden:

6.0 - PUISSANCE THERMIQUE P_t [kW]

C'est le paramètre qui indique la limite thermique du réducteur. La valeur est indiquée dans les tableaux de données techniques des réducteurs et des motoréducteurs et représente la puissance transmissible en service continu en correspondance de la vitesse d'entrée n_1 et à une température ambiante de 20°C sans que la température du lubrifiant ne dépasse pas la température de 85-90°C et, en conséquence, la surface du réducteur ne dépasse pas la température de 75-80°C sans recourir à un refroidissement auxiliaire.

Pour un type de service caractérisé par une durée de fonctionnement brève et par un temps de pause suffisamment long pour permettre le refroidissement du groupe, la puissance thermique ne revêt qu'une faible importance et peut, par conséquent, ne pas être prise en considération.

Si la température ambiante est différente de 20°C, et/ou le service n'est pas continu, il est opportun de corriger la valeur de puissance thermique P_t avec le facteur de correction f_t du tableau (A1).

Vérifier que l'équation suivante soit toujours satisfaite :

$$P_{r1} \leq P_t \times f_t \quad (4)$$

(A1)

t_a [°C]	Servizio continuo Continuous duty Dauerbetrieb Service continu	f_t			
		Servizio intermittente / Intermittent duty / Aussetzbetrieb / Service intermittent			
		Rapporto di intermittenza / Cyclic duration factor Relative Einschaltdauer / Rapport d'intermittence			
		80%	60%	40%	20%
10	1.2	1.3	1.6	1.8	2.0
20	1.0	1.1	1.3	1.5	1.7
30	0.9	1.0	1.2	1.3	1.5
40	0.7	0.8	0.9	1.0	1.2
50	0.5	0.6	0.7	0.8	0.9



Il rapporto di intermittenza (I)% è dato dal rapporto fra il tempo di funzionamento a carico t_f e il tempo totale ($t_f + t_r$), con t_r = tempo di riposo, espresso in percentuale:

Cyclic duration factor is the relationship of operating time under load t_f to total cycle time ($t_f + t_r$, where t_r stands for time at rest), expressed as a percentage.

Die relative Einschaltdauer (I) % wird von dem Verhältnis zwischen Betriebszeit unter Last t_f und der Gesamtbetriebszeit ($t_f + t_r$) gegeben, wobei t_r = Ruhezeit, in Prozenten ausgedrückt, ist.

Le rapport d'intermittence (I) % est donné par le rapport entre la durée de fonctionnement en charge t_f et le temps total ($t_f + t_r$) avec t_r = temps de repos, exprimé en pour cent :

$$I = \frac{t_f}{t_f + t_r} \times 100 \quad (5)$$

Se la potenza termica del riduttore in esecuzione convenzionale non soddisfa la condizione espressa dalla relazione (4) è suggerito ricorrere all'esecuzione caratterizzata da albero veloce cilindrico con ventola di raffreddamento, codici FV__, il cui valore di potenza termica è espresso nelle tabelle che seguono.

Should the gear unit in the conventional configuration fall short of thermal capacity and not verify the condition (4) above, it is recommended that the fan cooled input shaft - ordering code FV__ is specified instead. The relevant thermal capacity is listed in the charts here after.

Wenn die Wärmeleistung des Getriebes in der herkömmlichen Konfiguration überschritten wird und die oben genannten Bedingungen (4) nicht zutreffen, dann wird anstatt dessen die lüftergekühlte Eingangswelle, Option FV__, empfohlen. Die zulässige Wärmeleistung wird in der nachfolgenden Tabelle aufgeführt.

Si la puissance thermique du réducteur dans son exécution standard ne satisfait pas la condition exprimée dans la relation (4), il est suggéré d'utiliser la solution caractérisée par l'arbre rapide cylindrique avec ventilateur de refroidissement, codes FV__, dont la valeur de puissance thermique est exprimée dans les tableaux suivants.

(A2)

Potenza termica / Thermal capacity / Wärmeleistung / Puissance thermique							
Pt [kW] @ $n_1 = 1450$ rpm							
							
		FV05B	FV06B	FV07A	FV07B	FV010B	FV011B
303	L1	29	-	-	-	-	-
304	L1	30	-	-	-	-	-
305	L1	31	-	-	-	-	-
306	L1	-	45	-	-	-	-
	L2	31	-	-	-	-	-
307	L1	-	-	49	49	-	-
	L2	36	-	-	-	-	-
309	L1	-	-	52	52	-	-
	L2	36	-	-	-	-	-
310	L1	-	-	-	-	62	-
	L2	-	49	-	-	-	-
	L3	36	-	-	-	-	-
311	L1	-	-	-	-	-	62 (*)
	L2	-	-	53	52	-	-
	L3	36	-	-	-	-	-
313	L1	-	-	-	-	-	-
	L2	-	-	57	57	-	-
	L3	36	-	-	-	-	-
314	L2	-	-	-	-	67	-
	L3	-	52	-	-	-	-
	L4	33	-	-	-	-	-
315	L2	-	-	-	-	-	72 (*)
	L3	-	-	57	57	-	-
	L4	36	-	-	-	-	-
316	L2	-	-	-	-	-	72 (*)
	L3	-	-	57	57	-	-
	L4	36	-	-	-	-	-
317	L2	-	-	-	-	-	77 (*)
	L3	-	-	62	62	-	-
	L4	36	-	-	-	-	-
318	L3	-	-	-	-	-	62 (*)
	L4	-	-	45	45	-	-
319	L3	-	-	-	-	-	77 (*)
	L4	-	-	57	57	-	-
321	L3	-	-	-	-	-	87 (*)
	L4	-	-	62	62	-	-

Potenza termica / Thermal capacity / Wärmeleistung / Puissance thermique			
Pt [kW] @ $n_1 = 1450$ rpm			
			
		FV05B	FV06B
307	R2	52	-
309	R2	52	-
310	R2 (B)	-	82
	R2 (C)	-	82
311	R2 (B)	-	102
	R2 (C)	-	117
	R3	58	-
313	R2 (B)	-	102
	R2 (C)	-	117
	R3	58	-
314	R3 (B)	-	82
	R3 (C)	-	82
	R4	38	-
315	R3 (B)	-	102
	R3 (C)	-	117
	R4	58	-
316	R3 (B)	-	102
	R3 (C)	-	117
	R4	63	-
317	R3 (B)	-	117
	R3 (C)	-	127
	R4	68	-
318	R4 (B)	-	108
	R4 (C)	-	137
319	R4 (B)	-	122
	R4 (C)	-	142
321	R4 (B)	-	132
	R4 (C)	-	152

* @ $n_1 = 1150$ rpm



7.0 - RENDIMENTO

7.1 Rendimento dinamico $[\eta_d]$

È rappresentato dal rapporto fra la potenza misurata all'albero lento P_2 e quella applicata all'albero veloce P_1 :

7.0 - EFFICIENCY

7.1 Dynamic efficiency $[\eta_d]$

The parameter is defined as the relationship of the net power delivered to the output shaft P_2 to the power applied to the input shaft P_1 :

7.0 - WIRKUNGSGRAD

7.1 Dynamischer Wirkungsgrad $[\eta_d]$

Er ist gegeben durch das Verhältnis der Abtriebsleistung P_2 zur Antriebsleistung P_1 :

7.0 - RENDEMENT

7.1 Rendement dynamique $[\eta_d]$

Il est donné par le rapport entre la puissance en sortie P_2 et celle en entrée P_1 :

$$\eta_d = \frac{P_2}{P_1} \quad (6)$$

I valori indicativi di rendimento sono riportati nella tabella seguente.

Indicative values for the efficiency are listed in the chart here after.

Die Werte des indikativen Wirkungsgrads werden in der nachstehenden Tabelle aufgeführt.

Les valeurs indicatif de rendement sont indiquées sur le tableau suivant.

(A3)

N° stadi No. of reductions Anz. Stufen Nombre d'étages de réduction	Esecuzione / Configuration / Ausführung / Exécution		
	Epicycloidale Planetary Planetengetriebe Epicycloïdale	Combinato con riduttore a vite senza fine Combined with worm gear unit Kombiniert mit Schneckengetriebe Combinée avec réducteur à vis sans fin	Combinato con riduttore angolare Combined with right-angle unit Kombiniert mit Kegelradgetriebe Combinée avec réducteur angulaire
1	0.97	—	—
2	0.94	0.73	—
3	0.91	0.70	0.91
4	0.88	—	—

8.0 - RAPPORTO DI RIDUZIONE « i »

È definito come il rapporto fra la velocità di comando dell'albero veloce e la velocità misurata all'albero lento del riduttore.

8.0 - GEAR RATIO « i »

It is defined as the relationship of the speed the input shaft is driven at and the speed delivered at the output shaft of a gearbox.

8.0 - ÜBERSETZUNG « i »

Ist das Verhältnis zwischen Antriebs- und Abtriebsdrehzahl des Getriebes.

8.0 - RAPPORT DE REDUCTION « i »

C'est le rapport entre la vitesse d'entrée et la vitesse de sortie du réducteur.

$$i = \frac{n_1}{n_2} \quad (7)$$

9.0 - VELOCITÀ

9.1 Velocità in entrata n_1 [min⁻¹]

È la velocità con la quale è azionato il riduttore. Coincide con la velocità del motore nel caso in cui questo sia collegato direttamente al riduttore. Nel caso di azionamenti tramite trasmissioni esterne, la velocità del motore dovrà essere corretta in funzione del rapporto di trasmissione della trasmissione stessa. In questi casi è consigliabile che la velocità di comando del riduttore sia inferiore a 1400 min⁻¹. La velocità di comando non deve mai superare il valore indicato nelle tabelle dati tecnici dei riduttori.

9.0 - OPERATING SPEED

9.1 Input speed n_1 [min⁻¹]

The speed the gearbox is driven at. The value is coincident with the motor speed if this is directly connected to the gearbox. In case the gearbox is driven through an external transmission, the gearbox input speed is the speed of the motor divided by the reduction of the external transmission. In this case, it is recommended that the input speed be lower than 1400 min⁻¹. Input speed should never exceed the value listed in the gearbox rating chart.

9.0 - DREHZAHL

9.1 Drehzahl Antriebswelle n_1 [min⁻¹]

Ist die Geschwindigkeit des Antriebsmotors, wenn dieser direkt auf Achse mit dem Getriebe verbunden ist. Kann aber auch die Geschwindigkeit darstellen, die sich immer aus dem Motor und aus eventuellen Übersetzungsverhältnissen im Fall eines indirekten Antriebs ergibt, z.B. bei einem Riemenantrieb. In diesen Fällen wird am Getriebeantrieb eine unter 1400 min⁻¹ liegende Drehzahl empfohlen. Die Antriebsgeschwindigkeit darf die in den Tabellen der Getriebe angegebenen Werte nie überschreiten.

9.0 - VITESSE ANGULAIRE

9.1 Vitesse d'entrée n_1 [min⁻¹]

C'est la vitesse du moteur d'entraînement, au cas où celui-ci serait directement accouplé au réducteur de manière axiale. Ou bien la vitesse débouchant toujours du moteur, et des rapports de transmission éventuels, en cas d'entraînement indirect par exemple par courroies. Dans ces cas, une vitesse d'entrée au réducteur inférieure à 1400 min⁻¹ est conseillée. La vitesse en entrée ne doit jamais dépasser les valeurs indiquées aux tableaux des données techniques des réducteurs.

9.2 Velocità in uscita n_2 [min⁻¹]

È funzione della velocità in comando n_1 e del rapporto di trasmissione i , secondo la relazione:

9.2 Output speed n_2 [min⁻¹]

It is calculated from drive speed n_1 and gear ratio i , as per the following equation:

9.2 Abtriebsdrehzahl n_2 [min⁻¹]

Sie ist abhängig von der Antriebsdrehzahl n_1 und der Übersetzung i nach folgender Gleichung:

9.2 Vitesse en sortie n_2 [min⁻¹]

Elle varie en fonction de la vitesse d'entrée n_1 et du rapport de réduction i selon l'équation :

$$n_2 = \frac{n_1}{i} \quad (8)$$



10.0 - FATTORE DI SERVIZIO [f_s]

È un fattore che associa un valore numerico alla gravosità dell'applicazione.

Il parametro tiene conto, con qualche inevitabile approssimazione, della variabilità del carico col quale opera il riduttore, del tipo di servizio e della durata di funzionamento.

La tabella (A4) fornisce una indicazione per la determinazione del fattore di servizio.

10.0 - SERVICE FACTOR [f_s]

A parameter representing the severity of the application. This factor takes into account, although approximately, the type of load the gearbox operates with, the specific duty as well as the operating daily hours.

The table (A4) is of reference when determining the appropriate service factor.

10.0 - BETRIEBSFAKTOR [f_s]

Stellt einen Faktor dar, der die Applikationsart bestimmt. Er berücksichtigt, mit einer ausreichenden Annäherung, die Belastungsschwankungen, denen das Getriebe bei einer bestimmten Betriebsart und Betriebsdauer unterliegt.

Die Tabelle (A4) gibt einen Hinweis für die Auswahl des am besten geeigneten Betriebsfaktors.

10.0 - FACTEUR DE SERVICE [f_s]

C'est un facteur qui définit le type d'application. Il prend en considération, avec une approximation satisfaisante, la variabilité de la charge à laquelle le réducteur est soumis pour un type de service donné ainsi que la durée de fonctionnement.

Le tableau (A4) fournit une indication pour le choix du facteur de service le plus adapté.

(A4)

Fattore di servizio / Service factor / Betriebsfaktor / Facteur de service « f _s »						
Natura del carico Type of load Belastungsart Nature de la charge	N° avviamenti /ora Number of starts/hour Schaltungen/Std. N.bre démarrages/heures	Durata totale di funzionamento (h) Total operating hours (h) Gesamte Betriebsdauer (h) Durée totale de fonctionnement (h)				
		≤ 5000	10000	15000	25000	50000
		Durata di funzionamento giornaliera (h) Daily operating hours (h) Tägliche Betriebsdauer (h) Durée journalière de fonctionnement (h)				
		h < 4	4 < h < 8	8 < h < 12	12 < h < 16	16 < h < 24
Z						
Uniforme Uniform load Gleichmäßig Uniforme	Z < 10	0.90	1.00	1.15	1.30	1.60
	10 < Z < 30	0.95	1.15	1.30	1.50	1.80
	30 < Z < 100	1.00	1.25	1.45	1.60	2.00
Variabile con urti moderati Moderate shock load Variable mit mäßigen Stößen Variable avec chocs modérés	Z < 10	1.00	1.25	1.45	1.60	2.00
	10 < Z < 30	1.10	1.40	1.60	1.80	2.20
	30 < Z < 100	1.20	1.50	1.70	2.00	2.40
Variabile con urti forti Heavy shock load Variable mit starken Stößen Variable avec chocs fort	Z < 10	1.20	1.50	1.70	2.00	2.40
	10 < Z < 30	1.30	1.60	1.80	2.10	2.60
	30 < Z < 100	1.40	1.75	2.00	2.30	2.80

11.0 - FATTORE DI SICUREZZA [S]

È rappresentato dal rapporto fra la potenza trasmissibile dal riduttore in condizioni nominali e la potenza del motore elettrico installato.

11.0 - SAFETY FACTOR [S]

This is the relationship of the gear unit rated power to the power of the electric motor actually driving the unit.

11.0 - SICHERHEITSAKTOR [S]

Ist das Verhältnis zwischen der unter normalen Bedingungen vom Getriebe übertragenen Leistung und der Leistung des eingebauten Elektromotors.

11.0 - FACTEUR DE SECURITE [S]

C'est le rapport entre la puissance transmissible par le réducteur en conditions nominales et la puissance du moteur électrique installé.

$$S = \frac{P_{n1}}{P_1} \quad (9)$$

12.0 - SELEZIONE PRODOTTO

I dati necessari a completare la selezione di un riduttore, o motoriduttore, sono sintetizzati nella tabella (A5).

Una copia di questa, debitamente compilata in ogni parte, può essere inviata al nostro Servizio Tecnico per la selezione del riduttore più idoneo per la specifica applicazione.

12.0 - PRODUCT SELECTION

The key parameters that are necessary when selecting a gearbox, or a gearmotor, are listed in table (A5).

The form, duly filled in, can be forwarded to our Technical Service which will assist the Customer in selecting the most suitable drive for the specific application.

12.0 - ANTRIEBSAUSWAHL

Um ein Getriebe oder einen Getriebemotor in korrekter Weise auswählen zu können, muß man über einige grundsätzliche Daten verfügen. Daten, die auf der Tabelle (A5) zusammengefaßt werden.

Eine Kopie dieser Tabelle kann an unsere Verkaufsorganisation gesendet werden, um in dieser Weise gemeinsam die Wahl des für die jeweilige Applikationsart geeignetsten Getriebes treffen zu können.

12.0 - SELECTION

Pour choisir correctement un réducteur, ou motoréducteur, il est nécessaire de prendre en considération certaines données fondamentales, résumées dans le tableau (A5).

Un exemplaire de ce tableau peut être adressé à notre Organisation de vente afin de faciliter le choix du réducteur le plus adapté au type d'application.



(A5)

Tipo di applicazione
Type of application
Anwendung
Type d'application

**MOTORE ELETTRICO / ELECTRIC MOTOR
ELEKTROMOTOR / MOTEUR ELECTRIQUE**

Grandezza IEC
IEC size
IEC Baugröße
Taille CEI

RIDUTTORE / GEARBOX / GETRIEBE / REDUCTEUR

P_{r2} Potenza richiesta in uscita
Required output power
Am Abtrieb erforderliche Leistu
Puissance nécessaire en sortie

kW

M_{r2} Coppia richiesta in uscita
Required output torque
Am Abtrieb erforderliches Drehmoment
Couple nécessaire en sortie

Nm

n₂ Velocità in uscita
Output speed
Abtriebsdrehzahl
Vitesse en sortie

min⁻¹

n₁ Velocità in entrata
Input speed
Antriebsdrehzahl
Vitesse en entrée

min⁻¹

R₂ Carico radiale su albero in uscita
Radial load on output shaft
Radialkraft auf Abtriebswelle
Charge radiale sur l'arbre de sortie

N

X₂ Distanza di applicazione del carico
Load application distance
Abstand des Kraftangriffspunktes
Distance d'application de la charge

mm (*)

R₁ Carico radiale su albero in entrata
Radial load on input shaft
Radialkraft auf Antriebswelle
Charge radiale sur l'arbre d'entrée

N

X₁ Distanza di applicazione del carico
Load application distance
Abstand des Kraftangriffspunktes
Distance d'application de la charge

mm (*)

A₂ Carico assiale su albero in uscita
Thrust load on output shaft
Axialkraft auf Abtriebswelle
Charge axiale sur l'arbre de sortie

N (•)

A₁ Carico assiale su albero in entrata
Thrust load on input shaft
Axialkraft auf Antriebswelle
Charge axiale sur l'arbre d'entrée

N (•)

h Durata di vita
Requested life time
Lebensdauer
Durée de vie

h

t_a Temperatura ambiente
Ambient temperature
Umgebungstemperatur
Température ambiante

°C

P_n Potenza nominale
Rated power
Nennleistung
Puissance nominale

kW

Tensione di alimentazione
Motor voltage
Nennspannung des Motors
Tension d'alimentation moteur

V

N° poli
Number of poles
Anzahl der Pole
N.bre de pôles

Frequenza
Frequency
Frequenz
Fréquence

Hz

Fattore di intermittenza in accordo a CEI
Duty type to IEC norms
Relative Einschaltdauer gemäß CEI
Type de service selon CEI S...../.....%

S...../.....%

Z Frequenza di avviamento
Starts per hour
Schaltungshäufigkeit
Fréquence de démarrage

1/h

Grado di protezione motore
Motor protection degree
Schutzart des Motors
Degré de protection moteur IP.....

IP.....

Classe di isolamento
Insulation class
Isolierstoffklasse
Classe d'isolation

**FRENO SU MOTORE AUTOFRENANTE
MOTOR IN-BUILT BRAKE (IF FITTED)
BREMSE AUF SELBSTBREMSENDEM MOTOR
FREIN SUR MOTEUR AUTOFREINE**

Tensione di alimentazione freno
Brake voltage
Nennspannung der Bremse
Tension d'alimentation du frein

V

M_b Coppia frenante
Brake torque
Bremsmoment
Couple de freinage

Nm

Esecuzione
Type
Ausführung
Exécution



In linea
In line
In Reihe
Linéaire



Angolare
Right angle
Auf Winkel
Angulaire



Combinato con riduttore a vite senza fine
Combined with worm gearbox
Kombinierte mit Schneckengetriebe
Combiné avec réducteur à vis sans fin

Versione uscita
Output version
Abtriebsversion
Version sortie

Accessori
Accessories
Zubehör
Accessoires

Posizione di montaggio
Mounting position
Montageposition
Position de montage

N.B: Tab. (A4)

(*) La distanza X₁₋₂ è quella compresa fra il punto di applicazione della forza e la battuta dell'albero (se non indicata, si considererà la forza agente sulla mezziera della sporgenza dell'albero).

(•) + = compressione
- = trazione

N.B: Table (A4)

(*) Dimension x₁₋₂ is the distance between the point the force applies and the shaft shoulder (if not specified a force applying at mid-point of the shaft will be assumed).

(•) + = push
- = pull

N.B: Tab. (A4)

(*) Der Abstand X₁₋₂ ist der Abstand vom Kraftangriffspunkt zum Wellenansatz (wenn nicht anders angegeben, wird davon ausgegangen, daß die Kraft auf der Mitte des Wellenendes angreift).

(•) + = Druck
- = Zug

N.B: Tab. (A4)

(*) La distance X₁₋₂ est celle comprise entre le point d'application de la force et l'épaule de l'arbre (si non précisée l'on considèrera la force agissant au milieu de la saillie de l'arbre).

(•) + = compression
- = traction

**N.B.**

I criteri di scelta e i dati tecnici riportati in questo catalogo non sono validi per tutte le applicazioni, come ad esempio impianti di sollevamento, dove il riduttore funziona come organo di sicurezza verso persone e/o cose. In questi casi la selezione del riduttore deve essere fatta con criteri specifici, ed eventualmente in accordo alle vigenti norme di sicurezza, per cui è necessario interpellare il Servizio Tecnico di BONFIGLIOLI.

NOTE:

The selection criteria and specifications reported in this catalogue are not valid for every and each application, including those where the gearbox operates as a safety device preventing injury to persons or damage to objects, as is the case with hoisting equipment. For these applications, the gearbox should be selected according to specific criteria and in compliance with the applicable safety regulations. Should this be the case we recommend that you seek advice from BONFIGLIOLI Technical Service.

MERKE:

Die Auswahlkriterien und die technischen Daten, die in diesem Katalog aufgeführt werden, sind nicht für alle Applikationsarten gültig, wie z.B. an Hebeanlagen, wo das Getriebe die Funktion eines Sicherheitsorgans im Hinblick auf den Personen- und/oder Sachschutz hat. In diesen Fällen muß die Getriebewahl unter Anwendung spezifischer Kriterien und eventuell in Übereinstimmung mit den Sicherheitsnormen erfolgen. Es ist daher erforderlich, daß Sie sich diesbezüglich mit einer Verkaufsstelle der BONFIGLIOLI in Verbindung setzen.

N.B.

Les critères de sélection et les données techniques indiqués dans ce catalogue ne sont pas valables pour toutes les applications, telles que les équipements de levage, où le réducteur a fonction d'organe de sécurité vis-à-vis du personnel et des matériels. Dans ces cas, la sélection du réducteur doit être faite avec des critères spécifiques, et, s'il y a lieu, en conformité avec les règles de sécurité en vigueur; c'est pourquoi il faut consulter l'organisation de vente BONFIGLIOLI.

12.1 Selezione motoriduttore

In base al tipo di applicazione definire:

- a) il fattore di servizio f_s in funzione del tipo di carico, del n° di avviamenti/ora e della durata richiesta (tab A4);
- b) La potenza necessaria all'alimentazione:

12.1 Selecting a gearmotor

Consider the specific application and establish on beforehand:

- a) *service factor f_s according to type of load, number of starts per hour and expected lifetime (tab. A4);*
- b) *Required drive power:*

12.1 Wahl der Getriebemotor

Der Applikationsart gemäß ist folgendes zu definieren:

- a) Betriebsfaktor f_s in Abhängigkeit zur Belastungsart, zu den Schaltungen/Std. und zu geforderter Dauer (Tab. A4);
- b) die für den Antrieb erforderliche Leistung:

12.1 Choix du motoréducteur

En fonction du type d'application, il est nécessaire de définir :

- a) *le facteur de service f_s en fonction du type de charge et du nombre de démarrage/heure et de la durée nécessaire (tab. A4);*
- b) *La puissance nécessaire au mouvement;*

$$P_{r1} = \frac{M_{r2} \times n_2}{9550 \times \eta_d} \quad (10)$$

La tabella (A3) riporta i valori indicativi di rendimento η_d per vari tipi di riduttore.

Table (A3) lists the indicative values of efficiency η_d for the different types of gearboxes.

Die Tabelle (A3) führt die indikativen Werte des Wirkungsgrads η_d bezüglich der unterschiedlichen

Le tableau (A3) indique les valeurs indicatives de rendement η_d relatives aux différents types de réducteurs

- c) Disponendo del valore di potenza P_{r1} preventivamente calcolato e della velocità richiesta all'albero n_2 , consultare le tabelle di selezione motoriduttori identificando la tabella relativa alla potenza P_n normalizzata maggiore o uguale a P_{r1} :

- c) *After required power P_{r1} and output speed n_2 are known, locate the gearmotor rating charts and select the one relevant to normalized power P_n equal to or greater than P_{r1} :*

- c) Unter Bezugnahme auf den berechneten Leistungswert P_{r1} und die erforderliche Drehzahl n_2 , die Tabelle der technischen Daten der Getriebemotoren konsultieren, dabei die Tabelle bezüglich der genormten Leistung P_n , die dem Wert P_{r1} gleich kommt oder größer ist, herausuchen.

- c) *Une fois la valeur de puissance P_{r1} calculée et le nombre de tours n_2 demandé, consulter les tableaux des données techniques des motoréducteurs après avoir identifié le tableau correspondant à la puissance P_n normalisée, supérieure ou égale à P_{r1} .*

$$P_n \geq P_{r1} \quad (11)$$

Se non diversamente indicato, la potenza P_n dei motori riportata a catalogo si riferisce al servizio continuo S1.

Per i motori utilizzati in condizioni diverse da S1, può essere opportuno identificare il tipo di servizio previsto con riferimento alle Norme CEI 2-3/IEC 60034-1.

In particolare, per i servizi da S2 a S8 e per le grandezze motore uguali o inferiori a 132, è possibile ottenere una maggiorazione della potenza rispetto a quella prevista per il servizio continuo.

In questo caso la condizione da soddisfare sarà:

Unless otherwise specified, power P_n listed in the motor rating chart refers to continuous duty S1.

For motors operating in conditions other than S1, determine type of duty according to CEI 2-3/IEC 60034-1 standards.

Note that for duty cycles from S2 to S8 and motor frame sizes up to 132 included, power may be upgraded over that specified for continuous duty.

In this event, the condition to be verified is the following:

Falls nicht anders angegeben, bezieht sich die im Katalog angegebene Leistung der Motoren P_n auf den Dauerbetrieb S1.

Bei Motoren, die unter von S1 abweichenden Bedingungen verwendet werden, muß unter Bezugnahme auf die Normen CEI 2-3/IEC 60034-1 die entsprechende Betriebsart identifiziert werden.

Insbesondere ist es für Betriebe von S2 bis S8 und für Motorgrößen, die gleich oder größer als 132 sind, möglich, der für den Dauerbetrieb vorgesehenen Leistung gegenüber einen Leistungsausbau zu erhalten. Die zu erfüllende Bedingung ist daher:

Sauf indication diverse, la puissance P_n des moteurs indiquée dans le catalogue se réfère au service continu S1.

En cas de moteurs utilisés dans des conditions différentes de S1, il est nécessaire de déterminer le type de service prévu, dans le respect des Normes CEI 2-3 IEC 60034-1.

Plus particulièrement, en ce qui concerne les services de S2 à S8 et pour des tailles de moteur égales ou inférieures à 132, il est possible d'obtenir une majoration de la puissance par rapport à celle prévue pour le service continu, par conséquent, la condition doit être la suivante :

$$P_n = \frac{P_{r1}}{f_m} \quad (12)$$

Il fattore di maggiorazione f_m è ricavabile dalla tabella (A6).

The adjusting factor f_m can be obtained from table (A6).

Der Überdimensionierungsfaktor f_m kann der Tabelle (A6) entnommen werden.

Le facteur de majoration f_m se trouve dans le tableau (A6).



(A6)

	SERVIZIO / DUTY CYCLE / BETRIEB / SERVICE					
	S2			S3*		
	Durata del ciclo / Cycle time Zyklusdauer / Durée du cycle			Rapporto di intermittenza I / Cyclic duration rate I Relative Einschaltdauer I / Rapport d'intermittence I		
	10	30	60	25%	40%	60%
f_m	1.35	1.15	1.05	1.25	1.15	1.1

* La durata del ciclo dovrà comunque essere uguale, o inferiore, a 10 minuti; se superiore interpellare il nostro Servizio Tecnico.

* Cycle time must be equal to or less than 10 minutes. Should this not be the case contact our Technical Service for assistance.

* Die Zyklusdauer muß jedoch kürzer oder gleich 10 Minuten sein; sollte sie darüber liegen, sollten Sie sich mit unserer Verkaufsorganisation in Verbindung setzen.

* Dans tous les cas, la durée du cycle doit être égale ou inférieure à 10 minutes ; en cas de durée supérieure, contacter notre Service Technique.

Rapporto di intermittenza: vedere formula (5).

Cyclic duration rate: see formula (5).

Relative Einschaltdauer siehe Formel (5).

Rapport d'intermittence: voir formule (5).

Selezionare infine, in corrispondenza della velocità all'albero n_2 , il motoriduttore che presenta un fattore di sicurezza **S** che garantisce la seguente condizione:

For the output speed n_2 , or closest to, select the gearbox that yields a safety factor **S** meeting the following condition:

Daraufhin der Abtriebsdrehzahl n_2 gemäß, einen Getriebemotor mit einem Soll-Sicherheitsfaktor **S** auswählen, der folgendes gewährleistet:

Ensuite, en fonction de la vitesse de sortie n_2 , choisir le motoréducteur avec un facteur de sécurité **S** calculé assurant :

$$S \geq f_s \quad (13)$$

L'abbinamento di motori di grossa taglia a riduttori monostadio delle grandezze **300-307** con configurazione di uscita **FP** può comportare la limitazione della durata di vita teorica del riduttore. In questo caso contattare preventivamente il Servizio Tecnico di Bonfiglioli Riduttori.

The combination of large, heavy weight, motors with single reduction units of sizes **300 to 307** in the **FP** configuration, may result into a reduced theoretical lifetime for the gearbox. Should this be your case, kindly contact the local Bonfiglioli Technical Service for directions.

Durch die Kombination von großen, schweren Motoren mit einstufigen Planeten-getrieben der Baugröße **300 bis 307** in **FP** Ausführung, kann die theoretische Lebensdauer des Getriebes reduziert werden. In diesen Fällen kontaktieren Sie den technischen Service von Bonfiglioli.

L'assemblage entre des moteurs de grosse taille et des réducteurs monostage de taille **300-307** en version **FP** peut conduire à une limitation de la durée de vie théorique du réducteur. Dans ce cas nous vous conseillons de contacter préalablement notre Service Technique.

12.2 Selezione del riduttore

In base al tipo di applicazione definire:

- a) il fattore di servizio f_s in funzione del tipo di carico, del numero di avviamenti/ora e della durata richiesta (tab. A4);
- b) con il valore di coppia richiesta in uscita M_{r2} , determinare la coppia di calcolo:

12.2 Selecting a gearbox

Examine the application and establish:

- a) service factor f_s according to type of load, number of starts per hour and required lifetime (tab. A4);
- b) Determine calculated torque according to required output torque M_{r2} as follows:

$$M_{c2} = M_{r2} \times f_s \quad (14)$$

- c) In base alla velocità all'albero lento n_2 e a quella di comando n_1 , calcolare il rapporto di trasmissione:

- c) Determine gear ratio from required output speed n_2 and drive speed n_1 :

$$i = \frac{n_1}{n_2} \quad (15)$$

- d) disponendo dei valori di M_{c2} e i , consultare la tabella dati tecnici riduttori relativa alla velocità di comando n_1 e selezionare da questa il riduttore con il rapporto di trasmissione più prossimo a quello calcolato e che assicuri contemporaneamente la condizione:

- d) Once M_{c2} and i are determined, locate the gearbox rating chart for the drive speed n_1 and select a gearbox featuring the ratio i nearest to calculated ratio that also satisfies the condition:

$$M_{n2} \geq M_{c2} \quad (16)$$

12.2 Wahl der Getriebe

Der Applikationsart gemäß folgendes definieren:

- a) Betriebsfaktor f_s in Abhängigkeit zur Belastungsart, zu den Schaltungen/Std. und zu geforderter Dauer (Tab. A4);
- b) mit dem am Abtrieb erforderlichen Drehmoment M_{r2} den Soll-Drehmoment bestimmen:

12.2 Choix du réducteur

En fonction du type d'application, il est nécessaire de définir :

- a) le facteur de service f_s en fonction du type de charge et du nombre de démarrage/heure et de la durée nécessaire (tab. A4) ;
- b) avec la valeur de couple requise en sortie M_{r2} , déterminer le couple de calcul

- c) en fonction de la vitesse en sortie n_2 requise et de celle n_1 en entrée, calculer le rapport de réduction :

- d) avec la valeur de M_{c2} et i , consulter les tableaux des données techniques réducteurs correspondants à la vitesse n_1 puis sélectionner le réducteur ayant le rapport le plus proche de celui calculé et assurant :



Se al riduttore dovrà essere applicato un motore elettrico, verificarne l'applicabilità consultando le tabelle delle predisposizioni possibili.

If a IEC-normalised motor is to be fitted onto the gearbox, check availability of the applicable adapter.

Falls am ausgewählten Getriebe ein Elektromotor der Bauform B5 angebracht werden soll, muß die entsprechende Applizierbarkeit unter Bezugnahme auf die Tabellen, in denen die entsprechenden Möglichkeiten aufgeführt sind, geprüft werden.

Si le réducteur choisi doit être appliqué à un moteur électrique de forme B5, vérifier ses possibilités d'application en consultant les tableaux des dispositions possibles.

13.0 - VERIFICHE

Effettuata la selezione si raccomanda di procedere alle seguenti verifiche:

a) Potenza termica

Assicurarsi che la potenza termica del riduttore sia uguale, o superiore, alla potenza meccanica richiesta dall'applicazione. Vedi relazione (4) a pag. 9. In caso contrario provvedere ad applicare un sistema di raffreddamento ausiliario (vedi cap. 29) oppure selezionare un riduttore di grandezza superiore.

b) Coppia massima

Verificare che né la coppia istantanea di picco né la coppia di spunto sotto carico superino il valore di M_{2max} ammesso per il riduttore (vedi tab A7).

(A7)

Riduttore / Gearbox Getriebe / Réducteur	M_{2max} [Nm]	Riduttore / Gearbox Getriebe / Réducteur	M_{2max} [Nm]
300	1200	311	54000
301	2400	313	66000
303	3500	314	100000
304	4800	315	126000
305	7000	316	162000
306	12000	317	216000
307	18000	318	300000
309	27000	319	420000
310	36000	321	650000

c) Carichi radiali

In base al tipo di applicazione definire:
- la forza radiale risultante sull'albero in entrata o in uscita, secondo la seguente formula:

c) Overhung load

*Examine the application and establish:
- overhung load applying to input and/or output shaft through the following formula:*

c) Radialkräfte

Der Applikationsart gemäß, folgendes definieren:
- auf Antriebs- und Abtriebswelle einwirkende Radialkraft, gemäß folgender Formel:

c) Charges radiales

*En fonction du type d'application définir :
- la charge radiale sur l'arbre en entrée ou en sortie selon la formule suivante :*

$$R_{c1-2} = \frac{2000 \times M_{r1-2} \times K_r}{d} \quad (17)$$

R_{c1-2} carico radiale (N)

$_1$ = su albero veloce

$_2$ = su albero lento

M_{r1-2} Coppia all'albero (Nm)

d Diametro primitivo (mm) dell'organo calettato sull'albero (pignone, ingranaggio, puleggia, ecc.)

$K_r = 1$ pignone per catena

$K_r = 1,25$ ingranaggio

$K_r = 1,5-2,5$ puleggia per cinghia trapezoidale

R_{c1-2} overhung load (N)

$_1$ = for input shaft

$_2$ = for output shaft

M_{r1-2} Torque at the shaft (Nm)

d P.C.D (mm) of transmission element (sprocket, gear, pulley, etc.)

$K_r = 1$ chain transmission

$K_r = 1,25$ gear transmission

$K_r = 1,5-2,5$ V-belt transmission

R_{c1-2} Radialkraft (N)

$_1$ = auf Antriebswelle

$_2$ = auf Abtriebswelle

M_{r1-2} Drehmoment auf Welle (Nm)

d Durchmesser (mm) des Kettenrads, des Zahnrads, der Riemenscheibe, usw.

$K_r = 1$ Kettenrad

$K_r = 1,25$ Zahnrad

$K_r = 1,5-2,5$ Riemenscheibe für V Rieme

R_{c1-2} charge radiale (N)

$_1$ = sur l'arbre rapide

$_2$ = sur l'arbre lent

M_{r1-2} Couple sur l'arbre (Nm)

d Diamètre (mm) de la roue pour chaînes, engrenage, poulies, etc.

$K_r = 1$ roue pour chaîne

$K_r = 1,25$ engrenage

$K_r = 1,5-2,5$ poulie pour courroie en V



- qualora la durata richiesta sia diversa da 10000 h, il fattore di durata f_L secondo la tabella (A8).

- *for extended lifetime requirements, look up lifetime factor f_L in table (A8).*

- sollte die geforderte Dauer von den 10000 Stunden abweichen, den Dauerfaktor f_L , welcher der Tabelle (A8) entnommen werden kann.

- *en cas de durée requise autre de 10000 h, le facteur de durée f_L selon le tableau (A8).*

(A8)

Durata / Lifetime Dauer / Durée	2500 h	5000 h	10000 h	15000 h	25000 h	50000 h	100000 h
f_L	0.66	0.81	1.00	1.13	1.32	1.62	2.00

c1) albero lento

- per carichi in mezzzeria verificare che sia soddisfatta la seguente relazione:

c1) output shaft

- *for loads applying at shaft mid-point, check that the following condition is verified:*

c1) Abtriebswelle

- Bei Belastungen, die auf die Wellenmitte einwirken, prüfen, ob folgende Bedingung gegeben ist:

c1) arbre en sortie

- *pour des charges sur la moitié, vérifier l'existence de l'équation :*

$$R_{n2} \geq R_{c2} \times f_L \quad (18)$$

dove R_{n2} è il carico in mezzzeria ammissibile riportato nelle tabelle dei dati tecnici.

where R_{n2} is the permitted load at shaft mid-point, as listed in the rating charts.

wobei R_{n2} die zulässige, auf die Wellenmitte einwirkende Kraft darstellt, diese wird in den Tabellen der entsprechenden technischen Daten aufgeführt.

où R_{n2} est la charge admissible à la moitié indiquée dans les tableaux des données techniques.

- Per posizioni del carico diverse dalla mezzzeria (escluso esecuzione FZ) definire la posizione del carico x sull'albero e leggere il fattore moltiplicativo f_{x2} sul diagramma corrispondente (riportato dopo le pagine relative alle dimensioni della grandezza selezionata). Deve essere verificato:

- *Should the point of application not be located at shaft mid-point - with the exception of version FZ - establish the offset value x and find the adjusting factor f_{x2} in the relevant diagram (following the pages showing the installation drawing of gearbox under study). The following condition must be verified:*

- Für Kraftangriffspunkte außerhalb der Wellenmitte (ausgenommen Ausführung FZ), an der Welle die Position der Kräfteinwirkung x bestimmen und am entsprechenden Diagramm (folgt den Seiten mit den Maßen der gewählten Größe) den Multiplikationsfaktor f_{x2} erheben. Es muß folgendes geprüft werden:

- *Pour des positions de la charge autres que sur la moitié (à l'exclusion de l'exécution FZ), définir la position de la charge x sur l'arbre et repérer le facteur de multiplication f_{x2} sur le diagramme correspondant (reporté après les pages relatives aux dimensions de la taille sélectionnée). Vérifier l'existence de l'équation :*

$$R_{x2} = R_{n2} \times f_{x2} \geq R_{c2} \times f_L \quad (19)$$

- Esecuzione VK

Determinare:
- Carico radiale R_{c2}
- Carico assiale A_{c2}
- Distanza x del carico R_{c2}

Leggere sul diagramma relativo al riduttore in oggetto, in corrispondenza della distanza x e del rapporto A_{n2}/R_{n2} più prossimo al valore A_{c2}/R_{c2} , il valore del carico radiale ammissibile R_{x2} . Deve essere verificato:

- VK output

Determine:
- Radial load R_{c2}
- Thrust load A_{c2}
- Offset x of load R_{c2}

Look up the diagram relevant to the gearbox under study and identify permitted radial load R_{x2} corresponding to distance x and the ratio A_{n2}/R_{n2} nearest to value A_{c2}/R_{c2} . Make sure the following equation is verified:

- Ausführung VK

Folgendes bestimmen:
- Radialkraft R_{c2}
- Axialkraft A_{c2}
- Position x der Kräfteinwirkung R_{c2}

Am zur gewählten Größe gehörigen Diagramm, beim Wert x und dem Verhältnis A_{n2}/R_{n2} , welches A_{c2}/R_{c2} am nächsten kommt, den Wert der zulässigen Radialkraft R_{x2} ablesen. Es muß folgendes gegeben sein:

- Exécution VK

Définir :
- Charge radiale R_{c2}
- Charge axiale A_{c2}
- Position x de la charge R_{c2}

Sur le diagramme relatif à la taille sélectionnée, repérer, en face de la valeur x et du rapport A_{n2}/R_{n2} le plus proche de la valeur A_{c2}/R_{c2} , la valeur de la charge radiale admissible R_{x2} . Vérifier l'existence de l'équation :

$$R_{x2} \geq R_{c2} \quad (20)$$

I valori diagrammati sono validi per:

- velocità $n_2 = 10 \text{ min}^{-1}$
- durata teorica 10000 h

Per valori di velocità in uscita n_2 , o per durate diverse, definire:

- fattore di velocità f_{n2} secondo la tabella (A9):

Values in the diagram refer to:

- $n_2 = 10 \text{ rpm}$
- 10000 hrs theoretical lifetime

For different output speed n_2 , or lifetime expectancy, consider:

- a speed factor f_{n2} as per table (A9):

Die im Diagramm dargestellten Werte sind für

- $n_2 = 10 \text{ min}^{-1}$
- 10000 Std. gültig

Für die Werte der Abtriebsdrehzahl n_2 oder abweichenden Belastungsdauern, muß folgendes definiert werden:

- Drehzahlfaktor f_{n2} gemäß

Les valeurs indiquées sur le diagramme sont valables pour:

- $n_2 = 10 \text{ min}^{-1}$
- durée 10000 h

En cas de valeurs de vitesse en sortie n_2 ou de durée différentes, définir :

- facteur de vitesse f_{n2} selon le tableau (A9) suivant :

(A9)

n_2	1	2.5	5	10	15	25	50	100
f_{n2}	2.0	1.51	1.23	1.00	0.88	0.76	0.62	0.50



- fattore di durata f_L secondo la tabella (A8).
Deve essere verificato:

- a lifetime factor f_L according to table (A8).
This condition must be verified:

- Dauerfaktor f_L gemäß Tabelle (A8):
Folgendes muß gegeben sein:

- facteur de durée f_L selon le tableau (A8) :
Vérifier l'existence de l'équation :

$$R_{x2} \times f_{n2} \geq R_{c2} \times f_L$$

(21)

c₂)albero veloce

Con il valore di carico R_{c1} calcolato con la formula (17), definire la posizione assiale x sull'albero e leggere il valore del carico ammissibile R_{n1} sul diagramma dei carichi relativo alla grandezza di riduttore selezionato.
Deve essere verificato:

c₂)input shaft

Based on the load value R_{c1} calculated through formula (17), determine point of load application over shaft length x and locate permitted load R_{n1} in the load diagram relevant to the specific gearbox.
The following condition must be verified:

c₂)Antriebswelle

Unter Anwendung des anhand der Formel (17) berechneten Belastungswerts R_{c1} , die Axialposition x an der Welle bestimmen und den zulässigen Belastungswert R_{n1} am Belastungsdiagramm bezüglich der Größen des ausgewählten Getriebes erheben.
Folgendes muß gegeben sein:

c₂)arbre en entrée

Avec la valeur de charge R_{c1} calculée selon la formule (17), définir la position axiale x sur l'arbre et repérer la valeur de la charge admissible R_{n1} sur le diagramme des charges relatif à la taille de réducteur sélectionnée.
Vérifier l'existence de l'équation :

$$R_{n1} \geq R_{c1}$$

(22)

I valori diagrammati sono validi per:

- velocità $n_1 = 1000 \text{ min}^{-1}$
- durate teoriche di 10000 h

Per valori di velocità, o di durata diversi, definire: fattore di velocità f_{n1} secondo la tabella (A10) seguente:

Values listed in the diagram apply for:

- drive speed $n_1 = 1000 \text{ rpm}$
- 10000 hrs theoretical lifetime

For different input speed, or life expectancy, consider: The adjusting factor f_{n1} as per table (A10) here below:

Die im Diagramm dargestellten Werte sind bei:

- $n_1 = 1000 \text{ min}^{-1}$
- 10000 Std. gültig

Bei abweichenden Werten der Antriebsdrehzahl n_1 oder der Belastungsdauern, ist folgendes zu definieren: Drehzahlfaktor f_{n1} gemäß der nachstehenden Tabelle (A10):

Les valeurs indiquées sur le diagramme sont valables pour

- $n_1 = 1000 \text{ min}^{-1}$
- durée 10000 h

En cas de valeurs de vitesse en entrée n_1 , ou de durée différentes, définir: Facteur de vitesse f_{n1} selon le tableau (A10) suivant

(A10)

n_1	500	750	900	1200	1500	1800
f_{n1}	1.23	1.09	1.03	0.95	0.89	0.84

- fattore di durata f_L secondo la tabella (A8).

Deve essere verificato:

- a lifetime factor f_L as per table (A8).

The following condition must be verified:

- Dauerfaktor f_L , welcher der Tabelle (A8) entnommen werden kann.

Folgendes muß gegeben sein

- facteur de durée f_L selon le tableau (A8):

Vérifier l'existence de l'équation :

$$R_{n1} \times f_{n1} \geq R_{c1} \times f_L$$

(23)

d) Carichi assiali

Determinare il valore e verso di applicazione del carico Ac_2 che grava assialmente sull'albero del riduttore. Per il riduttore selezionato individuare il fattore moltiplicativo fa_2 corrispondente al tipo di uscita e al verso di applicazione del carico, con i segni (+) e (-) convenzionalmente assegnati come segue:

d) Thrust loads

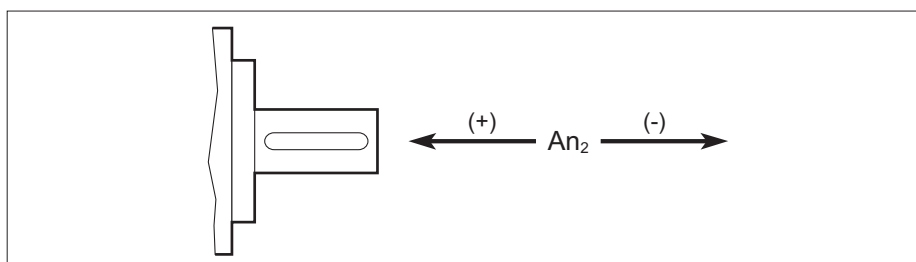
Calculate value and direction of thrust Ac_2 that applies axially onto the shaft. For the gearbox under study locate the adjusting factor fa_2 corresponding to the type of output and the direction the thrust load applies, with the signs (+) and (-) conventionally applied as follows:

d) Axialkräfte

Den Wert und die Richtung der Kraft Ac_2 festlegen, die axial auf die Getriebewelle einwirkt. Für das ausgewählte Getriebe den Multiplikationsfaktor fa_2 ermitteln, der der Abgangsart und der Richtung der Axialbelastung entspricht. Dabei werden die Zeichen (+) und (-) wie folgt angewandt:

d) Charges axiales

Calculer la valeur et la direction de la charge Ac_2 qui s'applique axialement sur l'arbre du réducteur. Pour le réducteur sélectionné, déterminer le facteur multiplicateur fa_2 correspondant au type de sortie et au sens d'application de la charge, avec les signes (+) et (-) conventionnellement choisis comme suit:





Con **Rn₂** e **fa₂** calcolare il valore del carico assiale ammissibile **An₂**:

From **Rn₂** and **fa₂** determine the value of admissible thrust load **An₂**:

Den zulässigen Axialbelastungswert **An₂** mit **Rn₂** und **fa₂** berechnen:

A partir de **Rn₂** et de **fa₂**, déterminer la valeur de la charge axiale **An₂** admissible:

$$An_2 = Rn_2 \times fa_2$$

(24)

Dalla tabella (A8) selezionare il fattore correttivo **f_L** corrispondente alla durata teorica attesa per i cuscinetti.

From chart (A8) select the adjusting factor **f_L** corresponding to the theoretical lifetime of bearings that is to be expected.

In der Tabelle (A8) den Korrekturfaktor **f_L** auswählen, der der theoretisch zu erwartenden Lebensdauer der Lager entspricht.

A partir de la table (A8) sélectionner le facteur de correction **f_L** correspondant à la durée de vie théorique souhaitée pour les roulements.

Dalla tabella seguente individuare il fattore correttivo del carico assiale **K_a** in funzione del tipo di applicazione del carico stesso:

From chart below locate the axial load duty factor **K_a** depending on the type of loading that is applicable:

In der nachstehenden Tabelle den Korrekturfaktor der Axialbelastung **K_a** je nach Einwirken der Belastung auswählen:

A partir de la table ci-après, sélectionner le facteur de correction de la charge axiale **K_a** en fonction du type d'application de cette charge:

	Natura del carico / Type of duty / Belastungsart / Nature de la charge		
	Uniforme / Uniform Gleichmäßig / Uniforme	Urti moderati / Moderate shock Mit mäßigen Stößen / Chocs modérés	Forti urti / Heavy shock Mit starken Stößen / Chocs fort
K_a	1.0	1.25	1.5

Con i fattori così predeterminati verificare infine che la seguente condizione sia soddisfatta:

With all factors so determined verify that the following condition is satisfied:

Nachdem diese Faktoren festgelegt wurden, muss überprüft werden, dass folgende Bedingung gegeben ist:

Avec les facteurs ainsi déterminés, vérifier que la condition suivante soit satisfaite:

$$Ac_2 \times f_L \times K_a \leq An_2$$

(25)

Per carichi radiali e assiali agenti contemporaneamente, contattare preferibilmente il nostro Servizio Tecnico.

If radial and axial loads apply simultaneously, please consult Bonfiglioli's Technical Service.

Wirken Radial- und Axialbelastungen gleichzeitig, wird empfohlen, unseren Kundendienst zu kontaktieren.

Dans le cas de charges radiales et axiales appliquées simultanément, contacter le Service Technique de Bonfiglioli.

14.0 - SCELTA DEL MOTORE

a) Tramite la formula sotto riportata ricavare la potenza richiesta all'albero veloce del riduttore, dopo aver preventivamente determinato:

- la coppia **M_{r2}**
- la velocità **n₂**
- il rendimento **η_d**

14.0 - SELECTING THE MOTOR

a) Through the formula here after calculate the power required to gearbox input shaft. The following parameters must be determined on beforehand:

- required torque **M_{r2}**
- output speed **n₂**
- efficiency **η_d**

14.0 - WAHL DES MOTOR

a) Da man **n₂** und den dynamischen Wirkungsgrad **η_d** kennt, kann man aus dem Drehmoment **M_{r2}** nun die Antriebsleistung errechnen:

14.0 - CHOIX DU MOTEUR

a) La formule ci-dessous permet de calculer la puissance requise sur l'arbre rapide du réducteur après avoir déterminé :

- le couple **M_{r2}**
- la vitesse **n₂**
- le rendement **η_d**

$$P_{r1} = \frac{M_{r2} \times n_2}{9550 \times \eta_d}$$

(26)

La tabella (A3) fornisce i valori di rendimento **η_d** indicativi relativi ai vari tipi di riduttore.

Table (A3) lists the efficiency values **η_d** for the various types of gearboxes.

Die Tabelle (A3) führt die Anhaltswerte des Wirkungsgrads **η_d** auf, die sich auf die unterschiedlichen Getriebetypen beziehen.

Le tableau (A3) indique les valeurs de rendement **η_d** indicatives relatives aux différents types de réducteur.

b) Nelle tabelle dati tecnici dei motori selezionare un motore

b) In the electric motor section select a motor that is sufficient

b) In den Tabellen mit den technischen Motordaten eine

b) Sélectionner au tableau données techniques des mo-



re caratterizzato da una potenza nominale **P_n** che soddisfi la condizione:

ciently rated, as per the following condition:

Größe mit einer solchen Nennleistung wählen, welche die folgende Anforderung.

teurs une taille avec puissance nominale **P_n** capable de satisfaire à :

$$P_n \geq P_{r1}$$

(27)

Per tipi di servizio diversi da quello continuo S1 la potenza **P_n** può essere corretta tramite il fattore **f_m** fornito dalla tabella (A6).
Preferibilmente scegliere motori a 4 poli, o superiori.

*For duties other than continuous S1 the motor rating can be upgraded through the factor **f_m**, listed in table (A6).
4-Pole motors, or lower speed motors, should be preferred.*

Für Einsatzbedingungen, die von den Standardbedingungen abweichen, siehe Tabelle (A6). Sollten vorzugsweise Motoren mit 4 oder mehr Polen gewählt werden.

*En cas d'utilisations différentes du service continu S1, la puissance **P_n** peut être corrigée à l'aide du facteur **f_m** fourni par le tableau (A6).
Choisir de préférence des moteurs à 4 pôles, ou supérieurs.*

15.0 - INSTALLAZIONE

È molto importante per l'affidabilità e il buon funzionamento del riduttore rispettare alcune norme per la sua corretta installazione.

Le norme qui riportate hanno valore per una prima indicazione per la installazione del riduttore.

Per provvedere ad una effettiva e corretta installazione attenersi al Manuale di installazione uso e manutenzione dei riduttori fornibile dalla nostra Organizzazione di Vendita.

Riportiamo in breve le norme da seguire:

15.0 - INSTALLATION

Observing a few rules for correct installation is essential to the reliable and proper operation of the gearbox.

The rules set out here are intended as a preliminary guide to selecting gearbox.

For effective and proper installation, follow the instructions given in the Installation, use and maintenance manual available from our Sales network.

Following is a brief outline of installation rules:

15.0 - INSTALLATION

Im Hinblick auf die Zuverlässigkeit und eine gute Betriebsweise des Getriebes ist es besonders wichtig, für deren korrekten Einbau Kenntnis über einige Richtlinien zu haben. Die hier in Folge angeführten Normen sind eine erste Anleitung für die Auswahl des Getriebes.

Um eine effektive und korrekt erfolgte Installation zu erhalten, muß man sich an das Anleitungs- und Instandhaltungshandbuch der Getriebe der Serie 300 halten. Dieses Handbuch ist bei unserer Verkaufsorganisation erhältlich. Wir möchten Ihnen hier nur kurz die zu befolgenden Normen anführen:

15.0 - INSTALLATION

Il est très important pour la fiabilité et le bon fonctionnement du réducteur de respecter certaines règles pour une installation correcte. Les règles indiquées n'ont qu'une valeur indicative d'orientation pour le choix du réducteur. Pour effectuer une installation définitive parfaite, respecter les consignes d'installation, utilisation et entretien des réducteurs de la série 300, qui peuvent être livrées par notre Organisation de Vente.

Voici brièvement les règles qu'il faut suivre :

a) Fissaggio:

- Appoggiare il riduttore a una struttura sufficientemente rigida, con superfici di accoppiamento piane e lavorate di macchina utensile.
- Le superfici di accoppiamento, specialmente per riduttori montati con flangia e con alberi in uscita femmina scanalati, devono risultare entro precise tolleranze geometriche (vedi manuale).
- Per alcune grandezze di riduttori, in applicazioni con elevati carichi radiali in uscita, è raccomandato il montaggio a flangia eseguito per utilizzare i doppi diametri di centraggio di cui tali riduttori sono provvisti.
- Verificare che il riduttore sia previsto per la posizione di montaggio richiesta.
- Fissare il riduttore con viti di classe 8.8, o superiore, serrandole ai valori di coppia indicati nelle relative tabelle. Per coppie massime trasmesse maggiori od uguali al 70% della coppia **M_{2max}** indicata e con frequenti in-

a) Fastening:

- *Place the gearbox on a surface providing adequate rigidity. Mating surfaces should be machined and flat.*
- *This applies especially to flange-mounted gearboxes with splined hollow output shafts.*
- *In applications that involve high radial loads at the output end, flange mounting is recommended for some gearboxes as this mounting pattern benefits from the double pilot diameters provided on these gearboxes.*
- *Make sure the gearbox is suitable for the required mounting position.*
- *Use bolts of grade 8.8 or greater to secure the gearbox. Tighten the bolts to the rated values specified in the relevant charts. With transmitted torque greater than or equal to 70% of the given **M_{2max}**, and with*

a) Befestigung:

- Das Getriebe auf einer ausreichend starken Struktur mit flachen und mittels Werkzeugmaschinen bearbeiteten Passungsflächen ablegen.
- Die Passungsflächen, besonders für die mit Flansch und Keilabtriebswellen montierten Getriebe, müssen innerhalb bestimmter geometrischer Toleranzen liegen (siehe Handbuch).
- Bei einigen Baugrößen der Getriebe, bei Applikationen mit hoher auf dem Abtrieb einwirkender Radialkraft, wird die Montageweise mit Flansch empfohlen, wodurch die doppelten Zentrierdurchmesser, mit denen die Getriebe ausgestattet sind, verwendet werden können.
- Unter Bezugnahme auf die Darstellung der Tabelle (A8) auf Seite 17 prüfen, ob das Getriebe auch für die betreffende Montageposition vorgesehen ist.
- Das Getriebe mit Schrauben der Widerstandsklasse 8.8 oder einer höheren Klasse befestigen, dabei auf die in den jeweiligen Tabellen angegebenen Anzugsmomente bringen. Für zu übertragene Maximaldrehmomente, die höher als

a) Fixation:

- *Faire en sorte que le réducteur repose sur un bâti suffisamment rigide avec des surfaces d'accouplement planes et usinées à la machine-outil.*
- *Les surfaces d'accouplement, spécialement pour les réducteurs avec bride d'assemblage et arbres de sortie femelle cannelés, doivent respecter des tolérances géométriques bien précises (voir catalogue).*
- *Pour certaines tailles de réducteur, dans des applications avec des charges radiales élevées à la sortie, on préconise un montage avec bride, afin d'utiliser les doubles diamètres de centrage, dont ces réducteurs sont pourvus.*
- *Veiller à ce que le réducteur convienne à la position de montage nécessaire.*
- *Fixer le réducteur avec des vis d'un degré de résistance 8.8 ou supérieur en les serrant aux valeurs de couple de serrage indiquées sur les tableaux correspondants. Pour des couples maximaux transmis plus importants ou*



versioni del moto, utilizzare viti in classe minima di resistenza 10.9.

Alcune grandezze di riduttori prevedono oltre il fissaggio con viti, anche spine. Inserire le spine di cui i riduttori sono provvisti, nella struttura sulla quale il riduttore viene installato per una lunghezza almeno pari a 1,5 volte il valore del loro diametro.

frequent reversals, use bolts with minimum grade 10.9.

Some gearboxes can be fastened using both bolts and pins. If a pin is used, the portion of the pin inserted into the structure the gearbox is being installed to should be at least 1.5 times its diameter.

70% des angegebenen Werts M_{2max} oder diesem Prozentsatz gleich kommen und im Fall von häufigen Schaltungen sind Schrauben aus der Klasse der min. Widerstandsgrade 10.9 zu verwenden. Einige Getriebebaugrößen der Getriebe sehen ausser der Befestigung durch die Schrauben, auch Stifte vor. Dazu die Stifte, mit denen die Getriebe ausgestattet sind, über eine Länge von mindestens gleich 1,5 des Werts ihres Durchmesser, in die Struktur einstecken, auf die das Getriebe installiert werden soll.

équivalents à 70% du couple M_{2max} indiqué, et en cas d'inversions fréquentes du mouvement, utiliser des vis dans une classe minimale de résistance 10.9. Certaines tailles de réducteurs prévoient une fixation tant par vis que par goupilles. Introduire les goupilles, livrées avec les réducteurs, dans le bâti sur lequel le réducteur sera installé sur une longueur au moins égale à 1,5 de la valeur de leur diamètre.

b) Collegamenti

- Fissare gli organi di collegamento in entrata ed uscita al riduttore evitando di battere con martello o equivalenti. Utilizzare per l'inserimento degli organi le viti di servizio e i fori filettati presenti negli alberi. Prima di montare gli organi di collegamento avere cura di pulire gli alberi eliminando grassi o protettivi eventualmente presenti.

- Versi di rotazione. Nell'effettuare il cablaggio del motore, tenere presente che i riduttori hanno i versi di rotazione entrata/uscita, come indicato nella tabella seguente:

b) Connections

- *When fitting transmission elements onto the gearbox do not tap them with hammers or similar tools. To slide these parts in, use the service screws and taps provided at the shaft ends. Be sure to clean off any grease or rust preventative from the shafts before fitting any parts.*

- *Direction of rotation*
Before wiring the motor please note the input/output shaft arrangement, as described in the diagram here after:

b) Anschlüsse

- Die Anschlußteile im An- und Abtrieb des Getriebes befestigen, dabei ist ein Einklopfen dieser unter Anwendung eines Hammers oder anderer gleichartiger Instrumente zu vermeiden. Zum Einführen der Teile die Service-schrauben und die Gewindebohrungen der Wellen verwenden. Vor der Montage der Verbindungsteile, die Wellen sorgfältig von Fett oder eventuell vorhandenen Schutzmitteln reinigen.

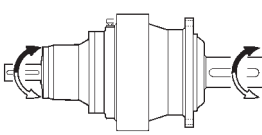
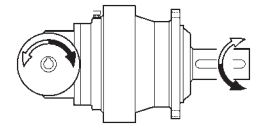
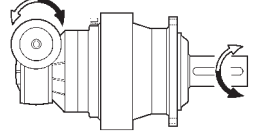
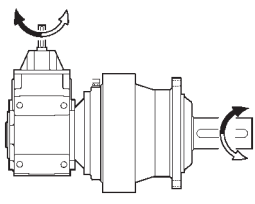
- Drehrichtungen
Beim Anschluß der Motoren an den Schaltkreis in Abhängigkeit zu ihren Umdrehungsrichtungen, muß berücksichtigt werden, daß die Getriebe im An-/Abtrieb die folgenden, in der nachstehenden Tabelle aufgeführten Drehrichtungen aufweisen:

b) Raccordements

- *Fixer les éléments de raccordement en entrée et en sortie du réducteur en évitant de frapper avec un marteau ou autre. Pour l'introduction des organes, utiliser les vis appropriées et les orifices filetés présents sur les arbres. Avant de monter les éléments de raccordement, nettoyer les arbres en éliminant les graisses ou produits de protection éventuellement présents.*

- *Sens de rotation.*
En ce qui concerne le raccordement des moteurs au circuit électrique, en fonction de leur sens de rotation différent, ne pas oublier que les sens de rotation entrée/sortie des réducteurs sont ceux indiqués dans le tableau suivant :

(A11)

In linea In line Linear Coaxiale  Angolare Right angle Rechtwinklig A renvoi d'angle 	Combinato con riduttori a vite senza fine Combined with worm gear unit Kombiniert mit Schneckengetrieben Combiné avec des réducteurs à vis sans fin  Combinato con riduttori ad assi ortogonali Combined with helical bevel gear unit Kombiniert mit Kegelradgetrieben Combiné avec des réducteurs à axes orthogonaux 

c) Verniciatura

- Utilizzare vernici compatibili con la vernice di fondo presente sui riduttori, vedi: Condizioni di fornitura. Durante la verniciatura proteggere gli anelli di tenuta presente sugli alberi. La vernice li può fare essiccare causando perdite d'olio.

c) Paint coating

- *Use paint compatible with the primer applied to the gearbox, see: Supply conditions. Prior to painting, tape the seal rings installed on the shafts. Contact with the solvent may deteriorate the seals with subsequent oil leakage.*

c) Lackierung

- Lackarten verwenden, die mit der Grundlackierung der Getriebe kompatibel sind. Siehe Lieferbedingungen auf Seite 21. angeführten Lieferbedingungen. Während des Lackiervorgangs sind die auf der Welle angeordneten Dichtringe in angemessener Weise zu schützen. Der Lack kann zum Austrocknen dieser Ringe führen, was letztendlich zu Ölverlusten führen würde.

c) Peinture

- *Utiliser des peintures compatibles avec la couche de fond déjà existante sur les réducteurs, voir Conditions de livraison. En cours de peinture, protéger les bagues à lèvres des arbres. La peinture peut les sécher et des fuites d'huile peuvent en découler.*



d) Lubrificazione

- Prima della messa in servizio riempire il riduttore di lubrificante (vedi: Lubrificazione) fino al raggiungimento del livello riscontrabile dall'apposito tappo di servizio di cui ogni riduttore è provvisto in funzione della posizione di montaggio specificata in fase di ordine.

NOTA: nei riduttori combinati la lubrificazione degli stadi epicicloidali è separata da quella dei riduttori a vite senza fine (serie 3/V), o ortogonali (serie 3/A). I riduttori forniti con lubrificazione permanente ad olio sintetico (vedi tab. A27) non necessitano delle operazioni sopra descritte.

d) Lubrication

- *Prior to commissioning, fill the gearbox with the recommended type and quantity of oil (see: Lubrication). The level is to be checked through the appropriate plug, or sight glass, each gearbox is provided with, and located according to the mounting position originally specified.*

NOTE: Combined gearboxes feature separate lubrication for planetary stages and for worm gears (series 3/V) or bevel helical units (series 3/A). The operations described above are not to be performed with life-lubed gearboxes, that are factory filled with synthetic oil (see tab. A27)

d) Schmierung

- Vor der Inbetriebnahme muß das Getriebe oder der Getriebemotor solange mit dem empfohlenen Schmieröl (siehe "Schmierung" auf Seite 33) gefüllt werden, bis der vorgesehene Pegel über die Einfüllschraube oder das Schauglas, mit denen die Getriebe je nach Montagelage ausgestattet sind, erkennbar ist.

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V) oder Kegelradgetriebe (3/A) getrennt.

Bei den mit Dauerschmierung mit Synthetiköl (siehe Tabelle A27) gelieferten Getriebe sind die zuvor genannten Arbeiten nicht erforderlich.

d) Lubrification

- *Avant la mise en service, remplir le réducteur avec l'huile conseillée (voir Lubrification) jusqu'au niveau prévu, vérifiable à travers le bouchon ou niveau visible équipant chaque réducteur, en fonction de la position de montage établie.*

REMARQUE : Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V) ou orthogonaux (3/A).

Sur les réducteurs fournis avec lubrification permanente avec de l'huile synthétique (voir tab. A27), il n'est pas nécessaire d'effectuer les opérations décrites ci-dessus.

16.0 - MANUTENZIONE

Controllare il serraggio dei bulloni dopo 50 ore di lavoro. Effettuare il primo cambio olio circa dopo 100-150 ore di lavoro; successivamente effettuare il cambio ogni 2000 3000 ore, a seconda degli impieghi, o almeno una volta all'anno. Sono esclusi i riduttori dotati di lubrificazione permanente. È buona norma comunque controllare il livello una volta al mese per funzionamento intermittente, o più frequentemente, per funzionamento in continuo, e aggiungere olio se necessario.

16.0 - MAINTENANCE

Check the tightness of mounting bolts after the initial 50 hours of operation. Change the oil first after 100-150 hours operation. Subsequently, change the oil every 2000 - 3000 hours operation, depending on the application. Alternatively change oil once a year. However, oil level should be checked at regular intervals and topped up as required. Check monthly if unit operates under intermittent duty, more frequently if duty is continuous.

16.0 - WARTUNG

Schrauben nach 50 Betriebsstunden auf festen Sitz prüfen. Ersten Ölwechsel nach zirka 100-150 Betriebsstunden durchführen. Anschließend alle 2000 - 3000 oder mindestens einmal jährlich einen Ölwechsel durchführen (je nach Einsatzbereich). Hiervon ausgeschlossen sind die Getriebe mit Dauerschmierung. Es sollte jedoch bei Aussetzbetrieb einmal monatlich und bei Dauerbetrieb häufiger der Ölstand kontrolliert werden. Falls notwendig, Öl nachfüllen.

16.0 - ENTRETIEN

Contrôler le serrage des vis et boulons, après 50 heures de travail. Effectuer la première vidange du lubrifiant, après 100 à 150 heures de travail. Ultérieurement, effectuer une vidange toutes les 2000 à 3000 heures, selon les applications, ou au minimum une fois par an. Les réducteurs avec lubrification permanente sont exclus. Toutefois, il est conseillé de contrôler le niveau d'huile une fois par mois, en cas de fonctionnement intermittent, plus souvent en cas de service continu, et de faire l'appoint si nécessaire.

17.0 - STOCCAGGIO

Il corretto stoccaggio dei prodotti richiede l'esecuzione delle seguenti attività:

- a) Escludere aree all'aperto, zone esposte alle intemperie o con eccessiva umidità.
- b) Interporre sempre tra il pavimento ed i prodotti, pianali lignei o di altra natura, atti ad impedire il diretto contatto col suolo.
- c) Per periodi di stoccaggio superiori ai 60 giorni, le superfici interessate agli accoppiamenti quali flangie, alberi e giunti, devono essere protette con idoneo prodotto antiossidante (Mobilarma 248 od equivalente).

17.0 - STORAGE

Observe the following instructions to ensure correct storage of the products:

- a) *Do not store outdoors, in areas exposed to weather or with excessive humidity.*
- b) *Always place boards, wood, or other material between the products and the floor. The gearbox should not have direct contact with the floor.*
- c) *For storage periods of over 60 days, all machined surfaces such as flanges, shafts and couplings must be protected with a suitable anti-oxidation product (Mobilarma 248 or equivalent product).*

17.0 - LAGERUNG

Die korrekte Lagerung der Antriebe erfordert folgende Vorkehrungen:

- a) Die Produkte nicht im Freien lagern und nicht in Räumen, die der Witterung ausgesetzt sind, oder eine hohe Feuchtigkeit aufweisen.
- b) Die Produkte nie direkt auf dem Boden, sondern auf Unterlagern aus Holz oder einem anderen Material lagern.
- c) Bei Lagerzeiten von mehr als 60 Tagen die Oberflächen für die Verbindung, wie Flansche, Wellen oder Kupplungen mit einem geeigneten Oxidationsschutzmittel behandeln (Mobilarma 248 oder ein äquivalentes Mittel).

17.0 - STOCKAGE

Un stockage correct des produits reçus nécessite de respecter les règles suivantes :

- a) *Exclure les zones à ciel ouvert, les zones exposées aux intempéries ou avec humidité excessive.*
- b) *Interposer dans tous les cas entre le plancher et les produits des planches de bois ou des supports d'autre nature empêchant le contact direct avec le sol.*
- c) *Pour les périodes de stockage supérieures à 60 jours, les surfaces concernées par les liaisons telles que les brides, les arbres et les accouplements doivent être protégées avec un produit antioxydant spécial (Mobilarma 248 ou équivalent).*



- d) Per periodi di stoccaggio previsti superiori ai 6 mesi, i prodotti devono essere oggetto delle seguenti attività:
- Ricoprire tutte le parti lavorate esterne con grasso atto ad evitare ossidazioni.
 - Posizionare i riduttori con il tappo di sfiato nella posizione più alta e riempirli di olio, ad eccezione di quelli dotati in fabbrica di lubrificazione permanente. I riduttori, prima del loro utilizzo, dovranno essere ripristinati con la corretta quantità e tipo di lubrificante previsto (vedi tab. A26 - A27).
- d) *When units are expected to be in storage for more than 6 months, the following extra measures are required:*
- *Smear all machined parts with grease to prevent oxidation.*
 - *Place the gearbox so that the breather plug is uppermost and fill it with oil (this does not apply to life-lubricated gearboxes). Before the gearbox is put into operation, the appropriate type and quantity of oil should be restored (tab. A26 - A27).*
- d) Bei Lagerzeiten von mehr als 6 Monaten müssen folgende Vorkehrungen getroffen werden:
- Die bearbeiteten Außenteile und die Passflächen mit Oxidationsschutzfett abdecken.
 - Die Getriebe mit der Entlüftungsschraube in der obersten Position ausgerichtet aufstellen und, die mit Dauerschmierung ausgestatteten Getriebe ausgenommen, mit Öl füllen. Die Getriebe müssen vor ihrem Einsatz mit der richtigen Menge des vorgesehenen Schmiermittels aufgefüllt werden (Tab. A26 - A27).
- d) *Pour les périodes de stockage prévues supérieures à 6 mois, les produits doivent faire l'objet des contrôles suivants :*
- *Recouvrir les parties extérieures usinées avec de la graisse contre l'oxydation.*
 - *Positionner les réducteurs avec le bouchon reniflard le plus haut possible et les remplir d'huile, à l'exception de ceux à lubrification permanente. Avant utilisation, les réducteurs doivent être remplis de la quantité et du type de lubrifiant préconisés (tab. A26- A27).*

18.0 - CONDIZIONI DI FORNITURA

I riduttori vengono forniti come segue:

- a) predisposti per l'installazione nella posizione di montaggio specificata nell'ordinativo;
- b) **senza olio lubrificante ed internamente protetti con un film d'olio usato per il collaudo finale (tipo SHELL ENSIS OIL N);**
- c) verniciati con vernice di fondo antiossidante all'acqua di colore grigio (tipo Idrayon Primer Ral 7042/C441). Le superfici di accoppiamento non sono verniciate. La verniciatura finale è a cura del cliente;
- d) collaudati secondo specifiche interne;
- e) appositamente imballati;
- f) provvisti di dadi e bulloni per montaggio motori elettrici versione IEC;
- g) dotati di carica di lubrificante per i tipi a lubrificazione permanente.

18.0 - SUPPLY CONDITIONS

Gearboxes are generally supplied as follows:

- a) *arranged for installation in the mounting position specified in the purchase order;*
- b) ***Unlubricated. Inner parts are protected by a film of the oil used for testing purpose (type SHELL ENSIS OIL N);***
- c) *primer coated with grey anti-oxidant water-based primer type Idrayon Primer-Ral 7042/C441. Mounting surfaces are not paint coated. Finish coating is to be applied by the Customer;*
- d) *tested to factory specifications;*
- e) *suitably packed;*
- f) *complete with mounting hardware for IEC electric motors;*
- g) *gearboxes lubricated "for life" are factory filled with oil.*

18.0 - LIEFERBEDINGUNGEN

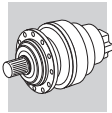
Die Getriebe werden folgendermaßen geliefert:

- a) bereits für die Installation in der Einbaulage gemäß Auftrags bereit.
- b) **ohne Schmieröl und innen mit einem Öl, das für die Endabnahmeprüfung verwendet wurde, überzogen (Typ SHELL ENSIS OIL N).**
- c) mit einer grauen, vor Oxidation durch Wasser schützenden Grundlackierung überzogen (Typ Idrayon Primer Ral 7042/C441). Die Verbindungsflächen sind nicht lackiert. Die Endlackierung geht zu Lasten des Kunden.
- d) gemäß werksinterner Spezifikationen geprüft.
- e) in angemessener Weise verpackt.
- f) mit Muttern und Schrauben für die Montage an Elektromotoren der Version IEC;
- g) die mit Dauerschmierung, bereits mit Schmiermittel ausgestattet.

18.0 - CONDITIONS DE LIVRAISON

Les réducteurs sont livrés comme suit :

- a) *déjà adaptés pour l'installation dans la position d'assemblage définie en cours de commande;*
- b) ***sans huile et protégés à l'intérieur avec un film d'huile utilisée lors de l'essai final (type SHELL ENSIS OIL N);***
- c) *peints avec une couche de fond de protection antioxydant à l'eau, de coloris gris (type idrayon Primer-Ral 7042/C441). Les surfaces d'accouplement ne sont pas peintes. La peinture de finition doit être réalisée par le client ;*
- d) *essayés d'après les spécifications internes ;*
- e) *dûment emballés ;*
- f) *pourvus d'écrous et de boulons pour l'assemblage aux moteurs électriques, version CEI ;*
- g) *déjà pourvus de lubrifiant pour ceux à lubrification permanente.*



19.0 - DESIGNAZIONE
RIDUTTORE 300

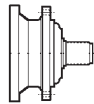
19.0 - 300 GEARBOX
DESIGNATION

19.0 - 300 GETRIEBE-
BEZEICHNUNG

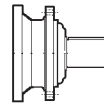
19.0 - DESIGNATION
REDUCTEUR 300

3 11 L 2 16.7 HZ

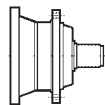
VERSIONE USCITA / OUTPUT VERSION / AUSGANGSVERSION / VERSION EN SORTIE



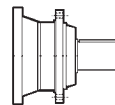
MZ: Albero maschio scanalato
Splined male shaft
Vielkeilwelle
Arbre de sortie cannelé



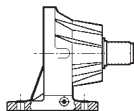
MC: Albero maschio cilindrico
Solid keyed shaft
Zylindrisches Welle
Arbre de sortie cyl. claveté



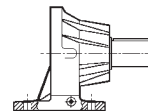
HZ: Albero maschio rinforzato scanalato
Heavy duty splined male shaft
Vielkeilwelle mit Verstärker
Lagerung
Arbres de sortie cannelé, paliers renforcés



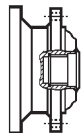
HC: Albero maschio rinforzato cilindrico
Heavy duty solid keyed shaft
Zylindrisches Welle mit Verstärker
Lagerung
Arbre de sortie cyl. claveté, paliers renforcés



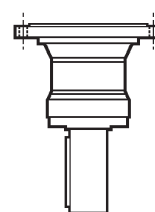
PZ: Uscita con albero scanalato e piedi di supporto
Foot base with splined shaft
Fußausführung mit Keilwelle
Base de support avec arbre mâle cannelé



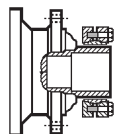
PC: Uscita con albero cilindrico e piedi di supporto
Foot base with solid keyed shaft
Fußausführung mit zylindrischer Welle
Base support à pattes avec arbre cyl. claveté



FZ / FZB:
Albero femmina scanalato
Hollow splined shaft
Vielkeilhohlwelle
Arbre de sortie creux cannelé



VK: Albero cilindrico rinforzato per agitatori e mescolatori
Reinforced output with heavy duty keyed shaft for stirrers and mixer
Verstärkter Abtrieb mit zylindrischer Welle für Rührwerke und Mischer
Sortie renforcée avec arbre cylindrique pour agitateurs et mélangeurs



FP: Albero femmina per giunto d'attrito
Hollow shaft for shrink disc
Zylindrische Hohlwelle für Schumpfscheibe
Arbre de sortie creux pour montage par frette

RAPPORTO DI RIDUZIONE / GEAR RATIO / ÜBERSETZUNG / RAPPORT DE REDUCTION

Indicare il valore del rapporto (compresi punto e decimali) riportato su pagine dati tecnici

Fill in the value of the transm. ratio (including point and decimals) reported in the selection charts

Den auf den Seiten der technischen Daten angegebenen Wert des Übersetzungs (einschließlich Punkt und Dezimalen) angeben

Indiquer la valeur du rapport (y inclus les chiffres décimaux) citée aux pages des données techniques

Es. / Ex. / Beispiel / Ex. : 1/5.33 = 5.33 1/44.6 = 44.6 1/131 = 131

NUMERO STADI DI RIDUZIONE / REDUCTIONS

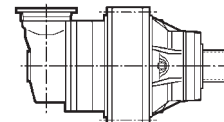
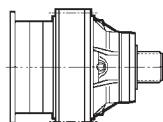
ANZAHL DER GETRIEBESTUFEN / N. ETAGES DE REDUCTION TOTAUX

1, 2, 3, 4

ESECUZIONE / DESIGN / AUSFÜHRUNG / EXECUTION

L = Lineare / In line / Linear / Coassiale

R = Angolare / Right angle / Rechtwinklig / A renvoi d'angle



GRANDEZZA RIDUTTORE / GEARBOX FRAME SIZE / GETRIEBEBAUGRÖSSE / TAILLE REDUCTEUR

00 = 300
01 = 301
03 = 303
04 = 304

228
236
244
254

05 = 305
06 = 306
07 = 307
09 = 309

264
274
284
294

10 = 310
11 = 311
13 = 313
14 = 314

304
314
324
334

15 = 315
16 = 316
17 = 317
18 = 318

344
354
362
370

19 = 319
21 = 321

378
386

SERIE / SERIES / SERIE / SERIE



P180 A W0A

OPZIONI / OPTIONS / OPTIONEN / OPTIONS

GUARNIZIONI / GASKET / DICHTUNGEN / MATIERE ETANCHE

STANDARD = NBR

PV = VITON®

SOLO PER ESECUZIONE ANGOLARE / ONLY FOR RIGHT ANGLE DESIGN

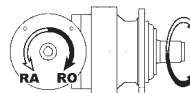
NUR FÜR WINKELAUSFÜHRUNGEN / UNIQUEMENT EN CASE D'EXECUTION D'ANGLE

senso di rotazione in ingresso preferenziale / preferential input direction of rotation

bevorzugte umdrehungsrichtung am antrieb / sense de rotation de preference en entrée

RA = Sinistro / Left / Links / Gauche

RO = Destro / Right / Rechts / Droit



CENTRALINA AUSILIARE DI RAFFREDDAMENTO

SUPPLEMENTARY COOLING SYSTEM

HILFSKÜHLSYSTEM

UNITE DE REFROIDISSEMENT AUXILIAIRE

CR1, CR2, CR3



ACCESSORI IN USCITA / OUTPUT FITTINGS / ZUBEHÖR (ABTRIEB) / ACCESSOIRES COTE SORTIE



P... = Pignoni
Pinions
Ritzel
Pignons



B0A = Barra scanalata
Splined bar
Vielkeilvollwelle
Barre cannelée



M0A = Manicotto liscio
Sleeve coupling
Nabe
Manchon lisse



G0A = Giunto ad attrito
Shrink disc
Schrumpfscheibe
Frette de serrage



W0A = Flangia
Flange
Flansch
Bride

POSIZIONE DI MONTAGGIO / MOUNTING POSITION EINBAULAGEN / POSITION DE MONTAGE



ENTRATA / INPUT / EINGANG / ENTREE



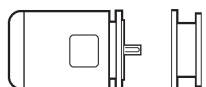
Albero veloce
Input keyed shaft
Eingangswelle
Arbre d'entrée cyl. claveté

	V01A	V01B	V05B	V06B	V07A	V07B	V10B	V11B
diam.	Ø24	Ø38	Ø48	Ø60	Ø60	Ø80	Ø80	Ø80



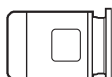
Albero veloce con ventola
Solid input shaft with fan
Lüfter gekühlte Eingangswelle
Arbre rapide équipé de ventilateur

	FV05B	FV06B	FV07A	FV07B	FV10B	FV11B
diam.	Ø48	Ø60	Ø60	Ø80	Ø80	Ø80



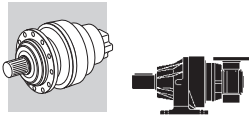
Predisposizione motore elettrico
Electric motor adapter input
Motoranbauteile für IEC-Motor
Adaptation pour moteur électrique

P+IEC (P71...P250)



Motoriduttore integrato completo di motore elettrico compatto
(disponibile fino alla grandezza 307)
Integrated gearmotor with in-built compact electric motor
(available up to size 307)
Integrierter Getriebemotor komplett mit kompakten Elektromotor
(bis zur Baugröße 307 verfügbar)
Motoréducteur intégré avec moteur électrique compact
(Disponible jusqu'à la taille 307)

S2, S3, S4



19.0 - DESIGNAZIONE
RIDUTTORE 3/V

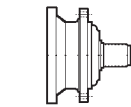
19.0 - 3/V GEARBOX
DESIGNATION

19.0 - 3/V GETRIEBE-
BEZEICHNUNG

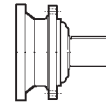
19.0 - DESIGNATION
REDUCTEUR 3/V

3/V 05 L 3 623 PC

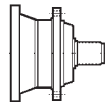
VERSIONE USCITA / OUTPUT VERSION / AUSGANGSVERSION / VERSION EN SORTIE



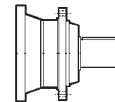
MZ: Albero maschio scanalato
Splined male shaft
Vielkeilwelle
Arbre de sortie cannelé



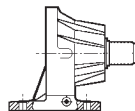
MC: Albero maschio cilindrico
Solid keyed shaft
Zylindrisches Welle
Arbre de sortie cyl. claveté



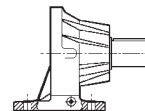
HZ: Albero maschio rinforzato
scanalato
Heavy duty splined male shaft
Vielkeilwelle mit Verstärker
Lagerung
Arbres de sortie cannelé, paliers
renforcés



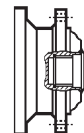
HC: Albero maschio rinforzato
cilindrico
Heavy duty solid keyed shaft
Zylindrisches Welle
mit Verstärker Lagerung
Arbre de sortie cyl. claveté,
paliers renforcés



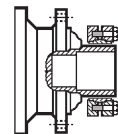
PZ: Uscita con albero scanalato
e piedi di supporto
Foot base with splined shaft
Fußausführung mit Keilwelle
Base de support avec arbre
mâle cannelé



PC: Uscita con albero cilindrico
e piedi di supporto
*Foot base with solid keyed
shaft*
Fußausführung mit
zylindrischer Welle
Base support à pattes avec
arbre cyl. claveté



FZ / FZB:
Albero femmina scanalato
Hollow splined shaft
Vielkeilhohlwelle
Arbre de sortie creux cannelé



FP: Albero femmina per giunto
d'attrito
Hollow shaft for shrink disc
Zylindrische Hohlwelle für
Schumpfscheibe
Arbre de sortie creux pour
montage par frette

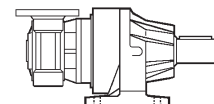
RAPPORTO DI RIDUZIONE / GEAR RATIO / ÜBERSETZUNG / RAPPORT DE REDUCTION

Indicare il valore del rapporto riportato su pagine dati tecnici
Fill in the value of the transm. ratio reported in the selection charts
Den auf den Seiten der technischen Daten angegebenen Wert des Übersetzungs angeben
Indiquer la valeur du rapport citée aux pages des données techniques
Es. / Ex. / Beispiel / Ex. : 1/773 = 773

NUMERO STADI DI RIDUZIONE / REDUCTIONS
ANZAHL DER GETRIEBESTUFEN / N. ETAGES DE REDUCTION TOTAUX
3, 4

ESECUZIONE / DESIGN / AUSFÜHRUNG / EXECUTION

L = Combinato serie 300, 2 o 3 stadi epicicloidali + vite senza fine
Combined 300 unit, 2 or 3 planetary stages + worm gear units
Kombinierte Version aus Serie 300, 2 oder 3 Planetenstufen + Schneckengetriebe
Combiné série 300, 2 ou 3 étages épicycloïdaux + réducteur à vis sans fin



GRANDEZZA RIDUTTORE / GEARBOX FRAME SIZE / GETRIEBEBAUGRÖSSE / TAILLE REDUCTEUR

00 = 3/V 00	230	05 = 3/V 05	266	10 = 3/V 10	306	15 = 3/V 15	346	19 = 3/V 19	380
01 = 3/V 01	238	06 = 3/V 06	276	11 = 3/V 11	316	16 = 3/V 16	356	21 = 3/V 21	388
03 = 3/V 03	246	07 = 3/V 07	286	13 = 3/V 13	326	17 = 3/V 17	364		
04 = 3/V 04	256	09 = 3/V 09	296	14 = 3/V 14	336	18 = 3/V 18	372		

SERIE / SERIES / SERIE / SERIE

Riduttori combinati serie 300 / riduttori a vite senza fine
Combined 300 gearboxes / Worm gear units
Kombinierte Getriebe aus Serie 300 / Schneckengetriebe
Réducteurs combinés série 300 / réducteur à vis sans fin



P80 B5 AF W0A ...

OPZIONI / *OPTIONS* / OPTIONEN / *OPTIONS*
 GUARNIZIONI / *GASKET* / DICHTUNGEN / *MATIERE ETANCHE*
 STANDARD = NBR
 PV = VITON®

ACCESSORI IN USCITA / *OUTPUT FITTINGS*
 ZUBEHÖR (ABTRIEB) / *ACCESSOIRES COTE SORTIE*



P... = Pignoni
Pinions
 Ritzel
Pignons



B0A = Barra scanalata
Splined bar
 Vielkeilvollwelle
Barre cannelée



M0A = Manicotto liscio
Sleeve coupling
 Nabe
Manchon lisse



G0A = Giunto ad attrito
Shrink disc
 Schrumpfscheibe
Frette de serrage



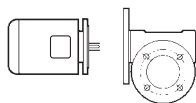
W0A = Flangia
Flange
 Flansch
Bride

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
 EINBAULAGEN / *POSITION DE MONTAGE*

33

FORMA COSTRUTTIVA / *MOTOR EXECUTION* / BAUFORM / *FORM DE CONSTRUCTION*
B5, B14

ENTRATA / *INPUT* / EINGANG / *ENTREE*



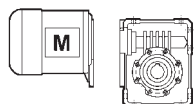
Predisposizione motore elettrico
Electric motor connection
 Motoranbauteile für IEC-Motor
Adaptation pour moteur électrique

P+IEC (P63...P180)

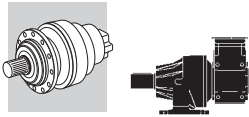


Albero veloce
Input keyed shaft
 Eingangswelle
Arbre d'entrée cyl. claveté

HS



S1, S2, S3



19.0 - DESIGNAZIONE
RIDUTTORE 3/A

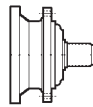
19.0 - 3/A GEARBOX
DESIGNATION

19.0 - 3/A GETRIEBE-
BEZEICHNUNG

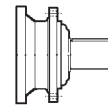
19.0 - DESIGNATION
REDUCTEUR 3/A

3/A 06 L 2 69.9 PC

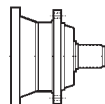
VERSIONE USCITA / OUTPUT VERSION / AUSGANGSVERSION / VERSION EN SORTIE



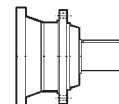
MZ: Albero maschio scanalato
Splined male shaft
Vielkeilwelle
Arbre de sortie cannelé sortant



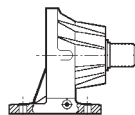
MC: Albero maschio cilindrico
Solid keyed shaft
Zylindrisches Welle
Arbre de sortie cyl. Claveté sortant



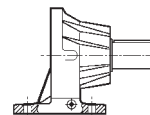
HZ: Albero maschio rinforzato scanalato
Heavy duty splined male shaft
Vielkeilwelle mit Verstärker Lagerung
Arbres de sortie cannelé sortant, paliers renforcés



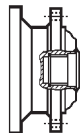
HC: Albero maschio rinforzato cilindrico
Heavy duty solid keyed shaft
Zylindrisches Welle mit Verstärker Lagerung
Arbre de sortie cyl. claveté sortant, paliers renforcés



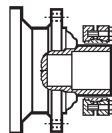
PZ: Base di supporto con albero maschio scanalato
Foot mounted with splined shaft
Fußausführung mit Keilwelle
Base de support avec arbre mâle cannelé



PC: Base di supporto con albero cilindrico
Foot mounted with solid keyed shaft
Fußausführung mit zylindrischer Welle
Base support à pattes avec arbre cyl. claveté



FZ: Albero femmina scanalato
Hollow splined shaft
Vielkeilhohlwelle
Arbre de sortie creux cannelé



FP: Albero femmina per giunto ad attrito
Hollow shaft for shrink disc
Zylindrische Hohlwelle für Schumpfscheibe
Arbre de sortie creux pour montage par frette

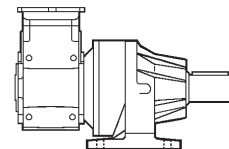
RAPPORTO DI RIDUZIONE / GEAR RATIO / ÜBERSETZUNG / RAPPORT DE REDUCTION

Indicare il valore del rapporto (compresi punto e decimali) riportato su pagine dati tecnici
Fill in the value of the transm. ratio (including point and decimals) reported in the selection charts
Den auf den Seiten der technischen Daten angegebenen Wert des Übersetzungs (einschließlich Punkt und Dezimalen) angeben
Indiquer la valeur du rapport (y inclus les chiffres décimaux) citée aux pages des données techniques
Es. / Ex. / Beispiel / Ex. : 1/19.4 = 19.4 1/175 = 175

NUMERO UNITÀ DI RIDUZIONE / TOTAL REDUCTION UNITS
ÜBERSETZUNGSSTUFEN INSGESAMT / N. ETAGES DE REDUCTION TOTAUX
2

ESECUZIONE / DESIGN / AUSFÜHRUNG / EXECUTION

L = Combinato serie 300, 1 stadio epicicloidale + riduttore ad assi ortogonali serie A
Combined 300 unit, 1 planetary stages + A helical bevel units
Kombinierte Version aus Serie 300, 1 Planetenstufe + Kegelradgetriebe der Serie A
Combiné série 300, 1 étage épicycloïdaux + réducteur à axes orthogonaux série A

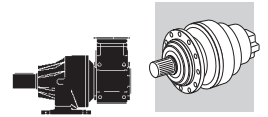


GRANDEZZA RIDUTTORE / GEARBOX SIZE / GETRIEBEBAUGRÖSSE / TAILLE REDUCTEUR

00 = 3/A 00 (300+A10)	231	05 = 3/A 05 (305+A41)	267
01 = 3/A 01 (301+A20)	239	06 = 3/A 06 (306+A50)	277
03 = 3/A 03 (303+A30)	247	07 = 3/A 07 (307+A60)	287
04 = 3/A 04 (304+A41)	257		

SERIE / SERIES / SERIE / SERIE

Riduttori combinati serie 300 / riduttori ad assi ortogonali serie A
Combined 300 gearboxes / A series helical bevel gear units
Kombinierte Getriebe aus Serie 300 / Kegelradgetriebe der Serie A
Réducteurs combinés série 300 / réducteur à axes orthogonaux série A



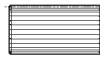
S4 EF W0A ...

OPZIONI / *OPTIONS* / OPTIONEN / *OPTIONS*
 GUARNIZIONI / *GASKET* / DICHTUNGEN / *MATIERE ETANCHE*
 STANDARD = NBR
 PV = VITON®

ACCESSORI IN USCITA / *OUTPUT FITTINGS* / ZUBEHÖR (ABTRIEB) / *ACCESSOIRES COTE SORTIE*



P... = Pignoni
Pinions
 Ritzel
Pignons



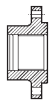
B0A = Barra scanalata
Splined bar
 Vielkeilvollwelle
Barre cannelée



M0A = Manicotto liscio
Sleeve coupling
 Nabe
Manchon lisse



G0A = Giunto ad attrito
Shrink disc
 Schrumpfscheibe
Frette de serrage

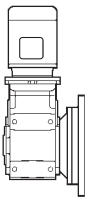


W0A = Flangia
Flange
 Flansch
Bride

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
 EINBAULAGEN / *POSITION DE MONTAGE*

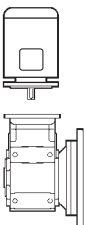
34

ENTRATA / *INPUT* / EINGANG / *ENTREE*



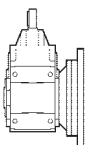
Motoriduttore integrato completo di motore elettrico compatto
Integrated gearmotor with in-built compact electric motor
 Integrierter Getriebemotor komplett mit kompakten Elektromotor
Motoréducteur intégré avec moteur électrique compact

S2, S3, S4



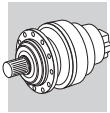
Predisposizione motore elettrico
Electric motor connection
 Motoranbauteile für IEC-Motor
Adaptation pour moteur électrique

P+IEC (P63...P180)



Albero veloce
Input keyed shaft
 Eingangswelle
Arbre d'entrée cyl. claveté

HS



19.1 - Designazione motore

19.1 - Motor designation

19.1 - Motor Bezeichnung

19.1 - Designation moteur

MOTORE / MOTOR / MOTOR / MOTEUR

FRENO / BRAKE / BREMSE / FREIN

M 1LA 4 230/400-50 IP54 CLF ... W**FD 7.5 R SB 220 SA ...**OPZIONI
OPTIONS
OPTIONEN
OPTIONSALIMENTAZ. FRENO
BRAKE SUPPLY
BREMSVERSORGUNG
ALIMENTATION FREINTIPO ALIMENTATORE
RECTIFIER TYPE
GLEICHRICHTERTYP
TYPE ALIMENTATEUR
NB, SB, NBR, SBRLEVA DI SBLOCCO FRENO
BRAKE HAND RELEASE
BRESENTHANDLÜFTUNG
LEVIER DE DEBLOCAGE FREIN
R, RMCOPPIA FRENANTE / BRAKE TORQUE
BREMSMOMENT/ COUPLE FREINTIPO FRENO / BRAKE TYPE
BRESENTYP / TYPE DE FREIN

FD (freno c.c./ d.c. brake / G.S. Bremse / frein c.c.)

FA, BA (freno c.a./ a.c. brake / W.S. Bremse / frein c.a.)

POSIZIONE MORSETTIERA / TERMINAL BOX POSITION
KLEMMENKASTENLAGE / POSITION BOITE A BORNE

W (default), N, E, S

FORMA COSTRUTTIVA / MOTOR MOUNTING
BAUFORM / FORM DE CONSTRUCTION

— (motore integrato / compact motor / kompaktes Motor / moteur compact)

B5 (motore IEC / IEC -motor / IEC Motor / moteur CEI)

CLASSE ISOLAMENTO / INSULATION CLASS
ISOLIERUNGSKLASSE / CLASSE ISOLATION

CL F standard

CL H option

GRADO DI PROTEZIONE / DEGREE OF PROTECTION
SCHUTZART / DEGRE DE PROTECTION

IP55 standard (IP54 - autofrenante / brake motor / Bremssmotor / moteur frein)

TENSIONE - FREQUENZA / VOLTAGE - FREQUENCY
SPANNUNG - FREQUENZ / TENSION - FREQUENCE

NUMERO DI POLI / POLE NUMBER / POLZAHL / N.bre POLES

4, 6, 2/4, 2/6, 2/8, 2/12

GRANDEZZA MOTORE / MOTOR SIZE / MOTOR-BAUGRÖSSE / TAILLE MOTEUR

1SD - 5LA (motore integrato / compact motor / kompaktes Motor / moteur compact)

63A - 250M (motore IEC / IEC motor / IEC - motor / moteur CEI)

TIPO MOTORE/ MOTOR TYPE / MOTORTYP / TYPE MOTEUR

M = trifase integrato / compact 3-phase / kompaktes Dreiphasen / 3 phasé compact

BN = trifase IEC / IEC 3-phase / IEC Dreiphasen / 3 phasé CEI



20.0 - POSIZIONE DI MONTAGGIO

Per la completa definizione della configurazione del riduttore, è necessario specificare la posizione di montaggio rispetto al suolo. Riferirsi per questo alla tabella (A12) per i riduttori in linea e alla (A13) per i riduttori con riduzione angolare.

20.0 - MOUNTING POSITION

The product designation is only complete when the mounting position is also specified. Please refer to table (A12) for in-line gear units and to (A13) for right angle drives.

20.0 - MONTAGEPOSITION

Für die vollständige Definition der Bauform des Getriebemotors oder des gewählten Getriebes ist die Montagestellung gegenüber dem Boden gemäß der Tabelle (A12) und der Ausrichtung des Winkelstücks festzulegen (A13).

20.0 - POSITION DE MONTAGE

Pour une définition complète de la forme de construction, du réducteur, préciser la position de montage par rapport au sol. D'après les tableaux (A12) et l'orientation de l'angulaire (A13).

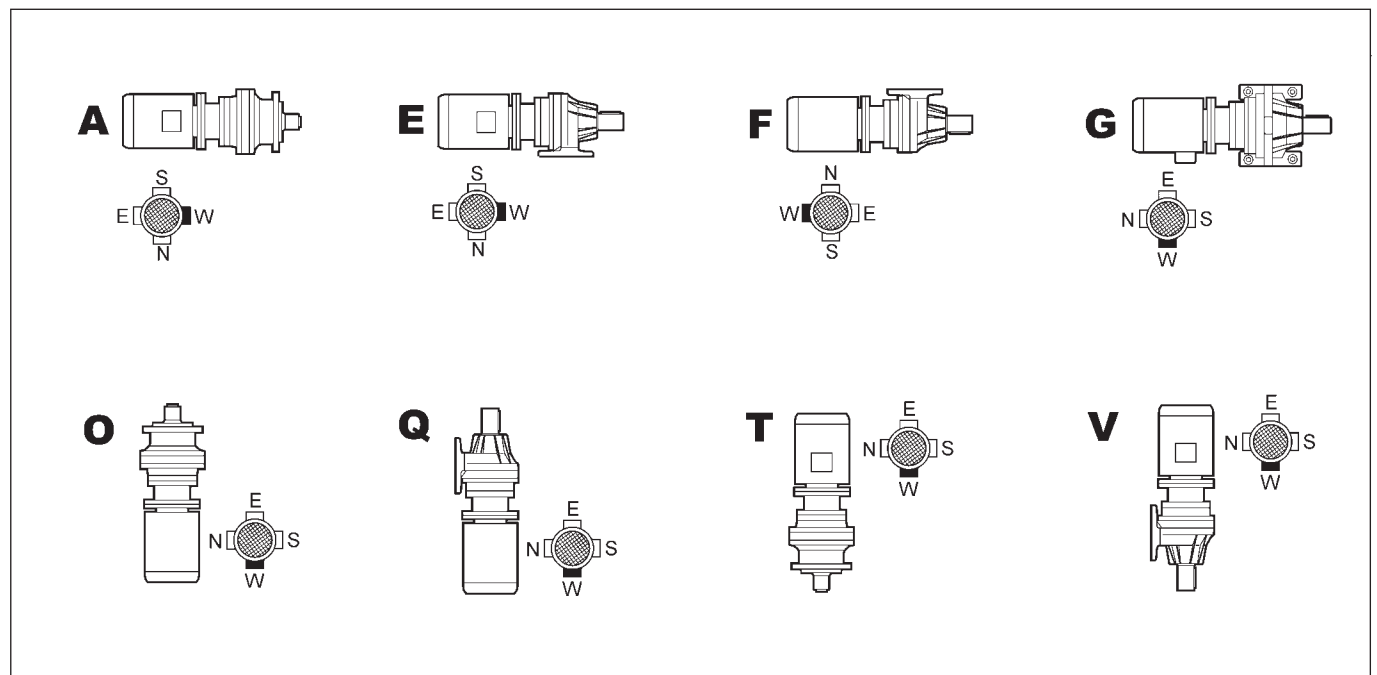
20.1 - Riduttori in linea

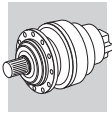
20.1 - In-line units

20.1 - Coassiale Untersetzungsgetriebe

20.1 - Réducteurs coaxiaux

(A12)





20.2 - Riduttori angolari

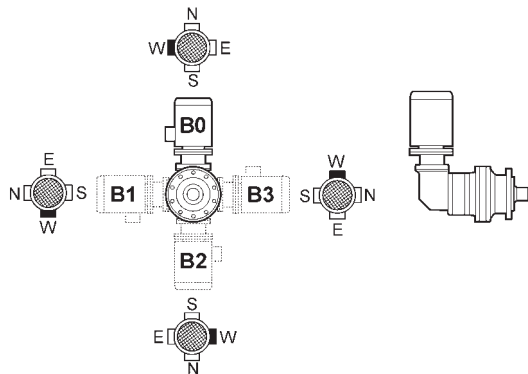
20.2 - Right angle units

20.2 - Rechtwinklige Untersetzungsgetriebe

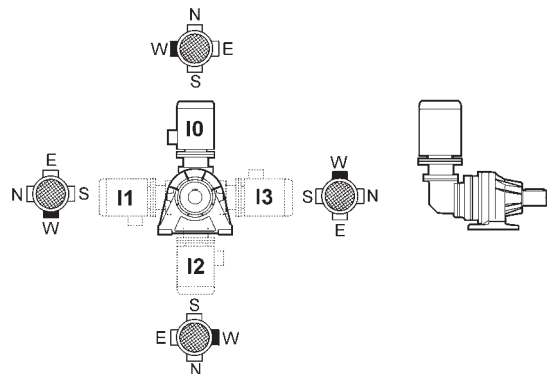
20.2 - Réducteurs a renvoi d'angle

(A13)

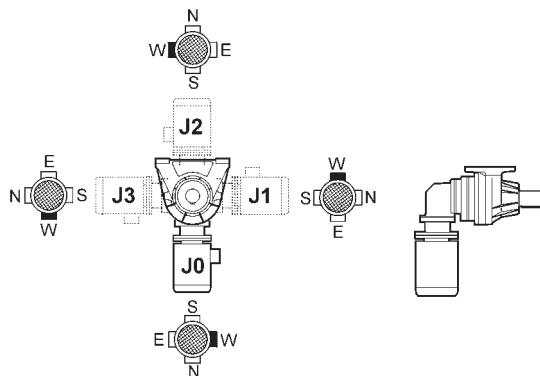
B0 - B1 - B2 - B3



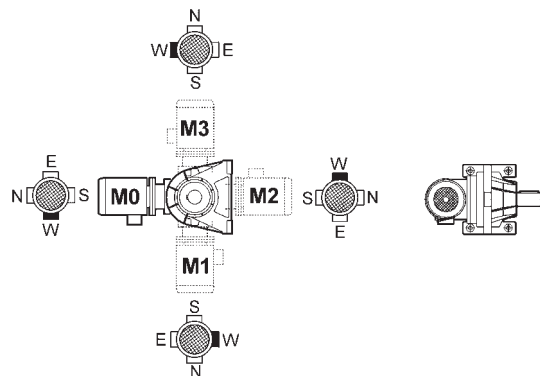
I0 - I1 - I2 - I3



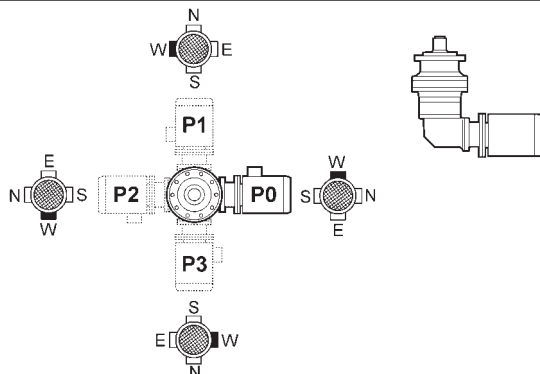
J0 - J1 - J2 - J3



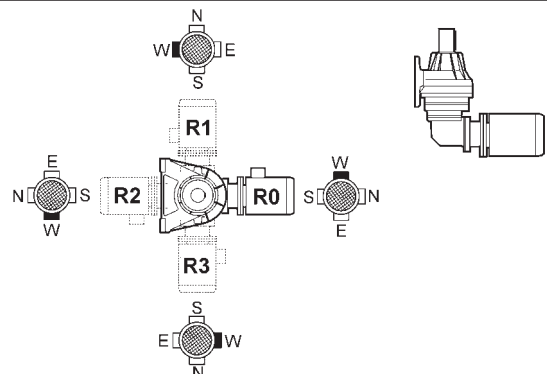
M0 - M1 - M2 - M3



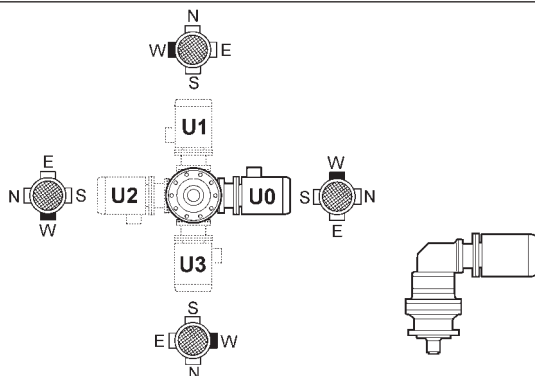
P0 - P1 - P2 - P3



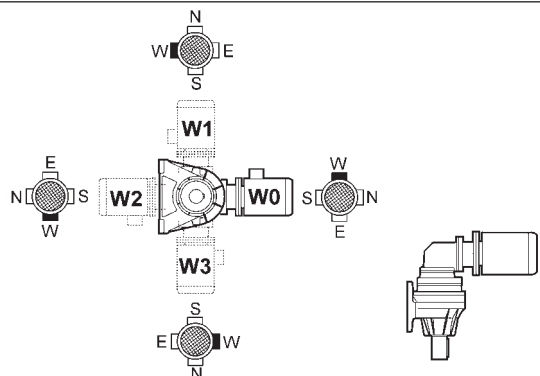
R0 - R1 - R2 - R3

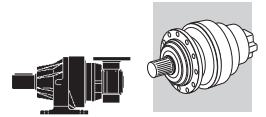


U0 - U1 - U2 - U3



W0 - W1 - W2 - W3





20.3 - Serie 3/V

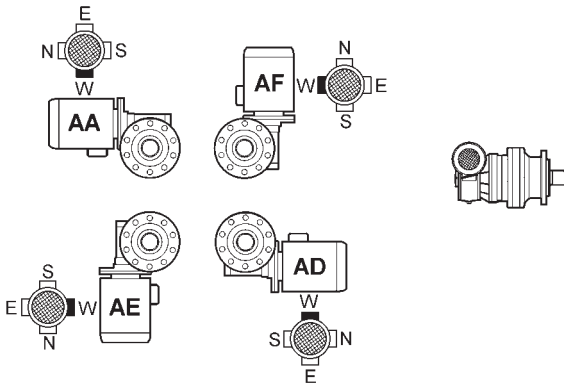
20.3 - 3/V Series

20.3 - Serie 3/V

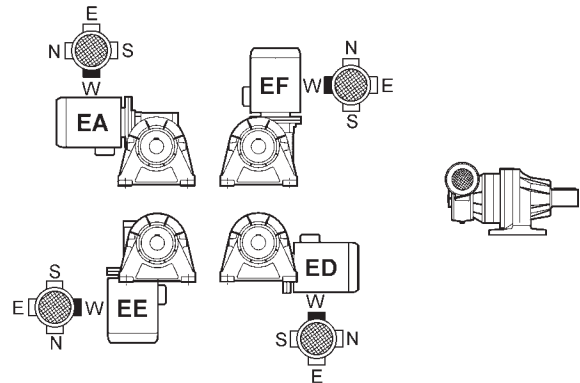
20.3 - Série 3/V

(A14)

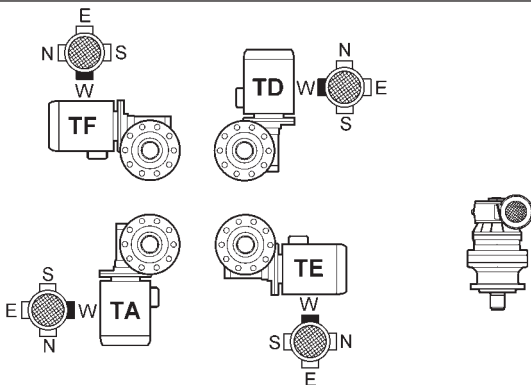
AA - AE - AF - AD



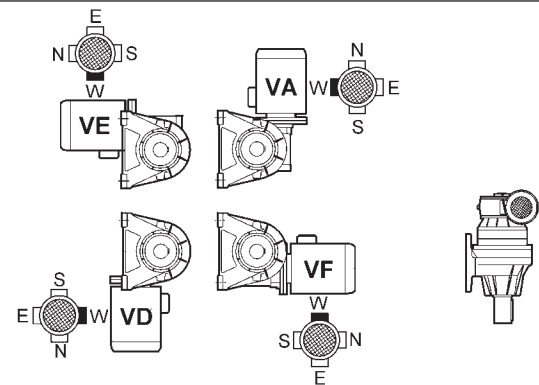
EA - EE - EF - ED



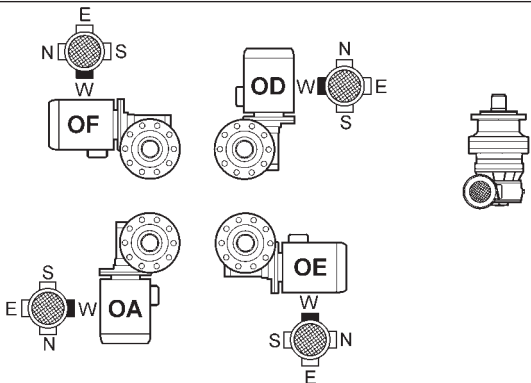
TA - TE - TF - TD



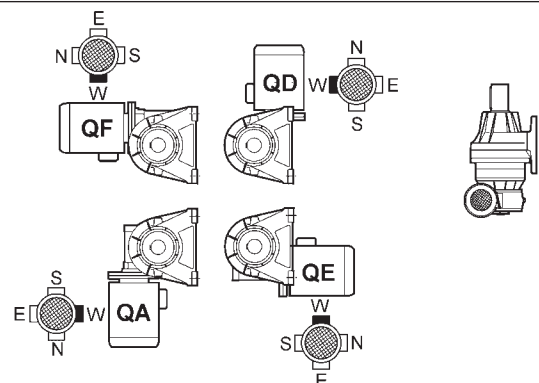
VA - VE - VF - VD



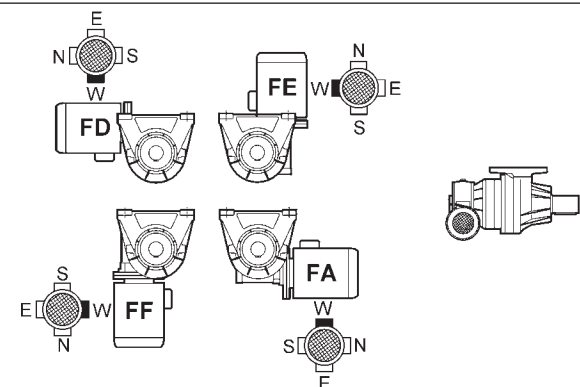
OA - OE - OF - OD

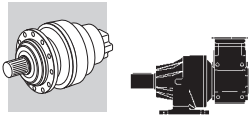


QA - QE - QF - QD



FA - FE - FF - FD





20.4 - Serie 3/A

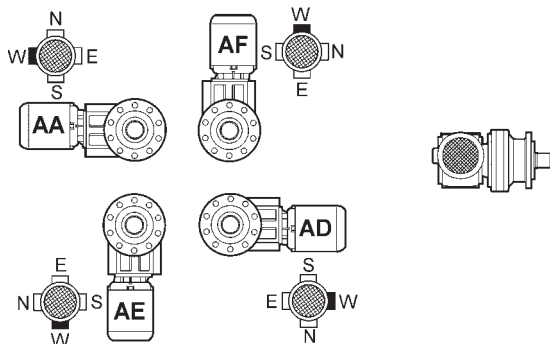
20.4 - 3/A Series

20.4 - Serie 3/A

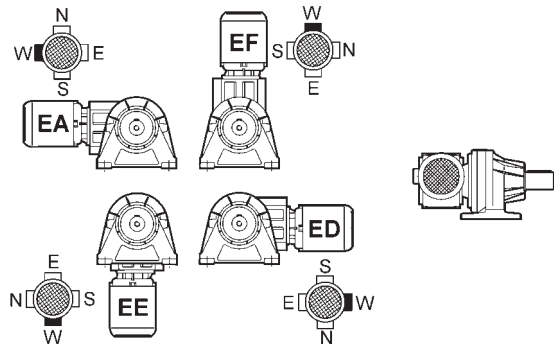
20.4 - Série 3/A

(A15)

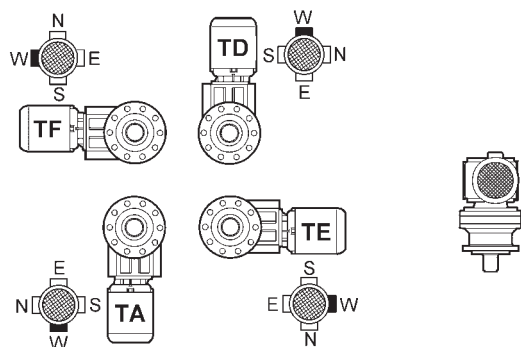
AA - AE - AF - AD



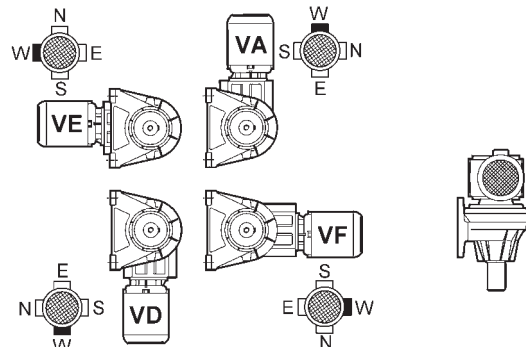
EA - EE - EF - ED



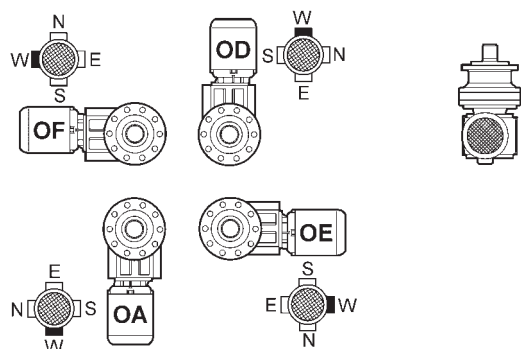
TA - TE - TF - TD



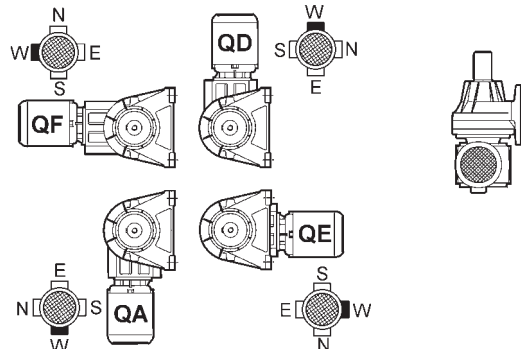
VA - VE - VF - VD



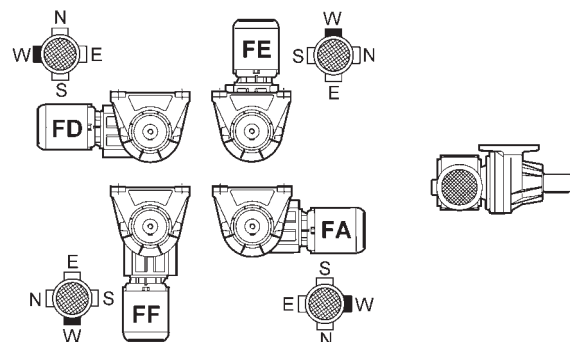
OA - OE - OF - OD

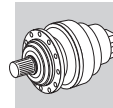


QA - QE - QF - QD



FA - FE - FF - FD





21.0 - LUBRIFICAZIONE

(prima della messa in servizio)

Tutti i riduttori prevedono una lubrificazione a bagno d'olio. Nelle posizioni di montaggio che prevedono i riduttori con un asse verticale, dove lo sbattimento dell'olio durante il funzionamento non sarebbe sufficiente a garantire la corretta lubrificazione dei cuscinetti superiori, vengono adottati adeguati sistemi di lubrificazione.

Il funzionamento dei riduttori è ammesso per temperature ambiente comprese fra -20°C e +40°C. Per temperature ambiente comprese fra -20°C e -10°C l'avviamento del riduttore potrà avvenire solo dopo aver effettuato un pre-riscaldamento progressivo ed omogeneo del gruppo, oppure con funzionamento "a vuoto", senza carico collegato.

Il carico potrà poi essere applicato all'albero del riduttore quando la temperatura dello stesso avrà raggiunto la temperatura di -10°C, o superiore.

Prima della messa in opera immettere la giusta quantità di lubrificante del tipo raccomandato in tabella (A16). A tal proposito i riduttori sono muniti dei tappi di carico, livello e scarico olio.

Al fine di predisporre il corretto orientamento dei tappi, per una adeguata lubrificazione, di precisare sempre la posizione di montaggio desiderata.

Nella tabella (A16) sono riportate le marche più diffuse di lubrificazione con i tipi di oli consigliati per applicazioni normali.

- Per funzionamenti particolari dove sono richiesti speciali requisiti, interpellare il nostro Servizio Tecnico.
- La temperatura max. del lubrificante in esercizio continuo non deve superare gli 85-90°C.
- Se non diversamente concordato, i riduttori sono forniti privi di lubrificante. Fanno eccezione i riduttori combinati (3/V e 3/A) nei quali il riduttore a vite, o ad assi ortogonali, può essere fornito con lubrificazione permanente a base di olio sintetico secondo lo schema riportato nelle tabelle di pag. 43 e 44.
- Le quantità d'olio indicate per i vari tipi di riduttori sono indicative, il riempimento deve considerarsi corretto quando il lubrificante raggiunge il tappo di livello, collocato in fabbrica in funzione della posizione di montaggio.
- nel caso in cui la potenza trasmessa superi quella termica, occorrerà provvedere ad una circolazione forzata dell'olio (vedi: Sistemi ausiliari di raffreddamento).

21.0 - LUBRICATION

(prior to start-up)

Gear units are oil lubricated. For gearboxes specified for vertical installation, whereas the oil coverage may not be sufficient to ensure proper lubrication of the uppermost bearings, extra lubrication provisions are used.

Operation of gear units is permitted at ambient temperatures between -20°C and +40°C. However, for temperatures between -20°C and -10°C unit may only start up after it has been progressively and evenly pre-heated, or otherwise initially operated unloaded.

Load may then be connected to the output shaft when the gear unit has reached the temperature of -10°C, or higher.

Prior to starting-up, fill the gearbox with the appropriate quantity of oil, selecting the viscosity as per table (A16).

Gearboxes are generally provided with oil fill, level and drain plugs. As such, the mounting position needs always to be specified when ordering the gearbox.

The table (A16) lists the most common brands of lubricant and the types recommended for normal applications.

- *Note: For applications with non-routine operating conditions, consult factory with complete information.*
- *Oil temperature must not exceed 85-90°C in operation.*
- *Unless otherwise specified, gear units are supplied unlubricated. Primary gear units belonging to 3/V and 3/A combinations instead may be supplied factory filled with long-life synthetic lubricant, depending on their frame size, as indicated in the charts at page 43 and 44.*
- *The oil capacities listed for the various types of unit are indicative only. Fill the gearbox up to the level plug, located as per the mounting position specified when ordering to ensure the gearbox is properly filled.*
- *Should transmitted power exceed the thermal capacity of the unit a supplementary cooling unit must be provided (see: Supplementary cooling systems).*

21.0 - SCHMIERUNG

(vor der Inbetriebnahme)

Alle Getriebe weisen eine Ölbadschmierung auf. Werden die Getriebe mit vertikaler Achse eingebaut, so daß nicht gewährleistet werden kann, daß das Öl während des Betriebs des Getriebes auch die oberen Lager ordnungsgemäß schmiert, werden entsprechende Dauerschmierungen vorgesehen.

Die Getriebe dürfen bei einer Umgebungstemperatur von -20°C bis +40°C betrieben werden. Allerdings darf ein Start unter Last bei -20°C bis -10°C erst nach stufenweiser und gleichmäßiger Vorwärmung erfolgen. Anderfalls muss das Anfahren ohne Last erfolgen.

Die Last darf erst zugeschaltet werden, wenn die Getriebeeinheit eine Temperatur von mindestens -10° oder höher erreicht hat.

Vor der Inbetriebnahme muß die entsprechende Schmiermittelmenge eingefüllt werden. Die hierzu jeweils erforderlichen Viskositätswerte können der Tabelle (A16) entnommen werden. Für diesen Füllvorgang wurden die Getriebe mit Verschläüssen für das Einfüllen, Nachfüllen und den Ablass des Öls ausgestattet. Um die Verschläüsse für eine angemessene Schmierung in korrekter Weise auszurichten zu können, empfehlen wir Ihnen, immer die gewünschte Montageposition anzugeben. In der Tabelle (A16) werden die bekanntesten Schmiermittelmärken mit den für normale Applikationen empfohlenen Öltypen aufgeführt.

- Im Falle von speziellen Einsatzbereichen, bei denen besondere Anforderungen vonnöten sind, wenden Sie sich bitte an unsere technische Abteilung.
- Die maximale Temperatur des Schmiermittels bei Dauerbetrieb darf 85-90°C nicht überschreiten.
- Die Getriebe werden ohne Öl ausgeliefert, es sei denn es ist anders spezifiziert. Die Getriebekombinationen 3/V und 3/A werden in einigen Baugrößen mit synthetischem lebensdauer Öl befüllt. Die Befüllung ist abhängig von der Baugröße, siehe Übersicht Seite 43 und 44.
- Die für die verschiedenen Getriebetypen angegebenen Ölmengen sind Anhaltswerte, der Füllstand ist dann korrekt, wenn das Schmiermittel den Ölstandverschluss erreicht, der in Abhängigkeit zur Einbaulage in der Herstellerfirma angeordnet wurde.
- Sollte die übertragende Leistung die Wärmeleistung über-

21.0 - LUBRIFICATION

(avant mise en route)

Tous les réducteurs prévoient une lubrification en bain d'huile. Dans les positions de montage qui prévoient les réducteurs avec axe vertical, où le barbotage de l'huile pendant le fonctionnement serait insuffisant pour garantir une lubrification correcte des paliers supérieurs, l'on adopte des systèmes appropriés de graissage à vie.

Le fonctionnement des réducteurs est admis pour des températures ambiantes comprises entre -20°C et +40°C. Pour des températures ambiantes comprises entre -20°C et -10°C le démarrage du réducteur est admis seulement après un préchauffage progressif et homogène, ou avec un fonctionnement « à vide », sans charge appliquée.

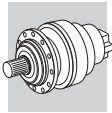
La charge pourra être ensuite appliquée à l'arbre du réducteur quand celui-ci aura atteint une température de -10°C, ou supérieure.

Avant la mise en service, introduire la quantité exacte de lubrifiant en choisissant la viscosité dans le tableau (A16). Les réducteurs sont pourvus de cet effet d'un bouchon de remplissage, jauge de niveau et élément de vidange huile.

Dans le but de réaliser une mise en place exacte des bouchons, pour une lubrification appropriée, il est conseillé de spécifier toujours la position de montage souhaitée.

Sur le tableau (A16), ont été reportées les marques les plus répandues de lubrifiants avec les types conseillés, pour des applications normales.

- Pour des applications dans des conditions de fonctionnement particulières, consulter nos Services Techniques.
- La température maxi du lubrifiant, en fonctionnement continu, ne doit pas dépasser 85-90°C.
- Sauf si différemment spécifié, les réducteurs sont livrés sans lubrifiant. Font exception les réducteurs combinés (3/V et 3/A) dans lesquels le réducteur à vis, ou à axes orthogonaux, peut être livré avec lubrification permanente à base d'huile synthétique selon le schéma indiqué dans les tableaux à page 43 et 44.
- Les quantités d'huile indiquées pour les différents types de réducteurs sont à titre indicatif ; le remplissage est correct quand le lubrifiant atteint le bouchon de niveau, placé à l'usine selon la position de montage.
- Dans le cas où la puissance transmise dépasserait la puissance thermique, il sera nécessaire de prévoir une circulation d'huile (voir Sys-



NOTA: nei riduttori di tipo combinato la lubrificazione degli stadi epicicloidali è separata da quella dei riduttori a vite senza fine (3/V), o ortogonali (3/A).

NOTE: Combined gearboxes and gearmotors feature separate lubrication for planetary stages and for worm gearboxes (3/V) or helical bevel units (3/A).

steigen, ist eine Ölumlagerung erforderlich (Siehe Hilfskühl-systeme).

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V) oder Kegelradgetriebe (3/A) getrennt.

temes auxiliaires de refroidissement).

REMARQUE: Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V) ou orthogonaux (3/A).

(A16)

			
Norme ISO 3448 con caratteristiche EP / ISO standard 3448 EP grade ISO-Normen 3448 EP-Merkmalen / Normes ISO 3448 avec caractéristiques EP			
T _a	-10°C / +30°C	+10°C / +45°C	-20°C / +60°C
	ISO VG 150	ISO VG 220	ISO VG 150-220
SHELL	OMALA EP150	OMALA EP220	TIVELA OIL S
AGIP	BLASIA150	BLASIA 220	BLASIA SX220
ARAL	DEGOL BG 150	DEGOL BG 220	DEGOL PAS 150-220
BP	ENERGOL GR XP 150	ENERGOL GR XP 220	EVERSYN EXP 150-220
CASTROL	ALPHA SP 150	ALPHA SP 220	ALPHASYN EP 150-220
CEPSA	ENGRANAJES HP 150	ENGRANAJES HP 220	ENGRANAJES HPX 150-220
CHEVRON	N.L. GEAR COMPOUNDS EP 150	N.L. GEAR COMPOUNDS EP 220	TEGRA SYNTHETIC GEAR EP 150-200
ESSO	SPARTAN EP 150	SPARTAN EP 220	SPARTAN S EP 150-220
FUCHS	RENOLIN CKC 150	RENOLIN CKC 220	RENOLIN UNISYN CKC 150-220
KLUBER	KLUBEROIL GEM1-150	KLUBEROIL GEM1-220	KLUBERSYNT EG 4-150 / 4-220
Q8	GOYA 150	GOYA 220	EL GRECO 220
MOBIL	MOBILGEAR 600 XP 150	MOBILGEAR 600 XP 220	MOBILGEAR SHC XMP 150-220
MOLYCOTE	L-0115	L-0122	L-2115 / L-2122
REPSOL	SUPER TAURO 150	SUPER TAURO 220	SUPER TAURO SINTETICO 150-220
TOTAL	CARTER EP 1500	CARTER EP 2200	CARTER SH 150-220

La temperatura sulla carcassa non deve superare, nel punto più caldo, 80-85°C.

The temperature of the gear case should never exceed 80-85°C at the hottest point.

Gehäusetemperatur, an der Wärmsten Stelle max. 80-85°C.

La température sur la carcasse ne devant pas dépasser les 80-85°C

■ Oli sintetici polialfaolefine (PAO)

■ Polyalphaolefin-based synthetic oil (PAO)

■ Synthetische Poly-Alpha-Olefin-Öle (PAO)

■ Huiles synthétiques polyalphaoléfinées (PAO)

					
Viscosità olio ISO VG / Oil viscosity ISO VG / Öl-Viskosität ISO VG / Viscosité de l'huile ISO VG					
	T _a ≤ -20°	-20° < T _a ≤ 10°	0° ≤ T _a ≤ 30°	20° ≤ T _a ≤ 40°	T _a > 40°
Mineral EP	(*)	150	320	460	460 (*)
PAO EP	(*)	150	220	320	460 (*)
PAG	(*)	150	220	320	460 (*)

(*) consultare il Servizio Tecnico Commerciale

(*) consult Bonfiglioli Technical Service.

(*) Bitte wenden Sie sich an die technische Abteilung von Bonfiglioli.

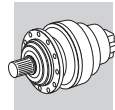
(*) Consulter le service technique Bonfiglioli.

Per i riduttori A 05...A 60 usare sempre e solo olio sintetico tipo PAG (a base poliglicolica) con viscosità ISO VG 320

When filling bevel helical gear units of models A 05 to A 60 use exclusively a PAG (polyglycol-based) synthetic oil with viscosity ISO VG 320.

Zur Befüllung der Kegelradge-triebe Baugröße A 05 bis A 60 darf ausschließlich PAG (auf Polyglycol basierend) synthetisches Öl mit der Viskosität von ISO VG 320 verwendet werden.

Pour les réducteurs A 05 à A 60, utiliser exclusivement une huile synthétique à base de polyglycol (PAG) d'une viscosité ISO VG 320



21.1 - Posizione tappi olio Serie 3_L - 3_R

21.1 - Oil plug positions 3_L - 3_R Series

21.1 - Position der Schrauben Serie 3_L - 3_R

21.1 - Positions des bouchons Série 3_L - 3_R

(A17)

TUTTI I RIDUTTORI

- 1 Tappo carico e sfiato
- 2 Tappo di livello
- 3 Tappo scarico

RIDUTTORI LINEARI AD UNO STADIO

- 1A Tappo carico e sfiato
- 3A Tappo scarico

RIDUTTORI ANGOLARI A DUE STADI

- 1B Tappo carico e sfiato
- 3B Tappo scarico

ALL UNITS

- 1 Filler/breather oil plug
- 2 Oil level plug
- 3 Oil draining plug

1 STAGE IN-LINE GEAR UNITS

- 1A Filler/breather oil plug
- 3A Oil draining plug

2 STAGE RIGHT ANGLE GEAR UNITS

- 1B Filler/breather oil plug
- 3B Oil draining plug

ALLE GETRIEBE

- 1 Einfüll-und Ablasschraube
- 2 Ölstandschrabe
- 3 Ölablasschraube

LINEAR GETRIEBE MIT 1 STUFEN

- 1A Einfüll-und Ablasschraube
- 3A Ölablasschraube

RECHTWINLIG GETRIEBE MIT 2 STUFEN

- 1B Einfüll-und Ablasschraube
- 3B Ölablasschraube

TOUTES REDUCTEURS

- 1 Bouchon de remplissage et reniflard
- 2 Bouchon de niveau
- 3 Bouchon de vidange

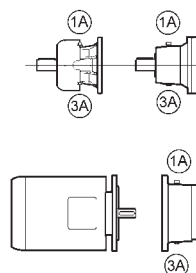
REDUCTEURS COAXIALE AVEC 1 TRAIN DE REDUCTION

- 1A Bouchon de remplissage et reniflard
- 3A Bouchon de vidange

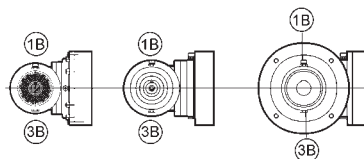
REDUCTEURS A RENVOI D'ANGLE AVEC 2 TRAINS DE REDUCTION

- 1B Bouchon de remplissage et reniflard
- 3B Bouchon de vidange

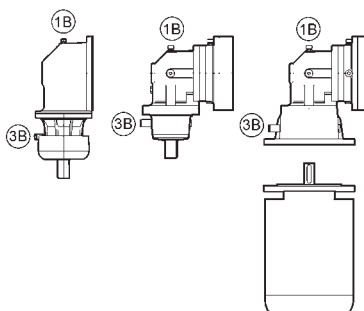
A - E



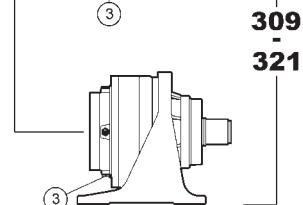
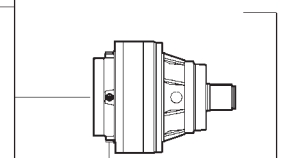
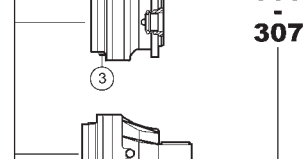
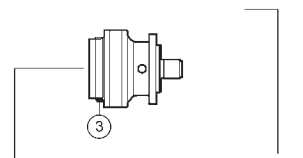
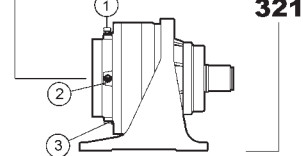
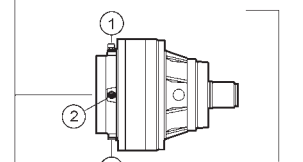
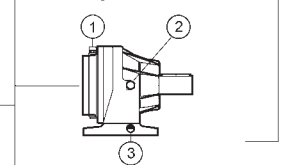
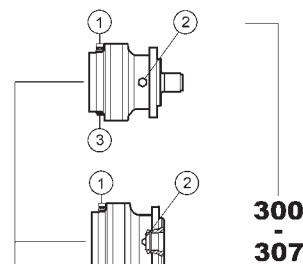
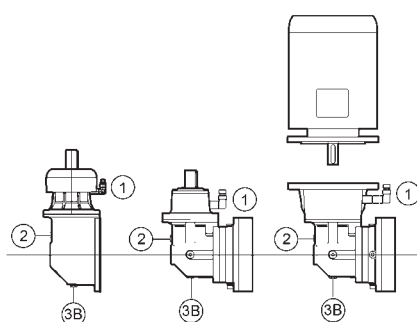
B1 - B3 - I1 - I3

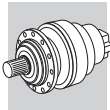


B2 - I2



B0 - I0





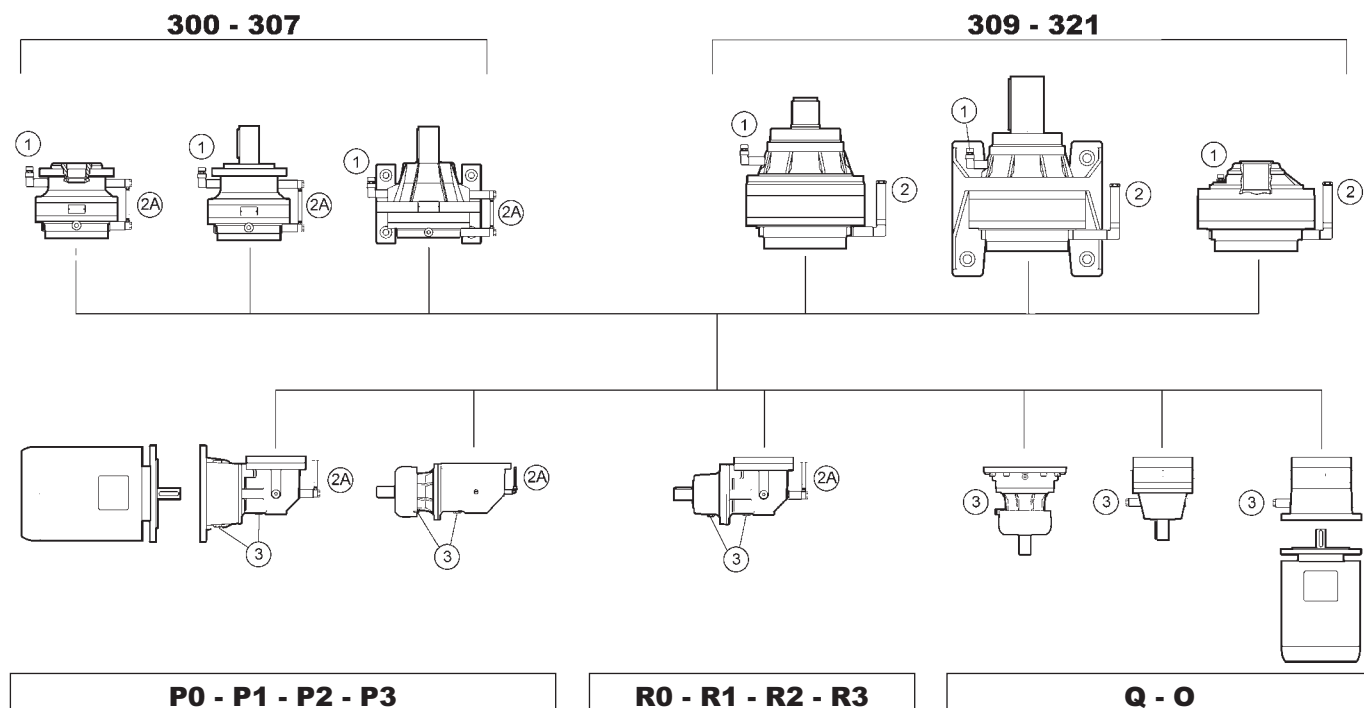
21.1 - Posizione tappi olio Serie 3_L - 3_R

21.1 - Oil plug positions 3_L - 3_R Series

21.1 - Position der Schrauben Serie 3_L - 3_R

21.1 - Positions des bouchons Série 3_L - 3_R

(A18)



TUTTI I RIDUTTORI

- 1 Tappo carico e sfiato
- 2 Tappo di livello
- 2A Tubo trasparente di livello
- 3 Tappo scarico
- 5 Vaso d'espansione per servizio continuo

ALL GEARBOXES

- Filler/breather oil plug
- Oil level plug
- Transparent oil level pipe
- Oil draining plug
- Expansion tank for continuous duty

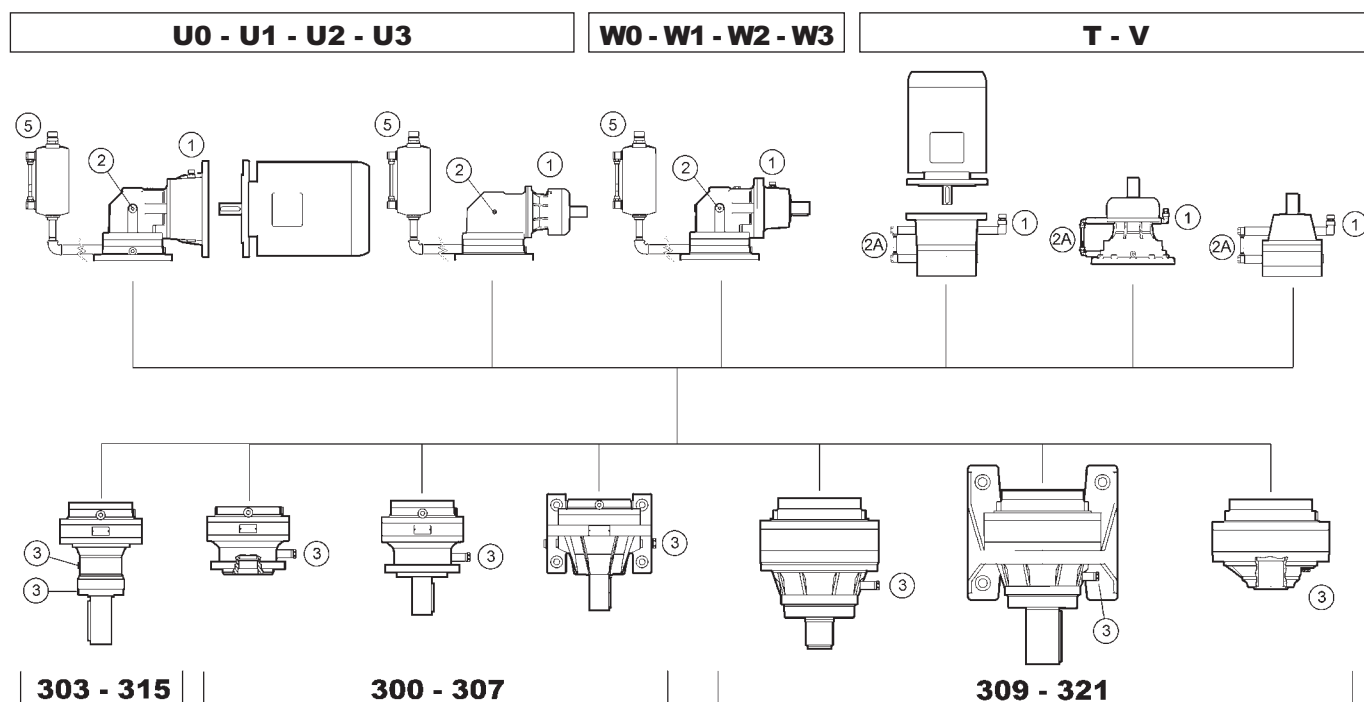
ALLE GETRIEBE

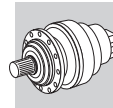
- Einfüll- und Ablassschraube
- Ölstandschraube
- Ölablassschraube
- Ölüberlaufgefäß für Applikationen im Dauerbetriebe

TOUTES REDUCTEURS

- Bouchon de remplissage et reniflard
- Bouchon de niveau
- Bouchon de niveau
- Bouchon de vidange
- Vase d'expansion pour des applications en service continu

(A19)





21.1 - Posizione tappi olio Serie 3/V

21.1 - Oil plug positions 3/V Series

21.1 - Position der Schrauben Serie 3/V

21.1 - Positions des bouchons Série 3/V

(A20)

A - E

TUTTI I RIDUTTORI (stadi epicicloidali)

- 1 Tappo carico e sfiato
- 2 Tappo di livello
- 3 Tappo scarico

(stadio a vite senza fine)

- 1V Tappo carico e sfiato
- 2V Tappo di livello
- 3V Tappo scarico

ALL GEARBOXES (planetary stages)

- 1 Filler/breather oil plug
- 2 Oil level plug
- 3 Oil draining plug

(worm reduction module)

- 1V Filler/breather oil plug
- 2V Oil level plug
- 3V Oil draining plug

ALLE GETRIEBE (Planetenstufen)

- 1 Einfüll-und Ablasschraube
- 2 Ölstandschrabe
- 3 Ölablassschraube

(Schneckenübersetzungsstufe)

- 1V Einfüll-und Ablasschraube
- 2V Ölstandschrabe
- 3V Ölablassschraube

TOUTES REDUCTEURS (étages épicycloïdaux)

- 1 Bouchon de remplissage et reniflard
- 2 Bouchon de niveau
- 3 Bouchon de vidange

(étage de réduction à vis sans fin)

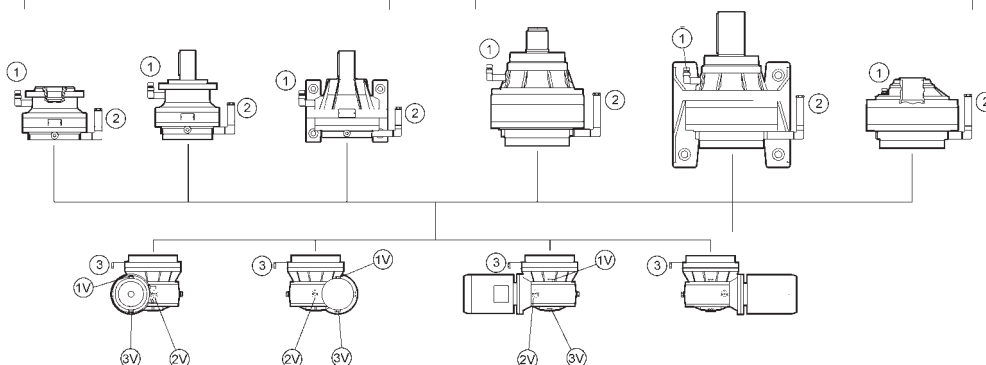
- 1V Bouchon de remplissage et reniflard
- 3V Bouchon de niveau
- 3V Bouchon de vidange

(A21)

O - Q

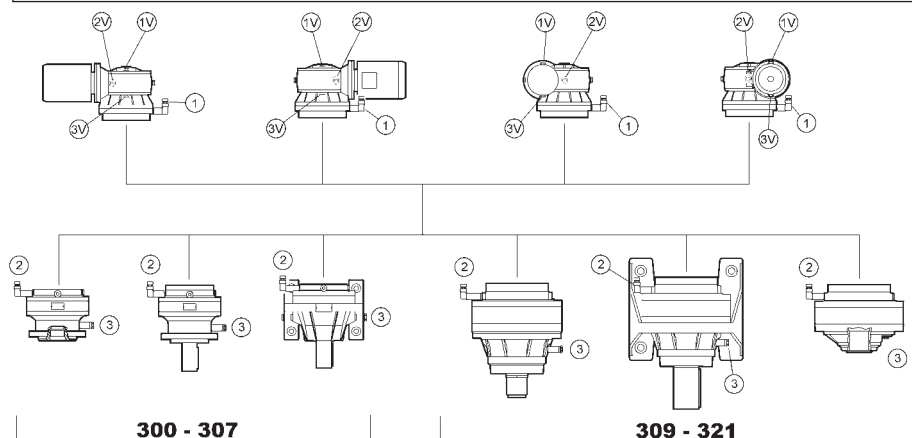
300 - 307

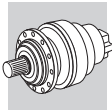
309 - 321



(A22)

T - V





21.1 - Posizione tappi olio Serie 3/A

21.1 - Oil plug position 3/A Series

21.1 - Position der Schrauben Serie 3/A

21.1 - Positions des bouchons Série 3/A

(A23)

A - E

TUTTI I RIDUTTORI (stadi epicicloidali)

- 1 Tappo carico e sfiato
- 2 Tappo di livello
- 3 Tappo scarico

(stadio ad assi ortogonali)

- 1A Tappo carico e sfiato
- 2A Tappo di livello
- 3A Tappo scarico

ALL GEARBOXES (planetary stages)

- 1 Filler/breather oil plug
- 2 Oil level plug
- 3 Oil draining plug

(helical bevel reduction module)

- 1A Filler/breather oil plug
- 2A Oil level plug
- 3A Oil draining plug

ALLE GETRIEBE (Planetenstufen)

- 1 Einfüll-und Ablasschraube
- 2 Ölstandschrabe
- 3 Ölablasschraube

(Kegelradübersetzungsstufe)

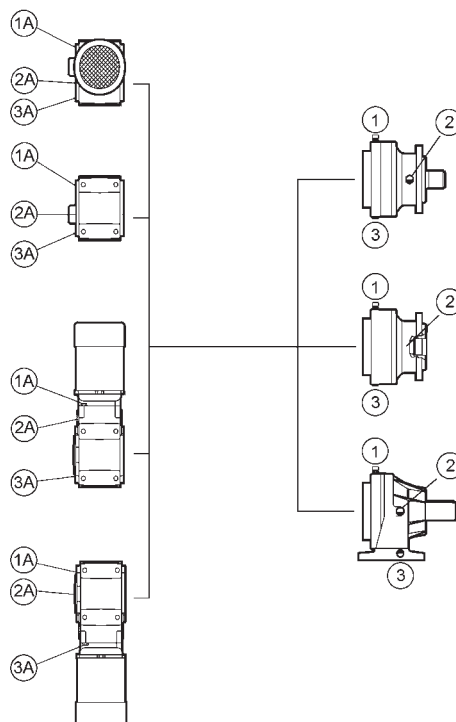
- 1A Einfüll-und Ablasschraube
- 2A Ölstandschrabe
- 3A Ölablasschraube

TOUTES REDUCTEURS (étages épicycloïdaux)

- 1 Bouchon de remplissage et reniflard
- 2 Bouchon de niveau
- 3 Bouchon de vidange

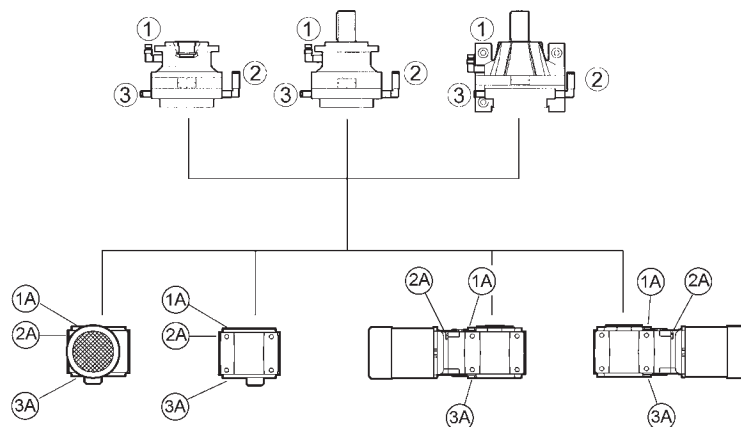
(étage de réduction à axes orthogonaux)

- 1A Bouchon de remplissage et reniflard
- 2A Bouchon de niveau
- 3A Bouchon de vidange



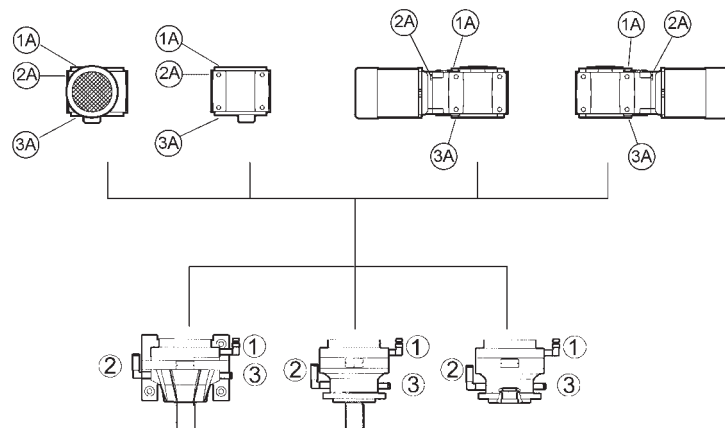
(A24)

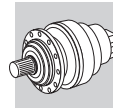
O - Q



(A25)

T - V





21.2 - Quantità olio (l) Serie 3_L

(A26a)

21.2 - Oil quantity (l) 3_L Series

21.2 - Schmierölmenge (l) Serie 3_L

21.2 - Quantité d'huile (l) Série 3_L

		Posizione di montaggio <i>Mounting position</i> Einbaulagen <i>Position de montage</i>			31
		A	T	O	
300	L1	0.6	1.0	0.9	
	L2	0.9	1.3	1.2	
	L3	1.2	1.6	1.5	
	L4	1.5	1.9	1.8	
301	L1	0.8	1.2	1.1	
	L2	1.1	1.5	1.4	
	L3	1.4	1.8	1.7	
	L4	1.7	2.1	2.0	
303	L1	1.3	2.3	2.0	
	L2	1.6	2.6	2.3	
	L3	1.9	2.9	2.6	
	L4	2.2	3.2	2.9	
304	L1	1.4	2.4	2.2	
	L2	1.9	2.9	2.7	
	L3	2.2	3.2	3.0	
	L4	2.5	3.5	3.3	
305	L1	1.6	2.6	2.4	
	L2	2.1	3.1	2.9	
	L3	2.4	3.4	3.2	
	L4	2.7	3.7	3.5	
306	L1	2.5	3.5	3.2	
	L2	3.3	4.3	4.0	
	L3	3.6	4.6	4.3	
	L4	3.9	4.9	4.6	
307	L1	3.5	5.0	4.5	
	L2	4.5	6.0	5.5	
	L3	5.0	6.5	6.0	
	L4	5.3	6.8	6.3	
309	L1	4.0	5.5	5.0	
	L2	5.0	6.5	6.0	
	L3	5.5	7.0	6.5	
	L4	5.8	7.3	6.8	

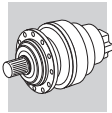
		Posizione di montaggio <i>Mounting position</i> Einbaulagen <i>Position de montage</i>			31
		A	T	O	
310	L1	5.0	6.5	6.0	
	L2	6.3	7.8	7.3	
	L3	7.1	8.6	8.1	
	L4	7.4	8.9	8.4	
311	L1	7.0	12	10	
	L2	9.0	14	12	
	L3	10	15	13	
	L4	11	16	14	
313	L1	9.0	14	12	
	L2	12	17	15	
	L3	13	18	16	
	L4	13	18	16	
314	L2	17	25	21	
	L3	19	27	23	
	L4	20	28	24	
315	L2	19	27	23	
	L3	21	29	25	
	L4	22	30	26	
316	L2	22	30	26	
	L3	24	32	28	
	L4	25	33	29	
317	L2	26	41	36	
	L3	29	44	39	
	L4	30	45	40	
318	L3	40	55	50	
	L4	43	58	53	
319	L3	50	70	60	
	L4	53	73	63	
321	L3	56	76	66	
	L4	60	80	70	

N.B. Le quantità d'olio sono indicative. Verificare l'esatto livello al momento del riempimento tramite l'apposito tappo.

N.B. Oil quantities are indicative. Check actual level after filling through the appropriate plug.

Achtung! Die Angabe bezüglich Ölmenge sind Richtwerte. Der Ölstand soll während des Einfüllens anhand des Ölstandstopfens überprüft werden.

N.B. Les quantités d'huile sont indicatives. Vérifiez la quantité correcte de lubrifiant selon le niveau d'huile.



21.2 - Quantità olio (l)
Serie 3_R

(A26b)

21.2 - Oil quantity (l)
3_R Series

21.2 - Schmierölmenge (l)
Serie 3_R

21.2 - Quantité d'huile (l)
Série 3_R

		Posizione di montaggio <i>Mounting position</i> Einbaulagen Position de montage 32		
		B0	U_	P_
300	R2	1.2	1.7	1.5
	R3	1.5	2.0	1.8
	R4	1.8	2.3	2.1
301	R2	1.6	2.1	1.9
	R3	1.9	2.4	2.2
	R4	2.2	2.7	2.5
303	R2	2.2	2.8	2.6
	R3	2.5	3.1	2.9
	R4	2.8	3.4	3.2
304	R2	2.3	2.9	2.7
	R3	2.8	3.4	3.2
	R4	3.1	3.7	3.5
305	R2	2.5	3.1	2.9
	R3	3.0	3.6	3.4
	R4	3.3	3.9	3.7
306	R2	4.0	5.0	4.8
	R3	4.8	5.8	5.6
	R4	5.1	6.1	5.9
307	R2	6.0	8.0	7.0
	R3	7.0	9.0	8.0
	R4	7.5	9.5	8.5

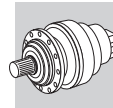
		Posizione di montaggio <i>Mounting position</i> Einbaulagen Position de montage 32		
		B0	U_	P_
309	R2	6.5	8.5	7.5
	R3	7.5	9.5	8.5
	R4	8.0	10	9.0
310	R2	13	15	14
	R3	11	13	12
	R4	12	14	13
311	R2	14	19	17
	R3	16	21	19
	R4	17	22	20
313	R2	16	21	19
	R3	19	24	22
	R4	20	25	23
314	R3	25	33	29
	R4	28	36	32
315	R3	27	35	31
	R4	30	38	34
316	R3	30	38	34
	R4	33	41	37
317	R3	38	52	48
	R4	42	56	52
318	R4	48	63	58

N.B. Le quantità d'olio sono indicative. Verificare l'esatto livello al momento del riempimento tramite l'apposito tappo.

N.B. Oil quantities are indicative. Check actual level after filling through the appropriate plug.

Achtung! Die Angabe bezüglich Ölmenge sind Richtwerte. Der Ölstand soll während des Einfüllens anhand des Ölstandstopfens überprüft werden.

N.B. Les quantités d'huile sont indicatives. Vérifiez la quantité correcte de lubrifiant selon le niveau d'huile.



21.2 - Quantità olio (l)
Serie 3/V

21.2 - Oil quantity (l)
3/V Series

21.2 - Schmierölmenge (l)
Serie 3/V

21.2 - Quantité d'huile (l)
Série 3/V

(A27a)

													
	AA - EA - FD			AF - EF - FE		AE - EE - FF		AD - ED - FA		TA - TE - TF - TD VA - VE - VF - VD		OA - OE - OF - OD QA - QE - QF - QD	
		input 			input 		input 		input 		input 		input 
		P(IEC)	HS		P(IEC) HS		P(IEC) HS		P(IEC) HS		P(IEC) HS		P(IEC) HS
3/V 00 L3	0.9	0.12	0.12	0.9	0.12	0.9	0.12	0.9	0.12	1.3	0.12	1.2	0.12
3/V 01 L3	1.1			1.1		1.1		1.1		1.5		1.4	
3/V 03 L3	1.6	0.25	0.25	1.6	0.31	1.6	0.31	1.6	0.38	2.6	0.31	2.3	0.25
3/V 04 L3	1.9	0.38	0.38	1.9	0.43	1.9	0.43	1.9	0.52	2.9	0.52	2.7	0.38
3/V 05 L3	2.1			2.1		2.1		2.1		3.1		2.9	
3/V 06 L3	3.3	0.64	0.64	3.3	0.76	3.3	0.76	3.3	0.85	4.3	0.76	4	0.76
3/V 10 L4	7.1			7.1		7.1		7.1		8.6		8.1	
3/V 07 L3	4.5			4.5		4.5		4.5		6		5.5	
3/V 11 L4	10	2.4	2.8	10	2.6	10	2.6	10	1.7	15	1.9	13	1.9
3/V 13 L4	13			13		13		13		18		16	
3/V 09 L3	5			5		5.0		5		6.5		6	
3/V 10 L3	6.3			6.3		6.3		6.3		7.8		7.3	
3/V 14 L4	19	4.3	4.5	19	3.9	19	3.9	19	3.0	27	3.5	23	3.5
3/V 15 L4	21			21		21		21		29		25	
3/V 16 L4	24			24		24		24		32		28	
3/V 11 L3	9			9		9		9		14		12	
3/V 13 L3	12	7.8	9.6	12	6.7	12	6.7	12	5.0	17	5.5	15	5.5
3/V 14 L3	17			17		17		17		25		21	
3/V 17 L4	29			29		29		29		44		39	
3/V 15 L3	19			19		19		19		27		23	
3/V 18 L4	40	11	15	40	8.9	40	9.4	40	7.5	55	9.5	50	9.5
3/V 19 L4	50			50		50		50		70		60	
3/V 16 L3	22			22		22		22		30		26	
3/V 17 L3	26	23	28	26	16.8	26	17.5	26	10.7	41	17	36	17
3/V 21 L4	56			56		56		56		76		66	

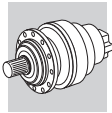
 Lubrificazione permanente / Life lubricated / Dauerschmierung / Lubrification permanente

NOTA: nei riduttori combinati la lubrificazione degli stadi epicycloidali è separata da quella dei riduttori a vite senza fine (3/V), o ortogonali (3/A).

NOTE: Combined gearboxes feature separate lubrication for planetary stages and for worm gearboxes (3/V), or helical bevel units (3/A).

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V), oder Kegelradgetriebe (3/A) getrennt

REMARQUE: Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V), ou orthogonaux (3/A).



**21.2 - Quantità olio (l)
Serie 3/A**

**21.2 - Oil quantity (l)
3/A Series**

**21.2 - Schmierölmenge (l)
Serie 3/A**

**21.2 - Quantité d'huile (l)
Série 3/A**

(A27b)

												
	AA - EA - FD		TA - TE - TF - TD VA - VE - VF - VD		OA - OE - OF - OD QA - QE - QF - QD		AD - ED - FA		AF - EF - FE		AE - EE - FF	
												
3/A 00 L2	0.60	1.4	1.0	1.4	0.9	1.4	0.6	1.4	0.6	1.4	0.6	1.4
3/A 01 L2	0.80	2.3	1.2	2.3	1.1	2.3	0.8	2.3	0.8	2.3	0.8	2.3
3/A 03 L2	1.3	3.2	2.3	3.2	2.0	3.2	1.3	3.2	1.3	3.2	1.3	3.2
3/A 04 L2	1.4	3.8	2.4	3.9	2.2	3.9	1.4	4.5	1.4	5.0	1.4	4.2
3/A 05 L2	1.6	4.0	2.6	4.1	2.4	4.1	1.6	4.7	1.6	5.2	1.6	4.4
3/A 06 L2	2.5	4.9	3.5	8.1	3.2	4.7	2.5	8.4	2.5	11	2.5	9.2
3/A 07 L2	3.5	6.8	5.0	8.1	4.5	12	3.5	15	3.5	18	3.5	15

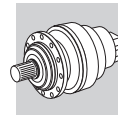
 Lubrificazione permanente / Life lubricated / Dauerschmierung / Lubrification permanente

NOTA: nei riduttori combinati la lubrificazione degli stadi epicicloidali è separata da quella dei riduttori a vite senza fine (3/V), o ortogonali (3/A).

NOTE: Combined gearboxes feature separate lubrication for planetary stages and for worm gearboxes (3/V), or helical bevel units (3/A).

MERKE: Bei den kombinierten Getrieben ist die Schmierung der Planetenstufen von denen der Schneckengetriebe (3/V), oder Kegelradgetriebe (3/A) getrennt

REMARQUE: Sur les réducteurs combinés, la lubrification des étages épicycloïdaux est séparée de celle des réducteurs à vis sans fin (3/V), ou orthogonaux (3/A).



22.0 - DATI TECNICI MOTORI- DUTTORI 300 L - 300 R

Guida alla consultazione delle
tabelle.

22.0 - 300 L - 300 R GEARMO- TOR RATING CHARTS

Reading the rating chart.

22.0 - 300 L - 300 R TECHNI- SCHEN DATEN DER GETRIEBEMOTOREN

Anleitung für die richtige Konsul-
tation der Tabellen.

22.0 - DONNEES TECHNIQUES MOTOREDUCTEURS 300 L - 300 R

Guide pour la consultation des
tableaux.



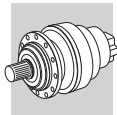
$P_1 = 30 \text{ kW}$ **$n_1 = 1400 \text{ min}^{-1}$**

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			
											HC/PC	HZ/PZ	FZ	
1.1	241161	1.4	1389	30	319 L4	—	BN 200L 4	—	—	—	636100	700800	199500	334
1.2	207451	1.6	1195	30	319 L4	—	BN 200L 4	—	—	—	608000	669900	189700	334
1.3	194773	2.5	1122	35	321 L4	—	BN 200L 4	—	—	—	731900	867900	1114500	386
1.4	183926	1.3	1059	22	318 L4	—	BN 200L 4	—	—	—	503000	520700	182200	370
1.4	179280	1.0	1032	18.0	317 L4	—	BN 200L 4	—	—	—	403600	429700	135500	362



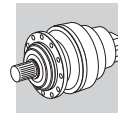
Valori di potenza termica inferiori alla potenza meccanica applicata / Thermal capacity lower than power applied / Wärmeleistung niedriger als die Motorleistung / Les valeurs de puissance thermique sont inférieures à la puissance mécanique appliquée

1	Potenza del motore elettrico abbinato al riduttore	Rating of electric motor connected to the gearbox	Übertragene Leistung am Getriebeantrieb	Puissance transmise à l'entrée du réducteur
2	Velocità del motore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Velocità albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
4	Coppia trasmessa all'albero lento	Torque delivered at output shaft	Übertragenes Drehmoment am Getriebeabtrieb	Couple transmise en sortie réducteur
5	Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité
6	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
7	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
8	Grandezza riduttore in esecuzione lineare	Frame size of the in-line gear unit	Baugröße des Lineargetriebes	Taille réducteur exécution linéaire
9	Grandezza riduttore in esecuzione angolare NOTA: i suffissi (B) (C) sulla stessa grandezza indicano riduzioni angolari di dimensioni differenti: vedere le pagine dimensionali	Frame size of the right-angled gear unit NOTE: Suffix (B) or (C) alongside the frame size refer to different bevel gear sets. See installation drawings for reference	Baugröße des Winkelgetriebes HINWEIS: Die Kennzeichnungen (B) (C) an der gleichen Baugröße weisen auf die Winkelreduzierung in unterschiedlichen Maßen hin: siehe Seiten mit Maßtabellen	Taille réducteur exécution angulaire REMARQUE: les indications (A) (B) (C) sur la même taille indiquent des réductions angulaires de dimensions différentes. Se reporter aux pages des dimensions
10	Grandezza motore IEC e polarità	IEC motor size and pole number	Baugröße des IEC-Motors und Anzahl der Pole	Taille moteur IEC et n° pôles
11	Grandezza motore compatto e polarità	Integral motor frame size and pole number	Baugröße des Kompaktmotors und Anzahl der Pole	Taille moteur compact et n° pôles
12	Carico radiale applicabile sull'albero lento, calcolato per: - fattore di sicurezza S=1 - durata teorica di 10000 h Per forze non agenti in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 hrs theoretical lifetime For forces not applying at shaft midpoint, see diagrams provided in the pages following dimensions of the specific gearbox	Auf die Mitte der Abtriebswelle für Sicherheitsfaktor S=1 und eine Dauer von 10000 Std. applizierbare Nenn-Radialkräfte. Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales applicables en milieu d'arbre de sortie pendant : - facteur de sécurité S=1 - durée de 10000 heures Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
13	Pagina delle dimensioni. Le dimensioni dei motoriduttori si riferiscono ad abbinamenti con motori di produzione BONFIGLIOLI	Page dimensions can be sorted from. Gearmotor overall dimensions refer to matches with BONFIGLIOLI motors only	Maßseiten. Die Maße der Getriebemotoren sind nur im Fall einer Montage mit Motoren der BONFIGLIOLI gültig	Page avec les dimensions. Les dimensions des motoréducteurs sont valables seulement avec moteurs BONFIGLIOLI



$P_1 = 0.25 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
0.47	4465	1.6	2916	6.0	306 L4	—	BN 71A 4	—	45000	51000	101000	119000	35000	274	
0.57	3709	3.0	2423	7.5	307 L4	—	BN 71A 4	—	52000	65000	109000	145000	45000	284	
0.59	3578	2.0	2337	6.0	306 L4	—	BN 71A 4	—	45000	51000	101000	119000	35000	274	
0.62	3434	1.1	2243	6.0	305 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	264	
0.67	3175	2.2	2074	6.0	306 L4	—	BN 71A 4	—	45000	51000	101000	119000	35000	274	
0.69	3048	0.9	1991	6.0	303 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	244	
0.69	3048	1.1	1991	6.0	304 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	254	
0.69	3048	1.8	1991	6.0	305 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	264	
0.74	2839	1.6	1854	6.0	305 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	264	
0.76	2780	1.0	1815	6.0	304 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	254	
0.87	2429	0.9	1586	6.0	303 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	244	
0.87	2429	1.6	1586	6.0	304 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	254	
0.87	2429	2.0	1586	6.0	305 L4	—	BN 71A 4	—	36000	42000	64000	74000	24000	264	
1.0	2098	1.1	1370	6.0	303 L4	—	BN 71A 4	—	36000	42000	62200	74000	23800	244	
1.0	2098	2.2	1370	6.0	305 L4	—	BN 71A 4	—	36000	42000	62200	74000	23800	264	
1.0	2057	1.8	1344	6.0	304 L4	—	BN 71A 4	—	36000	42000	61900	74000	23700	254	
1.1	1957	1.4	1278	6.0	303 L4	—	BN 71A 4	—	36000	41900	60900	73300	23300	244	
1.1	1957	2.8	1278	6.0	305 L4	—	BN 71A 4	—	36000	41900	60900	73300	23300	264	
1.1	1952	1.0	1275	6.0	301 L4	—	BN 71A 4	—	11800	11800	29800	34000	7750	236	
1.1	1946	2.0	1271	6.0	304 L4	—	BN 71A 4	—	36000	41800	60800	73200	23200	254	
1.2	1782	1.5	1164	6.0	304 L4	—	BN 71A 4	—	35200	40600	59200	71300	22600	254	
1.2	1696	1.0	1108	6.0	301 L4	—	BN 71A 4	—	11300	11300	28600	32900	7400	236	
1.3	1681	1.3	1098	6.0	303 L4	—	BN 71A 4	—	34500	39800	58200	70000	22100	244	
1.3	1681	2.6	1098	6.0	305 L4	—	BN 71A 4	—	34500	39800	58200	70000	22100	264	
1.4	1564	1.3	1022	6.0	301 L4	—	BN 71A 4	—	11000	11000	27900	32100	7200	236	
1.4	1559	1.8	1018	6.0	303 L4	—	BN 71A 4	—	33600	38800	56900	68500	21600	244	
1.4	1559	2.5	1018	6.0	304 L4	—	BN 71A 4	—	33600	38800	56900	68500	21600	254	
1.5	1443	1.4	942	6.0	301 L4	—	BN 71A 4	—	10700	10700	27200	31300	7010	236	
1.5	1372	1.6	896	6.0	303 L4	—	BN 71A 4	—	32200	37200	54800	65900	20700	244	
1.7	1261	1.7	824	12.0	—	303 R4	BN 71A 4	—	31300	36200	53400	64300	20100	245	
1.7	1253	1.6	819	6.0	301 L4	—	BN 71A 4	—	10200	10200	26100	30000	6690	236	
1.7	1250	2.2	816	6.0	303 L4	—	BN 71A 4	—	31300	36100	53300	64100	20000	244	
1.7	1250	3.0	816	6.0	304 L4	—	BN 71A 4	—	31300	36100	53300	64100	20000	254	
1.7	1220	1.5	797	12.0	—	303 R4	BN 71A 4	—	31000	35800	52900	63600	19900	245	
1.7	1220	2.9	797	12.0	—	305 R4	BN 71A 4	—	31000	35800	52900	63600	19900	265	
1.8	1173	1.3	766	10.0	—	301 R4	BN 71A 4	—	9950	9950	25600	29400	6540	237	
1.8	1156	1.7	755	6.0	301 L4	—	BN 71A 4	—	9900	9900	25500	29300	6510	236	
1.9	1100	1.9	718	6.0	303 L4	—	BN 71A 4	—	29900	34600	51300	61700	19200	244	
2.0	1075	2.3	702	6.0	304 L4	—	BN 71A 4	—	29700	34300	50900	61300	19100	254	
2.0	1071	2.3	699	12.0	—	304 R4	BN 71A 4	—	29700	34300	50900	61200	19000	255	
2.1	1009	2.0	659	12.0	—	303 R4	BN 71A 4	—	29100	33600	50000	60100	18700	245	
2.1	994	2.2	649	6.0	303 L4	—	BN 71A 4	—	29000	33400	49700	59800	18600	244	
2.2	944	1.1	616	6.0	300 L4	—	BN 71A 4	—	9260	9260	24000	27600	6090	228	
2.2	944	2.1	616	6.0	301 L4	—	BN 71A 4	—	9260	9260	24000	27600	6090	236	
2.3	939	1.6	613	10.0	—	301 R4	BN 71A 4	—	9240	9240	23900	27500	6080	237	
2.4	868	2.8	567	12.0	—	303 R4	BN 71A 4	—	27700	32000	47700	57400	17800	245	
2.5	857	2.8	560	12.0	—	304 R4	BN 71A 4	—	27600	31800	47600	57200	17700	255	
2.5	854	1.2	558	6.0	300 L4	—	BN 71A 4	—	8950	8950	23300	26700	5890	228	
2.5	854	2.3	558	6.0	301 L4	—	BN 71A 4	—	8950	8950	23300	26700	5890	236	
2.6	808	2.4	528	12.0	—	303 R4	BN 71A 4	—	27000	31200	46700	56200	17300	245	
2.8	756	1.3	494	6.0	300 L4	—	BN 71A 4	—	8600	8600	22400	25800	5650	228	
2.8	756	2.6	494	6.0	301 L4	—	BN 71A 4	—	8600	8600	22400	25800	5650	236	
2.8	752	0.9	491	10.0	—	300 R4	BN 71A 4	—	8580	8580	22400	25700	5640	229	
2.8	752	1.9	491	10.0	—	301 R4	BN 71A 4	—	8580	8580	22400	25700	5640	237	
3.0	694	1.4	453	10.0	—	300 R4	BN 71A 4	—	8350	8350	21900	25100	5490	229	
3.0	694	2.8	453	10.0	—	301 R4	BN 71A 4	—	8350	8350	21900	25100	5490	237	
3.1	684	1.4	447	6.0	300 L4	—	BN 71A 4	—	8320	8320	21800	25000	5470	228	
3.1	684	2.8	447	6.0	301 L4	—	BN 71A 4	—	8320	8320	21800	25000	5470	236	
3.4	617	1.1	403	6.0	300 L4	—	BN 71A 4	—	8040	8040	21100	24300	5280	228	
3.4	617	2.2	403	6.0	301 L4	—	BN 71A 4	—	8040	8040	21100	24300	5280	236	

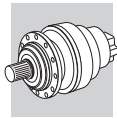


$P_1 = 0.25 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			FZ	
											HC/PC	HZ/PZ			
3.4	635	3.0	402	7.5	303 L3	—	BN 71A 4	—	24700	28500	43100	51800	15800	244	
3.5	603	1.1	394	10.0	—	300 R4	BN 71A 4	—	7970	7970	21000	24100	5240	229	
3.5	603	2.3	394	10.0	—	301 R4	BN 71A 4	—	7970	7970	21000	24100	5240	237	
3.5	614	2.8	389	7.5	303 L3	—	BN 71A 4	—	24400	28200	42600	51300	15700	244	
3.7	591	1.2	374	7.5	300 L3	—	BN 71A 4	—	7840	7840	20600	23700	5150	228	
3.7	591	2.3	374	7.5	301 L3	—	BN 71A 4	—	7840	7840	20600	23700	5150	236	
3.8	556	1.7	363	10.0	—	300 R4	BN 71A 4	—	7760	7760	20500	23500	5100	229	
4.2	506	1.8	330	6.0	300 L4	—	BN 71A 4	—	7520	7520	19900	22900	4940	228	
4.6	472	1.4	299	7.5	300 L3	—	BN 71A 4	—	7270	7270	19300	22200	4780	228	
4.6	472	2.8	299	7.5	301 L3	—	BN 71A 4	—	7270	7270	19300	22200	4780	236	
4.7	445	2.0	291	10.0	—	300 R4	BN 71A 4	—	7210	7210	19100	22000	4740	229	
5.1	411	2.2	268	10.0	—	300 R4	BN 71A 4	—	7020	7020	18700	21500	4610	229	
5.8	379	1.7	240	7.5	300 L3	—	BN 71A 4	—	6760	6760	18100	20800	4440	228	
5.8	364	1.8	237	10.0	—	300 R4	BN 71A 4	—	6740	6740	18000	20700	4430	229	
6.2	349	2.5	221	7.5	300 L3	—	BN 71A 4	—	6580	6580	17600	20300	4320	228	
6.4	329	2.6	215	10.0	—	300 R4	BN 71A 4	—	6520	6520	17500	20100	4280	229	
7.2	303	2.1	192	7.5	300 L3	—	BN 71A 4	—	6280	6280	16900	19400	4130	228	
9.6	219	3.0	143	10.0	—	300 R4	BN 71A 4	—	5690	5690	15500	17800	3740	229	
10.4	210	2.6	133	12.0	—	300 R3	BN 71A 4	—	5550	5550	15100	17400	3650	229	

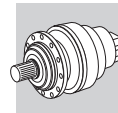
$P_1 = 0.37 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.47	6656	1.1	2916	6.0	306 L4	—	BN 71B 4	M 1SD 4	45000	51000	101000	119000	35000	274	
0.57	5530	2.0	2423	7.5	307 L4	—	BN 71B 4	M 1SD 4	52000	65000	109000	145000	45000	284	
0.59	5333	1.3	2337	6.0	306 L4	—	BN 71B 4	M 1SD 4	45000	51000	101000	119000	35000	274	
0.66	4733	1.5	2074	6.0	306 L4	—	BN 71B 4	M 1SD 4	45000	51000	101000	119000	35000	274	
0.67	4659	3.0	2041	7.5	307 L4	—	BN 71B 4	M 1SD 4	52000	65000	109000	145000	45000	284	
0.69		1.2	1991	6.0	305 L4	—	BN 71B 4	M 1SD 4	36000	42000	64000	74000	24000	264	
0.74	4233	1.1	1854	6.0	305 L4	—	BN 71B 4	M 1SD 4	36000	42000	64000	74000	24000	264	
0.74	4207	2.3	1843	6.0	306 L4	—	BN 71B 4	M 1SD 4	45000	51000	101000	119000	35000	274	
0.86	3645	2.3	1597	6.0	306 L4	—	BN 71B 4	M 1SD 4	45000	51000	101000	119000	35000	274	
0.86	3621	1.1	1586	6.0	304 L4	—	BN 71B 4	M 1SD 4	36000	42000	64000	74000	24000	254	
0.86	3621	1.3	1586	6.0	305 L4	—	BN 71B 4	M 1SD 4	36000	42000	64000	74000	24000	264	
0.93	3366	2.8	1475	6.0	306 L4	—	BN 71B 4	M 1SD 4	45000	51000	101000	119000	35000	274	
1.0	3128	1.5	1370	6.0	305 L4	—	BN 71B 4	M 1SD 4	36000	42000	62200	74000	23800	264	
1.0	3067	1.2	1344	6.0	304 L4	—	BN 71B 4	M 1SD 4	36000	42000	61900	74000	23700	254	
1.1	2920	2.9	1279	6.0	306 L4	—	BN 71B 4	M 1SD 4	45000	51000	99700	116100	34000	274	
1.1	2917	1.0	1278	6.0	303 L4	—	BN 71B 4	M 1SD 4	36000	41900	60900	73300	23300	244	
1.1	2917	1.9	1278	6.0	305 L4	—	BN 71B 4	M 1SD 4	36000	41900	60900	73300	23300	264	
1.1	2901	1.4	1271	6.0	304 L4	—	BN 71B 4	M 1SD 4	36000	41800	60800	73200	23200	254	
1.2	2656	1.0	1164	6.0	304 L4	—	BN 71B 4	M 1SD 4	35200	40600	59200	71300	22600	254	
1.2	2506	1.8	1098	6.0	305 L4	—	BN 71B 4	M 1SD 4	34500	39800	58200	70000	22100	264	
1.3	2498	3.0	1095	6.0	306 L4	—	BN 71B 4	M 1SD 4	42900	48600	95200	110800	32200	274	
1.3	2325	1.2	1018	6.0	303 L4	—	BN 71B 4	M 1SD 4	33600	38800	56900	68500	21600	244	
1.3	2325	1.7	1018	6.0	304 L4	—	BN 71B 4	M 1SD 4	33600	38800	56900	68500	21600	254	
1.3	2325	2.3	1018	6.0	305 L4	—	BN 71B 4	M 1SD 4	33600	38800	56900	68500	21600	264	
1.5	2151	0.9	942	6.0	301 L4	—	BN 71B 4	M 1SD 4	10700	10700	27200	31300	7010	236	
1.5	2046	1.1	896	6.0	303 L4	—	BN 71B 4	M 1SD 4	32200	37200	54800	65900	20700	244	
1.5	2046	2.1	896	6.0	305 L4	—	BN 71B 4	M 1SD 4	32200	37200	54800	65900	20700	264	
1.7	1880	1.1	824	12.0	—	303 R4	BN 71B 4	M 1SD 4	31300	36200	53400	64300	20100	245	
1.7	1880	2.2	824	12.0	—	305 R4	BN 71B 4	M 1SD 4	31300	36200	53400	64300	20100	265	
1.7	1869	1.1	819	6.0	301 L4	—	BN 71B 4	M 1SD 4	10200	10200	26100	30000	6690	236	
1.7	1863	1.5	816	6.0	303 L4	—	BN 71B 4	M 1SD 4	31300	36100	53300	64100	20000	244	
1.7	1863	2.0	816	6.0	304 L4	—	BN 71B 4	M 1SD 4	31300	36100	53300	64100	20000	254	
1.7	1863	2.9	816	6.0	305 L4	—	BN 71B 4	M 1SD 4	31300	36100	53300	64100	20000	264	
1.7	1819	1.0	797	12.0	—	303 R4	BN 71B 4	M 1SD 4	31000	35800	52900	63600	19900	245	
1.7	1819	1.9	797	12.0	—	305 R4	BN 71B 4	M 1SD 4	31000	35800	52900	63600	19900	265	
1.8	1723	1.2	755	6.0	301 L4	—	BN 71B 4	M 1SD 4	9900	9900	25500	29300	6510	236	
1.9	1639	1.3	718	6.0	303 L4	—	BN 71B 4	M 1SD 4	29900	34600	51300	61700	19200	244	
1.9	1639	2.5	718	6.0	305 L4	—	BN 71B 4	M 1SD 4	29900	34600	51300	61700	19200	264	



$P_1 = 0.37 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
2.0	1602	1.5	702	6.0	304 L4	—	BN 71B 4	M 1SD 4	29700	34300	50900	61300	19100	254	
2.0	1597	1.6	699	12.0	—	304 R4	BN 71B 4	M 1SD 4	29700	34300	50900	61200	19000	255	
2.1	1504	1.4	659	12.0	—	303 R4	BN 71B 4	M 1SD 4	29100	33600	50000	60100	18700	245	
2.1	1504	2.7	659	12.0	—	305 R4	BN 71B 4	M 1SD 4	29100	33600	50000	60100	18700	265	
2.1	1482	1.5	649	6.0	303 L4	—	BN 71B 4	M 1SD 4	29000	33400	49700	59800	18600	244	
2.1	1482	2.4	649	6.0	304 L4	—	BN 71B 4	M 1SD 4	29000	33400	49700	59800	18600	254	
2.1	1482	3.0	649	6.0	305 L4	—	BN 71B 4	M 1SD 4	29000	33400	49700	59800	18600	264	
2.2	1407	1.4	616	6.0	301 L4	—	BN 71B 4	M 1SD 4	9260	9260	24000	27600	6090	236	
2.2	1399	1.1	613	10.0	—	301 R4	BN 71B 4	M 1SD 4	9240	9240	23900	27500	6080	237	
2.4	1294	1.9	567	12.0	—	303 R4	BN 71B 4	M 1SD 4	27700	32000	47700	57400	17800	245	
2.4	1277	1.9	560	12.0	—	304 R4	BN 71B 4	M 1SD 4	27600	31800	47600	57200	17700	255	
2.5	1273	1.6	558	6.0	301 L4	—	BN 71B 4	M 1SD 4	8950	8950	23300	26700	5890	236	
2.5	1269	2.2	556	6.0	303 L4	—	BN 71B 4	M 1SD 4	27500	31700	47500	57100	17600	244	
2.5	1269	2.9	556	6.0	304 L4	—	BN 71B 4	M 1SD 4	27500	31700	47500	57100	17600	254	
2.6	1205	1.6	528	12.0	—	303 R4	BN 71B 4	M 1SD 4	27000	31200	46700	56200	17300	245	
2.8	1127	1.7	494	6.0	301 L4	—	BN 71B 4	M 1SD 4	8600	8600	22400	25800	5650	236	
2.8	1124	2.4	492	6.0	303 L4	—	BN 71B 4	M 1SD 4	26400	30500	45800	55100	16900	244	
2.8	1121	1.3	491	10.0	—	301 R4	BN 71B 4	M 1SD 4	8580	8580	22400	25700	5640	237	
3.0	1034	0.9	453	10.0	—	300 R4	BN 71B 4	M 1SD 4	8350	8350	21900	25100	5490	229	
3.0	1034	1.9	453	10.0	—	301 R4	BN 71B 4	M 1SD 4	8350	8350	21900	25100	5490	237	
3.0	1031	2.2	452	12.0	—	303 R4	BN 71B 4	M 1SD 4	25700	29600	44600	53700	16500	245	
3.1	1020	0.9	447	6.0	300 L4	—	BN 71B 4	M 1SD 4	8320	8320	21800	25000	5470	228	
3.1	1020	1.9	447	6.0	301 L4	—	BN 71B 4	M 1SD 4	8320	8320	21800	25000	5470	236	
3.1	1017	2.7	446	6.0	303 L4	—	BN 71B 4	M 1SD 4	25500	29500	44400	53400	16400	244	
3.2	1003	2.4	426	7.5	304 L3	—	BN 71B 4	M 1SD 4	25200	29000	43800	52700	16100	254	
3.3	944	2.5	414	12.0	—	304 R4	BN 71B 4	M 1SD 4	24900	28800	43400	52300	16000	255	
3.3	943	2.5	413	6.0	303 L4	—	BN 71B 4	M 1SD 4	24900	28800	43400	52200	16000	244	
3.4	920	1.5	403	6.0	301 L4	—	BN 71B 4	M 1SD 4	8040	8040	21100	24300	5280	236	
3.4	946	2.0	402	7.5	303 L3	—	BN 71B 4	M 1SD 4	24700	28500	43100	51800	15800	244	
3.5	899	1.5	394	10.0	—	301 R4	BN 71B 4	M 1SD 4	7970	7970	21000	24100	5240	237	
3.5	891	2.1	390	12.0	—	303 R4	BN 71B 4	M 1SD 4	24400	28200	42700	51400	15700	245	
3.5	916	1.9	389	7.5	303 L3	—	BN 71B 4	M 1SD 4	24400	28200	42600	51300	15700	244	
3.7	880	1.5	374	7.5	301 L3	—	BN 71B 4	M 1SD 4	7840	7840	20600	23700	5150	236	
3.8	831	2.8	364	12.0	—	303 R4	BN 71B 4	M 1SD 4	23900	27600	41800	50300	15300	245	
3.8	829	1.1	363	10.0	—	300 R4	BN 71B 4	M 1SD 4	7760	7760	20500	23500	5100	229	
3.8	829	2.2	363	10.0	—	301 R4	BN 71B 4	M 1SD 4	7760	7760	20500	23500	5100	237	
4.0	803	2.9	341	7.5	304 L3	—	BN 71B 4	M 1SD 4	23400	27000	41000	49300	15000	254	
4.1	770	3.0	338	12.0	—	304 R4	BN 71B 4	M 1SD 4	23300	26900	40900	49200	14900	255	
4.1	766	3.0	336	12.0	—	303 R4	BN 71B 4	M 1SD 4	23200	26800	40800	49100	14900	245	
4.1	754	1.2	330	6.0	300 L4	—	BN 71B 4	M 1SD 4	7520	7520	19900	22900	4940	228	
4.1	754	2.4	330	6.0	301 L4	—	BN 71B 4	M 1SD 4	7520	7520	19900	22900	4940	236	
4.3	757	2.4	321	7.5	303 L3	—	BN 71B 4	M 1SD 4	22900	26400	40300	48500	14700	244	
4.4	714	2.6	313	12.0	—	303 R4	BN 71B 4	M 1SD 4	22700	26200	39900	48100	14600	245	
4.6	704	0.9	299	7.5	300 L3	—	BN 71B 4	M 1SD 4	7270	7270	19300	22200	4780	228	
4.6	704	1.9	299	7.5	301 L3	—	BN 71B 4	M 1SD 4	7270	7270	19300	22200	4780	236	
4.7	664	1.4	291	10.0	—	300 R4	BN 71B 4	M 1SD 4	7210	7210	19100	22000	4740	229	
4.7	664	2.7	291	10.0	—	301 R4	BN 71B 4	M 1SD 4	7210	7210	19100	22000	4740	237	
5.1	612	1.5	268	10.0	—	300 R4	BN 71B 4	M 1SD 4	7020	7020	18700	21500	4610	229	
5.1	612	2.9	268	10.0	—	301 R4	BN 71B 4	M 1SD 4	7020	7020	18700	21500	4610	237	
5.3	606	3.0	258	7.5	303 L3	—	BN 71B 4	M 1SD 4	21300	24600	37700	45300	13600	244	
5.7	564	1.2	240	7.5	300 L3	—	BN 71B 4	M 1SD 4	6760	6760	18100	20800	4440	228	
5.7	564	2.3	240	7.5	301 L3	—	BN 71B 4	M 1SD 4	6760	6760	18100	20800	4440	236	
5.8	542	1.2	237	10.0	—	300 R4	BN 71B 4	M 1SD 4	6740	6740	18000	20700	4430	229	
5.8	542	2.4	237	10.0	—	301 R4	BN 71B 4	M 1SD 4	6740	6740	18000	20700	4430	237	
6.2	520	1.7	221	7.5	300 L3	—	BN 71B 4	M 1SD 4	6580	6580	17600	20300	4320	228	
6.4	491	1.8	215	10.0	—	300 R4	BN 71B 4	M 1SD 4	6520	6520	17500	20100	4280	229	
7.1	452	1.4	192	7.5	300 L3	—	BN 71B 4	M 1SD 4	6280	6280	16900	19400	4130	228	
7.1	452	2.9	192	7.5	301 L3	—	BN 71B 4	M 1SD 4	6280	6280	16900	19400	4130	236	
7.7	417	2.1	177	7.5	300 L3	—	BN 71B 4	M 1SD 4	6110	6110	16500	19000	4020	228	
7.8	401	2.1	175	10.0	—	300 R4	BN 71B 4	M 1SD 4	6090	6090	16500	18900	4000	229	
8.6	363	2.4	159	10.0	—	300 R4	BN 71B 4	M 1SD 4	5890	5890	16000	18300	3870	229	

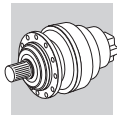


$P_1 = 0.37 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
9.6	327	2.0	143	10.0	—	300 R4	BN 71B 4	M 1SD 4	5690	5690	15500	17800	3740	229	
9.7	334	2.5	142	7.5	300 L3	—	BN 71B 4	M 1SD 4	5670	5670	15400	17700	3730	228	
10.3	313	1.8	133	12.0	—	300 R3	BN 71B 4	M 1SD 4	5550	5550	15100	17400	3650	229	
10.5	308	2.8	131	7.5	300 L3	—	BN 71B 4	M 1SD 4	5520	5520	15100	17300	3630	228	
10.6	296	2.9	130	10.0	—	300 R4	BN 71B 4	M 1SD 4	5510	5510	15000	17300	3620	229	
11.8	273	2.4	116	7.5	300 L3	—	BN 71B 4	M 1SD 4	5300	5300	14500	16700	3490	228	
12.9	251	2.6	106	12.0	—	300 R3	BN 71B 4	M 1SD 4	5160	5160	14200	16300	3390	229	

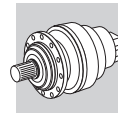
$P_1 = 0.55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.57	8160	1.3	2423	7.5	307 L4	—	BN 80A 4	M 1LA 4	52000	65000	109000	145000	45000	284	
0.57	8101	2.1	2423	7.5	309 L4	—	BN 80A 4	—	—	—	110000	145000	36000	294	
0.67	6985	1.0	2074	6.0	306 L4	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	274	
0.68	6876	2.0	2041	7.5	307 L4	—	BN 80A 4	M 1LA 4	52000	65000	109000	145000	45000	284	
0.69	6736	2.5	2003	7.5	309 L4	—	BN 80A 4	—	—	—	110000	145000	36000	294	
0.75	6209	1.5	1843	6.0	306 L4	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	274	
0.78	5953	2.5	1767	7.5	307 L4	—	BN 80A 4	M 1LA 4	52000	65000	109000	145000	45000	284	
0.81	5761	3.0	1723	7.5	309 L4	—	BN 80A 4	—	—	—	110000	145000	36000	294	
0.86	5379	1.6	1597	6.0	306 L4	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	274	
0.87	5358	2.8	1591	7.5	307 L4	—	BN 80A 4	M 1LA 4	52000	65000	109000	145000	45000	284	
0.94	4967	1.9	1475	6.0	306 L4	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	274	
1.0	4615	1.0	1370	6.0	305 L4	—	BN 80A 4	M 1LA 4	36000	42000	62200	74000	23800	264	
1.1	4310	1.9	1279	6.0	306 L4	—	BN 80A 4	M 1LA 4	45000	51000	99700	116100	34000	274	
1.1	4305	1.3	1278	6.0	305 L4	—	BN 80A 4	M 1LA 4	36000	41900	60900	73300	23300	264	
1.1	4293	2.9	1274	7.5	307 L4	—	BN 80A 4	M 1LA 4	50200	63000	107100	140400	43600	284	
1.1	4282	0.9	1271	6.0	304 L4	—	BN 80A 4	M 1LA 4	36000	41800	60800	73200	23200	254	
1.3	3698	1.2	1098	6.0	305 L4	—	BN 80A 4	M 1LA 4	34500	39800	58200	70000	22100	264	
1.3	3687	2.0	1095	6.0	306 L4	—	BN 80A 4	M 1LA 4	42900	48600	95200	110800	32200	274	
1.4	3431	1.1	1018	6.0	304 L4	—	BN 80A 4	M 1LA 4	33600	38800	56900	68500	21600	254	
1.4	3431	1.6	1018	6.0	305 L4	—	BN 80A 4	M 1LA 4	33600	38800	56900	68500	21600	264	
1.4	3419	2.6	1015	6.0	306 L4	—	BN 80A 4	M 1LA 4	41900	47400	93000	108300	31400	274	
1.5	3019	1.4	896	6.0	305 L4	—	BN 80A 4	M 1LA 4	32200	37200	54800	65900	20700	264	
1.6	2954	2.5	877	6.0	306 L4	—	BN 80A 4	M 1LA 4	39900	45200	89000	103700	29900	274	
1.7	2797	2.3	830	12.0	—	306 R4	BN 80A 4	M 1LA 4	39100	44300	87600	102000	29400	275	
1.7	2774	1.5	824	12.0	—	305 R4	BN 80A 4	M 1LA 4	31300	36200	53400	64300	20100	265	
1.7	2749	1.0	816	6.0	303 L4	—	BN 80A 4	M 1LA 4	31300	36100	53300	64100	20000	244	
1.7	2749	1.4	816	6.0	304 L4	—	BN 80A 4	M 1LA 4	31300	36100	53300	64100	20000	254	
1.7	2749	2.0	816	6.0	305 L4	—	BN 80A 4	M 1LA 4	31300	36100	53300	64100	20000	264	
1.7	2724	2.7	809	6.0	306 L4	—	BN 80A 4	M 1LA 4	38800	44000	86900	101200	29200	274	
1.7	2685	1.3	797	12.0	—	305 R4	BN 80A 4	M 1LA 4	31000	35800	52900	63600	19900	265	
1.9	2419	1.7	718	6.0	305 L4	—	BN 80A 4	M 1LA 4	29900	34600	51300	61700	19200	264	
2.0	2364	1.0	702	6.0	304 L4	—	BN 80A 4	M 1LA 4	29700	34300	50900	61300	19100	254	
2.0	2356	1.1	699	12.0	—	304 R4	BN 80A 4	M 1LA 4	29700	34300	50900	61200	19000	255	
2.1	2241	2.7	665	12.0	—	306 R4	BN 80A 4	M 1LA 4	36400	41200	82000	95400	27300	275	
2.1	2219	0.9	659	12.0	—	303 R4	BN 80A 4	M 1LA 4	29100	33600	50000	60100	18700	245	
2.1	2219	1.8	659	12.0	—	305 R4	BN 80A 4	M 1LA 4	29100	33600	50000	60100	18700	265	
2.1	2188	1.0	649	6.0	303 L4	—	BN 80A 4	M 1LA 4	29000	33400	49700	59800	18600	244	
2.1	2188	1.6	649	6.0	304 L4	—	BN 80A 4	M 1LA 4	29000	33400	49700	59800	18600	254	
2.1	2188	2.1	649	6.0	305 L4	—	BN 80A 4	M 1LA 4	29000	33400	49700	59800	18600	264	
2.2	2076	1.0	616	6.0	301 L4	—	BN 80A 4	M 1LA 4	9260	9260	24000	27600	6090	236	
2.4	1909	1.3	567	12.0	—	303 R4	BN 80A 4	M 1LA 4	27700	32000	47700	57400	17800	245	
2.4	1909	2.6	567	12.0	—	305 R4	BN 80A 4	M 1LA 4	27700	32000	47700	57400	17800	265	
2.5	1885	1.3	560	12.0	—	304 R4	BN 80A 4	M 1LA 4	27600	31800	47600	57200	17700	255	
2.5	1879	1.1	558	6.0	301 L4	—	BN 80A 4	M 1LA 4	8950	8950	23300	26700	5890	236	
2.5	1873	1.5	556	6.0	303 L4	—	BN 80A 4	M 1LA 4	27500	31700	47500	57100	17600	244	
2.5	1873	2.0	556	6.0	304 L4	—	BN 80A 4	M 1LA 4	27500	31700	47500	57100	17600	254	
2.5	1873	2.9	556	6.0	305 L4	—	BN 80A 4	M 1LA 4	27500	31700	47500	57100	17600	264	
2.6	1778	1.1	528	12.0	—	303 R4	BN 80A 4	M 1LA 4	27000	31200	46700	56200	17300	245	
2.6	1778	2.2	528	12.0	—	305 R4	BN 80A 4	M 1LA 4	27000	31200	46700	56200	17300	265	



$P_1 = 0.55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
2.8	1663	1.2	494	6.0	301 L4	—	BN 80A 4	M 1LA 4	8600	8600	22400	25800	5650	236	
2.8	1658	1.6	492	6.0	303 L4	—	BN 80A 4	M 1LA 4	26400	30500	45800	55100	16900	244	
2.8	1658	2.2	492	6.0	304 L4	—	BN 80A 4	M 1LA 4	26400	30500	45800	55100	16900	254	
3.0	1526	1.3	453	10.0	—	301 R4	BN 80A 4	M 1LA 4	8350	8350	21900	25100	5490	237	
3.1	1521	1.5	452	12.0	—	303 R4	BN 80A 4	M 1LA 4	25700	29600	44600	53700	16500	245	
3.1	1521	2.4	452	12.0	—	304 R4	BN 80A 4	M 1LA 4	25700	29600	44600	53700	16500	255	
3.1	1506	1.3	447	6.0	301 L4	—	BN 80A 4	M 1LA 4	8320	8320	21800	25000	5470	236	
3.1	1501	1.8	446	6.0	303 L4	—	BN 80A 4	M 1LA 4	25500	29500	44400	53400	16400	244	
3.1	1501	2.5	446	6.0	304 L4	—	BN 80A 4	M 1LA 4	25500	29500	44400	53400	16400	254	
3.2	1480	1.6	426	7.5	304 L3	—	BN 80A 4	M 1LA 4	25200	29000	43800	52700	16100	254	
3.3	1393	1.7	414	12.0	—	304 R4	BN 80A 4	M 1LA 4	24900	28800	43400	52300	16000	255	
3.3	1392	1.7	413	6.0	303 L4	—	BN 80A 4	M 1LA 4	24900	28800	43400	52200	16000	244	
3.3	1392	2.1	413	6.0	304 L4	—	BN 80A 4	M 1LA 4	24900	28800	43400	52200	16000	254	
3.4	1358	1.0	403	6.0	301 L4	—	BN 80A 4	M 1LA 4	8040	8040	21100	24300	5280	236	
3.4	1396	1.4	402	7.5	303 L3	—	BN 80A 4	M 1LA 4	24700	28500	43100	51800	15800	244	
3.4	1396	2.7	402	7.5	305 L3	—	BN 80A 4	M 1LA 4	24700	28500	43100	51800	15800	264	
3.5	1326	1.0	394	10.0	—	301 R4	BN 80A 4	M 1LA 4	7970	7970	21000	24100	5240	237	
3.5	1314	1.4	390	12.0	—	303 R4	BN 80A 4	M 1LA 4	24400	28200	42700	51400	15700	245	
3.5	1314	2.9	390	12.0	—	305 R4	BN 80A 4	M 1LA 4	24400	28200	42700	51400	15700	265	
3.5	1351	1.3	389	7.5	303 L3	—	BN 80A 4	M 1LA 4	24400	28200	42600	51300	15700	244	
3.5	1351	2.4	389	7.5	305 L3	—	BN 80A 4	M 1LA 4	24400	28200	42600	51300	15700	264	
3.7	1299	1.0	374	7.5	301 L3	—	BN 80A 4	M 1LA 4	7840	7840	20600	23700	5150	236	
3.8	1226	1.9	364	12.0	—	303 R4	BN 80A 4	M 1LA 4	23900	27600	41800	50300	15300	245	
3.8	1226	2.4	364	12.0	—	304 R4	BN 80A 4	M 1LA 4	23900	27600	41800	50300	15300	255	
3.8	1223	1.5	363	10.0	—	301 R4	BN 80A 4	M 1LA 4	7760	7760	20500	23500	5100	237	
4.0	1186	2.0	341	7.5	304 L3	—	BN 80A 4	M 1LA 4	23400	27000	41000	49300	15000	254	
4.1	1137	2.0	338	12.0	—	304 R4	BN 80A 4	M 1LA 4	23300	26900	40900	49200	14900	255	
4.1	1130	2.0	336	12.0	—	303 R4	BN 80A 4	M 1LA 4	23200	26800	40800	49100	14900	245	
4.2	1113	1.6	330	6.0	301 L4	—	BN 80A 4	M 1LA 4	7520	7520	19900	22900	4940	236	
4.3	1117	1.6	321	7.5	303 L3	—	BN 80A 4	M 1LA 4	22900	26400	40300	48500	14700	244	
4.4	1053	1.7	313	12.0	—	303 R4	BN 80A 4	M 1LA 4	22700	26200	39900	48100	14600	245	
4.6	1039	1.3	299	7.5	301 L3	—	BN 80A 4	M 1LA 4	7270	7270	19300	22200	4780	236	
4.7	980	0.9	291	10.0	—	300 R4	BN 80A 4	M 1LA 4	7210	7210	19100	22000	4740	229	
4.7	980	1.8	291	10.0	—	301 R4	BN 80A 4	M 1LA 4	7210	7210	19100	22000	4740	237	
4.8	977	2.7	290	12.0	—	303 R4	BN 80A 4	M 1LA 4	22100	25600	39100	47000	14200	245	
5.0	961	2.3	276	7.5	303 L3	—	BN 80A 4	M 1LA 4	21800	25200	38500	46300	14000	244	
5.1	949	2.4	273	7.5	304 L3	—	BN 80A 4	M 1LA 4	21700	25000	38300	46100	13900	254	
5.1	904	1.0	268	10.0	—	300 R4	BN 80A 4	M 1LA 4	7020	7020	18700	21500	4610	229	
5.1	904	1.9	268	10.0	—	301 R4	BN 80A 4	M 1LA 4	7020	7020	18700	21500	4610	237	
5.4	895	2.0	258	7.5	303 L3	—	BN 80A 4	M 1LA 4	21300	24600	37700	45300	13600	244	
5.4	860	2.1	255	12.0	—	303 R4	BN 80A 4	M 1LA 4	21200	24500	37600	45200	13600	245	
5.8	833	1.6	240	7.5	301 L3	—	BN 80A 4	M 1LA 4	6760	6760	18100	20800	4440	236	
5.8	800	1.6	237	10.0	—	301 R4	BN 80A 4	M 1LA 4	6740	6740	18000	20700	4430	237	
6.0	778	2.3	231	12.0	—	303 R4	BN 80A 4	M 1LA 4	20500	23700	36500	43900	13200	245	
6.2	768	1.1	221	7.5	300 L3	—	BN 80A 4	M 1LA 4	6580	6580	17600	20300	4320	244	
6.2	768	2.3	221	7.5	301 L3	—	BN 80A 4	M 1LA 4	6580	6580	17600	20300	4320	236	
6.3	766	2.9	220	7.5	303 L3	—	BN 80A 4	M 1LA 4	20200	23300	36000	43300	13000	244	
6.4	724	1.2	215	10.0	—	300 R4	BN 80A 4	M 1LA 4	6520	6520	17500	20100	4280	229	
6.4	724	2.4	215	10.0	—	301 R4	BN 80A 4	M 1LA 4	6520	6520	17500	20100	4280	237	
7.2	667	1.0	192	7.5	300 L3	—	BN 80A 4	M 1LA 4	6280	6280	16900	19400	4130	244	
7.2	667	1.9	192	7.5	301 L3	—	BN 80A 4	M 1LA 4	6280	6280	16900	19400	4130	236	
7.3	661	2.7	190	7.5	303 L3	—	BN 80A 4	M 1LA 4	19200	22200	34400	41400	12300	244	
7.8	615	1.4	177	7.5	300 L3	—	BN 80A 4	M 1LA 4	6110	6110	16500	19000	4020	244	
7.8	615	2.8	177	7.5	301 L3	—	BN 80A 4	M 1LA 4	6110	6110	16500	19000	4020	236	
7.9	591	1.5	175	10.0	—	300 R4	BN 80A 4	M 1LA 4	6090	6090	16500	18900	4000	229	
7.9	591	2.9	175	10.0	—	301 R4	BN 80A 4	M 1LA 4	6090	6090	16500	18900	4000	237	
8.7	535	1.6	159	10.0	—	300 R4	BN 80A 4	M 1LA 4	5890	5890	16000	18300	3870	229	
9.6	482	1.3	143	10.0	—	300 R4	BN 80A 4	M 1LA 4	5690	5690	15500	17800	3740	229	
9.6	482	2.7	143	10.0	—	301 R4	BN 80A 4	M 1LA 4	5690	5690	15500	17800	3740	237	
9.7	493	1.7	142	7.5	300 L3	—	BN 80A 4	M 1LA 4	5670	5670	15400	17700	3730	244	
10.4	462	1.2	133	12.0	—	300 R3	BN 80A 4	M 1LA 4	5550	5550	15100	17400	3650	229	

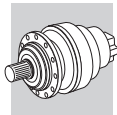


$P_1 = 0.55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
10.4	462	2.5	133	12.0	—	301 R3	BN 80A 4	M 1LA 4	5550	5550	15100	17400	3650	237	
10.5	455	1.9	131	7.5	300 L3	—	BN 80A 4	M 1LA 4	5520	5520	15100	17300	3630	244	
10.6	437	1.9	130	10.0	—	300 R4	BN 80A 4	M 1LA 4	5510	5510	15000	17300	3620	229	
11.9	403	1.6	116	7.5	300 L3	—	BN 80A 4	M 1LA 4	5300	5300	14500	16700	3490	244	
13.0	370	1.8	106	12.0	—	300 R3	BN 80A 4	M 1LA 4	5160	5160	14200	16300	3390	229	
13.0	357	2.3	106	10.0	—	300 R4	BN 80A 4	M 1LA 4	5150	5150	14100	16200	3380	229	
13.2	364	2.3	105	7.5	300 L3	—	BN 80A 4	M 1LA 4	5130	5130	14100	16200	3370	244	
16.1	297	2.8	85.6	7.5	300 L3	—	BN 80A 4	M 1LA 4	4790	4790	13300	15200	3150	244	
16.2	296	2.2	85.2	12.0	—	300 R3	BN 80A 4	M 1LA 4	4790	4790	13200	15200	3150	229	
17.5	273	3.0	78.7	12.0	—	300 R3	BN 80A 4	M 1LA 4	4660	4660	12900	14900	3060	229	
17.8	269	3.0	77.5	7.5	300 L3	—	BN 80A 4	M 1LA 4	4640	4640	12900	14800	3050	244	
19.8	243	2.7	69.9	7.5	300 L3	—	BN 80A 4	M 1LA 4	4480	4480	12500	14300	2950	244	
20.2	237	2.7	68.2	12.0	—	300 R3	BN 80A 4	M 1LA 4	4440	4440	12400	14200	2920	229	
21.3	232	2.4	64.8	7.5	300 L2	—	BN 80A 4	M 1LA 4	4370	4370	12200	14000	2870	228	

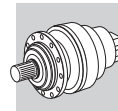
$P_1 = 0.75 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.55	11426	2.3	2523	11.0	310 L4	—	BN 80B 4	—	—	—	133000	166000	65000	304	
0.58	10969	1.0	2423	7.5	307 L4	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	284	
0.58	10969	1.5	2423	7.5	309 L4	—	BN 80B 4	—	—	—	110000	145000	36000	294	
0.69	9242	1.5	2041	7.5	307 L4	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	284	
0.69	9155	2.8	2022	11.0	310 L4	—	BN 80B 4	—	—	—	133000	166000	65000	304	
0.70	9040	1.9	2003	7.5	309 L4	—	BN 80B 4	—	—	—	110000	145000	36000	294	
0.76	8345	1.1	1843	6.0	306 L4	—	BN 80B 4	M 2SA 4	45000	51000	101000	119000	35000	274	
0.79	8002	1.9	1767	7.5	307 L4	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	284	
0.81	7800	2.2	1723	7.5	309 L4	—	BN 80B 4	—	—	—	110000	145000	36000	294	
0.87	7265	2.3	1605	7.5	309 L4	—	BN 80B 4	—	—	—	110000	145000	36000	294	
0.88	7230	1.2	1597	6.0	306 L4	—	BN 80B 4	M 2SA 4	45000	51000	101000	119000	35000	274	
0.88	7202	2.1	1591	7.5	307 L4	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	284	
0.95	6676	1.4	1475	6.0	306 L4	—	BN 80B 4	M 2SA 4	45000	51000	101000	119000	35000	274	
0.99	6376	2.4	1408	7.5	307 L4	—	BN 80B 4	M 2SA 4	51900	65000	109000	144700	45000	284	
1.0	6250	2.7	1380	7.5	309 L4	—	BN 80B 4	—	—	—	110000	143800	35800	294	
1.1	5822	2.9	1286	7.5	309 L4	—	BN 80B 4	—	—	—	109200	140800	35000	294	
1.1	5793	1.4	1279	6.0	306 L4	—	BN 80B 4	M 2SA 4	45000	51000	99700	116100	34000	274	
1.1	5787	1.0	1278	6.0	305 L4	—	BN 80B 4	M 2SA 4	36000	41900	60900	73300	23300	264	
1.1	5770	2.1	1274	7.5	307 L4	—	BN 80B 4	M 2SA 4	50200	63000	107100	140400	43600	284	
1.2	5237	2.6	1157	7.5	307 L4	—	BN 80B 4	M 2SA 4	48600	60900	104100	136400	42200	284	
1.3	4956	1.5	1095	6.0	306 L4	—	BN 80B 4	M 2SA 4	42900	48600	95200	110800	32200	274	
1.4	4611	1.2	1018	6.0	305 L4	—	BN 80B 4	M 2SA 4	33600	38800	56900	68500	21600	264	
1.4	4596	2.0	1015	6.0	306 L4	—	BN 80B 4	M 2SA 4	41900	47400	93000	108300	31400	274	
1.4	4524	2.9	999	7.5	307 L4	—	BN 80B 4	M 2SA 4	46300	58000	99600	130500	40200	284	
1.6	4058	1.1	896	6.0	305 L4	—	BN 80B 4	M 2SA 4	32200	37200	54800	65900	20700	264	
1.6	3971	1.9	877	6.0	306 L4	—	BN 80B 4	M 2SA 4	39900	45200	89000	103700	29900	274	
1.7	3759	1.7	830	12.0	—	306 R4	BN 80B 4	M 2SA 4	39100	44300	87600	102000	29400	275	
1.7	3729	1.1	824	12.0	—	305 R4	BN 80B 4	M 2SA 4	31300	36200	53400	64300	20100	265	
1.7	3695	1.0	816	6.0	304 L4	—	BN 80B 4	M 2SA 4	31300	36100	53300	64100	20000	254	
1.7	3695	1.5	816	6.0	305 L4	—	BN 80B 4	M 2SA 4	31300	36100	53300	64100	20000	264	
1.7	3662	2.0	809	6.0	306 L4	—	BN 80B 4	M 2SA 4	38800	44000	86900	101200	29200	274	
1.8	3609	1.0	797	12.0	—	305 R4	BN 80B 4	M 2SA 4	31000	35800	52900	63600	19900	265	
1.9	3252	1.3	718	6.0	305 L4	—	BN 80B 4	M 2SA 4	29900	34600	51300	61700	19200	264	
2.0	3168	2.8	700	6.0	306 L4	—	BN 80B 4	M 2SA 4	37000	41900	83200	96900	27800	274	
2.1	3012	2.0	665	12.0	—	306 R4	BN 80B 4	M 2SA 4	36400	41200	82000	95400	27300	275	
2.1	2983	1.4	659	12.0	—	305 R4	BN 80B 4	M 2SA 4	29100	33600	50000	60100	18700	265	
2.2	2941	1.2	649	6.0	304 L4	—	BN 80B 4	M 2SA 4	29000	33400	49700	59800	18600	254	
2.2	2941	1.5	649	6.0	305 L4	—	BN 80B 4	M 2SA 4	29000	33400	49700	59800	18600	264	
2.2	2878	3.0	636	6.0	306 L4	—	BN 80B 4	M 2SA 4	35800	40600	80800	94100	26900	274	
2.5	2566	1.0	567	12.0	—	303 R4	BN 80B 4	M 2SA 4	27700	32000	47700	57400	17800	245	
2.5	2566	1.9	567	12.0	—	305 R4	BN 80B 4	M 2SA 4	27700	32000	47700	57400	17800	265	
2.5	2534	0.9	560	12.0	—	304 R4	BN 80B 4	M 2SA 4	27600	31800	47600	57200	17700	255	
2.5	2518	1.1	556	6.0	303 L4	—	BN 80B 4	M 2SA 4	27500	31700	47500	57100	17600	244	



$P_1 = 0.75 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
2.5	2518	1.5	556	6.0	304 L4	—	BN 80B 4	M 2SA 4	27500	31700	47500	57100	17600	254	
2.5	2518	2.2	556	6.0	305 L4	—	BN 80B 4	M 2SA 4	27500	31700	47500	57100	17600	264	
2.5	2490	2.9	550	12.0	—	306 R4	BN 80B 4	M 2SA 4	34100	38700	77400	90100	25600	275	
2.7	2390	1.6	528	12.0	—	305 R4	BN 80B 4	M 2SA 4	27000	31200	46700	56200	17300	265	
2.8	2229	1.2	492	6.0	303 L4	—	BN 80B 4	M 2SA 4	26400	30500	45800	55100	16900	244	
2.8	2229	1.7	492	6.0	304 L4	—	BN 80B 4	M 2SA 4	26400	30500	45800	55100	16900	254	
2.8	2229	2.4	492	6.0	305 L4	—	BN 80B 4	M 2SA 4	26400	30500	45800	55100	16900	264	
3.1	2051	0.9	453	10.0	—	301 R4	BN 80B 4	M 2SA 4	8350	8350	21900	25100	5490	237	
3.1	2045	1.1	452	12.0	—	303 R4	BN 80B 4	M 2SA 4	25700	29600	44600	53700	16500	245	
3.1	2045	1.8	452	12.0	—	304 R4	BN 80B 4	M 2SA 4	25700	29600	44600	53700	16500	255	
3.1	2045	2.3	452	12.0	—	305 R4	BN 80B 4	M 2SA 4	25700	29600	44600	53700	16500	265	
3.1	2024	0.9	447	6.0	301 L4	—	BN 80B 4	M 2SA 4	8320	8320	21800	25000	5470	236	
3.1	2018	1.3	446	6.0	303 L4	—	BN 80B 4	M 2SA 4	25500	29500	44400	53400	16400	244	
3.1	2018	1.8	446	6.0	304 L4	—	BN 80B 4	M 2SA 4	25500	29500	44400	53400	16400	254	
3.1	2018	2.7	446	6.0	305 L4	—	BN 80B 4	M 2SA 4	25500	29500	44400	53400	16400	264	
3.3	1989	1.2	426	7.5	304 L3	—	BN 80B 4	M 2SA 4	25200	29000	43800	52700	16100	254	
3.4	1872	1.3	414	12.0	—	304 R4	BN 80B 4	M 2SA 4	24900	28800	43400	52300	16000	255	
3.4	1871	1.3	413	6.0	303 L4	—	BN 80B 4	M 2SA 4	24900	28800	43400	52200	16000	244	
3.4	1871	1.6	413	6.0	304 L4	—	BN 80B 4	M 2SA 4	24900	28800	43400	52200	16000	254	
3.4	1871	2.5	413	6.0	305 L4	—	BN 80B 4	M 2SA 4	24900	28800	43400	52200	16000	264	
3.5	1892	3.0	405	7.5	306 L3	—	BN 80B 4	M 2SA 4	30800	34900	70600	82200	23100	274	
3.5	1877	1.0	402	7.5	303 L3	—	BN 80B 4	M 2SA 4	24700	28500	43100	51800	15800	244	
3.5	1877	2.0	402	7.5	305 L3	—	BN 80B 4	M 2SA 4	24700	28500	43100	51800	15800	264	
3.6	1766	1.1	390	12.0	—	303 R4	BN 80B 4	M 2SA 4	24400	28200	42700	51400	15700	245	
3.6	1766	2.1	390	12.0	—	305 R4	BN 80B 4	M 2SA 4	24400	28200	42700	51400	15700	265	
3.6	1816	0.9	389	7.5	303 L3	—	BN 80B 4	M 2SA 4	24400	28200	42600	51300	15700	244	
3.6	1816	1.8	389	7.5	305 L3	—	BN 80B 4	M 2SA 4	24400	28200	42600	51300	15700	264	
3.8	1648	1.4	364	12.0	—	303 R4	BN 80B 4	M 2SA 4	23900	27600	41800	50300	15300	245	
3.8	1648	1.8	364	12.0	—	304 R4	BN 80B 4	M 2SA 4	23900	27600	41800	50300	15300	255	
3.8	1648	2.8	364	12.0	—	305 R4	BN 80B 4	M 2SA 4	23900	27600	41800	50300	15300	265	
3.9	1644	1.1	363	10.0	—	301 R4	BN 80B 4	M 2SA 4	7760	7760	20500	23500	5100	237	
4.1	1594	1.5	341	7.5	304 L3	—	BN 80B 4	M 2SA 4	23400	27000	41000	49300	15000	254	
4.1	1528	1.5	338	12.0	—	304 R4	BN 80B 4	M 2SA 4	23300	26900	40900	49200	14900	255	
4.2	1519	1.5	336	12.0	—	303 R4	BN 80B 4	M 2SA 4	23200	26800	40800	49100	14900	245	
4.2	1519	3.0	336	12.0	—	305 R4	BN 80B 4	M 2SA 4	23200	26800	40800	49100	14900	265	
4.2	1496	1.2	330	6.0	301 L4	—	BN 80B 4	M 2SA 4	7520	7520	19900	22900	4940	236	
4.4	1501	1.2	321	7.5	303 L3	—	BN 80B 4	M 2SA 4	22900	26400	40300	48500	14700	244	
4.4	1501	2.4	321	7.5	305 L3	—	BN 80B 4	M 2SA 4	22900	26400	40300	48500	14700	264	
4.5	1415	1.3	313	12.0	—	303 R4	BN 80B 4	M 2SA 4	22700	26200	39900	48100	14600	245	
4.5	1415	2.6	313	12.0	—	305 R4	BN 80B 4	M 2SA 4	22700	26200	39900	48100	14600	265	
4.6	1388	2.5	307	12.0	—	304 R4	BN 80B 4	M 2SA 4	22500	26000	39700	47800	14500	255	
4.7	1397	0.9	299	7.5	301 L3	—	BN 80B 4	M 2SA 4	7270	7270	19300	22200	4780	236	
4.8	1317	1.3	291	10.0	—	301 R4	BN 80B 4	M 2SA 4	7210	7210	19100	22000	4740	237	
4.8	1313	2.0	290	12.0	—	303 R4	BN 80B 4	M 2SA 4	22100	25600	39100	47000	14200	245	
4.8	1313	2.8	290	12.0	—	304 R4	BN 80B 4	M 2SA 4	22100	25600	39100	47000	14200	255	
5.1	1291	1.7	276	7.5	303 L3	—	BN 80B 4	M 2SA 4	21800	25200	38500	46300	14000	244	
5.1	1275	1.8	273	7.5	304 L3	—	BN 80B 4	M 2SA 4	21700	25000	38300	46100	13900	254	
5.2	1215	1.4	268	10.0	—	301 R4	BN 80B 4	M 2SA 4	7020	7020	18700	21500	4610	237	
5.2	1211	3.0	267	12.0	—	304 R4	BN 80B 4	M 2SA 4	21500	24900	38100	45900	13800	255	
5.4	1203	1.5	258	7.5	303 L3	—	BN 80B 4	M 2SA 4	21300	24600	37700	45300	13600	244	
5.4	1203	3.0	258	7.5	305 L3	—	BN 80B 4	M 2SA 4	21300	24600	37700	45300	13600	264	
5.5	1155	1.6	255	12.0	—	303 R4	BN 80B 4	M 2SA 4	21200	24500	37600	45200	13600	245	
5.8	1119	1.2	240	7.5	301 L3	—	BN 80B 4	M 2SA 4	6760	6760	18100	20800	4440	236	
5.9	1075	1.2	237	10.0	—	301 R4	BN 80B 4	M 2SA 4	6740	6740	18000	20700	4430	237	
6.1	1046	1.7	231	12.0	—	303 R4	BN 80B 4	M 2SA 4	20500	23700	36500	43900	13200	245	
6.3	1032	1.7	221	7.5	301 L3	—	BN 80B 4	M 2SA 4	6580	6580	17600	20300	4320	236	
6.4	1029	2.2	220	7.5	303 L3	—	BN 80B 4	M 2SA 4	20200	23300	36000	43300	13000	244	
6.5	973	1.8	215	10.0	—	301 R4	BN 80B 4	M 2SA 4	6520	6520	17500	20100	4280	237	
6.5	970	2.7	214	12.0	—	303 R4	BN 80B 4	M 2SA 4	20000	23100	35700	42900	12800	245	
6.9	942	2.4	202	7.5	304 L3	—	BN 80B 4	M 2SA 4	19600	22600	35000	42100	12600	254	
7.3	897	1.4	192	7.5	301 L3	—	BN 80B 4	M 2SA 4	6280	6280	16900	19400	4130	236	

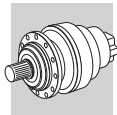


$P_1 = 0.75 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
7.4	889	2.0	190	7.5	303 L3	—	BN 80B 4	M 2SA 4	19200	22200	34400	41400	12300	244
7.6	837	2.5	185	12.0	—	303 R4	BN 80B 4	M 2SA 4	19100	22000	34100	41100	12200	245
7.9	829	2.7	178	7.5	303 L3	—	BN 80B 4	M 2SA 4	18800	21700	33700	40600	12100	244
7.9	827	1.0	177	7.5	300 L3	—	BN 80B 4	M 2SA 4	6110	6110	16500	19000	4020	228
7.9	827	2.1	177	7.5	301 L3	—	BN 80B 4	M 2SA 4	6110	6110	16500	19000	4020	236
8.0	794	1.1	175	10.0	—	300 R4	BN 80B 4	M 2SA 4	6090	6090	16500	18900	4000	229
8.0	794	2.2	175	10.0	—	301 R4	BN 80B 4	M 2SA 4	6090	6090	16500	18900	4000	237
8.5	769	3.0	165	7.5	304 L3	—	BN 80B 4	M 2SA 4	18300	21200	33000	39600	11800	254
8.6	765	2.9	164	7.5	303 L3	—	BN 80B 4	M 2SA 4	18300	21100	32900	39600	11700	244
8.8	719	1.2	159	10.0	—	300 R4	BN 80B 4	M 2SA 4	5890	5890	16000	18300	3870	229
8.8	719	2.4	159	10.0	—	301 R4	BN 80B 4	M 2SA 4	5890	5890	16000	18300	3870	237
9.2	712	2.5	152	7.5	303 L3	—	BN 80B 4	M 2SA 4	17900	20600	32200	38700	11500	244
9.8	649	1.0	143	10.0	—	300 R4	BN 80B 4	M 2SA 4	5690	5690	15500	17800	3740	229
9.8	649	2.0	143	10.0	—	301 R4	BN 80B 4	M 2SA 4	5690	5690	15500	17800	3740	237
9.9	663	1.3	142	7.5	300 L3	—	BN 80B 4	M 2SA 4	5670	5670	15400	17700	3730	228
9.9	663	2.6	142	7.5	301 L3	—	BN 80B 4	M 2SA 4	5670	5670	15400	17700	3730	236
10.5	620	1.9	133	12.0	—	301 R3	BN 80B 4	M 2SA 4	5550	5550	15100	17400	3650	237
10.7	611	1.4	131	7.5	300 L3	—	BN 80B 4	M 2SA 4	5520	5520	15100	17300	3630	228
10.7	611	2.7	131	7.5	301 L3	—	BN 80B 4	M 2SA 4	5520	5520	15100	17300	3630	236
10.8	587	1.4	130	10.0	—	300 R4	BN 80B 4	M 2SA 4	5510	5510	15000	17300	3620	229
10.8	587	2.9	130	10.0	—	301 R4	BN 80B 4	M 2SA 4	5510	5510	15000	17300	3620	237
12.1	541	1.2	116	7.5	300 L3	—	BN 80B 4	M 2SA 4	5300	5300	14500	16700	3490	228
12.1	541	2.4	116	7.5	301 L3	—	BN 80B 4	M 2SA 4	5300	5300	14500	16700	3490	236
13.2	497	1.3	106	12.0	—	300 R3	BN 80B 4	M 2SA 4	5160	5160	14200	16300	3390	245
13.2	497	2.6	106	12.0	—	301 R3	BN 80B 4	M 2SA 4	5160	5160	14200	16300	3390	237
13.2	479	1.7	106	10.0	—	300 R4	BN 80B 4	M 2SA 4	5150	5150	14100	16200	3380	229
13.4	490	1.7	105	7.5	300 L3	—	BN 80B 4	M 2SA 4	5130	5130	14100	16200	3370	228
16.4	400	2.1	85.6	7.5	300 L3	—	BN 80B 4	M 2SA 4	4790	4790	13300	15200	3150	228
16.4	398	1.6	85.2	12.0	—	300 R3	BN 80B 4	M 2SA 4	4790	4790	13200	15200	3150	245
17.8	367	2.2	78.7	12.0	—	300 R3	BN 80B 4	M 2SA 4	4660	4660	12900	14900	3060	245
18.1	362	2.3	77.5	7.5	300 L3	—	BN 80B 4	M 2SA 4	4640	4640	12900	14800	3050	228
20.0	326	2.0	69.9	7.5	300 L3	—	BN 80B 4	M 2SA 4	4480	4480	12500	14300	2950	228
20.5	319	2.0	68.2	12.0	—	300 R3	BN 80B 4	M 2SA 4	4440	4440	12400	14200	2920	245
21.6	312	1.8	64.8	7.5	300 L2	—	BN 80B 4	M 2SA 4	4370	4370	12200	14000	2870	228
22.1	295	2.7	63.2	7.5	300 L3	—	BN 80B 4	M 2SA 4	4330	4330	12100	13900	2850	228
22.2	294	2.7	62.9	12.0	—	300 R3	BN 80B 4	M 2SA 4	4330	4330	12100	13900	2840	245
27.0	250	2.6	51.9	7.5	300 L2	—	BN 80B 4	M 2SA 4	4060	4060	11400	13100	2670	228

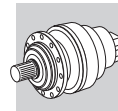
$P_1 = 1.1 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.55	16757	1.6	2523	11.0	310 L4	—	BN 90S 4	—	—	—	133000	166000	65000	304
0.58	16087	1.1	2423	7.5	309 L4	—	BN 90S 4	—	—	—	110000	145000	36000	294
0.67	13922	2.4	2096	11.0	311 L4	—	BN 90S 4	—	—	—	157000	195000	65000	314
0.69	13555	1.0	2041	7.5	307 L4	—	BN 90S 4	M 2SB 4	52000	65000	109000	145000	45000	284
0.69	13427	1.9	2022	11.0	310 L4	—	BN 90S 4	—	—	—	133000	166000	65000	304
0.70	13295	1.3	2003	7.5	309 L4	—	BN 90S 4	—	—	—	110000	145000	36000	294
0.78	11916	2.2	1794	11.0	310 L4	—	BN 90S 4	—	—	—	133000	166000	65000	304
0.79	11736	1.3	1767	7.5	307 L4	—	BN 90S 4	M 2SB 4	52000	65000	109000	145000	45000	284
0.81	11440	1.5	1723	7.5	309 L4	—	BN 90S 4	—	—	—	110000	145000	36000	294
0.83	11155	3.0	1680	11.0	311 L4	—	BN 90S 4	—	—	—	157000	195000	65000	314
0.84	11100	2.3	1672	11.0	310 L4	—	BN 90S 4	—	—	—	133000	166000	65000	304
0.87	10656	1.6	1605	7.5	309 L4	—	BN 90S 4	—	—	—	110000	145000	36000	294
0.88	10562	1.4	1591	7.5	307 L4	—	BN 90S 4	M 2SB 4	52000	65000	109000	145000	45000	284
0.95	9792	1.0	1475	6.0	306 L4	—	BN 90S 4	M 2SB 4	45000	51000	101000	119000	35000	274
0.97	9548	2.7	1438	11.0	310 L4	—	BN 90S 4	—	—	—	133000	166000	65000	304
0.99	9352	1.6	1408	7.5	307 L4	—	BN 90S 4	M 2SB 4	51900	65000	109000	144700	45000	284
1.0	9166	1.9	1380	7.5	309 L4	—	BN 90S 4	—	—	—	110000	143800	35800	294
1.1	8538	2.0	1286	7.5	309 L4	—	BN 90S 4	—	—	—	109200	140800	35000	294
1.1	8496	1.0	1279	6.0	306 L4	—	BN 90S 4	M 2SB 4	45000	51000	99700	116100	34000	274



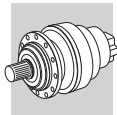
P₁ = 1.1 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
1.1	8463	1.5	1274	7.5	307 L4	—	BN 90S 4	M 2SB 4	50200	63000	107100	140400	43600	284	
1.2	7681	1.8	1157	7.5	307 L4	—	BN 90S 4	M 2SB 4	48600	60900	104100	136400	42200	284	
1.2	7632	2.1	1149	7.5	309 L4	—	BN 90S 4	—	—	—	105500	136100	33700	294	
1.3	7268	1.0	1095	6.0	306 L4	—	BN 90S 4	M 2SB 4	42900	48600	95200	110800	32200	274	
1.4	6740	1.3	1015	6.0	306 L4	—	BN 90S 4	M 2SB 4	41900	47400	93000	108300	31400	274	
1.4	6635	2.0	999	7.5	307 L4	—	BN 90S 4	M 2SB 4	46300	58000	99600	130500	40200	284	
1.4	6635	2.7	999	7.5	309 L4	—	BN 90S 4	—	—	—	101200	130500	32200	294	
1.5	6018	2.4	906	7.5	307 L4	—	BN 90S 4	M 2SB 4	44800	56200	96700	126800	38900	284	
1.5	6018	3.0	906	7.5	309 L4	—	BN 90S 4	—	—	—	98300	126800	31100	294	
1.6	5824	1.3	877	6.0	306 L4	—	BN 90S 4	M 2SB 4	39900	45200	89000	103700	29900	274	
1.7	5513	1.2	830	12.0	—	306 R4	BN 90S 4	M 2SB 4	39100	44300	87600	102000	29400	275	
1.7	5419	1.0	816	6.0	305 L4	—	BN 90S 4	M 2SB 4	31300	36100	53300	64100	20000	264	
1.7	5371	1.4	809	6.0	306 L4	—	BN 90S 4	M 2SB 4	38800	44000	86900	101200	29200	274	
1.7	5316	2.4	801	7.5	307 L4	—	BN 90S 4	M 2SB 4	43000	53900	93200	122100	37400	284	
1.9	4796	2.9	722	7.5	307 L4	—	BN 90S 4	M 2SB 4	41500	52100	90400	118400	36100	284	
2.0	4646	1.9	700	6.0	306 L4	—	BN 90S 4	M 2SB 4	37000	41900	83200	96900	27800	274	
2.0	4580	2.2	690	15.0	—	307 R4	BN 90S 4	M 2SB 4	40900	51300	89100	116800	35500	285	
2.1	4418	1.4	665	12.0	—	306 R4	BN 90S 4	M 2SB 4	36400	41200	82000	95400	27300	275	
2.1	4375	0.9	659	12.0	—	305 R4	BN 90S 4	M 2SB 4	29100	33600	50000	60100	18700	265	
2.1	4340	2.8	654	7.5	307 L4	—	BN 90S 4	M 2SB 4	40200	50400	87700	114900	34900	284	
2.2	4313	1.0	649	6.0	305 L4	—	BN 90S 4	M 2SB 4	29000	33400	49700	59800	18600	264	
2.2	4220	2.1	636	6.0	306 L4	—	BN 90S 4	M 2SB 4	35800	40600	80800	94100	26900	274	
2.4	3921	2.2	590	12.0	—	306 R4	BN 90S 4	M 2SB 4	34900	39600	79100	92100	26200	275	
2.4	3914	2.2	589	6.0	306 L4	—	BN 90S 4	M 2SB 4	34900	39600	79000	92000	26200	274	
2.5	3764	1.3	567	12.0	—	305 R4	BN 90S 4	M 2SB 4	27700	32000	47700	57400	17800	265	
2.5	3693	1.0	556	6.0	304 L4	—	BN 90S 4	M 2SB 4	27500	31700	47500	57100	17600	254	
2.5	3693	1.5	556	6.0	305 L4	—	BN 90S 4	M 2SB 4	27500	31700	47500	57100	17600	264	
2.5	3652	2.0	550	12.0	—	306 R4	BN 90S 4	M 2SB 4	34100	38700	77400	90100	25600	275	
2.7	3506	1.1	528	12.0	—	305 R4	BN 90S 4	M 2SB 4	27000	31200	46700	56200	17300	265	
2.7	3382	2.6	509	6.0	306 L4	—	BN 90S 4	M 2SB 4	33300	37700	75600	88100	25000	274	
2.8	3269	1.1	492	6.0	304 L4	—	BN 90S 4	M 2SB 4	26400	30500	45800	55100	16900	254	
2.8	3269	1.6	492	6.0	305 L4	—	BN 90S 4	M 2SB 4	26400	30500	45800	55100	16900	264	
2.9	3257	2.9	490	15.0	—	307 R4	BN 90S 4	M 2SB 4	36500	45800	80500	105400	31700	285	
2.9	3241	2.6	488	12.0	—	306 R4	BN 90S 4	M 2SB 4	32800	37100	74700	87000	24600	275	
3.1	3019	2.3	455	12.0	—	306 R4	BN 90S 4	M 2SB 4	32000	36300	73100	85100	24100	275	
3.1	2999	1.2	452	12.0	—	304 R4	BN 90S 4	M 2SB 4	25700	29600	44600	53700	16500	255	
3.1	2999	1.6	452	12.0	—	305 R4	BN 90S 4	M 2SB 4	25700	29600	44600	53700	16500	265	
3.1	2959	0.9	446	6.0	303 L4	—	BN 90S 4	M 2SB 4	25500	29500	44400	53400	16400	244	
3.1	2959	1.2	446	6.0	304 L4	—	BN 90S 4	M 2SB 4	25500	29500	44400	53400	16400	254	
3.1	2959	1.8	446	6.0	305 L4	—	BN 90S 4	M 2SB 4	25500	29500	44400	53400	16400	264	
3.3	2788	2.9	420	12.0	—	306 R4	BN 90S 4	M 2SB 4	31200	35300	71400	83100	23400	275	
3.4	2744	1.1	413	6.0	304 L4	—	BN 90S 4	M 2SB 4	24900	28800	43400	52200	16000	254	
3.4	2744	1.7	413	6.0	305 L4	—	BN 90S 4	M 2SB 4	24900	28800	43400	52200	16000	264	
3.5	2775	2.1	405	7.5	306 L3	—	BN 90S 4	M 2SB 4	30800	34900	70600	82200	23100	274	
3.5	2752	1.4	402	7.5	305 L3	—	BN 90S 4	M 2SB 4	24700	28500	43100	51800	15800	264	
3.6	2596	2.6	391	6.0	306 L4	—	BN 90S 4	M 2SB 4	30400	34500	69900	81400	22900	274	
3.6	2591	1.5	390	12.0	—	305 R4	BN 90S 4	M 2SB 4	24400	28200	42700	51400	15700	265	
3.6	2583	2.6	389	12.0	—	306 R4	BN 90S 4	M 2SB 4	30400	34400	69800	81200	22800	275	
3.6	2664	1.2	389	7.5	305 L3	—	BN 90S 4	M 2SB 4	24400	28200	42600	51300	15700	264	
3.8	2417	0.9	364	12.0	—	303 R4	BN 90S 4	M 2SB 4	23900	27600	41800	50300	15300	245	
3.8	2417	1.2	364	12.0	—	304 R4	BN 90S 4	M 2SB 4	23900	27600	41800	50300	15300	255	
3.8	2417	1.9	364	12.0	—	305 R4	BN 90S 4	M 2SB 4	23900	27600	41800	50300	15300	265	
4.1	2338	1.0	341	7.5	304 L3	—	BN 90S 4	M 2SB 4	23400	27000	41000	49300	15000	254	
4.1	2241	1.0	338	12.0	—	304 R4	BN 90S 4	M 2SB 4	23300	26900	40900	49200	14900	255	
4.2	2229	1.0	336	12.0	—	303 R4	BN 90S 4	M 2SB 4	23200	26800	40800	49100	14900	245	
4.2	2229	2.0	336	12.0	—	305 R4	BN 90S 4	M 2SB 4	23200	26800	40800	49100	14900	265	
4.3	2223	2.5	325	7.5	306 L3	—	BN 90S 4	M 2SB 4	28600	32400	66100	76900	21500	274	
4.4	2202	1.7	321	7.5	305 L3	—	BN 90S 4	M 2SB 4	22900	26400	40300	48500	14700	264	
4.5	2076	1.8	313	12.0	—	305 R4	BN 90S 4	M 2SB 4	22700	26200	39900	48100	14600	265	
4.6	2036	1.7	307	12.0	—	304 R4	BN 90S 4	M 2SB 4	22500	26000	39700	47800	14500	255	
4.8	1932	0.9	291	10.0	—	301 R4	BN 90S 4	M 2SB 4	7210	7210	19100	22000	4740	237	



P₁ = 1.1 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
4.8	1926	1.4	290	12.0	—	303 R4	BN 90S 4	M 2SB 4	22100	25600	39100	47000	14200	245	
4.8	1926	1.9	290	12.0	—	304 R4	BN 90S 4	M 2SB 4	22100	25600	39100	47000	14200	255	
4.8	1926	2.8	290	12.0	—	305 R4	BN 90S 4	M 2SB 4	22100	25600	39100	47000	14200	265	
4.9	1973	2.8	288	7.5	306 L3	—	BN 90S 4	M 2SB 4	27500	31200	63700	74200	20700	274	
5.1	1894	1.2	276	7.5	303 L3	—	BN 90S 4	M 2SB 4	21800	25200	38500	46300	14000	244	
5.1	1894	2.3	276	7.5	305 L3	—	BN 90S 4	M 2SB 4	21800	25200	38500	46300	14000	264	
5.1	1870	1.2	273	7.5	304 L3	—	BN 90S 4	M 2SB 4	21700	25000	38300	46100	13900	254	
5.2	1838	3.0	268	7.5	306 L3	—	BN 90S 4	M 2SB 4	26900	30400	62400	72700	20200	274	
5.2	1781	1.0	268	10.0	—	301 R4	BN 90S 4	M 2SB 4	7020	7020	18700	21500	4610	237	
5.2	1776	2.0	267	12.0	—	304 R4	BN 90S 4	M 2SB 4	21500	24900	38100	45900	13800	255	
5.4	1764	1.0	258	7.5	303 L3	—	BN 90S 4	M 2SB 4	21300	24600	37700	45300	13600	244	
5.4	1764	2.0	258	7.5	305 L3	—	BN 90S 4	M 2SB 4	21300	24600	37700	45300	13600	264	
5.5	1695	1.1	255	12.0	—	303 R4	BN 90S 4	M 2SB 4	21200	24500	37600	45200	13600	245	
5.5	1695	2.1	255	12.0	—	305 R4	BN 90S 4	M 2SB 4	21200	24500	37600	45200	13600	265	
6.1	1534	1.2	231	12.0	—	303 R4	BN 90S 4	M 2SB 4	20500	23700	36500	43900	13200	245	
6.1	1534	2.3	231	12.0	—	305 R4	BN 90S 4	M 2SB 4	20500	23700	36500	43900	13200	265	
6.2	1504	2.3	227	12.0	—	304 R4	BN 90S 4	M 2SB 4	20400	23500	36300	43600	13100	255	
6.3	1514	1.1	221	7.5	301 L3	—	BN 90S 4	M 2SB 4	6580	6580	17600	20300	4320	236	
6.4	1509	1.5	220	7.5	303 L3	—	BN 90S 4	M 2SB 4	20200	23300	36000	43300	13000	244	
6.4	1509	2.4	220	7.5	304 L3	—	BN 90S 4	M 2SB 4	20200	23300	36000	43300	13000	254	
6.5	1427	1.2	215	10.0	—	301 R4	BN 90S 4	M 2SB 4	6520	6520	17500	20100	4280	237	
6.5	1423	1.8	214	12.0	—	303 R4	BN 90S 4	M 2SB 4	20000	23100	35700	42900	12800	245	
6.5	1423	2.5	214	12.0	—	304 R4	BN 90S 4	M 2SB 4	20000	23100	35700	42900	12800	255	
6.9	1382	1.7	202	7.5	304 L3	—	BN 90S 4	M 2SB 4	19600	22600	35000	42100	12600	254	
7.3	1316	1.0	192	7.5	301 L3	—	BN 90S 4	M 2SB 4	6280	6280	16900	19400	4130	236	
7.4	1304	1.4	190	7.5	303 L3	—	BN 90S 4	M 2SB 4	19200	22200	34400	41400	12300	244	
7.4	1304	2.8	190	7.5	305 L3	—	BN 90S 4	M 2SB 4	19200	22200	34400	41400	12300	264	
7.6	1228	1.7	185	12.0	—	303 R4	BN 90S 4	M 2SB 4	19100	22000	34100	41100	12200	245	
7.6	1228	2.8	185	12.0	—	304 R4	BN 90S 4	M 2SB 4	19100	22000	34100	41100	12200	255	
7.9	1216	1.8	178	7.5	303 L3	—	BN 90S 4	M 2SB 4	18800	21700	33700	40600	12100	244	
7.9	1216	2.3	178	7.5	304 L3	—	BN 90S 4	M 2SB 4	18800	21700	33700	40600	12100	254	
7.9	1213	1.4	177	7.5	301 L3	—	BN 90S 4	M 2SB 4	6110	6110	16500	19000	4020	236	
8.0	1165	1.5	175	10.0	—	301 R4	BN 90S 4	M 2SB 4	6090	6090	16500	18900	4000	237	
8.5	1128	2.0	165	7.5	304 L3	—	BN 90S 4	M 2SB 4	18300	21200	33000	39600	11800	254	
8.6	1122	2.0	164	7.5	303 L3	—	BN 90S 4	M 2SB 4	18300	21100	32900	39600	11700	244	
8.8	1055	1.6	159	10.0	—	301 R4	BN 90S 4	M 2SB 4	5890	5890	16000	18300	3870	237	
8.8	1052	2.5	158	12.0	—	303 R4	BN 90S 4	M 2SB 4	18100	20900	32600	39200	11600	245	
9.2	1045	1.7	152	7.5	303 L3	—	BN 90S 4	M 2SB 4	17900	20600	32200	38700	11500	244	
9.4	984	2.1	148	12.0	—	303 R4	BN 90S 4	M 2SB 4	17700	20400	31900	38400	11400	245	
9.8	951	1.4	143	10.0	—	301 R4	BN 90S 4	M 2SB 4	5690	5690	15500	17800	3740	237	
9.9	972	1.7	142	7.5	301 L3	—	BN 90S 4	M 2SB 4	5670	5670	15400	17700	3730	236	
9.9	969	2.7	141	7.5	303 L3	—	BN 90S 4	M 2SB 4	17400	20100	31500	37900	11200	244	
10.5	910	1.3	133	12.0	—	301 R3	BN 90S 4	M 2SB 4	5550	5550	15100	17400	3650	237	
10.7	896	0.9	131	7.5	300 L3	—	BN 90S 4	M 2SB 4	5520	5520	15100	17300	3630	228	
10.7	896	1.9	131	7.5	301 L3	—	BN 90S 4	M 2SB 4	5520	5520	15100	17300	3630	236	
10.8	861	1.0	130	10.0	—	300 R4	BN 90S 4	M 2SB 4	5510	5510	15000	17300	3620	229	
10.8	861	2.0	130	10.0	—	301 R4	BN 90S 4	M 2SB 4	5510	5510	15000	17300	3620	237	
10.8	858	3.0	129	12.0	—	303 R4	BN 90S 4	M 2SB 4	16900	19500	30600	36900	10800	245	
11.2	853	2.1	124	7.5	303 L3	—	BN 90S 4	M 2SB 4	16700	19300	30300	36500	10700	244	
11.5	831	2.8	121	14.0	—	304 R3	BN 90S 4	M 2SB 4	16600	19100	30100	36200	10600	255	
12.1	794	1.6	116	7.5	301 L3	—	BN 90S 4	M 2SB 4	5300	5300	14500	16700	3490	236	
12.2	784	2.3	114	14.0	—	303 R3	BN 90S 4	M 2SB 4	16200	18700	29500	35500	10400	245	
12.4	772	2.3	113	7.5	303 L3	—	BN 90S 4	M 2SB 4	16200	18600	29400	35400	10400	244	
13.2	729	1.8	106	12.0	—	301 R3	BN 90S 4	M 2SB 4	5160	5160	14200	16300	3390	237	
13.2	703	1.2	106	10.0	—	300 R4	BN 90S 4	M 2SB 4	5150	5150	14100	16200	3380	229	
13.2	703	2.3	106	10.0	—	301 R4	BN 90S 4	M 2SB 4	5150	5150	14100	16200	3380	237	
13.4	718	1.2	105	7.5	300 L3	—	BN 90S 4	M 2SB 4	5130	5130	14100	16200	3370	228	
13.4	718	2.3	105	7.5	301 L3	—	BN 90S 4	M 2SB 4	5130	5130	14100	16200	3370	236	
15.3	627	2.9	91.5	14.0	—	303 R3	BN 90S 4	M 2SB 4	15100	17400	27600	33200	9670	245	
16.4	586	1.4	85.6	7.5	300 L3	—	BN 90S 4	M 2SB 4	4790	4790	13300	15200	3150	228	
16.4	586	2.7	85.6	7.5	301 L3	—	BN 90S 4	M 2SB 4	4790	4790	13300	15200	3150	236	

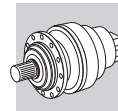


$P_1 = 1.1 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
16.4	583	1.1	85.2	12.0	—	300 R3	BN 90S 4	M 2SB 4	4790	4790	13200	15200	3150	229	
16.4	583	2.2	85.2	12.0	—	301 R3	BN 90S 4	M 2SB 4	4790	4790	13200	15200	3150	237	
17.8	539	1.5	78.7	12.0	—	300 R3	BN 90S 4	M 2SB 4	4660	4660	12900	14900	3060	229	
17.8	539	2.8	78.7	12.0	—	301 R3	BN 90S 4	M 2SB 4	4660	4660	12900	14900	3060	237	
18.1	531	1.5	77.5	7.5	300 L3	—	BN 90S 4	M 2SB 4	4640	4640	12900	14800	3050	228	
18.1	531	2.9	77.5	7.5	301 L3	—	BN 90S 4	M 2SB 4	4640	4640	12900	14800	3050	236	
20.0	479	1.4	69.9	7.5	300 L3	—	BN 90S 4	M 2SB 4	4480	4480	12500	14300	2950	228	
20.0	479	2.7	69.9	7.5	301 L3	—	BN 90S 4	M 2SB 4	4480	4480	12500	14300	2950	236	
20.5	467	1.4	68.2	12.0	—	300 R3	BN 90S 4	M 2SB 4	4440	4440	12400	14200	2920	229	
20.5	467	2.8	68.2	12.0	—	301 R3	BN 90S 4	M 2SB 4	4440	4440	12400	14200	2920	237	
21.6	458	1.2	64.8	7.5	300 L2	—	BN 90S 4	M 2SB 4	4370	4370	12200	14000	2870	228	
21.6	458	2.5	64.8	7.5	301 L2	—	BN 90S 4	M 2SB 4	4370	4370	12200	14000	2870	236	
22.1	433	1.8	63.2	7.5	300 L3	—	BN 90S 4	M 2SB 4	4330	4330	12100	13900	2850	228	
22.2	431	1.9	62.9	12.0	—	300 R3	BN 90S 4	M 2SB 4	4330	4330	12100	13900	2840	229	
27.0	367	1.8	51.9	7.5	300 L2	—	BN 90S 4	M 2SB 4	4060	4060	11400	13100	2670	228	
27.1	354	2.2	51.6	7.5	300 L3	—	BN 90S 4	M 2SB 4	4050	4050	11400	13100	2660	228	
27.8	345	2.3	50.4	12.0	—	300 R3	BN 90S 4	M 2SB 4	4020	4020	11300	13000	2640	229	
34	293	2.2	41.5	7.5	300 L2	—	BN 90S 4	M 2SB 4	3770	3770	10700	12300	2480	228	
34	282	2.3	41.2	12.0	—	300 R3	BN 90S 4	M 2SB 4	3760	3760	10600	12200	2470	229	
36	271	2.9	38.4	7.5	300 L2	—	BN 90S 4	M 2SB 4	3670	3670	10400	12000	2410	228	
42	235	2.8	33.3	7.5	300 L2	—	BN 90S 4	M 2SB 4	3500	3500	9990	11500	2300	228	
76	130	2.8	18.5	12.0	—	300 R2	BN 90S 4	M 2SB 4	2870	2870	8370	9620	1890	229	

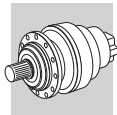
$P_1 = 1.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.55	23015	1.1	2523	11.0	310 L4	—	BN 90LA 4	—	—	—	133000	166000	65000	304	
0.64	19947	2.5	2187	11.0	313 L4	—	BN 90LA 4	—	—	—	192000	231000	80000	324	
0.66	19121	1.8	2096	11.0	311 L4	—	BN 90LA 4	—	—	—	157000	195000	65000	314	
0.69	18442	1.4	2022	11.0	310 L4	—	BN 90LA 4	—	—	—	133000	166000	65000	304	
0.77	16367	1.6	1794	11.0	310 L4	—	BN 90LA 4	—	—	—	133000	166000	65000	304	
0.79	16111	2.7	1766	11.0	311 L4	—	BN 90LA 4	—	—	—	157000	195000	65000	314	
0.80	15890	0.9	1767	7.5	307 L4	—	BN 90LA 4	M 3SA 4	52000	65000	109000	145000	45000	284	
0.81	15712	1.1	1723	7.5	309 L4	—	BN 90LA 4	—	—	—	110000	145000	36000	294	
0.83	15321	2.2	1680	11.0	311 L4	—	BN 90LA 4	—	—	—	157000	195000	65000	314	
0.83	15245	1.7	1672	11.0	310 L4	—	BN 90LA 4	—	—	—	133000	166000	65000	304	
0.87	14635	1.2	1605	7.5	309 L4	—	BN 90LA 4	—	—	—	110000	145000	36000	294	
0.89	14301	1.0	1591	7.5	307 L4	—	BN 90LA 4	M 3SA 4	52000	65000	109000	145000	45000	284	
0.97	13114	2.0	1438	11.0	310 L4	—	BN 90LA 4	—	—	—	133000	166000	65000	304	
1.0	12662	1.2	1408	7.5	307 L4	—	BN 90LA 4	M 3SA 4	51900	65000	109000	144700	45000	284	
1.0	12590	1.4	1380	7.5	309 L4	—	BN 90LA 4	—	—	—	110000	143800	35800	294	
1.1	11727	1.4	1286	7.5	309 L4	—	BN 90LA 4	—	—	—	109200	140800	35000	294	
1.1	11482	2.4	1259	11.0	310 L4	—	BN 90LA 4	—	—	—	128500	161600	62700	304	
1.1	11459	1.1	1274	7.5	307 L4	—	BN 90LA 4	M 3SA 4	50200	63000	107100	140400	43600	284	
1.2	10619	2.7	1164	11.0	310 L4	—	BN 90LA 4	—	—	—	125500	157900	61100	304	
1.2	10483	1.6	1149	7.5	309 L4	—	BN 90LA 4	—	—	—	105500	136100	33700	294	
1.2	10400	1.3	1157	7.5	307 L4	—	BN 90LA 4	M 3SA 4	48600	60900	104100	136400	42200	284	
1.4	9308	3.0	1021	11.0	310 L4	—	BN 90LA 4	—	—	—	120700	151800	58500	304	
1.4	9126	1.0	1015	6.0	306 L4	—	BN 90LA 4	M 3SA 4	41900	47400	93000	108300	31400	274	
1.4	9113	2.0	999	7.5	309 L4	—	BN 90LA 4	—	—	—	101200	130500	32200	294	
1.4	8983	1.5	999	7.5	307 L4	—	BN 90LA 4	M 3SA 4	46300	58000	99600	130500	40200	284	
1.5	8266	2.2	906	7.5	309 L4	—	BN 90LA 4	—	—	—	98300	126800	31100	294	
1.5	8191	2.9	898	15.0	—	310 R4	BN 90LA 4	—	—	—	116100	146000	56100	305	
1.6	8149	1.8	906	7.5	307 L4	—	BN 90LA 4	M 3SA 4	44800	56200	96700	126800	38900	284	
1.6	7886	0.9	877	6.0	306 L4	—	BN 90LA 4	M 3SA 4	39900	45200	89000	103700	29900	274	
1.7	7302	2.5	801	7.5	309 L4	—	BN 90LA 4	—	—	—	94700	122100	29900	294	
1.7	7272	1.0	809	6.0	306 L4	—	BN 90LA 4	M 3SA 4	38800	44000	86900	101200	29200	274	
1.8	7198	1.8	801	7.5	307 L4	—	BN 90LA 4	M 3SA 4	43000	53900	93200	122100	37400	284	
2.0	6493	2.2	722	7.5	307 L4	—	BN 90LA 4	M 3SA 4	41500	52100	90400	118400	36100	284	
2.0	6291	2.4	690	15.0	—	309 R4	BN 90LA 4	—	—	—	90600	116800	28400	295	



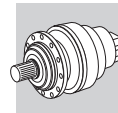
P₁ = 1.5 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
2.0	6290	1.4	700	6.0	306 L4	—	BN 90LA 4	M 3SA 4	37000	41900	83200	96900	27800	274
2.0	6202	1.6	690	15.0	—	307 R4	BN 90LA 4	M 3SA 4	40900	51300	89100	116800	35500	285
2.1	5982	1.0	665	12.0	—	306 R4	BN 90LA 4	M 3SA 4	36400	41200	82000	95400	27300	275
2.1	5960	3.0	654	7.5	309 L4	—	BN 90LA 4	—	—	—	89100	114900	27900	294
2.2	5875	2.1	654	7.5	307 L4	—	BN 90LA 4	M 3SA 4	40200	50400	87700	114900	34900	284
2.2	5714	1.5	636	6.0	306 L4	—	BN 90LA 4	M 3SA 4	35800	40600	80800	94100	26900	274
2.4	5308	1.6	590	12.0	—	306 R4	BN 90LA 4	M 3SA 4	34900	39600	79100	92100	26200	275
2.4	5301	3.0	581	15.0	—	309 R4	BN 90LA 4	—	—	—	86000	110900	26900	295
2.4	5299	1.6	589	6.0	306 L4	—	BN 90LA 4	M 3SA 4	34900	39600	79000	92000	26200	274
2.4	5226	2.3	581	15.0	—	307 R4	BN 90LA 4	M 3SA 4	38600	48500	84700	110900	33600	285
2.4	5203	2.7	579	7.5	307 L4	—	BN 90LA 4	M 3SA 4	38600	48400	84500	110800	33500	284
2.5	5096	1.0	567	12.0	—	305 R4	BN 90LA 4	M 3SA 4	27700	32000	47700	57400	17800	265
2.5	5000	1.1	556	6.0	305 L4	—	BN 90LA 4	M 3SA 4	27500	31700	47500	57100	17600	264
2.6	4945	1.5	550	12.0	—	306 R4	BN 90LA 4	M 3SA 4	34100	38700	77400	90100	25600	275
2.8	4579	1.9	509	6.0	306 L4	—	BN 90LA 4	M 3SA 4	33300	37700	75600	88100	25000	274
2.8	4579	3.0	509	7.5	307 L4	—	BN 90LA 4	M 3SA 4	37000	46400	81400	106600	32100	284
2.9	4426	1.2	492	6.0	305 L4	—	BN 90LA 4	M 3SA 4	26400	30500	45800	55100	16900	264
2.9	4410	2.1	490	15.0	—	307 R4	BN 90LA 4	M 3SA 4	36500	45800	80500	105400	31700	285
2.9	4388	1.9	488	12.0	—	306 R4	BN 90LA 4	M 3SA 4	32800	37100	74700	87000	24600	275
3.0	4180	2.8	465	7.5	307 L4	—	BN 90LA 4	M 3SA 4	35800	45000	79200	103700	31200	284
3.1	4088	1.7	455	12.0	—	306 R4	BN 90LA 4	M 3SA 4	32000	36300	73100	85100	24100	275
3.1	4061	0.91	452	12.0	—	304 R4	BN 90LA 4	M 3SA 4	25700	29600	44600	53700	16500	255
3.1	4061	1.2	452	12.0	—	305 R4	BN 90LA 4	M 3SA 4	25700	29600	44600	53700	16500	265
3.2	4007	0.9	446	6.0	304 L4	—	BN 90LA 4	M 3SA 4	25500	29500	44400	53400	16400	254
3.2	4007	1.4	446	6.0	305 L4	—	BN 90LA 4	M 3SA 4	25500	29500	44400	53400	16400	264
3.2	3994	2.4	444	6.0	306 L4	—	BN 90LA 4	M 3SA 4	31800	36000	72600	84500	23900	274
3.4	3775	2.2	420	12.0	—	306 R4	BN 90LA 4	M 3SA 4	31200	35300	71400	83100	23400	275
3.4	3715	1.3	413	6.0	305 L4	—	BN 90LA 4	M 3SA 4	24900	28800	43400	52200	16000	264
3.5	3757	1.5	405	7.5	306 L3	—	BN 90LA 4	M 3SA 4	30800	34900	70600	82200	23100	274
3.5	3727	1.0	402	7.5	305 L3	—	BN 90LA 4	M 3SA 4	24700	28500	43100	51800	15800	264
3.6	3515	1.9	391	6.0	306 L4	—	BN 90LA 4	M 3SA 4	30400	34500	69900	81400	22900	274
3.6	3508	1.1	390	12.0	—	305 R4	BN 90LA 4	M 3SA 4	24400	28200	42700	51400	15700	265
3.6	3497	2.0	389	12.0	—	306 R4	BN 90LA 4	M 3SA 4	30400	34400	69800	81200	22800	275
3.9	3272	1.4	364	12.0	—	305 R4	BN 90LA 4	M 3SA 4	23900	27600	41800	50300	15300	265
4.2	3121	2.9	336	11.0	307 L3	—	BN 90LA 4	M 3SA 4	32200	40400	71900	94200	28000	284
4.2	3017	1.5	336	12.0	—	305 R4	BN 90LA 4	M 3SA 4	23200	26800	40800	49100	14900	265
4.3	3010	1.9	325	7.5	306 L3	—	BN 90LA 4	M 3SA 4	28600	32400	66100	76900	21500	274
4.4	2981	1.2	321	7.5	305 L3	—	BN 90LA 4	M 3SA 4	22900	26400	40300	48500	14700	264
4.5	2811	1.3	313	12.0	—	305 R4	BN 90LA 4	M 3SA 4	22700	26200	39900	48100	14600	265
4.5	2802	2.6	312	12.0	—	306 R4	BN 90LA 4	M 3SA 4	28200	32000	65300	76000	21200	275
4.6	2756	1.3	307	12.0	—	304 R4	BN 90LA 4	M 3SA 4	22500	26000	39700	47800	14500	255
4.9	2607	1.0	290	12.0	—	303 R4	BN 90LA 4	M 3SA 4	22100	25600	39100	47000	14200	245
4.9	2607	1.4	290	12.0	—	304 R4	BN 90LA 4	M 3SA 4	22100	25600	39100	47000	14200	255
4.9	2607	2.0	290	12.0	—	305 R4	BN 90LA 4	M 3SA 4	22100	25600	39100	47000	14200	265
4.9	2598	3.0	289	12.0	—	306 R4	BN 90LA 4	M 3SA 4	27500	31200	63800	74300	20700	275
4.9	2671	2.1	288	7.5	306 L3	—	BN 90LA 4	M 3SA 4	27500	31200	63700	74200	20700	274
5.1	2565	1.7	276	7.5	305 L3	—	BN 90LA 4	M 3SA 4	21800	25200	38500	46300	14000	264
5.2	2532	0.90	273	7.5	304 L3	—	BN 90LA 4	M 3SA 4	21700	25000	38300	46100	13900	254
5.3	2488	2.2	268	7.5	306 L3	—	BN 90LA 4	M 3SA 4	26900	30400	62400	72700	20200	274
5.3	2405	1.5	267	12.0	—	304 R4	BN 90LA 4	M 3SA 4	21500	24900	38100	45900	13800	255
5.5	2389	1.5	258	7.5	305 L3	—	BN 90LA 4	M 3SA 4	21300	24600	37700	45300	13600	264
5.5	2294	1.6	255	12.0	—	305 R4	BN 90LA 4	M 3SA 4	21200	24500	37600	45200	13600	265
6.1	2077	1.7	231	12.0	—	305 R4	BN 90LA 4	M 3SA 4	20500	23700	36500	43900	13200	265
6.2	2037	1.7	227	12.0	—	304 R4	BN 90LA 4	M 3SA 4	20400	23500	36300	43600	13100	255
6.4	2044	1.1	220	7.5	303 L3	—	BN 90LA 4	M 3SA 4	20200	23300	36000	43300	13000	244
6.4	2044	1.8	220	7.5	304 L3	—	BN 90LA 4	M 3SA 4	20200	23300	36000	43300	13000	254
6.4	2044	2.3	220	7.5	305 L3	—	BN 90LA 4	M 3SA 4	20200	23300	36000	43300	13000	264
6.6	1933	0.90	215	10.0	—	301 R4	BN 90LA 4	M 3SA 4	6520	6520	17500	20100	4280	237
6.6	1927	1.4	214	12.0	—	303 R4	BN 90LA 4	M 3SA 4	20000	23100	35700	42900	12800	245
6.6	1927	1.9	214	12.0	—	304 R4	BN 90LA 4	M 3SA 4	20000	23100	35700	42900	12800	255
6.6	1927	2.7	214	12.0	—	305 R4	BN 90LA 4	M 3SA 4	20000	23100	35700	42900	12800	265



P₁ = 1.5 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
MC	MZ	HC/PC	HZ/PZ	FZ										
7.0	1871	1.2	202	7.5	304 L3	—	BN 90LA 4	M 3SA 4	19600	22600	35000	42100	12600	254
7.4	1765	1.0	190	7.5	303 L3	—	BN 90LA 4	M 3SA 4	19200	22200	34400	41400	12300	244
7.4	1765	2.0	190	7.5	305 L3	—	BN 90LA 4	M 3SA 4	19200	22200	34400	41400	12300	264
7.6	1663	1.3	185	12.0	—	303 R4	BN 90LA 4	M 3SA 4	19100	22000	34100	41100	12200	245
7.6	1663	2.1	185	12.0	—	304 R4	BN 90LA 4	M 3SA 4	19100	22000	34100	41100	12200	255
7.6	1663	2.6	185	12.0	—	305 R4	BN 90LA 4	M 3SA 4	19100	22000	34100	41100	12200	265
7.9	1647	1.3	178	7.5	303 L3	—	BN 90LA 4	M 3SA 4	18800	21700	33700	40600	12100	244
7.9	1647	1.7	178	7.5	304 L3	—	BN 90LA 4	M 3SA 4	18800	21700	33700	40600	12100	254
7.9	1647	2.7	178	7.5	305 L3	—	BN 90LA 4	M 3SA 4	18800	21700	33700	40600	12100	264
8.0	1643	1.0	177	7.5	301 L3	—	BN 90LA 4	M 3SA 4	6110	6110	16500	19000	4020	236
8.0	1578	1.1	175	10.0	—	301 R4	BN 90LA 4	M 3SA 4	6090	6090	16500	18900	4000	237
8.6	1527	1.5	165	7.5	304 L3	—	BN 90LA 4	M 3SA 4	18300	21200	33000	39600	11800	254
8.6	1518	1.4	164	7.5	303 L3	—	BN 90LA 4	M 3SA 4	18300	21100	32900	39600	11700	244
8.6	1518	2.9	164	7.5	305 L3	—	BN 90LA 4	M 3SA 4	18300	21100	32900	39600	11700	264
8.9	1428	1.2	159	10.0	—	301 R4	BN 90LA 4	M 3SA 4	5890	5890	16000	18300	3870	237
8.9	1424	1.8	158	12.0	—	303 R4	BN 90LA 4	M 3SA 4	18100	20900	32600	39200	11600	245
8.9	1424	2.5	158	12.0	—	304 R4	BN 90LA 4	M 3SA 4	18100	20900	32600	39200	11600	255
9.2	1414	1.3	152	7.5	303 L3	—	BN 90LA 4	M 3SA 4	17900	20600	32200	38700	11500	244
9.2	1414	2.5	152	7.5	305 L3	—	BN 90LA 4	M 3SA 4	17900	20600	32200	38700	11500	264
9.4	1387	2.5	150	7.5	304 L3	—	BN 90LA 4	M 3SA 4	17800	20500	32000	38500	11400	254
9.5	1332	1.6	148	12.0	—	303 R4	BN 90LA 4	M 3SA 4	17700	20400	31900	38400	11400	245
9.5	1332	2.6	148	12.0	—	304 R4	BN 90LA 4	M 3SA 4	17700	20400	31900	38400	11400	255
9.8	1288	1.0	143	10.0	—	301 R4	BN 90LA 4	M 3SA 4	5690	5690	15500	17800	3740	237
9.9	1316	1.3	142	7.5	301 L3	—	BN 90LA 4	M 3SA 4	5670	5670	15400	17700	3730	236
10.0	1312	2.0	141	7.5	303 L3	—	BN 90LA 4	M 3SA 4	17400	20100	31500	37900	11200	244
10.0	1312	2.7	141	7.5	304 L3	—	BN 90LA 4	M 3SA 4	17400	20100	31500	37900	11200	254
10.6	1232	0.9	133	12.0	—	301 R3	BN 90LA 4	M 3SA 4	5550	5550	15100	17400	3650	237
10.8	1214	1.4	131	7.5	301 L3	—	BN 90LA 4	M 3SA 4	5520	5520	15100	17300	3630	236
10.8	1210	2.9	130	7.5	304 L3	—	BN 90LA 4	M 3SA 4	17000	19600	30700	37000	10900	254
10.9	1166	1.4	130	10.0	—	301 R4	BN 90LA 4	M 3SA 4	5510	5510	15000	17300	3620	237
10.9	1162	2.2	129	12.0	—	303 R4	BN 90LA 4	M 3SA 4	16900	19500	30600	36900	10800	245
10.9	1162	3.0	129	12.0	—	304 R4	BN 90LA 4	M 3SA 4	16900	19500	30600	36900	10800	255
11.3	1155	1.6	124	7.5	303 L3	—	BN 90LA 4	M 3SA 4	16700	19300	30300	36500	10700	244
11.6	1125	2.0	121	14.0	—	304 R3	BN 90LA 4	M 3SA 4	16600	19100	30100	36200	10600	255
12.2	1074	1.2	116	7.5	301 L3	—	BN 90LA 4	M 3SA 4	5300	5300	14500	16700	3490	236
12.3	1061	1.7	114	14.0	—	303 R3	BN 90LA 4	M 3SA 4	16200	18700	29500	35500	10400	245
12.5	1045	1.7	113	7.5	303 L3	—	BN 90LA 4	M 3SA 4	16200	18600	29400	35400	10400	244
13.2	987	1.3	106	12.0	—	301 R3	BN 90LA 4	M 3SA 4	5160	5160	14200	16300	3390	237
13.3	952	1.7	106	10.0	—	301 R4	BN 90LA 4	M 3SA 4	5150	5150	14100	16200	3380	237
13.4	973	1.7	105	7.5	301 L3	—	BN 90LA 4	M 3SA 4	5130	5130	14100	16200	3370	236
13.5	970	2.6	105	7.5	303 L3	—	BN 90LA 4	M 3SA 4	15800	18200	28800	34600	10100	244
14.5	900	2.5	97.0	14.0	—	304 R3	BN 90LA 4	M 3SA 4	15400	17700	28100	33800	9860	255
15.4	849	2.1	91.5	14.0	—	303 R3	BN 90LA 4	M 3SA 4	15100	17400	27600	33200	9670	245
15.6	837	2.4	90.2	7.5	303 L3	—	BN 90LA 4	M 3SA 4	15000	17300	27500	33100	9620	244
16.5	794	1.0	85.6	7.5	300 L3	—	BN 90LA 4	M 3SA 4	4790	4790	13300	15200	3150	228
16.5	794	2.0	85.6	7.5	301 L3	—	BN 90LA 4	M 3SA 4	4790	4790	13300	15200	3150	236
16.6	790	1.6	85.2	12.0	—	301 R3	BN 90LA 4	M 3SA 4	4790	4790	13200	15200	3150	237
17.9	730	2.9	78.7	14.0	—	303 R3	BN 90LA 4	M 3SA 4	14300	16500	26400	31800	9190	245
17.9	730	1.1	78.7	12.0	—	300 R3	BN 90LA 4	M 3SA 4	4660	4660	12900	14900	3060	229
17.9	730	2.0	78.7	12.0	—	301 R3	BN 90LA 4	M 3SA 4	4660	4660	12900	14900	3060	237
18.2	719	1.1	77.5	7.5	300 L3	—	BN 90LA 4	M 3SA 4	4640	4640	12900	14800	3050	228
18.2	719	2.2	77.5	7.5	301 L3	—	BN 90LA 4	M 3SA 4	4640	4640	12900	14800	3050	236
19.2	680	2.6	73.3	14.0	—	303 R3	BN 90LA 4	M 3SA 4	14000	16200	25900	31100	8980	245
19.5	670	3.0	72.3	7.5	303 L3	—	BN 90LA 4	M 3SA 4	13900	16100	25700	31000	8940	244
20.2	648	1.0	69.9	7.5	300 L3	—	BN 90LA 4	M 3SA 4	4480	4480	12500	14300	2950	228
20.2	648	2.0	69.9	7.5	301 L3	—	BN 90LA 4	M 3SA 4	4480	4480	12500	14300	2950	236
20.7	633	1.0	68.2	12.0	—	300 R3	BN 90LA 4	M 3SA 4	4440	4440	12400	14200	2920	229
20.7	633	2.1	68.2	12.0	—	301 R3	BN 90LA 4	M 3SA 4	4440	4440	12400	14200	2920	237
21.8	619	1.9	64.8	7.5	301 L2	—	BN 90LA 4	M 3SA 4	4370	4370	12200	14000	2870	236
22.3	587	1.4	63.2	7.5	300 L3	—	BN 90LA 4	M 3SA 4	4330	4330	12100	13900	2850	228
22.3	587	2.6	63.2	7.5	301 L3	—	BN 90LA 4	M 3SA 4	4330	4330	12100	13900	2850	236

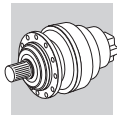


$P_1 = 1.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	R _{n2} [N]			
											HC/PC	HZ/PZ	FZ	
22.4	584	1.4	62.9	12.0	—	300 R3	BN 90LA 4	M 3SA 4	4330	4330	12100	13900	2840	229
22.4	584	2.6	62.9	12.0	—	301 R3	BN 90LA 4	M 3SA 4	4330	4330	12100	13900	2840	237
27.2	496	1.3	51.9	7.5	300 L2	—	BN 90LA 4	M 3SA 4	4060	4060	11400	13100	2670	228
27.2	496	2.6	51.9	7.5	301 L2	—	BN 90LA 4	M 3SA 4	4060	4060	11400	13100	2670	236
27.3	479	1.6	51.6	7.5	300 L3	—	BN 90LA 4	M 3SA 4	4050	4050	11400	13100	2660	228
28.0	468	1.7	50.4	12.0	—	300 R3	BN 90LA 4	M 3SA 4	4020	4020	11300	13000	2640	229
34	397	1.6	41.5	7.5	300 L2	—	BN 90LA 4	M 3SA 4	3770	3770	10700	12300	2480	228
34	382	1.7	41.2	12.0	—	300 R3	BN 90LA 4	M 3SA 4	3760	3760	10600	12200	2470	229
37	367	2.1	38.4	7.5	300 L2	—	BN 90LA 4	M 3SA 4	3670	3670	10400	12000	2410	228
38	346	2.3	37.3	12.0	—	300 R3	BN 90LA 4	M 3SA 4	3630	3630	10300	11900	2390	229
42	318	2.0	33.3	7.5	300 L2	—	BN 90LA 4	M 3SA 4	3500	3500	9990	11500	2300	228
46	293	2.6	30.7	7.5	300 L2	—	BN 90LA 4	M 3SA 4	3410	3410	9750	11200	2240	228
46	282	2.7	30.4	12.0	—	300 R3	BN 90LA 4	M 3SA 4	3400	3400	9730	11200	2230	229
57	230	2.8	24.8	12.0	—	300 R3	BN 90LA 4	M 3SA 4	3170	3170	9150	10500	2090	229
76	176	2.1	18.5	12.0	—	300 R2	BN 90LA 4	M 3SA 4	2870	2870	8370	9620	1890	229

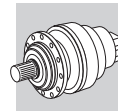
$P_1 = 1.85 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.55	28386	0.9	2523	11.0	310 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	304
0.64	24601	2.0	2187	11.0	313 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	324
0.66	23582	1.4	2096	11.0	311 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	314
0.69	22745	1.1	2022	11.0	310 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	304
0.77	20438	2.7	1817	11.0	313 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	324
0.77	20185	1.3	1794	11.0	310 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	304
0.79	19870	2.2	1766	11.0	311 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	314
0.83	18896	1.8	1680	11.0	311 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	314
0.83	18803	1.4	1672	11.0	310 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	304
0.87	18050	0.9	1605	7.5	309 L4	—	BN 90LB 4	—	—	—	110000	145000	36000	294
0.97	16174	1.6	1438	11.0	310 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	304
0.98	15921	2.7	1415	11.0	311 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	314
0.99	15842	0.9	1408	7.5	307 L4	—	BN 90LB 4	—	51900	65000	109000	144700	45000	284
1.0	15527	1.1	1380	7.5	309 L4	—	BN 90LB 4	—	—	—	110000	143800	35800	294
1.1	14463	1.2	1286	7.5	309 L4	—	BN 90LB 4	—	—	—	109200	140800	35000	294
1.1	14162	2.0	1259	11.0	310 L4	—	BN 90LB 4	—	—	—	128500	161600	62700	304
1.1	13840	3.0	1230	11.0	311 L4	—	BN 90LB 4	—	—	—	150800	187900	62300	314
1.2	13097	2.2	1164	11.0	310 L4	—	BN 90LB 4	—	—	—	125500	157900	61100	304
1.2	13011	1.0	1157	7.5	307 L4	—	BN 90LB 4	—	48600	60900	104100	136400	42200	284
1.2	12929	1.3	1149	7.5	309 L4	—	BN 90LB 4	—	—	—	105500	136100	33700	294
1.4	11480	2.4	1021	11.0	310 L4	—	BN 90LB 4	—	—	—	120700	151800	58500	304
1.4	11239	1.2	999	7.5	307 L4	—	BN 90LB 4	—	46300	58000	99600	130500	40200	284
1.4	11239	1.6	999	7.5	309 L4	—	BN 90LB 4	—	—	—	101200	130500	32200	294
1.5	10561	2.6	939	11.0	310 L4	—	BN 90LB 4	—	—	—	117700	148000	56900	304
1.5	10195	1.4	906	7.5	307 L4	—	BN 90LB 4	—	44800	56200	96700	126800	38900	284
1.5	10195	1.7	906	7.5	309 L4	—	BN 90LB 4	—	—	—	98300	126800	31100	294
1.5	10103	2.3	898	15.0	—	310 R4	BN 90LB 4	—	—	—	116100	146000	56100	305
1.7	9199	2.9	818	11.0	310 L4	—	BN 90LB 4	—	—	—	112900	142000	54300	304
1.7	9005	1.4	801	7.5	307 L4	—	BN 90LB 4	—	43000	53900	93200	122100	37400	284
1.7	9005	2.0	801	7.5	309 L4	—	BN 90LB 4	—	—	—	94700	122100	29900	294
1.9	8124	1.7	722	7.5	307 L4	—	BN 90LB 4	—	41500	52100	90400	118400	36100	284
1.9	8124	2.6	722	7.5	309 L4	—	BN 90LB 4	—	—	—	91800	118400	28900	294
2.0	7870	1.1	700	6.0	306 L4	—	BN 90LB 4	—	37000	41900	83200	96900	27800	274
2.0	7759	1.3	690	15.0	—	307 R4	BN 90LB 4	—	40900	51300	89100	116800	35500	285
2.0	7759	1.9	690	15.0	—	309 R4	BN 90LB 4	—	—	—	90600	116800	28400	295
2.1	7351	1.7	654	7.5	307 L4	—	BN 90LB 4	—	40200	50400	87700	114900	34900	284
2.1	7351	2.5	654	7.5	309 L4	—	BN 90LB 4	—	—	—	89100	114900	27900	294
2.2	7184	3.0	639	15.0	—	310 R4	BN 90LB 4	—	—	—	104800	131800	50000	305
2.2	7149	1.2	636	6.0	306 L4	—	BN 90LB 4	—	35800	40600	80800	94100	26900	274
2.4	6641	1.3	590	12.0	—	306 R4	BN 90LB 4	—	34900	39600	79100	92100	26200	275
2.4	6629	1.3	589	6.0	306 L4	—	BN 90LB 4	—	34900	39600	79000	92000	26200	274



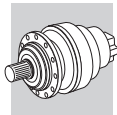
$P_1 = 1.85 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
2.4	6537	1.9	581	15.0	—	307 R4	BN 90LB 4	—	38600	48500	84700	110900	33600	285	
2.4	6537	2.4	581	15.0	—	309 R4	BN 90LB 4	—	—	—	86000	110900	26900	295	
2.4	6510	2.1	579	7.5	307 L4	—	BN 90LB 4	—	38600	48400	84500	110800	33500	284	
2.5	6186	1.2	550	12.0	—	306 R4	BN 90LB 4	—	34100	38700	77400	90100	25600	275	
2.7	5728	1.5	509	6.0	306 L4	—	BN 90LB 4	—	33300	37700	75600	88100	25000	274	
2.7	5728	2.4	509	7.5	307 L4	—	BN 90LB 4	—	37000	46400	81400	106600	32100	284	
2.7	5728	2.5	509	7.5	309 L4	—	BN 90LB 4	—	—	—	82700	106600	25700	294	
2.8	5537	1.0	492	6.0	305 L4	—	BN 90LB 4	—	26400	30500	45800	55100	16900	264	
2.8	5517	1.7	490	15.0	—	307 R4	BN 90LB 4	—	36500	45800	80500	105400	31700	285	
2.8	5517	2.6	490	15.0	—	309 R4	BN 90LB 4	—	—	—	81700	105400	25400	295	
2.8	5490	1.5	488	12.0	—	306 R4	BN 90LB 4	—	32800	37100	74700	87000	24600	275	
3.0	5229	2.2	465	7.5	307 L4	—	BN 90LB 4	—	35800	45000	79200	103700	31200	284	
3.0	5139	2.7	457	15.0	—	309 R4	BN 90LB 4	—	—	—	80000	103200	24800	295	
3.1	5114	1.4	455	12.0	—	306 R4	BN 90LB 4	—	32000	36300	73100	85100	24100	275	
3.1	5094	2.7	453	15.0	—	307 R4	BN 90LB 4	—	35500	44600	78600	102900	30900	285	
3.1	5081	0.9	452	12.0	—	305 R4	BN 90LB 4	—	25700	29600	44600	53700	16500	265	
3.1	5013	1.1	446	6.0	305 L4	—	BN 90LB 4	—	25500	29500	44400	53400	16400	264	
3.1	4997	1.9	444	6.0	306 L4	—	BN 90LB 4	—	31800	36000	72600	84500	23900	274	
3.3	4723	1.7	420	12.0	—	306 R4	BN 90LB 4	—	31200	35300	71400	83100	23400	275	
3.4	4649	2.5	413	15.0	—	307 R4	BN 90LB 4	—	34500	43200	76400	100100	30000	285	
3.4	4648	1.0	413	6.0	305 L4	—	BN 90LB 4	—	24900	28800	43400	52200	16000	264	
3.4	4562	2.5	406	7.5	307 L4	—	BN 90LB 4	—	34300	43000	76000	99600	29800	284	
3.4	4700	1.2	405	7.5	306 L3	—	BN 90LB 4	—	30800	34900	70600	82200	23100	274	
3.6	4397	1.6	391	6.0	306 L4	—	BN 90LB 4	—	30400	34500	69900	81400	22900	274	
3.6	4375	1.6	389	12.0	—	306 R4	BN 90LB 4	—	30400	34400	69800	81200	22800	275	
3.8	4093	1.1	364	12.0	—	305 R4	BN 90LB 4	—	23900	27600	41800	50300	15300	265	
3.8	4082	3.0	363	15.0	—	307 R4	BN 90LB 4	—	33000	41400	73500	96300	28700	285	
4.1	3905	2.3	336	11.0	307 L3	—	BN 90LB 4	—	32200	40400	71900	94200	28000	284	
4.1	3775	1.2	336	12.0	—	305 R4	BN 90LB 4	—	23200	26800	40800	49100	14900	265	
4.2	3725	3.0	331	15.0	—	307 R4	BN 90LB 4	—	32000	40200	71500	93700	27800	285	
4.3	3766	1.5	325	7.5	306 L3	—	BN 90LB 4	—	28600	32400	66100	76900	21500	274	
4.3	3730	1.0	321	7.5	305 L3	—	BN 90LB 4	—	22900	26400	40300	48500	14700	264	
4.4	3516	1.0	313	12.0	—	305 R4	BN 90LB 4	—	22700	26200	39900	48100	14600	265	
4.5	3506	2.1	312	12.0	—	306 R4	BN 90LB 4	—	28200	32000	65300	76000	21200	275	
4.5	3448	1.0	307	12.0	—	304 R4	BN 90LB 4	—	22500	26000	39700	47800	14500	255	
4.8	3262	1.1	290	12.0	—	304 R4	BN 90LB 4	—	22100	25600	39100	47000	14200	255	
4.8	3262	1.6	290	12.0	—	305 R4	BN 90LB 4	—	22100	25600	39100	47000	14200	265	
4.8	3251	2.4	289	12.0	—	306 R4	BN 90LB 4	—	27500	31200	63800	74300	20700	275	
4.8	3342	1.7	288	7.5	306 L3	—	BN 90LB 4	—	27500	31200	63700	74200	20700	274	
5.0	3208	1.4	276	7.5	305 L3	—	BN 90LB 4	—	21800	25200	38500	46300	14000	264	
5.2	3113	1.8	268	7.5	306 L3	—	BN 90LB 4	—	26900	30400	62400	72700	20200	274	
5.2	3008	1.2	267	12.0	—	304 R4	BN 90LB 4	—	21500	24900	38100	45900	13800	255	
5.4	2989	1.2	258	7.5	305 L3	—	BN 90LB 4	—	21300	24600	37700	45300	13600	264	
5.4	2870	1.3	255	12.0	—	305 R4	BN 90LB 4	—	21200	24500	37600	45200	13600	265	
5.6	2796	2.8	249	12.0	—	306 R4	BN 90LB 4	—	26200	29700	61000	71000	19700	275	
5.8	2763	2.8	238	7.5	306 L3	—	BN 90LB 4	—	25800	29200	60200	70100	19400	274	
6.0	2598	1.4	231	12.0	—	305 R4	BN 90LB 4	—	20500	23700	36500	43900	13200	265	
6.0	2590	2.9	230	12.0	—	306 R4	BN 90LB 4	—	25500	28900	59600	69400	19200	275	
6.1	2548	1.4	227	12.0	—	304 R4	BN 90LB 4	—	20400	23500	36300	43600	13100	255	
6.3	2574	2.5	222	7.5	306 L3	—	BN 90LB 4	—	25200	28600	58900	68600	18900	274	
6.3	2557	1.4	220	7.5	304 L3	—	BN 90LB 4	—	20200	23300	36000	43300	13000	254	
6.3	2557	1.9	220	7.5	305 L3	—	BN 90LB 4	—	20200	23300	36000	43300	13000	264	
6.5	2410	1.1	214	12.0	—	303 R4	BN 90LB 4	—	20000	23100	35700	42900	12800	245	
6.5	2410	1.5	214	12.0	—	304 R4	BN 90LB 4	—	20000	23100	35700	42900	12800	255	
6.5	2410	2.2	214	12.0	—	305 R4	BN 90LB 4	—	20000	23100	35700	42900	12800	265	
6.9	2341	1.0	202	7.5	304 L3	—	BN 90LB 4	—	19600	22600	35000	42100	12600	254	
7.3	2208	1.6	190	7.5	305 L3	—	BN 90LB 4	—	19200	22200	34400	41400	12300	264	
7.3	2202	3.0	190	7.5	306 L3	—	BN 90LB 4	—	23900	27100	56200	65500	18000	274	
7.5	2080	1.0	185	12.0	—	303 R4	BN 90LB 4	—	19100	22000	34100	41100	12200	245	
7.5	2080	1.7	185	12.0	—	304 R4	BN 90LB 4	—	19100	22000	34100	41100	12200	255	
7.5	2080	2.0	185	12.0	—	305 R4	BN 90LB 4	—	19100	22000	34100	41100	12200	265	



P₁ = 1.85 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
MC	MZ	HC/PC	HZ/PZ	FZ										
7.8	2060	1.1	178	7.5	303 L3	—	BN 90LB 4	—	18800	21700	33700	40600	12100	244
7.8	2060	1.4	178	7.5	304 L3	—	BN 90LB 4	—	18800	21700	33700	40600	12100	254
7.8	2060	2.1	178	7.5	305 L3	—	BN 90LB 4	—	18800	21700	33700	40600	12100	264
8.4	1911	1.2	165	7.5	304 L3	—	BN 90LB 4	—	18300	21200	33000	39600	11800	254
8.5	1900	1.2	164	7.5	303 L3	—	BN 90LB 4	—	18300	21100	32900	39600	11700	244
8.5	1900	2.3	164	7.5	305 L3	—	BN 90LB 4	—	18300	21100	32900	39600	11700	264
8.8	1787	1.0	159	10.0	—	301 R4	BN 90LB 4	—	5890	5890	16000	18300	3870	237
8.8	1781	1.5	158	12.0	—	303 R4	BN 90LB 4	—	18100	20900	32600	39200	11600	245
8.8	1781	2.0	158	12.0	—	304 R4	BN 90LB 4	—	18100	20900	32600	39200	11600	255
8.8	1781	2.9	158	12.0	—	305 R4	BN 90LB 4	—	18100	20900	32600	39200	11600	265
9.1	1770	1.0	152	7.5	303 L3	—	BN 90LB 4	—	17900	20600	32200	38700	11500	244
9.1	1770	2.0	152	7.5	305 L3	—	BN 90LB 4	—	17900	20600	32200	38700	11500	264
9.3	1735	2.0	150	7.5	304 L3	—	BN 90LB 4	—	17800	20500	32000	38500	11400	254
9.4	1667	1.3	148	12.0	—	303 R4	BN 90LB 4	—	17700	20400	31900	38400	11400	245
9.4	1667	2.1	148	12.0	—	304 R4	BN 90LB 4	—	17700	20400	31900	38400	11400	255
9.4	1667	2.5	148	12.0	—	305 R4	BN 90LB 4	—	17700	20400	31900	38400	11400	265
9.8	1647	1.0	142	7.5	301 L3	—	BN 90LB 4	—	5670	5670	15400	17700	3730	236
9.8	1642	1.6	141	7.5	303 L3	—	BN 90LB 4	—	17400	20100	31500	37900	11200	244
9.8	1642	2.2	141	7.5	304 L3	—	BN 90LB 4	—	17400	20100	31500	37900	11200	254
10.6	1519	1.1	131	7.5	301 L3	—	BN 90LB 4	—	5520	5520	15100	17300	3630	236
10.7	1514	2.3	130	7.5	304 L3	—	BN 90LB 4	—	17000	19600	30700	37000	10900	254
10.7	1458	1.2	130	10.0	—	301 R4	BN 90LB 4	—	5510	5510	15000	17300	3620	237
10.8	1454	1.8	129	12.0	—	303 R4	BN 90LB 4	—	16900	19500	30600	36900	10800	245
10.8	1454	2.4	129	12.0	—	304 R4	BN 90LB 4	—	16900	19500	30600	36900	10800	255
11.2	1445	1.2	124	7.5	303 L3	—	BN 90LB 4	—	16700	19300	30300	36500	10700	244
11.2	1445	2.5	124	7.5	305 L3	—	BN 90LB 4	—	16700	19300	30300	36500	10700	264
11.5	1407	1.6	121	14.0	—	304 R3	BN 90LB 4	—	16600	19100	30100	36200	10600	255
12.0	1344	1.0	116	7.5	301 L3	—	BN 90LB 4	—	5300	5300	14500	16700	3490	236
12.2	1327	1.3	114	14.0	—	303 R3	BN 90LB 4	—	16200	18700	29500	35500	10400	245
12.2	1327	2.6	114	14.0	—	305 R3	BN 90LB 4	—	16200	18700	29500	35500	10400	265
12.3	1308	1.4	113	7.5	303 L3	—	BN 90LB 4	—	16200	18600	29400	35400	10400	244
12.3	1308	2.7	113	7.5	305 L3	—	BN 90LB 4	—	16200	18600	29400	35400	10400	264
12.6	1282	2.6	111	7.5	304 L3	—	BN 90LB 4	—	16000	18500	29200	35200	10300	254
12.7	1232	2.8	109	12.0	—	304 R4	BN 90LB 4	—	16000	18500	29200	35100	10300	255
13.1	1235	1.1	106	12.0	—	301 R3	BN 90LB 4	—	5160	5160	14200	16300	3390	237
13.1	1191	1.4	106	10.0	—	301 R4	BN 90LB 4	—	5150	5150	14100	16200	3380	237
13.3	1217	1.3	105	7.5	301 L3	—	BN 90LB 4	—	5130	5130	14100	16200	3370	236
13.3	1213	2.0	105	7.5	303 L3	—	BN 90LB 4	—	15800	18200	28800	34600	10100	244
13.3	1213	2.8	105	7.5	304 L3	—	BN 90LB 4	—	15800	18200	28800	34600	10100	254
14.3	1126	2.0	97.0	14.0	—	304 R3	BN 90LB 4	—	15400	17700	28100	33800	9860	255
15.2	1062	1.7	91.5	14.0	—	303 R3	BN 90LB 4	—	15100	17400	27600	33200	9670	245
15.4	1047	1.9	90.2	7.5	303 L3	—	BN 90LB 4	—	15000	17300	27500	33100	9620	244
16.2	993	1.6	85.6	7.5	301 L3	—	BN 90LB 4	—	4790	4790	13300	15200	3150	236
16.3	988	1.3	85.2	12.0	—	301 R3	BN 90LB 4	—	4790	4790	13200	15200	3150	237
17.7	914	2.3	78.7	14.0	—	303 R3	BN 90LB 4	—	14300	16500	26400	31800	9190	245
17.7	913	0.90	78.7	12.0	—	300 R3	BN 90LB 4	—	4660	4660	12900	14900	3060	229
17.7	913	1.6	78.7	12.0	—	301 R3	BN 90LB 4	—	4660	4660	12900	14900	3060	237
17.9	899	0.9	77.5	7.5	300 L3	—	BN 90LB 4	—	4640	4640	12900	14800	3050	228
17.9	899	1.7	77.5	7.5	301 L3	—	BN 90LB 4	—	4640	4640	12900	14800	3050	236
18.0	896	2.6	77.2	7.5	303 L3	—	BN 90LB 4	—	14200	16400	26300	31600	9140	244
19.0	851	2.1	73.3	14.0	—	303 R3	BN 90LB 4	—	14000	16200	25900	31100	8980	245
19.2	839	2.4	72.3	7.5	303 L3	—	BN 90LB 4	—	13900	16100	25700	31000	8940	244
19.9	811	1.6	69.9	7.5	301 L3	—	BN 90LB 4	—	4480	4480	12500	14300	2950	236
20.4	792	1.6	68.2	12.0	—	301 R3	BN 90LB 4	—	4440	4440	12400	14200	2920	237
21.5	775	1.5	64.8	7.5	301 L2	—	BN 90LB 4	—	4370	4370	12200	14000	2870	236
22.0	734	1.1	63.2	7.5	300 L3	—	BN 90LB 4	—	4330	4330	12100	13900	2850	228
22.0	734	2.1	63.2	7.5	301 L3	—	BN 90LB 4	—	4330	4330	12100	13900	2850	236
22.0	732	2.9	63.1	14.0	—	303 R3	BN 90LB 4	—	13300	15400	24700	29700	8540	245
22.1	730	1.1	62.9	12.0	—	300 R3	BN 90LB 4	—	4330	4330	12100	13900	2840	229
22.1	730	2.1	62.9	12.0	—	301 R3	BN 90LB 4	—	4330	4330	12100	13900	2840	237
24.9	667	2.7	55.8	9.0	303 L2	—	BN 90LB 4	—	12800	14800	23800	28700	8200	244

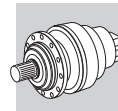


$P_1 = 1.85 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
25.7	629	2.8	54.2	14.0	—	303 R3	BN 90LB 4	—	12700	14600	23600	28400	8120	245
26.8	621	1.0	51.9	7.5	300 L2	—	BN 90LB 4	—	4060	4060	11400	13100	2670	228
26.8	621	2.1	51.9	7.5	301 L2	—	BN 90LB 4	—	4060	4060	11400	13100	2670	236
26.9	599	1.3	51.6	7.5	300 L3	—	BN 90LB 4	—	4050	4050	11400	13100	2660	228
26.9	599	2.5	51.6	7.5	301 L3	—	BN 90LB 4	—	4050	4050	11400	13100	2660	236
27.6	585	1.4	50.4	12.0	—	300 R3	BN 90LB 4	—	4020	4020	11300	13000	2640	229
27.6	585	2.5	50.4	12.0	—	301 R3	BN 90LB 4	—	4020	4020	11300	13000	2640	237
33	497	1.3	41.5	7.5	300 L2	—	BN 90LB 4	—	3770	3770	10700	12300	2480	228
33	497	2.6	41.5	7.5	301 L2	—	BN 90LB 4	—	3770	3770	10700	12300	2480	236
34	478	1.4	41.2	12.0	—	300 R3	BN 90LB 4	—	3760	3760	10600	12200	2470	229
34	478	2.7	41.2	12.0	—	301 R3	BN 90LB 4	—	3760	3760	10600	12200	2470	237
36	459	1.7	38.4	7.5	300 L2	—	BN 90LB 4	—	3670	3670	10400	12000	2410	228
36	459	2.9	38.4	7.5	301 L2	—	BN 90LB 4	—	3670	3670	10400	12000	2410	236
37	432	1.8	37.3	12.0	—	300 R3	BN 90LB 4	—	3630	3630	10300	11900	2390	229
42	398	1.6	33.3	7.5	300 L2	—	BN 90LB 4	—	3500	3500	9990	11500	2300	228
45	367	2.1	30.7	7.5	300 L2	—	BN 90LB 4	—	3410	3410	9750	11200	2240	228
46	353	2.2	30.4	12.0	—	300 R3	BN 90LB 4	—	3400	3400	9730	11200	2230	229
56	288	2.3	24.8	12.0	—	300 R3	BN 90LB 4	—	3170	3170	9150	10500	2090	229
56	296	2.9	24.8	18.0	—	303 R2	BN 90LB 4	—	9750	11300	18700	22500	6250	245
57	294	2.5	24.6	7.5	300 L2	—	BN 90LB 4	—	3160	3160	9130	10500	2080	228
69	240	2.6	20.1	7.5	300 L2	—	BN 90LB 4	—	2960	2960	8590	9870	1940	228
75	221	1.7	18.5	12.0	—	300 R2	BN 90LB 4	—	2870	2870	8370	9620	1890	229
75	221	3.0	18.5	12.0	—	301 R2	BN 90LB 4	—	2870	2870	8370	9620	1890	237
76	217	3.0	18.2	7.5	300 L2	—	BN 90LB 4	—	2860	2860	8330	9580	1880	228
94	177	2.9	14.8	12.0	—	300 R2	BN 90LB 4	—	2670	2670	7830	9000	1750	229
154	111	2.9	9.00	7.5	300 L1	—	BN 90LB 4	—	2260	2260	6750	7750	1490	228

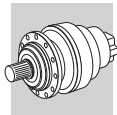
$P_1 = 2.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.64	28840	1.7	2187	11.0	313 L4	—	BN 100LA 4	—	—	—	192000	231000	80000	324
0.67	27646	1.2	2096	11.0	311 L4	—	BN 100LA 4	—	—	—	157000	195000	65000	314
0.70	26664	1.0	2022	11.0	310 L4	—	BN 100LA 4	—	—	—	133000	166000	65000	304
0.78	23960	2.3	1817	11.0	313 L4	—	BN 100LA 4	—	—	—	192000	231000	80000	324
0.79	23664	1.1	1794	11.0	310 L4	—	BN 100LA 4	—	—	—	133000	166000	65000	304
0.80	23294	1.8	1766	11.0	311 L4	—	BN 100LA 4	—	—	—	157000	195000	65000	314
0.84	22152	1.5	1680	11.0	311 L4	—	BN 100LA 4	—	—	—	157000	195000	65000	314
0.84	22043	1.2	1672	11.0	310 L4	—	BN 100LA 4	—	—	—	133000	166000	65000	304
0.94	19807	2.8	1502	11.0	313 L4	—	BN 100LA 4	—	—	—	192000	231000	80000	324
0.98	18961	1.4	1438	11.0	310 L4	—	BN 100LA 4	—	—	—	133000	166000	65000	304
1.0	18665	2.3	1415	11.0	311 L4	—	BN 100LA 4	—	—	—	157000	195000	65000	314
1.0	18382	2.9	1394	11.0	313 L4	—	BN 100LA 4	—	—	—	192000	229000	79900	324
1.0	18203	0.9	1380	7.5	309 L4	—	BN 100LA 4	—	—	—	110000	143800	35800	294
1.1	16956	1.0	1286	7.5	309 L4	—	BN 100LA 4	—	—	—	109200	140800	35000	294
1.1	16602	1.7	1259	11.0	310 L4	—	BN 100LA 4	—	—	—	128500	161600	62700	304
1.1	16225	2.6	1230	11.0	311 L4	—	BN 100LA 4	—	—	—	150800	187900	62300	314
1.2	15354	1.9	1164	11.0	310 L4	—	BN 100LA 4	—	—	—	125500	157900	61100	304
1.2	15157	1.1	1149	7.5	309 L4	—	BN 100LA 4	—	—	—	105500	136100	33700	294
1.3	13957	2.9	1058	11.0	311 L4	—	BN 100LA 4	—	—	—	144200	179600	59200	314
1.4	13459	2.1	1021	11.0	310 L4	—	BN 100LA 4	—	—	—	120700	151800	58500	304
1.4	13175	1.0	999	7.5	307 L4	—	BN 100LA 4	M 3LA 4	46300	58000	99600	130500	40200	284
1.4	13175	1.4	999	7.5	309 L4	—	BN 100LA 4	—	—	—	101200	130500	32200	294
1.5	12381	2.2	939	11.0	310 L4	—	BN 100LA 4	—	—	—	117700	148000	56900	304
1.6	11951	1.2	906	7.5	307 L4	—	BN 100LA 4	M 3LA 4	44800	56200	96700	126800	38900	284
1.6	11951	1.5	906	7.5	309 L4	—	BN 100LA 4	—	—	—	98300	126800	31100	294
1.6	11843	2.0	898	15.0	—	310 R4	BN 100LA 4	—	—	—	116100	146000	56100	304
1.7	10784	2.5	818	11.0	310 L4	—	BN 100LA 4	—	—	—	112900	142000	54300	304
1.8	10557	1.2	801	7.5	307 L4	—	BN 100LA 4	M 3LA 4	43000	53900	93200	122100	37400	284
1.8	10557	1.7	801	7.5	309 L4	—	BN 100LA 4	—	—	—	94700	122100	29900	294
1.9	9979	2.6	757	15.0	—	310 R4	BN 100LA 4	—	—	—	110300	138700	52900	304



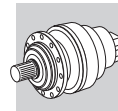
P₁ = 2.2 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
											HC/PC	HZ/PZ		
1.9	9571	2.8	726	11.0	310 L4	—	BN 100LA 4	—	—	—	108900	137000	52200	304
2.0	9524	1.5	722	7.5	307 L4	—	BN 100LA 4	M 3LA 4	41500	52100	90400	118400	36100	284
2.0	9524	2.2	722	7.5	309 L4	—	BN 100LA 4	—	—	—	91800	118400	28900	294
2.0	9226	0.9	700	6.0	306 L4	—	BN 100LA 4	M 3LA 4	37000	41900	83200	96900	27800	274
2.0	9096	1.1	690	15.0	—	307 R4	BN 100LA 4	M 3LA 4	40900	51300	89100	116800	35500	285
2.0	9096	1.6	690	15.0	—	309 R4	BN 100LA 4	—	—	—	90600	116800	28400	295
2.2	8618	1.4	654	7.5	307 L4	—	BN 100LA 4	M 3LA 4	40200	50400	87700	114900	34900	284
2.2	8618	2.1	654	7.5	309 L4	—	BN 100LA 4	—	—	—	89100	114900	27900	294
2.2	8422	2.6	639	15.0	—	310 R4	BN 100LA 4	—	—	—	104800	131800	50000	304
2.2	8381	1.0	636	6.0	306 L4	—	BN 100LA 4	M 3LA 4	35800	40600	80800	94100	26900	274
2.4	7786	1.1	590	12.0	—	306 R4	BN 100LA 4	M 3LA 4	34900	39600	79100	92100	26200	275
2.4	7776	2.8	590	15.0	—	310 R4	BN 100LA 4	—	—	—	102400	128700	48700	304
2.4	7772	1.1	589	6.0	306 L4	—	BN 100LA 4	M 3LA 4	34900	39600	79000	92000	26200	274
2.4	7664	1.6	581	15.0	—	307 R4	BN 100LA 4	M 3LA 4	38600	48500	84700	110900	33600	285
2.4	7664	2.1	581	15.0	—	309 R4	BN 100LA 4	—	—	—	86000	110900	26900	295
2.4	7631	1.8	579	7.5	307 L4	—	BN 100LA 4	M 3LA 4	38600	48400	84500	110800	33500	284
2.4	7631	2.7	579	7.5	309 L4	—	BN 100LA 4	—	—	—	85900	110800	26800	294
2.6	7252	1.0	550	12.0	—	306 R4	BN 100LA 4	M 3LA 4	34100	38700	77400	90100	25600	275
2.8	6715	1.3	509	6.0	306 L4	—	BN 100LA 4	M 3LA 4	33300	37700	75600	88100	25000	274
2.8	6715	2.0	509	7.5	307 L4	—	BN 100LA 4	M 3LA 4	37000	46400	81400	106600	32100	284
2.8	6715	2.1	509	7.5	309 L4	—	BN 100LA 4	—	—	—	82700	106600	25700	294
2.9	6468	1.5	490	15.0	—	307 R4	BN 100LA 4	M 3LA 4	36500	45800	80500	105400	31700	285
2.9	6468	2.2	490	15.0	—	309 R4	BN 100LA 4	—	—	—	81700	105400	25400	295
2.9	6436	1.3	488	12.0	—	306 R4	BN 100LA 4	M 3LA 4	32800	37100	74700	87000	24600	275
3.0	6130	1.9	465	7.5	307 L4	—	BN 100LA 4	M 3LA 4	35800	45000	79200	103700	31200	284
3.0	6130	2.9	465	7.5	309 L4	—	BN 100LA 4	—	—	—	80400	103700	24900	294
3.1	6025	2.3	457	15.0	—	309 R4	BN 100LA 4	—	—	—	80000	103200	24800	295
3.1	5995	1.2	455	12.0	—	306 R4	BN 100LA 4	M 3LA 4	32000	36300	73100	85100	24100	275
3.1	5972	2.3	453	15.0	—	307 R4	BN 100LA 4	M 3LA 4	35500	44600	78600	102900	30900	285
3.2	5877	0.9	446	6.0	305 L4	—	BN 100LA 4	M 3LA 4	25500	29500	44400	53400	16400	264
3.2	5858	1.6	444	6.0	306 L4	—	BN 100LA 4	M 3LA 4	31800	36000	72600	84500	23900	274
3.4	5536	1.5	420	12.0	—	306 R4	BN 100LA 4	M 3LA 4	31200	35300	71400	83100	23400	275
3.4	5450	2.1	413	15.0	—	307 R4	BN 100LA 4	M 3LA 4	34500	43200	76400	100100	30000	285
3.5	5348	2.1	406	7.5	307 L4	—	BN 100LA 4	M 3LA 4	34300	43000	76000	99600	29800	284
3.5	5510	1.0	405	7.5	306 L3	—	BN 100LA 4	M 3LA 4	30800	34900	70600	82200	23100	274
3.6	5155	1.3	391	6.0	306 L4	—	BN 100LA 4	M 3LA 4	30400	34500	69900	81400	22900	274
3.6	5129	1.3	389	12.0	—	306 R4	BN 100LA 4	M 3LA 4	30400	34400	69800	81200	22800	275
3.8	4937	2.9	374	15.0	—	309 R4	BN 100LA 4	—	—	—	75400	97200	23200	295
3.9	4799	1.0	364	12.0	—	305 R4	BN 100LA 4	M 3LA 4	23900	27600	41800	50300	15300	265
3.9	4785	2.6	363	15.0	—	307 R4	BN 100LA 4	M 3LA 4	33000	41400	73500	96300	28700	285
4.0	4603	2.9	349	7.5	307 L4	—	BN 100LA 4	M 3LA 4	32600	40900	72700	95200	28300	284
4.2	4577	2.0	336	11.0	307 L3	—	BN 100LA 4	M 3LA 4	32200	40400	71900	94200	28000	284
4.2	4577	2.9	336	11.0	309 L3	—	BN 100LA 4	—	—	—	73000	94200	22400	294
4.2	4426	1.0	336	12.0	—	305 R4	BN 100LA 4	M 3LA 4	23200	26800	40800	49100	14900	265
4.3	4367	2.5	331	15.0	—	307 R4	BN 100LA 4	M 3LA 4	32000	40200	71500	93700	27800	285
4.3	4415	1.3	325	7.5	306 L3	—	BN 100LA 4	M 3LA 4	28600	32400	66100	76900	21500	274
4.5	4110	1.8	312	12.0	—	306 R4	BN 100LA 4	M 3LA 4	28200	32000	65300	76000	21200	275
4.9	3824	1.0	290	12.0	—	304 R4	BN 100LA 4	M 3LA 4	22100	25600	39100	47000	14200	255
4.9	3824	1.4	290	12.0	—	305 R4	BN 100LA 4	M 3LA 4	22100	25600	39100	47000	14200	265
4.9	3811	2.1	289	12.0	—	306 R4	BN 100LA 4	M 3LA 4	27500	31200	63800	74300	20700	275
4.9	3918	1.4	288	7.5	306 L3	—	BN 100LA 4	M 3LA 4	27500	31200	63700	74200	20700	274
5.0	3751	2.9	284	15.0	—	307 R4	BN 100LA 4	M 3LA 4	30400	38200	68300	89500	26500	285
5.0	3857	2.8	284	11.0	307 L3	—	BN 100LA 4	M 3LA 4	30400	38100	68300	89400	26400	284
5.1	3761	1.2	276	7.5	305 L3	—	BN 100LA 4	M 3LA 4	21800	25200	38500	46300	14000	264
5.3	3650	1.5	268	7.5	306 L3	—	BN 100LA 4	M 3LA 4	26900	30400	62400	72700	20200	274
5.3	3527	1.0	267	12.0	—	304 R4	BN 100LA 4	M 3LA 4	21500	24900	38100	45900	13800	255
5.5	3504	1.0	258	7.5	305 L3	—	BN 100LA 4	M 3LA 4	21300	24600	37700	45300	13600	264
5.5	3365	1.1	255	12.0	—	305 R4	BN 100LA 4	M 3LA 4	21200	24500	37600	45200	13600	265
5.7	3278	2.4	249	12.0	—	306 R4	BN 100LA 4	M 3LA 4	26200	29700	61000	71000	19700	275
5.9	3255	2.7	239	11.0	307 L3	—	BN 100LA 4	M 3LA 4	28700	36000	64900	85000	25000	284
5.9	3239	2.4	238	7.5	306 L3	—	BN 100LA 4	M 3LA 4	25800	29200	60200	70100	19400	274



P₁ = 2.2 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
									MC	MZ	HC/PC	HZ/PZ	FZ	
6.1	3046	1.2	231	12.0	—	305 R4	BN 100LA 4	M 3LA 4	20500	23700	36500	43900	13200	265
6.1	3037	2.4	230	12.0	—	306 R4	BN 100LA 4	M 3LA 4	25500	28900	59600	69400	19200	275
6.2	2987	1.2	227	12.0	—	304 R4	BN 100LA 4	M 3LA 4	20400	23500	36300	43600	13100	255
6.4	3017	2.2	222	7.5	306 L3	—	BN 100LA 4	M 3LA 4	25200	28600	58900	68600	18900	274
6.4	2997	1.2	220	7.5	304 L3	—	BN 100LA 4	M 3LA 4	20200	23300	36000	43300	13000	254
6.4	2997	1.6	220	7.5	305 L3	—	BN 100LA 4	M 3LA 4	20200	23300	36000	43300	13000	264
6.6	2826	0.9	214	12.0	—	303 R4	BN 100LA 4	M 3LA 4	20000	23100	35700	42900	12800	245
6.6	2826	1.3	214	12.0	—	304 R4	BN 100LA 4	M 3LA 4	20000	23100	35700	42900	12800	255
6.6	2826	1.9	214	12.0	—	305 R4	BN 100LA 4	M 3LA 4	20000	23100	35700	42900	12800	265
6.9	2786	2.8	205	7.5	306 L3	—	BN 100LA 4	M 3LA 4	24500	27800	57600	67000	18400	274
7.4	2589	1.4	190	7.5	305 L3	—	BN 100LA 4	M 3LA 4	19200	22200	34400	41400	12300	264
7.4	2581	2.5	190	7.5	306 L3	—	BN 100LA 4	M 3LA 4	23900	27100	56200	65500	18000	274
7.6	2438	1.4	185	12.0	—	304 R4	BN 100LA 4	M 3LA 4	19100	22000	34100	41100	12200	255
7.6	2438	1.7	185	12.0	—	305 R4	BN 100LA 4	M 3LA 4	19100	22000	34100	41100	12200	265
7.9	2415	0.9	178	7.5	303 L3	—	BN 100LA 4	M 3LA 4	18800	21700	33700	40600	12100	244
7.9	2415	1.2	178	7.5	304 L3	—	BN 100LA 4	M 3LA 4	18800	21700	33700	40600	12100	254
7.9	2415	1.8	178	7.5	305 L3	—	BN 100LA 4	M 3LA 4	18800	21700	33700	40600	12100	264
8.6	2240	1.0	165	7.5	304 L3	—	BN 100LA 4	M 3LA 4	18300	21200	33000	39600	11800	254
8.6	2227	1.0	164	7.5	303 L3	—	BN 100LA 4	M 3LA 4	18300	21100	32900	39600	11700	244
8.6	2227	2.0	164	7.5	305 L3	—	BN 100LA 4	M 3LA 4	18300	21100	32900	39600	11700	264
8.9	2088	1.2	158	12.0	—	303 R4	BN 100LA 4	M 3LA 4	18100	20900	32600	39200	11600	245
8.9	2088	1.7	158	12.0	—	304 R4	BN 100LA 4	M 3LA 4	18100	20900	32600	39200	11600	255
8.9	2088	2.5	158	12.0	—	305 R4	BN 100LA 4	M 3LA 4	18100	20900	32600	39200	11600	265
9.2	2075	1.7	152	7.5	305 L3	—	BN 100LA 4	M 3LA 4	17900	20600	32200	38700	11500	264
9.4	2034	1.7	150	7.5	304 L3	—	BN 100LA 4	M 3LA 4	17800	20500	32000	38500	11400	254
9.5	1954	1.1	148	12.0	—	303 R4	BN 100LA 4	M 3LA 4	17700	20400	31900	38400	11400	245
9.5	1954	1.8	148	12.0	—	304 R4	BN 100LA 4	M 3LA 4	17700	20400	31900	38400	11400	255
9.5	1954	2.2	148	12.0	—	305 R4	BN 100LA 4	M 3LA 4	17700	20400	31900	38400	11400	265
9.8	1961	2.8	144	14.0	—	306 R3	BN 100LA 4	M 3LA 4	21800	24700	51800	60300	16400	275
10.0	1924	1.4	141	7.5	303 L3	—	BN 100LA 4	M 3LA 4	17400	20100	31500	37900	11200	244
10.0	1924	1.8	141	7.5	304 L3	—	BN 100LA 4	M 3LA 4	17400	20100	31500	37900	11200	254
10.0	1924	2.7	141	7.5	305 L3	—	BN 100LA 4	M 3LA 4	17400	20100	31500	37900	11200	264
10.8	1780	0.9	131	7.5	301 L3	—	BN 100LA 4	M 3LA 4	5520	5520	15100	17300	3630	236
10.8	1775	2.0	130	7.5	304 L3	—	BN 100LA 4	M 3LA 4	17000	19600	30700	37000	10900	254
10.9	1710	1.0	130	10.0	—	301 R4	BN 100LA 4	M 3LA 4	5510	5510	15000	17300	3620	237
10.9	1705	1.5	129	12.0	—	303 R4	BN 100LA 4	M 3LA 4	16900	19500	30600	36900	10800	245
10.9	1705	2.1	129	12.0	—	304 R4	BN 100LA 4	M 3LA 4	16900	19500	30600	36900	10800	255
10.9	1705	3.0	129	12.0	—	305 R4	BN 100LA 4	M 3LA 4	16900	19500	30600	36900	10800	265
11.3	1693	1.1	124	7.5	303 L3	—	BN 100LA 4	M 3LA 4	16700	19300	30300	36500	10700	244
11.3	1693	2.1	124	7.5	305 L3	—	BN 100LA 4	M 3LA 4	16700	19300	30300	36500	10700	264
11.6	1649	1.4	121	14.0	—	304 R3	BN 100LA 4	M 3LA 4	16600	19100	30100	36200	10600	255
12.3	1556	1.2	114	14.0	—	303 R3	BN 100LA 4	M 3LA 4	16200	18700	29500	35500	10400	245
12.3	1556	2.2	114	14.0	—	305 R3	BN 100LA 4	M 3LA 4	16200	18700	29500	35500	10400	265
12.5	1533	1.2	113	7.5	303 L3	—	BN 100LA 4	M 3LA 4	16200	18600	29400	35400	10400	244
12.5	1533	2.3	113	7.5	305 L3	—	BN 100LA 4	M 3LA 4	16200	18600	29400	35400	10400	264
12.8	1503	2.3	111	7.5	304 L3	—	BN 100LA 4	M 3LA 4	16000	18500	29200	35200	10300	254
12.9	1444	2.3	109	12.0	—	304 R4	BN 100LA 4	M 3LA 4	16000	18500	29200	35100	10300	255
13.2	1448	0.90	106	12.0	—	301 R3	BN 100LA 4	M 3LA 4	5160	5160	14200	16300	3390	237
13.3	1396	1.2	106	10.0	—	301 R4	BN 100LA 4	M 3LA 4	5150	5150	14100	16200	3380	237
13.4	1426	1.1	105	7.5	301 L3	—	BN 100LA 4	M 3LA 4	5130	5130	14100	16200	3370	236
13.5	1422	1.7	105	7.5	303 L3	—	BN 100LA 4	M 3LA 4	15800	18200	28800	34600	10100	244
13.5	1422	2.4	105	7.5	304 L3	—	BN 100LA 4	M 3LA 4	15800	18200	28800	34600	10100	254
14.5	1320	1.7	97.0	14.0	—	304 R3	BN 100LA 4	M 3LA 4	15400	17700	28100	33800	9860	255
15.4	1245	1.4	91.5	14.0	—	303 R3	BN 100LA 4	M 3LA 4	15100	17400	27600	33200	9670	245
15.4	1245	2.9	91.5	14.0	—	305 R3	BN 100LA 4	M 3LA 4	15100	17400	27600	33200	9670	265
15.6	1227	1.7	90.2	7.5	303 L3	—	BN 100LA 4	M 3LA 4	15000	17300	27500	33100	9620	244
15.6	1227	2.7	90.2	7.5	304 L3	—	BN 100LA 4	M 3LA 4	15000	17300	27500	33100	9620	254
15.8	1179	2.8	89.4	12.0	—	304 R4	BN 100LA 4	M 3LA 4	15000	17300	27400	33000	9590	255
16.5	1164	1.4	85.6	7.5	301 L3	—	BN 100LA 4	M 3LA 4	4790	4790	13300	15200	3150	236
16.6	1158	1.1	85.2	12.0	—	301 R3	BN 100LA 4	M 3LA 4	4790	4790	13200	15200	3150	237
17.9	1071	2.0	78.7	14.0	—	303 R3	BN 100LA 4	M 3LA 4	14300	16500	26400	31800	9190	245

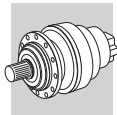


$P_1 = 2.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
17.9	1071	2.6	78.7	14.0	—	304 R3	BN 100LA 4	M 3LA 4	14300	16500	26400	31800	9190	255	
17.9	1070	1.4	78.7	12.0	—	301 R3	BN 100LA 4	M 3LA 4	4660	4660	12900	14900	3060	237	
18.2	1054	1.5	77.5	7.5	301 L3	—	BN 100LA 4	M 3LA 4	4640	4640	12900	14800	3050	236	
18.3	1051	2.2	77.2	7.5	303 L3	—	BN 100LA 4	M 3LA 4	14200	16400	26300	31600	9140	244	
19.2	998	1.8	73.3	14.0	—	303 R3	BN 100LA 4	M 3LA 4	14000	16200	25900	31100	8980	245	
19.5	983	2.1	72.3	7.5	303 L3	—	BN 100LA 4	M 3LA 4	13900	16100	25700	31000	8940	244	
20.2	951	1.4	69.9	7.5	301 L3	—	BN 100LA 4	M 3LA 4	4480	4480	12500	14300	2950	236	
20.7	928	1.4	68.2	12.0	—	301 R3	BN 100LA 4	M 3LA 4	4440	4440	12400	14200	2920	237	
21.8	909	1.3	64.8	7.5	301 L2	—	BN 100LA 4	M 3LA 4	4370	4370	12200	14000	2870	236	
22.3	860	0.9	63.2	7.5	300 L3	—	BN 100LA 4	M 3LA 4	4330	4330	12100	13900	2850	244	
22.3	860	1.8	63.2	7.5	301 L3	—	BN 100LA 4	M 3LA 4	4330	4330	12100	13900	2850	236	
22.4	858	2.5	63.1	14.0	—	303 R3	BN 100LA 4	M 3LA 4	13300	15400	24700	29700	8540	245	
22.4	858	2.7	63.1	7.5	303 L3	—	BN 100LA 4	M 3LA 4	13300	15400	24700	29700	8540	244	
22.4	856	0.9	62.9	12.0	—	300 R3	BN 100LA 4	M 3LA 4	4330	4330	12100	13900	2840	229	
22.4	856	1.8	62.9	12.0	—	301 R3	BN 100LA 4	M 3LA 4	4330	4330	12100	13900	2840	237	
23.8	829	2.8	59.1	9.0	304 L2	—	BN 100LA 4	M 3LA 4	13000	15000	24200	29200	8360	254	
25.3	782	2.3	55.8	9.0	303 L2	—	BN 100LA 4	M 3LA 4	12800	14800	23800	28700	8200	244	
26.0	737	2.4	54.2	14.0	—	303 R3	BN 100LA 4	M 3LA 4	12700	14600	23600	28400	8120	245	
26.4	727	2.6	53.4	7.5	303 L3	—	BN 100LA 4	M 3LA 4	12600	14500	23500	28300	8080	244	
27.2	728	1.8	51.9	7.5	301 L2	—	BN 100LA 4	M 3LA 4	4060	4060	11400	13100	2670	236	
27.3	702	1.1	51.6	7.5	300 L3	—	BN 100LA 4	M 3LA 4	4050	4050	11400	13100	2660	244	
27.3	702	2.1	51.6	7.5	301 L3	—	BN 100LA 4	M 3LA 4	4050	4050	11400	13100	2660	236	
28.0	686	1.2	50.4	12.0	—	300 R3	BN 100LA 4	M 3LA 4	4020	4020	11300	13000	2640	229	
28.0	686	2.1	50.4	12.0	—	301 R3	BN 100LA 4	M 3LA 4	4020	4020	11300	13000	2640	237	
32	626	2.8	44.6	9.0	303 L2	—	BN 100LA 4	M 3LA 4	11900	13700	22300	26800	7610	244	
34	582	1.1	41.5	7.5	300 L2	—	BN 100LA 4	M 3LA 4	3770	3770	10700	12300	2480	228	
34	582	2.2	41.5	7.5	301 L2	—	BN 100LA 4	M 3LA 4	3770	3770	10700	12300	2480	236	
34	560	1.2	41.2	12.0	—	300 R3	BN 100LA 4	M 3LA 4	3760	3760	10600	12200	2470	229	
34	560	2.3	41.2	12.0	—	301 R3	BN 100LA 4	M 3LA 4	3760	3760	10600	12200	2470	237	
37	538	1.4	38.4	7.5	300 L2	—	BN 100LA 4	M 3LA 4	3670	3670	10400	12000	2410	228	
37	538	2.4	38.4	7.5	301 L2	—	BN 100LA 4	M 3LA 4	3670	3670	10400	12000	2410	236	
38	507	1.5	37.3	12.0	—	300 R3	BN 100LA 4	M 3LA 4	3630	3630	10300	11900	2390	229	
38	507	2.8	37.3	12.0	—	301 R3	BN 100LA 4	M 3LA 4	3630	3630	10300	11900	2390	237	
42	467	1.4	33.3	7.5	300 L2	—	BN 100LA 4	M 3LA 4	3500	3500	9990	11500	2300	228	
42	467	2.8	33.3	7.5	301 L2	—	BN 100LA 4	M 3LA 4	3500	3500	9990	11500	2300	236	
46	430	1.8	30.7	7.5	300 L2	—	BN 100LA 4	M 3LA 4	3410	3410	9750	11200	2240	228	
46	414	1.8	30.4	12.0	—	300 R3	BN 100LA 4	M 3LA 4	3400	3400	9730	11200	2230	229	
57	338	1.9	24.8	12.0	—	300 R3	BN 100LA 4	M 3LA 4	3170	3170	9150	10500	2090	229	
57	347	2.5	24.8	18.0	—	303 R2	BN 100LA 4	M 3LA 4	9750	11300	18700	22500	6250	245	
57	345	2.1	24.6	7.5	300 L2	—	BN 100LA 4	M 3LA 4	3160	3160	9130	10500	2080	228	
70	282	2.2	20.1	7.5	300 L2	—	BN 100LA 4	M 3LA 4	2960	2960	8590	9870	1940	228	
76	259	1.4	18.5	12.0	—	300 R2	BN 100LA 4	M 3LA 4	2870	2870	8370	9620	1890	229	
76	259	2.6	18.5	12.0	—	301 R2	BN 100LA 4	M 3LA 4	2870	2870	8370	9620	1890	237	
78	255	2.6	18.2	7.5	300 L2	—	BN 100LA 4	M 3LA 4	2860	2860	8330	9580	1880	228	
95	208	3.0	14.8	7.5	300 L2	—	BN 100LA 4	M 3LA 4	2670	2670	7840	9010	1760	228	
96	207	2.5	14.8	12.0	—	300 R2	BN 100LA 4	M 3LA 4	2670	2670	7830	9000	1750	229	
157	130	2.5	9.00	7.5	300 L1	—	BN 100LA 4	M 3LA 4	2260	2260	6750	7750	1490	236	

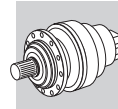
$P_1 = 3 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.64	39328	1.2	2187	11.0	313 L4	—	BN 100LB 4	—	—	—	192000	231000	80000	324	
0.67	37699	0.90	2096	11.0	311 L4	—	BN 100LB 4	—	—	—	157000	195000	65000	314	
0.78	32672	1.7	1817	11.0	313 L4	—	BN 100LB 4	—	—	—	192000	231000	80000	324	
0.78	32463	2.5	1805	18.0	315 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	344	
0.80	31765	1.4	1766	11.0	311 L4	—	BN 100LB 4	—	—	—	157000	195000	65000	314	
0.84	30207	1.1	1680	11.0	311 L4	—	BN 100LB 4	—	—	—	157000	195000	65000	314	
0.94	27009	2.0	1502	11.0	313 L4	—	BN 100LB 4	—	—	—	192000	231000	80000	324	
0.94	26836	3.0	1492	18.0	315 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	344	
0.98	25856	1.0	1438	11.0	310 L4	—	BN 100LB 4	—	—	—	133000	166000	65000	304	
1.0	25452	1.7	1415	11.0	311 L4	—	BN 100LB 4	—	—	—	157000	195000	65000	314	



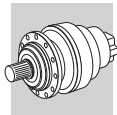
$P_1 = 3 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
1.0	25066	2.1	1394	11.0	313 L4	—	BN 100LB 4	—	—	—	192000	229000	79900	324
1.1	22758	2.4	1266	11.0	313 L4	—	BN 100LB 4	—	—	—	188000	222500	77400	324
1.1	22639	1.2	1259	11.0	310 L4	—	BN 100LB 4	—	—	—	128500	161600	62700	304
1.1	22125	1.9	1230	11.0	311 L4	—	BN 100LB 4	—	—	—	150800	187900	62300	314
1.2	20937	1.4	1164	11.0	310 L4	—	BN 100LB 4	—	—	—	125500	157900	61100	304
1.3	20085	2.6	1117	11.0	313 L4	—	BN 100LB 4	—	—	—	181100	214300	74200	324
1.3	19033	2.1	1058	11.0	311 L4	—	BN 100LB 4	—	—	—	144200	179600	59200	314
1.4	18353	1.5	1021	11.0	310 L4	—	BN 100LB 4	—	—	—	120700	151800	58500	304
1.4	18235	2.9	1014	11.0	313 L4	—	BN 100LB 4	—	—	—	175900	208200	71800	324
1.4	17967	1.0	999	7.5	309 L4	—	BN 100LB 4	—	—	—	101200	130500	32200	294
1.4	17729	2.3	986	11.0	311 L4	—	BN 100LB 4	—	—	—	141100	175800	57800	314
1.5	16883	1.6	939	11.0	310 L4	—	BN 100LB 4	—	—	—	117700	148000	56900	304
1.6	16297	1.1	906	7.5	309 L4	—	BN 100LB 4	—	—	—	98300	126800	31100	294
1.6	16251	2.8	904	11.0	311 L4	—	BN 100LB 4	—	—	—	137500	171300	56200	314
1.6	16150	1.5	898	15.0	—	310 R4	BN 100LB 4	—	—	—	116100	146000	56100	305
1.7	14831	2.9	825	11.0	311 L4	—	BN 100LB 4	—	—	—	133800	166600	54500	314
1.7	14706	1.8	818	11.0	310 L4	—	BN 100LB 4	—	—	—	112900	142000	54300	304
1.8	14396	1.3	801	7.5	309 L4	—	BN 100LB 4	—	—	—	94700	122100	29900	294
1.9	13608	1.9	757	15.0	—	310 R4	BN 100LB 4	—	—	—	110300	138700	52900	305
1.9	13417	2.3	746	22	—	311 R4	BN 100LB 4	—	—	—	129800	161700	52700	315
1.9	13051	2.0	726	11.0	310 L4	—	BN 100LB 4	—	—	—	108900	137000	52200	304
2.0	12987	1.1	722	7.5	307 L4	—	BN 100LB 4	M 3LB 4	41500	52100	90400	118400	36100	284
2.0	12987	1.6	722	7.5	309 L4	—	BN 100LB 4	—	—	—	91800	118400	28900	294
2.0	12403	1.2	690	15.0	—	309 R4	BN 100LB 4	—	—	—	90600	116800	28400	295
2.2	11752	1.0	654	7.5	307 L4	—	BN 100LB 4	M 3LB 4	40200	50400	87700	114900	34900	284
2.2	11752	1.5	654	7.5	309 L4	—	BN 100LB 4	—	—	—	89100	114900	27900	294
2.2	11485	1.9	639	15.0	—	310 R4	BN 100LB 4	—	—	—	104800	131800	50000	305
2.2	11448	2.3	637	11.0	310 L4	—	BN 100LB 4	—	—	—	104700	131700	50000	304
2.4	10604	2.1	590	15.0	—	310 R4	BN 100LB 4	—	—	—	102400	128700	48700	305
2.4	10451	1.2	581	15.0	—	307 R4	BN 100LB 4	M 3LB 4	38600	48500	84700	110900	33600	285
2.4	10451	1.5	581	15.0	—	309 R4	BN 100LB 4	—	—	—	86000	110900	26900	295
2.4	10406	1.3	579	7.5	307 L4	—	BN 100LB 4	M 3LB 4	38600	48400	84500	110800	33500	284
2.4	10406	2.0	579	7.5	309 L4	—	BN 100LB 4	—	—	—	85900	110800	26800	294
2.5	9997	2.7	556	11.0	310 L4	—	BN 100LB 4	—	—	—	100600	126500	47800	304
2.7	9299	2.7	517	15.0	—	310 R4	BN 100LB 4	—	—	—	98400	123800	46600	305
2.8	9157	1.0	509	6.0	306 L4	—	BN 100LB 4	M 3LB 4	33300	37700	75600	88100	25000	274
2.8	9157	1.5	509	7.5	307 L4	—	BN 100LB 4	M 3LB 4	37000	46400	81400	106600	32100	284
2.8	9157	1.6	509	7.5	309 L4	—	BN 100LB 4	—	—	—	82700	106600	25700	294
2.8	9123	2.7	507	11.0	310 L4	—	BN 100LB 4	—	—	—	97900	123000	46300	304
2.9	8820	1.1	490	15.0	—	307 R4	BN 100LB 4	M 3LB 4	36500	45800	80500	105400	31700	285
2.9	8820	1.6	490	15.0	—	309 R4	BN 100LB 4	—	—	—	81700	105400	25400	295
2.9	8777	1.0	488	12.0	—	306 R4	BN 100LB 4	M 3LB 4	32800	37100	74700	87000	24600	275
3.0	8359	1.4	465	7.5	307 L4	—	BN 100LB 4	M 3LB 4	35800	45000	79200	103700	31200	284
3.0	8359	2.1	465	7.5	309 L4	—	BN 100LB 4	—	—	—	80400	103700	24900	294
3.1	8216	1.7	457	15.0	—	309 R4	BN 100LB 4	—	—	—	80000	103200	24800	295
3.1	8167	2.5	454	15.0	—	310 R4	BN 100LB 4	—	—	—	94700	119000	44700	305
3.1	8144	1.7	453	15.0	—	307 R4	BN 100LB 4	M 3LB 4	35500	44600	78600	102900	30900	285
3.1	8104	3.0	451	11.0	310 L4	—	BN 100LB 4	—	—	—	94400	118700	44500	304
3.2	7989	1.2	444	6.0	306 L4	—	BN 100LB 4	M 3LB 4	31800	36000	72600	84500	23900	274
3.4	7550	1.1	420	12.0	—	306 R4	BN 100LB 4	M 3LB 4	31200	35300	71400	83100	23400	275
3.4	7432	1.5	413	15.0	—	307 R4	BN 100LB 4	M 3LB 4	34500	43200	76400	100100	30000	285
3.4	7432	2.3	413	15.0	—	309 R4	BN 100LB 4	—	—	—	77700	100100	24000	295
3.5	7292	1.6	406	7.5	307 L4	—	BN 100LB 4	M 3LB 4	34300	43000	76000	99600	29800	284
3.5	7292	2.4	406	7.5	309 L4	—	BN 100LB 4	—	—	—	77200	99600	23800	294
3.6	7043	2.8	392	11.0	310 L4	—	BN 100LB 4	—	—	—	90500	113900	42500	304
3.6	7030	1.0	391	6.0	306 L4	—	BN 100LB 4	M 3LB 4	30400	34500	69900	81400	22900	274
3.6	6994	1.0	389	12.0	—	306 R4	BN 100LB 4	M 3LB 4	30400	34400	69800	81200	22800	275
3.8	6732	2.1	374	15.0	—	309 R4	BN 100LB 4	—	—	—	75400	97200	23200	295
3.9	6525	1.9	363	15.0	—	307 R4	BN 100LB 4	M 3LB 4	33000	41400	73500	96300	28700	285
4.0	6277	2.1	349	7.5	307 L4	—	BN 100LB 4	M 3LB 4	32600	40900	72700	95200	28300	284
4.2	6242	1.4	336	11.0	307 L3	—	BN 100LB 4	M 3LB 4	32200	40400	71900	94200	28000	284



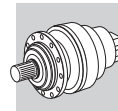
P₁ = 3 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
4.2	6242	2.1	336	11.0	309 L3	—	BN 100LB 4	—	—	—	73000	94200	22400	294
4.3	5955	1.8	331	15.0	—	307 R4	BN 100LB 4	M 3LB 4	32000	40200	71500	93700	27800	285
4.3	5955	2.8	331	15.0	—	309 R4	BN 100LB 4	—	—	—	72700	93700	22300	295
4.3	6020	0.9	325	7.5	306 L3	—	BN 100LB 4	M 3LB 4	28600	32400	66100	76900	21500	274
4.5	5604	1.3	312	12.0	—	306 R4	BN 100LB 4	M 3LB 4	28200	32000	65300	76000	21200	275
4.7	5394	2.4	300	15.0	—	307 R4	BN 100LB 4	M 3LB 4	31000	38900	69400	91000	26900	285
4.9	5215	1.0	290	12.0	—	305 R4	BN 100LB 4	M 3LB 4	22100	25600	39100	47000	14200	265
4.9	5197	1.5	289	12.0	—	306 R4	BN 100LB 4	M 3LB 4	27500	31200	63800	74300	20700	275
4.9	5343	1.0	288	7.5	306 L3	—	BN 100LB 4	M 3LB 4	27500	31200	63700	74200	20700	274
5.0	5115	2.1	284	15.0	—	307 R4	BN 100LB 4	M 3LB 4	30400	38200	68300	89500	26500	285
5.0	5259	2.0	284	11.0	307 L3	—	BN 100LB 4	M 3LB 4	30400	38100	68300	89400	26400	284
5.0	5259	3.0	284	11.0	309 L3	—	BN 100LB 4	—	—	—	69400	89400	21100	294
5.3	4977	1.1	268	7.5	306 L3	—	BN 100LB 4	M 3LB 4	26900	30400	62400	72700	20200	274
5.5	4640	2.8	258	15.0	—	307 R4	BN 100LB 4	M 3LB 4	29500	37000	66400	87000	25600	285
5.7	4470	1.7	249	12.0	—	306 R4	BN 100LB 4	M 3LB 4	26200	29700	61000	71000	19700	275
5.9	4439	2.0	239	11.0	307 L3	—	BN 100LB 4	M 3LB 4	28700	36000	64900	85000	25000	284
5.9	4439	2.9	239	11.0	309 L3	—	BN 100LB 4	—	—	—	65900	85000	20000	294
5.9	4417	1.8	238	7.5	306 L3	—	BN 100LB 4	M 3LB 4	25800	29200	60200	70100	19400	274
6.1	4176	2.5	232	15.0	—	307 R4	BN 100LB 4	M 3LB 4	28400	35700	64300	84200	24700	285
6.1	4141	1.8	230	12.0	—	306 R4	BN 100LB 4	M 3LB 4	25500	28900	59600	69400	19200	275
6.4	4114	1.6	222	7.5	306 L3	—	BN 100LB 4	M 3LB 4	25200	28600	58900	68600	18900	274
6.4	4087	1.2	220	7.5	305 L3	—	BN 100LB 4	M 3LB 4	20200	23300	36000	43300	13000	264
6.6	3853	0.9	214	12.0	—	304 R4	BN 100LB 4	M 3LB 4	20000	23100	35700	42900	12800	255
6.6	3853	1.4	214	12.0	—	305 R4	BN 100LB 4	M 3LB 4	20000	23100	35700	42900	12800	265
6.6	3841	2.3	214	12.0	—	306 R4	BN 100LB 4	M 3LB 4	24900	28200	58300	67900	18700	275
6.9	3799	2.1	205	7.5	306 L3	—	BN 100LB 4	M 3LB 4	24500	27800	57600	67000	18400	274
7.0	3740	2.8	202	11.0	307 L3	—	BN 100LB 4	M 3LB 4	27100	34000	61600	80700	23600	284
7.4	3531	1.0	190	7.5	305 L3	—	BN 100LB 4	M 3LB 4	19200	22200	34400	41400	12300	264
7.4	3520	1.8	190	7.5	306 L3	—	BN 100LB 4	M 3LB 4	23900	27100	56200	65500	18000	274
7.6	3325	1.0	185	12.0	—	304 R4	BN 100LB 4	M 3LB 4	19100	22000	34100	41100	12200	255
7.6	3325	1.3	185	12.0	—	305 R4	BN 100LB 4	M 3LB 4	19100	22000	34100	41100	12200	265
7.8	3254	2.4	181	12.0	—	306 R4	BN 100LB 4	M 3LB 4	23600	26700	55500	64600	17700	275
7.9	3293	1.3	178	7.5	305 L3	—	BN 100LB 4	M 3LB 4	18800	21700	33700	40600	12100	264
8.4	3017	2.5	168	12.0	—	306 R4	BN 100LB 4	M 3LB 4	23000	26000	54200	63100	17300	275
8.6	3037	1.4	164	7.5	305 L3	—	BN 100LB 4	M 3LB 4	18300	21100	32900	39600	11700	264
8.9	2847	0.9	158	12.0	—	303 R4	BN 100LB 4	M 3LB 4	18100	20900	32600	39200	11600	245
8.9	2847	1.3	158	12.0	—	304 R4	BN 100LB 4	M 3LB 4	18100	20900	32600	39200	11600	255
8.9	2847	1.8	158	12.0	—	305 R4	BN 100LB 4	M 3LB 4	18100	20900	32600	39200	11600	265
9.2	2829	1.3	152	7.5	305 L3	—	BN 100LB 4	M 3LB 4	17900	20600	32200	38700	11500	264
9.3	2820	2.6	152	7.5	306 L3	—	BN 100LB 4	M 3LB 4	22200	25200	52600	61300	16700	274
9.4	2774	1.2	150	7.5	304 L3	—	BN 100LB 4	M 3LB 4	17800	20500	32000	38500	11400	254
9.5	2664	1.3	148	12.0	—	304 R4	BN 100LB 4	M 3LB 4	17700	20400	31900	38400	11400	255
9.5	2664	1.6	148	12.0	—	305 R4	BN 100LB 4	M 3LB 4	17700	20400	31900	38400	11400	265
9.8	2674	2.1	144	14.0	—	306 R3	BN 100LB 4	M 3LB 4	21800	24700	51800	60300	16400	275
10.0	2624	1.0	141	7.5	303 L3	—	BN 100LB 4	M 3LB 4	17400	20100	31500	37900	11200	244
10.0	2624	1.3	141	7.5	304 L3	—	BN 100LB 4	M 3LB 4	17400	20100	31500	37900	11200	254
10.0	2624	2.0	141	7.5	305 L3	—	BN 100LB 4	M 3LB 4	17400	20100	31500	37900	11200	264
10.0	2615	3.0	141	7.5	306 L3	—	BN 100LB 4	M 3LB 4	21700	24600	51500	59900	16300	274
10.8	2420	1.5	130	7.5	304 L3	—	BN 100LB 4	M 3LB 4	17000	19600	30700	37000	10900	254
10.9	2324	1.1	129	12.0	—	303 R4	BN 100LB 4	M 3LB 4	16900	19500	30600	36900	10800	245
10.9	2324	1.5	129	12.0	—	304 R4	BN 100LB 4	M 3LB 4	16900	19500	30600	36900	10800	255
10.9	2324	2.2	129	12.0	—	305 R4	BN 100LB 4	M 3LB 4	16900	19500	30600	36900	10800	265
11.3	2309	1.6	124	7.5	305 L3	—	BN 100LB 4	M 3LB 4	16700	19300	30300	36500	10700	264
11.6	2249	1.0	121	14.0	—	304 R3	BN 100LB 4	M 3LB 4	16600	19100	30100	36200	10600	255
11.8	2211	2.9	119	14.0	—	306 R3	BN 100LB 4	M 3LB 4	20500	23200	48900	57000	15400	275
12.3	2122	1.6	114	14.0	—	305 R3	BN 100LB 4	M 3LB 4	16200	18700	29500	35500	10400	265
12.5	2090	1.7	113	7.5	305 L3	—	BN 100LB 4	M 3LB 4	16200	18600	29400	35400	10400	264
12.8	2050	1.7	111	7.5	304 L3	—	BN 100LB 4	M 3LB 4	16000	18500	29200	35200	10300	254
12.9	1969	1.7	109	12.0	—	304 R4	BN 100LB 4	M 3LB 4	16000	18500	29200	35100	10300	255
13.5	1939	1.3	105	7.5	303 L3	—	BN 100LB 4	M 3LB 4	15800	18200	28800	34600	10100	244
13.5	1939	1.8	105	7.5	304 L3	—	BN 100LB 4	M 3LB 4	15800	18200	28800	34600	10100	254



$P_1 = 3 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					Rn ₂ [N]					
					MC	MZ	HC/PC	HZ/PZ	FZ					
13.5	1939	2.5	105	7.5	305 L3	—	BN 100LB 4	M 3LB 4	15800	18200	28800	34600	10100	264
14.5	1799	1.3	97.0	14.0	—	304 R3	BN 100LB 4	M 3LB 4	15400	17700	28100	33800	9860	255
15.4	1698	1.1	91.5	14.0	—	303 R3	BN 100LB 4	M 3LB 4	15100	17400	27600	33200	9670	245
15.4	1698	2.1	91.5	14.0	—	305 R3	BN 100LB 4	M 3LB 4	15100	17400	27600	33200	9670	265
15.6	1673	1.2	90.2	7.5	303 L3	—	BN 100LB 4	M 3LB 4	15000	17300	27500	33100	9620	244
15.6	1673	1.9	90.2	7.5	304 L3	—	BN 100LB 4	M 3LB 4	15000	17300	27500	33100	9620	254
15.6	1673	2.3	90.2	7.5	305 L3	—	BN 100LB 4	M 3LB 4	15000	17300	27500	33100	9620	264
15.8	1607	2.1	89.4	12.0	—	304 R4	BN 100LB 4	M 3LB 4	15000	17300	27400	33000	9590	255
16.5	1588	1.0	85.6	7.5	301 L3	—	BN 100LB 4	M 3LB 4	4790	4790	13300	15200	3150	236
17.9	1460	1.5	78.7	14.0	—	303 R3	BN 100LB 4	M 3LB 4	14300	16500	26400	31800	9190	245
17.9	1460	1.9	78.7	14.0	—	304 R3	BN 100LB 4	M 3LB 4	14300	16500	26400	31800	9190	255
17.9	1460	2.8	78.7	14.0	—	305 R3	BN 100LB 4	M 3LB 4	14300	16500	26400	31800	9190	265
17.9	1459	1.0	78.7	12.0	—	301 R3	BN 100LB 4	M 3LB 4	4660	4660	12900	14900	3060	237
18.2	1437	1.1	77.5	7.5	301 L3	—	BN 100LB 4	M 3LB 4	4640	4640	12900	14800	3050	236
18.3	1433	1.6	77.2	7.5	303 L3	—	BN 100LB 4	M 3LB 4	14200	16400	26300	31600	9140	244
18.3	1433	2.3	77.2	7.5	304 L3	—	BN 100LB 4	M 3LB 4	14200	16400	26300	31600	9140	254
19.2	1360	1.3	73.3	14.0	—	303 R3	BN 100LB 4	M 3LB 4	14000	16200	25900	31100	8980	245
19.2	1360	2.6	73.3	14.0	—	305 R3	BN 100LB 4	M 3LB 4	14000	16200	25900	31100	8980	265
19.5	1341	1.5	72.3	7.5	303 L3	—	BN 100LB 4	M 3LB 4	13900	16100	25700	31000	8940	244
19.5	1341	2.5	72.3	7.5	304 L3	—	BN 100LB 4	M 3LB 4	13900	16100	25700	31000	8940	254
19.5	1341	2.8	72.3	7.5	305 L3	—	BN 100LB 4	M 3LB 4	13900	16100	25700	31000	8940	264
20.2	1296	1.0	69.9	7.5	301 L3	—	BN 100LB 4	M 3LB 4	4480	4480	12500	14300	2950	236
20.7	1266	1.0	68.2	12.0	—	301 R3	BN 100LB 4	M 3LB 4	4440	4440	12400	14200	2920	237
21.8	1239	0.9	64.8	7.5	301 L2	—	BN 100LB 4	M 3LB 4	4370	4370	12200	14000	2870	236
22.3	1173	1.3	63.2	7.5	301 L3	—	BN 100LB 4	M 3LB 4	4330	4330	12100	13900	2850	236
22.4	1170	1.8	63.1	14.0	—	303 R3	BN 100LB 4	M 3LB 4	13300	15400	24700	29700	8540	245
22.4	1170	2.4	63.1	14.0	—	304 R3	BN 100LB 4	M 3LB 4	13300	15400	24700	29700	8540	255
22.4	1170	2.0	63.1	7.5	303 L3	—	BN 100LB 4	M 3LB 4	13300	15400	24700	29700	8540	244
22.4	1170	2.8	63.1	7.5	304 L3	—	BN 100LB 4	M 3LB 4	13300	15400	24700	29700	8540	254
22.4	1167	1.3	62.9	12.0	—	301 R3	BN 100LB 4	M 3LB 4	4330	4330	12100	13900	2840	237
23.8	1131	2.0	59.1	9.0	304 L2	—	BN 100LB 4	M 3LB 4	13000	15000	24200	29200	8360	254
25.3	1067	1.7	55.8	9.0	303 L2	—	BN 100LB 4	M 3LB 4	12800	14800	23800	28700	8200	244
25.3	1067	3.0	55.8	9.0	305 L2	—	BN 100LB 4	M 3LB 4	12800	14800	23800	28700	8200	264
26.0	1005	1.8	54.2	14.0	—	303 R3	BN 100LB 4	M 3LB 4	12700	14600	23600	28400	8120	245
26.4	991	1.9	53.4	7.5	303 L3	—	BN 100LB 4	M 3LB 4	12600	14500	23500	28300	8080	244
27.2	993	1.3	51.9	7.5	301 L2	—	BN 100LB 4	M 3LB 4	4060	4060	11400	13100	2670	236
27.3	958	1.5	51.6	7.5	301 L3	—	BN 100LB 4	M 3LB 4	4050	4050	11400	13100	2660	236
28.0	935	1.6	50.4	12.0	—	301 R3	BN 100LB 4	M 3LB 4	4020	4020	11300	13000	2640	237
28.1	932	2.3	50.3	14.0	—	303 R3	BN 100LB 4	M 3LB 4	12300	14200	23100	27800	7920	245
29.8	905	2.5	47.3	9.0	304 L2	—	BN 100LB 4	M 3LB 4	12100	14000	22700	27300	7760	254
30	865	2.5	46.6	14.0	—	303 R3	BN 100LB 4	M 3LB 4	12000	13900	22600	27200	7720	245
30.3	865	2.6	46.6	14.0	—	304 R3	BN 100LB 4	M 3LB 4	12000	13900	22600	27200	7720	255
32	854	2.1	44.6	9.0	303 L2	—	BN 100LB 4	M 3LB 4	11900	13700	22300	26800	7610	244
33	790	2.3	42.6	14.0	—	303 R3	BN 100LB 4	M 3LB 4	11700	13500	22000	26400	7490	245
34	794	1.6	41.5	7.5	301 L2	—	BN 100LB 4	M 3LB 4	3770	3770	10700	12300	2480	236
34	764	1.7	41.2	12.0	—	301 R3	BN 100LB 4	M 3LB 4	3760	3760	10600	12200	2470	237
37	734	2.8	38.4	9.0	303 L2	—	BN 100LB 4	M 3LB 4	11300	13000	21300	25600	7240	244
37	734	1.1	38.4	7.5	300 L2	—	BN 100LB 4	M 3LB 4	3670	3670	10400	12000	2410	228
37	734	1.8	38.4	7.5	301 L2	—	BN 100LB 4	M 3LB 4	3670	3670	10400	12000	2410	236
38	691	1.1	37.3	12.0	—	300 R3	BN 100LB 4	M 3LB 4	3630	3630	10300	11900	2390	229
38	691	2.0	37.3	12.0	—	301 R3	BN 100LB 4	M 3LB 4	3630	3630	10300	11900	2390	237
38	689	3.0	37.1	14.0	—	303 R3	BN 100LB 4	M 3LB 4	11200	12900	21100	25400	7160	245
46	587	2.3	30.7	7.5	301 L2	—	BN 100LB 4	M 3LB 4	3410	3410	9750	11200	2240	236
46	564	1.3	30.4	12.0	—	300 R3	BN 100LB 4	M 3LB 4	3400	3400	9730	11200	2230	229
46	564	2.4	30.4	12.0	—	301 R3	BN 100LB 4	M 3LB 4	3400	3400	9730	11200	2230	237
57	461	1.4	24.8	12.0	—	300 R3	BN 100LB 4	M 3LB 4	3170	3170	9150	10500	2090	229
57	461	2.7	24.8	12.0	—	301 R3	BN 100LB 4	M 3LB 4	3170	3170	9150	10500	2090	237
57	474	1.8	24.8	18.0	—	303 R2	BN 100LB 4	M 3LB 4	9750	11300	18700	22500	6250	245
57	470	1.6	24.6	7.5	300 L2	—	BN 100LB 4	M 3LB 4	3160	3160	9130	10500	2080	228
57	470	2.8	24.6	7.5	301 L2	—	BN 100LB 4	M 3LB 4	3160	3160	9130	10500	2080	236
70	384	1.6	20.1	7.5	300 L2	—	BN 100LB 4	M 3LB 4	2960	2960	8590	9870	1940	228

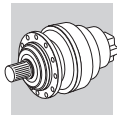


$P_1 = 3 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
70	384	3.0	20.1	7.5	301 L2	—	BN 100LB 4	M 3LB 4	2960	2960	8590	9870	1940	236	
76	353	1.0	18.5	12.0	—	300 R2	BN 100LB 4	M 3LB 4	2870	2870	8370	9620	1890	229	
76	353	1.9	18.5	12.0	—	301 R2	BN 100LB 4	M 3LB 4	2870	2870	8370	9620	1890	237	
78	348	1.9	18.2	7.5	300 L2	—	BN 100LB 4	M 3LB 4	2860	2860	8330	9580	1880	228	
95	284	2.2	14.8	7.5	300 L2	—	BN 100LB 4	M 3LB 4	2670	2670	7840	9010	1760	228	
96	282	1.8	14.8	12.0	—	300 R2	BN 100LB 4	M 3LB 4	2670	2670	7830	9000	1750	229	
116	232	2.6	12.1	7.5	300 L2	—	BN 100LB 4	M 3LB 4	2500	2500	7380	8480	1640	228	
119	226	2.4	11.8	12.0	—	300 R2	BN 100LB 4	M 3LB 4	2480	2480	7330	8420	1630	229	
157	177	1.8	9.00	7.5	300 L1	—	BN 100LB 4	M 3LB 4	2260	2260	6750	7750	1490	228	
196	142	3.0	7.20	7.5	300 L1	—	BN 100LB 4	M 3LB 4	2100	2100	6310	7250	1380	228	

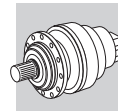
$P_1 = 4 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.65	51703	0.9	2187	11.0	313 L4	—	BN 112M 4	—	—	—	192000	231000	80000	324	
0.79	42954	1.3	1817	11.0	313 L4	—	BN 112M 4	—	—	—	192000	231000	80000	324	
0.81	41760	1.0	1766	11.0	311 L4	—	BN 112M 4	—	—	—	157000	195000	65000	314	
0.95	35508	1.5	1502	11.0	313 L4	—	BN 112M 4	—	—	—	192000	231000	80000	324	
1.0	33462	1.3	1415	11.0	311 L4	—	BN 112M 4	—	—	—	157000	195000	65000	314	
1.0	32954	1.6	1394	11.0	313 L4	—	BN 112M 4	—	—	—	192000	229000	79900	324	
1.1	29919	1.8	1266	11.0	313 L4	—	BN 112M 4	—	—	—	188000	222500	77400	324	
1.1	29763	0.9	1259	11.0	310 L4	—	BN 112M 4	—	—	—	128500	161600	62700	304	
1.2	29088	1.4	1230	11.0	311 L4	—	BN 112M 4	—	—	—	150800	187900	62300	314	
1.2	27525	1.0	1164	11.0	310 L4	—	BN 112M 4	—	—	—	125500	157900	61100	304	
1.3	26405	2.0	1117	11.0	313 L4	—	BN 112M 4	—	—	—	181100	214300	74200	324	
1.4	25022	1.6	1058	11.0	311 L4	—	BN 112M 4	—	—	—	144200	179600	59200	314	
1.4	24128	1.2	1021	11.0	310 L4	—	BN 112M 4	—	—	—	120700	151800	58500	304	
1.4	23974	2.2	1014	11.0	313 L4	—	BN 112M 4	—	—	—	175900	208200	71800	324	
1.5	23308	1.7	986	11.0	311 L4	—	BN 112M 4	—	—	—	141100	175800	57800	314	
1.5	22196	1.2	939	11.0	310 L4	—	BN 112M 4	—	—	—	117700	148000	56900	304	
1.6	21365	2.1	904	11.0	311 L4	—	BN 112M 4	—	—	—	137500	171300	56200	314	
1.6	21232	1.1	898	15.0	—	310 R4	BN 112M 4	—	—	—	116100	146000	56100	305	
1.6	21025	2.4	889	11.0	313 L4	—	BN 112M 4	—	—	—	169100	200100	68800	324	
1.7	19498	2.2	825	11.0	311 L4	—	BN 112M 4	—	—	—	133800	166600	54500	314	
1.7	19334	1.4	818	11.0	310 L4	—	BN 112M 4	—	—	—	112900	142000	54300	304	
1.8	18927	1.0	801	7.5	309 L4	—	BN 112M 4	—	—	—	94700	122100	29900	294	
1.8	18674	2.8	790	11.0	313 L4	—	BN 112M 4	—	—	—	163200	193100	66100	324	
1.8	18401	2.4	778	22	—	313 R4	BN 112M 4	—	—	—	162500	192300	65800	325	
1.9	17890	1.5	757	15.0	—	310 R4	BN 112M 4	—	—	—	110300	138700	52900	305	
1.9	17639	1.7	746	22	—	311 R4	BN 112M 4	—	—	—	129800	161700	52700	315	
2.0	17158	1.5	726	11.0	310 L4	—	BN 112M 4	—	—	—	108900	137000	52200	304	
2.0	17119	2.6	724	11.0	311 L4	—	BN 112M 4	—	—	—	128700	160300	52200	314	
2.0	17074	1.2	722	7.5	309 L4	—	BN 112M 4	—	—	—	91800	118400	28900	294	
2.1	16434	3.0	695	11.0	313 L4	—	BN 112M 4	—	—	—	157000	185900	63300	324	
2.1	16306	0.9	690	15.0	—	309 R4	BN 112M 4	—	—	—	90600	116800	28400	295	
2.2	15450	1.2	654	7.5	309 L4	—	BN 112M 4	—	—	—	89100	114900	27900	294	
2.2	15099	1.4	639	15.0	—	310 R4	BN 112M 4	—	—	—	104800	131800	50000	305	
2.2	15051	1.7	637	11.0	310 L4	—	BN 112M 4	—	—	—	104700	131700	50000	304	
2.3	14863	2.5	629	22	—	311 R4	BN 112M 4	—	—	—	123300	153600	49800	315	
2.3	14816	2.5	627	11.0	311 L4	—	BN 112M 4	—	—	—	123200	153500	49700	314	
2.4	13974	1.0	579	7.5	307 L4	—	BN 112M 4	M 3LC 4	38600	48400	84500	110800	33500	284	
2.4	13940	1.6	590	15.0	—	310 R4	BN 112M 4	—	—	—	102400	128700	48700	305	
2.5	13740	1.1	581	15.0	—	309 R4	BN 112M 4	—	—	—	86000	110900	26900	295	
2.5	13681	1.5	579	7.5	309 L4	—	BN 112M 4	—	—	—	85900	110800	26800	294	
2.6	13142	2.1	556	11.0	310 L4	—	BN 112M 4	—	—	—	100600	126500	47800	304	
2.7	12297	1.1	509	7.5	307 L4	—	BN 112M 4	M 3LC 4	37000	46400	81400	106600	32100	284	
2.8	12286	2.9	520	22	—	311 R4	BN 112M 4	—	—	—	116500	145100	46700	315	
2.8	12226	2.1	517	15.0	—	310 R4	BN 112M 4	—	—	—	98400	123800	46600	305	
2.8	12039	1.2	509	7.5	309 L4	—	BN 112M 4	—	—	—	82700	106600	25700	294	



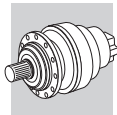
$P_1 = 4 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
2.8	11994	2.1	507	11.0	310 L4	—	BN 112M 4	—	—	—	97900	123000	46300	304
2.9	11596	1.2	490	15.0	—	309 R4	BN 112M 4	—	—	—	81700	105400	25400	295
2.9	11581	3.0	490	22	—	311 R4	BN 112M 4	—	—	—	114400	142500	45800	315
3.0	11225	1.0	465	7.5	307 L4	—	BN 112M 4	M 3LC 4	35800	45000	79200	103700	31200	284
3.1	10990	1.6	465	7.5	309 L4	—	BN 112M 4	—	—	—	80400	103700	24900	294
3.1	10936	1.2	453	15.0	—	307 R4	BN 112M 4	M 3LC 4	35500	44600	78600	102900	30900	285
3.1	10801	1.3	457	15.0	—	309 R4	BN 112M 4	—	—	—	80000	103200	24800	295
3.1	10737	1.9	454	15.0	—	310 R4	BN 112M 4	—	—	—	94700	119000	44700	305
3.2	10654	2.3	451	11.0	310 L4	—	BN 112M 4	—	—	—	94400	118700	44500	304
3.4	9980	1.1	413	15.0	—	307 R4	BN 112M 4	M 3LC 4	34500	43200	76400	100100	30000	285
3.4	9913	2.9	419	15.0	—	310 R4	BN 112M 4	—	—	—	92400	116200	43500	305
3.5	9792	1.2	406	7.5	307 L4	—	BN 112M 4	M 3LC 4	34300	43000	76000	99600	29800	284
3.5	9770	1.8	413	15.0	—	309 R4	BN 112M 4	—	—	—	77700	100100	24000	295
3.5	9587	1.8	406	7.5	309 L4	—	BN 112M 4	—	—	—	77200	99600	23800	294
3.7	9259	2.1	392	11.0	310 L4	—	BN 112M 4	—	—	—	90500	113900	42500	304
3.8	8851	1.6	374	15.0	—	309 R4	BN 112M 4	—	—	—	75400	97200	23200	295
3.9	8763	1.4	363	15.0	—	307 R4	BN 112M 4	M 3LC 4	33000	41400	73500	96300	28700	285
3.9	8587	2.8	363	15.0	—	310 R4	BN 112M 4	—	—	—	88500	111300	41500	305
4.0	8429	1.6	349	7.5	307 L4	—	BN 112M 4	M 3LC 4	32600	40900	72700	95200	28300	284
4.1	8252	2.4	349	7.5	309 L4	—	BN 112M 4	—	—	—	73800	95200	22700	294
4.2	8382	1.1	336	11.0	307 L3	—	BN 112M 4	M 3LC 4	32200	40400	71900	94200	28000	284
4.2	7997	1.4	331	15.0	—	307 R4	BN 112M 4	M 3LC 4	32000	40200	71500	93700	27800	285
4.3	8206	1.6	336	11.0	309 L3	—	BN 112M 4	—	—	—	73000	94200	22400	294
4.3	7829	2.1	331	15.0	—	309 R4	BN 112M 4	—	—	—	72700	93700	22300	295
4.5	7525	1.0	312	12.0	—	306 R4	BN 112M 4	M 3LC 4	28200	32000	65300	76000	21200	275
4.7	7244	1.8	300	15.0	—	307 R4	BN 112M 4	M 3LC 4	31000	38900	69400	91000	26900	285
4.8	6978	1.1	289	12.0	—	306 R4	BN 112M 4	M 3LC 4	27500	31200	63800	74300	20700	275
4.9	6869	1.6	284	15.0	—	307 R4	BN 112M 4	M 3LC 4	30400	38200	68300	89500	26500	285
4.9	7063	1.5	284	11.0	307 L3	—	BN 112M 4	M 3LC 4	30400	38100	68300	89400	26400	284
5.0	6725	2.4	284	15.0	—	309 R4	BN 112M 4	—	—	—	69400	89500	21200	295
5.0	6914	2.3	284	11.0	309 L3	—	BN 112M 4	—	—	—	69400	89400	21100	294
5.4	6231	2.1	258	15.0	—	307 R4	BN 112M 4	M 3LC 4	29500	37000	66400	87000	25600	285
5.5	6100	2.8	258	15.0	—	309 R4	BN 112M 4	—	—	—	67400	87000	20500	295
5.6	6003	1.3	249	12.0	—	306 R4	BN 112M 4	M 3LC 4	26200	29700	61000	71000	19700	275
5.9	5960	1.5	239	11.0	307 L3	—	BN 112M 4	M 3LC 4	28700	36000	64900	85000	25000	284
5.9	5931	1.3	238	7.5	306 L3	—	BN 112M 4	M 3LC 4	25800	29200	60200	70100	19400	274
6.0	5835	2.2	239	11.0	309 L3	—	BN 112M 4	—	—	—	65900	85000	20000	294
6.0	5607	1.9	232	15.0	—	307 R4	BN 112M 4	M 3LC 4	28400	35700	64300	84200	24700	285
6.1	5561	1.3	230	12.0	—	306 R4	BN 112M 4	M 3LC 4	25500	28900	59600	69400	19200	275
6.2	5490	2.9	232	15.0	—	309 R4	BN 112M 4	—	—	—	65300	84200	19800	295
6.3	5525	1.2	222	7.5	306 L3	—	BN 112M 4	M 3LC 4	25200	28600	58900	68600	18900	274
6.3	5503	2.3	221	11.0	307 L3	—	BN 112M 4	M 3LC 4	28000	35100	63300	83000	24300	284
6.4	5436	2.4	223	11.0	309 L3	—	BN 112M 4	—	—	—	64500	83200	19500	294
6.5	5175	1.0	214	12.0	—	305 R4	BN 112M 4	M 3LC 4	20000	23100	35700	42900	12800	265
6.6	5159	1.7	214	12.0	—	306 R4	BN 112M 4	M 3LC 4	24900	28200	58300	67900	18700	275
6.8	4965	2.6	206	15.0	—	307 R4	BN 112M 4	M 3LC 4	27300	34300	62000	81200	23700	285
6.8	5102	1.5	205	7.5	306 L3	—	BN 112M 4	M 3LC 4	24500	27800	57600	67000	18400	274
6.9	5022	2.1	202	11.0	307 L3	—	BN 112M 4	M 3LC 4	27100	34000	61600	80700	23600	284
7.3	4604	2.8	191	15.0	—	307 R4	BN 112M 4	M 3LC 4	26600	33400	60600	79400	23200	285
7.4	4726	1.4	190	7.5	306 L3	—	BN 112M 4	M 3LC 4	23900	27100	56200	65500	18000	274
7.6	4465	0.9	185	12.0	—	305 R4	BN 112M 4	M 3LC 4	19100	22000	34100	41100	12200	265
7.7	4370	1.8	181	12.0	—	306 R4	BN 112M 4	M 3LC 4	23600	26700	55500	64600	17700	275
7.9	4422	1.0	178	7.5	305 L3	—	BN 112M 4	M 3LC 4	18800	21700	33700	40600	12100	264
7.9	4410	2.8	177	11.0	307 L3	—	BN 112M 4	M 3LC 4	26000	32600	59300	77700	22600	284
8.3	4052	1.9	168	12.0	—	306 R4	BN 112M 4	M 3LC 4	23000	26000	54200	63100	17300	275
8.5	3989	2.6	165	15.0	—	307 R4	BN 112M 4	M 3LC 4	25400	31900	58000	76100	22100	285
8.6	4078	1.1	164	7.5	305 L3	—	BN 112M 4	M 3LC 4	18300	21100	32900	39600	11700	264
8.7	4024	2.6	162	11.0	307 L3	—	BN 112M 4	M 3LC 4	25200	31600	57700	75600	21900	284



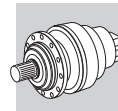
$P_1 = 4 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
8.8	3824	0.9	158	12.0	—	304 R4	BN 112M 4	M 3LC 4	18100	20900	32600	39200	11600	255
8.8	3824	1.4	158	12.0	—	305 R4	BN 112M 4	M 3LC 4	18100	20900	32600	39200	11600	265
8.9	3812	2.3	158	12.0	—	306 R4	BN 112M 4	M 3LC 4	22500	25500	53200	62000	16900	275
9.2	3799	0.9	152	7.5	305 L3	—	BN 112M 4	M 3LC 4	17900	20600	32200	38700	11500	264
9.2	3787	2.0	152	7.5	306 L3	—	BN 112M 4	M 3LC 4	22200	25200	52600	61300	16700	274
9.4	3725	0.9	150	7.5	304 L3	—	BN 112M 4	M 3LC 4	17800	20500	32000	38500	11400	254
9.4	3578	1.0	148	12.0	—	304 R4	BN 112M 4	M 3LC 4	17700	20400	31900	38400	11400	255
9.4	3578	1.2	148	12.0	—	305 R4	BN 112M 4	M 3LC 4	17700	20400	31900	38400	11400	265
9.7	3591	1.5	144	14.0	—	306 R3	BN 112M 4	M 3LC 4	21800	24700	51800	60300	16400	275
9.9	3524	1.0	141	7.5	304 L3	—	BN 112M 4	M 3LC 4	17400	20100	31500	37900	11200	254
9.9	3524	1.5	141	7.5	305 L3	—	BN 112M 4	M 3LC 4	17400	20100	31500	37900	11200	264
9.9	3512	2.2	141	7.5	306 L3	—	BN 112M 4	M 3LC 4	21700	24600	51500	59900	16300	274
10.1	3457	3.0	139	11.0	307 L3	—	BN 112M 4	M 3LC 4	24000	30100	55100	72200	20800	284
10.7	3250	1.1	130	7.5	304 L3	—	BN 112M 4	M 3LC 4	17000	19600	30700	37000	10900	254
10.8	3121	1.1	129	12.0	—	304 R4	BN 112M 4	M 3LC 4	16900	19500	30600	36900	10800	255
10.8	3121	1.6	129	12.0	—	305 R4	BN 112M 4	M 3LC 4	16900	19500	30600	36900	10800	265
11.2	3101	1.2	124	7.5	305 L3	—	BN 112M 4	M 3LC 4	16700	19300	30300	36500	10700	264
11.5	3021	2.5	121	7.5	306 L3	—	BN 112M 4	M 3LC 4	20600	23400	49200	57300	15500	274
11.7	2983	2.9	120	22	—	307 R3	BN 112M 4	M 3LC 4	22800	28600	52700	69100	19800	285
11.7	2968	2.2	119	14.0	—	306 R3	BN 112M 4	M 3LC 4	20500	23200	48900	57000	15400	275
12.2	2850	1.2	114	14.0	—	305 R3	BN 112M 4	M 3LC 4	16200	18700	29500	35500	10400	265
12.4	2807	1.3	113	7.5	305 L3	—	BN 112M 4	M 3LC 4	16200	18600	29400	35400	10400	264
12.5	2798	2.5	112	7.5	306 L3	—	BN 112M 4	M 3LC 4	20100	22800	48100	56000	15100	274
12.7	2753	1.2	111	7.5	304 L3	—	BN 112M 4	M 3LC 4	16000	18500	29200	35200	10300	254
12.8	2644	1.3	109	12.0	—	304 R4	BN 112M 4	M 3LC 4	16000	18500	29200	35100	10300	255
13.4	2604	1.0	105	7.5	303 L3	—	BN 112M 4	M 3LC 4	15800	18200	28800	34600	10100	244
13.4	2604	1.3	105	7.5	304 L3	—	BN 112M 4	M 3LC 4	15800	18200	28800	34600	10100	254
13.4	2604	1.9	105	7.5	305 L3	—	BN 112M 4	M 3LC 4	15800	18200	28800	34600	10100	264
13.4	2596	2.9	104	7.5	306 L3	—	BN 112M 4	M 3LC 4	19600	22200	47000	54700	14700	274
14.2	2454	2.6	98.5	14.0	—	306 R3	BN 112M 4	M 3LC 4	19200	21800	46200	53800	14400	275
14.4	2416	0.9	97.0	14.0	—	304 R3	BN 112M 4	M 3LC 4	15400	17700	28100	33800	9860	255
15.3	2280	1.6	91.5	14.0	—	305 R3	BN 112M 4	M 3LC 4	15100	17400	27600	33200	9670	265
15.5	2247	0.91	90.2	7.5	303 L3	—	BN 112M 4	M 3LC 4	15000	17300	27500	33100	9620	244
15.5	2247	1.5	90.2	7.5	304 L3	—	BN 112M 4	M 3LC 4	15000	17300	27500	33100	9620	254
15.5	2247	1.7	90.2	7.5	305 L3	—	BN 112M 4	M 3LC 4	15000	17300	27500	33100	9620	264
15.7	2158	1.6	89.4	12.0	—	304 R4	BN 112M 4	M 3LC 4	15000	17300	27400	33000	9590	255
15.9	2199	2.9	88.3	7.5	306 L3	—	BN 112M 4	M 3LC 4	18500	21000	44700	52100	13900	274
17.8	1961	1.1	78.7	14.0	—	303 R3	BN 112M 4	M 3LC 4	14300	16500	26400	31800	9190	245
17.8	1961	1.4	78.7	14.0	—	304 R3	BN 112M 4	M 3LC 4	14300	16500	26400	31800	9190	255
17.8	1961	2.1	78.7	14.0	—	305 R3	BN 112M 4	M 3LC 4	14300	16500	26400	31800	9190	265
18.1	1924	1.2	77.2	7.5	303 L3	—	BN 112M 4	M 3LC 4	14200	16400	26300	31600	9140	244
18.1	1924	1.7	77.2	7.5	304 L3	—	BN 112M 4	M 3LC 4	14200	16400	26300	31600	9140	254
18.1	1924	2.4	77.2	7.5	305 L3	—	BN 112M 4	M 3LC 4	14200	16400	26300	31600	9140	264
19.1	1827	1.0	73.3	14.0	—	303 R3	BN 112M 4	M 3LC 4	14000	16200	25900	31100	8980	245
19.1	1827	2.0	73.3	14.0	—	305 R3	BN 112M 4	M 3LC 4	14000	16200	25900	31100	8980	265
19.4	1801	1.1	72.3	7.5	303 L3	—	BN 112M 4	M 3LC 4	13900	16100	25700	31000	8940	244
19.4	1801	1.8	72.3	7.5	304 L3	—	BN 112M 4	M 3LC 4	13900	16100	25700	31000	8940	254
19.4	1801	2.1	72.3	7.5	305 L3	—	BN 112M 4	M 3LC 4	13900	16100	25700	31000	8940	264
22.1	1576	1.0	63.2	7.5	301 L3	—	BN 112M 4	M 3LC 4	4330	4330	12100	13900	2850	236
22.2	1571	1.4	63.1	14.0	—	303 R3	BN 112M 4	M 3LC 4	13300	15400	24700	29700	8540	245
22.2	1571	1.8	63.1	14.0	—	304 R3	BN 112M 4	M 3LC 4	13300	15400	24700	29700	8540	255
22.2	1571	2.5	63.1	14.0	—	305 R3	BN 112M 4	M 3LC 4	13300	15400	24700	29700	8540	265
22.2	1571	1.5	63.1	7.5	303 L3	—	BN 112M 4	M 3LC 4	13300	15400	24700	29700	8540	244
22.2	1571	2.1	63.1	7.5	304 L3	—	BN 112M 4	M 3LC 4	13300	15400	24700	29700	8540	254
22.2	1571	2.8	63.1	7.5	305 L3	—	BN 112M 4	M 3LC 4	13300	15400	24700	29700	8540	264
22.2	1568	1.0	62.9	12.0	—	301 R3	BN 112M 4	M 3LC 4	4330	4330	12100	13900	2840	237
23.7	1519	1.5	59.1	9.0	304 L2	—	BN 112M 4	M 3LC 4	13000	15000	24200	29200	8360	254
25.1	1433	1.2	55.8	9.0	303 L2	—	BN 112M 4	M 3LC 4	12800	14800	23800	28700	8200	244



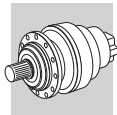
$P_1 = 4 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
25.1	1433	2.2	55.8	9.0	305 L2	—	BN 112M 4	M 3LC 4	12800	14800	23800	28700	8200	264	
25.8	1350	1.3	54.2	14.0	—	303 R3	BN 112M 4	M 3LC 4	12700	14600	23600	28400	8120	245	
25.8	1350	2.6	54.2	14.0	—	305 R3	BN 112M 4	M 3LC 4	12700	14600	23600	28400	8120	265	
26.2	1331	1.4	53.4	7.5	303 L3	—	BN 112M 4	M 3LC 4	12600	14500	23500	28300	8080	244	
26.2	1331	2.4	53.4	7.5	304 L3	—	BN 112M 4	M 3LC 4	12600	14500	23500	28300	8080	254	
26.2	1331	2.7	53.4	7.5	305 L3	—	BN 112M 4	M 3LC 4	12600	14500	23500	28300	8080	264	
27.0	1333	1.0	51.9	7.5	301 L2	—	BN 112M 4	M 3LC 4	4060	4060	11400	13100	2670	236	
27.1	1286	1.1	51.6	7.5	301 L3	—	BN 112M 4	M 3LC 4	4050	4050	11400	13100	2660	236	
27.8	1256	1.2	50.4	12.0	—	301 R3	BN 112M 4	M 3LC 4	4020	4020	11300	13000	2640	237	
27.9	1252	1.7	50.3	14.0	—	303 R3	BN 112M 4	M 3LC 4	12300	14200	23100	27800	7920	245	
27.9	1252	2.6	50.3	14.0	—	304 R3	BN 112M 4	M 3LC 4	12300	14200	23100	27800	7920	255	
29.6	1215	1.9	47.3	9.0	304 L2	—	BN 112M 4	M 3LC 4	12100	14000	22700	27300	7760	254	
30	1161	1.8	46.6	14.0	—	303 R3	BN 112M 4	M 3LC 4	12000	13900	22600	27200	7720	245	
30	1161	2.4	46.6	14.0	—	304 R3	BN 112M 4	M 3LC 4	12000	13900	22600	27200	7720	255	
31	1146	1.5	44.6	9.0	303 L2	—	BN 112M 4	M 3LC 4	11900	13700	22300	26800	7610	244	
32	1086	2.9	43.6	7.5	304 L3	—	BN 112M 4	M 3LC 4	11800	13600	22100	26600	7550	254	
33	1061	1.7	42.6	14.0	—	303 R3	BN 112M 4	M 3LC 4	11700	13500	22000	26400	7490	245	
33	1061	3.0	42.6	14.0	—	304 R3	BN 112M 4	M 3LC 4	11700	13500	22000	26400	7490	255	
34	1067	1.2	41.5	7.5	301 L2	—	BN 112M 4	M 3LC 4	3770	3770	10700	12300	2480	236	
34	1025	1.3	41.2	12.0	—	301 R3	BN 112M 4	M 3LC 4	3760	3760	10600	12200	2470	237	
36	986	2.1	38.4	9.0	303 L2	—	BN 112M 4	M 3LC 4	11300	13000	21300	25600	7240	244	
36	986	2.8	38.4	9.0	304 L2	—	BN 112M 4	M 3LC 4	11300	13000	21300	25600	7240	254	
36	985	1.3	38.4	7.5	301 L2	—	BN 112M 4	M 3LC 4	3670	3670	10400	12000	2410	236	
38	928	1.5	37.3	12.0	—	301 R3	BN 112M 4	M 3LC 4	3630	3630	10300	11900	2390	237	
38	925	2.3	37.1	14.0	—	303 R3	BN 112M 4	M 3LC 4	11200	12900	21100	25400	7160	245	
39	918	1.9	35.8	9.0	303 L2	—	BN 112M 4	M 3LC 4	11000	12700	20800	25100	7070	244	
42	855	1.5	33.3	7.5	301 L2	—	BN 112M 4	M 3LC 4	3500	3500	9990	11500	2300	236	
44	784	2.3	31.5	14.0	—	303 R3	BN 112M 4	M 3LC 4	10600	12200	20100	24100	6770	245	
46	790	2.7	30.8	9.0	303 L2	—	BN 112M 4	M 3LC 4	10500	12100	19900	24000	6720	244	
46	788	1.0	30.7	7.5	300 L2	—	BN 112M 4	M 3LC 4	3410	3410	9750	11200	2240	228	
46	788	1.7	30.7	7.5	301 L2	—	BN 112M 4	M 3LC 4	3410	3410	9750	11200	2240	236	
46	758	1.0	30.4	12.0	—	300 R3	BN 112M 4	M 3LC 4	3400	3400	9730	11200	2230	229	
46	758	1.8	30.4	12.0	—	301 R3	BN 112M 4	M 3LC 4	3400	3400	9730	11200	2230	237	
53	679	2.5	26.4	9.0	303 L2	—	BN 112M 4	M 3LC 4	9960	11500	19000	22900	6390	244	
55	640	2.8	25.7	14.0	—	303 R3	BN 112M 4	M 3LC 4	9870	11400	18900	22700	6330	245	
56	618	1.1	24.8	12.0	—	300 R3	BN 112M 4	M 3LC 4	3170	3170	9150	10500	2090	229	
56	618	2.0	24.8	12.0	—	301 R3	BN 112M 4	M 3LC 4	3170	3170	9150	10500	2090	237	
57	636	1.4	24.8	18.0	—	303 R2	BN 112M 4	M 3LC 4	9750	11300	18700	22500	6250	245	
57	632	1.2	24.6	7.5	300 L2	—	BN 112M 4	M 3LC 4	3160	3160	9130	10500	2080	228	
57	632	2.1	24.6	7.5	301 L2	—	BN 112M 4	M 3LC 4	3160	3160	9130	10500	2080	236	
57	630	2.9	24.5	9.0	303 L2	—	BN 112M 4	M 3LC 4	9720	11200	18600	22400	6230	244	
67	533	2.9	20.8	9.0	303 L2	—	BN 112M 4	M 3LC 4	9190	10600	17700	21300	5900	244	
70	515	1.2	20.1	7.5	300 L2	—	BN 112M 4	M 3LC 4	2960	2960	8590	9870	1940	228	
70	515	2.3	20.1	7.5	301 L2	—	BN 112M 4	M 3LC 4	2960	2960	8590	9870	1940	236	
76	474	1.4	18.5	12.0	—	301 R2	BN 112M 4	M 3LC 4	2870	2870	8370	9620	1890	237	
77	467	1.4	18.2	7.5	300 L2	—	BN 112M 4	M 3LC 4	2860	2860	8330	9580	1880	228	
77	467	2.6	18.2	7.5	301 L2	—	BN 112M 4	M 3LC 4	2860	2860	8330	9580	1880	236	
94	381	1.6	14.8	7.5	300 L2	—	BN 112M 4	M 3LC 4	2670	2670	7840	9010	1760	228	
94	381	2.9	14.8	7.5	301 L2	—	BN 112M 4	M 3LC 4	2670	2670	7840	9010	1760	236	
95	379	1.3	14.8	12.0	—	300 R2	BN 112M 4	M 3LC 4	2670	2670	7830	9000	1750	229	
95	379	2.5	14.8	12.0	—	301 R2	BN 112M 4	M 3LC 4	2670	2670	7830	9000	1750	237	
116	311	2.0	12.1	7.5	300 L2	—	BN 112M 4	M 3LC 4	2500	2500	7380	8480	1640	228	
118	304	1.8	11.8	12.0	—	300 R2	BN 112M 4	M 3LC 4	2480	2480	7330	8420	1630	229	
145	256	3.0	9.67	11.0	303 L1	—	—	M 3LC 4	7120	8220	14100	16900	4570	244	
156	238	1.3	9.00	7.5	300 L1	—	BN 112M 4	M 3LC 4	2260	2260	6750	7750	1490	228	
156	238	2.4	9.00	7.5	301 L1	—	BN 112M 4	M 3LC 4	2260	2260	6750	7750	1490	236	
160	224	2.4	8.74	12.0	—	300 R2	BN 112M 4	M 3LC 4	2240	2240	6690	7690	1470	229	
194	191	2.2	7.20	7.5	300 L1	—	BN 112M 4	M 3LC 4	2100	2100	6310	7250	1380	228	
196	183	2.8	7.13	12.0	—	300 R2	BN 112M 4	M 3LC 4	2090	2090	6300	7230	1380	229	
243	153	2.9	5.77	7.5	300 L1	—	BN 112M 4	M 3LC 4	1950	1950	5910	6790	1280	228	



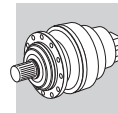
P₁ = 5.5 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
0.76	61095	2.4	1893	18.0	317 L4	—	BN 132S 4	—	—	—	442000	470000	150000	362
0.79	58651	0.9	1817	11.0	313 L4	—	BN 132S 4	—	—	—	192000	231000	80000	324
0.80	58275	1.4	1805	18.0	315 L4	—	BN 132S 4	—	—	—	206000	243000	90000	344
0.80	57987	1.1	1796	15.0	314 L4	—	BN 132S 4	—	—	—	206000	243000	90000	334
0.96	48485	1.1	1502	11.0	313 L4	—	BN 132S 4	—	—	—	192000	231000	80000	324
0.96	48174	1.7	1492	18.0	315 L4	—	BN 132S 4	—	—	—	206000	243000	90000	344
0.97	47936	1.3	1485	15.0	314 L4	—	BN 132S 4	—	—	—	206000	243000	90000	334
1.0	45691	0.9	1415	11.0	311 L4	—	BN 132S 4	—	—	—	157000	195000	65000	314
1.0	44997	1.2	1394	11.0	313 L4	—	BN 132S 4	—	—	—	192000	229000	79900	324
1.1	41440	2.4	1284	18.0	315 L4	—	BN 132S 4	—	—	—	201500	236600	87400	344
1.1	41235	1.9	1277	15.0	314 L4	—	BN 132S 4	—	—	—	201200	236300	87300	334
1.1	40853	1.3	1266	11.0	313 L4	—	BN 132S 4	—	—	—	188000	222500	77400	324
1.2	39718	1.1	1230	11.0	311 L4	—	BN 132S 4	—	—	—	150800	187900	62300	314
1.3	36055	1.5	1117	11.0	313 L4	—	BN 132S 4	—	—	—	181100	214300	74200	324
1.3	35647	2.7	1104	18.0	315 L4	—	BN 132S 4	—	—	—	192600	226200	83200	344
1.3	35471	2.2	1099	15.0	314 L4	—	BN 132S 4	—	—	—	192400	225800	83000	334
1.4	34166	1.2	1058	11.0	311 L4	—	BN 132S 4	—	—	—	144200	179600	59200	314
1.4	33493	2.5	1038	15.0	314 L4	—	BN 132S 4	—	—	—	189100	222000	81400	334
1.4	32735	1.6	1014	11.0	313 L4	—	BN 132S 4	—	—	—	175900	208200	71800	324
1.5	31825	1.3	986	11.0	311 L4	—	BN 132S 4	—	—	—	141100	175800	57800	314
1.6	29888	2.5	926	15.0	314 L4	—	BN 132S 4	—	—	—	182700	214500	78400	334
1.6	29353	2.6	909	40	—	315 R4	BN 132S 4	—	—	—	181700	213400	77900	345
1.6	29173	1.5	904	11.0	311 L4	—	BN 132S 4	—	—	—	137500	171300	56200	314
1.6	28708	1.8	889	11.0	313 L4	—	BN 132S 4	—	—	—	169100	200100	68800	324
1.7	27687	3.0	858	15.0	314 L4	—	BN 132S 4	—	—	—	178600	209700	76400	334
1.7	26623	1.6	825	11.0	311 L4	—	BN 132S 4	—	—	—	133800	166600	54500	314
1.8	26399	1.0	818	11.0	310 L4	—	BN 132S 4	—	—	—	112900	142000	54300	304
1.8	25498	2.1	790	11.0	313 L4	—	BN 132S 4	—	—	—	163200	193100	66100	324
1.9	25126	1.8	778	22	—	313 R4	BN 132S 4	—	—	—	162500	192300	65800	325
1.9	24428	1.1	757	15.0	—	310 R4	BN 132S 4	—	—	—	110300	138700	52900	305
1.9	24085	1.3	746	22	—	311 R4	BN 132S 4	—	—	—	129800	161700	52700	315
2.0	23428	1.1	726	11.0	310 L4	—	BN 132S 4	—	—	—	108900	137000	52200	304
2.0	23376	1.9	724	11.0	311 L4	—	BN 132S 4	—	—	—	128700	160300	52200	314
2.1	22439	2.2	695	11.0	313 L4	—	BN 132S 4	—	—	—	157000	185900	63300	324
2.2	20874	2.4	647	22	—	313 R4	BN 132S 4	—	—	—	153700	181900	61800	325
2.3	20616	1.1	639	15.0	—	310 R4	BN 132S 4	—	—	—	104800	131800	50000	305
2.3	20551	1.3	637	11.0	310 L4	—	BN 132S 4	—	—	—	104700	131700	50000	304
2.3	20431	2.6	633	11.0	313 L4	—	BN 132S 4	—	—	—	152700	180700	61400	324
2.3	20294	1.8	629	22	—	311 R4	BN 132S 4	—	—	—	123300	153600	49800	315
2.3	20230	1.8	627	11.0	311 L4	—	BN 132S 4	—	—	—	123200	153500	49700	314
2.3	19812	2.9	614	22	—	314 R4	BN 132S 4	—	—	—	161500	189600	68400	335
2.4	19035	1.1	590	15.0	—	310 R4	BN 132S 4	—	—	—	102400	128700	48700	305
2.5	18681	1.1	579	7.5	309 L4	—	BN 132S 4	—	—	—	85900	110800	26800	294
2.5	18325	2.3	568	11.0	311 L4	—	BN 132S 4	—	—	—	119600	149000	48100	314
2.6	18199	3.0	564	11.0	313 L4	—	BN 132S 4	—	—	—	147500	174500	59100	324
2.6	17945	1.5	556	11.0	310 L4	—	BN 132S 4	—	—	—	100600	126500	47800	304
2.7	17256	2.8	535	22	—	313 R4	BN 132S 4	—	—	—	145100	171800	58000	325
2.8	16777	2.1	520	22	—	311 R4	BN 132S 4	—	—	—	116500	145100	46700	315
2.8	16694	1.5	517	15.0	—	310 R4	BN 132S 4	—	—	—	98400	123800	46600	305
2.8	16581	2.9	514	11.0	313 L4	—	BN 132S 4	—	—	—	143400	169700	57300	324
2.8	16531	2.7	512	11.0	311 L4	—	BN 132S 4	—	—	—	116000	144500	46500	314
2.8	16377	1.5	507	11.0	310 L4	—	BN 132S 4	—	—	—	97900	123000	46300	304
2.9	15814	2.2	490	22	—	311 R4	BN 132S 4	—	—	—	114400	142500	45800	315
3.1	15006	1.2	465	7.5	309 L4	—	BN 132S 4	—	—	—	80400	103700	24900	294
3.2	14749	0.9	457	15.0	—	309 R4	BN 132S 4	—	—	—	80000	103200	24800	295



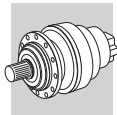
P₁ = 5.5 kW **n₁ = 1400 min⁻¹**

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
3.2	14661	1.4	454	15.0	—	310 R4	BN 132S 4	—	—	—	94700	119000	44700	305	
3.2	14619	0.9	453	15.0	—	307 R4	BN 132S 4	M 4SA 4	35500	44600	78600	102900	30900	285	
3.2	14548	1.7	451	11.0	310 L4	—	BN 132S 4	—	—	—	94400	118700	44500	304	
3.3	14136	2.5	438	22	—	311 R4	BN 132S 4	—	—	—	110600	137800	44100	315	
3.4	13536	2.1	419	15.0	—	310 R4	BN 132S 4	—	—	—	92400	116200	43500	305	
3.5	13341	1.3	413	15.0	—	309 R4	BN 132S 4	—	—	—	77700	100100	24000	295	
3.5	13325	3.0	413	22	—	311 R4	BN 132S 4	—	—	—	108700	135400	43300	315	
3.6	13091	1.3	406	7.5	309 L4	—	BN 132S 4	—	—	—	77200	99600	23800	294	
3.7	12643	1.5	392	11.0	310 L4	—	BN 132S 4	—	—	—	90500	113900	42500	304	
3.8	12085	1.2	374	15.0	—	309 R4	BN 132S 4	—	—	—	75400	97200	23200	295	
4.0	11726	2.0	363	15.0	—	310 R4	BN 132S 4	—	—	—	88500	111300	41500	305	
4.0	11714	1.1	363	15.0	—	307 R4	BN 132S 4	M 4SA 4	33000	41400	73500	96300	28700	285	
4.1	11672	1.6	350	18.0	310 L3	—	BN 132S 4	—	—	—	87600	110100	41000	304	
4.1	11268	1.2	349	7.5	307 L4	—	BN 132S 4	M 4SA 4	32600	40900	72700	95200	28300	284	
4.1	11268	1.7	349	7.5	309 L4	—	BN 132S 4	—	—	—	73800	95200	22700	294	
4.3	11205	1.2	336	11.0	309 L3	—	BN 132S 4	—	—	—	73000	94200	22400	294	
4.3	10787	2.4	334	15.0	—	310 R4	BN 132S 4	—	—	—	86300	108600	40300	305	
4.3	10690	1.0	331	15.0	—	307 R4	BN 132S 4	M 4SA 4	32000	40200	71500	93700	27800	285	
4.3	10690	1.6	331	15.0	—	309 R4	BN 132S 4	—	—	—	72700	93700	22300	295	
4.7	9844	2.3	305	15.0	—	310 R4	BN 132S 4	—	—	—	84000	105600	39100	305	
4.8	9683	1.3	300	15.0	—	307 R4	BN 132S 4	M 4SA 4	31000	38900	69400	91000	26900	285	
4.9	9835	2.3	295	18.0	310 L3	—	BN 132S 4	—	—	—	83200	104600	38700	304	
4.9	9697	2.8	291	18.0	311 L3	—	BN 132S 4	—	—	—	97900	121900	38500	314	
5.1	9183	1.2	284	15.0	—	307 R4	BN 132S 4	M 4SA 4	30400	38200	68300	89500	26500	285	
5.1	9183	1.8	284	15.0	—	309 R4	BN 132S 4	—	—	—	69400	89500	21200	295	
5.1	9441	1.1	284	11.0	307 L3	—	BN 132S 4	M 4SA 4	30400	38100	68300	89400	26400	284	
5.1	9441	1.7	284	11.0	309 L3	—	BN 132S 4	—	—	—	69400	89400	21100	294	
5.1	9137	2.5	283	15.0	—	310 R4	BN 132S 4	—	—	—	82100	103300	38100	305	
5.6	8338	2.7	258	15.0	—	310 R4	BN 132S 4	—	—	—	79900	100500	37000	305	
5.6	8330	1.5	258	15.0	—	307 R4	BN 132S 4	M 4SA 4	29500	37000	66400	87000	25600	285	
5.6	8330	2.1	258	15.0	—	309 R4	BN 132S 4	—	—	—	67400	87000	20500	295	
5.8	8300	2.2	249	18.0	310 L3	—	BN 132S 4	—	—	—	79100	99400	36600	304	
5.8	8025	1.0	249	12.0	—	306 R4	BN 132S 4	M 4SA 4	26200	29700	61000	71000	19700	275	
6.0	7968	1.1	239	11.0	307 L3	—	BN 132S 4	M 4SA 4	28700	36000	64900	85000	25000	284	
6.0	7968	1.6	239	11.0	309 L3	—	BN 132S 4	—	—	—	65900	85000	20000	294	
6.0	7929	1.0	238	7.5	306 L3	—	BN 132S 4	M 4SA 4	25800	29200	60200	70100	19400	274	
6.2	7553	2.7	234	15.0	—	310 R4	BN 132S 4	—	—	—	77600	97600	35800	305	
6.2	7496	1.4	232	15.0	—	307 R4	BN 132S 4	M 4SA 4	28400	35700	64300	84200	24700	285	
6.2	7496	2.1	232	15.0	—	309 R4	BN 132S 4	—	—	—	65300	84200	19800	295	
6.3	7434	1.0	230	12.0	—	306 R4	BN 132S 4	M 4SA 4	25500	28900	59600	69400	19200	275	
6.3	7663	2.8	230	18.0	310 L3	—	BN 132S 4	—	—	—	77200	97100	35600	304	
6.5	7422	1.8	223	11.0	309 L3	—	BN 132S 4	—	—	—	64500	83200	19500	294	
6.5	7357	1.7	221	11.0	307 L3	—	BN 132S 4	M 4SA 4	28000	35100	63300	83000	24300	284	
6.7	6896	1.3	214	12.0	—	306 R4	BN 132S 4	M 4SA 4	24900	28200	58300	67900	18700	275	
7.0	6638	1.9	206	15.0	—	307 R4	BN 132S 4	M 4SA 4	27300	34300	62000	81200	23700	285	
7.0	6638	2.5	206	15.0	—	309 R4	BN 132S 4	—	—	—	63000	81200	19000	295	
7.0	6820	1.1	205	7.5	306 L3	—	BN 132S 4	M 4SA 4	24500	27800	57600	67000	18400	274	
7.1	6714	1.6	202	11.0	307 L3	—	BN 132S 4	M 4SA 4	27100	34000	61600	80700	23600	284	
7.1	6714	2.4	202	11.0	309 L3	—	BN 132S 4	—	—	—	62600	80700	18900	294	
7.6	6155	2.1	191	15.0	—	307 R4	BN 132S 4	M 4SA 4	26600	33400	60600	79400	23200	285	
7.6	6155	2.6	191	15.0	—	309 R4	BN 132S 4	—	—	—	61600	79400	18500	295	
7.6	6318	1.0	190	7.5	306 L3	—	BN 132S 4	M 4SA 4	23900	27100	56200	65500	18000	274	
7.9	6082	2.4	183	11.0	309 L3	—	BN 132S 4	—	—	—	60800	78400	18300	294	
8.0	5841	1.3	181	12.0	—	306 R4	BN 132S 4	M 4SA 4	23600	26700	55500	64600	17700	275	
8.1	5902	3.0	177	18.0	310 L3	—	BN 132S 4	—	—	—	71400	89800	32600	304	



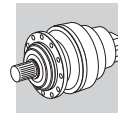
P₁ = 5.5 kW **n₁ = 1400 min⁻¹**

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
8.1	5895	2.1	177	11.0	307 L3	—	BN 132S 4	M 4SA 4	26000	32600	59300	77700	22600	284
8.6	5417	1.4	168	12.0	—	306 R4	BN 132S 4	M 4SA 4	23000	26000	54200	63100	17300	275
8.7	5332	2.0	165	15.0	—	307 R4	BN 132S 4	M 4SA 4	25400	31900	58000	76100	22100	285
8.7	5332	2.8	165	15.0	—	309 R4	BN 132S 4	—	—	—	59000	76100	17700	295
8.9	5380	2.0	162	11.0	307 L3	—	BN 132S 4	M 4SA 4	25200	31600	57700	75600	21900	284
8.9	5380	3.0	162	11.0	309 L3	—	BN 132S 4	—	—	—	58600	75600	17500	294
9.1	5112	1.0	158	12.0	—	305 R4	BN 132S 4	M 4SA 4	18100	20900	32600	39200	11600	265
9.1	5096	1.7	158	12.0	—	306 R4	BN 132S 4	M 4SA 4	22500	25500	53200	62000	16900	275
9.5	5063	1.5	152	7.5	306 L3	—	BN 132S 4	M 4SA 4	22200	25200	52600	61300	16700	274
9.5	4905	2.5	152	15.0	—	307 R4	BN 132S 4	M 4SA 4	24700	31000	56600	74200	21500	285
9.5	4905	2.8	152	15.0	—	309 R4	BN 132S 4	—	—	—	57500	74200	17200	295
9.8	4873	2.6	146	11.0	307 L3	—	BN 132S 4	M 4SA 4	24400	30600	56000	73300	21200	284
10.0	4800	1.1	144	14.0	—	306 R3	BN 132S 4	M 4SA 4	21800	24700	51800	60300	16400	275
10.2	4711	1.1	141	7.5	305 L3	—	BN 132S 4	—	17400	20100	31500	37900	11200	264
10.2	4695	1.7	141	7.5	306 L3	—	BN 132S 4	M 4SA 4	21700	24600	51500	59900	16300	274
10.4	4621	2.3	139	11.0	307 L3	—	BN 132S 4	M 4SA 4	24000	30100	55100	72200	20800	284
11.1	4173	1.2	129	12.0	—	305 R4	BN 132S 4	M 4SA 4	16900	19500	30600	36900	10800	265
11.4	4192	2.9	126	11.0	307 L3	—	BN 132S 4	M 4SA 4	23200	29100	53500	70100	20200	284
11.9	4038	1.9	121	7.5	306 L3	—	BN 132S 4	M 4SA 4	20600	23400	49200	57300	15500	274
12.0	3988	2.2	120	22	—	307 R3	BN 132S 4	M 4SA 4	22800	28600	52700	69100	19800	285
12.1	3968	1.6	119	14.0	—	306 R3	BN 132S 4	M 4SA 4	20500	23200	48900	57000	15400	275
12.6	3809	0.9	114	14.0	—	305 R3	BN 132S 4	M 4SA 4	16200	18700	29500	35500	10400	265
12.7	3772	2.7	113	11.0	307 L3	—	BN 132S 4	M 4SA 4	22400	28100	51800	67900	19500	284
12.8	3753	1.0	113	7.5	305 L3	—	BN 132S 4	—	16200	18600	29400	35400	10400	264
12.8	3741	1.9	112	7.5	306 L3	—	BN 132S 4	M 4SA 4	20100	22800	48100	56000	15100	274
13.0	3680	0.9	111	7.5	304 L3	—	BN 132S 4	—	16000	18500	29200	35200	10300	254
13.2	3534	1.0	109	12.0	—	304 R4	BN 132S 4	—	16000	18500	29200	35100	10300	255
13.8	3481	1.0	105	7.5	304 L3	—	BN 132S 4	—	15800	18200	28800	34600	10100	254
13.8	3481	1.4	105	7.5	305 L3	—	BN 132S 4	—	15800	18200	28800	34600	10100	264
13.8	3470	2.2	104	7.5	306 L3	—	BN 132S 4	M 4SA 4	19600	22200	47000	54700	14700	274
14.5	3297	2.6	99.0	22	—	307 R3	BN 132S 4	M 4SA 4	21400	26900	49800	65200	18600	285
14.6	3280	1.9	98.5	14.0	—	306 R3	BN 132S 4	M 4SA 4	19200	21800	46200	53800	14400	275
15.7	3048	1.2	91.5	14.0	—	305 R3	BN 132S 4	M 4SA 4	15100	17400	27600	33200	9670	265
16.0	3004	1.1	90.2	7.5	304 L3	—	BN 132S 4	—	15000	17300	27500	33100	9620	254
16.0	3004	1.3	90.2	7.5	305 L3	—	BN 132S 4	—	15000	17300	27500	33100	9620	264
16.1	2885	1.2	89.4	12.0	—	304 R4	BN 132S 4	—	15000	17300	27400	33000	9590	255
16.3	2940	2.2	88.3	7.5	306 L3	—	BN 132S 4	M 4SA 4	18500	21000	44700	52100	13900	274
17.0	2822	2.5	84.7	14.0	—	306 R3	BN 132S 4	M 4SA 4	18300	20700	44200	51400	13700	275
17.6	2726	2.4	81.9	7.5	306 L3	—	BN 132S 4	M 4SA 4	18100	20500	43700	50900	13600	274
18.3	2622	1.1	78.7	14.0	—	304 R3	BN 132S 4	—	14300	16500	26400	31800	9190	255
18.3	2622	1.6	78.7	14.0	—	305 R3	BN 132S 4	M 4SA 4	14300	16500	26400	31800	9190	265
18.6	2572	0.9	77.2	7.5	303 L3	—	BN 132S 4	—	14200	16400	26300	31600	9140	244
18.6	2572	1.3	77.2	7.5	304 L3	—	BN 132S 4	—	14200	16400	26300	31600	9140	254
18.6	2572	1.8	77.2	7.5	305 L3	—	BN 132S 4	—	14200	16400	26300	31600	9140	264
18.7	2564	2.8	77.0	7.5	306 L3	—	BN 132S 4	M 4SA 4	17700	20100	42900	50000	13300	274
19.6	2442	1.5	73.3	14.0	—	305 R3	BN 132S 4	M 4SA 4	14000	16200	25900	31100	8980	265
19.8	2427	2.8	72.9	14.0	—	306 R3	BN 132S 4	M 4SA 4	17400	19700	42200	49200	13100	275
19.9	2488	2.1	72.5	13.0	306 L2	—	BN 132S 4	M 4SA 4	17400	19700	42100	49100	13000	274
19.9	2407	1.4	72.3	7.5	304 L3	—	BN 132S 4	—	13900	16100	25700	31000	8940	254
19.9	2407	1.6	72.3	7.5	305 L3	—	BN 132S 4	—	13900	16100	25700	31000	8940	264
21.3	2249	2.7	67.5	14.0	—	306 R3	BN 132S 4	M 4SA 4	17000	19200	41300	48000	12700	275
22.1	2172	2.8	65.2	7.5	306 L3	—	BN 132S 4	M 4SA 4	16800	19000	40800	47500	12600	274
22.8	2101	1.0	63.1	14.0	—	303 R3	BN 132S 4	—	13300	15400	24700	29700	8540	245
22.8	2101	1.3	63.1	14.0	—	304 R3	BN 132S 4	—	13300	15400	24700	29700	8540	255
22.8	2101	1.9	63.1	14.0	—	305 R3	BN 132S 4	M 4SA 4	13300	15400	24700	29700	8540	265



$P_1 = 5.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
											HC/PC	HZ/PZ		
22.8	2100	1.1	63.1	7.5	303 L3	—	BN 132S 4	—	13300	15400	24700	29700	8540	244
22.8	2100	1.6	63.1	7.5	304 L3	—	BN 132S 4	—	13300	15400	24700	29700	8540	254
22.8	2100	2.1	63.1	7.5	305 L3	—	BN 132S 4	—	13300	15400	24700	29700	8540	264
24.3	2030	1.1	59.1	9.0	304 L2	—	BN 132S 4	—	13000	15000	24200	29200	8360	254
25.6	1931	2.6	56.3	13.0	306 L2	—	BN 132S 4	M 4SA 4	16000	18100	39100	45500	12000	274
25.8	1915	0.9	55.8	9.0	303 L2	—	BN 132S 4	—	12800	14800	23800	28700	8200	244
25.8	1915	1.7	55.8	9.0	305 L2	—	BN 132S 4	—	12800	14800	23800	28700	8200	264
26.6	1804	1.0	54.2	14.0	—	303 R3	BN 132S 4	—	12700	14600	23600	28400	8120	245
26.6	1804	2.0	54.2	14.0	—	305 R3	BN 132S 4	M 4SA 4	12700	14600	23600	28400	8120	265
27.0	1779	1.1	53.4	7.5	303 L3	—	BN 132S 4	—	12600	14500	23500	28300	8080	244
27.0	1779	1.8	53.4	7.5	304 L3	—	BN 132S 4	—	12600	14500	23500	28300	8080	254
27.0	1779	2.0	53.4	7.5	305 L3	—	BN 132S 4	—	12600	14500	23500	28300	8080	264
28.6	1674	1.3	50.3	14.0	—	303 R3	BN 132S 4	—	12300	14200	23100	27800	7920	245
28.6	1674	1.9	50.3	14.0	—	304 R3	BN 132S 4	—	12300	14200	23100	27800	7920	255
28.6	1674	2.4	50.3	14.0	—	305 R3	BN 132S 4	M 4SA 4	12300	14200	23100	27800	7920	265
30	1624	1.4	47.3	9.0	304 L2	—	BN 132S 4	—	12100	14000	22700	27300	7760	254
31	1552	1.4	46.6	14.0	—	303 R3	BN 132S 4	—	12000	13900	22600	27200	7720	245
31	1552	1.8	46.6	14.0	—	304 R3	BN 132S 4	—	12000	13900	22600	27200	7720	255
31	1552	2.5	46.6	14.0	—	305 R3	BN 132S 4	M 4SA 4	12000	13900	22600	27200	7720	265
32	1532	1.1	44.6	9.0	303 L2	—	BN 132S 4	—	11900	13700	22300	26800	7610	244
32	1532	2.3	44.6	9.0	305 L2	—	BN 132S 4	—	11900	13700	22300	26800	7610	264
33	1452	2.2	43.6	7.5	304 L3	—	BN 132S 4	—	11800	13600	22100	26600	7550	254
34	1418	1.3	42.6	14.0	—	303 R3	BN 132S 4	—	11700	13500	22000	26400	7490	245
34	1418	2.3	42.6	14.0	—	304 R3	BN 132S 4	—	11700	13500	22000	26400	7490	255
34	1418	2.4	42.6	14.0	—	305 R3	BN 132S 4	M 4SA 4	11700	13500	22000	26400	7490	265
35	1426	0.9	41.5	7.5	301 L2	—	BN 132S 4	M 4SA 4	3770	3770	10700	12300	2480	236
35	1371	0.9	41.2	12.0	—	301 R3	BN 132S 4	—	3760	3760	10600	12200	2470	237
38	1318	1.5	38.4	9.0	303 L2	—	BN 132S 4	—	11300	13000	21300	25600	7240	244
38	1318	2.1	38.4	9.0	304 L2	—	BN 132S 4	—	11300	13000	21300	25600	7240	254
38	1318	2.8	38.4	9.0	305 L2	—	BN 132S 4	—	11300	13000	21300	25600	7240	264
38	1317	1.0	38.4	7.5	301 L2	—	BN 132S 4	M 4SA 4	3670	3670	10400	12000	2410	236
39	1241	1.1	37.3	12.0	—	301 R3	BN 132S 4	—	3630	3630	10300	11900	2390	237
39	1237	1.7	37.1	14.0	—	303 R3	BN 132S 4	—	11200	12900	21100	25400	7160	245
39	1237	2.5	37.1	14.0	—	304 R3	BN 132S 4	—	11200	12900	21100	25400	7160	255
39	1237	2.8	37.1	14.0	—	305 R3	BN 132S 4	M 4SA 4	11200	12900	21100	25400	7160	265
40	1228	1.4	35.8	9.0	303 L2	—	BN 132S 4	—	11000	12700	20800	25100	7070	244
40	1228	2.9	35.8	9.0	305 L2	—	BN 132S 4	—	11000	12700	20800	25100	7070	264
43	1142	1.1	33.3	7.5	301 L2	—	BN 132S 4	M 4SA 4	3500	3500	9990	11500	2300	236
46	1048	1.7	31.5	14.0	—	303 R3	BN 132S 4	—	10600	12200	20100	24100	6770	245
46	1048	2.8	31.5	14.0	—	304 R3	BN 132S 4	—	10600	12200	20100	24100	6770	255
46	1048	2.8	31.5	14.0	—	305 R3	BN 132S 4	M 4SA 4	10600	12200	20100	24100	6770	265
47	1056	2.0	30.8	9.0	303 L2	—	BN 132S 4	—	10500	12100	19900	24000	6720	244
47	1056	2.6	30.8	9.0	304 L2	—	BN 132S 4	—	10500	12100	19900	24000	6720	254
47	1054	1.3	30.7	7.5	301 L2	—	BN 132S 4	M 4SA 4	3410	3410	9750	11200	2240	236
47	1013	1.4	30.4	12.0	—	301 R3	BN 132S 4	—	3400	3400	9730	11200	2230	237
54	907	1.9	26.4	9.0	303 L2	—	BN 132S 4	—	9960	11500	19000	22900	6390	244
56	855	2.1	25.7	14.0	—	303 R3	BN 132S 4	—	9870	11400	18900	22700	6330	245
56	855	2.8	25.7	14.0	—	304 R3	BN 132S 4	—	9870	11400	18900	22700	6330	255
56	855	2.8	25.7	14.0	—	305 R3	BN 132S 4	M 4SA 4	9870	11400	18900	22700	6330	265
58	827	1.5	24.8	12.0	—	301 R3	BN 132S 4	—	3170	3170	9150	10500	2090	237
58	850	1.0	24.8	18.0	—	303 R2	BN 132S 4	M 4SA 4	9750	11300	18700	22500	6250	245
59	844	1.5	24.6	7.5	301 L2	—	BN 132S 4	M 4SA 4	3160	3160	9130	10500	2080	236
59	842	2.2	24.5	9.0	303 L2	—	BN 132S 4	—	9720	11200	18600	22400	6230	244
63	780	2.5	22.7	9.0	303 L2	—	BN 132S 4	—	9470	10900	18200	21900	6080	244

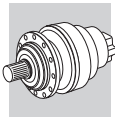


$P_1 = 5.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		HC/PC	HZ/PZ	FZ	
69	713	2.2	20.8	9.0	303 L2	—	BN 132S 4	—	9190	10600	17700	21300	5900	244	244	
72	689	0.90	20.1	7.5	300 L2	—	BN 132S 4	M 4SA 4	2960	2960	8590	9870	1940	228	228	
72	689	1.7	20.1	7.5	301 L2	—	BN 132S 4	M 4SA 4	2960	2960	8590	9870	1940	236	236	
75	660	2.4	19.2	18.0	—	303 R2	BN 132S 4	M 4SA 4	8960	10300	17300	20800	5750	245	245	
78	633	1.0	18.5	12.0	—	301 R2	BN 132S 4	M 4SA 4	2870	2870	8370	9620	1890	237	237	
79	624	1.1	18.2	7.5	300 L2	—	BN 132S 4	M 4SA 4	2860	2860	8330	9580	1880	228	228	
79	624	1.9	18.2	7.5	301 L2	—	BN 132S 4	M 4SA 4	2860	2860	8330	9580	1880	236	236	
79	622	2.8	18.1	9.0	303 L2	—	BN 132S 4	—	8780	10100	17000	20400	5630	244	244	
91	545	2.7	15.9	18.0	—	303 R2	BN 132S 4	M 4SA 4	8410	9710	16300	19700	5390	245	245	
94	527	2.8	15.3	9.0	303 L2	—	BN 132S 4	—	8310	9590	16200	19500	5330	244	244	
97	509	1.2	14.8	7.5	300 L2	—	BN 132S 4	M 4SA 4	2670	2670	7840	9010	1760	228	228	
97	509	2.2	14.8	7.5	301 L2	—	BN 132S 4	M 4SA 4	2670	2670	7840	9010	1760	236	236	
98	507	1.0	14.8	12.0	—	300 R2	BN 132S 4	M 4SA 4	2670	2670	7830	9000	1750	229	229	
98	507	1.9	14.8	12.0	—	301 R2	BN 132S 4	M 4SA 4	2670	2670	7830	9000	1750	237	237	
119	416	1.5	12.1	7.5	300 L2	—	BN 132S 4	M 4SA 4	2500	2500	7380	8480	1640	228	228	
119	416	2.5	12.1	7.5	301 L2	—	BN 132S 4	M 4SA 4	2500	2500	7380	8480	1640	236	236	
122	406	1.4	11.8	12.0	—	300 R2	BN 132S 4	M 4SA 4	2480	2480	7330	8420	1630	229	229	
122	406	2.5	11.8	12.0	—	301 R2	BN 132S 4	M 4SA 4	2480	2480	7330	8420	1630	237	237	
149	342	2.3	9.67	11.0	303 L1	—	BN 132S 4	M 4SA 4	7120	8220	14100	16900	4570	244	244	
160	318	1.0	9.00	7.5	300 L1	—	BN 132S 4	M 4SA 4	2260	2260	6750	7750	1490	228	228	
160	318	1.8	9.00	7.5	301 L1	—	BN 132S 4	M 4SA 4	2260	2260	6750	7750	1490	236	236	
165	300	1.8	8.74	12.0	—	300 R2	BN 132S 4	M 4SA 4	2240	2240	6690	7690	1470	229	229	
165	300	2.8	8.74	12.0	—	301 R2	BN 132S 4	M 4SA 4	2240	2240	6690	7690	1470	237	237	
200	255	1.6	7.20	7.5	300 L1	—	BN 132S 4	M 4SA 4	2100	2100	6310	7250	1380	228	228	
200	255	3.0	7.20	7.5	301 L1	—	BN 132S 4	M 4SA 4	2100	2100	6310	7250	1380	236	236	
202	245	2.1	7.13	12.0	—	300 R2	BN 132S 4	M 4SA 4	2090	2090	6300	7230	1380	229	229	
202	245	2.8	7.13	12.0	—	301 R2	BN 132S 4	M 4SA 4	2090	2090	6300	7230	1380	237	237	
250	204	2.2	5.77	7.5	300 L1	—	BN 132S 4	M 4SA 4	1950	1950	5910	6790	1280	228	228	
338	151	2.9	4.26	7.5	300 L1	—	BN 132S 4	M 4SA 4	1760	1760	5390	6200	1160	228	228	

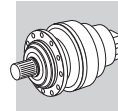
$P_1 = 7.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		HC/PC	HZ/PZ	FZ	
0.76	83311	1.7	1893	18.0	317 L4	—	BN 132MA 4	—	—	—	442000	470000	150000	362	362	
0.80	79466	1.0	1805	18.0	315 L4	—	BN 132MA 4	—	—	—	206000	243000	90000	344	344	
0.90	70197	2.4	1595	18.0	317 L4	—	BN 132MA 4	—	—	—	442000	470000	150000	362	362	
0.96	65692	1.2	1492	18.0	315 L4	—	BN 132MA 4	—	—	—	206000	243000	90000	344	344	
0.97	65368	1.0	1485	15.0	314 L4	—	BN 132MA 4	—	—	—	206000	243000	90000	334	334	
1.1	58030	2.5	1318	18.0	317 L4	—	BN 132MA 4	—	—	—	434300	462400	147000	362	362	
1.1	56509	1.7	1284	18.0	315 L4	—	BN 132MA 4	—	—	—	201500	236600	87400	344	344	
1.1	56230	1.4	1277	15.0	314 L4	—	BN 132MA 4	—	—	—	201200	236300	87300	334	334	
1.1	55709	1.0	1266	11.0	313 L4	—	BN 132MA 4	—	—	—	188000	222500	77400	324	324	
1.2	54473	2.3	1237	18.0	316 L4	—	BN 132MA 4	—	—	—	331400	368600	144000	354	354	
1.3	49166	1.1	1117	11.0	313 L4	—	BN 132MA 4	—	—	—	181100	214300	74200	324	324	
1.3	48610	2.0	1104	18.0	315 L4	—	BN 132MA 4	—	—	—	192600	226200	83200	344	344	
1.3	48370	1.6	1099	15.0	314 L4	—	BN 132MA 4	—	—	—	192400	225800	83000	334	334	
1.4	45898	2.3	1043	18.0	315 L4	—	BN 132MA 4	—	—	—	189400	222300	81600	344	344	
1.4	45898	2.8	1043	18.0	316 L4	—	BN 132MA 4	—	—	—	314800	350100	136000	354	354	
1.4	45672	1.8	1038	15.0	314 L4	—	BN 132MA 4	—	—	—	189100	222000	81400	334	334	



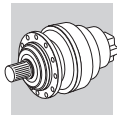
P₁ = 7.5 kW **n₁ = 1400 min⁻¹**

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
1.4	44638	1.2	1014	11.0	313 L4	—	BN 132MA 4	—	—	—	175900	208200	71800	324
1.5	43398	0.9	986	11.0	311 L4	—	BN 132MA 4	—	—	—	141100	175800	57800	314
1.5	40958	2.3	930	18.0	315 L4	—	BN 132MA 4	—	—	—	183000	214800	78500	344
1.6	40756	1.8	926	15.0	314 L4	—	BN 132MA 4	—	—	—	182700	214500	78400	334
1.6	40027	1.9	909	40	—	315 R4	BN 132MA 4	—	—	—	181700	213400	77900	345
1.6	39781	1.1	904	11.0	311 L4	—	BN 132MA 4	—	—	—	137500	171300	56200	314
1.6	39147	1.3	889	11.0	313 L4	—	BN 132MA 4	—	—	—	169100	200100	68800	324
1.7	37943	2.7	862	18.0	315 L4	—	BN 132MA 4	—	—	—	178800	210000	76600	344
1.7	37755	2.2	858	15.0	314 L4	—	BN 132MA 4	—	—	—	178600	209700	76400	334
1.7	36304	1.2	825	11.0	311 L4	—	BN 132MA 4	—	—	—	133800	166600	54500	314
1.8	34770	1.5	790	11.0	313 L4	—	BN 132MA 4	—	—	—	163200	193100	66100	324
1.8	34432	2.6	782	40	—	315 R4	BN 132MA 4	—	—	—	173700	203900	74100	345
1.9	34263	1.3	778	22	—	313 R4	BN 132MA 4	—	—	—	162500	192300	65800	325
1.9	32844	0.9	746	22	—	311 R4	BN 132MA 4	—	—	—	129800	161700	52700	315
2.0	32478	2.5	738	15.0	314 L4	—	BN 132MA 4	—	—	—	170700	200400	72700	334
2.0	31876	1.4	724	11.0	311 L4	—	BN 132MA 4	—	—	—	128700	160300	52200	314
2.1	30599	1.6	695	11.0	313 L4	—	BN 132MA 4	—	—	—	157000	185900	63300	324
2.2	29420	2.7	668	15.0	314 L4	—	BN 132MA 4	—	—	—	165700	194500	70300	334
2.2	28465	1.7	647	22	—	313 R4	BN 132MA 4	—	—	—	153700	181900	61800	325
2.3	28024	0.9	637	11.0	310 L4	—	BN 132MA 4	—	—	—	104700	131700	50000	304
2.3	27861	1.9	633	11.0	313 L4	—	BN 132MA 4	—	—	—	152700	180700	61400	324
2.3	27674	1.3	629	22	—	311 R4	BN 132MA 4	—	—	—	123300	153600	49800	315
2.3	27586	1.3	627	11.0	311 L4	—	BN 132MA 4	—	—	—	123200	153500	49700	314
2.3	27017	2.1	614	22	—	314 R4	BN 132MA 4	—	—	—	161500	189600	68400	335
2.5	24989	1.7	568	11.0	311 L4	—	BN 132MA 4	—	—	—	119600	149000	48100	314
2.6	24816	2.2	564	11.0	313 L4	—	BN 132MA 4	—	—	—	147500	174500	59100	324
2.6	24471	1.1	556	11.0	310 L4	—	BN 132MA 4	—	—	—	100600	126500	47800	304
2.7	23531	2.0	535	22	—	313 R4	BN 132MA 4	—	—	—	145100	171800	58000	325
2.7	23240	3.0	528	22	—	314 R4	BN 132MA 4	—	—	—	154400	181300	65000	335
2.8	22877	1.6	520	22	—	311 R4	BN 132MA 4	—	—	—	116500	145100	46700	315
2.8	22764	1.1	517	15.0	—	310 R4	BN 132MA 4	—	—	—	98400	123800	46600	305
2.8	22611	2.1	514	11.0	313 L4	—	BN 132MA 4	—	—	—	143400	169700	57300	324
2.8	22543	1.9	512	11.0	311 L4	—	BN 132MA 4	—	—	—	116000	144500	46500	314
2.8	22332	1.1	507	11.0	310 L4	—	BN 132MA 4	—	—	—	97900	123000	46300	304
2.9	21838	2.4	496	22	—	313 R4	BN 132MA 4	—	—	—	141900	168000	56600	325
2.9	21564	1.6	490	22	—	311 R4	BN 132MA 4	—	—	—	114400	142500	45800	315
3.2	19992	1.0	454	15.0	—	310 R4	BN 132MA 4	—	—	—	94700	119000	44700	305
3.2	19885	2.7	452	11.0	313 L4	—	BN 132MA 4	—	—	—	138000	163300	54900	324
3.2	19838	1.2	451	11.0	310 L4	—	BN 132MA 4	—	—	—	94400	118700	44500	304
3.2	19827	2.4	450	22	—	313 R4	BN 132MA 4	—	—	—	137900	163200	54800	325
3.3	19276	1.8	438	22	—	311 R4	BN 132MA 4	—	—	—	110600	137800	44100	315
3.4	18458	1.5	419	15.0	—	310 R4	BN 132MA 4	—	—	—	92400	116200	43500	305
3.5	18192	0.9	413	15.0	—	309 R4	BN 132MA 4	—	—	—	77700	100100	24000	295
3.5	18170	2.2	413	22	—	311 R4	BN 132MA 4	—	—	—	108700	135400	43300	315
3.5	18063	2.3	410	11.0	311 L4	—	BN 132MA 4	—	—	—	108500	135200	43200	314
3.6	17851	1.0	406	7.5	309 L4	—	BN 132MA 4	—	—	—	77200	99600	23800	294
3.7	17240	1.1	392	11.0	310 L4	—	BN 132MA 4	—	—	—	90500	113900	42500	304
3.7	17055	2.7	387	22	—	313 R4	BN 132MA 4	—	—	—	131800	156000	52100	325
4.0	15989	1.5	363	15.0	—	310 R4	BN 132MA 4	—	—	—	88500	111300	41500	305
4.1	15495	2.9	352	11.0	313 L4	—	BN 132MA 4	—	—	—	128000	151500	50500	324
4.1	15916	1.2	350	18.0	310 L3	—	BN 132MA 4	—	—	—	87600	110100	41000	304
4.1	15366	1.3	349	7.5	309 L4	—	BN 132MA 4	—	—	—	73800	95200	22700	294
4.1	15300	2.6	348	11.0	311 L4	—	BN 132MA 4	—	—	—	103200	128600	40900	314
4.2	15020	2.6	341	22	—	311 R4	BN 132MA 4	—	—	—	102700	127900	40600	315



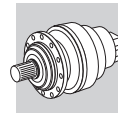
$P_1 = 7.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
4.3	14709	1.7	334	15.0	—	310 R4	BN 132MA 4	—	—	—	86300	108600	40300	305
4.3	14577	1.1	331	15.0	—	309 R4	BN 132MA 4	—	—	—	72700	93700	22300	295
4.5	14158	2.7	322	22	—	311 R4	BN 132MA 4	—	—	—	100900	125600	39800	315
4.7	13423	1.7	305	15.0	—	310 R4	BN 132MA 4	—	—	—	84000	105600	39100	305
4.7	13794	2.9	304	18.0	313 L3	—	BN 132MA 4	—	—	—	122500	145000	48100	324
4.8	13205	1.0	300	15.0	—	307 R4	BN 132MA 4	M 4LA 4	31000	38900	69400	91000	26900	285
4.9	13411	1.7	295	18.0	310 L3	—	BN 132MA 4	—	—	—	83200	104600	38700	304
4.9	12921	2.9	294	22	—	311 R4	BN 132MA 4	—	—	—	98100	122200	38600	315
4.9	13223	2.0	291	18.0	311 L3	—	BN 132MA 4	—	—	—	97900	121900	38500	314
5.1	12522	1.3	284	15.0	—	309 R4	BN 132MA 4	—	—	—	69400	89500	21200	295
5.1	12874	1.2	284	11.0	309 L3	—	BN 132MA 4	—	—	—	69400	89400	21100	294
5.1	12459	1.8	283	15.0	—	310 R4	BN 132MA 4	—	—	—	82100	103300	38100	305
5.6	11370	2.0	258	15.0	—	310 R4	BN 132MA 4	—	—	—	79900	100500	37000	305
5.6	11359	1.1	258	15.0	—	307 R4	BN 132MA 4	M 4LA 4	29500	37000	66400	87000	25600	285
5.6	11359	1.5	258	15.0	—	309 R4	BN 132MA 4	—	—	—	67400	87000	20500	295
5.8	11318	1.6	249	18.0	310 L3	—	BN 132MA 4	—	—	—	79100	99400	36600	304
5.9	11141	2.9	245	18.0	311 L3	—	BN 132MA 4	—	—	—	93000	115800	36400	314
6.0	10865	1.2	239	11.0	309 L3	—	BN 132MA 4	—	—	—	65900	85000	20000	294
6.2	10300	2.0	234	15.0	—	310 R4	BN 132MA 4	—	—	—	77600	97600	35800	305
6.2	10222	1.0	232	15.0	—	307 R4	BN 132MA 4	M 4LA 4	28400	35700	64300	84200	24700	285
6.2	10222	1.6	232	15.0	—	309 R4	BN 132MA 4	—	—	—	65300	84200	19800	295
6.3	10450	2.0	230	18.0	310 L3	—	BN 132MA 4	—	—	—	77200	97100	35600	304
6.5	10121	1.3	223	11.0	309 L3	—	BN 132MA 4	—	—	—	64500	83200	19500	294
6.5	10032	1.3	221	11.0	307 L3	—	BN 132MA 4	M 4LA 4	28000	35100	63300	83000	24300	284
6.7	9404	1.0	214	12.0	—	306 R4	BN 132MA 4	M 4LA 4	24900	28200	58300	67900	18700	275
7.0	9061	2.4	206	15.0	—	310 R4	BN 132MA 4	—	—	—	74700	93900	34300	305
7.0	9052	1.4	206	15.0	—	307 R4	BN 132MA 4	M 4LA 4	27300	34300	62000	81200	23700	285
7.0	9052	1.8	206	15.0	—	309 R4	BN 132MA 4	—	—	—	63000	81200	19000	295
7.1	9165	2.4	202	18.0	310 L3	—	BN 132MA 4	—	—	—	74200	93300	34100	304
7.1	9155	1.2	202	11.0	307 L3	—	BN 132MA 4	M 4LA 4	27100	34000	61600	80700	23600	284
7.1	9155	1.8	202	11.0	309 L3	—	BN 132MA 4	—	—	—	62600	80700	18900	294
7.6	8394	1.5	191	15.0	—	307 R4	BN 132MA 4	M 4LA 4	26600	33400	60600	79400	23200	285
7.6	8394	1.9	191	15.0	—	309 R4	BN 132MA 4	—	—	—	61600	79400	18500	295
7.6	8335	2.8	189	15.0	—	310 R4	BN 132MA 4	—	—	—	72800	91500	33400	305
7.9	8293	1.7	183	11.0	309 L3	—	BN 132MA 4	—	—	—	60800	78400	18300	294
8.0	7965	1.0	181	12.0	—	306 R4	BN 132MA 4	M 4LA 4	23600	26700	55500	64600	17700	275
8.1	8048	2.2	177	18.0	310 L3	—	BN 132MA 4	—	—	—	71400	89800	32600	304
8.1	8038	1.5	177	11.0	307 L3	—	BN 132MA 4	M 4LA 4	26000	32600	59300	77700	22600	284
8.6	7386	1.0	168	12.0	—	306 R4	BN 132MA 4	M 4LA 4	23000	26000	54200	63100	17300	275
8.7	7271	1.4	165	15.0	—	307 R4	BN 132MA 4	M 4LA 4	25400	31900	58000	76100	22100	285
8.7	7271	2.1	165	15.0	—	309 R4	BN 132MA 4	—	—	—	59000	76100	17700	295
8.8	7431	3.0	164	18.0	310 L3	—	BN 132MA 4	—	—	—	69700	87600	31800	304
8.9	7336	1.4	162	11.0	307 L3	—	BN 132MA 4	M 4LA 4	25200	31600	57700	75600	21900	284
8.9	7336	2.2	162	11.0	309 L3	—	BN 132MA 4	—	—	—	58600	75600	17500	294
9.1	6949	1.3	158	12.0	—	306 R4	BN 132MA 4	M 4LA 4	22500	25500	53200	62000	16900	275
9.5	6904	1.1	152	7.5	306 L3	—	BN 132MA 4	M 4LA 4	22200	25200	52600	61300	16700	274
9.5	6689	1.9	152	15.0	—	307 R4	BN 132MA 4	M 4LA 4	24700	31000	56600	74200	21500	285
9.5	6689	2.1	152	15.0	—	309 R4	BN 132MA 4	—	—	—	57500	74200	17200	295
9.8	6645	1.9	146	11.0	307 L3	—	BN 132MA 4	M 4LA 4	24400	30600	56000	73300	21200	284
10.2	6402	1.2	141	7.5	306 L3	—	BN 132MA 4	M 4LA 4	21700	24600	51500	59900	16300	274
10.4	6302	1.7	139	11.0	307 L3	—	BN 132MA 4	M 4LA 4	24000	30100	55100	72200	20800	284
10.4	6302	2.5	139	11.0	309 L3	—	BN 132MA 4	—	—	—	56000	72200	16700	294
11.1	5690	0.90	129	12.0	—	305 R4	BN 132MA 4	M 4LA 4	16900	19500	30600	36900	10800	265
11.4	5716	2.1	126	11.0	307 L3	—	BN 132MA 4	M 4LA 4	23200	29100	53500	70100	20200	284



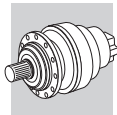
$P_1 = 7.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
11.4	5716	2.6	126	11.0	309 L3	—	BN 132MA 4	—	—	—	54400	70100	16100	294
11.9	5507	1.4	121	7.5	306 L3	—	BN 132MA 4	M 4LA 4	20600	23400	49200	57300	15500	274
12.0	5438	1.6	120	22	—	307 R3	BN 132MA 4	M 4LA 4	22800	28600	52700	69100	19800	285
12.0	5438	2.3	120	22	—	309 R3	BN 132MA 4	—	—	—	53600	69100	15900	295
12.1	5411	1.2	119	14.0	—	306 R3	BN 132MA 4	M 4LA 4	20500	23200	48900	57000	15400	275
12.7	5144	2.0	113	11.0	307 L3	—	BN 132MA 4	M 4LA 4	22400	28100	51800	67900	19500	284
12.7	5144	3.0	113	11.0	309 L3	—	BN 132MA 4	—	—	—	52700	67900	15600	294
12.8	5101	1.4	112	7.5	306 L3	—	BN 132MA 4	M 4LA 4	20100	22800	48100	56000	15100	274
13.8	4747	1.0	105	7.5	305 L3	—	BN 132MA 4	—	15800	18200	28800	34600	10100	264
13.8	4732	1.6	104	7.5	306 L3	—	BN 132MA 4	M 4LA 4	19600	22200	47000	54700	14700	274
14.4	4555	2.5	100	11.0	307 L3	—	BN 132MA 4	M 4LA 4	21500	27000	50000	65500	18700	284
14.4	4555	2.9	100	11.0	309 L3	—	BN 132MA 4	—	—	—	50800	65500	15000	294
14.5	4495	1.9	99.0	22	—	307 R3	BN 132MA 4	M 4LA 4	21400	26900	49800	65200	18600	285
14.5	4495	2.7	99.0	22	—	309 R3	BN 132MA 4	—	—	—	50600	65200	14900	295
14.6	4473	1.4	98.5	14.0	—	306 R3	BN 132MA 4	M 4LA 4	19200	21800	46200	53800	14400	275
15.5	4224	2.6	93.0	11.0	307 L3	—	BN 132MA 4	M 4LA 4	21000	26300	48900	64000	18200	284
16.0	4096	1.0	90.2	7.5	305 L3	—	BN 132MA 4	—	15000	17300	27500	33100	9620	264
16.3	4009	1.6	88.3	7.5	306 L3	—	BN 132MA 4	M 4LA 4	18500	21000	44700	52100	13900	274
17.0	3848	1.8	84.7	14.0	—	306 R3	BN 132MA 4	M 4LA 4	18300	20700	44200	51400	13700	275
17.3	3788	2.5	83.4	22	—	307 R3	BN 132MA 4	M 4LA 4	20200	25400	47300	62000	17600	285
17.6	3717	1.8	81.9	7.5	306 L3	—	BN 132MA 4	M 4LA 4	18100	20500	43700	50900	13600	274
17.9	3659	2.6	80.6	11.0	307 L3	—	BN 132MA 4	M 4LA 4	20000	25100	46800	61300	17400	284
18.3	3575	1.1	78.7	14.0	—	305 R3	BN 132MA 4	M 4LA 4	14300	16500	26400	31800	9190	265
18.3	3570	2.9	78.6	22	—	307 R3	BN 132MA 4	M 4LA 4	19800	24900	46500	60900	17200	285
18.6	3508	1.0	77.2	7.5	304 L3	—	BN 132MA 4	—	14200	16400	26300	31600	9140	254
18.6	3508	1.3	77.2	7.5	305 L3	—	BN 132MA 4	—	14200	16400	26300	31600	9140	264
18.7	3497	2.1	77.0	7.5	306 L3	—	BN 132MA 4	M 4LA 4	17700	20100	42900	50000	13300	274
19.6	3330	1.1	73.3	14.0	—	305 R3	BN 132MA 4	M 4LA 4	14000	16200	25900	31100	8980	265
19.8	3310	2.1	72.9	14.0	—	306 R3	BN 132MA 4	M 4LA 4	17400	19700	42200	49200	13100	275
19.9	3393	1.5	72.5	13.0	306 L2	—	BN 132MA 4	M 4LA 4	17400	19700	42100	49100	13000	274
19.9	3282	1.0	72.3	7.5	304 L3	—	BN 132MA 4	—	13900	16100	25700	31000	8940	254
19.9	3282	1.2	72.3	7.5	305 L3	—	BN 132MA 4	—	13900	16100	25700	31000	8940	264
20.1	3258	2.8	71.8	22	—	307 R3	BN 132MA 4	M 4LA 4	19200	24100	45200	59200	16700	285
21.3	3066	1.9	67.5	14.0	—	306 R3	BN 132MA 4	M 4LA 4	17000	19200	41300	48000	12700	275
22.1	2962	2.0	65.2	7.5	306 L3	—	BN 132MA 4	M 4LA 4	16800	19000	40800	47500	12600	274
22.8	2864	1.0	63.1	14.0	—	304 R3	BN 132MA 4	—	13300	15400	24700	29700	8540	255
22.8	2864	1.4	63.1	14.0	—	305 R3	BN 132MA 4	M 4LA 4	13300	15400	24700	29700	8540	265
22.8	2863	1.2	63.1	7.5	304 L3	—	BN 132MA 4	—	13300	15400	24700	29700	8540	254
22.8	2863	1.5	63.1	7.5	305 L3	—	BN 132MA 4	—	13300	15400	24700	29700	8540	264
24.8	2638	2.7	58.1	14.0	—	306 R3	BN 132MA 4	M 4LA 4	16100	18300	39400	45900	12100	275
25.6	2633	1.9	56.3	13.0	306 L2	—	BN 132MA 4	M 4LA 4	16000	18100	39100	45500	12000	274
25.8	2612	1.2	55.8	9.0	305 L2	—	BN 132MA 4	—	12800	14800	23800	28700	8200	264
26.6	2461	1.5	54.2	14.0	—	305 R3	BN 132MA 4	M 4LA 4	12700	14600	23600	28400	8120	265
27.0	2425	1.3	53.4	7.5	304 L3	—	BN 132MA 4	—	12600	14500	23500	28300	8080	254
27.0	2425	1.5	53.4	7.5	305 L3	—	BN 132MA 4	—	12600	14500	23500	28300	8080	264
27.0	2418	2.4	53.2	7.5	306 L3	—	BN 132MA 4	M 4LA 4	15700	17800	38400	44700	11800	274
28.6	2283	0.9	50.3	14.0	—	303 R3	BN 132MA 4	—	12300	14200	23100	27800	7920	245
28.6	2283	1.4	50.3	14.0	—	304 R3	BN 132MA 4	—	12300	14200	23100	27800	7920	255
28.6	2283	1.8	50.3	14.0	—	305 R3	BN 132MA 4	M 4LA 4	12300	14200	23100	27800	7920	265
30	2215	1.0	47.3	9.0	304 L2	—	BN 132MA 4	—	12100	14000	22700	27300	7760	254
31	2117	1.0	46.6	14.0	—	303 R3	BN 132MA 4	—	12000	13900	22600	27200	7720	245
31	2117	1.3	46.6	14.0	—	304 R3	BN 132MA 4	—	12000	13900	22600	27200	7720	255
31	2117	1.8	46.6	14.0	—	305 R3	BN 132MA 4	M 4LA 4	12000	13900	22600	27200	7720	265
31	2176	2.7	46.5	13.0	306 L2	—	BN 132MA 4	M 4LA 4	15000	17000	36900	43000	11300	274



P₁ = 7.5 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
											HC/PC	HZ/PZ		
32	2089	1.7	44.6	9.0	305 L2	—	BN 132MA 4	—	11900	13700	22300	26800	7610	264
33	1980	1.6	43.6	7.5	304 L3	—	BN 132MA 4	—	11800	13600	22100	26600	7550	254
34	1934	0.9	42.6	14.0	—	303 R3	BN 132MA 4	—	11700	13500	22000	26400	7490	245
34	1934	1.7	42.6	14.0	—	304 R3	BN 132MA 4	—	11700	13500	22000	26400	7490	255
34	1934	1.7	42.6	14.0	—	305 R3	BN 132MA 4	M 4LA 4	11700	13500	22000	26400	7490	265
38	1797	1.1	38.4	9.0	303 L2	—	BN 132MA 4	—	11300	13000	21300	25600	7240	244
38	1797	1.5	38.4	9.0	304 L2	—	BN 132MA 4	—	11300	13000	21300	25600	7240	254
38	1797	2.1	38.4	9.0	305 L2	—	BN 132MA 4	—	11300	13000	21300	25600	7240	264
39	1687	1.2	37.1	14.0	—	303 R3	BN 132MA 4	—	11200	12900	21100	25400	7160	245
39	1687	1.9	37.1	14.0	—	304 R3	BN 132MA 4	—	11200	12900	21100	25400	7160	255
39	1687	2.1	37.1	14.0	—	305 R3	BN 132MA 4	M 4LA 4	11200	12900	21100	25400	7160	265
40	1674	1.1	35.8	9.0	303 L2	—	BN 132MA 4	—	11000	12700	20800	25100	7070	244
40	1674	2.1	35.8	9.0	305 L2	—	BN 132MA 4	—	11000	12700	20800	25100	7070	264
46	1429	1.3	31.5	14.0	—	303 R3	BN 132MA 4	—	10600	12200	20100	24100	6770	245
46	1429	2.1	31.5	14.0	—	304 R3	BN 132MA 4	—	10600	12200	20100	24100	6770	255
46	1429	2.1	31.5	14.0	—	305 R3	BN 132MA 4	M 4LA 4	10600	12200	20100	24100	6770	265
47	1440	1.5	30.8	9.0	303 L2	—	BN 132MA 4	—	10500	12100	19900	24000	6720	244
47	1440	1.9	30.8	9.0	304 L2	—	BN 132MA 4	—	10500	12100	19900	24000	6720	254
47	1440	2.5	30.8	9.0	305 L2	—	BN 132MA 4	—	10500	12100	19900	24000	6720	264
47	1437	1.0	30.7	7.5	301 L2	—	BN 132MA 4	M 4LA 4	3410	3410	9750	11200	2240	236
47	1381	1.0	30.4	12.0	—	301 R3	BN 132MA 4	—	3400	3400	9730	11200	2230	237
54	1237	1.4	26.4	9.0	303 L2	—	BN 132MA 4	—	9960	11500	19000	22900	6390	244
54	1237	2.8	26.4	9.0	305 L2	—	BN 132MA 4	—	9960	11500	19000	22900	6390	264
56	1166	1.5	25.7	14.0	—	303 R3	BN 132MA 4	—	9870	11400	18900	22700	6330	245
56	1166	2.1	25.7	14.0	—	304 R3	BN 132MA 4	—	9870	11400	18900	22700	6330	255
56	1166	2.1	25.7	14.0	—	305 R3	BN 132MA 4	M 4LA 4	9870	11400	18900	22700	6330	265
58	1127	1.1	24.8	12.0	—	301 R3	BN 132MA 4	—	3170	3170	9150	10500	2090	237
59	1151	1.1	24.6	7.5	301 L2	—	BN 132MA 4	M 4LA 4	3160	3160	9130	10500	2080	236
59	1148	1.6	24.5	9.0	303 L2	—	BN 132MA 4	—	9720	11200	18600	22400	6230	244
59	1148	2.6	24.5	9.0	304 L2	—	BN 132MA 4	—	9720	11200	18600	22400	6230	254
59	1148	2.9	24.5	9.0	305 L2	—	BN 132MA 4	—	9720	11200	18600	22400	6230	264
63	1064	1.9	22.7	9.0	303 L2	—	BN 132MA 4	—	9470	10900	18200	21900	6080	244
63	1064	2.5	22.7	9.0	304 L2	—	BN 132MA 4	—	9470	10900	18200	21900	6080	254
69	972	1.6	20.8	9.0	303 L2	—	BN 132MA 4	—	9190	10600	17700	21300	5900	244
69	972	2.9	20.8	9.0	305 L2	—	BN 132MA 4	—	9190	10600	17700	21300	5900	264
69	972	2.9	20.8	9.0	304 L2	—	BN 132MA 4	—	9190	10600	17700	21300	5900	254
72	940	1.2	20.1	7.5	301 L2	—	BN 132MA 4	M 4LA 4	2960	2960	8590	9870	1940	236
75	900	1.7	19.2	18.0	—	303 R2	BN 132MA 4	M 4LA 4	8960	10300	17300	20800	5750	245
75	900	3.0	19.2	18.0	—	305 R2	BN 132MA 4	M 4LA 4	8960	10300	17300	20800	5750	265
79	851	1.4	18.2	7.5	301 L2	—	BN 132MA 4	M 4LA 4	2860	2860	8330	9580	1880	236
79	848	2.1	18.1	9.0	303 L2	—	BN 132MA 4	—	8780	10100	17000	20400	5630	244
86	788	2.8	16.8	18.0	—	304 R2	BN 132MA 4	M 4LA 4	8570	9900	16600	20000	5500	255
91	744	2.0	15.9	18.0	—	303 R2	BN 132MA 4	M 4LA 4	8410	9710	16300	19700	5390	245
94	718	2.1	15.3	9.0	303 L2	—	BN 132MA 4	—	8310	9590	16200	19500	5330	244
97	694	1.6	14.8	7.5	301 L2	—	BN 132MA 4	M 4LA 4	2670	2670	7840	9010	1760	236
98	691	1.4	14.8	12.0	—	301 R2	BN 132MA 4	M 4LA 4	2670	2670	7830	9000	1750	237
105	640	2.6	13.7	18.0	—	303 R2	BN 132MA 4	M 4LA 4	8000	9230	15600	18800	5130	245
115	586	2.5	12.5	9.0	303 L2	—	BN 132MA 4	—	7770	8970	15200	18300	4980	244
119	567	1.1	12.1	7.5	300 L2	—	BN 132MA 4	M 4LA 4	2500	2500	7380	8480	1640	228
119	567	1.9	12.1	7.5	301 L2	—	BN 132MA 4	M 4LA 4	2500	2500	7380	8480	1640	236
122	554	1.0	11.8	12.0	—	300 R2	BN 132MA 4	M 4LA 4	2480	2480	7330	8420	1630	229
122	554	1.8	11.8	12.0	—	301 R2	BN 132MA 4	M 4LA 4	2480	2480	7330	8420	1630	237
149	466	1.7	9.67	11.0	303 L1	—	BN 132MA 4	M 4LA 4	7120	8220	14100	16900	4570	244
160	434	1.3	9.00	7.5	301 L1	—	BN 132MA 4	M 4LA 4	2260	2260	6750	7750	1490	236

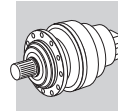


$P_1 = 7.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
											HC/PC	HZ/PZ		
165	409	1.3	8.74	12.0	—	300 R2	BN 132MA 4	M 4LA 4	2240	2240	6690	7690	1470	229
165	409	2.1	8.74	12.0	—	301 R2	BN 132MA 4	M 4LA 4	2240	2240	6690	7690	1470	237
200	347	1.2	7.20	7.5	300 L1	—	BN 132MA 4	M 4LA 4	2100	2100	6310	7250	1380	228
200	347	2.2	7.20	7.5	301 L1	—	BN 132MA 4	M 4LA 4	2100	2100	6310	7250	1380	236
202	334	1.6	7.13	12.0	—	300 R2	BN 132MA 4	M 4LA 4	2090	2090	6300	7230	1380	229
202	334	2.1	7.13	12.0	—	301 R2	BN 132MA 4	M 4LA 4	2090	2090	6300	7230	1380	237
250	278	1.6	5.77	7.5	300 L1	—	BN 132MA 4	M 4LA 4	1950	1950	5910	6790	1280	228
250	278	2.9	5.77	7.5	301 L1	—	BN 132MA 4	M 4LA 4	1950	1950	5910	6790	1280	236
338	206	2.1	4.26	7.5	300 L1	—	BN 132MA 4	M 4LA 4	1760	1760	5390	6200	1160	228

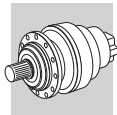
$P_1 = 9.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
											HC/PC	HZ/PZ		
0.76	102195	1.4	1893	18.0	317 L4	—	BN 132MB 4	—	—	—	442000	470000	150000	362
0.90	86109	2.0	1595	18.0	317 L4	—	BN 132MB 4	—	—	—	442000	470000	150000	362
0.96	80582	1.0	1492	18.0	315 L4	—	BN 132MB 4	—	—	—	206000	243000	90000	344
1.1	71183	2.0	1318	18.0	317 L4	—	BN 132MB 4	—	—	—	434300	462400	147000	362
1.1	69318	1.4	1284	18.0	315 L4	—	BN 132MB 4	—	—	—	201500	236600	87400	344
1.1	68976	1.1	1277	15.0	314 L4	—	BN 132MB 4	—	—	—	201200	236300	87300	334
1.2	66820	1.8	1237	18.0	316 L4	—	BN 132MB 4	—	—	—	331400	368600	144000	354
1.3	61233	2.7	1134	18.0	317 L4	—	BN 132MB 4	—	—	—	415100	442000	139800	362
1.3	59628	1.6	1104	18.0	315 L4	—	BN 132MB 4	—	—	—	192600	226200	83200	344
1.3	59334	1.3	1099	15.0	314 L4	—	BN 132MB 4	—	—	—	192400	225800	83000	334
1.4	56302	1.8	1043	18.0	315 L4	—	BN 132MB 4	—	—	—	189400	222300	81600	344
1.4	56302	2.3	1043	18.0	316 L4	—	BN 132MB 4	—	—	—	314800	350100	136000	354
1.4	56024	1.5	1038	15.0	314 L4	—	BN 132MB 4	—	—	—	189100	222000	81400	334
1.4	54756	1.0	1014	11.0	313 L4	—	BN 132MB 4	—	—	—	175900	208200	71800	324
1.5	51476	2.7	953	50	—	317 R4	BN 132MB 4	—	—	—	394100	419600	132000	363
1.5	50242	1.9	930	18.0	315 L4	—	BN 132MB 4	—	—	—	183000	214800	78500	344
1.6	49994	1.5	926	15.0	314 L4	—	BN 132MB 4	—	—	—	182700	214500	78400	334
1.6	49100	1.5	909	40	—	315 R4	BN 132MB 4	—	—	—	181700	213400	77900	345
1.6	48798	0.9	904	11.0	311 L4	—	BN 132MB 4	—	—	—	137500	171300	56200	314
1.6	48021	1.1	889	11.0	313 L4	—	BN 132MB 4	—	—	—	169100	200100	68800	324
1.7	46543	2.2	862	18.0	315 L4	—	BN 132MB 4	—	—	—	178800	210000	76600	344
1.7	46543	2.7	862	18.0	316 L4	—	BN 132MB 4	—	—	—	297400	330700	127600	354
1.7	46313	1.8	858	15.0	314 L4	—	BN 132MB 4	—	—	—	178600	209700	76400	334
1.7	44533	1.0	825	11.0	311 L4	—	BN 132MB 4	—	—	—	133800	166600	54500	314
1.8	43872	2.9	812	18.0	316 L4	—	BN 132MB 4	—	—	—	292100	324900	125100	354
1.8	42652	1.2	790	11.0	313 L4	—	BN 132MB 4	—	—	—	163200	193100	66100	324
1.8	42237	2.2	782	40	—	315 R4	BN 132MB 4	—	—	—	173700	203900	74100	345
1.9	42029	1.1	778	22	—	313 R4	BN 132MB 4	—	—	—	162500	192300	65800	325
1.9	40037	2.5	742	18.0	315 L4	—	BN 132MB 4	—	—	—	170900	200700	72800	344
2.0	39839	2.0	738	15.0	314 L4	—	BN 132MB 4	—	—	—	170700	200400	72700	334
2.0	39101	1.2	724	11.0	311 L4	—	BN 132MB 4	—	—	—	128700	160300	52200	314
2.1	37535	1.3	695	11.0	313 L4	—	BN 132MB 4	—	—	—	157000	185900	63300	324
2.1	36267	2.8	671	18.0	315 L4	—	BN 132MB 4	—	—	—	165900	194800	70500	344
2.2	36088	2.2	668	15.0	314 L4	—	BN 132MB 4	—	—	—	165700	194500	70300	334



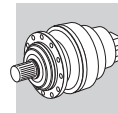
P₁ = 9.2 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
2.2	35588	2.5	659	40	—	315 R4	BN 132MB 4	—	—	—	165000	193700	70000	345
2.2	34917	1.4	647	22	—	313 R4	BN 132MB 4	—	—	—	153700	181900	61800	325
2.3	34176	1.5	633	11.0	313 L4	—	BN 132MB 4	—	—	—	152700	180700	61400	324
2.3	33947	1.1	629	22	—	311 R4	BN 132MB 4	—	—	—	123300	153600	49800	315
2.3	33839	1.1	627	11.0	311 L4	—	BN 132MB 4	—	—	—	123200	153500	49700	314
2.3	33657	3.0	623	40	—	315 R4	BN 132MB 4	—	—	—	162300	190500	68700	345
2.3	33141	1.7	614	22	—	314 R4	BN 132MB 4	—	—	—	161500	189600	68400	335
2.4	31747	2.5	588	15.0	314 L4	—	BN 132MB 4	—	—	—	159500	187200	67400	334
2.5	30653	1.4	568	11.0	311 L4	—	BN 132MB 4	—	—	—	119600	149000	48100	314
2.6	30442	1.8	564	11.0	313 L4	—	BN 132MB 4	—	—	—	147500	174500	59100	324
2.6	30017	0.90	556	11.0	310 L4	—	BN 132MB 4	—	—	—	100600	126500	47800	304
2.6	29925	2.7	554	15.0	314 L4	—	BN 132MB 4	—	—	—	156600	183900	66100	334
2.7	28864	1.7	535	22	—	313 R4	BN 132MB 4	—	—	—	145100	171800	58000	325
2.7	28508	2.4	528	22	—	314 R4	BN 132MB 4	—	—	—	154400	181300	65000	335
2.8	28063	1.3	520	22	—	311 R4	BN 132MB 4	—	—	—	116500	145100	46700	315
2.8	27924	0.90	517	15.0	—	310 R4	BN 132MB 4	—	—	—	98400	123800	46600	305
2.8	27736	1.7	514	11.0	313 L4	—	BN 132MB 4	—	—	—	143400	169700	57300	324
2.8	27652	1.6	512	11.0	311 L4	—	BN 132MB 4	—	—	—	116000	144500	46500	314
2.8	27394	0.9	507	11.0	310 L4	—	BN 132MB 4	—	—	—	97900	123000	46300	304
2.9	26788	1.9	496	22	—	313 R4	BN 132MB 4	—	—	—	141900	168000	56600	325
2.9	26704	3.0	495	15.0	314 L4	—	BN 132MB 4	—	—	—	151400	177700	63600	334
2.9	26452	1.3	490	22	—	311 R4	BN 132MB 4	—	—	—	114400	142500	45800	315
3.2	24392	2.2	452	11.0	313 L4	—	BN 132MB 4	—	—	—	138000	163300	54900	324
3.2	24334	1.0	451	11.0	310 L4	—	BN 132MB 4	—	—	—	94400	118700	44500	304
3.2	24321	1.9	450	22	—	313 R4	BN 132MB 4	—	—	—	137900	163200	54800	325
3.2	24021	2.8	445	22	—	314 R4	BN 132MB 4	—	—	—	146700	172200	61400	335
3.3	23645	1.5	438	22	—	311 R4	BN 132MB 4	—	—	—	110600	137800	44100	315
3.4	22642	1.3	419	15.0	—	310 R4	BN 132MB 4	—	—	—	92400	116200	43500	305
3.5	22288	1.8	413	22	—	311 R4	BN 132MB 4	—	—	—	108700	135400	43300	315
3.5	22157	1.9	410	11.0	311 L4	—	BN 132MB 4	—	—	—	108500	135200	43200	314
3.7	21279	2.6	394	11.0	313 L4	—	BN 132MB 4	—	—	—	132500	156800	52400	324
3.7	21148	0.9	392	11.0	310 L4	—	BN 132MB 4	—	—	—	90500	113900	42500	304
3.7	20921	2.2	387	22	—	313 R4	BN 132MB 4	—	—	—	131800	156000	52100	325
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4.1	19007	2.4	352	11.0	313 L4	—	BN 132MB 4	—	—	—	128000	151500	50500	324
4.1	19524	1.0	350	18.0	310 L3	—	BN 132MB 4	—	—	—	87600	110100	41000	304
4.1	18849	1.0	349	7.5	309 L4	—	BN 132MB 4	—	—	—	73800	95200	22700	294
4.1	18769	2.1	348	11.0	311 L4	—	BN 132MB 4	—	—	—	103200	128600	40900	314
4.2	18659	2.6	346	22	—	313 R4	BN 132MB 4	—	—	—	127300	150700	50200	325
4.2	18425	2.1	341	22	—	311 R4	BN 132MB 4	—	—	—	102700	127900	40600	315
4.3	18043	1.4	334	15.0	—	310 R4	BN 132MB 4	—	—	—	86300	108600	40300	305
4.3	17881	0.9	331	15.0	—	309 R4	BN 132MB 4	—	—	—	72700	93700	22300	295
4.5	17367	2.2	322	22	—	311 R4	BN 132MB 4	—	—	—	100900	125600	39800	315
4.7	16672	2.6	309	22	—	313 R4	BN 132MB 4	—	—	—	123100	145700	48300	325
4.7	16466	1.4	305	15.0	—	310 R4	BN 132MB 4	—	—	—	84000	105600	39100	305
4.7	16921	2.3	304	18.0	313 L3	—	BN 132MB 4	—	—	—	122500	145000	48100	324
4.9	16451	1.4	295	18.0	310 L3	—	BN 132MB 4	—	—	—	83200	104600	38700	304
4.9	15849	2.4	294	22	—	311 R4	BN 132MB 4	—	—	—	98100	122200	38600	315
4.9	16220	1.7	291	18.0	311 L3	—	BN 132MB 4	—	—	—	97900	121900	38500	314
5.1	15361	1.1	284	15.0	—	309 R4	BN 132MB 4	—	—	—	69400	89500	21200	295
5.1	15793	1.0	284	11.0	309 L3	—	BN 132MB 4	—	—	—	69400	89400	21100	294
5.1	15283	1.5	283	15.0	—	310 R4	BN 132MB 4	—	—	—	82100	103300	38100	305



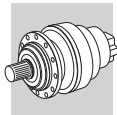
P₁ = 9.2 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
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5.4	14357	2.6	266	22	—	311 R4	BN 132MB 4	—	—	—	95300	118700	37400	315
5.6	13948	1.6	258	15.0	—	310 R4	BN 132MB 4	—	—	—	79900	100500	37000	305
5.6	13934	0.9	258	15.0	—	307 R4	BN 132MB 4	M 4LB 4	29500	37000	66400	87000	25600	285
5.6	13934	1.2	258	15.0	—	309 R4	BN 132MB 4	—	—	—	67400	87000	20500	295
5.8	13884	1.3	249	18.0	310 L3	—	BN 132MB 4	—	—	—	79100	99400	36600	304
5.9	13667	2.4	245	18.0	311 L3	—	BN 132MB 4	—	—	—	93000	115800	36400	314
6.0	13328	1.0	239	11.0	309 L3	—	BN 132MB 4	—	—	—	65900	85000	20000	294
6.1	12790	2.7	237	22	—	313 R4	BN 132MB 4	—	—	—	113700	134600	44200	325
6.2	12634	1.6	234	15.0	—	310 R4	BN 132MB 4	—	—	—	77600	97600	35800	305
6.2	12539	1.3	232	15.0	—	309 R4	BN 132MB 4	—	—	—	65300	84200	19800	295
6.3	12819	1.7	230	18.0	310 L3	—	BN 132MB 4	—	—	—	77200	97100	35600	304
6.3	12350	2.8	229	22	—	311 R4	BN 132MB 4	—	—	—	91100	113400	35500	315
6.5	12415	1.0	223	11.0	309 L3	—	BN 132MB 4	—	—	—	64500	83200	19500	294
6.5	12306	1.0	221	11.0	307 L3	—	BN 132MB 4	M 4LB 4	28000	35100	63300	83000	24300	284
7.0	11114	2.0	206	15.0	—	310 R4	BN 132MB 4	—	—	—	74700	93900	34300	305
7.0	11103	1.1	206	15.0	—	307 R4	BN 132MB 4	M 4LB 4	27300	34300	62000	81200	23700	285
7.0	11103	1.5	206	15.0	—	309 R4	BN 132MB 4	—	—	—	63000	81200	19000	295
7.1	11298	2.9	203	18.0	311 L3	—	BN 132MB 4	—	—	—	87800	109400	34100	314
7.1	11242	1.9	202	18.0	310 L3	—	BN 132MB 4	—	—	—	74200	93300	34100	304
7.1	11230	0.9	202	11.0	307 L3	—	BN 132MB 4	M 4LB 4	27100	34000	61600	80700	23600	284
7.1	11230	1.4	202	11.0	309 L3	—	BN 132MB 4	—	—	—	62600	80700	18900	294
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7.5	10649	3.0	191	18.0	311 L3	—	BN 132MB 4	—	—	—	86300	107500	33500	314
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7.6	10224	2.3	189	15.0	—	310 R4	BN 132MB 4	—	—	—	72800	91500	33400	305
7.8	9967	2.7	185	22	—	313 R4	BN 132MB 4	—	—	—	105500	124900	40700	325
7.9	10173	1.4	183	11.0	309 L3	—	BN 132MB 4	—	—	—	60800	78400	18300	294
7.9	9842	2.7	182	22	—	311 R4	BN 132MB 4	—	—	—	85100	106000	32900	315
8.1	9873	1.8	177	18.0	310 L3	—	BN 132MB 4	—	—	—	71400	89800	32600	304
8.1	9860	1.2	177	11.0	307 L3	—	BN 132MB 4	M 4LB 4	26000	32600	59300	77700	22600	284
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8.9	8999	1.2	162	11.0	307 L3	—	BN 132MB 4	M 4LB 4	25200	31600	57700	75600	21900	284
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9.0	8661	2.6	160	15.0	—	310 R4	BN 132MB 4	—	—	—	69300	87100	31600	305
9.1	8524	1.0	158	12.0	—	306 R4	BN 132MB 4	M 4LB 4	22500	25500	53200	62000	16900	275
9.3	8336	2.7	154	22	—	311 R4	BN 132MB 4	—	—	—	80900	100800	31200	315
9.5	8205	1.5	152	15.0	—	307 R4	BN 132MB 4	M 4LB 4	24700	31000	56600	74200	21500	285
9.5	8205	1.7	152	15.0	—	309 R4	BN 132MB 4	—	—	—	57500	74200	17200	295
9.8	8151	1.5	146	11.0	307 L3	—	BN 132MB 4	M 4LB 4	24400	30600	56000	73300	21200	284
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10.4	7730	1.4	139	11.0	307 L3	—	BN 132MB 4	M 4LB 4	24000	30100	55100	72200	20800	284
10.4	7730	2.1	139	11.0	309 L3	—	BN 132MB 4	—	—	—	56000	72200	16700	294
10.6	7336	2.7	136	15.0	—	310 R4	BN 132MB 4	—	—	—	65900	82900	29900	305
11.0	7264	2.8	130	18.0	310 L3	—	BN 132MB 4	—	—	—	65100	81900	29500	304
11.4	7012	1.7	126	11.0	307 L3	—	BN 132MB 4	M 4LB 4	23200	29100	53500	70100	20200	284
11.4	7012	2.1	126	11.0	309 L3	—	BN 132MB 4	—	—	—	54400	70100	16100	294



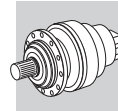
P₁ = 9.2 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
11.9	6755	1.1	121	7.5	306 L3	—	BN 132MB 4	M 4LB 4	20600	23400	49200	57300	15500	274
12.0	6671	1.3	120	22	—	307 R3	BN 132MB 4	M 4LB 4	22800	28600	52700	69100	19800	285
12.0	6671	1.9	120	22	—	309 R3	BN 132MB 4	—	—	—	53600	69100	15900	295
12.0	6671	2.6	120	22	—	310 R3	BN 132MB 4	—	—	—	63500	79800	28600	305
12.1	6638	1.0	119	14.0	—	306 R3	BN 132MB 4	M 4LB 4	20500	23200	48900	57000	15400	275
12.1	6629	2.9	119	18.0	310 L3	—	BN 132MB 4	—	—	—	63300	79600	28600	304
12.7	6310	1.6	113	11.0	307 L3	—	BN 132MB 4	M 4LB 4	22400	28100	51800	67900	19500	284
12.7	6310	2.4	113	11.0	309 L3	—	BN 132MB 4	—	—	—	52700	67900	15600	294
12.8	6258	1.1	112	7.5	306 L3	—	BN 132MB 4	M 4LB 4	20100	22800	48100	56000	15100	274
13.0	6153	2.8	110	18.0	310 L3	—	BN 132MB 4	—	—	—	61900	77900	27900	304
13.8	5805	1.3	104	7.5	306 L3	—	BN 132MB 4	M 4LB 4	19600	22200	47000	54700	14700	274
14.4	5588	2.0	100	11.0	307 L3	—	BN 132MB 4	M 4LB 4	21500	27000	50000	65500	18700	284
14.4	5588	2.4	100	11.0	309 L3	—	BN 132MB 4	—	—	—	50800	65500	15000	294
14.5	5514	1.5	99.0	22	—	307 R3	BN 132MB 4	M 4LB 4	21400	26900	49800	65200	18600	285
14.5	5514	2.2	99.0	22	—	309 R3	BN 132MB 4	—	—	—	50600	65200	14900	295
14.5	5514	2.7	99.0	22	—	310 R3	BN 132MB 4	—	—	—	59900	75400	26900	305
14.6	5487	1.2	98.5	14.0	—	306 R3	BN 132MB 4	M 4LB 4	19200	21800	46200	53800	14400	275
15.5	5181	2.1	93.0	11.0	307 L3	—	BN 132MB 4	M 4LB 4	21000	26300	48900	64000	18200	284
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15.8	5086	3.0	91.3	18.0	310 L3	—	BN 132MB 4	—	—	—	58500	73600	26200	304
16.3	4917	1.3	88.3	7.5	306 L3	—	BN 132MB 4	M 4LB 4	18500	21000	44700	52100	13900	274
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17.3	4646	2.7	83.4	22	—	309 R3	BN 132MB 4	—	—	—	48000	62000	14100	295
17.3	4646	2.7	83.4	22	—	310 R3	BN 132MB 4	—	—	—	56900	71600	25400	305
17.6	4560	1.4	81.9	7.5	306 L3	—	BN 132MB 4	M 4LB 4	18100	20500	43700	50900	13600	274
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17.9	4488	3.0	80.6	11.0	309 L3	—	BN 132MB 4	—	—	—	47600	61300	13900	294
18.3	4385	0.9	78.7	14.0	—	305 R3	BN 132MB 4	M 4LB 4	14300	16500	26400	31800	9190	265
18.3	4380	2.4	78.6	22	—	307 R3	BN 132MB 4	M 4LB 4	19800	24900	46500	60900	17200	285
18.3	4380	2.7	78.6	22	—	310 R3	BN 132MB 4	—	—	—	55900	70300	24900	305
18.6	4303	1.1	77.2	7.5	305 L3	—	BN 132MB 4	—	14200	16400	26300	31600	9140	264
18.7	4290	1.7	77.0	7.5	306 L3	—	BN 132MB 4	M 4LB 4	17700	20100	42900	50000	13300	274
19.4	4129	2.5	74.1	11.0	307 L3	—	BN 132MB 4	M 4LB 4	19400	24400	45600	59800	16900	284
19.8	4060	1.7	72.9	14.0	—	306 R3	BN 132MB 4	M 4LB 4	17400	19700	42200	49200	13100	275
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20.1	3997	2.7	71.8	22	—	310 R3	BN 132MB 4	—	—	—	54400	68400	24100	305
21.3	3761	1.6	67.5	14.0	—	306 R3	BN 132MB 4	M 4LB 4	17000	19200	41300	48000	12700	275
22.1	3634	1.7	65.2	7.5	306 L3	—	BN 132MB 4	M 4LB 4	16800	19000	40800	47500	12600	274
22.2	3621	2.7	65.0	22	—	307 R3	BN 132MB 4	M 4LB 4	18600	23300	43900	57500	16200	285
22.2	3621	2.7	65.0	22	—	309 R3	BN 132MB 4	—	—	—	44600	57500	12900	295
22.2	3621	2.7	65.0	22	—	310 R3	BN 132MB 4	—	—	—	52800	66400	23400	305
22.8	3514	1.1	63.1	14.0	—	305 R3	BN 132MB 4	M 4LB 4	13300	15400	24700	29700	8540	265
22.8	3512	0.9	63.1	7.5	304 L3	—	BN 132MB 4	—	13300	15400	24700	29700	8540	254
22.8	3512	1.2	63.1	7.5	305 L3	—	BN 132MB 4	—	13300	15400	24700	29700	8540	264
23.8	3370	2.9	60.5	11.0	307 L3	—	BN 132MB 4	M 4LB 4	18200	22800	42900	56300	15800	284
24.8	3236	2.2	58.1	14.0	—	306 R3	BN 132MB 4	M 4LB 4	16100	18300	39400	45900	12100	275
25.6	3230	1.6	56.3	13.0	306 L2	—	BN 132MB 4	M 4LB 4	16000	18100	39100	45500	12000	274
25.8	3114	2.7	55.9	22	—	307 R3	BN 132MB 4	M 4LB 4	17700	22200	41900	55000	15400	285



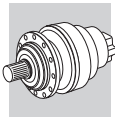
$P_1 = 9.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
25.8	3114	2.7	55.9	22	—	309 R3	BN 132MB 4	—	—	—	42600	55000	12300	295	
25.8	3114	2.7	55.9	22	—	310 R3	BN 132MB 4	—	—	—	50500	63500	22200	305	
25.8	3204	1.0	55.8	9.0	305 L2	—	BN 132MB 4	—	12800	14800	23800	28700	8200	264	
26.6	3018	1.2	54.2	14.0	—	305 R3	BN 132MB 4	M 4LB 4	12700	14600	23600	28400	8120	265	
27.0	2975	1.1	53.4	7.5	304 L3	—	BN 132MB 4	—	12600	14500	23500	28300	8080	254	
27.0	2975	1.2	53.4	7.5	305 L3	—	BN 132MB 4	—	12600	14500	23500	28300	8080	264	
27.0	2966	2.0	53.2	7.5	306 L3	—	BN 132MB 4	M 4LB 4	15700	17800	38400	44700	11800	274	
28.6	2800	1.2	50.3	14.0	—	304 R3	BN 132MB 4	—	12300	14200	23100	27800	7920	255	
28.6	2800	1.4	50.3	14.0	—	305 R3	BN 132MB 4	M 4LB 4	12300	14200	23100	27800	7920	265	
31	2683	3.0	46.7	18.0	307 L2	—	BN 132MB 4	M 4LB 4	16700	20900	39700	52100	14500	284	
31	2596	1.1	46.6	14.0	—	304 R3	BN 132MB 4	—	12000	13900	22600	27200	7720	255	
31	2596	1.5	46.6	14.0	—	305 R3	BN 132MB 4	M 4LB 4	12000	13900	22600	27200	7720	265	
31	2670	2.2	46.5	13.0	306 L2	—	BN 132MB 4	M 4LB 4	15000	17000	36900	43000	11300	274	
31	2578	2.6	46.3	14.0	—	306 R3	BN 132MB 4	M 4LB 4	15000	16900	36800	42900	11200	275	
32	2563	1.4	44.6	9.0	305 L2	—	BN 132MB 4	—	11900	13700	22300	26800	7610	264	
32	2482	2.7	44.6	22	—	307 R3	BN 132MB 4	M 4LB 4	16400	20600	39200	51300	14300	285	
32	2482	2.7	44.6	22	—	309 R3	BN 132MB 4	—	—	—	39800	51300	11400	295	
32	2482	2.7	44.6	22	—	310 R3	BN 132MB 4	—	—	—	47200	59300	20600	305	
33	2429	1.3	43.6	7.5	304 L3	—	BN 132MB 4	—	11800	13600	22100	26600	7550	254	
34	2372	1.3	42.6	14.0	—	304 R3	BN 132MB 4	—	11700	13500	22000	26400	7490	255	
34	2372	1.4	42.6	14.0	—	305 R3	BN 132MB 4	M 4LB 4	11700	13500	22000	26400	7490	265	
37	2184	2.5	39.2	14.0	—	306 R3	BN 132MB 4	M 4LB 4	14100	16000	35000	40800	10600	275	
37	2207	2.7	38.4	13.0	306 L2	—	BN 132MB 4	M 4LB 4	14100	15900	34800	40600	10600	274	
38	2205	0.9	38.4	9.0	303 L2	—	BN 132MB 4	—	11300	13000	21300	25600	7240	244	
38	2205	1.3	38.4	9.0	304 L2	—	BN 132MB 4	—	11300	13000	21300	25600	7240	254	
38	2205	1.7	38.4	9.0	305 L2	—	BN 132MB 4	—	11300	13000	21300	25600	7240	264	
38	2102	2.7	37.7	22	—	307 R3	BN 132MB 4	M 4LB 4	15500	19500	37300	48800	13500	285	
38	2102	2.7	37.7	22	—	309 R3	BN 132MB 4	—	—	—	37900	48800	10800	295	
38	2102	2.7	37.7	22	—	310 R3	BN 132MB 4	—	—	—	44900	56400	19500	305	
39	2069	1.0	37.1	14.0	—	303 R3	BN 132MB 4	—	11200	12900	21100	25400	7160	245	
39	2069	1.5	37.1	14.0	—	304 R3	BN 132MB 4	—	11200	12900	21100	25400	7160	255	
39	2069	1.7	37.1	14.0	—	305 R3	BN 132MB 4	M 4LB 4	11200	12900	21100	25400	7160	265	
40	2054	1.7	35.8	9.0	305 L2	—	BN 132MB 4	—	11000	12700	20800	25100	7070	264	
43	1850	2.7	33.2	14.0	—	306 R3	BN 132MB 4	M 4LB 4	13400	15200	33300	38800	10100	275	
44	1898	3.0	33.1	13.0	306 L2	—	BN 132MB 4	M 4LB 4	13400	15100	33300	38800	10000	274	
46	1762	2.7	31.6	22	—	307 R3	BN 132MB 4	M 4LB 4	14600	18400	35400	46300	12700	285	
46	1762	2.7	31.6	22	—	309 R3	BN 132MB 4	—	—	—	35900	46300	10200	295	
46	1753	1.0	31.5	14.0	—	303 R3	BN 132MB 4	—	10600	12200	20100	24100	6770	245	
46	1753	1.7	31.5	14.0	—	304 R3	BN 132MB 4	—	10600	12200	20100	24100	6770	255	
46	1753	1.7	31.5	14.0	—	305 R3	BN 132MB 4	M 4LB 4	10600	12200	20100	24100	6770	265	
47	1767	1.2	30.8	9.0	303 L2	—	BN 132MB 4	—	10500	12100	19900	24000	6720	244	
47	1767	1.6	30.8	9.0	304 L2	—	BN 132MB 4	—	10500	12100	19900	24000	6720	254	
47	1767	2.1	30.8	9.0	305 L2	—	BN 132MB 4	—	10500	12100	19900	24000	6720	264	
54	1518	1.1	26.4	9.0	303 L2	—	BN 132MB 4	—	9960	11500	19000	22900	6390	244	
54	1518	2.3	26.4	9.0	305 L2	—	BN 132MB 4	—	9960	11500	19000	22900	6390	264	
55	1513	3.0	26.4	13.0	306 L2	—	BN 132MB 4	M 4LB 4	12400	14000	31100	36200	9310	274	
56	1431	1.3	25.7	14.0	—	303 R3	BN 132MB 4	—	9870	11400	18900	22700	6330	245	
56	1431	1.7	25.7	14.0	—	304 R3	BN 132MB 4	—	9870	11400	18900	22700	6330	255	
56	1431	1.7	25.7	14.0	—	305 R3	BN 132MB 4	M 4LB 4	9870	11400	18900	22700	6330	265	
58	1383	0.9	24.8	12.0	—	301 R3	BN 132MB 4	—	3170	3170	9150	10500	2090	237	
59	1412	0.9	24.6	7.5	301 L2	—	BN 132MB 4	M 4LB 4	3160	3160	9130	10500	2080	236	
59	1408	1.3	24.5	9.0	303 L2	—	BN 132MB 4	—	9720	11200	18600	22400	6230	244	
59	1408	2.1	24.5	9.0	304 L2	—	BN 132MB 4	—	9720	11200	18600	22400	6230	254	



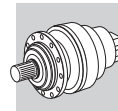
$P_1 = 9.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
											HC/PC	HZ/PZ			
59	1408	2.4	24.5	9.0	305 L2	—	BN 132MB 4	—	9720	11200	18600	22400	6230	264	
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63	1305	2.0	22.7	9.0	304 L2	—	BN 132MB 4	—	9470	10900	18200	21900	6080	254	
63	1305	2.6	22.7	9.0	305 L2	—	BN 132MB 4	—	9470	10900	18200	21900	6080	264	
69	1192	1.3	20.8	9.0	303 L2	—	BN 132MB 4	—	9190	10600	17700	21300	5900	244	
69	1192	2.4	20.8	9.0	305 L2	—	BN 132MB 4	—	9190	10600	17700	21300	5900	264	
69	1192	2.4	20.8	9.0	304 L2	—	BN 132MB 4	—	9190	10600	17700	21300	5900	254	
72	1153	1.0	20.1	7.5	301 L2	—	BN 132MB 4	M 4LB 4	2960	2960	8590	9870	1940	236	
75	1103	1.4	19.2	18.0	—	303 R2	BN 132MB 4	M 4LB 4	8960	10300	17300	20800	5750	245	
75	1103	2.4	19.2	18.0	—	305 R2	BN 132MB 4	M 4LB 4	8960	10300	17300	20800	5750	265	
75	1103	2.7	19.2	18.0	—	306 R2	BN 132MB 4	M 4LB 4	11200	12600	28300	33000	8380	275	
79	1043	1.1	18.2	7.5	301 L2	—	BN 132MB 4	M 4LB 4	2860	2860	8330	9580	1880	236	
79	1040	1.7	18.1	9.0	303 L2	—	BN 132MB 4	—	8780	10100	17000	20400	5630	244	
79	1040	2.6	18.1	9.0	304 L2	—	BN 132MB 4	—	8780	10100	17000	20400	5630	254	
86	967	2.3	16.8	18.0	—	304 R2	BN 132MB 4	M 4LB 4	8570	9900	16600	20000	5500	255	
91	912	1.6	15.9	18.0	—	303 R2	BN 132MB 4	M 4LB 4	8410	9710	16300	19700	5390	245	
91	912	2.7	15.9	18.0	—	305 R2	BN 132MB 4	M 4LB 4	8410	9710	16300	19700	5390	265	
91	912	2.7	15.9	18.0	—	306 R2	BN 132MB 4	M 4LB 4	10500	11900	26700	31100	7870	275	
94	881	1.7	15.3	9.0	303 L2	—	BN 132MB 4	—	8310	9590	16200	19500	5330	244	
94	881	3.0	15.3	9.0	304 L2	—	BN 132MB 4	—	8310	9590	16200	19500	5330	254	
97	852	1.3	14.8	7.5	301 L2	—	BN 132MB 4	M 4LB 4	2670	2670	7840	9010	1760	236	
98	847	1.1	14.8	12.0	—	301 R2	BN 132MB 4	M 4LB 4	2670	2670	7830	9000	1750	237	
105	785	2.2	13.7	18.0	—	303 R2	BN 132MB 4	M 4LB 4	8000	9230	15600	18800	5130	245	
105	785	2.7	13.7	18.0	—	305 R2	BN 132MB 4	M 4LB 4	8000	9230	15600	18800	5130	265	
105	785	2.7	13.7	18.0	—	306 R2	BN 132MB 4	M 4LB 4	9960	11300	25500	29700	7480	275	
105	785	2.8	13.7	18.0	—	304 R2	BN 132MB 4	M 4LB 4	8000	9230	15600	18800	5130	255	
115	719	2.0	12.5	9.0	303 L2	—	BN 132MB 4	—	7770	8970	15200	18300	4980	244	
119	695	1.5	12.1	7.5	301 L2	—	BN 132MB 4	M 4LB 4	2500	2500	7380	8480	1640	236	
122	679	1.5	11.8	12.0	—	301 R2	BN 132MB 4	M 4LB 4	2480	2480	7330	8420	1630	237	
132	625	2.6	10.9	18.0	—	303 R2	BN 132MB 4	M 4LB 4	7410	8560	14600	17600	4760	245	
132	625	2.7	10.9	18.0	—	305 R2	BN 132MB 4	M 4LB 4	7410	8560	14600	17600	4760	265	
132	625	2.7	10.9	18.0	—	306 R2	BN 132MB 4	M 4LB 4	9230	10500	23900	27800	6930	275	
132	625	2.8	10.9	18.0	—	304 R2	BN 132MB 4	M 4LB 4	7410	8560	14600	17600	4760	255	
149	572	1.3	9.67	11.0	303 L1	—	BN 132MB 4	M 4LB 4	7120	8220	14100	16900	4570	244	
156	530	2.7	9.23	18.0	—	303 R2	BN 132MB 4	M 4LB 4	7010	8100	13900	16700	4500	245	
156	530	2.7	9.23	18.0	—	305 R2	BN 132MB 4	M 4LB 4	7010	8100	13900	16700	4500	265	
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156	530	2.8	9.23	18.0	—	304 R2	BN 132MB 4	M 4LB 4	7010	8100	13900	16700	4500	255	
160	533	1.1	9.00	7.5	301 L1	—	BN 132MB 4	M 4LB 4	2260	2260	6750	7750	1490	236	
165	502	1.1	8.74	12.0	—	300 R2	BN 132MB 4	M 4LB 4	2240	2240	6690	7690	1470	229	
165	502	1.7	8.74	12.0	—	301 R2	BN 132MB 4	M 4LB 4	2240	2240	6690	7690	1470	237	
192	444	2.8	7.50	11.0	303 L1	—	BN 132MB 4	M 4LB 4	6550	7560	13000	15700	4200	244	
200	426	1.0	7.20	7.5	300 L1	—	BN 132MB 4	M 4LB 4	2100	2100	6310	7250	1380	228	
200	426	1.8	7.20	7.5	301 L1	—	BN 132MB 4	M 4LB 4	2100	2100	6310	7250	1380	236	
202	410	1.3	7.13	12.0	—	300 R2	BN 132MB 4	M 4LB 4	2090	2090	6300	7230	1380	229	
202	410	1.7	7.13	12.0	—	301 R2	BN 132MB 4	M 4LB 4	2090	2090	6300	7230	1380	237	
232	367	3.0	6.20	11.0	303 L1	—	BN 132MB 4	M 4LB 4	6140	7090	12300	14800	3940	244	
250	341	1.3	5.77	7.5	300 L1	—	BN 132MB 4	M 4LB 4	1950	1950	5910	6790	1280	228	
250	341	2.3	5.77	7.5	301 L1	—	BN 132MB 4	M 4LB 4	1950	1950	5910	6790	1280	236	
338	252	1.7	4.26	7.5	300 L1	—	BN 132MB 4	M 4LB 4	1760	1760	5390	6200	1160	228	



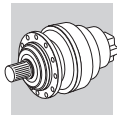
$P_1 = 11 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
0.76	122190	1.2	1893	18.0	317 L4	—	BN 160MR 4	—	—	—	442000	470000	150000	362
0.90	102956	1.7	1595	18.0	317 L4	—	BN 160MR 4	—	—	—	442000	470000	150000	362
1.1	85110	1.7	1318	18.0	317 L4	—	BN 160MR 4	—	—	—	434300	462400	147000	362
1.1	82880	1.2	1284	18.0	315 L4	—	BN 160MR 4	—	—	—	201500	236600	87400	344
1.1	82471	0.9	1277	15.0	314 L4	—	BN 160MR 4	—	—	—	201200	236300	87300	334
1.2	79893	1.5	1237	18.0	316 L4	—	BN 160MR 4	—	—	—	331400	368600	144000	354
1.3	73213	2.3	1134	18.0	317 L4	—	BN 160MR 4	—	—	—	415100	442000	139800	362
1.3	71295	1.3	1104	18.0	315 L4	—	BN 160MR 4	—	—	—	192600	226200	83200	344
1.3	70943	1.1	1099	15.0	314 L4	—	BN 160MR 4	—	—	—	192400	225800	83000	334
1.4	67318	1.5	1043	18.0	315 L4	—	BN 160MR 4	—	—	—	189400	222300	81600	344
1.4	67318	1.9	1043	18.0	316 L4	—	BN 160MR 4	—	—	—	314800	350100	136000	354
1.4	66985	1.2	1038	15.0	314 L4	—	BN 160MR 4	—	—	—	189100	222000	81400	334
1.4	66649	2.7	1032	18.0	317 L4	—	BN 160MR 4	—	—	—	403600	429700	135500	362
1.5	61547	2.2	953	50	—	317 R4	BN 160MR 4	—	—	—	394100	419600	132000	363
1.5	60072	1.6	930	18.0	315 L4	—	BN 160MR 4	—	—	—	183000	214800	78500	344
1.6	59776	1.2	926	15.0	314 L4	—	BN 160MR 4	—	—	—	182700	214500	78400	334
1.6	58707	1.3	909	40	—	315 R4	BN 160MR 4	—	—	—	181700	213400	77900	345
1.6	58342	2.8	904	18.0	317 L4	—	BN 160MR 4	—	—	—	387800	412900	129600	362
1.6	57416	0.90	889	11.0	313 L4	—	BN 160MR 4	—	—	—	169100	200100	68800	324
1.7	55649	1.8	862	18.0	315 L4	—	BN 160MR 4	—	—	—	178800	210000	76600	344
1.7	55649	2.3	862	18.0	316 L4	—	BN 160MR 4	—	—	—	297400	330700	127600	354
1.7	55374	1.5	858	15.0	314 L4	—	BN 160MR 4	—	—	—	178600	209700	76400	334
1.8	52455	2.4	812	18.0	316 L4	—	BN 160MR 4	—	—	—	292100	324900	125100	354
1.8	50996	1.0	790	11.0	313 L4	—	BN 160MR 4	—	—	—	163200	193100	66100	324
1.8	50500	1.8	782	40	—	315 R4	BN 160MR 4	—	—	—	173700	203900	74100	345
1.9	47870	2.1	741	18.0	315 L4	—	BN 160MR 4	—	—	—	170900	200700	72800	344
1.9	47870	2.6	741	18.0	316 L4	—	BN 160MR 4	—	—	—	284200	316100	121400	354
2.0	47634	1.7	738	15.0	314 L4	—	BN 160MR 4	—	—	—	170700	200400	72700	334
2.0	46890	2.7	726	18.0	316 L4	—	BN 160MR 4	—	—	—	282500	314100	120500	354
2.0	46752	1.0	724	11.0	311 L4	—	BN 160MR 4	—	—	—	128700	160300	52200	314
2.1	44878	1.1	695	11.0	313 L4	—	BN 160MR 4	—	—	—	157000	185900	63300	324
2.1	44198	2.9	685	18.0	316 L4	—	BN 160MR 4	—	—	—	277500	308600	118200	354
2.1	43363	2.3	672	18.0	315 L4	—	BN 160MR 4	—	—	—	165900	194800	70500	344
2.2	43149	1.9	668	15.0	314 L4	—	BN 160MR 4	—	—	—	165700	194500	70300	334
2.2	42551	2.1	659	40	—	315 R4	BN 160MR 4	—	—	—	165000	193700	70000	345
2.2	41748	1.2	647	22	—	313 R4	BN 160MR 4	—	—	—	153700	181900	61800	325
2.3	40863	1.3	633	11.0	313 L4	—	BN 160MR 4	—	—	—	152700	180700	61400	324
2.3	40588	0.9	629	22	—	311 R4	BN 160MR 4	—	—	—	123300	153600	49800	315
2.3	40460	0.9	627	11.0	311 L4	—	BN 160MR 4	—	—	—	123200	153500	49700	314
2.3	40243	2.5	623	40	—	315 R4	BN 160MR 4	—	—	—	162300	190500	68700	345
2.3	40243	2.9	623	45	—	316 R4	BN 160MR 4	—	—	—	269800	300100	114500	355
2.3	39625	1.4	614	22	—	314 R4	BN 160MR 4	—	—	—	161500	189600	68400	335
2.4	38147	2.6	591	18.0	315 L4	—	BN 160MR 4	—	—	—	159700	187500	67500	344
2.4	37958	2.1	588	15.0	314 L4	—	BN 160MR 4	—	—	—	159500	187200	67400	334
2.5	36650	1.1	568	11.0	311 L4	—	BN 160MR 4	—	—	—	119600	149000	48100	314
2.6	36397	1.5	564	11.0	313 L4	—	BN 160MR 4	—	—	—	147500	174500	59100	324
2.6	35780	2.2	554	15.0	314 L4	—	BN 160MR 4	—	—	—	156600	183900	66100	334
2.7	34512	1.4	535	22	—	313 R4	BN 160MR 4	—	—	—	145100	171800	58000	325
2.7	34440	2.9	533	18.0	315 L4	—	BN 160MR 4	—	—	—	154900	181800	65200	344
2.7	34086	2.0	528	22	—	314 R4	BN 160MR 4	—	—	—	154400	181300	65000	335
2.7	33908	2.9	525	40	—	315 R4	BN 160MR 4	—	—	—	154100	181000	64900	345
2.8	33553	1.1	520	22	—	311 R4	BN 160MR 4	—	—	—	116500	145100	46700	315
2.8	33163	1.4	514	11.0	313 L4	—	BN 160MR 4	—	—	—	143400	169700	57300	324
2.8	33063	1.3	512	11.0	311 L4	—	BN 160MR 4	—	—	—	116000	144500	46500	314
2.9	32029	1.6	496	22	—	313 R4	BN 160MR 4	—	—	—	141900	168000	56600	325
2.9	31929	2.5	495	15.0	314 L4	—	BN 160MR 4	—	—	—	151400	177700	63600	334



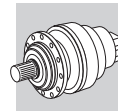
$P_1 = 11 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
2.9	31627	1.1	490	22	—	311 R4	BN 160MR 4	—	—	—	114400	142500	45800	315
3.1	29578	2.7	458	15.0	314 L4	—	BN 160MR 4	—	—	—	148000	173700	62000	334
3.2	29165	1.8	452	11.0	313 L4	—	BN 160MR 4	—	—	—	138000	163300	54900	324
3.2	29079	1.6	450	22	—	313 R4	BN 160MR 4	—	—	—	137900	163200	54800	325
3.2	28720	2.3	445	22	—	314 R4	BN 160MR 4	—	—	—	146700	172200	61400	335
3.3	28272	1.2	438	22	—	311 R4	BN 160MR 4	—	—	—	110600	137800	44100	315
3.4	27162	2.9	421	22	—	314 R4	BN 160MR 4	—	—	—	144200	169300	60300	335
3.4	27072	1.0	419	15.0	—	310 R4	BN 160MR 4	—	—	—	92400	116200	43500	305
3.5	26649	1.5	413	22	—	311 R4	BN 160MR 4	—	—	—	108700	135400	43300	315
3.5	26493	1.6	410	11.0	311 L4	—	BN 160MR 4	—	—	—	108500	135200	43200	314
3.7	25442	2.2	394	11.0	313 L4	—	BN 160MR 4	—	—	—	132500	156800	52400	324
3.7	25015	1.9	387	22	—	313 R4	BN 160MR 4	—	—	—	131800	156000	52100	325
4.0	23451	1.0	363	15.0	—	310 R4	BN 160MR 4	—	—	—	88500	111300	41500	305
4.1	22726	2.0	352	11.0	313 L4	—	BN 160MR 4	—	—	—	128000	151500	50500	324
4.1	22441	1.8	348	11.0	311 L4	—	BN 160MR 4	—	—	—	103200	128600	40900	314
4.2	22310	2.2	346	22	—	313 R4	BN 160MR 4	—	—	—	127300	150700	50200	325
4.2	22030	1.7	341	22	—	311 R4	BN 160MR 4	—	—	—	102700	127900	40600	315
4.3	21573	1.2	334	15.0	—	310 R4	BN 160MR 4	—	—	—	86300	108600	40300	305
4.5	20765	1.9	322	22	—	311 R4	BN 160MR 4	—	—	—	100900	125600	39800	315
4.7	19933	2.2	309	22	—	313 R4	BN 160MR 4	—	—	—	123100	145700	48300	325
4.7	19687	1.2	305	15.0	—	310 R4	BN 160MR 4	—	—	—	84000	105600	39100	305
4.7	20231	1.9	304	18.0	313 L3	—	BN 160MR 4	—	—	—	122500	145000	48100	324
4.9	19669	1.2	295	18.0	310 L3	—	BN 160MR 4	—	—	—	83200	104600	38700	304
4.9	18950	2.0	294	22	—	311 R4	BN 160MR 4	—	—	—	98100	122200	38600	315
4.9	19393	1.4	291	18.0	311 L3	—	BN 160MR 4	—	—	—	97900	121900	38500	314
5.1	18274	1.2	283	15.0	—	310 R4	BN 160MR 4	—	—	—	82100	103300	38100	305
5.1	18150	2.2	281	22	—	313 R4	BN 160MR 4	—	—	—	119700	141700	46800	325
5.4	17166	2.1	266	22	—	311 R4	BN 160MR 4	—	—	—	95300	118700	37400	315
5.6	16676	1.3	258	15.0	—	310 R4	BN 160MR 4	—	—	—	79900	100500	37000	305
5.6	16660	1.0	258	15.0	—	309 R4	BN 160MR 4	—	—	—	67400	87000	20500	295
5.7	16807	2.7	252	18.0	313 L3	—	BN 160MR 4	—	—	—	115900	137100	45200	324
5.8	16600	1.1	249	18.0	310 L3	—	BN 160MR 4	—	—	—	79100	99400	36600	304
5.9	16341	2.0	245	18.0	311 L3	—	BN 160MR 4	—	—	—	93000	115800	36400	314
6.1	15293	2.2	237	22	—	313 R4	BN 160MR 4	—	—	—	113700	134600	44200	325
6.2	15106	1.3	234	15.0	—	310 R4	BN 160MR 4	—	—	—	77600	97600	35800	305
6.2	14992	1.1	232	15.0	—	309 R4	BN 160MR 4	—	—	—	65300	84200	19800	295
6.3	15327	1.4	230	18.0	310 L3	—	BN 160MR 4	—	—	—	77200	97100	35600	304
6.3	14767	2.4	229	22	—	311 R4	BN 160MR 4	—	—	—	91100	113400	35500	315
7.0	13289	1.6	206	15.0	—	310 R4	BN 160MR 4	—	—	—	74700	93900	34300	305
7.0	13276	1.0	206	15.0	—	307 R4	BN 160MR 4	M 4LC 4	27300	34300	62000	81200	23700	285
7.0	13276	1.2	206	15.0	—	309 R4	BN 160MR 4	—	—	—	63000	81200	19000	295
7.1	13508	2.4	203	18.0	311 L3	—	BN 160MR 4	—	—	—	87800	109400	34100	314
7.1	13441	1.6	202	18.0	310 L3	—	BN 160MR 4	—	—	—	74200	93300	34100	304
7.1	13427	1.2	202	11.0	309 L3	—	BN 160MR 4	—	—	—	62600	80700	18900	294
7.2	12954	2.2	201	22	—	313 R4	BN 160MR 4	—	—	—	108200	128000	41900	325
7.3	12792	2.2	198	22	—	311 R4	BN 160MR 4	—	—	—	87200	108600	33900	315
7.5	12733	2.5	191	18.0	311 L3	—	BN 160MR 4	—	—	—	86300	107500	33500	314
7.6	12311	1.0	191	15.0	—	307 R4	BN 160MR 4	M 4LC 4	26600	33400	60600	79400	23200	285
7.6	12311	1.3	191	15.0	—	309 R4	BN 160MR 4	—	—	—	61600	79400	18500	295
7.6	12225	1.9	189	15.0	—	310 R4	BN 160MR 4	—	—	—	72800	91500	33400	305
7.8	11917	2.2	185	22	—	313 R4	BN 160MR 4	—	—	—	105500	124900	40700	325
7.9	12163	1.2	183	11.0	309 L3	—	BN 160MR 4	—	—	—	60800	78400	18300	294
7.9	11767	2.2	182	22	—	311 R4	BN 160MR 4	—	—	—	85100	106000	32900	315
8.1	11804	1.5	177	18.0	310 L3	—	BN 160MR 4	—	—	—	71400	89800	32600	304
8.1	11790	1.0	177	11.0	307 L3	—	BN 160MR 4	M 4LC 4	26000	32600	59300	77700	22600	284



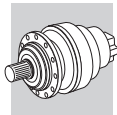
$P_1 = 11 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
8.4	11382	2.8	171	18.0	311 L3	—	BN 160MR 4	—	—	—	83400	103900	32200	314
8.7	10664	1.0	165	15.0	—	307 R4	BN 160MR 4	M 4LC 4	25400	31900	58000	76100	22100	285
8.7	10664	1.4	165	15.0	—	309 R4	BN 160MR 4	—	—	—	59000	76100	17700	295
8.8	10899	2.0	164	18.0	310 L3	—	BN 160MR 4	—	—	—	69700	87600	31800	304
8.9	10759	1.0	162	11.0	307 L3	—	BN 160MR 4	M 4LC 4	25200	31600	57700	75600	21900	284
8.9	10759	1.5	162	11.0	309 L3	—	BN 160MR 4	—	—	—	58600	75600	17500	294
8.9	10729	2.9	161	18.0	311 L3	—	BN 160MR 4	—	—	—	82000	102100	31600	314
9.0	10355	2.1	160	15.0	—	310 R4	BN 160MR 4	—	—	—	69300	87100	31600	305
9.3	9967	2.2	154	22	—	311 R4	BN 160MR 4	—	—	—	80900	100800	31200	315
9.5	9810	1.3	152	15.0	—	307 R4	BN 160MR 4	M 4LC 4	24700	31000	56600	74200	21500	285
9.5	9810	1.4	152	15.0	—	309 R4	BN 160MR 4	—	—	—	57500	74200	17200	295
9.8	9768	2.8	147	40	—	311 R3	BN 160MR 4	—	—	—	79700	99300	30600	315
9.8	9746	1.3	146	11.0	307 L3	—	BN 160MR 4	M 4LC 4	24400	30600	56000	73300	21200	284
10.2	9441	2.2	142	18.0	310 L3	—	BN 160MR 4	—	—	—	66700	83900	30300	304
10.4	9242	1.1	139	11.0	307 L3	—	BN 160MR 4	M 4LC 4	24000	30100	55100	72200	20800	284
10.4	9242	1.7	139	11.0	309 L3	—	BN 160MR 4	—	—	—	56000	72200	16700	294
10.6	8771	2.2	136	15.0	—	310 R4	BN 160MR 4	—	—	—	65900	82900	29900	305
11.0	8685	2.3	130	18.0	310 L3	—	BN 160MR 4	—	—	—	65100	81900	29500	304
11.4	8384	1.4	126	11.0	307 L3	—	BN 160MR 4	M 4LC 4	23200	29100	53500	70100	20200	284
11.4	8384	1.8	126	11.0	309 L3	—	BN 160MR 4	—	—	—	54400	70100	16100	294
11.9	8077	0.9	121	7.5	306 L3	—	BN 160MR 4	M 4LC 4	20600	23400	49200	57300	15500	274
12.0	7976	1.1	120	22	—	307 R3	BN 160MR 4	M 4LC 4	22800	28600	52700	69100	19800	285
12.0	7976	1.6	120	22	—	309 R3	BN 160MR 4	—	—	—	53600	69100	15900	295
12.0	7976	2.1	120	22	—	310 R3	BN 160MR 4	—	—	—	63500	79800	28600	305
12.1	7926	2.5	119	18.0	310 L3	—	BN 160MR 4	—	—	—	63300	79600	28600	304
12.7	7545	1.3	113	11.0	307 L3	—	BN 160MR 4	M 4LC 4	22400	28100	51800	67900	19500	284
12.7	7545	2.0	113	11.0	309 L3	—	BN 160MR 4	—	—	—	52700	67900	15600	294
12.8	7482	0.9	112	7.5	306 L3	—	BN 160MR 4	M 4LC 4	20100	22800	48100	56000	15100	274
13.0	7357	2.3	110	18.0	310 L3	—	BN 160MR 4	—	—	—	61900	77900	27900	304
13.8	6941	1.1	104	7.5	306 L3	—	BN 160MR 4	M 4LC 4	19600	22200	47000	54700	14700	274
14.3	6714	2.8	101	18.0	310 L3	—	BN 160MR 4	—	—	—	60300	75800	27000	304
14.4	6681	1.7	100	11.0	307 L3	—	BN 160MR 4	M 4LC 4	21500	27000	50000	65500	18700	284
14.4	6681	2.0	100	11.0	309 L3	—	BN 160MR 4	—	—	—	50800	65500	15000	294
14.5	6593	1.3	99.0	22	—	307 R3	BN 160MR 4	M 4LC 4	21400	26900	49800	65200	18600	285
14.5	6593	1.9	99.0	22	—	309 R3	BN 160MR 4	—	—	—	50600	65200	14900	295
14.5	6593	2.2	99.0	22	—	310 R3	BN 160MR 4	—	—	—	59900	75400	26900	305
14.6	6561	1.0	98.5	14.0	—	306 R3	BN 160MR 4	M 4LC 4	19200	21800	46200	53800	14400	275
15.5	6195	1.8	93.0	11.0	307 L3	—	BN 160MR 4	M 4LC 4	21000	26300	48900	64000	18200	284
15.5	6195	2.2	93.0	11.0	309 L3	—	BN 160MR 4	—	—	—	49600	64000	14600	294
15.8	6082	2.5	91.3	18.0	310 L3	—	BN 160MR 4	—	—	—	58500	73600	26200	304
16.3	5879	1.1	88.3	7.5	306 L3	—	BN 160MR 4	M 4LC 4	18500	21000	44700	52100	13900	274
17.0	5644	1.2	84.7	14.0	—	306 R3	BN 160MR 4	M 4LC 4	18300	20700	44200	51400	13700	275
17.3	5555	1.7	83.4	22	—	307 R3	BN 160MR 4	M 4LC 4	20200	25400	47300	62000	17600	285
17.3	5555	2.2	83.4	22	—	309 R3	BN 160MR 4	—	—	—	48000	62000	14100	295
17.3	5555	2.2	83.4	22	—	310 R3	BN 160MR 4	—	—	—	56900	71600	25400	305
17.6	5452	1.2	81.9	7.5	306 L3	—	BN 160MR 4	M 4LC 4	18100	20500	43700	50900	13600	274
17.9	5367	1.8	80.6	11.0	307 L3	—	BN 160MR 4	M 4LC 4	20000	25100	46800	61300	17400	284
17.9	5367	2.5	80.6	11.0	309 L3	—	BN 160MR 4	—	—	—	47600	61300	13900	294
18.3	5237	2.0	78.6	22	—	307 R3	BN 160MR 4	M 4LC 4	19800	24900	46500	60900	17200	285
18.3	5237	2.2	78.6	22	—	310 R3	BN 160MR 4	—	—	—	55900	70300	24900	305
18.7	5129	1.4	77.0	7.5	306 L3	—	BN 160MR 4	M 4LC 4	17700	20100	42900	50000	13300	274
19.4	4937	2.1	74.1	11.0	307 L3	—	BN 160MR 4	M 4LC 4	19400	24400	45600	59800	16900	284
19.4	4937	2.6	74.1	11.0	309 L3	—	BN 160MR 4	—	—	—	46400	59800	13500	294
19.8	4855	1.4	72.9	14.0	—	306 R3	BN 160MR 4	M 4LC 4	17400	19700	42200	49200	13100	275
19.9	4977	1.0	72.5	13.0	306 L2	—	BN 160MR 4	M 4LC 4	17400	19700	42100	49100	13000	274



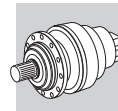
P₁ = 11 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
20.1	4779	1.9	71.8	22	—	307 R3	BN 160MR 4	M 4LC 4	19200	24100	45200	59200	16700	285
20.1	4779	2.2	71.8	22	—	309 R3	BN 160MR 4	—	—	—	45900	59200	13400	295
20.1	4779	2.2	71.8	22	—	310 R3	BN 160MR 4	—	—	—	54400	68400	24100	305
21.3	4497	1.3	67.5	14.0	—	306 R3	BN 160MR 4	M 4LC 4	17000	19200	41300	48000	12700	275
22.1	4344	1.4	65.2	7.5	306 L3	—	BN 160MR 4	M 4LC 4	16800	19000	40800	47500	12600	274
22.2	4329	2.2	65.0	22	—	307 R3	BN 160MR 4	M 4LC 4	18600	23300	43900	57500	16200	285
22.2	4329	2.2	65.0	22	—	309 R3	BN 160MR 4	—	—	—	44600	57500	12900	295
22.2	4329	2.2	65.0	22	—	310 R3	BN 160MR 4	—	—	—	52800	66400	23400	305
22.8	4201	0.9	63.1	14.0	—	305 R3	—	M 4LC 4	13300	15400	24700	29700	8540	265
22.8	4200	1.0	63.1	7.5	305 L3	—	BN 160MR 4	—	13300	15400	24700	29700	8540	264
23.8	4030	2.4	60.5	11.0	307 L3	—	BN 160MR 4	M 4LC 4	18200	22800	42900	56300	15800	284
23.8	4030	2.8	60.5	11.0	309 L3	—	BN 160MR 4	—	—	—	43600	56300	12600	294
24.8	3869	1.8	58.1	14.0	—	306 R3	BN 160MR 4	M 4LC 4	16100	18300	39400	45900	12100	275
25.6	3861	1.3	56.3	13.0	306 L2	—	BN 160MR 4	M 4LC 4	16000	18100	39100	45500	12000	274
25.8	3724	2.2	55.9	22	—	307 R3	BN 160MR 4	M 4LC 4	17700	22200	41900	55000	15400	285
25.8	3724	2.2	55.9	22	—	309 R3	BN 160MR 4	—	—	—	42600	55000	12300	295
25.8	3724	2.2	55.9	22	—	310 R3	BN 160MR 4	—	—	—	50500	63500	22200	305
26.6	3609	1.0	54.2	14.0	—	305 R3	—	M 4LC 4	12700	14600	23600	28400	8120	265
27.0	3557	0.9	53.4	7.5	304 L3	—	BN 160MR 4	—	12600	14500	23500	28300	8080	254
27.0	3557	1.0	53.4	7.5	305 L3	—	BN 160MR 4	—	12600	14500	23500	28300	8080	264
27.0	3546	1.7	53.2	7.5	306 L3	—	BN 160MR 4	M 4LC 4	15700	17800	38400	44700	11800	274
28.1	3414	2.8	51.3	11.0	307 L3	—	BN 160MR 4	M 4LC 4	17200	21600	40900	53500	14900	284
28.1	3414	2.8	51.3	11.0	309 L3	—	BN 160MR 4	—	—	—	41500	53500	12000	294
28.6	3348	1.2	50.3	14.0	—	305 R3	—	M 4LC 4	12300	14200	23100	27800	7920	265
31	3208	2.5	46.7	18.0	307 L2	—	BN 160MR 4	M 4LC 4	16700	20900	39700	52100	14500	284
31	3104	1.2	46.6	14.0	—	305 R3	—	M 4LC 4	12000	13900	22600	27200	7720	265
31	3192	1.9	46.5	13.0	306 L2	—	BN 160MR 4	M 4LC 4	15000	17000	36900	43000	11300	274
31	3083	2.2	46.3	14.0	—	306 R3	BN 160MR 4	M 4LC 4	15000	16900	36800	42900	11200	275
32	3064	1.2	44.6	9.0	305 L2	—	BN 160MR 4	—	11900	13700	22300	26800	7610	264
32	2967	2.2	44.6	22	—	307 R3	BN 160MR 4	M 4LC 4	16400	20600	39200	51300	14300	285
32	2967	2.2	44.6	22	—	309 R3	BN 160MR 4	—	—	—	39800	51300	11400	295
32	2967	2.2	44.6	22	—	310 R3	BN 160MR 4	—	—	—	47200	59300	20600	305
33	2904	1.1	43.6	7.5	304 L3	—	BN 160MR 4	—	11800	13600	22100	26600	7550	254
34	2836	1.2	42.6	14.0	—	305 R3	—	M 4LC 4	11700	13500	22000	26400	7490	265
37	2611	2.1	39.2	14.0	—	306 R3	BN 160MR 4	M 4LC 4	14100	16000	35000	40800	10600	275
37	2652	3.0	38.6	18.0	307 L2	—	BN 160MR 4	M 4LC 4	15600	19600	37500	49200	13600	284
37	2639	2.2	38.4	13.0	306 L2	—	BN 160MR 4	M 4LC 4	14100	15900	34800	40600	10600	274
38	2636	1.0	38.4	9.0	304 L2	—	BN 160MR 4	—	11300	13000	21300	25600	7240	254
38	2636	1.4	38.4	9.0	305 L2	—	BN 160MR 4	—	11300	13000	21300	25600	7240	264
38	2514	2.2	37.7	22	—	307 R3	BN 160MR 4	M 4LC 4	15500	19500	37300	48800	13500	285
38	2514	2.2	37.7	22	—	309 R3	BN 160MR 4	—	—	—	37900	48800	10800	295
38	2514	2.2	37.7	22	—	310 R3	BN 160MR 4	—	—	—	44900	56400	19500	305
39	2474	1.4	37.1	14.0	—	305 R3	—	M 4LC 4	11200	12900	21100	25400	7160	265
40	2455	1.4	35.8	9.0	305 L2	—	BN 160MR 4	—	11000	12700	20800	25100	7070	264
43	2212	2.2	33.2	14.0	—	306 R3	BN 160MR 4	M 4LC 4	13400	15200	33300	38800	10100	275
44	2270	2.5	33.1	13.0	306 L2	—	BN 160MR 4	M 4LC 4	13400	15100	33300	38800	10000	274
46	2107	2.2	31.6	22	—	307 R3	BN 160MR 4	M 4LC 4	14600	18400	35400	46300	12700	285
46	2107	2.2	31.6	22	—	309 R3	BN 160MR 4	—	—	—	35900	46300	10200	295
46	2096	1.4	31.5	14.0	—	305 R3	—	M 4LC 4	10600	12200	20100	24100	6770	265
47	2112	1.0	30.8	9.0	303 L2	—	BN 160MR 4	—	10500	12100	19900	24000	6720	244
47	2112	1.3	30.8	9.0	304 L2	—	BN 160MR 4	—	10500	12100	19900	24000	6720	254
47	2112	1.7	30.8	9.0	305 L2	—	BN 160MR 4	—	10500	12100	19900	24000	6720	264
51	1953	2.9	28.4	13.0	306 L2	—	BN 160MR 4	M 4LC 4	12700	14400	31800	37100	9550	274
54	1814	0.9	26.4	9.0	303 L2	—	BN 160MR 4	—	9960	11500	19000	22900	6390	244
54	1814	1.9	26.4	9.0	305 L2	—	BN 160MR 4	—	9960	11500	19000	22900	6390	264



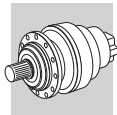
$P_1 = 11 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			FZ	
											HC/PC	HZ/PZ			
55	1809	2.5	26.4	13.0	306 L2	—	BN 160MR 4	M 4LC 4	12400	14000	31100	36200	9310	274	
56	1711	1.4	25.7	14.0	—	305 R3	—	M 4LC 4	9870	11400	18900	22700	6330	265	
59	1683	1.1	24.5	9.0	303 L2	—	BN 160MR 4	—	9720	11200	18600	22400	6230	244	
59	1683	1.8	24.5	9.0	304 L2	—	BN 160MR 4	—	9720	11200	18600	22400	6230	254	
59	1683	2.0	24.5	9.0	305 L2	—	BN 160MR 4	—	9720	11200	18600	22400	6230	264	
63	1561	1.3	22.7	9.0	303 L2	—	BN 160MR 4	—	9470	10900	18200	21900	6080	244	
63	1561	1.7	22.7	9.0	304 L2	—	BN 160MR 4	—	9470	10900	18200	21900	6080	254	
63	1561	2.2	22.7	9.0	305 L2	—	BN 160MR 4	—	9470	10900	18200	21900	6080	264	
69	1426	1.1	20.8	9.0	303 L2	—	BN 160MR 4	—	9190	10600	17700	21300	5900	244	
69	1426	2.0	20.8	9.0	305 L2	—	BN 160MR 4	—	9190	10600	17700	21300	5900	264	
69	1426	2.0	20.8	9.0	304 L2	—	BN 160MR 4	—	9190	10600	17700	21300	5900	254	
75	1319	1.2	19.2	18.0	—	303 R2	—	M 4LC 4	8960	10300	17300	20800	5750	245	
75	1319	2.0	19.2	18.0	—	305 R2	—	M 4LC 4	8960	10300	17300	20800	5750	265	
75	1319	2.2	19.2	18.0	—	306 R2	BN 160MR 4	M 4LC 4	11200	12600	28300	33000	8380	275	
79	1248	1.0	18.2	7.5	301 L2	—	—	M 4LC 4	2860	2860	8330	9580	1880	236	
79	1244	1.4	18.1	9.0	303 L2	—	BN 160MR 4	—	8780	10100	17000	20400	5630	244	
79	1244	2.2	18.1	9.0	304 L2	—	BN 160MR 4	—	8780	10100	17000	20400	5630	254	
79	1244	2.6	18.1	9.0	305 L2	—	BN 160MR 4	—	8780	10100	17000	20400	5630	264	
86	1156	1.9	16.8	18.0	—	304 R2	BN 160MR 4	M 4LC 4	8570	9900	16600	20000	5500	255	
91	1091	1.3	15.9	18.0	—	303 R2	—	M 4LC 4	8410	9710	16300	19700	5390	245	
91	1091	2.2	15.9	18.0	—	305 R2	—	M 4LC 4	8410	9710	16300	19700	5390	265	
91	1091	2.2	15.9	18.0	—	306 R2	BN 160MR 4	M 4LC 4	10500	11900	26700	31100	7870	275	
94	1054	1.4	15.3	9.0	303 L2	—	BN 160MR 4	—	8310	9590	16200	19500	5330	244	
94	1054	2.5	15.3	9.0	304 L2	—	BN 160MR 4	—	8310	9590	16200	19500	5330	254	
94	1054	2.6	15.3	9.0	305 L2	—	BN 160MR 4	—	8310	9590	16200	19500	5330	264	
97	1018	1.1	14.8	7.5	301 L2	—	—	M 4LC 4	2670	2670	7840	9010	1760	236	
105	938	1.8	13.7	18.0	—	303 R2	—	M 4LC 4	8000	9230	15600	18800	5130	245	
105	938	2.3	13.7	18.0	—	305 R2	—	M 4LC 4	8000	9230	15600	18800	5130	265	
105	938	2.2	13.7	18.0	—	306 R2	BN 160MR 4	M 4LC 4	9960	11300	25500	29700	7480	275	
105	938	2.3	13.7	18.0	—	304 R2	BN 160MR 4	M 4LC 4	8000	9230	15600	18800	5130	255	
115	860	1.7	12.5	9.0	303 L2	—	BN 160MR 4	—	7770	8970	15200	18300	4980	244	
115	860	2.8	12.5	9.0	304 L2	—	BN 160MR 4	—	7770	8970	15200	18300	4980	254	
115	860	2.8	12.5	9.0	305 L2	—	BN 160MR 4	—	7770	8970	15200	18300	4980	264	
119	831	1.3	12.1	7.5	301 L2	—	—	M 4LC 4	2500	2500	7380	8480	1640	236	
132	748	2.2	10.9	18.0	—	303 R2	—	M 4LC 4	7410	8560	14600	17600	4760	245	
132	748	2.2	10.9	18.0	—	305 R2	—	M 4LC 4	7410	8560	14600	17600	4760	265	
132	748	2.2	10.9	18.0	—	306 R2	BN 160MR 4	M 4LC 4	9230	10500	23900	27800	6930	275	
132	748	2.3	10.9	18.0	—	304 R2	BN 160MR 4	M 4LC 4	7410	8560	14600	17600	4760	255	
149	684	1.1	9.67	11.0	303 L1	—	BN 160MR 4	M 4LC 4	7120	8220	14100	16900	4570	244	
156	633	2.2	9.23	18.0	—	303 R2	—	M 4LC 4	7010	8100	13900	16700	4500	245	
156	633	2.2	9.23	18.0	—	305 R2	—	M 4LC 4	7010	8100	13900	16700	4500	265	
156	633	2.2	9.23	18.0	—	306 R2	BN 160MR 4	M 4LC 4	8730	9900	22700	26400	6560	275	
156	633	2.3	9.23	18.0	—	304 R2	BN 160MR 4	M 4LC 4	7010	8100	13900	16700	4500	255	
160	637	0.9	9.00	7.5	301 L1	—	—	M 4LC 4	2260	2260	6750	7750	1490	236	
192	531	2.3	7.50	11.0	303 L1	—	BN 160MR 4	M 4LC 4	6550	7560	13000	15700	4200	244	
200	509	1.5	7.20	7.5	301 L1	—	—	M 4LC 4	2100	2100	6310	7250	1380	236	
202	490	1.1	7.13	12.0	—	300 R2	—	M 4LC 4	2090	2090	6300	7230	1380	229	
232	439	2.5	6.20	11.0	303 L1	—	BN 160MR 4	M 4LC 4	6140	7090	12300	14800	3940	244	
250	408	1.1	5.77	7.5	300 L1	—	—	M 4LC 4	1950	1950	5910	6790	1280	228	
250	408	2.0	5.77	7.5	301 L1	—	—	M 4LC 4	1950	1950	5910	6790	1280	236	
338	302	1.4	4.26	7.5	300 L1	—	—	M 4LC 4	1760	1760	5390	6200	1160	228	
338	302	2.6	4.26	7.5	301 L1	—	—	M 4LC 4	1760	1760	5390	6200	1160	236	



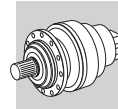
$P_1 = 15 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
											HC/PC	HZ/PZ		
0.92	138472	1.2	1595	18.0	317 L4	—	BN 160L 4	—	—	—	442000	470000	150000	362
1.1	114470	1.3	1318	18.0	317 L4	—	BN 160L 4	—	—	—	434300	462400	147000	362
1.2	107453	1.1	1237	18.0	316 L4	—	BN 160L 4	—	—	—	331400	368600	144000	354
1.3	98469	1.7	1134	18.0	317 L4	—	BN 160L 4	—	—	—	415100	442000	139800	362
1.3	95888	1.0	1104	18.0	315 L4	—	BN 160L 4	—	—	—	192600	226200	83200	344
1.4	90539	1.1	1043	18.0	315 L4	—	BN 160L 4	—	—	—	189400	222300	81600	344
1.4	90539	1.4	1043	18.0	316 L4	—	BN 160L 4	—	—	—	314800	350100	136000	354
1.4	90092	0.9	1038	15.0	314 L4	—	BN 160L 4	—	—	—	189100	222000	81400	334
1.4	89640	2.0	1032	18.0	317 L4	—	BN 160L 4	—	—	—	403600	429700	135500	362
1.5	82779	1.7	953	50	—	317 R4	BN 160L 4	—	—	—	394100	419600	132000	363
1.6	80795	1.2	930	18.0	315 L4	—	BN 160L 4	—	—	—	183000	214800	78500	344
1.6	80396	0.9	926	15.0	314 L4	—	BN 160L 4	—	—	—	182700	214500	78400	334
1.6	78958	1.0	909	40	—	315 R4	BN 160L 4	—	—	—	181700	213400	77900	345
1.6	78467	2.1	904	18.0	317 L4	—	BN 160L 4	—	—	—	387800	412900	129600	362
1.7	74846	1.4	862	18.0	315 L4	—	BN 160L 4	—	—	—	178800	210000	76600	344
1.7	74846	1.7	862	18.0	316 L4	—	BN 160L 4	—	—	—	297400	330700	127600	354
1.7	74476	1.1	858	15.0	314 L4	—	BN 160L 4	—	—	—	178600	209700	76400	334
1.8	70550	1.8	812	18.0	316 L4	—	BN 160L 4	—	—	—	292100	324900	125100	354
1.8	69749	2.3	803	50	—	317 R4	BN 160L 4	—	—	—	374300	398500	124600	363
1.8	68771	2.6	792	18.0	317 L4	—	BN 160L 4	—	—	—	372700	396900	124100	362
1.9	67921	1.3	782	40	—	315 R4	BN 160L 4	—	—	—	173700	203900	74100	345
2.0	64383	1.6	741	18.0	315 L4	—	BN 160L 4	—	—	—	170900	200700	72800	344
2.0	64383	1.9	741	18.0	316 L4	—	BN 160L 4	—	—	—	284200	316100	121400	354
2.0	64065	1.3	738	15.0	314 L4	—	BN 160L 4	—	—	—	170700	200400	72700	334
2.0	63064	2.0	726	18.0	316 L4	—	BN 160L 4	—	—	—	282500	314100	120500	354
2.0	62438	2.8	719	18.0	317 L4	—	BN 160L 4	—	—	—	362100	385500	120100	362
2.1	59445	2.2	685	18.0	316 L4	—	BN 160L 4	—	—	—	277500	308600	118200	354
2.2	58770	2.7	677	50	—	317 R4	BN 160L 4	—	—	—	355600	378600	117700	363
2.2	58321	1.7	672	18.0	315 L4	—	BN 160L 4	—	—	—	165900	194800	70500	344
2.2	58033	1.4	668	15.0	314 L4	—	BN 160L 4	—	—	—	165700	194500	70300	334
2.2	57230	1.6	659	40	—	315 R4	BN 160L 4	—	—	—	165000	193700	70000	345
2.3	54958	0.9	633	11.0	313 L4	—	BN 160L 4	—	—	—	152700	180700	61400	324
2.3	54350	2.9	626	50	—	317 R4	BN 160L 4	—	—	—	347300	369800	114700	363
2.3	54249	2.3	625	18.0	316 L4	—	BN 160L 4	—	—	—	270000	300300	114600	354
2.3	54124	1.9	623	40	—	315 R4	BN 160L 4	—	—	—	162300	190500	68700	345
2.3	54124	2.1	623	45	—	316 R4	BN 160L 4	—	—	—	269800	300100	114500	355
2.4	53293	1.1	614	22	—	314 R4	BN 160L 4	—	—	—	161500	189600	68400	335
2.5	51305	2.0	591	18.0	315 L4	—	BN 160L 4	—	—	—	159700	187500	67500	344
2.5	51305	2.4	591	18.0	316 L4	—	BN 160L 4	—	—	—	265500	295300	112500	354
2.5	51052	1.6	588	15.0	314 L4	—	BN 160L 4	—	—	—	159500	187200	67400	334
2.6	49141	2.6	566	18.0	316 L4	—	BN 160L 4	—	—	—	262100	291500	110900	354
2.6	48953	1.1	564	11.0	313 L4	—	BN 160L 4	—	—	—	147500	174500	59100	324
2.6	48122	1.7	554	15.0	314 L4	—	BN 160L 4	—	—	—	156600	183900	66100	334
2.7	46417	1.0	535	22	—	313 R4	BN 160L 4	—	—	—	145100	171800	58000	325
2.7	46321	2.2	533	18.0	315 L4	—	BN 160L 4	—	—	—	154900	181800	65200	344
2.7	46321	2.7	533	18.0	316 L4	—	BN 160L 4	—	—	—	257500	286400	108700	354
2.8	45844	1.5	528	22	—	314 R4	BN 160L 4	—	—	—	154400	181300	65000	335
2.8	45605	2.2	525	40	—	315 R4	BN 160L 4	—	—	—	154100	181000	64900	345
2.8	45605	2.6	525	45	—	316 R4	BN 160L 4	—	—	—	256300	285000	108200	355
2.8	44602	1.1	514	11.0	313 L4	—	BN 160L 4	—	—	—	143400	169700	57300	324
2.9	44468	1.0	512	11.0	311 L4	—	BN 160L 4	—	—	—	116000	144500	46500	314
2.9	43078	1.2	496	22	—	313 R4	BN 160L 4	—	—	—	141900	168000	56600	325
3.0	42943	1.9	495	15.0	314 L4	—	BN 160L 4	—	—	—	151400	177700	63600	334
3.0	42272	2.4	487	18.0	315 L4	—	BN 160L 4	—	—	—	150700	176900	63300	344
3.0	42272	2.9	487	18.0	316 L4	—	BN 160L 4	—	—	—	250500	278600	105500	354
3.2	39781	2.0	458	15.0	314 L4	—	BN 160L 4	—	—	—	148000	173700	62000	334
3.2	39225	1.4	452	11.0	313 L4	—	BN 160L 4	—	—	—	138000	163300	54900	324
3.2	39111	1.2	450	22	—	313 R4	BN 160L 4	—	—	—	137900	163200	54800	325



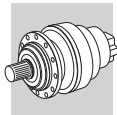
$P_1 = 15 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]		FZ	
											HC/PC	HZ/PZ		
3.3	38628	1.7	445	22	—	314 R4	BN 160L 4	—	—	—	146700	172200	61400	335
3.3	38292	2.6	441	18.0	315 L4	—	BN 160L 4	—	—	—	146300	171700	61200	344
3.3	38024	0.9	438	22	—	311 R4	BN 160L 4	—	—	—	110600	137800	44100	315
3.5	36532	2.2	421	22	—	314 R4	BN 160L 4	—	—	—	144200	169300	60300	335
3.5	35842	1.1	413	22	—	311 R4	BN 160L 4	—	—	—	108700	135400	43300	315
3.6	35631	1.2	410	11.0	311 L4	—	BN 160L 4	—	—	—	108500	135200	43200	314
3.6	35536	2.8	409	40	—	315 R4	BN 160L 4	—	—	—	143000	167900	59700	345
3.7	34219	1.6	394	11.0	313 L4	—	BN 160L 4	—	—	—	132500	156800	52400	324
3.8	33697	2.3	388	15.0	314 L4	—	BN 160L 4	—	—	—	140800	165300	58700	334
3.8	33643	1.4	387	22	—	313 R4	BN 160L 4	—	—	—	131800	156000	52100	325
4.1	30781	2.4	354	22	—	314 R4	BN 160L 4	—	—	—	137000	160800	56900	335
4.1	30565	1.5	352	11.0	313 L4	—	BN 160L 4	—	—	—	128000	151500	50500	324
4.2	30182	1.3	348	11.0	311 L4	—	BN 160L 4	—	—	—	103200	128600	40900	314
4.2	30005	1.6	346	22	—	313 R4	BN 160L 4	—	—	—	127300	150700	50200	325
4.3	29629	1.3	341	22	—	311 R4	BN 160L 4	—	—	—	102700	127900	40600	315
4.5	27929	1.4	322	22	—	311 R4	BN 160L 4	—	—	—	100900	125600	39800	315
4.6	27269	2.8	314	15.0	314 L4	—	BN 160L 4	—	—	—	132100	155100	54700	334
4.7	26810	1.6	309	22	—	313 R4	BN 160L 4	—	—	—	123100	145700	48300	325
4.8	27210	1.4	304	18.0	313 L3	—	BN 160L 4	—	—	—	122500	145000	48100	324
5.0	25487	1.5	294	22	—	311 R4	BN 160L 4	—	—	—	98100	122200	38600	315
5.0	26083	1.0	291	18.0	311 L3	—	BN 160L 4	—	—	—	97900	121900	38500	314
5.2	24577	0.9	283	15.0	—	310 R4	BN 160L 4	—	—	—	82100	103300	38100	305
5.2	24411	1.7	281	22	—	313 R4	BN 160L 4	—	—	—	119700	141700	46800	325
5.3	23986	2.4	276	22	—	314 R4	BN 160L 4	—	—	—	127100	149200	52400	335
5.5	23088	1.6	266	22	—	311 R4	BN 160L 4	—	—	—	95300	118700	37400	315
5.7	22429	1.0	258	15.0	—	310 R4	BN 160L 4	—	—	—	79900	100500	37000	305
5.8	22605	2.0	252	18.0	313 L3	—	BN 160L 4	—	—	—	115900	137100	45200	324
6.0	21977	1.5	245	18.0	311 L3	—	BN 160L 4	—	—	—	93000	115800	36400	314
6.1	20633	2.4	238	22	—	314 R4	BN 160L 4	—	—	—	121500	142700	49800	335
6.2	20568	1.7	237	22	—	313 R4	BN 160L 4	—	—	—	113700	134600	44200	325
6.2	20317	1.0	234	15.0	—	310 R4	BN 160L 4	—	—	—	77600	97600	35800	305
6.3	20614	1.0	230	18.0	310 L3	—	BN 160L 4	—	—	—	77200	97100	35600	304
6.4	19860	1.8	229	22	—	311 R4	BN 160L 4	—	—	—	91100	113400	35500	315
7.0	18687	2.4	209	18.0	313 L3	—	BN 160L 4	—	—	—	109400	129500	42400	324
7.1	17873	1.2	206	15.0	—	310 R4	BN 160L 4	—	—	—	74700	93900	34300	305
7.1	17855	0.9	206	15.0	—	309 R4	BN 160L 4	—	—	—	63000	81200	19000	295
7.2	18168	1.8	203	18.0	311 L3	—	BN 160L 4	—	—	—	87800	109400	34100	314
7.2	18078	1.2	202	18.0	310 L3	—	BN 160L 4	—	—	—	74200	93300	34100	304
7.3	17423	1.7	201	22	—	313 R4	BN 160L 4	—	—	—	108200	128000	41900	325
7.4	17204	1.7	198	22	—	311 R4	BN 160L 4	—	—	—	87200	108600	33900	315
7.5	17343	2.8	194	18.0	313 L3	—	BN 160L 4	—	—	—	107000	126700	41400	324
7.6	17125	1.9	191	18.0	311 L3	—	BN 160L 4	—	—	—	86300	107500	33500	314
7.7	16557	1.0	191	15.0	—	309 R4	BN 160L 4	—	—	—	61600	79400	18500	295
7.7	16442	1.4	189	15.0	—	310 R4	BN 160L 4	—	—	—	72800	91500	33400	305
7.7	16442	2.4	189	22	—	314 R4	BN 160L 4	—	—	—	113500	133300	46200	335
7.9	16027	1.7	185	22	—	313 R4	BN 160L 4	—	—	—	105500	124900	40700	325
8.0	15826	1.7	182	22	—	311 R4	BN 160L 4	—	—	—	85100	106000	32900	315
8.0	16304	2.4	182	18.0	313 L3	—	BN 160L 4	—	—	—	105100	124300	40500	324
8.2	15876	1.1	177	18.0	310 L3	—	BN 160L 4	—	—	—	71400	89800	32600	304
8.3	15746	2.9	176	18.0	313 L3	—	BN 160L 4	—	—	—	104000	123000	40100	324
8.5	15308	2.1	171	18.0	311 L3	—	BN 160L 4	—	—	—	83400	103900	32200	314
8.8	14343	1.0	165	15.0	—	309 R4	BN 160L 4	—	—	—	59000	76100	17700	295
8.9	14659	1.5	164	18.0	310 L3	—	BN 160L 4	—	—	—	69700	87600	31800	304
9.0	14613	3.0	163	18.0	313 L3	—	BN 160L 4	—	—	—	101700	120300	39100	324
9.0	14471	1.1	162	11.0	309 L3	—	BN 160L 4	—	—	—	58600	75600	17500	294
9.1	14430	2.2	161	18.0	311 L3	—	BN 160L 4	—	—	—	82000	102100	31600	314
9.1	13927	1.6	160	15.0	—	310 R4	BN 160L 4	—	—	—	69300	87100	31600	305
9.1	13927	2.4	160	22	—	314 R4	BN 160L 4	—	—	—	108000	126800	43700	335



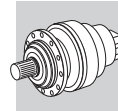
P₁ = 15 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
											HC/PC	HZ/PZ		
9.5	13406	1.7	154	22	—	311 R4	BN 160L 4	—	—	—	80900	100800	31200	315
9.5	13706	2.8	153	40	—	313 R3	BN 160L 4	—	—	—	99700	118000	38200	325
9.6	13194	0.9	152	15.0	—	307 R4	BN 160L 4	—	24700	31000	56600	74200	21500	285
9.6	13194	1.0	152	15.0	—	309 R4	BN 160L 4	—	—	—	57500	74200	17200	295
9.9	13168	2.4	147	18.0	311 L3	—	BN 160L 4	—	—	—	79700	99300	30700	314
10.0	13138	2.1	147	40	—	311 R3	BN 160L 4	—	—	—	79700	99300	30600	315
10.0	13108	1.0	146	11.0	307 L3	—	BN 160L 4	—	24400	30600	56000	73300	21200	284
10.3	12698	1.6	142	18.0	310 L3	—	BN 160L 4	—	—	—	66700	83900	30300	304
10.5	12431	1.3	139	11.0	309 L3	—	BN 160L 4	—	—	—	56000	72200	16700	294
10.7	11797	1.7	136	15.0	—	310 R4	BN 160L 4	—	—	—	65900	82900	29900	305
11.0	11928	2.5	133	18.0	311 L3	—	BN 160L 4	—	—	—	77400	96400	29700	314
11.2	11681	1.7	130	18.0	310 L3	—	BN 160L 4	—	—	—	65100	81900	29500	304
11.6	11276	1.1	126	11.0	307 L3	—	BN 160L 4	—	23200	29100	53500	70100	20200	284
11.6	11276	1.3	126	11.0	309 L3	—	BN 160L 4	—	—	—	54400	70100	16100	294
11.6	11244	2.6	126	18.0	311 L3	—	BN 160L 4	—	—	—	76100	94700	29100	314
11.8	11070	2.8	124	40	—	311 R3	BN 160L 4	—	—	—	75700	94300	28900	315
12.2	10727	1.2	120	22	—	309 R3	BN 160L 4	—	—	—	53600	69100	15900	295
12.2	10727	1.6	120	22	—	310 R3	BN 160L 4	—	—	—	63500	79800	28600	305
12.3	10660	1.8	119	18.0	310 L3	—	BN 160L 4	—	—	—	63300	79600	28600	304
12.7	10261	2.8	115	18.0	311 L3	—	BN 160L 4	—	—	—	74000	92200	28200	314
12.9	10147	1.0	113	11.0	307 L3	—	BN 160L 4	—	22400	28100	51800	67900	19500	284
12.9	10147	1.5	113	11.0	309 L3	—	BN 160L 4	—	—	—	52700	67900	15600	294
13.2	9895	1.7	110	18.0	310 L3	—	BN 160L 4	—	—	—	61900	77900	27900	304
14.1	9295	3.0	104	18.0	311 L3	—	BN 160L 4	—	—	—	71800	89500	27300	314
14.5	9030	2.1	101	18.0	310 L3	—	BN 160L 4	—	—	—	60300	75800	27000	304
14.6	8985	1.3	100	11.0	307 L3	—	BN 160L 4	—	21500	27000	50000	65500	18700	284
14.6	8985	1.5	100	11.0	309 L3	—	BN 160L 4	—	—	—	50800	65500	15000	294
14.7	8868	1.0	99.0	22	—	307 R3	BN 160L 4	—	21400	26900	49800	65200	18600	285
14.7	8868	1.4	99.0	22	—	309 R3	BN 160L 4	—	—	—	50600	65200	14900	295
14.7	8868	1.7	99.0	22	—	310 R3	BN 160L 4	—	—	—	59900	75400	26900	305
15.7	8332	1.3	93.0	11.0	307 L3	—	BN 160L 4	—	21000	26300	48900	64000	18200	284
15.7	8332	1.6	93.0	11.0	309 L3	—	BN 160L 4	—	—	—	49600	64000	14600	294
16.0	8179	1.9	91.3	18.0	310 L3	—	BN 160L 4	—	—	—	58500	73600	26200	304
17.2	7590	0.9	84.7	14.0	—	306 R3	BN 160L 4	—	18300	20700	44200	51400	13700	275
17.5	7472	1.3	83.4	22	—	307 R3	BN 160L 4	—	20200	25400	47300	62000	17600	285
17.5	7472	1.7	83.4	22	—	309 R3	BN 160L 4	—	—	—	48000	62000	14100	295
17.5	7472	1.7	83.4	22	—	310 R3	BN 160L 4	—	—	—	56900	71600	25400	305
18.1	7218	1.3	80.6	11.0	307 L3	—	BN 160L 4	—	20000	25100	46800	61300	17400	284
18.1	7218	1.9	80.6	11.0	309 L3	—	BN 160L 4	—	—	—	47600	61300	13900	294
18.2	7196	2.4	80.3	18.0	310 L3	—	BN 160L 4	—	—	—	56300	70800	25100	304
18.6	7043	1.5	78.6	22	—	307 R3	BN 160L 4	—	19800	24900	46500	60900	17200	285
18.6	7043	1.7	78.6	22	—	310 R3	BN 160L 4	—	—	—	55900	70300	24900	305
19.0	6898	1.1	77.0	7.5	306 L3	—	BN 160L 4	—	17700	20100	42900	50000	13300	274
19.7	6640	1.6	74.1	11.0	307 L3	—	BN 160L 4	—	19400	24400	45600	59800	16900	284
19.7	6640	1.9	74.1	11.0	309 L3	—	BN 160L 4	—	—	—	46400	59800	13500	294
19.8	6619	2.7	73.9	18.0	310 L3	—	BN 160L 4	—	—	—	54900	69000	24400	304
20.0	6529	1.1	72.9	14.0	—	306 R3	BN 160L 4	—	17400	19700	42200	49200	13100	275
20.3	6427	1.4	71.8	22	—	307 R3	BN 160L 4	—	19200	24100	45200	59200	16700	285
20.3	6427	1.7	71.8	22	—	309 R3	BN 160L 4	—	—	—	45900	59200	13400	295
20.3	6427	1.7	71.8	22	—	310 R3	BN 160L 4	—	—	—	54400	68400	24100	305
21.6	6049	1.0	67.5	14.0	—	306 R3	BN 160L 4	—	17000	19200	41300	48000	12700	275
22.4	5843	1.0	65.2	7.5	306 L3	—	BN 160L 4	—	16800	19000	40800	47500	12600	274
22.5	5822	1.7	65.0	22	—	307 R3	BN 160L 4	—	18600	23300	43900	57500	16200	285
22.5	5822	1.7	65.0	22	—	309 R3	BN 160L 4	—	—	—	44600	57500	12900	295
22.5	5822	1.7	65.0	22	—	310 R3	BN 160L 4	—	—	—	52800	66400	23400	305
23.3	5607	2.8	62.6	18.0	310 L3	—	BN 160L 4	—	—	—	52200	65700	23100	304
24.1	5420	1.8	60.5	11.0	307 L3	—	BN 160L 4	—	18200	22800	42900	56300	15800	284
24.1	5420	2.1	60.5	11.0	309 L3	—	BN 160L 4	—	—	—	43600	56300	12600	294



$P_1 = 15 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			FZ	
											HC/PC	HZ/PZ			
25.1	5203	1.4	58.1	14.0	—	306 R3	BN 160L 4	—	16100	18300	39400	45900	12100	275	
26.0	5193	1.0	56.3	13.0	306 L2	—	BN 160L 4	M 5SB 4	16000	18100	39100	45500	12000	274	
26.1	5008	1.7	55.9	22	—	307 R3	BN 160L 4	—	17700	22200	41900	55000	15400	285	
26.1	5008	1.7	55.9	22	—	309 R3	BN 160L 4	—	—	—	42600	55000	12300	295	
26.1	5008	1.7	55.9	22	—	310 R3	BN 160L 4	—	—	—	50500	63500	22200	305	
27.4	4770	1.2	53.2	7.5	306 L3	—	BN 160L 4	—	15700	17800	38400	44700	11800	274	
27.5	4749	2.8	53.0	18.0	310 L3	—	BN 160L 4	—	—	—	49700	62500	21800	304	
28.5	4591	2.0	51.3	11.0	307 L3	—	BN 160L 4	—	17200	21600	40900	53500	14900	284	
28.5	4591	2.1	51.3	11.0	309 L3	—	BN 160L 4	—	—	—	41500	53500	12000	294	
31	4315	1.9	46.7	18.0	307 L2	—	BN 160L 4	M 5SB 4	16700	20900	39700	52100	14500	284	
31	4315	2.6	46.7	18.0	309 L2	—	BN 160L 4	—	—	—	40400	52100	11600	294	
31	4293	1.4	46.5	13.0	306 L2	—	BN 160L 4	M 5SB 4	15000	17000	36900	43000	11300	274	
32	4146	1.6	46.3	14.0	—	306 R3	BN 160L 4	—	15000	16900	36800	42900	11200	275	
33	3991	1.7	44.6	22	—	307 R3	BN 160L 4	—	16400	20600	39200	51300	14300	285	
33	3991	1.7	44.6	22	—	309 R3	BN 160L 4	—	—	—	39800	51300	11400	295	
33	3991	1.7	44.6	22	—	310 R3	BN 160L 4	—	—	—	47200	59300	20600	305	
37	3512	1.6	39.2	14.0	—	306 R3	BN 160L 4	—	14100	16000	35000	40800	10600	275	
38	3567	2.2	38.6	18.0	307 L2	—	BN 160L 4	M 5SB 4	15600	19600	37500	49200	13600	284	
38	3549	1.7	38.4	13.0	306 L2	—	BN 160L 4	M 5SB 4	14100	15900	34800	40600	10600	274	
38	3545	1.1	38.4	9.0	305 L2	—	BN 160L 4	—	11300	13000	21300	25600	7240	264	
39	3381	1.7	37.7	22	—	307 R3	BN 160L 4	—	15500	19500	37300	48800	13500	285	
39	3381	1.7	37.7	22	—	309 R3	BN 160L 4	—	—	—	37900	48800	10800	295	
39	3381	1.7	37.7	22	—	310 R3	BN 160L 4	—	—	—	44900	56400	19500	305	
41	3302	1.1	35.8	9.0	305 L2	—	BN 160L 4	—	11000	12700	20800	25100	7070	264	
44	2975	1.7	33.2	14.0	—	306 R3	BN 160L 4	—	13400	15200	33300	38800	10100	275	
44	3053	1.8	33.1	13.0	306 L2	—	BN 160L 4	M 5SB 4	13400	15100	33300	38800	10000	274	
45	3005	2.6	32.6	18.0	307 L2	—	BN 160L 4	M 5SB 4	14800	18500	35700	46700	12800	284	
46	2833	1.7	31.6	22	—	307 R3	BN 160L 4	—	14600	18400	35400	46300	12700	285	
46	2833	1.7	31.6	22	—	309 R3	BN 160L 4	—	—	—	35900	46300	10200	295	
47	2841	1.0	30.8	9.0	304 L2	—	BN 160L 4	—	10500	12100	19900	24000	6720	254	
47	2841	1.3	30.8	9.0	305 L2	—	BN 160L 4	—	10500	12100	19900	24000	6720	264	
48	2833	2.8	30.7	18.0	307 L2	—	BN 160L 4	M 5SB 4	14500	18200	35000	45900	12600	284	
51	2626	2.2	28.4	13.0	306 L2	—	BN 160L 4	M 5SB 4	12700	14400	31800	37100	9550	274	
52	2585	3.0	28.0	18.0	307 L2	—	BN 160L 4	M 5SB 4	14100	17600	34100	44700	12200	284	
55	2440	1.4	26.4	9.0	305 L2	—	BN 160L 4	—	9960	11500	19000	22900	6390	264	
55	2433	1.9	26.4	13.0	306 L2	—	BN 160L 4	M 5SB 4	12400	14000	31100	36200	9310	274	
60	2264	1.3	24.5	9.0	304 L2	—	BN 160L 4	—	9720	11200	18600	22400	6230	254	
60	2264	1.5	24.5	9.0	305 L2	—	BN 160L 4	—	9720	11200	18600	22400	6230	264	
64	2099	0.9	22.7	9.0	303 L2	—	BN 160L 4	—	9470	10900	18200	21900	6080	244	
64	2099	1.3	22.7	9.0	304 L2	—	BN 160L 4	—	9470	10900	18200	21900	6080	254	
64	2099	1.6	22.7	9.0	305 L2	—	BN 160L 4	—	9470	10900	18200	21900	6080	264	
64	2093	2.6	22.7	13.0	306 L2	—	BN 160L 4	M 5SB 4	11800	13400	29700	34600	8850	274	
70	1918	1.5	20.8	9.0	305 L2	—	BN 160L 4	—	9190	10600	17700	21300	5900	264	
70	1918	1.5	20.8	9.0	304 L2	—	BN 160L 4	—	9190	10600	17700	21300	5900	254	
76	1774	1.7	19.2	18.0	—	306 R2	BN 160L 4	—	11200	12600	28300	33000	8380	275	
81	1673	1.1	18.1	9.0	303 L2	—	BN 160L 4	—	8780	10100	17000	20400	5630	244	
81	1673	1.6	18.1	9.0	304 L2	—	BN 160L 4	—	8780	10100	17000	20400	5630	254	
81	1673	1.9	18.1	9.0	305 L2	—	BN 160L 4	—	8780	10100	17000	20400	5630	264	
81	1668	2.8	18.1	13.0	306 L2	—	BN 160L 4	M 5SB 4	10900	12400	27800	32300	8210	274	
92	1467	1.7	15.9	18.0	—	306 R2	BN 160L 4	—	10500	11900	26700	31100	7870	275	
95	1417	1.1	15.3	9.0	303 L2	—	BN 160L 4	—	8310	9590	16200	19500	5330	244	
95	1417	1.8	15.3	9.0	304 L2	—	BN 160L 4	—	8310	9590	16200	19500	5330	254	
95	1417	1.9	15.3	9.0	305 L2	—	BN 160L 4	—	8310	9590	16200	19500	5330	264	
95	1413	2.8	15.3	13.0	306 L2	—	BN 160L 4	M 5SB 4	10300	11700	26400	30800	7770	274	
107	1262	1.6	13.7	18.0	—	306 R2	BN 160L 4	—	9960	11300	25500	29700	7480	275	
113	1197	2.8	13.0	13.0	306 L2	—	BN 160L 4	M 5SB 4	9780	11100	25100	29300	7350	274	
117	1157	1.3	12.5	9.0	303 L2	—	BN 160L 4	—	7770	8970	15200	18300	4980	244	
117	1157	2.1	12.5	9.0	304 L2	—	BN 160L 4	—	7770	8970	15200	18300	4980	254	

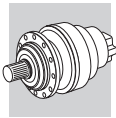


$P_1 = 15 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			FZ	
											HC/PC	HZ/PZ			
117	1157	2.1	12.5	9.0	305 L2	—	BN 160L 4	—	7770	8970	15200	18300	4980	264	
134	1006	1.7	10.9	18.0	—	306 R2	BN 160L 4	—	9230	10500	23900	27800	6930	275	
158	852	1.7	9.23	18.0	—	306 R2	BN 160L 4	—	8730	9900	22700	26400	6560	275	
195	714	1.7	7.50	11.0	303 L1	—	BN 160L 4	—	6550	7560	13000	15700	4200	244	
195	714	2.8	7.50	13.0	305 L1	—	BN 160L 4	—	6550	7560	13000	15700	4200	264	
222	625	2.8	6.57	12.0	304 L1	—	BN 160L 4	—	6260	7230	12500	15100	4020	254	
235	590	1.9	6.20	11.0	303 L1	—	BN 160L 4	—	6140	7090	12300	14800	3940	244	
274	508	2.5	5.33	11.0	303 L1	—	BN 160L 4	—	5840	6750	11800	14200	3750	244	
344	404	2.8	4.25	11.0	303 L1	—	BN 160L 4	—	5420	6250	11000	13200	3480	244	

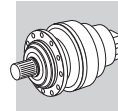
$P_1 = 18.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.92	170782	1.0	1595	18.0	317 L4	—	BN 180M 4	—	—	—	442000	470000	150000	362	
1.1	148716	2.3	1389	30	319 L4	—	BN 180M 4	—	—	—	636100	700800	199500	334	
1.1	141179	1.0	1318	18.0	317 L4	—	BN 180M 4	—	—	—	434300	462400	147000	362	
1.2	132525	0.9	1237	18.0	316 L4	—	BN 180M 4	—	—	—	331400	368600	144000	354	
1.2	127928	2.6	1195	30	319 L4	—	BN 180M 4	—	—	—	608000	669900	189700	334	
1.3	121445	1.4	1134	18.0	317 L4	—	BN 180M 4	—	—	—	415100	442000	139800	362	
1.4	113421	2.1	1059	22	318 L4	—	BN 180M 4	—	—	—	503000	520700	182200	370	
1.4	111665	0.9	1043	18.0	315 L4	—	BN 180M 4	—	—	—	189400	222300	81600	344	
1.4	111665	1.1	1043	18.0	316 L4	—	BN 180M 4	—	—	—	314800	350100	136000	354	
1.4	110556	1.6	1032	18.0	317 L4	—	BN 180M 4	—	—	—	403600	429700	135500	362	
1.5	107791	3.0	1007	30	319 L4	—	BN 180M 4	—	—	—	577600	636300	179200	334	
1.5	102094	1.3	953	50	—	317 R4	BN 180M 4	—	—	—	394100	419600	132000	363	
1.6	99647	0.9	930	18.0	315 L4	—	BN 180M 4	—	—	—	183000	214800	78500	344	
1.6	97566	2.6	911	22	318 L4	—	BN 180M 4	—	—	—	487700	497700	173300	370	
1.6	96776	1.7	904	18.0	317 L4	—	BN 180M 4	—	—	—	387800	412900	129600	362	
1.7	92310	1.1	862	18.0	315 L4	—	BN 180M 4	—	—	—	178800	210000	76600	344	
1.7	92310	1.4	862	18.0	316 L4	—	BN 180M 4	—	—	—	297400	330700	127600	354	
1.8	87012	1.4	812	18.0	316 L4	—	BN 180M 4	—	—	—	292100	324900	125100	354	
1.8	86023	1.9	803	50	—	317 R4	BN 180M 4	—	—	—	374300	398500	124600	363	
1.8	84818	2.1	792	18.0	317 L4	—	BN 180M 4	—	—	—	372700	396900	124100	362	
1.9	83769	1.1	782	40	—	315 R4	BN 180M 4	—	—	—	173700	203900	74100	345	
1.9	82209	3.0	768	22	318 L4	—	BN 180M 4	—	—	—	463300	472800	163700	370	
2.0	79406	1.3	741	18.0	315 L4	—	BN 180M 4	—	—	—	170900	200700	72800	344	
2.0	79406	1.6	741	18.0	316 L4	—	BN 180M 4	—	—	—	284200	316100	121400	354	
2.0	79014	1.0	738	15.0	314 L4	—	BN 180M 4	—	—	—	170700	200400	72700	334	
2.0	77779	1.7	726	18.0	316 L4	—	BN 180M 4	—	—	—	282500	314100	120500	354	
2.0	77007	2.3	719	18.0	317 L4	—	BN 180M 4	—	—	—	362100	385500	120100	362	
2.1	74027	2.9	691	110	—	318 R4 (C)	BN 180M 4	—	—	—	448900	458100	158100	371	
2.1	73315	1.7	685	18.0	316 L4	—	BN 180M 4	—	—	—	277500	308600	118200	354	
2.2	72483	2.2	677	50	—	317 R4	BN 180M 4	—	—	—	355600	378600	117700	363	
2.2	71930	1.4	672	18.0	315 L4	—	BN 180M 4	—	—	—	165900	194800	70500	344	
2.2	71574	1.1	668	15.0	314 L4	—	BN 180M 4	—	—	—	165700	194500	70300	334	
2.2	70583	1.3	659	40	—	315 R4	BN 180M 4	—	—	—	165000	193700	70000	345	
2.3	67031	2.3	626	50	—	317 R4	BN 180M 4	—	—	—	347300	369800	114700	363	
2.3	66907	1.9	625	18.0	316 L4	—	BN 180M 4	—	—	—	270000	300300	114600	354	
2.3	66754	1.5	623	40	—	315 R4	BN 180M 4	—	—	—	162300	190500	68700	345	
2.3	66754	1.7	623	45	—	316 R4	BN 180M 4	—	—	—	269800	300100	114500	355	
2.4	66243	2.7	619	18.0	317 L4	—	BN 180M 4	—	—	—	346100	368500	114200	362	
2.5	63277	1.6	591	18.0	315 L4	—	BN 180M 4	—	—	—	159700	187500	67500	344	
2.5	63277	1.9	591	18.0	316 L4	—	BN 180M 4	—	—	—	265500	295300	112500	354	
2.5	62964	1.3	588	15.0	314 L4	—	BN 180M 4	—	—	—	159500	187200	67400	334	



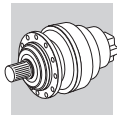
$P_1 = 18.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
2.6	60607	2.1	566	18.0	316 L4	—	BN 180M 4	—	—	—	262100	291500	110900	354
2.6	59351	1.3	554	15.0	314 L4	—	BN 180M 4	—	—	—	156600	183900	66100	334
2.6	59079	3.0	552	18.0	317 L4	—	BN 180M 4	—	—	—	334400	356100	110000	362
2.7	57129	1.7	533	18.0	315 L4	—	BN 180M 4	—	—	—	154900	181800	65200	344
2.7	57129	2.2	533	18.0	316 L4	—	BN 180M 4	—	—	—	257500	286400	108700	354
2.8	56246	1.8	525	40	—	315 R4	BN 180M 4	—	—	—	154100	181000	64900	345
2.8	56246	2.1	525	45	—	316 R4	BN 180M 4	—	—	—	256300	285000	108200	355
2.8	55687	2.8	520	50	—	317 R4	BN 180M 4	—	—	—	328500	349800	107800	363
3.0	52963	1.5	495	15.0	314 L4	—	BN 180M 4	—	—	—	151400	177700	63600	334
3.0	52135	1.9	487	18.0	315 L4	—	BN 180M 4	—	—	—	150700	176900	63300	344
3.0	52135	2.3	487	18.0	316 L4	—	BN 180M 4	—	—	—	250500	278600	105500	354
3.2	49063	1.6	458	15.0	314 L4	—	BN 180M 4	—	—	—	148000	173700	62000	334
3.3	47392	2.5	443	45	—	316 R4	BN 180M 4	—	—	—	243500	270800	102200	355
3.3	47227	2.1	441	18.0	315 L4	—	BN 180M 4	—	—	—	146300	171700	61200	344
3.3	47227	2.5	441	18.0	316 L4	—	BN 180M 4	—	—	—	243200	270500	102100	354
3.3	46922	2.8	438	50	—	317 R4	BN 180M 4	—	—	—	312100	332300	101800	363
3.6	43828	2.2	409	40	—	315 R4	BN 180M 4	—	—	—	143000	167900	59700	345
3.6	43828	2.6	409	45	—	316 R4	BN 180M 4	—	—	—	237800	264500	99600	355
3.7	42723	2.8	399	50	—	317 R4	BN 180M 4	—	—	—	303400	323100	98700	363
3.8	41559	1.9	388	15.0	314 L4	—	BN 180M 4	—	—	—	140800	165300	58700	334
4.0	39580	2.5	370	18.0	315 L4	—	BN 180M 4	—	—	—	138700	162900	57700	344
4.0	39580	2.8	370	18.0	316 L4	—	BN 180M 4	—	—	—	230600	256500	96200	354
4.2	36929	2.6	345	40	—	315 R4	BN 180M 4	—	—	—	135900	159500	56400	345
4.2	36929	3.0	345	45	—	316 R4	BN 180M 4	—	—	—	225900	251200	94000	355
4.3	35998	2.8	336	50	—	317 R4	BN 180M 4	—	—	—	288200	306900	93200	363
4.6	33632	2.3	314	15.0	314 L4	—	BN 180M 4	—	—	—	132100	155100	54700	334
4.8	33559	1.2	304	18.0	313 L3	—	BN 180M 4	—	—	—	122500	145000	48100	324
4.8	32373	3.0	302	18.0	315 L4	—	BN 180M 4	—	—	—	130600	153300	54000	344
5.4	28776	2.7	269	40	—	315 R4	BN 180M 4	—	—	—	126100	148000	51900	345
5.6	28051	2.8	262	50	—	317 R4	BN 180M 4	—	—	—	267500	284800	85800	363
5.8	27880	1.6	252	18.0	313 L3	—	BN 180M 4	—	—	—	115900	137100	45200	324
6.0	27105	1.2	245	18.0	311 L3	—	BN 180M 4	—	—	—	93000	115800	36400	314
6.1	26593	2.4	241	30	315 L3	—	BN 180M 4	—	—	—	122000	143200	50000	344
6.1	26462	2.0	240	25	314 L3	—	BN 180M 4	—	—	—	121800	143000	50000	334
6.5	24117	2.8	225	40	—	315 R4	BN 180M 4	—	—	—	119600	140400	48900	345
6.7	23509	2.8	220	50	—	317 R4	BN 180M 4	—	—	—	253600	270100	80900	363
7.0	23047	2.0	209	18.0	313 L3	—	BN 180M 4	—	—	—	109400	129500	42400	324
7.1	22763	2.8	206	25	314 L3	—	BN 180M 4	—	—	—	116400	136700	47500	334
7.2	22407	1.4	203	18.0	311 L3	—	BN 180M 4	—	—	—	87800	109400	34100	314
7.2	22296	1.0	202	18.0	310 L3	—	BN 180M 4	—	—	—	74200	93300	34100	304
7.5	21389	2.2	194	18.0	313 L3	—	BN 180M 4	—	—	—	107000	126700	41400	324
7.6	21121	1.5	191	18.0	311 L3	—	BN 180M 4	—	—	—	86300	107500	33500	314
8.0	20108	1.9	182	18.0	313 L3	—	BN 180M 4	—	—	—	105100	124300	40500	324
8.2	19581	0.9	177	18.0	310 L3	—	BN 180M 4	—	—	—	71400	89800	32600	304
8.3	19419	2.3	176	18.0	313 L3	—	BN 180M 4	—	—	—	104000	123000	40100	324
8.5	18880	1.7	171	18.0	311 L3	—	BN 180M 4	—	—	—	83400	103900	32200	314
8.9	18079	1.2	164	18.0	310 L3	—	BN 180M 4	—	—	—	69700	87600	31800	304
9.0	18022	2.4	163	18.0	313 L3	—	BN 180M 4	—	—	—	101700	120300	39100	324
9.1	17796	1.8	161	18.0	311 L3	—	BN 180M 4	—	—	—	82000	102100	31600	314
9.3	17357	3.0	157	55	—	314 R3 (C)	BN 180M 4	—	—	—	107300	126000	43400	335
9.5	16904	2.3	153	40	—	313 R3	BN 180M 4	—	—	—	99700	118000	38200	325
9.7	16705	2.7	151	18.0	313 L3	—	BN 180M 4	—	—	—	99400	117600	38100	324
9.9	16241	2.0	147	18.0	311 L3	—	BN 180M 4	—	—	—	79700	99300	30700	314
10.0	16204	1.7	147	40	—	311 R3	BN 180M 4	—	—	—	79700	99300	30600	315
10.2	15799	2.8	143	18.0	313 L3	—	BN 180M 4	—	—	—	97700	115700	37400	324



$P_1 = 18.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
10.3	15661	1.3	142	18.0	310 L3	—	BN 180M 4	—	—	—	66700	83900	30300	304
10.8	14899	3.0	135	18.0	313 L3	—	BN 180M 4	—	—	—	96000	113600	36700	324
11.0	14712	2.0	133	18.0	311 L3	—	BN 180M 4	—	—	—	77400	96400	29700	314
11.2	14407	1.4	130	18.0	310 L3	—	BN 180M 4	—	—	—	65100	81900	29500	304
11.5	14043	2.8	127	40	—	313 R3	BN 180M 4	—	—	—	94300	111600	36000	325
11.6	13867	2.1	126	18.0	311 L3	—	BN 180M 4	—	—	—	76100	94700	29100	314
11.8	13653	2.3	124	40	—	311 R3	BN 180M 4	—	—	—	75700	94300	28900	315
12.3	13147	1.5	119	18.0	310 L3	—	BN 180M 4	—	—	—	63300	79600	28600	304
12.7	12655	2.3	115	18.0	311 L3	—	BN 180M 4	—	—	—	74000	92200	28200	314
13.2	12203	1.4	110	18.0	310 L3	—	BN 180M 4	—	—	—	61900	77900	27900	304
13.6	11833	2.8	107	40	—	313 R3	BN 180M 4	—	—	—	89600	106000	34000	325
14.0	11504	2.5	104	40	—	311 R3	BN 180M 4	—	—	—	71900	89600	27300	315
14.1	11464	2.4	104	18.0	311 L3	—	BN 180M 4	—	—	—	71800	89500	27300	314
14.5	11137	1.7	101	18.0	310 L3	—	BN 180M 4	—	—	—	60300	75800	27000	304
15.0	10774	2.8	97.5	40	—	313 R3	BN 180M 4	—	—	—	87100	103100	32900	325
15.2	10639	2.5	96.3	40	—	311 R3	BN 180M 4	—	—	—	70200	87500	26600	315
16.0	10088	1.5	91.3	18.0	310 L3	—	BN 180M 4	—	—	—	58500	73600	26200	304
16.3	9866	2.7	89.3	18.0	311 L3	—	BN 180M 4	—	—	—	68100	84900	25700	314
17.8	9078	2.8	82.2	40	—	313 R3	BN 180M 4	—	—	—	82800	97900	31100	325
18.0	8964	2.8	81.1	40	—	311 R3	BN 180M 4	—	—	—	66700	83100	25200	315
18.2	8874	2.0	80.3	18.0	310 L3	—	BN 180M 4	—	—	—	56300	70800	25100	304
18.9	8542	3.0	77.3	18.0	311 L3	—	BN 180M 4	—	—	—	65800	81900	24800	314
19.8	8164	2.2	73.9	18.0	310 L3	—	BN 180M 4	—	—	—	54900	69000	24400	304
20.9	7727	2.8	69.9	40	—	313 R3	BN 180M 4	—	—	—	78900	93300	29500	325
21.5	7513	2.8	68.0	40	—	311 R3	BN 180M 4	—	—	—	63300	78800	23700	315
22.8	7074	2.8	64.0	40	—	313 R3	BN 180M 4	—	—	—	76800	90900	28600	325
23.1	6985	2.8	63.2	40	—	311 R3	BN 180M 4	—	—	—	61900	77100	23100	315
23.3	6915	2.3	62.6	18.0	310 L3	—	BN 180M 4	—	—	—	52200	65700	23100	304
27.2	5928	2.8	53.7	40	—	313 R3	BN 180M 4	—	—	—	72800	86200	27000	325
27.5	5858	2.3	53.0	18.0	310 L3	—	BN 180M 4	—	—	—	49700	62500	21800	304
27.6	5854	2.8	53.0	40	—	311 R3	BN 180M 4	—	—	—	58700	73100	21800	315
31	5321	1.5	46.7	18.0	307 L2	—	BN 180M 4	M 5LA 4	16700	20900	39700	52100	14500	284
31	5321	2.1	46.7	18.0	309 L2	—	BN 180M 4	—	—	—	40400	52100	11600	294
31	5321	2.6	46.7	22	310 L2	—	BN 180M 4	—	—	—	47800	60200	20900	304
31	5295	1.1	46.5	13.0	306 L2	—	BN 180M 4	M 5LA 4	15000	17000	36900	43000	11300	274
38	4399	1.8	38.6	18.0	307 L2	—	BN 180M 4	M 5LA 4	15600	19600	37500	49200	13600	284
38	4399	2.5	38.6	18.0	309 L2	—	BN 180M 4	—	—	—	38100	49200	10900	294
38	4377	1.3	38.4	13.0	306 L2	—	BN 180M 4	M 5LA 4	14100	15900	34800	40600	10600	274
44	3765	1.5	33.1	13.0	306 L2	—	BN 180M 4	M 5LA 4	13400	15100	33300	38800	10000	274
45	3706	2.1	32.6	18.0	307 L2	—	BN 180M 4	M 5LA 4	14800	18500	35700	46700	12800	284
45	3706	3.0	32.6	18.0	309 L2	—	BN 180M 4	—	—	—	36200	46700	10300	294
48	3494	2.3	30.7	18.0	307 L2	—	BN 180M 4	M 5LA 4	14500	18200	35000	45900	12600	284
51	3239	1.8	28.4	13.0	306 L2	—	BN 180M 4	M 5LA 4	12700	14400	31800	37100	9550	274
52	3188	2.4	28.0	18.0	307 L2	—	BN 180M 4	M 5LA 4	14100	17600	34100	44700	12200	284
55	3000	1.5	26.4	13.0	306 L2	—	BN 180M 4	M 5LA 4	12400	14000	31100	36200	9310	274
58	2888	2.7	25.4	18.0	307 L2	—	BN 180M 4	M 5LA 4	13600	17100	33100	43400	11800	284
62	2680	2.8	23.5	35	—	309 R2	BN 180M 4	—	—	—	32900	42400	9220	295
62	2680	2.7	23.5	35	—	307 R2	BN 180M 4	M 5LA 4	13300	16600	32400	42400	11500	285
64	2581	2.1	22.7	13.0	306 L2	—	BN 180M 4	M 5LA 4	11800	13400	29700	34600	8850	274
67	2484	2.9	21.8	18.0	307 L2	—	BN 180M 4	M 5LA 4	12900	16200	31600	41400	11200	284
74	2258	2.8	19.8	35	—	309 R2	BN 180M 4	—	—	—	31200	40300	8710	295
74	2258	2.8	19.8	35	—	307 R2	BN 180M 4	M 5LA 4	12500	15700	30700	40300	10900	285
81	2057	2.3	18.1	13.0	306 L2	—	BN 180M 4	M 5LA 4	10900	12400	27800	32300	8210	274
94	1760	2.8	15.5	35	—	309 R2	BN 180M 4	—	—	—	29000	37400	8020	295
94	1760	2.8	15.5	35	—	307 R2	BN 180M 4	M 5LA 4	11500	14500	28500	37400	10000	285

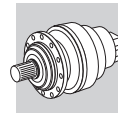


$P_1 = 18.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					Rn_2 [N]					
MC	MZ	HC/PC	HZ/PZ	FZ										
95	1742	2.3	15.3	13.0	306 L2	—	BN 180M 4	M 5LA 4	10300	11700	26400	30800	7770	274
113	1476	2.3	13.0	13.0	306 L2	—	BN 180M 4	M 5LA 4	9780	11100	25100	29300	7350	274
113	1475	2.8	13.0	35	—	309 R2	BN 180M 4	—	—	—	27500	35400	7560	295
113	1475	2.8	13.0	35	—	307 R2	BN 180M 4	M 5LA 4	10900	13600	27000	35400	9450	285
195	880	1.4	7.50	11.0	303 L1	—	BN 180M 4	—	6550	7560	13000	15700	4200	244
195	880	2.3	7.50	13.0	305 L1	—	BN 180M 4	—	6550	7560	13000	15700	4200	264
222	771	2.3	6.57	12.0	304 L1	—	BN 180M 4	—	6260	7230	12500	15100	4020	254
235	728	1.5	6.20	11.0	303 L1	—	BN 180M 4	—	6140	7090	12300	14800	3940	244
274	626	2.0	5.33	11.0	303 L1	—	BN 180M 4	—	5840	6750	11800	14200	3750	244
274	626	2.8	5.33	12.0	304 L1	—	BN 180M 4	—	5840	6750	11800	14200	3750	254
344	499	2.2	4.25	11.0	303 L1	—	BN 180M 4	—	5420	6250	11000	13200	3480	244
344	499	2.8	4.25	12.0	304 L1	—	BN 180M 4	—	5420	6250	11000	13200	3480	254

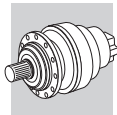
$P_1 = 22 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

1.1	176852	1.9	1389	30	319 L4	—	BN 180L 4	—	—	—	636100	700800	199500	334
1.2	152131	2.2	1195	30	319 L4	—	BN 180L 4	—	—	—	608000	669900	189700	334
1.3	144421	1.1	1134	18.0	317 L4	—	BN 180L 4	—	—	—	415100	442000	139800	362
1.4	134879	1.7	1059	22	318 L4	—	BN 180L 4	—	—	—	503000	520700	182200	370
1.4	132791	1.0	1043	18.0	316 L4	—	BN 180L 4	—	—	—	314800	350100	136000	354
1.4	131472	1.4	1032	18.0	317 L4	—	BN 180L 4	—	—	—	403600	429700	135500	362
1.5	128184	2.5	1007	30	319 L4	—	BN 180L 4	—	—	—	577600	636300	179200	334
1.5	121409	1.1	953	50	—	317 R4	BN 180L 4	—	—	—	394100	419600	132000	363
1.6	116115	2.7	912	30	319 L4	—	BN 180L 4	—	—	—	560700	617700	173400	334
1.6	116025	2.2	911	22	318 L4	—	BN 180L 4	—	—	—	487700	497700	173300	370
1.6	115427	2.7	906	115	—	319 R4 (C)	BN 180L 4	—	—	—	559700	616600	173000	379
1.6	115085	1.4	904	18.0	317 L4	—	BN 180L 4	—	—	—	387800	412900	129600	362
1.7	109774	0.9	862	18.0	315 L4	—	BN 180L 4	—	—	—	178800	210000	76600	344
1.7	109774	1.1	862	18.0	316 L4	—	BN 180L 4	—	—	—	297400	330700	127600	354
1.7	108316	2.8	850	30	319 L4	—	BN 180L 4	—	—	—	549100	605000	169400	334
1.8	103473	1.2	812	18.0	316 L4	—	BN 180L 4	—	—	—	292100	324900	125100	354
1.8	102298	1.6	803	50	—	317 R4	BN 180L 4	—	—	—	374300	398500	124600	363
1.8	100865	1.8	792	18.0	317 L4	—	BN 180L 4	—	—	—	372700	396900	124100	362
1.9	99617	0.9	782	40	—	315 R4	BN 180L 4	—	—	—	173700	203900	74100	345
1.9	97762	2.6	768	22	318 L4	—	BN 180L 4	—	—	—	463300	472800	163700	370
2.0	94429	1.1	741	18.0	315 L4	—	BN 180L 4	—	—	—	170900	200700	72800	344
2.0	94429	1.3	741	18.0	316 L4	—	BN 180L 4	—	—	—	284200	316100	121400	354
2.0	92494	1.4	726	18.0	316 L4	—	BN 180L 4	—	—	—	282500	314100	120500	354
2.0	92457	2.7	726	22	318 L4	—	BN 180L 4	—	—	—	455600	464900	160700	370
2.0	91576	1.9	719	18.0	317 L4	—	BN 180L 4	—	—	—	362100	385500	120100	362
2.0	91266	2.8	717	30	319 L4	—	BN 180L 4	—	—	—	521600	574700	160000	334
2.1	88032	2.5	691	110	—	318 R4 (C)	BN 180L 4	—	—	—	448900	458100	158100	371
2.1	87186	1.5	685	18.0	316 L4	—	BN 180L 4	—	—	—	277500	308600	118200	354
2.2	86314	2.8	678	30	319 L4	—	BN 180L 4	—	—	—	513000	565100	157000	334
2.2	86196	1.8	677	50	—	317 R4	BN 180L 4	—	—	—	355600	378600	117700	363
2.2	85538	1.2	672	18.0	315 L4	—	BN 180L 4	—	—	—	165900	194800	70500	344
2.2	85115	0.9	668	15.0	314 L4	—	BN 180L 4	—	—	—	165700	194500	70300	334
2.2	83937	1.1	659	40	—	315 R4	BN 180L 4	—	—	—	165000	193700	70000	345
2.3	82373	3.0	647	22	318 L4	—	BN 180L 4	—	—	—	440100	449100	154600	370
2.3	79713	1.9	626	50	—	317 R4	BN 180L 4	—	—	—	347300	369800	114700	363
2.3	79565	1.6	625	18.0	316 L4	—	BN 180L 4	—	—	—	270000	300300	114600	354
2.3	79383	1.3	623	40	—	315 R4	BN 180L 4	—	—	—	162300	190500	68700	345
2.3	79383	1.5	623	45	—	316 R4	BN 180L 4	—	—	—	269800	300100	114500	355
2.4	78775	2.2	619	18.0	317 L4	—	BN 180L 4	—	—	—	346100	368500	114200	362
2.5	75248	1.3	591	18.0	315 L4	—	BN 180L 4	—	—	—	159700	187500	67500	344



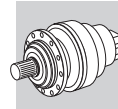
P₁ = 22 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]		FZ	
											HC/PC	HZ/PZ		
2.5	75248	1.6	591	18.0	316 L4	—	BN 180L 4	—	—	—	265500	295300	112500	354
2.5	74876	1.1	588	15.0	314 L4	—	BN 180L 4	—	—	—	159500	187200	67400	334
2.6	72727	2.8	571	30	319 L4	—	BN 180L 4	—	—	—	487300	536800	148300	334
2.6	72074	1.7	566	18.0	316 L4	—	BN 180L 4	—	—	—	262100	291500	110900	354
2.6	70579	1.1	554	15.0	314 L4	—	BN 180L 4	—	—	—	156600	183900	66100	334
2.6	70257	2.5	552	18.0	317 L4	—	BN 180L 4	—	—	—	334400	356100	110000	362
2.7	67937	1.5	533	18.0	315 L4	—	BN 180L 4	—	—	—	154900	181800	65200	344
2.7	67937	1.8	533	18.0	316 L4	—	BN 180L 4	—	—	—	257500	286400	108700	354
2.8	67258	2.8	528	30	319 L4	—	BN 180L 4	—	—	—	476000	524400	144500	334
2.8	66887	1.5	525	40	—	315 R4	BN 180L 4	—	—	—	154100	181000	64900	345
2.8	66887	1.8	525	45	—	316 R4	BN 180L 4	—	—	—	256300	285000	108200	355
2.8	66223	2.4	520	50	—	317 R4	BN 180L 4	—	—	—	328500	349800	107800	363
3.0	62983	1.3	495	15.0	314 L4	—	BN 180L 4	—	—	—	151400	177700	63600	334
3.0	62774	2.7	493	18.0	317 L4	—	BN 180L 4	—	—	—	323300	344200	105900	362
3.0	61999	1.6	487	18.0	315 L4	—	BN 180L 4	—	—	—	150700	176900	63300	344
3.0	61999	2.0	487	18.0	316 L4	—	BN 180L 4	—	—	—	250500	278600	105500	354
3.2	58345	1.4	458	15.0	314 L4	—	BN 180L 4	—	—	—	148000	173700	62000	334
3.3	57157	2.8	449	18.0	317 L4	—	BN 180L 4	—	—	—	314300	334700	102700	362
3.3	56671	2.8	445	30	319 L4	—	BN 180L 4	—	—	—	452100	498100	136500	334
3.3	56359	2.1	443	45	—	316 R4	BN 180L 4	—	—	—	243500	270800	102200	355
3.3	56161	1.8	441	18.0	315 L4	—	BN 180L 4	—	—	—	146300	171700	61200	344
3.3	56161	2.1	441	18.0	316 L4	—	BN 180L 4	—	—	—	243200	270500	102100	354
3.3	55799	2.4	438	50	—	317 R4	BN 180L 4	—	—	—	312100	332300	101800	363
3.6	52120	1.9	409	40	—	315 R4	BN 180L 4	—	—	—	143000	167900	59700	345
3.6	52120	2.2	409	45	—	316 R4	BN 180L 4	—	—	—	237800	264500	99600	355
3.7	50806	2.4	399	50	—	317 R4	BN 180L 4	—	—	—	303400	323100	98700	363
3.8	49422	1.6	388	15.0	314 L4	—	BN 180L 4	—	—	—	140800	165300	58700	334
4.0	47068	2.1	370	18.0	315 L4	—	BN 180L 4	—	—	—	138700	162900	57700	344
4.0	47068	2.4	370	18.0	316 L4	—	BN 180L 4	—	—	—	230600	256500	96200	354
4.1	45882	2.6	360	18.0	317 L4	—	BN 180L 4	—	—	—	294300	313300	95400	362
4.2	44159	2.8	347	30	319 L4	—	BN 180L 4	—	—	—	419500	462200	125600	334
4.2	43916	2.2	345	40	—	315 R4	BN 180L 4	—	—	—	135900	159500	56400	345
4.2	43916	2.5	345	45	—	316 R4	BN 180L 4	—	—	—	225900	251200	94000	355
4.3	42809	2.4	336	50	—	317 R4	BN 180L 4	—	—	—	288200	306900	93200	363
4.4	41849	2.6	329	18.0	316 L4	—	BN 180L 4	—	—	—	222700	247600	92500	354
4.6	39995	1.9	314	15.0	314 L4	—	BN 180L 4	—	—	—	132100	155100	54700	334
4.7	39468	2.8	310	18.0	317 L4	—	BN 180L 4	—	—	—	281300	299500	90700	362
4.8	39908	1.0	304	18.0	313 L3	—	BN 180L 4	—	—	—	122500	145000	48100	324
4.8	38498	2.5	302	18.0	315 L4	—	BN 180L 4	—	—	—	130600	153300	54000	344
4.8	38498	2.7	302	18.0	316 L4	—	BN 180L 4	—	—	—	217100	241500	90000	354
5.1	36806	2.9	289	45	—	316 R4	BN 180L 4	—	—	—	214200	238300	88700	355
5.4	34220	2.3	269	40	—	315 R4	BN 180L 4	—	—	—	126100	148000	51900	345
5.4	34220	3.0	269	45	—	316 R4	BN 180L 4	—	—	—	209600	233100	86500	355
5.6	33357	2.4	262	50	—	317 R4	BN 180L 4	—	—	—	267500	284800	85800	363
5.7	32610	2.8	256	18.0	316 L4	—	BN 180L 4	—	—	—	206600	229800	85100	354
5.8	33154	1.4	252	18.0	313 L3	—	BN 180L 4	—	—	—	115900	137100	45200	324
6.0	32233	1.0	245	18.0	311 L3	—	BN 180L 4	—	—	—	93000	115800	36400	314
6.1	31624	2.1	241	30	315 L3	—	BN 180L 4	—	—	—	122000	143200	50000	344
6.1	31468	1.7	240	25	314 L3	—	BN 180L 4	—	—	—	121800	143000	50000	334
6.5	28680	2.3	225	40	—	315 R4	BN 180L 4	—	—	—	119600	140400	48900	345
6.7	27957	2.4	220	50	—	317 R4	BN 180L 4	—	—	—	253600	270100	80900	363
6.8	27330	2.8	215	18.0	316 L4	—	BN 180L 4	—	—	—	195900	217900	80300	354
7.0	27408	1.6	209	18.0	313 L3	—	BN 180L 4	—	—	—	109400	129500	42400	324
7.1	27204	2.9	207	30	315 L3	—	BN 180L 4	—	—	—	116600	136900	47600	344
7.1	27069	2.3	206	25	314 L3	—	BN 180L 4	—	—	—	116400	136700	47500	334
7.2	26646	1.2	203	18.0	311 L3	—	BN 180L 4	—	—	—	87800	109400	34100	314
7.5	25436	1.9	194	18.0	313 L3	—	BN 180L 4	—	—	—	107000	126700	41400	324
7.6	25117	1.3	191	18.0	311 L3	—	BN 180L 4	—	—	—	86300	107500	33500	314
8.0	23912	1.6	182	18.0	313 L3	—	BN 180L 4	—	—	—	105100	124300	40500	324
8.3	23093	1.9	176	18.0	313 L3	—	BN 180L 4	—	—	—	104000	123000	40100	324



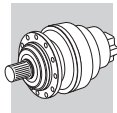
P₁ = 22 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
8.4	22808	2.7	174	25	314 L3	—	BN 180L 4	—	—	—	110600	129800	44900	334
8.5	22452	1.4	171	18.0	311 L3	—	BN 180L 4	—	—	—	83400	103900	32200	314
8.9	21571	3.0	164	25	314 L3	—	BN 180L 4	—	—	—	108700	127700	44100	334
8.9	21499	1.0	164	18.0	310 L3	—	BN 180L 4	—	—	—	69700	87600	31800	304
9.0	21432	2.0	163	18.0	313 L3	—	BN 180L 4	—	—	—	101700	120300	39100	324
9.1	21163	1.5	161	18.0	311 L3	—	BN 180L 4	—	—	—	82000	102100	31600	314
9.3	20640	2.5	157	55	—	314 R3 (C)	BN 180L 4	—	—	—	107300	126000	43400	335
9.5	20102	1.9	153	40	—	313 R3	BN 180L 4	—	—	—	99700	118000	38200	325
9.7	19865	2.3	151	18.0	313 L3	—	BN 180L 4	—	—	—	99400	117600	38100	324
9.9	19314	1.7	147	18.0	311 L3	—	BN 180L 4	—	—	—	79700	99300	30700	314
10.0	19269	1.4	147	40	—	311 R3	BN 180L 4	—	—	—	79700	99300	30600	315
10.2	18787	2.4	143	18.0	313 L3	—	BN 180L 4	—	—	—	97700	115700	37400	324
10.3	18624	1.1	142	18.0	310 L3	—	BN 180L 4	—	—	—	66700	83900	30300	304
10.8	17755	2.9	135	55	—	314 R3 (C)	BN 180L 4	—	—	—	102600	120400	41300	335
10.8	17717	2.5	135	18.0	313 L3	—	BN 180L 4	—	—	—	96000	113600	36700	324
11.0	17495	1.7	133	18.0	311 L3	—	BN 180L 4	—	—	—	77400	96400	29700	314
11.2	17132	1.2	130	18.0	310 L3	—	BN 180L 4	—	—	—	65100	81900	29500	304
11.5	16700	2.4	127	40	—	313 R3	BN 180L 4	—	—	—	94300	111600	36000	325
11.6	16491	1.8	126	18.0	311 L3	—	BN 180L 4	—	—	—	76100	94700	29100	314
11.8	16236	1.9	124	40	—	311 R3	BN 180L 4	—	—	—	75700	94300	28900	315
12.1	15830	2.7	120	18.0	313 L3	—	BN 180L 4	—	—	—	92800	109900	35300	324
12.3	15635	1.2	119	18.0	310 L3	—	BN 180L 4	—	—	—	63300	79600	28600	304
12.7	15049	1.9	115	18.0	311 L3	—	BN 180L 4	—	—	—	74000	92200	28200	314
13.2	14512	1.2	110	18.0	310 L3	—	BN 180L 4	—	—	—	61900	77900	27900	304
13.3	14414	2.8	110	18.0	313 L3	—	BN 180L 4	—	—	—	90300	106800	34200	324
13.6	14149	2.9	108	55	—	314 R3 (C)	BN 180L 4	—	—	—	95800	112500	38300	335
13.6	14071	2.4	107	40	—	313 R3	BN 180L 4	—	—	—	89600	106000	34000	325
14.0	13680	2.1	104	40	—	311 R3	BN 180L 4	—	—	—	71900	89600	27300	315
14.1	13632	2.0	104	18.0	311 L3	—	BN 180L 4	—	—	—	71800	89500	27300	314
14.5	13244	1.4	101	18.0	310 L3	—	BN 180L 4	—	—	—	60300	75800	27000	304
15.0	12812	2.4	97.5	40	—	313 R3	BN 180L 4	—	—	—	87100	103100	32900	325
15.2	12651	2.1	96.3	40	—	311 R3	BN 180L 4	—	—	—	70200	87500	26600	315
15.8	12145	2.8	92.4	18.0	313 L3	—	BN 180L 4	—	—	—	85700	101500	32300	324
16.0	11997	1.3	91.3	18.0	310 L3	—	BN 180L 4	—	—	—	58500	73600	26200	304
16.3	11733	2.2	89.3	18.0	311 L3	—	BN 180L 4	—	—	—	68100	84900	25700	314
17.8	10795	2.4	82.2	40	—	313 R3	BN 180L 4	—	—	—	82800	97900	31100	325
18.0	10660	2.4	81.1	40	—	311 R3	BN 180L 4	—	—	—	66700	83100	25200	315
18.2	10553	1.6	80.3	18.0	310 L3	—	BN 180L 4	—	—	—	56300	70800	25100	304
18.6	10287	2.8	78.3	18.0	313 L3	—	BN 180L 4	—	—	—	81600	96500	30600	324
18.9	10158	2.5	77.3	18.0	311 L3	—	BN 180L 4	—	—	—	65800	81900	24800	314
19.8	9708	1.8	73.9	18.0	310 L3	—	BN 180L 4	—	—	—	54900	69000	24400	304
20.3	9464	2.8	72.0	18.0	313 L3	—	BN 180L 4	—	—	—	79600	94100	29800	324
20.5	9345	2.6	71.1	18.0	311 L3	—	BN 180L 4	—	—	—	64100	79900	24100	314
20.9	9189	2.4	69.9	40	—	313 R3	BN 180L 4	—	—	—	78900	93300	29500	325
21.5	8934	2.4	68.0	40	—	311 R3	BN 180L 4	—	—	—	63300	78800	23700	315
22.8	8412	2.4	64.0	40	—	313 R3	BN 180L 4	—	—	—	76800	90900	28600	325
23.1	8307	2.4	63.2	40	—	311 R3	BN 180L 4	—	—	—	61900	77100	23100	315
23.3	8223	1.9	62.6	18.0	310 L3	—	BN 180L 4	—	—	—	52200	65700	23100	304
23.9	8016	2.8	61.0	18.0	313 L3	—	BN 180L 4	—	—	—	75700	89600	28200	324
24.2	7916	2.8	60.2	18.0	311 L3	—	BN 180L 4	—	—	—	61000	76000	22800	314
27.2	7050	2.4	53.7	40	—	313 R3	BN 180L 4	—	—	—	72800	86200	27000	325
27.5	6966	1.9	53.0	18.0	310 L3	—	BN 180L 4	—	—	—	49700	62500	21800	304
27.6	6962	2.4	53.0	40	—	311 R3	BN 180L 4	—	—	—	58700	73100	21800	315
28.6	6718	2.8	51.1	18.0	313 L3	—	BN 180L 4	—	—	—	71800	85000	26500	324
28.9	6634	2.8	50.5	18.0	311 L3	—	BN 180L 4	—	—	—	57900	72100	21500	314
31	6328	1.3	46.7	18.0	307 L2	—	BN 180L 4	—	16700	20900	39700	52100	14500	284
31	6328	1.8	46.7	18.0	309 L2	—	BN 180L 4	—	—	—	40400	52100	11600	294
31	6328	2.2	46.7	22	310 L2	—	BN 180L 4	—	—	—	47800	60200	20900	304
31	6297	0.9	46.5	13.0	306 L2	—	BN 180L 4	—	15000	17000	36900	43000	11300	274
38	5231	1.5	38.6	18.0	307 L2	—	BN 180L 4	—	15600	19600	37500	49200	13600	284



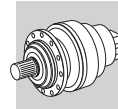
P₁ = 22 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
38	5231	2.1	38.6	18.0	309 L2	—	BN 180L 4	—	—	—	38100	49200	10900	294
38	5231	2.6	38.6	22	310 L2	—	BN 180L 4	—	—	—	45200	56800	19600	304
38	5205	1.1	38.4	13.0	306 L2	—	BN 180L 4	—	14100	15900	34800	40600	10600	274
44	4478	1.3	33.1	13.0	306 L2	—	BN 180L 4	—	13400	15100	33300	38800	10000	274
45	4408	1.8	32.6	18.0	307 L2	—	BN 180L 4	—	14800	18500	35700	46700	12800	284
45	4408	2.5	32.6	18.0	309 L2	—	BN 180L 4	—	—	—	36200	46700	10300	294
45	4408	3.0	32.6	22	310 L2	—	BN 180L 4	—	—	—	42900	54000	18600	304
48	4155	1.9	30.7	18.0	307 L2	—	BN 180L 4	—	14500	18200	35000	45900	12600	284
48	4155	3.0	30.7	22	310 L2	—	BN 180L 4	—	—	—	42200	53000	18200	304
51	3852	1.5	28.4	13.0	306 L2	—	BN 180L 4	—	12700	14400	31800	37100	9550	274
52	3792	2.0	28.0	18.0	307 L2	—	BN 180L 4	—	14100	17600	34100	44700	12200	284
52	3792	2.8	28.0	18.0	309 L2	—	BN 180L 4	—	—	—	34600	44700	9770	294
55	3568	1.3	26.4	13.0	306 L2	—	BN 180L 4	—	12400	14000	31100	36200	9310	274
58	3435	2.2	25.4	18.0	307 L2	—	BN 180L 4	—	13600	17100	33100	43400	11800	284
58	3435	2.6	25.4	18.0	309 L2	—	BN 180L 4	—	—	—	33600	43400	9460	294
62	3187	2.4	23.5	35	—	309 R2	BN 180L 4	—	—	—	32900	42400	9220	295
62	3187	2.3	23.5	35	—	307 R2	BN 180L 4	—	13300	16600	32400	42400	11500	285
64	3069	1.7	22.7	13.0	306 L2	—	BN 180L 4	—	11800	13400	29700	34600	8850	274
67	2954	2.5	21.8	18.0	307 L2	—	BN 180L 4	—	12900	16200	31600	41400	11200	284
67	2954	2.8	21.8	18.0	309 L2	—	BN 180L 4	—	—	—	32100	41400	8990	294
74	2686	2.4	19.8	35	—	309 R2	BN 180L 4	—	—	—	31200	40300	8710	295
74	2686	2.4	19.8	35	—	307 R2	BN 180L 4	—	12500	15700	30700	40300	10900	285
81	2446	1.9	18.1	13.0	306 L2	—	BN 180L 4	—	10900	12400	27800	32300	8210	274
84	2354	2.8	17.4	18.0	307 L2	—	BN 180L 4	—	12000	15000	29500	38700	10400	284
84	2354	2.8	17.4	18.0	309 L2	—	BN 180L 4	—	—	—	30000	38700	8340	294
94	2093	2.4	15.5	35	—	309 R2	BN 180L 4	—	—	—	29000	37400	8020	295
94	2093	2.4	15.5	35	—	307 R2	BN 180L 4	—	11500	14500	28500	37400	10000	285
95	2072	1.9	15.3	13.0	306 L2	—	BN 180L 4	—	10300	11700	26400	30800	7770	274
99	1994	2.8	14.7	18.0	307 L2	—	BN 180L 4	—	11300	14200	28100	36800	9860	284
99	1994	2.8	14.7	18.0	309 L2	—	BN 180L 4	—	—	—	28600	36800	7890	294
113	1755	1.9	13.0	13.0	306 L2	—	BN 180L 4	—	9780	11100	25100	29300	7350	274
113	1754	2.4	13.0	35	—	309 R2	BN 180L 4	—	—	—	27500	35400	7560	295
113	1754	2.4	13.0	35	—	307 R2	BN 180L 4	—	10900	13600	27000	35400	9450	285
118	1671	2.8	12.3	18.0	307 L2	—	BN 180L 4	—	10700	13400	26700	34900	9300	284
118	1671	2.8	12.3	18.0	309 L2	—	BN 180L 4	—	—	—	27100	34900	7440	294
195	1047	1.2	7.50	11.0	303 L1	—	BN 180L 4	—	6550	7560	13000	15700	4200	244
195	1047	1.9	7.50	13.0	305 L1	—	BN 180L 4	—	6550	7560	13000	15700	4200	264
195	1047	3.0	7.50	18.0	306 L1	—	BN 180L 4	—	8150	9240	21300	24800	6120	274
222	917	1.9	6.57	12.0	304 L1	—	BN 180L 4	—	6260	7230	12500	15100	4020	254
235	865	1.3	6.20	11.0	303 L1	—	BN 180L 4	—	6140	7090	12300	14800	3940	244
235	865	2.6	6.20	13.0	305 L1	—	BN 180L 4	—	6140	7090	12300	14800	3940	264
274	744	1.7	5.33	11.0	303 L1	—	BN 180L 4	—	5840	6750	11800	14200	3750	244
274	744	2.4	5.33	12.0	304 L1	—	BN 180L 4	—	5840	6750	11800	14200	3750	254
274	744	2.8	5.33	13.0	305 L1	—	BN 180L 4	—	5840	6750	11800	14200	3750	264
344	593	1.9	4.25	11.0	303 L1	—	BN 180L 4	—	5420	6250	11000	13200	3480	244
344	593	2.4	4.25	12.0	304 L1	—	BN 180L 4	—	5420	6250	11000	13200	3480	254
344	593	2.8	4.25	13.0	305 L1	—	BN 180L 4	—	5420	6250	11000	13200	3480	264



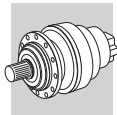
$P_1 = 30 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
1.1	241161	1.4	1389	30	319 L4	—	BN 200L 4	—	—	—	636100	700800	199500	334
1.2	207451	1.6	1195	30	319 L4	—	BN 200L 4	—	—	—	608000	669900	189700	334
1.3	194773	2.5	1122	35	321 L4	—	BN 200L 4	—	—	—	731900	867900	1114500	386
1.4	183926	1.3	1059	22	318 L4	—	BN 200L 4	—	—	—	503000	520700	182200	370
1.4	179280	1.0	1032	18.0	317 L4	—	BN 200L 4	—	—	—	403600	429700	135500	362
1.5	174796	1.8	1007	30	319 L4	—	BN 200L 4	—	—	—	577600	636300	179200	334
1.6	158338	2.0	912	30	319 L4	—	BN 200L 4	—	—	—	560700	617700	173400	334
1.6	158216	1.6	911	22	318 L4	—	BN 200L 4	—	—	—	487700	497700	173300	370
1.6	157400	2.0	906	115	—	319 R4 (C)	BN 200L 4	—	—	—	559700	616600	173000	379
1.6	156934	1.0	904	18.0	317 L4	—	BN 200L 4	—	—	—	387800	412900	129600	362
1.7	147703	2.1	850	30	319 L4	—	BN 200L 4	—	—	—	549100	605000	169400	334
1.8	139497	1.1	803	50	—	317 R4	BN 200L 4	—	—	—	374300	398500	124600	363
1.8	137543	1.3	792	18.0	317 L4	—	BN 200L 4	—	—	—	372700	396900	124100	362
1.9	135398	2.3	780	115	—	319 R4 (C)	BN 200L 4	—	—	—	535000	589400	164500	379
1.9	133311	1.9	768	22	318 L4	—	BN 200L 4	—	—	—	463300	472800	163700	370
2.0	128767	1.0	741	18.0	316 L4	—	BN 200L 4	—	—	—	284200	316100	121400	354
2.0	126129	1.0	726	18.0	316 L4	—	BN 200L 4	—	—	—	282500	314100	120500	354
2.0	126078	2.0	726	22	318 L4	—	BN 200L 4	—	—	—	455600	464900	160700	370
2.0	124876	1.4	719	18.0	317 L4	—	BN 200L 4	—	—	—	362100	385500	120100	362
2.0	124453	2.1	717	30	319 L4	—	BN 200L 4	—	—	—	521600	574700	160000	334
2.1	120044	1.8	691	110	—	318 R4 (C)	BN 200L 4	—	—	—	448900	458100	158100	371
2.1	118890	1.1	685	18.0	316 L4	—	BN 200L 4	—	—	—	277500	308600	118200	354
2.2	117701	2.1	678	30	319 L4	—	BN 200L 4	—	—	—	513000	565100	157000	334
2.2	117539	1.3	677	50	—	317 R4	BN 200L 4	—	—	—	355600	378600	117700	363
2.2	114085	2.6	657	115	—	319 R4 (C)	BN 200L 4	—	—	—	508200	559900	155400	379
2.2	113696	2.6	655	95	—	319 R4 (B)	BN 200L 4	—	—	—	507700	559300	155200	379
2.3	112327	2.2	647	22	318 L4	—	BN 200L 4	—	—	—	440100	449100	154600	370
2.3	108699	1.4	626	50	—	317 R4	BN 200L 4	—	—	—	347300	369800	114700	363
2.3	108498	1.2	625	18.0	316 L4	—	BN 200L 4	—	—	—	270000	300300	114600	354
2.3	108249	0.9	623	40	—	315 R4	BN 200L 4	—	—	—	162300	190500	68700	345
2.3	108249	1.1	623	45	—	316 R4	BN 200L 4	—	—	—	269800	300100	114500	355
2.4	107420	1.6	619	18.0	317 L4	—	BN 200L 4	—	—	—	346100	368500	114200	362
2.4	106233	2.4	612	22	318 L4	—	BN 200L 4	—	—	—	432800	441700	151800	370
2.5	103263	2.4	595	110	—	318 R4 (C)	BN 200L 4	—	—	—	429100	437900	150300	371
2.5	102611	1.0	591	18.0	315 L4	—	BN 200L 4	—	—	—	159700	187500	67500	344
2.5	102611	1.2	591	18.0	316 L4	—	BN 200L 4	—	—	—	265500	295300	112500	354
2.6	99174	2.1	571	30	319 L4	—	BN 200L 4	—	—	—	487300	536800	148300	334
2.6	98282	1.3	566	18.0	316 L4	—	BN 200L 4	—	—	—	262100	291500	110900	354
2.6	97803	3.0	563	95	—	319 R4 (B)	BN 200L 4	—	—	—	485200	534600	147600	379
2.6	95804	1.9	552	18.0	317 L4	—	BN 200L 4	—	—	—	334400	356100	110000	362
2.7	92641	1.1	533	18.0	315 L4	—	BN 200L 4	—	—	—	154900	181800	65200	344
2.7	92641	1.3	533	18.0	316 L4	—	BN 200L 4	—	—	—	257500	286400	108700	354
2.8	91715	2.1	528	30	319 L4	—	BN 200L 4	—	—	—	476000	524400	144500	334
2.8	91210	1.1	525	40	—	315 R4	BN 200L 4	—	—	—	154100	181000	64900	345
2.8	91210	1.3	525	45	—	316 R4	BN 200L 4	—	—	—	256300	285000	108200	355
2.8	90304	1.7	520	50	—	317 R4	BN 200L 4	—	—	—	328500	349800	107800	363
2.8	89511	2.7	515	22	318 L4	—	BN 200L 4	—	—	—	411100	419500	143300	370
2.9	87009	2.8	501	110	—	318 R4 (C)	BN 200L 4	—	—	—	407600	416000	142000	371
2.9	86712	2.4	499	90	—	318 R4 (B)	BN 200L 4	—	—	—	407200	415600	141800	371
3.0	85886	0.9	495	15.0	314 L4	—	BN 200L 4	—	—	—	151400	177700	63600	334
3.0	85601	2.0	493	18.0	317 L4	—	BN 200L 4	—	—	—	323300	344200	105900	362
3.0	84544	1.2	487	18.0	315 L4	—	BN 200L 4	—	—	—	150700	176900	63300	344
3.0	84544	1.4	487	18.0	316 L4	—	BN 200L 4	—	—	—	250500	278600	105500	354
3.1	82779	2.9	477	22	318 L4	—	BN 200L 4	—	—	—	401600	409800	139700	370
3.1	82288	2.9	474	110	—	318 R4 (C)	BN 200L 4	—	—	—	400900	409100	139400	371
3.2	79562	1.0	458	15.0	314 L4	—	BN 200L 4	—	—	—	148000	173700	62000	334
3.3	77941	2.1	449	18.0	317 L4	—	BN 200L 4	—	—	—	314300	334700	102700	362
3.3	77278	2.1	445	30	319 L4	—	BN 200L 4	—	—	—	452100	498100	136500	334
3.3	76853	1.6	443	45	—	316 R4	BN 200L 4	—	—	—	243500	270800	102200	355



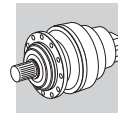
$P_1 = 30 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			
											HC/PC	HZ/PZ	FZ	
3.3	76584	1.3	441	18.0	315 L4	—	BN 200L 4	—	—	—	146300	171700	61200	344
3.3	76584	1.5	441	18.0	316 L4	—	BN 200L 4	—	—	—	243200	270500	102100	354
3.3	76089	1.7	438	50	—	317 R4	BN 200L 4	—	—	—	312100	332300	101800	363
3.6	71073	1.4	409	40	—	315 R4	BN 200L 4	—	—	—	143000	167900	59700	345
3.6	71073	1.6	409	45	—	316 R4	BN 200L 4	—	—	—	237800	264500	99600	355
3.7	69281	1.7	399	50	—	317 R4	BN 200L 4	—	—	—	303400	323100	98700	363
3.8	67393	1.2	388	15.0	314 L4	—	BN 200L 4	—	—	—	140800	165300	58700	334
4.0	64184	1.5	370	18.0	315 L4	—	BN 200L 4	—	—	—	138700	162900	57700	344
4.0	64184	1.7	370	18.0	316 L4	—	BN 200L 4	—	—	—	230600	256500	96200	354
4.1	62566	1.9	360	18.0	317 L4	—	BN 200L 4	—	—	—	294300	313300	95400	362
4.1	62566	1.9	360	18.0	317 L4	—	BN 200L 4	—	—	—	294300	313300	95400	362
4.2	60217	2.1	347	30	319 L4	—	BN 200L 4	—	—	—	419500	462200	125600	334
4.2	59885	1.6	345	40	—	315 R4	BN 200L 4	—	—	—	135900	159500	56400	345
4.2	59885	1.8	345	45	—	316 R4	BN 200L 4	—	—	—	225900	251200	94000	355
4.3	58375	1.7	336	50	—	317 R4	BN 200L 4	—	—	—	288200	306900	93200	363
4.4	57067	1.9	329	18.0	316 L4	—	BN 200L 4	—	—	—	222700	247600	92500	354
4.6	54538	1.4	314	15.0	314 L4	—	BN 200L 4	—	—	—	132100	155100	54700	334
4.7	53820	2.1	310	18.0	317 L4	—	BN 200L 4	—	—	—	281300	299500	90700	362
4.8	52497	1.9	302	18.0	315 L4	—	BN 200L 4	—	—	—	130600	153300	54000	344
4.8	52497	2.0	302	18.0	316 L4	—	BN 200L 4	—	—	—	217100	241500	90000	354
5.1	50190	2.1	289	45	—	316 R4	BN 200L 4	—	—	—	214200	238300	88700	355
5.4	46664	1.7	269	40	—	315 R4	BN 200L 4	—	—	—	126100	148000	51900	345
5.4	46664	2.2	269	45	—	316 R4	BN 200L 4	—	—	—	209600	233100	86500	355
5.6	45487	1.7	262	50	—	317 R4	BN 200L 4	—	—	—	267500	284800	85800	363
5.7	44468	2.1	256	18.0	316 L4	—	BN 200L 4	—	—	—	206600	229800	85100	354
5.8	45210	1.0	252	18.0	313 L3	—	BN 200L 4	—	—	—	115900	137100	45200	324
5.8	45210	2.5	252	35	317 L3	—	BN 200L 4	—	—	—	264500	281600	84700	362
6.1	43124	1.5	241	30	315 L3	—	BN 200L 4	—	—	—	122000	143200	50000	344
6.1	42911	1.2	240	25	314 L3	—	BN 200L 4	—	—	—	121800	143000	50000	334
6.5	39109	1.7	225	40	—	315 R4	BN 200L 4	—	—	—	119600	140400	48900	345
6.5	39109	2.5	225	45	—	316 R4	BN 200L 4	—	—	—	198800	221100	81600	355
6.7	38123	1.7	220	50	—	317 R4	BN 200L 4	—	—	—	253600	270100	80900	363
6.8	37268	2.1	215	18.0	316 L4	—	BN 200L 4	—	—	—	195900	217900	80300	354
7.0	37374	1.2	209	18.0	313 L3	—	BN 200L 4	—	—	—	109400	129500	42400	324
7.1	37096	2.1	207	30	315 L3	—	BN 200L 4	—	—	—	116600	136900	47600	344
7.1	36913	1.7	206	25	314 L3	—	BN 200L 4	—	—	—	116400	136700	47500	334
7.5	34685	1.4	194	18.0	313 L3	—	BN 200L 4	—	—	—	107000	126700	41400	324
7.6	34250	0.9	191	18.0	311 L3	—	BN 200L 4	—	—	—	86300	107500	33500	314
8.0	32607	1.2	182	18.0	313 L3	—	BN 200L 4	—	—	—	105100	124300	40500	324
8.3	31491	1.4	176	18.0	313 L3	—	BN 200L 4	—	—	—	104000	123000	40100	324
8.4	31257	2.5	174	30	315 L3	—	BN 200L 4	—	—	—	110700	130000	45000	344
8.4	31102	2.0	174	25	314 L3	—	BN 200L 4	—	—	—	110600	129800	44900	334
8.5	30616	1.0	171	18.0	311 L3	—	BN 200L 4	—	—	—	83400	103900	32200	314
8.8	29561	2.8	165	30	315 L3	—	BN 200L 4	—	—	—	108900	127900	44100	344
8.8	29561	2.8	165	35	316 L3	—	BN 200L 4	—	—	—	181100	201400	73500	354
8.9	29415	2.2	164	25	314 L3	—	BN 200L 4	—	—	—	108700	127700	44100	334
9.0	29226	1.5	163	18.0	313 L3	—	BN 200L 4	—	—	—	101700	120300	39100	324
9.1	28859	1.1	161	18.0	311 L3	—	BN 200L 4	—	—	—	82000	102100	31600	314
9.1	28859	1.1	161	18.0	311 L3	—	BN 200L 4	—	—	—	82000	102100	31600	314
9.3	28146	1.8	157	55	—	314 R3 (C)	BN 200L 4	—	—	—	107300	126000	43400	335
9.3	28146	2.3	157	90	—	315 R3 (C)	BN 200L 4	—	—	—	107300	126000	43400	345
9.5	27412	1.4	153	40	—	313 R3	BN 200L 4	—	—	—	99700	118000	38200	325
9.7	27089	1.7	151	18.0	313 L3	—	BN 200L 4	—	—	—	99400	117600	38100	324
9.9	26337	1.2	147	18.0	311 L3	—	BN 200L 4	—	—	—	79700	99300	30700	314
10.0	26276	1.0	147	40	—	311 R3	BN 200L 4	—	—	—	79700	99300	30600	315
10.2	25619	1.8	143	18.0	313 L3	—	BN 200L 4	—	—	—	97700	115700	37400	324
10.6	24785	2.6	138	25	314 L3	—	BN 200L 4	—	—	—	103300	121300	41600	334
10.8	24211	2.2	135	55	—	314 R3 (C)	BN 200L 4	—	—	—	102600	120400	41300	335
10.8	24160	1.9	135	18.0	313 L3	—	BN 200L 4	—	—	—	96000	113600	36700	324
11.0	23857	1.2	133	18.0	311 L3	—	BN 200L 4	—	—	—	77400	96400	29700	314



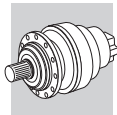
$P_1 = 30 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
11.5	22773	1.7	127	40	—	313 R3	BN 200L 4	—	—	—	94300	111600	36000	325
11.6	22488	1.3	126	18.0	311 L3	—	BN 200L 4	—	—	—	76100	94700	29100	314
11.8	22140	1.4	124	40	—	311 R3	BN 200L 4	—	—	—	75700	94300	28900	315
12.1	21587	2.0	120	18.0	313 L3	—	BN 200L 4	—	—	—	92800	109900	35300	324
12.3	21320	0.9	119	18.0	310 L3	—	BN 200L 4	—	—	—	63300	79600	28600	304
12.7	20522	1.4	115	18.0	311 L3	—	BN 200L 4	—	—	—	74000	92200	28200	314
12.8	20400	2.4	114	55	—	314 R3 (C)	BN 200L 4	—	—	—	97400	114400	39000	335
12.9	20331	2.4	113	55	—	314 R3 (B)	BN 200L 4	—	—	—	97300	114300	38900	335
12.9	20331	3.0	113	75	—	315 R3 (B)	BN 200L 4	—	—	—	97300	114300	38900	345
13.3	19655	2.1	110	18.0	313 L3	—	BN 200L 4	—	—	—	90300	106800	34200	324
13.5	19313	2.6	108	25	314 L3	—	BN 200L 4	—	—	—	95900	112500	38300	334
13.6	19294	2.1	108	55	—	314 R3 (C)	BN 200L 4	—	—	—	95800	112500	38300	335
13.6	19188	1.7	107	40	—	313 R3	BN 200L 4	—	—	—	89600	106000	34000	325
14.0	18655	1.6	104	40	—	311 R3	BN 200L 4	—	—	—	71900	89600	27300	315
14.1	18590	1.5	104	18.0	311 L3	—	BN 200L 4	—	—	—	71800	89500	27300	314
14.5	18059	1.0	101	18.0	310 L3	—	BN 200L 4	—	—	—	60300	75800	27000	304
15.0	17471	1.7	97.5	40	—	313 R3	BN 200L 4	—	—	—	87100	103100	32900	325
15.2	17252	1.6	96.3	40	—	311 R3	BN 200L 4	—	—	—	70200	87500	26600	315
15.7	16613	2.6	92.7	25	314 L3	—	BN 200L 4	—	—	—	91600	107600	36400	334
15.8	16561	2.1	92.4	18.0	313 L3	—	BN 200L 4	—	—	—	85700	101500	32300	324
16.0	16359	0.9	91.3	18.0	310 L3	—	BN 200L 4	—	—	—	58500	73600	26200	304
16.1	16257	2.4	90.7	55	—	314 R3 (C)	BN 200L 4	—	—	—	91000	106900	36200	335
16.3	15999	1.6	89.3	18.0	311 L3	—	BN 200L 4	—	—	—	68100	84900	25700	314
17.8	14721	1.7	82.2	40	—	313 R3	BN 200L 4	—	—	—	82800	97900	31100	325
18.0	14536	1.7	81.1	40	—	311 R3	BN 200L 4	—	—	—	66700	83100	25200	315
18.2	14391	1.2	80.3	18.0	310 L3	—	BN 200L 4	—	—	—	56300	70800	25100	304
18.6	14028	2.1	78.3	18.0	313 L3	—	BN 200L 4	—	—	—	81600	96500	30600	324
18.9	13852	1.8	77.3	18.0	311 L3	—	BN 200L 4	—	—	—	65800	81900	24800	314
19.8	13239	1.3	73.9	18.0	310 L3	—	BN 200L 4	—	—	—	54900	69000	24400	304
19.8	13239	2.6	73.9	25	314 L3	—	BN 200L 4	—	—	—	85600	100500	33800	334
20.3	12905	2.1	72.0	18.0	313 L3	—	BN 200L 4	—	—	—	79600	94100	29800	324
20.5	12743	1.9	71.1	18.0	311 L3	—	BN 200L 4	—	—	—	64100	79900	24100	314
20.6	12667	2.9	70.7	55	—	314 R3 (C)	BN 200L 4	—	—	—	84500	99200	33300	335
20.9	12531	1.7	69.9	40	—	313 R3	BN 200L 4	—	—	—	78900	93300	29500	325
21.5	12183	1.7	68.0	40	—	311 R3	BN 200L 4	—	—	—	63300	78800	23700	315
22.8	11471	1.7	64.0	40	—	313 R3	BN 200L 4	—	—	—	76800	90900	28600	325
23.1	11327	1.7	63.2	40	—	311 R3	BN 200L 4	—	—	—	61900	77100	23100	315
23.3	11214	1.4	62.6	18.0	310 L3	—	BN 200L 4	—	—	—	52200	65700	23100	304
23.3	11214	2.6	62.6	25	314 L3	—	BN 200L 4	—	—	—	81400	95600	31900	334
23.9	10931	2.1	61.0	18.0	313 L3	—	BN 200L 4	—	—	—	75700	89600	28200	324
24.2	10794	2.1	60.2	18.0	311 L3	—	BN 200L 4	—	—	—	61000	76000	22800	314
27.2	9614	1.7	53.7	40	—	313 R3	BN 200L 4	—	—	—	72800	86200	27000	325
27.5	9499	1.4	53.0	18.0	310 L3	—	BN 200L 4	—	—	—	49700	62500	21800	304
27.6	9493	1.7	53.0	40	—	311 R3	BN 200L 4	—	—	—	58700	73100	21800	315
28.6	9161	2.1	51.1	18.0	313 L3	—	BN 200L 4	—	—	—	71800	85000	26500	324
28.9	9046	2.1	50.5	18.0	311 L3	—	BN 200L 4	—	—	—	57900	72100	21500	314
31	8629	0.9	46.7	18.0	307 L2	—	BN 200L 4	—	16700	20900	39700	52100	14500	284
31	8629	1.3	46.7	18.0	309 L2	—	BN 200L 4	—	—	—	40400	52100	11600	294
31	8629	1.6	46.7	22	310 L2	—	BN 200L 4	—	—	—	47800	60200	20900	304
38	7169	2.8	38.8	26	311 L2	—	BN 200L 4	—	—	—	53500	66600	19700	314
38	7133	1.1	38.6	18.0	307 L2	—	BN 200L 4	—	15600	19600	37500	49200	13600	284
38	7133	1.5	38.6	18.0	309 L2	—	BN 200L 4	—	—	—	38100	49200	10900	294
38	7133	1.9	38.6	22	310 L2	—	BN 200L 4	—	—	—	45200	56800	19600	304
44	6106	0.9	33.1	13.0	306 L2	—	BN 200L 4	—	13400	15100	33300	38800	10000	274
45	6011	1.3	32.6	18.0	307 L2	—	BN 200L 4	—	14800	18500	35700	46700	12800	284
45	6011	1.8	32.6	18.0	309 L2	—	BN 200L 4	—	—	—	36200	46700	10300	294
45	6011	2.2	32.6	22	310 L2	—	BN 200L 4	—	—	—	42900	54000	18600	304
48	5666	1.4	30.7	18.0	307 L2	—	BN 200L 4	—	14500	18200	35000	45900	12600	284
48	5666	2.2	30.7	22	310 L2	—	BN 200L 4	—	—	—	42200	53000	18200	304
51	5252	1.1	28.4	13.0	306 L2	—	BN 200L 4	—	12700	14400	31800	37100	9550	274



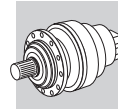
P₁ = 30 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			FZ	
52	5170	1.5	28.0	18.0	307 L2	—	BN 200L 4	—	14100	17600	34100	44700	12200	284	
52	5170	2.1	28.0	18.0	309 L2	—	BN 200L 4	—	—	—	34600	44700	9770	294	
52	5170	2.5	28.0	22	310 L2	—	BN 200L 4	—	—	—	41000	51600	17600	304	
55	4866	0.9	26.4	13.0	306 L2	—	BN 200L 4	—	12400	14000	31100	36200	9310	274	
58	4684	1.6	25.4	18.0	307 L2	—	BN 200L 4	—	13600	17100	33100	43400	11800	284	
58	4684	1.9	25.4	18.0	309 L2	—	BN 200L 4	—	—	—	33600	43400	9460	294	
58	4684	2.6	25.4	22	310 L2	—	BN 200L 4	—	—	—	39800	50100	17100	304	
58	4679	2.6	25.3	55	—	310 R2 (C)	BN 200L 4	—	—	—	39800	50100	17100	305	
62	4346	1.7	23.5	35	—	309 R2	BN 200L 4	—	—	—	32900	42400	9220	295	
62	4346	1.7	23.5	35	—	307 R2	BN 200L 4	—	13300	16600	32400	42400	11500	285	
64	4186	1.3	22.7	13.0	306 L2	—	BN 200L 4	—	11800	13400	29700	34600	8850	274	
67	4029	1.8	21.8	18.0	307 L2	—	BN 200L 4	—	12900	16200	31600	41400	11200	284	
67	4029	2.1	21.8	18.0	309 L2	—	BN 200L 4	—	—	—	32100	41400	8990	294	
67	4029	2.6	21.8	22	310 L2	—	BN 200L 4	—	—	—	38100	47900	16200	304	
68	3942	3.0	21.3	55	—	310 R2 (C)	BN 200L 4	—	—	—	37800	47600	16100	305	
74	3662	1.7	19.8	35	—	309 R2	BN 200L 4	—	—	—	31200	40300	8710	295	
74	3662	1.7	19.8	35	—	307 R2	BN 200L 4	—	12500	15700	30700	40300	10900	285	
81	3335	1.4	18.1	13.0	306 L2	—	BN 200L 4	—	10900	12400	27800	32300	8210	274	
84	3210	2.1	17.4	18.0	307 L2	—	BN 200L 4	—	12000	15000	29500	38700	10400	284	
84	3210	2.1	17.4	18.0	309 L2	—	BN 200L 4	—	—	—	30000	38700	8340	294	
84	3210	2.6	17.4	22	310 L2	—	BN 200L 4	—	—	—	35600	44700	15100	304	
94	2854	1.7	15.5	35	—	309 R2	BN 200L 4	—	—	—	29000	37400	8020	295	
94	2854	1.7	15.5	35	—	307 R2	BN 200L 4	—	11500	14500	28500	37400	10000	285	
95	2825	1.4	15.3	13.0	306 L2	—	BN 200L 4	—	10300	11700	26400	30800	7770	274	
99	2719	2.1	14.7	18.0	307 L2	—	BN 200L 4	—	11300	14200	28100	36800	9860	284	
99	2719	2.1	14.7	18.0	309 L2	—	BN 200L 4	—	—	—	28600	36800	7890	294	
99	2719	2.6	14.7	22	310 L2	—	BN 200L 4	—	—	—	33800	42600	14200	304	
113	2393	1.4	13.0	13.0	306 L2	—	BN 200L 4	—	9780	11100	25100	29300	7350	274	
113	2392	1.8	13.0	35	—	309 R2	BN 200L 4	—	—	—	27500	35400	7560	295	
113	2392	1.7	13.0	35	—	307 R2	BN 200L 4	—	10900	13600	27000	35400	9450	285	
118	2279	2.1	12.3	18.0	307 L2	—	BN 200L 4	—	10700	13400	26700	34900	9300	284	
118	2279	2.1	12.3	18.0	309 L2	—	BN 200L 4	—	—	—	27100	34900	7440	294	
195	1428	1.4	7.50	13.0	305 L1	—	BN 200L 4	—	6550	7560	13000	15700	4200	264	
195	1428	2.2	7.50	18.0	306 L1	—	BN 200L 4	—	8150	9240	21300	24800	6120	274	
222	1251	1.4	6.57	12.0	304 L1	—	BN 200L 4	—	6260	7230	12500	15100	4020	254	
235	1180	0.9	6.20	11.0	303 L1	—	BN 200L 4	—	6140	7090	12300	14800	3940	244	
235	1180	1.9	6.20	13.0	305 L1	—	BN 200L 4	—	6140	7090	12300	14800	3940	264	
235	1180	2.6	6.20	18.0	306 L1	—	BN 200L 4	—	7650	8670	20200	23500	5750	274	
274	1015	1.3	5.33	11.0	303 L1	—	BN 200L 4	—	5840	6750	11800	14200	3750	244	
274	1015	1.7	5.33	12.0	304 L1	—	BN 200L 4	—	5840	6750	11800	14200	3750	254	
274	1015	2.1	5.33	13.0	305 L1	—	BN 200L 4	—	5840	6750	11800	14200	3750	264	
274	1015	2.6	5.33	18.0	306 L1	—	BN 200L 4	—	7280	8240	19300	22400	5470	274	
344	809	1.4	4.25	11.0	303 L1	—	BN 200L 4	—	5420	6250	11000	13200	3480	244	
344	809	1.7	4.25	12.0	304 L1	—	BN 200L 4	—	5420	6250	11000	13200	3480	254	
344	809	2.1	4.25	13.0	305 L1	—	BN 200L 4	—	5420	6250	11000	13200	3480	264	
344	809	2.6	4.25	18.0	306 L1	—	BN 200L 4	—	6750	7640	18000	21000	5070	274	



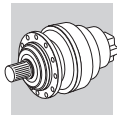
$P_1 = 37 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			
											HC/PC	HZ/PZ	FZ	
1.1	295409	1.1	1389	30	319 L4	—	BN 225S 4	—	—	—	636100	700800	199500	334
1.2	254115	1.3	1195	30	319 L4	—	BN 225S 4	—	—	—	608000	669900	189700	334
1.3	238586	2.1	1122	35	321 L4	—	BN 225S 4	—	—	—	731900	867900	1114500	386
1.4	225299	1.0	1059	22	318 L4	—	BN 225S 4	—	—	—	503000	520700	182200	370
1.5	214116	1.5	1007	30	319 L4	—	BN 225S 4	—	—	—	577600	636300	179200	334
1.6	201031	2.5	945	35	321 L4	—	BN 225S 4	—	—	—	695300	824500	1052600	386
1.6	193956	1.6	912	30	319 L4	—	BN 225S 4	—	—	—	560700	617700	173400	334
1.6	193805	1.3	911	22	318 L4	—	BN 225S 4	—	—	—	487700	497700	173300	370
1.6	192806	1.6	906	115	—	319 R4 (C)	BN 225S 4	—	—	—	559700	616600	173000	379
1.7	180928	1.7	850	30	319 L4	—	BN 225S 4	—	—	—	549100	605000	169400	334
1.8	169387	2.9	796	35	321 L4	—	BN 225S 4	—	—	—	660400	783200	994200	386
1.9	165855	1.9	780	115	—	319 R4 (C)	BN 225S 4	—	—	—	535000	589400	164500	379
1.9	163299	1.5	768	22	318 L4	—	BN 225S 4	—	—	—	463300	472800	163700	370
2.0	155719	2.8	732	125	—	321 R4 (C)	BN 225S 4	—	—	—	644000	763700	966700	387
2.0	154439	1.6	726	22	318 L4	—	BN 225S 4	—	—	—	455600	464900	160700	370
2.1	152448	1.7	717	30	319 L4	—	BN 225S 4	—	—	—	521600	574700	160000	334
2.1	147047	1.5	691	110	—	318 R4 (C)	BN 225S 4	—	—	—	448900	458100	158100	371
2.2	144177	1.7	678	30	319 L4	—	BN 225S 4	—	—	—	513000	565100	157000	334
2.2	139748	2.1	657	115	—	319 R4 (C)	BN 225S 4	—	—	—	508200	559900	155400	379
2.2	139271	2.2	655	95	—	319 R4 (B)	BN 225S 4	—	—	—	507700	559300	155200	379
2.3	137594	1.8	647	22	318 L4	—	BN 225S 4	—	—	—	440100	449100	154600	370
2.4	131208	2.7	617	125	—	321 R4 (C)	BN 225S 4	—	—	—	611700	725400	913100	387
2.4	130129	1.9	612	22	318 L4	—	BN 225S 4	—	—	—	432800	441700	151800	370
2.5	126492	2.0	595	110	—	318 R4 (C)	BN 225S 4	—	—	—	429100	437900	150300	371
2.6	121482	1.7	571	30	319 L4	—	BN 225S 4	—	—	—	487300	536800	148300	334
2.6	119803	2.4	563	95	—	319 R4 (B)	BN 225S 4	—	—	—	485200	534600	147600	379
2.6	118087	2.6	555	115	—	319 R4 (C)	BN 225S 4	—	—	—	483100	532300	146900	379
2.8	112346	1.7	528	30	319 L4	—	BN 225S 4	—	—	—	476000	524400	144500	334
2.8	111680	2.6	525	115	—	319 R4 (C)	BN 225S 4	—	—	—	475100	523500	144200	379
2.9	109646	2.2	515	22	318 L4	—	BN 225S 4	—	—	—	411100	419500	143300	370
2.9	109003	2.7	512	125	—	321 R4 (C)	BN 225S 4	—	—	—	578600	686200	858400	387
2.9	106581	2.3	501	110	—	318 R4 (C)	BN 225S 4	—	—	—	407600	416000	142000	371
2.9	106217	2.0	499	90	—	318 R4 (B)	BN 225S 4	—	—	—	407200	415600	141800	371
3.1	102240	2.7	481	125	—	321 R4 (C)	BN 225S 4	—	—	—	567600	673100	840200	387
3.1	101399	2.4	477	22	318 L4	—	BN 225S 4	—	—	—	401600	409800	139700	370
3.1	100945	2.8	475	95	—	319 R4 (B)	BN 225S 4	—	—	—	460900	507800	139400	379
3.1	100798	2.4	474	110	—	318 R4 (C)	BN 225S 4	—	—	—	400900	409100	139400	371
3.3	94662	1.7	445	30	319 L4	—	BN 225S 4	—	—	—	452100	498100	136500	334
3.3	94101	2.6	442	115	—	319 R4 (C)	BN 225S 4	—	—	—	451300	497200	136200	379
3.4	91370	2.6	430	90	—	318 R4 (B)	BN 225S 4	—	—	—	389200	397200	134900	371
3.5	89858	2.6	422	22	318 L4	—	BN 225S 4	—	—	—	387300	395200	134100	370
3.7	85438	2.7	402	22	318 L4	—	BN 225S 4	—	—	—	381500	389300	131900	370
3.7	84938	3.0	399	125	—	321 R4 (C)	BN 225S 4	—	—	—	536900	636700	789900	387
3.7	84932	2.6	399	110	—	318 R4 (C)	BN 225S 4	—	—	—	380800	388600	131600	371
4.1	76987	2.9	362	90	—	318 R4 (B)	BN 225S 4	—	—	—	369700	377300	127400	371
4.2	73762	1.7	347	30	319 L4	—	BN 225S 4	—	—	—	419500	462200	125600	334
4.3	73325	2.6	345	115	—	319 R4 (C)	BN 225S 4	—	—	—	418800	461400	125400	379
4.7	66181	2.6	311	110	—	318 R4 (C)	BN 225S 4	—	—	—	353300	360600	121100	371
4.8	65164	3.0	306	125	—	321 R4 (C)	BN 225S 4	—	—	—	495900	588000	723100	387
5.8	55380	2.1	252	35	317 L3	—	BN 225S 4	—	—	—	264500	281600	84700	362
6.1	52824	1.2	241	30	315 L3	—	BN 225S 4	—	—	—	122000	143200	50000	344
6.1	52563	1.0	240	25	314 L3	—	BN 225S 4	—	—	—	121800	143000	50000	334
6.9	46663	2.9	213	35	317 L3	—	BN 225S 4	—	—	—	251200	267500	80000	362
7.1	45440	1.7	207	30	315 L3	—	BN 225S 4	—	—	—	116600	136900	47600	344
7.1	45216	1.4	206	25	314 L3	—	BN 225S 4	—	—	—	116400	136700	47500	334
8.4	38288	2.0	174	30	315 L3	—	BN 225S 4	—	—	—	110700	130000	45000	344
8.5	38099	1.6	174	25	314 L3	—	BN 225S 4	—	—	—	110600	129800	44900	334
8.9	36210	2.3	165	30	315 L3	—	BN 225S 4	—	—	—	108900	127900	44100	344
8.9	36210	2.3	165	35	316 L3	—	BN 225S 4	—	—	—	181100	201400	73500	354
8.9	36145	2.7	165	100	—	317 R3 (C)	BN 225S 4	—	—	—	232700	247800	73500	363



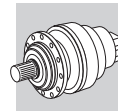
$P_1 = 37 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	R _{n2} [N]			
											HC/PC	HZ/PZ	FZ	
9.0	36031	1.8	164	25	314 L3	—	BN 225S 4	—	—	—	108700	127700	44100	334
9.4	34477	1.5	157	55	—	314 R3 (C)	BN 225S 4	—	—	—	107300	126000	43400	335
9.4	34477	1.9	157	90	—	315 R3 (C)	BN 225S 4	—	—	—	107300	126000	43400	345
10.6	30510	2.7	139	30	315 L3	—	BN 225S 4	—	—	—	103500	121500	41700	344
10.6	30510	2.7	139	35	316 L3	—	BN 225S 4	—	—	—	172000	191300	69500	354
10.6	30456	2.7	139	100	—	317 R3 (C)	BN 225S 4	—	—	—	221000	235400	69400	363
10.6	30360	2.1	138	25	314 L3	—	BN 225S 4	—	—	—	103300	121300	41600	334
10.9	29658	1.8	135	55	—	314 R3 (C)	BN 225S 4	—	—	—	102600	120400	41300	335
10.9	29658	2.6	135	90	—	315 R3 (C)	BN 225S 4	—	—	—	102600	120400	41300	345
12.8	25302	2.7	115	100	—	317 R3 (C)	BN 225S 4	—	—	—	209100	222600	65300	363
12.9	24989	2.0	114	55	—	314 R3 (C)	BN 225S 4	—	—	—	97400	114400	39000	335
12.9	24989	2.6	114	90	—	315 R3 (C)	BN 225S 4	—	—	—	97400	114400	39000	345
13.0	24904	2.0	113	55	—	314 R3 (B)	BN 225S 4	—	—	—	97300	114300	38900	335
13.0	24904	2.5	113	75	—	315 R3 (B)	BN 225S 4	—	—	—	97300	114300	38900	345
13.6	23732	2.8	108	100	—	317 R3 (C)	BN 225S 4	—	—	—	205100	218400	63900	363
13.6	23657	2.1	108	25	314 L3	—	BN 225S 4	—	—	—	95900	112500	38300	334
13.7	23633	1.7	108	55	—	314 R3 (C)	BN 225S 4	—	—	—	95800	112500	38300	335
13.7	23633	2.6	108	90	—	315 R3 (C)	BN 225S 4	—	—	—	95800	112500	38300	345
13.7	23633	2.8	108	90	—	316 R3 (C)	BN 225S 4	—	—	—	159300	177200	63800	355
15.1	21423	2.6	97.6	55	—	314 R3 (B)	BN 225S 4	—	—	—	93000	109200	37000	335
15.9	20350	2.1	92.7	25	314 L3	—	BN 225S 4	—	—	—	91600	107600	36400	334
16.2	19913	2.0	90.7	55	—	314 R3 (C)	BN 225S 4	—	—	—	91000	106900	36200	335
16.2	19913	2.6	90.7	90	—	315 R3 (C)	BN 225S 4	—	—	—	91000	106900	36200	345
16.2	19913	2.7	90.7	90	—	316 R3 (C)	BN 225S 4	—	—	—	151300	168300	60300	355
16.4	19716	2.9	89.8	100	—	317 R3 (C)	BN 225S 4	—	—	—	194000	206600	60100	363
17.9	18051	3.0	82.3	55	—	314 R3 (B)	BN 225S 4	—	—	—	88400	103800	35000	335
19.9	16216	2.1	73.9	25	314 L3	—	BN 225S 4	—	—	—	85600	100500	33800	334
20.8	15517	2.4	70.7	55	—	314 R3 (C)	BN 225S 4	—	—	—	84500	99200	33300	335
20.8	15517	2.6	70.7	90	—	315 R3 (C)	BN 225S 4	—	—	—	84500	99200	33300	345
20.8	15517	2.8	70.7	90	—	316 R3 (C)	BN 225S 4	—	—	—	140400	156200	55400	355
21.3	15126	2.9	68.9	100	—	317 R3 (C)	BN 225S 4	—	—	—	179200	190800	55000	363
23.5	13736	2.1	62.6	25	314 L3	—	BN 225S 4	—	—	—	81400	95600	31900	334
31	10570	1.3	46.7	22	310 L2	—	BN 225S 4	—	—	—	47800	60200	20900	304
38	8781	2.3	38.8	26	311 L2	—	BN 225S 4	—	—	—	53500	66600	19700	314
38	8738	1.5	38.6	22	310 L2	—	BN 225S 4	—	—	—	45200	56800	19600	304
45	7399	2.8	32.7	26	311 L2	—	BN 225S 4	—	—	—	50800	63300	18600	314
45	7363	1.8	32.6	22	310 L2	—	BN 225S 4	—	—	—	42900	54000	18600	304
48	6940	1.8	30.7	22	310 L2	—	BN 225S 4	—	—	—	42200	53000	18200	304
53	6333	2.0	28.0	22	310 L2	—	BN 225S 4	—	—	—	41000	51600	17600	304
56	5979	2.7	26.4	90	—	313 R2 (C)	BN 225S 4	—	—	—	58900	69700	21300	325
58	5737	2.1	25.4	22	310 L2	—	BN 225S 4	—	—	—	39800	50100	17100	304
58	5731	2.1	25.3	55	—	310 R2 (C)	BN 225S 4	—	—	—	39800	50100	17100	305
58	5731	2.7	25.3	90	—	311 R2 (C)	BN 225S 4	—	—	—	47100	58600	17100	315
62	5324	1.4	23.5	35	—	309 R2	BN 225S 4	—	—	—	32900	42400	9220	295
67	4967	2.7	22.0	90	—	313 R2 (C)	BN 225S 4	—	—	—	55700	65900	20000	325
67	4935	2.1	21.8	22	310 L2	—	BN 225S 4	—	—	—	38100	47900	16200	304
69	4829	2.4	21.3	55	—	310 R2 (C)	BN 225S 4	—	—	—	37800	47600	16100	305
69	4829	2.7	21.3	90	—	311 R2 (C)	BN 225S 4	—	—	—	44700	55700	16100	315
80	4140	2.7	18.3	55	—	310 R2 (B)	BN 225S 4	—	—	—	36100	45400	15300	305
85	3933	2.1	17.4	22	310 L2	—	BN 225S 4	—	—	—	35600	44700	15100	304
87	3811	2.7	16.8	90	—	313 R2 (C)	BN 225S 4	—	—	—	51400	60900	18300	325
88	3763	2.7	16.6	90	—	311 R2 (C)	BN 225S 4	—	—	—	41500	51700	14800	315
88	3763	2.8	16.6	55	—	310 R2 (C)	BN 225S 4	—	—	—	35100	44100	14800	305
95	3488	3.0	15.4	55	—	310 R2 (B)	BN 225S 4	—	—	—	34300	43100	14500	305
100	3331	2.1	14.7	22	310 L2	—	BN 225S 4	—	—	—	33800	42600	14200	304
196	1749	1.8	7.50	18.0	306 L1	—	BN 225S 4	—	8150	9240	21300	24800	6120	274
237	1446	2.1	6.20	18.0	306 L1	—	BN 225S 4	—	7650	8670	20200	23500	5750	274
276	1244	2.1	5.33	18.0	306 L1	—	BN 225S 4	—	7280	8240	19300	22400	5470	274
346	991	2.1	4.25	18.0	306 L1	—	BN 225S 4	—	6750	7640	18000	21000	5070	274



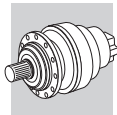
P₁ = 45 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
1.1	358064	0.9	1389	30	319 L4	—	BN 225M 4	—	—	—	636100	700800	199500	334
1.2	308012	1.1	1195	30	319 L4	—	BN 225M 4	—	—	—	608000	669900	189700	334
1.3	289189	1.7	1122	35	321 L4	—	BN 225M 4	—	—	—	731900	867900	1114500	386
1.5	259528	1.2	1007	30	319 L4	—	BN 225M 4	—	—	—	577600	636300	179200	334
1.6	243668	2.1	945	35	321 L4	—	BN 225M 4	—	—	—	695300	824500	1052600	386
1.6	235092	1.3	912	30	319 L4	—	BN 225M 4	—	—	—	560700	617700	173400	334
1.6	234910	1.1	911	22	318 L4	—	BN 225M 4	—	—	—	487700	497700	173300	370
1.6	233699	1.4	906	115	—	319 R4 (C)	BN 225M 4	—	—	—	559700	616600	173000	379
1.7	219301	1.4	850	30	319 L4	—	BN 225M 4	—	—	—	549100	605000	169400	334
1.9	205313	2.4	796	35	321 L4	—	BN 225M 4	—	—	—	660400	783200	994200	386
1.9	201031	1.5	780	115	—	319 R4 (C)	BN 225M 4	—	—	—	535000	589400	164500	379
1.9	197934	1.3	768	22	318 L4	—	BN 225M 4	—	—	—	463300	472800	163700	370
2.0	189871	2.6	736	35	321 L4	—	BN 225M 4	—	—	—	645100	765000	968700	386
2.0	188746	2.3	732	125	—	321 R4 (C)	BN 225M 4	—	—	—	644000	763700	966700	387
2.0	187194	1.3	726	22	318 L4	—	BN 225M 4	—	—	—	455600	464900	160700	370
2.1	184782	1.4	717	30	319 L4	—	BN 225M 4	—	—	—	521600	574700	160000	334
2.1	178234	1.2	691	110	—	318 R4 (C)	BN 225M 4	—	—	—	448900	458100	158100	371
2.2	174756	1.4	678	30	319 L4	—	BN 225M 4	—	—	—	513000	565100	157000	334
2.2	169388	1.8	657	115	—	319 R4 (C)	BN 225M 4	—	—	—	508200	559900	155400	379
2.3	168809	1.8	655	95	—	319 R4 (B)	BN 225M 4	—	—	—	507700	559300	155200	379
2.3	166777	1.5	647	22	318 L4	—	BN 225M 4	—	—	—	440100	449100	154600	370
2.4	159036	2.2	617	125	—	321 R4 (C)	BN 225M 4	—	—	—	611700	725400	913100	387
2.4	157739	3.0	612	35	321 L4	—	BN 225M 4	—	—	—	610200	723600	910600	386
2.4	157728	1.6	612	22	318 L4	—	BN 225M 4	—	—	—	432800	441700	151800	370
2.5	153320	1.6	595	110	—	318 R4 (C)	BN 225M 4	—	—	—	429100	437900	150300	371
2.6	147248	1.4	571	30	319 L4	—	BN 225M 4	—	—	—	487300	536800	148300	334
2.6	145212	2.0	563	95	—	319 R4 (B)	BN 225M 4	—	—	—	485200	534600	147600	379
2.7	143133	2.2	555	115	—	319 R4 (C)	BN 225M 4	—	—	—	483100	532300	146900	379
2.8	136173	1.4	528	30	319 L4	—	BN 225M 4	—	—	—	476000	524400	144500	334
2.8	135366	2.2	525	115	—	319 R4 (C)	BN 225M 4	—	—	—	475100	523500	144200	379
2.9	132901	1.8	515	22	318 L4	—	BN 225M 4	—	—	—	411100	419500	143300	370
2.9	132122	2.2	512	125	—	321 R4 (C)	BN 225M 4	—	—	—	578600	686200	858400	387
2.9	129186	1.9	501	110	—	318 R4 (C)	BN 225M 4	—	—	—	407600	416000	142000	371
3.0	128745	1.6	499	90	—	318 R4 (B)	BN 225M 4	—	—	—	407200	415600	141800	371
3.1	123924	2.2	481	125	—	321 R4 (C)	BN 225M 4	—	—	—	567600	673100	840200	387
3.1	122905	2.0	477	22	318 L4	—	BN 225M 4	—	—	—	401600	409800	139700	370
3.1	122355	2.3	475	95	—	319 R4 (B)	BN 225M 4	—	—	—	460900	507800	139400	379
3.1	122177	2.0	474	110	—	318 R4 (C)	BN 225M 4	—	—	—	400900	409100	139400	371
3.3	114739	1.4	445	30	319 L4	—	BN 225M 4	—	—	—	452100	498100	136500	334
3.3	114059	2.2	442	115	—	319 R4 (C)	BN 225M 4	—	—	—	451300	497200	136200	379
3.4	110749	2.1	430	90	—	318 R4 (B)	BN 225M 4	—	—	—	389200	397200	134900	371
3.5	108916	2.2	422	22	318 L4	—	BN 225M 4	—	—	—	387300	395200	134100	370
3.7	103559	2.2	402	22	318 L4	—	BN 225M 4	—	—	—	381500	389300	131900	370
3.7	102952	2.5	399	125	—	321 R4 (C)	BN 225M 4	—	—	—	536900	636700	789900	387
3.7	102945	2.2	399	110	—	318 R4 (C)	BN 225M 4	—	—	—	380800	388600	131600	371
4.1	93316	2.4	362	90	—	318 R4 (B)	BN 225M 4	—	—	—	369700	377300	127400	371
4.3	89407	1.4	347	30	319 L4	—	BN 225M 4	—	—	—	419500	462200	125600	334
4.3	88877	2.2	345	115	—	319 R4 (C)	BN 225M 4	—	—	—	418800	461400	125400	379
4.3	88253	2.5	342	90	—	318 R4 (B)	BN 225M 4	—	—	—	363600	371000	125100	371
4.4	86792	2.6	337	22	318 L4	—	BN 225M 4	—	—	—	361800	369200	124400	370
4.7	80695	2.7	313	22	318 L4	—	BN 225M 4	—	—	—	353900	361200	121400	370
4.7	80217	2.2	311	110	—	318 R4 (C)	BN 225M 4	—	—	—	353300	360600	121100	371
4.8	78985	2.5	306	125	—	321 R4 (C)	BN 225M 4	—	—	—	495900	588000	723100	387
5.1	74361	2.9	288	90	—	318 R4 (B)	BN 225M 4	—	—	—	345400	352500	118100	371
5.6	67630	2.7	262	22	318 L4	—	BN 225M 4	—	—	—	335700	342600	114400	370
5.8	67126	1.7	252	35	317 L3	—	BN 225M 4	—	—	—	264500	281600	84700	362
6.1	64028	1.0	241	30	315 L3	—	BN 225M 4	—	—	—	122000	143200	50000	344
6.9	56560	2.4	213	35	317 L3	—	BN 225M 4	—	—	—	251200	267500	80000	362
7.1	55078	1.4	207	30	315 L3	—	BN 225M 4	—	—	—	116600	136900	47600	344



$P_1 = 45 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
7.2	54806	1.1	206	25	314 L3	—	BN 225M 4	—	—	—	116400	136700	47500	334
8.2	47657	2.8	179	35	317 L3	—	BN 225M 4	—	—	—	238700	254100	75600	362
8.5	46408	1.7	174	30	315 L3	—	BN 225M 4	—	—	—	110700	130000	45000	344
8.5	46179	1.4	174	25	314 L3	—	BN 225M 4	—	—	—	110600	129800	44900	334
8.9	44073	2.8	166	35	317 L3	—	BN 225M 4	—	—	—	233100	248200	73600	362
8.9	43890	1.9	165	30	315 L3	—	BN 225M 4	—	—	—	108900	127900	44100	344
8.9	43890	1.9	165	35	316 L3	—	BN 225M 4	—	—	—	181100	201400	73500	354
9.0	43812	2.2	165	100	—	317 R3 (C)	BN 225M 4	—	—	—	232700	247800	73500	363
9.0	43673	1.5	164	25	314 L3	—	BN 225M 4	—	—	—	108700	127700	44100	334
9.4	41789	1.2	157	55	—	314 R3 (C)	BN 225M 4	—	—	—	107300	126000	43400	335
9.4	41789	1.6	157	90	—	315 R3 (C)	BN 225M 4	—	—	—	107300	126000	43400	345
10.6	36982	2.2	139	30	315 L3	—	BN 225M 4	—	—	—	103500	121500	41700	344
10.6	36982	2.3	139	35	316 L3	—	BN 225M 4	—	—	—	172000	191300	69500	354
10.6	36915	2.3	139	100	—	317 R3 (C)	BN 225M 4	—	—	—	221000	235400	69400	363
10.7	36799	1.8	138	25	314 L3	—	BN 225M 4	—	—	—	103300	121300	41600	334
10.9	35948	1.5	135	55	—	314 R3 (C)	BN 225M 4	—	—	—	102600	120400	41300	335
10.9	35948	2.1	135	90	—	315 R3 (C)	BN 225M 4	—	—	—	102600	120400	41300	345
12.6	31160	2.6	117	35	316 L3	—	BN 225M 4	—	—	—	163400	181700	65600	354
12.8	30668	2.2	115	100	—	317 R3 (C)	BN 225M 4	—	—	—	209100	222600	65300	363
13.0	30289	1.6	114	55	—	314 R3 (C)	BN 225M 4	—	—	—	97400	114400	39000	335
13.0	30289	2.2	114	90	—	315 R3 (C)	BN 225M 4	—	—	—	97400	114400	39000	345
13.0	30186	1.6	113	55	—	314 R3 (B)	BN 225M 4	—	—	—	97300	114300	38900	335
13.0	30186	2.0	113	75	—	315 R3 (B)	BN 225M 4	—	—	—	97300	114300	38900	345
13.6	28817	2.5	108	30	315 L3	—	BN 225M 4	—	—	—	96000	112700	38400	344
13.6	28817	2.7	108	35	316 L3	—	BN 225M 4	—	—	—	159600	177500	63900	354
13.6	28765	2.3	108	100	—	317 R3 (C)	BN 225M 4	—	—	—	205100	218400	63900	363
13.7	28674	1.8	108	25	314 L3	—	BN 225M 4	—	—	—	95900	112500	38300	334
13.7	28646	1.4	108	55	—	314 R3 (C)	BN 225M 4	—	—	—	95800	112500	38300	335
13.7	28646	2.2	108	90	—	315 R3 (C)	BN 225M 4	—	—	—	95800	112500	38300	345
13.7	28646	2.3	108	90	—	316 R3 (C)	BN 225M 4	—	—	—	159300	177200	63800	355
15.1	25966	2.2	97.6	55	—	314 R3 (B)	BN 225M 4	—	—	—	93000	109200	37000	335
15.1	25966	2.7	97.6	75	—	315 R3 (B)	BN 225M 4	—	—	—	93000	109200	37000	345
15.9	24666	1.8	92.7	25	314 L3	—	BN 225M 4	—	—	—	91600	107600	36400	334
16.2	24281	2.7	91.3	30	315 L3	—	BN 225M 4	—	—	—	91200	107100	36200	344
16.2	24281	2.7	91.3	35	316 L3	—	BN 225M 4	—	—	—	151600	168600	60400	354
16.3	24137	1.6	90.7	55	—	314 R3 (C)	BN 225M 4	—	—	—	91000	106900	36200	335
16.3	24137	2.2	90.7	90	—	315 R3 (C)	BN 225M 4	—	—	—	91000	106900	36200	345
16.3	24137	2.3	90.7	90	—	316 R3 (C)	BN 225M 4	—	—	—	151300	168300	60300	355
16.4	23897	2.4	89.8	100	—	317 R3 (C)	BN 225M 4	—	—	—	194000	206600	60100	363
17.9	21879	2.4	82.2	55	—	314 R3 (B)	BN 225M 4	—	—	—	88400	103800	35000	335
19.0	20692	2.5	77.8	55	—	314 R3 (B)	BN 225M 4	—	—	—	86900	102000	34300	335
19.3	20350	2.7	76.5	35	316 L3	—	BN 225M 4	—	—	—	143800	159900	56900	354
20.0	19656	1.8	73.9	25	314 L3	—	BN 225M 4	—	—	—	85600	100500	33800	334
20.7	18920	2.7	71.1	30	315 L3	—	BN 225M 4	—	—	—	84600	99300	33300	344
20.7	18920	2.7	71.1	35	316 L3	—	BN 225M 4	—	—	—	140700	156500	55600	354
20.9	18808	1.9	70.7	55	—	314 R3 (C)	BN 225M 4	—	—	—	84500	99200	33300	335
20.9	18808	2.2	70.7	90	—	315 R3 (C)	BN 225M 4	—	—	—	84500	99200	33300	345
20.9	18808	2.3	70.7	90	—	316 R3 (C)	BN 225M 4	—	—	—	140400	156200	55400	355
21.4	18334	2.4	68.9	100	—	317 R3 (C)	BN 225M 4	—	—	—	179200	190800	55000	363
22.5	17435	2.9	65.5	55	—	314 R3 (B)	BN 225M 4	—	—	—	82600	96900	32400	335
23.6	16650	1.8	62.6	25	314 L3	—	BN 225M 4	—	—	—	81400	95600	31900	334
24.7	15857	2.7	59.6	30	315 L3	—	BN 225M 4	—	—	—	80200	94200	31400	344
24.7	15857	2.7	59.6	35	316 L3	—	BN 225M 4	—	—	—	133400	148400	52400	354
28.9	13586	2.8	51.1	55	—	314 R3 (B)	BN 225M 4	—	—	—	76600	89900	29800	335
32	12812	1.1	46.7	22	310 L2	—	BN 225M 4	—	—	—	47800	60200	20900	304
36	11104	2.7	40.5	30	313 L2	—	BN 225M 4	—	—	—	66900	79200	24600	324
38	10644	1.9	38.8	26	311 L2	—	BN 225M 4	—	—	—	53500	66600	19700	314
38	10591	1.3	38.6	22	310 L2	—	BN 225M 4	—	—	—	45200	56800	19600	304

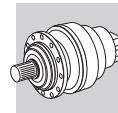


$P_1 = 45 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn ₂ [N]			
											HC/PC	HZ/PZ	FZ	
45	8968	2.3	32.7	26	311 L2	—	BN 225M 4	—	—	—	50800	63300	18600	314
45	8924	1.5	32.6	22	310 L2	—	BN 225M 4	—	—	—	42900	54000	18600	304
48	8412	1.5	30.7	22	310 L2	—	BN 225M 4	—	—	—	42200	53000	18200	304
53	7677	1.7	28.0	22	310 L2	—	BN 225M 4	—	—	—	41000	51600	17600	304
54	7557	2.6	27.6	26	311 L2	—	BN 225M 4	—	—	—	48300	60100	17600	314
56	7247	2.2	26.4	90	—	313 R2 (C)	BN 225M 4	—	—	—	58900	69700	21300	325
58	6988	2.6	25.5	26	311 L2	—	BN 225M 4	—	—	—	47100	58700	17100	314
58	6954	1.8	25.4	22	310 L2	—	BN 225M 4	—	—	—	39800	50100	17100	304
58	6947	1.8	25.3	55	—	310 R2 (C)	BN 225M 4	—	—	—	39800	50100	17100	305
58	6947	2.2	25.3	90	—	311 R2 (C)	BN 225M 4	—	—	—	47100	58600	17100	315
67	6021	2.2	22.0	90	—	313 R2 (C)	BN 225M 4	—	—	—	55700	65900	20000	325
68	5982	1.8	21.8	22	310 L2	—	BN 225M 4	—	—	—	38100	47900	16200	304
69	5888	2.7	21.5	26	311 L2	—	BN 225M 4	—	—	—	44800	55800	16200	314
69	5853	2.0	21.3	55	—	310 R2 (C)	BN 225M 4	—	—	—	37800	47600	16100	305
69	5853	2.2	21.3	90	—	311 R2 (C)	BN 225M 4	—	—	—	44700	55700	16100	315
81	5018	2.2	18.3	55	—	310 R2 (B)	BN 225M 4	—	—	—	36100	45400	15300	305
82	4935	2.7	18.0	26	311 L2	—	BN 225M 4	—	—	—	42500	52900	15200	314
85	4767	1.8	17.4	22	310 L2	—	BN 225M 4	—	—	—	35600	44700	15100	304
88	4619	2.3	16.8	90	—	313 R2 (C)	BN 225M 4	—	—	—	51400	60900	18300	325
88	4588	2.7	16.7	26	311 L2	—	BN 225M 4	—	—	—	41600	51800	14900	314
89	4561	2.3	16.6	90	—	311 R2 (C)	BN 225M 4	—	—	—	41500	51700	14800	315
89	4561	2.3	16.6	55	—	310 R2 (C)	BN 225M 4	—	—	—	35100	44100	14800	305
96	4228	2.5	15.4	55	—	310 R2 (B)	BN 225M 4	—	—	—	34300	43100	14500	305
100	4038	1.8	14.7	22	310 L2	—	BN 225M 4	—	—	—	33800	42600	14200	304
105	3845	2.7	14.0	26	311 L2	—	BN 225M 4	—	—	—	39400	49100	14000	314
123	3295	3.0	12.0	55	—	310 R2 (B)	BN 225M 4	—	—	—	31800	40000	13300	305
197	2120	1.5	7.50	18.0	306 L1	—	BN 225M 4	—	8150	9240	21300	24800	6120	274
237	1761	2.7	6.23	22	307 L1	—	BN 225M 4	—	8520	10700	21700	28500	7400	284
238	1752	1.8	6.20	18.0	306 L1	—	BN 225M 4	—	7650	8670	20200	23500	5750	274
277	1507	1.8	5.33	18.0	306 L1	—	BN 225M 4	—	7280	8240	19300	22400	5470	274
281	1484	2.7	5.25	22	307 L1	—	BN 225M 4	—	8040	10100	20600	27000	6990	284
347	1201	1.8	4.25	18.0	306 L1	—	BN 225M 4	—	6750	7640	18000	21000	5070	274
361	1156	2.7	4.09	22	307 L1	—	BN 225M 4	—	7400	9290	19100	25100	6430	284

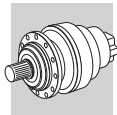
$P_1 = 55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

1.3	353453	1.4	1122	35	321 L4	—	BN 250M 4	—	—	—	731900	867900	1114500	386
1.5	317201	1.0	1007	30	319 L4	—	BN 250M 4	—	—	—	577600	636300	179200	334
1.6	297817	1.7	945	35	321 L4	—	BN 250M 4	—	—	—	695300	824500	1052600	386
1.6	287335	1.1	912	30	319 L4	—	BN 250M 4	—	—	—	560700	617700	173400	334
1.6	285632	1.1	906	115	—	319 R4 (C)	BN 250M 4	—	—	—	559700	616600	173000	379
1.7	268035	1.1	850	30	319 L4	—	BN 250M 4	—	—	—	549100	605000	169400	334
1.9	250938	1.9	796	35	321 L4	—	BN 250M 4	—	—	—	660400	783200	994200	386
1.9	245705	1.3	780	115	—	319 R4 (C)	BN 250M 4	—	—	—	535000	589400	164500	379
1.9	241919	1.0	768	22	318 L4	—	BN 250M 4	—	—	—	463300	472800	163700	370
2.0	232065	2.1	736	35	321 L4	—	BN 250M 4	—	—	—	645100	765000	968700	386
2.0	230690	1.9	732	125	—	321 R4 (C)	BN 250M 4	—	—	—	644000	763700	966700	387
2.0	228793	1.1	726	22	318 L4	—	BN 250M 4	—	—	—	455600	464900	160700	370
2.1	225844	1.1	717	30	319 L4	—	BN 250M 4	—	—	—	521600	574700	160000	334
2.1	217842	1.0	691	110	—	318 R4 (C)	BN 250M 4	—	—	—	448900	458100	158100	371
2.2	213590	1.1	678	30	319 L4	—	BN 250M 4	—	—	—	513000	565100	157000	334
2.2	207029	1.4	657	115	—	319 R4 (C)	BN 250M 4	—	—	—	508200	559900	155400	379
2.3	206322	1.5	655	95	—	319 R4 (B)	BN 250M 4	—	—	—	507700	559300	155200	379
2.3	203839	1.2	647	22	318 L4	—	BN 250M 4	—	—	—	440100	449100	154600	370



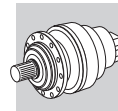
$P_1 = 55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min^{-1}	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			
											HC/PC	HZ/PZ	FZ	
2.4	194377	1.8	617	125	—	321 R4 (C)	BN 250M 4	—	—	—	611700	725400	913100	387
2.4	192792	2.5	612	35	321 L4	—	BN 250M 4	—	—	—	610200	723600	910600	386
2.4	192777	1.3	612	22	318 L4	—	BN 250M 4	—	—	—	432800	441700	151800	370
2.5	187392	1.3	595	110	—	318 R4 (C)	BN 250M 4	—	—	—	429100	437900	150300	371
2.6	179970	1.1	571	30	319 L4	—	BN 250M 4	—	—	—	487300	536800	148300	334
2.6	177482	1.6	563	95	—	319 R4 (B)	BN 250M 4	—	—	—	485200	534600	147600	379
2.7	174940	1.8	555	115	—	319 R4 (C)	BN 250M 4	—	—	—	483100	532300	146900	379
2.8	166636	2.7	529	105	—	321 R4 (B)	BN 250M 4	—	—	—	584100	692700	867400	387
2.8	166434	1.2	528	30	319 L4	—	BN 250M 4	—	—	—	476000	524400	144500	334
2.8	165448	1.8	525	115	—	319 R4 (C)	BN 250M 4	—	—	—	475100	523500	144200	379
2.9	162446	2.8	515	35	321 L4	—	BN 250M 4	—	—	—	579700	687400	860100	386
2.9	162434	1.5	515	22	318 L4	—	BN 250M 4	—	—	—	411100	419500	143300	370
2.9	161483	1.8	512	125	—	321 R4 (C)	BN 250M 4	—	—	—	578600	686200	858400	387
2.9	157894	1.5	501	110	—	318 R4 (C)	BN 250M 4	—	—	—	407600	416000	142000	371
3.0	157355	1.3	499	90	—	318 R4 (B)	BN 250M 4	—	—	—	407200	415600	141800	371
3.1	151463	1.8	481	125	—	321 R4 (C)	BN 250M 4	—	—	—	567600	673100	840200	387
3.1	150217	1.6	477	22	318 L4	—	BN 250M 4	—	—	—	401600	409800	139700	370
3.1	149545	1.9	475	95	—	319 R4 (B)	BN 250M 4	—	—	—	460900	507800	139400	379
3.1	149327	1.6	474	110	—	318 R4 (C)	BN 250M 4	—	—	—	400900	409100	139400	371
3.1	147910	2.9	469	35	321 L4	—	BN 250M 4	—	—	—	563600	668300	833600	386
3.3	140406	2.9	446	105	—	321 R4 (B)	BN 250M 4	—	—	—	554800	658000	819300	387
3.3	140236	1.1	445	30	319 L4	—	BN 250M 4	—	—	—	452100	498100	136500	334
3.3	139405	1.8	442	115	—	319 R4 (C)	BN 250M 4	—	—	—	451300	497200	136200	379
3.4	135359	1.7	430	90	—	318 R4 (B)	BN 250M 4	—	—	—	389200	397200	134900	371
3.5	133119	1.8	422	22	318 L4	—	BN 250M 4	—	—	—	387300	395200	134100	370
3.7	126572	1.8	402	22	318 L4	—	BN 250M 4	—	—	—	381500	389300	131900	370
3.7	126365	2.5	401	95	—	319 R4 (B)	BN 250M 4	—	—	—	438200	482800	131800	379
3.7	125831	2.0	399	125	—	321 R4 (C)	BN 250M 4	—	—	—	536900	636700	789900	387
3.7	125822	1.8	399	110	—	318 R4 (C)	BN 250M 4	—	—	—	380800	388600	131600	371
3.7	124628	2.9	395	35	321 L4	—	BN 250M 4	—	—	—	535400	634900	787400	386
3.9	119509	2.6	379	95	—	319 R4 (B)	BN 250M 4	—	—	—	430900	474800	129400	379
4.0	116645	2.9	370	105	—	321 R4 (B)	BN 250M 4	—	—	—	524800	622400	770200	387
4.1	114053	2.0	362	90	—	318 R4 (B)	BN 250M 4	—	—	—	369700	377300	127400	371
4.2	109407	2.9	347	105	—	321 R4 (B)	BN 250M 4	—	—	—	514800	610500	753900	387
4.3	109275	1.1	347	30	319 L4	—	BN 250M 4	—	—	—	419500	462200	125600	334
4.3	108627	1.8	345	115	—	319 R4 (C)	BN 250M 4	—	—	—	418800	461400	125400	379
4.3	107864	2.1	342	90	—	318 R4 (B)	BN 250M 4	—	—	—	363600	371000	125100	371
4.4	106079	2.1	337	22	318 L4	—	BN 250M 4	—	—	—	361800	369200	124400	370
4.6	100697	2.9	320	95	—	319 R4 (B)	BN 250M 4	—	—	—	409400	451000	122200	379
4.7	98628	2.2	313	22	318 L4	—	BN 250M 4	—	—	—	353900	361200	121400	370
4.7	98043	1.8	311	110	—	318 R4 (C)	BN 250M 4	—	—	—	353300	360600	121100	371
4.8	97112	2.9	308	35	321 L4	—	BN 250M 4	—	—	—	496800	589100	724500	386
4.8	96537	2.0	306	125	—	321 R4 (C)	BN 250M 4	—	—	—	495900	588000	723100	387
5.1	90892	2.9	288	105	—	321 R4 (B)	BN 250M 4	—	—	—	487000	577500	708700	387
5.1	90885	2.4	288	90	—	318 R4 (B)	BN 250M 4	—	—	—	345400	352500	118100	371
5.6	82659	2.2	262	22	318 L4	—	BN 250M 4	—	—	—	335700	342600	114400	370
5.7	81389	2.9	258	35	321 L4	—	BN 250M 4	—	—	—	471100	558700	683100	386
5.8	82043	1.4	252	35	317 L3	—	BN 250M 4	—	—	—	264500	281600	84700	362
5.9	78465	2.9	249	95	—	319 R4 (B)	BN 250M 4	—	—	—	379800	418500	112500	379
6.6	70820	2.8	225	90	—	318 R4 (B)	BN 250M 4	—	—	—	320500	327000	108700	371
6.7	69732	2.9	221	105	—	321 R4 (B)	BN 250M 4	—	—	—	449800	533400	648800	387
6.9	69129	2.0	213	35	317 L3	—	BN 250M 4	—	—	—	251200	267500	80000	362
7.1	67317	1.2	207	30	315 L3	—	BN 250M 4	—	—	—	116600	136900	47600	344
7.2	66985	0.9	206	25	314 L3	—	BN 250M 4	—	—	—	116400	136700	47500	334
8.2	58247	2.3	179	35	317 L3	—	BN 250M 4	—	—	—	238700	254100	75600	362
8.5	56721	1.4	174	30	315 L3	—	BN 250M 4	—	—	—	110700	130000	45000	344
8.5	56441	1.1	174	25	314 L3	—	BN 250M 4	—	—	—	110600	129800	44900	334
8.9	53867	2.3	166	35	317 L3	—	BN 250M 4	—	—	—	233100	248200	73600	362



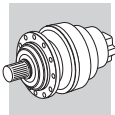
$P_1 = 55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

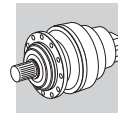
n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			
											HC/PC	HZ/PZ	FZ	
8.9	53643	1.5	165	30	315 L3	—	BN 250M 4	—	—	—	108900	127900	44100	344
8.9	53643	1.6	165	35	316 L3	—	BN 250M 4	—	—	—	181100	201400	73500	354
9.0	53547	1.8	165	100	—	317 R3 (C)	BN 250M 4	—	—	—	232700	247800	73500	363
9.0	53379	1.2	164	25	314 L3	—	BN 250M 4	—	—	—	108700	127700	44100	334
9.4	51076	1.0	157	55	—	314 R3 (C)	BN 250M 4	—	—	—	107300	126000	43400	335
9.4	51076	1.3	157	90	—	315 R3 (C)	BN 250M 4	—	—	—	107300	126000	43400	345
10.6	45200	1.8	139	30	315 L3	—	BN 250M 4	—	—	—	103500	121500	41700	344
10.6	45200	1.8	139	35	316 L3	—	BN 250M 4	—	—	—	172000	191300	69500	354
10.6	45119	1.8	139	100	—	317 R3 (C)	BN 250M 4	—	—	—	221000	235400	69400	363
10.7	44976	1.4	138	25	314 L3	—	BN 250M 4	—	—	—	103300	121300	41600	334
10.7	44751	2.6	138	35	317 L3	—	BN 250M 4	—	—	—	220500	234800	69200	362
10.9	43936	1.2	135	55	—	314 R3 (C)	BN 250M 4	—	—	—	102600	120400	41300	335
10.9	43936	1.8	135	90	—	315 R3 (C)	BN 250M 4	—	—	—	102600	120400	41300	345
12.4	38679	2.8	119	90	—	317 R3 (B)	BN 250M 4	—	—	—	211100	224700	65900	363
12.6	38085	2.1	117	35	316 L3	—	BN 250M 4	—	—	—	163400	181700	65600	354
12.7	37707	2.9	116	35	317 L3	—	BN 250M 4	—	—	—	209500	223000	65400	362
12.8	37483	1.8	115	100	—	317 R3 (C)	BN 250M 4	—	—	—	209100	222600	65300	363
13.0	37020	1.3	114	55	—	314 R3 (C)	BN 250M 4	—	—	—	97400	114400	39000	335
13.0	37020	1.8	114	90	—	315 R3 (C)	BN 250M 4	—	—	—	97400	114400	39000	345
13.0	36894	1.7	113	75	—	315 R3 (B)	BN 250M 4	—	—	—	97300	114300	38900	345
13.6	35220	2.1	108	30	315 L3	—	BN 250M 4	—	—	—	96000	112700	38400	344
13.6	35220	2.2	108	35	316 L3	—	BN 250M 4	—	—	—	159600	177500	63900	354
13.6	35157	1.9	108	100	—	317 R3 (C)	BN 250M 4	—	—	—	205100	218400	63900	363
13.7	35047	1.4	108	25	314 L3	—	BN 250M 4	—	—	—	95900	112500	38300	334
13.7	35012	1.2	108	55	—	314 R3 (C)	BN 250M 4	—	—	—	95800	112500	38300	335
13.7	35012	1.8	108	90	—	315 R3 (C)	BN 250M 4	—	—	—	95800	112500	38300	345
13.7	35012	1.9	108	90	—	316 R3 (C)	BN 250M 4	—	—	—	159300	177200	63800	355
14.0	34333	2.9	106	35	317 L3	—	BN 250M 4	—	—	—	203700	216800	63400	362
14.7	32591	2.9	100	90	—	317 R3 (B)	BN 250M 4	—	—	—	200500	213500	62300	363
15.1	31737	2.2	97.6	75	—	315 R3 (B)	BN 250M 4	—	—	—	93000	109200	37000	345
15.9	30148	1.4	92.7	25	314 L3	—	BN 250M 4	—	—	—	91600	107600	36400	334
16.2	29677	2.2	91.3	30	315 L3	—	BN 250M 4	—	—	—	91200	107100	36200	344
16.2	29677	2.2	91.3	35	316 L3	—	BN 250M 4	—	—	—	151600	168600	60400	354
16.3	29501	1.3	90.7	55	—	314 R3 (C)	BN 250M 4	—	—	—	91000	106900	36200	335
16.3	29501	1.8	90.7	90	—	315 R3 (C)	BN 250M 4	—	—	—	91000	106900	36200	345
16.3	29501	1.9	90.7	90	—	316 R3 (C)	BN 250M 4	—	—	—	151300	168300	60300	355
16.4	29208	2.0	89.8	100	—	317 R3 (C)	BN 250M 4	—	—	—	194000	206600	60100	363
16.6	28928	2.9	89.0	35	317 L3	—	BN 250M 4	—	—	—	193500	206000	59900	362
17.7	27075	2.9	83.3	90	—	317 R3 (B)	BN 250M 4	—	—	—	189700	201900	58600	363
17.9	26741	2.5	82.3	75	—	315 R3 (B)	BN 250M 4	—	—	—	88400	103800	35000	345
18.9	25395	2.9	78.1	90	—	317 R3 (B)	BN 250M 4	—	—	—	186000	198100	57300	363
19.0	25290	2.6	77.8	75	—	315 R3 (B)	BN 250M 4	—	—	—	86900	102000	34300	345
19.0	25290	2.6	77.8	75	—	316 R3 (B)	BN 250M 4	—	—	—	144500	160700	57200	355
19.3	24872	2.2	76.5	35	316 L3	—	BN 250M 4	—	—	—	143800	159900	56900	354
20.0	24024	1.4	73.9	25	314 L3	—	BN 250M 4	—	—	—	85600	100500	33800	334
20.7	23125	2.2	71.1	30	315 L3	—	BN 250M 4	—	—	—	84600	99300	33300	344
20.7	23125	2.2	71.1	35	316 L3	—	BN 250M 4	—	—	—	140700	156500	55600	354
20.9	22988	1.6	70.7	55	—	314 R3 (C)	BN 250M 4	—	—	—	84500	99200	33300	335
20.9	22988	1.8	70.7	90	—	315 R3 (C)	BN 250M 4	—	—	—	84500	99200	33300	345
20.9	22988	1.9	70.7	90	—	316 R3 (C)	BN 250M 4	—	—	—	140400	156200	55400	355
21.3	22542	2.9	69.3	35	317 L3	—	BN 250M 4	—	—	—	179500	191100	55100	362
21.4	22408	2.0	68.9	100	—	317 R3 (C)	BN 250M 4	—	—	—	179200	190800	55000	363
22.5	21309	2.9	65.5	75	—	315 R3 (B)	BN 250M 4	—	—	—	82600	96900	32400	345
22.5	21309	2.9	65.5	75	—	316 R3 (B)	BN 250M 4	—	—	—	137300	152700	54100	355
22.7	21098	2.9	64.9	90	—	317 R3 (B)	BN 250M 4	—	—	—	176000	187400	53900	363
23.6	20350	1.4	62.6	25	314 L3	—	BN 250M 4	—	—	—	81400	95600	31900	334
24.7	19381	2.2	59.6	30	315 L3	—	BN 250M 4	—	—	—	80200	94200	31400	344
24.7	19381	2.2	59.6	35	316 L3	—	BN 250M 4	—	—	—	133400	148400	52400	354



$P_1 = 55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC	MZ	Rn_2 [N]			
											HC/PC	HZ/PZ	FZ	
25.4	18892	2.9	58.1	35	317 L3	—	BN 250M 4	—	—	—	170200	181300	51900	362
28.9	16605	2.9	51.1	75	—	315 R3 (B)	BN 250M 4	—	—	—	76600	89900	29800	345
28.9	16605	2.9	51.1	75	—	316 R3 (B)	BN 250M 4	—	—	—	127400	141700	49700	355
29.6	16186	2.9	49.8	90	—	317 R3 (B)	BN 250M 4	—	—	—	162500	173000	49300	363
32	15659	0.90	46.7	22	310 L2	—	BN 250M 4	—	—	—	47800	60200	20900	304
36	13571	2.2	40.5	30	313 L2	—	BN 250M 4	—	—	—	66900	79200	24600	324
38	13009	1.5	38.8	26	311 L2	—	BN 250M 4	—	—	—	53500	66600	19700	314
38	12945	1.0	38.6	22	310 L2	—	BN 250M 4	—	—	—	45200	56800	19600	304
44	11275	2.6	33.6	30	313 L2	—	BN 250M 4	—	—	—	63300	74900	23100	324
45	10961	1.9	32.7	26	311 L2	—	BN 250M 4	—	—	—	50800	63300	18600	314
45	10907	1.2	32.6	22	310 L2	—	BN 250M 4	—	—	—	42900	54000	18600	304
48	10281	1.2	30.7	22	310 L2	—	BN 250M 4	—	—	—	42200	53000	18200	304
52	9500	2.9	28.4	30	313 L2	—	BN 250M 4	—	—	—	60100	71200	21800	324
53	9383	1.4	28.0	22	310 L2	—	BN 250M 4	—	—	—	41000	51600	17600	304
54	9236	2.1	27.6	26	311 L2	—	BN 250M 4	—	—	—	48300	60100	17600	314
56	8858	1.8	26.4	90	—	313 R2 (C)	BN 250M 4	—	—	—	58900	69700	21300	325
57	8650	2.9	25.8	30	313 L2	—	BN 250M 4	—	—	—	58500	69200	21100	324
58	8541	2.1	25.5	26	311 L2	—	BN 250M 4	—	—	—	47100	58700	17100	314
58	8499	1.4	25.4	22	310 L2	—	BN 250M 4	—	—	—	39800	50100	17100	304
58	8491	1.4	25.3	55	—	310 R2 (C)	BN 250M 4	—	—	—	39800	50100	17100	305
58	8491	1.8	25.3	90	—	311 R2 (C)	BN 250M 4	—	—	—	47100	58600	17100	315
67	7359	1.8	22.0	90	—	313 R2 (C)	BN 250M 4	—	—	—	55700	65900	20000	325
68	7311	1.4	21.8	22	310 L2	—	BN 250M 4	—	—	—	38100	47900	16200	304
68	7288	2.9	21.8	30	313 L2	—	BN 250M 4	—	—	—	55500	65700	20000	324
69	7197	2.2	21.5	26	311 L2	—	BN 250M 4	—	—	—	44800	55800	16200	314
69	7154	1.6	21.3	55	—	310 R2 (C)	BN 250M 4	—	—	—	37800	47600	16100	305
69	7154	1.8	21.3	90	—	311 R2 (C)	BN 250M 4	—	—	—	44700	55700	16100	315
77	6398	2.9	19.1	75	—	313 R2 (B)	BN 250M 4	—	—	—	53400	63200	19100	325
80	6204	2.9	18.5	30	313 L2	—	BN 250M 4	—	—	—	52900	62600	18900	324
81	6133	2.7	18.3	75	—	311 R2 (B)	BN 250M 4	—	—	—	42700	53200	15300	315
82	6032	2.2	18.0	26	311 L2	—	BN 250M 4	—	—	—	42500	52900	15200	314
85	5826	1.4	17.4	22	310 L2	—	BN 250M 4	—	—	—	35600	44700	15100	304
87	5679	2.9	16.9	30	313 L2	—	BN 250M 4	—	—	—	51500	61000	18400	324
88	5645	1.8	16.8	90	—	313 R2 (C)	BN 250M 4	—	—	—	51400	60900	18300	325
88	5608	2.2	16.7	26	311 L2	—	BN 250M 4	—	—	—	41600	51800	14900	314
89	5575	1.8	16.6	90	—	311 R2 (C)	BN 250M 4	—	—	—	41500	51700	14800	315
89	5575	1.9	16.6	55	—	310 R2 (C)	BN 250M 4	—	—	—	35100	44100	14800	305
93	5315	2.9	15.9	75	—	313 R2 (B)	BN 250M 4	—	—	—	50500	59800	18000	325
96	5168	2.9	15.4	75	—	311 R2 (B)	BN 250M 4	—	—	—	40500	50500	14500	315
100	4935	1.4	14.7	22	310 L2	—	BN 250M 4	—	—	—	33800	42600	14200	304
105	4700	2.2	14.0	26	311 L2	—	BN 250M 4	—	—	—	39400	49100	14000	314
121	4078	2.9	12.2	75	—	313 R2 (B)	BN 250M 4	—	—	—	46700	55200	16400	325
123	4027	2.9	12.0	75	—	311 R2 (B)	BN 250M 4	—	—	—	37600	46900	13300	315
197	2591	1.2	7.50	18.0	306 L1	—	BN 250M 4	—	8150	9240	21300	24800	6120	274
237	2152	2.2	6.23	22	307 L1	—	BN 250M 4	—	8520	10700	21700	28500	7400	284
237	2152	2.9	6.23	25	309 L1	—	BN 250M 4	—	—	—	22100	28500	5920	294
238	2142	1.4	6.20	18.0	306 L1	—	BN 250M 4	—	7650	8670	20200	23500	5750	274
277	1842	1.4	5.33	18.0	306 L1	—	BN 250M 4	—	7280	8240	19300	22400	5470	274
281	1813	2.2	5.25	22	307 L1	—	BN 250M 4	—	8040	10100	20600	27000	6990	284
281	1813	2.9	5.25	25	309 L1	—	BN 250M 4	—	—	—	21000	27000	5590	294
347	1468	1.4	4.25	18.0	306 L1	—	BN 250M 4	—	6750	7640	18000	21000	5070	274
361	1413	2.2	4.09	22	307 L1	—	BN 250M 4	—	7400	9290	19100	25100	6430	284
361	1413	2.9	4.09	25	309 L1	—	BN 250M 4	—	—	—	19400	25100	5150	294





23.0 - DATI TECNICI RIDOTTO- RI IN LINEA 300 L

Guida alla consultazione delle
tabelle.

23.0 - RATING CHARTS FOR IN-LINE UNITS 300 L

Reading the rating chart.

23.0 - TECHNISCHE DATEN DER GETRIEBE 300 L

Anleitung für die richtige Konsul-
tation der Tabellen.

23.0 - DONNEES TECHNIQUES REDUCTEURS 300 L

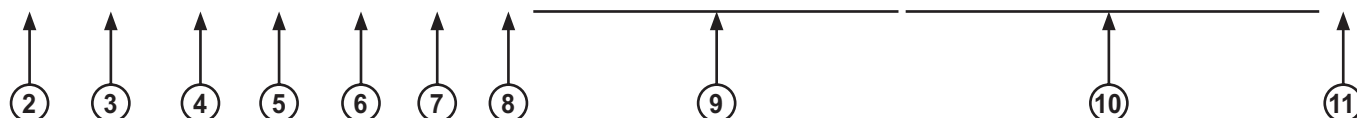
Guide pour la consultation des
tableaux.



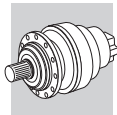
300 L

1000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 						R_{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
1400	300 L1	4.26	328	430	15.1	7.5	71	80	90	100	112	132	1760	1760	5390	6200	1160	228
	300 L1	5.77	243	440	11.6	7.5	71	80	90	100	112	132	1950	1950	5910	6790	1280	228
	300 L1	7.20	194	420	8.8	7.5	71	80	90	100	112	132	2100	2100	6310	7250	1380	228
	300 L1	9.00	156	320	5.4	7.5	71	80	90	100	112	132	2260	2260	6750	7750	1490	228
	300 L2	12.1	116	610	7.9	7.5	71	80	90	100	112	132	2500	2500	7380	8480	1640	228
	300 L2	14.8	94	620	6.5	7.5	71	80	90	100	112	132	2670	2670	7840	9010	1760	228
	300 L2	18.2	77	660	5.7	7.5	71	80	90	100	112	132	2860	2860	8330	9580	1880	228



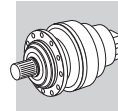
1	Coppia massima trasmissibile dal riduttore	Max. transmissible torque	Nenn-Drehmoment am Abtrieb des Bezuggetriebes	Couple maximum du réducteur
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione lineare	Frame size of the in-line gear unit	Getriebegröße in Linearausführung	Taille réducteur exécution coaxiale
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated output torque based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Drehmoment am Getriebeabtrieb mit Sicherheitsfaktor S=1 für eine Dauer von 10000 Std.	Couple nominal à la sortie du réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
7	Potenza nominale applicabile al riduttore, per: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Leistung am Getriebeantrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 Std.	Puissance nominale en entrée réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile	Frame size of available IEC motor	Baugröße des installierbaren IEC-Motors	Taille IEC moteur électrique à installer
10	Carichi radiali applicabili all'albero lento, basati su: - fattore di sicurezza S=1 - durata teorica di 10000 h Per forze non applicate in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 h theoretical lifetime. For forces applying off mid-point of the shaft, see diagrams provided in the pages following dimensions of the specific gearbox	Auf die Mitte der Abtriebswelle für: - Dauer von 10000 Std. applizierbare Nenn-Radialkräfte - Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions



300 L

1000 Nm

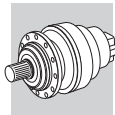
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
1400	300 L1	4.26	328	430	15.1	7.5	71	80	90	100	112	132	1760	1760	5390	6200	1160	228
	300 L1	5.77	243	440	11.6	7.5	71	80	90	100	112	132	1950	1950	5910	6790	1280	228
	300 L1	7.20	194	420	8.8	7.5	71	80	90	100	112	132	2100	2100	6310	7250	1380	228
	300 L1	9.00	156	320	5.4	7.5	71	80	90	100	112	132	2260	2260	6750	7750	1490	228
	300 L2	12.1	116	610	7.9	7.5	71	80	90	100	112	132	2500	2500	7380	8480	1640	228
	300 L2	14.8	94	620	6.5	7.5	71	80	90	100	112	132	2670	2670	7840	9010	1760	228
	300 L2	18.2	77	660	5.7	7.5	71	80	90	100	112	132	2860	2860	8330	9580	1880	228
	300 L2	20.1	70	620	4.8	7.5	71	80	90	100	112	132	2960	2960	8590	9870	1940	228
	300 L2	24.6	57	730	4.6	7.5	71	80	90	100	112	132	3160	3160	9130	10500	2080	228
	300 L2	30.7	46	760	3.9	7.5	71	80	90	100	112	132	3410	3410	9750	11200	2240	228
	300 L2	33.3	42	650	3.0	7.5	71	80	90	100	112	132	3500	3500	9990	11500	2300	228
	300 L2	38.4	36	780	3.2	7.5	71	80	90	100	112	132	3670	3670	10400	12000	2410	228
	300 L2	41.5	34	650	2.4	7.5	71	80	90	100	112	132	3770	3770	10700	12300	2480	228
	300 L2	51.9	27.0	650	2.0	7.5	71	80	90	100	112	132	4060	4060	11400	13100	2670	228
	300 L2	64.8	21.6	550	1.3	7.5	71	80	90	100	112	132	4370	4370	12200	14000	2870	228
	300 L3	51.6	27.1	790	2.5	7.5	71	80	90	100	112	132	4050	4050	11400	13100	2660	228
	300 L3	63.2	22.1	800	2.0	7.5	71	80	90	100	112	132	4330	4330	12100	13900	2850	228
	300 L3	69.9	20.0	650	1.5	7.5	71	80	90	100	112	132	4480	4480	12500	14300	2950	228
	300 L3	77.5	18.1	820	1.7	7.5	71	80	90	100	112	132	4640	4640	12900	14800	3050	228
	300 L3	85.6	16.4	820	1.5	7.5	71	80	90	100	112	132	4790	4790	13300	15200	3150	228
	300 L3	105	13.4	830	1.3	7.5	71	80	90	100	112	132	5130	5130	14100	16200	3370	228
	300 L3	116	12.1	650	0.90	7.5	71	80	90	100	112	132	5300	5300	14500	16700	3490	228
	300 L3	131	10.7	850	1.0	7.5	71	80	90	100	112	132	5520	5520	15100	17300	3630	228
	300 L3	142	9.9	850	0.96	7.5	71	80	90	100	112	132	5670	5670	15400	17700	3730	228
	300 L3	177	7.9	860	0.78	7.5	71	80	90	100	112	132	6110	6110	16500	19000	4020	228
	300 L3	192	7.3	650	0.54	7.5	71	80	90	100	112	132	6280	6280	16900	19400	4130	228
	300 L3	221	6.3	880	0.64	7.5	71	80	90	100	112	132	6580	6580	17600	20300	4320	228
	300 L3	240	5.8	650	0.44	7.5	71	80	90	100	112	132	6760	6760	18100	20800	4440	228
	300 L3	299	4.7	660	0.35	7.5	71	80	90	100	112	132	7270	7270	19300	22200	4780	228
	300 L3	374	3.7	680	0.29	7.5	71	80	90	100	112	132	7840	7840	20600	23700	5150	228
	300 L4	330	4.2	920	0.46	6.0	71	80	90	100	112	132	7520	7520	19900	22900	4940	228
	300 L4	403	3.5	690	0.28	6.0	71	80	90	100	112	132	8040	8040	21100	24300	5280	228
	300 L4	447	3.1	960	0.36	6.0	71	80	90	100	112	132	8320	8320	21800	25000	5470	228
	300 L4	494	2.8	980	0.33	6.0	71	80	90	100	112	132	8600	8600	22400	25800	5650	228
	300 L4	558	2.5	1000	0.30	6.0	71	80	90	100	112	132	8950	8950	23300	26700	5890	228
	300 L4	616	2.3	1000	0.27	6.0	71	80	90	100	112	132	9260	9260	24000	27600	6090	228
	300 L4	755	1.9	1000	0.22	6.0	71	80	90	100	112	132	9900	9900	25500	29300	6510	228
	300 L4	819	1.7	1000	0.20	6.0	71	80	90	100	112	132	10200	10200	26100	30000	6690	228
	300 L4	942	1.5	1000	0.18	6.0	71	80	90	100	112	132	10700	10700	27200	31300	7010	228
	300 L4	1022	1.4	1000	0.16	6.0	71	80	90	100	112	132	11000	11000	27900	32100	7200	228
	300 L4	1108	1.3	820	0.12	6.0	71	80	90	100	112	132	11300	11300	28600	32900	7400	228
	300 L4	1275	1.1	1000	0.13	6.0	71	80	90	100	112	132	11800	11800	29800	34000	7750	228
	300 L4	1383	1.0	860	0.10	6.0	71	80	90	100	112	132	12000	12100	30600	34000	7970	228
	300 L4	1591	0.88	1000	0.10	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	1725	0.81	860	0.08	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	2153	0.65	860	0.07	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	2692	0.52	1000	0.06	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
900	300 L1	3.48	259	480	13.4	9.0	71	80	90	100	112	132	1910	1910	5790	6660	1260	228
	300 L1	4.26	211	490	11.1	9.0	71	80	90	100	112	132	2040	2040	6160	7080	1340	228
	300 L1	5.77	156	510	8.5	9.0	71	80	90	100	112	132	2260	2260	6740	7750	1490	228
	300 L1	7.20	125	480	6.4	9.0	71	80	90	100	112	132	2430	2430	7210	8280	1600	228
	300 L1	9.00	100	370	4.0	9.0	71	80	90	100	112	132	2620	2620	7710	8850	1720	228
	300 L2	12.1	74	640	5.3	9.0	71	80	90	100	112	132	2890	2890	8420	9680	1900	228
	300 L2	14.8	61	710	4.8	9.0	71	80	90	100	112	132	3100	3100	8950	10300	2040	228
	300 L2	18.2	50	760	4.2	9.0	71	80	90	100	112	132	3310	3310	9520	10900	2180	228
	300 L2	20.1	45	650	3.2	9.0	71	80	90	100	112	132	3430	3430	9800	11300	2250	228
	300 L2	24.6	37	780	3.2	9.0	71	80	90	100	112	132	3670	3670	10400	12000	2410	228
	300 L2	30.7	29.3	790	2.6	9.0	71	80	90	100	112	132	3950	3950	11100	12800	2590	228
	300 L2	33.3	27.0	650	2.0	9.0	71	80	90	100	112	132	4050	4050	11400	13100	2670	228
	300 L2	38.4	23.5	800	2.1	9.0	71	80	90	100	112	132	4250	4250	11900	13700	2790	228
	300 L2	41.5	21.7	650	1.6	9.0	71	80	90	100	112	132	4360	4360	12200	14000	2870	228
	300 L2	51.9	17.3	650	1.3	9.0	71	80	90	100	112	132	4700	4700	13000	15000	3090	228
	300 L2	64.8	13.9	550	0.85	9.0	71	80	90	100	112	132	5060	5060	13900	16000	3330	228



300 L

1000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						Rn ₂ [N]					
													MC/PC	MZ/PZ	HC	HZ	FZ	
900	300 L3	51.6	17.4	820	1.6	9.0	71	80	90	100	112	132	4690	4690	13000	15000	3090	228
	300 L3	63.2	14.2	830	1.4	9.0	71	80	90	100	112	132	5020	5020	13800	15900	3300	228
	300 L3	69.9	12.9	650	0.96	9.0	71	80	90	100	112	132	5190	5190	14300	16400	3410	228
	300 L3	77.5	11.6	840	1.1	9.0	71	80	90	100	112	132	5370	5370	14700	16900	3530	228
	300 L3	85.6	10.5	850	1.0	9.0	71	80	90	100	112	132	5550	5550	15100	17400	3650	228
	300 L3	105	8.6	860	0.85	9.0	71	80	90	100	112	132	5940	5940	16100	18500	3910	228
	300 L3	116	7.8	650	0.58	9.0	71	80	90	100	112	132	6140	6140	16600	19100	4040	228
	300 L3	131	6.9	870	0.69	9.0	71	80	90	100	112	132	6400	6400	17200	19800	4210	228
	300 L3	142	6.3	880	0.64	9.0	71	80	90	100	112	132	6570	6570	17600	20300	4320	228
	300 L3	177	5.1	890	0.52	9.0	71	80	90	100	112	132	7080	7080	18800	21600	4650	228
	300 L3	192	4.7	660	0.35	9.0	71	80	90	100	112	132	7270	7270	19300	22200	4780	228
	300 L3	221	4.1	920	0.43	9.0	71	80	90	100	112	132	7620	7620	20100	23100	5010	228
	300 L3	240	3.8	680	0.29	9.0	71	80	90	100	112	132	7830	7830	20600	23700	5150	228
	300 L3	299	3.0	710	0.24	9.0	71	80	90	100	112	132	8430	8430	22000	25300	5540	228
	300 L3	374	2.4	730	0.20	9.0	71	80	90	100	112	132	9080	9080	23600	27100	5970	228
	300 L4	330	2.7	990	0.32	7.2	71	80	90	100	112	132	8710	8710	22700	26100	5730	228
	300 L4	403	2.2	740	0.20	7.2	71	80	90	100	112	132	9310	9310	24100	27700	6120	228
	300 L4	447	2.0	1000	0.24	7.2	71	80	90	100	112	132	9640	9640	24900	28600	6340	228
	300 L4	494	1.8	1000	0.22	7.2	71	80	90	100	112	132	9960	9960	25600	29400	6550	228
	300 L4	558	1.6	1000	0.19	7.2	71	80	90	100	112	132	10400	10400	26600	30500	6820	228
	300 L4	616	1.5	1000	0.17	7.2	71	80	90	100	112	132	10700	10700	27400	31500	7050	228
	300 L4	755	1.2	1000	0.14	7.2	71	80	90	100	112	132	11500	11500	29100	33400	7540	228
	300 L4	819	1.1	1000	0.13	7.2	71	80	90	100	112	132	11800	11800	29800	34000	7750	228
	300 L4	942	0.96	1000	0.11	7.2	71	80	90	100	112	132	12000	12400	31000	34000	8000	228
	300 L4	1022	0.88	1000	0.10	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	1108	0.81	860	0.08	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	1275	0.71	1000	0.08	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	1383	0.65	860	0.07	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	1591	0.57	1000	0.07	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	1725	0.52	860	0.05	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	2153	0.42	860	0.04	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4	2692	0.33	1000	0.04	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
500	300 L1	3.48	144	570	8.9	15.0	71	80	90	100	112	132	2320	2320	6910	7940	1530	228
	300 L1	4.26	117	580	7.4	15.0	71	80	90	100	112	132	2490	2490	7350	8440	1630	228
	300 L1	5.77	87	590	5.6	15.0	71	80	90	100	112	132	2750	2750	8040	9240	1810	228
	300 L1	7.20	69	530	4.0	15.0	71	80	90	100	112	132	2960	2960	8600	9880	1950	228
	300 L1	9.00	56	370	2.2	15.0	71	80	90	100	112	132	3190	3190	9190	10600	2100	228
	300 L2	12.1	41	650	3.0	15.0	71	80	90	100	112	132	3520	3520	10000	11500	2310	228
	300 L2	14.8	34	780	2.9	15.0	71	80	90	100	112	132	3770	3770	10700	12300	2480	228
	300 L2	18.2	27.5	790	2.4	15.0	71	80	90	100	112	132	4030	4030	11300	13000	2650	228
	300 L2	20.1	24.9	650	1.8	15.0	71	80	90	100	112	132	4170	4170	11700	13400	2740	228
	300 L2	24.6	20.3	810	1.8	15.0	71	80	90	100	112	132	4460	4460	12400	14300	2930	228
	300 L2	30.7	16.3	820	1.5	15.0	71	80	90	100	112	132	4800	4800	13300	15300	3160	228
	300 L2	33.3	15.0	650	1.1	15.0	71	80	90	100	112	132	4930	4930	13600	15600	3240	228
	300 L2	38.4	13.0	830	1.2	15.0	71	80	90	100	112	132	5170	5170	14200	16300	3400	228
	300 L2	41.5	12.0	650	0.87	15.0	71	80	90	100	112	132	5310	5310	14500	16700	3490	228
	300 L2	51.9	9.6	650	0.70	15.0	71	80	90	100	112	132	5720	5720	15600	17900	3760	228
	300 L2	64.8	7.7	550	0.47	15.0	71	80	90	100	112	132	6160	6160	16600	19100	4050	228
	300 L3	51.6	9.7	850	0.95	15.0	71	80	90	100	112	132	5710	5710	15500	17800	3750	228
	300 L3	63.2	7.9	860	0.78	15.0	71	80	90	100	112	132	6110	6110	16500	19000	4020	228
	300 L3	69.9	7.2	650	0.53	15.0	71	80	90	100	112	132	6310	6310	17000	19500	4150	228
	300 L3	77.5	6.5	880	0.65	15.0	71	80	90	100	112	132	6540	6540	17500	20100	4300	228
	300 L3	85.6	5.8	880	0.59	15.0	71	80	90	100	112	132	6760	6760	18100	20800	4440	228
	300 L3	105	4.8	900	0.49	15.0	71	80	90	100	112	132	7230	7230	19200	22100	4750	228
	300 L3	116	4.3	670	0.33	15.0	71	80	90	100	112	132	7470	7470	19800	22700	4910	228
	300 L3	131	3.8	930	0.41	15.0	71	80	90	100	112	132	7780	7780	20500	23600	5120	228
	300 L3	142	3.5	940	0.38	15.0	71	80	90	100	112	132	8000	8000	21000	24200	5260	228
	300 L3	177	2.8	980	0.32	15.0	71	80	90	100	112	132	8610	8610	22500	25800	5660	228
	300 L3	192	2.6	730	0.22	15.0	71	80	90	100	112	132	8850	8850	23000	26500	5820	228
	300 L3	221	2.3	1000	0.26	15.0	71	80	90	100	112	132	9270	9270	24000	27600	6090	228
	300 L3	240	2.1	750	0.18	15.0	71	80	90	100	112	132	9520	9520	24600	28300	6260	228
	300 L3	299	1.7	780	0.15	15.0	71	80	90	100	112	132	10300	10300	26300	30200	6740	228
	300 L3	374	1.3	820	0.13	15.0	71	80	90	100	112	132	11000	11000	28100	32300	7260	228



300 L

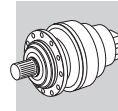
1000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
500	300 L4 330		1.5	1000	0.18	12.0	71	80	90	100	112	132	10600	10600	27100	31100	6970	228
	300 L4 403		1.2	830	0.12	12.0	71	80	90	100	112	132	11300	11300	28800	33000	7450	228
	300 L4 447		1.1	1000	0.13	12.0	71	80	90	100	112	132	11700	11700	29700	34000	7710	228
	300 L4 494		1.0	1000	0.12	12.0	71	80	90	100	112	132	12000	12100	30600	34000	7970	228
	300 L4 558		0.90	1000	0.11	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 616		0.81	1000	0.10	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 755		0.66	1000	0.08	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 819		0.61	1000	0.07	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 942		0.53	1000	0.06	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 1022		0.49	1000	0.06	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 1108		0.45	860	0.05	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 1275		0.39	1000	0.05	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 1383		0.36	860	0.04	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 1591		0.31	1000	0.04	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 1725		0.29	860	0.03	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 2153		0.23	860	0.02	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228
	300 L4 2692		0.19	1000	0.02	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	228

301 L

1750 Nm

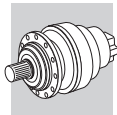
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
1400	301 L1 4.26		328	770	27	7.5	71	80	90	100	112	132	1760	1760	5390	6200	1160	236
	301 L1 5.77		243	800	21	7.5	71	80	90	100	112	132	1950	1950	5910	6790	1280	236
	301 L1 7.20		194	770	16.2	7.5	71	80	90	100	112	132	2100	2100	6310	7250	1380	236
	301 L1 9.00		156	580	9.7	7.5	71	80	90	100	112	132	2260	2260	6750	7750	1490	236
	301 L2 12.1		116	1050	13.5	7.5	71	80	90	100	112	132	2500	2500	7380	8480	1640	236
	301 L2 14.8		94	1120	11.8	7.5	71	80	90	100	112	132	2670	2670	7840	9010	1760	236
	301 L2 18.2		77	1190	10.2	7.5	71	80	90	100	112	132	2860	2860	8330	9580	1880	236
	301 L2 20.1		70	1170	9.1	7.5	71	80	90	100	112	132	2960	2960	8590	9870	1940	236
	301 L2 24.6		57	1300	8.2	7.5	71	80	90	100	112	132	3160	3160	9130	10500	2080	236
	301 L2 30.7		46	1370	6.9	7.5	71	80	90	100	112	132	3410	3410	9750	11200	2240	236
	301 L2 33.3		42	1300	6.1	7.5	71	80	90	100	112	132	3500	3500	9990	11500	2300	236
	301 L2 38.4		36	1310	5.3	7.5	71	80	90	100	112	132	3670	3670	10400	12000	2410	236
	301 L2 41.5		34	1300	4.9	7.5	71	80	90	100	112	132	3770	3770	10700	12300	2480	236
	301 L2 51.9		27.0	1300	3.9	7.5	71	80	90	100	112	132	4060	4060	11400	13100	2670	236
	301 L2 64.8		21.6	1150	2.8	7.5	71	80	90	100	112	132	4370	4370	12200	14000	2870	236
	301 L3 51.6		27.1	1470	4.6	7.5	71	80	90	100	112	132	4050	4050	11400	13100	2660	236
	301 L3 63.2		22.1	1520	3.9	7.5	71	80	90	100	112	132	4330	4330	12100	13900	2850	236
	301 L3 69.9		20.0	1300	3.0	7.5	71	80	90	100	112	132	4480	4480	12500	14300	2950	236
	301 L3 77.5		18.1	1560	3.2	7.5	71	80	90	100	112	132	4640	4640	12900	14800	3050	236
	301 L3 85.6		16.4	1580	3.0	7.5	71	80	90	100	112	132	4790	4790	13300	15200	3150	236
	301 L3 105		13.4	1630	2.5	7.5	71	80	90	100	112	132	5130	5130	14100	16200	3370	236
	301 L3 116		12.1	1300	1.8	7.5	71	80	90	100	112	132	5300	5300	14500	16700	3490	236
	301 L3 131		10.7	1680	2.1	7.5	71	80	90	100	112	132	5520	5520	15100	17300	3630	236
	301 L3 142		9.9	1700	1.9	7.5	71	80	90	100	112	132	5670	5670	15400	17700	3730	236
	301 L3 177		7.9	1720	1.6	7.5	71	80	90	100	112	132	6110	6110	16500	19000	4020	236
	301 L3 192		7.3	1300	1.1	7.5	71	80	90	100	112	132	6280	6280	16900	19400	4130	236
	301 L3 221		6.3	1730	1.3	7.5	71	80	90	100	112	132	6580	6580	17600	20300	4320	236
	301 L3 240		5.8	1300	0.87	7.5	71	80	90	100	112	132	6760	6760	18100	20800	4440	236
	301 L3 299		4.7	1310	0.71	7.5	71	80	90	100	112	132	7270	7270	19300	22200	4780	236
	301 L3 374		3.7	1360	0.58	7.5	71	80	90	100	112	132	7840	7840	20600	23700	5150	236
	301 L4 330		4.2	1810	0.91	6.0	71	80	90	100	112	132	7520	7520	19900	22900	4940	236
	301 L4 403		3.5	1380	0.57	6.0	71	80	90	100	112	132	8040	8040	21100	24300	5280	236
	301 L4 447		3.1	1920	0.71	6.0	71	80	90	100	112	132	8320	8320	21800	25000	5470	236
	301 L4 494		2.8	1950	0.65	6.0	71	80	90	100	112	132	8600	8600	22400	25800	5650	236
	301 L4 558		2.5	2000	0.59	6.0	71	80	90	100	112	132	8950	8950	23300	26700	5890	236
	301 L4 616		2.3	2000	0.54	6.0	71	80	90	100	112	132	9260	9260	24000	27600	6090	236
	301 L4 755		1.9	2000	0.44	6.0	71	80	90	100	112	132	9900	9900	25500	29300	6510	236
	301 L4 819		1.7	2000	0.40	6.0	71	80	90	100	112	132	10200	10200	26100	30000	6690	236
	301 L4 942		1.5	2000	0.35	6.0	71	80	90	100	112	132	10700	10700	27200	31300	7010	236



301 L

1750 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
1400	301 L4	1022	1.4	2000	0.32	6.0	71	80	90	100	112	132	11000	11000	27900	32100	7200	236
	301 L4	1108	1.3	1630	0.24	6.0	71	80	90	100	112	132	11300	11300	28600	32900	7400	236
	301 L4	1275	1.1	2000	0.26	6.0	71	80	90	100	112	132	11800	11800	29800	34000	7750	236
	301 L4	1383	1.0	1700	0.20	6.0	71	80	90	100	112	132	12000	12100	30600	34000	7970	236
	301 L4	1591	0.88	2000	0.21	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	1725	0.81	1700	0.16	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	2153	0.65	1700	0.13	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	2692	0.52	1700	0.10	6.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
900	301 L1	3.48	259	830	23	9.0	71	80	90	100	112	132	1910	1910	5790	6660	1260	236
	301 L1	4.26	211	880	20	9.0	71	80	90	100	112	132	2040	2040	6160	7080	1340	236
	301 L1	5.77	156	920	15.5	9.0	71	80	90	100	112	132	2260	2260	6740	7750	1490	236
	301 L1	7.20	125	880	11.9	9.0	71	80	90	100	112	132	2430	2430	7210	8280	1600	236
	301 L1	9.00	100	660	7.1	9.0	71	80	90	100	112	132	2620	2620	7710	8850	1720	236
	301 L2	12.1	74	1180	9.8	9.0	71	80	90	100	112	132	2890	2890	8420	9680	1900	236
	301 L2	14.8	61	1280	8.6	9.0	71	80	90	100	112	132	3100	3100	8950	10300	2040	236
	301 L2	18.2	50	1350	7.5	9.0	71	80	90	100	112	132	3310	3310	9520	10900	2180	236
	301 L2	20.1	45	1300	6.5	9.0	71	80	90	100	112	132	3430	3430	9800	11300	2250	236
	301 L2	24.6	37	1410	5.7	9.0	71	80	90	100	112	132	3670	3670	10400	12000	2410	236
	301 L2	30.7	29.3	1460	4.8	9.0	71	80	90	100	112	132	3950	3950	11100	12800	2590	236
	301 L2	33.3	27.0	1300	3.9	9.0	71	80	90	100	112	132	4050	4050	11400	13100	2670	236
	301 L2	38.4	23.5	1390	3.6	9.0	71	80	90	100	112	132	4250	4250	11900	13700	2790	236
	301 L2	41.5	21.7	1300	3.1	9.0	71	80	90	100	112	132	4360	4360	12200	14000	2870	236
	301 L2	51.9	17.3	1300	2.5	9.0	71	80	90	100	112	132	4700	4700	13000	15000	3090	236
	301 L2	64.8	13.9	1150	1.8	9.0	71	80	90	100	112	132	5060	5060	13900	16000	3330	236
	301 L3	51.6	17.4	1570	3.1	9.0	71	80	90	100	112	132	4690	4690	13000	15000	3090	236
	301 L3	63.2	14.2	1620	2.6	9.0	71	80	90	100	112	132	5020	5020	13800	15900	3300	236
	301 L3	69.9	12.9	1300	1.9	9.0	71	80	90	100	112	132	5190	5190	14300	16400	3410	236
	301 L3	77.5	11.6	1660	2.2	9.0	71	80	90	100	112	132	5370	5370	14700	16900	3530	236
	301 L3	85.6	10.5	1690	2.0	9.0	71	80	90	100	112	132	5550	5550	15100	17400	3650	236
	301 L3	105	8.6	1710	1.7	9.0	71	80	90	100	112	132	5940	5940	16100	18500	3910	236
	301 L3	116	7.8	1300	1.2	9.0	71	80	90	100	112	132	6140	6140	16600	19100	4040	236
	301 L3	131	6.9	1730	1.4	9.0	71	80	90	100	112	132	6400	6400	17200	19800	4210	236
	301 L3	142	6.3	1730	1.3	9.0	71	80	90	100	112	132	6570	6570	17600	20300	4320	236
	301 L3	177	5.1	1750	1.0	9.0	71	80	90	100	112	132	7080	7080	18800	21600	4650	236
	301 L3	192	4.7	1310	0.71	9.0	71	80	90	100	112	132	7270	7270	19300	22200	4780	236
	301 L3	221	4.1	1820	0.85	9.0	71	80	90	100	112	132	7620	7620	20100	23100	5010	236
	301 L3	240	3.8	1360	0.59	9.0	71	80	90	100	112	132	7830	7830	20600	23700	5150	236
	301 L3	299	3.0	1410	0.49	9.0	71	80	90	100	112	132	8430	8430	22000	25300	5540	236
	301 L3	374	2.4	1460	0.40	9.0	71	80	90	100	112	132	9080	9080	23600	27100	5970	236
301 L4	330	2.7	1970	0.63	7.2	71	80	90	100	112	132	8710	8710	22700	26100	5730	236	
301 L4	403	2.2	1480	0.39	7.2	71	80	90	100	112	132	9310	9310	24100	27700	6120	236	
301 L4	447	2.0	2000	0.48	7.2	71	80	90	100	112	132	9640	9640	24900	28600	6340	236	
301 L4	494	1.8	2000	0.43	7.2	71	80	90	100	112	132	9960	9960	25600	29400	6550	236	
301 L4	558	1.6	2000	0.38	7.2	71	80	90	100	112	132	10400	10400	26600	30500	6820	236	
301 L4	616	1.5	2000	0.35	7.2	71	80	90	100	112	132	10700	10700	27400	31500	7050	236	
301 L4	755	1.2	2000	0.28	7.2	71	80	90	100	112	132	11500	11500	29100	33400	7540	236	
301 L4	819	1.1	2000	0.26	7.2	71	80	90	100	112	132	11800	11800	29800	34000	7750	236	
301 L4	942	0.96	2000	0.23	7.2	71	80	90	100	112	132	12000	12400	31000	34000	8000	236	
301 L4	1022	0.88	2000	0.21	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
301 L4	1108	0.81	1700	0.16	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
301 L4	1275	0.71	2000	0.17	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
301 L4	1383	0.65	1700	0.13	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
301 L4	1591	0.57	2000	0.13	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
301 L4	1725	0.52	1700	0.10	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
301 L4	2153	0.42	1700	0.08	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
301 L4	2692	0.33	1700	0.07	7.2	71	80	90	100	112	132	12000	12500	31000	34000	8000	236	
500	301 L1	3.48	144	990	15.3	15.0	71	80	90	100	112	132	2320	2320	6910	7940	1530	236
	301 L1	4.26	117	1050	13.3	15.0	71	80	90	100	112	132	2490	2490	7350	8440	1630	236
	301 L1	5.77	87	1100	10.3	15.0	71	80	90	100	112	132	2750	2750	8040	9240	1810	236
	301 L1	7.20	69	1050	7.8	15.0	71	80	90	100	112	132	2960	2960	8600	9880	1950	236
	301 L1	9.00	56	660	4.0	15.0	71	80	90	100	112	132	3190	3190	9190	10600	2100	236
	301 L2	12.1	41	1300	6.0	15.0	71	80	90	100	112	132	3520	3520	10000	11500	2310	236



301 L

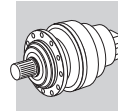
1750 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
500	301 L2	14.8	34	1430	5.4	15.0	71	80	90	100	112	132	3770	3770	10700	12300	2480	236
	301 L2	18.2	27.5	1470	4.5	15.0	71	80	90	100	112	132	4030	4030	11300	13000	2650	236
	301 L2	20.1	24.9	1300	3.6	15.0	71	80	90	100	112	132	4170	4170	11700	13400	2740	236
	301 L2	24.6	20.3	1540	3.5	15.0	71	80	90	100	112	132	4460	4460	12400	14300	2930	236
	301 L2	30.7	16.3	1590	2.9	15.0	71	80	90	100	112	132	4800	4800	13300	15300	3160	236
	301 L2	33.3	15.0	1300	2.2	15.0	71	80	90	100	112	132	4930	4930	13600	15600	3240	236
	301 L2	38.4	13.0	1510	2.2	15.0	71	80	90	100	112	132	5170	5170	14200	16300	3400	236
	301 L2	41.5	12.0	1300	1.7	15.0	71	80	90	100	112	132	5310	5310	14500	16700	3490	236
	301 L2	51.9	9.6	1300	1.4	15.0	71	80	90	100	112	132	5720	5720	15600	17900	3760	236
	301 L2	64.8	7.7	1150	0.99	15.0	71	80	90	100	112	132	6160	6160	16600	19100	4050	236
	301 L3	51.6	9.7	1700	1.9	15.0	71	80	90	100	112	132	5710	5710	15500	17800	3750	236
	301 L3	63.2	7.9	1720	1.6	15.0	71	80	90	100	112	132	6110	6110	16500	19000	4020	236
	301 L3	69.9	7.2	1300	1.1	15.0	71	80	90	100	112	132	6310	6310	17000	19500	4150	236
	301 L3	77.5	6.5	1730	1.3	15.0	71	80	90	100	112	132	6540	6540	17500	20100	4300	236
	301 L3	85.6	5.8	1740	1.2	15.0	71	80	90	100	112	132	6760	6760	18100	20800	4440	236
	301 L3	105	4.8	1770	0.97	15.0	71	80	90	100	112	132	7230	7230	19200	22100	4750	236
	301 L3	116	4.3	1330	0.66	15.0	71	80	90	100	112	132	7470	7470	19800	22700	4910	236
	301 L3	131	3.8	1840	0.81	15.0	71	80	90	100	112	132	7780	7780	20500	23600	5120	236
	301 L3	142	3.5	1870	0.76	15.0	71	80	90	100	112	132	8000	8000	21000	24200	5260	236
	301 L3	177	2.8	1950	0.63	15.0	71	80	90	100	112	132	8610	8610	22500	25800	5660	236
	301 L3	192	2.6	1440	0.43	15.0	71	80	90	100	112	132	8850	8850	23000	26500	5820	236
	301 L3	221	2.3	2000	0.52	15.0	71	80	90	100	112	132	9270	9270	24000	27600	6090	236
	301 L3	240	2.1	1500	0.36	15.0	71	80	90	100	112	132	9520	9520	24600	28300	6260	236
	301 L3	299	1.7	1550	0.30	15.0	71	80	90	100	112	132	10300	10300	26300	30200	6740	236
	301 L3	374	1.3	1620	0.25	15.0	71	80	90	100	112	132	11000	11000	28100	32300	7260	236
	301 L4	330	1.5	2000	0.36	12.0	71	80	90	100	112	132	10600	10600	27100	31100	6970	236
	301 L4	403	1.2	1640	0.24	12.0	71	80	90	100	112	132	11300	11300	28800	33000	7450	236
	301 L4	447	1.1	2000	0.26	12.0	71	80	90	100	112	132	11700	11700	29700	34000	7710	236
	301 L4	494	1.0	2000	0.24	12.0	71	80	90	100	112	132	12000	12100	30600	34000	7970	236
	301 L4	558	0.90	2000	0.21	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	616	0.81	2000	0.19	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	755	0.66	2000	0.16	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	819	0.61	2000	0.14	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	942	0.53	2000	0.13	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	1022	0.49	2000	0.12	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	1108	0.45	1700	0.09	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	1275	0.39	2000	0.09	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	1383	0.36	1700	0.07	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	1591	0.31	2000	0.07	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	1725	0.29	1700	0.06	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	2153	0.23	1700	0.05	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236
	301 L4	2692	0.19	1700	0.04	12.0	71	80	90	100	112	132	12000	12500	31000	34000	8000	236

303 L

2500 Nm

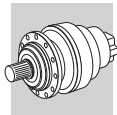
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ											
1400	303 L1	4.25	329	1120	40	11.0	—	—	—	—	—	132	160	180	200	5420	6250	11000	13200	3480	244	
	303 L1	5.33	263	1270	36	11.0	—	—	—	—	—	132	160	180	200	5840	6750	11800	14200	3750	244	
	303 L1	6.20	226	1100	27	11.0	—	—	—	—	—	132	160	180	200	6140	7090	12300	14800	3940	244	
	303 L1	7.50	187	1240	25	11.0	—	—	—	—	—	132	160	180	200	6550	7560	13000	15700	4200	244	
	303 L1	9.67	145	770	12.0	11.0	—	—	—	—	—	132	160	180	200	7120	8220	14100	16900	4570	244	
	303 L2	12.5	112	1450	18.0	9.0	71	80	90	100	112	132	160	—	—	7770	8970	15200	18300	4980	244	
	303 L2	15.3	91	1490	15.1	9.0	71	80	90	100	112	132	160	—	—	8310	9590	16200	19500	5330	244	
	303 L2	18.1	77	1770	15.2	9.0	71	80	90	100	112	132	160	—	—	8780	10100	17000	20400	5630	244	
	303 L2	20.8	67	1560	11.7	9.0	71	80	90	100	112	132	160	—	—	9190	10600	17700	21300	5900	244	
	303 L2	22.7	62	1970	13.5	9.0	71	80	90	100	112	132	160	—	—	9470	10900	18200	21900	6080	244	
	303 L2	24.5	57	1830	11.6	9.0	71	80	90	100	112	132	160	—	—	9720	11200	18600	22400	6230	244	
	303 L2	26.4	53	1720	10.1	9.0	71	80	90	100	112	132	160	—	—	9960	11500	19000	22900	6390	244	
	303 L2	30.8	46	2110	10.7	9.0	71	80	90	100	112	132	160	—	—	10500	12100	19900	24000	6720	244	
	303 L2	35.8	39	1760	7.7	9.0	71	80	90	100	112	132	160	—	—	11000	12700	20800	25100	7070	244	



303 L

2500 Nm

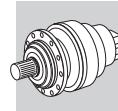
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
															MC	MZ	HC/PC	HZ/PZ	FZ			
1400	303 L2	38.4	36	2040	8.3	9.0	71	80	90	100	112	132	160	—	—	11300	13000	21300	25600	7240	244	
	303 L2	44.6	31	1760	6.2	9.0	71	80	90	100	112	132	160	—	—	11900	13700	22300	26800	7610	244	
	303 L2	55.8	25.1	1770	4.9	9.0	71	80	90	100	112	132	160	—	—	12800	14800	23800	28700	8200	244	
	303 L3	53.4	26.2	1910	5.8	7.5	71	80	90	100	112	132	160	—	—	12600	14500	23500	28300	8080	244	
	303 L3	63.1	22.2	2340	6.0	7.5	71	80	90	100	112	132	160	—	—	13300	15400	24700	29700	8540	244	
	303 L3	72.3	19.4	2020	4.5	7.5	71	80	90	100	112	132	160	—	—	13900	16100	25700	31000	8940	244	
	303 L3	77.2	18.1	2360	4.9	7.5	71	80	90	100	112	132	160	—	—	14200	16400	26300	31600	9140	244	
	303 L3	90.2	15.5	2040	3.6	7.5	71	80	90	100	112	132	160	—	—	15000	17300	27500	33100	9620	244	
	303 L3	105	13.4	2480	3.8	7.5	71	80	90	100	112	132	160	—	—	15800	18200	28800	34600	10100	244	
	303 L3	113	12.4	1790	2.6	7.5	71	80	90	100	112	132	160	—	—	16200	18600	29400	35400	10400	244	
	303 L3	124	11.2	1800	2.3	7.5	71	80	90	100	112	132	160	—	—	16700	19300	30300	36500	10700	244	
	303 L3	141	9.9	2600	3.0	7.5	71	80	90	100	112	132	160	—	—	17400	20100	31500	37900	11200	244	
	303 L3	152	9.2	1800	1.9	7.5	71	80	90	100	112	132	160	—	—	17900	20600	32200	38700	11500	244	
	303 L3	164	8.6	2200	2.2	7.5	71	80	90	100	112	132	160	—	—	18300	21100	32900	39600	11700	244	
	303 L3	178	7.9	2200	2.0	7.5	71	80	90	100	112	132	160	—	—	18800	21700	33700	40600	12100	244	
	303 L3	190	7.4	1800	1.5	7.5	71	80	90	100	112	132	160	—	—	19200	22200	34400	41400	12300	244	
	303 L3	220	6.4	2250	1.6	7.5	71	80	90	100	112	132	160	—	—	20200	23300	36000	43300	13000	244	
	303 L3	258	5.4	1800	1.1	7.5	71	80	90	100	112	132	160	—	—	21300	24600	37700	45300	13600	244	
	303 L3	276	5.1	2200	1.3	7.5	71	80	90	100	112	132	160	—	—	21800	25200	38500	46300	14000	244	
	303 L3	321	4.4	1840	0.92	7.5	71	80	90	100	112	132	160	—	—	22900	26400	40300	48500	14700	244	
	303 L3	389	3.6	1700	0.70	7.5	71	80	90	100	112	132	160	—	—	24400	28200	42600	51300	15700	244	
	303 L3	402	3.5	1900	0.76	7.5	71	80	90	100	112	132	160	—	—	24700	28500	43100	51800	15800	244	
	303 L4	413	3.4	2340	0.94	6.0	71	80	90	100	112	132	160	—	—	24900	28800	43400	52200	16000	244	
	303 L4	446	3.1	2720	1.0	6.0	71	80	90	100	112	132	160	—	—	25500	29500	44400	53400	16400	244	
	303 L4	492	2.8	2690	0.91	6.0	71	80	90	100	112	132	160	—	—	26400	30500	45800	55100	16900	244	
	303 L4	556	2.5	2750	0.82	6.0	71	80	90	100	112	132	160	—	—	27500	31700	47500	57100	17600	244	
	303 L4	649	2.2	2220	0.56	6.0	71	80	90	100	112	132	160	—	—	29000	33400	49700	59800	18600	244	
	303 L4	718	1.9	2080	0.48	6.0	71	80	90	100	112	132	160	—	—	29900	34600	51300	61700	19200	244	
	303 L4	816	1.7	2720	0.55	6.0	71	80	90	100	112	132	160	—	—	31300	36100	53300	64100	20000	244	
	303 L4	896	1.6	2150	0.40	6.0	71	80	90	100	112	132	160	—	—	32200	37200	54800	65900	20700	244	
	303 L4	1018	1.4	2730	0.44	6.0	71	80	90	100	112	132	160	—	—	33600	38800	56900	68500	21600	244	
	303 L4	1098	1.3	2220	0.33	6.0	71	80	90	100	112	132	160	—	—	34500	39800	58200	70000	22100	244	
	303 L4	1278	1.1	2810	0.36	6.0	71	80	90	100	112	132	160	—	—	36000	41900	60900	73300	23300	244	
	303 L4	1370	1.0	2290	0.28	6.0	71	80	90	100	112	132	160	—	—	36000	42000	62200	74000	23800	244	
	303 L4	1586	0.88	2250	0.23	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	244	
	303 L4	1854	0.76	2300	0.21	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	244	
	303 L4	1991	0.70	2850	0.24	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	244	
	303 L4	2243	0.62	2000	0.15	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	244	
	303 L4	2799	0.50	2000	0.12	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	244	
900	303 L1	3.60	250	1330	36	13.2	—	—	—	—	—	132	160	180	200	5940	6860	12000	14400	3810	244	
	303 L1	4.25	212	1400	32	13.2	—	—	—	—	—	132	160	180	200	6280	7250	12600	15100	4030	244	
	303 L1	5.33	169	1450	26	13.2	—	—	—	—	—	132	160	180	200	6770	7820	13400	16200	4340	244	
	303 L1	6.20	145	1250	19.6	13.2	—	—	—	—	—	132	160	180	200	7120	8220	14100	16900	4570	244	
	303 L1	7.50	120	1420	18.4	13.2	—	—	—	—	—	132	160	180	200	7580	8760	14900	17900	4870	244	
	303 L1	9.67	93	860	8.6	13.2	—	—	—	—	—	132	160	180	200	8250	9530	16100	19300	5300	244	
	303 L2	12.5	72	1660	13.3	10.8	71	80	90	100	112	132	160	—	—	9000	10400	17400	20900	5770	244	
	303 L2	15.3	59	1710	11.2	10.8	71	80	90	100	112	132	160	—	—	9630	11100	18500	22200	6180	244	
	303 L2	18.1	50	2000	11.1	10.8	71	80	90	100	112	132	160	—	—	10200	11700	19400	23300	6530	244	
	303 L2	20.8	43	1730	8.4	10.8	71	80	90	100	112	132	160	—	—	10700	12300	20200	24300	6830	244	
	303 L2	22.7	40	2110	9.3	10.8	71	80	90	100	112	132	160	—	—	11000	12700	20800	25000	7040	244	
	303 L2	24.5	37	2020	8.2	10.8	71	80	90	100	112	132	160	—	—	11300	13000	21200	25600	7220	244	
	303 L2	26.4	34	1760	6.7	10.8	71	80	90	100	112	132	160	—	—	11500	13300	21700	26100	7400	244	
	303 L2	30.8	29.3	2130	6.9	10.8	71	80	90	100	112	132	160	—	—	12100	14000	22700	27400	7790	244	
	303 L2	35.8	25.2	1770	5.0	10.8	71	80	90	100	112	132	160	—	—	12800	14700	23800	28600	8190	244	
	303 L2	38.4	23.4	2090	5.5	10.8	71	80	90	100	112	132	160	—	—	13100	15100	24300	29200	8390	244	
	303 L2	44.6	20.2	1780	4.0	10.8	71	80	90	100	112	132	160	—	—	13700	15900	25400	30600	8820	244	



303 L

2500 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
900	303 L3	113	8.0	1800	1.6	9.0	71	80	90	100	112	132	160	—	—		18700	21600	33600	40400	12000	244
	303 L3	124	7.2	1800	1.5	9.0	71	80	90	100	112	132	160	—	—		19300	22300	34600	41600	12400	244
	303 L3	141	6.4	2630	1.9	9.0	71	80	90	100	112	132	160	—	—		20200	23300	35900	43200	13000	244
	303 L3	152	5.9	1800	1.2	9.0	71	80	90	100	112	132	160	—	—		20700	23900	36800	44200	13300	244
	303 L3	164	5.5	2200	1.4	9.0	71	80	90	100	112	132	160	—	—		21200	24500	37600	45200	13600	244
	303 L3	178	5.1	2200	1.3	9.0	71	80	90	100	112	132	160	—	—		21800	25100	38500	46300	14000	244
	303 L3	190	4.7	1820	0.98	9.0	71	80	90	100	112	132	160	—	—		22300	25700	39300	47300	14300	244
	303 L3	220	4.1	2240	1.0	9.0	71	80	90	100	112	132	160	—	—		23400	27000	41100	49400	15000	244
	303 L3	258	3.5	1900	0.76	9.0	71	80	90	100	112	132	160	—	—		24700	28500	43000	51800	15800	244
	303 L3	276	3.3	2350	0.88	9.0	71	80	90	100	112	132	160	—	—		25200	29100	44000	52900	16200	244
	303 L3	321	2.8	1970	0.63	9.0	71	80	90	100	112	132	160	—	—		26500	30600	46000	55300	17000	244
	303 L3	389	2.3	1770	0.47	9.0	71	80	90	100	112	132	160	—	—		28300	32600	48700	58600	18100	244
	303 L3	402	2.2	2030	0.52	9.0	71	80	90	100	112	132	160	—	—		28600	33000	49200	59200	18300	244
	303 L4	413	2.2	2510	0.65	7.2	71	80	90	100	112	132	160	—	—		28900	33300	49600	59700	18500	244
	303 L4	446	2.0	2780	0.67	7.2	71	80	90	100	112	132	160	—	—		29600	34200	50700	61000	19000	244
	303 L4	492	1.8	2720	0.59	7.2	71	80	90	100	112	132	160	—	—		30600	35300	52300	62900	19600	244
	303 L4	556	1.6	2820	0.54	7.2	71	80	90	100	112	132	160	—	—		31900	36800	54200	65200	20400	244
	303 L4	649	1.4	2260	0.37	7.2	71	80	90	100	112	132	160	—	—		33600	38700	56800	68300	21500	244
	303 L4	718	1.3	2220	0.33	7.2	71	80	90	100	112	132	160	—	—		34700	40100	58500	70400	22300	244
	303 L4	816	1.1	2740	0.36	7.2	71	80	90	100	112	132	160	—	—		36000	41800	60800	73200	23200	244
	303 L4	896	1.0	2300	0.27	7.2	71	80	90	100	112	132	160	—	—		36000	42000	62500	74000	24000	244
	303 L4	1018	0.88	2750	0.29	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1098	0.82	2300	0.22	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1278	0.70	2850	0.24	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1370	0.66	2300	0.18	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1586	0.57	2250	0.15	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1854	0.49	2300	0.13	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1991	0.45	2850	0.15	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	2243	0.40	2000	0.09	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	2799	0.32	2000	0.08	7.2	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
500	303 L1	3.60	139	1590	24	22	—	—	—	—	—	132	160	180	200		7220	8340	14300	17200	4630	244
	303 L1	4.25	118	1670	21	22	—	—	—	—	—	132	160	180	200		7630	8810	15000	18000	4900	244
	303 L1	5.33	94	1730	17.5	22	—	—	—	—	—	132	160	180	200		8240	9510	16000	19300	5280	244
	303 L1	6.20	81	1500	13.1	22	—	—	—	—	—	132	160	180	200		8660	10000	16800	20200	5560	244
	303 L1	7.50	67	1590	11.4	22	—	—	—	—	—	132	160	180	200		9230	10700	17800	21400	5920	244
	303 L1	9.67	52	860	4.8	22	—	—	—	—	—	132	160	180	200		10000	11600	19200	23100	6440	244
	303 L2	12.5	40	1880	8.4	18.0	71	80	90	100	112	132	160	—	—		10900	12600	20700	24900	7020	244
	303 L2	15.3	33	1880	6.8	18.0	71	80	90	100	112	132	160	—	—		11700	13500	22000	26500	7510	244
	303 L2	18.1	27.6	2200	6.8	18.0	71	80	90	100	112	132	160	—	—		12400	14300	23100	27800	7940	244
	303 L2	20.8	24.1	1870	5.0	18.0	71	80	90	100	112	132	160	—	—		13000	15000	24100	29000	8310	244
	303 L2	22.7	22.0	2150	5.3	18.0	71	80	90	100	112	132	160	—	—		13400	15400	24800	29800	8570	244
	303 L2	24.5	20.4	2260	5.1	18.0	71	80	90	100	112	132	160	—	—		13700	15800	25300	30500	8780	244
	303 L2	26.4	18.9	1780	3.7	18.0	71	80	90	100	112	132	160	—	—		14000	16200	25900	31200	9010	244
	303 L2	30.8	16.3	2170	3.9	18.0	71	80	90	100	112	132	160	—	—		14800	17100	27100	32600	9480	244
	303 L2	35.8	14.0	1790	2.8	18.0	71	80	90	100	112	132	160	—	—		15500	17900	28400	34200	9960	244
	303 L2	38.4	13.0	2170	3.1	18.0	71	80	90	100	112	132	160	—	—		15900	18400	29000	34900	10200	244
	303 L2	44.6	11.2	1800	2.2	18.0	71	80	90	100	112	132	160	—	—		16700	19300	30300	36500	10700	244
	303 L2	55.8	9.0	1800	1.8	18.0	71	80	90	100	112	132	160	—	—		18000	20800	32400	39000	11600	244
	303 L3	53.4	9.4	2100	2.3	15.0	71	80	90	100	112	132	160	—	—		17800	20500	32000	38500	11400	244
	303 L3	63.1	7.9	2620	2.4	15.0	71	80	90	100	112	132	160	—	—		18800	21700	33600	40500	12000	244
	303 L3	72.3	6.9	2130	1.7	15.0	71	80	90	100	112	132	160	—	—		19600	22700	35100	42200	12600	244
	303 L3	77.2	6.5	2630	2.0	15.0	71	80	90	100	112	132	160	—	—		20100	23200	35800	43000	12900	244
	303 L3	90.2	5.5	2140	1.4	15.0	71	80	90	100	112	132	160	—	—		21100	24400	37500	45100	13600	244
	303 L3	105	4.8	2660	1.5	15.0	71	80	90	100	112	132	160	—	—		22200	25600	39200	47100	14200	244
	303 L3	113	4.4	1830	0.93	15.0	71	80	90	100	112	132	160	—	—		22800	26300	40100	48200	14600	244
	303 L3	124	4.0	1860	0.86	15.0	71	80	90	100	112	132	160	—	—		23500	27200	41300	49600	15100	244
	303 L3	141	3.5	2670	1.1	15.0	71	80	90	100	112	132	160	—	—		24600	28400	42900	51600	15800	244
	303 L3	152	3.3	1920	0.72	15.0	71	80	90	100	112	132	160	—	—		25200	29100	43900	52800	16200	244
	303 L3	164	3.1	2370	0.83	15.0	71	80	90	100	112	132	160	—	—		25800	29800	44800	53900	16500	244
	303 L3	178	2.8	2410	0.78	15.0	71	80	90	100	112	132	160	—	—		26500	30600	45900	55200	17000	244
	303 L3	190	2.6	1980	0.60	15.0	71	80	90	100	112	132	160	—	—		27100	31300	46900	56400	17400	244



303 L

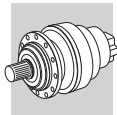
2500 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
500	303 L3	321	1.6	2150	0.38	15.0	71	80	90	100	112	132	160	—	—		32300	37300	54900	66000	20700	244
	303 L3	389	1.3	1930	0.28	15.0	71	80	90	100	112	132	160	—	—		34400	39700	58100	69900	22100	244
	303 L3	402	1.2	2220	0.32	15.0	71	80	90	100	112	132	160	—	—		34800	40200	58600	70600	22300	244
	303 L4	413	1.2	2760	0.40	12.0	71	80	90	100	112	132	160	—	—		35100	40500	59100	71200	22500	244
	303 L4	446	1.1	2880	0.38	12.0	71	80	90	100	112	132	160	—	—		36000	41600	60500	72800	23100	244
	303 L4	492	1.0	2750	0.33	12.0	71	80	90	100	112	132	160	—	—		36000	42000	62300	74000	23900	244
	303 L4	556	0.90	2900	0.31	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	649	0.77	2300	0.21	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	718	0.70	2300	0.19	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	816	0.61	2750	0.20	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	896	0.56	2300	0.15	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1018	0.49	2750	0.16	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1098	0.46	2300	0.12	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1278	0.39	2850	0.13	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1370	0.36	2300	0.10	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1586	0.32	2250	0.08	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1854	0.27	2300	0.07	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	1991	0.25	2850	0.08	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	2243	0.22	2000	0.05	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244
	303 L4	2799	0.18	2000	0.04	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	244

304 L

3600 Nm

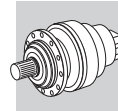
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
1400	304 L1	4.25	329	1410	50	12.0	—	—	—	—	—	132	160	180	200		5420	6250	11000	13200	3480	254
	304 L1	5.33	263	1760	50	12.0	—	—	—	—	—	132	160	180	200		5840	6750	11800	14200	3750	254
	304 L1	6.57	213	1740	40	12.0	—	—	—	—	—	132	160	180	200		6260	7230	12500	15100	4020	254
	304 L2	12.5	112	2410	30	9.0	71	80	90	100	112	132	160	—	—		7770	8970	15200	18300	4980	254
	304 L2	15.3	91	2600	26	9.0	71	80	90	100	112	132	160	—	—		8310	9590	16200	19500	5330	254
	304 L2	18.1	77	2700	23	9.0	71	80	90	100	112	132	160	—	—		8780	10100	17000	20400	5630	254
	304 L2	20.8	67	2850	21	9.0	71	80	90	100	112	132	160	—	—		9190	10600	17700	21300	5900	254
	304 L2	22.7	62	2650	18.2	9.0	71	80	90	100	112	132	160	—	—		9470	10900	18200	21900	6080	254
	304 L2	24.5	57	2950	18.8	9.0	71	80	90	100	112	132	160	—	—		9720	11200	18600	22400	6230	254
	304 L2	30.8	46	2750	13.9	9.0	71	80	90	100	112	132	160	—	—		10500	12100	19900	24000	6720	254
	304 L2	38.4	36	2760	11.2	9.0	71	80	90	100	112	132	160	—	—		11300	13000	21300	25600	7240	254
	304 L2	47.3	29.6	2290	7.5	9.0	71	80	90	100	112	132	160	—	—		12100	14000	22700	27300	7760	254
	304 L2	59.1	23.7	2290	6.0	9.0	71	80	90	100	112	132	160	—	—		13000	15000	24200	29200	8360	254
	304 L3	43.6	32	3200	11.8	7.5	71	80	90	100	112	132	160	—	—		11800	13600	22100	26600	7550	254
	304 L3	53.4	26.2	3240	9.8	7.5	71	80	90	100	112	132	160	—	—		12600	14500	23500	28300	8080	254
	304 L3	63.1	22.2	3300	8.4	7.5	71	80	90	100	112	132	160	—	—		13300	15400	24700	29700	8540	254
	304 L3	72.3	19.4	3300	7.3	7.5	71	80	90	100	112	132	160	—	—		13900	16100	25700	31000	8940	254
	304 L3	77.2	18.1	3360	7.0	7.5	71	80	90	100	112	132	160	—	—		14200	16400	26300	31600	9140	254
	304 L3	90.2	15.5	3260	5.8	7.5	71	80	90	100	112	132	160	—	—		15000	17300	27500	33100	9620	254
	304 L3	105	13.4	3450	5.3	7.5	71	80	90	100	112	132	160	—	—		15800	18200	28800	34600	10100	254
	304 L3	111	12.7	3390	4.9	7.5	71	80	90	100	112	132	160	—	—		16000	18500	29200	35200	10300	254
	304 L3	130	10.7	3520	4.3	7.5	71	80	90	100	112	132	160	—	—		17000	19600	30700	37000	10900	254
	304 L3	141	9.9	3540	4.0	7.5	71	80	90	100	112	132	160	—	—		17400	20100	31500	37900	11200	254
	304 L3	150	9.4	3450	3.7	7.5	71	80	90	100	112	132	160	—	—		17800	20500	32000	38500	11400	254
	304 L3	165	8.5	2290	2.2	7.5	71	80	90	100	112	132	160	—	—		18300	21200	33000	39600	11800	254
	304 L3	178	7.9	2800	2.5	7.5	71	80	90	100	112	132	160	—	—		18800	21700	33700	40600	12100	254
	304 L3	202	6.9	2290	1.8	7.5	71	80	90	100	112	132	160	—	—		19600	22600	35000	42100	12600	254
	304 L3	220	6.4	3610	2.6	7.5	71	80	90	100	112	132	160	—	—		20200	23300	36000	43300	13000	254
	304 L3	273	5.1	2290	1.3	7.5	71	80	90	100	112	132	160	—	—		21700	25000	38300	46100	13900	254
	304 L3	341	4.1	2320	1.1	7.5	71	80	90	100	112	132	160	—	—		23400	27000	41000	49300	15000	254
	304 L3	426	3.3	2360	0.89	7.5	71	80	90	100	112	132	160	—	—		25200	29000	43800	52700	16100	254
	304 L4	413	3.4	2950	1.2	6.0	71	80	90	100	112	132	160	—	—		24900	28800	43400	52200	16000	254
	304 L4	446	3.1	3690	1.4	6.0	71	80	90	100	112	132	160	—	—		25500	29500	44400	53400	16400	254
	304 L4	492	2.8	3700	1.2	6.0	71	80	90	100	112	132	160	—	—		26400	30500	45800	55100	16900	254



304 L

3600 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										R _{n2} [N]					
																MC	MZ	HC/PC	HZ/PZ	FZ		
1400	304 L4	556	2.5	3710	1.1	6.0	71	80	90	100	112	132	160	—	—	27500	31700	47500	57100	17600	254	
	304 L4	649	2.2	3550	0.91	6.0	71	80	90	100	112	132	160	—	—	29000	33400	49700	59800	18600	254	
	304 L4	702	2.0	2480	0.59	6.0	71	80	90	100	112	132	160	—	—	29700	34300	50900	61300	19100	254	
	304 L4	816	1.7	3810	0.77	6.0	71	80	90	100	112	132	160	—	—	31300	36100	53300	64100	20000	254	
	304 L4	1018	1.4	3870	0.63	6.0	71	80	90	100	112	132	160	—	—	33600	38800	56900	68500	21600	254	
	304 L4	1164	1.2	2680	0.38	6.0	71	80	90	100	112	132	160	—	—	35200	40600	59200	71300	22600	254	
	304 L4	1271	1.1	3930	0.51	6.0	71	80	90	100	112	132	160	—	—	36000	41800	60800	73200	23200	254	
	304 L4	1344	1.0	3700	0.46	6.0	71	80	90	100	112	132	160	—	—	36000	42000	61900	74000	23700	254	
	304 L4	1586	0.88	3960	0.41	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
	304 L4	1815	0.77	2750	0.25	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
	304 L4	1991	0.70	3500	0.29	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
	304 L4	2269	0.62	2750	0.20	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
	304 L4	2453	0.57	2750	0.19	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
900	304 L1	3.60	250	1850	50	14.4	—	—	—	—	—	132	160	180	200	5940	6860	12000	14400	3810	254	
	304 L1	4.25	212	2000	46	14.4	—	—	—	—	—	132	160	180	200	6280	7250	12600	15100	4030	254	
	304 L1	5.33	169	2080	38	14.4	—	—	—	—	—	132	160	180	200	6770	7820	13400	16200	4340	254	
	304 L1	6.57	137	1980	29	14.4	—	—	—	—	—	132	160	180	200	7260	8380	14300	17200	4660	254	
	304 L2	12.5	72	2800	22	10.8	71	80	90	100	112	132	160	—	—	9000	10400	17400	20900	5770	254	
	304 L2	15.3	59	2970	19.4	10.8	71	80	90	100	112	132	160	—	—	9630	11100	18500	22200	6180	254	
	304 L2	18.1	50	3070	17.0	10.8	71	80	90	100	112	132	160	—	—	10200	11700	19400	23300	6530	254	
	304 L2	20.8	43	3150	15.2	10.8	71	80	90	100	112	132	160	—	—	10700	12300	20200	24300	6830	254	
	304 L2	22.7	40	2760	12.1	10.8	71	80	90	100	112	132	160	—	—	11000	12700	20800	25000	7040	254	
	304 L2	24.5	37	3160	12.9	10.8	71	80	90	100	112	132	160	—	—	11300	13000	21200	25600	7220	254	
	304 L2	30.8	29.3	2770	9.0	10.8	71	80	90	100	112	132	160	—	—	12100	14000	22700	27400	7790	254	
	304 L2	38.4	23.4	2770	7.2	10.8	71	80	90	100	112	132	160	—	—	13100	15100	24300	29200	8390	254	
	304 L2	47.3	19.0	2290	4.8	10.8	71	80	90	100	112	132	160	—	—	14000	16200	25900	31100	8990	254	
	304 L2	59.1	15.2	2290	3.9	10.8	71	80	90	100	112	132	160	—	—	15100	17400	27700	33300	9680	254	
	304 L3	43.6	20.6	3290	7.8	9.0	71	80	90	100	112	132	160	—	—	13600	15700	25300	30400	8750	254	
	304 L3	53.4	16.9	3330	6.4	9.0	71	80	90	100	112	132	160	—	—	14600	16800	26800	32300	9360	254	
	304 L3	63.1	14.3	3430	5.6	9.0	71	80	90	100	112	132	160	—	—	15400	17800	28200	33900	9890	254	
	304 L3	72.3	12.5	3390	4.8	9.0	71	80	90	100	112	132	160	—	—	16100	18600	29400	35400	10400	254	
	304 L3	77.2	11.7	3490	4.7	9.0	71	80	90	100	112	132	160	—	—	16500	19100	30000	36100	10600	254	
	304 L3	90.2	10.0	3440	3.9	9.0	71	80	90	100	112	132	160	—	—	17400	20100	31400	37800	11100	254	
	304 L3	105	8.6	3560	3.5	9.0	71	80	90	100	112	132	160	—	—	18300	21100	32800	39500	11700	254	
	304 L3	111	8.1	3460	3.2	9.0	71	80	90	100	112	132	160	—	—	18600	21500	33400	40200	11900	254	
	304 L3	130	6.9	3600	2.8	9.0	71	80	90	100	112	132	160	—	—	19700	22700	35100	42200	12600	254	
	304 L3	141	6.4	3610	2.6	9.0	71	80	90	100	112	132	160	—	—	20200	23300	35900	43200	13000	254	
	304 L3	150	6.0	3480	2.4	9.0	71	80	90	100	112	132	160	—	—	20600	23700	36600	44000	13200	254	
	304 L3	165	5.5	2290	1.4	9.0	71	80	90	100	112	132	160	—	—	21200	24500	37600	45300	13600	254	
	304 L3	178	5.1	2800	1.6	9.0	71	80	90	100	112	132	160	—	—	21800	25100	38500	46300	14000	254	
	304 L3	202	4.5	2310	1.2	9.0	71	80	90	100	112	132	160	—	—	22700	26200	40000	48100	14600	254	
	304 L3	220	4.1	3670	1.7	9.0	71	80	90	100	112	132	160	—	—	23400	27000	41100	49400	15000	254	
	304 L3	273	3.3	2360	0.89	9.0	71	80	90	100	112	132	160	—	—	25100	29000	43800	52700	16100	254	
	304 L3	341	2.6	2390	0.72	9.0	71	80	90	100	112	132	160	—	—	27100	31300	46800	56300	17400	254	
	304 L3	426	2.1	2460	0.60	9.0	71	80	90	100	112	132	160	—	—	29200	33700	50000	60200	18700	254	
	304 L4	413	2.2	3140	0.81	7.2	71	80	90	100	112	132	160	—	—	28900	33300	49600	59700	18500	254	
	304 L4	446	2.0	3770	0.90	7.2	71	80	90	100	112	132	160	—	—	29600	34200	50700	61000	19000	254	
	304 L4	492	1.8	3790	0.82	7.2	71	80	90	100	112	132	160	—	—	30600	35300	52300	62900	19600	254	
	304 L4	556	1.6	3830	0.73	7.2	71	80	90	100	112	132	160	—	—	31900	36800	54200	65200	20400	254	
	304 L4	649	1.4	3640	0.60	7.2	71	80	90	100	112	132	160	—	—	33600	38700	56800	68300	21500	254	
	304 L4	702	1.3	2650	0.40	7.2	71	80	90	100	112	132	160	—	—	34400	39800	58100	69900	22100	254	
	304 L4	816	1.1	3930	0.51	7.2	71	80	90	100	112	132	160	—	—	36000	41800	60800	73200	23200	254	
	304 L4	1018	0.88	3960	0.41	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
	304 L4	1164	0.77	2750	0.25	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
	304 L4	1271	0.71	3960	0.33	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
	304 L4	1344	0.67	3710	0.29	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	2400		



304 L

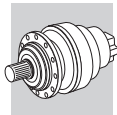
3600 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 								R _{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ										
500	304 L1	5.33	94	2460	25	24	—	—	—	—	—	132	160	180	200	8240	9510	16000	19300	5280	254
	304 L1	6.57	76	2220	18.3	24	—	—	—	—	—	132	160	180	200	8830	10200	17100	20500	5660	254
	304 L2	12.5	40	3160	14.0	18.0	71	80	90	100	112	132	160	—	—	10900	12600	20700	24900	7020	254
	304 L2	15.3	33	3200	11.6	18.0	71	80	90	100	112	132	160	—	—	11700	13500	22000	26500	7510	254
	304 L2	18.1	27.6	3240	9.9	18.0	71	80	90	100	112	132	160	—	—	12400	14300	23100	27800	7940	254
	304 L2	20.8	24.1	3260	8.7	18.0	71	80	90	100	112	132	160	—	—	13000	15000	24100	29000	8310	254
	304 L2	22.7	22.0	2780	6.8	18.0	71	80	90	100	112	132	160	—	—	13400	15400	24800	29800	8570	254
	304 L2	24.5	20.4	3320	7.5	18.0	71	80	90	100	112	132	160	—	—	13700	15800	25300	30500	8780	254
	304 L2	30.8	16.3	2780	5.0	18.0	71	80	90	100	112	132	160	—	—	14800	17100	27100	32600	9480	254
	304 L2	38.4	13.0	2790	4.0	18.0	71	80	90	100	112	132	160	—	—	15900	18400	29000	34900	10200	254
	304 L2	47.3	10.6	2290	2.7	18.0	71	80	90	100	112	132	160	—	—	17000	19700	30900	37100	10900	254
	304 L2	59.1	8.5	2290	2.2	18.0	71	80	90	100	112	132	160	—	—	18400	21200	33000	39700	11800	254
	304 L3	43.6	11.5	3410	4.5	15.0	71	80	90	100	112	132	160	—	—	16600	19200	30100	36200	10600	254
	304 L3	53.4	9.4	3450	3.7	15.0	71	80	90	100	112	132	160	—	—	17800	20500	32000	38500	11400	254
	304 L3	63.1	7.9	3580	3.3	15.0	71	80	90	100	112	132	160	—	—	18800	21700	33600	40500	12000	254
	304 L3	72.3	6.9	3470	2.8	15.0	71	80	90	100	112	132	160	—	—	19600	22700	35100	42200	12600	254
	304 L3	77.2	6.5	3610	2.7	15.0	71	80	90	100	112	132	160	—	—	20100	23200	35800	43000	12900	254
	304 L3	90.2	5.5	3490	2.2	15.0	71	80	90	100	112	132	160	—	—	21100	24400	37500	45100	13600	254
	304 L3	105	4.8	3650	2.0	15.0	71	80	90	100	112	132	160	—	—	22200	25600	39200	47100	14200	254
	304 L3	111	4.5	3500	1.8	15.0	71	80	90	100	112	132	160	—	—	22600	26100	39800	47900	14500	254
	304 L3	130	3.8	3670	1.6	15.0	71	80	90	100	112	132	160	—	—	23900	27600	41900	50400	15300	254
	304 L3	141	3.5	3680	1.5	15.0	71	80	90	100	112	132	160	—	—	24600	28400	42900	51600	15800	254
	304 L3	150	3.3	3510	1.3	15.0	71	80	90	100	112	132	160	—	—	25000	28900	43600	52500	16000	254
	304 L3	165	3.0	2370	0.83	15.0	71	80	90	100	112	132	160	—	—	25800	29800	44900	54000	16600	254
	304 L3	178	2.8	3030	0.98	15.0	71	80	90	100	112	132	160	—	—	26500	30600	45900	55200	17000	254
	304 L3	202	2.5	2400	0.68	15.0	71	80	90	100	112	132	160	—	—	27600	31900	47700	57400	17700	254
	304 L3	220	2.3	3740	0.97	15.0	71	80	90	100	112	132	160	—	—	28500	32900	49000	58900	18300	254
	304 L3	273	1.8	2510	0.53	15.0	71	80	90	100	112	132	160	—	—	30600	35300	52200	62800	19600	254
	304 L3	341	1.5	2600	0.44	15.0	71	80	90	100	112	132	160	—	—	32900	38000	55800	67200	21100	254
	304 L3	426	1.2	2690	0.36	15.0	71	80	90	100	112	132	160	—	—	35500	40900	59700	71800	22700	254
	304 L4	413	1.2	3410	0.49	12.0	71	80	90	100	112	132	160	—	—	35100	40500	59100	71200	22500	254
	304 L4	446	1.1	3930	0.52	12.0	71	80	90	100	112	132	160	—	—	36000	41600	60500	72800	23100	254
	304 L4	492	1.0	3960	0.48	12.0	71	80	90	100	112	132	160	—	—	36000	42000	62300	74000	23900	254
	304 L4	556	0.90	3960	0.42	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254
	304 L4	649	0.77	3710	0.34	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254
	304 L4	702	0.71	2750	0.23	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254
	304 L4	816	0.61	3960	0.29	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254
	304 L4	1018	0.49	3960	0.23	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254
	304 L4	1164	0.43	2750	0.14	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254
	304 L4	1271	0.39	3960	0.18	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254
304 L4	1344	0.37	3710	0.16	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
304 L4	1586	0.32	3960	0.15	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
304 L4	1815	0.28	2750	0.09	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
304 L4	1991	0.25	3500	0.10	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
304 L4	2269	0.22	2750	0.07	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	
304 L4	2453	0.20	2750	0.07	12.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	254	

305 L

5000 Nm

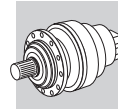
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 								R _{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ										
1400	305 L1	4.25	329	1690	60	13.0	—	—	—	—	—	132	160	180	200	5420	6250	11000	13200	3480	264
	305 L1	5.33	263	2120	60	13.0	—	—	—	—	—	132	160	180	200	5840	6750	11800	14200	3750	264
	305 L1	6.20	226	2270	55	13.0	—	—	—	—	—	132	160	180	200	6140	7090	12300	14800	3940	264
	305 L1	7.50	187	1990	40	13.0	—	—	—	—	—	132	160	180	200	6550	7560	13000	15700	4200	264
	305 L2	12.5	112	2410	30	9.0	71	80	90	100	112	132	160	—	—	7770	8970	15200	18300	4980	264
	305 L2	15.3	91	2720	28	9.0	71	80	90	100	112	132	160	—	—	8310	9590	16200	19500	5330	264
	305 L2	18.1	77	3190	27	9.0	71	80	90	100	112	132	160	—	—	8780	10100	17000	20400	5630	264
	305 L2	20.8	67	2830	21	9.0	71	80	90	100	112	132	160	—	—	9190	10600	17700	21300	5900	264



305 L

5000 Nm

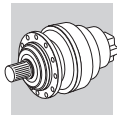
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										Rn ₂ [N]					
															MC	MZ	HC/PC	HZ/PZ	FZ			
1400	305 L2	22.7	62	3390	23	9.0	71	80	90	100	112	132	160	—	—	9470	10900	18200	21900	6080	264	
	305 L2	24.5	57	3310	21	9.0	71	80	90	100	112	132	160	—	—	9720	11200	18600	22400	6230	264	
	305 L2	26.4	53	3490	21	9.0	71	80	90	100	112	132	160	—	—	9960	11500	19000	22900	6390	264	
	305 L2	30.8	46	3640	18.4	9.0	71	80	90	100	112	132	160	—	—	10500	12100	19900	24000	6720	264	
	305 L2	35.8	39	3560	15.5	9.0	71	80	90	100	112	132	160	—	—	11000	12700	20800	25100	7070	264	
	305 L2	38.4	36	3740	15.2	9.0	71	80	90	100	112	132	160	—	—	11300	13000	21300	25600	7240	264	
	305 L2	44.6	31	3560	12.4	9.0	71	80	90	100	112	132	160	—	—	11900	13700	22300	26800	7610	264	
	305 L2	55.8	25.1	3180	8.9	9.0	71	80	90	100	112	132	160	—	—	12800	14800	23800	28700	8200	264	
	305 L3	53.4	26.2	3600	10.8	7.5	71	80	90	100	112	132	160	—	—	12600	14500	23500	28300	8080	264	
	305 L3	63.1	22.2	4360	11.1	7.5	71	80	90	100	112	132	160	—	—	13300	15400	24700	29700	8540	264	
	305 L3	72.3	19.4	3780	8.4	7.5	71	80	90	100	112	132	160	—	—	13900	16100	25700	31000	8940	264	
	305 L3	77.2	18.1	4560	9.5	7.5	71	80	90	100	112	132	160	—	—	14200	16400	26300	31600	9140	264	
	305 L3	90.2	15.5	3920	7.0	7.5	71	80	90	100	112	132	160	—	—	15000	17300	27500	33100	9620	264	
	305 L3	105	13.4	4880	7.5	7.5	71	80	90	100	112	132	160	—	—	15800	18200	28800	34600	10100	264	
	305 L3	113	12.4	3590	5.1	7.5	71	80	90	100	112	132	160	—	—	16200	18600	29400	35400	10400	264	
	305 L3	124	11.2	3600	4.6	7.5	71	80	90	100	112	132	160	—	—	16700	19300	30300	36500	10700	264	
	305 L3	141	9.9	5200	5.9	7.5	71	80	90	100	112	132	160	—	—	17400	20100	31500	37900	11200	264	
	305 L3	152	9.2	3600	3.8	7.5	71	80	90	100	112	132	160	—	—	17900	20600	32200	38700	11500	264	
	305 L3	164	8.6	4400	4.3	7.5	71	80	90	100	112	132	160	—	—	18300	21100	32900	39600	11700	264	
	305 L3	178	7.9	4400	4.0	7.5	71	80	90	100	112	132	160	—	—	18800	21700	33700	40600	12100	264	
	305 L3	190	7.4	3600	3.0	7.5	71	80	90	100	112	132	160	—	—	19200	22200	34400	41400	12300	264	
	305 L3	220	6.4	4750	3.5	7.5	71	80	90	100	112	132	160	—	—	20200	23300	36000	43300	13000	264	
	305 L3	258	5.4	3600	2.2	7.5	71	80	90	100	112	132	160	—	—	21300	24600	37700	45300	13600	264	
	305 L3	276	5.1	4400	2.6	7.5	71	80	90	100	112	132	160	—	—	21800	25200	38500	46300	14000	264	
	305 L3	321	4.4	3670	1.8	7.5	71	80	90	100	112	132	160	—	—	22900	26400	40300	48500	14700	264	
	305 L3	389	3.6	3190	1.3	7.5	71	80	90	100	112	132	160	—	—	24400	28200	42600	51300	15700	264	
	305 L3	402	3.5	3780	1.5	6.0	71	80	90	100	112	132	160	—	—	24700	28500	43100	51800	15800	264	
	305 L4	413	3.4	4670	1.9	6.0	71	80	90	100	112	132	160	—	—	24900	28800	43400	52200	16000	264	
	305 L4	446	3.1	5430	2.0	6.0	71	80	90	100	112	132	160	—	—	25500	29500	44400	53400	16400	264	
	305 L4	492	2.8	5340	1.8	6.0	71	80	90	100	112	132	160	—	—	26400	30500	45800	55100	16900	264	
	305 L4	556	2.5	5500	1.6	6.0	71	80	90	100	112	132	160	—	—	27500	31700	47500	57100	17600	264	
	305 L4	649	2.2	4490	1.1	6.0	71	80	90	100	112	132	160	—	—	29000	33400	49700	59800	18600	264	
	305 L4	718	1.9	4120	0.95	6.0	71	80	90	100	112	132	160	—	—	29900	34600	51300	61700	19200	264	
	305 L4	816	1.7	5410	1.1	6.0	71	80	90	100	112	132	160	—	—	31300	36100	53300	64100	20000	264	
	305 L4	896	1.6	4270	0.79	6.0	71	80	90	100	112	132	160	—	—	32200	37200	54800	65900	20700	264	
	305 L4	1018	1.4	5450	0.89	6.0	71	80	90	100	112	132	160	—	—	33600	38800	56900	68500	21600	264	
	305 L4	1098	1.3	4420	0.67	6.0	71	80	90	100	112	132	160	—	—	34500	39800	58200	70000	22100	264	
	305 L4	1278	1.1	5530	0.72	6.0	71	80	90	100	112	132	160	—	—	36000	41900	60900	73300	23300	264	
	305 L4	1370	1.0	4580	0.55	6.0	71	80	90	100	112	132	160	—	—	36000	42000	62200	74000	23800	264	
	305 L4	1586	0.88	4750	0.50	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264	
	305 L4	1854	0.76	4600	0.41	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264	
	305 L4	1991	0.70	5600	0.47	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264	
	305 L4	2243	0.62	3800	0.28	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264	
	305 L4	2799	0.50	3800	0.22	6.0	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264	
900	305 L1	3.60	250	2220	60	15.6	—	—	—	—	—	132	160	180	200	5940	6860	12000	14400	3810	264	
	305 L1	4.25	212	2400	55	15.6	—	—	—	—	—	132	160	180	200	6280	7250	12600	15100	4030	264	
	305 L1	5.33	169	2520	46	15.6	—	—	—	—	—	132	160	180	200	6770	7820	13400	16200	4340	264	
	305 L1	6.20	145	2590	41	15.6	—	—	—	—	—	132	160	180	200	7120	8220	14100	16900	4570	264	
	305 L1	7.50	120	2270	29	15.6	—	—	—	—	—	132	160	180	200	7580	8760	14900	17900	4870	264	
	305 L2	12.5	72	2920	23	10.8	71	80	90	100	112	132	160	—	—	9000	10400	17400	20900	5770	264	
	305 L2	15.3	59	3100	20	10.8	71	80	90	100	112	132	160	—	—	9630	11100	18500	22200	6180	264	
	305 L2	18.1	50	3660	20	10.8	71	80	90	100	112	132	160	—	—	10200	11700	19400	23300	6530	264	
	305 L2	20.8	43	3180	15.4	10.8	71	80	90	100	112	132	160	—	—	10700	12300	20200	24300	6830	264	
	305 L2	22.7	40	3710	16.3	10.8	71	80	90	100	112	132	160	—	—	11000	12700	20800	25000	7040	264	
	305 L2	24.5	37	3730	15.2	10.8	71	80	90	100	112	132	160	—	—	11300	13000	21200	25600	7220	264	
	305 L2	26.4	34	3560	13.5	10.8	71	80	90	100	112	132	160	—	—	11500	13300	21700	26100	7400	264	
	305 L2	30.8	29.3																			



305 L

5000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 								R _{n2} [N]						
															MC	MZ	HC/PC	HZ/PZ	FZ		
900	305 L3	72.3	12.5	4060	5.8	9.0	71	80	90	100	112	132	160	—	—	16100	18600	29400	35400	10400	264
	305 L3	77.2	11.7	5030	6.7	9.0	71	80	90	100	112	132	160	—	—	16500	19100	30000	36100	10600	264
	305 L3	90.2	10.0	4200	4.8	9.0	71	80	90	100	112	132	160	—	—	17400	20100	31400	37800	11100	264
	305 L3	105	8.6	5220	5.2	9.0	71	80	90	100	112	132	160	—	—	18300	21100	32800	39500	11700	264
	305 L3	113	8.0	3600	3.3	9.0	71	80	90	100	112	132	160	—	—	18700	21600	33600	40400	12000	264
	305 L3	124	7.2	3600	3.0	9.0	71	80	90	100	112	132	160	—	—	19300	22300	34600	41600	12400	264
	305 L3	141	6.4	5270	3.8	9.0	71	80	90	100	112	132	160	—	—	20200	23300	35900	43200	13000	264
	305 L3	152	5.9	3600	2.4	9.0	71	80	90	100	112	132	160	—	—	20700	23900	36800	44200	13300	264
	305 L3	164	5.5	4400	2.8	9.0	71	80	90	100	112	132	160	—	—	21200	24500	37600	45200	13600	264
	305 L3	178	5.1	4400	2.6	9.0	71	80	90	100	112	132	160	—	—	21800	25100	38500	46300	14000	264
	305 L3	190	4.7	3630	2.0	9.0	71	80	90	100	112	132	160	—	—	22300	25700	39300	47300	14300	264
	305 L3	220	4.1	4750	2.2	9.0	71	80	90	100	112	132	160	—	—	23400	27000	41100	49400	15000	264
	305 L3	258	3.5	3780	1.5	9.0	71	80	90	100	112	132	160	—	—	24700	28500	43000	51800	15800	264
	305 L3	276	3.3	4700	1.8	9.0	71	80	90	100	112	132	160	—	—	25200	29100	44000	52900	16200	264
	305 L3	321	2.8	3890	1.2	9.0	71	80	90	100	112	132	160	—	—	26500	30600	46000	55300	17000	264
	305 L3	389	2.3	3340	0.89	9.0	71	80	90	100	112	132	160	—	—	28300	32600	48700	58600	18100	264
	305 L3	402	2.2	4020	1.0	7.2	71	80	90	100	112	132	160	—	—	28600	33000	49200	59200	18300	264
	305 L4	413	2.2	5000	1.3	7.2	71	80	90	100	112	132	160	—	—	28900	33300	49600	59700	18500	264
	305 L4	446	2.0	5570	1.3	7.2	71	80	90	100	112	132	160	—	—	29600	34200	50700	61000	19000	264
	305 L4	492	1.8	5400	1.2	7.2	71	80	90	100	112	132	160	—	—	30600	35300	52300	62900	19600	264
	305 L4	556	1.6	5640	1.1	7.2	71	80	90	100	112	132	160	—	—	31900	36800	54200	65200	20400	264
	305 L4	649	1.4	4610	0.76	7.2	71	80	90	100	112	132	160	—	—	33600	38700	56800	68300	21500	264
	305 L4	718	1.3	4430	0.66	7.2	71	80	90	100	112	132	160	—	—	34700	40100	58500	70400	22300	264
	305 L4	816	1.1	5480	0.72	7.2	71	80	90	100	112	132	160	—	—	36000	41800	60800	73200	23200	264
	305 L4	896	1.0	4600	0.55	7.2	71	80	90	100	112	132	160	—	—	36000	42000	62500	74000	24000	264
	305 L4	1018	0.88	5500	0.57	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	1098	0.82	4600	0.45	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	1278	0.70	5600	0.47	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	1370	0.66	4600	0.36	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	1586	0.57	4750	0.32	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	1854	0.49	4600	0.26	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	1991	0.45	5600	0.30	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	2243	0.40	3800	0.18	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
	305 L4	2799	0.32	3800	0.14	7.2	71	80	90	100	112	132	160	—	—	36000	42000	64000	74000	24000	264
500	305 L1	3.60	139	2760	41	26	—	—	—	—	—	132	160	180	200	7220	8340	14300	17200	4630	264
	305 L1	4.25	118	2860	36	26	—	—	—	—	—	132	160	180	200	7630	8810	15000	18000	4900	264
	305 L1	5.33	94	3010	30	26	—	—	—	—	—	132	160	180	200	8240	9510	16000	19300	5280	264
	305 L1	6.20	81	3090	27	26	—	—	—	—	—	132	160	180	200	8660	10000	16800	20200	5560	264
	305 L1	7.50	67	2730	19.7	26	—	—	—	—	—	132	160	180	200	9230	10700	17800	21400	5920	264
	305 L2	12.5	40	3370	15.0	18.0	71	80	90	100	112	132	160	—	—	10900	12600	20700	24900	7020	264
	305 L2	15.3	33	3480	12.6	18.0	71	80	90	100	112	132	160	—	—	11700	13500	22000	26500	7510	264
	305 L2	18.1	27.6	4160	12.8	18.0	71	80	90	100	112	132	160	—	—	12400	14300	23100	27800	7940	264
	305 L2	20.8	24.1	3560	9.5	18.0	71	80	90	100	112	132	160	—	—	13000	15000	24100	29000	8310	264
	305 L2	22.7	22.0	3990	9.8	18.0	71	80	90	100	112	132	160	—	—	13400	15400	24800	29800	8570	264
	305 L2	24.5	20.4	4340	9.8	18.0	71	80	90	100	112	132	160	—	—	13700	15800	25300	30500	8780	264
	305 L2	26.4	18.9	3580	7.5	18.0	71	80	90	100	112	132	160	—	—	14000	16200	25900	31200	9010	264
	305 L2	30.8	16.3	4140	7.5	18.0	71	80	90	100	112	132	160	—	—	14800	17100	27100	32600	9480	264
	305 L2	35.8	14.0	3590	5.6	18.0	71	80	90	100	112	132	160	—	—	15500	17900	28400	34200	9960	264
	305 L2	38.4	13.0	4260	6.2	18.0	71	80	90	100	112	132	160	—	—	15900	18400	29000	34900	10200	264
	305 L2	44.6	11.2	3600	4.5	18.0	71	80	90	100	112	132	160	—	—	16700	19300	30300	36500	10700	264
	305 L2	55.8	9.0	3600	3.6	18.0	71	80	90	100	112	132	160	—	—	18000	20800	32400	39000	11600	264
	305 L3	53.4	9.4	4210	4.5	15.0	71	80	90	100	112	132	160	—	—	17800	20500	32000	38500	11400	264
	305 L3	63.1	7.9	5230	4.8	15.0	71	80	90	100	112	132	160	—	—	18800	21700	33600	40500	12000	264
	305 L3	72.3	6.9	4250	3.4	15.0	71	80	90	100	112	132	160	—	—	19600	22700	35100	42200	12600	264
	305 L3	77.2	6.5	5260	3.9	15.0	71	80	90	100	112	132	160	—	—	20100	23200	35800	43000	12900	264
	305 L3	90.2	5.5	4280	2.7	15.0	71	80	90	100	112	132	160	—	—	21100	24400	37500	45100		



305 L

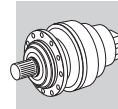
5000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
500	305 L3	220	2.3	4750	1.2	15.0	71	80	90	100	112	132	160	—	—		28500	32900	49000	58900	18300	264
	305 L3	258	1.9	4120	0.92	15.0	71	80	90	100	112	132	160	—	—		30000	34600	51300	61700	19200	264
	305 L3	276	1.8	5140	1.1	15.0	71	80	90	100	112	132	160	—	—		30700	35400	52400	63100	19700	264
	305 L3	321	1.6	4270	0.76	15.0	71	80	90	100	112	132	160	—	—		32300	37300	54900	66000	20700	264
	305 L3	389	1.3	3660	0.54	15.0	71	80	90	100	112	132	160	—	—		34400	39700	58100	69900	22100	264
	305 L3	402	1.2	4440	0.63	12.0	71	80	90	100	112	132	160	—	—		34800	40200	58600	70600	22300	264
	305 L4	413	1.2	5450	0.78	12.0	71	80	90	100	112	132	160	—	—		35100	40500	59100	71200	22500	264
	305 L4	446	1.1	5760	0.76	12.0	71	80	90	100	112	132	160	—	—		36000	41600	60500	72800	23100	264
	305 L4	492	1.0	5500	0.66	12.0	71	80	90	100	112	132	160	—	—		36000	42000	62300	74000	23900	264
	305 L4	556	0.90	5800	0.62	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	649	0.77	4700	0.43	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	718	0.70	4600	0.38	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	816	0.61	5500	0.40	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	896	0.56	4600	0.30	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	1018	0.49	5500	0.32	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	1098	0.46	4600	0.25	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	1278	0.39	5600	0.26	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	1370	0.36	4600	0.20	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	1586	0.32	4750	0.18	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	1854	0.27	4600	0.15	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	1991	0.25	5600	0.17	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	2243	0.22	3800	0.10	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264
	305 L4	2799	0.18	3800	0.08	12.0	71	80	90	100	112	132	160	—	—		36000	42000	64000	74000	24000	264

306 L

8500 Nm

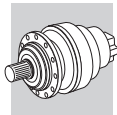
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
1400	306 L1	4.25	329	2110	75	18.0	—	—	—	—	—	160	180	200	225	250	6750	7640	18000	21000	5070	274
	306 L1	5.33	263	2650	75	18.0	—	—	—	—	—	160	180	200	225	250	7280	8240	19300	22400	5470	274
	306 L1	6.20	226	3080	75	18.0	—	—	—	—	—	160	180	200	225	250	7650	8670	20200	23500	5750	274
	306 L1	7.50	187	3190	64	18.0	—	—	—	—	—	160	180	200	225	250	8150	9240	21300	24800	6120	274
	306 L2	13.0	108	3330	40	13.0	—	—	—	—	132	160	180	200	—	—	9780	11100	25100	29300	7350	274
	306 L2	15.3	92	3930	40	13.0	—	—	—	—	132	160	180	200	—	—	10300	11700	26400	30800	7770	274
	306 L2	18.1	78	4640	40	13.0	—	—	—	—	132	160	180	200	—	—	10900	12400	27800	32300	8210	274
	306 L2	22.7	62	5340	37	13.0	—	—	—	—	132	160	180	200	—	—	11800	13400	29700	34600	8850	274
	306 L2	26.4	53	4560	27	13.0	—	—	—	—	132	160	180	200	—	—	12400	14000	31100	36200	9310	274
	306 L2	28.4	49	5720	31	13.0	—	—	—	—	132	160	180	200	—	—	12700	14400	31800	37100	9550	274
	306 L2	33.1	42	5610	26	13.0	—	—	—	—	132	160	180	200	—	—	13400	15100	33300	38800	10000	274
	306 L2	38.4	36	5890	24	13.0	—	—	—	—	132	160	180	200	—	—	14100	15900	34800	40600	10600	274
	306 L2	46.5	30	5980	20	13.0	—	—	—	—	132	160	180	200	—	—	15000	17000	36900	43000	11300	274
	306 L2	56.3	24.9	5030	13.9	13.0	—	—	—	—	132	160	180	200	—	—	16000	18100	39100	45500	12000	274
	306 L2	72.5	19.3	5160	11.1	13.0	—	—	—	—	132	160	180	200	—	—	17400	19700	42100	49100	13000	274
	306 L3	53.2	26.3	5880	17.7	7.5	71	80	90	100	112	132	160	—	—	—	15700	17800	38400	44700	11800	274
	306 L3	65.2	21.5	6070	14.9	7.5	71	80	90	100	112	132	160	—	—	—	16800	19000	40800	47500	12600	274
	306 L3	77.0	18.2	7290	15.2	7.5	71	80	90	100	112	132	160	—	—	—	17700	20100	42900	50000	13300	274
	306 L3	81.9	17.1	6550	12.9	7.5	71	80	90	100	112	132	160	—	—	—	18100	20500	43700	50900	13600	274
	306 L3	88.3	15.9	6440	11.7	7.5	71	80	90	100	112	132	160	—	—	—	18500	21000	44700	52100	13900	274
	306 L3	104	13.4	7590	11.7	7.5	71	80	90	100	112	132	160	—	—	—	19600	22200	47000	54700	14700	274
	306 L3	112	12.5	6930	9.9	7.5	71	80	90	100	112	132	160	—	—	—	20100	22800	48100	56000	15100	274
	306 L3	121	11.5	7580	10.0	7.5	71	80	90	100	112	132	160	—	—	—	20600	23400	49200	57300	15500	274
	306 L3	141	9.9	7800	8.9	7.5	71	80	90	100	112	132	160	—	—	—	21700	24600	51500	59900	16300	274
	306 L3	152	9.2	7400	7.8	7.5	71	80	90	100	112	132	160	—	—	—	22200	25200	52600	61300	16700	274
	306 L3	190	7.4	6500	5.5	7.5	71	80	90	100	112	132	160	—	—	—	23900	27100	56200	65500	18000	274
	306 L3	205	6.8	7800	6.1	7.5	71	80	90	100	112	132	160	—	—	—	24500	27800	57600	67000	18400	274
	306 L3	222	6.3	6500	4.7	7.5	71	80	90	100	112	132	160	—	—	—	25200	28600	58900	68600	18900	274
	306 L3	238	5.9	7800	5.3	7.5	71	80	90	100	112	132	160	—	—	—	25800	29200	60200	70100	19400	274
	306 L3	268	5.2	5500	3.3	7.5	71	80	90	100	112	132	160	—	—	—	26900	30400	62400	72700	20200	274
	306 L3	288	4.9	5520	3.1	7.5	71	80	90	100	112	132	160	—	—	—	27500	31200	63700	74200	20700	274



306 L

8500 Nm

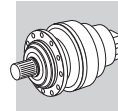
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										R _{n2} [N]						
																	MC	MZ	HC/PC	HZ/PZ	FZ		
1400	306 L3	325	4.3	5580	2.8	7.5	71	80	90	100	112	132	160	—	—	—	28600	32400	66100	76900	21500	274	
	306 L3	405	3.5	5710	2.3	7.5	71	80	90	100	112	132	160	—	—	—	30800	34900	70600	82200	23100	274	
	306 L4	391	3.6	6830	2.9	6.0	71	80	90	100	112	132	160	—	—	—	30400	34500	69900	81400	22900	274	
	306 L4	444	3.2	9530	3.6	6.0	71	80	90	100	112	132	160	—	—	—	31800	36000	72600	84500	23900	274	
	306 L4	509	2.7	8700	2.8	6.0	71	80	90	100	112	132	160	—	—	—	33300	37700	75600	88100	25000	274	
	306 L4	589	2.4	8550	2.4	6.0	71	80	90	100	112	132	160	—	—	—	34900	39600	79000	92000	26200	274	
	306 L4	636	2.2	8730	2.3	6.0	71	80	90	100	112	132	160	—	—	—	35800	40600	80800	94100	26900	274	
	306 L4	700	2.0	8730	2.1	6.0	71	80	90	100	112	132	160	—	—	—	37000	41900	83200	96900	27800	274	
	306 L4	809	1.7	7440	1.5	6.0	71	80	90	100	112	132	160	—	—	—	38800	44000	86900	101200	29200	274	
	306 L4	877	1.6	7450	1.4	6.0	71	80	90	100	112	132	160	—	—	—	39900	45200	89000	103700	29900	274	
	306 L4	1015	1.4	9010	1.5	6.0	71	80	90	100	112	132	160	—	—	—	41900	47400	93000	108300	31400	274	
	306 L4	1095	1.3	7470	1.1	6.0	71	80	90	100	112	132	160	—	—	—	42900	48600	95200	110800	32200	274	
	306 L4	1279	1.1	8360	1.1	6.0	71	80	90	100	112	132	160	—	—	—	45000	51000	99700	116100	34000	274	
	306 L4	1475	0.95	9500	1.1	6.0	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274	
	306 L4	1597	0.88	8500	0.88	6.0	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274	
	306 L4	1843	0.76	9500	0.85	6.0	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274	
	306 L4	2074	0.68	7000	0.56	6.0	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274	
	306 L4	2337	0.60	7000	0.50	6.0	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274	
	306 L4	2916	0.48	7000	0.40	6.0	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274	
900	306 L1	3.60	250	2780	75	22	—	—	—	—	—	—	160	180	200	225	250	7400	8380	19500	22800	5560	274
	306 L1	4.25	212	3280	75	22	—	—	—	—	—	—	160	180	200	225	250	7820	8860	20500	23900	5870	274
	306 L1	5.33	169	3930	72	22	—	—	—	—	—	—	160	180	200	225	250	8430	9550	22000	25600	6330	274
	306 L1	6.20	145	4160	65	22	—	—	—	—	—	—	160	180	200	225	250	8860	10000	23000	26800	6660	274
	306 L1	7.50	120	3650	47	22	—	—	—	—	—	—	160	180	200	225	250	9440	10700	24400	28400	7100	274
	306 L2	13.0	69	4630	36	15.6	—	—	—	—	—	132	160	180	200	—	—	11300	12800	28700	33400	8520	274
	306 L2	15.3	59	4860	32	15.6	—	—	—	—	—	132	160	180	200	—	—	12000	13600	30200	35100	9000	274
	306 L2	18.1	50	5810	32	15.6	—	—	—	—	—	132	160	180	200	—	—	12700	14300	31700	36900	9510	274
	306 L2	22.7	40	6100	27	15.6	—	—	—	—	—	132	160	180	200	—	—	13700	15500	34000	39500	10300	274
	306 L2	26.4	34	5190	19.7	15.6	—	—	—	—	—	132	160	180	200	—	—	14400	16300	35500	41400	10800	274
	306 L2	28.4	32	6230	22	15.6	—	—	—	—	—	132	160	180	200	—	—	14700	16700	36300	42300	11100	274
	306 L2	33.1	27.2	6200	18.8	15.6	—	—	—	—	—	132	160	180	200	—	—	15500	17500	38000	44300	11600	274
	306 L2	38.4	23.4	6090	15.9	15.6	—	—	—	—	—	132	160	180	200	—	—	16300	18500	39800	46300	12200	274
	306 L2	46.5	19.4	6180	13.3	15.6	—	—	—	—	—	132	160	180	200	—	—	17400	19700	42100	49000	13000	274
	306 L2	56.3	16.0	5250	9.4	15.6	—	—	—	—	—	132	160	180	200	—	—	18500	20900	44600	51900	13900	274
	306 L2	72.5	12.4	5390	7.4	15.6	—	—	—	—	—	132	160	180	200	—	—	20100	22800	48100	56000	15100	274
	306 L3	53.2	16.9	6570	12.7	9.0	71	80	90	100	112	132	160	—	—	—	—	18200	20600	43900	51100	13600	274
	306 L3	65.2	13.8	6860	10.9	9.0	71	80	90	100	112	132	160	—	—	—	—	19400	22000	46600	54300	14600	274
	306 L3	77.0	11.7	8310	11.1	9.0	71	80	90	100	112	132	160	—	—	—	—	20500	23300	49000	57100	15400	274
	306 L3	81.9	11.0	7320	9.2	9.0	71	80	90	100	112	132	160	—	—	—	—	21000	23700	49900	58100	15700	274
	306 L3	88.3	10.2	7360	8.6	9.0	71	80	90	100	112	132	160	—	—	—	—	21500	24300	51000	59400	16100	274
	306 L3	104	8.6	8520	8.4	9.0	71	80	90	100	112	132	160	—	—	—	—	22700	25700	53700	62500	17100	274
	306 L3	112	8.0	7400	6.8	9.0	71	80	90	100	112	132	160	—	—	—	—	23300	26400	54900	63900	17500	274
	306 L3	121	7.4	7800	6.6	9.0	71	80	90	100	112	132	160	—	—	—	—	23900	27100	56100	65400	17900	274
	306 L3	141	6.4	7800	5.7	9.0	71	80	90	100	112	132	160	—	—	—	—	25100	28500	58700	68400	18900	274
	306 L3	152	5.9	7400	5.0	9.0	71	80	90	100	112	132	160	—	—	—	—	25800	29200	60100	70000	19300	274
	306 L3	190	4.7	6550	3.6	9.0	71	80	90	100	112	132	160	—	—	—	—	27700	31400	64200	74800	20800	274
	306 L3	205	4.4	7930	4.0	9.0	71	80	90	100	112	132	160	—	—	—	—	28400	32200	65700	76500	21400	274
	306 L3	222	4.1	6700	3.1	9.0	71	80	90	100	112	132	160	—	—	—	—	29200	33100	67300	78400	21900	274
	306 L3	238	3.8	8080	3.5	9.0	71	80	90	100	112	132	160	—	—	—	—	29900	33900	68700	80000	22500	274
	306 L3	268	3.4	5730	2.2	9.0	71	80	90	100	112	132	160	—	—	—	—	31100	35300	71300	83000	23400	274
	306 L3	288	3.1	5770	2.1	9.0	71	80	90	100	112	132	160	—	—	—	—	31900	36100	72800	84800	23900	274
	306 L3	325	2.8	5840	1.9	9.0	71	80	90	100	112	132	160	—	—	—	—	33200	37600	75400	87800	24900	274
	306 L3	405	2.2	6030	1.5	9.0	71	80	90	100	112	132	160	—	—	—	—	35700	40400	80600	93900	26800	274



306 L

8500 Nm

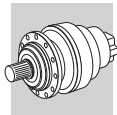
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
900	306 L4 1279		0.70	8500	0.71	7.2	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1475		0.61	9500	0.69	7.2	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1597		0.56	8500	0.57	7.2	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1843		0.49	9500	0.55	7.2	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 2074		0.43	7000	0.36	7.2	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 2337		0.39	7000	0.32	7.2	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 2916		0.31	7000	0.26	7.2	71	80	90	100	112	132	160	—	—	—	45000	51000	101000	119000	35000	274
500	306 L1 3.60	139	4890	73	36	—	—	—	—	—	—	160	180	200	225	250	9000	10200	23300	27200	6760	274
	306 L1 4.25	118	4620	59	36	—	—	—	—	—	—	160	180	200	225	250	9510	10800	24500	28500	7140	274
	306 L1 5.33	94	4690	47	36	—	—	—	—	—	—	160	180	200	225	250	10300	11600	26200	30600	7700	274
	306 L1 6.20	81	4950	43	36	—	—	—	—	—	—	160	180	200	225	250	10800	12200	27400	32000	8100	274
	306 L1 7.50	67	4330	31	36	—	—	—	—	—	—	160	180	200	225	250	11500	13000	29100	33800	8630	274
	306 L2 13.0	39	5400	23	26	—	—	—	—	—	132	160	180	200	—	—	13800	15600	34200	39900	10400	274
	306 L2 15.3	33	5650	21	26	—	—	—	—	—	132	160	180	200	—	—	14600	16500	36000	41900	10900	274
	306 L2 18.1	27.7	6900	21	26	—	—	—	—	—	132	160	180	200	—	—	15400	17400	37800	44100	11600	274
	306 L2 22.7	22.1	7230	17.8	26	—	—	—	—	—	132	160	180	200	—	—	16600	18800	40500	47200	12500	274
	306 L2 26.4	19.0	6150	13.0	26	—	—	—	—	—	132	160	180	200	—	—	17500	19800	42400	49300	13100	274
	306 L2 28.4	17.6	6990	13.7	26	—	—	—	—	—	132	160	180	200	—	—	17900	20300	43400	50500	13500	274
	306 L2 33.1	15.1	7100	11.9	26	—	—	—	—	—	132	160	180	200	—	—	18800	21300	45400	52800	14200	274
	306 L2 38.4	13.0	6370	9.2	26	—	—	—	—	—	132	160	180	200	—	—	19800	22400	47500	55300	14900	274
	306 L2 46.5	10.8	6460	7.7	26	—	—	—	—	—	132	160	180	200	—	—	21100	23900	50200	58500	15900	274
	306 L2 56.3	8.9	5500	5.4	26	—	—	—	—	—	132	160	180	200	—	—	22500	25500	53200	61900	16900	274
	306 L2 72.5	6.9	5500	4.2	26	—	—	—	—	—	132	160	180	200	—	—	24500	27700	57400	66800	18400	274
	306 L3 53.2	9.4	7520	8.1	15.0	71	80	90	100	112	132	160	—	—	—	—	22100	25000	52300	60900	16600	274
	306 L3 65.2	7.7	7580	6.7	15.0	71	80	90	100	112	132	160	—	—	—	—	23600	26800	55600	64800	17800	274
	306 L3 77.0	6.5	9130	6.8	15.0	71	80	90	100	112	132	160	—	—	—	—	25000	28300	58400	68100	18800	274
	306 L3 81.9	6.1	7640	5.4	15.0	71	80	90	100	112	132	160	—	—	—	—	25500	28900	59500	69300	19100	274
	306 L3 88.3	5.7	8450	5.5	15.0	71	80	90	100	112	132	160	—	—	—	—	26100	29600	60900	70900	19600	274
	306 L3 104	4.8	9410	5.2	15.0	71	80	90	100	112	132	160	—	—	—	—	27600	31300	64000	74500	20800	274
	306 L3 112	4.5	7400	3.8	15.0	71	80	90	100	112	132	160	—	—	—	—	28300	32100	65500	76200	21300	274
	306 L3 121	4.1	7990	3.8	15.0	71	80	90	100	112	132	160	—	—	—	—	29100	32900	67000	78000	21800	274
	306 L3 141	3.5	8140	3.3	15.0	71	80	90	100	112	132	160	—	—	—	—	30500	34600	70100	81600	23000	274
	306 L3 152	3.3	7400	2.8	15.0	71	80	90	100	112	132	160	—	—	—	—	31300	35500	71700	83500	23500	274
	306 L3 190	2.6	7140	2.2	15.0	71	80	90	100	112	132	160	—	—	—	—	33700	38200	76600	89200	25300	274
	306 L3 205	2.4	8520	2.4	15.0	71	80	90	100	112	132	160	—	—	—	—	34600	39200	78400	91300	26000	274
	306 L3 222	2.3	7340	1.9	15.0	71	80	90	100	112	132	160	—	—	—	—	35500	40300	80300	93500	26700	274
	306 L3 238	2.1	8650	2.1	15.0	71	80	90	100	112	132	160	—	—	—	—	36400	41200	82000	95500	27300	274
	306 L3 268	1.9	6230	1.3	15.0	71	80	90	100	112	132	160	—	—	—	—	37900	42900	85000	99000	28400	274
	306 L3 288	1.7	6320	1.3	15.0	71	80	90	100	112	132	160	—	—	—	—	38800	43900	86800	101100	29100	274
	306 L3 325	1.5	6460	1.1	15.0	71	80	90	100	112	132	160	—	—	—	—	40300	45700	90000	104800	30300	274
	306 L3 405	1.2	6730	0.95	15.0	71	80	90	100	112	132	160	—	—	—	—	43400	49200	96200	112000	32600	274
	306 L4 391	1.3	8130	1.2	12.0	71	80	90	100	112	132	160	—	—	—	—	42900	48600	95200	110800	32200	274
	306 L4 444	1.1	9950	1.3	12.0	71	80	90	100	112	132	160	—	—	—	—	44800	50700	98900	115100	33600	274
	306 L4 509	0.98	8900	1.0	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 589	0.85	9500	0.95	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 636	0.79	8900	0.83	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 700	0.71	9500	0.80	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 809	0.62	7500	0.55	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 877	0.57	7500	0.51	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1015	0.49	9300	0.54	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1095	0.46	7500	0.41	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1279	0.39	8500	0.39	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1475	0.34	9500	0.38	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1597	0.31	8500	0.31	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 1843	0.27	9500	0.30	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 2074	0.24	7000	0.20	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 2337	0.21	7000	0.18	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274
	306 L4 2916	0.17	7000	0.14	12.0	71	80	90	100	112	132	160	—	—	—	—	45000	51000	101000	119000	35000	274



307 L

12500 Nm

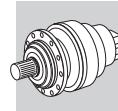
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 										R _{n2} [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
1400	307 L1	4.09	342	3110	115	22	—	—	—	—	—	—	180	200	225	250	7400	9290	19100	25100	6430	284
	307 L1	5.25	267	3990	115	22	—	—	—	—	—	—	180	200	225	250	8040	10100	20600	27000	6990	284
	307 L1	6.23	225	4740	115	22	—	—	—	—	—	—	180	200	225	250	8520	10700	21700	28500	7400	284
1400	307 L2	12.3	113	4750	60	18.0	—	—	—	—	—	132	160	180	200	—	10700	13400	26700	34900	9300	284
	307 L2	14.7	95	5670	60	18.0	—	—	—	—	—	132	160	180	200	—	11300	14200	28100	36800	9860	284
	307 L2	17.4	81	6700	60	18.0	—	—	—	—	—	132	160	180	200	—	12000	15000	29500	38700	10400	284
	307 L2	21.8	64	7320	52	18.0	—	—	—	—	—	132	160	180	200	—	12900	16200	31600	41400	11200	284
	307 L2	25.4	55	7670	47	18.0	—	—	—	—	—	132	160	180	200	—	13600	17100	33100	43400	11800	284
	307 L2	28.0	50	7700	43	18.0	—	—	—	—	—	132	160	180	200	—	14100	17600	34100	44700	12200	284
	307 L2	30.7	46	8000	41	18.0	—	—	—	—	—	132	160	180	200	—	14500	18200	35000	45900	12600	284
	307 L2	32.6	43	7930	38	18.0	—	—	—	—	—	132	160	180	200	—	14800	18500	35700	46700	12800	284
	307 L2	38.6	36	7890	32	18.0	—	—	—	—	—	132	160	180	200	—	15600	19600	37500	49200	13600	284
	307 L2	46.7	30.0	8010	27	18.0	—	—	—	—	—	132	160	180	200	—	16700	20900	39700	52100	14500	284
	307 L3	51.3	27.3	9390	29	11.0	71	80	90	100	112	132	160	—	—	—	17200	21600	40900	53500	14900	284
	307 L3	60.5	23.1	9840	26	11.0	71	80	90	100	112	132	160	—	—	—	18200	22800	42900	56300	15800	284
	307 L3	74.1	18.9	10400	23	11.0	71	80	90	100	112	132	160	—	—	—	19400	24400	45600	59800	16900	284
	307 L3	80.6	17.4	9440	18.8	11.0	71	80	90	100	112	132	160	—	—	—	20000	25100	46800	61300	17400	284
	307 L3	93.0	15.1	11100	19.2	11.0	71	80	90	100	112	132	160	—	—	—	21000	26300	48900	64000	18200	284
	307 L3	100	14.0	11400	18.2	11.0	71	80	90	100	112	132	160	—	—	—	21500	27000	50000	65500	18700	284
307 L3	113	12.4	10100	14.3	11.0	71	80	90	100	112	132	160	—	—	—	22400	28100	51800	67900	19500	284	
307 L3	126	11.1	12100	15.5	11.0	71	80	90	100	112	132	160	—	—	—	23200	29100	53500	70100	20200	284	
307 L3	139	10.1	10500	12.1	11.0	71	80	90	100	112	132	160	—	—	—	24000	30100	55100	72200	20800	284	
307 L3	146	9.6	12500	13.7	11.0	71	80	90	100	112	132	160	—	—	—	24400	30600	56000	73300	21200	284	
307 L3	162	8.7	10500	10.5	11.0	71	80	90	100	112	132	160	—	—	—	25200	31600	57700	75600	21900	284	
307 L3	177	7.9	12300	11.2	11.0	71	80	90	100	112	132	160	—	—	—	26000	32600	59300	77700	22600	284	
307 L3	202	6.9	10600	8.4	11.0	71	80	90	100	112	132	160	—	—	—	27100	34000	61600	80700	23600	284	
307 L3	221	6.3	12800	9.3	11.0	71	80	90	100	112	132	160	—	—	—	28000	35100	63300	83000	24300	284	
307 L3	239	5.9	8700	5.8	11.0	71	80	90	100	112	132	160	—	—	—	28700	36000	64900	85000	25000	284	
307 L3	284	4.9	10700	6.1	11.0	71	80	90	100	112	132	160	—	—	—	30400	38100	68300	89400	26400	284	
307 L3	336	4.2	8930	4.3	11.0	71	80	90	100	112	132	160	—	—	—	32200	40400	71900	94200	28000	284	
1400	307 L4	349	4.0	13200	6.3	7.5	71	80	90	100	112	132	160	—	—	—	32600	40900	72700	95200	28300	284
	307 L4	405	3.5	11400	4.6	7.5	71	80	90	100	112	132	160	—	—	—	34300	43000	76000	99600	29800	284
	307 L4	465	3.0	11600	4.1	7.5	71	80	90	100	112	132	160	—	—	—	35800	45000	79200	103700	31200	284
	307 L4	509	2.7	13700	4.4	7.5	71	80	90	100	112	132	160	—	—	—	37000	46400	81400	106600	32100	284
	307 L4	579	2.4	13800	4.0	7.5	71	80	90	100	112	132	160	—	—	—	38600	48400	84500	110800	33500	284
	307 L4	654	2.1	12300	3.1	7.5	71	80	90	100	112	132	160	—	—	—	40200	50400	87700	114900	34900	284
	307 L4	722	1.9	14100	3.2	7.5	71	80	90	100	112	132	160	—	—	—	41500	52100	90400	118400	36100	284
	307 L4	801	1.7	12700	2.6	7.5	71	80	90	100	112	132	160	—	—	—	43000	53900	93200	122100	37400	284
	307 L4	906	1.5	14400	2.6	7.5	71	80	90	100	112	132	160	—	—	—	44800	56200	96700	126800	38900	284
	307 L4	999	1.4	13200	2.2	7.5	71	80	90	100	112	132	160	—	—	—	46300	58000	99600	130500	40200	284
	307 L4	1157	1.2	13600	1.9	7.5	71	80	90	100	112	132	160	—	—	—	48600	60900	104100	136400	42200	284
	307 L4	1274	1.1	12300	1.6	7.5	71	80	90	100	112	132	160	—	—	—	50200	63000	107100	140400	43600	284
	307 L4	1408	0.99	15000	1.8	7.5	71	80	90	100	112	132	160	—	—	—	51900	65000	109000	144700	45000	284
	307 L4	1591	0.88	15000	1.6	7.5	71	80	90	100	112	132	160	—	—	—	52000	65000	109000	145000	45000	284
	307 L4	1767	0.79	15000	1.4	7.5	71	80	90	100	112	132	160	—	—	—	52000	65000	109000	145000	45000	284
	307 L4	2041	0.69	14000	1.1	7.5	71	80	90	100	112	132	160	—	—	—	52000	65000	109000	145000	45000	284
307 L4	2423	0.58	11000	0.75	7.5	71	80	90	100	112	132	160	—	—	—	52000	65000	109000	145000	45000	284	
900	307 L1	3.43	263	4060	115	26	—	—	—	—	—	—	180	200	225	250	8090	10100	20700	27200	7030	284
	307 L1	4.09	220	4840	115	26	—	—	—	—	—	—	180	200	225	250	8580	10800	21900	28600	7450	284
	307 L1	5.25	171	5270	98	26	—	—	—	—	—	—	180	200	225	250	9320	11700	23500	30900	8100	284
900	307 L1	6.23	144	5550	87	26	—	—	—	—	—	—	180	200	225	250	9870	12400	24800	32500	8580	284
	307 L2	12.3	73	7150	58	22	—	—	—	—	—	132	160	180	200	—	12400	15500	30400	39900	10800	284
	307 L2	14.7	61	7430	51	22	—	—	—	—	—	132	160	180	200	—	13100	16500	32100	42100	11400	284
	307 L2	17.4	52	7820	45	22	—	—	—	—	—	132	160	180	200	—	13900	17400	33700	44200	12100	284
	307																					



307 L

12500 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 																R _{n2} [N]					
																							MC	MZ	HC/PC	HZ/PZ	FZ	
900	307 L3	60.5	14.9	11200	19.0	13.2	71	80	90	100	112	132	160	—	—	—	—	21100	26400	49000	64300	18300	284					
	307 L3	74.1	12.1	11800	16.5	13.2	71	80	90	100	112	132	160	—	—	—	—	22500	28300	52100	68300	19600	284					
	307 L3	80.6	11.2	10300	13.2	13.2	71	80	90	100	112	132	160	—	—	—	—	23200	29100	53400	70000	20100	284					
	307 L3	93.0	9.7	12500	13.9	13.2	71	80	90	100	112	132	160	—	—	—	—	24300	30500	55800	73100	21100	284					
	307 L3	100	9.0	12600	12.9	13.2	71	80	90	100	112	132	160	—	—	—	—	24900	31300	57100	74800	21700	284					
	307 L3	113	7.9	10600	9.6	13.2	71	80	90	100	112	132	160	—	—	—	—	25900	32600	59200	77500	22600	284					
	307 L3	126	7.1	12700	10.4	13.2	71	80	90	100	112	132	160	—	—	—	—	26900	33700	61100	80000	23400	284					
	307 L3	139	6.5	10600	7.9	13.2	71	80	90	100	112	132	160	—	—	—	—	27800	34800	62900	82400	24100	284					
	307 L3	146	6.2	12800	9.0	13.2	71	80	90	100	112	132	160	—	—	—	—	28300	35500	63900	83700	24600	284					
	307 L3	162	5.6	10700	6.8	13.2	71	80	90	100	112	132	160	—	—	—	—	29200	36600	65800	86300	25400	284					
	307 L3	177	5.1	12300	7.2	13.2	71	80	90	100	112	132	160	—	—	—	—	30100	37800	67700	88700	26200	284					
	307 L3	202	4.5	10900	5.6	13.2	71	80	90	100	112	132	160	—	—	—	—	31400	39400	70400	92200	27300	284					
	307 L3	221	4.1	13200	6.2	13.2	71	80	90	100	112	132	160	—	—	—	—	32400	40700	72300	94800	28200	284					
	307 L3	239	3.8	9060	3.9	13.2	71	80	90	100	112	132	160	—	—	—	—	33300	41800	74100	97100	28900	284					
	307 L3	284	3.2	11500	4.2	13.2	71	80	90	100	112	132	160	—	—	—	—	35200	44200	77900	102100	30600	284					
	307 L3	336	2.7	9510	2.9	13.2	71	80	90	100	112	132	160	—	—	—	—	37300	46800	82000	107500	32400	284					
	307 L4	349	2.6	13800	4.2	9.0	71	80	90	100	112	132	160	—	—	—	—	37800	47400	82900	108700	32800	284					
	307 L4	406	2.2	12200	3.2	9.0	71	80	90	100	112	132	160	—	—	—	—	39700	49800	86800	113700	34500	284					
	307 L4	465	1.9	12500	2.9	9.0	71	80	90	100	112	132	160	—	—	—	—	41500	52100	90400	118400	36100	284					
	307 L4	509	1.8	14200	3.0	9.0	71	80	90	100	112	132	160	—	—	—	—	42800	53700	92900	121700	37200	284					
	307 L4	579	1.6	14400	2.7	9.0	71	80	90	100	112	132	160	—	—	—	—	44700	56100	96500	126500	38800	284					
	307 L4	654	1.4	13300	2.2	9.0	71	80	90	100	112	132	160	—	—	—	—	46500	58400	100100	131200	40400	284					
	307 L4	722	1.2	14700	2.2	9.0	71	80	90	100	112	132	160	—	—	—	—	48100	60400	103200	135200	41800	284					
	307 L4	801	1.1	13700	1.8	9.0	71	80	90	100	112	132	160	—	—	—	—	49800	62500	106400	139400	43300	284					
	307 L4	906	0.99	15000	1.8	9.0	71	80	90	100	112	132	160	—	—	—	—	51900	65000	109000	144700	45000	284					
	307 L4	999	0.90	14000	1.5	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1157	0.78	14000	1.3	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1274	0.71	12300	1.0	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1408	0.64	15000	1.1	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1591	0.57	15000	1.0	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1767	0.51	15000	0.90	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	2041	0.44	14000	0.73	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	2423	0.37	11000	0.48	9.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
500	307 L1	3.43	146	5800	91	44	—	—	—	—	—	—	—	180	200	225	250	9840	12300	24700	32400	8550	284					
	307 L1	4.09	122	6030	80	44	—	—	—	—	—	—	—	180	200	225	250	10400	13100	26100	34200	9070	284					
	307 L1	5.25	95	6300	65	44	—	—	—	—	—	—	—	180	200	225	250	11300	14200	28100	36800	9850	284					
	307 L1	6.23	80	6640	58	44	—	—	—	—	—	—	—	180	200	225	250	12000	15100	29600	38800	10400	284					
	307 L2	12.3	41	8120	37	36	—	—	—	—	—	132	160	180	200	—	—	15100	18900	36300	47600	13100	284					
	307 L2	14.7	34	8820	33	36	—	—	—	—	—	132	160	180	200	—	—	16000	20100	38300	50200	13900	284					
	307 L2	17.4	28.8	9250	30	36	—	—	—	—	—	132	160	180	200	—	—	16900	21200	40200	52700	14700	284					
	307 L2	21.8	22.9	9870	25	36	—	—	—	—	—	132	160	180	200	—	—	18200	22900	43100	56400	15800	284					
	307 L2	25.4	19.7	10300	23	36	—	—	—	—	—	132	160	180	200	—	—	19200	24000	45100	59000	16700	284					
	307 L2	28.0	17.9	9390	18.7	36	—	—	—	—	—	132	160	180	200	—	—	19800	24900	46400	60800	17200	284					
	307 L2	30.7	16.3	10700	19.4	36	—	—	—	—	—	132	160	180	200	—	—	20400	25600	47700	62500	17700	284					
	307 L2	32.6	15.4	9670	16.5	36	—	—	—	—	—	132	160	180	200	—	—	20800	26100	48600	63600	18100	284					
	307 L2	38.6	12.9	8530	12.3	36	—	—	—	—	—	132	160	180	200	—	—	22000	27700	51100	67000	19200	284					
	307 L2	46.7	10.7	8660	10.3	36	—	—	—	—	—	132	160	180	200	—	—	23500	29500	54100	70900	20400	284					
	307 L3	51.3	9.8	12500	14.0	22	71	80	90	100	112	132	160	—	—	—	—	24200	30400	55600	72900	21100	284					
	307 L3	60.5	8.3	12600	12.0	22	71	80	90	100	112	132	160	—	—	—	—	25600	32100	58500	76600	22300	284					
	307 L3	74.1	6.7	12700	9.8	22	71	80	90	100	112	132	160	—	—	—	—	27400	34400	62200	81500	23800	284					
	307 L3	80.6	6.2	10600	7.6	22	71	80	90	100	112	132	160	—	—	—	—	28200	35300	63700	83500	24500	284					
	307 L3	93.0	5.4	12900	7.9	22	71	80	90	100	112	132	160	—	—	—	—	29600	37100	66500	87200	25700	284					
	307 L3	100	5.0	12900	7.4	22	71	80	90	100	112	132	160	—	—	—	—	30300	38000	68100	89200	26300	284					
	307																											



307 L

12500 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 																R _{n2} [N]					
																		MC	MZ	HC/PC	HZ/PZ	FZ						
500	307 L4	349	1.4	14500	2.5	15.0	71	80	90	100	112	132	160	—	—	—	—	45900	57600	98900	129700	39900	284					
	307 L4	405	1.2	13500	2.0	15.0	71	80	90	100	112	132	160	—	—	—	—	48300	60600	103500	135600	42000	284					
	307 L4	465	1.1	13800	1.8	15.0	71	80	90	100	112	132	160	—	—	—	—	50500	63400	107800	141300	43900	284					
	307 L4	509	0.98	15000	1.7	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	579	0.86	15000	1.5	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	654	0.77	14000	1.3	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	722	0.69	15000	1.2	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	801	0.62	14000	1.0	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	906	0.55	15000	0.98	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	999	0.50	14000	0.83	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1157	0.43	14000	0.72	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1274	0.39	12300	0.57	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1408	0.36	15000	0.63	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1591	0.31	15000	0.56	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	1767	0.28	15000	0.50	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	2041	0.24	14000	0.41	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					
	307 L4	2423	0.21	11000	0.27	15.0	71	80	90	100	112	132	160	—	—	—	—	52000	65000	109000	145000	45000	284					

309 L

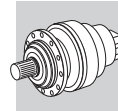
18000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 														MC	MZ	R _{n2} [N]		HC/PC	HZ/PZ	FZ	
1400	309 L1	4.09	342	4060	150	25	—	—	—	—	—	—	—	180	200	225	250	—	—	19400	25100	5150	294					
	309 L1	5.25	267	5210	150	25	—	—	—	—	—	—	—	180	200	225	250	—	—	21000	27000	5590	294					
	309 L1	6.23	225	6180	150	25	—	—	—	—	—	—	—	180	200	225	250	—	—	22100	28500	5920	294					
	309 L2	12.3	113	4750	60	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	27100	34900	7440	294					
	309 L2	14.7	95	5670	60	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	28600	36800	7890	294					
	309 L2	17.4	81	6700	60	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	30000	38700	8340	294					
	309 L2	21.8	64	8400	60	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	32100	41400	8990	294					
	309 L2	25.4	55	8940	55	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	33600	43400	9460	294					
	309 L2	28.0	50	10700	60	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	34600	44700	9770	294					
	309 L2	32.6	43	11100	53	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	36200	46700	10300	294					
	309 L2	38.6	36	10900	44	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	38100	49200	10900	294					
	309 L2	46.7	30.0	11200	37	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	40400	52100	11600	294					
	309 L3	51.3	27.3	9570	30	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	41500	53500	12000	294					
	309 L3	60.5	23.1	11300	30	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	43600	56300	12600	294					
	309 L3	74.1	18.9	12800	28	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	46400	59800	13500	294					
	309 L3	80.6	17.4	13600	27	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	47600	61300	13900	294					
	309 L3	93.0	15.1	13500	23	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	49600	64000	14600	294					
	309 L3	100	14.0	13200	21	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	50800	65500	15000	294					
	309 L3	113	12.4	15200	22	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	52700	67900	15600	294					
	309 L3	126	11.1	14700	18.8	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	54400	70100	16100	294					
	309 L3	139	10.1	16000	18.5	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	56000	72200	16700	294					
	309 L3	162	8.7	16000	16.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	58600	75600	17500	294					
	309 L3	183	7.7	14300	12.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	60800	78400	18300	294					
	309 L3	202	6.9	16100	12.8	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	62600	80700	18900	294					
	309 L3	223	6.3	13000	9.4	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	64500	83200	19500	294					
	309 L3	239	5.9	13000	8.7	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	65900	85000	20000	294					
	309 L3	284	4.9	15800	9.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	69400	89400	21100	294					
	309 L3	336	4.2	13400	6.4	11.0	71	80	90	100	112	132	160	—	—	—	—	—	—	73000	94200	22400	294					
	309 L4	349	4.0	19500	9.2	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	73800	95200	22700	294					
	309 L4	405	3.5	17200	7.0	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	77200	99600	23800	294					
	309 L4	465	3.0	17600	6.3	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	80400	103700	24900	294					
	309 L4	509	2.7	14300	4.7	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	82700	106600	25700	294					
	309 L4	579	2.4	20600	5.9	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	85900	110800	26800	294					
	309 L4	654	2.1	18100	4.6	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	89100	114900	27900	294					
	309 L4	722	1.9	20800	4.8	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	91800	118400	28900	294					
309 L4	801	1.7	18200	3.8	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	94700	122100	29900	294						
309 L4	906	1.5	17800	3.2	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	98300	126800	31100	294						
309 L4	999	1.4	18200	3.0	7.5	71	80	90	100	112	132	160	—	—	—	—	—	—	101200	130500	32200	294						



18000 Nm

136



309 L

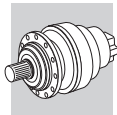
18000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ												
500	309 L2	28.0	17.9	13800	28	36	—	—	—	—	—	132	160	180	200	—	—	—	—	47200	60800	13800	294
	309 L2	32.6	15.4	14400	25	36	—	—	—	—	—	132	160	180	200	—	—	—	—	49300	63600	14500	294
	309 L2	38.6	12.9	12500	18.1	36	—	—	—	—	—	132	160	180	200	—	—	—	—	51900	67000	15300	294
	309 L2	46.7	10.7	12900	15.3	36	—	—	—	—	—	132	160	180	200	—	—	—	—	55000	70900	16300	294
	309 L3	51.3	9.8	13900	15.6	22	71	80	90	100	112	132	160	—	—	—	—	—	—	56500	72900	16800	294
	309 L3	60.5	8.3	16400	15.5	22	71	80	90	100	112	132	160	—	—	—	—	—	—	59400	76600	17800	294
	309 L3	74.1	6.7	17400	13.5	22	71	80	90	100	112	132	160	—	—	—	—	—	—	63200	81500	19100	294
	309 L3	80.6	6.2	16100	11.5	22	71	80	90	100	112	132	160	—	—	—	—	—	—	64800	83500	19600	294
	309 L3	93.0	5.4	17200	10.6	22	71	80	90	100	112	132	160	—	—	—	—	—	—	67600	87200	20600	294
	309 L3	100	5.0	18000	10.3	22	71	80	90	100	112	132	160	—	—	—	—	—	—	69200	89200	21100	294
	309 L3	113	4.4	16500	8.4	22	71	80	90	100	112	132	160	—	—	—	—	—	—	71700	92500	21900	294
	309 L3	126	4.0	17500	8.0	22	71	80	90	100	112	132	160	—	—	—	—	—	—	74000	95500	22700	294
	309 L3	139	3.6	17100	7.1	22	71	80	90	100	112	132	160	—	—	—	—	—	—	76200	98300	23500	294
	309 L3	162	3.1	17500	6.2	22	71	80	90	100	112	132	160	—	—	—	—	—	—	79800	102900	24700	294
	309 L3	183	2.7	14300	4.5	22	71	80	90	100	112	132	160	—	—	—	—	—	—	82800	106800	25700	294
	309 L3	202	2.5	18100	5.2	22	71	80	90	100	112	132	160	—	—	—	—	—	—	85300	110000	26600	294
	309 L3	223	2.2	14700	3.8	22	71	80	90	100	112	132	160	—	—	—	—	—	—	87900	113300	27500	294
	309 L3	239	2.1	14900	3.6	22	71	80	90	100	112	132	160	—	—	—	—	—	—	89800	115800	28200	294
	309 L3	284	1.8	15800	3.2	22	71	80	90	100	112	132	160	—	—	—	—	—	—	94500	121800	29800	294
	309 L3	336	1.5	15800	2.7	22	71	80	90	100	112	132	160	—	—	—	—	—	—	99400	128200	31500	294
	309 L4	349	1.4	21000	3.6	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	100500	129700	31900	294
	309 L4	405	1.2	20300	3.0	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	105200	135600	33600	294
	309 L4	465	1.1	20800	2.6	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	109600	141300	35100	294
	309 L4	509	0.98	14500	1.7	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	579	0.86	21300	2.2	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	654	0.77	18300	1.7	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	722	0.69	21300	1.7	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	801	0.62	18300	1.4	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	906	0.55	18000	1.2	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	999	0.50	18300	1.1	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	1149	0.44	17000	0.87	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	1286	0.39	17000	0.78	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
	309 L4	1380	0.36	17000	0.73	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294
309 L4	1605	0.31	17000	0.63	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294	
309 L4	1723	0.29	17000	0.58	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294	
309 L4	2003	0.25	17000	0.50	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294	
309 L4	2423	0.21	17000	0.42	15.0	71	80	90	100	112	132	160	—	—	—	—	—	—	110000	145000	36000	294	

310 L

25000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										R _{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ												
1400	310 L1	4.09	342	4740	175	35	—	—	—	—	—	—	—	200	225	250	—	—	23000	29000	9290	304	
	310 L1	5.25	267	6080	175	35	—	—	—	—	—	—	—	200	225	250	—	—	24800	31200	10100	304	
	310 L1	6.23	225	7210	175	35	—	—	—	—	—	—	—	200	225	250	—	—	26100	32900	10700	304	
	310 L2	14.7	95	7090	75	22	—	—	—	—	—	—	160	180	200	225	250	—	—	33800	42600	14200	304
	310 L2	17.4	81	8370	75	22	—	—	—	—	—	—	160	180	200	225	250	—	—	35600	44700	15100	304
	310 L2	21.8	64	10500	75	22	—	—	—	—	—	—	160	180	200	225	250	—	—	38100	47900	16200	304
	310 L2	25.4	55	12200	75	22	—	—	—	—	—	—	160	180	200	225	250	—	—	39800	50100	17100	304
	310 L2	28.0	50	12700	71	22	—	—	—	—	—	—	160	180	200	225	250	—	—	41000	51600	17600	304
	310 L2	30.7	46	12600	64	22	—	—	—	—	—	—	160	180	200	225	250	—	—	42200	53000	18200	304
	310 L2	32.6	43	13300	64	22	—	—	—	—	—	—	160	180	200	225	250	—	—	42900	54000	18600	304
	310 L2	38.6	36	13500	54	22	—	—	—	—	—	—	160	180	200	225	250	—	—	45200	56800	19600	304
	310 L2	46.7	30.0	14100	47	22	—	—	—	—	—	—	160	180	200	225	250	—	—	47800	60200	20900	304
	310 L3	53.0	26.4	13200	40	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	49700	62500	21800	304
	310 L3	62.6	22.4	15600	40	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	52200	65700	23100	304
	310 L3	73.9	18.9	17600	38	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	54900	69000	24400	304
310 L3	80.3	17.4	17400	35	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	56300	70800	25100	304	
310 L3	91.3	15.3	15300	27	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	58500	73600	26200	304	
310 L3	101	13.9	18600	30	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	60300	75800	27000	304	

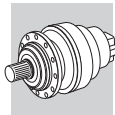


310 L

25000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										MC	MZ	R _{n2} [N]		FZ		
1400	310 L3	110	12.7	17000	25	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	61900	77900	27900	304
	310 L3	119	11.8	19500	26	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	63300	79600	28600	304
	310 L3	130	10.7	20100	25	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	65100	81900	29500	304
	310 L3	142	9.9	20500	23	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	66700	83900	30300	304
	310 L3	164	8.6	22300	22	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	69700	87600	31800	304
	310 L3	177	7.9	17900	16.2	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	71400	89800	32600	304
	310 L3	202	6.9	21600	17.2	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	74200	93300	34100	304
	310 L3	230	6.1	21200	14.8	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	77200	97100	35600	304
	310 L3	249	5.6	18000	11.6	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	79100	99400	36600	304
	310 L3	295	4.7	22900	12.5	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	83200	104600	38700	304
	310 L3	350	4.0	19100	8.7	18.0	—	—	—	—	—	132	160	180	200	—	—	—	—	87600	110100	41000	304
	310 L4	392	3.6	19500	8.3	11.0	71	80	90	100	112	132	160	—	—	—	—	—	90500	113900	42500	304	
	310 L4	451	3.1	24100	8.9	11.0	71	80	90	100	112	132	160	—	—	—	—	—	94400	118700	44500	304	
	310 L4	507	2.8	25000	8.2	11.0	71	80	90	100	112	132	160	—	—	—	—	—	97900	123000	46300	304	
	310 L4	556	2.5	27000	8.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	100600	126500	47800	304	
	310 L4	637	2.2	25900	6.7	11.0	71	80	90	100	112	132	160	—	—	—	—	—	104700	131700	50000	304	
	310 L4	726	1.9	26500	6.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	108900	137000	52200	304	
	310 L4	818	1.7	26900	5.5	11.0	71	80	90	100	112	132	160	—	—	—	—	—	112900	142000	54300	304	
	310 L4	939	1.5	27000	4.8	11.0	71	80	90	100	112	132	160	—	—	—	—	—	117700	148000	56900	304	
	310 L4	1021	1.4	27900	4.5	11.0	71	80	90	100	112	132	160	—	—	—	—	—	120700	151800	58500	304	
	310 L4	1164	1.2	28600	4.1	11.0	71	80	90	100	112	132	160	—	—	—	—	—	125500	157900	61100	304	
	310 L4	1259	1.1	27700	3.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	128500	161600	62700	304	
	310 L4	1438	0.97	26000	3.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	133000	166000	65000	304	
	310 L4	1672	0.84	26000	2.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	133000	166000	65000	304	
	310 L4	1794	0.78	26000	2.4	11.0	71	80	90	100	112	132	160	—	—	—	—	—	133000	166000	65000	304	
	310 L4	2022	0.69	26000	2.1	11.0	71	80	90	100	112	132	160	—	—	—	—	—	133000	166000	65000	304	
	310 L4	2523	0.55	26000	1.7	11.0	71	80	90	100	112	132	160	—	—	—	—	—	133000	166000	65000	304	
900	310 L1	4.09	220	7370	175	42	—	—	—	—	—	—	—	200	225	250	—	—	26300	33100	10800	304	
	310 L1	5.25	171	8760	162	42	—	—	—	—	—	—	—	—	200	225	250	—	—	28400	35700	11700	304
	310 L1	6.23	144	9130	142	42	—	—	—	—	—	—	—	—	200	225	250	—	—	29800	37500	12400	304
	310 L2	14.7	61	11000	75	26	—	—	—	—	—	—	160	180	200	225	250	—	—	38600	48600	16500	304
	310 L2	17.4	52	13000	75	26	—	—	—	—	—	—	160	180	200	225	250	—	—	40600	51100	17400	304
	310 L2	21.8	41	13900	64	26	—	—	—	—	—	—	160	180	200	225	250	—	—	43500	54700	18800	304
	310 L2	25.4	35	14500	57	26	—	—	—	—	—	—	160	180	200	225	250	—	—	45500	57200	19800	304
	310 L2	28.0	32	14500	52	26	—	—	—	—	—	—	160	180	200	225	250	—	—	46800	58900	20400	304
	310 L2	30.7	29.3	14400	47	26	—	—	—	—	—	—	160	180	200	225	250	—	—	48200	60500	21100	304
	310 L2	32.6	27.6	15100	47	26	—	—	—	—	—	—	160	180	200	225	250	—	—	49000	61600	21500	304
	310 L2	38.6	23.3	14800	38	26	—	—	—	—	—	—	160	180	200	225	250	—	—	51600	64900	22800	304
	310 L2	46.7	19.3	15500	33	26	—	—	—	—	—	—	160	180	200	225	250	—	—	54600	68700	24200	304
	310 L3	53.0	17.0	18200	35	22	—	—	—	—	—	132	160	180	200	—	—	—	56700	71300	25300	304	
	310 L3	62.6	14.4	19100	31	22	—	—	—	—	—	132	160	180	200	—	—	—	59600	75000	26700	304	
	310 L3	73.9	12.2	20100	28	22	—	—	—	—	—	132	160	180	200	—	—	—	62700	78800	28300	304	
	310 L3	80.3	11.2	19800	25	22	—	—	—	—	—	132	160	180	200	—	—	—	64300	80800	29000	304	
	310 L3	91.3	9.9	17500	19.8	22	—	—	—	—	—	132	160	180	200	—	—	—	66800	84000	30300	304	
	310 L3	101	8.9	20800	21	22	—	—	—	—	—	132	160	180	200	—	—	—	68800	86500	31300	304	
	310 L3	110	8.1	19500	18.2	22	—	—	—	—	—	132	160	180	200	—	—	—	70700	88900	32300	304	
	310 L3	119	7.6	21400	18.5	22	—	—	—	—	—	132	160	180	200	—	—	—	72300	90900	33100	304	
	310 L3	130	6.9	22900	18.2	22	—	—	—	—	—	132	160	180	200	—	—	—	74300	93500	34100	304	
	310 L3	142	6.3	21900	16.0	22	—	—	—	—	—	132	160	180	200	—	—	—	76200	95800	35100	304	
	310 L3	164	5.5	25500	16.1	22	—	—	—	—	—	132	160	180	200	—	—	—	79600	100000	36800	304	
	310 L3	177	5.1	18100	10.5	22	—	—	—	—	—	132	160	180	200	—	—	—	81500	102500	37800	304	
	310 L3	202	4.5	23100	11.8	22	—	—	—	—	—	132	160	180	200	—	—	—	84700	106500	39500	304	
	310 L3	230	3.9	21800	9.8	22	—	—	—	—	—	132	160	180	200	—	—	—	88100	110800	41300	304	
	310 L3	249	3.6	19500	8.1	22	—	—	—	—	—	132	160	180	200	—	—	—	90300	113500	42400	304	
	310 L3	295	3.0	24600	8.6	22	—	—	—	—	—	132	160	180	200	—	—	—	95000	119400	44800	304	
	310 L3	350	2.6	21100	6.2	22	—	—	—	—	—	132	160	180	200	—	—	—	100000	125700	47500	304	
	310 L4	392	2.3	2160																			

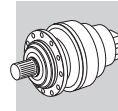




311 L

40000 Nm

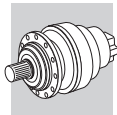
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
1400	311 L1	4.09	342	5410	200	35	—	—	—	—	—	—	—	—	—	—	—	—	27200	33900	9290	314
	311 L1	5.25	267	6950	200	35	—	—	—	—	—	—	—	—	—	—	—	—	29300	36600	10100	314
	311 L1	6.23	225	8250	200	35	—	—	—	—	—	—	—	—	—	—	—	—	30900	38500	10700	314
	311 L2	14.0	100	10400	115	26	—	—	—	—	—	—	180	200	225	250	—	—	39400	49100	14000	314
	311 L2	16.7	84	12400	115	26	—	—	—	—	—	—	180	200	225	250	—	—	41600	51800	14900	314
	311 L2	18.0	78	13300	115	26	—	—	—	—	—	—	180	200	225	250	—	—	42500	52900	15200	314
	311 L2	21.5	65	15900	115	26	—	—	—	—	—	—	180	200	225	250	—	—	44800	55800	16200	314
	311 L2	25.5	55	18200	111	26	—	—	—	—	—	—	180	200	225	250	—	—	47100	58700	17100	314
	311 L2	27.6	51	19600	111	26	—	—	—	—	—	—	180	200	225	250	—	—	48300	60100	17600	314
	311 L2	32.7	43	20600	98	26	—	—	—	—	—	—	180	200	225	250	—	—	50800	63300	18600	314
	311 L2	38.8	36	20100	81	26	—	—	—	—	—	—	180	200	225	250	—	—	53500	66600	19700	314
	311 L3	50.5	27.7	18900	60	18.0	—	—	—	—	—	132	160	180	200	—	—	—	57900	72100	21500	314
	311 L3	60.2	23.2	22500	60	18.0	—	—	—	—	—	132	160	180	200	—	—	—	61000	76000	22800	314
	311 L3	71.1	19.7	24700	56	18.0	—	—	—	—	—	132	160	180	200	—	—	—	64100	79900	24100	314
	311 L3	77.3	18.1	25400	53	18.0	—	—	—	—	—	132	160	180	200	—	—	—	65800	81900	24800	314
	311 L3	89.3	15.7	26500	48	18.0	—	—	—	—	—	132	160	180	200	—	—	—	68100	84900	25700	314
	311 L3	104	13.5	27700	43	18.0	—	—	—	—	—	132	160	180	200	—	—	—	71800	89500	27300	314
	311 L3	115	12.2	28500	40	18.0	—	—	—	—	—	132	160	180	200	—	—	—	74000	92200	28200	314
	311 L3	126	11.2	29300	38	18.0	—	—	—	—	—	132	160	180	200	—	—	—	76100	94700	29100	314
	311 L3	133	10.5	29800	36	18.0	—	—	—	—	—	132	160	180	200	—	—	—	77400	96400	29700	314
	311 L3	147	9.5	32000	35	18.0	—	—	—	—	—	132	160	180	200	—	—	—	79700	99300	30700	314
	311 L3	161	8.7	31600	32	18.0	—	—	—	—	—	132	160	180	200	—	—	—	82000	102100	31600	314
	311 L3	171	8.2	32100	30	18.0	—	—	—	—	—	132	160	180	200	—	—	—	83400	103900	32200	314
	311 L3	191	7.3	32100	27	18.0	—	—	—	—	—	132	160	180	200	—	—	—	86300	107500	33500	314
	311 L3	203	6.9	32200	25	18.0	—	—	—	—	—	132	160	180	200	—	—	—	87800	109400	34100	314
	311 L3	245	5.7	32200	21	18.0	—	—	—	—	—	132	160	180	200	—	—	—	93000	115800	36400	314
	311 L3	291	4.8	27100	15.0	18.0	—	—	—	—	—	132	160	180	200	—	—	—	97900	121900	38500	314
	311 L4	348	4.0	39600	18.9	11.0	71	80	90	100	112	132	160	—	—	—	—	—	103200	128600	40900	314
	311 L4	410	3.4	41400	16.7	11.0	71	80	90	100	112	132	160	—	—	—	—	—	108500	135200	43200	314
	311 L4	512	2.7	43900	14.2	11.0	71	80	90	100	112	132	160	—	—	—	—	—	116000	144500	46500	314
	311 L4	568	2.5	41700	12.2	11.0	71	80	90	100	112	132	160	—	—	—	—	—	119600	149000	48100	314
	311 L4	627	2.2	37200	9.8	11.0	71	80	90	100	112	132	160	—	—	—	—	—	123200	153500	49700	314
	311 L4	724	1.9	45000	10.3	11.0	71	80	90	100	112	132	160	—	—	—	—	—	128700	160300	52200	314
	311 L4	825	1.7	42700	8.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	133800	166600	54500	314
	311 L4	904	1.5	45000	8.2	11.0	71	80	90	100	112	132	160	—	—	—	—	—	137500	171300	56200	314
	311 L4	986	1.4	40400	6.8	11.0	71	80	90	100	112	132	160	—	—	—	—	—	141100	175800	57800	314
	311 L4	1058	1.3	40900	6.4	11.0	71	80	90	100	112	132	160	—	—	—	—	—	144200	179600	59200	314
	311 L4	1230	1.1	42000	5.7	11.0	71	80	90	100	112	132	160	—	—	—	—	—	150800	187900	62300	314
	311 L4	1415	0.99	43000	5.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	157000	195000	65000	314
	311 L4	1680	0.83	34000	3.4	11.0	71	80	90	100	112	132	160	—	—	—	—	—	157000	195000	65000	314
	311 L4	1766	0.79	43000	4.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	157000	195000	65000	314
	311 L4	2096	0.67	34000	2.7	11.0	71	80	90	100	112	132	160	—	—	—	—	—	157000	195000	65000	314
900	311 L1	4.09	220	8420	200	42	—	—	—	—	—	—	—	—	—	—	—	—	31100	38700	10800	314
	311 L1	5.25	171	10800	200	42	—	—	—	—	—	—	—	—	—	—	—	—	33500	41700	11700	314
	311 L1	6.23	144	12800	200	42	—	—	—	—	—	—	—	—	—	—	—	—	35300	43900	12400	314
	311 L2	14.0	64	16100	115	31	—	—	—	—	—	—	180	200	225	250	—	—	45000	56000	16200	314
	311 L2	16.7	54	18300	110	31	—	—	—	—	—	—	180	200	225	250	—	—	47400	59100	17200	314
	311 L2	18.0	50	19700	110	31	—	—	—	—	—	—	180	200	225	250	—	—	48500	60400	17600	314
	311 L2	21.5	42	19700	92	31	—	—	—	—	—	—	180	200	225	250	—	—	51100	63700	18700	314
	311 L2	25.5	35	20800	82	31	—	—	—	—	—	—	180	200	225	250	—	—	53800	67000	19800	314
	311 L2	27.6	33	22400	81	31	—	—	—	—	—	—	180	200	225	250	—	—	55100	68600	20300	314
	311 L2	32.7	27.5	23600	72	31	—	—	—	—	—	—	180	200	225	250	—	—	58000	72300	21500	314
	311 L2	38.8	23.2	22200	57	31	—	—	—	—	—	—	180	200	225	250	—	—	61100	76100	22800	314
	311 L3	50.5	17.8	25500	52	22	—	—	—	—	—	132	160	180	200	—	—	—	66100	82300	24900	314
	311 L3	60.2	14.9	26900	46	22	—	—	—	—	—	132	160	180	200	—	—	—	69700	86800	26400	314
	311 L3	71.1	12.7	28200	41	22	—	—	—	—	—	132	160	180	200	—	—	—	73200	91200	27900	314
	311 L3	77.3	11.6	29000	39	22	—	—	—	—	—	132	160	180	200	—	—	—	75100	93500	28700	314
	311 L3	87.0	10.3	30000	36	22	—	—	—	—	—	132	160	180	200	—	—	—	77800	96900	29800	314
	311 L3	104	8.7	31600	31	22	—	—	—	—	—	132	160	180	200	—	—	—	82000	102200	31600	314
	311 L3	115	7.9	32600	29	22	—	—	—	—	—	132	160	180	200	—	—	—	84500	105200	32700	314
	311 L3	126	7.2	33500	28	22	—	—	—	—	—	132	160	180	200	—	—	—	86800	108200	33700	314
	311 L3	133	6.8	34100	26	22	—	—	—	—	—	132	160	180	200	—	—	—	88400	110100	34400	314



311 L

40000 Nm

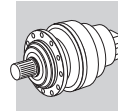
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										MC	MZ	R _{n2} [N]		HC/PC	HZ/PZ	FZ	
900	311 L3	147	6.1	32200	23	22	—	—	—	—	—	132	160	180	200	—	—	—	—	91000	113400	35500	314	
	311 L3	161	5.6	36200	23	22	—	—	—	—	—	132	160	180	200	—	—	—	—	93600	116600	36600	314	
	311 L3	171	5.3	32300	19.5	22	—	—	—	—	—	132	160	180	200	—	—	—	—	95300	118700	37400	314	
	311 L3	191	4.7	34500	18.6	22	—	—	—	—	—	132	160	180	200	—	—	—	—	98500	122700	38800	314	
	311 L3	203	4.4	33000	16.8	22	—	—	—	—	—	132	160	180	200	—	—	—	—	100300	124900	39600	314	
	311 L3	245	3.7	34100	14.4	22	—	—	—	—	—	132	160	180	200	—	—	—	—	106200	132300	42100	314	
	311 L3	291	3.1	28700	10.2	22	—	—	—	—	—	132	160	180	200	—	—	—	—	111800	139200	44600	314	
	311 L4	348	2.6	44600	13.7	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	117900	146800	47300	314	
	311 L4	410	2.2	45000	11.7	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	123900	154300	50000	314	
	311 L4	512	1.8	45000	9.4	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	132400	164900	53900	314	
	311 L4	568	1.6	42900	8.0	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	136600	170100	55700	314	
	311 L4	627	1.4	40300	6.8	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	140700	175200	57600	314	
	311 L4	724	1.2	45000	6.6	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	146900	183000	60500	314	
	311 L4	825	1.1	43900	5.7	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	152700	190300	63100	314	
	311 L4	904	1.00	45000	5.3	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	986	0.91	43000	4.6	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	1058	0.85	43000	4.3	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	1230	0.73	43000	3.7	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	1415	0.64	43000	3.2	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	1680	0.54	34000	2.2	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	1766	0.51	43000	2.6	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
311 L4	2096	0.43	34000	1.7	13.2	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314		
500	311 L1	4.09	122	14300	189	70	—	—	—	—	—	—	—	—	—	—	—	—	37100	46200	13100	314		
	311 L1	5.25	95	16200	167	70	—	—	—	—	—	—	—	—	—	—	—	—	40000	49800	14200	314		
	311 L1	6.23	80	16100	140	70	—	—	—	—	—	—	—	—	—	—	—	—	42100	52400	15100	314		
	311 L2	14.0	36	20700	82	52	—	—	—	—	—	—	—	180	200	225	250	—	—	53700	66900	19800	314	
	311 L2	16.7	29.9	21800	73	52	—	—	—	—	—	—	—	180	200	225	250	—	—	56600	70500	20900	314	
	311 L2	18.0	27.8	23500	73	52	—	—	—	—	—	—	—	180	200	225	250	—	—	57800	72100	21500	314	
	311 L2	21.5	23.3	23500	61	52	—	—	—	—	—	—	—	180	200	225	250	—	—	61000	76000	22800	314	
	311 L2	25.5	19.6	24800	54	52	—	—	—	—	—	—	—	180	200	225	250	—	—	64200	80000	24100	314	
	311 L2	27.6	18.1	26700	54	52	—	—	—	—	—	—	—	180	200	225	250	—	—	65700	81900	24700	314	
	311 L2	32.7	15.3	28200	48	52	—	—	—	—	—	—	—	180	200	225	250	—	—	69200	86200	26200	314	
	311 L2	38.8	12.9	25500	36	52	—	—	—	—	—	—	—	180	200	225	250	—	—	72800	90700	27700	314	
	311 L3	50.5	9.9	30400	35	36	—	—	—	—	—	132	160	180	200	—	—	—	—	78800	98200	30300	314	
	311 L3	60.2	8.3	32100	31	36	—	—	—	—	—	132	160	180	200	—	—	—	—	83100	103500	32100	314	
	311 L3	71.1	7.0	33700	27	36	—	—	—	—	—	132	160	180	200	—	—	—	—	87400	108800	33900	314	
	311 L3	77.3	6.5	34600	26	36	—	—	—	—	—	132	160	180	200	—	—	—	—	89600	111600	34900	314	
	311 L3	87.0	5.7	34500	23	36	—	—	—	—	—	132	160	180	200	—	—	—	—	92800	115600	36300	314	
	311 L3	104	4.8	37800	21	36	—	—	—	—	—	132	160	180	200	—	—	—	—	97800	121900	38500	314	
	311 L3	115	4.4	38200	19.1	36	—	—	—	—	—	132	160	180	200	—	—	—	—	100800	125500	39800	314	
	311 L3	126	4.0	39700	18.2	36	—	—	—	—	—	132	160	180	200	—	—	—	—	103600	129000	41000	314	
	311 L3	133	3.8	39100	16.9	36	—	—	—	—	—	132	160	180	200	—	—	—	—	105400	131300	41800	314	
	311 L3	147	3.4	34600	13.5	36	—	—	—	—	—	132	160	180	200	—	—	—	—	108600	135300	43200	314	
	311 L3	161	3.1	40300	14.4	36	—	—	—	—	—	132	160	180	200	—	—	—	—	111600	139000	44600	314	
	311 L3	171	2.9	35500	11.9	36	—	—	—	—	—	132	160	180	200	—	—	—	—	113600	141500	45400	314	
	311 L3	191	2.6	34500	10.4	36	—	—	—	—	—	132	160	180	200	—	—	—	—	117500	146400	47200	314	
	311 L3	203	2.5	36600	10.3	36	—	—	—	—	—	132	160	180	200	—	—	—	—	119600	149000	48100	314	
	311 L3	245	2.0	37900	8.9	36	—	—	—	—	—	132	160	180	200	—	—	—	—	126600	157800	51300	314	
	311 L3	291	1.7	31300	6.2	36	—	—	—	—	—	132	160	180	200	—	—	—	—	133300	166100	54300	314	
	311 L4	348	1.4	45000	7.7	22	71	80	90	100	112	132	160	—	—	—	—	—	—	140600	175100	57600	314	
	311 L4	410	1.2	45000	6.5	22	71	80	90	100	112	132	160	—	—	—	—	—	—	147800	184100	60900	314	
	311 L4	512	0.98	45000	5.2	22	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	568	0.88	44100	4.6	22	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	627	0.80	43000	4.1	22	71	80	90	100	112	132	160	—	—	—	—	—	—	157000	195000	65000	314	
	311 L4	724	0.69	45000	3.7	22	71	80	90	100	112	132	160	—	—	—	—							



313 L

55000 Nm

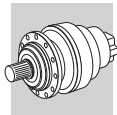
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
1400	313 L2	14.2	99	13700	150	30	—	—	—	—	—	—	180	200	225	250	—	—	48900	57800	17300	324
	313 L2	16.9	83	16300	150	30	—	—	—	—	—	—	180	200	225	250	—	—	51500	61000	18400	324
	313 L2	18.5	76	17800	150	30	—	—	—	—	—	—	180	200	225	250	—	—	52900	62600	18900	324
	313 L2	21.8	64	20900	150	30	—	—	—	—	—	—	180	200	225	250	—	—	55500	65700	20000	324
	313 L2	25.8	54	24900	150	30	—	—	—	—	—	—	180	200	225	250	—	—	58500	69200	21100	324
	313 L2	28.4	49	27300	150	30	—	—	—	—	—	—	180	200	225	250	—	—	60100	71200	21800	324
	313 L2	33.6	42	29400	136	30	—	—	—	—	—	—	180	200	225	250	—	—	63300	74900	23100	324
	313 L2	40.5	35	30000	115	30	—	—	—	—	—	—	180	200	225	250	—	—	66900	79200	24600	324
	313 L3	51.1	27.4	19100	60	18.0	—	—	—	—	132	160	180	200	—	—	—	—	71800	85000	26500	324
	313 L3	61.0	22.9	22800	60	18.0	—	—	—	—	132	160	180	200	—	—	—	—	75700	89600	28200	324
	313 L3	72.0	19.4	26900	60	18.0	—	—	—	—	132	160	180	200	—	—	—	—	79600	94100	29800	324
	313 L3	78.3	17.9	29200	60	18.0	—	—	—	—	132	160	180	200	—	—	—	—	81600	96500	30600	324
	313 L3	92.4	15.1	34500	60	18.0	—	—	—	—	132	160	180	200	—	—	—	—	85700	101500	32300	324
	313 L3	110	12.8	41000	60	18.0	—	—	—	—	132	160	180	200	—	—	—	—	90300	106800	34200	324
	313 L3	120	11.6	43000	57	18.0	—	—	—	—	132	160	180	200	—	—	—	—	92800	109900	35300	324
	313 L3	135	10.4	44900	53	18.0	—	—	—	—	132	160	180	200	—	—	—	—	96000	113600	36700	324
	313 L3	143	9.8	45000	51	18.0	—	—	—	—	132	160	180	200	—	—	—	—	97700	115700	37400	324
	313 L3	151	9.3	45000	48	18.0	—	—	—	—	132	160	180	200	—	—	—	—	99400	117600	38100	324
	313 L3	163	8.6	43300	43	18.0	—	—	—	—	132	160	180	200	—	—	—	—	101700	120300	39100	324
	313 L3	176	8.0	45000	41	18.0	—	—	—	—	132	160	180	200	—	—	—	—	104000	123000	40100	324
	313 L3	182	7.7	39000	34	18.0	—	—	—	—	132	160	180	200	—	—	—	—	105100	124300	40500	324
	313 L3	194	7.2	47700	40	18.0	—	—	—	—	132	160	180	200	—	—	—	—	107000	126700	41400	324
	313 L3	209	6.7	45000	35	18.0	—	—	—	—	132	160	180	200	—	—	—	—	109400	129500	42400	324
	313 L3	252	5.5	45000	29	18.0	—	—	—	—	132	160	180	200	—	—	—	—	115900	137100	45200	324
	313 L3	304	4.6	39400	21	18.0	—	—	—	—	132	160	180	200	—	—	—	—	122500	145000	48100	324
	313 L4	352	4.0	45100	21	11.0	71	80	90	100	112	132	160	—	—	—	—	—	128000	151500	50500	324
	313 L4	394	3.6	55000	23	11.0	71	80	90	100	112	132	160	—	—	—	—	—	132500	156800	52400	324
	313 L4	452	3.1	53400	19.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	138000	163300	54900	324
	313 L4	514	2.7	47800	15.4	11.0	71	80	90	100	112	132	160	—	—	—	—	—	143400	169700	57300	324
	313 L4	564	2.5	55000	16.2	11.0	71	80	90	100	112	132	160	—	—	—	—	—	147500	174500	59100	324
	313 L4	633	2.2	52100	13.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	152700	180700	61400	324
	313 L4	695	2.0	49700	11.8	11.0	71	80	90	100	112	132	160	—	—	—	—	—	157000	185900	63300	324
	313 L4	790	1.8	52300	11.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	163200	193100	66100	324
	313 L4	889	1.6	51500	9.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	169100	200100	68800	324
	313 L4	1014	1.4	52500	8.6	11.0	71	80	90	100	112	132	160	—	—	—	—	—	175900	208200	71800	324
	313 L4	1117	1.3	52600	7.8	11.0	71	80	90	100	112	132	160	—	—	—	—	—	181100	214300	74200	324
	313 L4	1266	1.1	54200	7.1	11.0	71	80	90	100	112	132	160	—	—	—	—	—	188000	222500	77400	324
	313 L4	1394	1.0	52800	6.3	11.0	71	80	90	100	112	132	160	—	—	—	—	—	192000	229000	79900	324
	313 L4	1502	0.93	55000	6.1	11.0	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1817	0.77	55000	5.0	11.0	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	2187	0.64	49000	3.7	11.0	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
900	313 L1	4.14	217	10700	250	45	—	—	—	—	—	—	—	—	—	—	—	—	38600	45600	13300	324
	313 L1	5.40	167	13900	250	45	—	—	—	—	—	—	—	—	—	—	—	—	41800	49400	14500	324
	313 L1	6.50	138	16700	250	45	—	—	—	—	—	—	—	—	—	—	—	—	44100	52200	15500	324
	313 L2	14.2	63	21300	150	36	—	—	—	—	—	—	180	200	225	250	—	—	55800	66000	20100	324
	313 L2	16.9	53	25400	150	36	—	—	—	—	—	—	180	200	225	250	—	—	58800	69600	21300	324
	313 L2	18.5	49	27700	150	36	—	—	—	—	—	—	180	200	225	250	—	—	60400	71500	21900	324
	313 L2	21.8	41	29600	136	36	—	—	—	—	—	—	180	200	225	250	—	—	63400	75100	23100	324
	313 L2	25.8	35	30500	118	36	—	—	—	—	—	—	180	200	225	250	—	—	66800	79000	24500	324
	313 L2	28.4	32	31800	113	36	—	—	—	—	—	—	180	200	225	250	—	—	68700	81300	25300	324
	313 L2	33.6	26.7	33500	100	36	—	—	—	—	—	—	180	200	225	250	—	—	72300	85500	26700	324
	313 L2	40.5	22.2	32900	81	36	—	—	—	—	—	—	180	200	225	250	—	—	76400	90400	28500	324
	313 L3	51.1	17.6	29700	60	22	—	—	—	—	132	160	180	200	—	—	—	—	82000	97000	30800	324
	313 L3	61.0	14.8	35500	60	22	—	—	—	—	132	160	180	200	—	—	—	—	86400	102300	32600	324
	313 L3	72.0	12.5	38200	55	22	—	—	—	—	132	160	180	200	—	—	—	—	90800	107500	34500	324
	313 L3	78.3	11.5	43500	57	22	—	—	—	—	132	160	180	200	—	—	—	—	93100	110200	35400	324
	313 L3	92.4	9.7	45700	51	22	—	—	—	—	132	160	180	200	—	—	—	—	97900	115800	37500	324
	313 L3	110	8.2	46400	44	22	—	—	—	—	132	160	180	200	—	—	—	—	103000	122000	39700	324
	313 L3	121	7.5	45000	39	22	—	—	—	—	132	160	180	200	—	—	—	—	106000	125400	40900	324
	313 L3	135	6.7	50800	39	22	—	—	—	—	132	160	180	200	—	—	—	—	109600	129700	42500	324
	313 L3	143	6.3	45000	32	22	—	—	—	—	132	160	180	200	—	—	—	—	111600	132000	43300	324
	313 L3	151	6.0	45000	31	22	—	—	—	—	132	160	180	200	—	—	—	—	113500	134300	44100	324
	313 L3	163	5.5	49400	31	22	—	—	—	—	132	160	180	200	—	—	—	—	116100	137400	45300	324



313 L

55000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
900	313 L3	176	5.1	45000	26	22	—	—	—	—	—	132	160	180	200	—	—	—	118700	140500	46400	324
	313 L3	182	4.9	39100	22	22	—	—	—	—	—	132	160	180	200	—	—	—	119900	142000	47000	324
	313 L3	194	4.6	52000	28	22	—	—	—	—	—	132	160	180	200	—	—	—	122200	144600	47900	324
	313 L3	209	4.3	45700	23	22	—	—	—	—	—	132	160	180	200	—	—	—	125000	147900	49100	324
	313 L3	252	3.6	46500	19.0	22	—	—	—	—	—	132	160	180	200	—	—	—	132300	156600	52400	324
	313 L3	304	3.0	41500	14.1	22	—	—	—	—	—	132	160	180	200	—	—	—	139900	165500	55700	324
	313 L4	352	2.6	51500	15.6	13.2	71	80	90	100	112	132	160	—	—	—	—	—	146200	173000	58500	324
	313 L4	394	2.3	55000	14.9	13.2	71	80	90	100	112	132	160	—	—	—	—	—	151200	179000	60700	324
	313 L4	452	2.0	55000	13.0	13.2	71	80	90	100	112	132	160	—	—	—	—	—	157600	186500	63600	324
	313 L4	514	1.8	50700	10.5	13.2	71	80	90	100	112	132	160	—	—	—	—	—	163700	193800	66400	324
	313 L4	564	1.6	55000	10.4	13.2	71	80	90	100	112	132	160	—	—	—	—	—	168400	199300	68500	324
	313 L4	633	1.4	52500	8.8	13.2	71	80	90	100	112	132	160	—	—	—	—	—	174300	206300	71100	324
	313 L4	695	1.3	53000	8.1	13.2	71	80	90	100	112	132	160	—	—	—	—	—	179300	212200	73400	324
	313 L4	790	1.1	52700	7.1	13.2	71	80	90	100	112	132	160	—	—	—	—	—	186300	220500	76600	324
	313 L4	889	1.0	54900	6.6	13.2	71	80	90	100	112	132	160	—	—	—	—	—	192000	228500	79700	324
	313 L4	1014	0.89	55000	5.8	13.2	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1117	0.81	52800	5.0	13.2	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1266	0.71	55000	4.6	13.2	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1394	0.65	52800	4.0	13.2	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
500	313 L1	4.14	121	19200	250	85	—	—	—	—	—	—	—	—	—	—	—	—	46000	54400	16200	324
	313 L1	5.40	93	23100	231	85	—	—	—	—	—	—	—	—	—	—	—	—	49800	58900	17700	324
	313 L1	6.50	77	24400	202	85	—	—	—	—	—	—	—	—	—	—	—	—	52700	62300	18800	324
	313 L2	14.2	35	31500	124	60	—	—	—	—	—	—	—	180	200	225	250	—	66600	78800	24400	324
	313 L2	16.9	29.5	32000	105	60	—	—	—	—	—	—	—	180	200	225	250	—	70200	83100	25900	324
	313 L2	18.5	27.0	33400	100	60	—	—	—	—	—	—	—	180	200	225	250	—	72100	85300	26700	324
	313 L2	21.8	23.0	35400	90	60	—	—	—	—	—	—	—	180	200	225	250	—	75600	89500	28100	324
	313 L2	25.8	19.4	36400	78	60	—	—	—	—	—	—	—	180	200	225	250	—	79600	94200	29800	324
	313 L2	28.4	17.6	38000	75	60	—	—	—	—	—	—	—	180	200	225	250	—	81900	96900	30700	324
	313 L2	33.6	14.9	40000	66	60	—	—	—	—	—	—	—	180	200	225	250	—	86200	102000	32500	324
	313 L2	40.5	12.3	37300	51	60	—	—	—	—	—	—	—	180	200	225	250	—	91200	107900	34600	324
	313 L3	51.1	9.8	37100	42	36	—	—	—	—	—	132	160	180	200	—	—	—	97800	115700	37400	324
	313 L3	61.0	8.2	44200	42	36	—	—	—	—	—	132	160	180	200	—	—	—	103100	122000	39700	324
	313 L3	72.0	6.9	45400	36	36	—	—	—	—	—	132	160	180	200	—	—	—	108300	128200	41900	324
	313 L3	78.3	6.4	51400	38	36	—	—	—	—	—	132	160	180	200	—	—	—	111100	131500	43100	324
	313 L3	92.4	5.4	53800	33	36	—	—	—	—	—	132	160	180	200	—	—	—	116800	138200	45600	324
	313 L3	110	4.6	52000	27	36	—	—	—	—	—	132	160	180	200	—	—	—	122900	145500	48300	324
	313 L3	120	4.1	45800	22	36	—	—	—	—	—	132	160	180	200	—	—	—	126400	149600	49800	324
	313 L3	135	3.7	55000	23	36	—	—	—	—	—	132	160	180	200	—	—	—	130800	154800	51700	324
	313 L3	143	3.5	46600	18.7	36	—	—	—	—	—	132	160	180	200	—	—	—	133100	157500	52700	324
	313 L3	151	3.3	46900	17.8	36	—	—	—	—	—	132	160	180	200	—	—	—	135300	160200	53700	324
	313 L3	163	3.1	53800	18.9	36	—	—	—	—	—	132	160	180	200	—	—	—	138500	163900	55100	324
	313 L3	176	2.8	47600	15.5	36	—	—	—	—	—	132	160	180	200	—	—	—	141600	167600	55500	324
	313 L3	182	2.7	41900	13.2	36	—	—	—	—	—	132	160	180	200	—	—	—	143100	169300	57100	324
	313 L3	194	2.6	52000	15.4	36	—	—	—	—	—	132	160	180	200	—	—	—	145800	172500	58300	324
	313 L3	209	2.4	48500	13.3	36	—	—	—	—	—	132	160	180	200	—	—	—	149100	176400	59800	324
	313 L3	252	2.0	49800	11.3	36	—	—	—	—	—	132	160	180	200	—	—	—	157800	186800	63700	324
	313 L3	304	1.6	45300	8.6	36	—	—	—	—	—	132	160	180	200	—	—	—	166800	197500	67800	324
	313 L4	352	1.4	53800	9.0	22	71	80	90	100	112	132	160	—	—	—	—	—	174400	206400	71200	324
	313 L4	394	1.3	55000	8.3	22	71	80	90	100	112	132	160	—	—	—	—	—	180400	213500	73900	324
	313 L4	452	1.1	55000	7.2	22	71	80	90	100	112	132	160	—	—	—	—	—	187900	222400	77300	324
	313 L4	514	0.97	55000	6.3	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	564	0.89	55000	5.8	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	633	0.79	52800	4.9	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	695	0.72	55000	4.7	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	790	0.63	52800	4.0	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	889	0.56	55000	3.7	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1014	0.49	55000	3.2	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1117	0.45	52800	2.8	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1266	0.40	55000	2.6	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1394	0.36	52800	2.2	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324



313 L

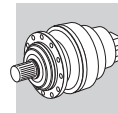
55000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
500	313 L4	1502	0.33	55000	2.2	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	1817	0.28	55000	1.8	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324
	313 L4	2187	0.23	49000	1.3	22	71	80	90	100	112	132	160	—	—	—	—	—	192000	231000	80000	324

314 L

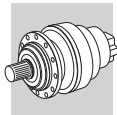
80000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
1400	314 L2	17.4	81	19500	175	40	—	—	—	200	225	250	—	—	—	—	—	—	55400	65100	20800	334
	314 L2	22.3	63	25100	175	40	—	—	—	200	225	250	—	—	—	—	—	—	59800	70200	22600	334
	314 L2	26.5	53	29700	175	40	—	—	—	200	225	250	—	—	—	—	—	—	62900	73900	24000	334
	314 L2	28.0	50	31400	175	40	—	—	—	200	225	250	—	—	—	—	—	—	64000	75100	24400	334
	314 L2	33.2	42	37300	175	40	—	—	—	200	225	250	—	—	—	—	—	—	67300	79100	25900	334
	314 L2	38.6	36	36000	145	40	—	—	—	200	225	250	—	—	—	—	—	—	70500	82700	27200	334
	314 L3	62.6	22.4	29200	75	25	—	160	180	200	225	250	—	—	—	—	—	—	81400	95600	31900	334
	314 L3	73.9	18.9	34500	75	25	—	160	180	200	225	250	—	—	—	—	—	—	85600	100500	33800	334
	314 L3	92.7	15.1	43300	75	25	—	160	180	200	225	250	—	—	—	—	—	—	91600	107600	36400	334
	314 L3	108	13.0	50300	75	25	—	160	180	200	225	250	—	—	—	—	—	—	95900	112500	38300	334
	314 L3	138	10.1	64600	75	25	—	160	180	200	225	250	—	—	—	—	—	—	103300	121300	41600	334
	314 L3	164	8.5	65600	64	25	—	160	180	200	225	250	—	—	—	—	—	—	108700	127700	44100	334
	314 L3	174	8.1	62600	58	25	—	160	180	200	225	250	—	—	—	—	—	—	110600	129800	44900	334
	314 L3	206	6.8	62800	49	25	—	160	180	200	225	250	—	—	—	—	—	—	116400	136700	47500	334
	314 L3	240	5.8	52000	35	25	—	160	180	200	225	250	—	—	—	—	—	—	121800	143000	50000	334
	314 L4	314	4.5	75900	40	15.0	132	160	180	200	—	—	—	—	—	—	—	—	132100	155100	54700	334
	314 L4	388	3.6	78700	34	15.0	132	160	180	200	—	—	—	—	—	—	—	—	140800	165300	58700	334
	314 L4	458	3.1	79300	29	15.0	132	160	180	200	—	—	—	—	—	—	—	—	148000	173700	62000	334
	314 L4	495	2.8	79600	27	15.0	132	160	180	200	—	—	—	—	—	—	—	—	151400	177700	63600	334
	314 L4	554	2.5	80000	24	15.0	132	160	180	200	—	—	—	—	—	—	—	—	156600	183900	66100	334
	314 L4	588	2.4	80200	23	15.0	132	160	180	200	—	—	—	—	—	—	—	—	159500	187200	67400	334
	314 L4	668	2.1	80800	20	15.0	132	160	180	200	—	—	—	—	—	—	—	—	165700	194500	70300	334
	314 L4	738	1.9	81200	18.2	15.0	132	160	180	200	—	—	—	—	—	—	—	—	170700	200400	72700	334
	314 L4	858	1.6	81800	15.8	15.0	132	160	180	200	—	—	—	—	—	—	—	—	178600	209700	76400	334
	314 L4	926	1.5	74700	13.4	15.0	132	160	180	200	—	—	—	—	—	—	—	—	182700	214500	78400	334
	314 L4	1038	1.3	82700	13.2	15.0	132	160	180	200	—	—	—	—	—	—	—	—	189100	222000	81400	334
	314 L4	1099	1.3	76500	11.5	15.0	132	160	180	200	—	—	—	—	—	—	—	—	192400	225800	83000	334
	314 L4	1277	1.1	78200	10.1	15.0	132	160	180	200	—	—	—	—	—	—	—	—	201200	236300	87300	334
	314 L4	1485	0.94	64000	7.1	15.0	132	160	180	200	—	—	—	—	—	—	—	—	206000	243000	90000	334
	314 L4	1796	0.78	64000	5.9	15.0	132	160	180	200	—	—	—	—	—	—	—	—	206000	243000	90000	334
900	314 L2	17.4	52	30400	175	48	—	—	—	200	225	250	—	—	—	—	—	—	63300	74300	24100	334
	314 L2	22.3	40	39000	175	48	—	—	—	200	225	250	—	—	—	—	—	—	68200	80100	26200	334
	314 L2	26.5	34	43400	164	48	—	—	—	200	225	250	—	—	—	—	—	—	71800	84300	27800	334
	314 L2	28.0	32	44400	159	48	—	—	—	200	225	250	—	—	—	—	—	—	73000	85800	28300	334
	314 L2	33.2	27.1	46700	141	48	—	—	—	200	225	250	—	—	—	—	—	—	76900	90300	30000	334
	314 L2	38.6	23.3	40800	106	48	—	—	—	200	225	250	—	—	—	—	—	—	80400	94400	31500	334
	314 L3	62.6	14.4	45500	75	30	—	160	180	200	225	250	—	—	—	—	—	—	93000	109200	37000	334
	314 L3	73.9	12.2	53700	75	30	—	160	180	200	225	250	—	—	—	—	—	—	97700	114700	39100	334
	314 L3	92.7	9.7	63800	71	30	—	160	180	200	225	250	—	—	—	—	—	—	104600	122800	42200	334
	314 L3	108	8.3	66700	64	30	—	160	180	200	225	250	—	—	—	—	—	—	109400	128500	44400	334
	314 L3	138	6.5	73100	55	30	—	160	180	200	225	250	—	—	—	—	—	—	117900	138500	48200	334
	314 L3	164	5.5	75400	47	30	—	160	180	200	225	250	—	—	—	—	—	—	124200	145800	51000	334
	314 L3	174	5.2	63200	38	30	—	160	180	200	225	250	—	—	—	—	—	—	126300	148200	52000	334
	314 L3	206	4.4	64400	32	30	—	160	180	200	225	250	—	—	—	—	—	—	132900	156100	55100	334
	314 L3	240	3.8	53600	23	30	—	160	180	200	225	250	—	—	—	—	—	—	139100	163300	57900	334
	314 L4	314	2.9	79500	27	18.0	132	160	180	200	—	—	—	—	—	—	—	—	150800	177100	63400	334
	314 L4	388	2.3	80300	22	18.0	132	160	180	200	—	—	—	—	—	—	—	—	160700	188700	68000	334
	314 L4	458	2.0	81000	18.8	18.0	132	160	180	200	—	—	—	—	—	—	—	—	168900	198300	71900	334
	314 L4	495	1.8	81400	17.5	18.0	132	160	180	200	—	—	—	—	—	—	—	—	172800	202900	73700	334
	314 L4	554	1.6	81900	15.7	18.0	132	160	180	200	—	—	—	—	—	—	—	—	178900	210000	76600	334



314 L							80000 Nm											
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
900	314 L4	588	1.5	82100	14.9	18.0	132	160	180	200	—	—	—	—	182100	213700	78100	334
	314 L4	668	1.3	82700	13.2	18.0	132	160	180	200	—	—	—	—	189200	222100	81500	334
	314 L4	738	1.2	83100	12.0	18.0	132	160	180	200	—	—	—	—	194900	228800	84200	334
	314 L4	858	1.0	83800	10.4	18.0	132	160	180	200	—	—	—	—	203900	239400	88600	334
	314 L4	926	0.97	79200	9.1	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1038	0.87	84000	8.6	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1099	0.82	79200	7.7	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1277	0.70	79200	6.6	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1485	0.61	64000	4.6	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	334
314 L4	1796	0.50	64000	3.8	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	334	
500	314 L2	17.4	28.8	46000	147	80	—	—	—	200	225	250	—	—	75500	88700	29400	334
	314 L2	22.4	22.4	52000	130	80	—	—	—	200	225	250	—	—	81400	95600	31900	334
	314 L2	26.5	18.9	51700	109	80	—	—	—	200	225	250	—	—	85700	100600	33800	334
	314 L2	28.0	17.9	52700	105	80	—	—	—	200	225	250	—	—	87100	102300	34400	334
	314 L2	33.2	15.0	55400	93	80	—	—	—	200	225	250	—	—	91700	107700	36500	334
	314 L2	38.6	12.9	48300	70	80	—	—	—	200	225	250	—	—	96000	112700	38300	334
	314 L3	62.6	8.0	67500	62	50	—	160	180	200	225	250	—	—	110900	130200	45000	334
	314 L3	73.9	6.8	70900	55	50	—	160	180	200	225	250	—	—	116600	136900	47600	334
	314 L3	92.7	5.4	75900	47	50	—	160	180	200	225	250	—	—	124800	146500	51300	334
	314 L3	108	4.6	77900	41	50	—	160	180	200	225	250	—	—	130500	153300	54000	334
	314 L3	138	3.6	78700	33	50	—	160	180	200	225	250	—	—	140700	165200	58600	334
	314 L3	164	3.0	79300	28	50	—	160	180	200	225	250	—	—	148100	173900	62100	334
	314 L3	174	2.9	68200	23	50	—	160	180	200	225	250	—	—	150600	176800	63300	334
	314 L3	206	2.4	69900	19.5	50	—	160	180	200	225	250	—	—	158500	186100	67000	334
	314 L3	240	2.1	57500	13.8	50	—	160	180	200	225	250	—	—	165900	194700	70400	334
	314 L4	314	1.6	81900	15.4	30	132	160	180	200	—	—	—	—	179900	211200	77100	334
	314 L4	388	1.3	82900	12.6	30	132	160	180	200	—	—	—	—	191700	225100	82700	334
	314 L4	458	1.1	83600	10.8	30	132	160	180	200	—	—	—	—	201500	236600	87400	334
	314 L4	495	1.0	84000	10.0	30	132	160	180	200	—	—	—	—	206000	242100	89700	334
	314 L4	554	0.90	84000	9.0	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	588	0.85	84000	8.4	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	668	0.75	84000	7.4	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	738	0.68	84000	6.7	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	858	0.58	84000	5.8	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	926	0.54	79200	5.1	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1038	0.48	84000	4.8	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1099	0.46	79200	4.3	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1277	0.39	79200	3.7	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1485	0.34	64000	2.5	30	132	160	180	200	—	—	—	—	206000	243000	90000	334
	314 L4	1796	0.28	64000	2.1	30	132	160	180	200	—	—	—	—	206000	243000	90000	334

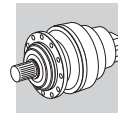
315 L							100000 Nm											
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
1400	315 L2	17.4	81	22300	200	45	—	—	—	—	—	—	—	—	55400	65100	20800	344
	315 L2	22.3	63	28600	200	45	—	—	—	—	—	—	—	—	59800	70200	22600	344
	315 L2	26.5	53	34000	200	45	—	—	—	—	—	—	—	—	62900	73900	24000	344
	315 L2	28.0	50	35900	200	45	—	—	—	—	—	—	—	—	64000	75100	24400	344
	315 L2	33.2	42	42700	200	45	—	—	—	—	—	—	—	—	67300	79100	25900	344
	315 L2	38.6	36	45000	181	45	—	—	—	—	—	—	—	—	70500	82700	27200	344
	315 L3	59.6	23.5	42700	115	30	—	—	180	200	225	250	—	—	80200	94200	31400	344
	315 L3	71.1	19.7	50900	115	30	—	—	180	200	225	250	—	—	84600	99300	33300	344
	315 L3	91.3	15.3	65400	115	30	—	—	180	200	225	250	—	—	91200	107100	36200	344
	315 L3	108	12.9	73100	108	30	—	—	180	200	225	250	—	—	96000	112700	38400	344
315 L3	139	10.1	82800	96	30	—	—	180	200	225	250	—	—	103500	121500	41700	344	
315 L3	165	8.5	82100	80	30	—	—	180	200	225	250	—	—	108900	127900	44100	344	
315 L3	174	8.0	78300	72	30	—	—	180	200	225	250	—	—	110700	130000	45000	344	
315 L3	207	6.8	78600	61	30	—	—	180	200	225	250	—	—	116600	136900	47600	344	
315 L3	241	5.8	65000	43	30	—	—	180	200	225	250	—	—	122000	143200	50000	344	



315 L

100000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						Rn ₂ [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	315 L4	302	4.6	97300	53	18.0	132	160	180	200	—	—	—	—	130600	153300	54000	344
	315 L4	370	3.8	98200	44	18.0	132	160	180	200	—	—	—	—	138700	162900	57700	344
	315 L4	441	3.2	99000	37	18.0	132	160	180	200	—	—	—	—	146300	171700	61200	344
	315 L4	487	2.9	99400	34	18.0	132	160	180	200	—	—	—	—	150700	176900	63300	344
	315 L4	533	2.6	99800	31	18.0	132	160	180	200	—	—	—	—	154900	181800	65200	344
	315 L4	591	2.4	100300	28	18.0	132	160	180	200	—	—	—	—	159700	187500	67500	344
	315 L4	672	2.1	101000	25	18.0	132	160	180	200	—	—	—	—	165900	194800	70500	344
	315 L4	742	1.9	101500	23	18.0	132	160	180	200	—	—	—	—	170900	200700	72800	344
	315 L4	862	1.6	102300	19.7	18.0	132	160	180	200	—	—	—	—	178800	210000	76600	344
	315 L4	930	1.5	93500	16.6	18.0	132	160	180	200	—	—	—	—	183000	214800	78500	344
	315 L4	1043	1.3	103400	16.4	18.0	132	160	180	200	—	—	—	—	189400	222300	81600	344
	315 L4	1104	1.3	95700	14.4	18.0	132	160	180	200	—	—	—	—	192600	226200	83200	344
	315 L4	1284	1.1	97800	12.6	18.0	132	160	180	200	—	—	—	—	201500	236600	87400	344
	315 L4	1492	0.94	80000	8.9	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1805	0.78	80000	7.3	18.0	132	160	180	200	—	—	—	—	206000	243000	90000	344
900	315 L2	17.4	52	34700	200	54	—	—	—	—	—	—	—	—	63300	74300	24100	344
	315 L2	22.3	40	44600	200	54	—	—	—	—	—	—	—	—	68200	80100	26200	344
	315 L2	26.5	34	52900	200	54	—	—	—	—	—	—	—	—	71800	84300	27800	344
	315 L2	28.0	32	55500	199	54	—	—	—	—	—	—	—	—	73000	85800	28300	344
	315 L2	33.2	27.1	58300	176	54	—	—	—	—	—	—	—	—	76900	90300	30000	344
	315 L2	38.6	23.3	51000	132	54	—	—	—	—	—	—	—	—	80400	94400	31500	344
	315 L3	59.6	15.1	66400	115	36	—	—	180	200	225	250	—	—	91600	107600	36400	344
	315 L3	71.1	12.7	73600	107	36	—	—	180	200	225	250	—	—	96600	113400	38600	344
	315 L3	91.3	9.9	79300	90	36	—	—	180	200	225	250	—	—	104100	122200	42000	344
	315 L3	108	8.3	83500	80	36	—	—	180	200	225	250	—	—	109600	128700	44400	344
	315 L3	139	6.5	91500	68	36	—	—	180	200	225	250	—	—	118100	138700	48300	344
	315 L3	165	5.5	94400	59	36	—	—	180	200	225	250	—	—	124300	146000	51100	344
	315 L3	174	5.2	79000	47	36	—	—	180	200	225	250	—	—	126400	148500	52100	344
	315 L3	207	4.3	80600	40	36	—	—	180	200	225	250	—	—	133100	156300	55100	344
	315 L3	241	3.7	67100	29	36	—	—	180	200	225	250	—	—	139300	163500	58000	344
	315 L4	302	3.0	99200	35	22	132	160	180	200	—	—	—	—	149100	175100	62600	344
	315 L4	370	2.4	100100	29	22	132	160	180	200	—	—	—	—	158400	186000	66900	344
	315 L4	441	2.0	101100	24	22	132	160	180	200	—	—	—	—	167000	196100	71000	344
	315 L4	487	1.8	101600	22	22	132	160	180	200	—	—	—	—	172000	202000	73300	344
	315 L4	533	1.7	102100	20	22	132	160	180	200	—	—	—	—	176800	207600	75600	344
	315 L4	591	1.5	102700	18.5	22	132	160	180	200	—	—	—	—	182300	214100	78200	344
	315 L4	672	1.3	103400	16.4	22	132	160	180	200	—	—	—	—	189500	222400	81600	344
	315 L4	741	1.2	103900	14.9	22	132	160	180	200	—	—	—	—	195200	229100	84400	344
	315 L4	862	1.0	104800	12.9	22	132	160	180	200	—	—	—	—	204200	239700	88700	344
	315 L4	931	0.97	99000	11.3	22	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1043	0.86	105000	10.7	22	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1104	0.82	99000	9.5	22	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1284	0.70	99000	8.2	22	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1492	0.60	80000	5.7	22	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1805	0.50	80000	4.7	22	132	160	180	200	—	—	—	—	206000	243000	90000	344
500	315 L2	17.4	28.8	57500	184	90	—	—	—	—	—	—	—	—	75500	88700	29400	344
	315 L2	22.3	22.4	65000	162	90	—	—	—	—	—	—	—	—	81400	95600	31900	344
	315 L2	26.5	18.9	64600	136	90	—	—	—	—	—	—	—	—	85700	100600	33800	344
	315 L2	28.0	17.9	65900	131	90	—	—	—	—	—	—	—	—	87100	102300	34400	344
	315 L2	33.2	15.0	69200	116	90	—	—	—	—	—	—	—	—	91700	107700	36500	344
	315 L2	38.6	12.9	60400	87	90	—	—	—	—	—	—	—	—	96000	112700	38300	344
	315 L3	59.6	8.4	83200	80	60	—	—	180	200	225	250	—	—	109300	128300	44300	344
	315 L3	71.1	7.0	87700	71	60	—	—	180	200	225	250	—	—	115200	135300	47000	344
	315 L3	91.3	5.5	94400	59	60	—	—	180	200	225	250	—	—	124200	145800	51100	344
	315 L3	108	4.6	97300	52	60	—	—	180	200	225	250	—	—	130700	153500	54100	344
	315 L3	139	3.6	98400	41	60	—	—	180	200	225	250	—	—	140900	165400	58700	344
	315 L3	165	3.0	99200	34	60	—	—	180	200	225	250	—	—	148300	174100	62200	344
	315 L3	174	2.9	85400	28	60	—	—	180	200	225	250	—	—	150800	177100	63400	344
	315 L3	207	2.4	87400	24	60	—	—	180	200	225	250	—	—	158800	186400	67100	344
	315 L3	241	2.1	71900	17.1	60	—	—	180	200	225	250	—	—	166100	195000	70500	344
	315 L4	302	1.7	102200	20	36	132	160	180	200	—	—	—	—	177900	208800	76100	344
	315 L4	370	1.4	103300	16.5	36	132	160	180	200	—	—	—	—	188900	221800	81400	344



315 L

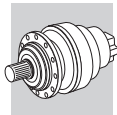
100000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 						R_{n2} [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
500	315 L4	441	1.1	104300	14.0	36	132	160	180	200	—	—	—	—	199200	233900	86300	344
	315 L4	487	1.0	104900	12.7	36	132	160	180	200	—	—	—	—	205200	240900	89200	344
	315 L4	533	0.94	105000	11.6	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	591	0.85	105000	10.5	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	672	0.74	105000	9.2	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	741	0.67	105000	8.4	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	862	0.58	105000	7.2	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	930	0.54	99000	6.3	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1043	0.48	105000	6.0	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1104	0.45	99000	5.3	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1284	0.39	99000	4.6	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1492	0.34	80000	3.2	36	132	160	180	200	—	—	—	—	206000	243000	90000	344
	315 L4	1805	0.28	80000	2.6	36	132	160	180	200	—	—	—	—	206000	243000	90000	344

316 L

135000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 						R_{n2} [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	316 L2	17.4	81	22300	200	50	—	—	—	—	—	—	—	—	92200	102500	34700	354
	316 L2	22.3	63	28600	200	50	—	—	—	—	—	—	—	—	99400	110500	37700	354
	316 L2	26.5	53	34000	200	50	—	—	—	—	—	—	—	—	104600	116300	40000	354
	316 L3	59.6	23.5	42700	115	35	—	—	180	200	225	250	—	—	133400	148400	52400	354
	316 L3	71.1	19.7	50900	115	35	—	—	180	200	225	250	—	—	140700	156500	55600	354
	316 L3	76.5	18.3	54800	115	35	—	—	180	200	225	250	—	—	143800	159900	56900	354
	316 L3	91.3	15.3	65400	115	35	—	—	180	200	225	250	—	—	151600	168600	60400	354
	316 L3	108	12.9	77500	115	35	—	—	180	200	225	250	—	—	159600	177500	63900	354
	316 L3	117	12.0	81000	111	35	—	—	180	200	225	250	—	—	163400	181700	65600	354
	316 L3	139	10.1	83500	97	35	—	—	180	200	225	250	—	—	172000	191300	69500	354
	316 L3	165	8.5	83600	81	35	—	—	180	200	225	250	—	—	181100	201400	73500	354
	316 L4	215	6.5	77800	60	18.0	132	160	180	200	—	—	—	—	195900	217900	80300	354
	316 L4	256	5.5	92800	60	18.0	132	160	180	200	—	—	—	—	206600	229800	85100	354
	316 L4	302	4.6	105300	58	18.0	132	160	180	200	—	—	—	—	217100	241500	90000	354
	316 L4	329	4.3	107900	54	18.0	132	160	180	200	—	—	—	—	222700	247600	92500	354
	316 L4	370	3.8	111700	50	18.0	132	160	180	200	—	—	—	—	230600	256500	96200	354
	316 L4	441	3.2	117500	44	18.0	132	160	180	200	—	—	—	—	243200	270500	102100	354
	316 L4	487	2.9	121000	41	18.0	132	160	180	200	—	—	—	—	250500	278600	105500	354
	316 L4	533	2.6	124200	39	18.0	132	160	180	200	—	—	—	—	257500	286400	108700	354
	316 L4	566	2.5	126100	37	18.0	132	160	180	200	—	—	—	—	262100	291500	110900	354
	316 L4	591	2.4	121600	34	18.0	132	160	180	200	—	—	—	—	265500	295300	112500	354
	316 L4	625	2.2	127000	34	18.0	132	160	180	200	—	—	—	—	270000	300300	114600	354
	316 L4	685	2.0	127900	31	18.0	132	160	180	200	—	—	—	—	277500	308600	118200	354
	316 L4	726	1.9	128500	29	18.0	132	160	180	200	—	—	—	—	282500	314100	120500	354
	316 L4	741	1.9	124300	28	18.0	132	160	180	200	—	—	—	—	284200	316100	121400	354
	316 L4	812	1.7	125400	26	18.0	132	160	180	200	—	—	—	—	292100	324900	125100	354
	316 L4	862	1.6	126100	24	18.0	132	160	180	200	—	—	—	—	297400	330700	127600	354
	316 L4	1043	1.3	128400	20	18.0	132	160	180	200	—	—	—	—	314800	350100	136000	354
	316 L4	1237	1.1	122700	16.4	18.0	132	160	180	200	—	—	—	—	331400	368600	144000	354
900	316 L2	17.4	52	34700	200	60	—	—	—	—	—	—	—	—	105300	117100	40200	354
	316 L2	22.3	40	44600	200	60	—	—	—	—	—	—	—	—	113400	126200	43700	354
	316 L2	26.5	34	52900	200	60	—	—	—	—	—	—	—	—	119400	132800	46300	354
	316 L3	59.6	15.1	66400	115	42	—	—	180	200	225	250	—	—	152300	169400	60700	354
	316 L3	71.1	12.7	78000	113	42	—	—	180	200	225	250	—	—	160600	178600	64400	354
	316 L3	76.5	11.8	81300	110	42	—	—	180	200	225	250	—	—	164200	182600	66000	354
	316 L3	91.3	9.9	84100	95	42	—	—	180	200	225	250	—	—	173100	192500	70000	354
	316 L3	108	8.3	88500	84	42	—	—	180	200	225	250	—	—	182200	202700	74100	354
	316 L3	117	7.7	93000	82	42	—	—	180	200	225	250	—	—	186600	207500	76000	354
	316 L3	139	6.5	95300	71	42	—	—	180	200	225	250	—	—	196400	218400	80500	354
	316 L3	165	5.5	95600	60	42	—	—	180	200	225	250	—	—	206700	229900	85200	354



316 L

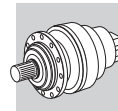
135000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
900	316 L4	215	4.2	108400	54	22	132	160	180	200	—	—	—	—	223700	248800	93000	354
	316 L4	256	3.5	114100	47	22	132	160	180	200	—	—	—	—	235900	262300	98700	354
	316 L4	302	3.0	119800	42	22	132	160	180	200	—	—	—	—	247900	275700	104300	354
	316 L4	329	2.7	122700	40	22	132	160	180	200	—	—	—	—	254200	282700	107200	354
	316 L4	370	2.4	126200	36	22	132	160	180	200	—	—	—	—	263300	292900	111500	354
	316 L4	441	2.0	127900	31	22	132	160	180	200	—	—	—	—	277700	308800	118300	354
	316 L4	487	1.8	128900	28	22	132	160	180	200	—	—	—	—	286000	318100	122200	354
	316 L4	533	1.7	129800	26	22	132	160	180	200	—	—	—	—	294000	327000	126000	354
	316 L4	566	1.6	130400	25	22	132	160	180	200	—	—	—	—	299200	332800	128500	354
	316 L4	591	1.5	126800	23	22	132	160	180	200	—	—	—	—	303100	337100	130400	354
	316 L4	625	1.4	131300	22	22	132	160	180	200	—	—	—	—	308300	342800	132800	354
	316 L4	685	1.3	132200	21	22	132	160	180	200	—	—	—	—	316800	352400	136900	354
	316 L4	726	1.2	132800	19.5	22	132	160	180	200	—	—	—	—	322500	358700	139700	354
	316 L4	741	1.2	129600	18.6	22	132	160	180	200	—	—	—	—	324500	360900	140600	354
	316 L4	812	1.1	130700	17.1	22	132	160	180	200	—	—	—	—	333500	370900	145000	354
	316 L4	862	1.0	131500	16.2	22	132	160	180	200	—	—	—	—	339500	377600	147900	354
	316 L4	1043	0.86	132000	13.5	22	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	1237	0.73	124000	10.7	22	132	160	180	200	—	—	—	—	345000	385000	150000	354
500	316 L2	17.4	28.8	60900	195	100	—	—	—	—	—	—	—	—	125600	139600	49000	354
	316 L2	22.3	22.4	67400	168	100	—	—	—	—	—	—	—	—	135300	150500	53200	354
	316 L2	26.5	18.9	65900	139	100	—	—	—	—	—	—	—	—	142400	158400	56300	354
	316 L3	59.6	8.4	88200	85	70	—	—	180	200	225	250	—	—	181700	202100	73800	354
	316 L3	71.1	7.0	93000	75	70	—	—	180	200	225	250	—	—	191600	213100	78300	354
	316 L3	76.5	6.5	98000	74	70	—	—	180	200	225	250	—	—	195800	217800	80200	354
	316 L3	91.3	5.5	100200	63	70	—	—	180	200	225	250	—	—	206500	229600	85100	354
	316 L3	108	4.6	104900	56	70	—	—	180	200	225	250	—	—	217400	241800	90100	354
	316 L3	117	4.3	111100	54	70	—	—	180	200	225	250	—	—	222500	247500	92500	354
	316 L3	139	3.6	111200	46	70	—	—	180	200	225	250	—	—	234300	260500	97900	354
	316 L3	165	3.0	110000	38	70	—	—	180	200	225	250	—	—	246600	274300	103700	354
	316 L4	215	2.3	126700	35	36	132	160	180	200	—	—	—	—	266800	296800	113100	354
	316 L4	256	2.0	128400	30	36	132	160	180	200	—	—	—	—	281400	312900	120000	354
	316 L4	302	1.7	130000	25	36	132	160	180	200	—	—	—	—	295700	328900	126800	354
	316 L4	329	1.5	130800	24	36	132	160	180	200	—	—	—	—	303200	337200	130400	354
	316 L4	370	1.4	132000	21	36	132	160	180	200	—	—	—	—	314100	349300	135600	354
	316 L4	441	1.1	133700	17.9	36	132	160	180	200	—	—	—	—	331200	368400	143800	354
	316 L4	487	1.0	134700	16.4	36	132	160	180	200	—	—	—	—	341200	379500	148700	354
	316 L4	533	0.94	135000	15.0	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	566	0.88	135000	14.1	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	591	0.85	132000	13.2	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	625	0.80	135000	12.8	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	685	0.73	135000	11.7	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	726	0.69	135000	11.0	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	741	0.67	132000	10.5	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	812	0.62	132000	9.6	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	862	0.58	132000	9.1	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	1043	0.48	132000	7.5	36	132	160	180	200	—	—	—	—	345000	385000	150000	354
	316 L4	1237	0.40	124000	5.9	36	132	160	180	200	—	—	—	—	345000	385000	150000	354

317 L

170000 Nm

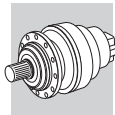
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	317 L3	58.1	24.1	54300	150	35	—	—	180	200	225	250	—	—	170200	181300	51900	362
	317 L3	69.3	20.2	64700	150	35	—	—	180	200	225	250	—	—	179500	191100	55100	362
	317 L3	89.0	15.7	83100	150	35	—	—	180	200	225	250	—	—	193500	206000	59900	362
	317 L3	106	13.3	98600	150	35	—	—	180	200	225	250	—	—	203700	216800	63400	362
	317 L3	116	12.1	108300	150	35	—	—	180	200	225	250	—	—	209500	223000	65400	362
	317 L3	138	10.2	116400	136	35	—	—	180	200	225	250	—	—	220500	234800	69200	362
	317 L3	166	8.4	123100	119	35	—	—	180	200	225	250	—	—	233100	248200	73600	362
	317 L3	179	7.8	133800	120	35	—	—	180	200	225	250	—	—	238700	254100	75600	362



317 L

170000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	317 L3	213	6.6	136500	103	35	—	—	180	200	225	250	—	—	251200	267500	80000	362
	317 L3	252	5.5	115000	73	35	—	—	180	200	225	250	—	—	264500	281600	84700	362
	317 L4	310	4.5	112300	60	18.0	132	160	180	200	—	—	—	—	281300	299500	90700	362
	317 L4	360	3.9	120500	55	18.0	132	160	180	200	—	—	—	—	294300	313300	95400	362
	317 L4	449	3.1	162600	60	18.0	132	160	180	200	—	—	—	—	314300	334700	102700	362
	317 L4	493	2.8	170400	57	18.0	132	160	180	200	—	—	—	—	323300	344200	105900	362
	317 L4	552	2.5	178200	53	18.0	132	160	180	200	—	—	—	—	334400	356100	110000	362
	317 L4	619	2.3	177200	47	18.0	132	160	180	200	—	—	—	—	346100	368500	114200	362
	317 L4	719	1.9	177500	41	18.0	132	160	180	200	—	—	—	—	362100	385500	120100	362
	317 L4	792	1.8	176900	37	18.0	132	160	180	200	—	—	—	—	372700	396900	124100	362
	317 L4	904	1.5	161700	30	18.0	132	160	180	200	—	—	—	—	387800	412900	129600	362
	317 L4	1032	1.4	178300	29	18.0	132	160	180	200	—	—	—	—	403600	429700	135500	362
	317 L4	1134	1.2	165900	24	18.0	132	160	180	200	—	—	—	—	415100	442000	139800	362
	317 L4	1318	1.1	145100	18.2	18.0	132	160	180	200	—	—	—	—	434300	462400	147000	362
	317 L4	1595	0.88	170000	17.7	18.0	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1893	0.74	145000	12.7	18.0	132	160	180	200	—	—	—	—	442000	470000	150000	362
900	317 L2	16.9	53	42300	250	55	—	—	—	—	—	—	—	—	134300	143000	39900	362
	317 L2	22.1	41	55100	250	55	—	—	—	—	—	—	—	—	145400	154800	43600	362
	317 L2	26.6	34	66400	250	55	—	—	—	—	—	—	—	—	153700	163700	46400	362
	317 L2	28.4	32	70800	250	55	—	—	—	—	—	—	—	—	156700	166900	47400	362
	317 L2	34.1	26.4	85200	250	55	—	—	—	—	—	—	—	—	165700	176400	50400	362
	317 L2	40.5	22.2	94900	235	55	—	—	—	—	—	—	—	—	174400	185700	53400	362
	317 L3	58.1	15.5	84400	150	42	—	—	180	200	225	250	—	—	194400	206900	60200	362
	317 L3	69.3	13.0	100700	150	42	—	—	180	200	225	250	—	—	204900	218200	63800	362
	317 L3	89.0	10.1	117600	136	42	—	—	180	200	225	250	—	—	220900	235200	69400	362
	317 L3	106	8.5	120700	118	42	—	—	180	200	225	250	—	—	232500	247600	73400	362
	317 L3	116	7.8	126200	112	42	—	—	180	200	225	250	—	—	239200	254600	75800	362
	317 L3	138	6.5	132900	100	42	—	—	180	200	225	250	—	—	251800	268100	80200	362
	317 L3	166	5.4	140500	88	42	—	—	180	200	225	250	—	—	266200	283400	85300	362
	317 L3	179	5.0	140900	81	42	—	—	180	200	225	250	—	—	272500	290100	87600	362
	317 L3	213	4.2	143800	70	42	—	—	180	200	225	250	—	—	286800	305400	92700	362
	317 L3	252	3.6	120200	49	42	—	—	180	200	225	250	—	—	302000	321500	98200	362
	317 L4	310	2.9	132900	46	22	132	160	180	200	—	—	—	—	321200	341900	105100	362
	317 L4	360	2.5	137000	40	22	132	160	180	200	—	—	—	—	336000	357700	110500	362
	317 L4	449	2.0	176200	42	22	132	160	180	200	—	—	—	—	358900	382100	118900	362
	317 L4	493	1.8	177700	38	22	132	160	180	200	—	—	—	—	369100	393000	122700	362
	317 L4	552	1.6	179500	35	22	132	160	180	200	—	—	—	—	381800	406500	127400	362
	317 L4	619	1.5	178200	31	22	132	160	180	200	—	—	—	—	395200	420700	132400	362
	317 L4	719	1.3	178500	26	22	132	160	180	200	—	—	—	—	413400	440200	139200	362
	317 L4	792	1.1	179300	24	22	132	160	180	200	—	—	—	—	425600	453100	143700	362
	317 L4	904	1.00	170000	20	22	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1032	0.87	179000	18.5	22	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1134	0.79	170000	16.0	22	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1318	0.68	170000	13.7	22	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1595	0.56	170000	11.3	22	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1893	0.48	145000	8.2	22	132	160	180	200	—	—	—	—	442000	470000	150000	362
500	317 L2	16.9	29.5	76100	250	104	—	—	—	—	—	—	—	—	160200	170600	48500	362
	317 L2	22.1	22.6	91400	230	104	—	—	—	—	—	—	—	—	173500	184700	53000	362
	317 L2	26.6	18.8	96700	202	104	—	—	—	—	—	—	—	—	183400	195300	56400	362
	317 L2	28.4	17.6	109500	215	104	—	—	—	—	—	—	—	—	186900	199000	57600	362
	317 L2	34.1	14.7	115900	189	104	—	—	—	—	—	—	—	—	197600	210400	61300	362
	317 L2	40.5	12.3	109300	150	104	—	—	—	—	—	—	—	—	208100	221500	64900	362
	317 L3	58.1	8.6	125400	124	70	—	—	180	200	225	250	—	—	231900	246900	73200	362
	317 L3	69.3	7.2	126600	105	70	—	—	180	200	225	250	—	—	244500	260300	77600	362
	317 L3	89.0	5.6	140100	90	70	—	—	180	200	225	250	—	—	263500	280500	84400	362
	317 L3	106	4.7	144300	78	70	—	—	180	200	225	250	—	—	277400	295300	89300	362
	317 L3	116	4.3	150500	74	70	—	—	180	200	225	250	—	—	285300	303700	92200	362
	317 L3	138	3.6	158400	66	70	—	—	180	200	225	250	—	—	300300	319700	97600	362
	317 L3	166	3.0	151900	53	70	—	—	180	200	225	250	—	—	317500	338000	103800	362
	317 L3	179	2.8	151000	48	70	—	—	180	200	225	250	—	—	325000	346100	106500	362
	317 L3	213	2.4	154100	42	70	—	—	180	200	225	250	—	—	342200	364300	112800	362
	317 L3	252	2.0	130600	30	70	—	—	180	200	225	250	—	—	360200	383500	119400	362



317 L

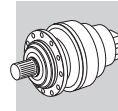
170000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
500	317 L4	310	1.6	157300	30	36	132	160	180	200	—	—	—	—	383100	407900	127900	362
	317 L4	360	1.4	163300	27	36	132	160	180	200	—	—	—	—	400800	426700	134500	362
	317 L4	449	1.1	179400	24	36	132	160	180	200	—	—	—	—	428100	455800	144700	362
	317 L4	493	1.0	179000	21	36	132	160	180	200	—	—	—	—	440300	468800	149300	362
	317 L4	552	0.91	180000	19.3	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	619	0.81	179000	17.1	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	719	0.70	179000	14.7	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	792	0.63	180000	13.4	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	904	0.55	170000	11.1	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1032	0.48	179000	10.3	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1134	0.44	170000	8.9	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1318	0.38	170000	7.6	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1595	0.31	170000	6.3	36	132	160	180	200	—	—	—	—	442000	470000	150000	362
	317 L4	1893	0.26	145000	4.5	36	132	160	180	200	—	—	—	—	442000	470000	150000	362

318 L

250000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	318 L3	76.5	18.3	95300	200	40	—	—	—	—	—	—	—	—	232000	236700	75900	370
	318 L3	98.2	14.3	122200	200	40	—	—	—	—	—	—	—	—	250000	255100	82500	370
	318 L3	117	12.0	145100	200	40	—	—	—	—	—	—	—	—	263200	268600	87300	370
	318 L3	123	11.4	153400	200	40	—	—	—	—	—	—	—	—	267600	273100	89000	370
	318 L3	146	9.6	175300	193	40	—	—	—	—	—	—	—	—	281700	287500	94200	370
	318 L3	170	8.2	182400	172	40	—	—	—	—	—	—	—	—	294700	300800	99000	370
	318 L4	262	5.3	182200	115	22	180	200	225	250	—	—	—	—	335700	342600	114400	370
	318 L4	313	4.5	217300	115	22	180	200	225	250	—	—	—	—	353900	361200	121400	370
	318 L4	337	4.2	222300	109	22	180	200	225	250	—	—	—	—	361800	369200	124400	370
	318 L4	402	3.5	231500	95	22	180	200	225	250	—	—	—	—	381500	389300	131900	370
	318 L4	422	3.3	234200	92	22	180	200	225	250	—	—	—	—	387300	395200	134100	370
	318 L4	477	2.9	240900	84	22	180	200	225	250	—	—	—	—	401600	409800	139700	370
	318 L4	515	2.7	245300	79	22	180	200	225	250	—	—	—	—	411100	419500	143300	370
	318 L4	612	2.3	250000	68	22	180	200	225	250	—	—	—	—	432800	441700	151800	370
	318 L4	647	2.2	250000	64	22	180	200	225	250	—	—	—	—	440100	449100	154600	370
	318 L4	726	1.9	250000	57	22	180	200	225	250	—	—	—	—	455600	464900	160700	370
	318 L4	768	1.8	250000	54	22	180	200	225	250	—	—	—	—	463300	472800	163700	370
	318 L4	911	1.5	250000	45	22	180	200	225	250	—	—	—	—	487700	497700	173300	370
	318 L4	1059	1.3	232800	36	22	180	200	225	250	—	—	—	—	503000	520700	182200	370
900	318 L3	76.5	11.8	148200	200	48	—	—	—	—	—	—	—	—	264800	270300	87900	370
	318 L3	98.2	9.2	177600	187	48	—	—	—	—	—	—	—	—	285400	291300	95600	370
	318 L3	117	7.7	186900	166	48	—	—	—	—	—	—	—	—	300500	306600	101200	370
	318 L3	123	7.3	190100	159	48	—	—	—	—	—	—	—	—	305500	311800	103100	370
	318 L3	146	6.2	200100	141	48	—	—	—	—	—	—	—	—	321600	328200	109100	370
	318 L3	170	5.3	205800	125	48	—	—	—	—	—	—	—	—	336500	343400	114700	370
	318 L4	262	3.4	232400	94	26	180	200	225	250	—	—	—	—	383300	391100	132600	370
	318 L4	313	2.9	242000	82	26	180	200	225	250	—	—	—	—	404100	412400	140600	370
	318 L4	337	2.7	246100	78	26	180	200	225	250	—	—	—	—	413000	421500	144100	370
	318 L4	402	2.2	250000	66	26	180	200	225	250	—	—	—	—	435500	444500	152800	370
	318 L4	422	2.1	250000	63	26	180	200	225	250	—	—	—	—	442200	451200	155400	370
	318 L4	477	1.9	250000	56	26	180	200	225	250	—	—	—	—	458500	467900	161800	370
	318 L4	515	1.7	250000	52	26	180	200	225	250	—	—	—	—	469400	479000	166100	370
	318 L4	612	1.5	250000	44	26	180	200	225	250	—	—	—	—	494100	504300	175800	370
	318 L4	647	1.4	250000	41	26	180	200	225	250	—	—	—	—	502500	512800	179100	370
	318 L4	726	1.2	250000	37	26	180	200	225	250	—	—	—	—	503000	530800	186200	370
	318 L4	768	1.2	250000	35	26	180	200	225	250	—	—	—	—	503000	539800	189700	370
	318 L4	911	0.99	250000	29	26	180	200	225	250	—	—	—	—	503000	565000	200000	370
	318 L4	1059	0.85	244000	25	26	180	200	225	250	—	—	—	—	503000	565000	200000	370



318 L

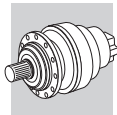
250000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 				MC	MZ	R_{n2} [N]		FZ	
													HC/PC	HZ/PZ		
500	318 L3	76.5	6.5	196500	147	80	—	—	—	—	—	—	315900	322400	107000	370
	318 L3	98.2	5.1	211800	124	80	—	—	—	—	—	—	340400	347400	116200	370
	318 L3	117	4.3	220700	109	80	—	—	—	—	—	—	358400	365700	123100	370
	318 L3	123	4.1	223500	104	80	—	—	—	—	—	—	364400	371900	125400	370
	318 L3	146	3.4	232500	91	80	—	—	—	—	—	—	383700	391500	132800	370
	318 L3	170	2.9	209000	71	80	—	—	—	—	—	—	401400	409600	139600	370
	318 L4	262	1.9	250000	56	44	180	200	225	250	—	—	457200	466600	161300	370
	318 L4	313	1.6	250000	47	44	180	200	225	250	—	—	482000	491900	171100	370
	318 L4	337	1.5	250000	44	44	180	200	225	250	—	—	492700	502800	175300	370
	318 L4	402	1.2	250000	37	44	180	200	225	250	—	—	503000	530200	185900	370
	318 L4	422	1.2	250000	35	44	180	200	225	250	—	—	503000	538200	189100	370
	318 L4	477	1.0	250000	31	44	180	200	225	250	—	—	503000	558100	196800	370
	318 L4	515	0.97	250000	29	44	180	200	225	250	—	—	503000	565000	200000	370
	318 L4	612	0.82	250000	24	44	180	200	225	250	—	—	503000	565000	200000	370
	318 L4	647	0.77	250000	23	44	180	200	225	250	—	—	503000	565000	200000	370
	318 L4	726	0.69	250000	20	44	180	200	225	250	—	—	503000	565000	200000	370
	318 L4	768	0.65	250000	19.3	44	180	200	225	250	—	—	503000	565000	200000	370
	318 L4	911	0.55	250000	16.2	44	180	200	225	250	—	—	503000	565000	200000	370
	318 L4	1059	0.47	244000	13.6	44	180	200	225	250	—	—	503000	565000	200000	370

319 L

350000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 				MC	MZ	R_{n2} [N]		FZ	
													HC/PC	HZ/PZ		
1400	319 L3	84.8	16.5	60700	115	50	—	—	—	—	—	—	274900	302900	78500	378
	319 L3	109	12.9	77900	115	50	—	—	—	—	—	—	296300	326400	85300	378
	319 L3	129	10.8	92400	115	50	—	—	—	—	—	—	311900	343600	90400	378
	319 L3	137	10.3	97700	115	50	—	—	—	—	—	—	317200	349400	92100	378
	319 L3	162	8.7	115700	115	50	—	—	—	—	—	—	333600	367600	97400	378
	319 L3	188	7.4	134800	115	50	—	—	—	—	—	—	349300	384900	102500	378
	319 L3	223	6.3	159600	115	50	—	—	—	—	—	—	367400	404800	108400	378
	319 L4	347	4.0	125600	60	30	180	200	225	250	—	—	419500	462200	125600	378
	319 L4	445	3.1	161200	60	30	180	200	225	250	—	—	452100	498100	136500	378
	319 L4	528	2.7	191400	60	30	180	200	225	250	—	—	476000	524400	144500	378
	319 L4	571	2.5	206900	60	30	180	200	225	250	—	—	487300	536800	148300	378
	319 L4	678	2.1	245600	60	30	180	200	225	250	—	—	513000	565100	157000	378
	319 L4	717	2.0	259700	60	30	180	200	225	250	—	—	521600	574700	160000	378
	319 L4	851	1.6	308200	60	30	180	200	225	250	—	—	549100	605000	169400	378
	319 L4	912	1.5	316600	58	30	180	200	225	250	—	—	560700	617700	173400	378
	319 L4	1007	1.4	321900	53	30	180	200	225	250	—	—	577600	636300	179200	378
	319 L4	1195	1.2	331200	46	30	180	200	225	250	—	—	608000	669900	189700	378
	319 L4	1389	1.0	339500	40	30	180	200	225	250	—	—	636100	700800	199500	378
900	319 L3	84.8	10.6	94400	115	60	—	—	—	—	—	—	313900	345800	91000	378
	319 L3	109	8.3	121100	115	60	—	—	—	—	—	—	338300	372700	98900	378
	319 L3	129	7.0	143800	115	60	—	—	—	—	—	—	356100	392400	104700	378
	319 L3	137	6.6	152000	115	60	—	—	—	—	—	—	362100	399000	106700	378
	319 L3	162	5.6	179900	115	60	—	—	—	—	—	—	380900	419700	112800	378
	319 L3	188	4.8	209700	115	60	—	—	—	—	—	—	398800	439400	118700	378
	319 L3	223	4.0	248200	115	60	—	—	—	—	—	—	419500	462200	125600	378
	319 L4	347	2.6	195400	60	36	180	200	225	250	—	—	479000	527700	145500	378
	319 L4	445	2.0	250800	60	36	180	200	225	250	—	—	516200	568700	158100	378
	319 L4	528	1.7	297700	60	36	180	200	225	250	—	—	543400	598700	167400	378
	319 L4	571	1.6	321900	60	36	180	200	225	250	—	—	556300	612900	171900	378
	319 L4	678	1.3	349400	55	36	180	200	225	250	—	—	585700	645300	182000	378
	319 L4	717	1.3	349500	52	36	180	200	225	250	—	—	595500	656100	185400	378
	319 L4	850	1.1	349900	44	36	180	200	225	250	—	—	626900	690700	196300	378
	319 L4	912	0.99	340000	40	36	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	1007	0.89	340000	36	36	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	1195	0.75	340000	30	36	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	1389	0.65	340000	26	36	180	200	225	250	—	—	638000	702000	200000	378



319 L

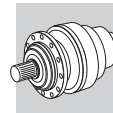
350000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 				MC	MZ	Rn ₂ [N]			
													HC/PC	HZ/PZ	FZ	
500	319 L3	84.8	5.9	169900	115	100	—	—	—	—	—	—	374400	412500	110700	378
	319 L3	109	4.6	218100	115	100	—	—	—	—	—	—	403500	444600	120300	378
	319 L3	129	3.9	258800	115	100	—	—	—	—	—	—	424800	468000	127400	378
	319 L3	137	3.7	273600	115	100	—	—	—	—	—	—	432000	475900	129700	378
	319 L3	162	3.1	281700	100	100	—	—	—	—	—	—	454400	500600	137200	378
	319 L3	188	2.7	290800	89	100	—	—	—	—	—	—	475800	524200	144400	378
	319 L3	223	2.2	297300	77	100	—	—	—	—	—	—	500400	551300	152800	378
	319 L4	347	1.4	349200	60	60	180	200	225	250	—	—	571400	629500	177000	378
	319 L4	445	1.1	349700	46	60	180	200	225	250	—	—	615800	678400	192400	378
	319 L4	528	0.95	350000	39	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	571	0.88	350000	36	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	678	0.74	350000	31	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	717	0.70	350000	29	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	850	0.59	350000	24	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	912	0.55	340000	22	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	1007	0.50	340000	20	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	1195	0.42	340000	16.8	60	180	200	225	250	—	—	638000	702000	200000	378
	319 L4	1389	0.36	340000	14.5	60	180	200	225	250	—	—	638000	702000	200000	378

321 L

500000 Nm

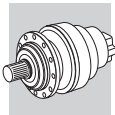
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 				MC	MZ	Rn ₂ [N]			
													HC/PC	HZ/PZ	FZ	
1400	321 L4	258	5.4	233900	150	35	180	200	225	250	—	—	471100	558700	683100	386
	321 L4	308	4.5	279100	150	35	180	200	225	250	—	—	496800	589100	724500	386
	321 L4	395	3.5	358200	150	35	180	200	225	250	—	—	535400	634900	787400	386
	321 L4	469	3.0	425100	150	35	180	200	225	250	—	—	563600	668300	833600	386
	321 L4	515	2.7	457200	147	35	180	200	225	250	—	—	579700	687400	860100	386
	321 L4	612	2.3	472700	128	35	180	200	225	250	—	—	610200	723600	910600	386
	321 L4	736	1.9	487000	110	35	180	200	225	250	—	—	645100	765000	968700	386
	321 L4	796	1.8	489200	102	35	180	200	225	250	—	—	660400	783200	994200	386
	321 L4	945	1.5	504100	88	35	180	200	225	250	—	—	695300	824500	1052600	386
	321 L4	1122	1.2	490100	72	35	180	200	225	250	—	—	731900	867900	1114500	386
900	321 L3	75.3	11.9	182400	250	60	—	—	—	—	—	—	371700	440800	524900	386
	321 L3	98.2	9.2	237700	250	60	—	—	—	—	—	—	402400	477200	573400	386
	321 L3	118	7.6	286100	250	60	—	—	—	—	—	—	425400	504500	609900	386
	321 L3	126	7.1	305100	250	60	—	—	—	—	—	—	433700	514300	623100	386
	321 L3	152	5.9	367200	250	60	—	—	—	—	—	—	458500	543700	662800	386
	321 L3	180	5.0	415000	238	60	—	—	—	—	—	—	482700	572400	701800	386
	321 L4	258	3.5	363900	150	42	180	200	225	250	—	—	537900	637900	791500	386
	321 L4	308	2.9	434200	150	42	180	200	225	250	—	—	567200	672600	839500	386
	321 L4	395	2.3	473100	127	42	180	200	225	250	—	—	611200	724800	912300	386
	321 L4	469	1.9	486300	110	42	180	200	225	250	—	—	643500	763100	965900	386
	321 L4	515	1.7	493700	102	42	180	200	225	250	—	—	661800	784800	996500	386
	321 L4	612	1.5	507500	88	42	180	200	225	250	—	—	696700	826200	1055100	386
	321 L4	736	1.2	522800	76	42	180	200	225	250	—	—	736600	873500	1122400	386
	321 L4	796	1.1	528500	71	42	180	200	225	250	—	—	754000	894200	1152000	386
	321 L4	945	0.95	540000	61	42	180	200	225	250	—	—	779000	923000	1200000	386
	321 L4	1122	0.80	498000	47	42	180	200	225	250	—	—	779000	923000	1200000	386
500	321 L3	75.3	6.6	328300	250	113	—	—	—	—	—	—	443300	525700	638500	386
	321 L3	98.2	5.1	394800	231	113	—	—	—	—	—	—	480000	569300	697500	386
	321 L3	118	4.2	411800	200	113	—	—	—	—	—	—	507500	601800	742000	386
	321 L3	126	4.0	426000	194	113	—	—	—	—	—	—	517300	613500	758000	386
	321 L3	152	3.3	439400	166	113	—	—	—	—	—	—	546900	648600	806300	386
	321 L3	180	2.8	457900	146	113	—	—	—	—	—	—	575800	682800	853700	386
	321 L4	258	1.9	485600	111	70	180	200	225	250	—	—	641600	760900	962800	386

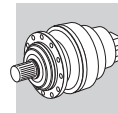


321 L

500000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 				R_{n_2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ					
500	321 L4	308	1.6	499600	96	70	180	200	225	250	—	—	676500	802300	1021200	386
	321 L4	395	1.3	520000	78	70	180	200	225	250	—	—	729100	864600	1109700	386
	321 L4	469	1.1	534500	67	70	180	200	225	250	—	—	767500	910200	1174900	386
	321 L4	516	0.97	540000	62	70	180	200	225	250	—	—	779000	923000	1200000	386
	321 L4	612	0.82	540000	52	70	180	200	225	250	—	—	779000	923000	1200000	386
	321 L4	736	0.68	540000	43	70	180	200	225	250	—	—	779000	923000	1200000	386
	321 L4	796	0.63	540000	40	70	180	200	225	250	—	—	779000	923000	1200000	386
	321 L4	945	0.53	540000	34	70	180	200	225	250	—	—	779000	923000	1200000	386
321 L4	1122	0.45	498000	26	70	180	200	225	250	—	—	779000	923000	1200000	386	





24.0 - DATI TECNICI RIDOTTO- RI ANGOLARI - 300 R

Guida alla consultazione delle
tabelle.

24.0 - RATING CHARTS FOR RIGHT-ANGLE UNITS 300 R

Reading the rating chart.

24.0 - TECHNISCHE DATEN DER GETRIEBE - 300 R

Anleitung für die richtige Konsul-
tation der Tabellen.

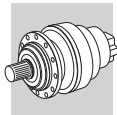
24.0 - DONNEES TECHNIQUES REDUCTEURS ANGULA- RES 300 R

Guide pour la consultation des
tableaux.



310 R							25000 Nm						
n ₁		i	n ₂	M _{n2}	P _{n1}	P _t	P (IEC)		R _{n2} [N]				
									MC	MZ	HC/PC	HZ/PZ	FZ
1400	310 R2 (B)	12.0											
	310 R2 (B)	15.4											
	310 R2 (B)	18.3											
	310 R2 (C)	16.6											
	310 R2 (C)	21.3											
	310 R2 (C)	25.3											
↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	
2	3	4	5	6	7	8		9			10		11

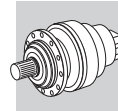
1	Coppia massima trasmissibile del riduttore	Max. transmissible torque	Nenn-Drehmoment am Abtrieb des Bezuggetriebes	Couple maximum du réducteur
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione angolare. NOTA: i suffissi (B) (C) sulla stessa grandezza indicano riduzioni angolari di dimensioni differenti: vedere le pagine dimensionali	Frame size of the right-angle gear unit. NOTE: letters (B) (C) near size indication identify different angle reduction dimensions. See pages relevant to dimensions	Getriebegröße in Winkelau-sführung. HINWEIS: Die Kennzeichnungen (B) (C) an der gleichen Bau-größe weisen auf die Winkelre-duzierung in unterschiedlichen Maßen hin: siehe Seiten mit Maßtabellen	Taille réducteur exécution angulaire. REMARQUE : les indications (B) (C) sur la même taille indique des réductions angulaires de dimensions différentes. Se repor-ter aux pages des dimensions
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie ré-ducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated output torque, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Drehmoment am Getriebe-abtrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 Std.	Couple nominal à la sortie du réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
7	Potenza nominale all'albero veloce del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Leistung am Getriebe-antrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 Std.	Puissance nominale en entrée réducteur avec : - facteur de sécurité S=1 - durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile	Frame size of available IEC motor	Baugröße des installierbaren IEC-Motors	Taille moteur électrique IEC à installer
10	Carichi radiali applicabili all'albero lento, basati su: - fattore di sicurezza S=1 - durata teorica 10000 h Per forze non applicate in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 hrs theoretical lifetime For forces applying off the mid-point, see diagrams provided in the pages following dimensions of the gearbox under study	Auf die Mitte der Abtriebswelle für eine Dauer von 10000 Std. applizierbare Nenn-Radialkräfte und Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions



300 R

1000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
1400	300 R2	7.13	196	520	11.4	12.0	71	80	90	100	112	132	2090	2090	6300	7230	1380	229
	300 R2	8.74	160	530	9.4	12.0	71	80	90	100	112	132	2240	2240	6690	7690	1470	229
	300 R2	11.8	118	550	7.3	12.0	71	80	90	100	112	132	2480	2480	7330	8420	1630	229
	300 R2	14.8	95	510	5.4	12.0	71	80	90	100	112	132	2670	2670	7830	9000	1750	229
	300 R2	18.5	76	370	3.1	12.0	71	80	90	100	112	132	2870	2870	8370	9620	1890	229
	300 R3	24.8	56	650	4.2	12.0	71	80	90	100	112	132	3170	3170	9150	10500	2090	229
	300 R3	30.4	46	760	4.0	12.0	71	80	90	100	112	132	3400	3400	9730	11200	2230	229
	300 R3	37.3	38	780	3.3	12.0	71	80	90	100	112	132	3630	3630	10300	11900	2390	229
	300 R3	41.2	34	650	2.5	12.0	71	80	90	100	112	132	3760	3760	10600	12200	2470	229
	300 R3	50.4	27.8	790	2.5	12.0	71	80	90	100	112	132	4020	4020	11300	13000	2640	229
	300 R3	62.9	22.2	800	2.1	12.0	71	80	90	100	112	132	4330	4330	12100	13900	2840	229
	300 R3	68.2	20.5	650	1.5	12.0	71	80	90	100	112	132	4440	4440	12400	14200	2920	229
	300 R3	78.7	17.8	820	1.7	12.0	71	80	90	100	112	132	4660	4660	12900	14900	3060	229
	300 R3	85.2	16.4	650	1.2	12.0	71	80	90	100	112	132	4790	4790	13200	15200	3150	229
	300 R3	107	13.2	650	0.98	12.0	71	80	90	100	112	132	5160	5160	14200	16300	3390	229
	300 R3	133	10.5	550	0.67	12.0	71	80	90	100	112	132	5550	5550	15100	17400	3650	229
	300 R4	106	13.2	830	1.3	10.0	71	80	90	100	112	132	5150	5150	14100	16200	3380	229
	300 R4	130	10.8	850	1.1	10.0	71	80	90	100	112	132	5510	5510	15000	17300	3620	229
	300 R4	143	9.8	650	0.75	10.0	71	80	90	100	112	132	5690	5690	15500	17800	3740	229
	300 R4	159	8.8	860	0.89	10.0	71	80	90	100	112	132	5890	5890	16000	18300	3870	229
	300 R4	175	8.0	860	0.81	10.0	71	80	90	100	112	132	6090	6090	16500	18900	4000	229
	300 R4	215	6.5	870	0.67	10.0	71	80	90	100	112	132	6520	6520	17500	20100	4280	229
	300 R4	237	5.9	650	0.45	10.0	71	80	90	100	112	132	6740	6740	18000	20700	4430	229
	300 R4	268	5.2	890	0.55	10.0	71	80	90	100	112	132	7020	7020	18700	21500	4610	229
	300 R4	291	4.8	900	0.51	10.0	71	80	90	100	112	132	7210	7210	19100	22000	4740	229
	300 R4	363	3.9	930	0.42	10.0	71	80	90	100	112	132	7760	7760	20500	23500	5100	229
	300 R4	394	3.6	690	0.29	10.0	71	80	90	100	112	132	7970	7970	21000	24100	5240	229
	300 R4	453	3.1	960	0.35	10.0	71	80	90	100	112	132	8350	8350	21900	25100	5490	229
	300 R4	491	2.8	710	0.24	10.0	71	80	90	100	112	132	8580	8580	22400	25700	5640	229
	300 R4	613	2.3	740	0.20	10.0	71	80	90	100	112	132	9240	9240	23900	27500	6080	229
	300 R4	766	1.8	770	0.17	10.0	71	80	90	100	112	132	9950	9950	25600	29400	6540	229
900	300 R2	7.13	126	600	8.4	14.4	71	80	90	100	112	132	2430	2430	7190	8260	1600	229
	300 R2	8.74	103	600	6.9	14.4	71	80	90	100	112	132	2600	2600	7640	8780	1710	229
	300 R2	11.8	76	610	5.1	14.4	71	80	90	100	112	132	2870	2870	8360	9610	1890	229
	300 R2	14.8	61	540	3.7	14.4	71	80	90	100	112	132	3090	3090	8940	10300	2030	229
	300 R2	18.5	49	370	2.0	14.4	71	80	90	100	112	132	3330	3330	9560	11000	2190	229
	300 R3	24.8	36	650	2.7	14.4	71	80	90	100	112	132	3680	3680	10400	12000	2420	229
	300 R3	30.4	29.6	790	2.7	14.4	71	80	90	100	112	132	3930	3930	11100	12800	2590	229
	300 R3	37.3	24.2	800	2.2	14.4	71	80	90	100	112	132	4210	4210	11800	13600	2770	229
	300 R3	41.2	21.9	650	1.6	14.4	71	80	90	100	112	132	4350	4350	12200	14000	2860	229
	300 R3	50.4	17.9	820	1.7	14.4	71	80	90	100	112	132	4660	4660	12900	14800	3060	229
	300 R3	62.9	14.3	830	1.4	14.4	71	80	90	100	112	132	5010	5010	13800	15900	3300	229
	300 R3	68.2	13.2	650	0.98	14.4	71	80	90	100	112	132	5150	5150	14200	16300	3390	229
	300 R3	78.7	11.4	840	1.1	14.4	71	80	90	100	112	132	5400	5400	14800	17000	3550	229
	300 R3	85.2	10.6	650	0.79	14.4	71	80	90	100	112	132	5540	5540	15100	17400	3650	229
	300 R3	107	8.5	650	0.63	14.4	71	80	90	100	112	132	5970	5970	16200	18600	3930	229
	300 R3	133	6.8	550	0.43	14.4	71	80	90	100	112	132	6430	6430	17300	19900	4230	229
	300 R4	106	8.5	860	0.86	12.0	71	80	90	100	112	132	5960	5960	16100	18500	3920	229
	300 R4	130	6.9	870	0.71	12.0	71	80	90	100	112	132	6380	6380	17200	19700	4190	229
	300 R4	143	6.3	650	0.48	12.0	71	80	90	100	112	132	6590	6590	17700	20300	4340	229
	300 R4	159	5.7	880	0.59	12.0	71	80	90	100	112	132	6830	6830	18200	20900	4490	229
	300 R4	175	5.1	890	0.54	12.0	71	80	90	100	112	132	7060	7060	18800	21600	4640	229
	300 R4	215	4.2	920	0.45	12.0	71	80	90	100	112	132	7550	7550	20000	22900	4960	229
	300 R4	237	3.8	680	0.31	12.0	71	80	90	100	112	132	7800	7800	20600	23600	5130	229
	300 R4	268	3.4	950	0.38	12.0	71	80	90	100	112	132	8130	8130	21300	24500	5340	229
	300 R4	291	3.1	960	0.35	12.0	71	80	90	100	112	132	8350	8350	21900	25100	5490	229
	300 R4	363	2.5	1000	0.29	12.0	71	80	90	100	112	132	8990	8990	23400	26800	5910	229
	300 R4	394	2.3	740	0.20	12.0	71	80	90	100	112	132	9240	9240	23900	27500	6070	229
	300 R4	453	2.0	1000	0.23	12.0	71	80	90	100	112	132	9680	9680	25000	28700	6360	229
	300 R4	491	1.8	770	0.17	12.0	71	80	90	100	112	132	9940	9940	25600	29400	6540	229
	300 R4	613	1.5	800	0.14	12.0	71	80	90	100	112	132	10700	10700	27300	31400	7040	229
	300 R4	766	1.2	840	0.12	12.0	71	80	90	100	112	132	11500	11500	29200	33600	7580	229



300 R

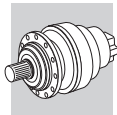
1000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
500	300 R2	7.13	70	650	5.0	24	71	80	90	100	112	132	2950	2950	8570	9850	1940	229
	300 R2	8.74	57	730	4.6	24	71	80	90	100	112	132	3160	3160	9110	10500	2080	229
	300 R2	11.8	42	650	3.1	24	71	80	90	100	112	132	3490	3490	9980	11500	2300	229
	300 R2	14.8	34	550	2.1	24	71	80	90	100	112	132	3760	3760	10700	12300	2470	229
	300 R2	18.5	27.1	370	1.1	24	71	80	90	100	112	132	4050	4050	11400	13100	2660	229
	300 R3	24.8	20.1	650	1.5	24	71	80	90	100	112	132	4470	4470	12500	14300	2940	229
	300 R3	30.4	16.4	820	1.5	24	71	80	90	100	112	132	4790	4790	13200	15200	3150	229
	300 R3	37.3	13.4	830	1.3	24	71	80	90	100	112	132	5120	5120	14100	16200	3370	229
	300 R3	41.2	12.1	650	0.91	24	71	80	90	100	112	132	5290	5290	14500	16700	3480	229
	300 R3	50.4	9.9	850	0.97	24	71	80	90	100	112	132	5660	5660	15400	17700	3720	229
	300 R3	62.9	7.9	860	0.79	24	71	80	90	100	112	132	6100	6100	16500	18900	4010	229
	300 R3	68.2	7.3	650	0.55	24	71	80	90	100	112	132	6260	6260	16900	19400	4120	229
	300 R3	78.7	6.4	880	0.64	24	71	80	90	100	112	132	6570	6570	17600	20200	4320	229
	300 R3	85.2	5.9	650	0.44	24	71	80	90	100	112	132	6750	6750	18000	20700	4430	229
	300 R3	107	4.7	660	0.35	24	71	80	90	100	112	132	7270	7270	19300	22200	4780	229
	300 R3	133	3.8	570	0.25	24	71	80	90	100	112	132	7820	7820	20600	23700	5140	229
	300 R4	107	4.7	900	0.50	20	71	80	90	100	112	132	7250	7250	19300	22100	4770	229
	300 R4	130	3.9	930	0.42	20	71	80	90	100	112	132	7760	7760	20500	23500	5100	229
	300 R4	143	3.5	690	0.29	20	71	80	90	100	112	132	8020	8020	21100	24200	5270	229
	300 R4	159	3.1	960	0.36	20	71	80	90	100	112	132	8300	8300	21700	25000	5460	229
	300 R4	175	2.8	980	0.33	20	71	80	90	100	112	132	8580	8580	22400	25700	5640	229
	300 R4	215	2.3	1000	0.28	20	71	80	90	100	112	132	9180	9180	23800	27400	6040	229
	300 R4	237	2.1	750	0.19	20	71	80	90	100	112	132	9490	9490	24500	28200	6240	229
	300 R4	268	1.9	1000	0.22	20	71	80	90	100	112	132	9890	9890	25500	29200	6500	229
	300 R4	291	1.7	1000	0.20	20	71	80	90	100	112	132	10200	10200	26100	30000	6680	229
	300 R4	363	1.4	1000	0.16	20	71	80	90	100	112	132	10900	10900	27900	32000	7190	229
	300 R4	394	1.3	820	0.12	20	71	80	90	100	112	132	11200	11200	28600	32800	7390	229
	300 R4	453	1.1	1000	0.13	20	71	80	90	100	112	132	11800	11800	29800	34000	7740	229
	300 R4	491	1.0	860	0.10	20	71	80	90	100	112	132	12000	12100	30500	34000	7950	229
	300 R4	613	0.82	860	0.08	20	71	80	90	100	112	132	12000	12500	31000	34000	8000	229
	300 R4	766	0.65	860	0.07	20	71	80	90	100	112	132	12000	12500	31000	34000	8000	229

301 R

1750 Nm

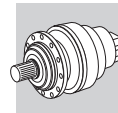
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						Rn ₂ [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
1400	301 R2	7.13	196	690	15.0	12.0	71	80	90	100	112	132	2090	2090	6300	7230	1380	237
	301 R2	8.74	160	840	15.0	12.0	71	80	90	100	112	132	2240	2240	6690	7690	1470	237
	301 R2	11.8	118	1000	13.1	12.0	71	80	90	100	112	132	2480	2480	7330	8420	1630	237
	301 R2	14.8	95	950	10.1	12.0	71	80	90	100	112	132	2670	2670	7830	9000	1750	237
	301 R2	18.5	76	660	5.6	12.0	71	80	90	100	112	132	2870	2870	8370	9620	1890	237
	301 R3	24.8	56	1260	8.2	12.0	71	80	90	100	112	132	3170	3170	9150	10500	2090	237
	301 R3	30.4	46	1370	7.2	12.0	71	80	90	100	112	132	3400	3400	9730	11200	2230	237
	301 R3	37.3	38	1410	6.1	12.0	71	80	90	100	112	132	3630	3630	10300	11900	2390	237
	301 R3	41.2	34	1300	5.1	12.0	71	80	90	100	112	132	3760	3760	10600	12200	2470	237
	301 R3	50.4	27.8	1470	4.7	12.0	71	80	90	100	112	132	4020	4020	11300	13000	2640	237
	301 R3	62.9	22.2	1520	3.9	12.0	71	80	90	100	112	132	4330	4330	12100	13900	2840	237
	301 R3	68.2	20.5	1300	3.1	12.0	71	80	90	100	112	132	4440	4440	12400	14200	2920	237
	301 R3	78.7	17.8	1490	3.0	12.0	71	80	90	100	112	132	4660	4660	12900	14900	3060	237
	301 R3	85.2	16.4	1300	2.5	12.0	71	80	90	100	112	132	4790	4790	13200	15200	3150	237
	301 R3	107	13.2	1300	2.0	12.0	71	80	90	100	112	132	5160	5160	14200	16300	3390	237
	301 R3	133	10.5	1150	1.4	12.0	71	80	90	100	112	132	5550	5550	15100	17400	3650	237
	301 R4	106	13.2	1630	2.6	10.0	71	80	90	100	112	132	5150	5150	14100	16200	3380	237
	301 R4	130	10.8	1680	2.1	10.0	71	80	90	100	112	132	5510	5510	15000	17300	3620	237
	301 R4	143	9.8	1300	1.5	10.0	71	80	90	100	112	132	5690	5690	15500	17800	3740	237
	301 R4	159	8.8	1710	1.8	10.0	71	80	90	100	112	132	5890	5890	16000	18300	3870	237
	301 R4	175	8.0	1720	1.6	10.0	71	80	90	100	112	132	6090	6090	16500	18900	4000	237
	301 R4	215	6.5	1730	1.3	10.0	71	80	90	100	112	132	6520	6520	17500	20100	4280	237
	301 R4	237	5.9	1300	0.91	10.0	71	80	90	100	112	132	6740	6740	18000	20700	4430	237
	301 R4	268	5.2	1750	1.1	10.0	71	80	90	100	112	132	7020	7020	18700	21500	4610	237



301 R

1750 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
1400	301 R4	291	4.8	1760	1.0	10.0	71	80	90	100	112	132	7210	7210	19100	22000	4740	237
	301 R4	363	3.9	1840	0.84	10.0	71	80	90	100	112	132	7760	7760	20500	23500	5100	237
	301 R4	394	3.6	1370	0.58	10.0	71	80	90	100	112	132	7970	7970	21000	24100	5240	237
	301 R4	453	3.1	1920	0.70	10.0	71	80	90	100	112	132	8350	8350	21900	25100	5490	237
	301 R4	491	2.8	1420	0.48	10.0	71	80	90	100	112	132	8580	8580	22400	25700	5640	237
	301 R4	613	2.3	1470	0.40	10.0	71	80	90	100	112	132	9240	9240	23900	27500	6080	237
	301 R4	766	1.8	1530	0.33	10.0	71	80	90	100	112	132	9950	9950	25600	29400	6540	237
900	301 R2	7.13	126	830	11.7	14.4	71	80	90	100	112	132	2430	2430	7190	8260	1600	237
	301 R2	8.74	103	1040	11.9	14.4	71	80	90	100	112	132	2600	2600	7640	8780	1710	237
	301 R2	11.8	76	1140	9.7	14.4	71	80	90	100	112	132	2870	2870	8360	9610	1890	237
	301 R2	14.8	61	1090	7.4	14.4	71	80	90	100	112	132	3090	3090	8940	10300	2030	237
	301 R2	18.5	49	660	3.6	14.4	71	80	90	100	112	132	3330	3330	9560	11000	2190	237
	301 R3	24.8	36	1300	5.4	14.4	71	80	90	100	112	132	3680	3680	10400	12000	2420	237
	301 R3	30.4	29.6	1460	4.9	14.4	71	80	90	100	112	132	3930	3930	11100	12800	2590	237
	301 R3	37.3	24.2	1500	4.2	14.4	71	80	90	100	112	132	4210	4210	11800	13600	2770	237
	301 R3	41.2	21.9	1300	3.3	14.4	71	80	90	100	112	132	4350	4350	12200	14000	2860	237
	301 R3	50.4	17.9	1560	3.2	14.4	71	80	90	100	112	132	4660	4660	12900	14800	3060	237
	301 R3	62.9	14.3	1620	2.7	14.4	71	80	90	100	112	132	5010	5010	13800	15900	3300	237
	301 R3	68.2	13.2	1300	2.0	14.4	71	80	90	100	112	132	5150	5150	14200	16300	3390	237
	301 R3	78.7	11.4	1570	2.1	14.4	71	80	90	100	112	132	5400	5400	14800	17000	3550	237
	301 R3	85.2	10.6	1300	1.6	14.4	71	80	90	100	112	132	5540	5540	15100	17400	3650	237
	301 R3	107	8.5	1300	1.3	14.4	71	80	90	100	112	132	5970	5970	16200	18600	3930	237
	301 R3	133	6.8	1150	0.89	14.4	71	80	90	100	112	132	6430	6430	17300	19900	4230	237
	301 R4	106	8.5	1710	1.7	12.0	71	80	90	100	112	132	5960	5960	16100	18500	3920	237
	301 R4	130	6.9	1730	1.4	12.0	71	80	90	100	112	132	6380	6380	17200	19700	4190	237
	301 R4	143	6.3	1300	0.97	12.0	71	80	90	100	112	132	6590	6590	17700	20300	4340	237
	301 R4	159	5.7	1740	1.2	12.0	71	80	90	100	112	132	6830	6830	18200	20900	4490	237
	301 R4	175	5.1	1750	1.1	12.0	71	80	90	100	112	132	7060	7060	18800	21600	4640	237
	301 R4	215	4.2	1810	0.90	12.0	71	80	90	100	112	132	7550	7550	20000	22900	4960	237
	301 R4	237	3.8	1360	0.61	12.0	71	80	90	100	112	132	7800	7800	20600	23600	5130	237
	301 R4	268	3.4	1890	0.75	12.0	71	80	90	100	112	132	8130	8130	21300	24500	5340	237
	301 R4	291	3.1	1920	0.70	12.0	71	80	90	100	112	132	8350	8350	21900	25100	5490	237
	301 R4	363	2.5	2000	0.59	12.0	71	80	90	100	112	132	8990	8990	23400	26800	5910	237
	301 R4	394	2.3	1470	0.40	12.0	71	80	90	100	112	132	9240	9240	23900	27500	6070	237
	301 R4	453	2.0	2000	0.47	12.0	71	80	90	100	112	132	9680	9680	25000	28700	6360	237
	301 R4	491	1.8	1530	0.33	12.0	71	80	90	100	112	132	9940	9940	25600	29400	6540	237
	301 R4	613	1.5	1590	0.28	12.0	71	80	90	100	112	132	10700	10700	27300	31400	7040	237
	301 R4	766	1.2	1650	0.23	12.0	71	80	90	100	112	132	11500	11500	29200	33600	7580	237
500	301 R2	7.13	70	990	7.7	24	71	80	90	100	112	132	2950	2950	8570	9850	1940	237
	301 R2	8.74	57	1210	7.7	24	71	80	90	100	112	132	3160	3160	9110	10500	2080	237
	301 R2	11.8	42	1300	6.1	24	71	80	90	100	112	132	3490	3490	9980	11500	2300	237
	301 R2	14.8	34	1150	4.3	24	71	80	90	100	112	132	3760	3760	10700	12300	2470	237
	301 R2	18.5	27.1	660	2.0	24	71	80	90	100	112	132	4050	4050	11400	13100	2660	237
	301 R3	24.8	20.1	1300	3.0	24	71	80	90	100	112	132	4470	4470	12500	14300	2940	237
	301 R3	30.4	16.4	1580	3.0	24	71	80	90	100	112	132	4790	4790	13200	15200	3150	237
	301 R3	37.3	13.4	1630	2.5	24	71	80	90	100	112	132	5120	5120	14100	16200	3370	237
	301 R3	41.2	12.1	1300	1.8	24	71	80	90	100	112	132	5290	5290	14500	16700	3480	237
	301 R3	50.4	9.9	1700	1.9	24	71	80	90	100	112	132	5660	5660	15400	17700	3720	237
	301 R3	62.9	7.9	1720	1.6	24	71	80	90	100	112	132	6100	6100	16500	18900	4010	237
	301 R3	68.2	7.3	1300	1.1	24	71	80	90	100	112	132	6260	6260	16900	19400	4120	237
	301 R3	78.7	6.4	1600	1.2	24	71	80	90	100	112	132	6570	6570	17600	20200	4320	237
	301 R3	85.2	5.9	1300	0.88	24	71	80	90	100	112	132	6750	6750	18000	20700	4430	237
	301 R3	106	4.7	1310	0.71	24	71	80	90	100	112	132	7270	7270	19300	22200	4780	237
	301 R3	133	3.8	1150	0.50	24	71	80	90	100	112	132	7820	7820	20600	23700	5140	237
	301 R4	107	4.7	1770	0.99	20	71	80	90	100	112	132	7250	7250	19300	22100	4770	237
	301 R4	130	3.9	1840	0.84	20	71	80	90	100	112	132	7760	7760	20500	23500	5100	237
	301 R4	143	3.5	1380	0.57	20	71	80	90	100	112	132	8020	8020	21100	24200	5270	237
	301 R4	159	3.1	1910	0.71	20	71	80	90	100	112	132	8300	8300	21700	25000	5460	237
	301 R4	175	2.8	1950	0.66	20	71	80	90	100	112	132	8580	8580	22400	25700	5640	237
	301 R4	215	2.3	2000	0.55	20	71	80	90	100	112	132	9180	9180	23800	27400	6040	237
	301 R4	237	2.1	1490	0.37	20	71	80	90	100	112	132	9490	9490	24500	28200	6240	237
	301 R4	268	1.9	2000	0.44	20	71	80	90	100	112	132	9890	9890	25500	29200	6500	237



301 R

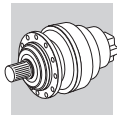
1750 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						MC	MZ	Rn ₂ [N]			FZ	
															HC/PC	HZ/PZ			
500	301 R4	291	1.7	2000	0.41	20	71	80	90	100	112	132	10200	10200	26100	30000	6680	237	
	301 R4	363	1.4	2000	0.33	20	71	80	90	100	112	132	10900	10900	27900	32000	7190	237	
	301 R4	394	1.3	1630	0.25	20	71	80	90	100	112	132	11200	11200	28600	32800	7390	237	
	301 R4	453	1.1	2000	0.26	20	71	80	90	100	112	132	11800	11800	29800	34000	7740	237	
	301 R4	491	1.0	1690	0.20	20	71	80	90	100	112	132	12000	12100	30500	34000	7950	237	
	301 R4	613	0.82	1700	0.16	20	71	80	90	100	112	132	12000	12500	31000	34000	8000	237	
	301 R4	766	0.65	1700	0.13	20	71	80	90	100	112	132	12000	12500	31000	34000	8000	237	

303 R

2500 Nm

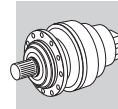
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						MC	MZ	Rn ₂ [N]			FZ	
															HC/PC	HZ/PZ			
1400	303 R2	9.23	152	1410	24	18.0	71	80	90	100	112	132	7010	8100	13900	16700	4500	245	
	303 R2	10.9	129	1620	23	18.0	71	80	90	100	112	132	7410	8560	14600	17600	4760	245	
	303 R2	13.7	102	1690	19.2	18.0	71	80	90	100	112	132	8000	9230	15600	18800	5130	245	
	303 R2	15.9	88	1460	14.3	18.0	71	80	90	100	112	132	8410	9710	16300	19700	5390	245	
	303 R2	19.2	73	1570	12.7	18.0	71	80	90	100	112	132	8960	10300	17300	20800	5750	245	
	303 R2	24.8	57	860	5.4	18.0	71	80	90	100	112	132	9750	11300	18700	22500	6250	245	
	303 R3	25.7	55	1800	11.3	14.0	71	80	90	100	112	132	9870	11400	18900	22700	6330	245	
	303 R3	31.5	45	1820	9.3	14.0	71	80	90	100	112	132	10600	12200	20100	24100	6770	245	
	303 R3	37.1	38	2090	9.1	14.0	71	80	90	100	112	132	11200	12900	21100	25400	7160	245	
	303 R3	42.6	33	1800	6.8	14.0	71	80	90	100	112	132	11700	13500	22000	26400	7490	245	
	303 R3	46.6	30	2130	7.3	14.0	71	80	90	100	112	132	12000	13900	22600	27200	7720	245	
	303 R3	50.3	27.9	2130	6.8	14.0	71	80	90	100	112	132	12300	14200	23100	27800	7920	245	
	303 R3	54.2	25.8	1770	5.2	14.0	71	80	90	100	112	132	12700	14600	23600	28400	8120	245	
	303 R3	63.1	22.2	2150	5.5	14.0	71	80	90	100	112	132	13300	15400	24700	29700	8540	245	
	303 R3	73.3	19.1	1780	3.9	14.0	71	80	90	100	112	132	14000	16200	25900	31100	8980	245	
	303 R3	78.7	17.8	2130	4.3	14.0	71	80	90	100	112	132	14300	16500	26400	31800	9190	245	
	303 R3	91.5	15.3	1790	3.1	14.0	71	80	90	100	112	132	15100	17400	27600	33200	9670	245	
	303 R3	114	12.2	1790	2.5	14.0	71	80	90	100	112	132	16200	18700	29500	35500	10400	245	
	303 R4	129	10.8	2570	3.3	12.0	71	80	90	100	112	132	16900	19500	30600	36900	10800	245	
	303 R4	148	9.4	2100	2.4	12.0	71	80	90	100	112	132	17700	20400	31900	38400	11400	245	
	303 R4	158	8.8	2610	2.7	12.0	71	80	90	100	112	132	18100	20900	32600	39200	11600	245	
	303 R4	185	7.6	2120	1.9	12.0	71	80	90	100	112	132	19100	22000	34100	41100	12200	245	
	303 R4	214	6.5	2630	2.0	12.0	71	80	90	100	112	132	20000	23100	35700	42900	12800	245	
	303 R4	231	6.1	1800	1.3	12.0	71	80	90	100	112	132	20500	23700	36500	43900	13200	245	
	303 R4	255	5.5	1800	1.2	12.0	71	80	90	100	112	132	21200	24500	37600	45200	13600	245	
	303 R4	290	4.8	2650	1.5	12.0	71	80	90	100	112	132	22100	25600	39100	47000	14200	245	
	303 R4	313	4.5	1830	0.97	12.0	71	80	90	100	112	132	22700	26200	39900	48100	14600	245	
	303 R4	336	4.2	2260	1.1	12.0	71	80	90	100	112	132	23200	26800	40800	49100	14900	245	
	303 R4	364	3.8	2290	1.0	12.0	71	80	90	100	112	132	23900	27600	41800	50300	15300	245	
	303 R4	390	3.6	1890	0.80	12.0	71	80	90	100	112	132	24400	28200	42700	51400	15700	245	
	303 R4	452	3.1	2250	0.82	12.0	71	80	90	100	112	132	25700	29600	44600	53700	16500	245	
	303 R4	528	2.7	1980	0.62	12.0	71	80	90	100	112	132	27000	31200	46700	56200	17300	245	
	303 R4	567	2.5	2450	0.72	12.0	71	80	90	100	112	132	27700	32000	47700	57400	17800	245	
	303 R4	659	2.1	2050	0.52	12.0	71	80	90	100	112	132	29100	33600	50000	60100	18700	245	
	303 R4	797	1.8	1840	0.38	12.0	71	80	90	100	112	132	31000	35800	52900	63600	19900	245	
	303 R4	824	1.7	2120	0.43	12.0	71	80	90	100	112	132	31300	36200	53400	64300	20100	245	
900	303 R2	9.23	98	1610	17.5	22	71	80	90	100	112	132	8130	9380	15800	19100	5210	245	
	303 R2	10.9	83	1850	17.0	22	71	80	90	100	112	132	8590	9920	16700	20000	5510	245	
	303 R2	13.7	66	1930	14.2	22	71	80	90	100	112	132	9260	10700	17800	21500	5940	245	
	303 R2	15.9	57	1680	10.6	22	71	80	90	100	112	132	9740	11200	18700	22400	6250	245	
	303 R2	19.2	47	1650	8.6	22	71	80	90	100	112	132	10400	12000	19800	23800	6660	245	
	303 R2	24.8	36	860	3.5	22	71	80	90	100	112	132	11300	13000	21300	25600	7250	245	
	303 R3	25.7	35	1900	7.6	16.8	71	80	90	100	112	132	11400	13200	21500	25900	7330	245	
	303 R3	31.5	28.6	1900	6.2	16.8	71	80	90	100	112	132	12200	14100	22900	27600	7850	245	
	303 R3	37.1	24.2	2250	6.3	16.8	71	80	90	100	112	132	12900	14900	24100	29000	8290	245	
	303 R3	42.6	21.1	1900	4.6	16.8	71	80	90	100	112	132	13500	15600	25100	30200	8680	245	
	303 R3	46.6	19.3	2160	4.8	16.8	71	80	90	100	112	132	13900	16100	25800	31000	8950	245	



303 R

2500 Nm

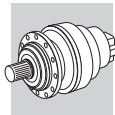
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ								
900	303 R3	50.3	17.9	2320	4.8	16.8	71	80	90	100	112	132	14300	16500	26400	31700	9170	245	
	303 R3	54.2	16.6	1780	3.4	16.8	71	80	90	100	112	132	14700	16900	27000	32400	9410	245	
	303 R3	63.1	14.3	2180	3.6	16.8	71	80	90	100	112	132	15400	17800	28200	33900	9900	245	
	303 R3	73.3	12.3	1790	2.5	16.8	71	80	90	100	112	132	16200	18700	29500	35500	10400	245	
	303 R3	78.7	11.4	2180	2.9	16.8	71	80	90	100	112	132	16600	19200	30200	36300	10700	245	
	303 R3	91.5	9.8	1800	2.0	16.8	71	80	90	100	112	132	17500	20200	31500	38000	11200	245	
	303 R3	114	7.9	1800	1.6	16.8	71	80	90	100	112	132	18800	21700	33700	40600	12100	245	
	303 R4	129	7.0	2630	2.2	14.4	71	80	90	100	112	132	19600	22600	35000	42100	12600	245	
	303 R4	148	6.1	2140	1.5	14.4	71	80	90	100	112	132	20500	23700	36500	43900	13200	245	
	303 R4	158	5.7	2640	1.8	14.4	71	80	90	100	112	132	21000	24200	37200	44700	13400	245	
	303 R4	185	4.9	2150	1.2	14.4	71	80	90	100	112	132	22100	25500	39000	46900	14200	245	
	303 R4	214	4.2	2670	1.3	14.4	71	80	90	100	112	132	23200	26800	40700	49000	14900	245	
	303 R4	231	3.9	1870	0.86	14.4	71	80	90	100	112	132	23800	27400	41600	50100	15300	245	
	303 R4	255	3.5	1900	0.79	14.4	71	80	90	100	112	132	24600	28400	42900	51600	15800	245	
	303 R4	290	3.1	2680	0.99	14.4	71	80	90	100	112	132	25600	29600	44600	53600	16500	245	
	303 R4	313	2.9	1960	0.67	14.4	71	80	90	100	112	132	26300	30400	45600	54900	16900	245	
	303 R4	336	2.7	2420	0.77	14.4	71	80	90	100	112	132	26900	31100	46600	56000	17300	245	
	303 R4	364	2.5	2450	0.72	14.4	71	80	90	100	112	132	27700	31900	47700	57400	17700	245	
	303 R4	390	2.3	2020	0.55	14.4	71	80	90	100	112	132	28300	32700	48700	58600	18200	245	
	303 R4	452	2.0	2250	0.53	14.4	71	80	90	100	112	132	29700	34300	50900	61300	19100	245	
	303 R4	528	1.7	2120	0.43	14.4	71	80	90	100	112	132	31300	36200	53400	64200	20100	245	
	303 R4	567	1.6	2640	0.50	14.4	71	80	90	100	112	132	32100	37000	54500	65600	20600	245	
	303 R4	659	1.4	2190	0.35	14.4	71	80	90	100	112	132	33700	38900	57000	68600	21600	245	
	303 R4	797	1.1	1960	0.26	14.4	71	80	90	100	112	132	35900	41500	60400	72700	23000	245	
	303 R4	824	1.1	2270	0.29	14.4	71	80	90	100	112	132	36000	41900	61000	73400	23300	245	
	500	303 R2	9.23	54	1950	11.8	36	71	80	90	100	112	132	9890	11400	18900	22700	6340	245
		303 R2	10.9	46	2170	11.1	36	71	80	90	100	112	132	10400	12100	19900	23900	6700	245
		303 R2	13.7	37	2120	8.6	36	71	80	90	100	112	132	11300	13000	21300	25600	7230	245
		303 R2	15.9	31	1760	6.2	36	71	80	90	100	112	132	11800	13700	22300	26800	7600	245
		303 R2	19.2	26.0	1650	4.8	36	71	80	90	100	112	132	12600	14600	23600	28300	8100	245
303 R2		24.8	20.2	860	1.9	36	71	80	90	100	112	132	13700	15900	25400	30600	8810	245	
303 R3		25.7	19.5	1990	4.5	28	71	80	90	100	112	132	13900	16100	25700	30900	8920	245	
303 R3		31.5	15.9	2010	3.7	28	71	80	90	100	112	132	14900	17200	27300	32900	9550	245	
303 R3		37.1	13.5	2480	3.8	28	71	80	90	100	112	132	15700	18200	28700	34500	10100	245	
303 R3		42.6	11.7	2060	2.8	28	71	80	90	100	112	132	16500	19000	29900	36000	10600	245	
303 R3		46.6	10.7	2200	2.7	28	71	80	90	100	112	132	17000	19600	30700	37000	10900	245	
303 R3		50.3	9.9	2600	3.0	28	71	80	90	100	112	132	17400	20100	31400	37800	11200	245	
303 R3		54.2	9.2	1800	1.9	28	71	80	90	100	112	132	17800	20600	32200	38700	11400	245	
303 R3		63.1	7.9	2200	2.0	28	71	80	90	100	112	132	18800	21700	33700	40500	12000	245	
303 R3		73.3	6.8	1800	1.4	28	71	80	90	100	112	132	19700	22800	35200	42400	12700	245	
303 R3		78.7	6.4	2200	1.6	28	71	80	90	100	112	132	20200	23300	36000	43300	13000	245	
303 R3		91.5	5.5	1800	1.1	28	71	80	90	100	112	132	21200	24500	37600	45300	13600	245	
303 R3		114	4.4	1840	0.92	28	71	80	90	100	112	132	22900	26400	40200	48400	14700	245	
303 R4		129	3.9	2670	1.2	24	71	80	90	100	112	132	23800	27500	41700	50200	15300	245	
303 R4		148	3.4	2180	0.87	24	71	80	90	100	112	132	24900	28800	43500	52300	16000	245	
303 R4		158	3.2	2720	1.0	24	71	80	90	100	112	132	25500	29400	44400	53400	16400	245	
303 R4		185	2.7	2190	0.70	24	71	80	90	100	112	132	26900	31000	46500	55900	17200	245	
303 R4		214	2.3	2760	0.76	24	71	80	90	100	112	132	28200	32600	48600	58400	18100	245	
303 R4		231	2.2	2040	0.52	24	71	80	90	100	112	132	28900	33400	49700	59800	18600	245	
303 R4		255	2.0	2080	0.48	24	71	80	90	100	112	132	29900	34500	51200	61600	19200	245	
303 R4		290	1.7	2720	0.55	24	71	80	90	100	112	132	31200	36000	53200	64000	20000	245	
303 R4		313	1.6	2140	0.41	24	71	80	90	100	112	132	32000	36900	54400	65400	20500	245	
303 R4		336	1.5	2670	0.47	24	71	80	90	100	112	132	32800	37800	55600	66900	21000	245	
303 R4		364	1.4	2700	0.44	24	71	80	90	100	112	132	33700	38800	56900	68500	21600	245	
303 R4		390	1.3	2210	0.34	24	71	80	90	100	112	132	34400	39800	58100	69900	22100	245	
303 R4	452	1.1	2250	0.29	24	71	80	90	100	112	132	36000	41700	60700	73100	23200	245		
303 R4	528	0.95	2300	0.26	24	71	80	90	100	112	132	36000	42000	63700	74000	24000	245		
303 R4	567	0.88	2850	0.30	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	245		
303 R4	659	0.76	2300	0.21	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	245		
303 R4	797	0.63	2000	0.15	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	245		
303 R4	824	0.61	2300	0.17	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	245		



304 R

3600 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						MC	MZ	R _{n2} [N]		HC/PC	HZ/PZ	FZ	
1400	304 R2	9.23	152	1470	25	18.0	71	80	90	100	112	132	7010	8100	13900	16700	4500	255		
	304 R2	10.9	129	1730	25	18.0	71	80	90	100	112	132	7410	8560	14600	17600	4760	255		
	304 R2	13.7	102	2170	25	18.0	71	80	90	100	112	132	8000	9230	15600	18800	5130	255		
	304 R2	16.8	83	2210	20	18.0	71	80	90	100	112	132	8570	9900	16600	20000	5500	255		
	304 R3	25.7	55	2400	15.0	14.0	71	80	90	100	112	132	9870	11400	18900	22700	6330	255		
	304 R3	31.5	44	2940	15.0	14.0	71	80	90	100	112	132	10600	12200	20100	24100	6770	255		
	304 R3	37.1	38	3150	13.6	14.0	71	80	90	100	112	132	11200	12900	21100	25400	7160	255		
	304 R3	42.6	33	3200	12.1	14.0	71	80	90	100	112	132	11700	13500	22000	26400	7490	255		
	304 R3	46.6	30	2770	9.5	14.0	71	80	90	100	112	132	12000	13900	22600	27200	7720	255		
	304 R3	50.3	27.9	3230	10.3	14.0	71	80	90	100	112	132	12300	14200	23100	27800	7920	255		
	304 R3	63.1	22.2	2780	7.1	14.0	71	80	90	100	112	132	13300	15400	24700	29700	8540	255		
	304 R3	78.7	17.8	2780	5.7	14.0	71	80	90	100	112	132	14300	16500	26400	31800	9190	255		
	304 R3	97.0	14.4	2290	3.8	14.0	71	80	90	100	112	132	15400	17700	28100	33800	9860	255		
	304 R3	121	11.5	2290	3.0	14.0	71	80	90	100	112	132	16600	19100	30100	36200	10600	255		
	304 R4	89.4	15.7	3350	6.2	12.0	71	80	90	100	112	132	15000	17300	27400	33000	9590	255		
	304 R4	109	12.8	3390	5.1	12.0	71	80	90	100	112	132	16000	18500	29200	35100	10300	255		
	304 R4	129	10.8	3520	4.5	12.0	71	80	90	100	112	132	16900	19500	30600	36900	10800	255		
	304 R4	148	9.4	3440	3.8	12.0	71	80	90	100	112	132	17700	20400	31900	38400	11400	255		
	304 R4	158	8.8	3560	3.7	12.0	71	80	90	100	112	132	18100	20900	32600	39200	11600	255		
	304 R4	185	7.6	3460	3.1	12.0	71	80	90	100	112	132	19100	22000	34100	41100	12200	255		
	304 R4	214	6.5	3610	2.8	12.0	71	80	90	100	112	132	20000	23100	35700	42900	12800	255		
	304 R4	227	6.2	3480	2.5	12.0	71	80	90	100	112	132	20400	23500	36300	43600	13100	255		
	304 R4	267	5.2	3640	2.3	12.0	71	80	90	100	112	132	21500	24900	38100	45900	13800	255		
	304 R4	290	4.8	3650	2.1	12.0	71	80	90	100	112	132	22100	25600	39100	47000	14200	255		
	304 R4	307	4.6	3500	1.9	12.0	71	80	90	100	112	132	22500	26000	39700	47800	14500	255		
	304 R4	338	4.1	2320	1.1	12.0	71	80	90	100	112	132	23300	26900	40900	49200	14900	255		
	304 R4	364	3.8	2900	1.3	12.0	71	80	90	100	112	132	23900	27600	41800	50300	15300	255		
	304 R4	414	3.4	2350	0.94	12.0	71	80	90	100	112	132	24900	28800	43400	52300	16000	255		
	304 R4	452	3.1	3690	1.4	12.0	71	80	90	100	112	132	25700	29600	44600	53700	16500	255		
	304 R4	560	2.5	2400	0.71	12.0	71	80	90	100	112	132	27600	31800	47600	57200	17700	255		
	304 R4	699	2.0	2480	0.59	12.0	71	80	90	100	112	132	29700	34300	50900	61200	19000	255		
900	304 R2	9.23	98	1680	18.3	22	71	80	90	100	112	132	8130	9380	15800	19100	5210	255		
	304 R2	10.9	83	1980	18.2	22	71	80	90	100	112	132	8590	9920	16700	20000	5510	255		
	304 R2	13.7	66	2480	18.2	22	71	80	90	100	112	132	9260	10700	17800	21500	5940	255		
	304 R2	16.8	53	2280	13.6	22	71	80	90	100	112	132	9930	11500	19000	22800	6370	255		
	304 R3	25.7	35	2710	10.9	16.8	71	80	90	100	112	132	11400	13200	21500	25900	7330	255		
	304 R3	31.5	28.6	3080	10.1	16.8	71	80	90	100	112	132	12200	14100	22900	27600	7850	255		
	304 R3	37.1	24.2	3270	9.1	16.8	71	80	90	100	112	132	12900	14900	24100	29000	8290	255		
	304 R3	42.6	21.1	3290	8.0	16.8	71	80	90	100	112	132	13500	15600	25100	30200	8680	255		
	304 R3	46.6	19.3	2780	6.2	16.8	71	80	90	100	112	132	13900	16100	25800	31000	8950	255		
	304 R3	50.3	17.9	3360	6.9	16.8	71	80	90	100	112	132	14300	16500	26400	31700	9170	255		
	304 R3	63.1	14.3	2790	4.6	16.8	71	80	90	100	112	132	15400	17800	28200	33900	9900	255		
	304 R3	78.7	11.4	2800	3.7	16.8	71	80	90	100	112	132	16600	19200	30200	36300	10700	255		
	304 R3	97.0	9.3	2290	2.4	16.8	71	80	90	100	112	132	17800	20600	32100	38600	11400	255		
	304 R3	121	7.4	2290	2.0	16.8	71	80	90	100	112	132	19200	22100	34300	41300	12300	255		
	304 R4	89.4	10.1	3440	4.1	14.4	71	80	90	100	112	132	17300	20000	31300	37700	11100	255		
	304 R4	109	8.2	3460	3.4	14.4	71	80	90	100	112	132	18500	21400	33300	40100	11900	255		
	304 R4	129	7.0	3600	3.0	14.4	71	80	90	100	112	132	19600	22600	35000	42100	12600	255		
	304 R4	148	6.1	3480	2.5	14.4	71	80	90	100	112	132	20500	23700	36500	43900	13200	255		
	304 R4	158	5.7	3630	2.4	14.4	71	80	90	100	112	132	21000	24200	37200	44700	13400	255		
	304 R4	185	4.9	3500	2.0	14.4	71	80	90	100	112	132	22100	25500	39000	46900	14200	255		
	304 R4	214	4.2	3670	1.8	14.4	71	80	90	100	112	132	23200	26800	40700	49000	14900	255		
	304 R4	227	4.0	3510	1.6	14.4	71	80	90	100	112	132	23600	27300	41400	49800	15200	255		
	304 R4	267	3.4	3680	1.5	14.4	71	80	90	100	112	132	25000	28800	43500	52400	16000	255		
	304 R4	290	3.1	3690	1.4	14.4	71	80	90	100	112	132	25600	29600	44600	53600	16500	255		
	304 R4	307	2.9	3520	1.2	14.4	71	80	90	100	112	132	26100	30200	45300	54500	16800	255		
	304 R4	338	2.7	2390	0.75	14.4	71	80	90	100	112	132	27000	31100	46700	56100	17300	255		
	304 R4	364	2.5	3080	0.90	14.4	71	80	90	100	112	132	27700	31900	47700	57400	17700	255		
	304 R4	414	2.2	2450	0.63	14.4	71	80	90	100	112	132	28900	33300	49600	59700	18500	255		
	304 R4	452	2.0	3770	0.89	14.4	71	80	90	100	112	132	29700	34300	50900	61300	19100	255		
	304 R4	560	1.6	2560	0.49	14.4	71	80	90	100	112	132	31900	36900	54300	65300	20500	255		
	304 R4	699	1.3	2650	0.40	14.4	71	80	90	100	112	132	34400	39700	58100	69900	22100	255		



304 R

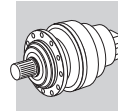
3600 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						MC	MZ	R _{n2} [N]		HC/PC	HZ/PZ	FZ	
500	304 R2	9.23	54	2000	12.1	36	71	80	90	100	112	132	9890	11400	18900	22700	6340	255		
	304 R2	10.9	46	2360	12.1	36	71	80	90	100	112	132	10400	12100	19900	23900	6700	255		
	304 R2	13.7	37	2720	11.1	36	71	80	90	100	112	132	11300	13000	21300	25600	7230	255		
	304 R2	16.8	29.7	2290	7.6	36	71	80	90	100	112	132	12100	13900	22600	27200	7750	255		
	304 R3	25.7	19.5	3030	6.8	28	71	80	90	100	112	132	13900	16100	25700	30900	8920	255		
	304 R3	31.5	15.9	3280	6.0	28	71	80	90	100	112	132	14900	17200	27300	32900	9550	255		
	304 R3	37.1	13.5	3450	5.3	28	71	80	90	100	112	132	15700	18200	28700	34500	10100	255		
	304 R3	42.6	11.7	3410	4.6	28	71	80	90	100	112	132	16500	19000	29900	36000	10600	255		
	304 R3	46.6	10.7	2800	3.4	28	71	80	90	100	112	132	17000	19600	30700	37000	10900	255		
	304 R3	50.3	9.9	3540	4.0	28	71	80	90	100	112	132	17400	20100	31400	37800	11200	255		
	304 R3	63.1	7.9	2800	2.5	28	71	80	90	100	112	132	18800	21700	33700	40500	12000	255		
	304 R3	78.7	6.4	2800	2.0	28	71	80	90	100	112	132	20200	23300	36000	43300	13000	255		
	304 R3	97.0	5.2	2290	1.4	28	71	80	90	100	112	132	21700	25000	38300	46100	13900	255		
	304 R3	121	4.1	2320	1.1	28	71	80	90	100	112	132	23300	26900	40900	49300	15000	255		
	304 R4	89.4	5.6	3490	2.3	24	71	80	90	100	112	132	21100	24300	37400	45000	13500	255		
	304 R4	109	4.6	3500	1.9	24	71	80	90	100	112	132	22500	26000	39700	47800	14500	255		
	304 R4	129	3.9	3670	1.7	24	71	80	90	100	112	132	23800	27500	41700	50200	15300	255		
	304 R4	148	3.4	3510	1.4	24	71	80	90	100	112	132	24900	28800	43500	52300	16000	255		
	304 R4	158	3.2	3690	1.4	24	71	80	90	100	112	132	25500	29400	44400	53400	16400	255		
	304 R4	185	2.7	3520	1.1	24	71	80	90	100	112	132	26900	31000	46500	55900	17200	255		
	304 R4	214	2.3	3730	1.0	24	71	80	90	100	112	132	28200	32600	48600	58400	18100	255		
	304 R4	227	2.2	3550	0.93	24	71	80	90	100	112	132	28700	33200	49400	59400	18400	255		
	304 R4	267	1.9	3790	0.84	24	71	80	90	100	112	132	30400	35100	51900	62500	19500	255		
	304 R4	290	1.7	3810	0.78	24	71	80	90	100	112	132	31200	36000	53200	64000	20000	255		
	304 R4	307	1.6	3610	0.70	24	71	80	90	100	112	132	31800	36700	54100	65100	20400	255		
	304 R4	338	1.5	2590	0.45	24	71	80	90	100	112	132	32800	37900	55700	67000	21100	255		
	304 R4	364	1.4	3350	0.54	24	71	80	90	100	112	132	33700	38800	56900	68500	21600	255		
	304 R4	414	1.2	2670	0.38	24	71	80	90	100	112	132	35100	40500	59200	71200	22500	255		
	304 R4	452	1.1	3930	0.51	24	71	80	90	100	112	132	36000	41700	60700	73100	23200	255		
	304 R4	560	0.89	2750	0.29	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	255		
	304 R4	699	0.71	2750	0.23	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	255		

305 R

5000 Nm

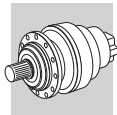
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						MC	R _{n2} [N]				
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	305 R2	9.23	152	1410	24	18.0	71	80	90	100	112	132	7010	8100	13900	16700	4500	265
	305 R2	10.9	129	1670	24	18.0	71	80	90	100	112	132	7410	8560	14600	17600	4760	265
	305 R2	13.7	102	2080	24	18.0	71	80	90	100	112	132	8000	9230	15600	18800	5130	265
	305 R2	15.9	88	2440	24	18.0	71	80	90	100	112	132	8410	9710	16300	19700	5390	265
	305 R2	19.2	73	2660	22	18.0	71	80	90	100	112	132	8960	10300	17300	20800	5750	265
	305 R3	25.7	55	2400	15.0	14.0	71	80	90	100	112	132	9870	11400	18900	22700	6330	265
	305 R3	31.5	45	2940	15.0	14.0	71	80	90	100	112	132	10600	12200	20100	24100	6770	265
	305 R3	37.1	38	3470	15.0	14.0	71	80	90	100	112	132	11200	12900	21100	25400	7160	265
	305 R3	42.6	33	3360	12.7	14.0	71	80	90	100	112	132	11700	13500	22000	26400	7490	265
	305 R3	46.6	30	3840	13.2	14.0	71	80	90	100	112	132	12000	13900	22600	27200	7720	265
	305 R3	50.3	27.9	4000	12.8	14.0	71	80	90	100	112	132	12300	14200	23100	27800	7920	265
	305 R3	54.2	25.8	3570	10.6	14.0	71	80	90	100	112	132	12700	14600	23600	28400	8120	265
	305 R3	63.1	22.2	3980	10.1	14.0	71	80	90	100	112	132	13300	15400	24700	29700	8540	265
	305 R3	73.3	19.1	3580	7.8	14.0	71	80	90	100	112	132	14000	16200	25900	31100	8980	265
	305 R3	78.7	17.8	4100	8.4	14.0	71	80	90	100	112	132	14300	16500	26400	31800	9190	265
	305 R3	91.5	15.3	3590	6.3	14.0	71	80	90	100	112	132	15100	17400	27600	33200	9670	265
	305 R3	114	12.2	3500	4.9	14.0	71	80	90	100	112	132	16200	18700	29500	35500	10400	265
	305 R4	129	10.8	5110	6.5	12.0	71	80	90	100	112	132	16900	19500	30600	36900	10800	265
	305 R4	148	9.4	4210	4.7	12.0	71	80	90	100	112	132	17700	20400	31900	38400	11400	265
	305 R4	158	8.8	5220	5.5	12.0	71	80	90	100	112	132	18100	20900	32600	39200	11600	265
	305 R4	185	7.6	4240	3.8	12.0	71	80	90	100	112	132	19100	22000	34100	41100	12200	265
	305 R4	214	6.5	5260	4.1	12.0	71	80	90	100	112	132	20000	23100	35700	42900	12800	265
	305 R4	231	6.1	3600	2.6	12.0	71	80	90	100	112	132	20500	23700	36500	43900	13200	265
	305 R4	255	5.5	3600	2.3	12.0	71	80	90	100	112	132	21200	24500	37600	45200	13600	265



305 R

5000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
1400	305 R4	290	4.8	5310	3.0	12.0	71	80	90	100	112	132	22100	25600	39100	47000	14200	265
	305 R4	313	4.5	3650	1.9	12.0	71	80	90	100	112	132	22700	26200	39900	48100	14600	265
	305 R4	336	4.2	4530	2.2	12.0	71	80	90	100	112	132	23200	26800	40800	49100	14900	265
	305 R4	364	3.8	4580	2.1	12.0	71	80	90	100	112	132	23900	27600	41800	50300	15300	265
	305 R4	390	3.6	3760	1.6	12.0	71	80	90	100	112	132	24400	28200	42700	51400	15700	265
	305 R4	452	3.1	4750	1.7	12.0	71	80	90	100	112	132	25700	29600	44600	53700	16500	265
	305 R4	528	2.7	3920	1.2	12.0	71	80	90	100	112	132	27000	31200	46700	56200	17300	265
	305 R4	567	2.5	4910	1.4	12.0	71	80	90	100	112	132	27700	32000	47700	57400	17800	265
	305 R4	659	2.1	4060	1.0	12.0	71	80	90	100	112	132	29100	33600	50000	60100	18700	265
	305 R4	797	1.8	3480	0.72	12.0	71	80	90	100	112	132	31000	35800	52900	63600	19900	265
	305 R4	824	1.7	4210	0.85	12.0	71	80	90	100	112	132	31300	36200	53400	64300	20100	265
900	305 R2	9.23	98	1610	17.5	22	71	80	90	100	112	132	8130	9380	15800	19100	5210	265
	305 R2	10.9	83	1900	17.5	22	71	80	90	100	112	132	8590	9920	16700	20000	5510	265
	305 R2	13.7	66	2390	17.5	22	71	80	90	100	112	132	9260	10700	17800	21500	5940	265
	305 R2	15.9	57	2790	17.6	22	71	80	90	100	112	132	9740	11200	18700	22400	6250	265
	305 R2	19.2	47	3000	15.7	22	71	80	90	100	112	132	10400	12000	19800	23800	6660	265
	305 R3	25.7	35	2880	11.6	16.8	71	80	90	100	112	132	11400	13200	21500	25900	7330	265
	305 R3	31.5	28.6	3370	11.1	16.8	71	80	90	100	112	132	12200	14100	22900	27600	7850	265
	305 R3	37.1	24.2	4120	11.4	16.8	71	80	90	100	112	132	12900	14900	24100	29000	8290	265
	305 R3	42.6	21.1	3650	8.8	16.8	71	80	90	100	112	132	13500	15600	25100	30200	8680	265
	305 R3	46.6	19.3	4050	9.0	16.8	71	80	90	100	112	132	13900	16100	25800	31000	8950	265
	305 R3	50.3	17.9	4480	9.2	16.8	71	80	90	100	112	132	14300	16500	26400	31700	9170	265
	305 R3	54.2	16.6	3580	6.8	16.8	71	80	90	100	112	132	14700	16900	27000	32400	9410	265
	305 R3	63.1	14.3	4210	6.9	16.8	71	80	90	100	112	132	15400	17800	28200	33900	9900	265
	305 R3	73.3	12.3	3590	5.1	16.8	71	80	90	100	112	132	16200	18700	29500	35500	10400	265
	305 R3	78.7	11.4	4330	5.7	16.8	71	80	90	100	112	132	16600	19200	30200	36300	10700	265
	305 R3	91.5	9.8	3600	4.1	16.8	71	80	90	100	112	132	17500	20200	31500	38000	11200	265
	305 R3	114	7.9	3600	3.2	16.8	71	80	90	100	112	132	18800	21700	33700	40600	12100	265
	305 R4	129	7.0	5250	4.3	14.4	71	80	90	100	112	132	19600	22600	35000	42100	12600	265
	305 R4	148	6.1	4270	3.1	14.4	71	80	90	100	112	132	20500	23700	36500	43900	13200	265
	305 R4	158	5.7	5280	3.6	14.4	71	80	90	100	112	132	21000	24200	37200	44700	13400	265
	305 R4	185	4.9	4310	2.5	14.4	71	80	90	100	112	132	22100	25500	39000	46900	14200	265
	305 R4	214	4.2	5350	2.7	14.4	71	80	90	100	112	132	23200	26800	40700	49000	14900	265
	305 R4	231	3.9	3720	1.7	14.4	71	80	90	100	112	132	23800	27400	41600	50100	15300	265
	305 R4	255	3.5	3770	1.6	14.4	71	80	90	100	112	132	24600	28400	42900	51600	15800	265
	305 R4	290	3.1	5370	2.0	14.4	71	80	90	100	112	132	25600	29600	44600	53600	16500	265
	305 R4	313	2.9	3880	1.3	14.4	71	80	90	100	112	132	26300	30400	45600	54900	16900	265
	305 R4	336	2.7	4850	1.5	14.4	71	80	90	100	112	132	26900	31100	46600	56000	17300	265
	305 R4	364	2.5	4910	1.4	14.4	71	80	90	100	112	132	27700	31900	47700	57400	17700	265
	305 R4	390	2.3	4000	1.1	14.4	71	80	90	100	112	132	28300	32700	48700	58600	18200	265
	305 R4	452	2.0	4750	1.1	14.4	71	80	90	100	112	132	29700	34300	50900	61300	19100	265
	305 R4	528	1.7	4210	0.85	14.4	71	80	90	100	112	132	31300	36200	53400	64200	20100	265
	305 R4	567	1.6	5240	0.98	14.4	71	80	90	100	112	132	32100	37000	54500	65600	20600	265
	305 R4	659	1.4	4370	0.71	14.4	71	80	90	100	112	132	33700	38900	57000	68600	21600	265
	305 R4	797	1.1	3730	0.50	14.4	71	80	90	100	112	132	35900	41500	60400	72700	23000	265
	305 R4	824	1.1	4530	0.59	14.4	71	80	90	100	112	132	36000	41900	61000	73400	23300	265
500	305 R2	9.23	54	1950	11.8	36	71	80	90	100	112	132	9890	11400	18900	22700	6340	265
	305 R2	10.9	46	2260	11.5	36	71	80	90	100	112	132	10400	12100	19900	23900	6700	265
	305 R2	13.7	37	2850	11.6	36	71	80	90	100	112	132	11300	13000	21300	25600	7230	265
	305 R2	15.9	32	3090	10.8	36	71	80	90	100	112	132	11800	13700	22300	26800	7600	265
	305 R2	19.2	26.0	3040	8.8	36	71	80	90	100	112	132	12600	14600	23600	28300	8100	265
	305 R3	25.7	19.5	3420	7.6	28	71	80	90	100	112	132	13900	16100	25700	30900	8920	265
	305 R3	31.5	15.9	3810	7.0	28	71	80	90	100	112	132	14900	17200	27300	32900	9550	265
	305 R3	37.1	13.5	4810	7.4	28	71	80	90	100	112	132	15700	18200	28700	34500	10100	265
	305 R3	42.6	11.7	4070	5.5	28	71	80	90	100	112	132	16500	19000	29900	36000	10600	265
	305 R3	46.6	10.7	4360	5.4	28	71	80	90	100	112	132	17000	19600	30700	37000	10900	265
	305 R3	50.3	9.9	5200	5.9	28	71	80	90	100	112	132	17400	20100	31400	37800	11200	265
	305 R3	54.2	9.2	3600	3.8	28	71	80	90	100	112	132	17800	20600	32200	38700	11400	265
	305 R3	63.1	7.9	4400	4.0	28	71	80	90	100	112	132	18800	21700	33700	40500	12000	265
	305 R3	73.3	6.8	3600	2.8	28	71	80	90	100	112	132	19700	22800	35200	42400	12700	265
	305 R3	78.7	6.4	4400	3.2	28	71	80	90	100	112	132	20200	23300	36000	43300	13000	265
	305 R3	91.5	5.5	3600	2.3	28	71	80	90	100	112	132	21200	24500	37600	45300	13600	265
	305 R3	114	4.4	3670	1.8	28	71	80	90	100	112	132	22900	26400	40200	48400	14700	265



305 R

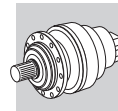
5000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ							
500	305 R4	129	3.9	5340	2.4	24	71	80	90	100	112	132	23800	27500	41700	50200	15300	265
	305 R4	148	3.4	4380	1.8	24	71	80	90	100	112	132	24900	28800	43500	52300	16000	265
	305 R4	158	3.2	5430	2.0	24	71	80	90	100	112	132	25500	29400	44400	53400	16400	265
	305 R4	185	2.7	4430	1.4	24	71	80	90	100	112	132	26900	31000	46500	55900	17200	265
	305 R4	214	2.3	5520	1.5	24	71	80	90	100	112	132	28200	32600	48600	58400	18100	265
	305 R4	231	2.2	4050	1.0	24	71	80	90	100	112	132	28900	33400	49700	59800	18600	265
	305 R4	255	2.0	4110	0.95	24	71	80	90	100	112	132	29900	34500	51200	61600	19200	265
	305 R4	290	1.7	5440	1.1	24	71	80	90	100	112	132	31200	36000	53200	64000	20000	265
	305 R4	313	1.6	4250	0.80	24	71	80	90	100	112	132	32000	36900	54400	65400	20500	265
	305 R4	336	1.5	5280	0.93	24	71	80	90	100	112	132	32800	37800	55600	66900	21000	265
	305 R4	364	1.4	5350	0.87	24	71	80	90	100	112	132	33700	38800	56900	68500	21600	265
	305 R4	390	1.3	4410	0.67	24	71	80	90	100	112	132	34400	39800	58100	69900	22100	265
	305 R4	452	1.1	4750	0.62	24	71	80	90	100	112	132	36000	41700	60700	73100	23200	265
	305 R4	528	0.95	4600	0.52	24	71	80	90	100	112	132	36000	42000	63700	74000	24000	265
	305 R4	567	0.88	5600	0.58	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	265
	305 R4	659	0.76	4600	0.41	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	265
	305 R4	797	0.63	3800	0.28	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	265
	305 R4	824	0.61	4600	0.33	24	71	80	90	100	112	132	36000	42000	64000	74000	24000	265

306 R

8000 Nm

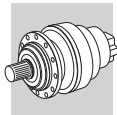
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						MC	MZ	Rn ₂ [N]		HC/PC	HZ/PZ	FZ	
1400	306 R2	9.23	152	1410	24	18.0	71	80	90	100	112	132	160	8730	9900	22700	26400	6560	275	
	306 R2	10.9	129	1670	24	18.0	71	80	90	100	112	132	160	9230	10500	23900	27800	6930	275	
	306 R2	13.7	102	2080	24	18.0	71	80	90	100	112	132	160	9960	11300	25500	29700	7480	275	
	306 R2	15.9	88	2440	24	18.0	71	80	90	100	112	132	160	10500	11900	26700	31100	7870	275	
	306 R2	19.2	73	2960	24	18.0	71	80	90	100	112	132	160	11200	12600	28300	33000	8380	275	
	306 R3	33.2	42	4920	24	14.0	71	80	90	100	112	132	160	13400	15200	33300	38800	10100	275	
	306 R3	39.2	36	5530	23	14.0	71	80	90	100	112	132	160	14100	16000	35000	40800	10600	275	
	306 R3	46.3	30	6720	23	14.0	71	80	90	100	112	132	160	15000	16900	36800	42900	11200	275	
	306 R3	58.1	24.1	7050	19.5	14.0	71	80	90	100	112	132	160	16100	18300	39400	45900	12100	275	
	306 R3	67.5	20.7	5970	14.2	14.0	71	80	90	100	112	132	160	17000	19200	41300	48000	12700	275	
	306 R3	72.9	19.2	6870	15.1	14.0	71	80	90	100	112	132	160	17400	19700	42200	49200	13100	275	
	306 R3	84.7	16.5	6950	13.2	14.0	71	80	90	100	112	132	160	18300	20700	44200	51400	13700	275	
	306 R3	98.5	14.2	6320	10.3	14.0	71	80	90	100	112	132	160	19200	21800	46200	53800	14400	275	
	306 R3	119	11.7	6420	8.6	14.0	71	80	90	100	112	132	160	20500	23200	48900	57000	15400	275	
	306 R3	144	9.7	5500	6.1	14.0	71	80	90	100	112	132	160	21800	24700	51800	60300	16400	275	
	306 R4	158	8.9	8900	9.3	12.0	71	80	90	100	112	132	160	22500	25500	53200	62000	16900	275	
	306 R4	168	8.3	7550	7.5	12.0	71	80	90	100	112	132	160	23000	26000	54200	63100	17300	275	
	306 R4	181	7.7	7860	7.2	12.0	71	80	90	100	112	132	160	23600	26700	55500	64600	17700	275	
	306 R4	214	6.6	8950	6.9	12.0	71	80	90	100	112	132	160	24900	28200	58300	67900	18700	275	
	306 R4	230	6.1	7400	5.3	12.0	71	80	90	100	112	132	160	25500	28900	59600	69400	19200	275	
	306 R4	249	5.6	7800	5.2	12.0	71	80	90	100	112	132	160	26200	29700	61000	71000	19700	275	
	306 R4	289	4.8	7830	4.5	12.0	71	80	90	100	112	132	160	27500	31200	63800	74300	20700	275	
	306 R4	312	4.5	7400	3.9	12.0	71	80	90	100	112	132	160	28200	32000	65300	76000	21200	275	
	306 R4	389	3.6	6820	2.9	12.0	71	80	90	100	112	132	160	30400	34400	69800	81200	22800	275	
	306 R4	420	3.3	8200	3.2	12.0	71	80	90	100	112	132	160	31200	35300	71400	83100	23400	275	
	306 R4	455	3.1	6980	2.5	12.0	71	80	90	100	112	132	160	32000	36300	73100	85100	24100	275	
	306 R4	488	2.9	8360	2.8	12.0	71	80	90	100	112	132	160	32800	37100	74700	87000	24600	275	
	306 R4	550	2.5	7180	2.2	12.0	71	80	90	100	112	132	160	34100	38700	77400	90100	25600	275	
	306 R4	590	2.4	8550	2.4	12.0	71	80	90	100	112	132	160	34900	39600	79100	92100	26200	275	
	306 R4	665	2.1	6090	1.5	12.0	71	80	90	100	112	132	160	36400	41200	82000	95400	27300	275	
	306 R4	830	1.7	6350	1.3	12.0	71	80	90	100	112	132	160	39100	44300	87600	102000	29400	275	
900	306 R2	9.23	98	1610	17.5	22	71	80	90	100	112	132	160	10100	11500	25900	30200	7600	275	
	306 R2	10.9	83	1900	17.5	22	71	80	90	100	112	132	160	10700	12100	27200	31700	8040	275	
	306 R2	13.7	66	2390	17.5	22	71	80	90	100	112	132	160	11500	13100	29200	34000	8670	275	
	306 R2	15.9	57	2790	17.6	22	71	80	90	100	112	132	160	12100	13700	30500	35500	9110	275	
	306 R2	19.2	47	3370	17.5	22	71	80	90	100	112	132	160	12900	14600	32300	37600	9710	275	
	306 R3	33.2	27.1	5560	17.3	16.8	71	80	90	100	112	132	160	15500	17600	38100	44300	11700	275	
	306 R3	39.2	23.0	6150	16.2	16.8	71	80	90	100	112	132	160	16400	18600	40000	46600	12300	275	



306 R

8000 Nm

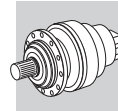
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 								MC	MZ	Rn ₂ [N]		HC/PC	HZ/PZ	FZ	
900	306 R3	46.3	19.4	7650	17.1	16.8	71	80	90	100	112	132	160	17300	19600	42100	49000	13000	275			
	306 R3	58.1	15.5	8010	14.2	16.8	71	80	90	100	112	132	160	18700	21200	45000	52400	14000	275			
	306 R3	67.5	13.3	6800	10.4	16.8	71	80	90	100	112	132	160	19600	22300	47100	54900	14800	275			
	306 R3	72.9	12.3	7490	10.6	16.8	71	80	90	100	112	132	160	20200	22800	48200	56100	15100	275			
	306 R3	84.7	10.6	7690	9.4	16.8	71	80	90	100	112	132	160	21200	24000	50400	58700	15900	275			
	306 R3	98.5	9.1	6500	6.8	16.8	71	80	90	100	112	132	160	22300	25200	52800	61400	16700	275			
	306 R3	119	7.6	6500	5.6	16.8	71	80	90	100	112	132	160	23700	26900	55900	65000	17800	275			
	306 R3	144	6.2	5500	3.9	16.8	71	80	90	100	112	132	160	25300	28700	59100	68900	19000	275			
	306 R4	158	5.7	9280	6.3	14.4	71	80	90	100	112	132	160	26100	29500	60800	70800	19600	275			
	306 R4	168	5.4	7680	4.9	14.4	71	80	90	100	112	132	160	26600	30200	61900	72100	20000	275			
	306 R4	181	5.0	8700	5.1	14.4	71	80	90	100	112	132	160	27300	30900	63300	73700	20500	275			
	306 R4	214	4.2	9450	4.7	14.4	71	80	90	100	112	132	160	28800	32700	66500	77500	21700	275			
	306 R4	230	3.9	7400	3.4	14.4	71	80	90	100	112	132	160	29600	33500	68100	79300	22200	275			
	306 R4	249	3.6	8120	3.5	14.4	71	80	90	100	112	132	160	30300	34400	69600	81100	22800	275			
	306 R4	289	3.1	8270	3.1	14.4	71	80	90	100	112	132	160	31900	36100	72900	84800	24000	275			
	306 R4	312	2.9	7400	2.5	14.4	71	80	90	100	112	132	160	32700	37100	74500	86800	24600	275			
	306 R4	389	2.3	7300	2.0	14.4	71	80	90	100	112	132	160	35200	39900	79700	92700	26500	275			
	306 R4	420	2.1	8660	2.2	14.4	71	80	90	100	112	132	160	36100	40900	81500	94900	27100	275			
	306 R4	455	2.0	7510	1.8	14.4	71	80	90	100	112	132	160	37100	42000	83500	97200	27900	275			
	306 R4	488	1.8	8760	1.9	14.4	71	80	90	100	112	132	160	38000	43000	85300	99300	28500	275			
	306 R4	550	1.6	7770	1.5	14.4	71	80	90	100	112	132	160	39500	44800	88400	102900	29700	275			
	306 R4	590	1.5	9030	1.6	14.4	71	80	90	100	112	132	160	40500	45900	90300	105100	30400	275			
	306 R4	665	1.4	6620	1.1	14.4	71	80	90	100	112	132	160	42100	47700	93600	109000	31600	275			
	306 R4	830	1.1	6900	0.88	14.4	71	80	90	100	112	132	160	45000	51000	100000	116400	34100	275			
500	306 R2	9.23	54	1950	11.8	36	71	80	90	100	112	132	160	12300	13900	30900	36000	9250	275			
	306 R2	10.9	46	2260	11.5	36	71	80	90	100	112	132	160	13000	14700	32500	37800	9770	275			
	306 R2	13.7	37	2850	11.6	36	71	80	90	100	112	132	160	14000	15900	34800	40500	10500	275			
	306 R2	15.9	31	3330	11.7	36	71	80	90	100	112	132	160	14800	16700	36400	42400	11100	275			
	306 R2	19.2	26.0	4030	11.7	36	71	80	90	100	112	132	160	15700	17800	38500	44900	11800	275			
	306 R3	33.2	15.1	6530	11.3	28	71	80	90	100	112	132	160	18900	21400	45400	52900	14200	275			
	306 R3	39.2	12.8	7080	10.4	28	71	80	90	100	112	132	160	19900	22600	47700	55600	15000	275			
	306 R3	46.3	10.8	9090	11.3	28	71	80	90	100	112	132	160	21100	23900	50200	58400	15800	275			
	306 R3	58.1	8.6	9100	9.0	28	71	80	90	100	112	132	160	22700	25800	53700	62500	17100	275			
	306 R3	67.5	7.4	7400	6.3	28	71	80	90	100	112	132	160	23900	27100	56200	65400	18000	275			
	306 R3	72.9	6.9	7800	6.1	28	71	80	90	100	112	132	160	24500	27800	57500	66900	18400	275			
	306 R3	84.7	5.9	7800	5.3	28	71	80	90	100	112	132	160	25800	29200	60100	70000	19400	275			
	306 R3	98.5	5.1	6500	3.8	28	71	80	90	100	112	132	160	27100	30700	62900	73300	20400	275			
	306 R3	119	4.2	6670	3.2	28	71	80	90	100	112	132	160	28900	32700	66600	77600	21700	275			
	306 R3	144	3.5	5710	2.3	28	71	80	90	100	112	132	160	30800	34900	70500	82100	23100	275			
	306 R4	158	3.2	9530	3.6	24	71	80	90	100	112	132	160	31700	35900	72500	84400	23800	275			
	306 R4	168	3.0	7700	2.7	24	71	80	90	100	112	132	160	32400	36700	73800	86000	24300	275			
	306 R4	181	2.8	8700	2.8	24	71	80	90	100	112	132	160	33200	37600	75500	87900	24900	275			
	306 R4	214	2.3	9630	2.7	24	71	80	90	100	112	132	160	35100	39800	79400	92400	26400	275			
	306 R4	230	2.2	7420	1.9	24	71	80	90	100	112	132	160	36000	40800	81200	94500	27000	275			
	306 R4	249	2.0	8730	2.1	24	71	80	90	100	112	132	160	36900	41800	83100	96700	27700	275			
	306 R4	289	1.7	8810	1.8	24	71	80	90	100	112	132	160	38800	44000	86900	101200	29200	275			
	306 R4	312	1.6	7450	1.4	24	71	80	90	100	112	132	160	39800	45100	88900	103500	29900	275			
	306 R4	389	1.3	8120	1.2	24	71	80	90	100	112	132	160	42800	48500	95000	110600	32200	275			
	306 R4	420	1.2	9300	1.3	24	71	80	90	100	112	132	160	44000	49800	97200	113200	33000	275			
	306 R4	455	1.1	8350	1.1	24	71	80	90	100	112	132	160	45000	51000	99600	115900	33900	275			
	306 R4	488	1.0	9280	1.1	24	71	80	90	100	112	132	160	45000	51000	101000	118400	34700	275			
	306 R4	550	0.91	8500	0.91	24	71	80	90	100	112	132	160	45000	51000	101000	119000	35000	275			
	306 R4	590	0.85	9500	0.95	24	71	80	90	100	112	132	160	45000	51000	101000	119000	35000	275			
	306 R4	665	0.75	7000	0.62	24	71	80	90	100	112	132	160	45000	51000	101000	119000	35000	275			
	306 R4	830	0.60	7000	0.50	24	71	80	90	100	112	132	160	45000	51000	101000	119000	35000	275			



307 R

12500 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 										Rn ₂ [N]					
															MC	MZ	HC/PC	HZ/PZ	FZ			
1400	307 R2	13.0	108	4150	50	35	—	—	—	—	—	132	160	180	200	10900	13600	27000	35400	9450	285	
	307 R2	15.5	91	4990	50	35	—	—	—	—	—	132	160	180	200	11500	14500	28500	37400	10000	285	
	307 R2	19.8	71	6370	50	35	—	—	—	—	—	132	160	180	200	12500	15700	30700	40300	10900	285	
	307 R2	23.5	59	7290	48	35	—	—	—	—	—	132	160	180	200	13300	16600	32400	42400	11500	285	
	307 R3	31.6	44	4720	24	22	71	80	90	100	112	132	160	—	—	14600	18400	35400	46300	12700	285	
	307 R3	37.7	37	5580	24	22	71	80	90	100	112	132	160	—	—	15500	19500	37300	48800	13500	285	
	307 R3	44.6	31	6670	24	22	71	80	90	100	112	132	160	—	—	16400	20600	39200	51300	14300	285	
	307 R3	55.9	25.0	8360	24	22	71	80	90	100	112	132	160	—	—	17700	22200	41900	55000	15400	285	
	307 R3	65.0	21.5	9670	24	22	71	80	90	100	112	132	160	—	—	18600	23300	43900	57500	16200	285	
	307 R3	71.8	19.5	9230	21	22	71	80	90	100	112	132	160	—	—	19200	24100	45200	59200	16700	285	
	307 R3	78.6	17.8	10400	21	22	71	80	90	100	112	132	160	—	—	19800	24900	46500	60900	17200	285	
	307 R3	83.4	16.8	9500	18.3	22	71	80	90	100	112	132	160	—	—	20200	25400	47300	62000	17600	285	
	307 R3	99.0	14.1	8470	13.8	22	71	80	90	100	112	132	160	—	—	21400	26900	49800	65200	18600	285	
	307 R3	120	11.7	8600	11.5	22	71	80	90	100	112	132	160	—	—	22800	28600	52700	69100	19800	285	
	307 R4	152	9.2	12500	13.7	15.0	71	80	90	100	112	132	160	—	—	24700	31000	56600	74200	21500	285	
	307 R4	165	8.5	10500	10.6	15.0	71	80	90	100	112	132	160	—	—	25400	31900	58000	76100	22100	285	
	307 R4	191	7.3	12700	11.0	15.0	71	80	90	100	112	132	160	—	—	26600	33400	60600	79400	23200	285	
	307 R4	206	6.8	12700	10.2	15.0	71	80	90	100	112	132	160	—	—	27300	34300	62000	81200	23700	285	
	307 R4	232	6.0	10600	7.6	15.0	71	80	90	100	112	132	160	—	—	28400	35700	64300	84200	24700	285	
	307 R4	258	5.4	12900	8.2	15.0	71	80	90	100	112	132	160	—	—	29500	37000	66400	87000	25600	285	
	307 R4	284	4.9	10700	6.2	15.0	71	80	90	100	112	132	160	—	—	30400	38200	68300	89500	26500	285	
	307 R4	300	4.7	13000	7.2	15.0	71	80	90	100	112	132	160	—	—	31000	38900	69400	91000	26900	285	
	307 R4	331	4.2	11000	5.5	15.0	71	80	90	100	112	132	160	—	—	32000	40200	71500	93700	27800	285	
	307 R4	363	3.9	12300	5.6	15.0	71	80	90	100	112	132	160	—	—	33000	41400	73500	96300	28700	285	
	307 R4	413	3.4	11400	4.6	15.0	71	80	90	100	112	132	160	—	—	34500	43200	76400	100100	30000	285	
	307 R4	453	3.1	13500	4.9	15.0	71	80	90	100	112	132	160	—	—	35500	44600	78600	102900	30900	285	
	307 R4	490	2.9	9420	3.2	15.0	71	80	90	100	112	132	160	—	—	36500	45800	80500	105400	31700	285	
	307 R4	581	2.4	12100	3.4	15.0	71	80	90	100	112	132	160	—	—	38600	48500	84700	110900	33600	285	
	307 R4	690	2.0	9900	2.4	15.0	71	80	90	100	112	132	160	—	—	40900	51300	89100	116800	35500	285	
900	307 R2	13.0	69	4770	37	42	—	—	—	—	—	132	160	180	200	12600	15800	30900	40500	10900	285	
	307 R2	15.5	58	5650	37	42	—	—	—	—	—	132	160	180	200	13400	16800	32600	42700	11600	285	
	307 R2	19.8	45	7230	37	42	—	—	—	—	—	132	160	180	200	14500	18200	35100	46000	12600	285	
	307 R2	23.5	38	7860	33	42	—	—	—	—	—	132	160	180	200	15400	19300	36900	48400	13400	285	
	307 R3	31.6	28.5	5390	17.6	26	71	80	90	100	112	132	160	—	—	17000	21300	40400	52900	14700	285	
	307 R3	37.7	23.8	6380	17.5	26	71	80	90	100	112	132	160	—	—	18000	22600	42600	55800	15600	285	
	307 R3	44.6	20.2	7610	17.6	26	71	80	90	100	112	132	160	—	—	19000	23800	44700	58600	16500	285	
	307 R3	55.9	16.1	9540	17.6	26	71	80	90	100	112	132	160	—	—	20500	25700	47900	62700	17800	285	
	307 R3	65.0	13.8	11100	17.6	26	71	80	90	100	112	132	160	—	—	21600	27000	50100	65600	18700	285	
	307 R3	71.8	12.5	10100	14.5	26	71	80	90	100	112	132	160	—	—	22300	28000	51600	67600	19400	285	
	307 R3	78.6	11.4	11800	15.5	26	71	80	90	100	112	132	160	—	—	23000	28800	53000	69500	20000	285	
	307 R3	83.4	10.8	10300	12.8	26	71	80	90	100	112	132	160	—	—	23400	29400	54000	70700	20400	285	
	307 R3	99.0	9.1	8700	9.1	26	71	80	90	100	112	132	160	—	—	24800	31100	56800	74500	21600	285	
	307 R3	120	7.5	8700	7.5	26	71	80	90	100	112	132	160	—	—	26400	33200	60200	78900	23000	285	
	307 R4	152	5.9	12800	9.0	18.0	71	80	90	100	112	132	160	—	—	28600	35900	64600	84700	24900	285	
	307 R4	165	5.4	10700	6.9	18.0	71	80	90	100	112	132	160	—	—	29400	36900	66300	86800	25600	285	
	307 R4	191	4.7	13000	7.2	18.0	71	80	90	100	112	132	160	—	—	30900	38700	69200	90700	26800	285	
	307 R4	206	4.4	13100	6.8	18.0	71	80	90	100	112	132	160	—	—	31600	39700	70800	92700	27500	285	
	307 R4	232	3.9	11200	5.1	18.0	71	80	90	100	112	132	160	—	—	33000	41400	73400	96200	28600	285	
	307 R4	258	3.5	13400	5.5	18.0	71	80	90	100	112	132	160	—	—	34100	42800	75800	99300	29700	285	
	307 R4	284	3.2	11500	4.3	18.0	71	80	90	100	112	132	160	—	—	35300	44200	78000	102200	30700	285	
	307 R4	300	3.0	13600	4.8	18.0	71	80	90	100	112	132	160	—	—	35900	45000	79300	103900	31200	285	
	307 R4	331	2.7	11800	3.8	18.0	71	80	90	100	112	132	160	—	—	37100	46500	81600	107000	32200	285	
	307 R4	363	2.5	12300	3.6	18.0	71	80	90	100	112	132	160	—	—	38200	48000	83900	110000	33200	285	
	307 R4	413	2.2	12300	3.2	18.0	71	80	90	100	112	132	160	—	—	39900	50100	87300	114300	34700		



307 R

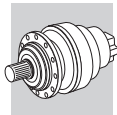
12500 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 								R _{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ										
500	307 R3	31.6	15.8	6440	11.7	44	71	80	90	100	112	132	160	–	–	20600	25900	48100	63100	17900	285
	307 R3	37.7	13.2	7620	11.6	44	71	80	90	100	112	132	160	–	–	21900	27400	50800	66500	19000	285
	307 R3	44.6	11.2	9080	11.7	44	71	80	90	100	112	132	160	–	–	23100	29000	53400	69900	20100	285
	307 R3	55.9	8.9	11300	11.6	44	71	80	90	100	112	132	160	–	–	24900	31300	57100	74800	21700	285
	307 R3	65.0	7.7	12500	11.0	44	71	80	90	100	112	132	160	–	–	26200	32900	59800	78300	22800	285
	307 R3	71.8	7.0	10600	8.5	44	71	80	90	100	112	132	160	–	–	27100	34000	61600	80700	23600	285
	307 R3	78.6	6.4	12300	9.0	44	71	80	90	100	112	132	160	–	–	27900	35100	63300	82900	24300	285
	307 R3	83.4	6.0	10600	7.3	44	71	80	90	100	112	132	160	–	–	28500	35800	64400	84400	24800	285
	307 R3	99.0	5.1	8700	5.0	44	71	80	90	100	112	132	160	–	–	30200	37900	67800	88800	26200	285
	307 R3	120	4.2	8930	4.3	44	71	80	90	100	112	132	160	–	–	32100	40300	71800	94100	27900	285
	307 R4	152	3.3	13400	5.2	30	71	80	90	100	112	132	160	–	–	34800	43700	77100	101000	30300	285
	307 R4	165	3.0	11600	4.2	30	71	80	90	100	112	132	160	–	–	35800	44900	79100	103600	31100	285
	307 R4	191	2.6	13700	4.3	30	71	80	90	100	112	132	160	–	–	37500	47100	82500	108100	32600	285
	307 R4	206	2.4	13800	4.0	30	71	80	90	100	112	132	160	–	–	38500	48300	84400	110600	33500	285
	307 R4	232	2.2	12300	3.1	30	71	80	90	100	112	132	160	–	–	40100	50300	87600	114700	34800	285
	307 R4	258	1.9	14100	3.2	30	71	80	90	100	112	132	160	–	–	41500	52100	90400	118400	36100	285
	307 R4	284	1.8	12700	2.6	30	71	80	90	100	112	132	160	–	–	42900	53800	93100	121900	37300	285
	307 R4	300	1.7	14300	2.8	30	71	80	90	100	112	132	160	–	–	43700	54800	94500	123900	38000	285
	307 R4	331	1.5	13100	2.3	30	71	80	90	100	112	132	160	–	–	45100	56600	97400	127600	39200	285
	307 R4	363	1.4	12300	2.0	30	71	80	90	100	112	132	160	–	–	46500	58400	100100	131200	40400	285
	307 R4	413	1.2	13600	1.9	30	71	80	90	100	112	132	160	–	–	48600	61000	104100	136400	42200	285
	307 R4	453	1.1	14900	1.9	30	71	80	90	100	112	132	160	–	–	50100	62800	107000	140200	43500	285
	307 R4	490	1.0	11000	1.3	30	71	80	90	100	112	132	160	–	–	51400	64500	109000	143600	44700	285
	307 R4	581	0.86	14000	1.4	30	71	80	90	100	112	132	160	–	–	52000	65000	109000	145000	45000	285
	307 R4	690	0.72	11000	0.94	30	71	80	90	100	112	132	160	–	–	52000	65000	109000	145000	45000	285

309 R

18000 Nm

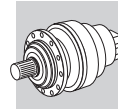
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 								R _{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ										
1400	309 R2	13.0	108	4200	51	35	—	—	—	—	—	132	160	180	200	—	—	27500	35400	7560	295
	309 R2	15.5	91	4940	50	35	—	—	—	—	—	132	160	180	200	—	—	29000	37400	8020	295
	309 R2	19.8	71	6370	50	35	—	—	—	—	—	132	160	180	200	—	—	31200	40300	8710	295
	309 R2	23.5	59	7590	50	35	—	—	—	—	—	132	160	180	200	—	—	32900	42400	9220	295
	309 R3	31.6	44	4720	24	22	71	80	90	100	112	132	160	—	—	—	—	35900	46300	10200	295
	309 R3	37.7	37	5580	24	22	71	80	90	100	112	132	160	—	—	—	—	37900	48800	10800	295
	309 R3	44.6	31	6670	24	22	71	80	90	100	112	132	160	—	—	—	—	39800	51300	11400	295
	309 R3	55.9	25.0	8360	24	22	71	80	90	100	112	132	160	—	—	—	—	42600	55000	12300	295
	309 R3	65.0	21.5	9670	24	22	71	80	90	100	112	132	160	—	—	—	—	44600	57500	12900	295
	309 R3	71.8	19.5	10700	24	22	71	80	90	100	112	132	160	—	—	—	—	45900	59200	13400	295
	309 R3	83.4	16.8	12400	24	22	71	80	90	100	112	132	160	—	—	—	—	48000	62000	14100	295
	309 R3	99.0	14.1	12300	20	22	71	80	90	100	112	132	160	—	—	—	—	50600	65200	14900	295
	309 R3	120	11.7	12700	17.1	22	71	80	90	100	112	132	160	—	—	—	—	53600	69100	15900	295
	309 R4	152	9.2	13800	15.0	15.0	71	80	90	100	112	132	160	—	—	—	—	57500	74200	17200	295
	309 R4	165	8.5	15000	15.0	15.0	71	80	90	100	112	132	160	—	—	—	—	59000	76100	17700	295
	309 R4	191	7.3	16200	14.1	15.0	71	80	90	100	112	132	160	—	—	—	—	61600	79400	18500	295
	309 R4	206	6.8	16400	13.2	15.0	71	80	90	100	112	132	160	—	—	—	—	63000	81200	19000	295
	309 R4	232	6.0	16100	11.5	15.0	71	80	90	100	112	132	160	—	—	—	—	65300	84200	19800	295
	309 R4	258	5.4	17200	11.0	15.0	71	80	90	100	112	132	160	—	—	—	—	67400	87000	20500	295
	309 R4	285	4.9	16200	9.5	15.0	71	80	90	100	112	132	160	—	—	—	—	69400	89500	21200	295
	309 R4	331	4.2	16600	8.3	15.0	71	80	90	100	112	132	160	—	—	—	—	72700	93700	22300	295
	309 R4	374	3.7	14300	6.3	15.0	71	80	90	100	112	132	160	—	—	—	—	75400	97200	23200	295
	309 R4	413	3.4	17200	6.9	15.0	71	80	90	100	112	132	160	—	—	—	—	77700	100100	24000	295
	309 R4	457	3.1	14000	5.1	15.0	71	80	90	100	112	132	160	—	—	—	—	80000	103200	24800	295
	309 R4	491	2.9	14100	4.8	15.0	71	80	90	100	112	132	160	—	—	—	—	81700	105400	25400	295
	309 R4	581	2.4	15800	4.5	15.0	71	80	90	100	112	132	160	—	—	—	—	86000	110900	26900	295
	309 R4	690	2.0	15000	3.6	15.0	71	80	90	100	112	132	160	—	—	—	—	90600	116800	28400	295



309 R

18000 Nm

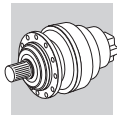
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 								R _{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ										
900	309 R2	13.0	69	4800	37	42	—	—	—	—	—	132	160	180	200	—	—	31400	40500	8760	295
	309 R2	15.5	58	5640	37	42	—	—	—	—	—	132	160	180	200	—	—	33100	42700	9290	295
	309 R2	19.8	45	7230	37	42	—	—	—	—	—	132	160	180	200	—	—	35700	46000	10100	295
	309 R2	23.5	38	8460	36	42	—	—	—	—	—	132	160	180	200	—	—	37500	48400	10700	295
	309 R3	31.6	28.5	5390	17.6	26	71	80	90	100	112	132	160	—	—	—	—	41000	52900	11800	295
	309 R3	37.7	23.8	6380	17.5	26	71	80	90	100	112	132	160	—	—	—	—	43200	55800	12500	295
	309 R3	44.6	20.2	7610	17.6	26	71	80	90	100	112	132	160	—	—	—	—	45400	58600	13200	295
	309 R3	55.9	16.1	9540	17.6	26	71	80	90	100	112	132	160	—	—	—	—	48700	62700	14300	295
	309 R3	65.0	13.8	11100	17.6	26	71	80	90	100	112	132	160	—	—	—	—	50900	65600	15000	295
	309 R3	71.8	12.5	12200	17.6	26	71	80	90	100	112	132	160	—	—	—	—	52400	67600	15500	295
	309 R3	83.4	10.8	14200	17.6	26	71	80	90	100	112	132	160	—	—	—	—	54900	70700	16300	295
	309 R3	99.0	9.1	13000	13.6	26	71	80	90	100	112	132	160	—	—	—	—	57700	74500	17200	295
	309 R3	120	7.5	13000	11.2	26	71	80	90	100	112	132	160	—	—	—	—	61100	78900	18400	295
	309 R4	152	5.9	17100	12.0	18.0	71	80	90	100	112	132	160	—	—	—	—	65700	84700	19900	295
	309 R4	165	5.4	16100	10.3	18.0	71	80	90	100	112	132	160	—	—	—	—	67300	86800	20500	295
	309 R4	191	4.7	17500	9.8	18.0	71	80	90	100	112	132	160	—	—	—	—	70300	90700	21500	295
	309 R4	206	4.4	18500	9.6	18.0	71	80	90	100	112	132	160	—	—	—	—	71900	92700	22000	295
	309 R4	232	3.9	16900	7.7	18.0	71	80	90	100	112	132	160	—	—	—	—	74600	96200	22900	295
	309 R4	258	3.5	17500	7.2	18.0	71	80	90	100	112	132	160	—	—	—	—	77000	99300	23700	295
	309 R4	285	3.2	17400	6.5	18.0	71	80	90	100	112	132	160	—	—	—	—	79300	102200	24500	295
	309 R4	331	2.7	17900	5.7	18.0	71	80	90	100	112	132	160	—	—	—	—	83000	107000	25800	295
	309 R4	374	2.4	14300	4.1	18.0	71	80	90	100	112	132	160	—	—	—	—	86100	111000	26900	295
	309 R4	413	2.2	18500	4.8	18.0	71	80	90	100	112	132	160	—	—	—	—	88700	114300	27800	295
	309 R4	457	2.0	15000	3.5	18.0	71	80	90	100	112	132	160	—	—	—	—	91400	117800	28700	295
	309 R4	491	1.8	15200	3.3	18.0	71	80	90	100	112	132	160	—	—	—	—	93300	120400	29400	295
	309 R4	581	1.5	15800	2.9	18.0	71	80	90	100	112	132	160	—	—	—	—	98200	126700	31100	295
	309 R4	690	1.3	16200	2.5	18.0	71	80	90	100	112	132	160	—	—	—	—	103400	133300	32900	295
500	309 R2	13.0	39	5520	24	70	—	—	—	—	—	132	160	180	200	—	—	37400	48300	10700	295
	309 R2	15.5	32	6380	23	70	—	—	—	—	—	132	160	180	200	—	—	39500	50900	11300	295
	309 R2	19.8	25.2	8110	23	70	—	—	—	—	—	132	160	180	200	—	—	42500	54800	12300	295
	309 R2	23.5	21.2	9570	23	70	—	—	—	—	—	132	160	180	200	—	—	44800	57700	13000	295
	309 R3	31.6	15.8	6440	11.7	44	71	80	90	100	112	132	160	—	—	—	—	48900	63100	14300	295
	309 R3	37.7	13.2	7620	11.6	44	71	80	90	100	112	132	160	—	—	—	—	51600	66500	15200	295
	309 R3	44.6	11.2	9080	11.7	44	71	80	90	100	112	132	160	—	—	—	—	54200	69900	16100	295
	309 R3	55.9	8.9	11400	11.7	44	71	80	90	100	112	132	160	—	—	—	—	58000	74800	17300	295
	309 R3	65.0	7.7	13000	11.4	44	71	80	90	100	112	132	160	—	—	—	—	60700	78300	18200	295
	309 R3	71.8	7.0	14600	11.7	44	71	80	90	100	112	132	160	—	—	—	—	62500	80700	18800	295
	309 R3	83.4	6.0	15700	10.8	44	71	80	90	100	112	132	160	—	—	—	—	65400	84400	19800	295
	309 R3	99.0	5.1	13000	7.5	44	71	80	90	100	112	132	160	—	—	—	—	68900	88800	21000	295
	309 R3	120	4.2	13400	6.4	44	71	80	90	100	112	132	160	—	—	—	—	72900	94100	22400	295
	309 R4	152	3.3	19500	7.6	30	71	80	90	100	112	132	160	—	—	—	—	78300	101000	24200	295
	309 R4	165	3.0	17600	6.3	30	71	80	90	100	112	132	160	—	—	—	—	80300	103600	24900	295
	309 R4	191	2.6	17500	5.4	30	71	80	90	100	112	132	160	—	—	—	—	83900	108100	26100	295
	309 R4	206	2.4	20600	5.9	30	71	80	90	100	112	132	160	—	—	—	—	85800	110600	26800	295
	309 R4	232	2.2	18100	4.6	30	71	80	90	100	112	132	160	—	—	—	—	89000	114700	27900	295
	309 R4	258	1.9	17600	4.0	30	71	80	90	100	112	132	160	—	—	—	—	91800	118400	28900	295
	309 R4	285	1.8	18200	3.8	30	71	80	90	100	112	132	160	—	—	—	—	94500	121900	29800	295
	309 R4	331	1.5	19600	3.5	30	71	80	90	100	112	132	160	—	—	—	—	99000	127600	31400	295
	309 R4	374	1.3	14400	2.3	30	71	80	90	100	112	132	160	—	—	—	—	102700	132400	32700	295
	309 R4	413	1.2	20400	2.9	30	71	80	90	100	112	132	160	—	—	—	—	105800	136400	33800	295
	309 R4	457	1.1	16700	2.2	30	71	80	90	100	112	132	160	—	—	—	—	109000	140600	34900	295
	309 R4	491	1.0	16900	2.0	30	71	80	90	100	112	132	160	—	—	—	—	110000	143600	35800	295
	309 R4	581	0.86	15800	1.6	30	71	80	90	100	112	132	160	—	—	—	—	110000	145000	36000	295
	309 R4	690	0.72	17000	1.5	30	71	80	90	100	112	132	160	—	—	—	—	110000	145000	36000	295



310 R

25000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 														R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ															
1400	310 R2 (B)	12.0	117	10000	130	55	—	—	—	—	—	—	180	200	225	—	—	—	31800	40000	13300	305				
	310 R2 (B)	15.4	91	10600	107	55	—	—	—	—	—	—	180	200	225	—	—	—	34300	43100	14500	305				
	310 R2 (B)	18.3	77	11100	94	55	—	—	—	—	—	—	180	200	225	—	—	—	36100	45400	15300	305				
	310 R2 (C)	16.6	84	10700	100	55	—	—	—	—	—	—	180	200	225	250	—	—	35100	44100	14800	305				
	310 R2 (C)	21.3	66	11700	85	55	—	—	—	—	—	—	180	200	225	250	—	—	37800	47600	16100	305				
	310 R2 (C)	25.3	55	12200	75	55	—	—	—	—	—	—	180	200	225	250	—	—	39800	50100	17100	305				
	310 R3	37.7	37	5580	24	22	71	80	90	100	112	132	160	—	—	—	—	—	44900	56400	19500	305				
	310 R3	44.6	31	6670	24	22	71	80	90	100	112	132	160	—	—	—	—	—	47200	59300	20600	305				
	310 R3	55.9	25.0	8360	24	22	71	80	90	100	112	132	160	—	—	—	—	—	50500	63500	22200	305				
	310 R3	65.0	21.5	9670	24	22	71	80	90	100	112	132	160	—	—	—	—	—	52800	66400	23400	305				
	310 R3	71.8	19.5	10700	24	22	71	80	90	100	112	132	160	—	—	—	—	—	54400	68400	24100	305				
	310 R3	78.6	17.8	11700	24	22	71	80	90	100	112	132	160	—	—	—	—	—	55900	70300	24900	305				
	310 R3	83.4	16.8	12400	24	22	71	80	90	100	112	132	160	—	—	—	—	—	56900	71600	25400	305				
	310 R3	99.0	14.1	14800	24	22	71	80	90	100	112	132	160	—	—	—	—	—	59900	75400	26900	305				
	310 R3	120	11.7	17100	23	22	71	80	90	100	112	132	160	—	—	—	—	—	63500	79800	28600	305				
	310 R4	136	10.3	19600	24	15.0	71	80	90	100	112	132	160	—	—	—	—	—	65900	82900	29900	305				
	310 R4	160	8.7	22200	23	15.0	71	80	90	100	112	132	160	—	—	—	—	—	69300	87100	31600	305				
	310 R4	189	7.4	23300	20	15.0	71	80	90	100	112	132	160	—	—	—	—	—	72800	91500	33400	305				
	310 R4	206	6.8	21700	17.5	15.0	71	80	90	100	112	132	160	—	—	—	—	—	74700	93900	34300	305				
	310 R4	234	6.0	20300	14.4	15.0	71	80	90	100	112	132	160	—	—	—	—	—	77600	97600	35800	305				
	310 R4	258	5.4	22400	14.4	15.0	71	80	90	100	112	132	160	—	—	—	—	—	79900	100500	37000	305				
	310 R4	283	4.9	22500	13.2	15.0	71	80	90	100	112	132	160	—	—	—	—	—	82100	103300	38100	305				
	310 R4	305	4.6	23000	12.5	15.0	71	80	90	100	112	132	160	—	—	—	—	—	84000	105600	39100	305				
	310 R4	334	4.2	25700	12.7	15.0	71	80	90	100	112	132	160	—	—	—	—	—	86300	108600	40300	305				
	310 R4	363	3.9	23700	10.8	15.0	71	80	90	100	112	132	160	—	—	—	—	—	88500	111300	41500	305				
	310 R4	419	3.3	28400	11.2	15.0	71	80	90	100	112	132	160	—	—	—	—	—	92400	116200	43500	305				
	310 R4	454	3.1	20200	7.4	15.0	71	80	90	100	112	132	160	—	—	—	—	—	94700	119000	44700	305				
	310 R4	517	2.7	25100	8.0	15.0	71	80	90	100	112	132	160	—	—	—	—	—	98400	123800	46600	305				
	310 R4	590	2.4	21800	6.1	15.0	71	80	90	100	112	132	160	—	—	—	—	—	102400	128700	48700	305				
	310 R4	639	2.2	21800	5.7	15.0	71	80	90	100	112	132	160	—	—	—	—	—	104800	131800	50000	305				
	310 R4	757	1.9	26200	5.7	15.0	71	80	90	100	112	132	160	—	—	—	—	—	110300	138700	52900	305				
	310 R4	898	1.6	23600	4.3	15.0	71	80	90	100	112	132	160	—	—	—	—	—	116100	146000	56100	305				
900	310 R2 (B)	12.0	75	11600	97	66	—	—	—	—	—	—	180	200	225	—	—	—	36300	45700	15400	305				
	310 R2 (B)	15.4	58	12100	79	66	—	—	—	—	—	—	180	200	225	—	—	—	39200	49300	16800	305				
	310 R2 (B)	18.3	49	12600	69	66	—	—	—	—	—	—	180	200	225	—	—	—	41200	51900	17700	305				
	310 R2 (C)	16.6	54	12200	74	66	—	—	—	—	—	—	180	200	225	250	—	—	40100	50400	17200	305				
	310 R2 (C)	21.3	42	13400	63	66	—	—	—	—	—	—	180	200	225	250	—	—	43200	54300	18700	305				
	310 R2 (C)	25.3	36	13600	54	66	—	—	—	—	—	—	180	200	225	250	—	—	45500	57200	19800	305				
	310 R3	37.7	23.8	6380	17.5	26	71	80	90	100	112	132	160	—	—	—	—	—	51200	64400	22600	305				
	310 R3	44.6	20.2	7610	17.6	26	71	80	90	100	112	132	160	—	—	—	—	—	53900	67700	23900	305				
	310 R3	55.9	16.1	9540	17.6	26	71	80	90	100	112	132	160	—	—	—	—	—	57600	72500	25700	305				
	310 R3	65.0	13.8	11100	17.6	26	71	80	90	100	112	132	160	—	—	—	—	—	60300	75800	27100	305				
	310 R3	71.8	12.5	12200	17.6	26	71	80	90	100	112	132	160	—	—	—	—	—	62100	78100	28000	305				
	310 R3	78.6	11.4	13400	17.5	26	71	80	90	100	112	132	160	—	—	—	—	—	63900	80300	28800	305				
	310 R3	83.4	10.8	14200	17.6	26	71	80	90	100	112	132	160	—	—	—	—	—	65000	81700	29400	305				
	310 R3	99.0	9.1	16600	17.3	26	71	80	90	100	112	132	160	—	—	—	—	—	68400	86000	31100	305				
	310 R3	120	7.5	17900	15.5	26	71	80	90	100	112	132	160	—	—	—	—	—	72400	91100	33200	305				
	310 R4	136	6.6	22400	17.6	18.0	71	80	90	100	112	132	160	—	—	—	—	—	75200	94600	34600	305				
	310 R4	160	5.6	25300	16.8	18.0	71	80	90	100	112	132	160	—	—	—	—	—	79100	99400	36600	305				
	310 R4	189	4.8	26500	14.9	18.0	71	80	90	100	112	132	160	—	—	—	—	—	83100	104500	38700	305				
	310 R4	206	4.4	23200	12.0	18.0	71	80	90	100	112	132	160	—	—	—	—	—	85200	107200	39800	305				
	310 R4	234	3.8	22700	10.3	18.0	71	80	90	100	112	132	160	—	—	—	—	—	88600	111400	41500	305				
	310 R4	258	3.5	24100	9.9	18.0	71	80	90	100	112	132	160	—	—	—	—	—	91200	114700	42900	305				
	310 R4	283	3.2	22800	8.6	18.0	71	80	90	100	112	132	160	—	—	—	—	—	93800	117900	44200	305				
	310 R4	305	3.0	24700	8.6	18.0	71	80	90	100	112	132	160	—	—	—	—	—	95900	120600	45300	305				
	310 R4	334	2.7	26800	8.5	18.0	71	80	90	100	112	132	160	—	—	—	—	—	98600	123900	46700	305				
	310 R4	363	2.5	25400	7.5	18.0	71	80	90	100	112															



310 R

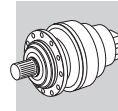
25000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 														R _{n2} [N]					
							71	80	90	100	112	132	160	-	-	-	-	MC	MZ	HC/PC	HZ/PZ	FZ				
900	310 R4	898	1.0	26000	3.1	18.0	71	80	90	100	112	132	160	-	-	-	-	-	-	132600	166000	65000	305			
500	310 R2 (B)	12.0	42	13800	64	110	-	-	-	-	-	-	-	180	200	225	-	-	-	43400	54500	18800	305			
	310 R2 (B)	15.4	32	14400	52	110	-	-	-	-	-	-	-	180	200	225	-	-	-	46700	58800	20400	305			
	310 R2 (B)	18.3	27.3	14300	44	110	-	-	-	-	-	-	-	180	200	225	-	-	-	49200	61900	21600	305			
	310 R2 (C)	16.6	30	14500	48	110	-	-	-	-	-	-	-	180	200	225	250	-	-	47800	60100	20900	305			
	310 R2 (C)	21.3	23.4	15900	41	110	-	-	-	-	-	-	-	180	200	225	250	-	-	51500	64800	22700	305			
	310 R2 (C)	25.3	19.7	15400	34	110	-	-	-	-	-	-	-	180	200	225	250	-	-	54200	68200	24100	305			
	310 R3	37.7	13.2	7620	11.6	44	71	80	90	100	112	132	160	-	-	-	-	-	-	61100	76900	27500	305			
	310 R3	44.6	11.2	9080	11.7	44	71	80	90	100	112	132	160	-	-	-	-	-	-	64200	80800	29000	305			
	310 R3	55.9	8.9	11400	11.7	44	71	80	90	100	112	132	160	-	-	-	-	-	-	68800	86500	31300	305			
	310 R3	65.0	7.7	13200	11.6	44	71	80	90	100	112	132	160	-	-	-	-	-	-	71900	90500	32900	305			
	310 R3	71.8	7.0	14600	11.7	44	71	80	90	100	112	132	160	-	-	-	-	-	-	74100	93200	34000	305			
	310 R3	78.6	6.4	15900	11.6	44	71	80	90	100	112	132	160	-	-	-	-	-	-	76200	95800	35100	305			
	310 R3	83.4	6.0	16900	11.7	44	71	80	90	100	112	132	160	-	-	-	-	-	-	77500	97500	35800	305			
	310 R3	99.0	5.1	18100	10.5	44	71	80	90	100	112	132	160	-	-	-	-	-	-	81600	102600	37900	305			
	310 R3	120	4.2	18900	9.0	44	71	80	90	100	112	132	160	-	-	-	-	-	-	86400	108700	40400	305			
	310 R4	136	3.7	26400	11.5	30	71	80	90	100	112	132	160	-	-	-	-	-	-	89800	112900	42100	305			
	310 R4	160	3.1	28600	10.5	30	71	80	90	100	112	132	160	-	-	-	-	-	-	94300	118600	44500	305			
	310 R4	189	2.6	29700	9.3	30	71	80	90	100	112	132	160	-	-	-	-	-	-	99200	124700	47000	305			
	310 R4	206	2.4	25500	7.3	30	71	80	90	100	112	132	160	-	-	-	-	-	-	101700	127800	48400	305			
	310 R4	234	2.1	24900	6.3	30	71	80	90	100	112	132	160	-	-	-	-	-	-	105700	132900	50500	305			
	310 R4	258	1.9	26500	6.1	30	71	80	90	100	112	132	160	-	-	-	-	-	-	108800	136900	52200	305			
	310 R4	283	1.8	22900	4.8	30	71	80	90	100	112	132	160	-	-	-	-	-	-	111900	140700	53800	305			
	310 R4	305	1.6	27200	5.3	30	71	80	90	100	112	132	160	-	-	-	-	-	-	114400	143800	55100	305			
	310 R4	334	1.5	27000	4.8	30	71	80	90	100	112	132	160	-	-	-	-	-	-	117600	147800	56800	305			
	310 R4	363	1.4	27900	4.5	30	71	80	90	100	112	132	160	-	-	-	-	-	-	120600	151600	58400	305			
	310 R4	419	1.2	30000	4.2	30	71	80	90	100	112	132	160	-	-	-	-	-	-	125900	158300	61300	305			
	310 R4	454	1.1	25400	3.3	30	71	80	90	100	112	132	160	-	-	-	-	-	-	128900	162100	62900	305			
	310 R4	517	0.97	29500	3.4	30	71	80	90	100	112	132	160	-	-	-	-	-	-	133000	166000	65000	305			
	310 R4	590	0.85	21800	2.2	30	71	80	90	100	112	132	160	-	-	-	-	-	-	133000	166000	65000	305			
	310 R4	639	0.78	26000	2.4	30	71	80	90	100	112	132	160	-	-	-	-	-	-	133000	166000	65000	305			
	310 R4	757	0.66	28000	2.2	30	71	80	90	100	112	132	160	-	-	-	-	-	-	133000	166000	65000	305			
	310 R4	898	0.56	26000	1.7	30	71	80	90	100	112	132	160	-	-	-	-	-	-	133000	166000	65000	305			

311 R

40000 Nm

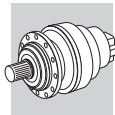
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 														Rn ₂ [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ															
1400	311 R2 (B)	12.0	117	11600	150	75	-	-	-	-	-	-	-	180	200	225	250	-	-	37600	46900	13300	315			
	311 R2 (B)	15.4	91	14800	150	75	-	-	-	-	-	-	-	180	200	225	250	-	-	40500	50500	14500	315			
	311 R2 (B)	18.3	77	16400	139	75	-	-	-	-	-	-	-	180	200	225	250	-	-	42700	53200	15300	315			
	311 R2 (C)	16.6	84	10300	96	90	-	-	-	-	-	-	-	180	200	225	250	-	-	41500	51700	14800	315			
	311 R2 (C)	21.3	66	13100	96	90	-	-	-	-	-	-	-	180	200	225	250	-	-	44700	55700	16100	315			
	311 R2 (C)	25.3	55	15500	95	90	-	-	-	-	-	-	-	180	200	225	250	-	-	47100	58600	17100	315			
	311 R3	53.0	26.4	16600	50	40	-	-	-	-	-	132	160	180	200	-	-	-	-	58700	73100	21800	315			
	311 R3	63.2	22.1	19700	50	40	-	-	-	-	-	132	160	180	200	-	-	-	-	61900	77100	23100	315			
	311 R3	68.0	20.6	21300	50	40	-	-	-	-	-	132	160	180	200	-	-	-	-	63300	78800	23700	315			
	311 R3	81.1	17.3	25300	50	40	-	-	-	-	-	132	160	180	200	-	-	-	-	66700	83100	25200	315			
	311 R3	96.3	14.5	27100	45	40	-	-	-	-	-	132	160	180	200	-	-	-	-	70200	87500	26600	315			
	311 R3	104	13.4	29300	45	40	-	-	-	-	-	132	160	180	200	-	-	-	-	71900	89600	27300	315			
	311 R3	124	11.3	30800	40	40	-	-	-	-	-	132	160	180	200	-	-	-	-	75700	94300	28900	315			
	311 R3	147	9.5	27000	30	40	-	-	-	-	-	132	160	180	200	-	-	-	-	79700	99300	30600	315			
	311 R4	154	9.1	22300	24	22	71	80	90	100	112	132	160	-	-	-	-	-	-	80900	100800	31200	315			
	311 R4	182	7.7	26300	24	22	71	80	90	100	112	132	160	-	-	-	-	-	-	85100	106000	32900	315			
	311 R4	198	7.1	28600	24	22	71	80	90	100	112	132	160	-	-	-	-	-	-	87200	108600	33900	315			
	311 R4	229	6.1	35100	25	22	71	80	90	100	112	132	160	-	-	-	-	-	-	91100	113400	35500	315			
	311 R4	266	5.3	36700	23	22	71	80	90	100	112	132	160	-	-	-	-	-	-	95300	118700	37400	315			
	311 R4	294	4.8	37600	21	22	71	80	90	100	112	132	160	-	-	-	-	-	-	98100	122200	38600	315			



311 R

40000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 														Rn ₂ [N]					
																		MC	MZ	HC/PC	HZ/PZ	FZ				
1400	311 R4	322	4.4	38700	19.9	22	71	80	90	100	112	132	160	–	–	–	–	–	–	100900	125600	39800	315			
	311 R4	341	4.1	38500	18.7	22	71	80	90	100	112	132	160	–	–	–	–	–	–	102700	127900	40600	315			
	311 R4	413	3.4	39700	15.9	22	71	80	90	100	112	132	160	–	–	–	–	–	–	108700	135400	43300	315			
	311 R4	438	3.2	35000	13.2	22	71	80	90	100	112	132	160	–	–	–	–	–	–	110600	137800	44100	315			
	311 R4	490	2.9	34500	11.7	22	71	80	90	100	112	132	160	–	–	–	–	–	–	114400	142500	45800	315			
	311 R4	520	2.7	36000	11.5	22	71	80	90	100	112	132	160	–	–	–	–	–	–	116500	145100	46700	315			
	311 R4	629	2.2	37300	9.8	22	71	80	90	100	112	132	160	–	–	–	–	–	–	123300	153600	49800	315			
	311 R4	746	1.9	30800	6.8	22	71	80	90	100	112	132	160	–	–	–	–	–	–	129800	161700	52700	315			
900	311 R2 (B)	12.0	75	13900	116	90	–	–	–	–	–	–	–	180	200	225	250	–	–	43000	53500	15400	315			
	311 R2 (B)	15.4	58	18000	117	90	–	–	–	–	–	–	–	180	200	225	250	–	–	46300	57700	16800	315			
	311 R2 (B)	18.3	49	18700	102	90	–	–	–	–	–	–	–	180	200	225	250	–	–	48700	60700	17700	315			
	311 R2 (C)	16.6	54	11600	70	108	–	–	–	–	–	–	–	180	200	225	250	–	–	47400	59000	17200	315			
	311 R2 (C)	21.3	42	15000	71	108	–	–	–	–	–	–	–	180	200	225	250	–	–	51000	63600	18700	315			
	311 R2 (C)	25.3	36	17700	70	108	–	–	–	–	–	–	–	180	200	225	250	–	–	53700	66900	19800	315			
	311 R3	53.0	17.0	18900	37	48	–	–	–	–	–	132	160	180	200	–	–	–	–	67000	83500	25300	315			
	311 R3	63.2	14.2	22500	37	48	–	–	–	–	–	132	160	180	200	–	–	–	–	70700	88100	26800	315			
	311 R3	68.0	13.2	24300	37	48	–	–	–	–	–	132	160	180	200	–	–	–	–	72200	90000	27500	315			
	311 R3	81.1	11.1	28900	37	48	–	–	–	–	–	132	160	180	200	–	–	–	–	76200	94900	29100	315			
	311 R3	96.3	9.3	30700	33	48	–	–	–	–	–	132	160	180	200	–	–	–	–	80200	99900	30900	315			
	311 R3	104	8.6	32100	32	48	–	–	–	–	–	132	160	180	200	–	–	–	–	82100	102300	31700	315			
	311 R3	124	7.3	32100	27	48	–	–	–	–	–	132	160	180	200	–	–	–	–	86400	107700	33500	315			
	311 R3	147	6.1	27000	19.0	48	–	–	–	–	–	132	160	180	200	–	–	–	–	91000	113300	35500	315			
	311 R4	154	5.8	25500	17.6	26	71	80	90	100	112	132	160	–	–	–	–	–	–	92400	115100	36100	315			
	311 R4	182	4.9	30000	17.5	26	71	80	90	100	112	132	160	–	–	–	–	–	–	97100	121000	38200	315			
	311 R4	198	4.5	32600	17.5	26	71	80	90	100	112	132	160	–	–	–	–	–	–	99600	124000	39200	315			
	311 R4	229	3.9	39800	18.5	26	71	80	90	100	112	132	160	–	–	–	–	–	–	104000	129500	41200	315			
	311 R4	266	3.4	41500	16.6	26	71	80	90	100	112	132	160	–	–	–	–	–	–	108800	135500	43300	315			
	311 R4	294	3.1	40400	14.6	26	71	80	90	100	112	132	160	–	–	–	–	–	–	112000	139600	44700	315			
	311 R4	322	2.8	43600	14.4	26	71	80	90	100	112	132	160	–	–	–	–	–	–	115200	143400	46100	315			
	311 R4	341	2.6	41300	12.9	26	71	80	90	100	112	132	160	–	–	–	–	–	–	117200	146000	47000	315			
	311 R4	413	2.2	42000	10.8	26	71	80	90	100	112	132	160	–	–	–	–	–	–	124100	154600	50100	315			
	311 R4	438	2.1	37800	9.2	26	71	80	90	100	112	132	160	–	–	–	–	–	–	126300	157400	51100	315			
	311 R4	490	1.8	34700	7.5	26	71	80	90	100	112	132	160	–	–	–	–	–	–	130600	162700	53100	315			
	311 R4	520	1.7	39000	8.0	26	71	80	90	100	112	132	160	–	–	–	–	–	–	133000	165700	54100	315			
	311 R4	629	1.4	40300	6.8	26	71	80	90	100	112	132	160	–	–	–	–	–	–	140800	175400	57700	315			
	311 R4	746	1.2	33000	4.7	26	71	80	90	100	112	132	160	–	–	–	–	–	–	148200	184600	61100	315			
500	311 R2 (B)	12.0	42	16600	77	150	–	–	–	–	–	–	–	180	200	225	250	–	–	51200	63800	18800	315			
	311 R2 (B)	15.4	32	21400	77	150	–	–	–	–	–	–	–	180	200	225	250	–	–	55200	68800	20400	315			
	311 R2 (B)	18.3	27.3	21400	65	150	–	–	–	–	–	–	–	180	200	225	250	–	–	58100	72400	21600	315			
	311 R2 (C)	16.6	30	13900	46	180	–	–	–	–	–	–	–	180	200	225	250	–	–	56500	70400	20900	315			
	311 R2 (C)	21.3	23.4	17900	47	180	–	–	–	–	–	–	–	180	200	225	250	–	–	60900	75800	22700	315			
	311 R2 (C)	25.3	19.7	21200	47	180	–	–	–	–	–	–	–	180	200	225	250	–	–	64100	79800	24100	315			
	311 R3	53.0	9.4	22300	24	80	–	–	–	–	–	132	160	180	200	–	–	–	–	80000	99600	30800	315			
	311 R3	63.2	7.9	26000	24	80	–	–	–	–	–	132	160	180	200	–	–	–	–	84300	105000	32600	315			
	311 R3	68.0	7.4	28000	24	80	–	–	–	–	–	132	160	180	200	–	–	–	–	86200	107400	33400	315			
	311 R3	81.1	6.2	34000	24	80	–	–	–	–	–	132	160	180	200	–	–	–	–	90900	113200	35500	315			
	311 R3	96.3	5.2	34300	20	80	–	–	–	–	–	132	160	180	200	–	–	–	–	95700	119200	37500	315			
	311 R3	104	4.8	32500	17.9	80	–	–	–	–	–	132	160	180	200	–	–	–	–	97900	122000	38500	315			
	311 R3	124	4.0	33500	15.6	80	–	–	–	–	–	132	160	180	200	–	–	–	–	103100	128400	40800	315			
	311 R3	147	3.4	28400	11.1	80	–	–	–	–	–	132	160	180	200	–	–	–	–	108500	135200	43200	315			
	311 R4	154	3.2	30400	11.6	44	71	80	90	100	112	132	160	–	–	–	–	–	–	110200	137300	43900	315			
	311 R4	182	2.7	35900	11.6	44	71	80	90	100	112	132	160	–	–	–	–	–	–	115800	144300	46400	315			
	311 R4	198	2.5	39000	11.6	44	71	80	90	100	112	132	160	–	–	–	–	–	–	118800	148000	47700	315			
	311 R4	229	2.2	45000	11.6	44	71	80	90	100	112	132	160	–	–	–	–	–	–	124000	154500	50100	315			
	311 R4	266	1.9	45000	10.0	44	71	80	90	100	112	132	160	–	–	–	–	–	–	129700	161600	52700	3151			



311 R

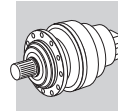
40000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 										R_{n2} [N]						
							MC	MZ	HC/PC	HZ/PZ	FZ												
500	311 R4	520	0.96	43000	4.9	44	71	80	90	100	112	132	160	–	–	–	–	–	–	157000	195000	65000	315
	311 R4	629	0.80	43000	4.0	44	71	80	90	100	112	132	160	–	–	–	–	–	–	157000	195000	65000	315
	311 R4	746	0.67	34000	2.7	44	71	80	90	100	112	132	160	–	–	–	–	–	–	157000	195000	65000	315

313 R

50000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 										R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ											
1400	313 R2 (B)	12.2	115	11700	150	75	-	-	-	-	-	-	180	200	225	250	-	-	46700	55200	16400	325
	313 R2 (B)	15.9	88	15300	150	75	-	-	-	-	-	-	180	200	225	250	-	-	50500	59800	18000	325
	313 R2 (B)	19.1	73	18400	150	75	-	-	-	-	-	-	180	200	225	250	-	-	53400	63200	19100	325
	313 R2 (C)	16.8	83	10400	96	90	-	-	-	-	-	-	180	200	225	250	-	-	51400	60900	18300	325
	313 R2 (C)	22.0	64	13400	95	90	-	-	-	-	-	-	180	200	225	250	-	-	55700	65900	20000	325
	313 R2 (C)	26.4	53	16100	95	90	-	-	-	-	-	-	180	200	225	250	-	-	58900	69700	21300	325
	313 R3	53.7	26.1	16800	50	40	-	-	-	-	132	160	180	200	-	-	-	72800	86200	27000	325	
	313 R3	64.0	21.9	20000	50	40	-	-	-	-	132	160	180	200	-	-	-	76800	90900	28600	325	
	313 R3	69.9	20.0	21800	50	40	-	-	-	-	132	160	180	200	-	-	-	78900	93300	29500	325	
	313 R3	82.2	17.0	25700	50	40	-	-	-	-	132	160	180	200	-	-	-	82800	97900	31100	325	
	313 R3	97.5	14.4	30400	50	40	-	-	-	-	132	160	180	200	-	-	-	87100	103100	32900	325	
	313 R3	107	13.1	33400	50	40	-	-	-	-	132	160	180	200	-	-	-	89600	106000	34000	325	
	313 R3	127	11.0	39600	50	40	-	-	-	-	132	160	180	200	-	-	-	94300	111600	36000	325	
	313 R3	153	9.2	39000	41	40	-	-	-	-	132	160	180	200	-	-	-	99700	118000	38200	325	
	313 R4	185	7.6	26600	24	22	71	80	90	100	112	132	160	-	-	-	-	-	105500	124900	40700	325
	313 R4	201	7.0	29000	24	22	71	80	90	100	112	132	160	-	-	-	-	-	108200	128000	41900	325
	313 R4	237	5.9	34200	24	22	71	80	90	100	112	132	160	-	-	-	-	-	113700	134600	44200	325
	313 R4	281	5.0	40600	24	22	71	80	90	100	112	132	160	-	-	-	-	-	119700	141700	46800	325
	313 R4	309	4.5	44000	24	22	71	80	90	100	112	132	160	-	-	-	-	-	123100	145700	48300	325
	313 R4	346	4.1	49200	24	22	71	80	90	100	112	132	160	-	-	-	-	-	127300	150700	50200	325
	313 R4	387	3.6	46500	19.9	22	71	80	90	100	112	132	160	-	-	-	-	-	131800	156000	52100	325
	313 R4	450	3.1	47200	17.3	22	71	80	90	100	112	132	160	-	-	-	-	-	137900	163200	54800	325
	313 R4	496	2.8	52000	17.4	22	71	80	90	100	112	132	160	-	-	-	-	-	141900	168000	56600	325
	313 R4	535	2.6	48000	14.9	22	71	80	90	100	112	132	160	-	-	-	-	-	145100	171800	58000	325
	313 R4	647	2.2	49200	12.6	22	71	80	90	100	112	132	160	-	-	-	-	-	153700	181900	61800	325
	313 R4	778	1.8	44700	9.5	22	71	80	90	100	112	132	160	-	-	-	-	-	162500	192300	65800	325
900	313 R2 (B)	12.2	74	14200	117	90	-	-	-	-	-	-	180	200	225	250	-	-	53300	63100	19100	325
	313 R2 (B)	15.9	57	18200	115	90	-	-	-	-	-	-	180	200	225	250	-	-	57700	68300	20800	325
	313 R2 (B)	19.1	47	22500	118	90	-	-	-	-	-	-	180	200	225	250	-	-	61000	72200	22100	325
	313 R2 (C)	16.8	53	11800	70	108	-	-	-	-	-	-	180	200	225	250	-	-	58700	69500	21200	325
	313 R2 (C)	22.0	41	15300	70	108	-	-	-	-	-	-	180	200	225	250	-	-	63600	75300	23200	325
	313 R2 (C)	26.4	34	18400	70	108	-	-	-	-	-	-	180	200	225	250	-	-	67200	79600	24700	325
	313 R3	53.7	16.8	19100	37	48	-	-	-	-	132	160	180	200	-	-	-	83200	98400	31300	325	
	313 R3	64.0	14.1	22800	37	48	-	-	-	-	132	160	180	200	-	-	-	87700	103800	33100	325	
	313 R3	69.9	12.9	24900	37	48	-	-	-	-	132	160	180	200	-	-	-	90000	106500	34100	325	
	313 R3	82.2	11.0	29300	37	48	-	-	-	-	132	160	180	200	-	-	-	94500	111800	36000	325	
	313 R3	97.5	9.2	34700	37	48	-	-	-	-	132	160	180	200	-	-	-	99500	117700	38100	325	
	313 R3	107	8.4	38100	37	48	-	-	-	-	132	160	180	200	-	-	-	102300	121100	39300	325	
	313 R3	127	7.1	42800	35	48	-	-	-	-	132	160	180	200	-	-	-	107700	127500	41700	325	
	313 R3	153	5.9	39000	26	48	-	-	-	-	132	160	180	200	-	-	-	113900	134800	44300	325	
	313 R4	185	4.9	30400	17.5	26	71	80	90	100	112	132	160	-	-	-	-	-	120500	142600	47200	325
	313 R4	201	4.5	33100	17.5	26	71	80	90	100	112	132	160	-	-	-	-	-	123500	146200	48500	325
	313 R4	237	3.8	39100	17.6	26	71	80	90	100	112	132	160	-	-	-	-	-	129800	153600	51300	325
	313 R4	281	3.2	46400	17.6	26	71	80	90	100	112	132	160	-	-	-	-	-	136700	161700	54300	325
	313 R4	309	2.9	47100	16.2	26	71	80	90	100	112	132	160	-	-	-	-	-	140600	166300	56000	325
	313 R4	346	2.6	54500	16.8	26	71	80	90	100	112	132	160	-	-	-	-	-	145400	172100	58100	325



313 R

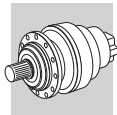
50000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 														R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ															
900	313 R4	387	2.3	48700	13.4	26	71	80	90	100	112	132	160	—	—	—	—	—	—	150500	178100	60400	325			
	313 R4	450	2.0	49800	11.8	26	71	80	90	100	112	132	160	—	—	—	—	—	—	157400	186300	63500	325			
	313 R4	496	1.8	52300	11.2	26	71	80	90	100	112	132	160	—	—	—	—	—	—	162000	191800	65600	325			
	313 R4	535	1.7	51000	10.2	26	71	80	90	100	112	132	160	—	—	—	—	—	—	165700	196100	67200	325			
	313 R4	647	1.4	52400	8.6	26	71	80	90	100	112	132	160	—	—	—	—	—	—	175500	207600	71700	325			
	313 R4	778	1.2	47900	6.5	26	71	80	90	100	112	132	160	—	—	—	—	—	—	185500	219500	76200	325			
500	313 R2 (B)	12.2	41	16900	77	150	—	—	—	—	—	—	—	180	200	225	250	—	—	63600	75200	23200	325			
	313 R2 (B)	15.9	32	21900	77	150	—	—	—	—	—	—	—	180	200	225	250	—	—	68800	81400	25300	325			
	313 R2 (B)	19.1	26.2	26900	78	150	—	—	—	—	—	—	—	180	200	225	250	—	—	72700	86100	26900	325			
	313 R2 (C)	16.8	29.7	14100	47	180	—	—	—	—	—	—	—	180	200	225	250	—	—	70100	82900	25800	325			
	313 R2 (C)	22.0	22.8	18100	46	180	—	—	—	—	—	—	—	180	200	225	250	—	—	75900	89800	28200	325			
	313 R2 (C)	26.4	18.9	21900	46	180	—	—	—	—	—	—	—	180	200	225	250	—	—	80200	94900	30000	325			
	313 R3	53.7	9.3	22500	24	80	—	—	—	—	—	132	160	180	200	—	—	—	—	99200	117400	38000	325			
	313 R3	64.0	7.8	26400	24	80	—	—	—	—	—	132	160	180	200	—	—	—	—	104600	123800	40300	325			
	313 R3	69.9	7.1	28800	24	80	—	—	—	—	—	132	160	180	200	—	—	—	—	107400	127100	41500	325			
	313 R3	82.2	6.1	34500	24	80	—	—	—	—	—	132	160	180	200	—	—	—	—	112700	133400	43800	325			
	313 R3	97.5	5.1	41500	24	80	—	—	—	—	—	132	160	180	200	—	—	—	—	118700	140400	46400	325			
	313 R3	107	4.7	44900	24	80	—	—	—	—	—	132	160	180	200	—	—	—	—	122000	144400	47900	325			
	313 R3	127	3.9	46100	21	80	—	—	—	—	—	132	160	180	200	—	—	—	—	128500	152000	50700	325			
	313 R3	153	3.3	41100	15.4	80	—	—	—	—	—	132	160	180	200	—	—	—	—	135800	160700	53900	325			
	313 R4	185	2.7	36300	11.6	44	71	80	90	100	112	132	160	—	—	—	—	—	—	143700	170000	57400	325			
	313 R4	201	2.5	39400	11.6	44	71	80	90	100	112	132	160	—	—	—	—	—	—	147300	174400	59000	325			
	313 R4	237	2.1	46100	11.5	44	71	80	90	100	112	132	160	—	—	—	—	—	—	154900	183300	62400	325			
	313 R4	281	1.8	51000	10.7	44	71	80	90	100	112	132	160	—	—	—	—	—	—	163000	192900	66000	325			
	313 R4	309	1.6	51300	9.8	44	71	80	90	100	112	132	160	—	—	—	—	—	—	167700	198400	68100	325			
	313 R4	346	1.4	55000	9.4	44	71	80	90	100	112	132	160	—	—	—	—	—	—	173400	205200	70700	325			
	313 R4	387	1.3	53000	8.1	44	71	80	90	100	112	132	160	—	—	—	—	—	—	179500	212400	73500	325			
	313 R4	450	1.1	54200	7.1	44	71	80	90	100	112	132	160	—	—	—	—	—	—	187800	222200	77300	325			
	313 R4	496	1.0	53000	6.3	44	71	80	90	100	112	132	160	—	—	—	—	—	—	192000	228800	79800	325			
	313 R4	535	0.94	55000	6.1	44	71	80	90	100	112	132	160	—	—	—	—	—	—	192000	231000	80000	325			
	313 R4	647	0.77	55000	5.0	44	71	80	90	100	112	132	160	—	—	—	—	—	—	192000	231000	80000	325			
	313 R4	778	0.64	49000	3.7	44	71	80	90	100	112	132	160	—	—	—	—	—	—	192000	231000	80000	325			

314 R

80000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	Pt kW	P (IEC) 														Rn ₂ [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ															
1400	314 R3 (B)	51.1	27.4	38200	120	55	-	-	-	-	-	-	-	180	200	225	-	-	-	76600	89900	29800	335			
	314 R3 (B)	65.5	21.4	50800	125	55	-	-	-	-	-	-	-	180	200	225	-	-	-	82600	96900	32400	335			
	314 R3 (B)	77.8	18.0	52600	109	55	-	-	-	-	-	-	-	180	200	225	-	-	-	86900	102000	34300	335			
	314 R3 (B)	82.3	17.0	53400	104	55	-	-	-	-	-	-	-	180	200	225	-	-	-	88400	103800	35000	335			
	314 R3 (B)	97.6	14.3	56200	92	55	-	-	-	-	-	-	-	180	200	225	-	-	-	93000	109200	37000	335			
	314 R3 (B)	113	12.3	49000	69	55	-	-	-	-	-	-	-	180	200	225	-	-	-	97300	114300	38900	335			
	314 R3 (C)	70.7	19.8	36500	83	55	-	-	-	-	-	-	-	180	200	225	250	-	-	84500	99200	33300	335			
	314 R3 (C)	90.7	15.4	39700	70	55	-	-	-	-	-	-	-	180	200	225	250	-	-	91000	106900	36200	335			
	314 R3 (C)	108	13.0	41100	61	55	-	-	-	-	-	-	-	180	200	225	250	-	-	95800	112500	38300	335			
	314 R3 (C)	114	12.3	49900	70	55	-	-	-	-	-	-	-	180	200	225	250	-	-	97400	114400	39000	335			
	314 R3 (C)	135	10.4	52200	62	55	-	-	-	-	-	-	-	180	200	225	250	-	-	102600	120400	41300	335			
	314 R3 (C)	157	8.9	52000	53	55	-	-	-	-	-	-	-	180	200	225	250	-	-	107300	126000	43400	335			
	314 R4	160	8.7	33900	35	22	71	80	90	100	112	132	160	-	-	-	-	-	-	108000	126800	43700	335			
	314 R4	189	7.4	40000	35	22	71	80	90	100	112	132	160	-	-	-	-	-	-	113500	133300	46200	335			
	314 R4	238	5.9	50200	35	22	71	80	90	100	112	132	160	-	-	-	-	-	-	121500	142700	49800	335			
	314 R4	276	5.1	58400	35	22	71	80	90	100	112	132	160	-	-	-	-	-	-	127100	149200	52400	335			
	314 R4	354	3.9	74900	35	22	71	80	90	100	112	132	160	-	-	-	-	-	-	137000	160800	56900	335			
	314 R4	421	3.3	79000	31	22	71	80	90	100	112	132	160	-	-	-	-	-	-	144200	169300	60300	335			
	314 R4	445	3.1	67400	25	22	71	80	90	100	112	132	160	-	-	-	-	-	-	146700	172200	61400	335			
	314 R4	528	2.7	69000	22	22	71	80	90	100	112	132	160	-	-	-	-	-	-	154400	181300	65000	335			
	314 R4	614	2.3	56800	15.3	22	71	80	90	100	112	132	160	-	-	-	-	-	-	161500	189600	68400	335			



314 R

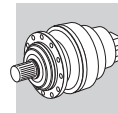
80000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										R _{n2} [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ											
900	314 R3 (B)	51.1	17.6	44000	89	66	—	—	—	—	—	—	180	200	225	—	—	—	87500	102700	34600	335
	314 R3 (B)	65.5	13.7	58500	92	66	—	—	—	—	—	—	180	200	225	—	—	—	94300	110700	37600	335
	314 R3 (B)	77.8	11.6	59800	79	66	—	—	—	—	—	—	180	200	225	—	—	—	99200	116500	39800	335
	314 R3 (B)	82.3	10.9	60800	76	66	—	—	—	—	—	—	180	200	225	—	—	—	100900	118500	40500	335
	314 R3 (B)	97.6	9.2	62500	66	66	—	—	—	—	—	—	180	200	225	—	—	—	106200	124700	42900	335
	314 R3 (B)	113	7.9	52000	47	66	—	—	—	—	—	—	180	200	225	—	—	—	111100	130500	45100	335
	314 R3 (C)	70.7	12.7	41700	61	66	—	—	—	—	—	—	180	200	225	250	—	—	96400	113200	38500	335
	314 R3 (C)	90.7	9.9	45400	52	66	—	—	—	—	—	—	180	200	225	250	—	—	103900	122000	41900	335
	314 R3 (C)	108	8.4	46100	44	66	—	—	—	—	—	—	180	200	225	250	—	—	109400	128500	44300	335
	314 R3 (C)	114	7.9	56300	51	66	—	—	—	—	—	—	180	200	225	250	—	—	111300	130600	45200	335
	314 R3 (C)	135	6.7	57700	44	66	—	—	—	—	—	—	180	200	225	250	—	—	117100	137500	47800	335
	314 R3 (C)	157	5.7	52000	34	66	—	—	—	—	—	—	180	200	225	250	—	—	122500	143900	50300	335
	314 R4	160	5.6	52700	35	26	71	80	90	100	112	132	160	—	—	—	—	—	123300	144800	50600	335
	314 R4	189	4.8	62300	35	26	71	80	90	100	112	132	160	—	—	—	—	—	129600	152100	53500	335
	314 R4	238	3.8	77600	35	26	71	80	90	100	112	132	160	—	—	—	—	—	138700	162900	57700	335
	314 R4	276	3.3	79100	30	26	71	80	90	100	112	132	160	—	—	—	—	—	145100	170400	60700	335
	314 R4	354	2.5	79900	24	26	71	80	90	100	112	132	160	—	—	—	—	—	156400	183600	66000	335
	314 R4	421	2.1	80700	20	26	71	80	90	100	112	132	160	—	—	—	—	—	164700	193300	69800	335
	314 R4	445	2.0	71700	17.2	26	71	80	90	100	112	132	160	—	—	—	—	—	167400	196600	71200	335
	314 R4	528	1.7	73500	14.8	26	71	80	90	100	112	132	160	—	—	—	—	—	176300	207000	75300	335
	314 R4	614	1.5	60500	10.5	26	71	80	90	100	112	132	160	—	—	—	—	—	184400	216500	79200	335
500	314 R3 (B)	51.1	9.8	53200	60	110	—	—	—	—	—	—	180	200	225	—	—	—	104300	122500	42100	335
	314 R3 (B)	65.5	7.6	69400	61	110	—	—	—	—	—	—	180	200	225	—	—	—	112400	132000	45700	335
	314 R3 (B)	77.8	6.4	71700	53	110	—	—	—	—	—	—	180	200	225	—	—	—	118400	139000	48400	335
	314 R3 (B)	82.3	6.1	63000	44	110	—	—	—	—	—	—	180	200	225	—	—	—	120400	141300	49300	335
	314 R3 (B)	97.6	5.1	63200	37	110	—	—	—	—	—	—	180	200	225	—	—	—	126700	148800	52200	335
	314 R3 (B)	113	4.4	52700	27	110	—	—	—	—	—	—	180	200	225	—	—	—	132600	155600	54900	335
	314 R3 (C)	70.7	7.1	49600	40	110	—	—	—	—	—	—	180	200	225	250	—	—	115000	135100	46900	335
	314 R3 (C)	90.7	5.5	54100	34	110	—	—	—	—	—	—	180	200	225	250	—	—	124000	145500	51000	335
	314 R3 (C)	108	4.6	52300	28	110	—	—	—	—	—	—	180	200	225	250	—	—	130500	153200	53900	335
	314 R3 (C)	114	4.4	64400	32	110	—	—	—	—	—	—	180	200	225	250	—	—	132700	155800	55000	335
	314 R3 (C)	135	3.7	64900	28	110	—	—	—	—	—	—	180	200	225	250	—	—	139700	164000	58200	335
	314 R3 (C)	157	3.2	54600	19.9	110	—	—	—	—	—	—	180	200	225	250	—	—	146200	171600	61200	335
	314 R4	160	3.1	65200	24	44	71	80	90	100	112	132	160	—	—	—	—	—	147100	172700	61600	335
	314 R4	189	2.6	77900	24	44	71	80	90	100	112	132	160	—	—	—	—	—	154600	181500	65100	335
	314 R4	238	2.1	80700	20	44	71	80	90	100	112	132	160	—	—	—	—	—	165500	194300	70200	335
	314 R4	276	1.8	81400	17.4	44	71	80	90	100	112	132	160	—	—	—	—	—	173100	203300	73800	335
	314 R4	354	1.4	82500	13.8	44	71	80	90	100	112	132	160	—	—	—	—	—	186600	219100	80300	335
	314 R4	421	1.2	83200	11.7	44	71	80	90	100	112	132	160	—	—	—	—	—	196400	230600	85000	335
	314 R4	445	1.1	77900	10.4	44	71	80	90	100	112	132	160	—	—	—	—	—	199700	234500	86600	335
	314 R4	528	0.95	79200	8.9	44	71	80	90	100	112	132	160	—	—	—	—	—	206000	243000	90000	335
	314 R4	614	0.81	64000	6.2	44	71	80	90	100	112	132	160	—	—	—	—	—	206000	243000	90000	335

315 R

90000 Nm

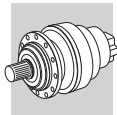
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										Rn ₂ [N]					
																	MC	MZ	HC/PC	HZ/PZ	FZ	
1400	315 R3 (B)	51.1	27.4	47700	150	75	—	—	180	200	225	250	—	—	—	—	—	—	76600	89900	29800	345
	315 R3 (B)	65.5	21.4	61200	150	75	—	—	180	200	225	250	—	—	—	—	—	—	82600	96900	32400	345
	315 R3 (B)	77.8	18.0	65700	136	75	—	—	180	200	225	250	—	—	—	—	—	—	86900	102000	34300	345
	315 R3 (B)	82.2	17.0	66800	130	75	—	—	180	200	225	250	—	—	—	—	—	—	88400	103800	35000	345
	315 R3 (B)	97.6	14.3	70200	116	75	—	—	180	200	225	250	—	—	—	—	—	—	93000	109200	37000	345
	315 R3 (B)	113	12.3	61200	87	75	—	—	180	200	225	250	—	—	—	—	—	—	97300	114300	38900	345
	315 R3 (C)	70.7	19.8	40500	92	90	—	—	180	200	225	250	—	—	—	—	—	—	84500	99200	33300	345
	315 R3 (C)	90.7	15.4	52600	93	90	—	—	180	200	225	250	—	—	—	—	—	—	91000	106900	36200	345
	315 R3 (C)	108	13.0	61900	92	90	—	—	180	200	225	250	—	—	—	—	—	—	95800	112500	38300	345
	315 R3 (C)	114	12.3	66000	93	90	—	—	180	200	225	250	—	—	—	—	—	—	97400	114400	39000	345
	315 R3 (C)	135	10.4	77200	92	90	—	—	180	200	225	250	—	—	—	—	—	—	102600	120400	41300	345
	315 R3 (C)	157	8.9	65000	66	90	—	—	180	200	225	250	—	—	—	—	—	—	107300	126000	43400	345



315 R

90000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						Rn ₂ [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	315 R4	225	6.2	66600	49	40	132	160	180	200	—	—	—	—	119600	140400	48900	345
	315 R4	269	5.2	79000	49	40	132	160	180	200	—	—	—	—	126100	148000	51900	345
	315 R4	345	4.1	96500	46	40	132	160	180	200	—	—	—	—	135900	159500	56400	345
	315 R4	409	3.4	98600	40	40	132	160	180	200	—	—	—	—	143000	167900	59700	345
	315 R4	525	2.7	99700	31	40	132	160	180	200	—	—	—	—	154100	181000	64900	345
	315 R4	623	2.2	100600	27	40	132	160	180	200	—	—	—	—	162300	190500	68700	345
	315 R4	659	2.1	89000	22	40	132	160	180	200	—	—	—	—	165000	193700	70000	345
	315 R4	782	1.8	91200	19.3	40	132	160	180	200	—	—	—	—	173700	203900	74100	345
	315 R4	909	1.5	75100	13.7	40	132	160	180	200	—	—	—	—	181700	213400	77900	345
900	315 R3 (B)	51.1	17.6	55000	111	90	—	—	180	200	225	250	—	—	87500	102700	34600	345
	315 R3 (B)	65.5	13.7	73100	115	90	—	—	180	200	225	250	—	—	94300	110700	37600	345
	315 R3 (B)	77.8	11.6	74800	99	90	—	—	180	200	225	250	—	—	99200	116500	39800	345
	315 R3 (B)	82.2	10.9	76000	95	90	—	—	180	200	225	250	—	—	100900	118500	40500	345
	315 R3 (B)	97.6	9.2	78100	83	90	—	—	180	200	225	250	—	—	106200	124700	42900	345
	315 R3 (B)	113	7.9	65000	59	90	—	—	180	200	225	250	—	—	111100	130500	45100	345
	315 R3 (C)	70.7	12.7	46200	67	108	—	—	180	200	225	250	—	—	96400	113200	38500	345
	315 R3 (C)	90.7	9.9	59700	68	108	—	—	180	200	225	250	—	—	103900	122000	41900	345
	315 R3 (C)	108	8.4	69500	67	108	—	—	180	200	225	250	—	—	109400	128500	44300	345
	315 R3 (C)	114	7.9	72900	66	108	—	—	180	200	225	250	—	—	111300	130600	45200	345
	315 R3 (C)	135	6.7	78600	60	108	—	—	180	200	225	250	—	—	117100	137500	47800	345
	315 R3 (C)	157	5.7	65000	43	108	—	—	180	200	225	250	—	—	122500	143900	50300	345
	315 R4	225	4.0	75800	36	48	132	160	180	200	—	—	—	—	136500	160300	56700	345
	315 R4	269	3.3	90500	36	48	132	160	180	200	—	—	—	—	143900	169000	60200	345
	315 R4	345	2.6	99700	31	48	132	160	180	200	—	—	—	—	155100	182100	65400	345
	315 R4	409	2.2	100700	26	48	132	160	180	200	—	—	—	—	163300	191700	69200	345
	315 R4	525	1.7	102000	21	48	132	160	180	200	—	—	—	—	176000	206600	75200	345
	315 R4	623	1.4	103000	17.6	48	132	160	180	200	—	—	—	—	185300	217500	79600	345
	315 R4	659	1.4	94700	15.3	48	132	160	180	200	—	—	—	—	188400	221200	81100	345
	315 R4	782	1.2	97100	13.2	48	132	160	180	200	—	—	—	—	198300	232900	85900	345
	315 R4	909	0.99	80000	9.4	48	132	160	180	200	—	—	—	—	206000	243000	90000	345
500	315 R3 (B)	51.1	9.8	66600	75	150	—	—	180	200	225	250	—	—	104300	122500	42100	345
	315 R3 (B)	65.5	7.6	86800	76	150	—	—	180	200	225	250	—	—	112400	132000	45700	345
	315 R3 (B)	77.8	6.4	89600	66	150	—	—	180	200	225	250	—	—	118400	139000	48400	345
	315 R3 (B)	82.2	6.1	78700	55	150	—	—	180	200	225	250	—	—	120400	141300	49300	345
	315 R3 (B)	97.6	5.1	79000	46	150	—	—	180	200	225	250	—	—	126700	148800	52200	345
	315 R3 (B)	113	4.4	65900	33	150	—	—	180	200	225	250	—	—	132600	155600	54900	345
	315 R3 (C)	70.7	7.1	55200	45	180	—	—	180	200	225	250	—	—	115000	135100	46900	345
	315 R3 (C)	90.7	5.5	71500	45	180	—	—	180	200	225	250	—	—	124000	145500	51000	345
	315 R3 (C)	108	4.6	78900	42	180	—	—	180	200	225	250	—	—	130500	153200	53900	345
	315 R3 (C)	114	4.4	80400	41	180	—	—	180	200	225	250	—	—	132700	155800	55000	345
	315 R3 (C)	135	3.7	82400	35	180	—	—	180	200	225	250	—	—	139700	164000	58200	345
	315 R3 (C)	157	3.2	68200	25	180	—	—	180	200	225	250	—	—	146200	171600	61200	345
	315 R4	225	2.2	88400	23	80	132	160	180	200	—	—	—	—	162800	191200	69000	345
	315 R4	269	1.9	100900	22	80	132	160	180	200	—	—	—	—	171700	201600	73200	345
	315 R4	345	1.4	102900	17.7	80	132	160	180	200	—	—	—	—	185000	217200	79500	345
	315 R4	409	1.2	103900	15.0	80	132	160	180	200	—	—	—	—	194800	228700	84200	345
	315 R4	525	0.95	105000	11.8	80	132	160	180	200	—	—	—	—	206000	243000	90000	345
	315 R4	623	0.80	105000	10.0	80	132	160	180	200	—	—	—	—	206000	243000	90000	345
	315 R4	659	0.76	99000	8.9	80	132	160	180	200	—	—	—	—	206000	243000	90000	345
	315 R4	782	0.64	99000	7.5	80	132	160	180	200	—	—	—	—	206000	243000	90000	345
	315 R4	909	0.55	80000	5.2	80	132	160	180	200	—	—	—	—	206000	243000	90000	345



316 R

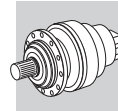
130000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						Rn ₂ [N]					
													MC	MZ	HC/PC	HZ/PZ	FZ	
1400	316 R3 (B)	51.1	27.4	47700	150	75	—	—	180	200	225	250	—	—	127400	141700	49700	355
	316 R3 (B)	65.5	21.4	61200	150	75	—	—	180	200	225	250	—	—	137300	152700	54100	355
	316 R3 (B)	77.8	18.0	66900	138	75	—	—	180	200	225	250	—	—	144500	160700	57200	355
	316 R3 (C)	70.7	19.8	42700	97	90	—	—	180	200	225	250	—	—	140400	156200	55400	355
	316 R3 (C)	90.7	15.4	54700	97	90	—	—	180	200	225	250	—	—	151300	168300	60300	355
	316 R3 (C)	108	13.0	65500	98	90	—	—	180	200	225	250	—	—	159300	177200	63800	355
	316 R4	225	6.2	96500	71	45	132	160	180	200	—	—	—	—	198800	221100	81600	355
	316 R4	269	5.2	101700	63	45	132	160	180	200	—	—	—	—	209600	233100	86500	355
	316 R4	289	4.8	107800	62	45	132	160	180	200	—	—	—	—	214200	238300	88700	355
	316 R4	345	4.1	109400	53	45	132	160	180	200	—	—	—	—	225900	251200	94000	355
	316 R4	409	3.4	112500	46	45	132	160	180	200	—	—	—	—	237800	264500	99600	355
	316 R4	443	3.2	119200	45	45	132	160	180	200	—	—	—	—	243500	270800	102200	355
	316 R4	525	2.7	119200	38	45	132	160	180	200	—	—	—	—	256300	285000	108200	355
	316 R4	623	2.2	116000	31	45	132	160	180	200	—	—	—	—	269800	300100	114500	355
900	316 R3 (B)	51.1	17.6	58800	119	90	—	—	180	200	225	250	—	—	145400	161700	57600	355
	316 R3 (B)	65.5	13.7	74800	118	90	—	—	180	200	225	250	—	—	156700	174300	62600	355
	316 R3 (B)	77.8	11.6	76200	101	90	—	—	180	200	225	250	—	—	165000	183500	66300	355
	316 R3 (C)	70.7	12.7	48800	71	108	—	—	180	200	225	250	—	—	160300	178300	64200	355
	316 R3 (C)	90.7	9.9	62100	71	108	—	—	180	200	225	250	—	—	172800	192200	69800	355
	316 R3 (C)	108	8.4	74600	72	108	—	—	180	200	225	250	—	—	181900	202300	73900	355
	316 R4	225	4.0	109900	52	54	132	160	180	200	—	—	—	—	227000	252400	94500	355
	316 R4	269	3.3	115700	46	54	132	160	180	200	—	—	—	—	239300	266200	100300	355
	316 R4	289	3.1	119600	44	54	132	160	180	200	—	—	—	—	244600	272000	102700	355
	316 R4	345	2.6	124400	38	54	132	160	180	200	—	—	—	—	257900	286800	108900	355
	316 R4	409	2.2	122500	32	54	132	160	180	200	—	—	—	—	271500	302000	115300	355
	316 R4	443	2.0	128000	31	54	132	160	180	200	—	—	—	—	278000	309100	118400	355
	316 R4	525	1.7	125400	25	54	132	160	180	200	—	—	—	—	292600	325400	125300	355
	316 R4	623	1.4	120300	21	54	132	160	180	200	—	—	—	—	308000	342600	132700	355
500	316 R3 (B)	51.1	9.8	70800	79	150	—	—	180	200	225	250	—	—	173500	192900	70100	355
	316 R3 (B)	65.5	7.6	90400	79	150	—	—	180	200	225	250	—	—	187000	207900	76200	355
	316 R3 (B)	77.8	6.4	90900	67	150	—	—	180	200	225	250	—	—	196800	218900	80700	355
	316 R3 (C)	70.7	7.1	58100	47	180	—	—	180	200	225	250	—	—	191300	212700	78100	355
	316 R3 (C)	90.7	5.5	75700	48	180	—	—	180	200	225	250	—	—	206100	229200	84900	355
	316 R3 (C)	108	4.6	88500	47	180	—	—	180	200	225	250	—	—	217000	241300	89900	355
	316 R4	225	2.2	127100	33	90	132	160	180	200	—	—	—	—	270700	301100	115000	355
	316 R4	269	1.9	128800	28	90	132	160	180	200	—	—	—	—	285500	317500	122000	355
	316 R4	289	1.7	129500	27	90	132	160	180	200	—	—	—	—	291800	324500	124900	355
	316 R4	345	1.4	131300	23	90	132	160	180	200	—	—	—	—	307700	342200	132500	355
	316 R4	409	1.2	129500	18.7	90	132	160	180	200	—	—	—	—	323900	360200	140300	355
	316 R4	443	1.1	133800	17.9	90	132	160	180	200	—	—	—	—	331600	368700	144000	355
	316 R4	525	0.95	132000	14.9	90	132	160	180	200	—	—	—	—	345000	385000	150000	355
	316 R4	623	0.80	124000	11.8	90	132	160	180	200	—	—	—	—	345000	385000	150000	355

317 R

150000 Nm

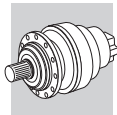
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
												MC	MZ	HC/PC	HZ/PZ	FZ		
1400	317 R3 (B)	49.8	28.1	46500	150	90	—	—	180	200	225	250	—	—	162500	173000	49300	363
	317 R3 (B)	64.9	21.6	60600	150	90	—	—	180	200	225	250	—	—	176000	187400	53900	363
	317 R3 (B)	78.1	17.9	72900	150	90	—	—	180	200	225	250	—	—	186000	198100	57300	363
	317 R3 (B)	83.3	16.8	77800	150	90	—	—	180	200	225	250	—	—	189700	201900	58600	363
	317 R3 (B)	100	14.0	93600	150	90	—	—	180	200	225	250	—	—	200500	213500	62300	363
	317 R3 (B)	119	11.8	110000	149	90	—	—	180	200	225	250	—	—	211100	224700	65900	363
	317 R3 (C)	68.9	20.3	44400	104	100	—	—	180	200	225	250	—	—	179200	190800	55000	363
	317 R3 (C)	89.8	15.6	57900	104	100	—	—	180	200	225	250	—	—	194000	206600	60100	363
	317 R3 (C)	108	12.9	66300	98	100	—	—	180	200	225	250	—	—	205100	218400	63900	363
	317 R3 (C)	115	12.1	68100	95	100	—	—	180	200	225	250	—	—	209100	222600	65300	363
	317 R3 (C)	139	10.1	83300	96	100	—	—	180	200	225	250	—	—	221000	235400	69400	363
	317 R3 (C)	165	8.5	97800	95	100	—	—	180	200	225	250	—	—	232700	247800	73500	363



317 R

150000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
												MC	MZ	HC/PC	HZ/PZ	FZ		
1400	317 R4	220	6.4	66100	50	50	132	160	180	200	—	—	—	—	253600	270100	80900	363
	317 R4	262	5.3	79400	50	50	132	160	180	200	—	—	—	—	267500	284800	85800	363
	317 R4	336	4.2	101600	50	50	132	160	180	200	—	—	—	—	288200	306900	93200	363
	317 R4	399	3.5	121100	50	50	132	160	180	200	—	—	—	—	303400	323100	98700	363
	317 R4	438	3.2	132800	50	50	132	160	180	200	—	—	—	—	312100	332300	101800	363
	317 R4	520	2.7	157500	50	50	132	160	180	200	—	—	—	—	328500	349800	107800	363
	317 R4	626	2.2	155000	41	50	132	160	180	200	—	—	—	—	347300	369800	114700	363
	317 R4	677	2.1	156400	38	50	132	160	180	200	—	—	—	—	355600	378600	117700	363
	317 R4	803	1.7	159500	33	50	132	160	180	200	—	—	—	—	374300	398500	124600	363
	317 R4	953	1.5	136700	24	50	132	160	180	200	—	—	—	—	394100	419600	132000	363
900	317 R3 (B)	49.8	18.1	53300	111	108	—	—	180	200	225	250	—	—	185600	197600	57200	363
	317 R3 (B)	64.9	13.9	69500	111	108	—	—	180	200	225	250	—	—	200900	213900	62400	363
	317 R3 (B)	78.1	11.5	88400	117	108	—	—	180	200	225	250	—	—	212400	226200	66400	363
	317 R3 (B)	83.3	10.8	93700	116	108	—	—	180	200	225	250	—	—	216500	230500	67800	363
	317 R3 (B)	100	9.0	112800	116	108	—	—	180	200	225	250	—	—	228900	243700	72200	363
	317 R3 (B)	119	7.6	115000	100	108	—	—	180	200	225	250	—	—	241000	256600	76400	363
	317 R3 (C)	68.9	13.1	50800	76	120	—	—	180	200	225	250	—	—	204600	217800	63700	363
	317 R3 (C)	89.8	10.0	66200	76	120	—	—	180	200	225	250	—	—	221500	235800	69600	363
	317 R3 (C)	108	8.3	75300	72	120	—	—	180	200	225	250	—	—	234200	249300	74000	363
	317 R3 (C)	115	7.8	77800	70	120	—	—	180	200	225	250	—	—	238700	254200	75600	363
	317 R3 (C)	139	6.5	94100	70	120	—	—	180	200	225	250	—	—	252400	268700	80400	363
	317 R3 (C)	165	5.5	111400	70	120	—	—	180	200	225	250	—	—	265700	282900	85200	363
	317 R4	220	4.1	75500	37	60	132	160	180	200	—	—	—	—	289600	308300	93700	363
	317 R4	262	3.4	90800	37	60	132	160	180	200	—	—	—	—	305400	325100	99400	363
	317 R4	336	2.7	116500	37	60	132	160	180	200	—	—	—	—	329100	350400	108000	363
	317 R4	399	2.3	137800	37	60	132	160	180	200	—	—	—	—	346400	368900	114400	363
	317 R4	438	2.1	150100	36	60	132	160	180	200	—	—	—	—	356300	379400	118000	363
	317 R4	520	1.7	168000	34	60	132	160	180	200	—	—	—	—	375100	399400	124900	363
	317 R4	626	1.4	155000	26	60	132	160	180	200	—	—	—	—	396600	422200	132900	363
	317 R4	677	1.3	164500	26	60	132	160	180	200	—	—	—	—	406000	432200	136400	363
	317 R4	803	1.1	167800	22	60	132	160	180	200	—	—	—	—	427400	455000	144400	363
	317 R4	953	0.94	145000	16.2	60	132	160	180	200	—	—	—	—	442000	470000	150000	363
500	317 R3 (B)	49.8	10.0	63600	73	180	—	—	180	200	225	250	—	—	221300	235700	69500	363
	317 R3 (B)	64.9	7.7	82800	73	180	—	—	180	200	225	250	—	—	239700	255200	75900	363
	317 R3 (B)	78.1	6.4	106500	78	180	—	—	180	200	225	250	—	—	253400	269800	80800	363
	317 R3 (B)	83.3	6.0	113100	78	180	—	—	180	200	225	250	—	—	258300	275000	82500	363
	317 R3 (B)	100	5.0	134900	77	180	—	—	180	200	225	250	—	—	273100	290700	87800	363
	317 R3 (B)	119	4.2	117700	57	180	—	—	180	200	225	250	—	—	287500	306100	92900	363
	317 R3 (C)	68.9	7.3	60400	50	200	—	—	180	200	225	250	—	—	244000	259800	77500	363
	317 R3 (C)	89.8	5.6	78900	50	200	—	—	180	200	225	250	—	—	264200	281300	84600	363
	317 R3 (C)	108	4.6	89200	47	200	—	—	180	200	225	250	—	—	279300	297400	90000	363
	317 R3 (C)	115	4.3	93200	46	200	—	—	180	200	225	250	—	—	284800	303200	92000	363
	317 R3 (C)	139	3.6	111900	46	200	—	—	180	200	225	250	—	—	301000	320500	97800	363
	317 R3 (C)	165	3.0	122600	43	200	—	—	180	200	225	250	—	—	316900	337400	103600	363
	317 R4	220	2.3	89100	24	100	132	160	180	200	—	—	—	—	345400	367800	114000	363
	317 R4	262	1.9	104200	24	100	132	160	180	200	—	—	—	—	364200	387800	120900	363
	317 R4	336	1.5	133100	23	100	132	160	180	200	—	—	—	—	392600	418000	131400	363
	317 R4	399	1.3	161700	24	100	132	160	180	200	—	—	—	—	413200	440000	139100	363
	317 R4	438	1.1	173300	23	100	132	160	180	200	—	—	—	—	425000	452500	143500	363
	317 R4	520	0.96	179000	20	100	132	160	180	200	—	—	—	—	442000	470000	150000	363
	317 R4	626	0.80	155000	14.6	100	132	160	180	200	—	—	—	—	442000	470000	150000	363
	317 R4	677	0.74	170000	14.9	100	132	160	180	200	—	—	—	—	442000	470000	150000	363
	317 R4	803	0.62	170000	12.5	100	132	160	180	200	—	—	—	—	442000	470000	150000	363
	317 R4	953	0.52	145000	9.0	100	132	160	180	200	—	—	—	—	442000	470000	150000	363



318 R

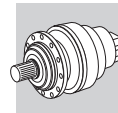
250000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 				Rn ₂ [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ					
1400	318 R4 (B) 225		6.2	199400	147	90	180	200	225	250	–	–	320500	327000	108700	371
	318 R4 (B) 288		4.9	214500	123	90	180	200	225	250	–	–	345400	352500	118100	371
	318 R4 (B) 342		4.1	223100	108	90	180	200	225	250	–	–	363600	371000	125100	371
	318 R4 (B) 362		3.9	226000	103	90	180	200	225	250	–	–	369700	377300	127400	371
	318 R4 (B) 430		3.3	235100	91	90	180	200	225	250	–	–	389200	397200	134900	371
	318 R4 (B) 499		2.8	209000	69	90	180	200	225	250	–	–	407200	415600	141800	371
	318 R4 (C) 311		4.5	173600	92	110	180	200	225	250	–	–	353300	360600	121100	371
	318 R4 (C) 399		3.5	223700	93	110	180	200	225	250	–	–	380800	388600	131600	371
	318 R4 (C) 474		3.0	240500	84	110	180	200	225	250	–	–	400900	409100	139400	371
	318 R4 (C) 501		2.8	243700	81	110	180	200	225	250	–	–	407600	416000	142000	371
	318 R4 (C) 595		2.4	250000	70	110	180	200	225	250	–	–	429100	437900	150300	371
	318 R4 (C) 691		2.0	216600	52	110	180	200	225	250	–	–	448900	458100	158100	371
900	318 R4 (B) 225		4.0	224200	106	108	180	200	225	250	–	–	365900	373400	125900	371
	318 R4 (B) 288		3.1	237500	88	108	180	200	225	250	–	–	394300	402400	136900	371
	318 R4 (B) 342		2.6	247100	77	108	180	200	225	250	–	–	415100	423600	144900	371
	318 R4 (B) 362		2.5	250000	74	108	180	200	225	250	–	–	422100	430800	147600	371
	318 R4 (B) 430		2.1	250000	62	108	180	200	225	250	–	–	444400	453500	156300	371
	318 R4 (B) 499		1.8	220900	47	108	180	200	225	250	–	–	464900	474500	164300	371
	318 R4 (C) 311		2.9	199000	68	132	180	200	225	250	–	–	403400	411700	140400	371
	318 R4 (C) 399		2.3	246300	66	132	180	200	225	250	–	–	434700	443700	152500	371
	318 R4 (C) 474		1.9	250000	56	132	180	200	225	250	–	–	457700	467100	161500	371
	318 R4 (C) 501		1.8	250000	53	132	180	200	225	250	–	–	465400	474900	164500	371
	318 R4 (C) 595		1.5	250000	45	132	180	200	225	250	–	–	489900	500000	174200	371
	318 R4 (C) 691		1.3	233400	36	132	180	200	225	250	–	–	503000	523100	183200	371
500	318 R4 (B) 225		2.2	250000	66	180	180	200	225	250	–	–	436500	445400	153200	371
	318 R4 (B) 288		1.7	250000	51	180	180	200	225	250	–	–	470400	480000	166500	371
	318 R4 (B) 342		1.5	250000	43	180	180	200	225	250	–	–	495200	505300	176300	371
	318 R4 (B) 362		1.4	250000	41	180	180	200	225	250	–	–	503000	513900	179600	371
	318 R4 (B) 430		1.2	250000	34	180	180	200	225	250	–	–	503000	541000	190100	371
	318 R4 (B) 499		1.0	243900	29	180	180	200	225	250	–	–	503000	565000	199900	371
	318 R4 (C) 311		1.6	227400	43	220	180	200	225	250	–	–	481200	491100	170700	371
	318 R4 (C) 399		1.3	249000	37	220	180	200	225	250	–	–	503000	529200	185500	371
	318 R4 (C) 474		1.1	250000	31	220	180	200	225	250	–	–	503000	557100	196400	371
	318 R4 (C) 501		1.00	250000	30	220	180	200	225	250	–	–	503000	565000	200000	371
	318 R4 (C) 595		0.84	250000	25	220	180	200	225	250	–	–	503000	565000	200000	371
	318 R4 (C) 691		0.72	244000	21	220	180	200	225	250	–	–	503000	565000	200000	371

319 R

300000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 				Rn ₂ [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ					
1400	319 R4 (B)	249	5.6	224100	149	95	180	200	225	250	–	–	379800	418500	112500	379
	319 R4 (B)	320	4.4	289400	150	95	180	200	225	250	–	–	409400	451000	122200	379
	319 R4 (B)	379	3.7	310400	136	95	180	200	225	250	–	–	430900	474800	129400	379
	319 R4 (B)	401	3.5	316600	131	95	180	200	225	250	–	–	438200	482800	131800	379
	319 R4 (B)	475	3.0	284000	99	95	180	200	225	250	–	–	460900	507800	139400	379
	319 R4 (B)	563	2.5	292300	86	95	180	200	225	250	–	–	485200	534600	147600	379
	319 R4 (B)	655	2.1	299700	76	95	180	200	225	250	–	–	507700	559300	155200	379
	319 R4 (C)	345	4.1	193900	93	115	180	200	225	250	–	–	418800	461400	125400	379
	319 R4 (C)	442	3.2	245600	92	115	180	200	225	250	–	–	451300	497200	136200	379
	319 R4 (C)	525	2.7	294900	93	115	180	200	225	250	–	–	475100	523500	144200	379
	319 R4 (C)	555	2.5	312200	93	115	180	200	225	250	–	–	483100	532300	146900	379
	319 R4 (C)	657	2.1	299800	76	115	180	200	225	250	–	–	508200	559900	155400	379
	319 R4 (C)	780	1.8	308500	66	115	180	200	225	250	–	–	535000	589400	164500	379
	319 R4 (C)	906	1.5	316300	58	115	180	200	225	250	–	–	559700	616600	173000	379
900	319 R4 (B)	249	3.6	257400	110	114	180	200	225	250	–	–	433700	477800	130300	379
	319 R4 (B)	320	2.8	333600	111	114	180	200	225	250	–	–	467400	514900	141600	379
	319 R4 (B)	379	2.4	348100	98	114	180	200	225	250	–	–	492000	542100	149900	379
	319 R4 (B)	401	2.2	348200	92	114	180	200	225	250	–	–	500300	551200	152800	379
	319 R4 (B)	475	1.9	305700	69	114	180	200	225	250	–	–	526300	579800	161600	379



319 R

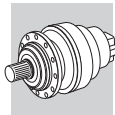
300000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 				Rn ₂ [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ					
900	319 R4 (B)	563	1.6	314500	60	114	180	200	225	250	–	–	554000	610400	171100	379
	319 R4 (B)	655	1.4	322500	52	114	180	200	225	250	–	–	579600	638600	179900	379
	319 R4 (C)	345	2.6	220700	68	138	180	200	225	250	–	–	478100	526800	145200	379
	319 R4 (C)	442	2.0	280500	67	138	180	200	225	250	–	–	515300	567700	157800	379
	319 R4 (C)	525	1.7	320100	65	138	180	200	225	250	–	–	542500	597700	167100	379
	319 R4 (C)	555	1.6	330000	63	138	180	200	225	250	–	–	551600	607700	170200	379
	319 R4 (C)	657	1.4	322700	52	138	180	200	225	250	–	–	580200	639200	180100	379
	319 R4 (C)	780	1.2	332000	45	138	180	200	225	250	–	–	610800	672900	190700	379
500	319 R4 (C)	906	0.99	340000	40	138	180	200	225	250	–	–	638000	702000	200000	379
	319 R4 (B)	249	2.0	302500	72	190	180	200	225	250	–	–	517300	570000	158500	379
	319 R4 (B)	320	1.6	347500	64	190	180	200	225	250	–	–	557500	614200	172300	379
	319 R4 (B)	379	1.3	349400	54	190	180	200	225	250	–	–	586900	646600	182400	379
	319 R4 (B)	401	1.2	349500	52	190	180	200	225	250	–	–	596800	657500	185800	379
	319 R4 (B)	475	1.1	337100	42	190	180	200	225	250	–	–	627700	691600	196500	379
	319 R4 (B)	563	0.89	340000	36	190	180	200	225	250	–	–	638000	702000	200000	379
	319 R4 (B)	655	0.76	340000	31	190	180	200	225	250	–	–	638000	702000	200000	379
	319 R4 (C)	345	1.5	261200	45	230	180	200	225	250	–	–	570300	628400	176700	379
	319 R4 (C)	442	1.1	336900	45	230	180	200	225	250	–	–	614700	677200	192000	379
	319 R4 (C)	525	0.95	350000	39	230	180	200	225	250	–	–	638000	702000	200000	379
	319 R4 (C)	555	0.90	350000	37	230	180	200	225	250	–	–	638000	702000	200000	379
	319 R4 (C)	657	0.76	340000	31	230	180	200	225	250	–	–	638000	702000	200000	379
	319 R4 (C)	780	0.64	340000	26	230	180	200	225	250	–	–	638000	702000	200000	379
	319 R4 (C)	906	0.55	340000	22	230	180	200	225	250	–	–	638000	702000	200000	379

321 R

350000 Nm

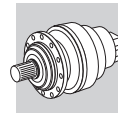
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 				Rn ₂ [N]					
							MC	MZ	HC/PC	HZ/PZ	FZ					
1400	321 R4 (B)	221	6.3	200400	150	105	180	200	225	250	–	–	449800	533400	648800	387
	321 R4 (B)	288	4.9	261300	150	105	180	200	225	250	–	–	487000	577500	708700	387
	321 R4 (B)	347	4.0	314500	150	105	180	200	225	250	–	–	514800	610500	753900	387
	321 R4 (B)	370	3.8	335300	150	105	180	200	225	250	–	–	524800	622400	770200	387
	321 R4 (B)	446	3.1	403600	150	105	180	200	225	250	–	–	554800	658000	819300	387
	321 R4 (B)	529	2.6	455700	143	105	180	200	225	250	–	–	584100	692700	867400	387
	321 R4 (C)	306	4.6	197500	107	125	180	200	225	250	–	–	495900	588000	723100	387
	321 R4 (C)	399	3.5	257500	107	125	180	200	225	250	–	–	536900	636700	789900	387
	321 R4 (C)	481	2.9	278100	96	125	180	200	225	250	–	–	567600	673100	840200	387
	321 R4 (C)	512	2.7	294700	95	125	180	200	225	250	–	–	578600	686200	858400	387
	321 R4 (C)	617	2.3	352200	95	125	180	200	225	250	–	–	611700	725400	913100	387
	321 R4 (C)	732	1.9	431400	98	125	180	200	225	250	–	–	644000	763700	966700	387
900	321 R4 (B)	221	4.1	241500	116	126	180	200	225	250	–	–	513500	609000	751700	387
	321 R4 (B)	288	3.1	315300	116	126	180	200	225	250	–	–	556000	659400	821200	387
	321 R4 (B)	347	2.6	373100	114	126	180	200	225	250	–	–	587800	697100	873500	387
	321 R4 (B)	370	2.4	405400	117	126	180	200	225	250	–	–	599200	710600	892400	387
	321 R4 (B)	446	2.0	457900	109	126	180	200	225	250	–	–	633500	751200	949300	387
	321 R4 (B)	529	1.7	475600	96	126	180	200	225	250	–	–	666900	790800	1005000	387
	321 R4 (C)	306	2.9	225500	78	150	180	200	225	250	–	–	566100	671400	837800	387
	321 R4 (C)	399	2.3	294000	78	150	180	200	225	250	–	–	613000	726900	915200	387
	321 R4 (C)	481	1.9	318300	71	150	180	200	225	250	–	–	648100	768500	973600	387
	321 R4 (C)	512	1.8	332300	69	150	180	200	225	250	–	–	660600	783400	994600	387
	321 R4 (C)	617	1.5	399700	69	150	180	200	225	250	–	–	698400	828200	1058000	387
	321 R4 (C)	732	1.2	475700	69	150	180	200	225	250	–	–	735200	871900	1120100	387
500	321 R4 (B)	221	2.3	290300	78	210	180	200	225	250	–	–	612500	726400	914500	387
	321 R4 (B)	288	1.7	379500	78	210	180	200	225	250	–	–	663200	786500	998900	387
	321 R4 (B)	347	1.4	450300	77	210	180	200	225	250	–	–	701200	831500	1062600	387
	321 R4 (B)	370	1.4	483100	77	210	180	200	225	250	–	–	714800	847600	1085500	387
	321 R4 (B)	446	1.1	525600	70	210	180	200	225	250	–	–	755600	896100	1154700	387
	321 R4 (B)	529	0.95	498000	56	210	180	200	225	250	–	–	779000	923000	1200000	387
	321 R4 (C)	306	1.6	268200	52	250	180	200	225	250	–	–	675300	800800	1019200	387
	321 R4 (C)	399	1.3	350600	52	250	180	200	225	250	–	–	731200	867100	1113300	387



321 R

350000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 				MC	MZ	R_{n2} [N]		HC/PC	HZ/PZ	FZ	
500	321 R4 (C)	481	1.0	379800	47	250	180	200	225	250	–	–	773000	916700	1184300	387		
	321 R4 (C)	512	0.98	387100	45	250	180	200	225	250	–	–	779000	923000	1200000	387		
	321 R4 (C)	617	0.81	445400	43	250	180	200	225	250	–	–	779000	923000	1200000	387		
	321 R4 (C)	732	0.68	498000	40	250	180	200	225	250	–	–	779000	923000	1200000	387		



25.0 - DATI TECNICI MOTORI- DUTTORI 3/V - 3/A

Guida alla consultazione delle
tabelle.

25.0 - 3/V - 3/A GEARMOTOR RATING CHARTS

Reading the rating chart.

25.0 - 3/V - 3/A TECHNISCHE DATEN DER GET- RIEBEMOTOREN

Anleitung für die richtige
Konsultation der Tabellen.

25.0 - DONNEES TECHNIQUES MOTOREDUCTEURS 3/V - 3/A

Guide pour la consultation des
tableaux

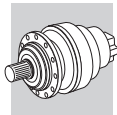


$P_1 = 0.12 \text{ kW}$ **$n_1 = 1400 \text{ min}^{-1}$**

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn_2 [N]			
											HC	HZ	FZ	
0.58	1176	1.4	2337	—	3/V 01 L3	—	BN 63A 4	—	12000	12500	31000	34000	8000	238
0.72	941	0.9	1869	—	3/V 00 L3	—	BN 63A 4	—	12000	12500	31000	34000	8000	230
0.72	941	1.8	1869	—	3/V 01 L3	—	BN 63A 4	—	12000	12500	31000	34000	8000	238
0.90	800	1.1	1495	—	3/V 00 L3	—	BN 63A 4	—	12000	12400	31000	34000	8000	230
0.90	800	2.1	1495	—	3/V 01 L3	—	BN 63A 4	—	12000	12400	31000	34000	8000	238



1	Potenza trasmessa in entrata riduttore	Power applied at gearbox input shaft	Am Getriebeantrieb übertragene Leistung	Puissance transmise à l'entrée du réducteur
2	Velocità angolare in entrata riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
4	Coppia trasmessa all'albero lento	Torque delivered at gearbox output shaft	Übertragenes Drehmoment am Getriebeabtrieb	Couple transmise en sortie réducteur
5	Fattore di sicurezza	Safety factor	Sicherheitsfaktor	Facteur de sécurité
6	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
7	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung des Getriebes	Puissance thermique réducteur
8	Grandezza riduttore combinato serie 300 + riduttore a vite senza fine	Model and frame size of combined planetary + worm gear unit	Baugröße des kombinierten Getriebemotors der Serie 300 + Schneckengetriebe	Taille réducteur combiné série 300 + réducteur à vis sans fin série
9	Grandezza riduttore combinato serie 300 + riduttore ad assi ortogonali serie A	Model and frame size of combined planetary + helical bevel gear unit, A type	Baugröße des kombinierten Getriebemotors der Serie 300 + Kegelradgetriebe der Serie A	Taille réducteur combiné série 300 + réducteur à axes orthogonaux série A
10	Grandezza motore IEC e polarità	IEC motor size and pole number	Baugröße des Kompaktmotors und Anzahl der Pole	Taille moteur IEC et n° pôles
11	Grandezza motore compatto e polarità	Compact motor size and pole number	Baugröße des Kompaktmotors und Anzahl der Pole	Taille moteur compact et n° pôles
12	Carico radiale applicabile sull'albero lento, calcolato per: - fattore di sicurezza S=1 - durata teorica di 10000 h Per forze non agenti in mezz'ora riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 h theoretical lifetime For forces applying off the midpoint, see diagrams provided in the pages following dimensions of the specific gearbox	Auf die Mitte der Abtriebswelle für eine Dauer von 10000 Std. applizierbare Nenn-Radialkräfte und Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales applicables en milieu d'arbre de sortie pendant : - facteur de sécurité S=1 - durée de 10000 heures Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
13	Pagina delle dimensioni. Le dimensioni dei motoriduttori si riferiscono ad abbinamenti con motori di produzione BONFIGLIOLI	Page installation drawing can be found at. Gearmotor dimensions refer to matches with BONFIGLIOLI motors only	Maßseiten. Die Maß der Getriebemotoren sind nur im Fall einer Montage mit Motoren der BONFIGLIOLI gültig	Page avec les dimensions Les dimensions des motoréducteurs sont valables seulement avec moteurs BONFIGLIOLI

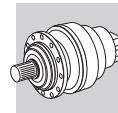


$$P_1 = 0.12 \text{ kW } n_1 = 1400 \text{ min}^{-1}$$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			HZ	FZ	
0.58	1176	1.4	2337	—	3/V 01 L3	—	BN 63A 4	—	12000	12500	31000	34000	8000	238		
0.72	941	0.9	1869	—	3/V 00 L3	—	BN 63A 4	—	12000	12500	31000	34000	8000	230		
0.72	941	1.8	1869	—	3/V 01 L3	—	BN 63A 4	—	12000	12500	31000	34000	8000	238		
0.90	800	1.1	1495	—	3/V 00 L3	—	BN 63A 4	—	12000	12400	31000	34000	8000	230		
0.90	800	2.1	1495	—	3/V 01 L3	—	BN 63A 4	—	12000	12400	31000	34000	8000	238		
0.98	695	1.4	1381	—	3/V 00 L3	—	BN 63A 4	—	12000	12100	30600	34000	7960	230		
0.98	695	2.7	1381	—	3/V 01 L3	—	BN 63A 4	—	12000	12100	30600	34000	7960	238		
1.1	641	1.3	1198	—	3/V 00 L3	—	BN 63A 4	—	11600	11600	29300	33600	7600	230		
1.1	641	2.6	1198	—	3/V 01 L3	—	BN 63A 4	—	11600	11600	29300	33600	7600	238		
1.2	557	1.8	1107	—	3/V 00 L3	—	BN 63A 4	—	11300	11300	28600	32800	7400	230		
1.4	597	1.4	997	—	3/V 00 L3	—	BN 63A 4	—	10900	10900	27700	31800	7140	230		
1.4	597	2.7	997	—	3/V 01 L3	—	BN 63A 4	—	10900	10900	27700	31800	7140	238		
1.5	455	1.8	903	—	3/V 00 L3	—	BN 63A 4	—	10500	10500	26900	30900	6910	230		
1.5	455	2.7	903	—	3/V 01 L3	—	BN 63A 4	—	10500	10500	26900	30900	6910	238		
1.7	412	2.4	818	—	3/V 00 L3	—	BN 63A 4	—	10200	10200	26100	30000	6690	230		
2.0	391	2.6	689	—	3/V 00 L3	—	BN 63A 4	—	9610	9610	24800	28500	6320	230		
2.0	499	2.3	665	—	—	3/A 01 L2	BN 63A 4	—	9490	9490	24500	28200	6240	239		
2.0	495	1.3	660	—	—	3/A 00 L2	BN 63A 4	—	9470	9470	24500	28100	6220	231		
2.1	350	2.9	654	—	3/V 00 L3	—	BN 63A 4	—	9440	9440	24400	28100	6210	230		
2.4	319	2.3	562	—	3/V 00 L3	—	BN 63A 4	—	8980	8980	23300	26800	5900	230		
2.5	413	1.5	550	—	—	3/A 00 L2	BN 63A 4	—	8910	8910	23200	26600	5860	231		
2.5	400	2.8	533	—	—	3/A 01 L2	BN 63A 4	—	8820	8820	23000	26400	5800	239		
3.1	331	2.1	441	—	—	3/A 00 L2	BN 63A 4	—	8280	8280	21700	24900	5440	231		
3.1	233	3.0	436	—	3/V 00 L3	—	BN 63A 4	—	8250	8250	21600	24800	5420	230		
3.4	295	2.8	393	—	—	3/A 01 L2	BN 63A 4	—	7970	7970	21000	24100	5240	239		
3.5	293	1.8	391	—	—	3/A 00 L2	BN 63A 4	—	7950	7950	20900	24000	5230	231		
3.7	277	2.1	369	—	—	3/A 00 L2	BN 63A 4	—	7800	7800	20600	23600	5130	231		
4.2	239	1.8	319	—	—	3/A 00 L2	BN 63A 4	—	7430	7430	19700	22600	4890	231		
4.6	222	3.0	296	—	—	3/A 00 L2	BN 63A 4	—	7250	7250	19200	22100	4770	231		
5.3	190	2.9	253	—	—	3/A 00 L2	BN 63A 4	—	6880	6880	18400	21100	4520	231		

$$P_1 = 0.18 \text{ kW } n_1 = 1400 \text{ min}^{-1}$$

0.56	1804	0.9	2337	—	3/V 01 L3	—	BN 63B 4	—	12000	12500	31000	34000	8000	238		
0.71	1443	1.2	1869	—	3/V 01 L3	—	BN 63B 4	—	12000	12500	31000	34000	8000	238		
0.88	1228	1.4	1495	—	3/V 01 L3	—	BN 63B 4	—	12000	12400	31000	34000	8000	238		
0.96	1066	0.9	1381	—	3/V 00 L3	—	BN 63B 4	—	12000	12100	30600	34000	7960	230		
0.96	1066	1.8	1381	—	3/V 01 L3	—	BN 63B 4	—	12000	12100	30600	34000	7960	238		
1.1	984	1.7	1198	—	3/V 01 L3	—	BN 63B 4	—	11600	11600	29300	33600	7600	238		
1.2	854	1.2	1107	—	3/V 00 L3	—	BN 63B 4	—	11300	11300	28600	32800	7400	230		
1.2	907	2.2	1105	—	3/V 01 L3	—	BN 63B 4	—	11200	11200	28600	32800	7390	238		
1.3	916	1.7	997	—	3/V 01 L3	—	BN 63B 4	—	10900	10900	27700	31800	7140	238		
1.5	697	1.1	903	—	3/V 00 L3	—	BN 63B 4	—	10500	10500	26900	30900	6910	230		
1.5	697	1.8	903	—	3/V 01 L3	—	BN 63B 4	—	10500	10500	26900	30900	6910	238		
1.6	631	1.6	818	—	3/V 00 L3	—	BN 63B 4	—	10200	10200	26100	30000	6690	230		
1.7	734	2.1	799	—	3/V 01 L3	—	BN 63B 4	—	10100	10100	25900	29800	6640	238		
1.8	842	2.2	731	—	—	3/A 03 L2	BN 63B 4	—	30100	34800	51500	62000	19300	247		
1.9	599	1.7	689	—	3/V 00 L3	—	BN 63B 4	—	9610	9610	24800	28500	6320	230		
1.9	599	2.9	689	—	3/V 01 L3	—	BN 63B 4	—	9610	9610	24800	28500	6320	238		
2.0	766	1.5	665	—	—	3/A 01 L2	BN 63B 4	—	9490	9490	24500	28200	6240	239		
2.0	537	1.9	654	—	3/V 00 L3	—	BN 63B 4	—	9440	9440	24400	28100	6210	230		
2.0	537	2.2	654	—	3/V 01 L3	—	BN 63B 4	—	9440	9440	24400	28100	6210	238		
2.2	696	2.6	605	—	—	3/A 03 L2	BN 63B 4	—	28300	32600	48700	58600	18100	247		
2.3	661	2.7	574	—	—	3/A 03 L2	BN 63B 4	—	27800	32100	47900	57700	17800	247		
2.3	489	1.5	562	—	3/V 00 L3	—	BN 63B 4	—	8980	8980	23300	26800	5900	230		
2.3	489	2.9	562	—	3/V 01 L3	—	BN 63B 4	—	8980	8980	23300	26800	5900	238		
2.4	634	0.9	550	—	—	3/A 00 L2	BN 63B 4	—	8910	8910	23200	26600	5860	231		
2.5	613	1.8	533	—	—	3/A 01 L2	BN 63B 4	—	8820	8820	23000	26400	5800	239		
2.6	443	2.2	509	—	3/V 00 L3	—	BN 63B 4	—	8680	8680	22600	26000	5710	230		
2.6	443	2.9	509	—	3/V 01 L3	—	BN 63B 4	—	8680	8680	22600	26000	5710	238		

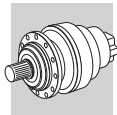


$P_1 = 0.18 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
2.9	523	2.2	454	—	—	3/A 01 L2	BN 63B 4	—	8360	8360	21900	25100	5500	239
3.0	508	1.4	441	—	—	3/A 00 L2	BN 63B 4	—	8280	8280	21700	24900	5440	231
3.0	358	2.0	436	—	3/V 00 L3	—	BN 63B 4	—	8250	8250	21600	24800	5420	230
3.2	361	2.6	415	—	3/V 00 L3	—	BN 63B 4	—	8120	8120	21300	24500	5340	230
3.4	453	1.8	393	—	—	3/A 01 L2	BN 63B 4	—	7970	7970	21000	24100	5240	239
3.4	450	1.2	391	—	—	3/A 00 L2	BN 63B 4	—	7950	7950	20900	24000	5230	231
3.6	425	1.3	369	—	—	3/A 00 L2	BN 63B 4	—	7800	7800	20600	23600	5130	231
4.1	367	1.2	319	—	—	3/A 00 L2	BN 63B 4	—	7430	7430	19700	22600	4890	231
4.5	341	1.9	296	—	—	3/A 00 L2	BN 63B 4	—	7250	7250	19200	22100	4770	231
5.2	291	1.9	253	—	—	3/A 00 L2	BN 63B 4	—	6880	6880	18400	21100	4520	231
6.0	252	2.5	219	—	—	3/A 00 L2	BN 63B 4	—	6550	6550	17600	20200	4310	231
6.5	233	2.8	203	—	—	3/A 00 L2	BN 63B 4	—	6390	6390	17200	19700	4200	231
7.7	197	2.8	171	—	—	3/A 00 L2	BN 63B 4	—	6040	6040	16300	18800	3970	231

$P_1 = 0.25 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.53	3075	2.3	2588	—	3/V 06 L3	—	BN 71A 4	—	45000	51000	101000	119000	35000	276
0.58	2773	1.0	2366	—	3/V 04 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	256
0.62	2616	1.6	2232	—	3/V 05 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	266
0.69	2191	1.0	2009	—	3/V 03 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	246
0.73	2218	1.2	1893	—	3/V 04 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	256
0.77	2093	2.2	1786	—	3/V 05 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	266
0.78	2224	1.2	1774	—	3/V 04 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	256
0.80	1885	1.5	1728	—	3/V 03 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	246
0.82	2098	2.0	1674	—	3/V 05 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	266
0.86	1756	1.3	1610	—	3/V 03 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	246
0.90	1800	1.9	1536	—	3/V 04 L3	—	BN 71A 4	—	36000	42000	64000	74000	24000	256
0.92	1631	1.0	1495	—	3/V 01 L3	—	BN 71A 4	—	12000	12400	31000	34000	8000	238
0.96	1677	2.7	1431	—	3/V 05 L3	—	BN 71A 4	—	36000	42000	63000	74000	24000	266
0.97	1779	1.5	1419	—	3/V 04 L3	—	BN 71A 4	—	36000	42000	62900	74000	24000	256
1.0	1510	1.9	1385	—	3/V 03 L3	—	BN 71A 4	—	36000	42000	62400	74000	23900	246
1.0	1417	1.3	1381	—	3/V 01 L3	—	BN 71A 4	—	12000	12100	30600	34000	7960	238
1.1	1443	2.4	1231	—	3/V 04 L3	—	BN 71A 4	—	35800	41400	60300	72500	23000	256
1.2	1307	1.3	1198	—	3/V 01 L3	—	BN 71A 4	—	11600	11600	29300	33600	7600	238
1.2	1297	1.7	1189	—	3/V 03 L3	—	BN 71A 4	—	35400	40900	59600	71800	22700	246
1.2	1444	2.4	1152	—	3/V 04 L3	—	BN 71A 4	—	35100	40500	59100	71100	22500	256
1.2	1205	1.7	1105	—	3/V 01 L3	—	BN 71A 4	—	11200	11200	28600	32800	7390	238
1.3	1116	2.4	1023	—	3/V 03 L3	—	BN 71A 4	—	33700	38900	57000	68600	21600	246
1.4	1217	1.3	997	—	3/V 01 L3	—	BN 71A 4	—	10900	10900	27700	31800	7140	238
1.5	1112	2.4	923	—	3/V 03 L3	—	BN 71A 4	—	32600	37600	55300	66500	20900	246
1.5	927	1.3	903	—	3/V 01 L3	—	BN 71A 4	—	10500	10500	26900	30900	6910	238
1.6	1228	2.1	887	—	3/V 04 L3	—	BN 71A 4	—	32100	37100	54600	65700	20600	256
1.7	839	1.2	818	—	3/V 00 L3	—	BN 71A 4	—	10200	10200	26100	30000	6690	230
1.7	975	1.6	799	—	3/V 01 L3	—	BN 71A 4	—	10100	10100	25900	29800	6640	238
1.7	955	2.2	793	—	3/V 03 L3	—	BN 71A 4	—	31000	35700	52800	63500	19900	246
1.9	1119	1.6	731	—	—	3/A 03 L2	BN 71A 4	—	30100	34800	51500	62000	19300	247
1.9	982	2.5	710	—	3/V 04 L3	—	BN 71A 4	—	29800	34400	51100	61500	19100	256
2.0	796	1.3	689	—	3/V 00 L3	—	BN 71A 4	—	9610	9610	24800	28500	6320	230
2.0	796	2.1	689	—	3/V 01 L3	—	BN 71A 4	—	9610	9610	24800	28500	6320	238
2.1	1017	1.1	665	—	—	3/A 01 L2	BN 71A 4	—	9490	9490	24500	28200	6240	239
2.1	714	1.4	654	—	3/V 00 L3	—	BN 71A 4	—	9440	9440	24400	28100	6210	230
2.1	714	1.7	654	—	3/V 01 L3	—	BN 71A 4	—	9440	9440	24400	28100	6210	238
2.2	751	2.9	623	—	3/V 03 L3	—	BN 71A 4	—	28600	33000	49100	59100	18300	246
2.3	925	1.9	605	—	—	3/A 03 L2	BN 71A 4	—	28300	32600	48700	58600	18100	247
2.4	878	2.0	574	—	—	3/A 03 L2	BN 71A 4	—	27800	32100	47900	57700	17800	247
2.5	650	1.1	562	—	3/V 00 L3	—	BN 71A 4	—	8980	8980	23300	26800	5900	230
2.5	650	2.2	562	—	3/V 01 L3	—	BN 71A 4	—	8980	8980	23300	26800	5900	238
2.6	815	1.4	533	—	—	3/A 01 L2	BN 71A 4	—	8820	8820	23000	26400	5800	239
2.7	796	3.0	520	—	—	3/A 04 L2	BN 71A 4	—	26900	31100	46500	56000	17300	257

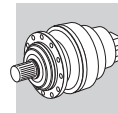


$P_1 = 0.25 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			FZ	
											HC	HZ			
2.7	588	1.7	509	—	3/V 00 L3	—	BN 71A 4	—	8680	8680	22600	26000	5710	230	
2.7	588	2.2	509	—	3/V 01 L3	—	BN 71A 4	—	8680	8680	22600	26000	5710	238	
2.7	662	3.0	502	—	3/V 03 L3	—	BN 71A 4	—	26600	30700	46000	55400	17100	246	
2.8	758	2.3	495	—	—	3/A 03 L2	BN 71A 4	—	26500	30500	45800	55200	17000	247	
3.0	695	1.7	454	—	—	3/A 01 L2	BN 71A 4	—	8360	8360	21900	25100	5500	239	
3.1	562	2.4	443	—	3/V 01 L3	—	BN 71A 4	—	8290	8290	21700	25000	5450	238	
3.1	675	1.0	441	—	—	3/A 00 L2	BN 71A 4	—	8280	8280	21700	24900	5440	231	
3.2	476	1.5	436	—	3/V 00 L3	—	BN 71A 4	—	8250	8250	21600	24800	5420	230	
3.3	480	2.0	415	—	3/V 00 L3	—	BN 71A 4	—	8120	8120	21300	24500	5340	230	
3.5	602	1.4	393	—	—	3/A 01 L2	BN 71A 4	—	7970	7970	21000	24100	5240	239	
3.5	598	0.9	391	—	—	3/A 00 L2	BN 71A 4	—	7950	7950	20900	24000	5230	231	
3.7	565	1.0	369	—	—	3/A 00 L2	BN 71A 4	—	7800	7800	20600	23600	5130	231	
3.8	557	2.4	364	—	—	3/A 01 L2	BN 71A 4	—	7770	7770	20500	23500	5110	239	
4.3	488	0.9	319	—	—	3/A 00 L2	BN 71A 4	—	7430	7430	19700	22600	4890	231	
4.4	476	2.4	311	—	—	3/A 01 L2	BN 71A 4	—	7370	7370	19500	22400	4850	239	
4.7	453	1.5	296	—	—	3/A 00 L2	BN 71A 4	—	7250	7250	19200	22100	4770	231	
5.1	412	2.5	269	—	—	3/A 01 L2	BN 71A 4	—	7020	7020	18700	21500	4620	239	
5.4	390	2.9	255	—	—	3/A 01 L2	BN 71A 4	—	6900	6900	18400	21100	4530	239	
5.5	387	1.4	253	—	—	3/A 00 L2	BN 71A 4	—	6880	6880	18400	21100	4520	231	
6.3	336	2.5	220	—	—	3/A 01 L2	BN 71A 4	—	6560	6560	17600	20200	4310	239	
6.3	335	1.9	219	—	—	3/A 00 L2	BN 71A 4	—	6550	6550	17600	20200	4310	231	
6.8	310	2.1	203	—	—	3/A 00 L2	BN 71A 4	—	6390	6390	17200	19700	4200	231	
8.1	262	2.1	171	—	—	3/A 00 L2	BN 71A 4	—	6040	6040	16300	18800	3970	231	
10.3	205	2.7	134	—	—	3/A 00 L2	BN 71A 4	—	5570	5570	15200	17400	3660	231	

$P_1 = 0.37 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW						MC/PC	MZ/PZ	HC	HZ	FZ	
0.27	8734	2.6	5081	—	3/V 10 L4	—	BN 71B 4	M 1SD 4	—	—	—	133000	166000	65000	306
0.53	4584	1.5	2588	—	3/V 06 L3	—	BN 71B 4	M 1SD 4	—	45000	51000	101000	119000	35000	276
0.61	3900	1.1	2232	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	64000	74000	24000	266
0.64	3790	2.2	2139	—	3/V 06 L3	—	BN 71B 4	M 1SD 4	—	45000	51000	101000	119000	35000	276
0.77	3120	1.5	1786	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	64000	74000	24000	266
0.77	3133	2.7	1768	—	3/V 06 L3	—	BN 71B 4	M 1SD 4	—	45000	51000	101000	119000	35000	276
0.79	2810	1.0	1728	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	64000	74000	24000	246
0.82	3128	1.3	1674	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	64000	74000	24000	266
0.89	2684	1.3	1536	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	64000	74000	24000	256
0.96	2500	1.8	1431	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	63000	74000	24000	266
0.97	2653	1.0	1419	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	62900	74000	24000	256
0.99	2252	1.3	1385	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	—	36000	42000	62400	74000	23900	246
1.1	2151	1.6	1231	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	35800	41400	60300	72500	23000	256
1.1	2151	2.6	1231	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	35800	41400	60300	72500	23000	266
1.2	1934	1.2	1189	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	—	35400	40900	59600	71800	22700	246
1.2	2153	1.6	1152	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	35100	40500	59100	71100	22500	256
1.2	2167	2.0	1116	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	34700	40000	58500	70400	22300	266
1.2	1797	1.1	1105	—	3/V 01 L3	—	BN 71B 4	—	—	11200	11200	28600	32800	7390	238
1.3	1848	2.4	1057	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	34100	39300	57600	69300	21900	266
1.3	1664	1.6	1023	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	—	33700	38900	57000	68600	21600	246
1.4	1714	2.3	981	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	33200	38400	56300	67700	21300	256
1.5	1658	1.6	923	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	—	32600	37600	55300	66500	20900	246
1.5	1736	2.5	894	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	32200	37200	54700	65900	20700	266
1.5	1830	1.4	887	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	32100	37100	54600	65700	20600	256
1.7	1454	1.1	799	—	3/V 01 L3	—	BN 71B 4	—	—	10100	10100	25900	29800	6640	238
1.7	1424	1.5	793	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	—	31000	35700	52800	63500	19900	246
1.7	1482	2.8	793	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	31000	35700	52800	63500	19900	266
1.8	1494	2.2	769	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	30600	35400	52300	63000	19700	256
1.9	1321	2.1	736	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	—	30200	34900	51600	62100	19400	246
1.9	1668	1.1	731	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	—	30100	34800	51500	62000	19300	247
1.9	1441	2.9	715	—	3/V 05 L3	—	BN 71B 4	M 1SD 4	—	29900	34500	51200	61600	19200	266
1.9	1464	1.7	710	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	—	29800	34400	51100	61500	19100	256

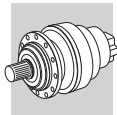


$P_1 = 0.37 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
2.0	1187	1.4	689	—	3/V 01 L3	—	BN 71B 4	—	9610	9610	24800	28500	6320	238
2.1	1064	0.9	654	—	3/V 00 L3	—	BN 71B 4	—	9440	9440	24400	28100	6210	230
2.1	1064	1.1	654	—	3/V 01 L3	—	BN 71B 4	—	9440	9440	24400	28100	6210	238
2.2	1119	2.0	623	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	28600	33000	49100	59100	18300	246
2.3	1379	1.3	605	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	28300	32600	48700	58600	18100	247
2.3	1355	2.5	594	—	—	3/A 05 L2	BN 71B 4	M 1SD 4	28100	32500	48400	58300	18000	267
2.4	1309	1.3	574	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	27800	32100	47900	57700	17800	247
2.4	1104	2.8	568	—	3/V 04 L3	—	BN 71B 4	M 1SD 4	27700	32000	47800	57500	17800	256
2.4	969	1.4	562	—	3/V 01 L3	—	BN 71B 4	—	8980	8980	23300	26800	5900	238
2.5	976	2.8	544	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	27300	31500	47200	56700	17500	246
2.6	1215	0.9	533	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	8820	8820	23000	26400	5800	239
2.6	1187	2.0	520	—	—	3/A 04 L2	BN 71B 4	M 1SD 4	26900	31100	46500	56000	17300	257
2.7	877	1.1	509	—	3/V 00 L3	—	BN 71B 4	—	8680	8680	22600	26000	5710	230
2.7	877	1.4	509	—	3/V 01 L3	—	BN 71B 4	—	8680	8680	22600	26000	5710	238
2.7	987	2.0	502	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	26600	30700	46000	55400	17100	246
2.8	1129	1.5	495	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	26500	30500	45800	55200	17000	247
2.9	1069	2.2	469	—	—	3/A 04 L2	BN 71B 4	M 1SD 4	26000	30000	45100	54300	16700	257
3.0	827	2.6	460	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	25800	29800	44900	54000	16600	246
3.0	1036	1.1	454	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	8360	8360	21900	25100	5500	239
3.1	838	1.6	443	—	3/V 01 L3	—	BN 71B 4	—	8290	8290	21700	25000	5450	238
3.1	709	1.0	436	—	3/V 00 L3	—	BN 71B 4	—	8250	8250	21600	24800	5420	230
3.2	845	2.2	430	—	3/V 01 L3	—	BN 71B 4	—	8210	8210	21500	24700	5400	238
3.3	716	1.3	415	—	3/V 00 L3	—	BN 71B 4	—	8120	8120	21300	24500	5340	230
3.3	934	2.0	409	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	24800	28700	43300	52100	15900	247
3.5	776	2.8	395	—	3/V 03 L3	—	BN 71B 4	M 1SD 4	24500	28300	42800	51500	15700	246
3.5	898	0.9	393	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	7970	7970	21000	24100	5240	239
3.5	882	2.7	386	—	—	3/A 04 L2	BN 71B 4	M 1SD 4	24400	28100	42600	51200	15600	257
3.8	831	1.6	364	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	7770	7770	20500	23500	5110	239
3.9	803	2.5	352	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	23600	27300	41400	49800	15100	247
3.9	796	2.9	349	—	—	3/A 04 L2	BN 71B 4	M 1SD 4	23500	27200	41300	49700	15100	257
4.2	743	2.2	326	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	23000	26600	40400	48600	14800	247
4.4	710	1.6	311	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	7370	7370	19500	22400	4850	239
4.6	675	1.0	296	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	7250	7250	19200	22100	4770	257
5.1	614	2.9	269	—	—	3/A 03 L2	BN 71B 4	M 1SD 4	21600	24900	38200	45900	13900	247
5.1	614	1.6	269	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	7020	7020	18700	21500	4620	239
5.4	581	2.0	255	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	6900	6900	18400	21100	4530	239
5.4	577	1.0	253	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	6880	6880	18400	21100	4520	257
6.2	501	1.7	220	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	6560	6560	17600	20200	4310	239
6.3	499	1.2	219	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	6550	6550	17600	20200	4310	257
6.7	466	2.8	204	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	6410	6410	17200	19800	4210	239
6.8	462	1.4	203	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	6390	6390	17200	19700	4200	257
7.4	420	2.5	184	—	—	3/A 01 L2	BN 71B 4	M 1SD 4	6190	6190	16700	19200	4070	239
8.0	391	1.4	171	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	6040	6040	16300	18800	3970	257
10.2	306	1.8	134	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	5570	5570	15200	17400	3660	257
12.8	245	2.7	107	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	5170	5170	14200	16300	3400	257
13.7	228	2.4	100	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	5050	5050	13900	16000	3320	257
15.5	202	2.7	89	—	—	3/A 00 L2	BN 71B 4	M 1SD 4	4850	4850	13400	15400	3190	257

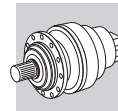
$P_1 = 0.55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.27	12889	1.8	5081	—	3/V 10 L4	—	BN 80A 4	M 1LA 4	—	—	133000	166000	65000	306
0.30	11762	2.5	4637	—	3/V 10 L4	—	BN 80A 4	M 1LA 4	—	—	133000	166000	65000	306
0.34	11782	2.5	4036	—	3/V 10 L4	—	BN 80A 4	M 1LA 4	—	—	133000	166000	65000	306
0.53	6765	1.0	2588	—	3/V 06 L3	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	276
0.56	6154	1.8	2472	—	3/V 07 L3	—	BN 80A 4	—	52000	65000	109000	145000	45000	286
0.65	5593	1.5	2139	—	3/V 06 L3	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	276
0.65	5656	1.9	2150	—	3/V 07 L3	—	BN 80A 4	—	52000	65000	109000	145000	45000	286
0.71	4888	2.5	1964	—	3/V 07 L3	—	BN 80A 4	—	52000	65000	109000	145000	45000	286



$P_1 = 0.55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.77	4605	1.0	1786	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	36000	42000	64000	74000	24000	266
0.78	4623	1.8	1768	—	3/V 06 L3	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	276
0.90	4176	2.6	1545	—	3/V 07 L3	—	BN 80A 4	—	52000	65000	109000	145000	45000	286
0.96	3690	1.2	1431	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	36000	42000	63000	74000	24000	266
0.99	3797	2.2	1395	—	3/V 06 L3	—	BN 80A 4	M 1LA 4	45000	51000	101000	119000	35000	276
1.1	3174	1.1	1231	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	35800	41400	60300	72500	23000	256
1.1	3174	1.7	1231	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	35800	41400	60300	72500	23000	266
1.1	3169	2.4	1212	—	3/V 06 L3	—	BN 80A 4	M 1LA 4	44400	50300	98100	114200	33400	276
1.2	3139	2.6	1153	—	3/V 06 L3	—	BN 80A 4	M 1LA 4	43700	49500	96700	112600	32800	276
1.2	3177	1.1	1152	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	35100	40500	59100	71100	22500	256
1.2	3198	1.4	1116	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	34700	40000	58500	70400	22300	266
1.3	2726	1.6	1057	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	34100	39300	57600	69300	21900	266
1.3	2455	1.1	1023	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	33700	38900	57000	68600	21600	246
1.4	2529	1.5	981	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	33200	38400	56300	67700	21300	256
1.5	2798	2.8	930	—	3/V 06 L3	—	BN 80A 4	M 1LA 4	40600	46100	90600	105500	30500	276
1.5	2447	1.1	923	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	32600	37600	55300	66500	20900	246
1.5	2562	1.7	894	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	32200	37200	54700	65900	20700	266
1.6	2701	1.0	887	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	32100	37100	54600	65700	20600	256
1.7	2102	1.0	793	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	31000	35700	52800	63500	19900	246
1.7	2187	1.9	793	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	31000	35700	52800	63500	19900	266
1.8	2204	1.5	769	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	30600	35400	52300	63000	19700	256
1.9	1950	1.4	736	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	30200	34900	51600	62100	19400	246
1.9	2127	1.9	715	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	29900	34500	51200	61600	19200	266
1.9	2161	1.2	710	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	29800	34400	51100	61500	19100	256
2.0	1739	1.0	689	—	3/V 01 L3	—	BN 80A 4	—	9610	9610	24800	28500	6320	238
2.1	2260	2.7	671	—	—	3/A 06 L2	BN 80A 4	M 1LA 4	36500	41300	82200	95700	27400	277
2.2	1718	2.1	623	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	28600	33000	49100	59100	18300	256
2.2	1651	1.3	623	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	28600	33000	49100	59100	18300	246
2.2	1718	2.6	623	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	28600	33000	49100	59100	18300	266
2.3	2058	2.9	611	—	—	3/A 06 L2	BN 80A 4	M 1LA 4	35300	40000	79900	93000	26600	277
2.3	2000	1.7	594	—	—	3/A 05 L2	BN 80A 4	M 1LA 4	28100	32500	48400	58300	18000	267
2.4	1754	2.8	576	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	27800	32100	48000	57700	17900	266
2.4	1932	0.9	574	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	27800	32100	47900	57700	17800	247
2.4	1629	1.9	568	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	27700	32000	47800	57500	17800	256
2.5	1419	1.0	562	—	3/V 01 L3	—	BN 80A 4	—	8980	8980	23300	26800	5900	238
2.5	1441	1.9	544	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	27300	31500	47200	56700	17500	246
2.6	1571	2.5	529	—	3/V 05 L3	—	BN 80A 4	M 1LA 4	27000	31200	46800	56300	17300	266
2.7	1752	1.4	520	—	—	3/A 04 L2	BN 80A 4	M 1LA 4	26900	31100	46500	56000	17300	257
2.7	1285	1.0	509	—	3/V 01 L3	—	BN 80A 4	—	8680	8680	22600	26000	5710	238
2.7	1457	1.4	502	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	26600	30700	46000	55400	17100	246
2.8	1292	2.3	501	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	26600	30700	46000	55400	17000	256
2.8	1667	1.0	495	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	26500	30500	45800	55200	17000	247
2.8	1653	2.3	491	—	—	3/A 05 L2	BN 80A 4	M 1LA 4	26400	30500	45700	55000	16900	267
2.9	1577	1.5	469	—	—	3/A 04 L2	BN 80A 4	M 1LA 4	26000	30000	45100	54300	16700	257
3.0	1220	1.8	460	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	25800	29800	44900	54000	16600	246
3.0	1298	2.8	453	—	3/V 04 L3	—	BN 80A 4	M 1LA 4	25700	29600	44600	53700	16500	256
3.1	1228	1.1	443	—	3/V 01 L3	—	BN 80A 4	—	8290	8290	21700	25000	5450	238
3.2	1238	1.5	430	—	3/V 01 L3	—	BN 80A 4	—	8210	8210	21500	24700	5400	238
3.3	1049	0.9	415	—	3/V 00 L3	—	BN 80A 4	—	8120	8120	21300	24500	5340	230
3.4	1378	1.4	409	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	24800	28700	43300	52100	15900	247
3.5	1341	2.4	398	—	—	3/A 05 L2	BN 80A 4	M 1LA 4	24600	28400	42900	51700	15800	267
3.5	1145	1.9	395	—	3/V 03 L3	—	BN 80A 4	M 1LA 4	24500	28300	42800	51500	15700	246
3.6	1301	1.8	386	—	—	3/A 04 L2	BN 80A 4	M 1LA 4	24400	28100	42600	51200	15600	257
3.8	1226	1.1	364	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	7770	7770	20500	23500	5110	239
3.9	1185	1.7	352	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	23600	27300	41400	49800	15100	247
4.0	1175	2.0	349	—	—	3/A 04 L2	BN 80A 4	M 1LA 4	23500	27200	41300	49700	15100	257
4.2	1096	1.5	326	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	23000	26600	40400	48600	14800	247
4.3	1069	2.2	317	—	—	3/A 04 L2	BN 80A 4	M 1LA 4	22800	26300	40100	48300	14600	257
4.4	1047	1.1	311	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	7370	7370	19500	22400	4850	239
4.9	953	2.9	283	—	—	3/A 04 L2	BN 80A 4	M 1LA 4	22000	25400	38800	46700	14100	257

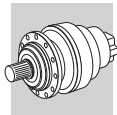


$P_1 = 0.55 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
5.1	906	2.0	269	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	21600	24900	38200	45900	13900	247
5.1	906	1.1	269	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	7020	7020	18700	21500	4620	239
5.4	858	1.3	255	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	6900	6900	18400	21100	4530	239
6.3	740	2.2	220	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	20200	23300	35900	43200	12900	247
6.3	739	1.1	220	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	6560	6560	17600	20200	4310	239
6.8	688	1.9	204	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	6410	6410	17200	19800	4210	239
6.8	682	1.0	203	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	6390	6390	17200	19700	4200	230
7.5	620	1.7	184	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	6190	6190	16700	19200	4070	239
7.6	612	2.9	182	—	—	3/A 03 L2	BN 80A 4	M 1LA 4	18900	21900	33900	40800	12200	247
8.1	577	1.0	171	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	6040	6040	16300	18800	3970	230
8.3	560	2.1	166	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	5980	5980	16200	18600	3930	239
10.3	451	1.2	134	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	5570	5570	15200	17400	3660	230
10.4	449	2.9	133	—	—	3/A 01 L2	BN 80A 4	M 1LA 4	5560	5560	15200	17400	3650	239
12.9	361	1.8	107	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	5170	5170	14200	16300	3400	230
13.8	337	1.6	100	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	5050	5050	13900	16000	3320	230
15.6	298	1.8	89	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	4850	4850	13400	15400	3190	230
17.2	270	2.4	80	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	4690	4690	13000	14900	3080	230
19.4	239	2.7	71	—	—	3/A 00 L2	BN 80A 4	M 1LA 4	4500	4500	12500	14400	2960	230

$P_1 = 0.75 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.28	17325	1.3	5081	—	3/V 10 L4	—	BN 80B 4	M 2SA 4	—	—	133000	166000	65000	306
0.28	17823	2.5	5021	—	3/V 11 L4	—	BN 80B 4	M 2SA 4	—	—	157000	195000	65000	216
0.30	15811	1.9	4637	—	3/V 10 L4	—	BN 80B 4	M 2SA 4	—	—	133000	166000	65000	306
0.32	15861	2.7	4410	—	3/V 11 L4	—	BN 80B 4	M 2SA 4	—	—	157000	195000	65000	216
0.35	15837	1.9	4036	—	3/V 10 L4	—	BN 80B 4	M 2SA 4	—	—	133000	166000	65000	306
0.35	13827	2.6	4000	—	3/V 11 L4	—	BN 80B 4	M 2SA 4	—	—	157000	195000	65000	216
0.39	12673	2.3	3570	—	3/V 10 L4	—	BN 80B 4	M 2SA 4	—	—	133000	166000	65000	306
0.43	12841	2.3	3273	—	3/V 10 L4	—	BN 80B 4	M 2SA 4	—	—	133000	166000	65000	306
0.49	11123	2.6	2835	—	3/V 10 L4	—	BN 80B 4	M 2SA 4	—	—	133000	166000	65000	306
0.57	8332	1.3	2472	—	3/V 07 L3	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	286
0.63	8668	2.6	2209	—	3/V 10 L4	—	BN 80B 4	M 2SA 4	—	—	133000	166000	65000	306
0.65	7658	1.4	2150	—	3/V 07 L3	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	286
0.65	7517	1.1	2139	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	45000	51000	101000	119000	35000	276
0.71	6617	1.9	1964	—	3/V 07 L3	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	286
0.79	6214	1.4	1768	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	45000	51000	101000	119000	35000	276
0.91	5654	1.9	1545	—	3/V 07 L3	—	BN 80B 4	M 2SA 4	52000	65000	109000	145000	45000	286
0.98	4959	0.9	1431	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	36000	42000	63000	74000	24000	266
0.99	5028	2.4	1411	—	3/V 07 L3	—	BN 80B 4	M 2SA 4	51900	65000	109000	144800	45000	286
1.0	5104	1.7	1395	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	45000	51000	101000	119000	35000	276
1.1	4266	1.3	1231	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	35800	41400	60300	72500	23000	266
1.2	4260	1.8	1212	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	44400	50300	98100	114200	33400	276
1.2	4296	2.5	1159	—	3/V 07 L3	—	BN 80B 4	M 2SA 4	48600	61000	104100	136500	42300	286
1.2	4219	1.9	1153	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	43700	49500	96700	112600	32800	276
1.3	4298	1.0	1116	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	34700	40000	58500	70400	22300	266
1.3	3665	1.2	1057	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	34100	39300	57600	69300	21900	266
1.4	3630	2.5	992	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	41500	47100	92400	107600	31200	276
1.4	3400	1.1	981	—	3/V 04 L3	—	BN 80B 4	M 2SA 4	33200	38400	56300	67700	21300	256
1.5	3761	2.1	930	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	40600	46100	90600	105500	30500	276
1.6	3444	1.2	894	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	32200	37200	54700	65900	20700	266
1.8	2939	1.4	793	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	31000	35700	52800	63500	19900	266
1.8	2892	2.6	791	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	38500	43600	86300	100500	28900	276
1.8	2963	1.1	769	—	3/V 04 L3	—	BN 80B 4	M 2SA 4	30600	35400	52300	63000	19700	256
1.9	2621	1.0	736	—	3/V 03 L3	—	BN 80B 4	M 2SA 4	30200	34900	51600	62100	19400	246
2.0	2859	1.4	715	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	29900	34500	51200	61600	19200	266
2.0	2854	2.6	698	—	3/V 06 L3	—	BN 80B 4	M 2SA 4	36900	41800	83100	96800	27700	276
2.1	3038	2.0	671	—	—	3/A 06 L2	BN 80B 4	M 2SA 4	36500	41300	82200	95700	27400	277
2.2	2310	1.5	623	—	3/V 04 L3	—	BN 80B 4	M 2SA 4	28600	33000	49100	59100	18300	256
2.2	2220	1.0	623	—	3/V 03 L3	—	BN 80B 4	M 2SA 4	28600	33000	49100	59100	18300	246
2.2	2310	1.9	623	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	28600	33000	49100	59100	18300	266
2.3	2766	2.2	611	—	—	3/A 06 L2	BN 80B 4	M 2SA 4	35300	40000	79900	93000	26600	277
2.4	2688	1.2	594	—	—	3/A 05 L2	BN 80B 4	M 2SA 4	28100	32500	48400	58300	18000	267

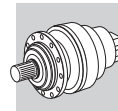


$P_1 = 0.75 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					Rn_2 [N]	MC/PC	MZ/PZ	HC	HZ	FZ	
2.4	2357	2.1	576	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	27800	32100	48000	57700	17900	266	
2.5	2189	1.4	568	—	3/V 04 L3	—	BN 80B 4	M 2SA 4	27700	32000	47800	57500	17800	256	
2.5	2511	2.9	555	—	—	3/A 06 L2	BN 80B 4	M 2SA 4	34200	38800	77600	90400	25700	277	
2.6	1936	1.4	544	—	3/V 03 L3	—	BN 80B 4	M 2SA 4	27300	31500	47200	56700	17500	246	
2.6	2112	1.9	529	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	27000	31200	46800	56300	17300	266	
2.7	2355	1.0	520	—	—	3/A 04 L2	BN 80B 4	M 2SA 4	26900	31100	46500	56000	17300	257	
2.8	1958	1.0	502	—	3/V 03 L3	—	BN 80B 4	M 2SA 4	26600	30700	46000	55400	17100	246	
2.8	1737	1.7	501	—	3/V 04 L3	—	BN 80B 4	M 2SA 4	26600	30700	46000	55400	17000	256	
2.9	2222	1.7	491	—	—	3/A 05 L2	BN 80B 4	M 2SA 4	26400	30500	45700	55000	16900	267	
3.0	2120	1.1	469	—	—	3/A 04 L2	BN 80B 4	M 2SA 4	26000	30000	45100	54300	16700	257	
3.0	1889	2.5	462	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	25800	29800	44900	54000	16600	266	
3.0	1640	1.3	460	—	3/V 03 L3	—	BN 80B 4	M 2SA 4	25800	29800	44900	54000	16600	246	
3.1	1745	2.1	453	—	3/V 04 L3	—	BN 80B 4	M 2SA 4	25700	29600	44600	53700	16500	256	
3.3	1676	1.1	430	—	3/V 01 L3	—	BN 80B 4	—	8210	8210	21500	24700	5400	238	
3.3	1912	2.3	422	—	—	3/A 05 L2	BN 80B 4	M 2SA 4	25100	29000	43700	52600	16100	267	
3.4	1852	1.0	409	—	—	3/A 03 L2	BN 80B 4	M 2SA 4	24800	28700	43300	52100	15900	247	
3.5	1802	1.8	398	—	—	3/A 05 L2	BN 80B 4	M 2SA 4	24600	28400	42900	51700	15800	267	
3.5	1622	2.3	396	—	3/V 05 L3	—	BN 80B 4	M 2SA 4	24600	28400	42900	51600	15800	266	
3.5	1539	1.4	395	—	3/V 03 L3	—	BN 80B 4	M 2SA 4	24500	28300	42800	51500	15700	246	
3.6	1749	1.3	386	—	—	3/A 04 L2	BN 80B 4	M 2SA 4	24400	28100	42600	51200	15600	257	
3.6	1478	2.4	384	—	3/V 04 L3	—	BN 80B 4	M 2SA 4	24300	28100	42500	51100	15600	256	
4.0	1593	1.3	352	—	—	3/A 03 L2	BN 80B 4	M 2SA 4	23600	27300	41400	49800	15100	247	
4.0	1579	1.5	349	—	—	3/A 04 L2	BN 80B 4	M 2SA 4	23500	27200	41300	49700	15100	257	
4.3	1490	2.5	329	—	—	3/A 05 L2	BN 80B 4	M 2SA 4	23100	26700	40600	48800	14800	267	
4.3	1473	1.1	326	—	—	3/A 03 L2	BN 80B 4	M 2SA 4	23000	26600	40400	48600	14800	247	
4.4	1436	1.6	317	—	—	3/A 04 L2	BN 80B 4	M 2SA 4	22800	26300	40100	48300	14600	257	
4.9	1282	2.2	283	—	—	3/A 04 L2	BN 80B 4	M 2SA 4	22000	25400	38800	46700	14100	257	
5.0	1265	2.8	280	—	—	3/A 05 L2	BN 80B 4	M 2SA 4	21900	25200	38600	46500	14000	267	
5.2	1218	1.5	269	—	—	3/A 03 L2	BN 80B 4	M 2SA 4	21600	24900	38200	45900	13900	247	
5.5	1153	1.0	255	—	—	3/A 01 L2	BN 80B 4	M 2SA 4	6900	6900	18400	21100	4530	239	
6.4	994	1.7	220	—	—	3/A 03 L2	BN 80B 4	M 2SA 4	20200	23300	35900	43200	12900	247	
6.9	924	1.4	204	—	—	3/A 01 L2	BN 80B 4	M 2SA 4	6410	6410	17200	19800	4210	239	
7.6	833	1.2	184	—	—	3/A 01 L2	BN 80B 4	M 2SA 4	6190	6190	16700	19200	4070	239	
7.7	822	2.2	182	—	—	3/A 03 L2	BN 80B 4	M 2SA 4	18900	21900	33900	40800	12200	247	
8.4	753	1.5	166	—	—	3/A 01 L2	BN 80B 4	M 2SA 4	5980	5980	16200	18600	3930	239	
10.5	606	0.9	134	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	5570	5570	15200	17400	3660	231	
10.5	603	2.2	133	—	—	3/A 01 L2	BN 80B 4	M 2SA 4	5560	5560	15200	17400	3650	239	
13.0	486	1.3	107	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	5170	5170	14200	16300	3400	231	
13.8	459	2.5	102	—	—	3/A 01 L2	BN 80B 4	M 2SA 4	5070	5070	14000	16000	3340	239	
14.0	453	1.2	100	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	5050	5050	13900	16000	3320	231	
15.8	401	1.4	88.6	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	4850	4850	13400	15400	3190	231	
17.5	363	1.8	80.2	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	4690	4690	13000	14900	3080	231	
19.7	321	2.0	71.0	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	4500	4500	12500	14400	2960	231	
22.9	277	2.3	61.2	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	4290	4290	12000	13800	2820	231	
27.0	235	2.3	51.8	—	—	3/A 00 L2	BN 80B 4	M 2SA 4	4060	4060	11400	13100	2670	231	

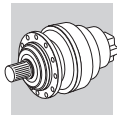
$P_1 = 1.1 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.28	25410	0.9	5081	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306	
0.28	25583	2.1	5046	—	3/V 13 L4	—	BN 90S 4	M 2SB 4	—	—	192000	231000	80000	326	
0.28	26140	1.7	5021	—	3/V 11 L4	—	BN 90S 4	M 2SB 4	—	—	157000	195000	65000	316	
0.30	23189	1.3	4637	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306	
0.31	23928	2.3	4536	—	3/V 13 L4	—	BN 90S 4	M 2SB 4	—	—	192000	231000	80000	326	
0.32	23263	1.8	4410	—	3/V 11 L4	—	BN 90S 4	M 2SB 4	—	—	157000	195000	65000	316	
0.35	21340	2.6	4046	—	3/V 13 L4	—	BN 90S 4	M 2SB 4	—	—	192000	231000	80000	326	
0.35	23227	1.3	4036	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306	
0.35	20279	1.8	4000	—	3/V 11 L4	—	BN 90S 4	M 2SB 4	—	—	157000	195000	65000	316	
0.39	18587	1.6	3570	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306	
0.39	18031	2.3	3557	—	3/V 11 L4	—	BN 90S 4	M 2SB 4	—	—	157000	195000	65000	316	
0.40	20230	2.7	3515	—	3/V 13 L4	—	BN 90S 4	M 2SB 4	—	—	192000	231000	80000	326	



$P_1 = 1.1 \text{ kW}$ **$n_1 = 1400 \text{ min}^{-1}$**

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.43	18833	1.6	3273	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306
0.43	18775	2.9	3263	—	3/V 13 L4	—	BN 90S 4	M 2SB 4	—	—	192000	231000	80000	326
0.43	18539	2.4	3222	—	3/V 11 L4	—	BN 90S 4	M 2SB 4	—	—	157000	195000	65000	316
0.48	16415	2.7	2887	—	3/V 11 L4	—	BN 90S 4	M 2SB 4	—	—	157000	195000	65000	316
0.49	16314	1.8	2835	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306
0.57	12220	0.9	2472	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	52000	65000	109000	145000	45000	286
0.57	14293	2.1	2455	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306
0.63	12713	1.8	2209	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306
0.65	11232	1.0	2150	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	52000	65000	109000	145000	45000	286
0.69	11601	2.5	2016	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306
0.71	9705	1.3	1964	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	52000	65000	109000	145000	45000	286
0.77	10509	2.4	1826	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306
0.79	9114	0.9	1768	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	45000	51000	101000	119000	35000	276
0.84	9648	2.4	1657	—	3/V 10 L4	—	BN 90S 4	M 2SB 4	—	—	133000	166000	65000	306
0.91	8292	1.3	1545	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	52000	65000	109000	145000	45000	286
0.99	7374	1.7	1411	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	51900	65000	109000	144800	45000	286
1.0	7486	1.1	1395	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	45000	51000	101000	119000	35000	276
1.1	6730	2.1	1288	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	50400	63200	107500	140800	43800	286
1.2	6248	1.2	1212	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	44400	50300	98100	114200	33400	276
1.2	6301	1.7	1159	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	48600	61000	104100	136500	42300	286
1.2	6188	1.3	1153	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	43700	49500	96700	112600	32800	276
1.4	5444	2.6	1015	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	46500	58300	100100	131100	40400	286
1.4	5323	1.7	992	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	41500	47100	92400	107600	31200	276
1.5	5516	1.4	930	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	40600	46100	90600	105500	30500	276
1.5	5004	2.5	920	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	45000	56500	97200	127300	39100	286
1.8	4311	1.0	793	—	3/V 05 L3	—	BN 90S 4	M 2SB 4	31000	35700	52800	63500	19900	266
1.8	4242	1.8	791	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	38500	43600	86300	100500	28900	276
1.8	4582	2.2	773	—	3/V 07 L3	—	BN 90S 4	M 2SB 4	42500	53300	92200	120800	36900	286
2.0	4193	1.0	715	—	3/V 05 L3	—	BN 90S 4	M 2SB 4	29900	34500	51200	61600	19200	266
2.0	4186	1.8	698	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	36900	41800	83100	96800	27700	276
2.1	4455	1.4	671	—	—	3/A 06 L2	BN 90S 4	M 2SB 4	36500	41300	82200	95700	27400	277
2.1	3922	2.2	661	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	36300	41100	81800	95300	27300	276
2.2	3388	1.0	623	—	3/V 04 L3	—	BN 90S 4	M 2SB 4	28600	33000	49100	59100	18300	256
2.2	3388	1.3	623	—	3/V 05 L3	—	BN 90S 4	M 2SB 4	28600	33000	49100	59100	18300	266
2.3	4057	1.5	611	—	—	3/A 06 L2	BN 90S 4	M 2SB 4	35300	40000	79900	93000	26600	277
2.4	3457	1.4	576	—	3/V 05 L3	—	BN 90S 4	M 2SB 4	27800	32100	48000	57700	17900	266
2.5	3374	2.5	569	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	34500	39100	78200	91100	25900	276
2.5	3211	1.0	568	—	3/V 04 L3	—	BN 90S 4	M 2SB 4	27700	32000	47800	57500	17800	256
2.5	3683	2.0	555	—	—	3/A 06 L2	BN 90S 4	M 2SB 4	34200	38800	77600	90400	25700	277
2.6	2840	1.0	544	—	3/V 03 L3	—	BN 90S 4	M 2SB 4	27300	31500	47200	56700	17500	246
2.6	3098	1.3	529	—	3/V 05 L3	—	BN 90S 4	M 2SB 4	27000	31200	46800	56300	17300	266
2.7	3126	2.4	527	—	3/V 06 L3	—	BN 90S 4	M 2SB 4	33600	38100	76400	89000	25300	276
2.8	3354	2.1	505	—	—	3/A 06 L2	BN 90S 4	M 2SB 4	33200	37600	75500	87900	24900	277
2.8	2548	1.2	501	—	3/V 04 L3	—	BN 90S 4	M 2SB 4	26600	30700	46000	55400	17000	256
2.9	3259	1.2	491	—	—	3/A 05 L2	BN 90S 4	M 2SB 4	26400	30500	45700	55000	16900	267
3.0	2770	1.7	462	—	3/V 05 L3	—	BN 90S 4	M 2SB 4	25800	29800	44900	54000	16600	266
3.0	2406	0.9	460	—	3/V 03 L3	—	BN 90S 4	M 2SB 4	25800	29800	44900	54000	16600	246
3.1	2559	1.4	453	—	3/V 04 L3	—	BN 90S 4	M 2SB 4	25700	29600	44600	53700	16500	256
3.2	2885	2.7	435	—	—	3/A 06 L2	BN 90S 4	M 2SB 4	31500	35700	72100	84000	23700	277
3.3	2804	1.6	422	—	—	3/A 05 L2	BN 90S 4	M 2SB 4	25100	29000	43700	52600	16100	267
3.5	2643	1.2	398	—	—	3/A 05 L2	BN 90S 4	M 2SB 4	24600	28400	42900	51700	15800	267
3.5	2380	1.6	396	—	3/V 05 L3	—	BN 90S 4	M 2SB 4	24600	28400	42900	51600	15800	266
3.5	2257	1.0	395	—	3/V 03 L3	—	BN 90S 4	M 2SB 4	24500	28300	42800	51500	15700	246
3.6	2574	2.2	388	—	—	3/A 06 L2	BN 90S 4	M 2SB 4	30400	34400	69700	81200	22800	277
3.6	2565	0.9	386	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	24400	28100	42600	51200	15600	257
3.6	2167	1.6	384	—	3/V 04 L3	—	BN 90S 4	M 2SB 4	24300	28100	42500	51100	15600	256
3.7	2525	2.4	380	—	—	3/A 06 L2	BN 90S 4	M 2SB 4	30200	34200	69300	80700	22700	277
4.0	2316	1.0	349	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	23500	27200	41300	49700	15100	257
4.3	2185	1.7	329	—	—	3/A 05 L2	BN 90S 4	M 2SB 4	23100	26700	40600	48800	14800	267
4.4	2107	1.1	317	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	22800	26300	40100	48300	14600	257
4.9	1880	1.5	283	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	22000	25400	38800	46700	14100	257

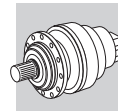


$P_1 = 1.1 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
5.0	1856	1.9	280	—	—	3/A 05 L2	BN 90S 4	M 2SB 4	21900	25200	38600	46500	14000	267
5.2	1786	1.0	269	—	—	3/A 03 L2	BN 90S 4	M 2SB 4	21600	24900	38200	45900	13900	247
5.6	1659	2.1	250	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	21100	24300	37300	44900	13500	257
5.8	1596	2.7	241	—	—	3/A 05 L2	BN 90S 4	M 2SB 4	20800	24000	36900	44400	13300	267
6.2	1498	2.3	226	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	20400	23500	36200	43600	13100	257
6.4	1459	1.1	220	—	—	3/A 03 L2	BN 90S 4	M 2SB 4	20200	23300	35900	43200	12900	247
6.6	1409	2.2	212	—	—	3/A 05 L2	BN 90S 4	M 2SB 4	19900	23000	35600	42800	12800	267
6.8	1362	2.6	205	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	19700	22800	35200	42400	12700	257
6.9	1356	1.0	204	—	—	3/A 01 L2	BN 90S 4	M 2SB 4	6410	6410	17200	19800	4210	239
7.7	1206	1.5	182	—	—	3/A 03 L2	BN 90S 4	M 2SB 4	18900	21900	33900	40800	12200	247
8.1	1154	2.6	174	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	18700	21500	33500	40300	12000	257
8.4	1104	1.0	166	—	—	3/A 01 L2	BN 90S 4	M 2SB 4	5980	5980	16200	18600	3930	239
8.6	1078	2.7	162	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	18200	21100	32800	39500	11700	257
9.4	990	2.3	149	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	17700	20500	32000	38500	11400	257
10.5	885	1.5	133	—	—	3/A 01 L2	BN 90S 4	M 2SB 4	5560	5560	15200	17400	3650	239
12.0	776	2.9	117	—	—	3/A 04 L2	BN 90S 4	M 2SB 4	16400	18900	29700	35800	10500	257
13.0	712	0.9	107	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	5170	5170	14200	16300	3400	231
13.8	674	1.7	102	—	—	3/A 01 L2	BN 90S 4	M 2SB 4	5070	5070	14000	16000	3340	239
14.4	643	2.6	96.9	—	—	3/A 03 L2	BN 90S 4	M 2SB 4	15400	17700	28100	33800	9850	247
15.8	588	0.9	88.6	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	4850	4850	13400	15400	3190	231
15.8	587	2.8	88.5	—	—	3/A 03 L2	BN 90S 4	M 2SB 4	14900	17200	27400	32900	9560	247
17.2	540	2.4	81.3	—	—	3/A 01 L2	BN 90S 4	M 2SB 4	4710	4710	13100	15000	3100	239
17.5	532	1.2	80.2	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	4690	4690	13000	14900	3080	231
18.9	492	2.3	74.2	—	—	3/A 01 L2	BN 90S 4	M 2SB 4	4570	4570	12700	14600	3000	239
19.7	471	1.4	71.0	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	4500	4500	12500	14400	2960	231
22.9	406	1.6	61.2	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	4290	4290	12000	13800	2820	231
27.0	344	1.6	51.8	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	4060	4060	11400	13100	2670	231
28.5	326	2.5	49.1	—	—	3/A 01 L2	BN 90S 4	M 2SB 4	3980	3980	11200	12900	2620	239
34	276	2.4	41.5	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	3770	3770	10700	12300	2480	231
35	263	2.1	39.6	—	—	3/A 00 L2	BN 90S 4	M 2SB 4	3710	3710	10500	12100	2440	231

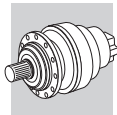
$P_1 = 1.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.28	34639	1.5	5046	—	3/V 13 L4	—	BN 90LA 4	M 3SA 4	—	—	192000	231000	80000	326
0.28	35393	1.3	5021	—	3/V 11 L4	—	BN 90LA 4	M 3SA 4	—	—	157000	195000	65000	316
0.30	31397	0.9	4637	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.31	32397	1.7	4536	—	3/V 13 L4	—	BN 90LA 4	M 3SA 4	—	—	192000	231000	80000	326
0.32	31497	1.4	4410	—	3/V 11 L4	—	BN 90LA 4	M 3SA 4	—	—	157000	195000	65000	316
0.35	28894	1.9	4046	—	3/V 13 L4	—	BN 90LA 4	M 3SA 4	—	—	192000	231000	80000	326
0.35	31448	0.9	4036	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.35	27457	1.3	4000	—	3/V 11 L4	—	BN 90LA 4	M 3SA 4	—	—	157000	195000	65000	316
0.39	25167	1.2	3570	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.40	24413	1.7	3557	—	3/V 11 L4	—	BN 90LA 4	M 3SA 4	—	—	157000	195000	65000	316
0.40	27391	2.0	3515	—	3/V 13 L4	—	BN 90LA 4	M 3SA 4	—	—	192000	231000	80000	326
0.43	25500	1.2	3273	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.43	25420	2.2	3263	—	3/V 13 L4	—	BN 90LA 4	M 3SA 4	—	—	192000	231000	80000	326
0.44	25101	1.8	3222	—	3/V 11 L4	—	BN 90LA 4	M 3SA 4	—	—	157000	195000	65000	316
0.49	22226	2.0	2887	—	3/V 11 L4	—	BN 90LA 4	M 3SA 4	—	—	157000	195000	65000	316
0.50	22089	1.3	2835	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.51	19806	2.8	2773	—	3/V 13 L4	—	BN 90LA 4	M 3SA 4	—	—	192000	231000	80000	326
0.56	19559	2.3	2510	—	3/V 11 L4	—	BN 90LA 4	M 3SA 4	—	—	157000	195000	65000	316
0.57	19352	1.6	2455	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.64	17212	1.3	2209	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.70	15708	1.9	2016	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.72	13141	0.9	1964	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	52000	65000	109000	145000	45000	286
0.77	14229	1.7	1826	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306



$P_1 = 1.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.85	13063	1.8	1657	—	3/V 10 L4	—	BN 90LA 4	M 3SA 4	—	—	133000	166000	65000	306
0.91	11227	1.0	1545	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	52000	65000	109000	145000	45000	286
1.0	9985	1.2	1411	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	51900	65000	109000	144800	45000	286
1.1	9112	1.5	1288	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	50400	63200	107500	140800	43800	286
1.2	8531	1.3	1159	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	48600	61000	104100	136500	42300	286
1.2	8379	1.0	1153	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	43700	49500	96700	112600	32800	276
1.4	7371	1.9	1015	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	46500	58300	100100	131100	40400	286
1.4	7208	1.2	992	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	41500	47100	92400	107600	31200	276
1.5	7468	1.1	930	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	40600	46100	90600	105500	30500	276
1.5	6776	1.8	920	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	45000	56500	97200	127300	39100	286
1.8	5744	1.3	791	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	38500	43600	86300	100500	28900	276
1.8	6205	1.6	773	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	42500	53300	92200	120800	36900	286
1.9	5601	2.5	761	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	42200	53000	91800	120300	36700	286
2.0	5668	1.3	698	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	36900	41800	83100	96800	27700	276
2.1	6032	1.0	671	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	36500	41300	82200	95700	27400	277
2.1	5311	1.6	661	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	36300	41100	81800	95300	27300	276
2.2	4818	2.9	655	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	40200	50400	87700	115000	34900	286
2.3	4587	1.0	623	—	3/V 05 L3	—	BN 90LA 4	M 3SA 4	28600	33000	49100	59100	18300	266
2.3	5493	1.1	611	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	35300	40000	79900	93000	26600	277
2.4	4681	1.1	576	—	3/V 05 L3	—	BN 90LA 4	M 3SA 4	27800	32100	48000	57700	17900	266
2.5	4568	1.9	569	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	34500	39100	78200	91100	25900	276
2.5	4987	1.4	555	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	34200	38800	77600	90400	25700	277
2.7	4195	0.9	529	—	3/V 05 L3	—	BN 90LA 4	M 3SA 4	27000	31200	46800	56300	17300	266
2.7	4232	1.7	527	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	33600	38100	76400	89000	25300	276
2.8	4541	1.6	505	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	33200	37600	75500	87900	24900	277
3.1	3751	1.3	462	—	3/V 05 L3	—	BN 90LA 4	M 3SA 4	25800	29800	44900	54000	16600	266
3.1	3464	1.1	453	—	3/V 04 L3	—	BN 90LA 4	M 3SA 4	25700	29600	44600	53700	16500	256
3.2	3942	2.4	439	—	—	3/A 07 L2	BN 90LA 4	M 3SA 4	35200	44100	77800	102000	30600	287
3.2	3906	2.0	435	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	31500	35700	72100	84000	23700	277
3.3	3467	2.4	427	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	31400	35500	71700	83500	23600	276
3.3	3796	1.2	422	—	—	3/A 05 L2	BN 90LA 4	M 3SA 4	25100	29000	43700	52600	16100	267
3.5	3640	2.5	405	—	—	3/A 07 L2	BN 90LA 4	M 3SA 4	34200	43000	76000	99500	29800	287
3.6	3222	1.2	396	—	3/V 05 L3	—	BN 90LA 4	M 3SA 4	24600	28400	42900	51600	15800	266
3.6	3212	2.3	395	—	3/V 06 L3	—	BN 90LA 4	M 3SA 4	30600	34600	70100	81600	23000	276
3.6	3485	1.6	388	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	30400	34400	69700	81200	22800	277
3.6	3213	2.8	386	—	3/V 07 L3	—	BN 90LA 4	M 3SA 4	33700	42300	74900	98100	29300	286
3.7	2934	1.2	384	—	3/V 04 L3	—	BN 90LA 4	M 3SA 4	24300	28100	42500	51100	15600	256
3.7	3418	1.8	380	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	30200	34200	69300	80700	22700	277
4.3	2959	1.2	329	—	—	3/A 05 L2	BN 90LA 4	M 3SA 4	23100	26700	40600	48800	14800	267
4.4	2881	2.3	321	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	28500	32300	65800	76700	21400	277
5.0	2545	1.1	283	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	22000	25400	38800	46700	14100	257
5.0	2513	1.4	280	—	—	3/A 05 L2	BN 90LA 4	M 3SA 4	21900	25200	38600	46500	14000	267
5.3	2399	2.3	267	—	—	3/A 06 L2	BN 90LA 4	M 3SA 4	26800	30400	62300	72600	20100	277
5.6	2246	1.6	250	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	21100	24300	37300	44900	13500	257
5.9	2162	2.0	241	—	—	3/A 05 L2	BN 90LA 4	M 3SA 4	20800	24000	36900	44400	13300	267
6.2	2028	1.7	226	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	20400	23500	36200	43600	13100	257
6.6	1907	1.6	212	—	—	3/A 05 L2	BN 90LA 4	M 3SA 4	19900	23000	35600	42800	12800	267
6.9	1845	1.9	205	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	19700	22800	35200	42400	12700	257
7.8	1632	1.1	182	—	—	3/A 03 L2	BN 90LA 4	M 3SA 4	18900	21900	33900	40800	12200	247
8.0	1577	2.3	175	—	—	3/A 05 L2	BN 90LA 4	M 3SA 4	18700	21600	33600	40400	12000	267
8.1	1563	1.9	174	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	18700	21500	33500	40300	12000	257
8.7	1459	2.0	162	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	18200	21100	32800	39500	11700	257
9.5	1341	1.7	149	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	17700	20500	32000	38500	11400	257
10.0	1265	2.8	141	—	—	3/A 05 L2	BN 90LA 4	M 3SA 4	17400	20100	31400	37800	11200	267
10.6	1198	1.1	133	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	5560	5560	15200	17400	3650	239
10.9	1161	2.3	129	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	16900	19500	30600	36900	10800	257
12.1	1051	2.2	117	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	16400	18900	29700	35800	10500	257
13.8	916	2.8	102	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	15600	18000	28500	34300	10000	257
13.9	912	1.3	102	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	5070	5070	14000	16000	3340	239
14.6	871	1.9	96.9	—	—	3/A 03 L2	BN 90LA 4	M 3SA 4	15400	17700	28100	33800	9850	247

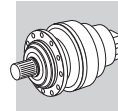


$P_1 = 1.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn_2 [N]			
											HC	HZ	FZ	
15.5	815	2.8	90.7	—	—	3/A 04 L2	BN 90LA 4	M 3SA 4	15000	17300	27600	33200	9640	257
15.9	795	2.1	88.5	—	—	3/A 03 L2	BN 90LA 4	M 3SA 4	14900	17200	27400	32900	9560	247
17.3	731	1.8	81.3	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	4710	4710	13100	15000	3100	239
17.6	721	0.9	80.2	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	4690	4690	13000	14900	3080	231
19.0	666	1.7	74.2	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	4570	4570	12700	14600	3000	239
19.3	657	2.7	73.2	—	—	3/A 03 L2	BN 90LA 4	M 3SA 4	14000	16100	25800	31100	8970	247
19.9	638	1.0	71.0	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	4500	4500	12500	14400	2960	231
22.4	566	2.7	62.9	—	—	3/A 03 L2	BN 90LA 4	M 3SA 4	13300	15400	24700	29700	8530	247
23.1	550	1.2	61.2	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	4290	4290	12000	13800	2820	231
23.7	534	2.4	59.4	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	4240	4240	11900	13700	2790	239
26.0	487	2.4	54.2	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	4120	4120	11600	13300	2710	239
27.2	466	1.2	51.8	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	4060	4060	11400	13100	2670	231
28.7	441	1.9	49.1	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	3980	3980	11200	12900	2620	239
32	395	2.4	43.9	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	3840	3840	10900	12500	2520	239
34	373	1.7	41.5	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	3770	3770	10700	12300	2480	231
35	360	2.4	40.1	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	3720	3720	10600	12100	2450	239
36	356	1.5	39.6	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	3710	3710	10500	12100	2440	231
39	322	2.4	35.8	—	—	3/A 01 L2	BN 90LA 4	M 3SA 4	3590	3590	10200	11700	2360	239
44	285	2.3	31.7	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	3440	3440	9850	11300	2260	231
60	211	2.8	23.4	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	3110	3110	9000	10300	2050	231
74	172	2.7	19.1	—	—	3/A 00 L2	BN 90LA 4	M 3SA 4	2910	2910	8460	9720	1910	231

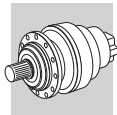
$P_1 = 1.85 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.28	43336	1.2	5046	—	3/V 13 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	326
0.28	44280	1.0	5021	—	3/V 11 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	316
0.31	40532	1.4	4536	—	3/V 13 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	326
0.32	39406	1.1	4410	—	3/V 11 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	316
0.34	36149	1.5	4046	—	3/V 13 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	326
0.35	34351	1.0	4000	—	3/V 11 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	316
0.39	31486	0.9	3570	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.39	30542	1.4	3557	—	3/V 11 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	316
0.40	34268	1.6	3515	—	3/V 13 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	326
0.42	31902	0.9	3273	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.43	31802	1.7	3263	—	3/V 13 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	326
0.43	31404	1.4	3222	—	3/V 11 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	316
0.48	27806	1.6	2887	—	3/V 11 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	316
0.49	27635	1.1	2835	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.50	24779	2.2	2773	—	3/V 13 L4	—	BN 90LB 4	—	—	—	192000	231000	80000	326
0.55	24470	1.8	2510	—	3/V 11 L4	—	BN 90LB 4	—	—	—	157000	195000	65000	316
0.57	24211	1.2	2455	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.63	21534	1.1	2209	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.69	19652	1.5	2016	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.76	17801	1.4	1826	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.84	16343	1.4	1657	—	3/V 10 L4	—	BN 90LB 4	—	—	—	133000	166000	65000	306
0.98	12492	1.0	1411	—	3/V 07 L3	—	BN 90LB 4	—	51900	65000	109000	144800	45000	286
1.1	11400	1.2	1288	—	3/V 07 L3	—	BN 90LB 4	—	50400	63200	107500	140800	43800	286
1.2	10673	1.0	1159	—	3/V 07 L3	—	BN 90LB 4	—	48600	61000	104100	136500	42300	286
1.4	9222	1.6	1015	—	3/V 07 L3	—	BN 90LB 4	—	46500	58300	100100	131100	40400	286
1.4	9017	1.0	992	—	3/V 06 L3	—	BN 90LB 4	—	41500	47100	92400	107600	31200	276
1.5	8477	1.5	920	—	3/V 07 L3	—	BN 90LB 4	—	45000	56500	97200	127300	39100	286
1.8	7186	1.0	791	—	3/V 06 L3	—	BN 90LB 4	—	38500	43600	86300	100500	28900	276
1.8	7762	1.3	773	—	3/V 07 L3	—	BN 90LB 4	—	42500	53300	92200	120800	36900	286
1.8	7008	2.0	761	—	3/V 07 L3	—	BN 90LB 4	—	42200	53000	91800	120300	36700	286
2.0	7091	1.1	698	—	3/V 06 L3	—	BN 90LB 4	—	36900	41800	83100	96800	27700	276
2.1	6644	1.3	661	—	3/V 06 L3	—	BN 90LB 4	—	36300	41100	81800	95300	27300	276
2.1	6028	2.3	655	—	3/V 07 L3	—	BN 90LB 4	—	40200	50400	87700	115000	34900	286
2.4	5716	1.5	569	—	3/V 06 L3	—	BN 90LB 4	—	34500	39100	78200	91100	25900	276



$P_1 = 1.85 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
2.5	6239	1.2	555	—	—	3/A 06 L2	BN 90LB 4	—	34200	38800	77600	90400	25700	277
2.6	5295	1.4	527	—	3/V 06 L3	—	BN 90LB 4	—	33600	38100	76400	89000	25300	276
2.7	5096	2.7	507	—	3/V 07 L3	—	BN 90LB 4	—	36900	46300	81300	106500	32100	286
2.8	5681	1.2	505	—	—	3/A 06 L2	BN 90LB 4	—	33200	37600	75500	87900	24900	277
3.0	4692	1.0	462	—	3/V 05 L3	—	BN 90LB 4	—	25800	29800	44900	54000	16600	266
3.0	4624	2.7	460	—	3/V 07 L3	—	BN 90LB 4	—	35700	44800	78900	103400	31100	286
3.2	4932	1.9	439	—	—	3/A 07 L2	BN 90LB 4	—	35200	44100	77800	102000	30600	287
3.2	4887	1.6	435	—	—	3/A 06 L2	BN 90LB 4	—	31500	35700	72100	84000	23700	277
3.3	4338	1.9	427	—	3/V 06 L3	—	BN 90LB 4	—	31400	35500	71700	83500	23600	276
3.3	4749	0.9	422	—	—	3/A 05 L2	BN 90LB 4	—	25100	29000	43700	52600	16100	267
3.4	4553	2.0	405	—	—	3/A 07 L2	BN 90LB 4	—	34200	43000	76000	99500	29800	287
3.5	4031	0.9	396	—	3/V 05 L3	—	BN 90LB 4	—	24600	28400	42900	51600	15800	266
3.5	4018	1.8	395	—	3/V 06 L3	—	BN 90LB 4	—	30600	34600	70100	81600	23000	276
3.6	4359	1.3	388	—	—	3/A 06 L2	BN 90LB 4	—	30400	34400	69700	81200	22800	277
3.6	4020	2.3	386	—	3/V 07 L3	—	BN 90LB 4	—	33700	42300	74900	98100	29300	286
3.6	3671	1.0	384	—	3/V 04 L3	—	BN 90LB 4	—	24300	28100	42500	51100	15600	257
3.7	4277	1.4	380	—	—	3/A 06 L2	BN 90LB 4	—	30200	34200	69300	80700	22700	277
4.1	3837	2.9	341	—	—	3/A 07 L2	BN 90LB 4	—	32300	40600	72200	94600	28100	287
4.2	3701	1.0	329	—	—	3/A 05 L2	BN 90LB 4	—	23100	26700	40600	48800	14800	267
4.3	3604	1.8	321	—	—	3/A 06 L2	BN 90LB 4	—	28500	32300	65800	76700	21400	277
4.9	3166	2.8	282	—	—	3/A 07 L2	BN 90LB 4	—	30300	38100	68100	89300	26400	287
5.0	3144	1.1	280	—	—	3/A 05 L2	BN 90LB 4	—	21900	25200	38600	46500	14000	267
5.0	3100	2.5	276	—	—	3/A 06 L2	BN 90LB 4	—	27100	30700	62900	73300	20400	277
5.2	3002	1.8	267	—	—	3/A 06 L2	BN 90LB 4	—	26800	30400	62300	72600	20100	277
5.6	2810	1.2	250	—	—	3/A 04 L2	BN 90LB 4	—	21100	24300	37300	44900	13500	257
5.8	2704	1.6	241	—	—	3/A 05 L2	BN 90LB 4	—	20800	24000	36900	44400	13300	267
6.2	2537	1.4	226	—	—	3/A 04 L2	BN 90LB 4	—	20400	23500	36200	43600	13100	257
6.3	2482	2.6	221	—	—	3/A 06 L2	BN 90LB 4	—	25200	28500	58900	68500	18900	277
6.5	2386	1.3	212	—	—	3/A 05 L2	BN 90LB 4	—	19900	23000	35600	42800	12800	267
6.8	2308	1.5	205	—	—	3/A 04 L2	BN 90LB 4	—	19700	22800	35200	42400	12700	257
7.0	2226	2.5	198	—	—	3/A 06 L2	BN 90LB 4	—	24300	27500	57000	66300	18200	277
7.9	1973	1.8	175	—	—	3/A 05 L2	BN 90LB 4	—	18700	21600	33600	40400	12000	267
8.0	1955	1.5	174	—	—	3/A 04 L2	BN 90LB 4	—	18700	21500	33500	40300	12000	257
8.6	1825	1.6	162	—	—	3/A 04 L2	BN 90LB 4	—	18200	21100	32800	39500	11700	257
9.3	1677	1.4	149	—	—	3/A 04 L2	BN 90LB 4	—	17700	20500	32000	38500	11400	257
9.9	1582	2.3	141	—	—	3/A 05 L2	BN 90LB 4	—	17400	20100	31400	37800	11200	267
10.8	1453	1.9	129	—	—	3/A 04 L2	BN 90LB 4	—	16900	19500	30600	36900	10800	257
11.5	1361	2.6	121	—	—	3/A 05 L2	BN 90LB 4	—	16500	19100	30000	36200	10600	267
11.9	1315	1.7	117	—	—	3/A 04 L2	BN 90LB 4	—	16400	18900	29700	35800	10500	257
13.4	1164	2.6	104	—	—	3/A 05 L2	BN 90LB 4	—	15700	18100	28700	34500	10100	267
13.6	1145	2.2	102	—	—	3/A 04 L2	BN 90LB 4	—	15600	18000	28500	34300	10000	257
13.7	1141	1.0	102	—	—	3/A 01 L2	BN 90LB 4	—	5070	5070	14000	16000	3340	239
14.3	1089	1.6	96.9	—	—	3/A 03 L2	BN 90LB 4	—	15400	17700	28100	33800	9850	247
15.3	1020	2.2	90.7	—	—	3/A 04 L2	BN 90LB 4	—	15000	17300	27600	33200	9640	257
15.7	995	1.7	88.5	—	—	3/A 03 L2	BN 90LB 4	—	14900	17200	27400	32900	9560	247
17.0	919	2.6	81.7	—	—	3/A 04 L2	BN 90LB 4	—	14500	16800	26700	32100	9310	257
17.1	915	1.4	81.3	—	—	3/A 01 L2	BN 90LB 4	—	4710	4710	13100	15000	3100	239
18.7	834	1.4	74.2	—	—	3/A 01 L2	BN 90LB 4	—	4570	4570	12700	14600	3000	239
19.0	823	2.2	73.2	—	—	3/A 03 L2	BN 90LB 4	—	14000	16100	25800	31100	8970	247
22.1	708	2.2	62.9	—	—	3/A 03 L2	BN 90LB 4	—	13300	15400	24700	29700	8530	247
22.7	688	0.9	61.2	—	—	3/A 00 L2	BN 90LB 4	—	4290	4290	12000	13800	2820	231
23.4	668	1.9	59.4	—	—	3/A 01 L2	BN 90LB 4	—	4240	4240	11900	13700	2790	239
25.6	610	1.9	54.2	—	—	3/A 01 L2	BN 90LB 4	—	4120	4120	11600	13300	2710	239
26.5	590	2.8	52.5	—	—	3/A 03 L2	BN 90LB 4	—	12500	14500	23400	28100	8030	247
26.8	583	0.9	51.8	—	—	3/A 00 L2	BN 90LB 4	—	4060	4060	11400	13100	2670	231
28.3	552	1.5	49.1	—	—	3/A 01 L2	BN 90LB 4	—	3980	3980	11200	12900	2620	239
32	494	1.9	43.9	—	—	3/A 01 L2	BN 90LB 4	—	3840	3840	10900	12500	2520	239
33	467	1.4	41.5	—	—	3/A 00 L2	BN 90LB 4	—	3770	3770	10700	12300	2480	231
35	451	1.9	40.1	—	—	3/A 01 L2	BN 90LB 4	—	3720	3720	10600	12100	2450	239
35	445	1.2	39.6	—	—	3/A 00 L2	BN 90LB 4	—	3710	3710	10500	12100	2440	231
39	403	1.9	35.8	—	—	3/A 01 L2	BN 90LB 4	—	3590	3590	10200	11700	2360	239

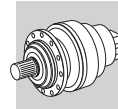


$P_1 = 1.85 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn_2 [N]			
											HC	HZ	FZ	
44	357	1.8	31.7	—	—	3/A 00 L2	BN 90LB 4	—	3440	3440	9850	11300	2260	231
59	264	2.2	23.4	—	—	3/A 00 L2	BN 90LB 4	—	3110	3110	9000	10300	2050	231
73	215	2.2	19.1	—	—	3/A 00 L2	BN 90LB 4	—	2910	2910	8460	9720	1910	231

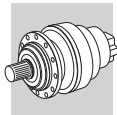
$P_1 = 2.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.27	56962	1.7	5234	—	3/V 15 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	346
0.28	50804	1.0	5046	—	3/V 13 L4	—	BN 100LA 4	M 3LA 4	—	—	192000	231000	80000	326
0.28	51943	1.6	4959	—	3/V 14 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	336
0.28	53872	1.9	4950	—	3/V 15 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	346
0.28	53872	2.3	4950	—	3/V 16 L4	—	BN 100LA 4	—	—	—	345000	385000	150000	356
0.31	47516	1.2	4536	—	3/V 13 L4	—	BN 100LA 4	M 3LA 4	—	—	192000	231000	80000	326
0.32	46196	0.9	4410	—	3/V 11 L4	—	BN 100LA 4	M 3LA 4	—	—	157000	195000	65000	316
0.33	45168	1.9	4312	—	3/V 14 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	336
0.34	45392	2.3	4171	—	3/V 15 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	346
0.34	45392	2.9	4171	—	3/V 16 L4	—	BN 100LA 4	—	—	—	345000	385000	150000	356
0.35	42378	1.3	4046	—	3/V 13 L4	—	BN 100LA 4	M 3LA 4	—	—	192000	231000	80000	326
0.35	45085	1.8	3993	—	3/V 14 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	336
0.40	35805	1.2	3557	—	3/V 11 L4	—	BN 100LA 4	M 3LA 4	—	—	157000	195000	65000	316
0.40	40173	1.4	3515	—	3/V 13 L4	—	BN 100LA 4	M 3LA 4	—	—	192000	231000	80000	326
0.43	37283	1.5	3263	—	3/V 13 L4	—	BN 100LA 4	M 3LA 4	—	—	192000	231000	80000	326
0.44	36815	1.2	3222	—	3/V 11 L4	—	BN 100LA 4	M 3LA 4	—	—	157000	195000	65000	316
0.44	35927	2.3	3182	—	3/V 14 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	336
0.49	32598	1.4	2887	—	3/V 11 L4	—	BN 100LA 4	M 3LA 4	—	—	157000	195000	65000	316
0.50	32397	0.9	2835	—	3/V 10 L4	—	BN 100LA 4	M 3LA 4	—	—	133000	166000	65000	306
0.51	30276	2.8	2782	—	3/V 14 L4	—	BN 100LA 4	—	—	—	206000	243000	90000	336
0.51	29049	1.9	2773	—	3/V 13 L4	—	BN 100LA 4	M 3LA 4	—	—	192000	231000	80000	326
0.56	28687	1.6	2510	—	3/V 11 L4	—	BN 100LA 4	M 3LA 4	—	—	157000	195000	65000	316
0.57	28384	1.1	2455	—	3/V 10 L4	—	BN 100LA 4	M 3LA 4	—	—	133000	166000	65000	306
0.58	25214	1.9	2430	—	3/V 13 L3	—	BN 100LA 4	—	—	—	192000	231000	80000	326
0.61	24169	1.4	2329	—	3/V 11 L3	—	BN 100LA 4	—	—	—	157000	195000	65000	316
0.61	24050	2.7	2318	—	3/V 14 L3	—	BN 100LA 4	—	—	—	206000	243000	90000	336
0.64	25245	0.9	2209	—	3/V 10 L4	—	BN 100LA 4	M 3LA 4	—	—	133000	166000	65000	306
0.70	20947	2.6	2019	—	3/V 13 L3	—	BN 100LA 4	—	—	—	192000	231000	80000	326
0.70	23038	1.3	2016	—	3/V 10 L4	—	BN 100LA 4	M 3LA 4	—	—	133000	166000	65000	306
0.72	20365	2.1	1963	—	3/V 11 L3	—	BN 100LA 4	—	—	—	157000	195000	65000	316
0.77	20869	1.2	1826	—	3/V 10 L4	—	BN 100LA 4	M 3LA 4	—	—	133000	166000	65000	306
0.79	18091	1.2	1792	—	3/V 09 L3	—	BN 100LA 4	—	—	—	110000	145000	36000	296
0.85	19159	1.2	1657	—	3/V 10 L4	—	BN 100LA 4	M 3LA 4	—	—	133000	166000	65000	306
0.86	17429	2.5	1636	—	3/V 11 L3	—	BN 100LA 4	—	—	—	157000	195000	65000	316
0.94	16166	1.1	1497	—	3/V 09 L3	—	BN 100LA 4	—	—	—	110000	145000	36000	296
1.0	15238	1.4	1411	—	3/V 10 L3	—	BN 100LA 4	—	—	—	133000	166000	65000	306
1.0	14686	2.9	1378	—	3/V 11 L3	—	BN 100LA 4	—	—	—	156100	194400	64700	316
1.1	13364	1.0	1288	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	50400	63200	107500	140800	43800	286
1.1	13906	1.5	1288	—	3/V 09 L3	—	BN 100LA 4	—	—	—	109200	140800	35000	296
1.1	13581	2.6	1274	—	3/V 11 L3	—	BN 100LA 4	—	—	—	152400	189900	63000	316
1.1	13250	1.6	1227	—	3/V 10 L3	—	BN 100LA 4	—	—	—	127500	160400	62200	306
1.2	13000	1.3	1159	—	3/V 09 L3	—	BN 100LA 4	—	—	—	105800	136500	33800	296
1.3	12092	2.3	1120	—	3/V 10 L3	—	BN 100LA 4	—	—	—	124100	156000	60300	306
1.4	10811	1.3	1015	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	46500	58300	100100	131100	40400	286
1.4	10836	1.6	1004	—	3/V 09 L3	—	BN 100LA 4	—	—	—	101300	130700	32200	296
1.4	10836	2.8	1004	—	3/V 10 L3	—	BN 100LA 4	—	—	—	120100	151000	58200	306
1.5	9938	1.2	920	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	45000	56500	97200	127300	39100	286
1.5	10325	2.1	920	—	3/V 10 L3	—	BN 100LA 4	—	—	—	117000	147100	56500	306
1.7	9422	2.1	840	—	3/V 09 L3	—	BN 100LA 4	—	—	—	96100	123900	30400	296
1.8	8635	2.4	800	—	3/V 09 L3	—	BN 100LA 4	—	—	—	94700	122100	29900	296



P₁ = 2.2 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
MC/PC	MZ/PZ	HC	HZ	FZ										
1.8	9100	1.1	773	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	42500	53300	92200	120800	36900	286
1.9	8535	1.7	761	—	3/V 09 L3	—	BN 100LA 4	—	—	—	93300	120300	29400	296
1.9	8215	1.7	761	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	42200	53000	91800	120300	36700	286
2.0	8313	0.9	698	—	3/V 06 L3	—	BN 100LA 4	M 3LA 4	36900	41800	83100	96800	27700	276
2.1	7789	1.1	661	—	3/V 06 L3	—	BN 100LA 4	M 3LA 4	36300	41100	81800	95300	27300	276
2.2	7067	2.0	655	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	40200	50400	87700	115000	34900	286
2.2	7342	2.4	655	—	3/V 09 L3	—	BN 100LA 4	—	—	—	89100	115000	27900	296
2.5	6700	1.3	569	—	3/V 06 L3	—	BN 100LA 4	M 3LA 4	34500	39100	78200	91100	25900	276
2.5	7314	1.0	555	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	34200	38800	77600	90400	25700	277
2.7	6207	1.2	527	—	3/V 06 L3	—	BN 100LA 4	M 3LA 4	33600	38100	76400	89000	25300	276
2.8	5975	2.3	507	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	36900	46300	81300	106500	32100	286
2.8	6660	1.1	505	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	33200	37600	75500	87900	24900	277
3.1	5421	2.3	460	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	35700	44800	78900	103400	31100	286
3.2	5781	1.6	439	—	—	3/A 07 L2	BN 100LA 4	M 3LA 4	35200	44100	77800	102000	30600	287
3.2	5729	1.4	435	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	31500	35700	72100	84000	23700	277
3.3	5085	1.6	427	—	3/V 06 L3	—	BN 100LA 4	M 3LA 4	31400	35500	71700	83500	23600	276
3.5	5338	1.7	405	—	—	3/A 07 L2	BN 100LA 4	M 3LA 4	34200	43000	76000	99500	29800	287
3.6	4711	1.6	395	—	3/V 06 L3	—	BN 100LA 4	M 3LA 4	30600	34600	70100	81600	23000	276
3.6	5111	1.1	388	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	30400	34400	69700	81200	22800	277
3.6	4712	1.9	386	—	3/V 07 L3	—	BN 100LA 4	M 3LA 4	33700	42300	74900	98100	29300	286
3.7	5013	1.2	380	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	30200	34200	69300	80700	22700	277
4.1	4498	2.5	341	—	—	3/A 07 L2	BN 100LA 4	M 3LA 4	32300	40600	72200	94600	28100	287
4.4	4225	1.6	321	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	28500	32300	65800	76700	21400	277
5.0	3712	2.3	282	—	—	3/A 07 L2	BN 100LA 4	M 3LA 4	30300	38100	68100	89300	26400	287
5.0	3685	1.0	280	—	—	3/A 05 L2	BN 100LA 4	M 3LA 4	21900	25200	38600	46500	14000	267
5.1	3634	2.1	276	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	27100	30700	62900	73300	20400	277
5.3	3519	1.6	267	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	26800	30400	62300	72600	20100	277
5.6	3294	1.1	250	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	21100	24300	37300	44900	13500	257
5.8	3181	2.8	241	—	—	3/A 07 L2	BN 100LA 4	M 3LA 4	28800	36200	65000	85200	25000	287
5.9	3170	1.4	241	—	—	3/A 05 L2	BN 100LA 4	M 3LA 4	20800	24000	36900	44400	13300	267
6.2	2974	1.2	226	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	20400	23500	36200	43600	13100	257
6.4	2909	2.2	221	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	25200	28500	58900	68500	18900	277
6.6	2798	1.1	212	—	—	3/A 05 L2	BN 100LA 4	M 3LA 4	19900	23000	35600	42800	12800	267
6.9	2706	1.3	205	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	19700	22800	35200	42400	12700	257
7.1	2610	2.1	198	—	—	3/A 06 L2	BN 100LA 4	M 3LA 4	24300	27500	57000	66300	18200	277
8.0	2313	1.6	175	—	—	3/A 05 L2	BN 100LA 4	M 3LA 4	18700	21600	33600	40400	12000	267
8.1	2292	1.3	174	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	18700	21500	33500	40300	12000	257
8.7	2140	1.4	162	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	18200	21100	32800	39500	11700	257
9.5	1966	1.2	149	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	17700	20500	32000	38500	11400	257
10.0	1855	1.9	141	—	—	3/A 05 L2	BN 100LA 4	M 3LA 4	17400	20100	31400	37800	11200	267
10.9	1703	1.6	129	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	16900	19500	30600	36900	10800	257
11.6	1596	2.2	121	—	—	3/A 05 L2	BN 100LA 4	M 3LA 4	16500	19100	30000	36200	10600	267
12.1	1542	1.5	117	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	16400	18900	29700	35800	10500	257
13.6	1364	2.3	104	—	—	3/A 05 L2	BN 100LA 4	M 3LA 4	15700	18100	28700	34500	10100	267
13.8	1343	1.9	102	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	15600	18000	28500	34300	10000	257
14.6	1277	1.3	96.9	—	—	3/A 03 L2	BN 100LA 4	M 3LA 4	15400	17700	28100	33800	9850	247
15.5	1195	1.9	90.7	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	15000	17300	27600	33200	9640	257
15.9	1166	1.4	88.5	—	—	3/A 03 L2	BN 100LA 4	M 3LA 4	14900	17200	27400	32900	9560	247
17.3	1077	2.2	81.7	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	14500	16800	26700	32100	9310	257
17.3	1072	1.2	81.3	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	4710	4710	13100	15000	3100	239
19.0	977	1.2	74.2	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	4570	4570	12700	14600	3000	239
19.3	964	1.8	73.2	—	—	3/A 03 L2	BN 100LA 4	M 3LA 4	14000	16100	25800	31100	8970	247
20.6	902	2.8	68.4	—	—	3/A 04 L2	BN 100LA 4	M 3LA 4	13700	15800	25300	30500	8770	257
22.4	829	1.9	62.9	—	—	3/A 03 L2	BN 100LA 4	M 3LA 4	13300	15400	24700	29700	8530	247
23.7	783	1.6	59.4	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	4240	4240	11900	13700	2790	239
26.0	715	1.7	54.2	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	4120	4120	11600	13300	2710	239
26.9	692	2.4	52.5	—	—	3/A 03 L2	BN 100LA 4	M 3LA 4	12500	14500	23400	28100	8030	247
28.7	647	1.3	49.1	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	3980	3980	11200	12900	2620	239
32	579	1.6	43.9	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	3840	3840	10900	12500	2520	239
34	547	1.2	41.5	—	—	3/A 00 L2	BN 100LA 4	M 3LA 4	3770	3770	10700	12300	2480	231
35	528	1.6	40.1	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	3720	3720	10600	12100	2450	239

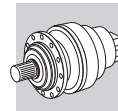


$P_1 = 2.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
36	522	1.1	39.6	—	—	3/A 00 L2	BN 100LA 4	M 3LA 4	3710	3710	10500	12100	2440	231
39	472	1.6	35.8	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	3590	3590	10200	11700	2360	239
44	418	1.6	31.7	—	—	3/A 00 L2	BN 100LA 4	M 3LA 4	3440	3440	9850	11300	2260	231
45	411	2.9	31.2	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	3420	3420	9800	11300	2250	239
60	309	1.9	23.4	—	—	3/A 00 L2	BN 100LA 4	M 3LA 4	3110	3110	9000	10300	2050	231
61	303	2.9	23.0	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	3090	3090	8950	10300	2030	239
74	252	1.9	19.1	—	—	3/A 00 L2	BN 100LA 4	M 3LA 4	2910	2910	8460	9720	1910	231
75	248	2.9	18.8	—	—	3/A 01 L2	BN 100LA 4	M 3LA 4	2890	2890	8420	9670	1900	239

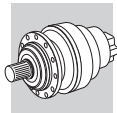
$P_1 = 3 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.27	77676	1.3	5234	—	3/V 15 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	346
0.28	70831	1.2	4959	—	3/V 14 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.28	73462	1.4	4950	—	3/V 15 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	346
0.28	73462	1.7	4950	—	3/V 16 L4	—	BN 100LB 4	—	—	—	345000	385000	150000	356
0.32	62725	2.9	4449	—	3/V 17 L4	—	BN 100LB 4	—	—	—	442000	470000	150000	364
0.33	61592	1.4	4312	—	3/V 14 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.34	61898	1.7	4171	—	3/V 15 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	346
0.34	61898	2.1	4171	—	3/V 16 L4	—	BN 100LB 4	—	—	—	345000	385000	150000	356
0.35	57788	1.0	4046	—	3/V 13 L4	—	BN 100LB 4	M 3LB 4	—	—	192000	231000	80000	326
0.35	61480	1.3	3993	—	3/V 14 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.40	54781	1.0	3515	—	3/V 13 L4	—	BN 100LB 4	M 3LB 4	—	—	192000	231000	80000	326
0.40	52155	2.6	3514	—	3/V 16 L4	—	BN 100LB 4	—	—	—	345000	385000	150000	356
0.43	50840	1.1	3263	—	3/V 13 L4	—	BN 100LB 4	M 3LB 4	—	—	192000	231000	80000	326
0.43	48232	2.7	3250	—	3/V 16 L4	—	BN 100LB 4	—	—	—	345000	385000	150000	356
0.44	48992	1.7	3182	—	3/V 14 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.49	44451	1.0	2887	—	3/V 11 L4	—	BN 100LB 4	M 3LB 4	—	—	157000	195000	65000	316
0.51	41285	2.0	2782	—	3/V 14 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.51	39613	1.4	2773	—	3/V 13 L4	—	BN 100LB 4	M 3LB 4	—	—	192000	231000	80000	326
0.51	40640	2.8	2738	—	3/V 16 L4	—	BN 100LB 4	—	—	—	345000	385000	150000	356
0.56	39119	1.2	2510	—	3/V 11 L4	—	BN 100LB 4	M 3LB 4	—	—	157000	195000	65000	316
0.56	35763	2.3	2504	—	3/V 14 L4	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.58	34382	1.4	2430	—	3/V 13 L3	—	BN 100LB 4	—	—	—	192000	231000	80000	326
0.61	32958	1.0	2329	—	3/V 11 L3	—	BN 100LB 4	—	—	—	157000	195000	65000	316
0.61	32795	2.0	2318	—	3/V 14 L3	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.70	28564	1.9	2019	—	3/V 13 L3	—	BN 100LB 4	—	—	—	192000	231000	80000	326
0.70	31416	0.9	2016	—	3/V 10 L4	—	BN 100LB 4	M 3LB 4	—	—	133000	166000	65000	306
0.71	28211	2.5	1994	—	3/V 14 L3	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.72	27770	1.5	1963	—	3/V 11 L3	—	BN 100LB 4	—	—	—	157000	195000	65000	316
0.84	24446	2.2	1682	—	3/V 13 L3	—	BN 100LB 4	—	—	—	192000	231000	80000	326
0.86	23767	1.8	1636	—	3/V 11 L3	—	BN 100LB 4	—	—	—	157000	195000	65000	316
0.89	22481	2.5	1589	—	3/V 14 L3	—	BN 100LB 4	—	—	—	206000	243000	90000	336
0.99	20598	2.7	1418	—	3/V 13 L3	—	BN 100LB 4	—	—	—	192000	230200	80000	326
1.0	20779	1.0	1411	—	3/V 10 L3	—	BN 100LB 4	—	—	—	133000	166000	65000	306
1.0	20026	2.0	1378	—	3/V 11 L3	—	BN 100LB 4	—	—	—	156100	194400	64700	316
1.1	18942	2.5	1339	—	3/V 14 L3	—	BN 100LB 4	—	—	—	204100	239600	88700	336
1.1	18755	2.8	1291	—	3/V 13 L3	—	BN 100LB 4	—	—	—	189100	223800	77900	326
1.1	18963	1.1	1288	—	3/V 09 L3	—	BN 100LB 4	—	—	—	109200	140800	35000	296
1.1	18520	1.9	1274	—	3/V 11 L3	—	BN 100LB 4	—	—	—	152400	189900	63000	316
1.1	18069	1.2	1227	—	3/V 10 L3	—	BN 100LB 4	—	—	—	127500	160400	62200	306
1.2	17727	0.9	1159	—	3/V 09 L3	—	BN 100LB 4	—	—	—	105800	136500	33800	296
1.3	16489	1.7	1120	—	3/V 10 L3	—	BN 100LB 4	—	—	—	124100	156000	60300	306
1.4	14743	1.0	1015	—	3/V 07 L3	—	BN 100LB 4	M 3LB 4	46500	58300	100100	131100	40400	286
1.4	14208	2.5	1004	—	3/V 11 L3	—	BN 100LB 4	—	—	—	141900	176800	58200	316
1.4	14776	1.2	1004	—	3/V 09 L3	—	BN 100LB 4	—	—	—	101300	130700	32200	296
1.4	14776	2.0	1004	—	3/V 10 L3	—	BN 100LB 4	—	—	—	120100	151000	58200	306



P₁ = 3 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					Rn ₂ [N]					
MC/PC	MZ/PZ	HC	HZ	FZ										
1.5	13552	0.9	920	—	3/V 07 L3	—	BN 100LB 4	M 3LB 4	45000	56500	97200	127300	39100	286
1.5	14080	1.5	920	—	3/V 10 L3	—	BN 100LB 4	—	—	—	117000	147100	56500	306
1.7	12849	1.5	840	—	3/V 09 L3	—	BN 100LB 4	—	—	—	96100	123900	30400	296
1.8	11775	1.8	800	—	3/V 09 L3	—	BN 100LB 4	—	—	—	94700	122100	29900	296
1.9	11639	1.2	761	—	3/V 09 L3	—	BN 100LB 4	—	—	—	93300	120300	29400	296
1.9	11203	1.2	761	—	3/V 07 L3	—	BN 100LB 4	M 3LB 4	42200	53000	91800	120300	36700	286
2.2	9637	1.5	655	—	3/V 07 L3	—	BN 100LB 4	M 3LB 4	40200	50400	87700	115000	34900	286
2.2	10012	1.8	655	—	3/V 09 L3	—	BN 100LB 4	—	—	—	89100	115000	27900	296
2.5	9137	0.9	569	—	3/V 06 L3	—	BN 100LB 4	M 3LB 4	34500	39100	78200	91100	25900	276
2.8	8147	1.7	507	—	3/V 07 L3	—	BN 100LB 4	M 3LB 4	36900	46300	81300	106500	32100	286
3.1	7392	1.7	460	—	3/V 07 L3	—	BN 100LB 4	M 3LB 4	35700	44800	78900	103400	31100	286
3.2	6758	2.5	442	—	3/V 09 L3	—	BN 100LB 4	—	—	—	79200	102200	24500	296
3.2	7884	1.2	439	—	—	3/A 07 L2	BN 100LB 4	M 3LB 4	35200	44100	77800	102000	30600	287
3.2	7812	1.0	435	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	31500	35700	72100	84000	23700	277
3.3	6934	1.2	427	—	3/V 06 L3	—	BN 100LB 4	M 3LB 4	31400	35500	71700	83500	23600	276
3.5	7279	1.3	405	—	—	3/A 07 L2	BN 100LB 4	M 3LB 4	34200	43000	76000	99500	29800	287
3.6	6424	1.2	395	—	3/V 06 L3	—	BN 100LB 4	M 3LB 4	30600	34600	70100	81600	23000	276
3.6	6426	1.4	386	—	3/V 07 L3	—	BN 100LB 4	M 3LB 4	33700	42300	74900	98100	29300	286
3.7	6837	0.9	380	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	30200	34200	69300	80700	22700	277
3.8	5664	2.3	370	—	3/V 09 L3	—	BN 100LB 4	—	—	—	75100	96900	23100	296
4.1	6133	1.8	341	—	—	3/A 07 L2	BN 100LB 4	M 3LB 4	32300	40600	72200	94600	28100	287
4.4	5761	1.2	321	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	28500	32300	65800	76700	21400	277
5.0	5062	1.7	282	—	—	3/A 07 L2	BN 100LB 4	M 3LB 4	30300	38100	68100	89300	26400	287
5.1	4955	1.6	276	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	27100	30700	62900	73300	20400	277
5.3	4799	1.1	267	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	26800	30400	62300	72600	20100	277
5.8	4338	2.1	241	—	—	3/A 07 L2	BN 100LB 4	M 3LB 4	28800	36200	65000	85200	25000	287
5.9	4323	1.0	241	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	20800	24000	36900	44400	13300	267
6.3	4005	2.2	223	—	—	3/A 07 L2	BN 100LB 4	M 3LB 4	28100	35200	63500	83200	24400	287
6.4	3967	1.6	221	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	25200	28500	58900	68500	18900	277
6.9	3689	0.9	205	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	19700	22800	35200	42400	12700	257
7.1	3559	1.5	198	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	24300	27500	57000	66300	18200	277
7.1	3550	2.5	198	—	—	3/A 07 L2	BN 100LB 4	M 3LB 4	27000	33800	61200	80300	23400	287
7.4	3412	2.3	190	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	23900	27100	56300	65500	18000	277
8.0	3154	1.1	175	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	18700	21600	33600	40400	12000	267
8.1	3125	1.0	174	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	18700	21500	33500	40300	12000	257
8.6	2942	2.2	164	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	22800	25800	53800	62700	17100	277
8.7	2918	1.0	162	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	18200	21100	32800	39500	11700	257
10.0	2530	1.4	141	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	17400	20100	31400	37800	11200	267
10.9	2323	1.2	129	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	16900	19500	30600	36900	10800	257
11.3	2238	2.4	125	—	—	3/A 06 L2	BN 100LB 4	M 3LB 4	20800	23600	49600	57700	15600	277
11.6	2176	1.6	121	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	16500	19100	30000	36200	10600	267
12.1	2102	1.1	117	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	16400	18900	29700	35800	10500	257
13.6	1860	1.7	104	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	15700	18100	28700	34500	10100	267
13.8	1831	1.4	102	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	15600	18000	28500	34300	10000	257
14.6	1742	1.0	96.9	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	15400	17700	28100	33800	9850	247
15.5	1630	1.4	90.7	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	15000	17300	27600	33200	9640	257
15.9	1591	1.0	88.5	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	14900	17200	27400	32900	9560	247
16.5	1538	2.3	85.6	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	14700	17000	27100	32600	9450	267
17.3	1469	1.6	81.7	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	14500	16800	26700	32100	9310	257
18.6	1361	2.2	75.8	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	14100	16300	26100	31400	9080	267
19.3	1315	1.4	73.2	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	14000	16100	25800	31100	8970	247
19.4	1304	2.5	72.5	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	13900	16100	25800	31000	8950	267
20.6	1230	2.0	68.4	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	13700	15800	25300	30500	8770	257
22.4	1131	1.4	62.9	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	13300	15400	24700	29700	8530	247
22.5	1125	2.9	62.6	—	—	3/A 05 L2	BN 100LB 4	M 3LB 4	13300	15300	24700	29700	8520	267
22.6	1122	2.5	62.4	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	13300	15300	24600	29600	8510	257
23.7	1068	1.2	59.4	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	4240	4240	11900	13700	2790	239
25.9	980	2.3	54.5	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	12700	14600	23700	28500	8140	257
26.0	975	1.2	54.2	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	4120	4120	11600	13300	2710	239
26.9	944	1.7	52.5	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	12500	14500	23400	28100	8030	247
28.4	894	2.5	49.7	—	—	3/A 04 L2	BN 100LB 4	M 3LB 4	12300	14200	23000	27700	7890	257

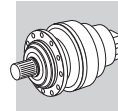


$P_1 = 3 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
28.7	882	0.9	49.1	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	3980	3980	11200	12900	2620	239
32	789	1.2	43.9	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	3840	3840	10900	12500	2520	239
32	780	2.3	43.4	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	11800	13600	22100	26600	7540	247
35	728	2.3	40.5	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	11500	13300	21600	26000	7370	247
35	720	1.2	40.1	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	3720	3720	10600	12100	2450	239
39	644	1.2	35.8	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	3590	3590	10200	11700	2360	239
42	602	2.9	33.5	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	10800	12400	20400	24600	6910	247
44	570	1.1	31.7	—	—	3/A 00 L2	BN 100LB 4	M 3LB 4	3440	3440	9850	11300	2260	231
45	560	2.1	31.2	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	3420	3420	9800	11300	2250	239
49	518	3.0	28.8	—	—	3/A 03 L2	BN 100LB 4	M 3LB 4	10300	11800	19500	23500	6580	247
60	421	1.4	23.4	—	—	3/A 00 L2	BN 100LB 4	M 3LB 4	3110	3110	9000	10300	2050	231
61	414	2.1	23.0	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	3090	3090	8950	10300	2030	239
74	344	1.4	19.1	—	—	3/A 00 L2	BN 100LB 4	M 3LB 4	2910	2910	8460	9720	1910	231
75	338	2.1	18.8	—	—	3/A 01 L2	BN 100LB 4	M 3LB 4	2890	2890	8420	9670	1900	239

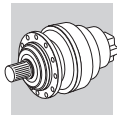
$P_1 = 4 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

0.27	102120	1.0	5234	—	3/V 15 L4	—	BN 112M 4	—	—	—	206000	243000	90000	346
0.29	96579	1.1	4950	—	3/V 15 L4	—	BN 112M 4	—	—	—	206000	243000	90000	346
0.29	96579	1.3	4950	—	3/V 16 L4	—	BN 112M 4	—	—	—	345000	385000	150000	356
0.32	82463	2.2	4449	—	3/V 17 L4	—	BN 112M 4	—	—	—	442000	470000	150000	364
0.33	80975	1.0	4312	—	3/V 14 L4	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.34	81377	1.3	4171	—	3/V 15 L4	—	BN 112M 4	—	—	—	206000	243000	90000	346
0.34	81377	1.6	4171	—	3/V 16 L4	—	BN 112M 4	—	—	—	345000	385000	150000	356
0.36	80826	1.0	3993	—	3/V 14 L4	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.41	68567	2.0	3514	—	3/V 16 L4	—	BN 112M 4	—	—	—	345000	385000	150000	356
0.44	63410	2.1	3250	—	3/V 16 L4	—	BN 112M 4	—	—	—	345000	385000	150000	356
0.45	64409	1.3	3182	—	3/V 14 L4	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.50	53194	1.0	2773	—	3/V 13 L4	—	BN 112M 4	M 3LC 4	—	—	192000	231000	80000	326
0.51	54277	1.5	2782	—	3/V 14 L4	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.52	53429	2.1	2738	—	3/V 16 L4	—	BN 112M 4	—	—	—	345000	385000	150000	356
0.57	47018	1.8	2504	—	3/V 14 L4	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.59	45202	1.1	2430	—	3/V 13 L3	—	BN 112M 4	—	—	—	192000	231000	80000	326
0.62	43115	1.5	2318	—	3/V 14 L3	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.71	37552	1.5	2019	—	3/V 13 L3	—	BN 112M 4	—	—	—	192000	231000	80000	326
0.72	37089	1.9	1994	—	3/V 14 L3	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.73	36509	1.2	1963	—	3/V 11 L3	—	BN 112M 4	—	—	—	157000	195000	65000	316
0.85	32139	1.7	1682	—	3/V 13 L3	—	BN 112M 4	—	—	—	192000	231000	80000	326
0.86	31742	2.5	1662	—	3/V 14 L3	—	BN 112M 4	—	—	—	206000	243000	90000	336
0.87	31247	1.4	1636	—	3/V 11 L3	—	BN 112M 4	—	—	—	157000	195000	65000	316
0.90	29555	1.9	1589	—	3/V 14 L3	—	BN 112M 4	—	—	—	206000	243000	90000	336
1.0	27080	2.0	1418	—	3/V 13 L3	—	BN 112M 4	—	—	—	192000	230200	80000	326
1.0	26328	1.6	1378	—	3/V 11 L3	—	BN 112M 4	—	—	—	156100	194400	64700	316
1.1	24903	1.9	1339	—	3/V 14 L3	—	BN 112M 4	—	—	—	204100	239600	88700	336
1.1	25295	2.5	1324	—	3/V 14 L3	—	BN 112M 4	—	—	—	203400	238800	88300	336
1.1	24657	2.1	1291	—	3/V 13 L3	—	BN 112M 4	—	—	—	189100	223800	77900	326
1.1	24348	1.4	1274	—	3/V 11 L3	—	BN 112M 4	—	—	—	152400	189900	63000	316
1.2	23755	0.9	1227	—	3/V 10 L3	—	BN 112M 4	—	—	—	127500	160400	62200	306
1.3	21678	1.3	1120	—	3/V 10 L3	—	BN 112M 4	—	—	—	124100	156000	60300	306
1.3	21313	2.5	1116	—	3/V 14 L3	—	BN 112M 4	—	—	—	193200	226900	83400	336
1.3	20776	2.5	1088	—	3/V 13 L3	—	BN 112M 4	—	—	—	179600	212600	73500	326
1.4	18678	1.9	1004	—	3/V 11 L3	—	BN 112M 4	—	—	—	141900	176800	58200	316
1.4	19426	0.9	1004	—	3/V 09 L3	—	BN 112M 4	—	—	—	101300	130700	32200	296
1.4	19426	1.5	1004	—	3/V 10 L3	—	BN 112M 4	—	—	—	120100	151000	58200	306
1.6	18510	1.2	920	—	3/V 10 L3	—	BN 112M 4	—	—	—	117000	147100	56500	306
1.6	17194	2.3	900	—	3/V 11 L3	—	BN 112M 4	—	—	—	137300	171100	56100	316
1.7	16892	1.1	840	—	3/V 09 L3	—	BN 112M 4	—	—	—	96100	123900	30400	296



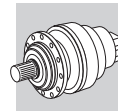
$P_1 = 4 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
1.8	15480	1.4	800	—	3/V 09 L3	—	BN 112M 4	—	—	—	94700	122100	29900	296
1.8	15043	0.9	761	—	3/V 07 L3	—	BN 112M 4	M 3LC 4	42200	53000	91800	120300	36700	286
1.9	15302	0.9	761	—	3/V 09 L3	—	BN 112M 4	—	—	—	93300	120300	29400	296
2.1	12941	1.1	655	—	3/V 07 L3	—	BN 112M 4	M 3LC 4	40200	50400	87700	115000	34900	286
2.2	13163	1.3	655	—	3/V 09 L3	—	BN 112M 4	—	—	—	89100	115000	27900	296
2.8	10941	1.2	507	—	3/V 07 L3	—	BN 112M 4	M 3LC 4	36900	46300	81300	106500	32100	286
3.0	9926	1.2	460	—	3/V 07 L3	—	BN 112M 4	M 3LC 4	35700	44800	78900	103400	31100	286
3.2	8885	1.9	442	—	3/V 09 L3	—	BN 112M 4	—	—	—	79200	102200	24500	296
3.5	9775	0.9	405	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	34200	43000	76000	99500	29800	287
3.6	8629	1.1	386	—	3/V 07 L3	—	BN 112M 4	M 3LC 4	33700	42300	74900	98100	29300	286
3.9	7446	1.7	370	—	3/V 09 L3	—	BN 112M 4	—	—	—	75100	96900	23100	296
4.1	8236	1.3	341	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	32300	40600	72200	94600	28100	287
5.0	6797	1.3	282	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	30300	38100	68100	89300	26400	287
5.1	6654	1.2	276	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	27100	30700	62900	73300	20400	277
5.8	5826	1.5	241	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	28800	36200	65000	85200	25000	287
6.3	5379	1.7	223	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	28100	35200	63500	83200	24400	287
6.3	5327	1.2	221	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	25200	28500	58900	68500	18900	277
7.1	4779	1.2	198	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	24300	27500	57000	66300	18200	277
7.1	4767	1.8	198	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	27000	33800	61200	80300	23400	287
7.4	4582	1.7	190	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	23900	27100	56300	65500	18000	277
7.8	4346	2.4	180	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	26100	32800	59600	78100	22700	287
8.6	3950	1.6	164	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	22800	25800	53800	62700	17100	277
9.0	3740	2.4	155	—	—	3/A 07 L2	BN 112M 4	M 3LC 4	24900	31200	56900	74600	21600	287
9.9	3398	2.3	141	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	21700	24500	51400	59900	16300	277
9.9	3397	1.1	141	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	17400	20100	31400	37800	11200	267
11.2	3005	1.8	125	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	20800	23600	49600	57700	15600	277
11.6	2922	1.2	121	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	16500	19100	30000	36200	10600	267
12.5	2708	2.3	112	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	20100	22800	48000	55900	15100	277
13.5	2498	1.2	104	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	15700	18100	28700	34500	10100	267
13.7	2459	1.0	102	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	15600	18000	28500	34300	10000	257
14.2	2371	2.2	98.3	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	19200	21800	46200	53800	14400	277
15.4	2189	1.0	90.7	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	15000	17300	27600	33200	9640	257
15.8	2137	2.9	88.5	—	—	3/A 06 L2	BN 112M 4	M 3LC 4	18600	21000	44700	52100	13900	277
16.4	2065	1.7	85.6	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	14700	17000	27100	32600	9450	267
17.1	1972	1.2	81.7	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	14500	16800	26700	32100	9310	257
18.5	1828	1.7	75.8	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	14100	16300	26100	31400	9080	267
19.1	1766	1.0	73.2	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	14000	16100	25800	31100	8970	247
19.3	1751	1.9	72.5	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	13900	16100	25800	31000	8950	267
20.5	1651	1.5	68.4	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	13700	15800	25300	30500	8770	257
22.2	1519	1.0	62.9	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	13300	15400	24700	29700	8530	247
22.4	1511	2.1	62.6	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	13300	15300	24700	29700	8520	267
22.4	1506	1.8	62.4	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	13300	15300	24600	29600	8510	257
24.5	1377	2.4	57.0	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	12900	14900	24000	28800	8260	267
25.7	1316	1.7	54.5	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	12700	14600	23700	28500	8140	257
25.8	1309	0.9	54.2	—	—	3/A 01 L2	BN 112M 4	M 3LC 4	4120	4120	11600	13300	2710	239
26.3	1285	2.4	53.3	—	—	3/A 05 L2	BN 112M 4	M 3LC 4	12600	14500	23500	28300	8070	267
26.7	1267	1.3	52.5	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	12500	14500	23400	28100	8030	247
28.2	1200	1.9	49.7	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	12300	14200	23000	27700	7890	257
32	1068	2.6	44.3	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	11800	13700	22200	26700	7590	257
32	1047	1.7	43.4	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	11800	13600	22100	26600	7540	247
35	977	1.7	40.5	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	11500	13300	21600	26000	7370	247
35	967	0.9	40.1	—	—	3/A 01 L2	BN 112M 4	M 3LC 4	3720	3720	10600	12100	2450	239
36	944	2.4	39.1	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	11400	13100	21400	25800	7280	257
40	851	2.7	35.3	—	—	3/A 04 L2	BN 112M 4	M 3LC 4	11000	12700	20800	25000	7040	257
42	808	2.2	33.5	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	10800	12400	20400	24600	6910	247
45	752	1.6	31.2	—	—	3/A 01 L2	BN 112M 4	M 3LC 4	3420	3420	9800	11300	2250	239
49	695	2.2	28.8	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	10300	11800	19500	23500	6580	247
60	566	1.0	23.4	—	—	3/A 00 L2	BN 112M 4	M 3LC 4	3110	3110	9000	10300	2050	231
61	556	1.6	23.0	—	—	3/A 01 L2	BN 112M 4	M 3LC 4	3090	3090	8950	10300	2030	239
61	554	2.2	22.9	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	9500	11000	18200	22000	6100	247
72	469	2.2	19.4	—	—	3/A 03 L2	BN 112M 4	M 3LC 4	8990	10400	17400	20900	5770	247
73	462	1.0	19.1	—	—	3/A 00 L2	BN 112M 4	M 3LC 4	2910	2910	8460	9720	1910	231
74	454	1.6	18.8	—	—	3/A 01 L2	BN 112M 4	M 3LC 4	2890	2890	8420	9670	1900	239



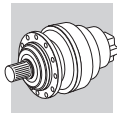
P₁ = 5.5 kW **n₁ = 1400 min⁻¹**

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.28	134133	2.6	5164	—	3/V 19 L4	—	BN 132S 4	—	—	—	638000	702000	200000	380
0.28	140948	1.7	5099	—	3/V 18 L4	—	BN 132S 4	—	—	—	503000	565000	200000	372
0.29	137388	1.1	4970	—	3/V 17 L4	—	BN 132S 4	—	—	—	442000	470000	150000	364
0.29	131874	0.9	4950	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.32	126175	2.7	4457	—	3/V 19 L4	—	BN 132S 4	—	—	—	638000	702000	200000	380
0.32	112600	1.6	4449	—	3/V 17 L4	—	BN 132S 4	—	—	—	442000	470000	150000	364
0.33	121246	2.1	4386	—	3/V 18 L4	—	BN 132S 4	—	—	—	503000	565000	200000	372
0.35	111116	0.9	4171	—	3/V 15 L4	—	BN 132S 4	—	—	—	206000	243000	90000	346
0.35	111116	1.2	4171	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.35	114138	1.6	4129	—	3/V 17 L4	—	BN 132S 4	—	—	—	442000	470000	150000	364
0.39	102161	2.4	3696	—	3/V 18 L4	—	BN 132S 4	—	—	—	503000	565000	200000	372
0.41	93625	1.4	3514	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.41	96618	2.6	3495	—	3/V 18 L4	—	BN 132S 4	—	—	—	503000	565000	200000	372
0.41	97608	1.0	3489	—	3/V 15 L4	—	BN 132S 4	—	—	—	206000	243000	90000	346
0.44	92312	1.1	3300	—	3/V 15 L4	—	BN 132S 4	—	—	—	206000	243000	90000	346
0.44	86584	1.5	3250	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.45	87947	1.0	3182	—	3/V 14 L4	—	BN 132S 4	—	—	—	206000	243000	90000	336
0.45	87566	2.1	3168	—	3/V 17 L4	—	BN 132S 4	—	—	—	442000	470000	150000	364
0.52	74113	1.1	2782	—	3/V 14 L4	—	BN 132S 4	—	—	—	206000	243000	90000	336
0.52	77781	1.3	2780	—	3/V 15 L4	—	BN 132S 4	—	—	—	206000	243000	90000	346
0.52	72039	2.3	2773	—	3/V 17 L4	—	BN 132S 4	—	—	—	442000	470000	150000	364
0.53	72955	1.6	2738	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.58	64200	1.3	2504	—	3/V 14 L4	—	BN 132S 4	—	—	—	206000	243000	90000	336
0.61	65538	2.1	2343	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.62	58872	1.1	2318	—	3/V 14 L3	—	BN 132S 4	—	—	—	206000	243000	90000	336
0.62	58077	1.4	2318	—	3/V 15 L3	—	BN 132S 4	—	—	—	206000	243000	90000	346
0.66	60609	2.1	2167	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.71	51276	1.1	2019	—	3/V 13 L3	—	BN 132S 4	—	—	—	192000	231000	80000	326
0.72	50643	1.4	1994	—	3/V 14 L3	—	BN 132S 4	—	—	—	206000	243000	90000	336
0.72	49958	1.9	1994	—	3/V 15 L3	—	BN 132S 4	—	—	—	206000	243000	90000	346
0.79	51068	2.1	1826	—	3/V 16 L4	—	BN 132S 4	—	—	—	345000	385000	150000	356
0.86	43885	1.3	1682	—	3/V 13 L3	—	BN 132S 4	—	—	—	192000	231000	80000	326
0.87	43343	1.8	1662	—	3/V 14 L3	—	BN 132S 4	—	—	—	206000	243000	90000	336
0.87	43343	2.3	1662	—	3/V 15 L3	—	BN 132S 4	—	—	—	206000	243000	90000	346
0.88	42666	1.0	1636	—	3/V 11 L3	—	BN 132S 4	—	—	—	157000	195000	65000	316
0.89	43371	1.1	1620	—	3/V 13 L3	—	BN 132S 4	—	—	—	192000	231000	80000	326
0.91	40356	1.4	1589	—	3/V 14 L3	—	BN 132S 4	—	—	—	206000	243000	90000	336
0.91	41447	2.7	1589	—	3/V 16 L3	—	BN 132S 4	—	—	—	345000	385000	150000	356
1.0	36977	1.5	1418	—	3/V 13 L3	—	BN 132S 4	—	—	—	192000	230200	80000	326
1.0	36520	2.4	1400	—	3/V 15 L3	—	BN 132S 4	—	—	—	206000	242900	90000	346
1.0	35950	1.2	1378	—	3/V 11 L3	—	BN 132S 4	—	—	—	156100	194400	64700	316
1.1	34004	1.4	1339	—	3/V 14 L3	—	BN 132S 4	—	—	—	204100	239600	88700	336
1.1	34538	3.2	1324	—	3/V 16 L3	—	BN 132S 4	—	—	—	339300	377400	147800	356
1.1	35587	2.8	1329	—	3/V 15 L3	—	BN 132S 4	—	—	—	203700	239100	88500	346
1.1	34539	1.8	1324	—	3/V 14 L3	—	BN 132S 4	—	—	—	203400	238800	88300	336
1.1	33668	1.6	1291	—	3/V 13 L3	—	BN 132S 4	—	—	—	189100	223800	77900	326
1.1	33246	1.1	1274	—	3/V 11 L3	—	BN 132S 4	—	—	—	152400	189900	63000	316
1.3	29601	1.0	1120	—	3/V 10 L3	—	BN 132S 4	—	—	—	124100	156000	60300	306
1.3	29102	1.8	1116	—	3/V 14 L3	—	BN 132S 4	—	—	—	193200	226900	83400	336
1.3	29517	1.4	1103	—	3/V 11 L3	—	BN 132S 4	—	—	—	146000	181800	60000	316
1.3	28368	1.8	1088	—	3/V 13 L3	—	BN 132S 4	—	—	—	179600	212600	73500	326
1.4	28756	1.8	1009	—	3/V 13 L3	—	BN 132S 4	—	—	—	175600	207900	71700	326
1.4	25504	1.4	1004	—	3/V 11 L3	—	BN 132S 4	—	—	—	141900	176800	58200	316
1.4	26525	1.1	1004	—	3/V 10 L3	—	BN 132S 4	—	—	—	120100	151000	58200	306
1.4	28401	2.2	997	—	3/V 14 L3	—	BN 132S 4	—	—	—	186800	219300	80400	336
1.6	23477	1.7	900	—	3/V 11 L3	—	BN 132S 4	—	—	—	137300	171100	56100	316
1.6	23894	2.3	893	—	3/V 14 L3	—	BN 132S 4	—	—	—	180700	212200	77500	336
1.7	23292	2.3	870	—	3/V 13 L3	—	BN 132S 4	—	—	—	168000	198800	68300	326
1.7	22677	2.4	869	—	3/V 16 L3	—	BN 132S 4	—	—	—	298100	331600	128000	356
1.7	23557	1.7	827	—	3/V 11 L3	—	BN 132S 4	—	—	—	133900	166800	54500	316
1.8	21137	1.0	800	—	3/V 09 L3	—	BN 132S 4	—	—	—	94700	122100	29900	296



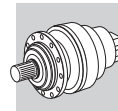
P₁ = 5.5 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
1.8	22632	2.2	794	—	3/V 14 L3	—	BN 132S 4	—	—	—	174500	204900	74500	336
1.9	22276	1.0	773	—	3/V 10 L3	—	BN 132S 4	—	—	—	111000	139600	53300	306
1.9	19827	2.3	741	—	3/V 13 L3	—	BN 132S 4	—	—	—	160100	189400	64700	326
2.0	19276	2.0	720	—	3/V 11 L3	—	BN 132S 4	—	—	—	128400	160000	52100	316
2.1	20932	1.1	701	—	3/V 10 L3	—	BN 132S 4	—	—	—	107800	135600	51600	306
2.1	18619	2.3	695	—	3/V 14 L3	—	BN 132S 4	—	—	—	167700	196900	71300	336
2.2	17973	1.0	655	—	3/V 09 L3	—	BN 132S 4	—	—	—	89100	115000	27900	296
2.2	18356	2.2	644	—	3/V 11 L3	—	BN 132S 4	—	—	—	124200	154800	50200	316
2.3	17692	1.2	614	—	3/V 10 L3	—	BN 132S 4	—	—	—	103600	130300	49400	306
2.6	16146	1.6	560	—	3/V 10 L3	—	BN 132S 4	—	—	—	100800	126700	47900	306
2.8	14626	0.9	507	—	3/V 07 L3	—	BN 132S 4	—	36900	46300	81300	106500	32100	286
2.8	14626	1.0	507	—	3/V 09 L3	—	BN 132S 4	—	—	—	82600	106500	25700	296
2.8	14626	1.8	507	—	3/V 10 L3	—	BN 132S 4	—	—	—	97800	123000	46300	306
3.1	13269	0.9	460	—	3/V 07 L3	—	BN 132S 4	—	35700	44800	78900	103400	31100	286
3.3	12132	1.4	442	—	3/V 09 L3	—	BN 132S 4	—	—	—	79200	102200	24500	296
3.3	12581	2.1	436	—	3/V 10 L3	—	BN 132S 4	—	—	—	93500	117600	44100	306
3.9	10168	1.3	370	—	3/V 09 L3	—	BN 132S 4	—	—	—	75100	96900	23100	296
4.2	11010	1.0	341	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	32300	40600	72200	94600	28100	287
5.1	9087	1.0	282	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	30300	38100	68100	89300	26400	287
6.0	7788	1.2	241	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	28800	36200	65000	85200	25000	287
6.5	7190	1.3	223	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	28100	35200	63500	83200	24400	287
6.5	7121	0.9	221	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	25200	28500	58900	68500	18900	277
7.3	6373	1.4	198	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	27000	33800	61200	80300	23400	287
7.6	6126	1.3	190	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	23900	27100	56300	65500	18000	277
8.0	5810	1.8	180	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	26100	32800	59600	78100	22700	287
8.8	5281	1.2	164	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	22800	25800	53800	62700	17100	277
9.3	5000	1.8	155	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	24900	31200	56900	74600	21600	287
10.2	4543	1.7	141	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	21700	24500	51400	59900	16300	277
10.3	4527	2.5	140	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	24000	30200	55300	72400	20900	287
11.1	4184	2.7	130	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	23400	29400	54000	70700	20400	287
11.6	4017	1.4	125	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	20800	23600	49600	57700	15600	277
11.9	3906	0.9	121	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	16500	19100	30000	36200	10600	267
12.8	3620	1.7	112	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	20100	22800	48000	55900	15100	277
13.2	3507	2.5	109	—	—	3/A 07 L2	BN 132S 4	M 4SA 4	22100	27700	51200	67100	19200	287
13.9	3339	0.9	104	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	15700	18100	28700	34500	10100	267
14.7	3170	1.7	98.3	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	19200	21800	46200	53800	14400	277
16.3	2856	2.2	88.5	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	18600	21000	44700	52100	13900	277
16.8	2761	1.3	85.6	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	14700	17000	27100	32600	9450	267
17.6	2637	0.9	81.7	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	14500	16800	26700	32100	9310	257
17.7	2620	2.4	81.2	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	18000	20400	43600	50800	13500	277
19.0	2444	1.3	75.8	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	14100	16300	26100	31400	9080	267
19.9	2340	1.4	72.5	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	13900	16100	25800	31000	8950	267
20.6	2254	2.5	69.9	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	17200	19400	41700	48500	12900	277
21.0	2208	1.1	68.4	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	13700	15800	25300	30500	8770	257
23.0	2020	1.6	62.6	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	13300	15300	24700	29700	8520	267
23.1	2013	1.4	62.4	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	13300	15300	24600	29600	8510	257
25.2	1840	1.8	57.0	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	12900	14900	24000	28800	8260	267
25.9	1796	2.5	55.7	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	15900	18000	38900	45300	11900	277
26.4	1760	1.3	54.5	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	12700	14600	23700	28500	8140	257
27.0	1718	1.8	53.3	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	12600	14500	23500	28300	8070	267
29.0	1604	1.4	49.7	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	12300	14200	23000	27700	7890	257
31	1522	2.5	47.2	—	—	3/A 06 L2	BN 132S 4	M 4SA 4	15000	17000	37000	43100	11300	277
33	1428	1.9	44.3	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	11800	13700	22200	26700	7590	257
33	1420	2.3	44.0	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	11800	13600	22200	26700	7580	267
37	1262	1.8	39.1	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	11400	13100	21400	25800	7280	257
37	1258	2.4	39.0	—	—	3/A 05 L2	BN 132S 4	M 4SA 4	11300	13100	21400	25700	7280	267
41	1138	2.0	35.3	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	11000	12700	20800	25000	7040	257
48	974	2.3	30.2	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	10400	12000	19800	23800	6680	257
56	825	2.3	25.6	—	—	3/A 04 L2	BN 132S 4	M 4SA 4	9850	11400	18800	22700	6320	257



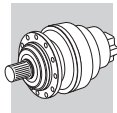
P₁ = 7.5 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.28	182908	1.9	5164	—	3/V 19 L4	—	BN 132MA 4	—	—	—	638000	702000	200000	380
0.28	192202	1.3	5099	—	3/V 18 L4	—	BN 132MA 4	—	—	—	503000	565000	200000	372
0.29	180813	3.0	5040	—	3/V 21 L4	—	BN 132MA 4	—	—	—	779000	923000	1200000	388
0.32	172057	2.0	4457	—	3/V 19 L4	—	BN 132MA 4	—	—	—	638000	702000	200000	380
0.32	153545	1.2	4449	—	3/V 17 L4	—	BN 132MA 4	—	—	—	442000	470000	150000	364
0.33	165335	1.5	4386	—	3/V 18 L4	—	BN 132MA 4	—	—	—	503000	565000	200000	372
0.35	155642	1.2	4129	—	3/V 17 L4	—	BN 132MA 4	—	—	—	442000	470000	150000	364
0.35	154349	2.3	4095	—	3/V 19 L4	—	BN 132MA 4	—	—	—	638000	702000	200000	380
0.39	139310	1.8	3696	—	3/V 18 L4	—	BN 132MA 4	—	—	—	503000	565000	200000	372
0.41	127671	1.1	3514	—	3/V 16 L4	—	BN 132MA 4	—	—	—	345000	385000	150000	356
0.41	131751	1.9	3495	—	3/V 18 L4	—	BN 132MA 4	—	—	—	503000	565000	200000	372
0.44	118069	1.1	3250	—	3/V 16 L4	—	BN 132MA 4	—	—	—	345000	385000	150000	356
0.45	124709	2.7	3231	—	3/V 19 L4	—	BN 132MA 4	—	—	—	638000	702000	200000	380
0.45	119408	1.5	3168	—	3/V 17 L4	—	BN 132MA 4	—	—	—	442000	470000	150000	364
0.49	111013	2.3	2945	—	3/V 18 L4	—	BN 132MA 4	—	—	—	503000	565000	200000	372
0.52	106065	1.0	2780	—	3/V 15 L4	—	BN 132MA 4	—	—	—	206000	243000	90000	346
0.52	98235	1.7	2773	—	3/V 17 L4	—	BN 132MA 4	—	—	—	442000	470000	150000	364
0.53	99484	1.1	2738	—	3/V 16 L4	—	BN 132MA 4	—	—	—	345000	385000	150000	356
0.58	87546	1.0	2504	—	3/V 14 L4	—	BN 132MA 4	—	—	—	206000	243000	90000	336
0.58	95111	2.6	2464	—	3/V 18 L4	—	BN 132MA 4	—	—	—	503000	565000	200000	372
0.61	89370	1.5	2343	—	3/V 16 L4	—	BN 132MA 4	—	—	—	345000	385000	150000	356
0.62	79195	1.0	2318	—	3/V 15 L3	—	BN 132MA 4	—	—	—	206000	243000	90000	346
0.63	86504	2.5	2295	—	3/V 18 L4	—	BN 132MA 4	—	—	—	503000	565000	200000	372
0.66	82648	1.6	2167	—	3/V 16 L4	—	BN 132MA 4	—	—	—	345000	385000	150000	356
0.72	69058	1.0	1994	—	3/V 14 L3	—	BN 132MA 4	—	—	—	206000	243000	90000	336
0.72	68125	1.4	1994	—	3/V 15 L3	—	BN 132MA 4	—	—	—	206000	243000	90000	346
0.79	69639	1.6	1826	—	3/V 16 L4	—	BN 132MA 4	—	—	—	345000	385000	150000	356
0.86	59843	0.9	1682	—	3/V 13 L3	—	BN 132MA 4	—	—	—	192000	231000	80000	326
0.87	59104	1.3	1662	—	3/V 14 L3	—	BN 132MA 4	—	—	—	206000	243000	90000	336
0.87	59104	1.7	1662	—	3/V 15 L3	—	BN 132MA 4	—	—	—	206000	243000	90000	346
0.91	55031	1.0	1589	—	3/V 14 L3	—	BN 132MA 4	—	—	—	206000	243000	90000	336
0.91	56518	2.0	1589	—	3/V 16 L3	—	BN 132MA 4	—	—	—	345000	385000	150000	356
1.0	50423	1.1	1418	—	3/V 13 L3	—	BN 132MA 4	—	—	—	192000	230200	80000	326
1.0	49800	1.7	1400	—	3/V 15 L3	—	BN 132MA 4	—	—	—	206000	242900	90000	346
1.1	46368	1.0	1339	—	3/V 14 L3	—	BN 132MA 4	—	—	—	204100	239600	88700	336
1.1	47097	2.4	1324	—	3/V 16 L3	—	BN 132MA 4	—	—	—	339300	377400	147800	356
1.1	48527	2.0	1329	—	3/V 15 L3	—	BN 132MA 4	—	—	—	203700	239100	88500	346
1.1	47098	1.3	1324	—	3/V 14 L3	—	BN 132MA 4	—	—	—	203400	238800	88300	336
1.1	45911	1.2	1291	—	3/V 13 L3	—	BN 132MA 4	—	—	—	189100	223800	77900	326
1.2	47769	3.0	1215	—	3/V 17 L3	—	BN 132MA 4	—	—	—	423800	451200	143100	364
1.3	40889	2.3	1120	—	3/V 15 L3	—	BN 132MA 4	—	—	—	193500	227100	83500	346
1.3	39685	1.3	1116	—	3/V 14 L3	—	BN 132MA 4	—	—	—	193200	226900	83400	336
1.3	40250	1.0	1103	—	3/V 11 L3	—	BN 132MA 4	—	—	—	146000	181800	60000	316
1.3	38684	1.3	1088	—	3/V 13 L3	—	BN 132MA 4	—	—	—	179600	212600	73500	326
1.4	39166	3.1	1059	—	3/V 16 L3	—	BN 132MA 4	—	—	—	316300	351800	136700	356
1.4	39213	1.3	1009	—	3/V 13 L3	—	BN 132MA 4	—	—	—	175600	207900	71700	326
1.4	34779	1.0	1004	—	3/V 11 L3	—	BN 132MA 4	—	—	—	141900	176800	58200	316
1.4	38729	1.6	997	—	3/V 14 L3	—	BN 132MA 4	—	—	—	186800	219300	80400	336
1.4	38729	2.4	997	—	3/V 15 L3	—	BN 132MA 4	—	—	—	186800	219300	80400	346
1.6	32015	1.2	900	—	3/V 11 L3	—	BN 132MA 4	—	—	—	137300	171100	56100	316
1.6	32583	1.7	893	—	3/V 14 L3	—	BN 132MA 4	—	—	—	180700	212200	77500	336
1.6	33019	3.1	893	—	3/V 16 L3	—	BN 132MA 4	—	—	—	298100	331600	128000	356
1.7	31762	1.7	870	—	3/V 13 L3	—	BN 132MA 4	—	—	—	168000	198800	68300	326
1.7	32632	2.5	840	—	3/V 15 L3	—	BN 132MA 4	—	—	—	177500	208400	75900	346
1.7	32123	1.2	827	—	3/V 11 L3	—	BN 132MA 4	—	—	—	133900	166800	54500	316
1.8	30862	1.6	794	—	3/V 14 L3	—	BN 132MA 4	—	—	—	174500	204900	74500	336
1.9	27037	1.7	741	—	3/V 13 L3	—	BN 132MA 4	—	—	—	160100	189400	64700	326
2.0	26286	1.5	720	—	3/V 11 L3	—	BN 132MA 4	—	—	—	128400	160000	52100	316
2.1	25390	1.7	695	—	3/V 14 L3	—	BN 132MA 4	—	—	—	167700	196900	71300	336
2.2	25031	1.6	644	—	3/V 11 L3	—	BN 132MA 4	—	—	—	124200	154800	50200	316
2.3	24126	0.9	614	—	3/V 10 L3	—	BN 132MA 4	—	—	—	103600	130300	49400	306



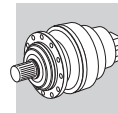
$P_1 = 7.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
2.6	22017	1.2	560	—	3/V 10 L3	—	BN 132MA 4	—	—	—	100800	126700	47900	306
2.8	19944	1.3	507	—	3/V 10 L3	—	BN 132MA 4	—	—	—	97800	123000	46300	306
3.3	16543	1.0	442	—	3/V 09 L3	—	BN 132MA 4	—	—	—	79200	102200	24500	296
3.3	17156	1.6	436	—	3/V 10 L3	—	BN 132MA 4	—	—	—	93500	117600	44100	306
3.9	13865	0.9	370	—	3/V 09 L3	—	BN 132MA 4	—	—	—	75100	96900	23100	296
6.5	9805	0.9	223	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	28100	35200	63500	83200	24400	287
7.3	8690	1.0	198	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	27000	33800	61200	80300	23400	287
7.6	8353	0.9	190	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	23900	27100	56300	65500	18000	277
8.0	7923	1.3	180	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	26100	32800	59600	78100	22700	287
8.8	7201	0.9	164	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	22800	25800	53800	62700	17100	277
9.3	6818	1.3	155	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	24900	31200	56900	74600	21600	287
10.2	6194	1.3	141	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	21700	24500	51400	59900	16300	277
10.3	6174	1.8	140	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	24000	30200	55300	72400	20900	287
11.1	5706	1.9	130	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	23400	29400	54000	70700	20400	287
11.6	5478	1.0	125	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	20800	23600	49600	57700	15600	277
12.8	4936	1.3	112	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	20100	22800	48000	55900	15100	277
13.2	4782	1.8	109	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	22100	27700	51200	67100	19200	287
14.7	4323	1.2	98.3	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	19200	21800	46200	53800	14400	277
16.3	3895	1.6	88.5	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	18600	21000	44700	52100	13900	277
16.4	3857	2.5	87.7	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	20600	25800	48000	62900	17900	287
16.8	3764	0.9	85.6	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	14700	17000	27100	32600	9450	267
17.7	3573	1.7	81.2	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	18000	20400	43600	50800	13500	277
19.0	3333	0.9	75.8	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	14100	16300	26100	31400	9080	267
19.9	3192	1.0	72.5	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	13900	16100	25800	31000	8950	267
20.6	3074	1.9	69.9	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	17200	19400	41700	48500	12900	277
21.1	3006	2.6	68.3	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	18900	23700	44500	58400	16400	287
23.0	2755	1.2	62.6	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	13300	15300	24700	29700	8520	267
23.1	2745	1.0	62.4	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	13300	15300	24600	29600	8510	257
23.9	2646	2.3	60.1	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	16300	18500	39800	46400	12300	277
25.1	2519	2.6	57.3	—	—	3/A 07 L2	BN 132MA 4	M 4LA 4	17800	22400	42200	55400	15500	287
25.2	2510	1.3	57.0	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	12900	14900	24000	28800	8260	267
25.9	2450	1.8	55.7	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	15900	18000	38900	45300	11900	277
26.4	2400	1.0	54.5	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	12700	14600	23700	28500	8140	257
27.0	2343	1.3	53.3	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	12600	14500	23500	28300	8070	267
27.8	2276	2.3	51.7	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	15500	17600	38100	44400	11700	277
29.0	2188	1.0	49.7	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	12300	14200	23000	27700	7890	257
31	2075	1.9	47.2	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	15000	17000	37000	43100	11300	277
33	1948	1.4	44.3	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	11800	13700	22200	26700	7590	257
33	1937	1.7	44.0	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	11800	13600	22200	26700	7580	267
35	1807	2.7	41.1	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	14400	16300	35500	41400	10800	277
37	1720	1.3	39.1	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	11400	13100	21400	25800	7280	257
37	1716	1.8	39.0	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	11300	13100	21400	25700	7280	267
41	1552	1.5	35.3	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	11000	12700	20800	25000	7040	257
41	1536	2.3	34.9	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	13600	15400	33900	39400	10200	277
44	1440	2.7	32.7	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	13300	15100	33200	38700	10000	277
45	1418	2.3	32.2	—	—	3/A 05 L2	BN 132MA 4	M 4LA 4	10600	12300	20200	24300	6830	267
48	1328	1.7	30.2	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	10400	12000	19800	23800	6680	257
52	1220	2.3	27.7	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	10100	11700	19300	23200	6490	257
52	1220	2.7	27.7	—	—	3/A 06 L2	BN 132MA 4	M 4LA 4	12600	14300	31600	36800	9470	277
56	1125	1.7	25.6	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	9850	11400	18800	22700	6320	257
65	972	2.3	22.1	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	9380	10800	18000	21700	6020	257
77	824	2.3	18.7	—	—	3/A 04 L2	BN 132MA 4	M 4LA 4	8880	10300	17200	20600	5700	257



$P_1 = 9.2 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.28	224367	1.6	5164	—	3/V 19 L4	—	BN 132MB 4	—	—	—	638000	702000	200000	380
0.28	235768	1.0	5099	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.29	221798	2.4	5040	—	3/V 21 L4	—	BN 132MB 4	—	—	—	779000	923000	1200000	388
0.32	212907	2.5	4550	—	3/V 21 L4	—	BN 132MB 4	—	—	—	779000	923000	1200000	388
0.32	211057	1.6	4457	—	3/V 19 L4	—	BN 132MB 4	—	—	—	638000	702000	200000	380
0.32	188349	1.0	4449	—	3/V 17 L4	—	BN 132MB 4	—	—	—	442000	470000	150000	364
0.33	202811	1.2	4386	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.35	190921	0.9	4129	—	3/V 17 L4	—	BN 132MB 4	—	—	—	442000	470000	150000	364
0.35	189335	1.8	4095	—	3/V 19 L4	—	BN 132MB 4	—	—	—	638000	702000	200000	380
0.38	176877	2.6	3780	—	3/V 21 L4	—	BN 132MB 4	—	—	—	779000	923000	1200000	388
0.39	170887	1.5	3696	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.40	172465	2.9	3600	—	3/V 21 L4	—	BN 132MB 4	—	—	—	779000	923000	1200000	388
0.41	161615	1.5	3495	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.44	144831	0.9	3250	—	3/V 16 L4	—	BN 132MB 4	—	—	—	345000	385000	150000	356
0.45	152976	2.2	3231	—	3/V 19 L4	—	BN 132MB 4	—	—	—	638000	702000	200000	380
0.45	146474	1.2	3168	—	3/V 17 L4	—	BN 132MB 4	—	—	—	442000	470000	150000	364
0.49	136176	1.8	2945	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.52	120502	1.4	2773	—	3/V 17 L4	—	BN 132MB 4	—	—	—	442000	470000	150000	364
0.53	122033	0.9	2738	—	3/V 16 L4	—	BN 132MB 4	—	—	—	345000	385000	150000	356
0.56	122251	2.9	2582	—	3/V 19 L4	—	BN 132MB 4	—	—	—	638000	702000	200000	380
0.58	116670	2.1	2464	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.61	109627	1.2	2343	—	3/V 16 L4	—	BN 132MB 4	—	—	—	345000	385000	150000	356
0.63	106111	2.0	2295	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.66	101382	1.3	2167	—	3/V 16 L4	—	BN 132MB 4	—	—	—	345000	385000	150000	356
0.72	83567	1.1	1994	—	3/V 15 L3	—	BN 132MB 4	—	—	—	206000	243000	90000	346
0.78	90591	2.8	1848	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.79	85423	1.3	1826	—	3/V 16 L4	—	BN 132MB 4	—	—	—	345000	385000	150000	356
0.82	85676	2.9	1748	—	3/V 18 L4	—	BN 132MB 4	—	—	—	503000	565000	200000	372
0.87	72501	1.1	1662	—	3/V 14 L3	—	BN 132MB 4	—	—	—	206000	243000	90000	336
0.87	72501	1.4	1662	—	3/V 15 L3	—	BN 132MB 4	—	—	—	206000	243000	90000	346
0.91	69329	1.6	1589	—	3/V 16 L3	—	BN 132MB 4	—	—	—	345000	385000	150000	356
1.0	61089	1.4	1400	—	3/V 15 L3	—	BN 132MB 4	—	—	—	206000	242900	90000	346
1.1	61912	2.5	1365	—	3/V 17 L3	—	BN 132MB 4	—	—	—	438900	467300	148700	364
1.1	57772	1.9	1324	—	3/V 16 L3	—	BN 132MB 4	—	—	—	339300	377400	147800	356
1.1	59527	1.7	1329	—	3/V 15 L3	—	BN 132MB 4	—	—	—	203700	239100	88500	346
1.1	57774	1.1	1324	—	3/V 14 L3	—	BN 132MB 4	—	—	—	203400	238800	88300	336
1.1	56318	0.9	1291	—	3/V 13 L3	—	BN 132MB 4	—	—	—	189100	223800	77900	326
1.2	58597	2.4	1215	—	3/V 17 L3	—	BN 132MB 4	—	—	—	423800	451200	143100	364
1.3	51435	2.5	1134	—	3/V 17 L3	—	BN 132MB 4	—	—	—	415100	442000	139800	364
1.3	50157	1.8	1120	—	3/V 15 L3	—	BN 132MB 4	—	—	—	193500	227100	83500	346
1.3	48680	1.1	1116	—	3/V 14 L3	—	BN 132MB 4	—	—	—	193200	226900	83400	336
1.3	47453	1.1	1088	—	3/V 13 L3	—	BN 132MB 4	—	—	—	179600	212600	73500	326
1.4	48044	2.5	1059	—	3/V 16 L3	—	BN 132MB 4	—	—	—	316300	351800	136700	356
1.4	49373	2.6	1024	—	3/V 17 L3	—	BN 132MB 4	—	—	—	402600	428600	135100	364
1.4	48101	1.1	1009	—	3/V 13 L3	—	BN 132MB 4	—	—	—	175600	207900	71700	326
1.4	47507	1.3	997	—	3/V 14 L3	—	BN 132MB 4	—	—	—	186800	219300	80400	336
1.4	47507	2.0	997	—	3/V 15 L3	—	BN 132MB 4	—	—	—	186800	219300	80400	346
1.6	39271	1.0	900	—	3/V 11 L3	—	BN 132MB 4	—	—	—	137300	171100	56100	316
1.6	39969	1.4	893	—	3/V 14 L3	—	BN 132MB 4	—	—	—	180700	212200	77500	336
1.6	40504	2.5	893	—	3/V 16 L3	—	BN 132MB 4	—	—	—	298100	331600	128000	356
1.7	38961	1.4	870	—	3/V 13 L3	—	BN 132MB 4	—	—	—	168000	198800	68300	326
1.7	41018	2.6	851	—	3/V 17 L3	—	BN 132MB 4	—	—	—	380800	405400	127000	364
1.7	40029	2.0	840	—	3/V 15 L3	—	BN 132MB 4	—	—	—	177500	208400	75900	346
1.7	39404	1.0	827	—	3/V 11 L3	—	BN 132MB 4	—	—	—	133900	166800	54500	316
1.8	37857	1.3	794	—	3/V 14 L3	—	BN 132MB 4	—	—	—	174500	204900	74500	336
1.8	38313	2.6	794	—	3/V 16 L3	—	BN 132MB 4	—	—	—	290200	322700	124200	356
1.9	33165	1.4	741	—	3/V 13 L3	—	BN 132MB 4	—	—	—	160100	189400	64700	326
2.0	32244	1.2	720	—	3/V 11 L3	—	BN 132MB 4	—	—	—	128400	160000	52100	316
2.1	31145	1.4	695	—	3/V 14 L3	—	BN 132MB 4	—	—	—	167700	196900	71300	336
2.2	32282	2.6	669	—	3/V 16 L3	—	BN 132MB 4	—	—	—	275600	306500	117300	356
2.2	32435	2.7	665	—	3/V 15 L3	—	BN 132MB 4	—	—	—	165400	194200	70200	346

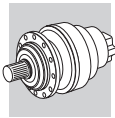


P₁ = 9.2 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
2.2	30704	1.3	644	—	3/V 11 L3	—	BN 132MB 4	—	—	—	124200	154800	50200	316
2.6	27008	0.9	560	—	3/V 10 L3	—	BN 132MB 4	—	—	—	100800	126700	47900	306
2.6	27329	3.0	560	—	3/V 15 L3	—	BN 132MB 4	—	—	—	157100	184500	66300	346
2.8	24465	1.1	507	—	3/V 10 L3	—	BN 132MB 4	—	—	—	97800	123000	46300	306
3.2	21778	3.0	446	—	3/V 15 L3	—	BN 132MB 4	—	—	—	146800	172300	61500	346
3.3	21045	1.3	436	—	3/V 10 L3	—	BN 132MB 4	—	—	—	93500	117600	44100	306
8.0	9719	1.1	180	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	26100	32800	59600	78100	22700	287
9.3	8364	1.1	155	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	24900	31200	56900	74600	21600	287
10.2	7598	1.0	141	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	21700	24500	51400	59900	16300	277
10.3	7573	1.5	140	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	24000	30200	55300	72400	20900	287
11.1	6999	1.6	130	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	23400	29400	54000	70700	20400	287
12.8	6055	1.0	112	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	20100	22800	48000	55900	15100	277
13.2	5866	1.5	109	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	22100	27700	51200	67100	19200	287
14.7	5302	1.0	98.3	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	19200	21800	46200	53800	14400	277
16.3	4778	1.3	88.5	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	18600	21000	44700	52100	13900	277
16.4	4732	2.0	87.7	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	20600	25800	48000	62900	17900	287
17.7	4383	1.4	81.2	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	18000	20400	43600	50800	13500	277
20.6	3770	1.5	69.9	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	17200	19400	41700	48500	12900	277
21.1	3687	2.2	68.3	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	18900	23700	44500	58400	16400	287
23.0	3380	1.0	62.6	—	—	3/A 05 L2	BN 132MB 4	M 4LB 4	13300	15300	24700	29700	8520	267
23.9	3246	1.9	60.1	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	16300	18500	39800	46400	12300	277
25.1	3090	2.2	57.3	—	—	3/A 07 L2	BN 132MB 4	M 4LB 4	17800	22400	42200	55400	15500	287
25.2	3078	1.1	57.0	—	—	3/A 05 L2	BN 132MB 4	M 4LB 4	12900	14900	24000	28800	8260	267
25.9	3005	1.5	55.7	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	15900	18000	38900	45300	11900	277
26.4	2944	0.9	54.5	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	12700	14600	23700	28500	8140	257
27.0	2874	1.1	53.3	—	—	3/A 05 L2	BN 132MB 4	M 4LB 4	12600	14500	23500	28300	8070	267
27.8	2792	1.9	51.7	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	15500	17600	38100	44400	11700	277
31	2545	1.5	47.2	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	15000	17000	37000	43100	11300	277
33	2389	1.2	44.3	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	11800	13700	22200	26700	7590	257
33	2376	1.4	44.0	—	—	3/A 05 L2	BN 132MB 4	M 4LB 4	11800	13600	22200	26700	7580	267
35	2216	2.2	41.1	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	14400	16300	35500	41400	10800	277
37	2110	1.1	39.1	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	11400	13100	21400	25800	7280	257
37	2105	1.4	39.0	—	—	3/A 05 L2	BN 132MB 4	M 4LB 4	11300	13100	21400	25700	7280	267
41	1904	1.2	35.3	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	11000	12700	20800	25000	7040	257
41	1885	1.9	34.9	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	13600	15400	33900	39400	10200	277
44	1766	2.2	32.7	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	13300	15100	33200	38700	10000	277
45	1740	1.9	32.2	—	—	3/A 05 L2	BN 132MB 4	M 4LB 4	10600	12300	20200	24300	6830	267
48	1629	1.4	30.2	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	10400	12000	19800	23800	6680	257
52	1497	1.8	27.7	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	10100	11700	19300	23200	6490	257
52	1497	1.9	27.7	—	—	3/A 05 L2	BN 132MB 4	M 4LB 4	10100	11700	19300	23200	6490	267
52	1496	2.2	27.7	—	—	3/A 06 L2	BN 132MB 4	M 4LB 4	12600	14300	31600	36800	9470	277
56	1379	1.4	25.6	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	9850	11400	18800	22700	6320	257
65	1193	1.9	22.1	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	9380	10800	18000	21700	6020	257
77	1010	1.9	18.7	—	—	3/A 04 L2	BN 132MB 4	M 4LB 4	8880	10300	17200	20600	5700	257

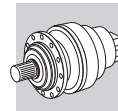
P₁ = 11 kW n₁ = 1400 min⁻¹

0.28	268265	1.3	5164	—	3/V 19 L4	—	BN 160MR 4	—	—	—	638000	702000	200000	380
0.29	265193	2.0	5040	—	3/V 21 L4	—	BN 160MR 4	—	—	—	779000	923000	1200000	388
0.32	254563	2.1	4550	—	3/V 21 L4	—	BN 160MR 4	—	—	—	779000	923000	1200000	388
0.32	252351	1.3	4457	—	3/V 19 L4	—	BN 160MR 4	—	—	—	638000	702000	200000	380
0.33	242492	1.0	4386	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
0.35	226379	1.5	4095	—	3/V 19 L4	—	BN 160MR 4	—	—	—	638000	702000	200000	380
0.38	211483	2.2	3780	—	3/V 21 L4	—	BN 160MR 4	—	—	—	779000	923000	1200000	388
0.39	204322	1.2	3696	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
0.40	206208	2.4	3600	—	3/V 21 L4	—	BN 160MR 4	—	—	—	779000	923000	1200000	388
0.41	193236	1.3	3495	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372



P₁ = 11 kW **n₁ = 1400 min⁻¹**

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.45	182907	1.9	3231	—	3/V 19 L4	—	BN 160MR 4	—	—	—	638000	702000	200000	380
0.45	175132	1.0	3168	—	3/V 17 L4	—	BN 160MR 4	—	—	—	442000	470000	150000	364
0.49	162819	1.5	2945	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
0.52	144078	1.2	2773	—	3/V 17 L4	—	BN 160MR 4	—	—	—	442000	470000	150000	364
0.56	146170	2.4	2582	—	3/V 19 L4	—	BN 160MR 4	—	—	—	638000	702000	200000	380
0.58	145664	1.1	2485	—	3/V 17 L4	—	BN 160MR 4	—	—	—	442000	470000	150000	364
0.58	139497	1.8	2464	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
0.61	131075	1.0	2343	—	3/V 16 L4	—	BN 160MR 4	—	—	—	345000	385000	150000	356
0.63	126872	1.7	2295	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
0.66	121217	1.1	2167	—	3/V 16 L4	—	BN 160MR 4	—	—	—	345000	385000	150000	356
0.70	121013	1.5	2065	—	3/V 17 L4	—	BN 160MR 4	—	—	—	442000	470000	150000	364
0.72	99917	0.9	1994	—	3/V 15 L3	—	BN 160MR 4	—	—	—	206000	243000	90000	346
0.78	108315	2.3	1848	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
0.79	102137	1.1	1826	—	3/V 16 L4	—	BN 160MR 4	—	—	—	345000	385000	150000	356
0.81	100747	1.8	1780	—	3/V 17 L4	—	BN 160MR 4	—	—	—	442000	470000	150000	364
0.82	102438	2.4	1748	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
0.87	86686	1.1	1662	—	3/V 15 L3	—	BN 160MR 4	—	—	—	206000	243000	90000	346
0.91	82893	1.4	1589	—	3/V 16 L3	—	BN 160MR 4	—	—	—	345000	385000	150000	356
0.98	86314	2.9	1473	—	3/V 18 L4	—	BN 160MR 4	—	—	—	503000	565000	200000	372
1.0	73041	1.2	1400	—	3/V 15 L3	—	BN 160MR 4	—	—	—	206000	242900	90000	346
1.1	74026	2.1	1365	—	3/V 17 L3	—	BN 160MR 4	—	—	—	438900	467300	148700	364
1.1	69076	1.6	1324	—	3/V 16 L3	—	BN 160MR 4	—	—	—	339300	377400	147800	356
1.1	71173	1.4	1329	—	3/V 15 L3	—	BN 160MR 4	—	—	—	203700	239100	88500	346
1.2	70061	2.0	1215	—	3/V 17 L3	—	BN 160MR 4	—	—	—	423800	451200	143100	364
1.3	61498	2.1	1134	—	3/V 17 L3	—	BN 160MR 4	—	—	—	415100	442000	139800	364
1.3	59970	1.5	1120	—	3/V 15 L3	—	BN 160MR 4	—	—	—	193500	227100	83500	346
1.4	57443	2.1	1059	—	3/V 16 L3	—	BN 160MR 4	—	—	—	316300	351800	136700	356
1.4	59033	2.2	1024	—	3/V 17 L3	—	BN 160MR 4	—	—	—	402600	428600	135100	364
1.4	57512	0.9	1009	—	3/V 13 L3	—	BN 160MR 4	—	—	—	175600	207900	71700	326
1.4	56802	1.1	997	—	3/V 14 L3	—	BN 160MR 4	—	—	—	186800	219300	80400	336
1.4	56802	1.7	997	—	3/V 15 L3	—	BN 160MR 4	—	—	—	186800	219300	80400	346
1.6	47789	1.2	893	—	3/V 14 L3	—	BN 160MR 4	—	—	—	180700	212200	77500	336
1.6	48429	2.1	893	—	3/V 16 L3	—	BN 160MR 4	—	—	—	298100	331600	128000	356
1.7	46584	1.2	870	—	3/V 13 L3	—	BN 160MR 4	—	—	—	168000	198800	68300	326
1.7	49043	2.2	851	—	3/V 17 L3	—	BN 160MR 4	—	—	—	380800	405400	127000	364
1.7	47861	1.7	840	—	3/V 15 L3	—	BN 160MR 4	—	—	—	177500	208400	75900	346
1.8	47264	0.9	810	—	3/V 13 L3	—	BN 160MR 4	—	—	—	164400	194600	66700	326
1.8	47820	2.8	810	—	3/V 17 L3	—	BN 160MR 4	—	—	—	375300	399500	125000	364
1.8	45264	1.1	794	—	3/V 14 L3	—	BN 160MR 4	—	—	—	174500	204900	74500	336
1.8	45809	2.2	794	—	3/V 16 L3	—	BN 160MR 4	—	—	—	290200	322700	124200	356
1.9	39654	1.2	741	—	3/V 13 L3	—	BN 160MR 4	—	—	—	160100	189400	64700	326
2.0	38552	1.0	720	—	3/V 11 L3	—	BN 160MR 4	—	—	—	128400	160000	52100	316
2.1	37238	1.2	695	—	3/V 14 L3	—	BN 160MR 4	—	—	—	167700	196900	71300	336
2.1	39265	1.3	673	—	3/V 13 L3	—	BN 160MR 4	—	—	—	155500	184100	62700	326
2.2	38599	2.2	669	—	3/V 16 L3	—	BN 160MR 4	—	—	—	275600	306500	117300	356
2.2	38780	1.8	665	—	3/V 14 L3	—	BN 160MR 4	—	—	—	165400	194200	70200	336
2.2	38780	2.3	665	—	3/V 15 L3	—	BN 160MR 4	—	—	—	165400	194200	70200	346
2.2	36711	1.1	644	—	3/V 11 L3	—	BN 160MR 4	—	—	—	124200	154800	50200	316
2.5	35005	1.6	579	—	3/V 14 L3	—	BN 160MR 4	—	—	—	158800	186400	67100	336
2.5	33085	1.5	567	—	3/V 13 L3	—	BN 160MR 4	—	—	—	147700	174800	59200	326
2.6	32676	2.5	560	—	3/V 15 L3	—	BN 160MR 4	—	—	—	157100	184500	66300	346
2.6	32163	1.1	551	—	3/V 11 L3	—	BN 160MR 4	—	—	—	118600	147700	47600	316
2.8	30124	1.7	516	—	3/V 13 L3	—	BN 160MR 4	—	—	—	143600	170000	57400	326
2.8	29746	1.2	510	—	3/V 11 L3	—	BN 160MR 4	—	—	—	115800	144300	46400	316
2.9	30112	1.9	498	—	3/V 14 L3	—	BN 160MR 4	—	—	—	151700	178200	63800	336
2.9	30112	2.8	498	—	3/V 15 L3	—	BN 160MR 4	—	—	—	151700	178200	63800	346
3.2	26039	1.8	446	—	3/V 14 L3	—	BN 160MR 4	—	—	—	146800	172300	61500	336
3.2	26039	2.5	446	—	3/V 15 L3	—	BN 160MR 4	—	—	—	146800	172300	61500	346
3.3	25162	1.1	436	—	3/V 10 L3	—	BN 160MR 4	—	—	—	93500	117600	44100	306
3.4	25064	1.6	430	—	3/V 11 L3	—	BN 160MR 4	—	—	—	110000	137000	43800	316

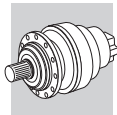


P₁ = 11 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
3.4	25689	1.8	425	—	3/V 13 L3	—	BN 160MR 4	—	—	—	135500	160400	53800	326
3.6	23995	1.9	397	—	3/V 14 L3	—	BN 160MR 4	—	—	—	141800	166400	59100	336
3.7	23602	2.9	386	—	3/V 15 L3	—	BN 160MR 4	—	—	—	140600	165000	58600	346
3.9	21606	1.8	370	—	3/V 13 L3	—	BN 160MR 4	—	—	—	130000	153900	51400	326
8.0	11620	0.9	180	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	26100	32800	59600	78100	22700	287
9.3	10000	0.9	155	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	24900	31200	56900	74600	21600	287
10.3	9055	1.2	140	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	24000	30200	55300	72400	20900	287
11.1	8368	1.3	130	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	23400	29400	54000	70700	20400	287
13.2	7013	1.3	109	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	22100	27700	51200	67100	19200	287
16.3	5713	1.1	88.5	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	18600	21000	44700	52100	13900	277
16.4	5658	1.7	87.7	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	20600	25800	48000	62900	17900	287
17.7	5241	1.2	81.2	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	18000	20400	43600	50800	13500	277
20.6	4508	1.3	69.9	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	17200	19400	41700	48500	12900	277
21.1	4408	1.8	68.3	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	18900	23700	44500	58400	16400	287
23.9	3881	1.5	60.1	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	16300	18500	39800	46400	12300	277
25.1	3695	1.8	57.3	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	17800	22400	42200	55400	15500	287
25.2	3681	0.9	57.0	—	—	3/A 05 L2	—	M 4LC 4	12900	14900	24000	28800	8260	267
25.9	3593	1.3	55.7	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	15900	18000	38900	45300	11900	277
27.8	3338	1.5	51.7	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	15500	17600	38100	44400	11700	277
29.3	3176	2.5	49.2	—	—	3/A 07 L2	BN 160MR 4	M 4LC 4	17000	21300	40400	52900	14700	287
31	3043	1.3	47.2	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	15000	17000	37000	43100	11300	277
33	2856	1.0	44.3	—	—	3/A 04 L2	—	M 4LC 4	11800	13700	22200	26700	7590	257
33	2841	1.2	44.0	—	—	3/A 05 L2	—	M 4LC 4	11800	13600	22200	26700	7580	267
35	2650	1.9	41.1	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	14400	16300	35500	41400	10800	277
37	2523	0.9	39.1	—	—	3/A 04 L2	—	M 4LC 4	11400	13100	21400	25800	7280	257
37	2517	1.2	39.0	—	—	3/A 05 L2	—	M 4LC 4	11300	13100	21400	25700	7280	267
41	2276	1.0	35.3	—	—	3/A 04 L2	—	M 4LC 4	11000	12700	20800	25000	7040	257
41	2253	1.5	34.9	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	13600	15400	33900	39400	10200	277
44	2112	1.9	32.7	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	13300	15100	33200	38700	10000	277
45	2080	1.6	32.2	—	—	3/A 05 L2	—	M 4LC 4	10600	12300	20200	24300	6830	267
48	1947	1.2	30.2	—	—	3/A 04 L2	—	M 4LC 4	10400	12000	19800	23800	6680	257
52	1790	1.5	27.7	—	—	3/A 04 L2	—	M 4LC 4	10100	11700	19300	23200	6490	257
52	1790	1.6	27.7	—	—	3/A 05 L2	—	M 4LC 4	10100	11700	19300	23200	6490	267
52	1789	1.9	27.7	—	—	3/A 06 L2	BN 160MR 4	M 4LC 4	12600	14300	31600	36800	9470	277
56	1649	1.2	25.6	—	—	3/A 04 L2	—	M 4LC 4	9850	11400	18800	22700	6320	257
65	1426	1.6	22.1	—	—	3/A 04 L2	—	M 4LC 4	9380	10800	18000	21700	6020	257
77	1208	1.6	18.7	—	—	3/A 04 L2	—	M 4LC 4	8880	10300	17200	20600	5700	257

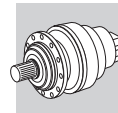
P₁ = 15 kW n₁ = 1400 min⁻¹

0.28	360805	1.0	5164	—	3/V 19 L4	—	BN 160L 4	—	—	—	638000	702000	200000	380
0.29	356673	1.5	5040	—	3/V 21 L4	—	BN 160L 4	—	—	—	779000	923000	1200000	388
0.32	342376	1.6	4550	—	3/V 21 L4	—	BN 160L 4	—	—	—	779000	923000	1200000	388
0.33	339401	1.0	4457	—	3/V 19 L4	—	BN 160L 4	—	—	—	638000	702000	200000	380
0.36	304470	1.1	4095	—	3/V 19 L4	—	BN 160L 4	—	—	—	638000	702000	200000	380
0.39	284435	1.6	3780	—	3/V 21 L4	—	BN 160L 4	—	—	—	779000	923000	1200000	388
0.40	274804	0.9	3696	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
0.41	277341	1.8	3600	—	3/V 21 L4	—	BN 160L 4	—	—	—	779000	923000	1200000	388
0.42	259893	1.0	3495	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
0.45	246001	1.4	3231	—	3/V 19 L4	—	BN 160L 4	—	—	—	638000	702000	200000	380
0.50	218984	1.1	2945	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
0.54	212843	2.3	2700	—	3/V 21 L4	—	BN 160L 4	—	—	—	779000	923000	1200000	388
0.57	196592	1.8	2582	—	3/V 19 L4	—	BN 160L 4	—	—	—	638000	702000	200000	380
0.58	194138	2.6	2520	—	3/V 21 L4	—	BN 160L 4	—	—	—	779000	923000	1200000	388
0.59	187617	1.3	2464	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
0.64	170637	1.2	2295	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
0.71	162758	1.1	2065	—	3/V 17 L4	—	BN 160L 4	—	—	—	442000	470000	150000	364



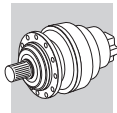
P₁ = 15 kW n₁ = 1400 min⁻¹

n ₂ min ⁻¹	M ₂ Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.79	145679	1.7	1848	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
0.82	135500	1.3	1780	—	3/V 17 L4	—	BN 160L 4	—	—	—	442000	470000	150000	364
0.84	137775	1.8	1748	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
0.99	116088	2.2	1473	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	565000	200000	372
1.1	99561	1.5	1365	—	3/V 17 L3	—	BN 160L 4	—	—	—	438900	467300	148700	364
1.1	95725	1.0	1329	—	3/V 15 L3	—	BN 160L 4	—	—	—	203700	239100	88500	346
1.2	98223	2.5	1232	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	544900	191700	372
1.2	94230	1.5	1215	—	3/V 17 L3	—	BN 160L 4	—	—	—	423800	451200	143100	364
1.3	92894	2.7	1165	—	3/V 18 L4	—	BN 160L 4	—	—	—	503000	535800	188100	372
1.3	82713	1.5	1134	—	3/V 17 L3	—	BN 160L 4	—	—	—	415100	442000	139800	364
1.3	80657	1.1	1120	—	3/V 15 L3	—	BN 160L 4	—	—	—	193500	227100	83500	346
1.4	77259	1.5	1059	—	3/V 16 L3	—	BN 160L 4	—	—	—	316300	351800	136700	356
1.4	79397	1.6	1024	—	3/V 17 L3	—	BN 160L 4	—	—	—	402600	428600	135100	364
1.5	76396	1.2	997	—	3/V 15 L3	—	BN 160L 4	—	—	—	186800	219300	80400	346
1.7	65961	1.6	851	—	3/V 17 L3	—	BN 160L 4	—	—	—	380800	405400	127000	364
1.7	64371	1.2	840	—	3/V 15 L3	—	BN 160L 4	—	—	—	177500	208400	75900	346
1.8	64315	2.1	810	—	3/V 17 L3	—	BN 160L 4	—	—	—	375300	399500	125000	364
1.8	61612	1.6	794	—	3/V 16 L3	—	BN 160L 4	—	—	—	290200	322700	124200	356
2.1	54192	2.6	683	—	3/V 17 L3	—	BN 160L 4	—	—	—	356500	379500	118100	364
2.2	52810	0.9	673	—	3/V 13 L3	—	BN 160L 4	—	—	—	155500	184100	62700	326
2.2	51913	1.6	669	—	3/V 16 L3	—	BN 160L 4	—	—	—	275600	306500	117300	356
2.2	52158	1.4	665	—	3/V 14 L3	—	BN 160L 4	—	—	—	165400	194200	70200	336
2.2	52158	1.7	665	—	3/V 15 L3	—	BN 160L 4	—	—	—	165400	194200	70200	346
2.4	49358	2.6	608	—	3/V 17 L3	—	BN 160L 4	—	—	—	344200	366500	113600	364
2.5	47080	1.2	579	—	3/V 14 L3	—	BN 160L 4	—	—	—	158800	186400	67100	336
2.6	44497	1.1	567	—	3/V 13 L3	—	BN 160L 4	—	—	—	147700	174800	59200	326
2.6	45021	2.6	567	—	3/V 17 L3	—	BN 160L 4	—	—	—	337200	359000	111000	364
2.6	43948	1.9	560	—	3/V 15 L3	—	BN 160L 4	—	—	—	157100	184500	66300	346
2.8	42052	2.6	530	—	3/V 16 L3	—	BN 160L 4	—	—	—	256900	285800	108500	356
2.8	40516	1.3	516	—	3/V 13 L3	—	BN 160L 4	—	—	—	143600	170000	57400	326
2.9	40499	1.4	498	—	3/V 14 L3	—	BN 160L 4	—	—	—	151700	178200	63800	336
2.9	40499	2.1	498	—	3/V 15 L3	—	BN 160L 4	—	—	—	151700	178200	63800	346
3.3	35021	1.4	446	—	3/V 14 L3	—	BN 160L 4	—	—	—	146800	172300	61500	336
3.3	35021	1.9	446	—	3/V 15 L3	—	BN 160L 4	—	—	—	146800	172300	61500	346
3.3	35433	2.6	446	—	3/V 16 L3	—	BN 160L 4	—	—	—	244100	271400	102500	356
3.4	33710	1.2	430	—	3/V 11 L3	—	BN 160L 4	—	—	—	110000	137000	43800	316
3.4	34551	1.4	425	—	3/V 13 L3	—	BN 160L 4	—	—	—	135500	160400	53800	326
3.7	32273	1.4	397	—	3/V 14 L3	—	BN 160L 4	—	—	—	141800	166400	59100	336
3.8	31743	2.1	386	—	3/V 15 L3	—	BN 160L 4	—	—	—	140600	165000	58600	346
3.9	29059	1.4	370	—	3/V 13 L3	—	BN 160L 4	—	—	—	130000	153900	51400	326
10.4	12178	0.9	140	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	24000	30200	55300	72400	20900	287
11.3	11255	1.0	130	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	23400	29400	54000	70700	20400	287
13.4	9433	0.9	109	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	22100	27700	51200	67100	19200	287
16.7	7609	1.3	87.7	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	20600	25800	48000	62900	17900	287
20.9	6063	0.9	69.9	—	—	3/A 06 L2	BN 160L 4	—	17200	19400	41700	48500	12900	267
21.4	5929	1.3	68.3	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	18900	23700	44500	58400	16400	287
24.3	5219	1.2	60.1	—	—	3/A 06 L2	BN 160L 4	—	16300	18500	39800	46400	12300	267
25.5	4969	1.3	57.3	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	17800	22400	42200	55400	15500	287
26.2	4832	0.9	55.7	—	—	3/A 06 L2	BN 160L 4	—	15900	18000	38900	45300	11900	267
28.2	4490	1.2	51.7	—	—	3/A 06 L2	BN 160L 4	—	15500	17600	38100	44400	11700	267
29.7	4272	1.9	49.2	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	17000	21300	40400	52900	14700	287
31	4093	0.9	47.2	—	—	3/A 06 L2	BN 160L 4	—	15000	17000	37000	43100	11300	267
35	3600	2.3	41.5	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	16000	20100	38300	50200	13900	287
36	3564	1.4	41.1	—	—	3/A 06 L2	BN 160L 4	—	14400	16300	35500	41400	10800	267
42	3031	1.2	34.9	—	—	3/A 06 L2	BN 160L 4	—	13600	15400	33900	39400	10200	267
45	2840	1.4	32.7	—	—	3/A 06 L2	BN 160L 4	—	13300	15100	33200	38700	10000	267
45	2805	2.8	32.3	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	14700	18500	35600	46600	12800	287
53	2406	1.4	27.7	—	—	3/A 06 L2	BN 160L 4	—	12600	14300	31600	36800	9470	267
54	2351	2.8	27.1	—	—	3/A 07 L2	BN 160L 4	M 5SB 4	13900	17400	33700	44200	12100	287



$P_1 = 18.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	Rn ₂ [N]			
											HC	HZ	FZ	
0.29	439897	1.2	5040	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.32	422264	1.3	4550	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.36	375513	0.9	4095	—	3/V 19 L4	—	BN 180M 4	—	—	—	638000	702000	200000	380
0.39	350804	1.3	3780	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.41	342053	1.5	3600	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.45	303402	1.1	3231	—	3/V 19 L4	—	BN 180M 4	—	—	—	638000	702000	200000	380
0.50	270081	0.9	2945	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	565000	200000	372
0.54	262506	1.9	2700	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.57	242464	1.4	2582	—	3/V 19 L4	—	BN 180M 4	—	—	—	638000	702000	200000	380
0.58	239437	2.1	2520	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.59	231394	1.1	2464	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	565000	200000	372
0.64	210452	1.0	2295	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	565000	200000	372
0.64	221186	2.4	2275	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.77	183754	2.5	1890	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.79	179671	1.4	1848	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	565000	200000	372
0.81	178981	2.8	1800	—	3/V 21 L4	—	BN 180M 4	—	—	—	779000	923000	1200000	388
0.82	167117	1.1	1780	—	3/V 17 L4	—	BN 180M 4	—	—	—	442000	470000	150000	364
0.84	169922	1.5	1748	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	565000	200000	372
0.99	143175	1.7	1473	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	565000	200000	372
1.1	122792	1.3	1365	—	3/V 17 L3	—	BN 180M 4	—	—	—	438900	467300	148700	364
1.2	121142	2.1	1232	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	544900	191700	372
1.2	116216	1.2	1215	—	3/V 17 L3	—	BN 180M 4	—	—	—	423800	451200	143100	364
1.3	114569	2.2	1165	—	3/V 18 L4	—	BN 180M 4	—	—	—	503000	535800	188100	372
1.3	102012	1.3	1134	—	3/V 17 L3	—	BN 180M 4	—	—	—	415100	442000	139800	364
1.3	99477	0.9	1120	—	3/V 15 L3	—	BN 180M 4	—	—	—	193500	227100	83500	346
1.4	95286	1.3	1059	—	3/V 16 L3	—	BN 180M 4	—	—	—	316300	351800	136700	356
1.4	97923	1.3	1024	—	3/V 17 L3	—	BN 180M 4	—	—	—	402600	428600	135100	364
1.5	94222	1.0	997	—	3/V 15 L3	—	BN 180M 4	—	—	—	186800	219300	80400	346
1.5	96535	2.5	982	—	3/V 18 L4	—	BN 180M 4	—	—	—	498800	509000	177700	372
1.7	81351	1.3	851	—	3/V 17 L3	—	BN 180M 4	—	—	—	380800	405400	127000	364
1.7	79391	1.0	840	—	3/V 15 L3	—	BN 180M 4	—	—	—	177500	208400	75900	346
1.8	79322	1.7	810	—	3/V 17 L3	—	BN 180M 4	—	—	—	375300	399500	125000	364
1.8	75988	1.3	794	—	3/V 16 L3	—	BN 180M 4	—	—	—	290200	322700	124200	356
1.9	75222	2.5	765	—	3/V 18 L4	—	BN 180M 4	—	—	—	462800	472300	163500	372
2.1	66836	2.1	683	—	3/V 17 L3	—	BN 180M 4	—	—	—	356500	379500	118100	364
2.2	64027	1.3	669	—	3/V 16 L3	—	BN 180M 4	—	—	—	275600	306500	117300	356
2.2	64328	1.1	665	—	3/V 14 L3	—	BN 180M 4	—	—	—	165400	194200	70200	336
2.2	64328	1.4	665	—	3/V 15 L3	—	BN 180M 4	—	—	—	165400	194200	70200	346
2.4	60875	2.1	608	—	3/V 17 L3	—	BN 180M 4	—	—	—	344200	366500	113600	364
2.5	58066	1.0	579	—	3/V 14 L3	—	BN 180M 4	—	—	—	158800	186400	67100	336
2.6	55526	2.1	567	—	3/V 17 L3	—	BN 180M 4	—	—	—	337200	359000	111000	364
2.6	54202	1.5	560	—	3/V 15 L3	—	BN 180M 4	—	—	—	157100	184500	66300	346
2.8	51865	2.1	530	—	3/V 16 L3	—	BN 180M 4	—	—	—	256900	285800	108500	356
2.8	49969	1.0	516	—	3/V 13 L3	—	BN 180M 4	—	—	—	143600	170000	57400	326
2.9	51293	2.5	512	—	3/V 17 L3	—	BN 180M 4	—	—	—	327000	348200	107300	364
2.9	49949	1.2	498	—	3/V 14 L3	—	BN 180M 4	—	—	—	151700	178200	63800	336
2.9	49949	1.7	498	—	3/V 15 L3	—	BN 180M 4	—	—	—	151700	178200	63800	346
3.3	43193	1.1	446	—	3/V 14 L3	—	BN 180M 4	—	—	—	146800	172300	61500	336
3.3	43193	1.5	446	—	3/V 15 L3	—	BN 180M 4	—	—	—	146800	172300	61500	346
3.3	43701	2.1	446	—	3/V 16 L3	—	BN 180M 4	—	—	—	244100	271400	102500	356
3.4	41576	1.0	430	—	3/V 11 L3	—	BN 180M 4	—	—	—	110000	137000	43800	316
3.4	42613	1.1	425	—	3/V 13 L3	—	BN 180M 4	—	—	—	135500	160400	53800	326
3.4	42613	2.5	425	—	3/V 17 L3	—	BN 180M 4	—	—	—	309300	329300	100800	364
3.6	41506	2.9	405	—	3/V 17 L3	—	BN 180M 4	—	—	—	304800	324500	99200	364
3.7	39803	1.2	397	—	3/V 14 L3	—	BN 180M 4	—	—	—	141800	166400	59100	336
3.7	39803	2.5	397	—	3/V 16 L3	—	BN 180M 4	—	—	—	235700	262100	98600	356
3.8	39150	1.7	386	—	3/V 15 L3	—	BN 180M 4	—	—	—	140600	165000	58600	346
3.9	35840	1.1	370	—	3/V 13 L3	—	BN 180M 4	—	—	—	130000	153900	51400	326
16.7	9385	1.0	87.7	—	—	3/A 07 L2	BN 180M 4	M 5LA 4	20600	25800	48000	62900	17900	287
21.4	7313	1.1	68.3	—	—	3/A 07 L2	BN 180M 4	M 5LA 4	18900	23700	44500	58400	16400	287
24.3	6437	0.9	60.1	—	—	3/A 06 L2	BN 180M 4	—	16300	18500	39800	46400	12300	277

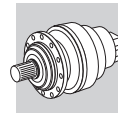


$P_1 = 18.5 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	R _{n2} [N]			
											HC	HZ	FZ	
25.5	6129	1.1	57.3	—	—	3/A 07 L2	BN 180M 4	M 5LA 4	17800	22400	42200	55400	15500	287
28.2	5537	0.9	51.7	—	—	3/A 06 L2	BN 180M 4	—	15500	17600	38100	44400	11700	277
29.7	5269	1.5	49.2	—	—	3/A 07 L2	BN 180M 4	M 5LA 4	17000	21300	40400	52900	14700	287
35	4439	1.9	41.5	—	—	3/A 07 L2	BN 180M 4	M 5LA 4	16000	20100	38300	50200	13900	287
36	4395	1.1	41.1	—	—	3/A 06 L2	BN 180M 4	—	14400	16300	35500	41400	10800	277
42	3738	0.9	34.9	—	—	3/A 06 L2	BN 180M 4	—	13600	15400	33900	39400	10200	277
45	3503	1.1	32.7	—	—	3/A 06 L2	BN 180M 4	—	13300	15100	33200	38700	10000	277
45	3459	2.3	32.3	—	—	3/A 07 L2	BN 180M 4	M 5LA 4	14700	18500	35600	46600	12800	287
53	2967	1.1	27.7	—	—	3/A 06 L2	BN 180M 4	—	12600	14300	31600	36800	9470	277
54	2899	2.3	27.1	—	—	3/A 07 L2	BN 180M 4	M 5LA 4	13900	17400	33700	44200	12100	287

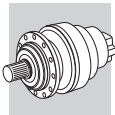
$P_1 = 22 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

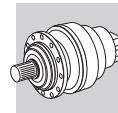
0.29	523120	1.0	5040	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.32	502151	1.1	4550	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.39	417172	1.1	3780	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.41	406766	1.2	3600	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.45	360802	0.9	3231	—	3/V 19 L4	—	BN 180L 4	—	—	—	638000	702000	200000	380
0.54	312169	1.6	2700	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.57	288335	1.2	2582	—	3/V 19 L4	—	BN 180L 4	—	—	—	638000	702000	200000	380
0.58	284736	1.8	2520	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.59	275172	0.9	2464	—	3/V 18 L4	—	BN 180L 4	—	—	—	503000	565000	200000	372
0.64	263032	2.1	2275	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.77	218519	2.1	1890	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.79	213663	1.2	1848	—	3/V 18 L4	—	BN 180L 4	—	—	—	503000	565000	200000	372
0.81	212843	2.3	1800	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.82	198734	0.9	1780	—	3/V 17 L4	—	BN 180L 4	—	—	—	442000	470000	150000	364
0.84	202070	1.2	1748	—	3/V 18 L4	—	BN 180L 4	—	—	—	503000	565000	200000	372
0.96	179340	2.9	1517	—	3/V 21 L4	—	BN 180L 4	—	—	—	779000	923000	1200000	388
0.99	170262	1.5	1473	—	3/V 18 L4	—	BN 180L 4	—	—	—	503000	565000	200000	372
1.1	146023	1.1	1365	—	3/V 17 L3	—	BN 180L 4	—	—	—	438900	467300	148700	364
1.2	148990	2.9	1260	—	3/V 21 L4	—	BN 180L 4	—	—	—	757900	898800	1158600	388
1.2	144060	1.7	1232	—	3/V 18 L4	—	BN 180L 4	—	—	—	503000	544900	191700	372
1.2	138203	1.0	1215	—	3/V 17 L3	—	BN 180L 4	—	—	—	423800	451200	143100	364
1.3	136244	1.8	1165	—	3/V 18 L4	—	BN 180L 4	—	—	—	503000	535800	188100	372
1.3	121312	1.1	1134	—	3/V 17 L3	—	BN 180L 4	—	—	—	415100	442000	139800	364
1.4	116449	1.1	1024	—	3/V 17 L3	—	BN 180L 4	—	—	—	402600	428600	135100	364
1.5	114798	2.1	982	—	3/V 18 L4	—	BN 180L 4	—	—	—	498800	509000	177700	372
1.7	96742	1.1	851	—	3/V 17 L3	—	BN 180L 4	—	—	—	380800	405400	127000	364
1.8	94329	1.4	810	—	3/V 17 L3	—	BN 180L 4	—	—	—	375300	399500	125000	364
1.9	89453	2.1	765	—	3/V 18 L4	—	BN 180L 4	—	—	—	462800	472300	163500	372
2.1	79481	1.8	683	—	3/V 17 L3	—	BN 180L 4	—	—	—	356500	379500	118100	364
2.2	76498	0.9	665	—	3/V 14 L3	—	BN 180L 4	—	—	—	165400	194200	70200	336
2.2	76498	1.2	665	—	3/V 15 L3	—	BN 180L 4	—	—	—	165400	194200	70200	346
2.4	72392	1.8	608	—	3/V 17 L3	—	BN 180L 4	—	—	—	344200	366500	113600	364
2.6	66030	1.8	567	—	3/V 17 L3	—	BN 180L 4	—	—	—	337200	359000	111000	364
2.6	64457	1.3	560	—	3/V 15 L3	—	BN 180L 4	—	—	—	157100	184500	66300	346
2.8	61677	1.8	530	—	3/V 16 L3	—	BN 180L 4	—	—	—	256900	285800	108500	356
2.9	60997	2.1	512	—	3/V 17 L3	—	BN 180L 4	—	—	—	327000	348200	107300	364
2.9	59399	1.0	498	—	3/V 14 L3	—	BN 180L 4	—	—	—	151700	178200	63800	336
2.9	59399	1.4	498	—	3/V 15 L3	—	BN 180L 4	—	—	—	151700	178200	63800	346
3.3	51364	0.9	446	—	3/V 14 L3	—	BN 180L 4	—	—	—	146800	172300	61500	336
3.3	51364	1.3	446	—	3/V 15 L3	—	BN 180L 4	—	—	—	146800	172300	61500	346
3.3	51968	1.8	446	—	3/V 16 L3	—	BN 180L 4	—	—	—	244100	271400	102500	356
3.4	50675	0.9	425	—	3/V 13 L3	—	BN 180L 4	—	—	—	135500	160400	53800	326
3.4	50675	2.1	425	—	3/V 17 L3	—	BN 180L 4	—	—	—	309300	329300	100800	364
3.6	49358	2.4	405	—	3/V 17 L3	—	BN 180L 4	—	—	—	304800	324500	99200	364
3.7	47333	1.0	397	—	3/V 14 L3	—	BN 180L 4	—	—	—	141800	166400	59100	336
3.7	47333	2.1	397	—	3/V 16 L3	—	BN 180L 4	—	—	—	235700	262100	98600	356



$P_1 = 22 \text{ kW}$ $n_1 = 1400 \text{ min}^{-1}$

n_2 min ⁻¹	M_2 Nm	S	i	Pt kW					MC/PC	MZ/PZ	R _{n2} [N]			
											HC	HZ	FZ	
3.8	46557	1.4	386	—	3/V 15 L3	—	BN 180L 4	—	—	—	140600	165000	58600	346
3.9	42621	0.9	370	—	3/V 13 L3	—	BN 180L 4	—	—	—	130000	153900	51400	326
21.4	8696	0.9	68	—	—	3/A 07 L2	BN 180L 4	—	18900	23700	44500	58400	16400	287
25.5	7288	0.9	57	—	—	3/A 07 L2	BN 180L 4	—	17800	22400	42200	55400	15500	287
29.7	6266	1.3	49	—	—	3/A 07 L2	BN 180L 4	—	17000	21300	40400	52900	14700	287
35	5279	1.6	41	—	—	3/A 07 L2	BN 180L 4	—	16000	20100	38300	50200	13900	287
36	5227	0.9	41	—	—	3/A 06 L2	BN 180L 4	—	14400	16300	35500	41400	10800	277
45	4166	0.9	33	—	—	3/A 06 L2	BN 180L 4	—	13300	15100	33200	38700	10000	277
45	4114	1.9	32	—	—	3/A 07 L2	BN 180L 4	—	14700	18500	35600	46600	12800	287
53	3528	0.9	28	—	—	3/A 06 L2	BN 180L 4	—	12600	14300	31600	36800	9470	277
54	3448	1.9	27	—	—	3/A 07 L2	BN 180L 4	—	13900	17400	33700	44200	12100	287





26.0 - DATI TECNICI RIDUTTORI COMBINATI VITE-PLANETARI - 3/V

Guida alla consultazione delle tabelle.

26.0 - 3/V - PLANETARYWORM RATING CHARTS

Reading the rating chart

26.0 - 3/VF - TECHNISCHE DATEN DER GETRIEBE

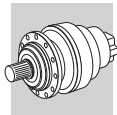
Anleitung für die richtige Konsultation der Tabellen.

26.0 - DONNEES TECHNIQUES REDUCTEURS COMBINÉ 3/V

Guide pour la consultation des tableaux.

3/V 00 L3							1000 Nm						
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC/PC	MZ/PZ	R _{n2} [N]			
							B5 / B14			HC	HZ	FZ	
1400	3/V 00 L3	415	3.4	950	0.50	—	63 71 80	8120	8120	21300	24500	5340	230
	3/V 00 L3	436	3.2	700	0.37	—	63 71 —	8250	8250	21600	24800	5420	230
	3/V 00 L3	509	2.8	980	0.42	—	63 71 80	8680	8680	22600	26000	5710	230
	3/V 00 L3	562	2.5	730	0.29	—	63 71 80	8980	8980	23300	26800	5900	230
	3/V 00 L3	654	2.1	1000	0.36	—	63 71 —	9440	9440	24400	28100	6210	230
													
													

1	Coppia massima trasmissibile dal riduttore	Gearbox max. transmissible torque	Nenn-Drehmoment am Abtrieb des Bezuggetriebes	Couple maximum du réducteur
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione combinata vite + epicicloidale	Frame size of combined worm + planetary gearbox	Baugröße des Getriebes 300 + kombinierten Schneckengetriebe	Taille réducteur combiné série 300 + réducteur à vis sans fin
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare in uscita riduttore	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata di 10000 h	Gearbox rated output torque, based on: - safety factor S=1 - 10000 hrs theoretical lifetime	Nenn-Drehmoment am Getriebeabtrieb mit Sicherheitsfaktor S=1 für eine Dauer von 10000 h	Couple nominal à la sortie du réducteur avec facteur de sécurité S=1 pendant une durée de 10000 h
7	Potenza nominale all'albero veloce del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 hrs theoretical lifetime	Nenn-Leistung im Getriebeantrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 h	Puissance nominale en entrée réducteur avec facteur de sécurité S=1 pendant une durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile. - Le predisposizioni contrassegnate con * sono dotate di una linguetta ribassata.	Frame size of compatible IEC electric motor - IEC inputs marked with * feature a lowered key.	Baugröße einbaubarer IEC-Elektromotor. - Alle Getriebe, die * gekennzeichnet sind, werden mit einer weiter unten eingebauten Passfeder geliefert.	Taille IEC moteur électrique à installer. - Les moteurs dont les prédispositions sont repérées par * sont dotées en série d'une clavette à hauteur réduite.
10	Carichi radiali applicabili all'albero lento, basati su: - fattore di sicurezza S=1 - durata teorica 10000 h Per forze non applicate in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 hrs theoretical lifetime For forces applying off the shaft midpoint, see diagrams provided in the pages following dimensions of the gearbox under study	Auf die Mitte der Abtriebswelle für eine Dauer von 10000 Std. applizierbare Nenn-Radialkräfte und Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions



3/V 00 L3

1000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 			R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ				
1400	3/V 00 L3	415	3.4	950	0.50	—	B5 / B14			8120	8120	21300	24500	5340	230
	3/V 00 L3	436	3.2	700	0.37	—	63	71	—	8250	8250	21600	24800	5420	230
	3/V 00 L3	509	2.8	980	0.42	—	63	71	80	8680	8680	22600	26000	5710	230
	3/V 00 L3	562	2.5	730	0.29	—	63	71	80	8980	8980	23300	26800	5900	230
	3/V 00 L3	654	2.1	1000	0.36	—	63	71	—	9440	9440	24400	28100	6210	230
	3/V 00 L3	689	2.0	1000	0.32	—	63	71	80	9610	9610	24800	28500	6320	230
	3/V 00 L3	818	1.7	1000	0.30	—	63	71	—	10200	10200	26100	30000	6690	230
	3/V 00 L3	903	1.5	800	0.22	—	63	71	—	10500	10500	26900	30900	6910	230
	3/V 00 L3	997	1.4	810	0.17	—	63	71	80	10900	10900	27700	31800	7140	230
	3/V 00 L3	1107	1.3	1000	0.22	—	63	71	—	11300	11300	28600	32800	7400	230
	3/V 00 L3	1198	1.2	840	0.16	—	63	71	—	11600	11600	29300	33600	7600	230
	3/V 00 L3	1381	1.0	1000	0.18	—	63	71	—	12000	12100	30600	34000	7960	230
	3/V 00 L3	1495	0.94	860	0.13	—	63	71	—	12000	12400	31000	34000	8000	230
	3/V 00 L3	1869	0.75	860	0.11	—	63	71	—	12000	12500	31000	34000	8000	230
	3/V 00 L3	2337	0.60	860	0.09	—	63	71	—	12000	12500	31000	34000	8000	230

3/V 01 L3

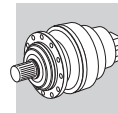
2000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 	R _{n2} [N]							
							MC/PC	MZ/PZ	HC	HZ	FZ				
1400	3/V 01 L3	430	3.3	1880	0.84	—	B5 / B14			8210	8210	21500	24700	5400	238
	3/V 01 L3	443	3.2	1370	0.62	—	63	71	80	8290	8290	21700	25000	5450	238
	3/V 01 L3	509	2.8	1270	0.55	—	63	71	80	8680	8680	22600	26000	5710	238
	3/V 01 L3	562	2.5	1400	0.55	—	63	71	80	8980	8980	23300	26800	5900	238
	3/V 01 L3	654	2.1	1180	0.42	—	63	71	—	9440	9440	24400	28100	6210	238
	3/V 01 L3	689	2.0	1710	0.55	—	63	71	80	9610	9610	24800	28500	6320	238
	3/V 01 L3	799	1.8	1540	0.40	—	63	71	80	10100	10100	25900	29800	6640	238
	3/V 01 L3	903	1.5	1230	0.34	—	63	71	—	10500	10500	26900	30900	6910	238
	3/V 01 L3	997	1.4	1600	0.33	—	63	71	80	10900	10900	27700	31800	7140	238
	3/V 01 L3	1105	1.3	1990	0.42	—	63	71	—	11200	11200	28600	32800	7390	238
	3/V 01 L3	1198	1.2	1650	0.32	—	63	71	—	11600	11600	29300	33600	7600	238
	3/V 01 L3	1381	1.0	1880	0.34	—	63	71	—	12000	12100	30600	34000	7960	238
	3/V 01 L3	1495	0.94	1700	0.26	—	63	71	—	12000	12400	31000	34000	8000	238
	3/V 01 L3	1869	0.75	1700	0.22	—	63	71	—	12000	12500	31000	34000	8000	238
	3/V 01 L3	2337	0.60	1700	0.18	—	63	71	—	12000	12500	31000	34000	8000	238

3/V 03 L3

2800 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 			R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ				
1400	3/V 03 L3	395	3.5	2170	1.1	—	B5 / B14			24500	28300	42800	51500	15700	246
	3/V 03 L3	460	3.0	2190	1.0	—	71	80	90	25800	29800	44900	54000	16600	246
	3/V 03 L3	502	2.8	1970	0.75	—	71	80	90	26600	30700	46000	55400	17100	246
	3/V 03 L3	544	2.6	2730	1.1	—	71	80	90	27300	31500	47200	56700	17500	246
	3/V 03 L3	623	2.2	2210	0.75	—	71	80	90	28600	33000	49100	59100	18300	246
	3/V 03 L3	736	1.9	2710	0.78	—	71	80	90	30200	34900	51600	62100	19400	246
	3/V 03 L3	793	1.8	2110	0.56	—	71	80	90	31000	35700	52800	63500	19900	246
	3/V 03 L3	923	1.5	2660	0.61	—	71	80	90	32600	37600	55300	66500	20900	246
	3/V 03 L3	1023	1.4	2710	0.62	—	71	80	—	33700	38900	57000	68600	21600	246
	3/V 03 L3	1189	1.2	2240	0.44	—	71	80	—	35400	40900	59600	71800	22700	246
	3/V 03 L3	1385	1.0	2840	0.48	—	71	80	—	36000	42000	62400	74000	23900	246
	3/V 03 L3	1610	0.87	2300	0.33	—	71	80	—	36000	42000	64000	74000	24000	246
	3/V 03 L3	1728	0.81	2850	0.38	—	71	80	—	36000	42000	64000	74000	24000	246
	3/V 03 L3	2009	0.70	2300	0.27	—	71	80	—	36000	42000	64000	74000	24000	246
	3/V 03 L3	2511	0.56	2300	0.21	—	71	80	—	36000	42000	64000	74000	24000	246



3/V 04 L3

3600 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 				R _{n2} [N]					
							B5	B5 / B14			MC/PC	MZ/PZ	HC	HZ	FZ	
1400	3/V 04 L3	384	3.6	3510	1.8	—	71	80	90	100	24300	28100	42500	51100	15600	256
	3/V 04 L3	453	3.1	3690	1.6	—	71	80	90	100	25700	29600	44600	53700	16500	256
	3/V 04 L3	501	2.8	3010	1.3	—	71	80	90	100	26600	30700	46000	55400	17000	256
	3/V 04 L3	568	2.5	3090	1.1	—	71	80	90	100	27700	32000	47800	57500	17800	256
	3/V 04 L3	623	2.2	3540	1.2	—	71	80	90	100	28600	33000	49100	59100	18300	256
	3/V 04 L3	710	2.0	2490	0.64	—	71	80	90	100	29800	34400	51100	61500	19100	256
	3/V 04 L3	769	1.8	3220	0.82	—	71	80	90	100	30600	35400	52300	63000	19700	256
	3/V 04 L3	887	1.6	2570	0.53	—	71	80	90	100	32100	37100	54600	65700	20600	256
	3/V 04 L3	981	1.4	3860	0.85	—	71	80	90	100	33200	38400	56300	67700	21300	256
	3/V 04 L3	1152	1.2	3410	0.60	—	71	80	90	100	35100	40500	59100	71100	22500	256
	3/V 04 L3	1231	1.1	3440	0.60	—	71	80	90	100	35800	41400	60300	72500	23000	256
	3/V 04 L3	1419	0.99	2750	0.39	—	71	80	90	100	36000	42000	62900	74000	24000	256
	3/V 04 L3	1536	0.91	3500	0.49	—	71	80	90	100	36000	42000	64000	74000	24000	256
	3/V 04 L3	1774	0.79	2750	0.31	—	71	80	90	100	36000	42000	64000	74000	24000	256
	3/V 04 L3	1893	0.74	2750	0.31	—	71	80	90	100	36000	42000	64000	74000	24000	256
	3/V 04 L3	2366	0.59	2750	0.25	—	71	80	90	100	36000	42000	64000	74000	24000	256

3/V 05 L3

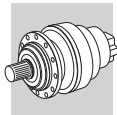
4600 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 				R _{n2} [N]					
							B5	B5 / B14			MC/PC	MZ/PZ	HC	HZ	FZ	
1400	3/V 05 L3	396	3.5	3770	1.7	—	71	80	90	100	24600	28400	42900	51600	15800	266
	3/V 05 L3	462	3.0	4760	1.9	—	71	80	90	100	25800	29800	44900	54000	16600	266
	3/V 05 L3	529	2.6	3920	1.4	—	71	80	90	100	27000	31200	46800	56300	17300	266
	3/V 05 L3	576	2.4	4920	1.6	—	71	80	90	100	27800	32100	48000	57700	17900	266
	3/V 05 L3	623	2.2	4480	1.5	—	71	80	90	100	28600	33000	49100	59100	18300	266
	3/V 05 L3	715	2.0	4110	1.1	—	71	80	90	100	29900	34500	51200	61600	19200	266
	3/V 05 L3	793	1.8	4190	1.1	—	71	80	90	100	31000	35700	52800	63500	19900	266
	3/V 05 L3	894	1.6	4270	0.93	—	71	80	90	100	32200	37200	54700	65900	20700	266
	3/V 05 L3	1057	1.3	4390	0.90	—	71	80	90	100	34100	39300	57600	69300	21900	266
	3/V 05 L3	1116	1.3	4430	0.77	—	71	80	90	100	34700	40000	58500	70400	22300	266
	3/V 05 L3	1231	1.1	5500	0.97	—	71	80	90	100	35800	41400	60300	72500	23000	266
	3/V 05 L3	1431	0.98	4600	0.70	—	71	80	90	100	36000	42000	63000	74000	24000	266
	3/V 05 L3	1674	0.84	4100	0.50	—	71	80	90	100	36000	42000	64000	74000	24000	266
	3/V 05 L3	1786	0.78	4600	0.56	—	71	80	90	100	36000	42000	64000	74000	24000	266
	3/V 05 L3	2232	0.63	4100	0.40	—	71	80	90	100	36000	42000	64000	74000	24000	266

3/V 06 L3

8500 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 				R _{n2} [N]					
							B5	B5 / B14			MC/PC	MZ/PZ	HC	HZ	FZ	
1400	3/V 06 L3	395	3.5	7400	3.4	—	71	80	90	100	30600	34600	70100	81600	23000	276
	3/V 06 L3	427	3.3	8220	3.5	—	71	80	90	100	31400	35500	71700	83500	23600	276
	3/V 06 L3	527	2.7	7400	2.6	—	71	80	90	100	33600	38100	76400	89000	25300	276
	3/V 06 L3	569	2.5	8520	2.8	—	71	80	90	100	34500	39100	78200	91100	25900	276
	3/V 06 L3	661	2.1	8640	2.4	—	71	80	90	100	36300	41100	81800	95300	27300	276
	3/V 06 L3	698	2.0	7490	2.0	—	71	80	90	100	36900	41800	83100	96800	27700	276
	3/V 06 L3	791	1.8	7440	1.9	—	71	80	90	100	38500	43600	86300	100500	28900	276
	3/V 06 L3	930	1.5	7890	1.6	—	71	80	90	100	40600	46100	90600	105500	30500	276
	3/V 06 L3	992	1.4	8990	1.9	—	71	80	90	100	41500	47100	92400	107600	31200	276
	3/V 06 L3	1153	1.2	8210	1.5	—	71	80	90	100	43700	49500	96700	112600	32800	276
	3/V 06 L3	1212	1.2	7480	1.3	—	71	80	90	100	44400	50300	98100	114200	33400	276
	3/V 06 L3	1395	1.0	8490	1.2	—	71	80	90	100	45000	51000	101000	119000	35000	276
	3/V 06 L3	1768	0.79	8500	1.0	—	71	80	90	100	45000	51000	101000	119000	35000	276
	3/V 06 L3	2139	0.65	8500	0.85	—	71	80	90	100	45000	51000	101000	119000	35000	276
	3/V 06 L3	2588	0.54	7000	0.58	—	71	80	90	100	45000	51000	101000	119000	35000	276



3/V 07 L3

14000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	R _{n2} [N]					
								MC/PC	MZ/PZ	HC	HZ	FZ	
							B5 / B14						
							B5						
1400	3/V 07 L3	386	3.6	9110	4.2	—	80 90 100 112 132	33700	42300	74900	98100	29300	286
	3/V 07 L3	460	3.0	12300	5.0	—	80 90 100 112 132	35700	44800	78900	103400	31100	286
	3/V 07 L3	507	2.8	13600	5.0	—	80 90 100 112 132	36900	46300	81300	106500	32100	286
	3/V 07 L3	655	2.1	14000	4.3	—	80 90 100 112 132	40200	50400	87700	115000	34900	286
	3/V 07 L3	761	1.8	14000	3.7	—	80 90 100 112 132	42200	53000	91800	120300	36700	286
	3/V 07 L3	773	1.8	10100	2.4	—	80 90 100 112 132	42500	53300	92200	120800	36900	286
	3/V 07 L3	920	1.5	12300	2.7	—	80 90 100 112 132	45000	56500	97200	127300	39100	286
	3/V 07 L3	1015	1.4	14300	2.9	—	80 90 100 112 132	46500	58300	100100	131100	40400	286
	3/V 07 L3	1159	1.2	10700	1.9	—	80 90 100 112 132	48600	61000	104100	136500	42300	286
	3/V 07 L3	1288	1.1	13800	2.3	—	80 90 100 112 132	50400	63200	107500	140800	43800	286
	3/V 07 L3	1411	0.99	12300	1.8	—	80 90 100 112 132	51900	65000	109000	144800	45000	286
	3/V 07 L3	1545	0.91	11000	1.5	—	80 90 100 112 132	52000	65000	109000	145000	45000	286
	3/V 07 L3	1964	0.71	12300	1.4	—	80 90 100 112 132	52000	65000	109000	145000	45000	286
	3/V 07 L3	2150	0.65	11000	1.1	—	80 90 100 112 132	52000	65000	109000	145000	45000	286
	3/V 07 L3	2472	0.57	11000	0.99	—	80 90 100 112 132	52000	65000	109000	145000	45000	286

3/V 09 L3

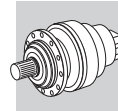
20000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	R _{n2} [N]					
								MC/PC	MZ/PZ	HC	HZ	FZ	
							B5						
1400	3/V 09 L3	370	3.8	13000	6.8	—	100 112 132	—	—	75100	96900	23100	296
	3/V 09 L3	442	3.2	16700	7.4	—	100 112 132	—	—	79200	102200	24500	296
	3/V 09 L3	507	2.8	14300	5.2	—	- - 132	—	—	82600	106500	25700	296
	3/V 09 L3	655	2.1	17600	5.2	—	100 112 132	—	—	89100	115000	27900	296
	3/V 09 L3	761	1.8	14400	3.7	—	100 112 132	—	—	93300	120300	29400	296
	3/V 09 L3	800	1.8	20900	5.3	—	100 112 132	—	—	94700	122100	29900	296
	3/V 09 L3	840	1.7	19300	4.5	—	100 112 132	—	—	96100	123900	30400	296
	3/V 09 L3	1004	1.4	17800	3.6	—	100 112 132	—	—	101300	130700	32200	296
	3/V 09 L3	1159	1.2	16400	2.8	—	100 112 132	—	—	105800	136500	33800	296
	3/V 09 L3	1288	1.1	20700	3.3	—	100 112 132	—	—	109200	140800	35000	296
	3/V 09 L3	1497	0.94	18300	2.5	—	100 112 132	—	—	110000	145000	36000	296
	3/V 09 L3	1623	0.86	14500	1.9	—	100 112 —	—	—	110000	145000	36000	296
	3/V 09 L3	1792	0.78	21000	2.5	—	100 112 —	—	—	110000	145000	36000	296
	3/V 09 L3	2150	0.65	17000	1.6	—	100 112 132	—	—	110000	145000	36000	296
	3/V 09 L3	2472	0.57	17000	1.5	—	100 112 —	—	—	110000	145000	36000	296

3/V 10 L3

30000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	R _{n2} [N]					
								MC/PC	MZ/PZ	HC	HZ	FZ	
							B5						
1400	3/V 10 L3	436	3.2	26700	11.3	—	— — 132 160 (*)	—	—	93500	117600	44100	306
	3/V 10 L3	507	2.8	25800	9.4	—	— — 132 160 (*)	—	—	97800	123000	46300	306
	3/V 10 L3	560	2.5	25400	8.4	—	— — 132 160 (*)	—	—	100800	126700	47900	306
	3/V 10 L3	614	2.3	21800	6.6	—	— — 132 160 (*)	—	—	103600	130300	49400	306
	3/V 10 L3	701	2.0	22300	5.7	—	— — 132 160 (*)	—	—	107800	135600	51600	306
	3/V 10 L3	773	1.8	22800	5.5	—	— — 132 160 (*)	—	—	111000	139600	53300	306
	3/V 10 L3	920	1.5	21800	4.6	—	100 112 132 —	—	—	117000	147100	56500	306
	3/V 10 L3	1004	1.4	30000	6.0	—	100 112 132 —	—	—	120100	151000	58200	306
	3/V 10 L3	1120	1.3	28400	5.1	—	100 112 132 —	—	—	124100	156000	60300	306
	3/V 10 L3	1227	1.1	21800	3.6	—	100 112 132 —	—	—	127500	160400	62200	306
	3/V 10 L3	1411	0.99	21800	3.1	—	100 112 132 —	—	—	133000	166000	65000	306



3/V 10 L4

30000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 					MC/PC	MZ/PZ	R_{n2} [N]				
							B5	B5 / B14										
1400	3/V 10 L4	1657	0.84	22900	2.6	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	1826	0.77	24900	2.6	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	2016	0.69	29400	2.8	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	2209	0.63	22900	2.0	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	2455	0.57	30000	2.3	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	2835	0.49	29300	2.0	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	3273	0.43	30000	1.8	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	3570	0.39	29500	1.7	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	4036	0.35	29500	1.4	—	71	80	90	100	112	—	—	133000	166000	65000	306	
	3/V 10 L4	4637	0.30	29500	1.4	—	71	80	90	100	112	—	—	133000	166000	65000	306	
3/V 10 L4	5081	0.28	22900	0.99	—	71	80	90	100	112	—	—	133000	166000	65000	306		

3/V 11 L3

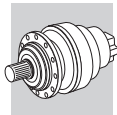
43000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 					MC/PC	MZ/PZ	R_{n_2} [N]			
							B5										
1400	3/V 11 L3	430	3.3	40000	17.1	—	—	—	—	160	180 (*)	—	—	110000	137000	43800	316
	3/V 11 L3	510	2.7	34500	12.4	—	—	—	—	160	180 (*)	—	—	115800	144300	46400	316
	3/V 11 L3	551	2.5	36400	12.1	—	—	—	—	160	180 (*)	—	—	118600	147700	47600	316
	3/V 11 L3	644	2.2	40000	11.7	—	—	—	132	160	—	—	—	124200	154800	50200	316
	3/V 11 L3	720	1.9	38200	10.6	—	—	—	132	160	—	—	—	128400	160000	52100	316
	3/V 11 L3	827	1.7	39100	8.9	—	—	—	132	160	—	—	—	133900	166800	54500	316
	3/V 11 L3	900	1.6	39700	9.1	—	100	112	132	—	—	—	—	137300	171100	56100	316
	3/V 11 L3	1004	1.4	35700	7.5	—	100	112	132	—	—	—	—	141900	176800	58200	316
	3/V 11 L3	1103	1.3	41200	7.5	—	—	—	132	160	—	—	—	146000	181800	60000	316
	3/V 11 L3	1274	1.1	35100	5.7	—	100	112	132	—	—	—	—	152400	189900	63000	316
	3/V 11 L3	1378	1.0	42900	6.4	—	100	112	132	—	—	—	—	156100	194400	64700	316
	3/V 11 L3	1636	0.86	43000	5.4	—	100	112	132	—	—	—	—	157000	195000	65000	316
	3/V 11 L3	1963	0.71	43000	4.6	—	100	112	132	—	—	—	—	157000	195000	65000	316
	3/V 11 L3	2329	0.60	34000	3.1	—	100	112	132	—	—	—	—	157000	195000	65000	316

3/V 11 L4

43000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 					MC/PC	MZ/PZ	R_{n2} [N]		HC	HZ	FZ	
							B5 / B14		B5										
1400	3/V 11 L4	2510	0.56	45000	3.4	—	80	90	100	112	132	—	—	157000	195000	65000	316		
	3/V 11 L4	2887	0.48	45000	3.0	—	80	90	100	112	132	—	—	157000	195000	65000	316		
	3/V 11 L4	3222	0.43	44100	2.6	—	80	90	100	112	132	—	—	157000	195000	65000	316		
	3/V 11 L4	3557	0.39	42300	2.6	—	80	90	100	112	132	—	—	157000	195000	65000	316		
	3/V 11 L4	4106	0.34	45000	2.4	—	80	90	100	112	132	—	—	157000	195000	65000	316		
	3/V 11 L4	4410	0.32	43000	2.0	—	80	90	100	112	132	—	—	157000	195000	65000	316		
	3/V 11 L4	5021	0.28	45000	1.9	—	80	90	100	112	132	—	—	157000	195000	65000	316		



3/V 13 L3

50000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 					MC/PC	MZ/PZ	R _{n2} [N]			
							B5							HC	HZ	FZ	
1400	3/V 13 L3	370	3.8	39500	19.6	—	—	—	—	160	180 (*)	—	—	130000	153900	51400	326
	3/V 13 L3	425	3.3	46900	19.5	—	—	—	—	160	180 (*)	—	—	135500	160400	53800	326
	3/V 13 L3	516	2.7	52000	18.5	—	—	—	—	160	180 (*)	—	—	143600	170000	57400	326
	3/V 13 L3	567	2.5	48300	15.6	—	—	—	—	160	180 (*)	—	—	147700	174800	59200	326
	3/V 13 L3	673	2.1	49500	13.5	—	—	—	—	160	180 (*)	—	—	155500	184100	62700	326
	3/V 13 L3	741	1.9	45800	12.4	—	—	—	132	160	—	—	—	160100	189400	64700	326
	3/V 13 L3	810	1.7	44900	10.2	—	—	—	—	160	180 (*)	—	—	164400	194600	66700	326
	3/V 13 L3	870	1.6	53800	12.4	—	—	—	132	160	—	—	—	168000	198800	68300	326
	3/V 13 L3	1009	1.4	52500	9.8	—	—	—	132	160	—	—	—	175600	207900	71700	326
	3/V 13 L3	1088	1.3	51200	9.6	—	100	112	132	—	—	—	—	179600	212600	73500	326
	3/V 13 L3	1291	1.1	52900	8.4	—	100	112	132	—	—	—	—	189100	223800	77900	326
	3/V 13 L3	1418	0.99	55000	8.0	—	100	112	132	—	—	—	—	192000	230200	80000	326
	3/V 13 L3	1620	0.86	49000	6.0	—	—	—	132	160	—	—	—	192000	231000	80000	326
	3/V 13 L3	1682	0.83	55000	6.7	—	100	112	132	—	—	—	—	192000	231000	80000	326
	3/V 13 L3	2019	0.69	55000	5.7	—	100	112	132	—	—	—	—	192000	231000	80000	326
	3/V 13 L3	2430	0.58	49000	4.2	—	100	112	132	—	—	—	—	192000	231000	80000	326

3/V 13 L4

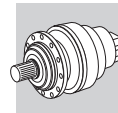
55000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 					MC/PC	MZ/PZ	R _{n2} [N]			
							B5 / B14							HC	HZ	FZ	
1400	3/V 13 L4	2773	0.50	55000	4.1	—	80	90	100	112	132	—	—	192000	231000	80000	326
	3/V 13 L4	3263	0.43	55000	3.2	—	80	90	100	112	132	—	—	192000	231000	80000	326
	3/V 13 L4	3515	0.40	55000	3.0	—	80	90	100	112	132	—	—	192000	231000	80000	326
	3/V 13 L4	4046	0.35	55000	2.8	—	80	90	100	112	132	—	—	192000	231000	80000	326
	3/V 13 L4	4536	0.31	55000	2.5	—	80	90	100	112	132	—	—	192000	231000	80000	326
	3/V 13 L4	5046	0.28	53000	2.3	—	80	90	100	112	132	—	—	192000	231000	80000	326

3/V 14L3

78000 Nm

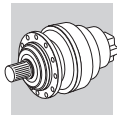
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 					MC/PC	MZ/PZ	R _{n2} [N]			
							B5							HC	HZ	FZ	
1400	3/V 14L3	397	3.5	46100	21	—	—	—	—	160	180 (*)	—	—	141800	166400	59100	336
	3/V 14L3	446	3.1	47700	19.6	—	—	—	—	160	180 (*)	—	—	146800	172300	61500	336
	3/V 14L3	498	2.8	57800	21	—	—	—	—	160	180 (*)	—	—	151700	178200	63800	336
	3/V 14L3	579	2.4	56300	17.2	—	—	—	—	160	180 (*)	—	—	158800	186400	67100	336
	3/V 14L3	665	2.1	71000	19.6	—	—	—	—	160	180 (*)	—	—	165400	194200	70200	336
	3/V 14L3	695	2.0	43000	12.4	—	—	—	132	160	—	—	—	167700	196900	71300	336
	3/V 14L3	794	1.8	49300	11.7	—	—	—	132	160	—	—	—	174500	204900	74500	336
	3/V 14L3	893	1.6	55200	12.4	—	—	—	132	160	—	—	—	180700	212200	77500	336
	3/V 14L3	997	1.4	61900	11.7	—	—	—	132	160	—	—	—	186800	219300	80400	336
	3/V 14L3	1116	1.3	52500	9.6	—	100	112	132	—	—	—	—	193200	226900	83400	336
	3/V 14L3	1324	1.1	62300	9.6	—	100	112	132	—	—	—	—	203400	238800	88300	336
	3/V 14L3	1339	1.0	47700	7.5	—	100	112	132	—	—	—	—	204100	239600	88700	336
	3/V 14L3	1589	0.88	56600	7.5	—	100	112	132	—	—	—	—	206000	243000	90000	336
	3/V 14L3	1662	0.84	78200	9.6	—	100	112	132	—	—	—	—	206000	243000	90000	336
	3/V 14L3	1994	0.70	71000	7.5	—	100	112	132	—	—	—	—	206000	243000	90000	336
	3/V 14L3	2318	0.60	64000	5.8	—	100	112	132	—	—	—	—	206000	243000	90000	336



3/V 14 L4							84000 Nm										
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 			MC/PC	MZ/PZ	Rn ₂ [N]		HC	HZ	FZ	
1400	3/V 14 L4	2504	0.56	84000	7.0	—	100	112	132	—	—	206000	243000	90000	336		
	3/V 14 L4	2782	0.50	84000	6.1	—	100	112	132	—	—	206000	243000	90000	336		
	3/V 14 L4	3182	0.44	84000	5.1	—	100	112	132	—	—	206000	243000	90000	336		
	3/V 14 L4	3472	0.40	79200	4.4	—	—	—	132	—	—	206000	243000	90000	336		
	3/V 14 L4	3993	0.35	79200	3.8	—	100	112	132	—	—	206000	243000	90000	336		
	3/V 14 L4	4312	0.32	84000	4.1	—	100	112	132	—	—	206000	243000	90000	336		
	3/V 14 L4	4959	0.28	84000	3.5	—	100	112	132	—	—	206000	243000	90000	336		

3/V 15 L3							95000 Nm										
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 					MC/PC	MZ/PZ	R _{n2} [N]			
							B5							HC	HZ	FZ	
1400	3/V 15 L3	386	3.6	67300	30	—	132	160	180	200	225	—	—	140600	165000	58600	346
	3/V 15 L3	446	3.1	65100	27	—	132	160	180	200	225	—	—	146800	172300	61500	346
	3/V 15 L3	498	2.8	85600	30	—	132	160	180	200	225	—	—	151700	178200	63800	346
	3/V 15 L3	560	2.5	81700	27	—	132	160	180	200	225	—	—	157100	184500	66300	346
	3/V 15 L3	665	2.1	89100	25	—	132	160	180	200	225	—	—	165400	194200	70200	346
	3/V 15 L3	840	1.7	80400	18.0	—	132	160	180	200	225	—	—	177500	208400	75900	346
	3/V 15 L3	997	1.4	94400	17.8	—	132	160	180	200	225	—	—	186800	219300	80400	346
	3/V 15 L3	1120	1.3	92200	16.4	—	132	160	180	200	225	—	—	193500	227100	83500	346
	3/V 15 L3	1329	1.1	98300	14.8	—	132	160	180	200	225	—	—	203700	239100	88500	346
	3/V 15 L3	1400	1.0	86900	12.7	—	132	160	180	200	225	—	—	206000	242900	90000	346
	3/V 15 L3	1662	0.84	99000	12.2	—	132	160	180	200	225	—	—	206000	243000	90000	346
	3/V 15 L3	1994	0.70	94300	10.1	—	132	160	180	200	225	—	—	206000	243000	90000	346
3/V 15 L3	2318	0.60	80000	7.4	—	132	160	180	200	225	—	—	206000	243000	90000	346	

3/V 15 L4							100000 Nm							
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC/PC	MZ/PZ	R _{n2} [N]				
										HC	HZ	FZ		
1400	3/V 15 L4	2780	0.50	105000	7.2	—	B5		—	—	206000	243000	90000	346
	3/V 15 L4	3300	0.42	105000	6.1	—	— — 132 160 (*)	—	—	206000	243000	90000	346	
	3/V 15 L4	3489	0.40	99000	5.4	—	— — 132 160 (*)	—	—	206000	243000	90000	346	
	3/V 15 L4	4171	0.34	105000	5.1	—	100 112 132 —	—	—	206000	243000	90000	346	
	3/V 15 L4	4950	0.28	105000	4.3	—	100 112 132 —	—	—	206000	243000	90000	346	
	3/V 15 L4	5234	0.27	99000	3.8	—	100 112 132 —	—	—	206000	243000	90000	346	



3/V 16 L3

85000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC/PC	MZ/PZ	Rn ₂ [N]			
										HC	HZ	FZ	
							B5						
1400	3/V 16 L3	397	3.5	71000	32	—	132 160 180 200 225	—	—	235700	262100	98600	356
	3/V 16 L3	446	3.1	65100	27	—	132 160 180 200 225	—	—	244100	271400	102500	356
	3/V 16 L3	530	2.6	77200	27	—	132 160 180 200 225	—	—	256900	285800	108500	356
	3/V 16 L3	669	2.1	64000	18.0	—	132 160 180 200 225	—	—	275600	306500	117300	356
	3/V 16 L3	794	1.8	76000	18.0	—	132 160 180 200 225	—	—	290200	322700	124200	356
	3/V 16 L3	869	1.6	54000	12.7	—	132 160 180 200 225	—	—	298100	331600	128000	356
	3/V 16 L3	1059	1.3	87200	16.4	—	132 160 180 200 225	—	—	316300	351800	136700	356
	3/V 16 L3	1339	1.0	63300	10.1	—	132 160 180 200 225	—	—	339300	377400	147800	356
	3/V 16 L3	1589	1.88	75100	10.1	—	132 160 180 200 225	—	—	345000	385000	150000	356

3/V 16 L4

130000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC/PC	MZ/PZ	Rn ₂ [N]			
										HC	HZ	FZ	
							B5						
1400	3/V 16 L4	1826	0.77	108300	11.3	—	— — 132 160 (*)	—	—	345000	385000	150000	356
	3/V 16 L4	2167	0.65	128500	11.3	—	— — 132 160 (*)	—	—	345000	385000	150000	356
	3/V 16 L4	2343	0.60	135000	11.0	—	— — 132 160 (*)	—	—	345000	385000	150000	356
	3/V 16 L4	2738	0.51	114100	8.4	—	100 112 132 —	—	—	345000	385000	150000	356
	3/V 16 L4	3250	0.43	132000	8.2	—	100 112 132 —	—	—	345000	385000	150000	356
	3/V 16 L4	3514	0.40	135000	7.7	—	100 112 132 —	—	—	345000	385000	150000	356
	3/V 16 L4	4171	0.34	132000	6.4	—	100 112 132 —	—	—	345000	385000	150000	356
	3/V 16 L4	4950	0.28	124000	5.0	—	100 112 132 —	—	—	345000	385000	150000	356

3/V 17 L3

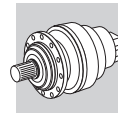
150000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC/PC	MZ/PZ	Rn ₂ [N]			
										HC	HZ	FZ	
							B5						
1400	3/V 17 L3	405	3.5	120700	52	—	132 160 180 200 225	—	—	304800	324500	99200	364
	3/V 17 L3	425	3.3	106700	44	—	132 160 180 200 225	—	—	309300	329300	100800	364
	3/V 17 L3	512	2.7	128400	44	—	132 160 180 200 225	—	—	327000	348200	107300	364
	3/V 17 L3	567	2.5	118700	38	—	132 160 180 200 225	—	—	337200	359000	111000	364
	3/V 17 L3	608	2.3	127600	37	—	132 160 180 200 225	—	—	344200	366500	113600	364
	3/V 17 L3	683	2.1	142900	38	—	132 160 180 200 225	—	—	356500	379500	118100	364
	3/V 17 L3	810	1.7	133300	30	—	132 160 180 200 225	—	—	375300	399500	125000	364
	3/V 17 L3	851	1.6	106700	23	—	132 160 180 200 225	—	—	380800	405400	127000	364
	3/V 17 L3	1024	1.4	128400	23	—	132 160 180 200 225	—	—	402600	428600	135100	364
	3/V 17 L3	1134	1.2	128000	22	—	132 160 180 200 225	—	—	415100	442000	139800	364
	3/V 17 L3	1215	1.2	141900	22	—	132 160 180 200 225	—	—	423800	451200	143100	364
	3/V 17 L3	1365	1.0	154100	22	—	132 160 180 200 225	—	—	438900	467300	148700	364

3/V 17 L4

180000 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 	MC/PC	MZ/PZ	Rn ₂ [N]			
										HC	HZ	FZ	
							B5						
1400	3/V 17 L4	1780	0.79	180000	19.1	—	— — — 160 180 (*)	—	—	442000	470000	150000	364
	3/V 17 L4	2065	0.68	179000	15.8	—	— — — 160 180 (*)	—	—	442000	470000	150000	364
	3/V 17 L4	2485	0.56	155000	11.4	—	— — — 160 180 (*)	—	—	442000	470000	150000	364
	3/V 17 L4	2773	0.50	166400	12.4	—	— — 132 160 —	—	—	442000	470000	150000	364
	3/V 17 L4	3168	0.44	180000	11.0	—	— — 132 160 —	—	—	442000	470000	150000	364
	3/V 17 L4	3583	0.39	170000	9.0	—	— — — 160 180 (*)	—	—	442000	470000	150000	364
	3/V 17 L4	4129	0.34	179000	8.4	—	— — 132 160 —	—	—	442000	470000	150000	364
	3/V 17 L4	4449	0.31	180000	8.6	—	100 112 132 —	—	—	442000	470000	150000	364
	3/V 17 L4	4970	0.28	155000	6.0	—	— — 132 160 —	—	—	442000	470000	150000	364



3/V 18 L4

250000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 					MC/PC	MZ/PZ	R _{n2} [N]			
							B5								HC	HZ	FZ
1400	3/V 18 L4	765	1.8	185000	44	—	132	160	180	200	225	—	—	462800	472300	163500	372
	3/V 18 L4	982	1.4	237400	44	—	132	160	180	200	225	—	—	498800	509000	177700	372
	3/V 18 L4	1165	1.2	250000	39	—	132	160	180	200	225	—	—	503000	535800	188100	372
	3/V 18 L4	1232	1.1	250000	37	—	132	160	180	200	225	—	—	503000	544900	191700	372
	3/V 18 L4	1473	0.95	250000	31	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	1748	0.80	250000	26	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	1848	0.76	250000	25	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	2295	0.61	212900	18.0	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	2464	0.57	250000	19.2	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	2945	0.48	250000	16.4	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	3495	0.40	250000	13.8	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	3696	0.38	250000	13.1	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	4386	0.32	250000	11.0	—	132	160	180	200	225	—	—	503000	565000	200000	372
	3/V 18 L4	5099	0.27	244000	9.3	—	132	160	180	200	225	—	—	503000	565000	200000	372

3/V 19 L4

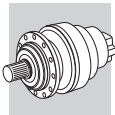
350000 Nm

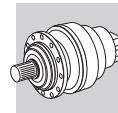
n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 					MC/PC	MZ/PZ	R _{n2} [N]			
							B5								HC	HZ	FZ
1400	3/V 19 L4	2582	0.54	350000	26	—	132	160	180	200	225	—	—	638000	702000	200000	380
	3/V 19 L4	3231	0.43	340000	19.9	—	132	160	180	200	225	—	—	638000	702000	200000	380
	3/V 19 L4	4095	0.34	350000	16.5	—	132	160	180	200	225	—	—	638000	702000	200000	380
	3/V 19 L4	4457	0.31	340000	14.4	—	132	160	180	200	225	—	—	638000	702000	200000	380
	3/V 19 L4	5164	0.27	350000	14.0	—	132	160	180	200	225	—	—	638000	702000	200000	380

3/V 21 L4

520000 Nm

n_1 min ⁻¹		i	n_2 min ⁻¹	M_{n2} Nm	P_{n1} kW	P_t kW	P (IEC) 					MC/PC	MZ/PZ	R _{n2} [N]			
							B5								HC	HZ	FZ
1400	3/V 21 L4	1062	1.3	443000	74	—	132	160	180	200	225	—	—	720000	853800	1094300	388
	3/V 21 L4	1260	1.1	425500	60	—	132	160	180	200	225	—	—	757900	898800	1158600	388
	3/V 21 L4	1517	0.92	512200	60	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	1800	0.78	498000	49	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	1890	0.74	460000	44	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	2275	0.62	540000	43	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	2520	0.56	511700	38	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	2700	0.52	498000	34	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	3600	0.39	498000	26	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	3780	0.37	460000	23	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	4550	0.31	540000	23	—	132	160	180	200	225	—	—	779000	923000	1200000	388
	3/V 21 L4	5040	0.28	540000	22	—	132	160	180	200	225	—	—	779000	923000	1200000	388





27.0 - DATI TECNICI RIDOTTO- RI COMBINATI - 3/A

27.0 - 3/A - COMBINED UNITS RATING CHARTS

27.0 - 3/A - TECHNISCHE DA- TEN DER GETRIEBE

27.0 - DONNEES TECHNIQUES REDUCTEURS COMBINÉ 3/A

Guida alla consultazione delle
tabelle.

Reading the rating chart.

Anleitung für die richtige Konsul-
tation der Tabellen.

Guide pour la consultation des
tableaux.

1

3/A 00 L2

650 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 						R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
1400	3/A 00 L2	19.1	73	470	4.0	—	63	71	80	90	100	112	2910	2910	8460	9720	1910	231
	3/A 00 L2	23.4	60	580	4.0	—	63	71	80	90	100	112	3110	3110	9000	10300	2050	231
	3/A 00 L2	31.7	44	650	3.3	—	63	71	80	90	100	112	3440	3440	9850	11300	2260	231
	3/A 00 L2	39.6	35	550	2.2	—	63	71	80	90	100	112	3710	3710	10500	12100	2440	231
	3/A 00 L2	41.5	34	650	2.5	—	63	71	80	90	100	112	3770	3770	10700	12300	2480	231

2

3

4

5

6

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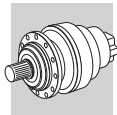
8

9

10

11

1	Coppia massima trasmissibile dal riduttore	Gearbox max. transmissible torque	Nenn-Drehmoment am Abtrieb des Bezuggetriebes	Couple maximum du réducteur
2	Velocità di comando riduttore	Gearbox drive speed	Drehzahl am Getriebeantrieb	Vitesse angulaire à l'entrée du réducteur
3	Grandezza riduttore in esecuzione combinata planetario-ortogonale	Frame size of combined planetary+bevel helical unit	Baugröße des kombinierten Getriebes 300 + Kegelradgetriebe Serie A	Taille réducteur combiné série 300 + réducteur à axes orthogonaux série A
4	Rapporto di riduzione	Gear ratio	Übersetzung	Rapport de réduction
5	Velocità angolare all'albero lento	Gearbox output speed	Drehzahl am Getriebeabtrieb	Vitesse angulaire en sortie réducteur
6	Coppia nominale all'albero lento del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated output torque, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Drehmoment am Getriebeabtrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 h	Couple nominal à la sortie du réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
7	Potenza nominale all'albero veloce del riduttore, basata su: - fattore di sicurezza S=1 - durata teorica di 10000 h	Gearbox rated input power, based on: - safety factor S=1 - 10000 h theoretical lifetime	Nenn-Leistung im Getriebeantrieb mit: - Sicherheitsfaktor S=1 - Dauer von 10000 h	Puissance nominale en entrée réducteur pendant : - facteur de sécurité S=1 - durée de 10000 h
8	Potenza termica riduttore	Gearbox thermal capacity	Wärmeleistung	Puissance thermique réducteur
9	Grandezza motore elettrico IEC installabile	Frame size of available IEC motor	Baugröße einbaubarer IEC-Elektromotor	Taille IEC moteur électrique à installer
10	Carichi radiali applicabili all'albero lento, basati su: - fattore di sicurezza S=1 - durata teorica 10000 h Per forze non applicate in mezzzeria riferirsi ai diagrammi riportati a seguito delle pagine dimensionali del riduttore in oggetto	Permitted overhung loading on output shaft, based on: - safety factor S=1 - 10000 hrs theoretical lifetime For forces applying off the shaft midpoint, see diagrams provided in the pages following dimensions of the gearbox under study	Auf die Mitte der Abtriebswelle für: - Dauer von 10000 Std. applizierbare Nenn-Radialkräfte - Sicherheitsfaktor S=1 Für andere Kraftangriffspunkte verweisen wir auf die Diagramme, die den Seiten mit den Maßen der gewählten Größe folgen	Charges radiales nominales applicables à la moitié de l'arbre pendant : - facteur de sécurité S=1 - durée de 10000 h Pour d'autres positions de charge, voir diagrammes figurant à la suite des pages dimensions de la taille sélectionnée
11	Pagina delle dimensioni	Page installation drawing can be found at	Maßseiten	Page avec les dimensions



3/A 00 L2

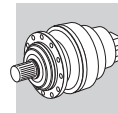
650 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
1400	3/A 00 L2	19.1	73	470	4.0	—	63	71	80	90	100	112	2910	2910	8460	9720	1910	231
	3/A 00 L2	23.4	60	580	4.0	—	63	71	80	90	100	112	3110	3110	9000	10300	2050	231
	3/A 00 L2	31.7	44	650	3.3	—	63	71	80	90	100	112	3440	3440	9850	11300	2260	231
	3/A 00 L2	39.6	35	550	2.2	—	63	71	80	90	100	112	3710	3710	10500	12100	2440	231
	3/A 00 L2	41.5	34	650	2.5	—	63	71	80	90	100	112	3770	3770	10700	12300	2480	231
	3/A 00 L2	51.8	27.0	550	1.7	—	63	71	80	90	100	112	4060	4060	11400	13100	2670	231
	3/A 00 L2	61.2	22.9	650	1.7	—	63	71	80	90	100	112	4290	4290	12000	13800	2820	231
	3/A 00 L2	71.0	19.7	650	1.5	—	63	71	80	90	100	112	4500	4500	12500	14400	2960	231
	3/A 00 L2	80.2	17.5	650	1.3	—	63	71	80	90	100	112	4690	4690	13000	14900	3080	231
	3/A 00 L2	88.6	15.8	550	1.0	—	63	71	80	90	100	112	4850	4850	13400	15400	3190	231
	3/A 00 L2	100	14.0	550	0.88	—	63	71	80	90	100	112	5050	5050	13900	16000	3320	231
	3/A 00 L2	107	13.0	650	0.97	—	63	71	80	90	100	112	5170	5170	14200	16300	3400	231
	3/A 00 L2	134	10.5	550	0.66	—	63	71	80	90	100	112	5570	5570	15200	17400	3660	231
	3/A 00 L2	171	8.2	550	0.52	—	63	71	80	90	100	112	6040	6040	16300	18800	3970	231
	3/A 00 L2	203	6.9	650	0.52	—	63	71	80	90	100	112	6390	6390	17200	19700	4200	231
	3/A 00 L2	219	6.4	620	0.46	—	63	71	80	90	100	112	6550	6550	17600	20200	4310	231
	3/A 00 L2	253	5.5	550	0.35	—	63	71	80	90	100	112	6880	6880	18400	21100	4520	231
	3/A 00 L2	296	4.7	660	0.36	—	63	71	80	90	100	112	7250	7250	19200	22100	4770	231
3/A 00 L2	319	4.4	440	0.22	—	63	71	—	—	—	—	7430	7430	19700	22600	4890	231	
3/A 00 L2	369	3.8	570	0.25	—	63	71	80	90	100	112	7800	7800	20600	23600	5130	231	
3/A 00 L2	391	3.6	540	0.22	—	63	71	—	—	—	—	7950	7950	20900	24000	5230	231	
3/A 00 L2	441	3.2	700	0.26	—	63	71	—	—	—	—	8280	8280	21700	24900	5440	231	
3/A 00 L2	550	2.5	600	0.17	—	63	71	—	—	—	—	8910	8910	23200	26600	5860	231	
3/A 00 L2	660	2.1	620	0.15	—	63	71	—	—	—	—	9470	9470	24500	28100	6220	231	

3/A 01 L2

1100 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 						R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
1400	3/A 01 L2	18.8	74	710	6.1	—	—	—	80	90	100	112	2890	2890	8420	9670	1900	239
	3/A 01 L2	23.0	61	870	6.1	—	—	—	80	90	100	112	3090	3090	8950	10300	2030	239
	3/A 01 L2	31.2	45	1180	6.1	—	—	—	80	90	100	112	3420	3420	9800	11300	2250	239
	3/A 01 L2	35.8	39	760	3.4	—	—	—	80	90	100	112	3590	3590	10200	11700	2360	239
	3/A 01 L2	40.1	35	870	3.5	—	63	71	80	90	100	112	3720	3720	10600	12100	2450	239
	3/A 01 L2	43.9	32	930	3.4	—	—	—	80	90	100	112	3840	3840	10900	12500	2520	239
	3/A 01 L2	49.1	28.5	830	2.7	—	63	71	80	90	100	112	3980	3980	11200	12900	2620	239
	3/A 01 L2	54.2	25.8	1180	3.5	—	63	71	80	90	100	112	4120	4120	11600	13300	2710	239
	3/A 01 L2	59.4	23.6	1260	3.4	—	—	—	80	90	100	112	4240	4240	11900	13700	2790	239
	3/A 01 L2	74.2	18.9	1150	2.5	—	—	—	80	90	100	112	4570	4570	12700	14600	3000	239
	3/A 01 L2	81.3	17.2	1300	2.6	—	63	71	80	90	100	112	4710	4710	13100	15000	3100	239
	3/A 01 L2	102	13.8	1150	1.8	—	63	71	80	90	100	112	5070	5070	14000	16000	3340	239
	3/A 01 L2	133	10.5	1300	1.6	—	63	71	80	90	100	112	5560	5560	15200	17400	3650	239
	3/A 01 L2	166	8.4	1150	1.1	—	63	71	80	90	100	112	5980	5980	16200	18600	3930	239
	3/A 01 L2	184	7.6	1030	0.90	—	63	71	80	90	100	112	6190	6190	16700	19200	4070	239
	3/A 01 L2	204	6.9	1300	1.0	—	63	71	80	90	100	112	6410	6410	17200	19800	4210	239
	3/A 01 L2	220	6.4	830	0.61	—	63	71	80	90	100	112	6560	6560	17600	20200	4310	239
	3/A 01 L2	255	5.5	1150	0.73	—	63	71	80	90	100	112	6900	6900	18400	21100	4530	239
	3/A 01 L2	269	5.2	1010	0.61	—	63	71	80	90	100	112	7020	7020	18700	21500	4620	239
	3/A 01 L2	311	4.5	1150	0.59	—	63	71	80	90	100	112	7370	7370	19500	22400	4850	239
3/A 01 L2	364	3.8	1350	0.60	—	63	71	80	90	100	112	7770	7770	20500	23500	5110	239	
3/A 01 L2	393	3.6	830	0.34	—	63	71	—	—	—	—	7970	7970	21000	24100	5240	239	
3/A 01 L2	454	3.1	1150	0.41	—	63	71	80	90	100	112	8360	8360	21900	25100	5500	239	
3/A 01 L2	533	2.6	1120	0.34	—	63	71	—	—	—	—	8820	8820	23000	26400	5800	239	
3/A 01 L2	665	2.1	1150	0.28	—	63	71	—	—	—	—	9490	9490	24500	28200	6240	239	



3/A 03 L2

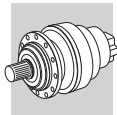
1800 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P ₋ (IEC) 						Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ							
1400	3/A 03 L2	19.4	72	1050	8.7	—	—	—	80	90	100	112	8990	10400	17400	20900	5770	247
	3/A 03 L2	23.0	61	1240	8.7	—	—	—	80	90	100	112	9500	11000	18200	22000	6100	247
	3/A 03 L2	28.8	49	1550	8.7	—	—	—	80	90	100	112	10300	11800	19500	23500	6580	247
	3/A 03 L2	33.5	42	1760	8.4	—	—	—	80	90	100	112	10800	12400	20400	24600	6910	247
	3/A 03 L2	40.5	35	1650	6.6	—	—	—	80	90	100	112	11500	13300	21600	26000	7370	247
	3/A 03 L2	43.4	32	1760	6.5	—	—	—	80	90	100	112	11800	13600	22100	26600	7540	247
	3/A 03 L2	52.5	26.7	1650	5.1	—	—	—	80	90	100	112	12500	14500	23400	28100	8030	247
	3/A 03 L2	52.5	26.7	1650	5.1	—	—	—	80	90	100	112	12500	14500	23400	28100	8030	247
	3/A 03 L2	62.9	22.2	1550	4.0	—	63	71	80	90	100	112	13300	15400	24700	29700	8530	247
	3/A 03 L2	73.2	19.1	1780	3.9	—	63	71	80	90	100	112	14000	16100	25800	31100	8970	247
	3/A 03 L2	88.5	15.8	1650	3.0	—	63	71	80	90	100	112	14900	17200	27400	32900	9560	247
	3/A 03 L2	96.9	14.4	1690	2.8	—	63	71	80	90	100	112	15400	17700	28100	33800	9850	247
	3/A 03 L2	182	7.7	1800	1.6	—	63	71	80	90	100	112	18900	21900	33900	40800	12200	247
	3/A 03 L2	220	6.4	1650	1.2	—	63	71	80	90	100	112	20200	23300	35900	43200	12900	247
	3/A 03 L2	269	5.2	1800	1.1	—	63	71	80	90	100	112	21600	24900	38200	45900	13900	247
	3/A 03 L2	269	5.2	1800	1.1	—	63	71	80	90	100	112	21600	24900	38200	45900	13900	247
	3/A 03 L2	326	4.3	1670	0.83	—	63	71	80	90	100	112	23000	26600	40400	48600	14800	247
	3/A 03 L2	352	4.0	2020	0.92	—	63	71	80	90	100	112	23600	27300	41400	49800	15100	247
	3/A 03 L2	409	3.4	1910	0.75	—	63	71	80	90	100	112	24800	28700	43300	52100	15900	247
	3/A 03 L2	495	2.8	1730	0.56	—	63	71	80	90	100	112	26500	30500	45800	55200	17000	247
	3/A 03 L2	574	2.4	1760	0.49	—	63	71	80	90	100	112	27800	32100	47900	57700	17800	247
	3/A 03 L2	605	2.3	1800	0.48	—	63	71	80	90	100	112	28300	32600	48700	58600	18100	247
	3/A 03 L2	731	1.9	1820	0.40	—	63	71	80	90	100	112	30100	34800	51500	62000	19300	247

3/A 04 L2

2900 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P ₋ (IEC) 							R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ								
1400	3/A 04 L2	18.7	75	1920	16.5	—	—	—	80	90	100	112	132	8880	10300	17200	20600	5700	257
	3/A 04 L2	22.1	63	2270	16.5	—	—	—	80	90	100	112	132	9380	10800	18000	21700	6020	257
	3/A 04 L2	25.6	55	1920	12.1	—	—	—	80	90	100	112	132	9850	11400	18800	22700	6320	257
	3/A 04 L2	27.7	50	2750	15.9	—	—	—	80	90	100	112	132	10100	11700	19300	23200	6490	257
	3/A 04 L2	30.2	46	2270	12.1	—	—	—	80	90	100	112	132	10400	12000	19800	23800	6680	257
	3/A 04 L2	35.3	40	2270	10.3	—	—	—	80	90	100	112	132	11000	12700	20800	25000	7040	257
	3/A 04 L2	39.1	36	2270	9.3	—	—	—	80	90	100	112	132	11400	13100	21400	25800	7280	257
	3/A 04 L2	44.3	32	2760	10.0	—	—	—	80	90	100	112	132	11800	13700	22200	26700	7590	257
	3/A 04 L2	49.7	28.2	2270	7.3	—	63	71	80	90	100	112	132	12300	14200	23000	27700	7890	257
	3/A 04 L2	54.5	25.7	2290	6.8	—	—	—	80	90	100	112	132	12700	14600	23700	28500	8140	257
	3/A 04 L2	62.4	22.4	2770	7.1	—	63	71	80	90	100	112	132	13300	15300	24600	29600	8510	257
	3/A 04 L2	68.4	20.5	2510	5.9	—	—	—	80	90	100	112	132	13700	15800	25300	30500	8770	257
	3/A 04 L2	81.7	17.1	2370	4.7	—	63	71	80	90	100	112	132	14500	16800	26700	32100	9310	257
	3/A 04 L2	90.7	15.4	2290	4.1	—	—	—	80	90	100	112	132	15000	17300	27600	33200	9640	257
	3/A 04 L2	102	13.7	2550	4.0	—	63	71	80	90	100	112	132	15600	18000	28500	34300	10000	257
	3/A 04 L2	117	12.0	2290	3.1	—	—	—	80	90	100	112	132	16400	18900	29700	35800	10500	257
	3/A 04 L2	129	10.8	2720	3.4	—	63	71	80	90	100	112	132	16900	19500	30600	36900	10800	257
	3/A 04 L2	149	9.4	2290	2.5	—	63	71	80	90	100	112	132	17700	20500	32000	38500	11400	257
	3/A 04 L2	162	8.6	2900	2.9	—	63	71	80	90	100	112	132	18200	21100	32800	39500	11700	257
	3/A 04 L2	174	8.1	2970	2.7	—	63	71	80	90	100	112	—	18700	21500	33500	40300	12000	257
	3/A 04 L2	205	6.8	3500	2.7	—	63	71	80	90	100	112	—	19700	22800	35200	42400	12700	257
	3/A 04 L2	226	6.2	3500	2.5	—	63	71	80	90	100	112	—	20400	23500	36200	43600	13100	257
	3/A 04 L2	250	5.6	3500	2.3	—	63	71	80	90	100	112	—	21100	24300	37300	44900	13500	257
	3/A 04 L2	283	4.9	2800	1.6	—	63	71	80	90	100	112	—	22000	25400	38800	46700	14100	257
	3/A 04 L2	317	4.4	2310	1.2	—	63	71	80	90	100	112	—	22800	26300	40100	48300	14600	257
	3/A 04 L2	349	4.0	2320	1.1	—	63	71	80	90	100	112	—	23500	27200	41300	49700	15100	257
	3/A 04 L2	386	3.6	2340	0.97	—	63	71	80	90	100	112	—	24400	28100	42600	51200	15600	257
	3/A 04 L2	469	3.0	2370	0.81	—	63	71	80	90	100	112	—	26000	30000	45100	54300	16700	257
	3/A 04 L2	520	2.7	2390	0.74	—	63	71	80	90	100	112	—	26900	31100	46500	56000	17300	257



3/A 05 L2

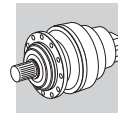
3600 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 								Rn ₂ [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ									
1400	3/A 05L2	18.7	75	1920	16.5	—	—	—	80	90	100	112	132	8880	10300	17200	20600	5700	267	
	3/A 05L2	22.1	63	2270	16.5	—	—	—	80	90	100	112	132	9380	10800	18000	21700	6020	267	
	3/A 05L2	27.7	51	2850	16.5	—	—	—	80	90	100	112	132	10100	11700	19300	23200	6490	267	
	3/A 05L2	32.2	43	3310	16.5	—	—	—	80	90	100	112	132	10600	12300	20200	24300	6830	267	
	3/A 05L2	39.0	36	3020	12.5	—	—	—	80	90	100	112	132	11300	13100	21400	25700	7280	267	
	3/A 05L2	44.0	32	3310	12.1	—	—	—	80	90	100	112	132	11800	13600	22200	26700	7580	267	
	3/A 05L2	53.3	26.3	3040	9.2	—	—	—	80	90	100	112	132	12600	14500	23500	28300	8070	267	
	3/A 05L2	57.0	24.5	3310	9.3	—	—	—	80	90	100	112	132	12900	14900	24000	28800	8260	267	
	3/A 05L2	62.6	22.4	3220	8.3	—	—	—	80	90	100	112	132	13300	15300	24700	29700	8520	267	
	3/A 05L2	72.5	19.3	3310	7.3	—	63	71	80	90	100	112	132	13900	16100	25800	31000	8950	267	
	3/A 05L2	75.8	18.5	3060	6.5	—	—	—	80	90	100	112	132	14100	16300	26100	31400	9080	267	
	3/A 05L2	85.6	16.4	3520	6.6	—	—	—	80	90	100	112	132	14700	17000	27100	32600	9450	267	
	3/A 05L2	104	13.5	3080	4.8	—	—	—	80	90	100	112	132	15700	18100	28700	34500	10100	267	
	3/A 05L2	121	11.6	3520	4.7	—	63	71	80	90	100	112	132	16500	19100	30000	36200	10600	267	
	3/A 05L2	141	9.9	3600	4.1	—	63	71	80	90	100	112	132	17400	20100	31400	37800	11200	267	
	3/A 05L2	162	8.6	2900	2.9	—	63	71	80	90	100	112	132	18200	21100	32800	39500	11700	267	
	3/A 05L2	175	8.0	3600	3.3	—	63	71	80	90	100	112	132	18700	21600	33600	40400	12000	267	
	3/A 05L2	212	6.6	3100	2.3	—	63	71	80	90	100	112	132	19900	23000	35600	42800	12800	267	
	3/A 05L2	212	6.6	3100	2.3	—	63	71	80	90	100	112	132	19900	23000	35600	42800	12800	267	
	3/A 05L2	241	5.8	4290	2.9	—	63	71	80	90	100	112	132	20800	24000	36900	44400	13300	267	
3/A 05L2	280	5.0	3600	2.1	—	63	71	80	90	100	112	132	21900	25200	38600	46500	14000	267		
3/A 05L2	329	4.3	3680	1.8	—	63	71	80	90	100	112	—	23100	26700	40600	48800	14800	267		
3/A 05L2	398	3.5	3200	1.3	—	63	71	80	90	100	112	—	24600	28400	42900	51700	15800	267		
3/A 05L2	422	3.3	4400	1.7	—	63	71	80	90	100	112	—	25100	29000	43700	52600	16100	267		
3/A 05L2	491	2.9	3880	1.3	—	63	71	80	90	100	112	—	26400	30500	45700	55000	16900	267		
3/A 05L2	594	2.4	3330	0.90	—	63	71	80	90	100	112	—	28100	32500	48400	58300	18000	267		

3/A 06 L2

6500 Nm

n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	Pt kW	P (IEC) 								Rn ₂ [N]						
							MC/PC	MZ/PZ	HC	HZ	FZ										
1400	3/A 06L2	27.7	51	3320	19.2	—	—	—	80	90	100	112	132	160	180	12600	14300	31600	36800	9470	277
	3/A 06L2	32.7	43	3920	19.2	—	—	—	80	90	100	112	132	160	180	13300	15100	33200	38700	10000	277
	3/A 06L2	34.9	40	3490	16.1	—	—	—	80	90	100	112	132	160	180	13600	15400	33900	39400	10200	277
	3/A 06L2	41.1	34	4910	19.2	—	—	—	80	90	100	112	132	160	180	14400	16300	35500	41400	10800	277
	3/A 06L2	47.2	29.7	3840	13.1	—	—	—	80	90	100	112	132	160	180	15000	17000	37000	43100	11300	277
	3/A 06L2	51.7	27.1	5170	16.1	—	—	—	80	90	100	112	132	160	180	15500	17600	38100	44400	11700	277
	3/A 06L2	55.7	25.1	4530	13.1	—	—	—	80	90	100	112	132	160	180	15900	18000	38900	45300	11900	277
	3/A 06L2	60.1	23.3	6010	16.1	—	—	—	80	90	100	112	132	160	180	16300	18500	39800	46400	12300	277
	3/A 06L2	69.9	20.0	5690	13.1	—	—	—	80	90	100	112	132	160	180	17200	19400	41700	48500	12900	277
	3/A 06L2	81.2	17.2	6220	12.3	—	—	—	80	90	100	112	132	160	180	18000	20400	43600	50800	13500	277
	3/A 06L2	88.5	15.8	6210	11.3	—	—	—	80	90	100	112	132	160	180	18600	21000	44700	52100	13900	277
	3/A 06L2	98.3	14.2	5310	8.7	—	—	—	80	90	100	112	132	160	180	19200	21800	46200	53800	14400	277
	3/A 06L2	112	12.5	6180	9.2	—	—	—	80	90	100	112	132	160	180	20100	22800	48000	55900	15100	277
	3/A 06L2	125	11.2	5440	7.0	—	—	—	80	90	100	112	132	160	180	20800	23600	49600	57700	15600	277
	3/A 06L2	141	9.9	7760	9.2	—	—	—	80	90	100	112	132	160	180	21700	24500	51400	59900	16300	277
	3/A 06L2	164	8.6	6500	6.6	—	—	—	80	90	100	112	132	160	180	22800	25800	53800	62700	17100	277
	3/A 06L2	190	7.4	7760	6.8	—	—	—	80	90	100	112	132	160	180	23900	27100	56300	65500	18000	277
	3/A 06L2	198	7.1	5500	4.6	—	—	—	80	90	100	112	132	160	180	24300	27500	57000	66300	18200	277
	3/A 06L2	221	6.3	6500	4.9	—	—	—	80	90	100	112	132	160	180	25200	28500	58900	68500	18900	277
	3/A 06L2	267	5.2	5500	3.4	—	—	—	80	90	100	112	132	160	180	26800	30400	62300	72600	20100	277
3/A 06L2	276	5.1	7760	4.7	—	63	71	80	90	100	112	132	160	180	27100	30700	62900	73300	20400	277	
3/A 06L2	321	4.4	6630	3.4	—	63	71	80	90	100	112	132	160	180	28500	32300	65800	76700	21400	277	
3/A 06L2	388	3.6	5680	2.4	—	63	71	80	90	100	112	132	160	180	30400	34400	69700	81200	22800	277	
3/A 06L2	380	3.7	6180	2.7	—	63	71	80	90	100	112	132	160	180	30200	34200	69300	80700	22700	277	
3/A 06L2	435	3.2	7760	3.0	—	63	71	80	90	100	112	132	160	180	31500	35700	72100	84000	23700	277	
3/A 06L2	505	2.8	7090	2.3	—	63	71	80	90	100	112	132	160	180	33200	37600	75500	87900	24900	277	
3/A 06L2	555	2.5	7190	2.2	—	63	71	80	90	100	112	132	160	180	34200	38800	77600	90400	25700	277	
3/A 06L2	611	2.3	6000	1.6	—	63	71	80	90	100	112	132	160	180	35300	40000	79900	93000	26600	277	
3/A 06L2	671	2.1	6100	1.5	—	63	71	80	90	100	112	132	160	180	36500	41300	82200	95700	27400	277	



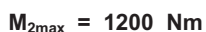
3/A 07 L2

9000 Nm

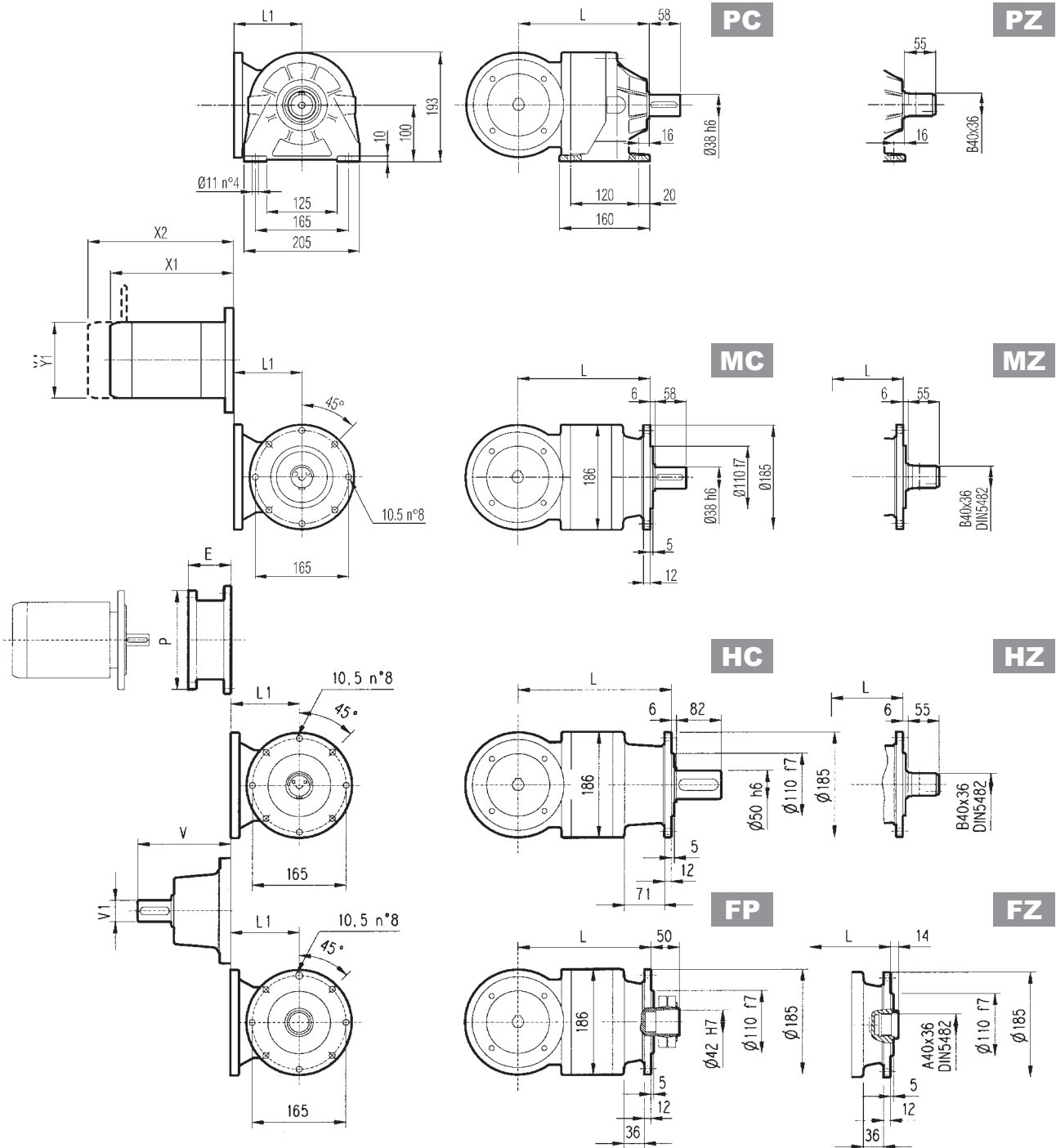
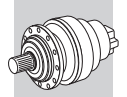
n ₁ min ⁻¹		i	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	P _t kW	P (IEC) 										R _{n2} [N]					
							MC/PC	MZ/PZ	HC	HZ	FZ											
1400	3/A 07L2	27.1	52	6650	39	—	—	—	—	—	—	132	160	180	13900	17400	33700	44200	12100	287		
	3/A 07L2	32.3	43	7940	39	—	—	—	—	—	—	132	160	180	14700	18500	35600	46600	12800	287		
	3/A 07L2	41.5	34	8310	32	—	—	—	—	—	—	132	160	180	16000	20100	38300	50200	13900	287		
	3/A 07L2	49.2	28.4	8040	26	—	—	—	—	—	—	132	160	180	17000	21300	40400	52900	14700	287		
	3/A 07L2	57.3	24.5	6650	18.7	—	—	—	80	90	100	112	132	160	180	17800	22400	42200	55400	15500	287	
	3/A 07L2	68.3	20.5	7940	18.7	—	—	—	80	90	100	112	132	160	180	18900	23700	44500	58400	16400	287	
	3/A 07L2	87.7	16.0	9590	17.6	—	—	—	80	90	100	112	132	160	180	20600	25800	48000	62900	17900	287	
	3/A 07L2	109	12.9	8830	13.5	—	—	—	80	90	100	112	132	160	180	22100	27700	51200	67100	19200	287	
	3/A 07L2	130	10.8	11100	14.2	—	—	—	80	90	100	112	132	160	180	23400	29400	54000	70700	20400	287	
	3/A 07L2	140	10.0	11100	13.2	—	—	—	80	90	100	112	132	160	180	24000	30200	55300	72400	20900	287	
	3/A 07L2	155	9.0	9000	9.6	—	—	—	80	90	100	112	132	160	180	24900	31200	56900	74600	21600	287	
	3/A 07L2	180	7.8	10600	9.8	—	—	—	80	90	100	112	132	160	180	26100	32800	59600	78100	22700	287	
	3/A 07L2	198	7.1	8700	7.3	—	—	—	80	90	100	112	132	160	180	27000	33800	61200	80300	23400	287	
	3/A 07L2	223	6.3	9000	6.7	—	63	71	80	90	100	112	132	160	180	28100	35200	63500	83200	24400	287	
	3/A 07L2	241	5.8	9000	6.2	—	63	71	80	90	100	112	132	160	180	28800	36200	65000	85200	25000	287	
	3/A 07L2	282	5.0	8710	5.1	—	—	—	80	90	100	112	132	160	180	30300	38100	68100	89300	26400	287	
	3/A 07L2	341	4.1	11100	5.4	—	63	71	80	90	100	112	132	160	180	32300	40600	72200	94600	28100	287	
	3/A 07L2	405	3.5	9170	3.8	—	63	71	80	90	100	112	132	160	180	34200	43000	76000	99500	29800	287	
	3/A 07L2	439	3.2	9270	3.5	—	63	71	80	90	100	112	132	160	180	35200	44100	77800	102000	30600	287	



28.0 - DIMENSIONS



 **Bonfiglioli**
Trasmissioni



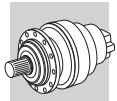
FP

M_{2max} = 1200 Nm

	L				L1	Kg									
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg
300 R2	172	178	207	172	122	32	37	34	30	137.5	24	6	158	38	7
300 R3	225	231	260	225	122	36	41	38	34	137.5	24	6	158	38	7
300 R4	278	284	313	278	122	40	45	42	38	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
300 R2	65	160	84	200	84	200	94	250	94	250	114	300
300 R3	65	160	84	200	84	200	94	250	94	250	114	300
300 R4	65	160	84	200	84	200	94	250	94	250	114	300

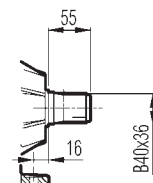
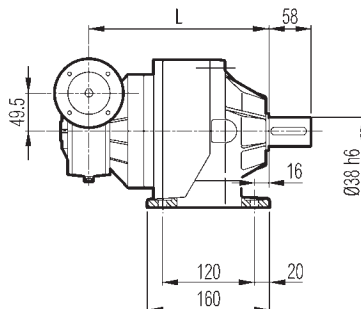
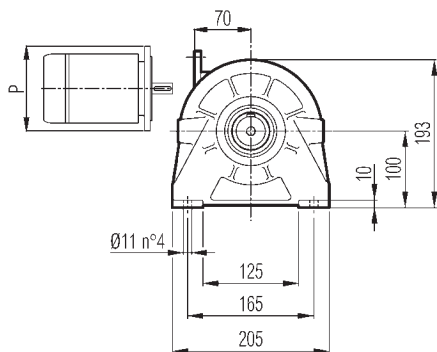
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
300 R2	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
300 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
300 R4	229	292	138	253	314	138	328	400	156	373	469	195	-	-	-	-	-	-



3/V 00 L3

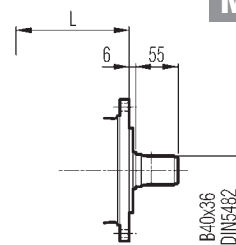
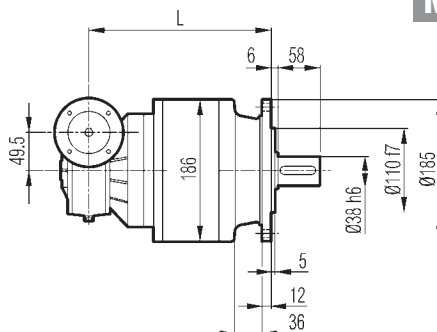
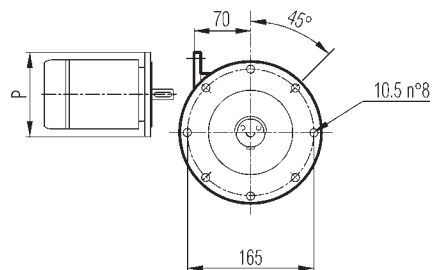
PC

PZ



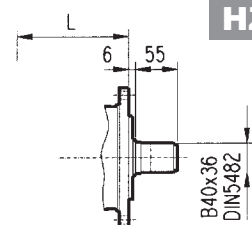
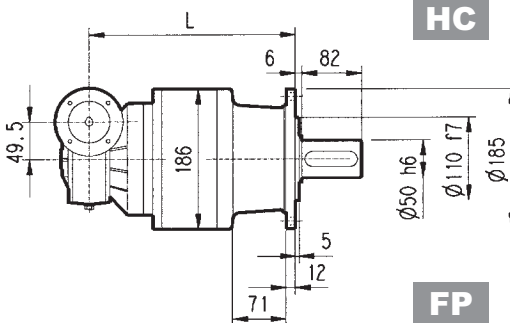
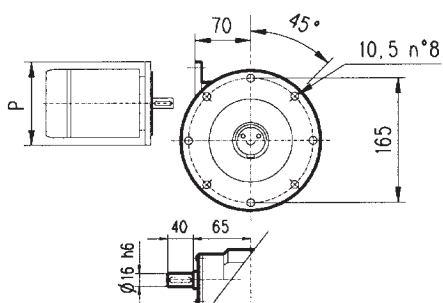
MC

MZ



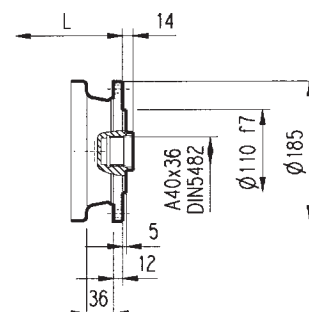
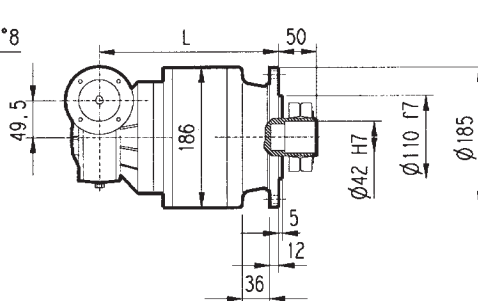
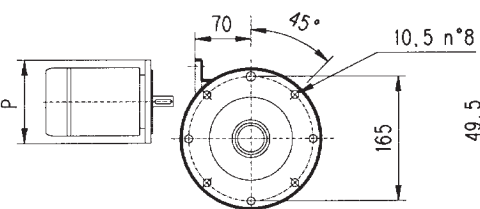
HC

HZ



FP

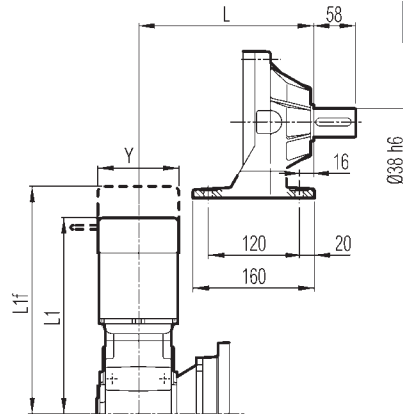
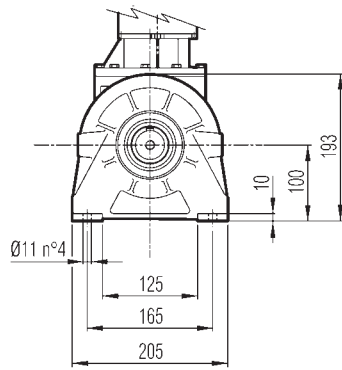
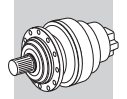
FZ



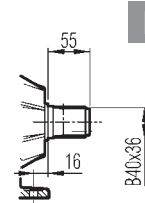
FP

M_{2max} = 1200 Nm

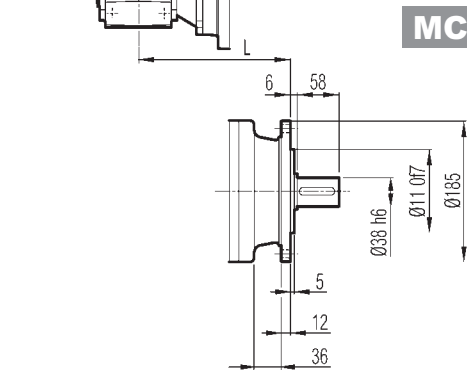
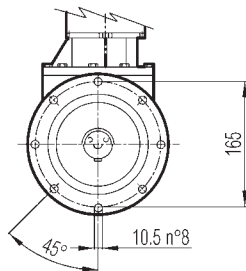
	L				Kg				P63	P71	P80
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P
3/V 00 L3	255	261	290	255	25	30	27	23	140	160	200



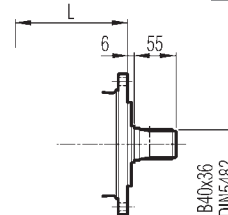
PC



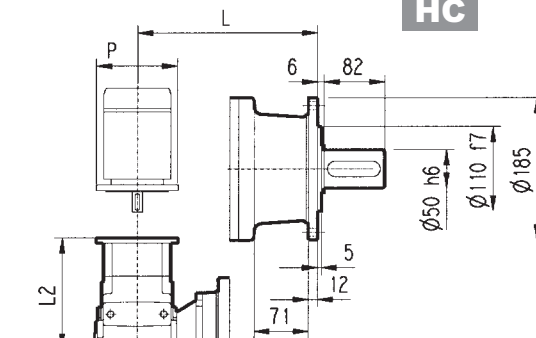
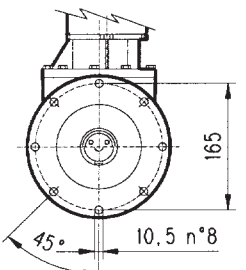
PZ



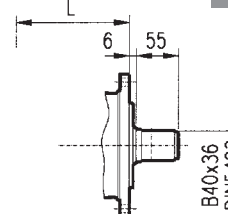
MC



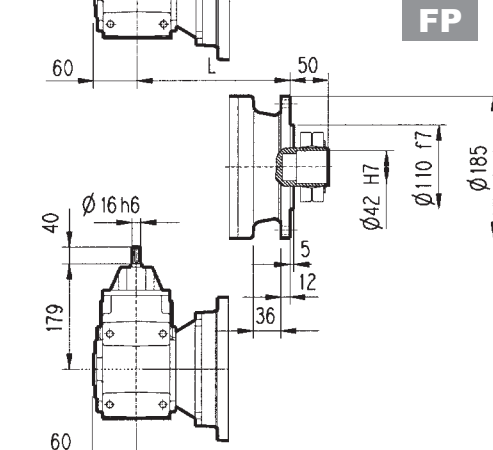
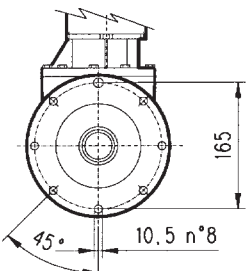
MZ



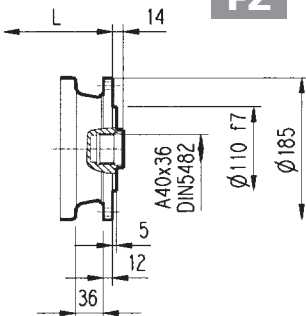
HC



HZ



FP

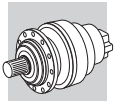


FZ

FP

 $M_{2max} = 1200 \text{ Nm}$

	L																															
	MC - MZ				PC - PZ				HC - HZ				FP - FZ				MC - MZ				PC - PZ				HC - HZ				FP - FZ			
3/A 00 L2	193				199				228				193				38				43				40				36			
	P63		P71		P80		P90		P100		S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3SA			S3 + M3LA									
	L2	P	L2	P	L2	P	L2	P	L2	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y							
3/A 00 L2	212.5	140	212.5	160	232	200	232	200	242	250	340	406	138	368	428	138	394	466	156	439	535	195	470	563	195							

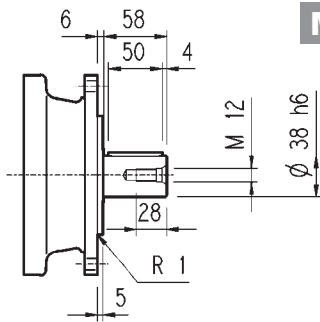


300 L

300 R

3/V 00 L3

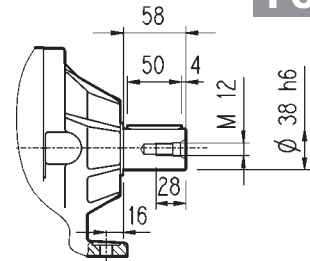
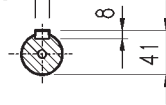
3/A 00 L2



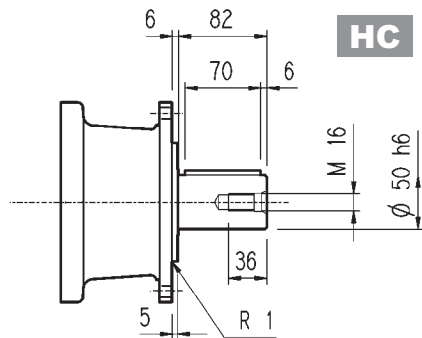
MC

A 10x8x50

UNI 6604
DIN 6885



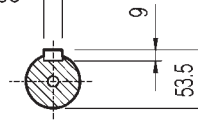
PC



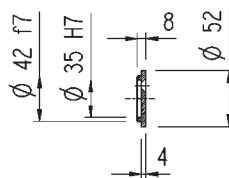
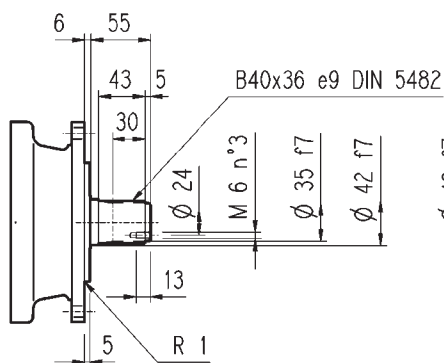
HC

A 14x9x70

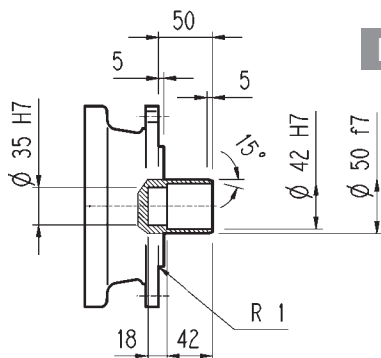
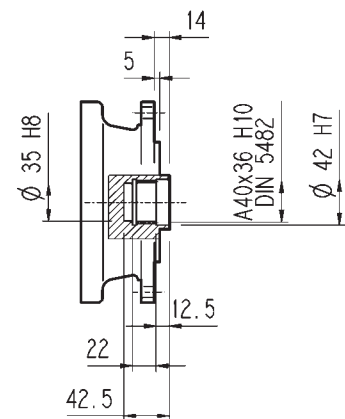
UNI 6604
DIN 6885



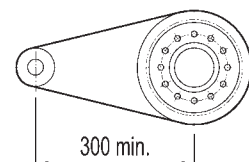
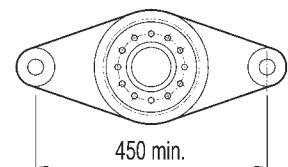
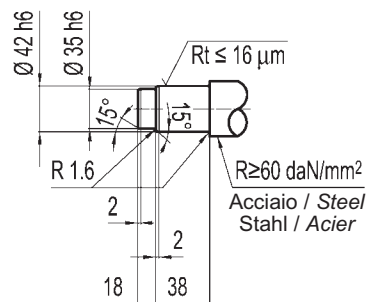
MZ HZ



FZ

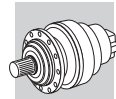
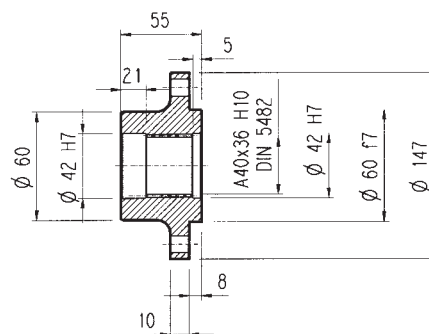
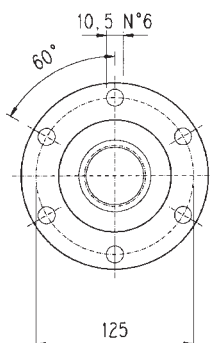
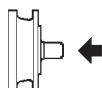


FP

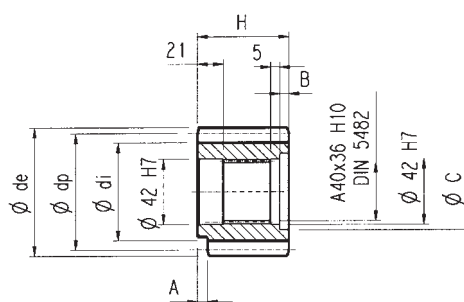
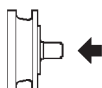


FP

M_{2max} = 1200 Nm

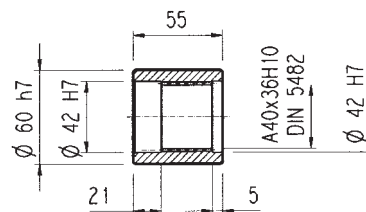
300 L**300 R****3/V 00 L3****3/A 00 L2**
Flangia / Flange
Flansch / Brides
W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

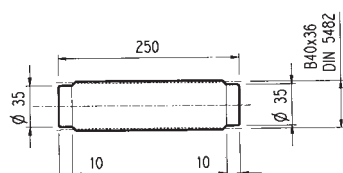
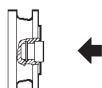
Pignoni / Pinion gears
Ritzel / Pignons
P...

	m	z	x	dp	di	de	H	A	B	C	☆
PBE	4.5	14	0.507	63	56	75.5	55	0	0	0	□
PCE	5	14	0.500	70	62.5	84.8	65	0	10	53	□
PDC	6	12	0.250	72	61	84.8	59	14	4	54	□
PDE	6	14	0.500	84	73	99.6	65	0	10	54	□

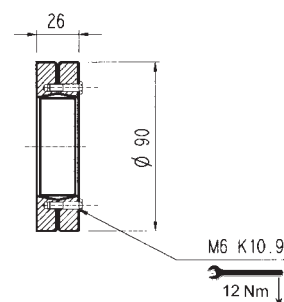
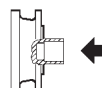
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimentée et trempé 18NiCrMo5

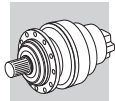
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure
MOA

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée
B0A

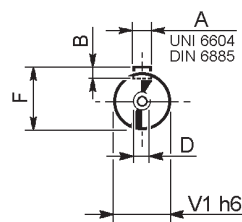
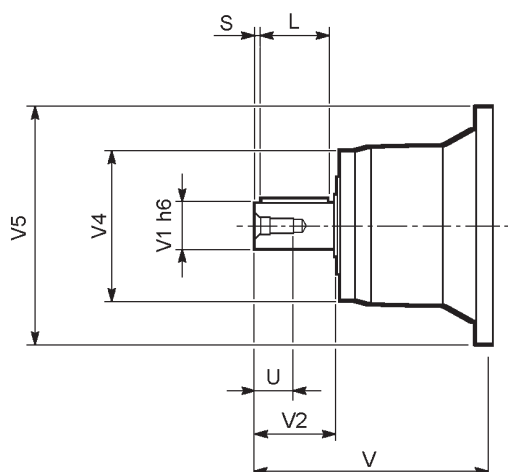
Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage
G0A



300 L

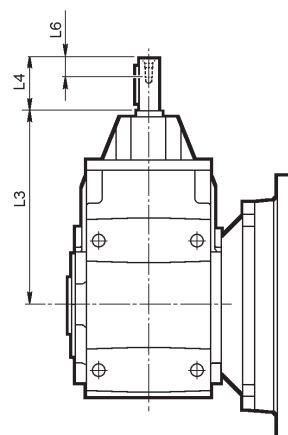
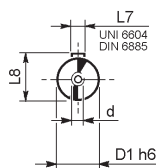
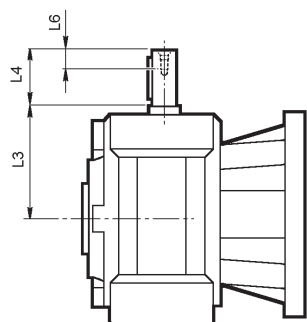
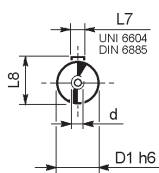
300 R



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
300 L1	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
300 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

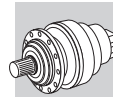
3/V 00 L3

3/A 00 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 00 L3_HS	16	65	40	16	5	18	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 00 L2_HS	16	179	40	16	5	18	M6

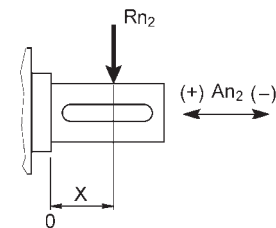
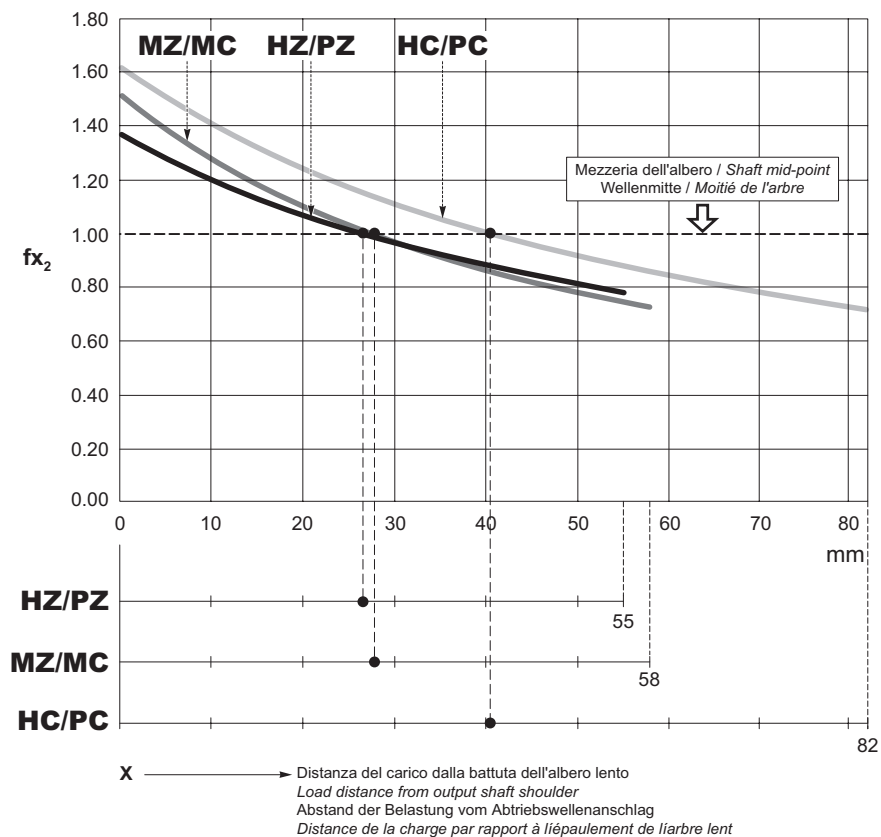


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load application point factor for radial loading on output shaft.

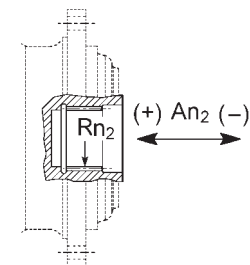
Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$$R_{x2} = R_{n2} \cdot f_{x2}$$

$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ	1.18	1.18
HC	1.29	1.29
MC	2.20	2.20
MZ	2.04	2.04



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	1.00	1.00

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

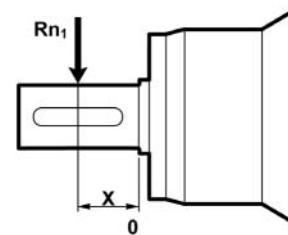
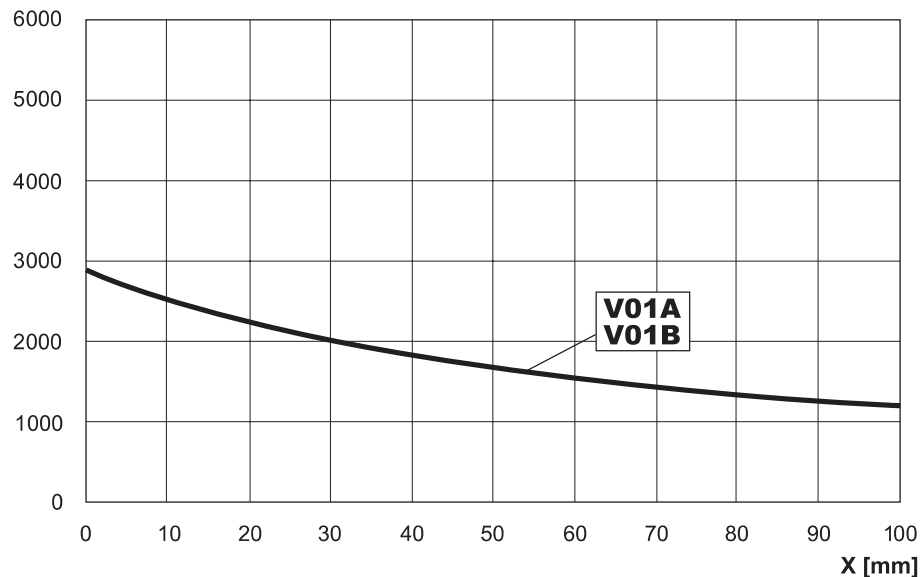
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.

R_{n1} [N]

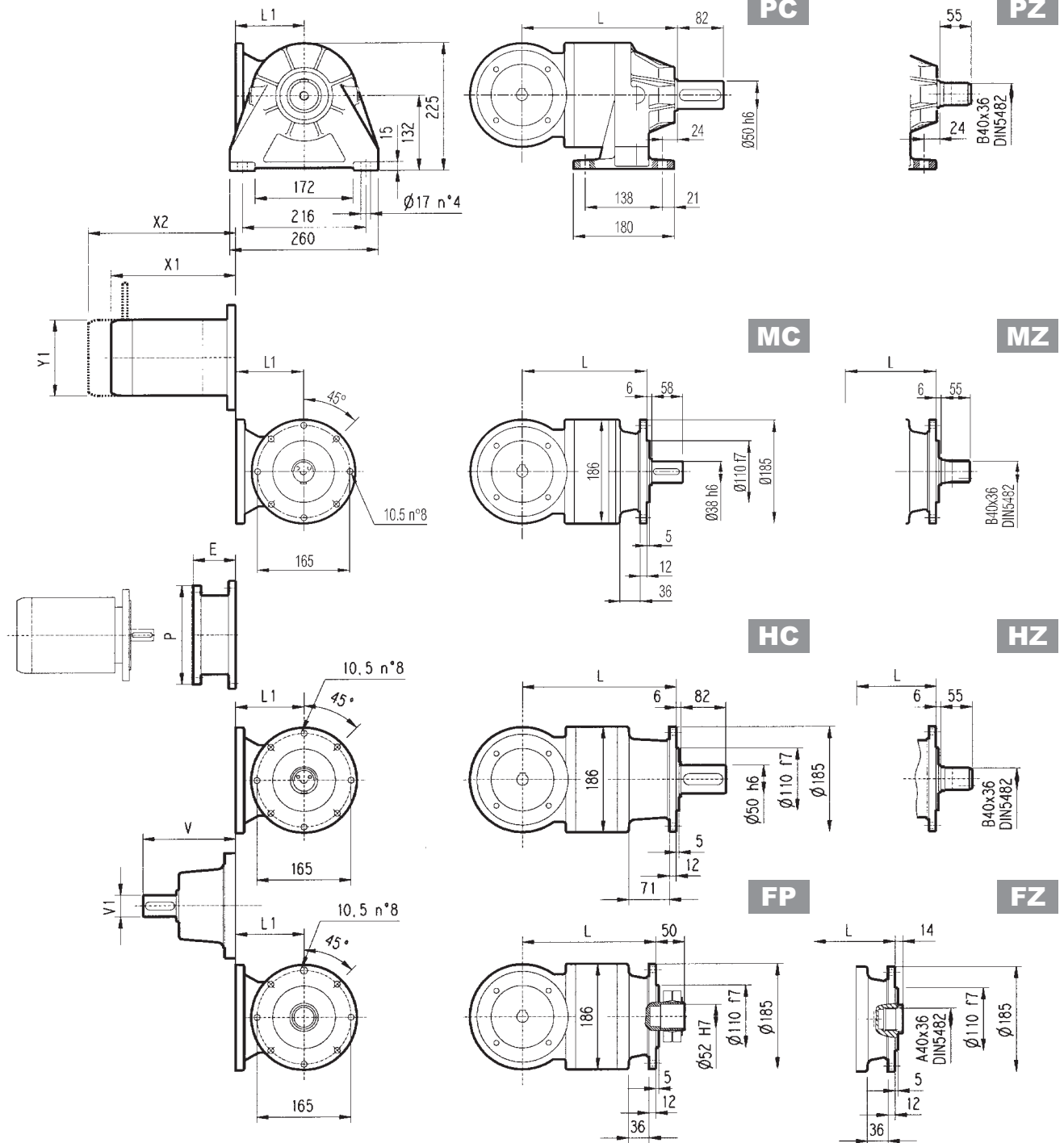
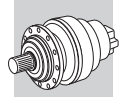




	L													
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1		V	V1	
301 L1	92	132	126	92	21	26	23	19	137.5	24	6	158	38	7
301 L2	145	185	176	145	25	30	27	23	137.5	24	6	158	38	7
301 L3	198	238	232	198	29	34	31	27	137.5	24	6	158	38	7
301 L4	251	291	285	251	33	38	35	31	137.5	24	6	158	38	7

	P71			P80			P90			P100			P112			P132		
	E	P		E	P		E	P		E	P		E	P		E	P	
301 L1	65	160		84	200		84	200		94	250		94	250		114	300	
301 L2	65	160		84	200		84	200		94	250		94	250		114	300	
301 L3	65	160		84	200		84	200		94	250		94	250		114	300	
301 L4	65	160		84	200		84	200		94	250		94	250		114	300	

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
301 L1	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
301 L2	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
301 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258
301 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258



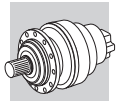
FP

$M_{2max} = 2400 \text{ Nm}$

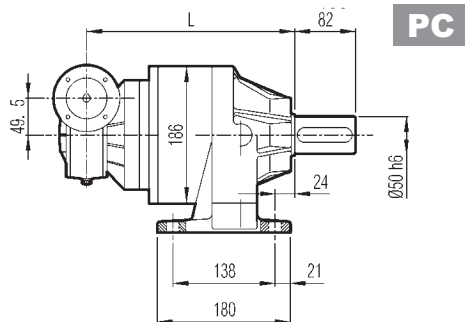
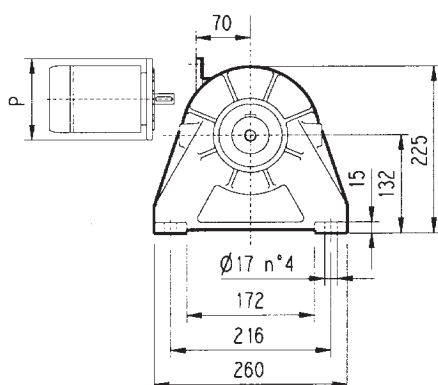
	L				L1	Kg									
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg
301 R2	184	225	219	184	122	35	42	37	33	137.5	24	6	158	38	7
301 R3	237	278	272	237	122	39	46	41	37	137.5	24	6	158	38	7
301 R4	290	331	325	290	122	43	50	45	41	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
301 R2	65	160	84	200	84	200	94	250	94	250	114	300
301 R3	65	160	84	200	84	200	94	250	94	250	114	300
301 R4	65	160	84	200	84	200	94	250	94	250	114	300

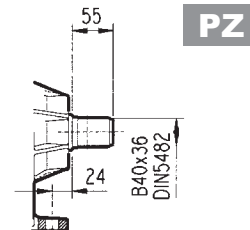
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
301 R2	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
301 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
301 R4	229	292	138	253	314	138	328	400	156	373	469	195	-	-	-	-	-	-



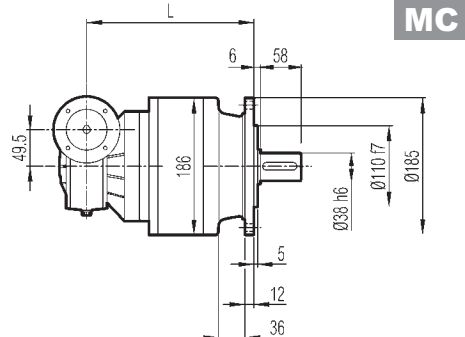
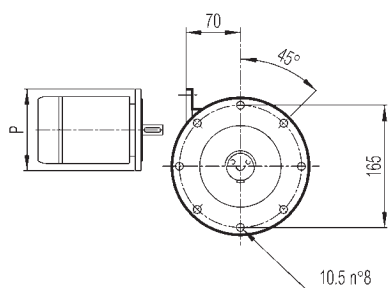
3/V 01 L3



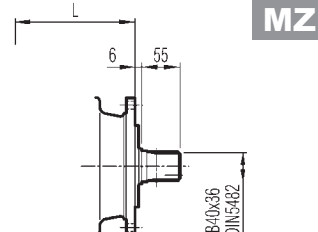
PC



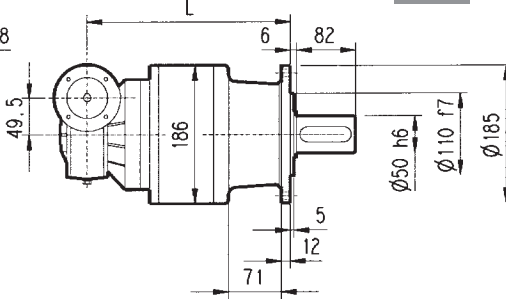
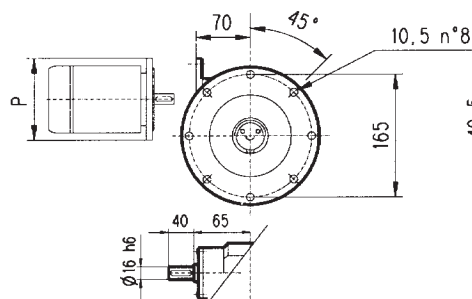
PZ



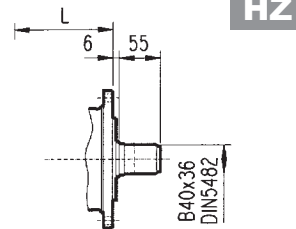
MC



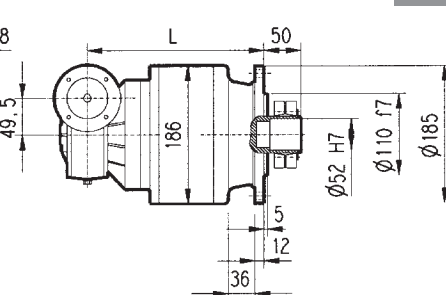
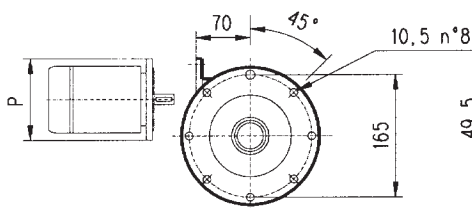
MZ



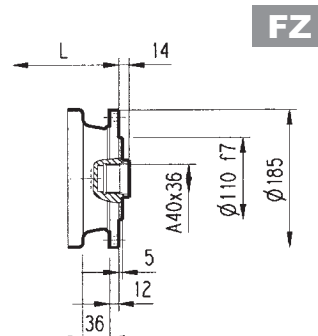
HC



HZ



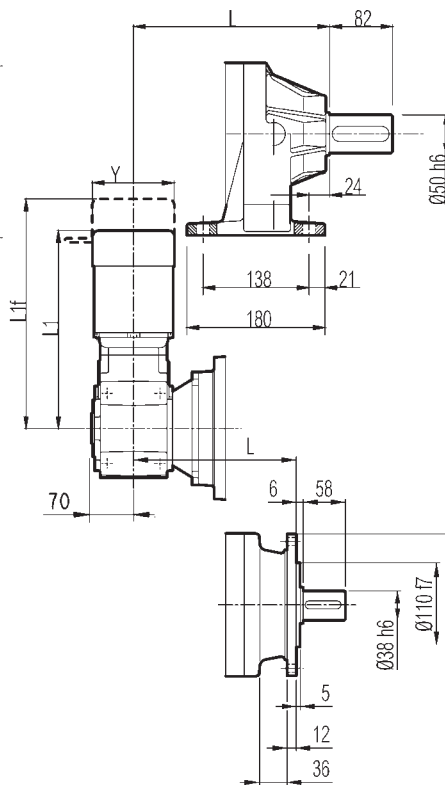
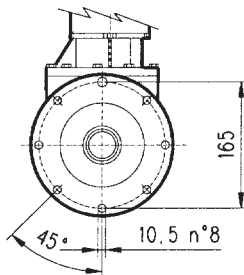
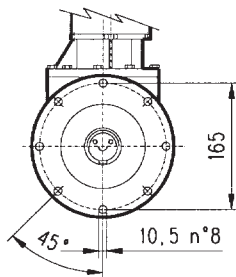
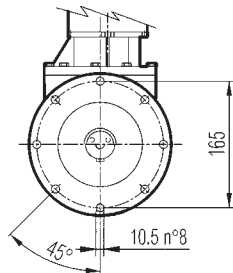
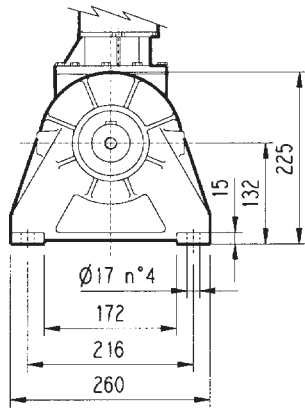
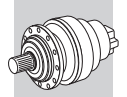
FP



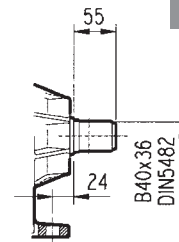
FZ

FP	M_{2max} = 2400 Nm

	L				Kg				P63	P71	P80
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P
3/V 01 L3	267	308	302	267	28	35	30	26	140	160	200

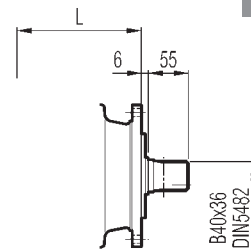


PC



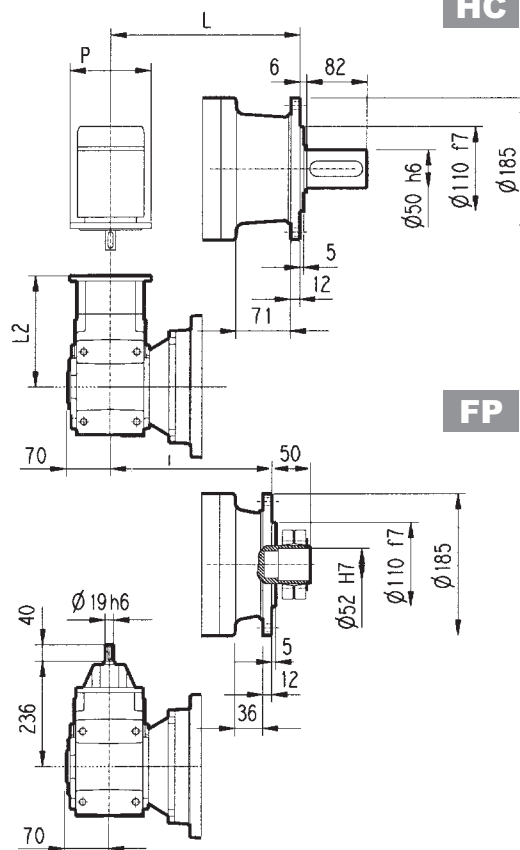
PZ

MC

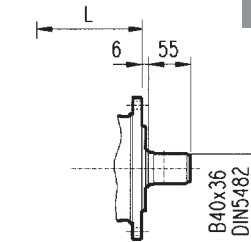


MZ

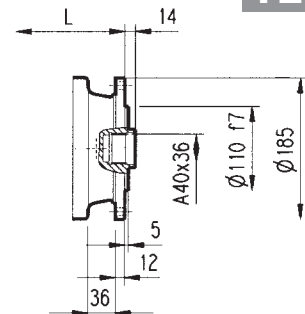
HC



HZ



FP

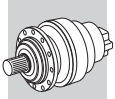


FZ

FP

 $M_{2max} = 2400 \text{ Nm}$

	L																															
	MC - MZ				PC - PZ				HC - HZ				FP - FZ				MC - MZ				PC - PZ				HC - HZ				FP - FZ			
3/A 01 L2	202				208				237				202				40				46				43				40			
	P63		P71		P80		P90		P100		S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3SA			S3 + M3LA									
	L2	P	L2	P	L2	P	L2	P	L2	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y							
3/A 01 L2	226	140	226	160	245.5	200	245.5	200	255.5	250	354	420	138	382	442	138	408	480	156	453	549	195	484	577	195							

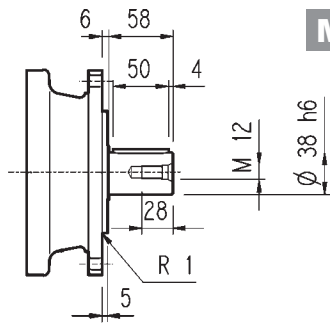


301 L

301 R

3/V 01 L3

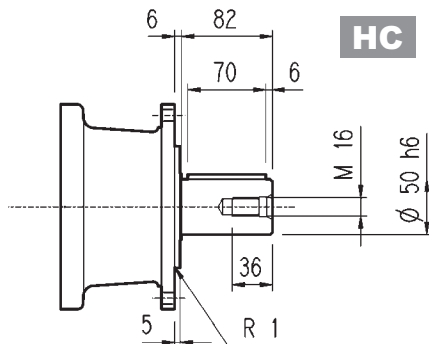
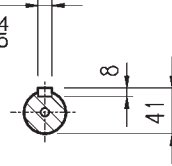
3/A 01 L2



MC

A 10x8x50

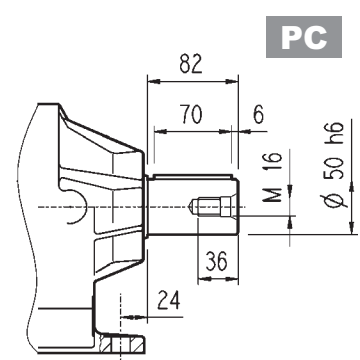
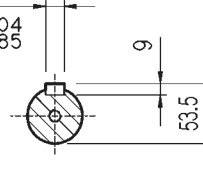
UNI 6604
DIN 6885



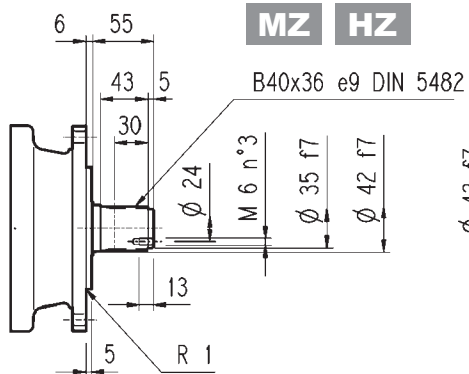
HC

A 14x9x70

UNI 6604
DIN 6885

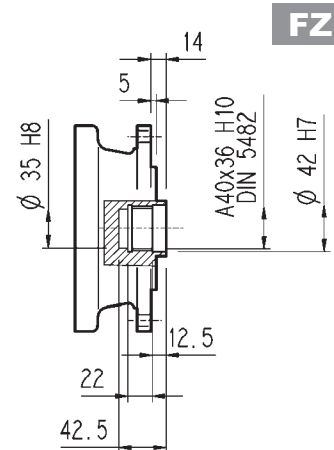
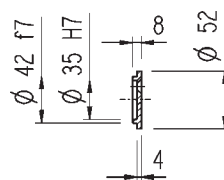


PC

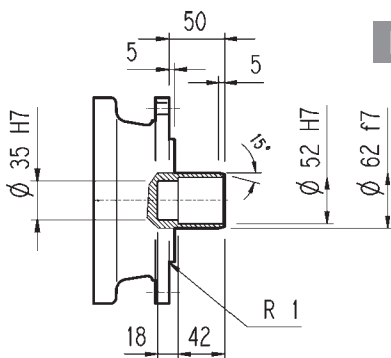


MZ HZ

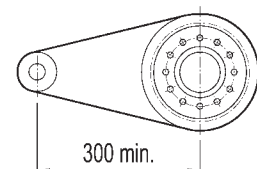
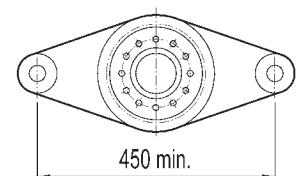
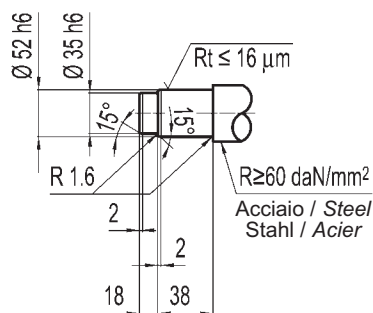
B40x36 e9 DIN 5482



FZ

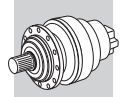


FP

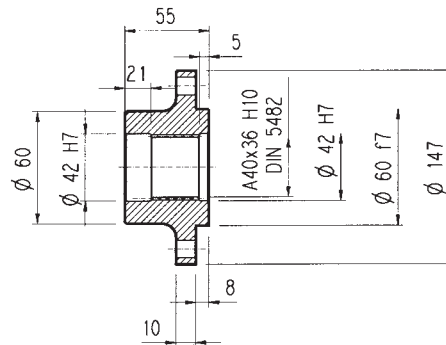
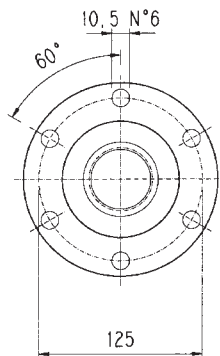
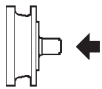


FP

M_{2max} = 2400 Nm

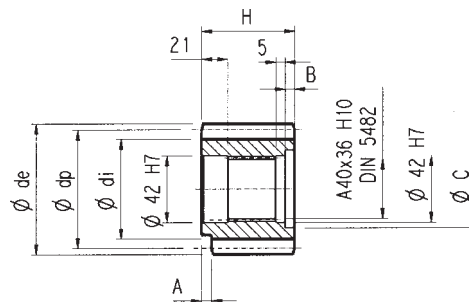
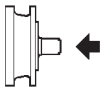
301 L**301 R****3/V 01 L3****3/A 01 L2**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

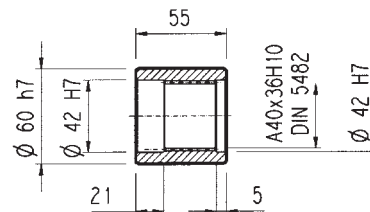
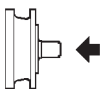
Pignoni / Pinion gears
Ritzel / Pignons

P...

	m	z	x	dp	di	de	H	A	B	C	☆
PBE	4.5	14	0.507	63	56	75.5	55	0	0	0	□
PCE	5	14	0.500	70	62.5	84.8	65	0	10	53	□
PDC	6	12	0.250	72	61	84.8	59	14	4	54	□
PDE	6	14	0.500	84	73	99.6	65	0	10	54	□

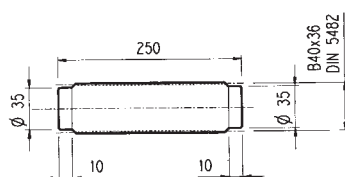
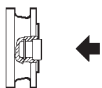
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

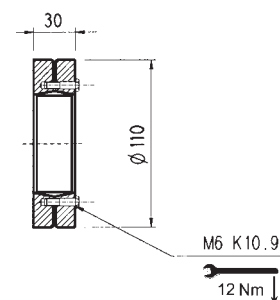
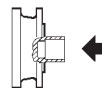
Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

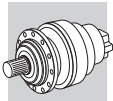
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

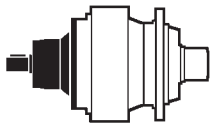
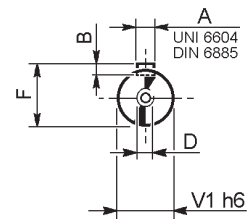
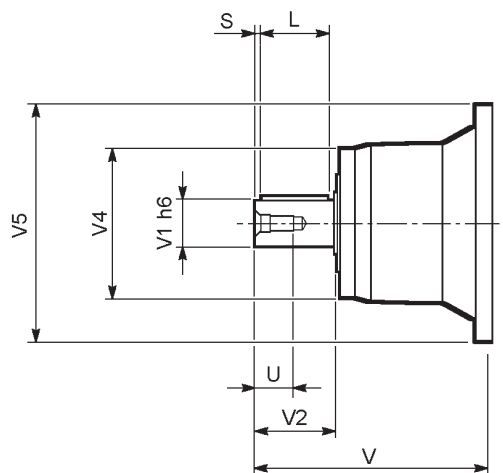
Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

G0A



301 L

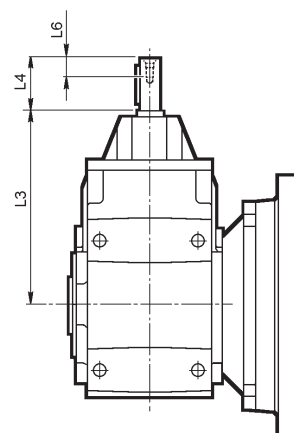
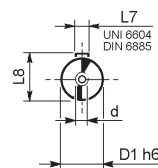
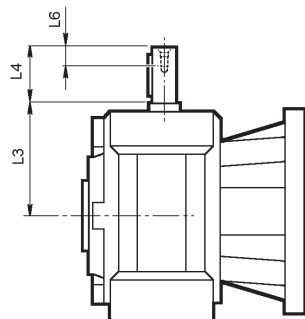
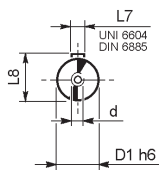
301 R



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
301 L1	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
301 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

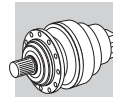
3/V 01 L3

3/A 01 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 01 L3_HS	16	65	40	16	5	18	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 01 L2_HS	19	235.5	40	16	6	21.5	M6

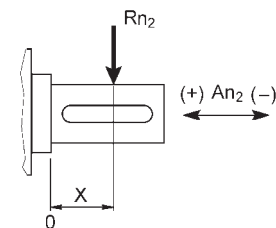
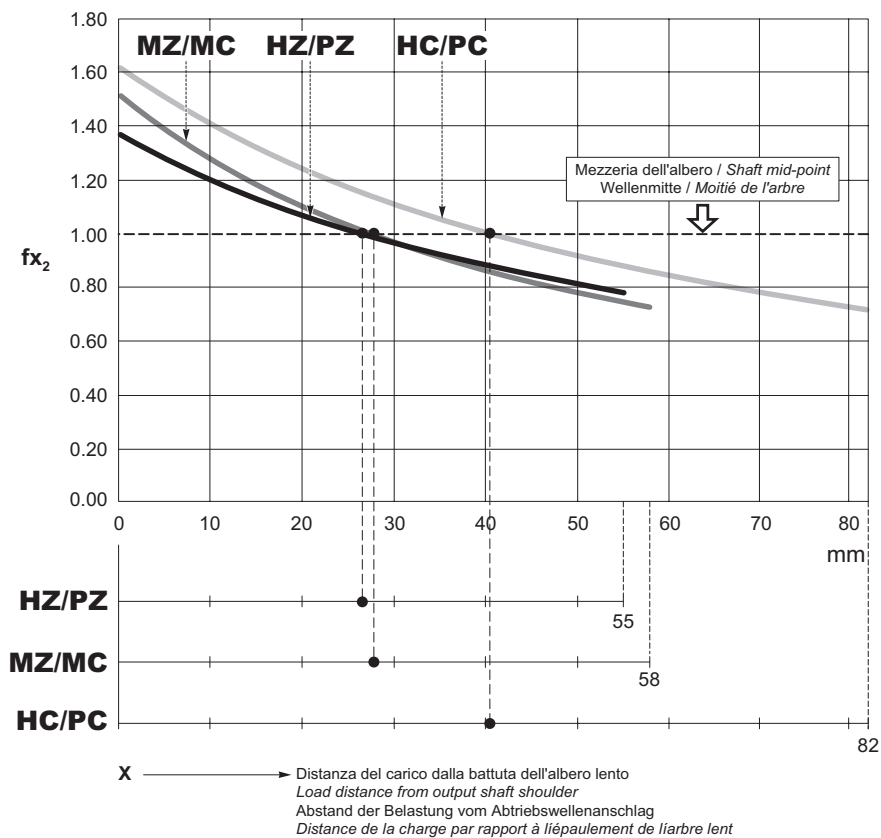


Fattore di posizione per carichi radiali sugli alberi in uscita.

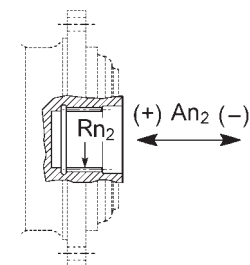
Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$R_{x2} = R_{n2} \cdot fx_2$		
$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ/PZ	1.18	1.18
HC/PC	1.29	1.29
MC	2.20	2.20
MZ	2.04	2.04



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	1.00	1.00

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

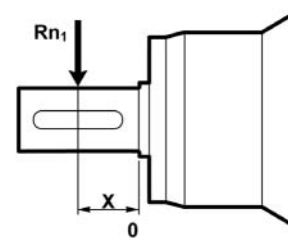
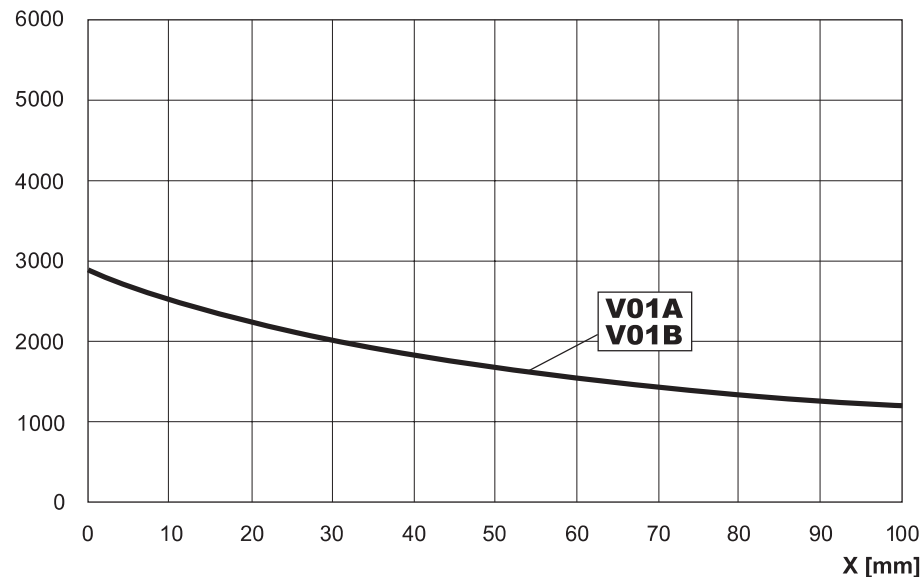
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

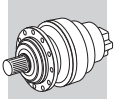
Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

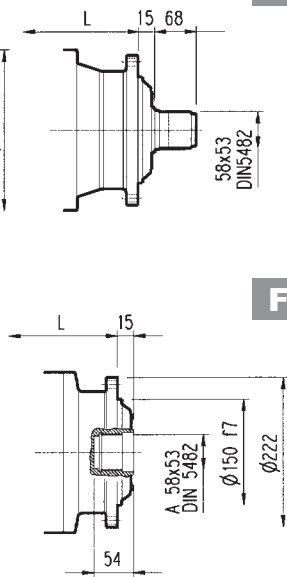
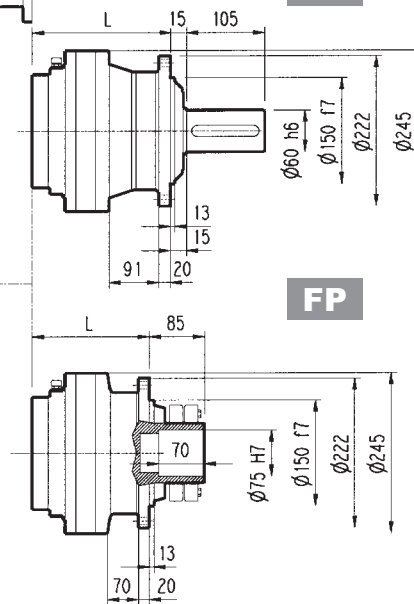
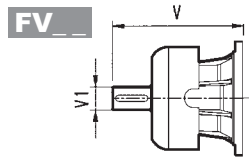
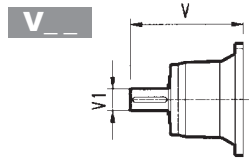
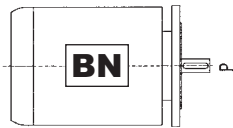
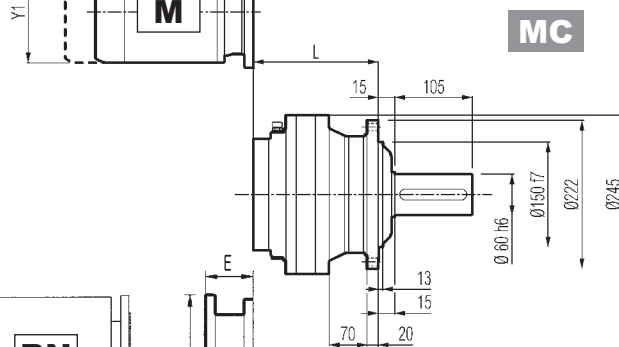
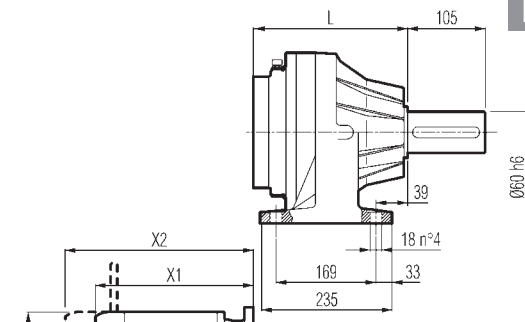
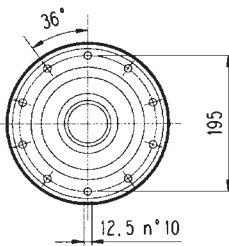
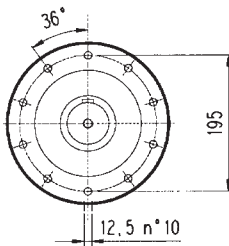
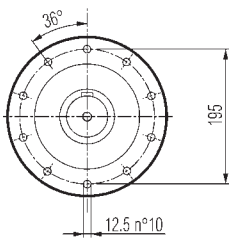
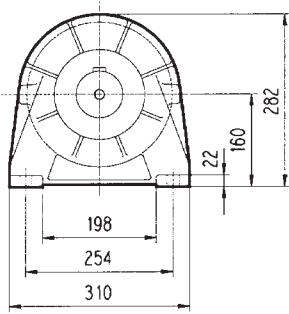
Pour des vitesses et/ou durées différentes, voir par. Vérifications.

$R_{n1} [N]$





303 L



PC

PZ

MC

MZ

HC

HZ

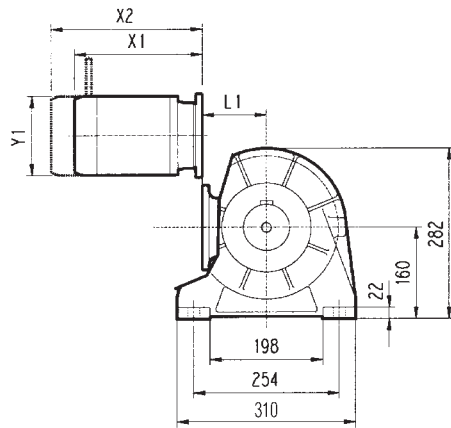
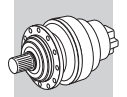
FP

FZ

FP

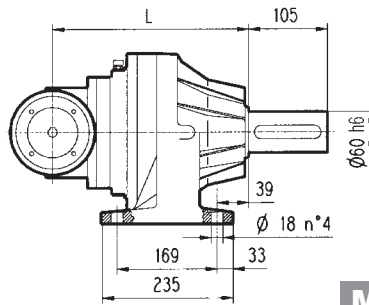
M_{2max} = 3500 Nm

	L																							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1		V	V1		V	V1		V	V1					
303 L1	125	165	150	125	31	40	35	31	239	48	15	-	-	-	276	48	17	-	-	-				
303 L2	178	218	203	178	35	44	39	35	137.5	24	6	158	38	7	-	-	-	-	-	-				
303 L3	231	271	256	231	39	48	43	39	137.5	24	6	158	38	7	-	-	-	-	-	-				
303 L4	284	324	309	284	43	52	47	43	137.5	24	6	158	38	7	-	-	-	-	-	-				
	P71			P80		P90		P100		P112		P132		P160		P180		P200						
	E	P		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P					
303 L1	-	-		-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400					
303 L2	65	160		84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
303 L3	65	160		84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
303 L4	65	160		84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
303 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
303 L2	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



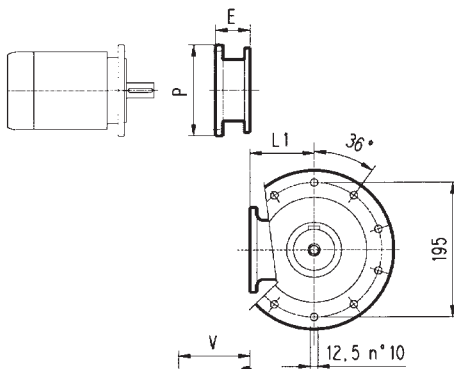
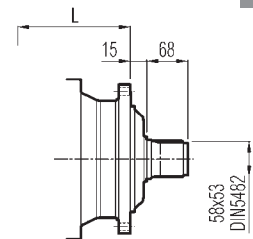
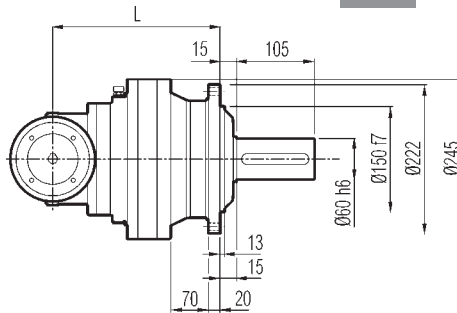
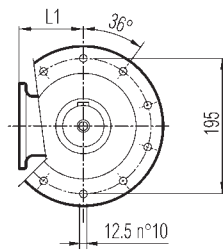
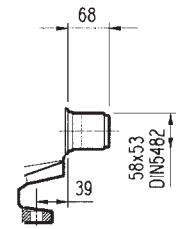
PC

PZ



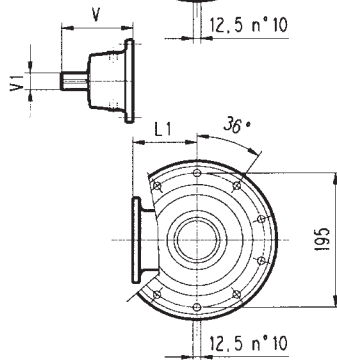
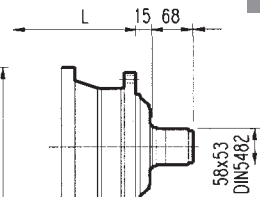
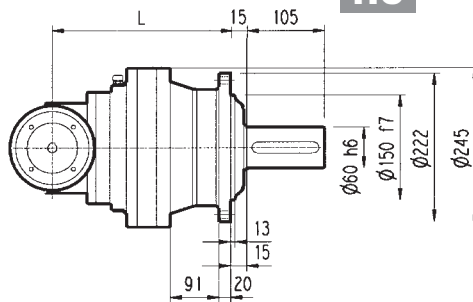
MC

MZ



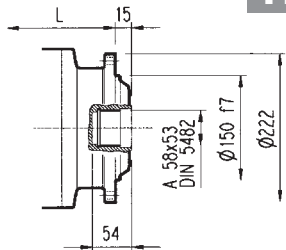
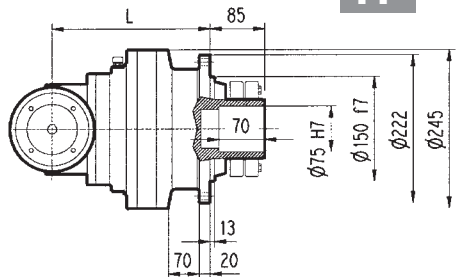
HC

HZ



FP

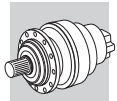
FZ



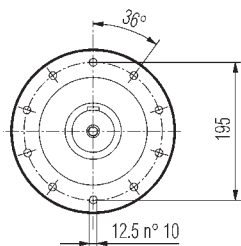
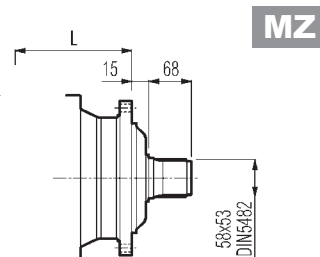
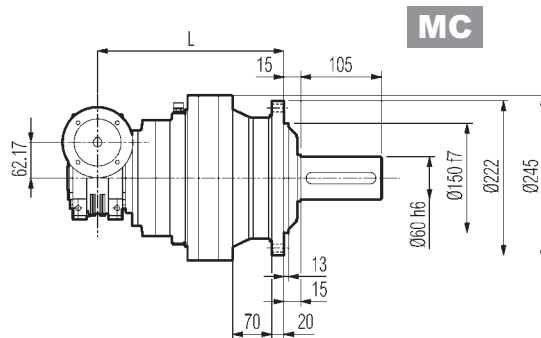
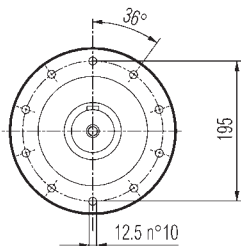
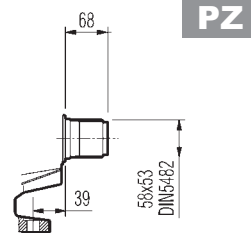
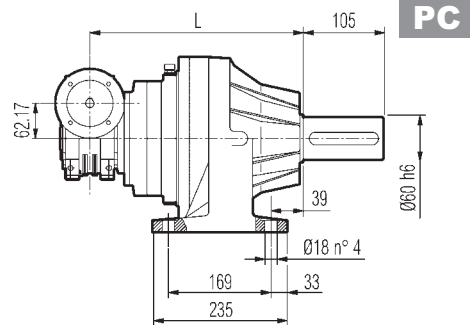
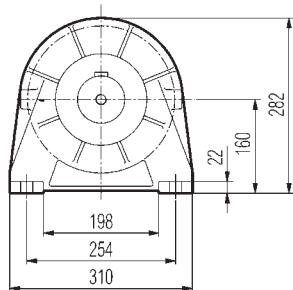
FP

$M_{2max} = 3500 \text{ Nm}$

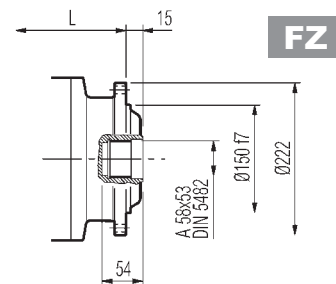
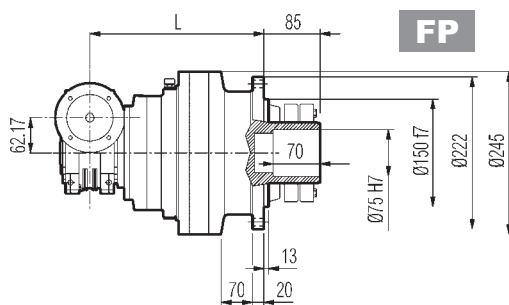
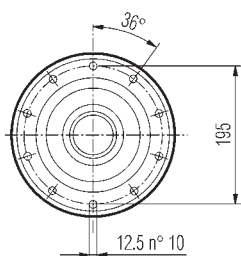
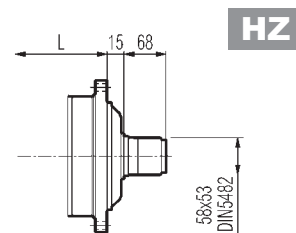
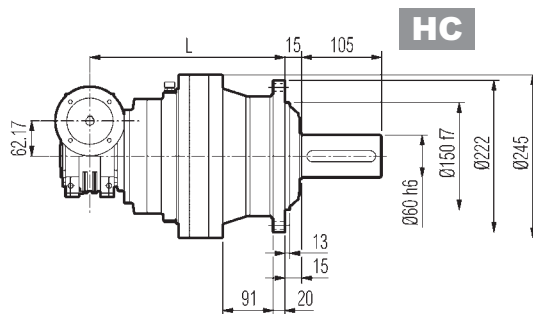
	L				L1													
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1		V	V1				
303 R2	217	257	242	217	140	51	60	55	51	137.5	24	6	158	38	7			
303 R3	270	310	295	270	122	49	58	53	49	137.5	24	6	158	38	7			
303 R4	323	363	348	323	122	53	62	57	53	137.5	24	6	158	38	7			
	P71			P80			P90			P100			P112			P132		
	E	P		E	P		E	P		E	P		E	P		E	P	
303 R2	65	160		84	200		84	200		94	250		94	250		114	300	
303 R3	65	160		84	200		84	200		94	250		94	250		114	300	
303 R4	65	160		84	200		84	200		94	250		94	250		114	300	
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
303 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
303 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
303 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



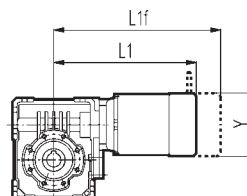
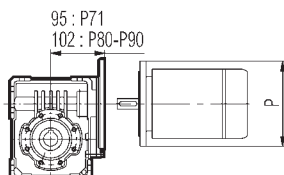
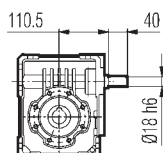
3/V 03 L3



A →



Vista da A
View from A

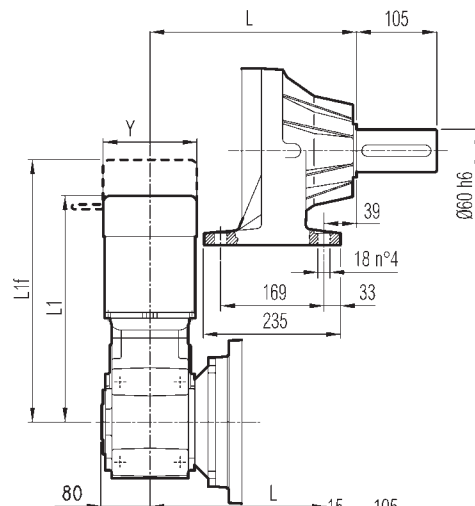
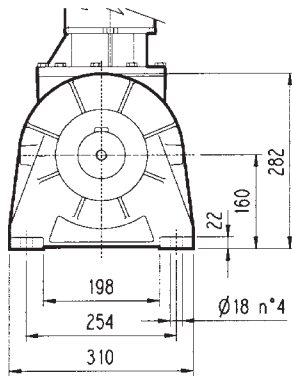
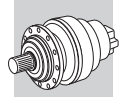


FP

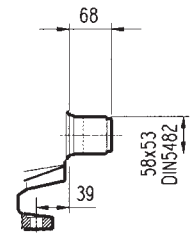
M_{2max} = 3500 Nm

	L				Kg			
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ
3/V 03 L3	270	330	315	270	43	51	45	41

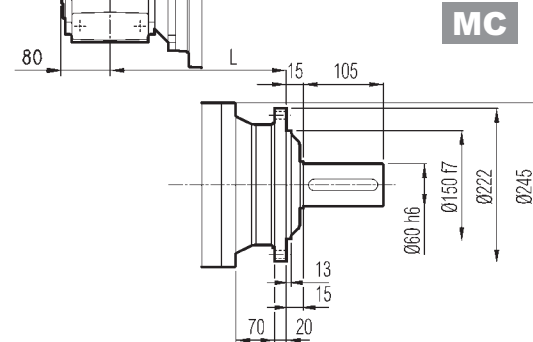
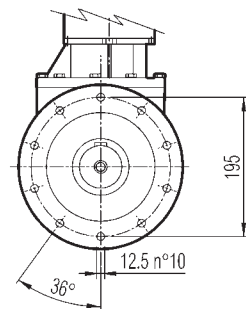
	P71 P	P80 P	P90 P	S1 + M1S			S1 + M1L			S2 + M2S		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/V 03 L3	160	200	200	265	328	138	289	350	138	317	393	156



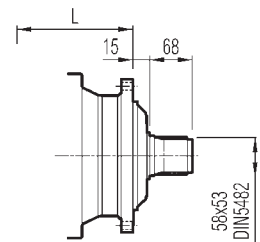
PC



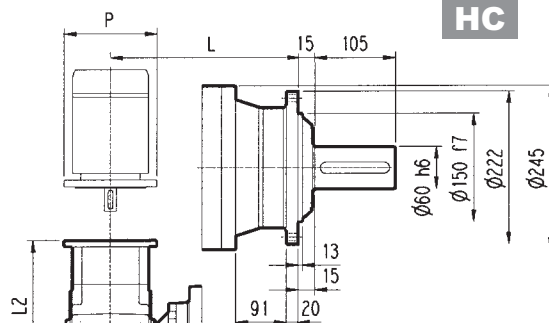
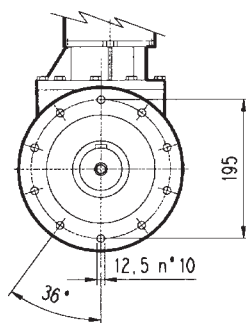
PZ



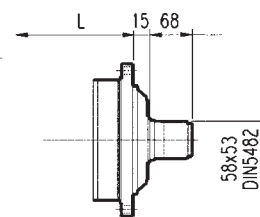
MC



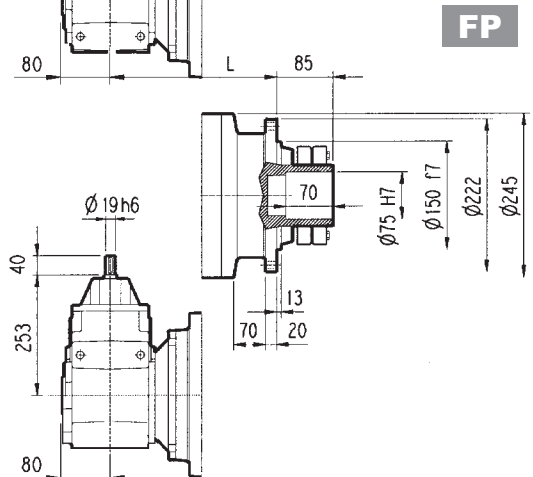
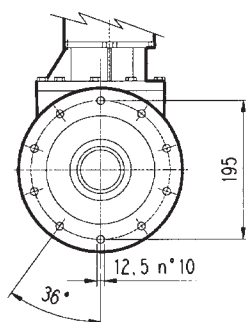
MZ



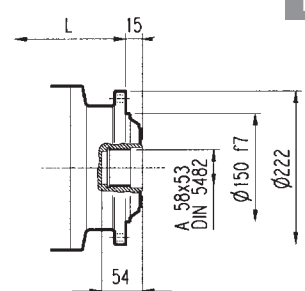
HC



HZ



FP



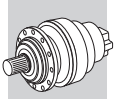
FZ

FP

M_{2max} = 3500 Nm

	L					Kg			
	MC - MZ		PC - PZ		MC - MZ	PC - PZ		MC - MZ	FP - FZ
3/A 03 L2	225		285		63	71		65	60

	P63		P71		P80		P90		P100		P112		S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3SA			S3 + M3LA		
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/A 03 L2	243	140	243	160	262	200	262	200	272	250	272	250	371	437	138	399	416	138	425	497	156	470	467	195	501	518	195



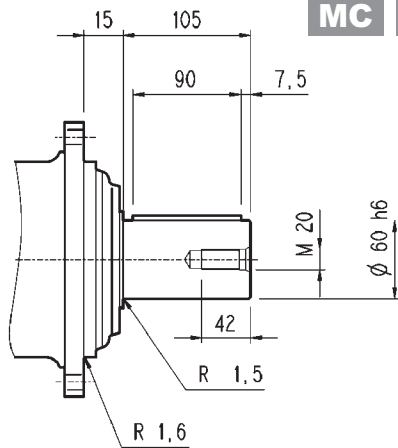
303 L

303 R

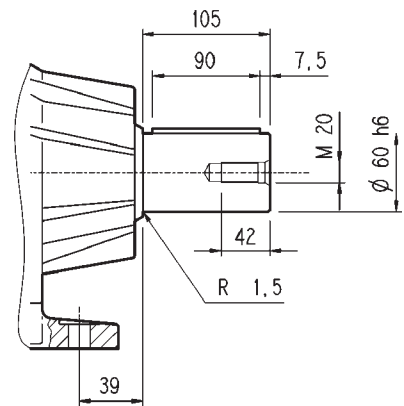
3/V 03 L3

3/A 03 L2

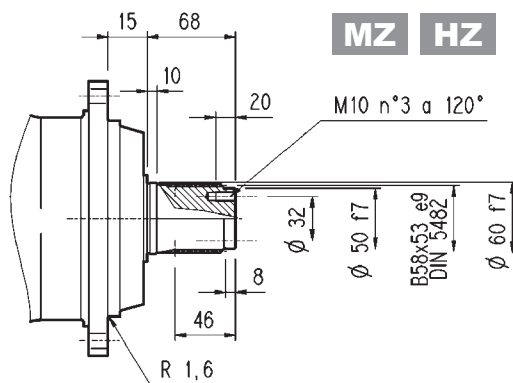
MC HC



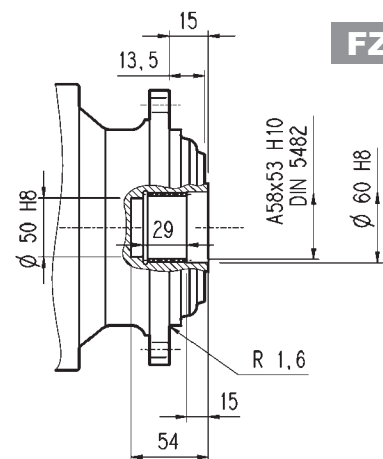
PC



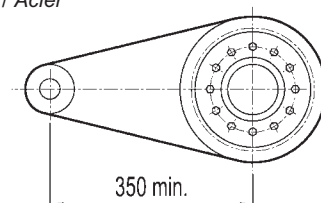
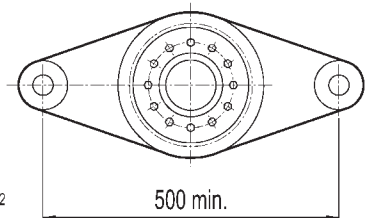
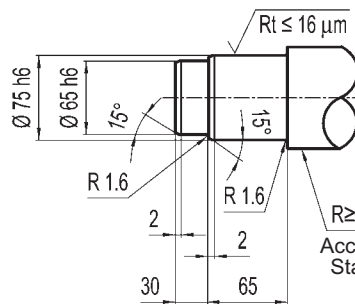
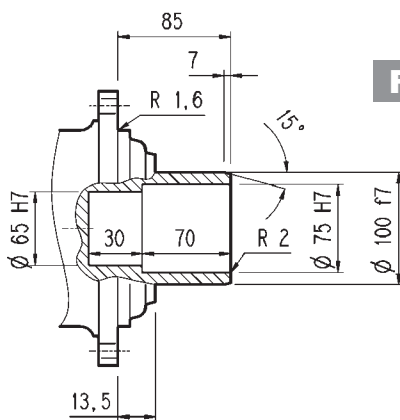
MZ HZ



FZ

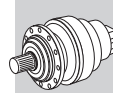


FP

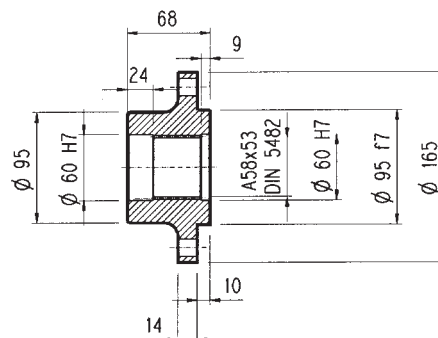
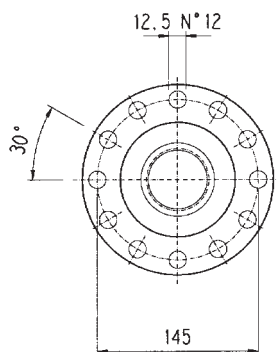
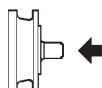


FP

M_{2max} = 3500 Nm

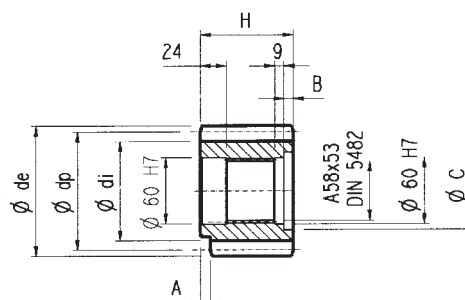
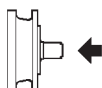
303 L**303 R****3/V 03 L3****3/A 03 L2**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

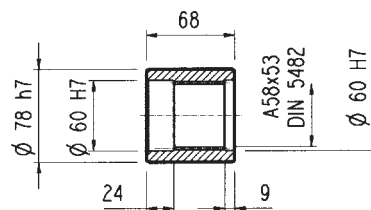
Pignoni / Pinion gears
Ritzel / Pignons

P...

	m	z	x	dp	di	de	H	A	B	C	☆
PCL1	5	19	0	95	82	104	77	12	9	72	□
PCL2	5	19	0	95	82	104	68	0	0	0	□
PCM	5	20	0	100	87.5	110	68	18	0	0	■
PCP	5	22	0	110	97.5	120	68	18	0	0	■
PDE	6	14	0.500	84	75	99.6	68	0	0	0	□
PDI	6	18	0.500	108	99	123.6	68	0	0	0	□
PDM	6	20	0.833	120	115	140	68	0	0	0	□
PFD	8	13	0.675	104	95	127.6	68	0	0	0	■
PFE1	8	14	0	112	92	126	68	0	0	0	■
PFE2	8	14	0	112	92	126	80	0	12	72	■
PFF	8	15	0	120	100	136	68	0	0	0	□
PFP	8	22	0	176	156	190	77	12	10	71	□
PHG	10	16	0.500	160	145	188	75	0	7	72	□

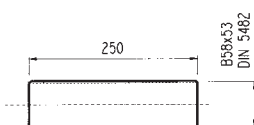
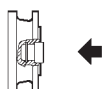
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémentée et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

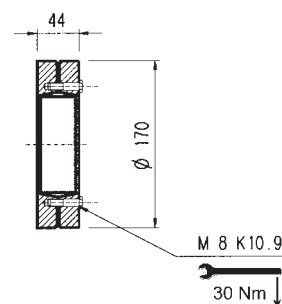
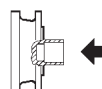
Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

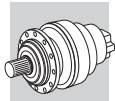
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e
 temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case
 hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet
 werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

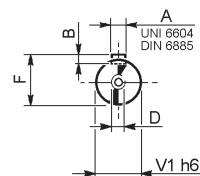
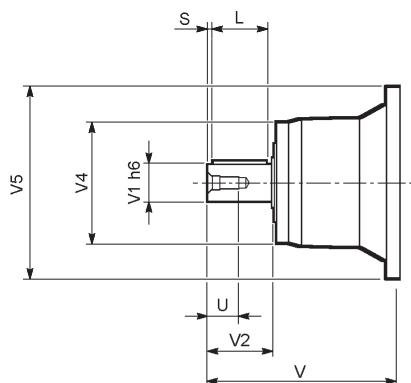
G0A



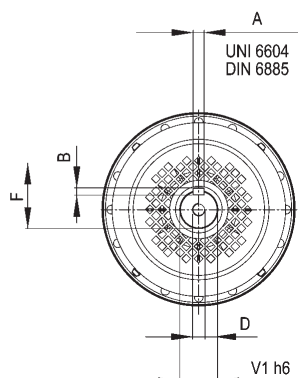
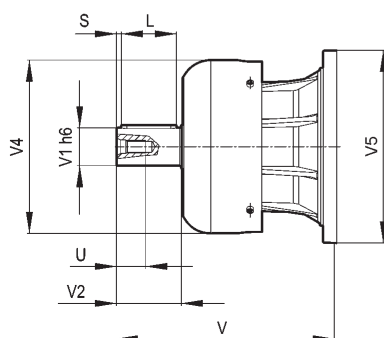
303 L

303 R

V _ _



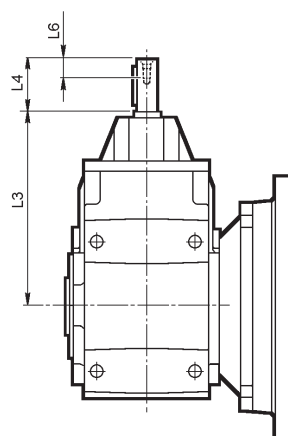
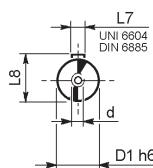
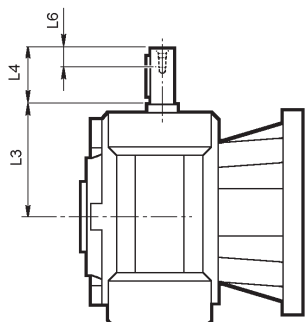
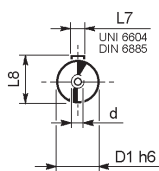
FV _ _



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
303 L1	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
303 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
303 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
303 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
303 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

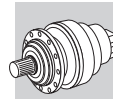
3/V 03 L3

3/A 03 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 03 L3_HS	18	110.5	40	16	6	20.5	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 03 L2_HS	19	252.5	40	16	6	21.5	M6

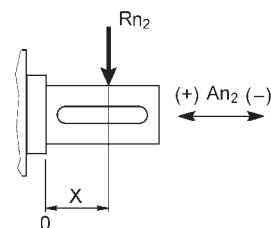
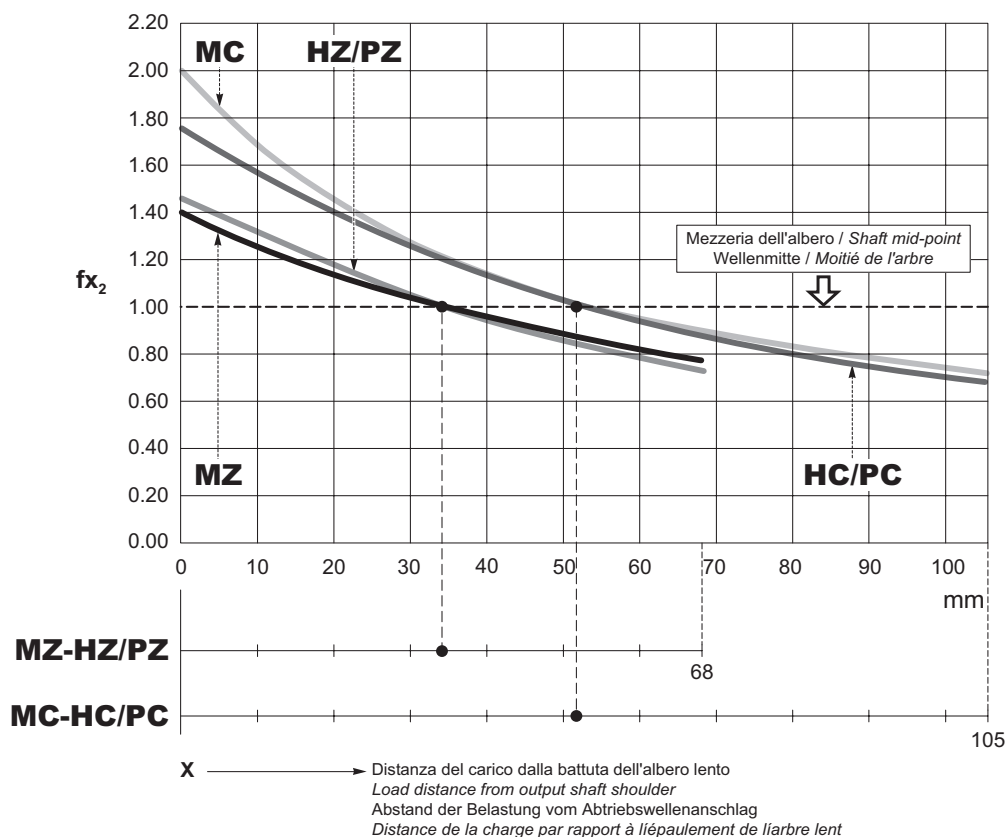


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

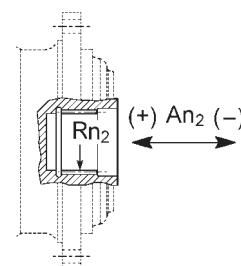
Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$$R_{x2} = R_{n2} \cdot f_{x2}$$

$An_2(\pm) = R_{n2} \cdot fa_2(\pm)$		
	$fa_2(+)$	$fa_2(-)$
HZ/PZ	0.74	0.59
HC/PC	0.86	0.69
MC	2.04	2.04
MZ	1.74	1.74



$An_2(\pm) = R_{n2} \cdot fa_2(\pm)$		
	$fa_2(+)$	$fa_2(-)$
FZ	1.00	1.00

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

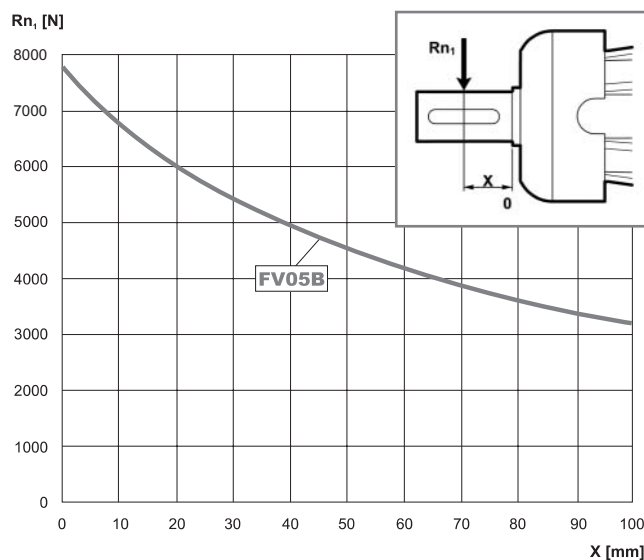
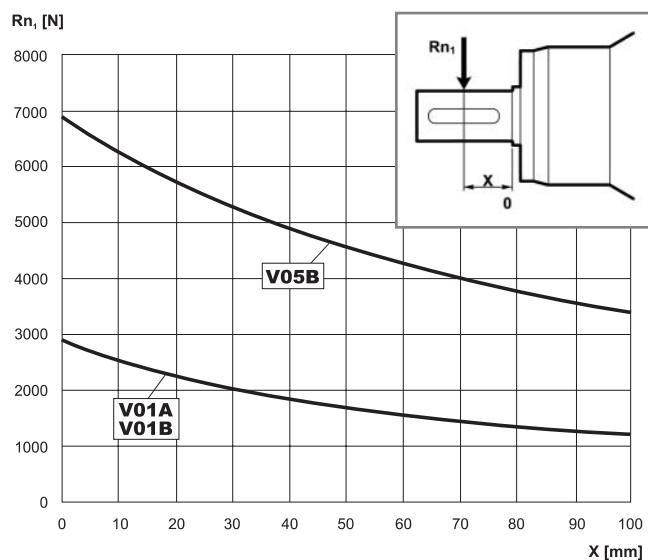
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

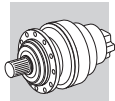
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par. Prüfungen

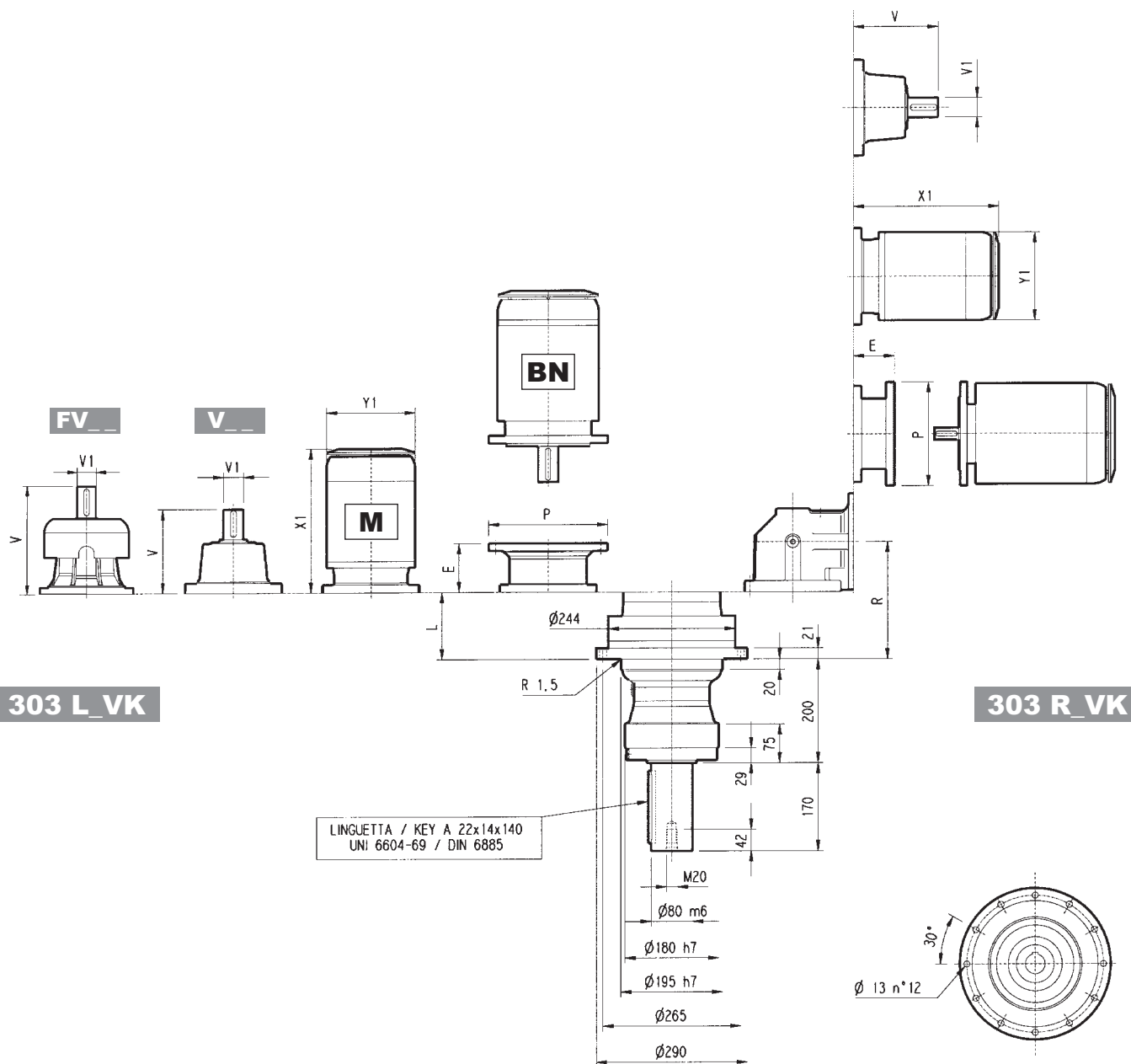
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





303_VK



303 L_VK

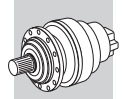
303 R_VK

	L																				P71		P80		P90		P100		P112		P132		P160		P180		P200	
	V	V1		V	V1		V	V1		V	V1		V	V1		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P							
303 L1	51	65	239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350						
303 L2	104	70	137.5	24	6	158	38	7	-	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
303 L3	157	73	137.5	24	6	158	38	7	-	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
303 L4	210	77	137.5	24	6	158	38	7	-	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					

	R	R1	Kg	V	V1	Kg	V	V1	Kg	P71	P80	P90	P100	P112	P132
										E	P	E	P	E	P
303 R2	143	140	85	137.5	24	6	158	38	7	65	160	84	200	84	200
303 R3	196	122	83	137.5	24	6	158	38	7	65	160	84	200	84	200
303 R4	249	122	87	137.5	24	6	158	38	7	65	160	84	200	84	200

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
303 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
303 L2	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
303 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
303 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
303 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
303 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 303_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 303_VK, with radial force applying at a distance x from shaft shoulder.

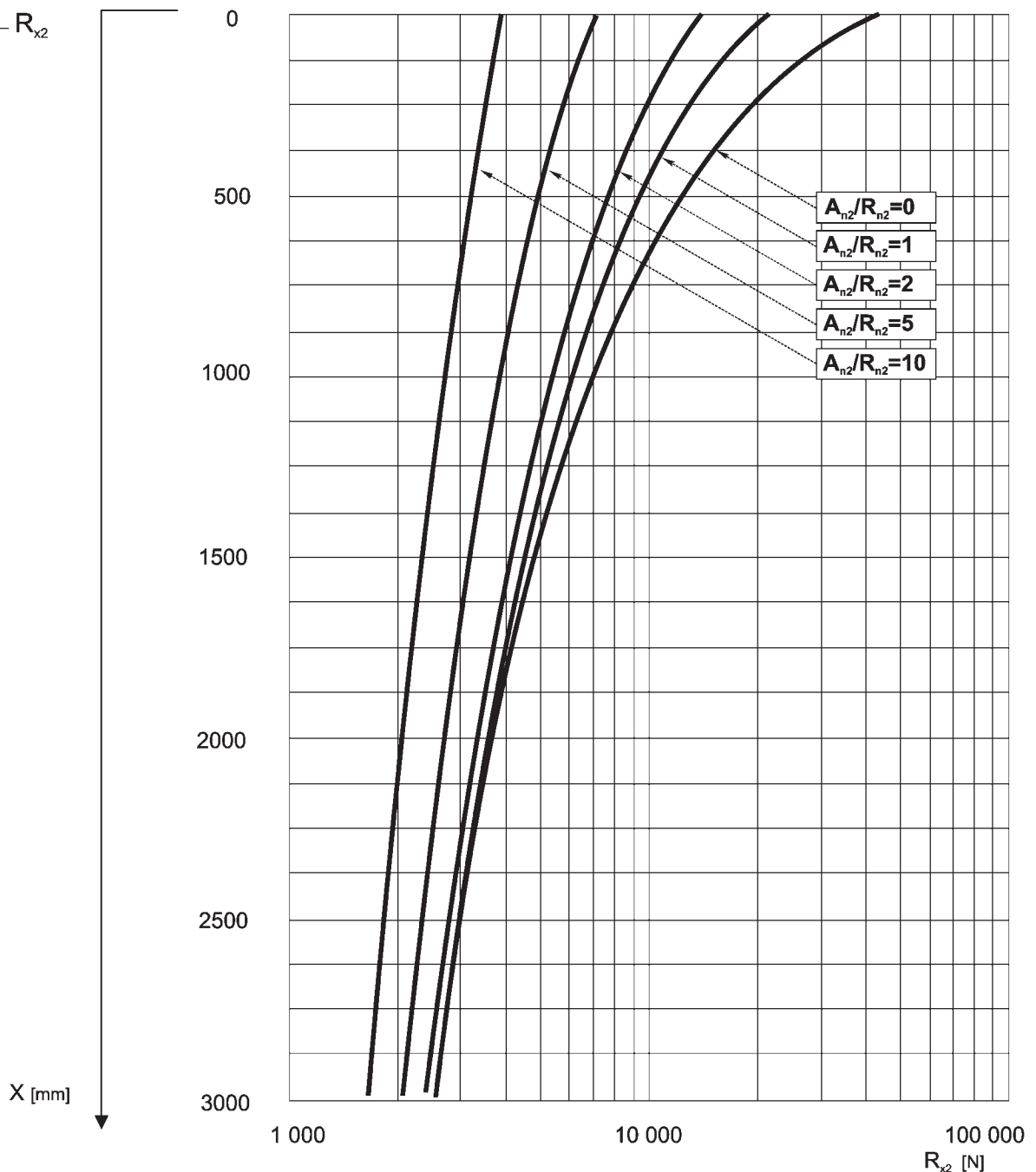
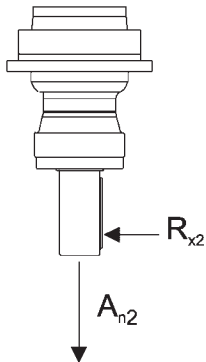
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

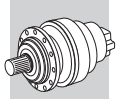
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 303_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

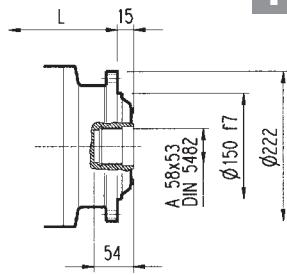
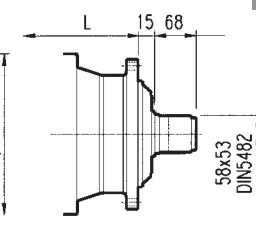
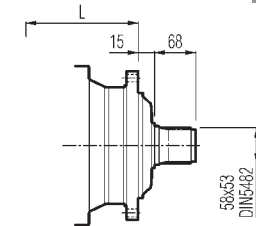
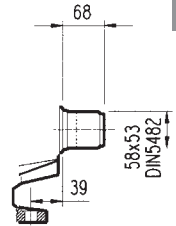
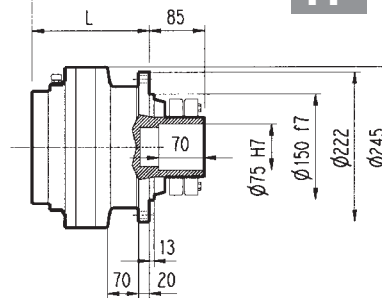
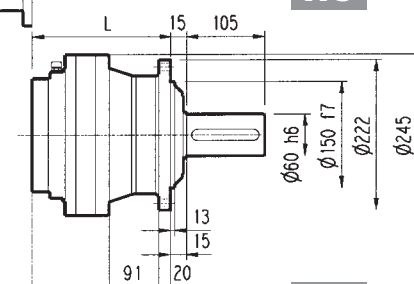
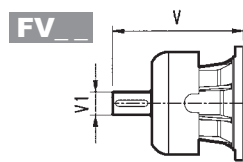
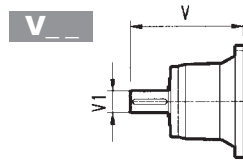
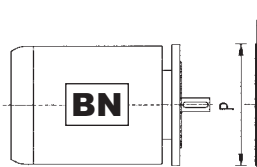
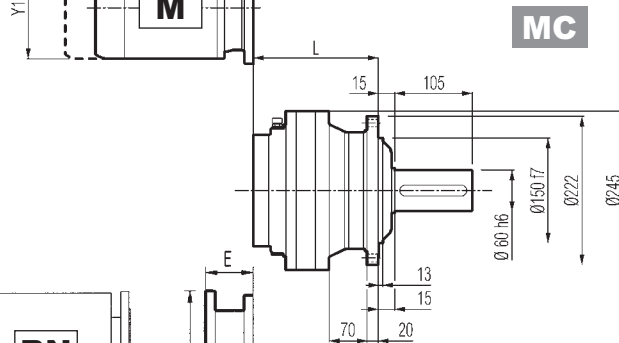
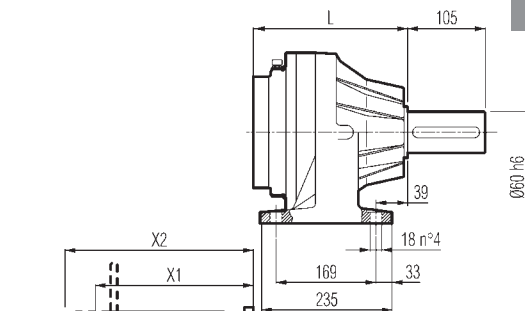
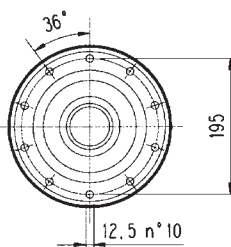
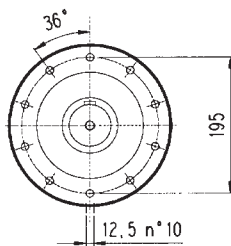
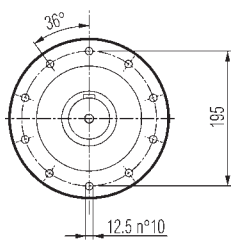
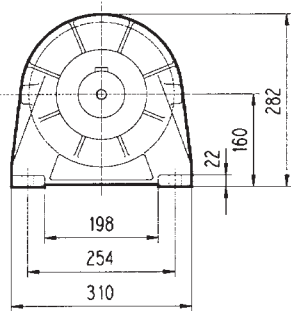
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 303_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





304 L



PC

PZ

MC

MZ

HC

HZ

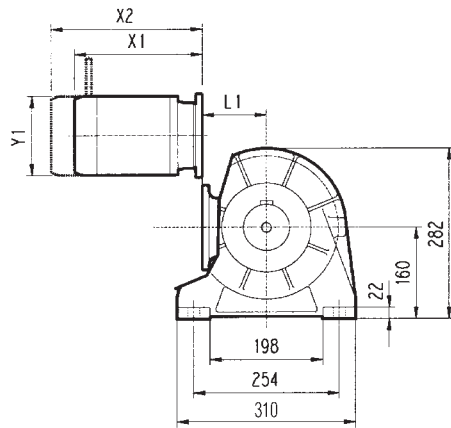
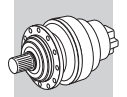
FP

FZ

FP

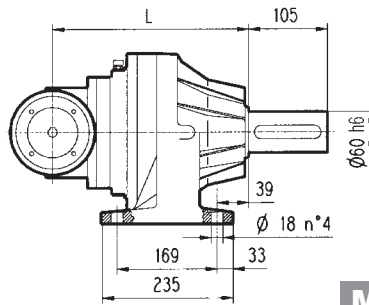
M_{2max} = 6000 Nm

	L																							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1		V	V1		V	V1		V	V1					
304 L1	125	165	150	125	31	40	35	31	239	48	15	-	-	-	276	48	17	-	-	-				
304 L2	190	230	215	190	38	47	42	38	137.5	24	6	158	38	7	-	-	-	-	-	-				
304 L3	243	283	268	243	42	51	46	42	137.5	24	6	158	38	7	-	-	-	-	-	-				
304 L4	296	336	321	296	46	55	50	46	137.5	24	6	158	38	7	-	-	-	-	-	-				
	P71			P80		P90		P100		P112		P132		P160		P180		P200						
	E	P		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P					
304 L1	-	-		-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400					
304 L2	65	160		84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
304 L3	65	160		84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
304 L4	65	160		84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-					
p	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
304 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
304 L2	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



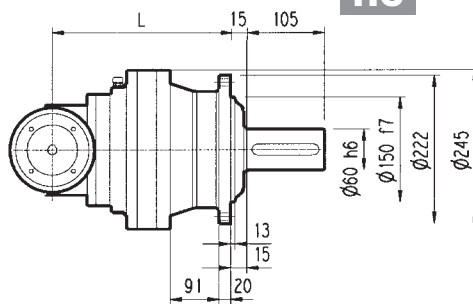
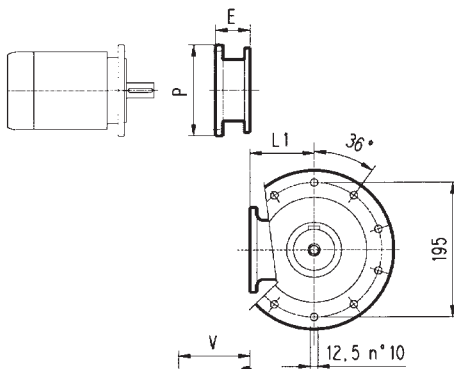
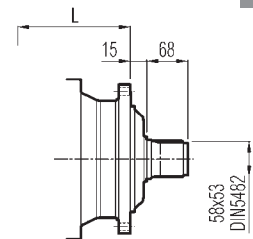
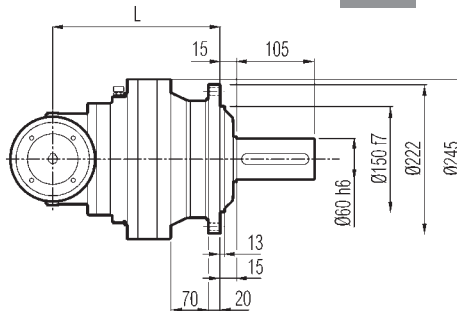
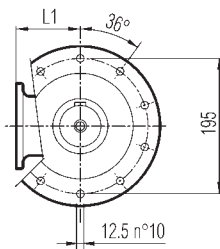
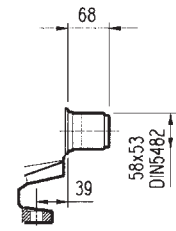
PC

PZ



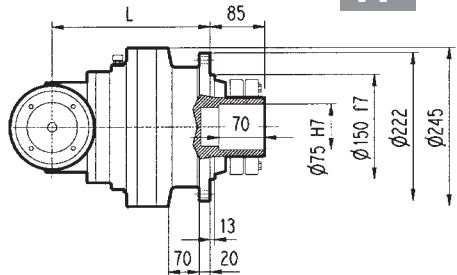
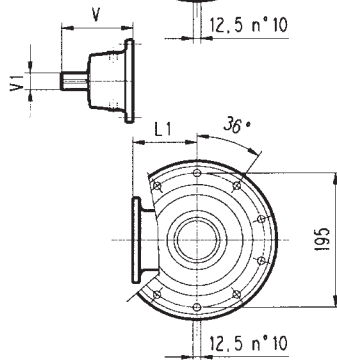
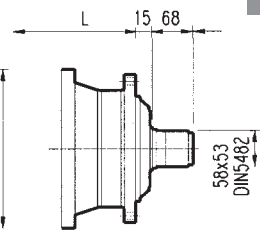
MC

MZ



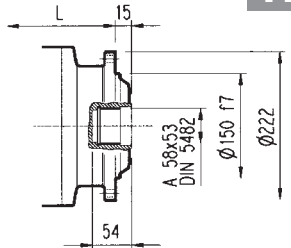
HC

HZ



FP

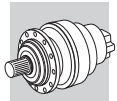
FZ



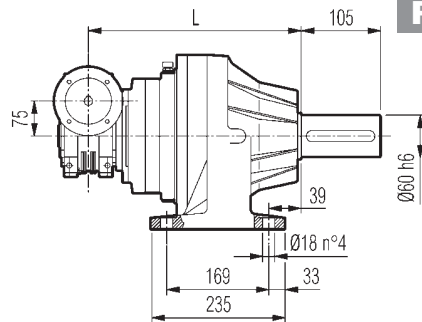
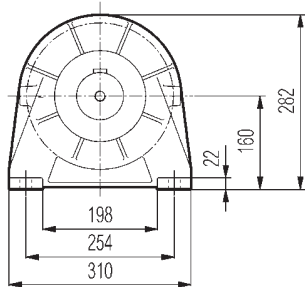
FP

$M_{2max} = 6000 \text{ Nm}$

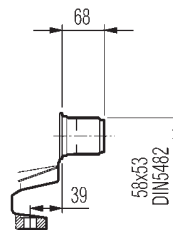
	L				L1	Kg												
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg			
304 R2	217	257	242	217	140	51	60	55	51	137.5	24	6	158	38	7			
304 R3	282	322	307	282	122	52	61	56	52	137.5	24	6	158	38	7			
304 R4	335	375	360	335	122	56	65	60	56	137.5	24	6	158	38	7			
	P71			P80			P90			P100			P112			P132		
	E	P		E	P		E	P		E	P		E	P		E	P	
304 R2	65	160		84	200		84	200		94	250		94	250		114	300	
304 R3	65	160		84	200		84	200		94	250		94	250		114	300	
304 R4	65	160		84	200		84	200		94	250		94	250		114	300	
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
304 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
304 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
304 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



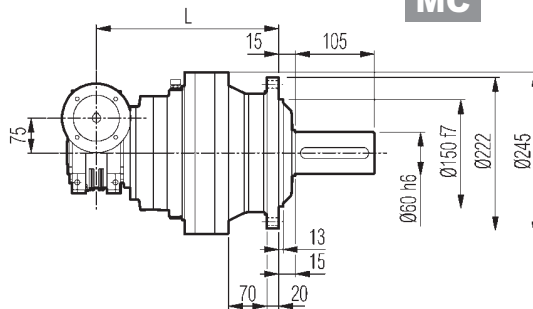
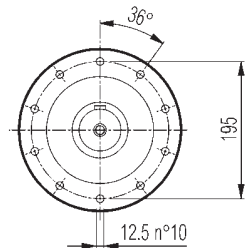
3/V 04 L3



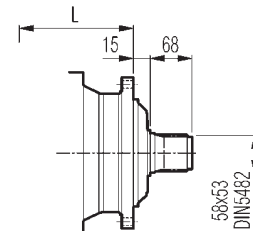
PC



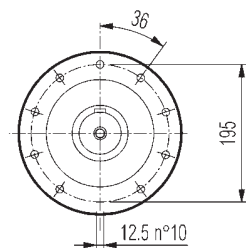
PZ



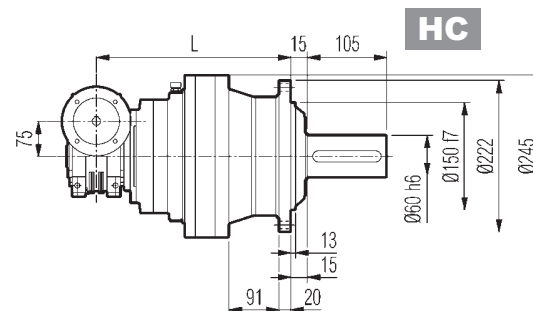
MC



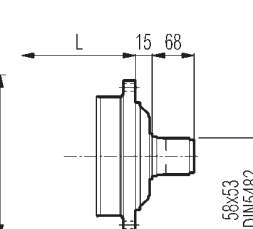
MZ



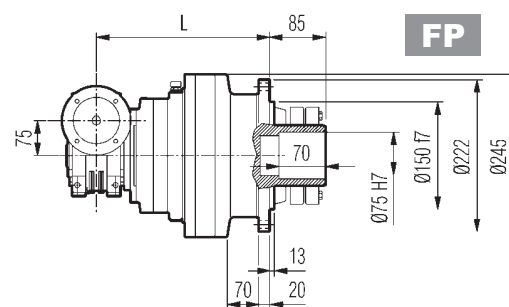
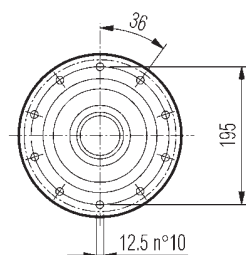
A →



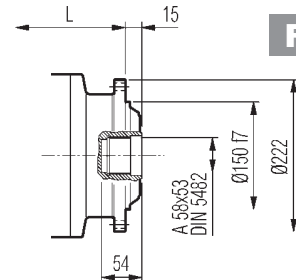
HC



HZ

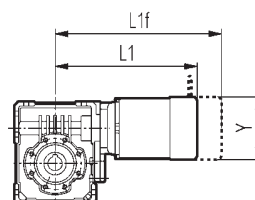
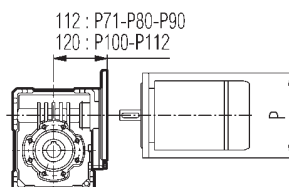
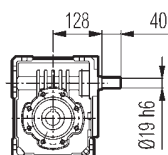


FP



FZ

Vista da
View from A

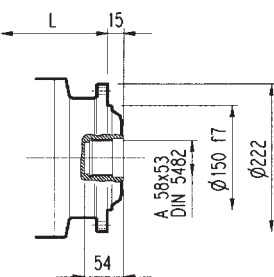
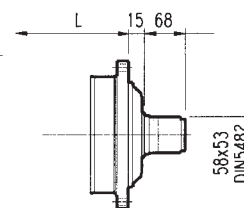
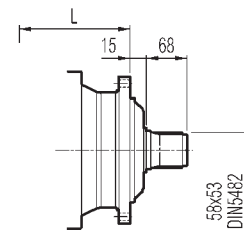
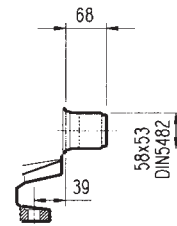
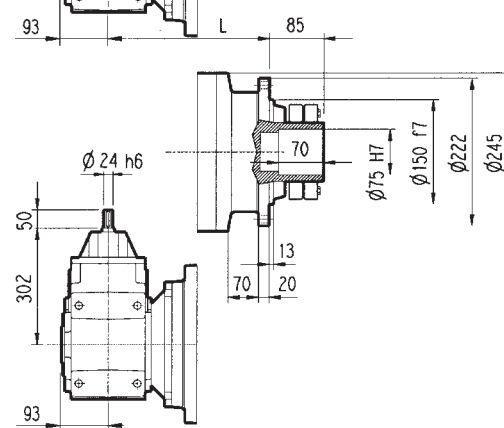
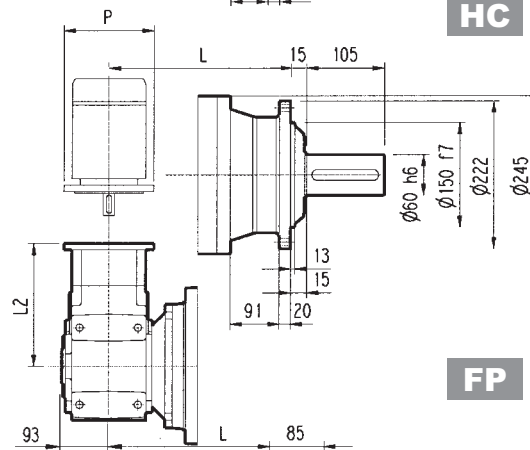
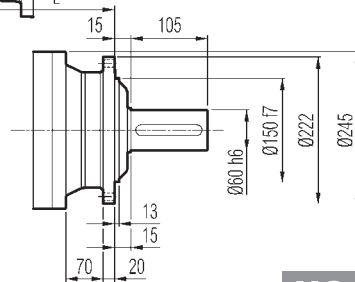
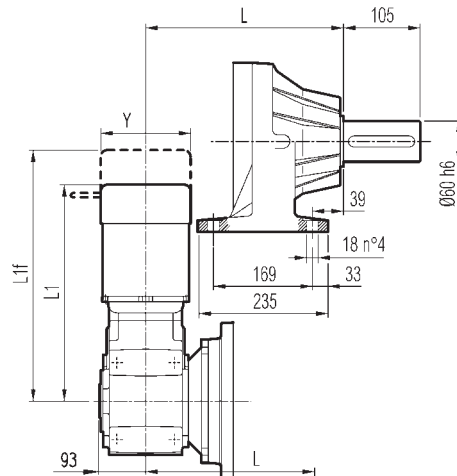
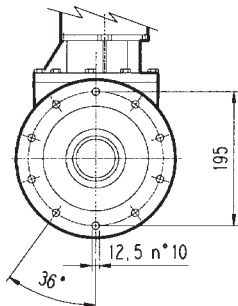
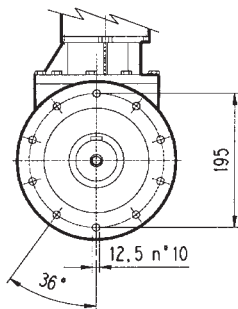
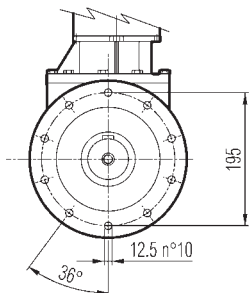
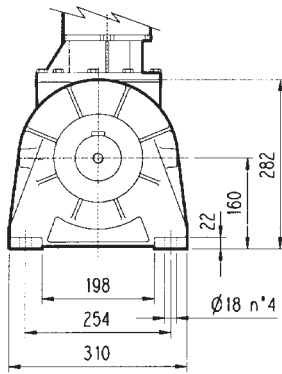
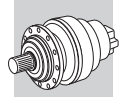


FP

M_{2max} = 6000 Nm

	L				Kg				P71	P80	P90	P100
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P
3/V 04 L3	305	345	330	305	47	56	51	47	160	200	200	250

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/V 04 L3	284	347	138	308	369	138	333	409	156	376	472	193	408	499	193



PC

PZ

MC

MZ

HC

HZ

FP

FZ

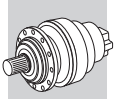
FP

 $M_{2max} = 6000 \text{ Nm}$

	L								$\overset{\circ}{K_g}$	D1	L3	L4
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ				
3/A 04 L2	258	298	283	258	80	95	90	80		24	302	50

	P63		P71		P80		P90		P100		P112		P132	
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/A 04 L2	263	140	263	160	282.5	200	282.5	200	292.5	250	292.5	250	329	457

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3SA			S3 + M3LA			S4 + M4		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/A 04 L2	394	457	138	418	439	138	447	517	156	490	487	195	522	538	195	630	738	258



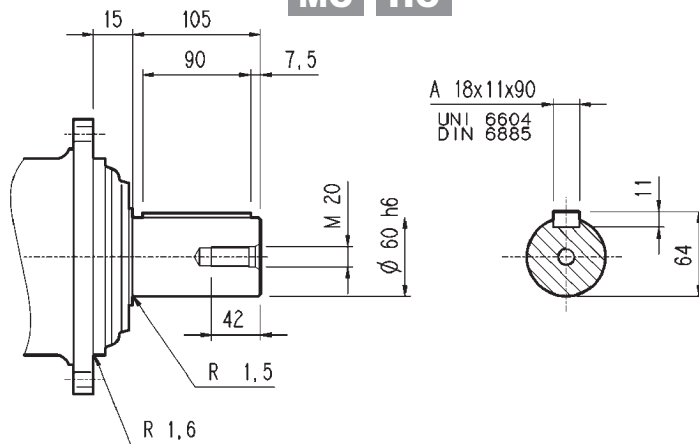
304 L

304 R

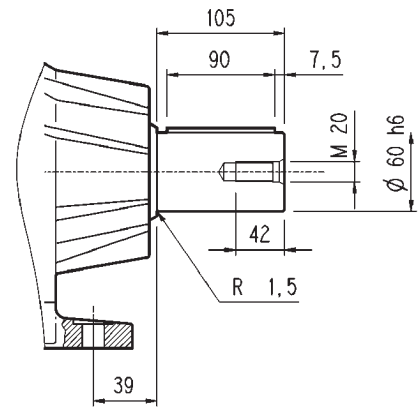
3/V 04 L3

3/A 04 L2

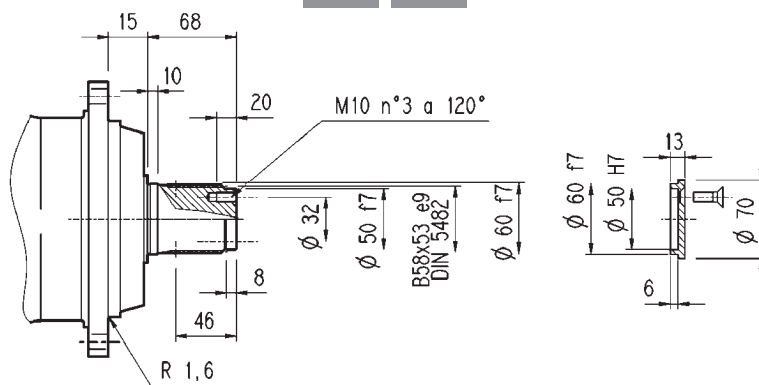
MC HC



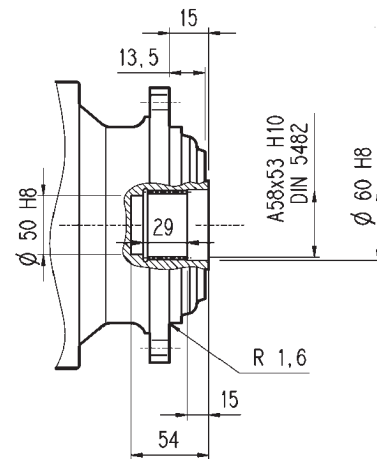
PC



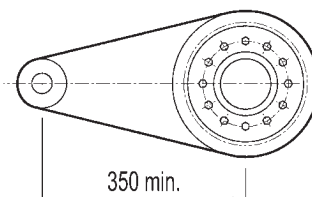
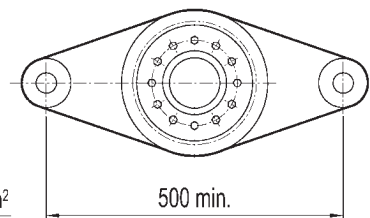
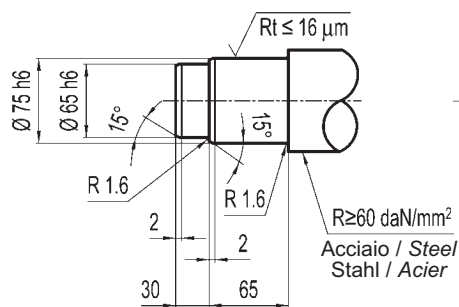
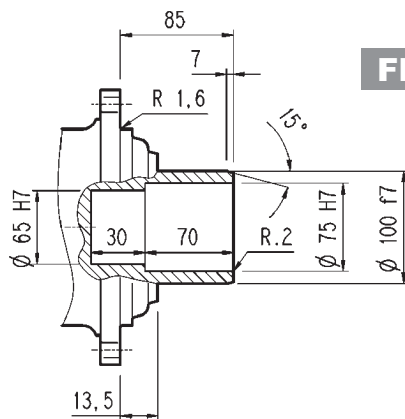
MZ HZ



FZ

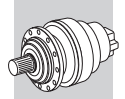


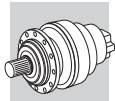
FP



FP

M_{2max} = 6000 Nm

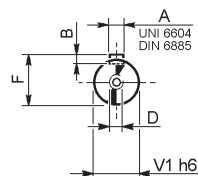
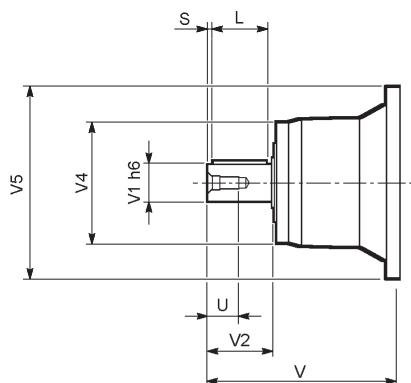




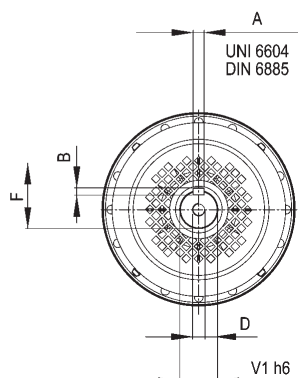
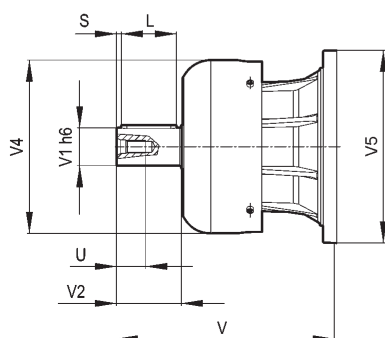
304 L

304 R

V



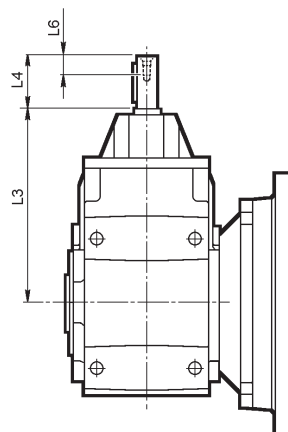
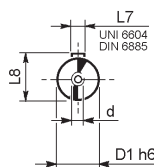
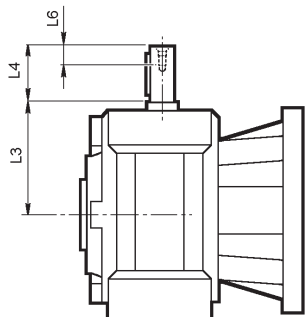
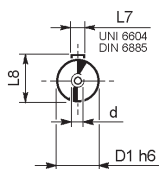
FV



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
304 L1	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
304 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
304 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
304 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
304 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

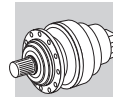
3/V 04 L3

3/A 04 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 04 L3_HS	19	128	40	16	6	21.5	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 04 L2_HS	24	302	50	19	8	27	M8

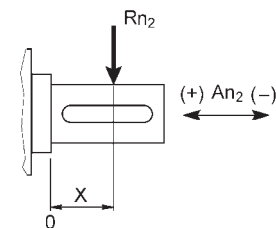
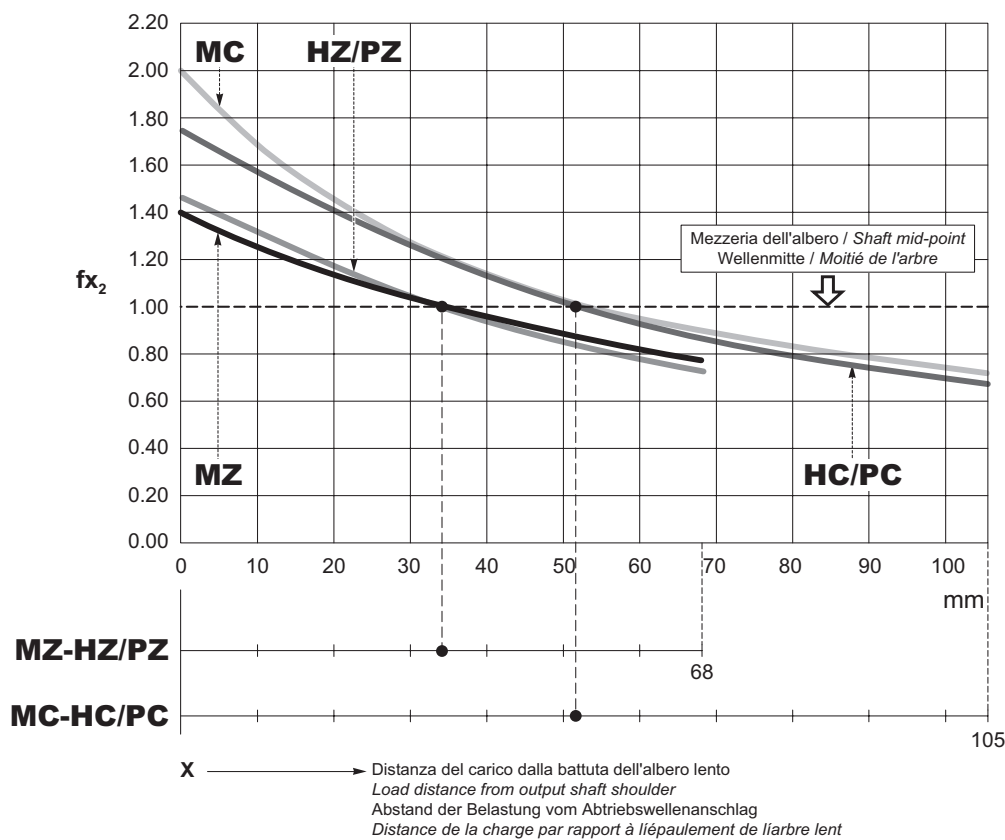


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

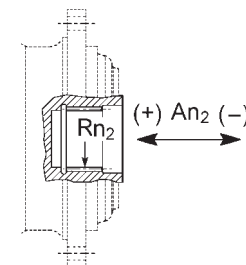
Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$$R_{x2} = R_{n2} \cdot f_{x2}$$

$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ/PZ	0.74	0.59
HC/PC	0.86	0.69
MC	2.04	2.04
MZ	1.74	1.74



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	1.04	1.04

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

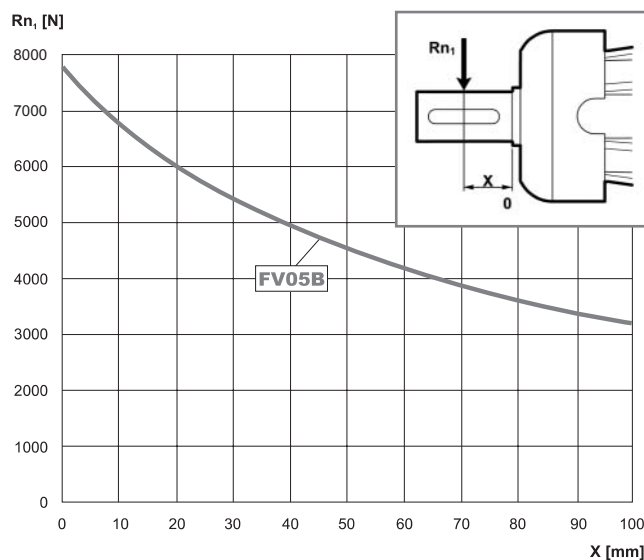
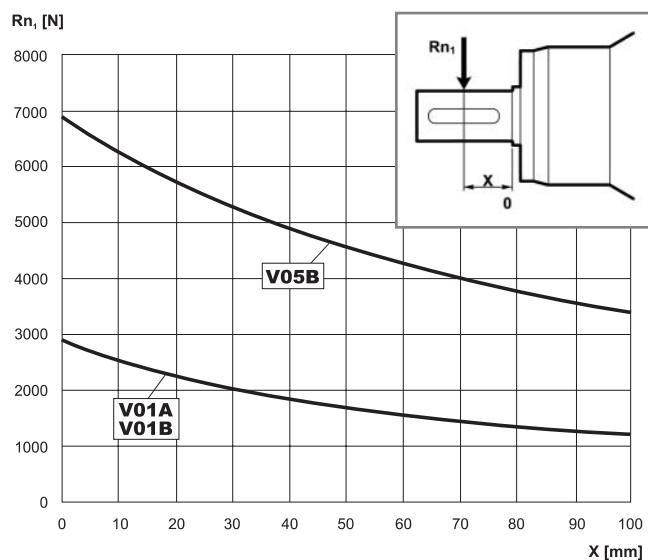
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

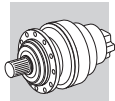
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

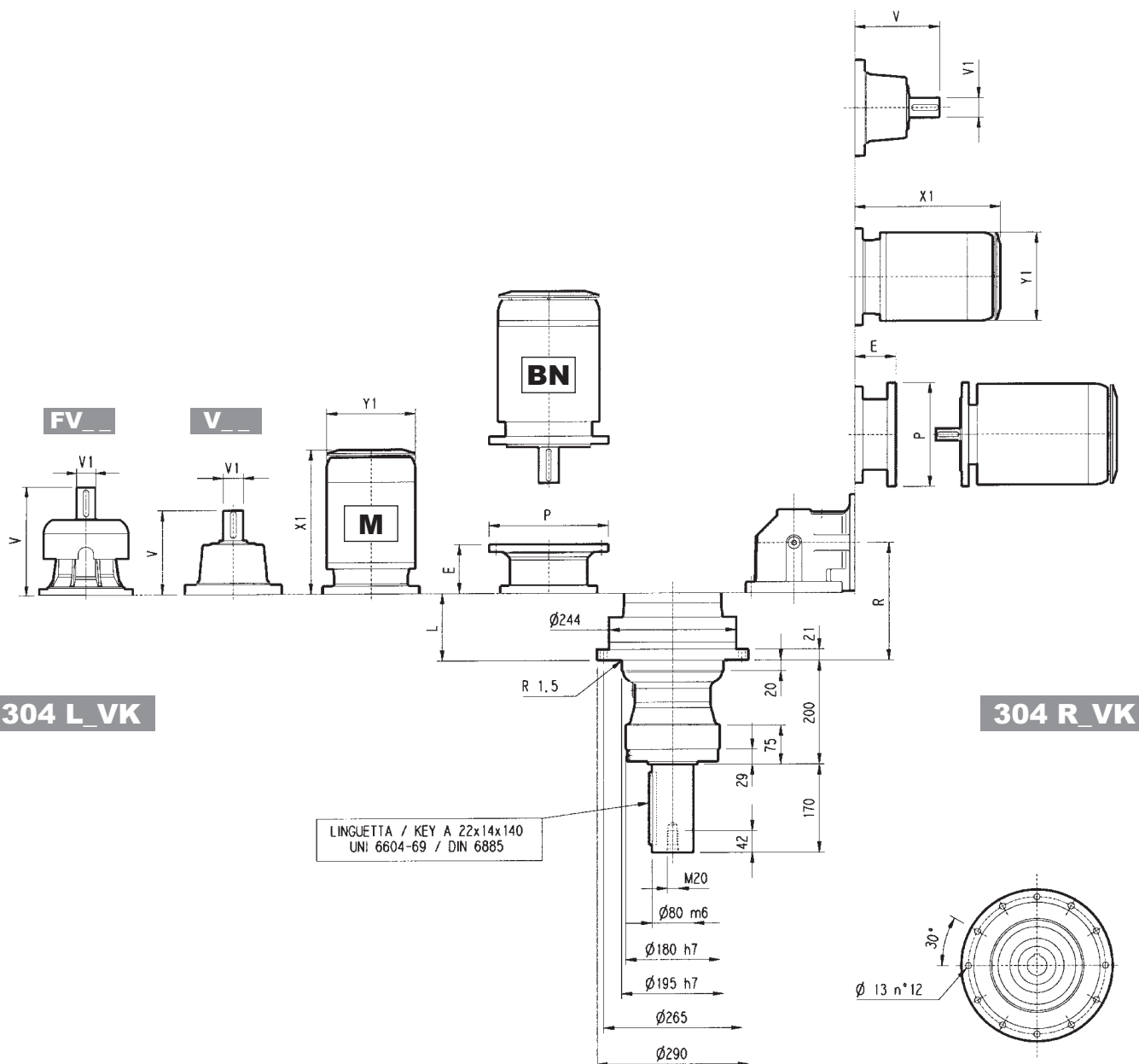
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





304_VK



304 L_VK

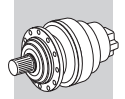
304 R_VK

		L													P71		P80		P90		P100		P112		P132		P160		P180		P200	
			V	V1		V	V1		V	V1		V	V1		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
304 L1	51	65	239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400		
304 L2	116	73	137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
304 L3	169	76	137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
304 L4	222	80	137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

	R	R1	Kg	V	V1	Kg	V	V1	Kg	P71	P80	P90	P100	P112	P132
										E	P	E	P	E	P
304 R2	143	140	85	137.5	24	6	158	38	7	65	160	84	200	84	200
304 R3	208	122	86	137.5	24	6	158	38	7	65	160	84	200	84	200
304 R4	261	122	90	137.5	24	6	158	38	7	65	160	84	200	84	200

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
304 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
304 L2	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
304 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
304 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
304 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-
304 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 304_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 304_VK, with radial force applying at a distance x from shaft shoulder.

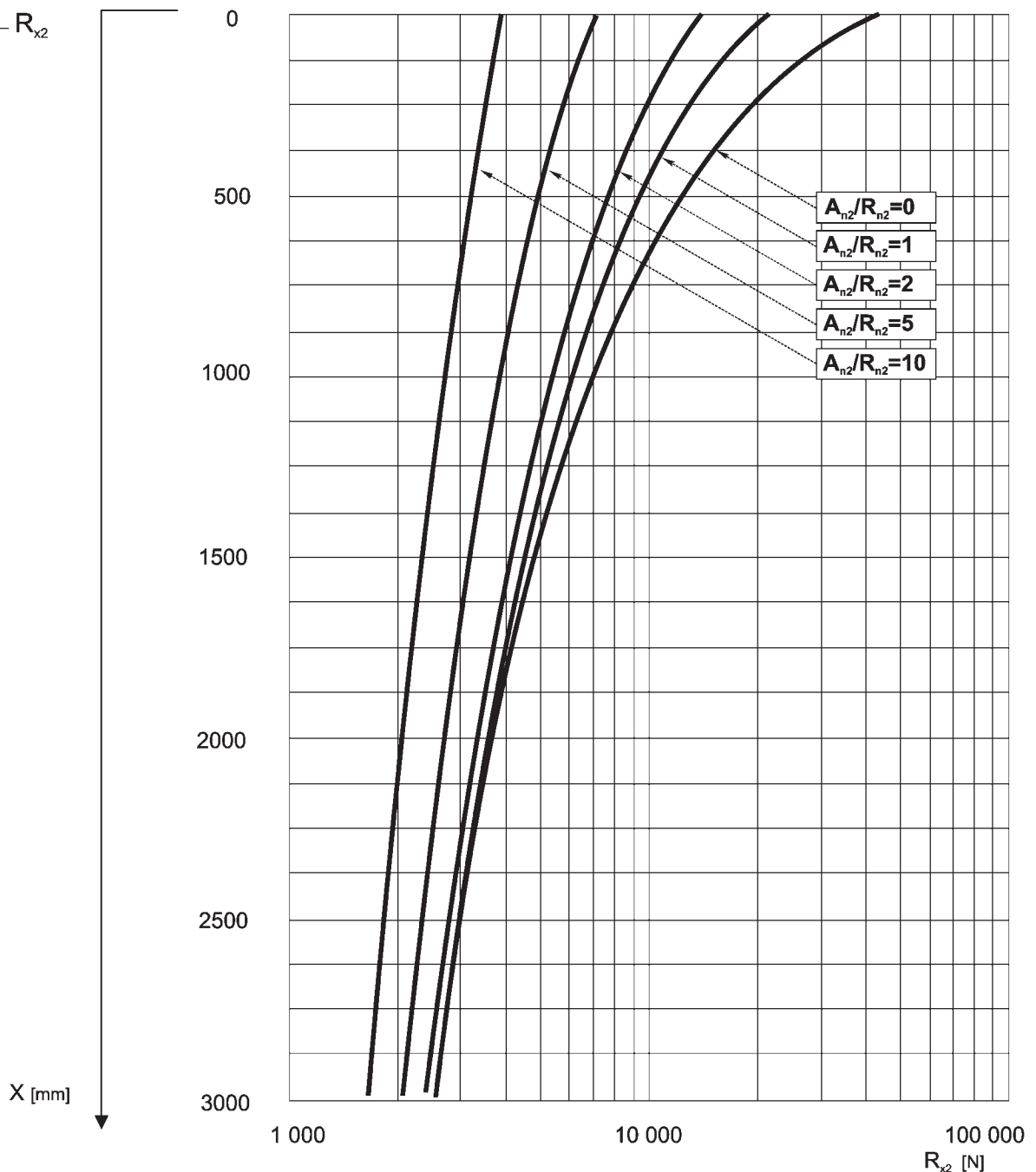
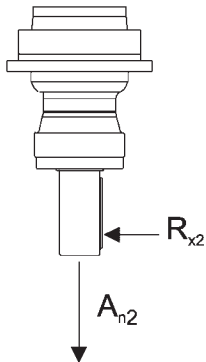
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

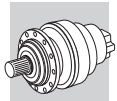
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 304_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

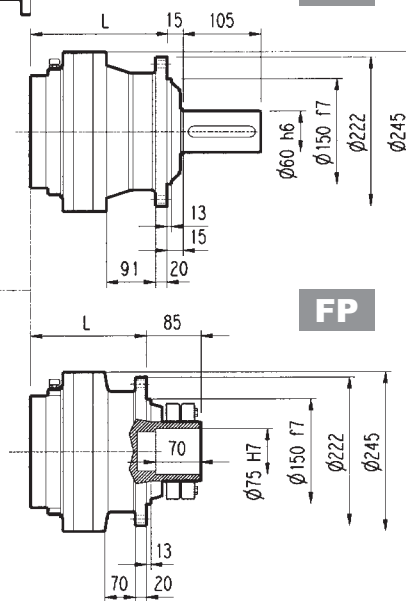
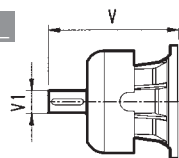
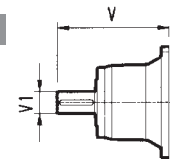
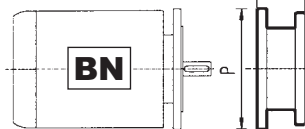
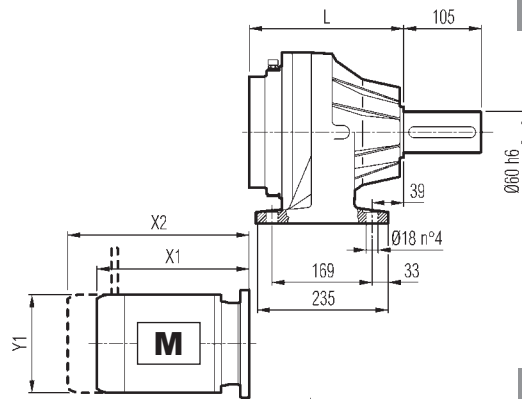
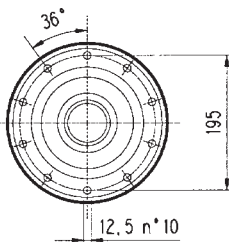
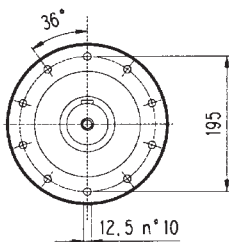
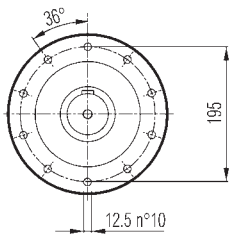
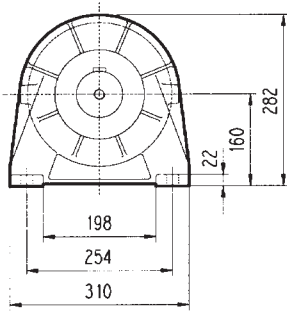
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 304_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.



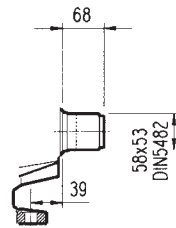


305 L



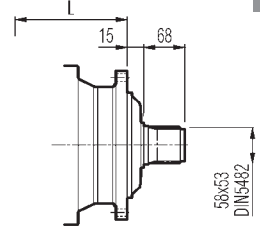
PC

PZ



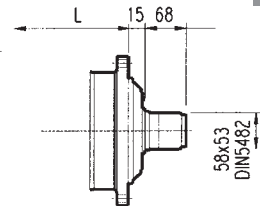
MC

MZ



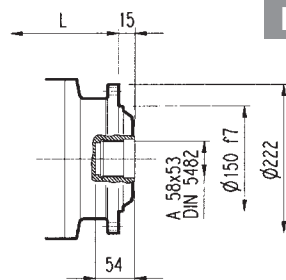
HC

HZ



FP

FZ



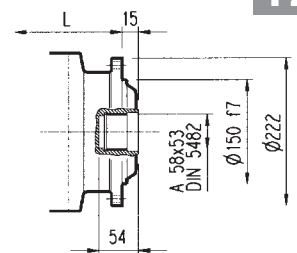
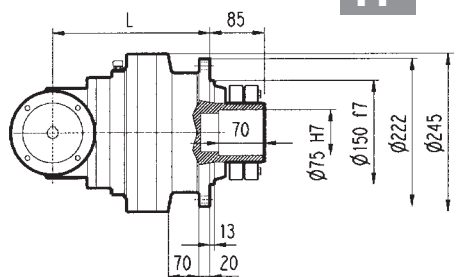
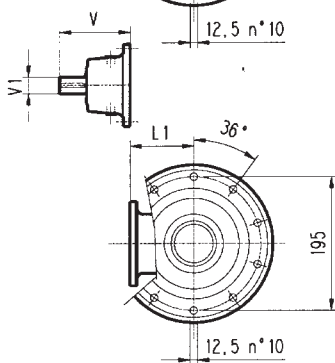
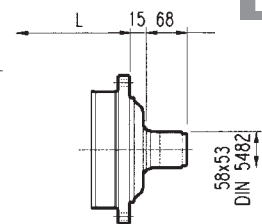
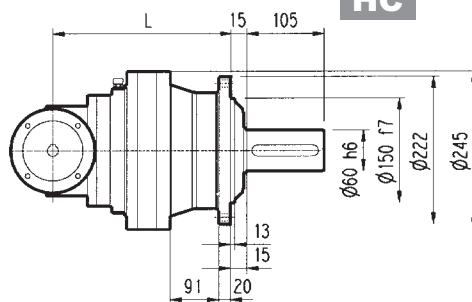
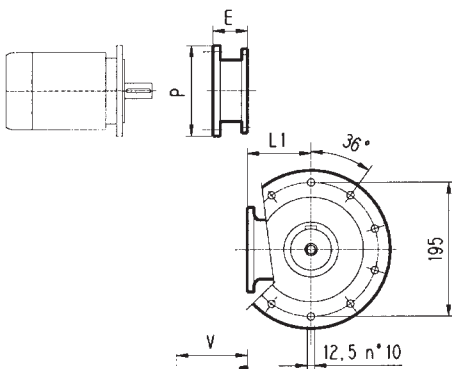
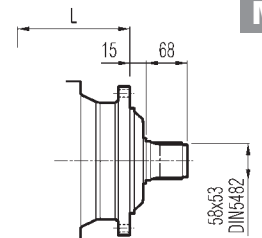
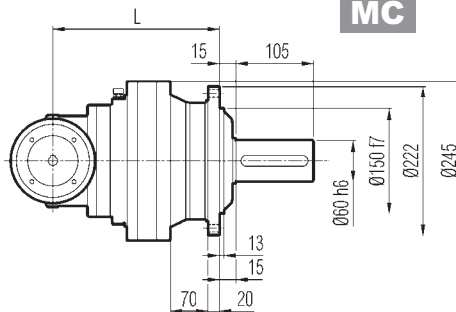
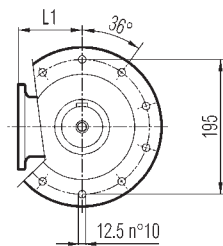
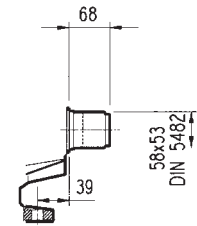
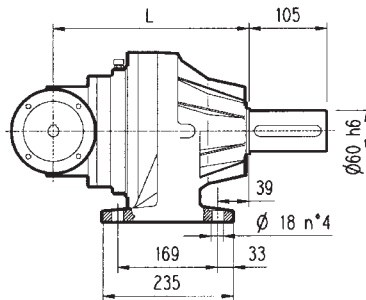
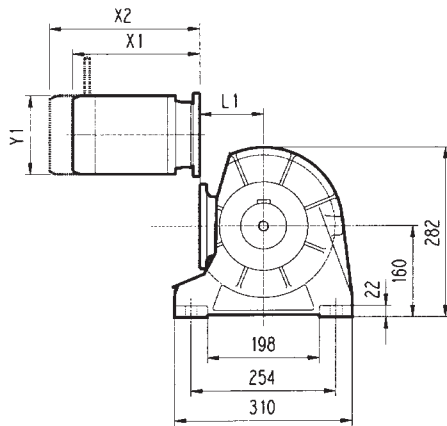
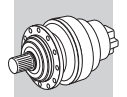
FP

M_{2max} = 7000 Nm

	L				Kg															
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
305 L1	143	183	168	143	36	45	40	36	239	48	15	-	-	-	276	48	17	-	-	-
305 L2	208	248	233	208	43	52	47	43	137.5	24	6	158	38	7	-	-	-	-	-	-
305 L3	261	301	286	261	47	56	51	47	137.5	24	6	158	38	7	-	-	-	-	-	-
305 L4	314	354	339	314	51	60	55	51	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
305 L1	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
305 L2	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
305 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
305 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
305 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
305 L2	-	-	-	-	-	-	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
305 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
305 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



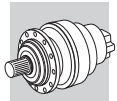
FP

M_{2max} = 7000 Nm

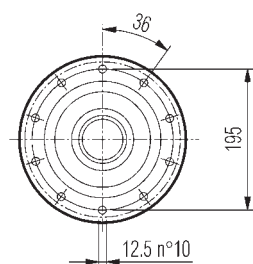
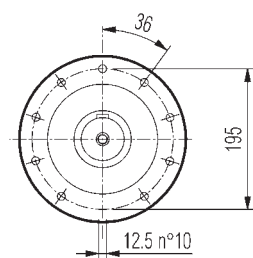
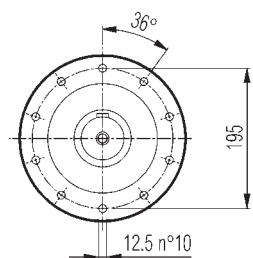
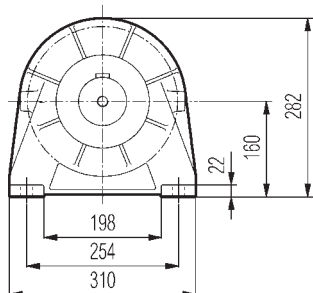
	L				L1	Kg									
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg
305 R2	235	375	260	235	140	56	65	60	56	137.5	24	6	158	38	7
305 R3	300	340	325	300	122	57	66	61	57	137.5	24	6	158	38	7
305 R4	353	393	378	353	122	61	70	65	61	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132	
	E	P	E	P	E	P	E	P	E	P	E	P
305 R2	65	160	84	200	84	200	94	250	94	250	114	300
305 R3	65	160	84	200	84	200	94	250	94	250	114	300
305 R4	65	160	84	200	84	200	94	250	94	250	114	300

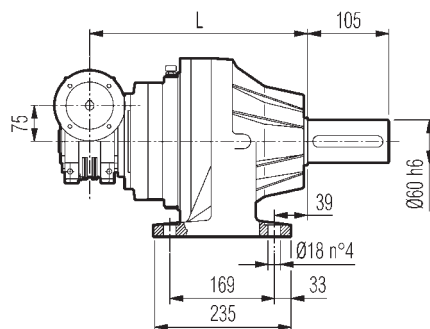
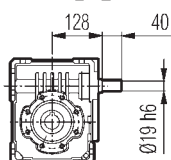
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
305 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
305 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
305 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



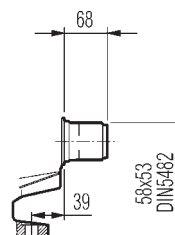
3/V 05 L3



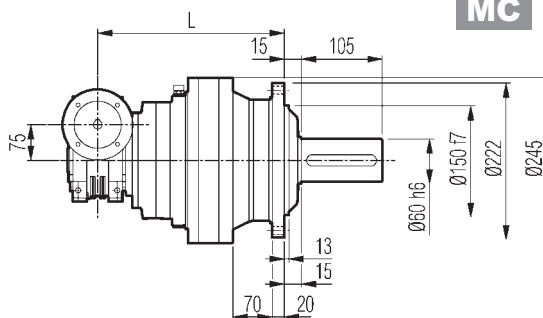
Vista da
View from **A**



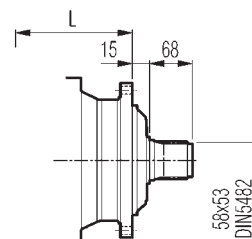
PC



PZ

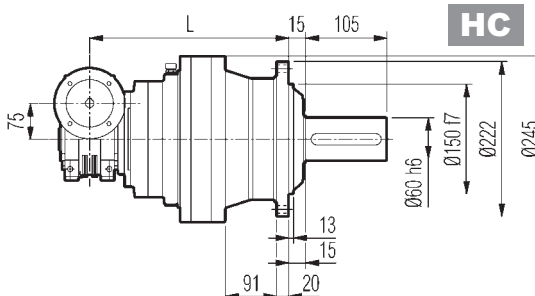


MC

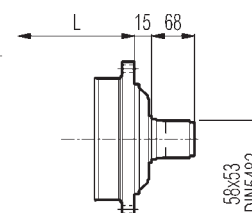


MZ

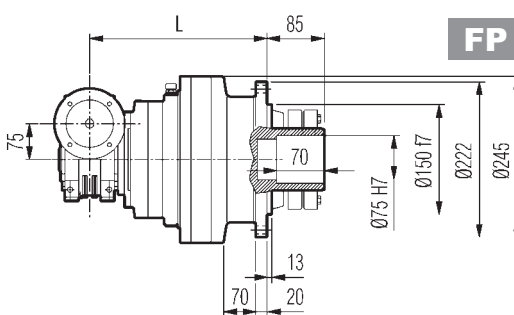
A →



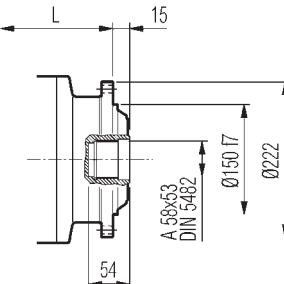
HC



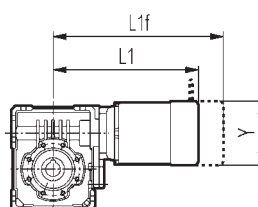
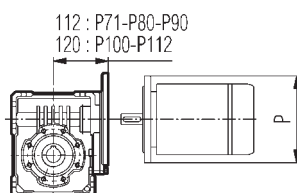
HZ



FP



FZ

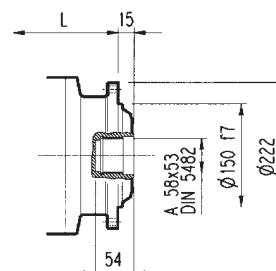
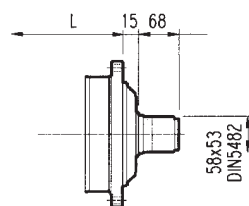
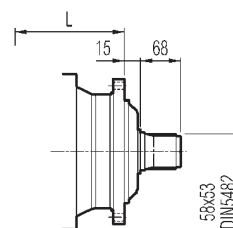
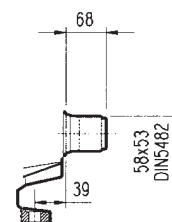
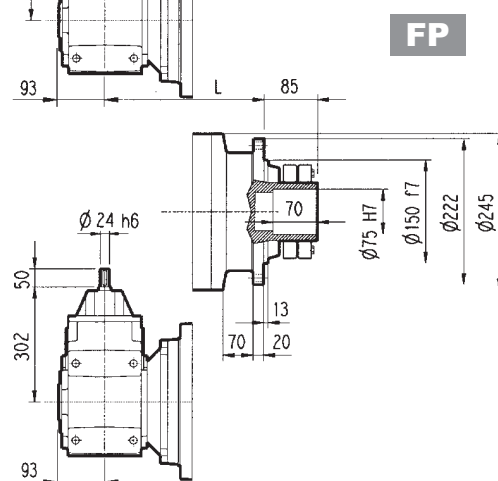
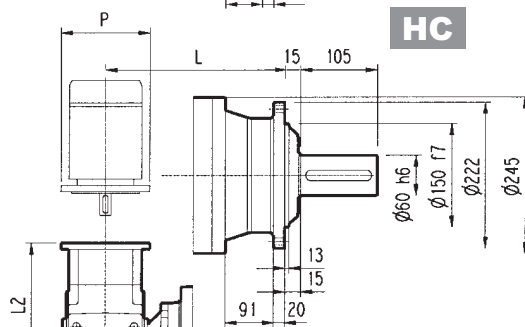
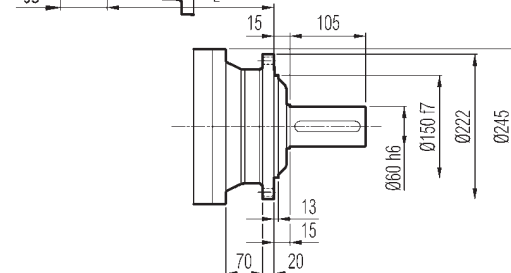
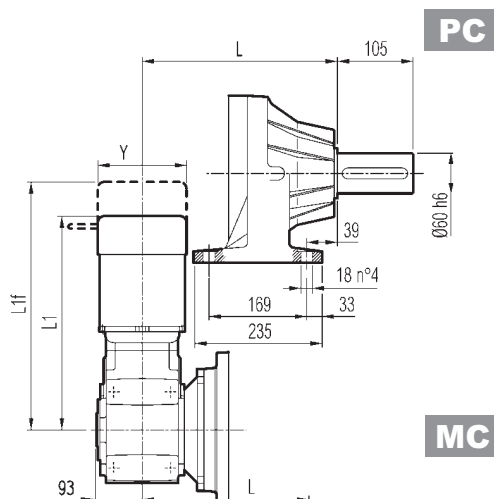
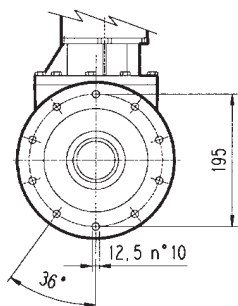
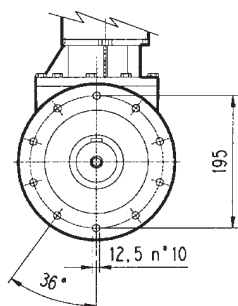
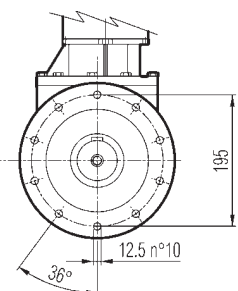
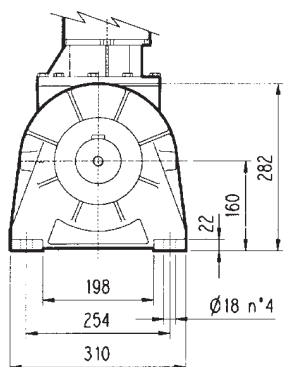
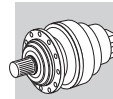


FP

M_{2max} = 7000 Nm

	L				Kg				P71	P80	P90	P100
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P
3/V 05 L3	323	363	348	323	51	60	55	51	160	200	200	250

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/V 05 L3	284	347	138	308	369	138	333	409	156	376	472	193	408	499	193



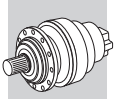
FP

$M_{2max} = 7000 \text{ Nm}$

	L				K_g				D1	L3	L4
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ			
3/A 05 L2	276	316	301	276	90	105	100	90	24	302	50

	P63		P71		P80		P90		P100		P112		P132	
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/A 05 L2	263	140	263	160	282.5	200	282.5	200	292.5	250	292.5	250	329	457

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3SA			S3 + M3LA			S4 + M4		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/A 05 L2	394	457	138	418	439	138	447	517	156	490	487	195	522	538	195	630	738	258



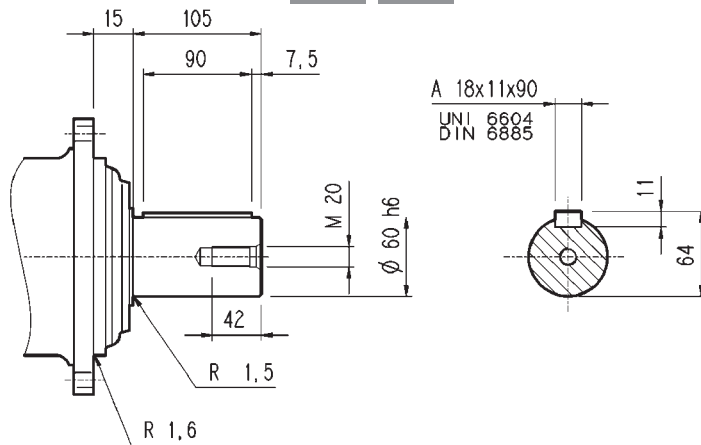
305 L

305 R

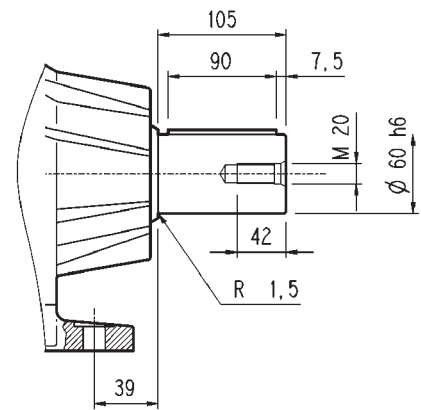
3/V 05 L3

3/A 05 L2

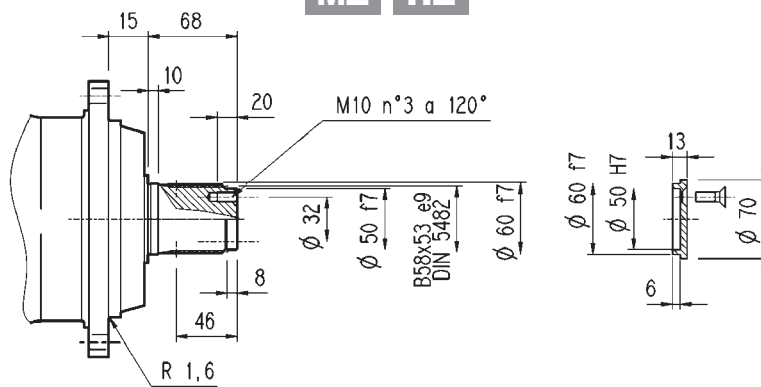
MC HC



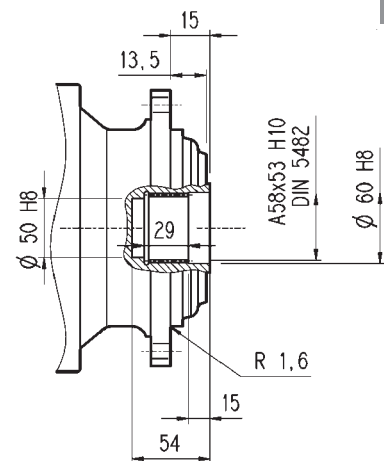
PC



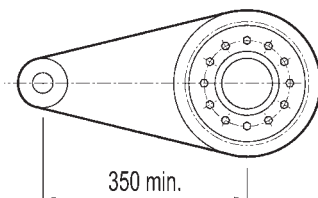
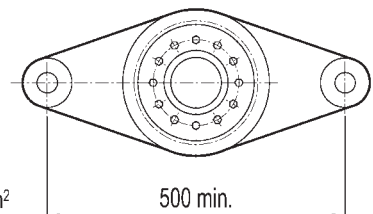
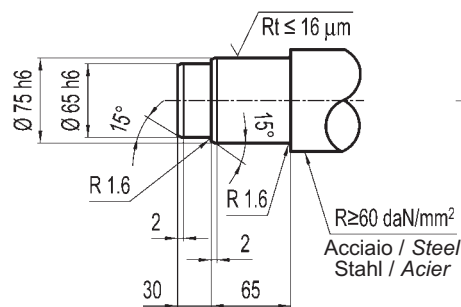
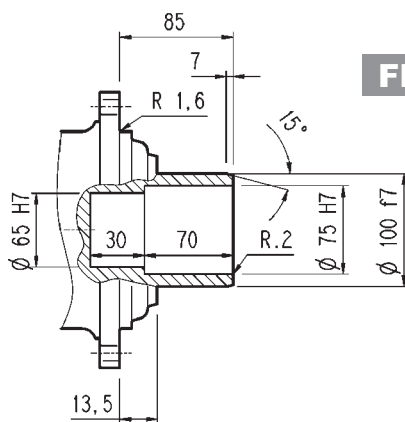
MZ HZ



FZ

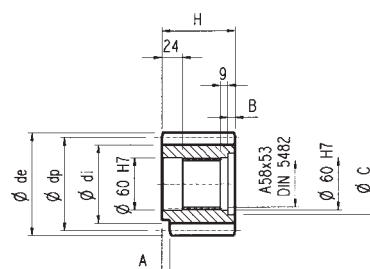
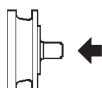
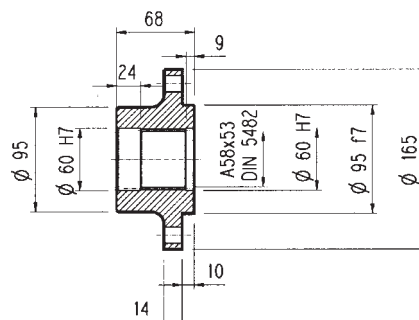
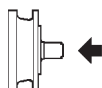
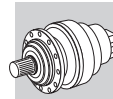


FP

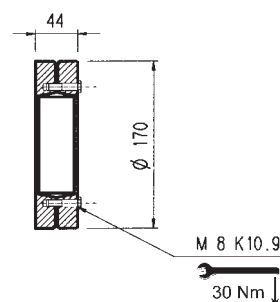
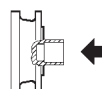
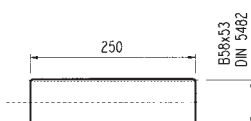
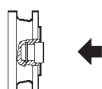
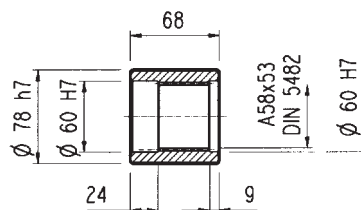


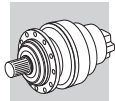
FP

M_{2max} = 7000 Nm



☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato <i>Steel 39NiCrMo3 hardened and tempered</i> Vergüteter Stahl 39NiCrMo3 <i>Acier bonifiée 39NiCrMo3</i>
■	Acciaio 18NiCrMo5 Cementato e temprato <i>Steel 18NiCrMo5 Case hardened</i> Einsatzstahl 18NiCrMo5 Einsatzgehärtet <i>Acier cémentée et trempée 18NiCrMo5</i>

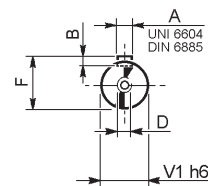
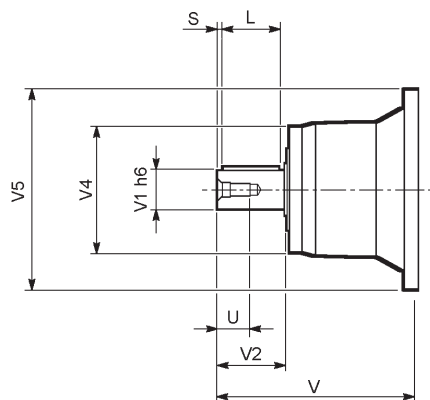




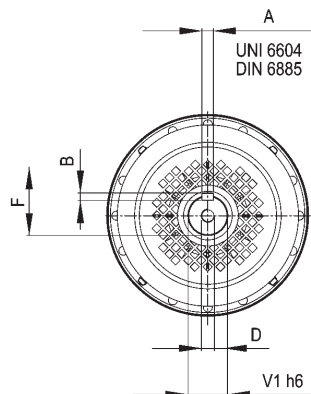
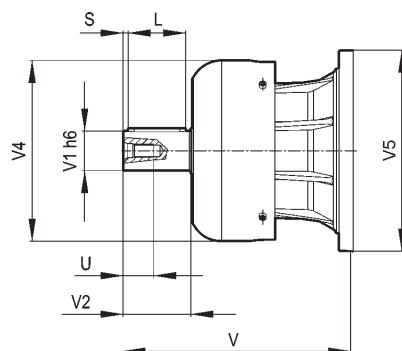
305 L

305 R

V



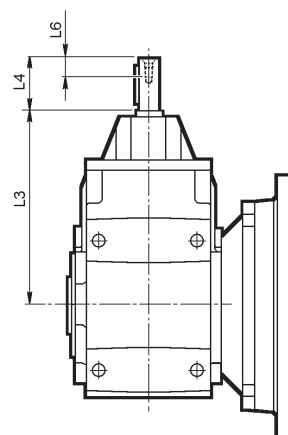
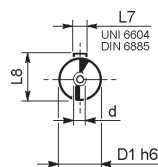
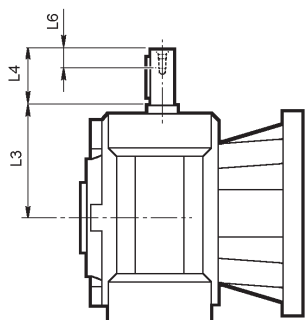
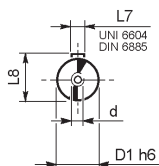
FV



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
305 L1	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
305 L2	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
305 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
305 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
305 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

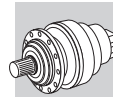
3/V 05 L3

3/A 05 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 05 L3_HS	19	128	40	16	6	21.5	M6

	D1 h6	L3	L4	L6	L7	L8	d
3/A 05 L2_HS	24	302	50	19	8	27	M8

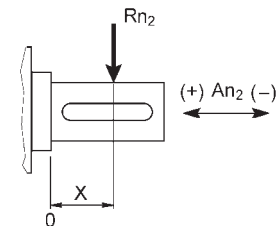
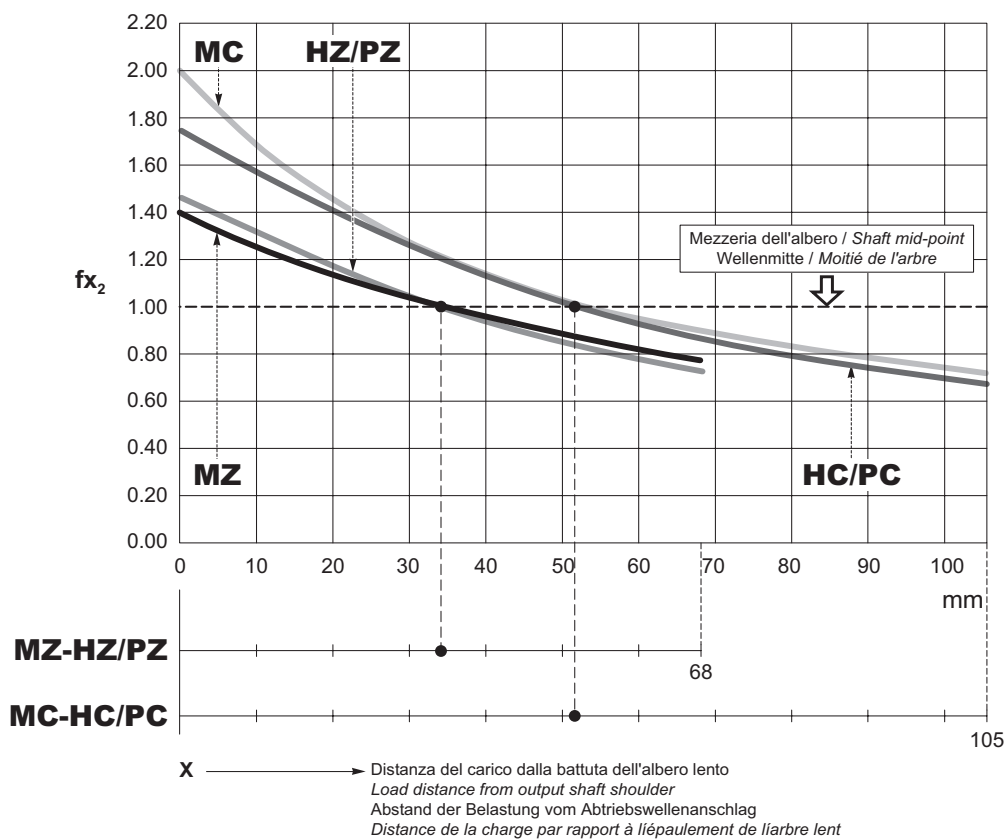


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

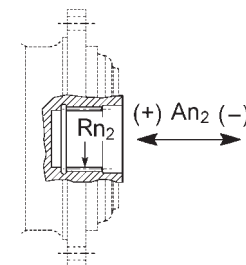
Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$$R_{x2} = R_{n2} \cdot f_{x2}$$

$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ/PZ	0.74	0.59
HC/PC	0.86	0.69
MC	2.04	2.04
MZ	1.74	1.74



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	1.04	1.04

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

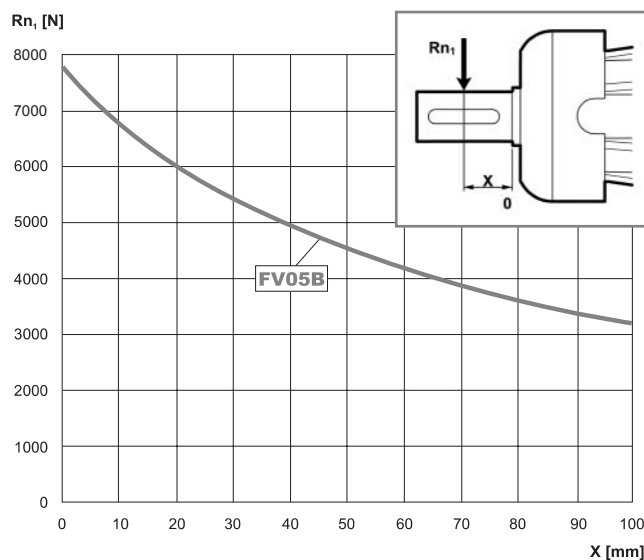
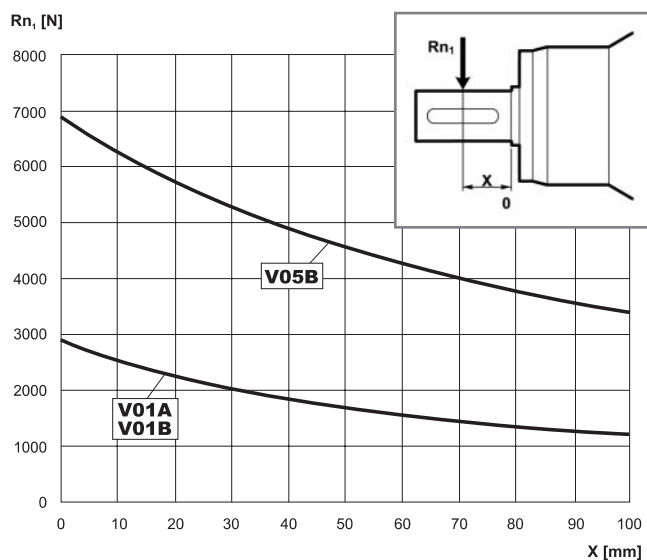
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

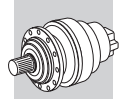
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
305 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
305 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
305 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 305_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 305_VK, with radial force applying at a distance x from shaft shoulder.

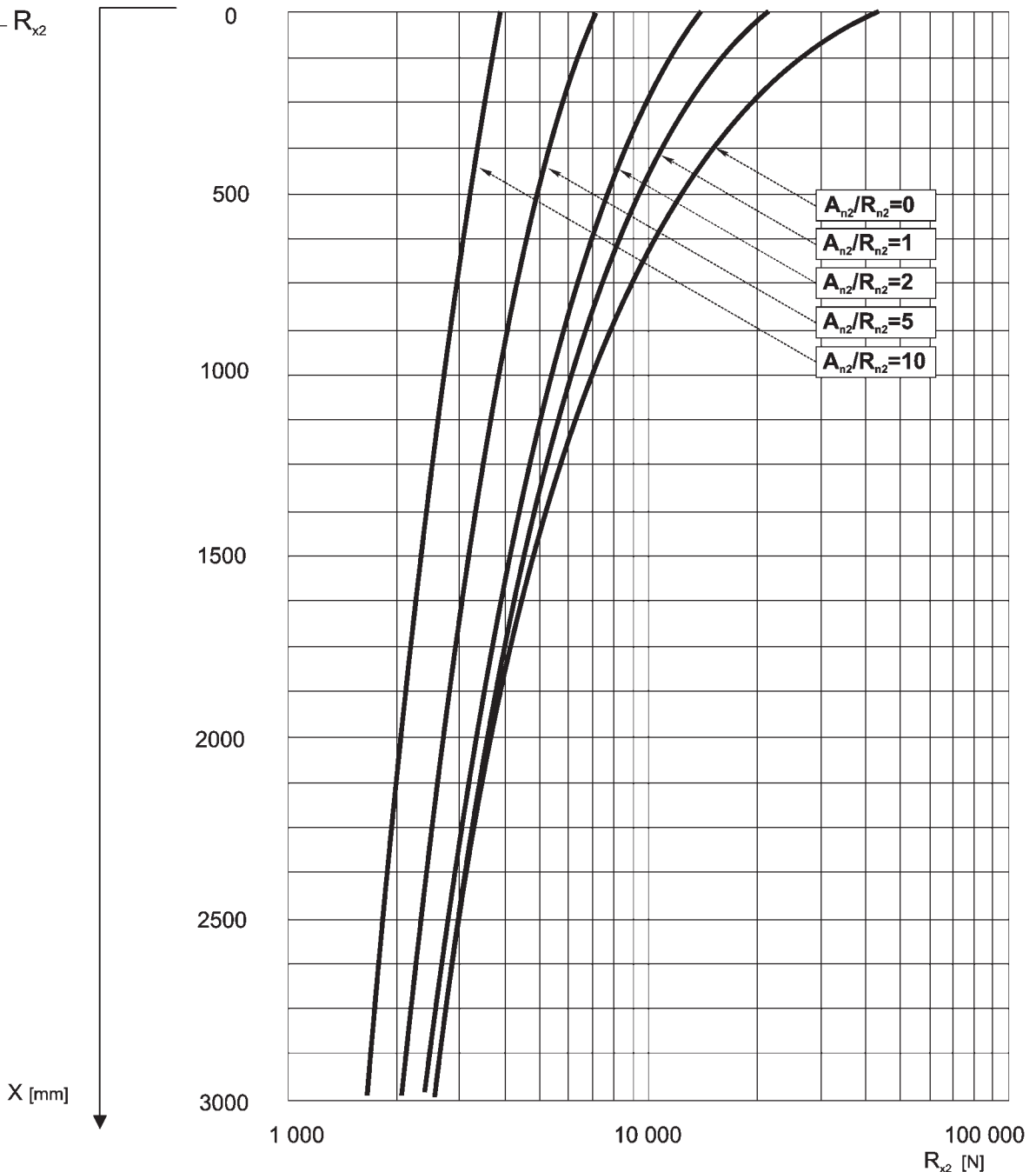
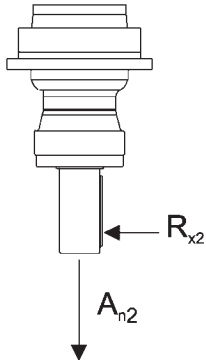
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

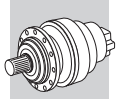
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 305_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

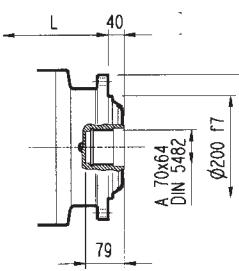
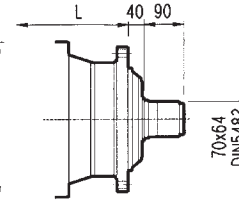
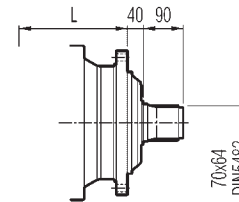
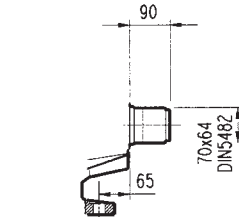
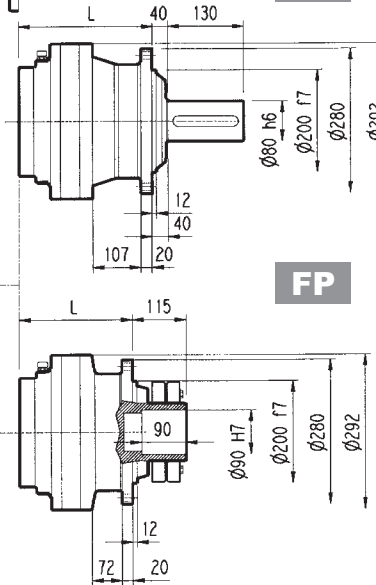
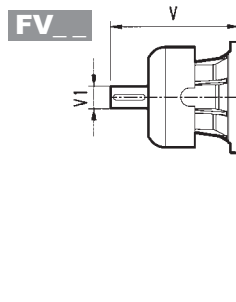
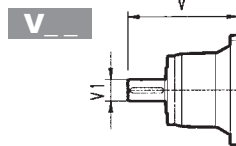
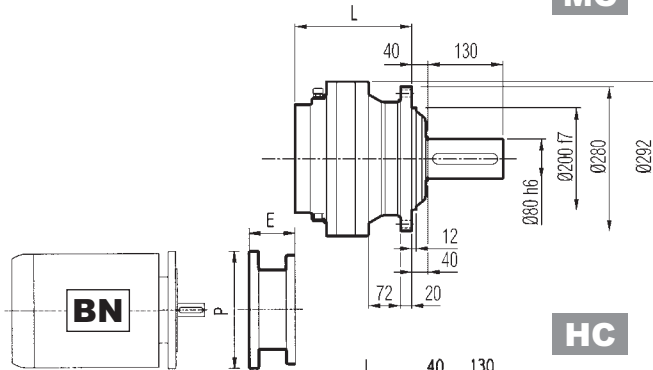
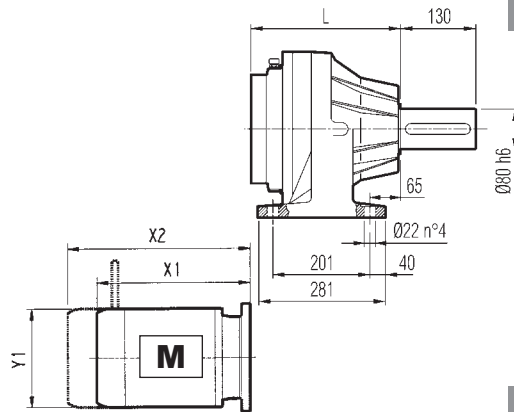
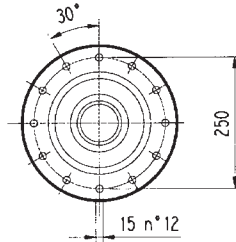
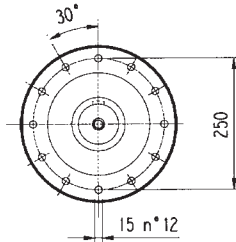
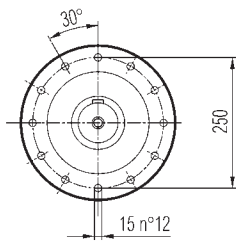
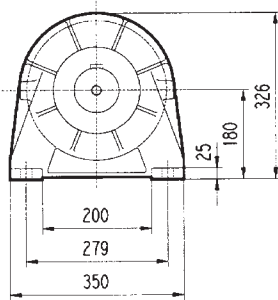
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 305_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





306 L



PC

PZ

MC

MZ

HC

HZ

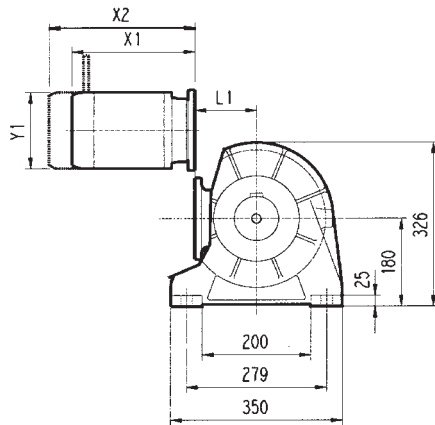
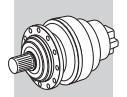
FP

FZ

FP

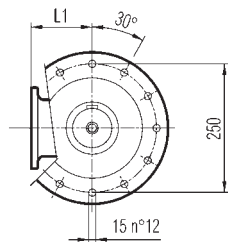
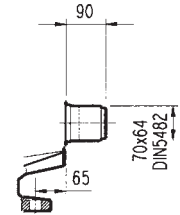
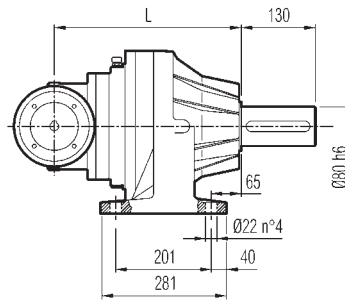
$M_{2max} = 12000 \text{ Nm}$

	L																							
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1		V	V1		V	V1		V	V1					
306 L1	160	235	195	160	65	85	70	65	307	60	23	-	-	-	357	60	28	-	-	-				
306 L2	225	300	260	225	74	95	79	74	239	48	15	-	-	-	276	48	17	-	-	-				
306 L3	278	353	313	278	78	98	83	78	137.5	24	6	158	38	7	-	-	-	-	-	-				
306 L4	331	406	366	331	82	103	87	82	137.5	24	6	158	38	7	-	-	-	-	-	-				
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250			
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P		
306 L1	-	-	-	-	-	-	-	-	-	-	-	-	144	350	153	350	183	400	212	450	193	550		
306 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-		
306 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-		
306 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-		
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
306 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
306 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
306 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
306 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



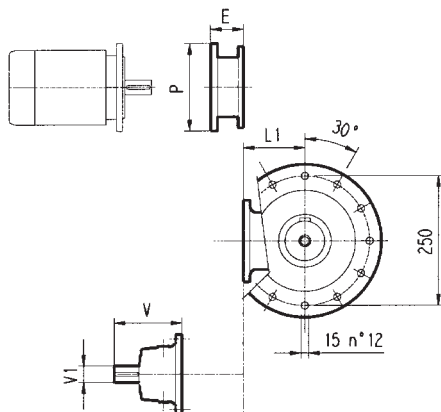
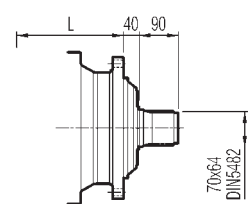
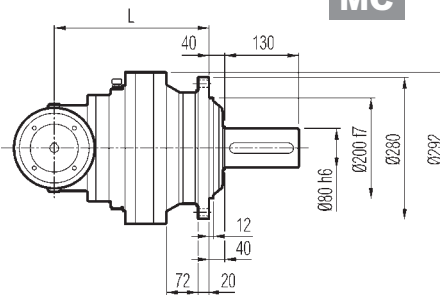
PC

PZ



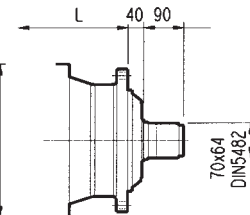
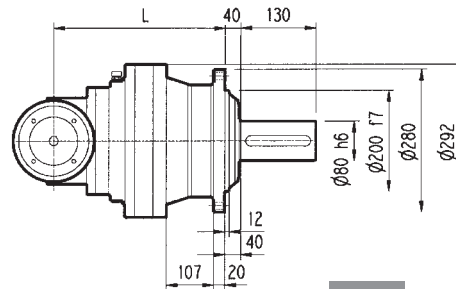
MC

MZ



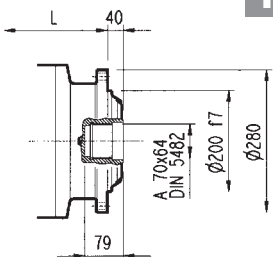
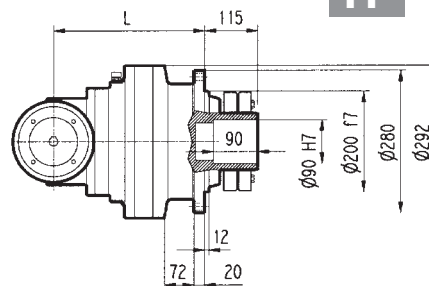
HC

HZ



FP

FZ



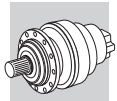
FP

$M_{2max} = 12000 \text{ Nm}$

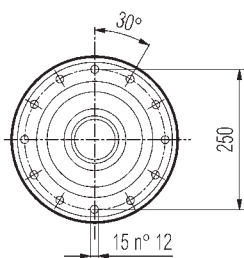
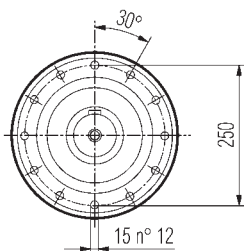
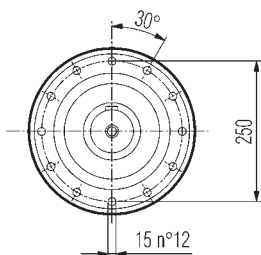
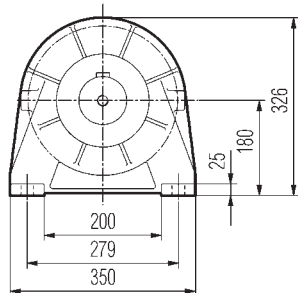
	L				L1	Kg									
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg
306 R2	297	372	332	297	140	89	105	94	89	137.5	24	6	158	38	7
306 R3	317	392	352	317	140	85	100	90	85	137.5	24	6	158	38	7
306 R4	370	445	405	370	122	79	95	84	79	137.5	24	6	158	38	7

	P71		P80		P90		P100		P112		P132		P160	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P
306 R2	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350

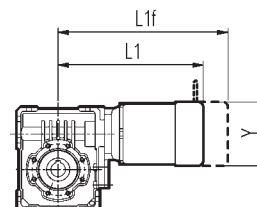
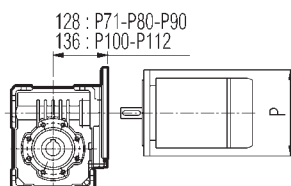
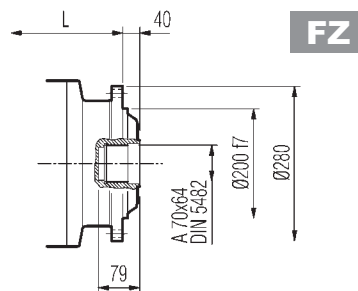
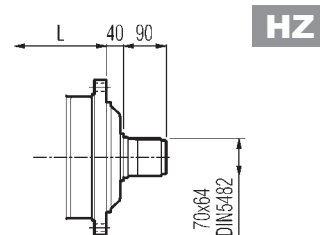
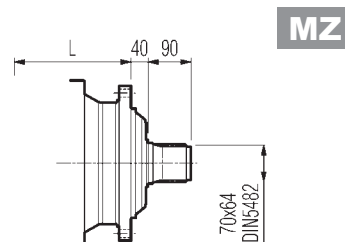
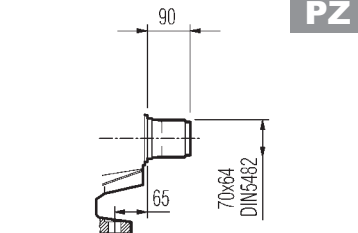
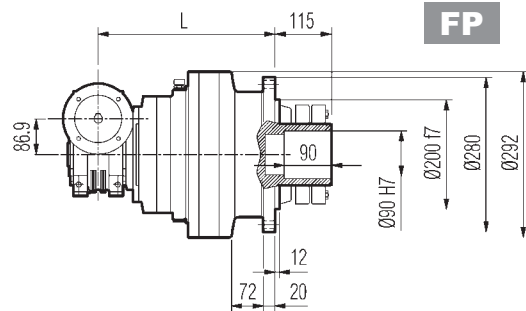
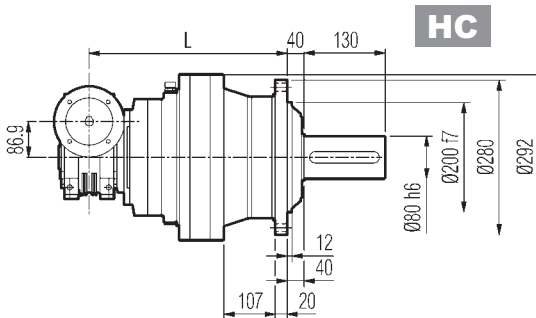
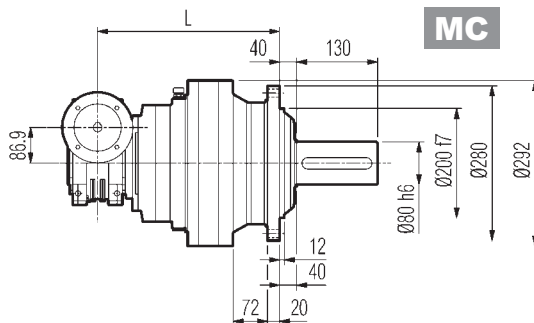
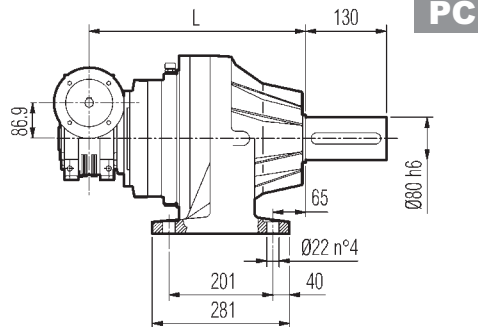
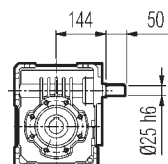
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	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
306 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
306 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
306 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



3/V 06 L3



Vista da
View from **A**

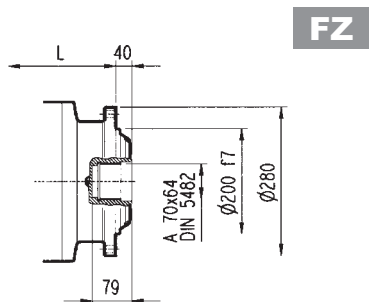
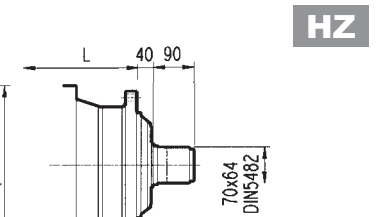
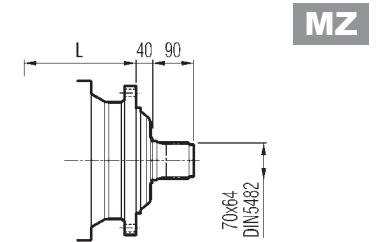
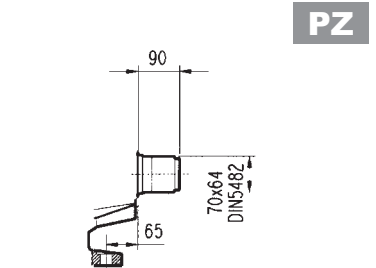
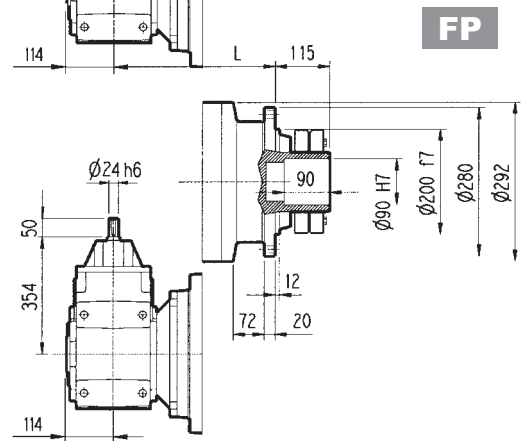
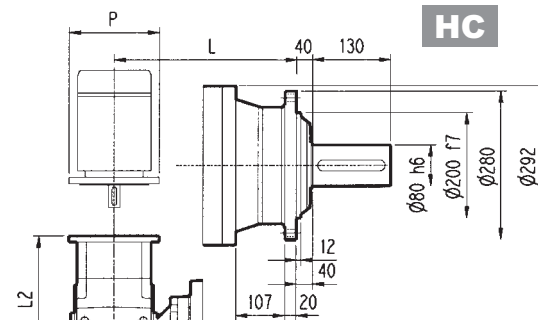
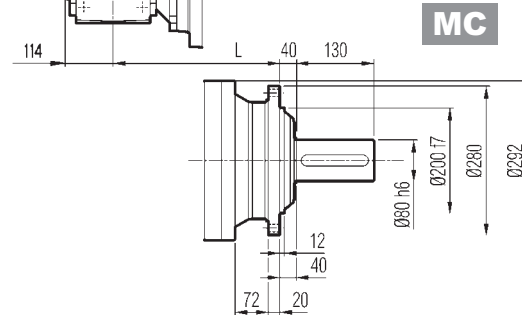
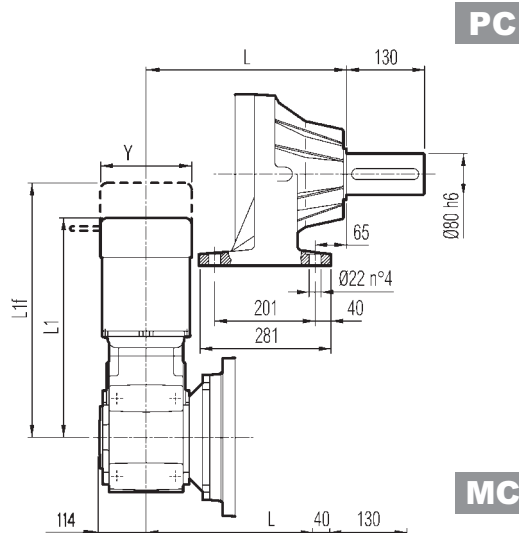
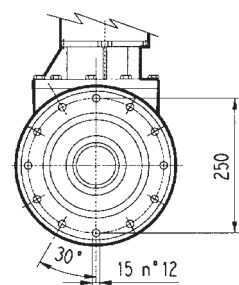
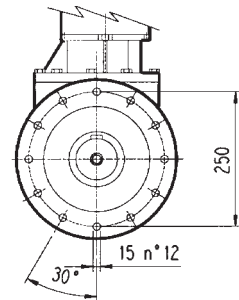
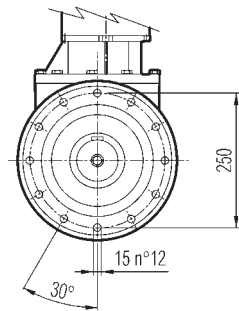
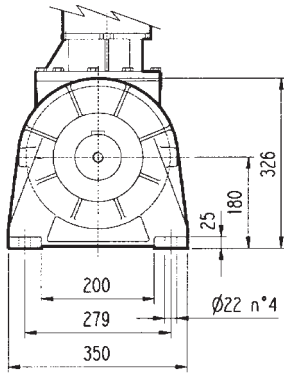
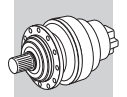


FP

M_{2max} = 12000 Nm

	L				Kg				P71	P80	P90	P100	P112
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P	P
3/V 06 L3	370	445	405	370	80	111	95	80	160	200	200	250	250

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/V 06 L3	300	363	138	324	385	138	349	425	156	392	477	193	424	515	193

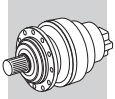


FP	M_{2max} = 12000 Nm

	L				Kg				D1	L3	L4
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ			
3/A 06 L2	340	415	375	340	140	170	150	140	24	354	50

	P63		P71		P80		P90		P100		P112		P132		P160		P180	
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/A 06 L2	314.5	140	314.5	160	334	200	334	200	344	250	344	250	380.5	300	431	350	431	350

	S1 + M1			S2 + M2S			S3 + M3SA			S3 + M3LA			S4 + M4		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y
3/A 06 L2	445	508	138	568	517	156	541	637	195	572	665	195	678	789	258



306 L

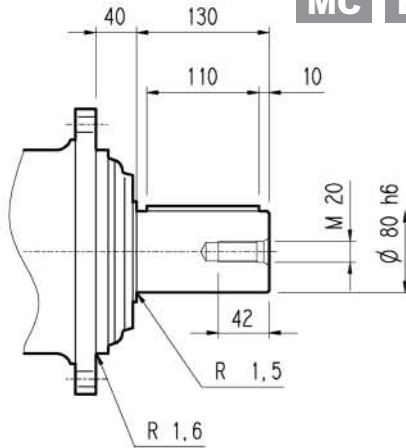
306 R

3/V 06 L3

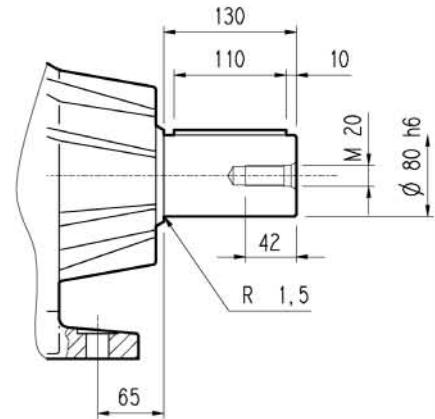
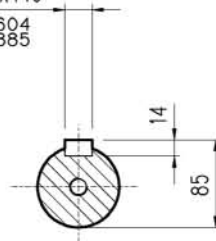
3/A 06 L2

MC HC

PC

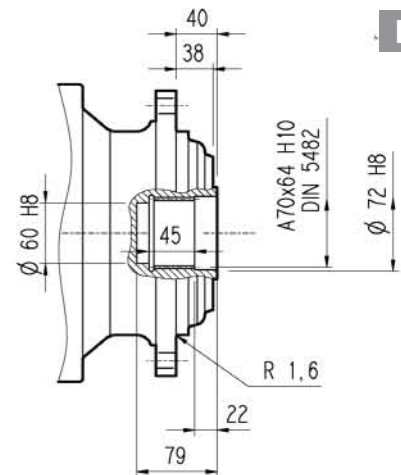
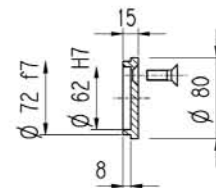
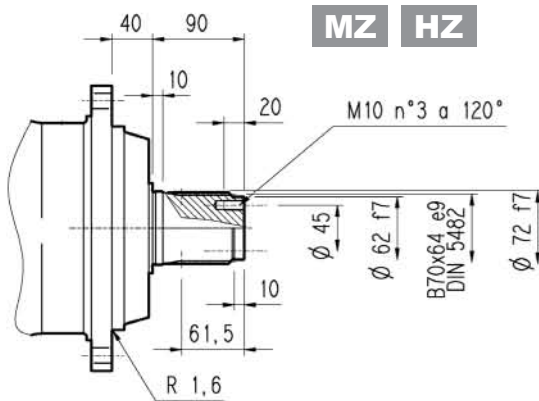


A 22x14x110
UNI 6604
DIN 6885

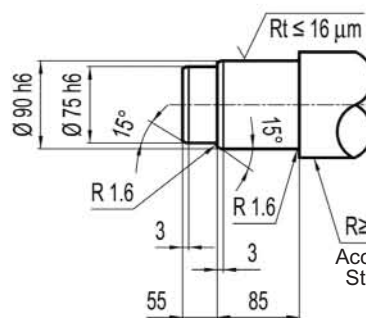
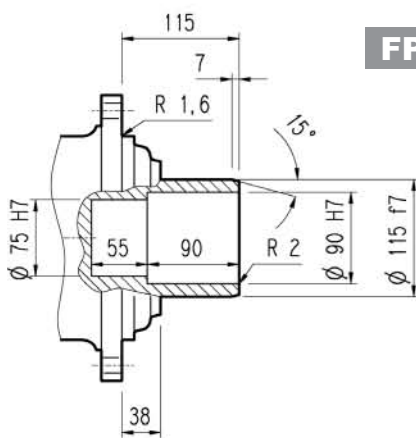


MZ HZ

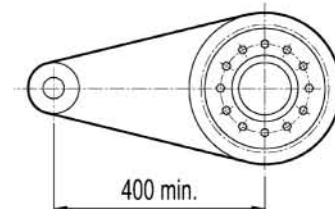
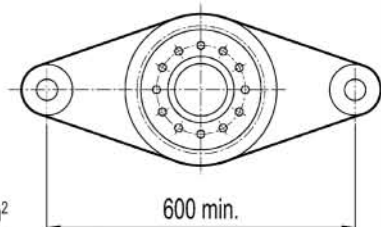
FZ



FP

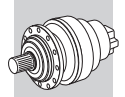


$R \geq 60 \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier

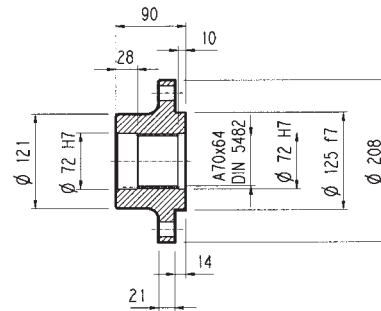
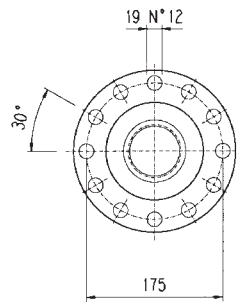
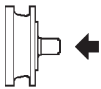


FP

$M_{2\max} = 12000 \text{ Nm}$

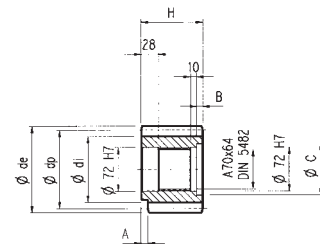
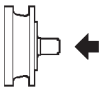
306 L**306 R****3/V 06 L3****3/A 06 L2**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

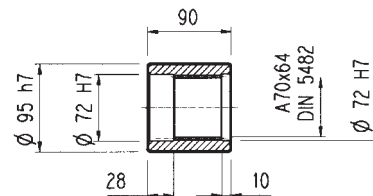
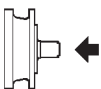
Pignoni / Pinion gears
Ritzel / Pignons

P...

	m	z	x	dp	di	de	H	A	B	C	☆
PFF1	8	15	0	120	100	134	90	0	0	0	□
PFF2	8	15	0.500	120	108	141	90	0	0	0	□
PHB	10	11	0.500	110	95	136	90	10	0	0	□
PHC1	10	12	0.450	120	104	145	90	0	0	0	□
PHC2	10	12	0.320	120	100	144.2	90	0	0	0	□
PHC3	10	12	0.350	120	101	144	90	0	0	0	□
PHD1	10	13	0.950	130	124	165	90	0	0	0	□
PHD2	10	13	0.500	130	115	159	90	0	0	0	□
PHE1	10	14	0	140	115	160	90	0	0	0	□
PHE2	10	14	0.500	140	125	166	90	0	0	0	■
PHF	10	15	0	150	127	167	90	24	0	0	□
PHH	10	17	0.480	170	154	197.5	90	10	0	0	□
PHM	10	20	0	200	175	220	90	10	0	0	■

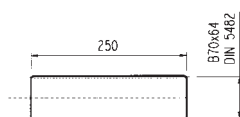
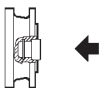
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimentée et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

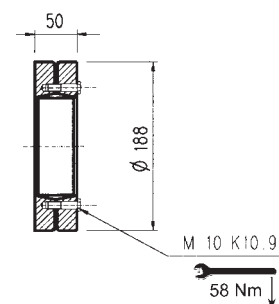
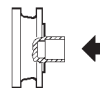
Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

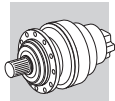
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e
 temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case
 hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet
 werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

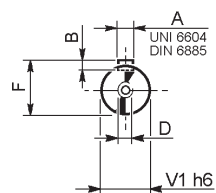
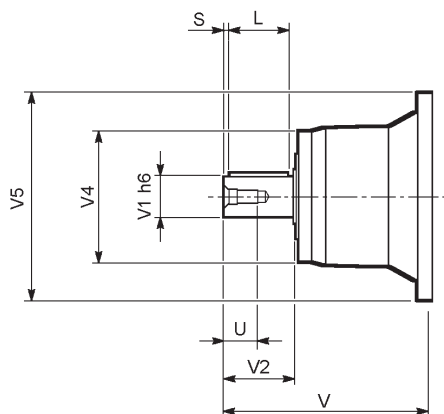
G0A



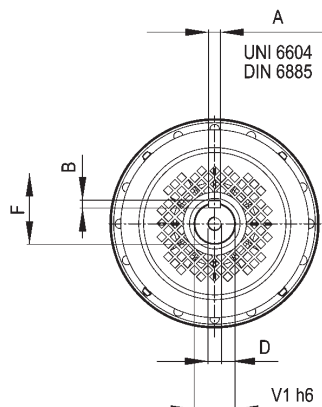
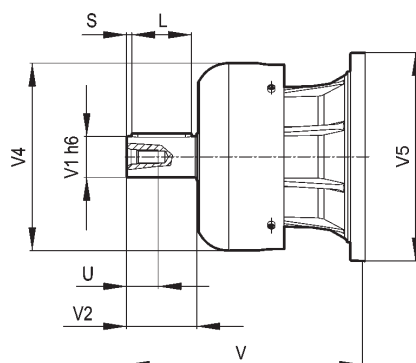
306 L

306 R

V _ _



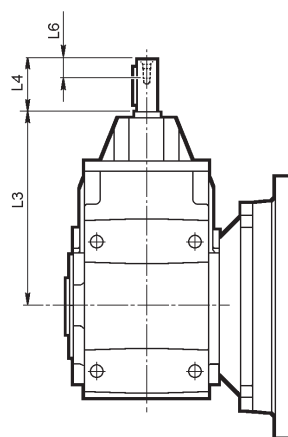
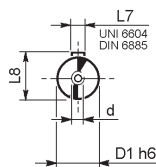
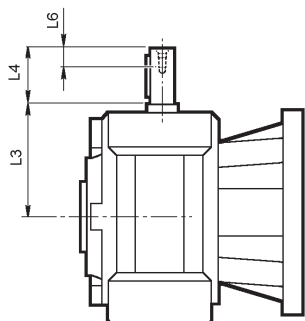
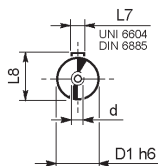
FV _ _



	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
306 L1	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
306 L2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
306 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
306 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
306 R2-R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

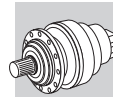
3/V 06 L3

3/A 06 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 06 L3_HS	25	144	50	19	8	28	M8

	D1 h6	L3	L4	L6	L7	L8	d
3/A 06 L2_HS	24	354	50	19	8	27	M8

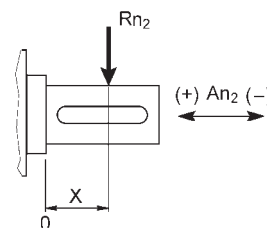
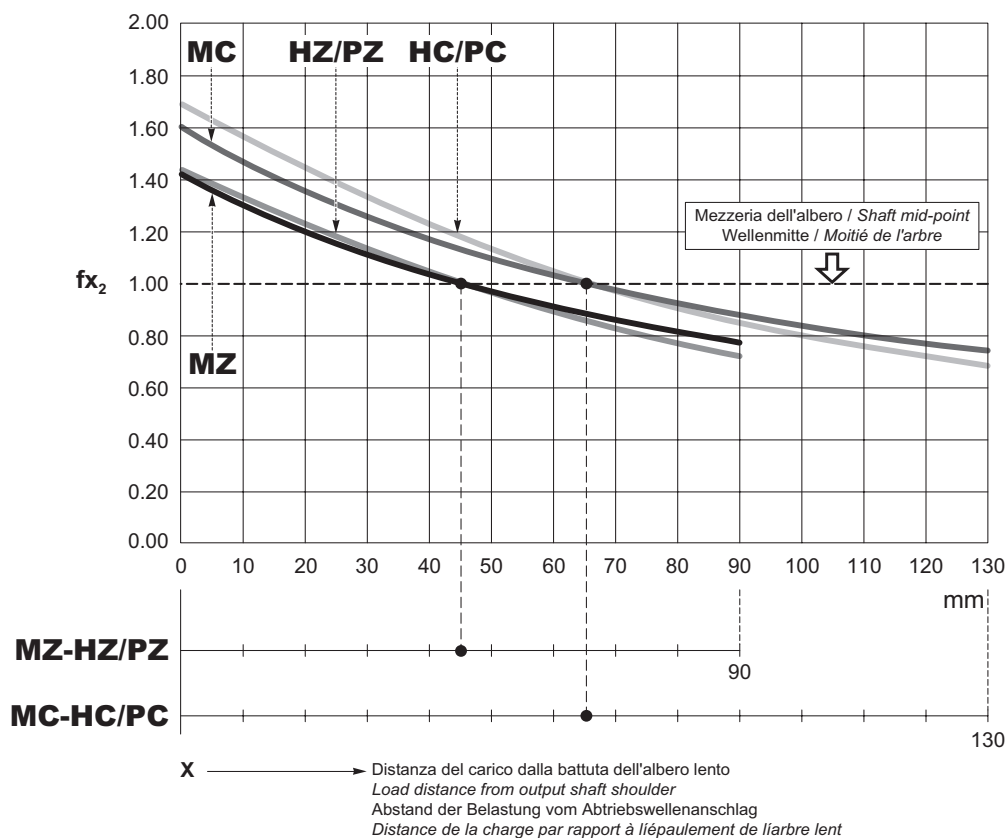


Fattore di posizione per carichi radiali sugli alberi in uscita.

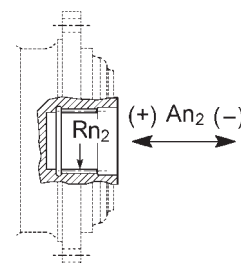
Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$R_{x2} = R_{n2} \cdot f_{x2}$		
$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ/PZ	1.01	0.50
HC/PC	1.19	0.59
MC	2.14	2.14
MZ	1.89	1.89



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	1.00	1.00

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

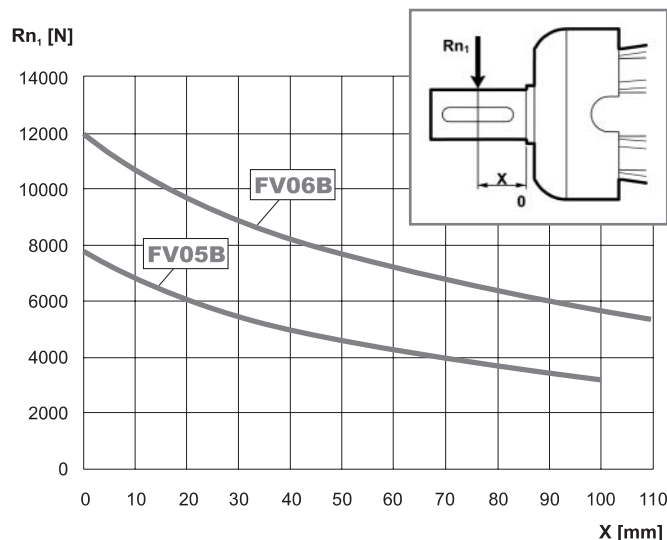
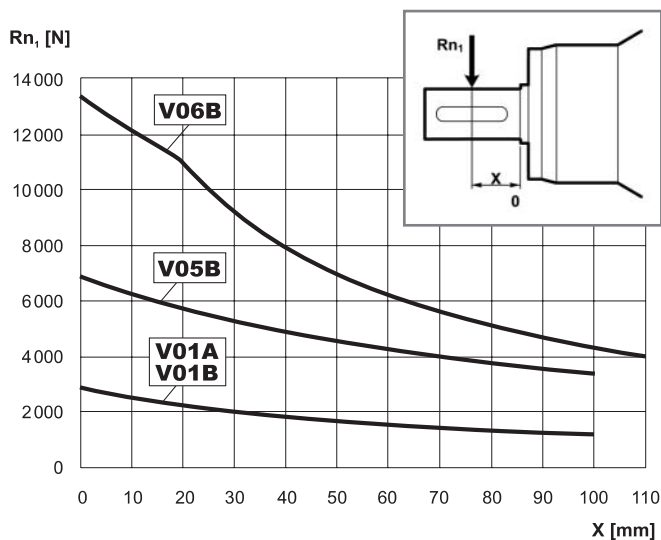
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

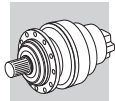
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

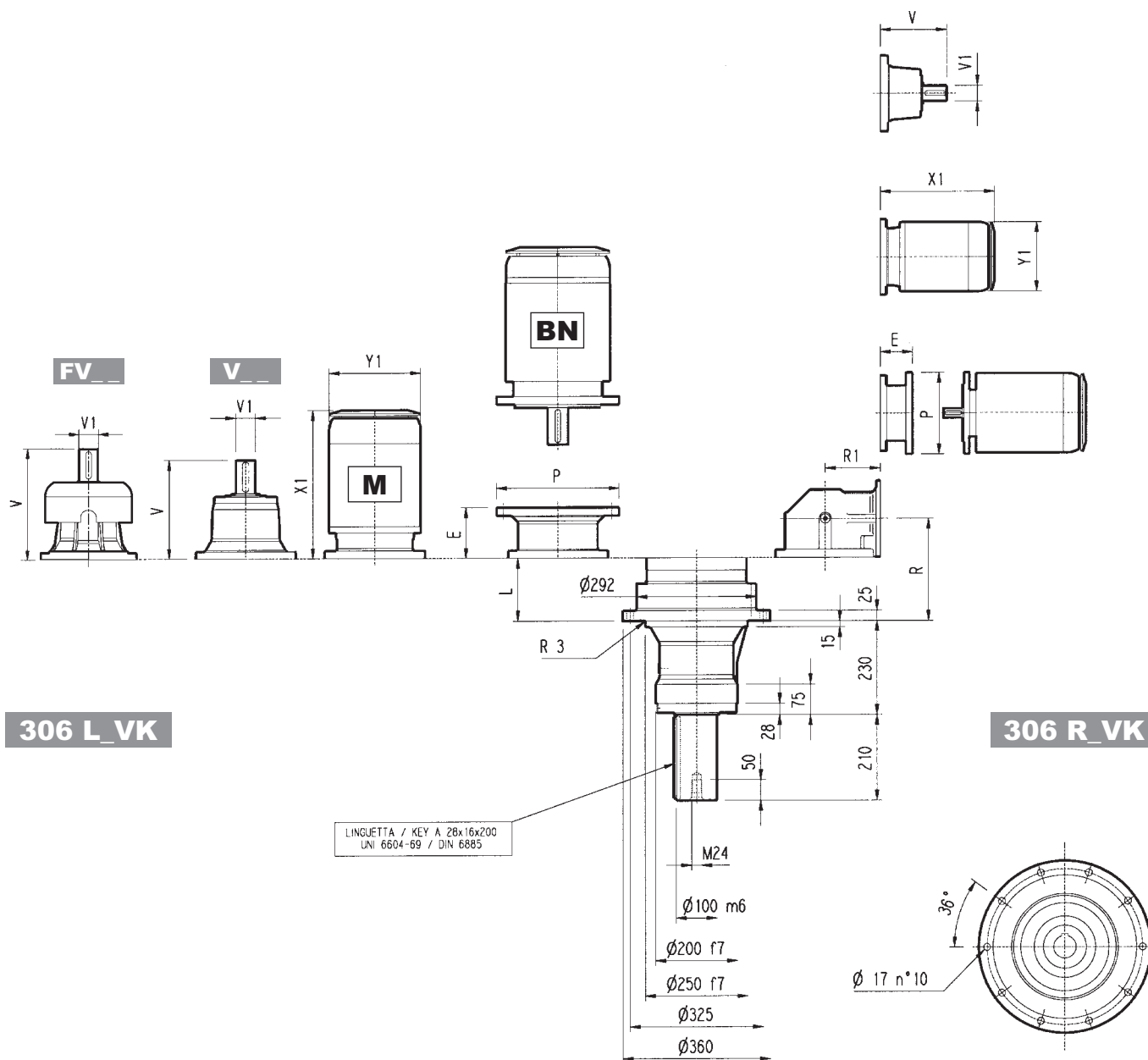
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





306_VK



306 L_VK

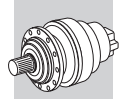
306 R_VK

	L														P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
			V	V1		V	V1		V	V1		V	V1		E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P		
306 L1	75	110	307	60	23	-	-	-	357	60	28	-	-	-	-	-	-	-	-	-	-	-	-	-	144	350	153	350	183	400	212	450	193	550		
306 L2	140	120	239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-	
306 L3	193	125	137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-		
306 L4	246	130	137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-		

	R	R1								P71		P80		P90		P100		P112		P132		P160	
				V	V1		V	V1		E	P	E	P	E	P	E	P	E	P	E	P	E	P
306 R2	212	140	130	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R3	232	140	125	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300	144	350
306 R4	285	122	120	137.5	24	6	158	38	7	65	160	84	200	84	200	94	250	94	250	114	300	144	350

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
306 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
306 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
306 L3	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
306 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
306 R2	-	-	-	-	-	-	328	400	156	373	469	195	405	497	195	508	619	258
306 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258
306 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 306_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 306_VK, with radial force applying at a distance x from shaft shoulder.

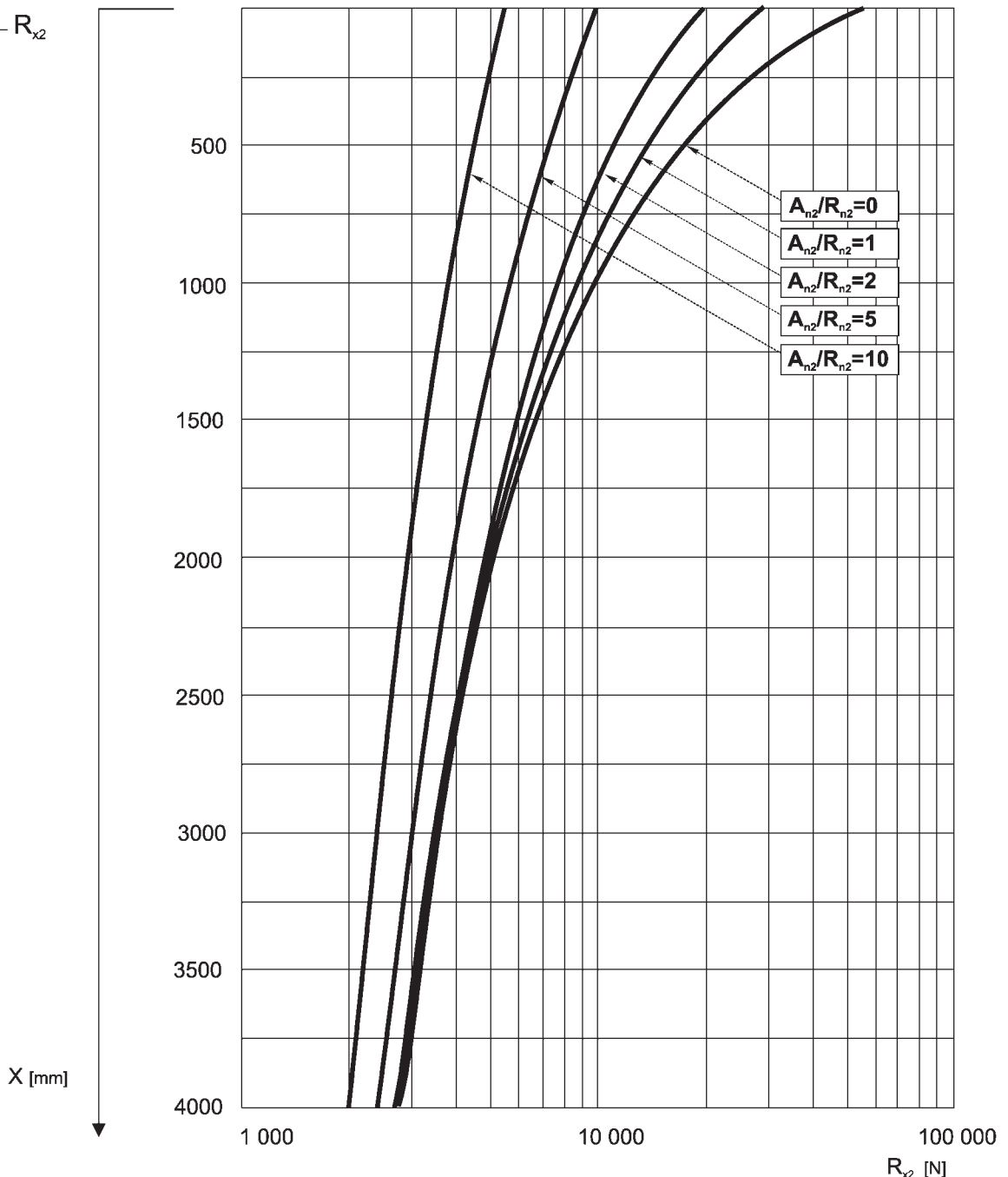
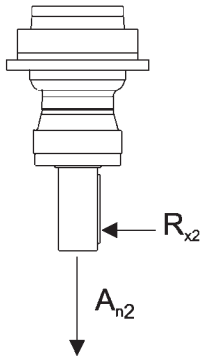
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

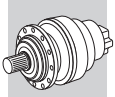
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 306_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

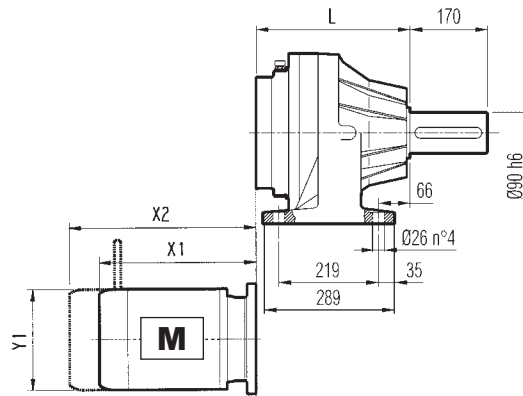
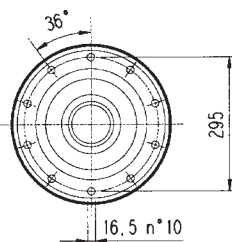
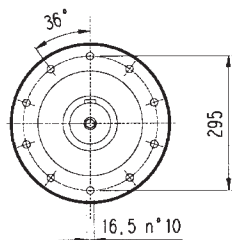
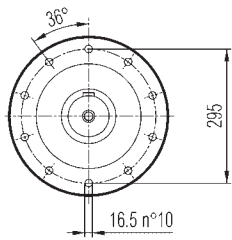
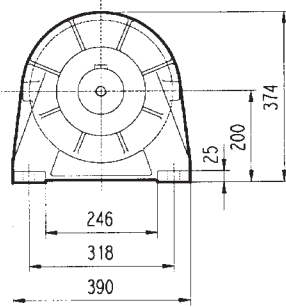
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 306_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

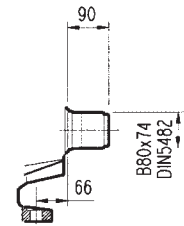




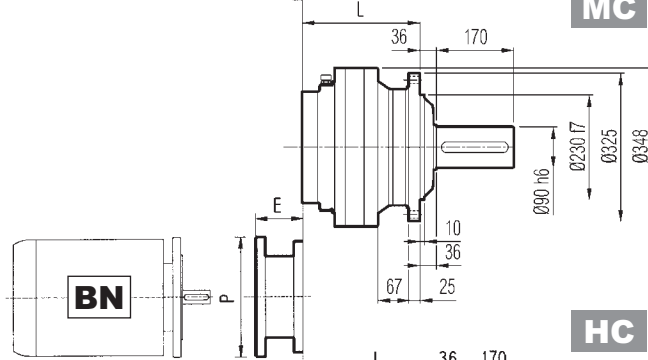
307 L



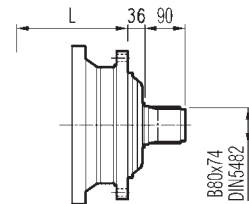
PC



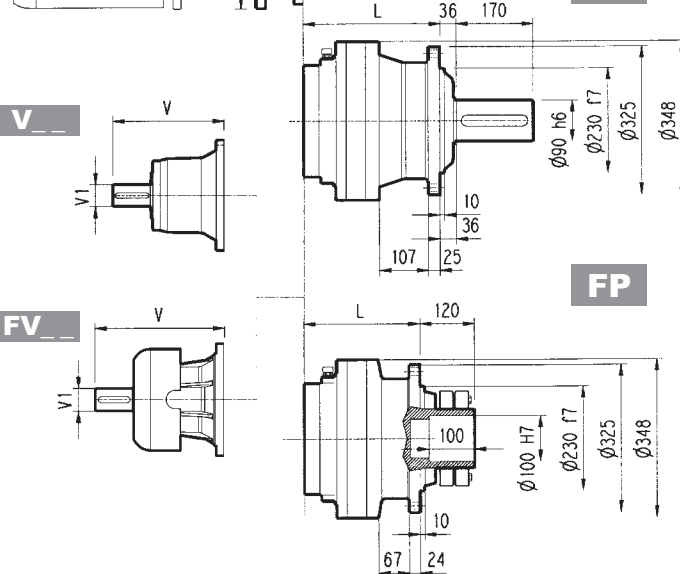
PZ



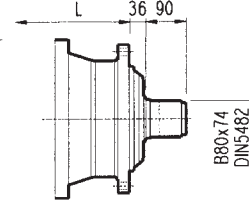
MC



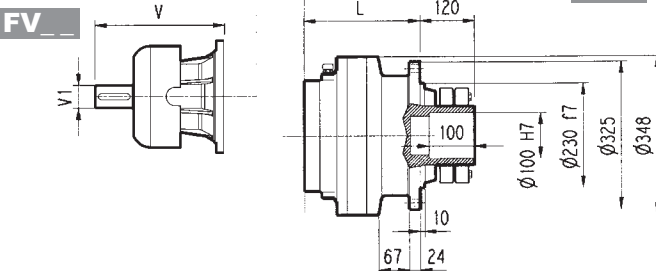
MZ



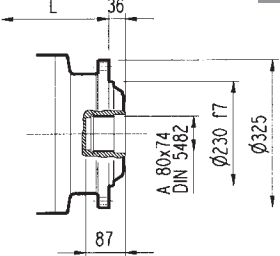
HC



HZ



FP



FZ

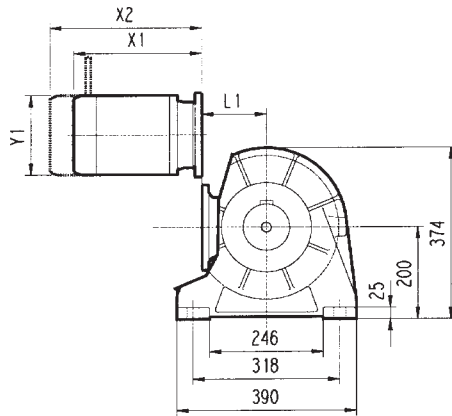
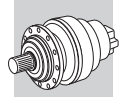
FP

$M_{2max} = 18000 \text{ Nm}$

	L				Kg															
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
307 L1	165	246	210	165	85	120	105	85	315	80	35	313	60	28	375	80	48	363	60	34
307 L2	254	335	299	254	97	132	117	97	239	48	15	-	-	-	276	48	17	-	-	-
307 L3	319	400	364	319	104	139	124	104	137.5	24	6	158	38	7	-	-	-	-	-	-
307 L4	372	453	417	372	108	143	128	108	137.5	24	6	158	38	7	-	-	-	-	-	-

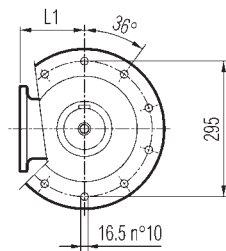
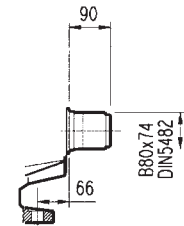
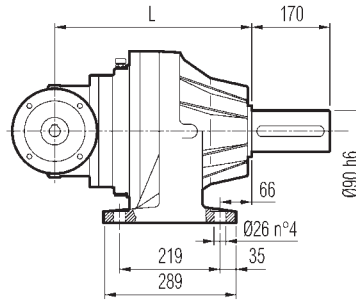
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
307 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	215	550
307 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
307 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-
307 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y
307 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
307 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	460	571	258	552	692	310	596	736	310
307 L3	-	-	-	-	-	-	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-
307 L4	229	292	138	253	314	138	280	352	156	325	421	195	357	449	195	460	571	258	-	-	-	-	-	-



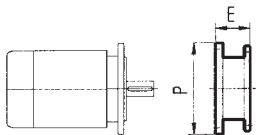
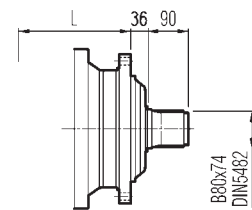
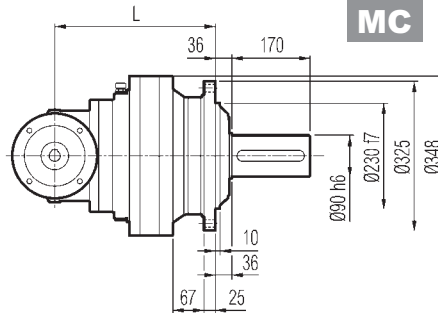
PC

PZ



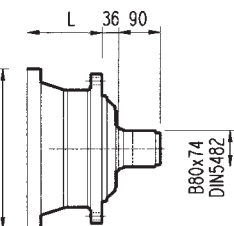
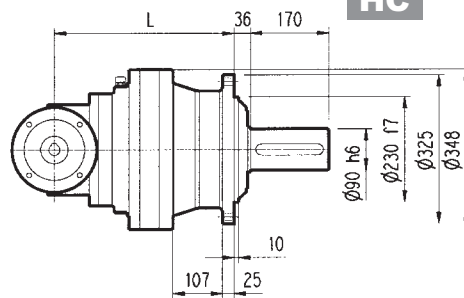
MC

MZ

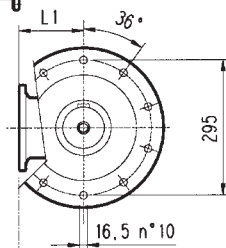
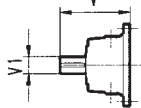


HC

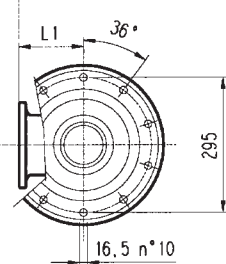
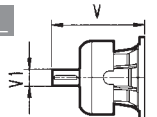
HZ



V

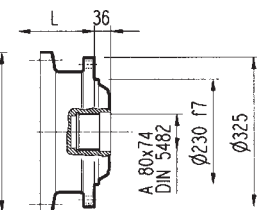
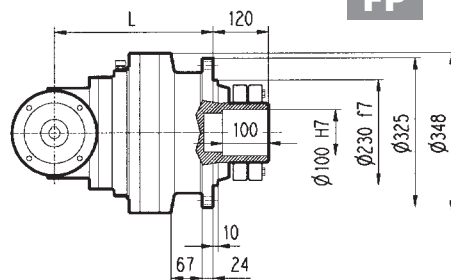


FV



FP

FZ



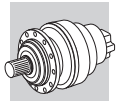
FP

$M_{2max} = 18000 \text{ Nm}$

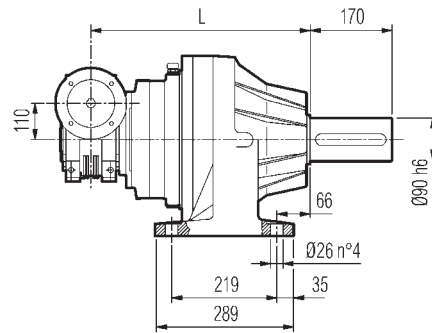
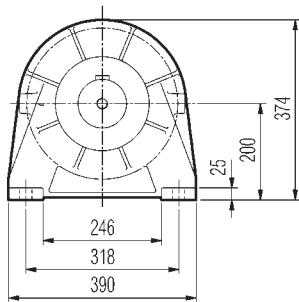
	L				L1																
	MC - MZ	PC - PZ	HC - HZ	FP - FZ		MC - MZ	PC - PZ	HC - HZ	FP - FZ	V	V1		V	V1		V	V1		V	V1	
307 R2	284	365	329	284	225	135	170	155	135	239	48	15	-	-	-	276	48	17	-	-	-
307 R3	346	427	391	346	140	117	152	137	117	137.5	24	6	158	38	7	-	-	-	-	-	-
307 R4	411	492	456	411	122	118	153	138	118	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
307 R2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
307 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
307 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

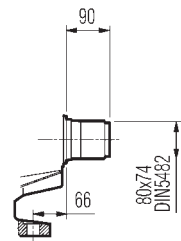
	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
307 R2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	508	619	258	552	692	310	596	736	310
307 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-
307 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-



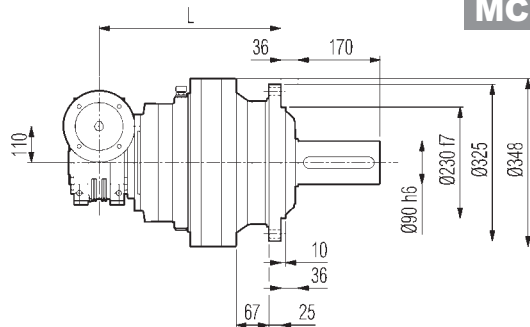
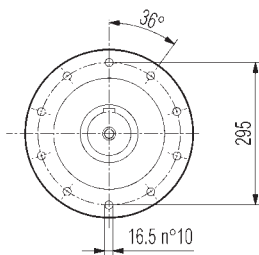
3/V 07 L3



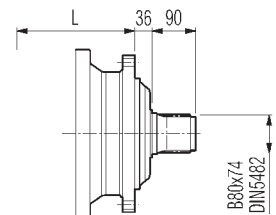
PC



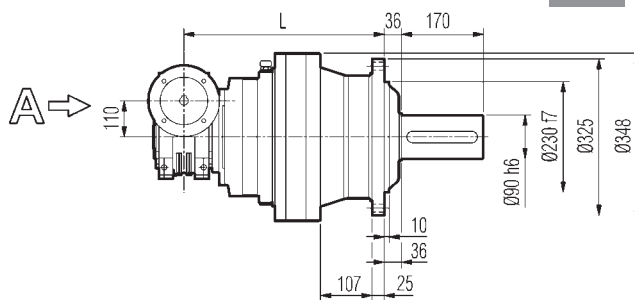
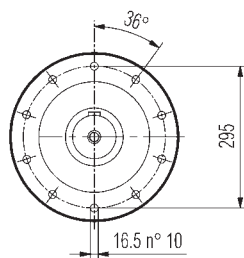
PZ



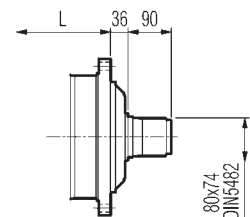
MC



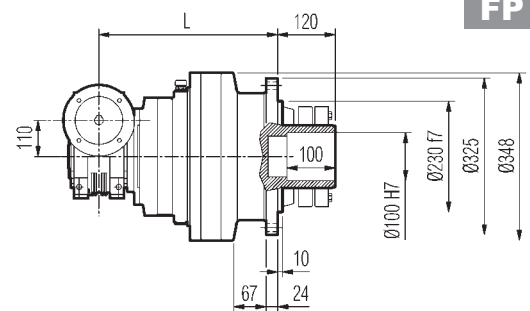
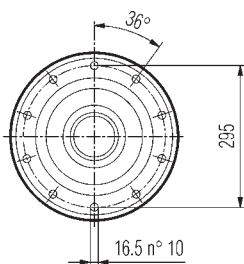
MZ



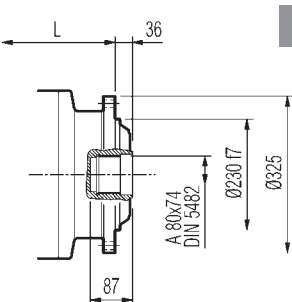
HC



HZ

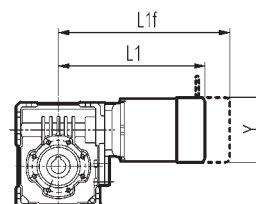
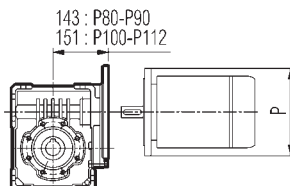
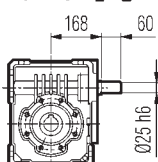


FP



FZ

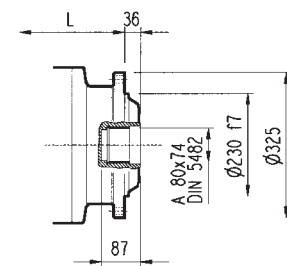
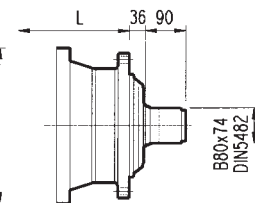
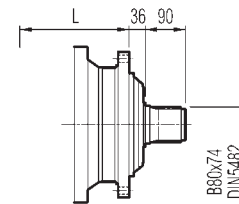
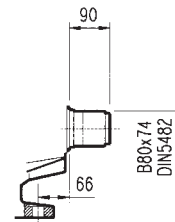
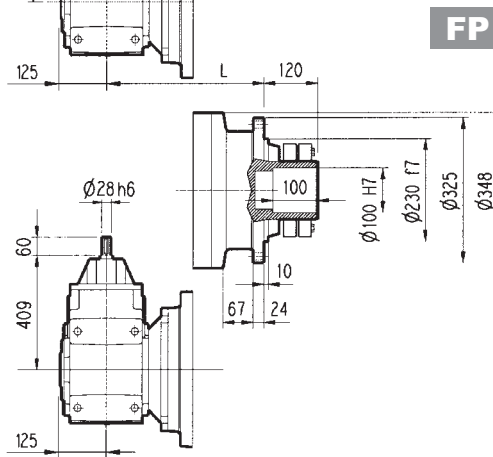
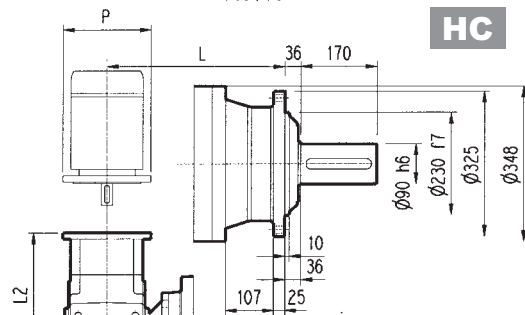
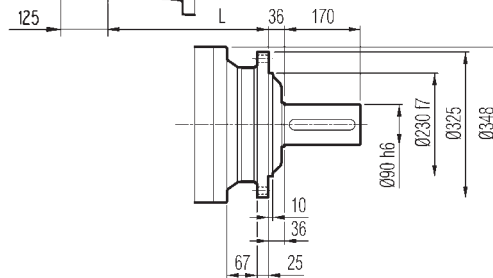
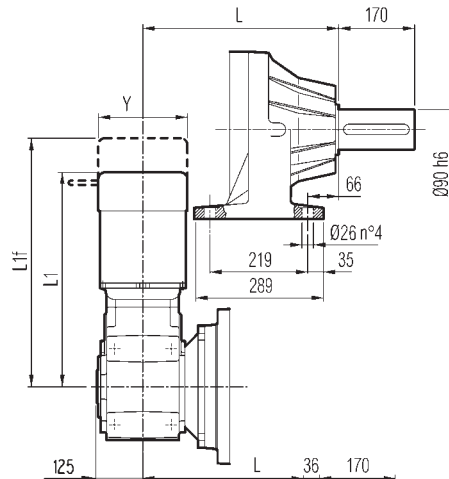
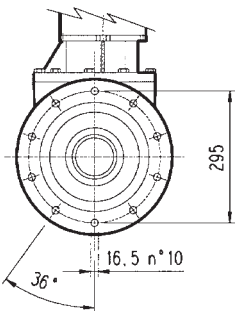
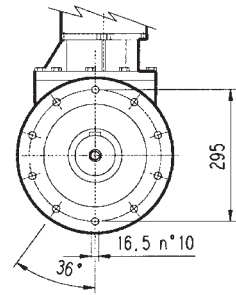
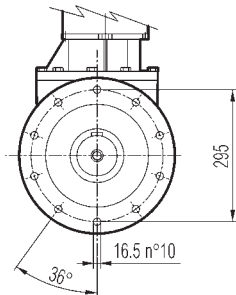
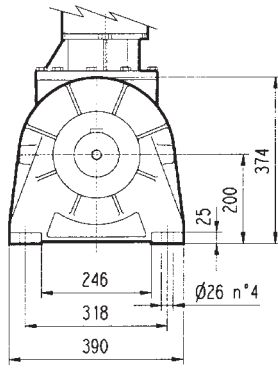
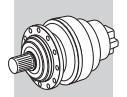
Vista da
View from A



FP

$M_{2max} = 18000 \text{ Nm}$

	L				Kg				P80	P90	P100	P112
	MC - MZ	PC - PZ	HC - HZ	FP - FZ	MC - MZ	PC - PZ	HC - HZ	FP - FZ	P	P	P	P
3/V 07 L3	414	495	459	414	130	165	150	130	200	200	250	250
	S2 + M2S			S3 + M3S			S3 + M3L					
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y			
3/V 07 L3	364	440	156	407	503	193	439	530	193			



PC

PZ

MC

MZ

HC

HZ

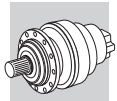
FP

FZ

FP

$M_{2max} = 18000 \text{ Nm}$

	L				Kg			
	MC - MZ		PC - PZ		MC - MZ		PC - PZ	
3/A 07 L2	336		417		200		230	
	P80		P90		P100		P112	
	L2	P	L2	P	L2	P	L2	P
3/A 07 L2	371	200	371	200	381	250	381	250
	S2 + M2		S3 + M3SA		S3 + M3LA		S4 + M4	
	L1	L1f	Y	L1	L1f	Y	L1	L1f
3/A 07 L2	535	605	156	578.5	674.5	195	610.5	701.5



307 L

307 R

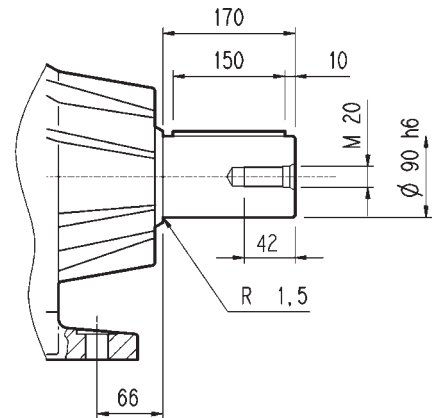
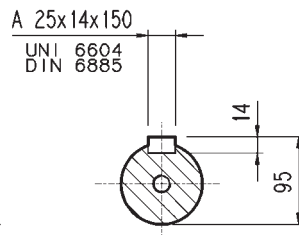
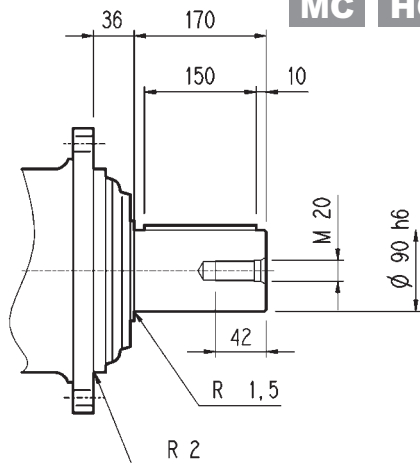
3/V 07 L3

3/A 07 L2

MC

HC

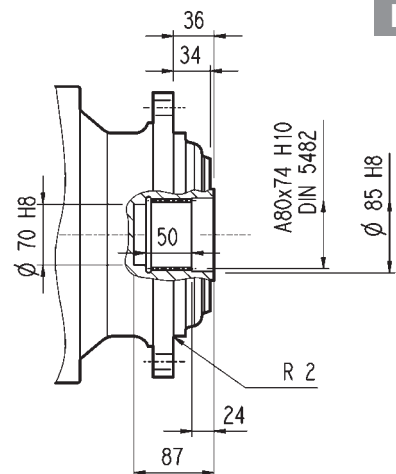
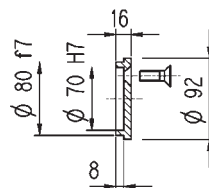
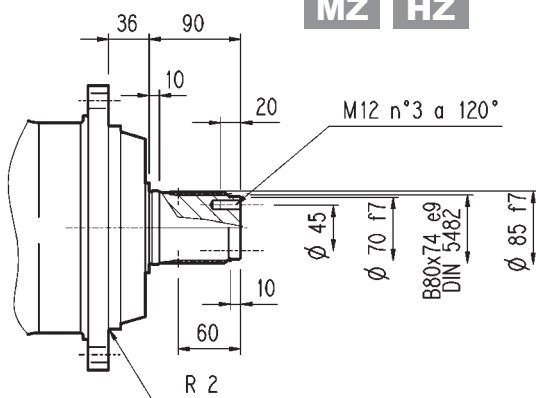
PC



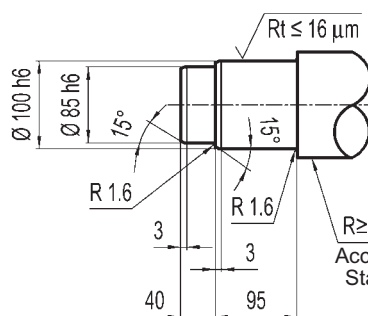
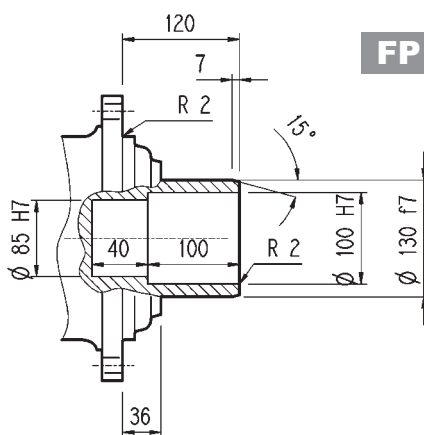
MZ

HZ

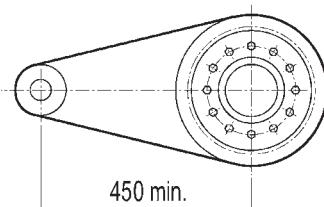
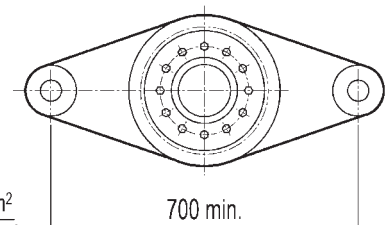
FZ



FP

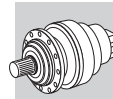


$R \geq 60 \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier

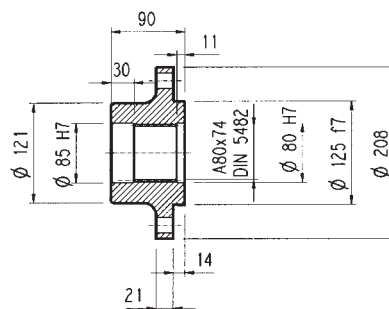
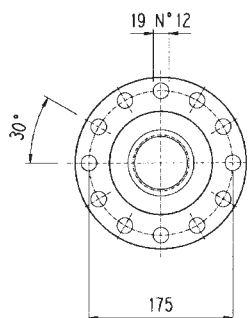
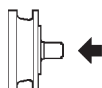


FP

$M_{2max} = 18000 \text{ Nm}$

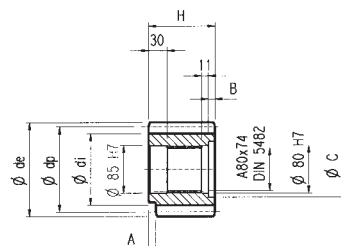
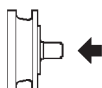
307 L**307 R****3/V 07 L3****3/A 07 L2**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

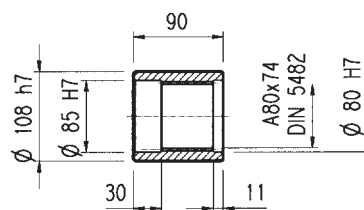
Pignoni / Pinion gears
Ritzel / Pignons

P...

	m	z	x	dp	di	de	H	A	B	C	☆
PFG	8	16	0.500	128	117	149.5	90	0	0	0	□
PHC	10	12	0.450	120	104	145	90	0	0	0	□
PHE	10	14	0.320	140	121	165	116	13	26	95	□
PHF	10	15	0.150	150	130	171.5	107	20	17	100	□
PHG	10	16	0.500	160	145	186	90	0	0	0	■
PHH1	10	17	0	170	145	190	90	0	0	0	■
PHH2	10	17	0.500	170	154	198	90	0	0	0	■
PLD	12	13	0.500	156	138	192	102	0	12	95	□
PLE	12	14	0.500	168	150	199.2	90	0	0	0	□
PLI	12	18	0.500	216	198	249.6	107	7	17	95	□
PLT	12	26	0	312	282	336	90	10	0	0	■

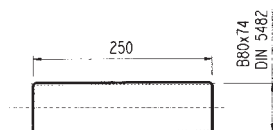
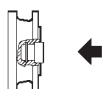
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémentée et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

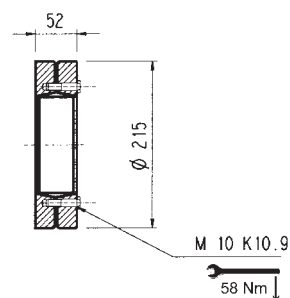
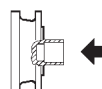
Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

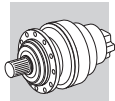
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

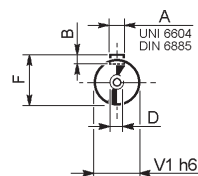
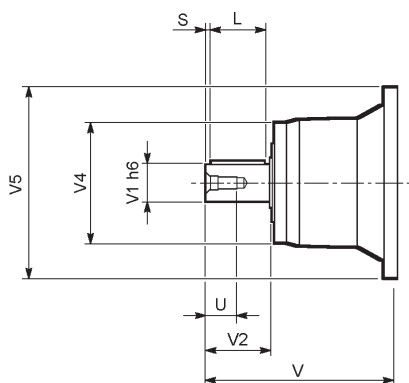
G0A



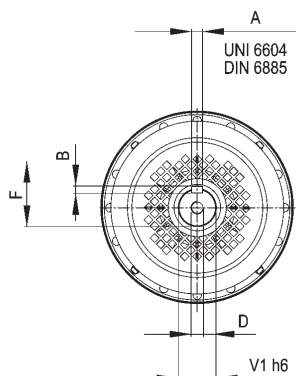
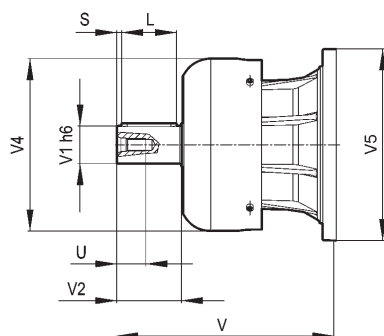
307 L

307 R

V

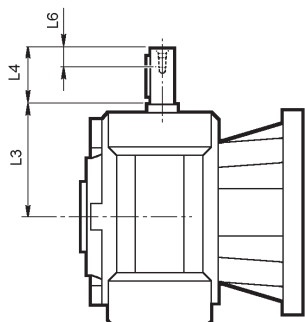
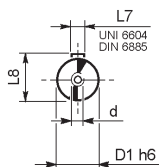


FV

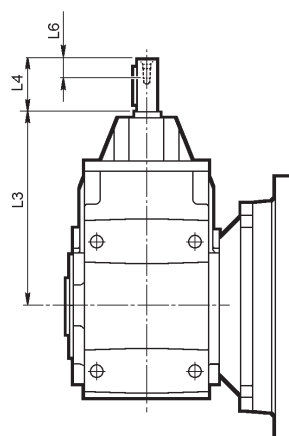
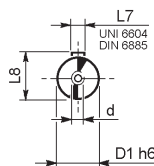


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
307 L1	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
307 L2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
307 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
307 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
307 R2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
307 R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 07 L3

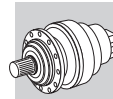


3/A 07 L2



	D1 h6	L3	L4	L6	L7	L8	d
3/V 07 L3_HS	25	168	60	19	8	28	M8

	D1 h6	L3	L4	L6	L7	L8	d
3/A 07 L2_HS	28	409	60	22	8	31	M10

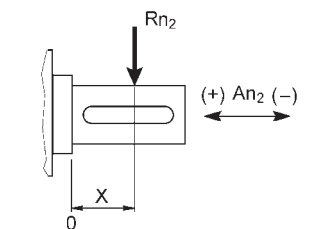
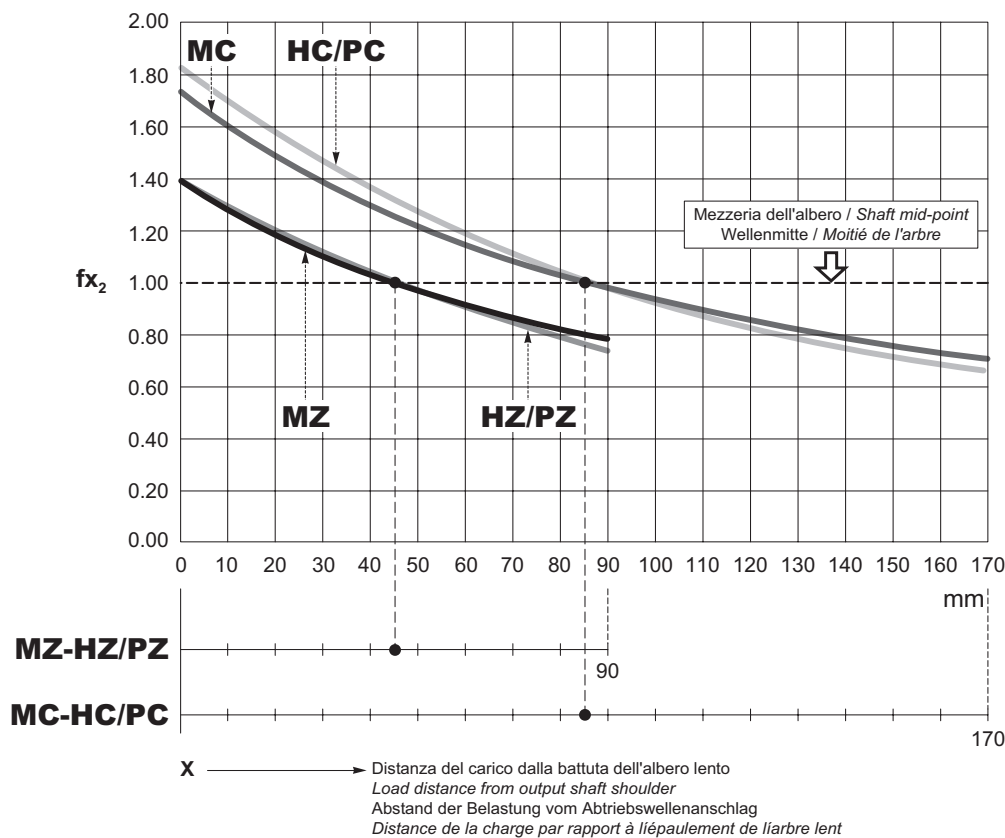


Fattore di posizione per carichi radiali sugli alberi in uscita.

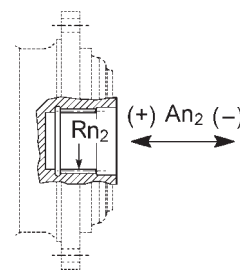
Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$R_{x2} = R_{n2} \cdot fx_2$		
$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ/PZ	1.10	0.55
HC/PC	1.47	0.73
MC	2.25	2.25
MZ	1.80	1.80



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	1.00	1.00

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

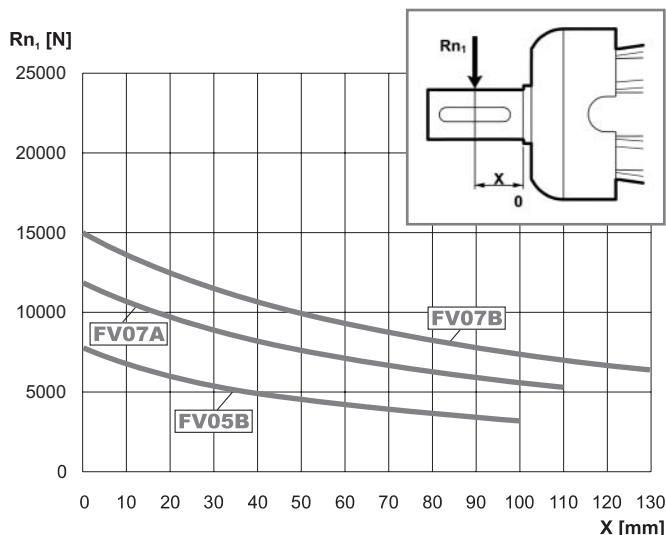
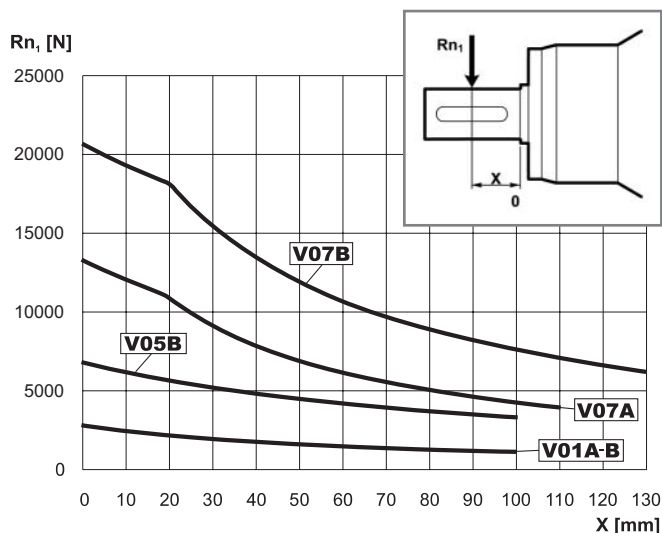
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

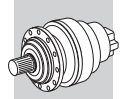
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L			S4 + M4			S5 + M5S			S5 + M5L		
	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1	X1	X2	Y1
307 R2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	508	619	258	552	692	310	596	736	310
307 R3	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-
307 R4	229	292	138	253	314	138	328	400	156	373	469	195	405	497	195	508	619	258	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 307_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 307_VK, with radial force applying at a distance x from shaft shoulder.

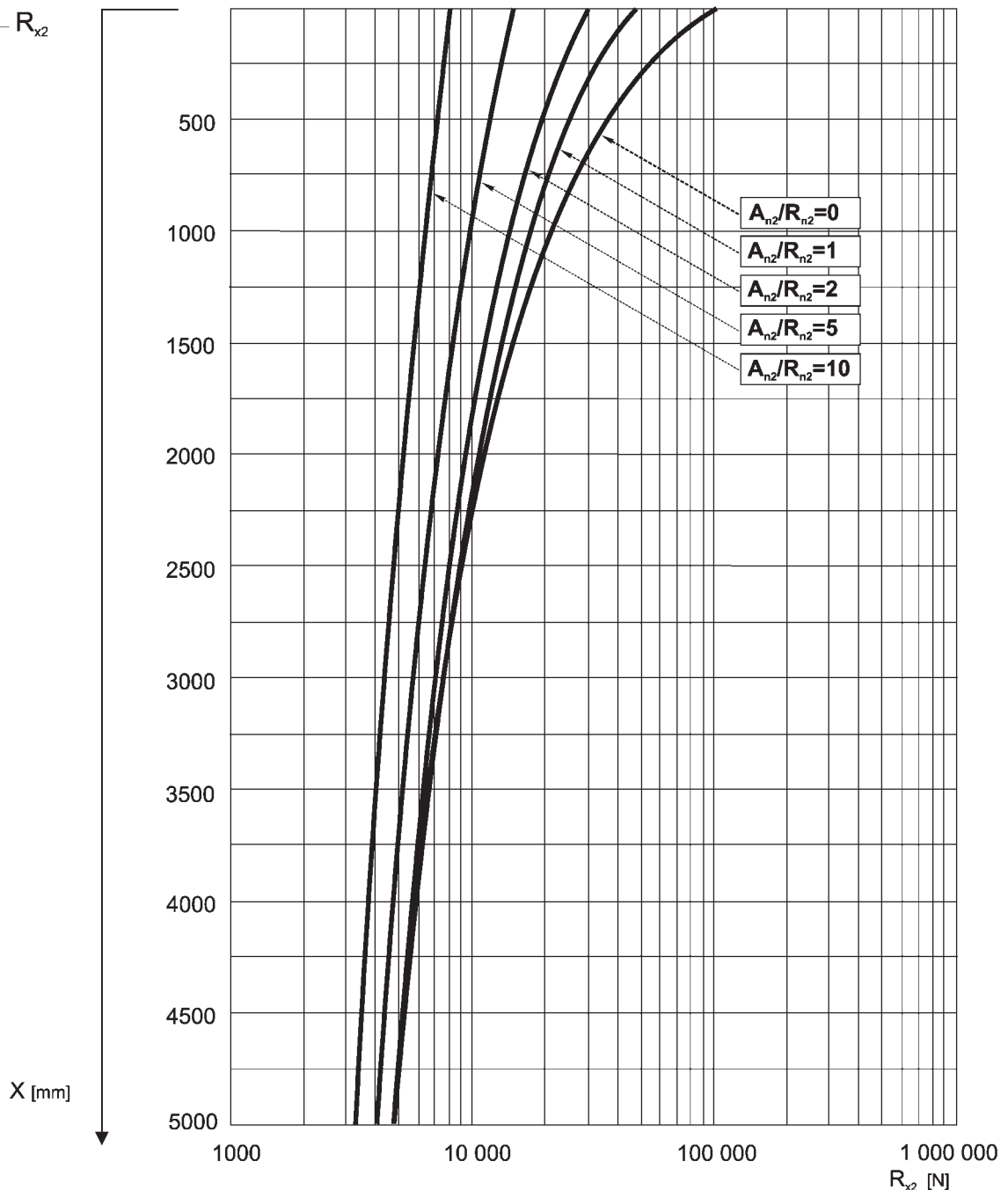
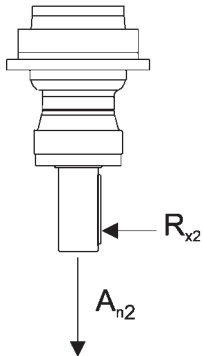
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

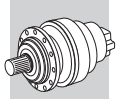
Das nachstehende Diagram ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 307_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

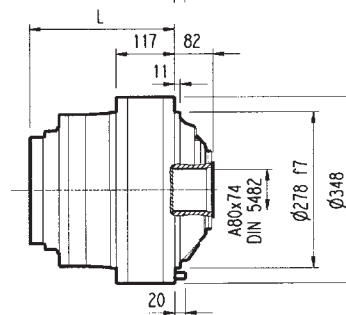
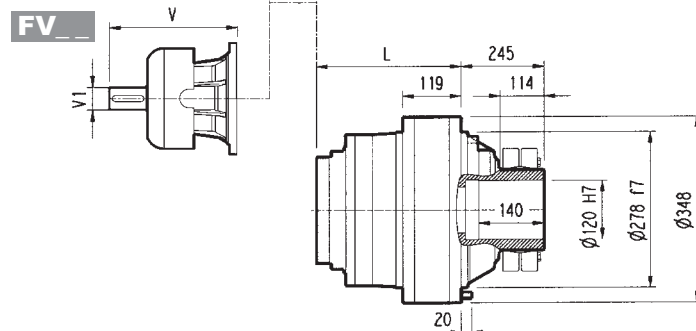
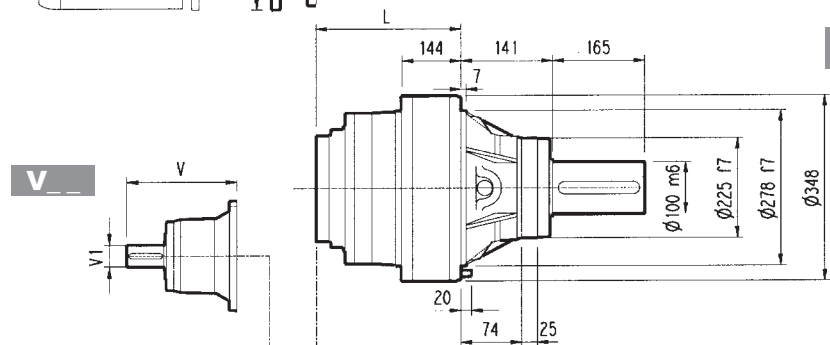
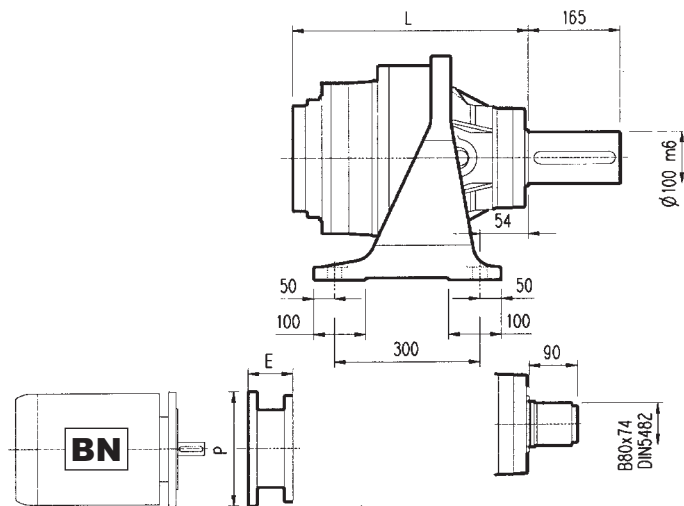
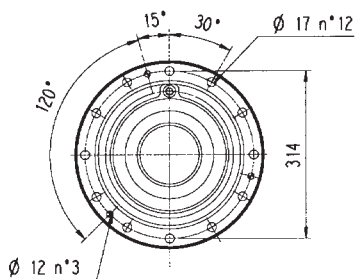
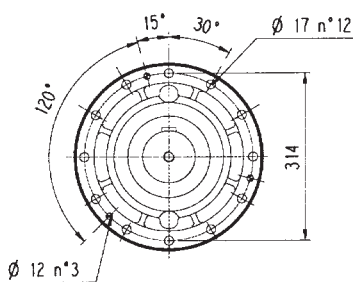
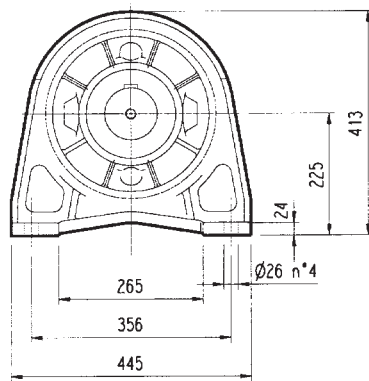
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 307_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





309 L



PC

HZ **PZ**

HC

FP

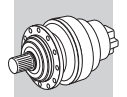
FZ

FP

$$M_{2\max} = 25000 \text{ Nm}$$

	L																			
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1		V	V1		V	V1		V	V1	
309 L1	267	126	99	101	130	115	95	100	315	80	35	313	60	28	375	80	48	363	60	34
309 L2	356	215	188	190	142	127	107	112	239	48	15	-	-	-	276	48	17	-	-	-
309 L3	421	280	253	255	149	134	114	119	137.5	24	6	158	38	7	-	-	-	-	-	-
309 L4	474	333	306	308	153	138	118	123	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
309 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
309 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
309 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-
309 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



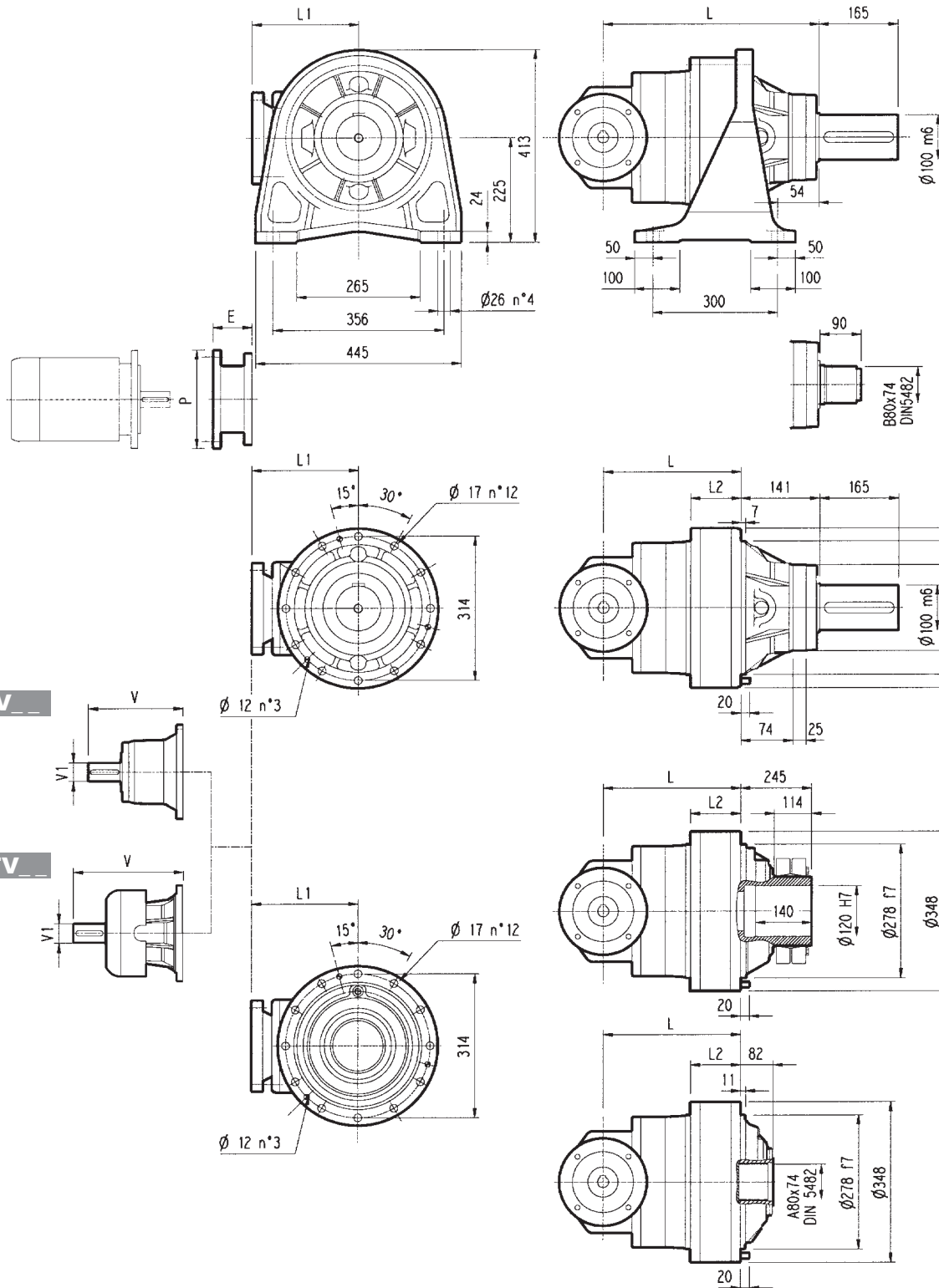
PC

HZ PZ

HC

FP

FZ

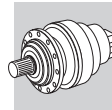


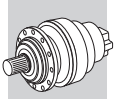
FP

$M_{2max} = 25000 \text{ Nm}$

	L				L1	L2																		
	PC-PZ	HC-HZ	FZ	FP		HC-HZ	FZ	FP	PC-PZ	HC-HZ	FZ	FP	V	V1		V	V1		V	V1		V	V1	
309 R2	386	245	218	220	225	168	141	143	180	165	145	150	239	48	15	-	-	-	276	48	17	-	-	-
309 R3	448	307	280	282	140	144	117	119	162	147	127	132	137.5	24	6	158	38	7	-	-	-	-	-	-
309 R4	513	372	345	347	122	144	117	119	163	148	128	133	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
309 R2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400
309 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-
309 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-

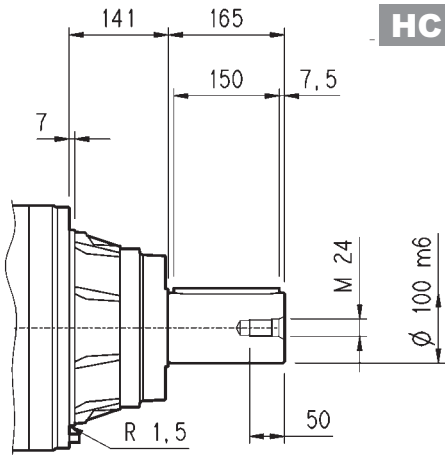




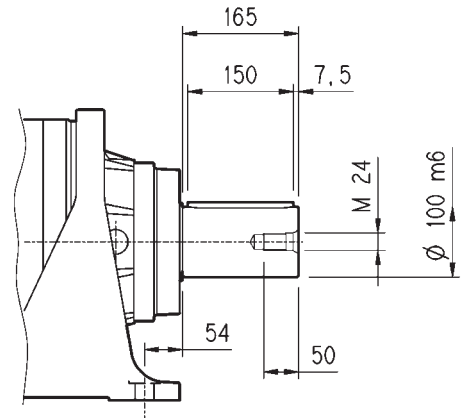
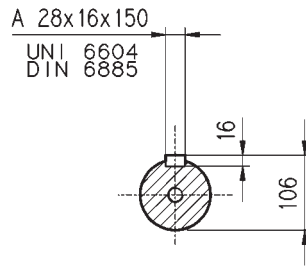
309 L

309 R

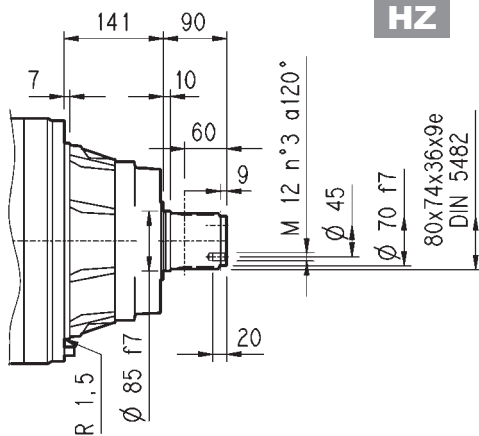
3/V 09 L3



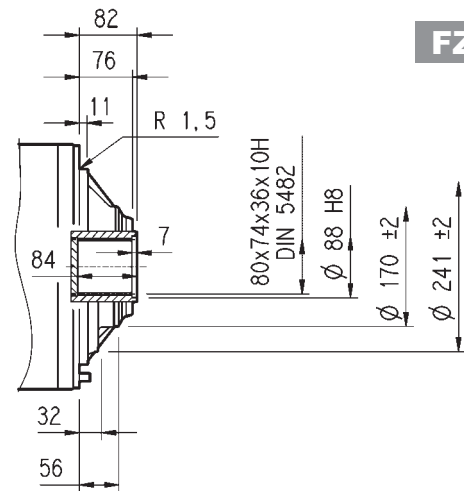
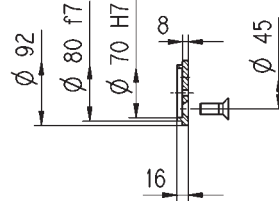
HC



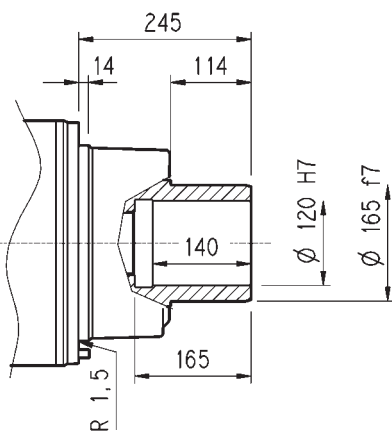
PC



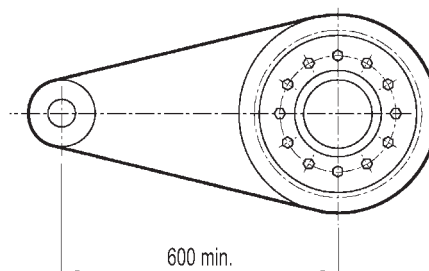
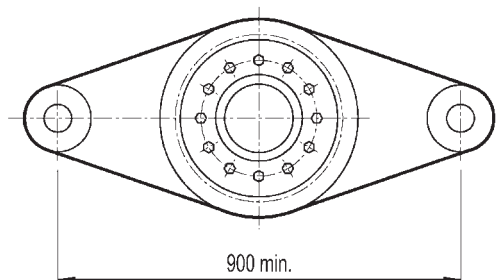
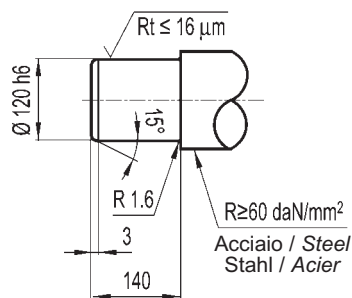
HZ



FZ

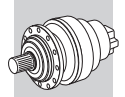


FP

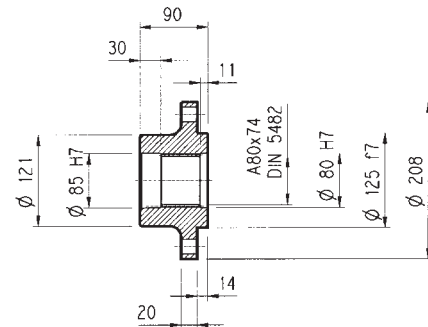
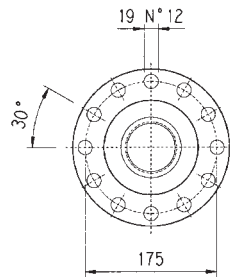
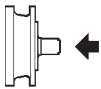


FP

M_{2max} = 25000 Nm


Flangia / Flange
Flansch / Brides

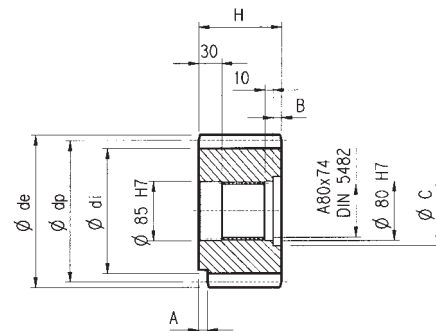
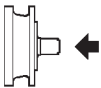
W0A



Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Pignoni / Pinion gears
Ritzel / Pignons

P...

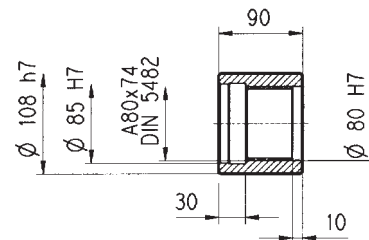
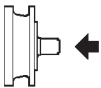


	m	z	x	dp	di	de	H	A	B	C	☆
PFG	8	16	0.500	128	117	149.5	90	0	0	0	□
PHC	10	12	0.450	120	104	145	90	0	0	0	□
PHE	10	14	0.320	140	121	165	116	13	26	95	□
PHF	10	15	0.150	150	130	171.5	107	20	17	100	□
PHG	10	16	0.500	160	145	186	90	0	0	0	■
PHH1	10	17	0	170	145	190	90	0	0	0	■
PHH2	10	17	0.500	170	154	198	90	0	0	0	■
PLD	12	13	0.500	156	138	192	102	0	12	95	□
PLE	12	14	0.500	168	150	199.2	90	0	0	0	□
PLI	12	18	0.500	216	198	249.6	107	7	17	95	□
PLT	12	26	0	312	282	336	90	10	0	0	■

☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémentée et trempée 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

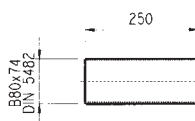
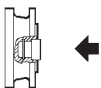
MOA



Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

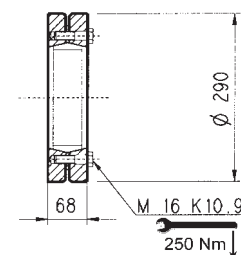
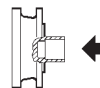
B0A

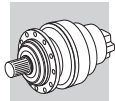


Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e
 temprare 50-55 HRC
*Case hardening steel 18NiCrMo5 UNI 5331 must be case
 hardened to 50-55 HRC*
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet
 werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

G0A

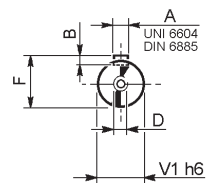
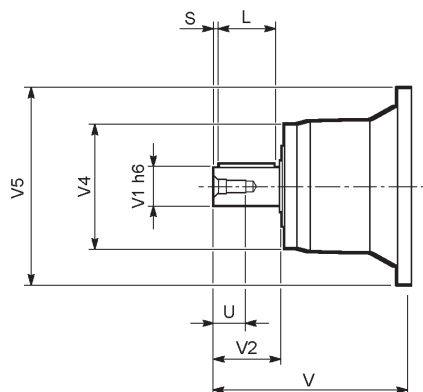




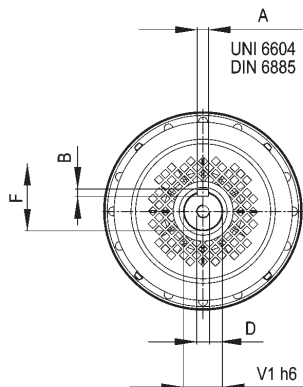
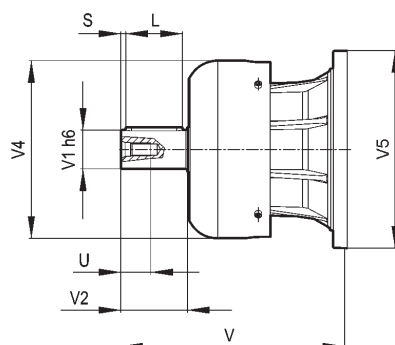
309 L

309 R

V _ _

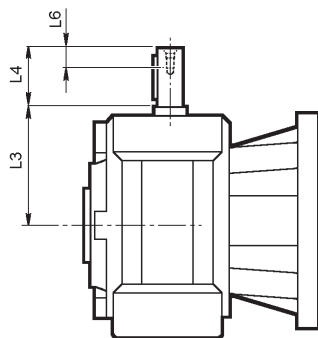
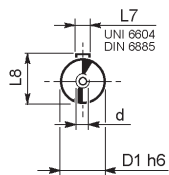


FV _ _

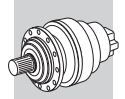


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
309 L1	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
309 L2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
309 L3	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
309 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
309 R2	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
309 R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 09 L3



	D1 h6	L3	L4	L6	L7	L8	d
3/V 09 L3 HS	35	185	65	20	10	38	M8

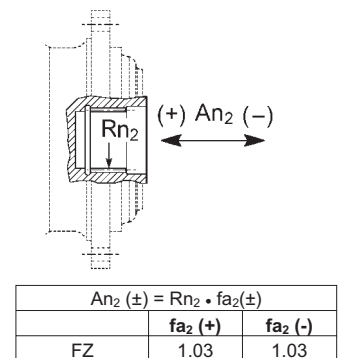
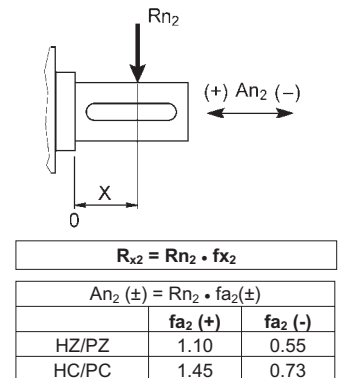
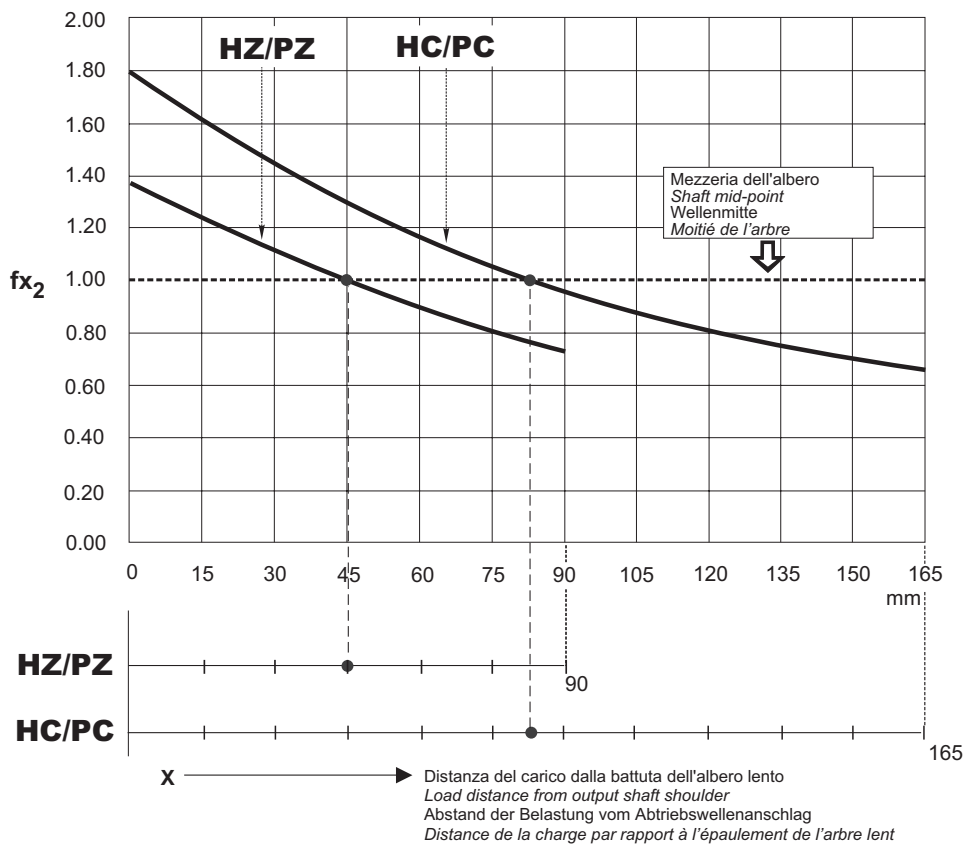


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

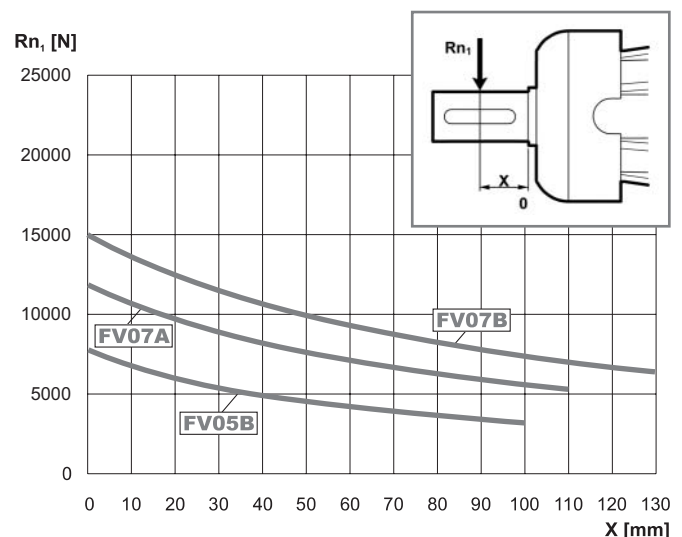
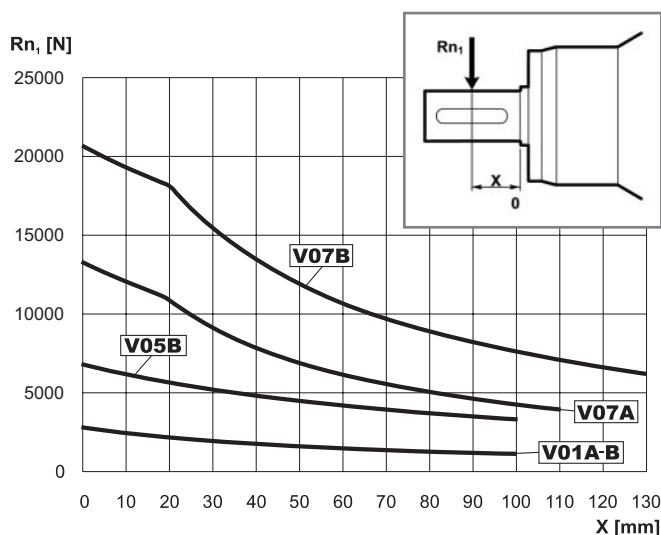
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

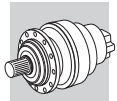
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

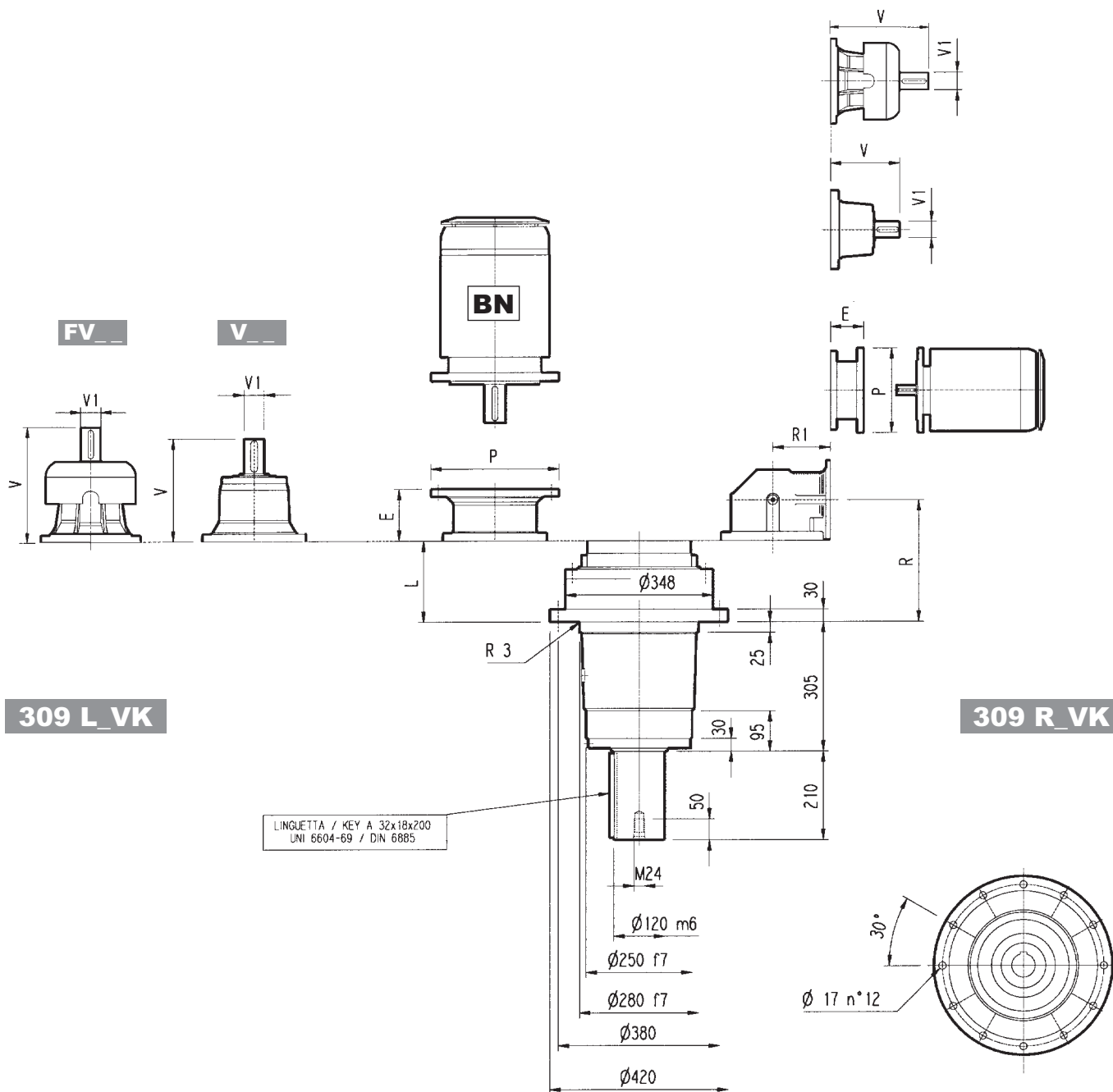
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





309_VK



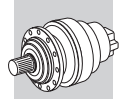
309 L_VK

309 R_VK

	L		Kg												
				V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
309 L1	102	165		315	80	35	313	60	28	375	80	48	363	60	34
309 L2	191	180		239	48	15	-	-	-	276	48	17	-	-	-
309 L3	256	190		137.5	24	6	158	38	7	-	-	-	-	-	-
309 L4	309	195		137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
309 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	450
309 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
309 L3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-
309 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R		R1	Kg													P71		P80		P90		P100		P112		P132		P160		P180		P200	
					V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P		
309 R2	221	225	200		239	48	15	-	-	-	276	48	17	-	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400		
309 R3	283	140	190		137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	
309 R4	348	122	195		137.5	24	6	158	38	7	-	-	-	-	-	-	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 309_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 309_VK, with radial force applying at a distance x from shaft shoulder.

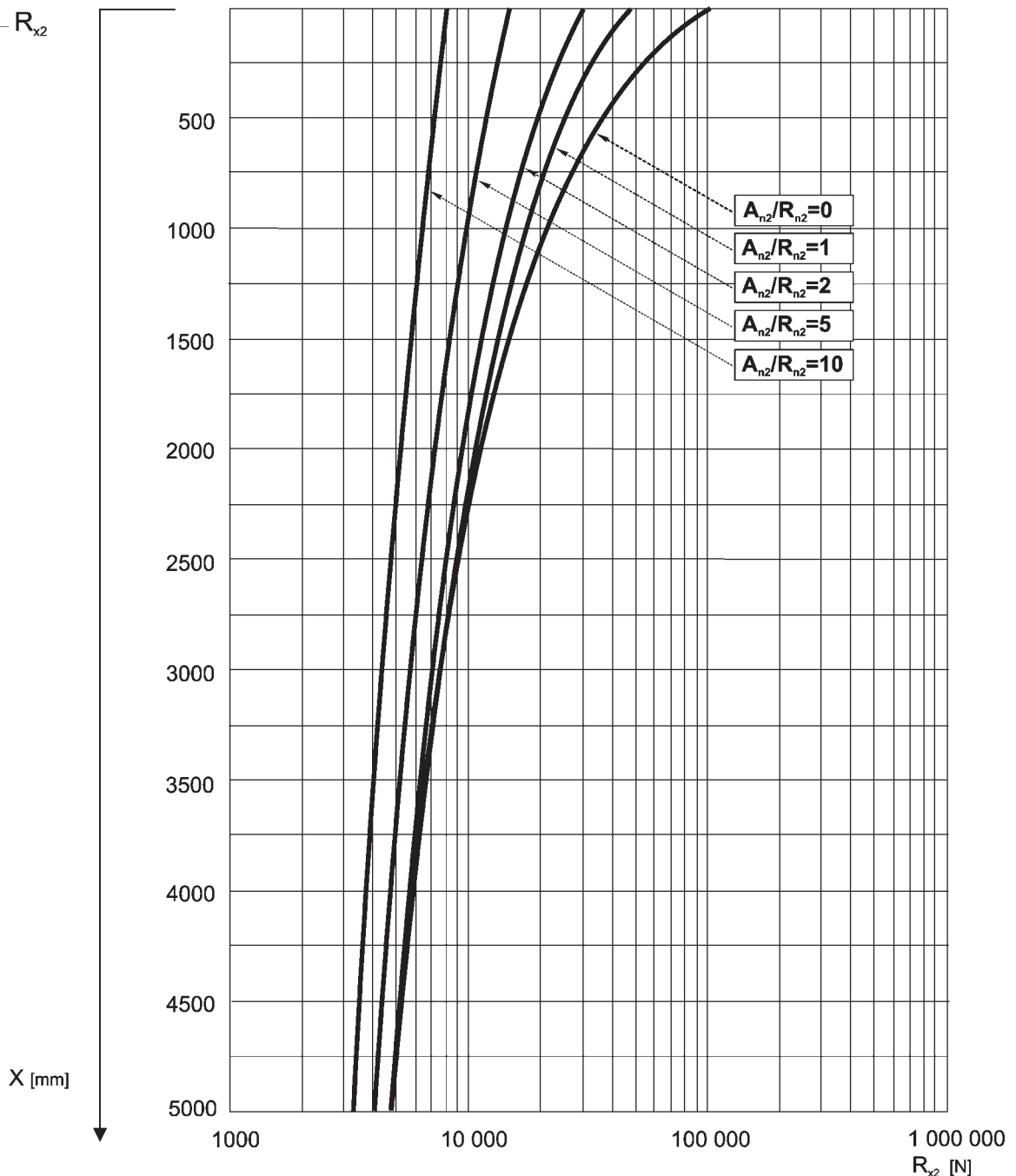
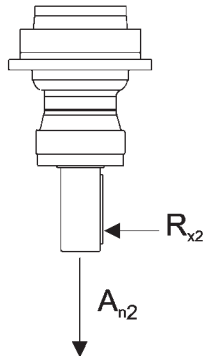
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

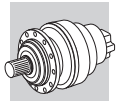
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 309_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

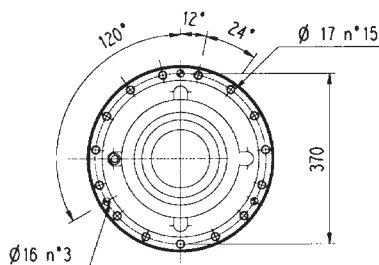
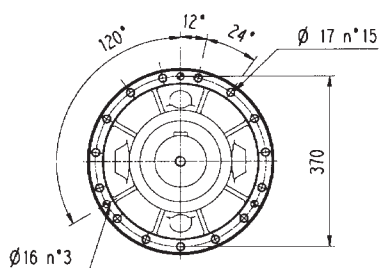
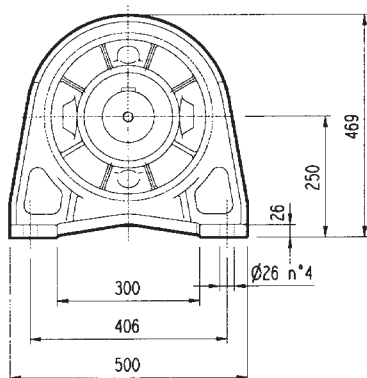
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 309_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

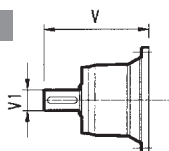




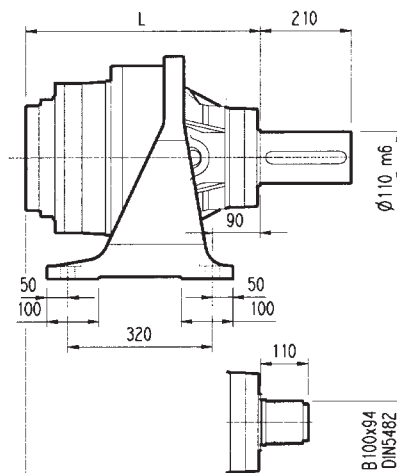
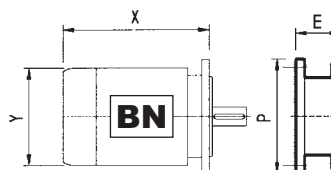
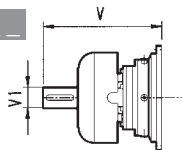
310 L



V



FV

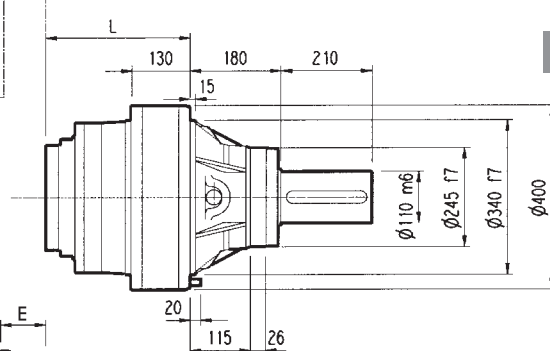


PC

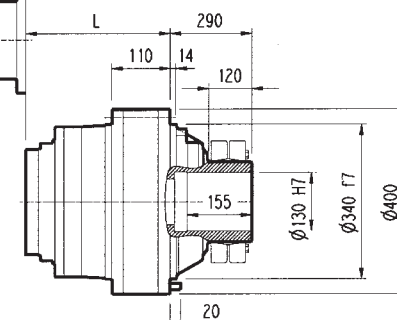
HZ

PZ

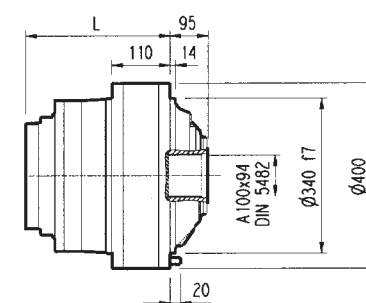
HC



FP



FZ



FP

$M_{2max} = 36000 \text{ Nm}$

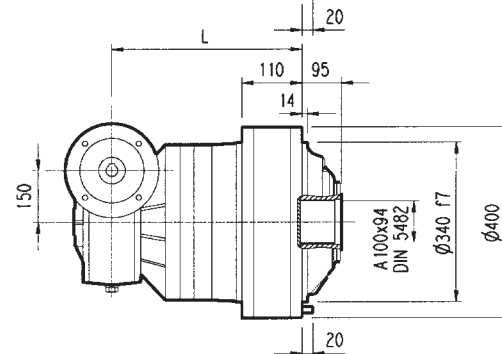
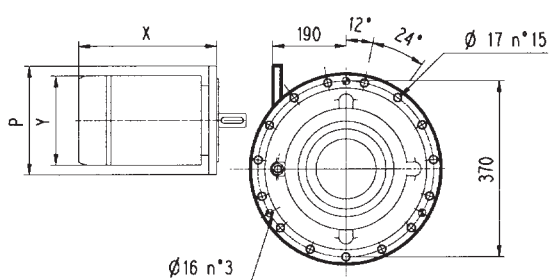
	L				Kg															
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
310 L1	288	108	88	88	155	135	110	115	377	80	50	-	-	-	457	80	63	-	-	-
310 L2	424	244	224	224	185	165	140	145	307	60	23	-	-	-	357	60	28	-	-	-
310 L3	489	309	289	289	194	174	149	154	239	48	15	-	-	-	276	48	17	-	-	-
310 L4	542	362	342	342	198	178	153	158	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
310 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	271	400	301	450	281	550
310 L2	-	-	-	-	-	-	-	-	-	-	-	-	152	350	153	350	183	400	212	450	193	550
310 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
310 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



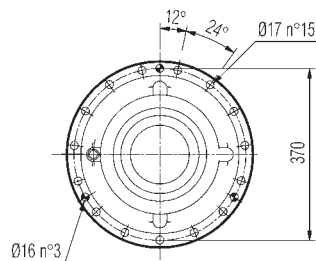
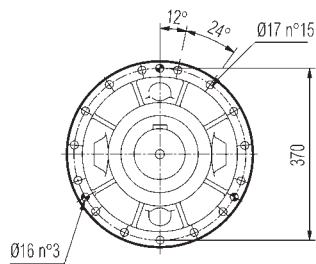
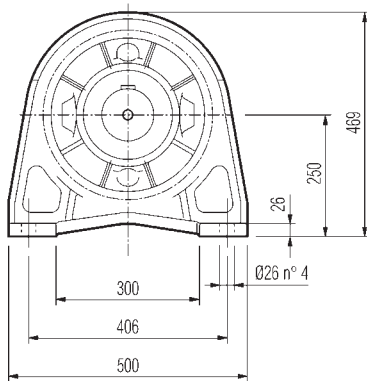
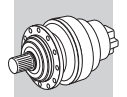
Per installare il riduttore usare viti prigioniere
For mounting the gearbox only use stud bolts
Für die Montage des Getriebes nur Schraubbolzen nutzen
Pour le montage du reducteur utiliser des goujons

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
310 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450
310 R2 (C)	-	-	-	-	-	-	-	-	-	-	114	300	152	350	152	350	182	400	212	450
310 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-
310 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-

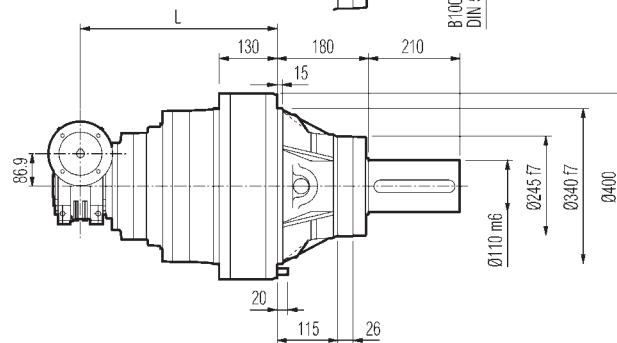
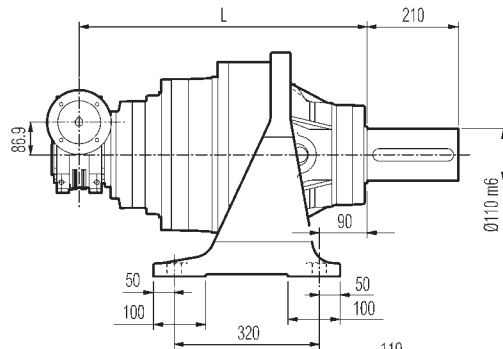
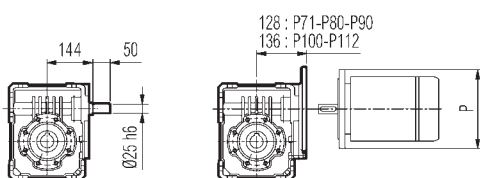


FZ

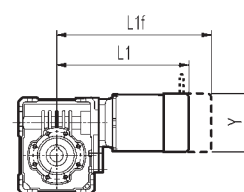
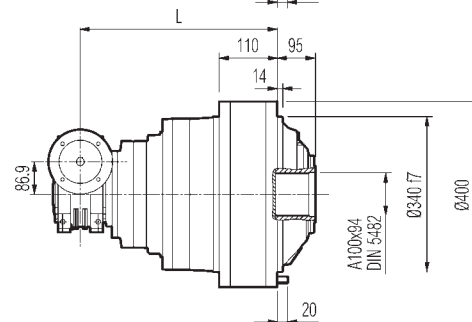
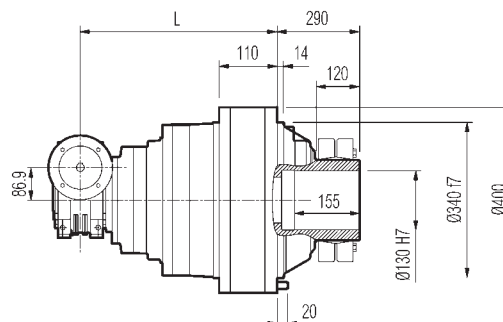
 **Bonfiglioli**
Trasmital



Vista da
View from **A**



A →



PC

HZ

PZ

HC

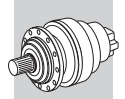
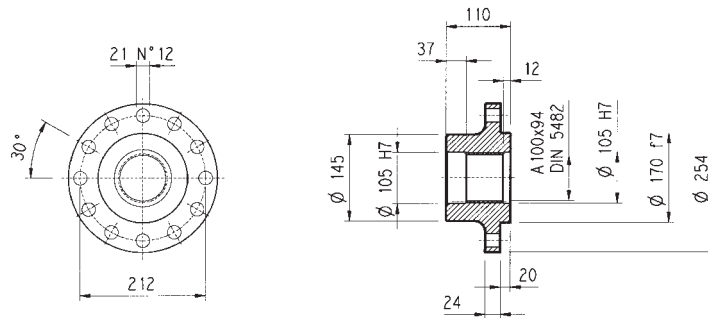
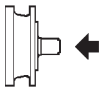
FP

FZ

FP

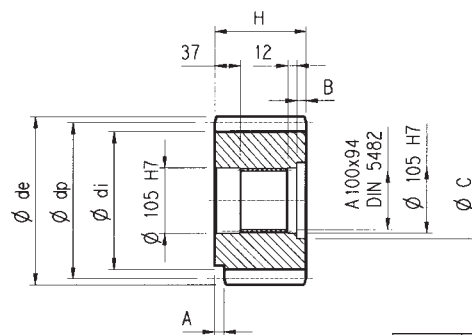
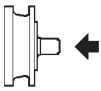
$M_{2max} = 36000 \text{ Nm}$

	L																			
	PC - PZ		HC - HZ		FZ	FP			PC - PZ		HC - HZ		FZ	FP						
3/V 10 L4	634		454		434	434			210		190		165	170						
	P71 P	P80 P	P90 P	P100 P	P112 P	S1 + M1S			S1 + M1L			S2 + M2S			S3 + M3S			S3 + M3L		
3/V 10 L4	160	200	200	250	250	300	363	138	324	385	138	349	425	156	392	477	193	424	515	193

**WOA**

Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

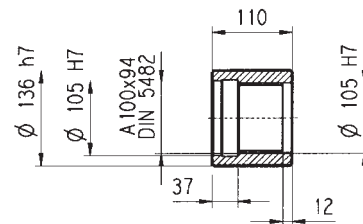
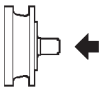
P...



	m	z	x	dp	di	de	H	A	B	C	☆
PLQ	12	23	0	276	246	300	110	0	0	0	■
PPD	16	13	0.500	208	184	252.5	145	0	35	116	□
PPF	16	15	0.450	240	215	280	125	0	15	120	□

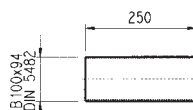
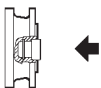
☆	Materiale / Material / Material / Matériau
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifié 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimenté et trempé 18NiCrMo5

MOA

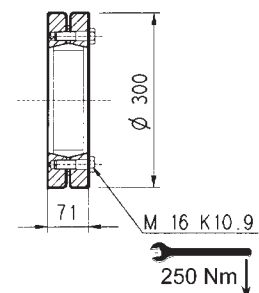
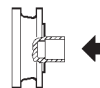


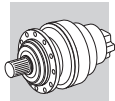
Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

BOA



Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e
temprare 50-55 HRC
*Case hardening steel 18NiCrMo5 UNI 5331 must be case
hardened to 50-55 HRC*
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet
werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

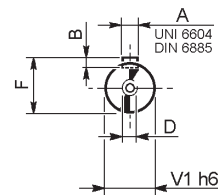
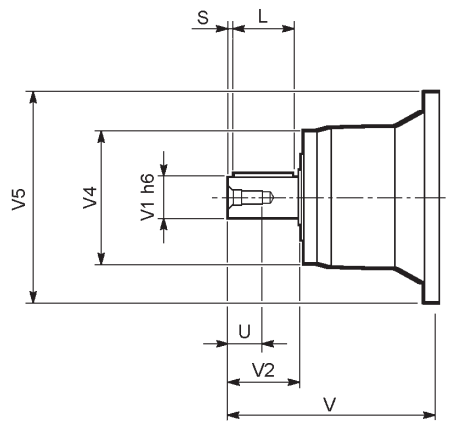
GOA



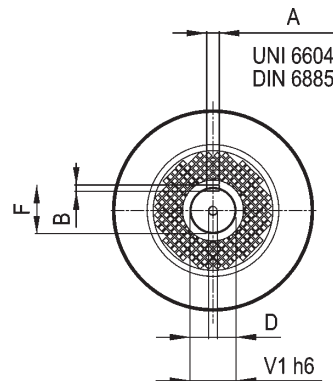
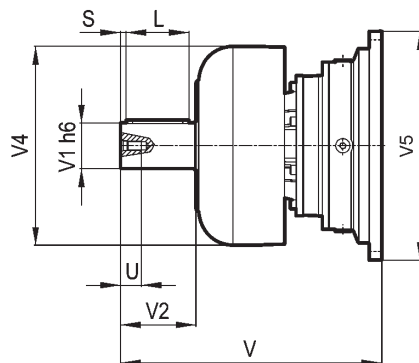
310 L

310 R

V _ _



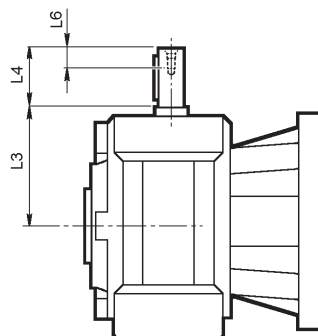
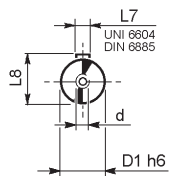
FV _ _



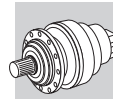
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
310 L1	V10B	377	80	130	200	400	22	14	85	110	10	M16	36
	FV10B	457	80	130	347.5	400	22	14	85	110	10	M16	36
310 L2	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
310 L3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
310 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
310 R2 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
310 R3-R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 10 L3

3/V 10 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 10 L3_HS	35	185	65	20	10	38	M8
3/V 10 L4_HS	25	144	50	19	8	28	M8

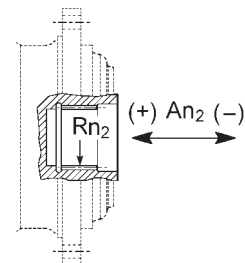
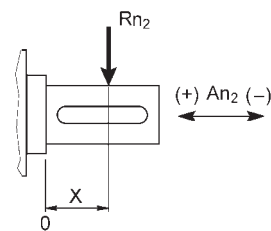
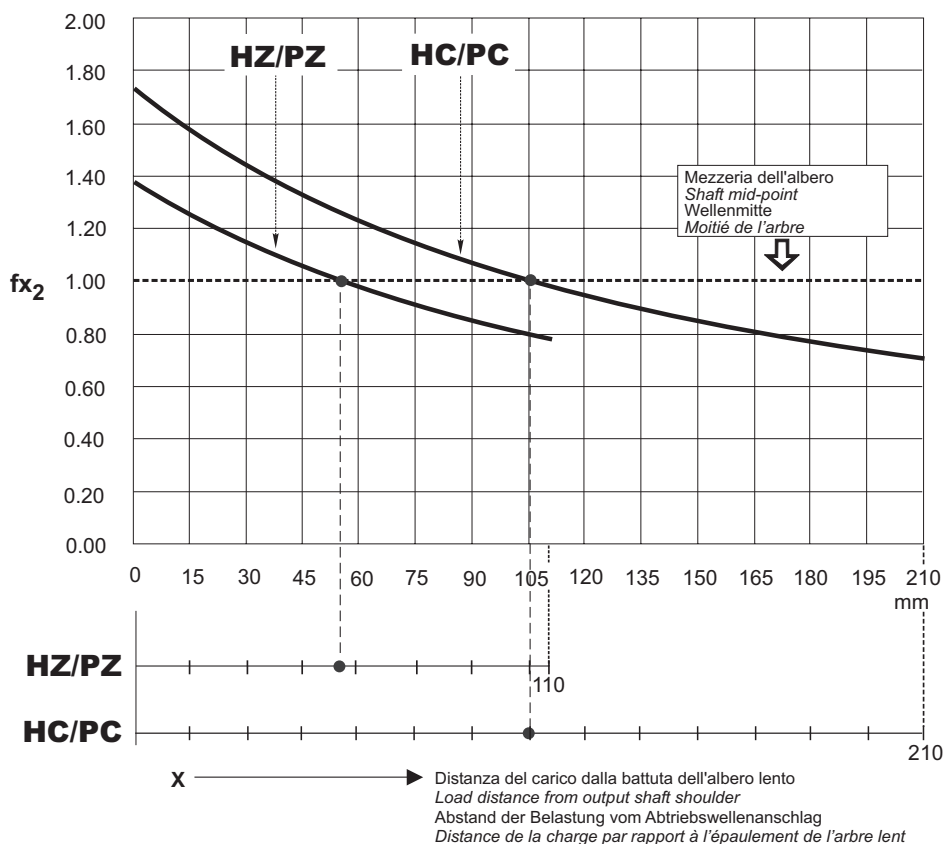


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

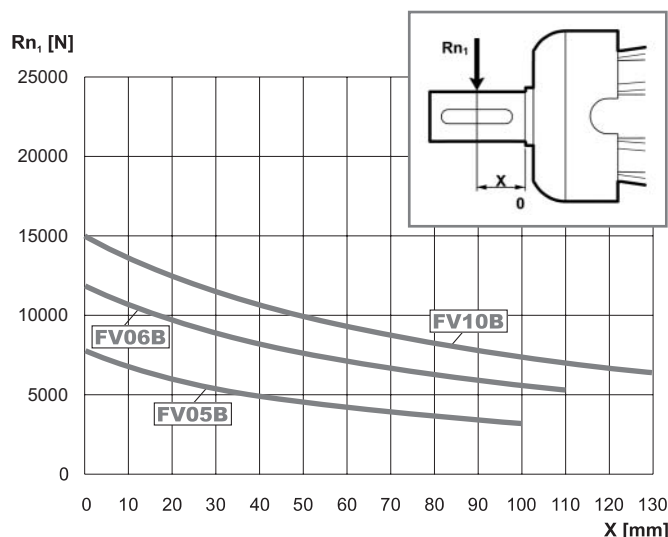
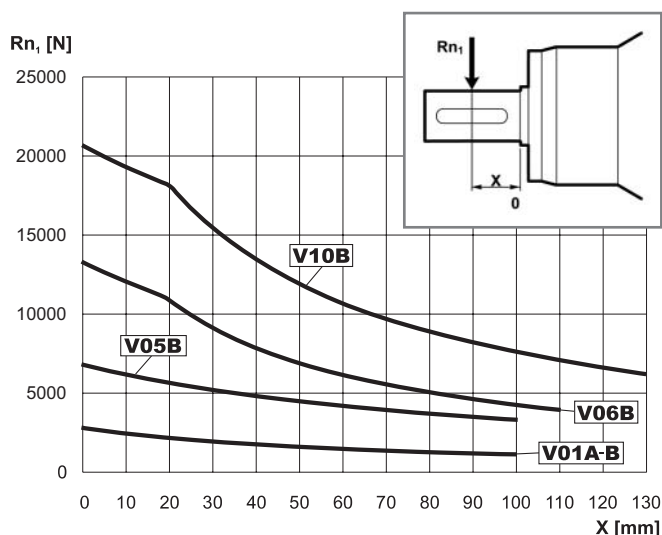
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

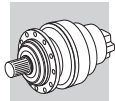
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

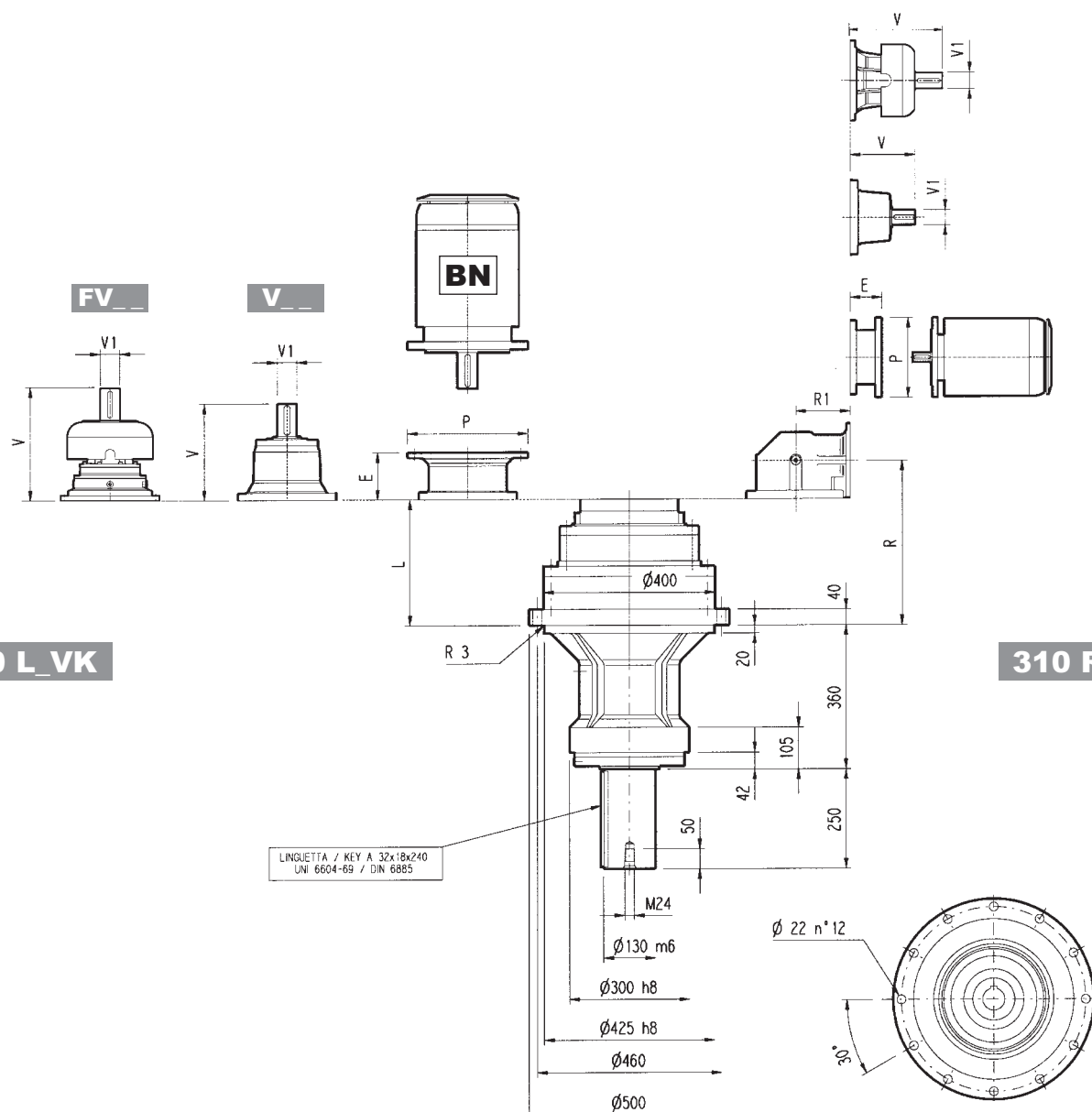
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





310_VK



310 L_VK

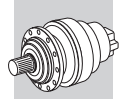
310 R_VK

	L													
			V	V1		V	V1		V	V1		V	V1	
310 L1	107	200	377	80	50	-	-	-	457	80	63	-	-	-
310 L2	243	230	307	60	23	-	-	-	357	60	28	-	-	-
310 L3	308	240	239	48	15	-	-	-	276	48	17	-	-	-
310 L4	361	245	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
310 L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	271	400	301	450	281	550
310 L2	-	-	-	-	-	-	-	-	-	-	-	-	152	350	153	350	183	400	212	450	193	550
310 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
310 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R	R1													
				V	V1		V	V1		V	V1		V	V1	
310 R2 (B)	315	345	320	307	60	23	-	-	-	357	60	28	-	-	-
310 R2 (C)	333	390	340	307	60	23	-	-	-	357	60	28	-	-	-
310 R3	380	140	250	137.5	24	6	158	38	7	-	-	-	-	-	-
310 R4	400	140	260	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
310 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450
310 R2 (C)	-	-	-	-	-	-	-	-	-	-	114	300	152	350	152	350	182	400	212	450
310 R3	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-
310 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 310_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 310_VK, with radial force applying at a distance x from shaft shoulder.

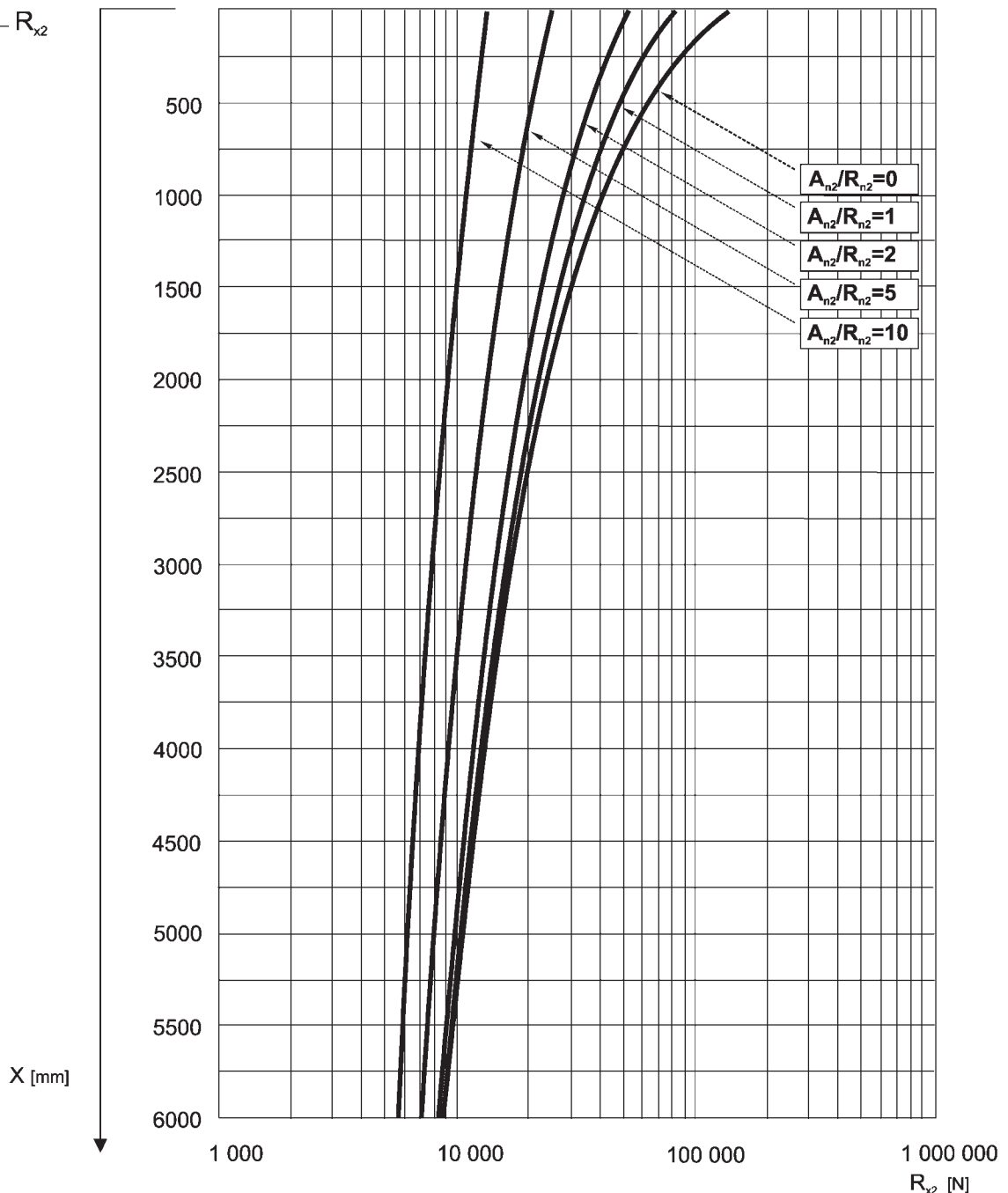
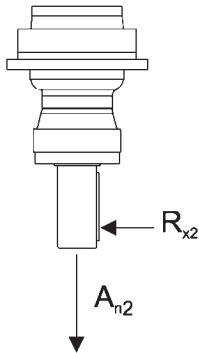
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

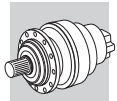
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 310_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

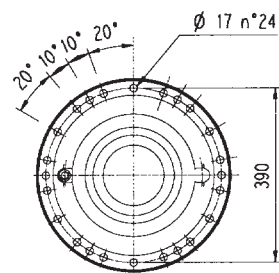
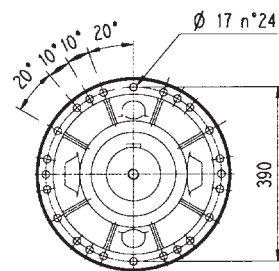
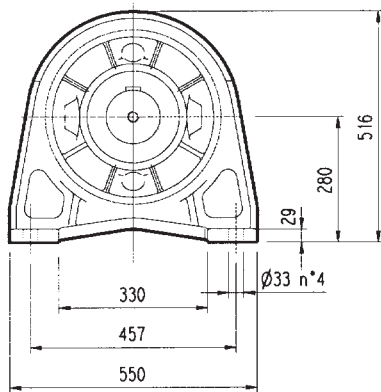
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 310_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

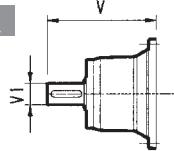




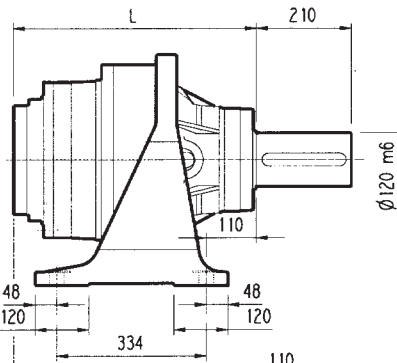
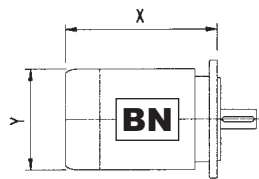
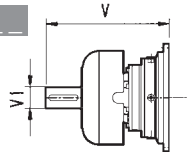
311 L



V



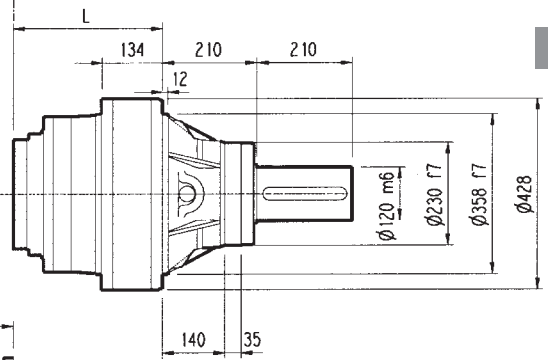
FV



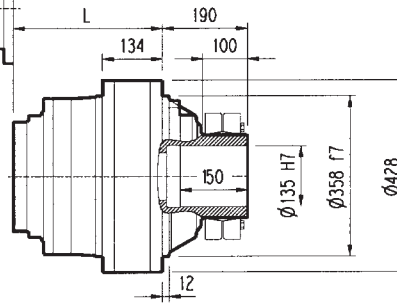
PC

HZ

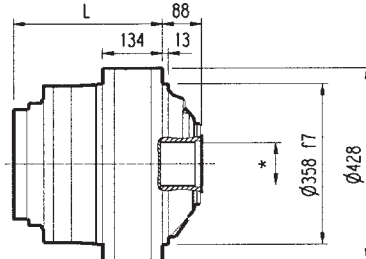
PZ



HC



FP



FZ

FZB

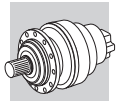
FP

M_{2max} = 54000 Nm

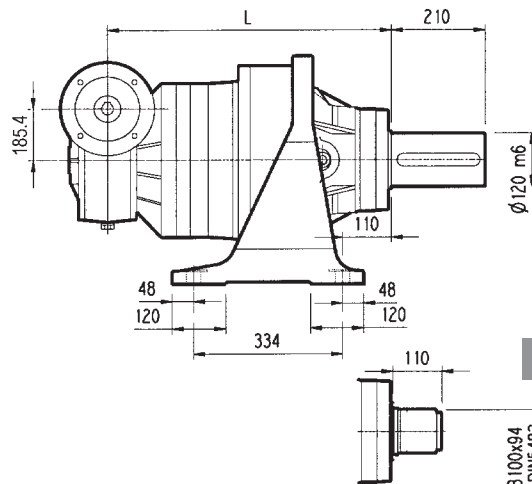
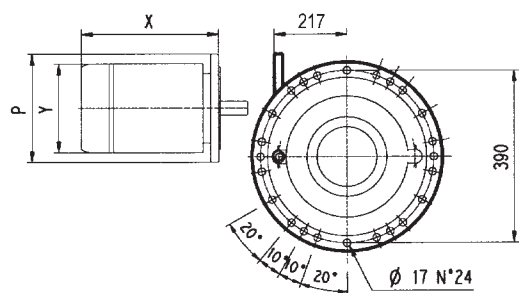
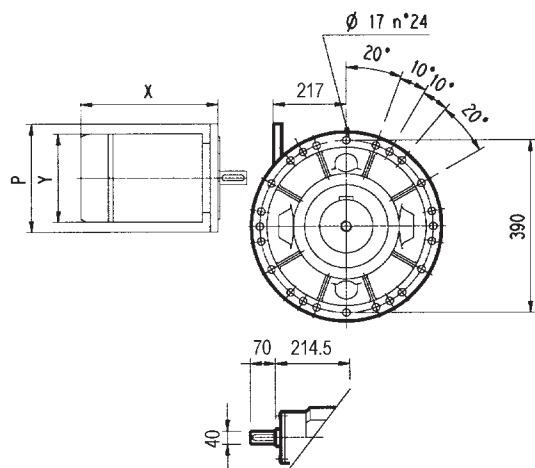
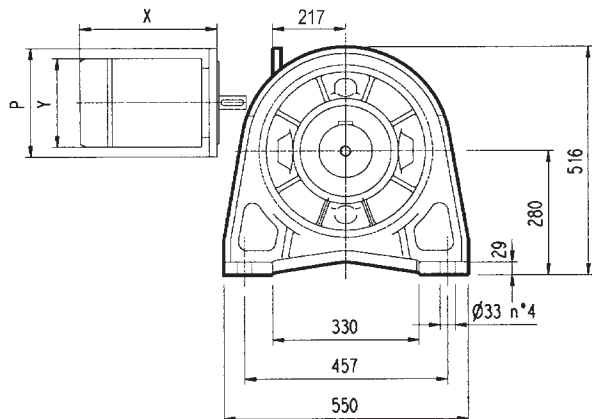
* Per dimensioni vedere pag. 318
For dimensions, refer to page 318
Für Abmessungen finden Sie auf Seite 318
Pour les dimensions, se référer à la page 318

	L				Kg				Kg				Kg				Kg			
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
311 L1	325	115	115	115	250	180	160	170	348	80	55	-	-	-	456	80	85	-	-	-
311 L2	458	248	248	248	295	225	205	215	315	80	35	313	60	28	375	80	48	363	60	34
311 L3	547	337	337	337	307	237	217	227	239	48	15	-	-	-	276	48	17	-	-	-
311 L4	612	402	402	402	314	244	224	234	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
311 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
311 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
311 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



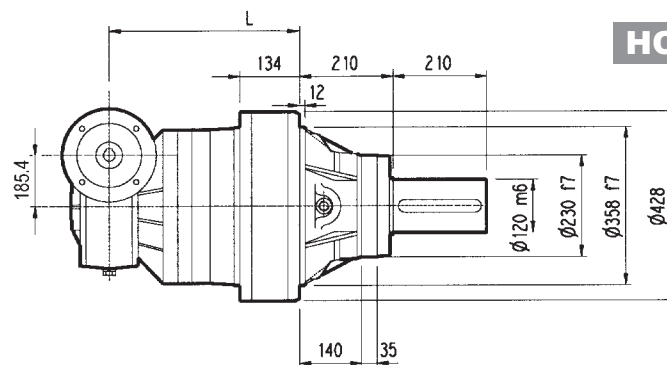
3/V 11 L3



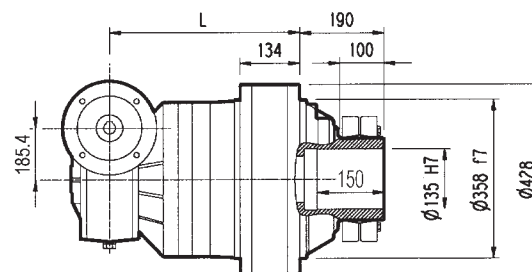
PC

HZ PZ

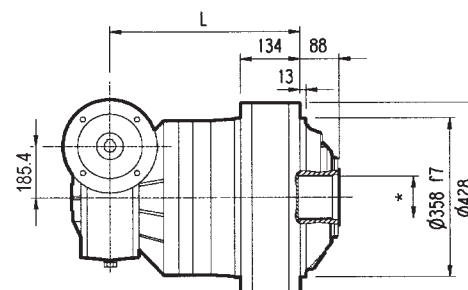
B100x94
DIN5482



HC



FP



FZ

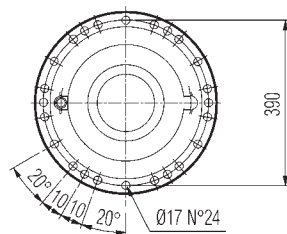
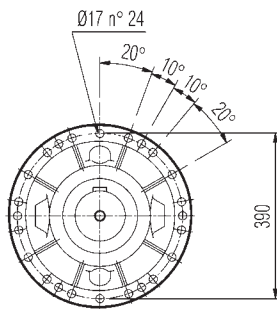
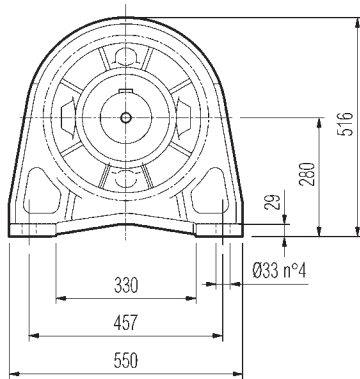
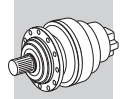
FZB

FP

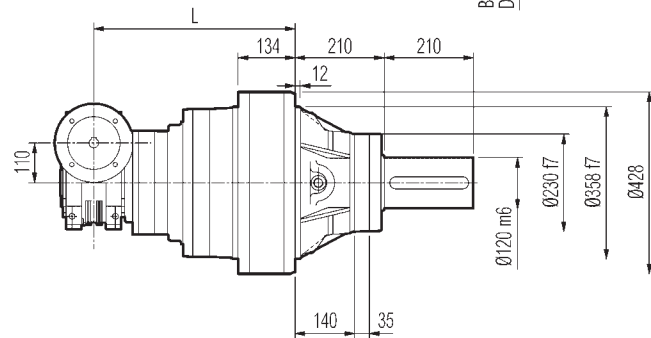
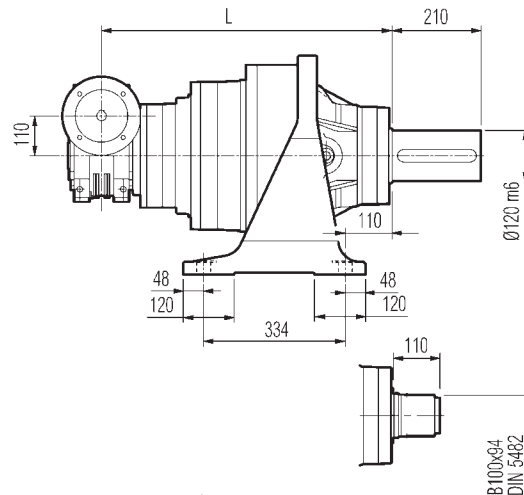
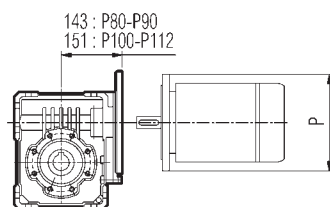
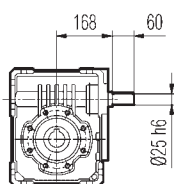
$M_{2max} = 54000 \text{ Nm}$

* Per dimensioni vedere pag. 318
For dimensions, refer to page 318
Für Abmessungen finden Sie auf Seite 318
Pour les dimensions, se référer à la page 318

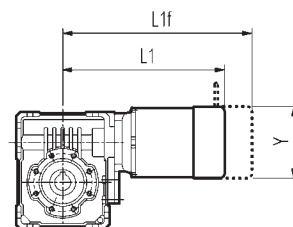
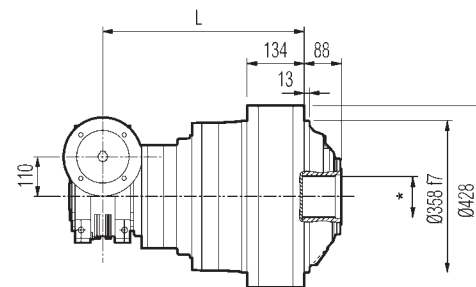
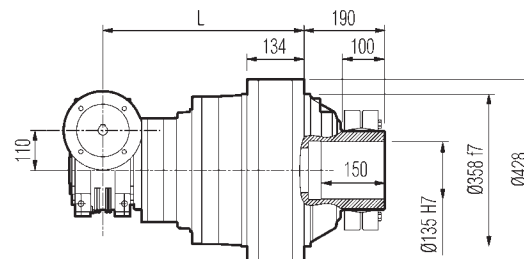
	L				Kg				P80	P90	P100	P112	P132	P160	P180
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	P	P	P	P	P	P	P
3/V 11 L3	659	449	449	449	390	320	300	310	-	-	250	250	300	350	350



Vista da A
View from A



A →



PC

HZ

PZ

HC

FP

FZ

FZB

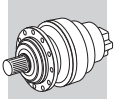
FP

$M_{2max} = 54000 \text{ Nm}$

* Per dimensioni vedere pag. 318
For dimensions, refer to page 318
Für Abmessungen finden Sie auf Seite 318
Pour les dimensions, se référer à la page 318

	L							
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP
3/V 11 L4	707	497	497	497	340	270	250	260

	P80 P	P90 P	P100 P	P112 P	S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	
3/V 11 L4	200	200	250	250	364	440	156	407	503	193	439	530	193



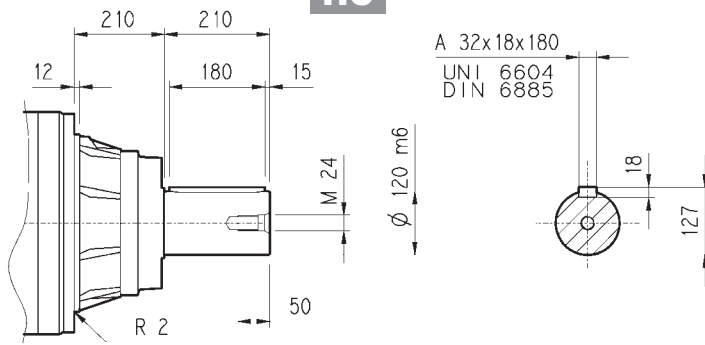
311 L

311 R

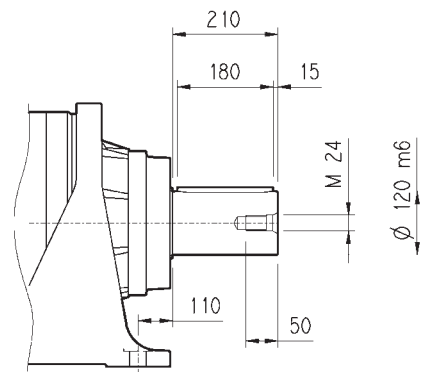
3/V 11 L3

3/V 11 L4

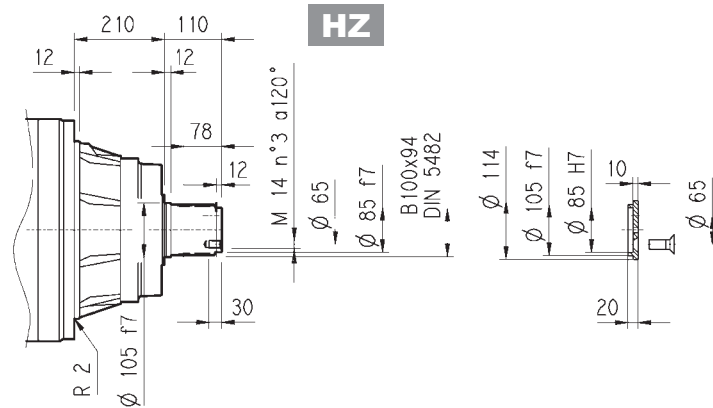
HC



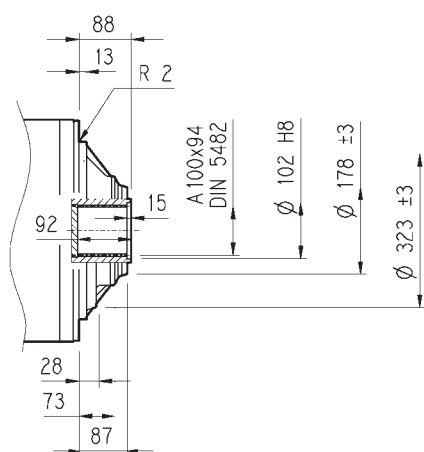
PC



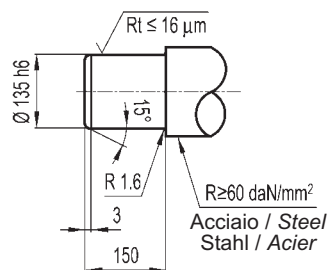
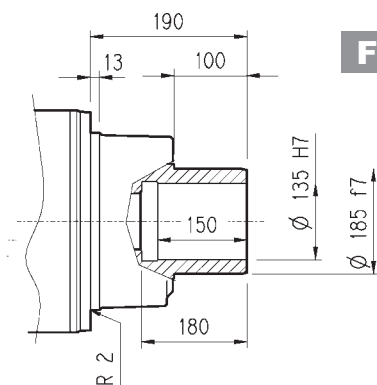
HZ



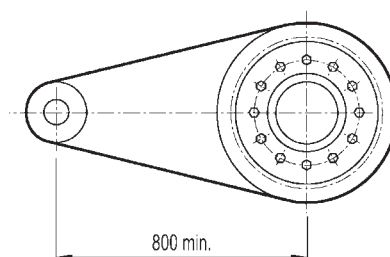
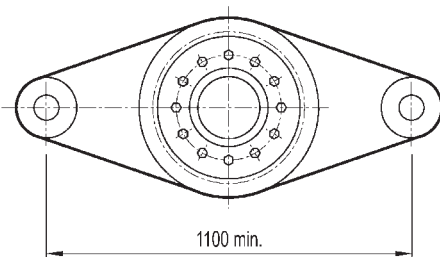
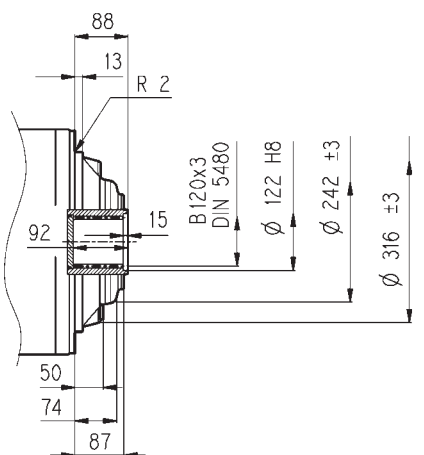
FZ



FP

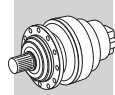


FZB

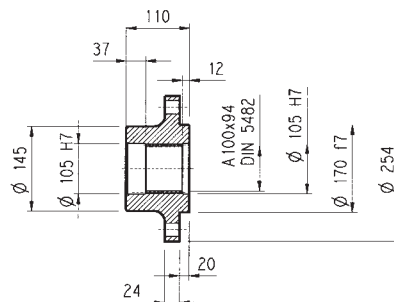
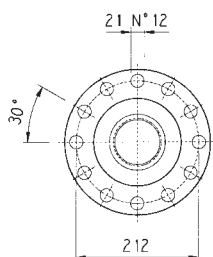
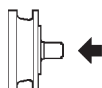


FP

M_{2max} = 54000 Nm

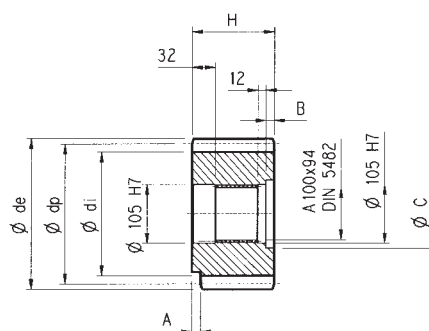
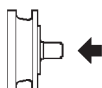
311 L**311 R****3/V 11 L3****3/V 11 L4**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

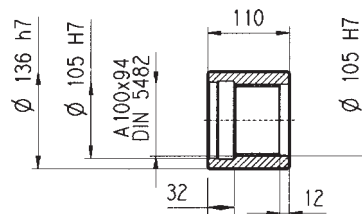
Pignoni / Pinion gears
Ritzel / Pignons

P...

	m	z	x	dp	di	de	H	A	B	C	☆
PLQ	12	23	0	276	246	300	110	0	0	0	■
PPD	16	13	0.500	208	184	252.5	145	0	35	116	□
PPF	16	15	0.450	240	215	280	125	0	15	120	□

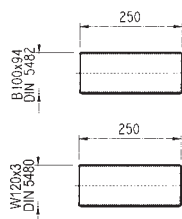
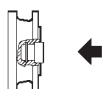
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

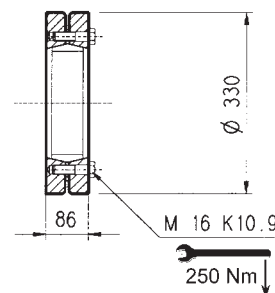
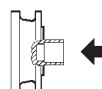
Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

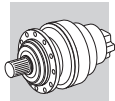
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A**FZ****FZB**

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

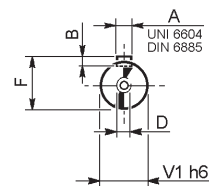
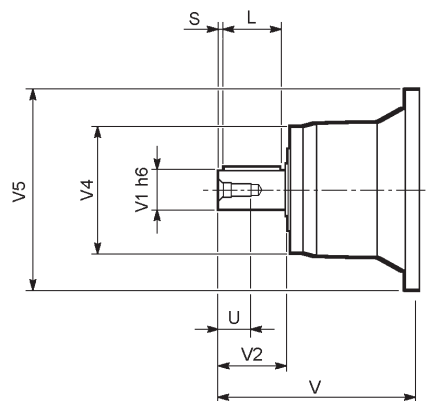
G0A



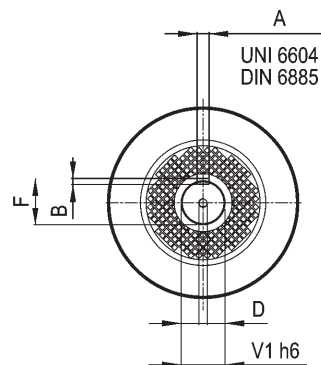
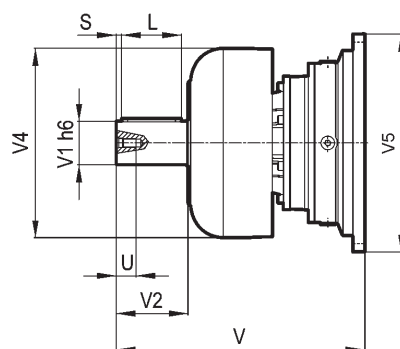
311 L

311 R

V



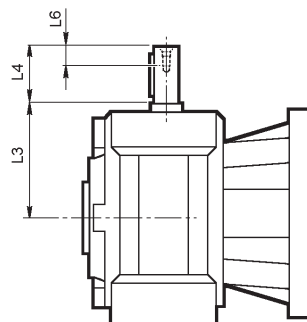
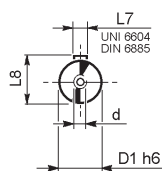
FV



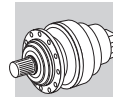
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
311 L1	V11B	348	80	130	200	428	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
311 L2	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
311 L3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
311 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
311 R2 (B)(C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
311 R3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
311 R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 11 L3

3/V 11 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 11 L3_HS	40	214.5	70	20	12	43	M8
3/V 11 L4_HS	25	168	60	19	8	28	M8

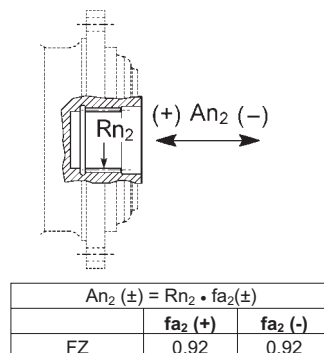
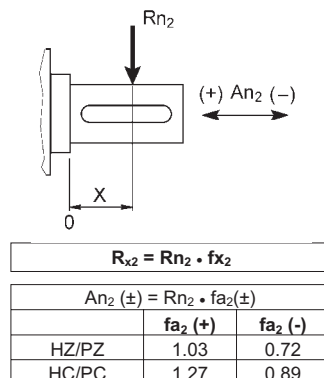
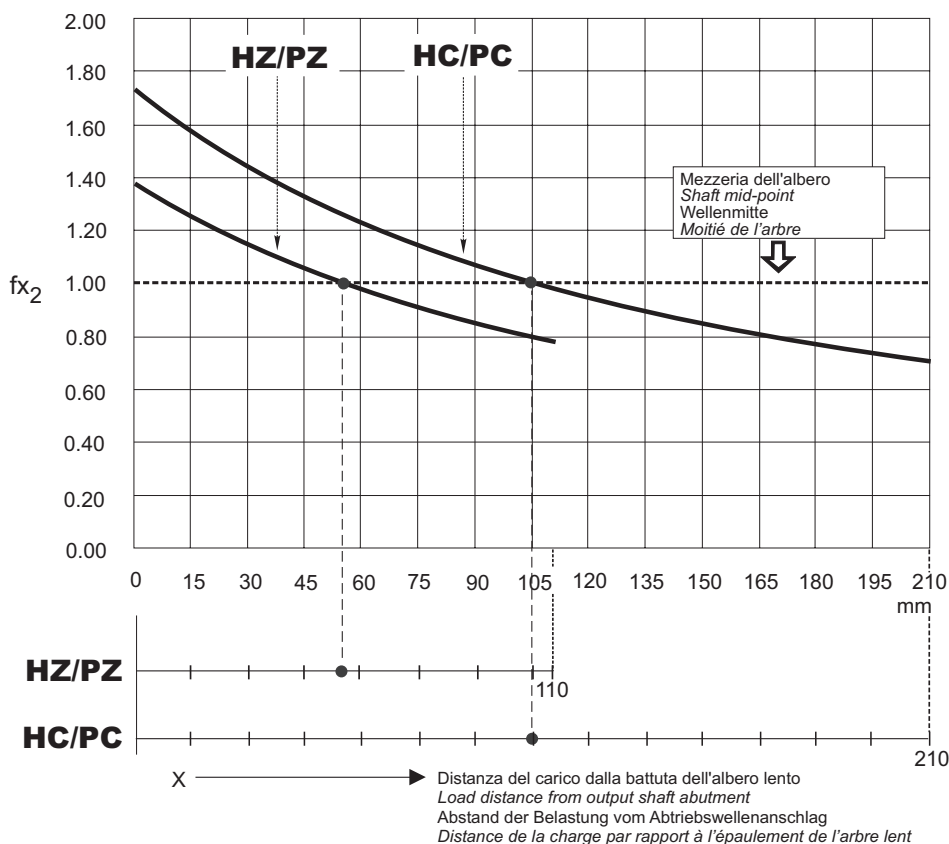


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

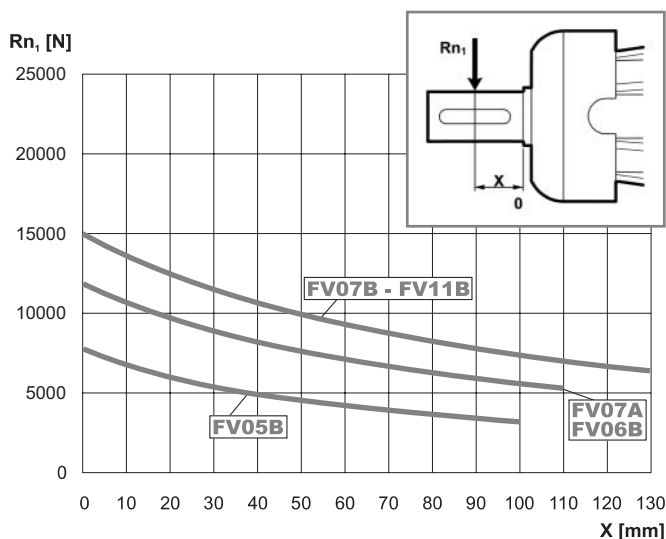
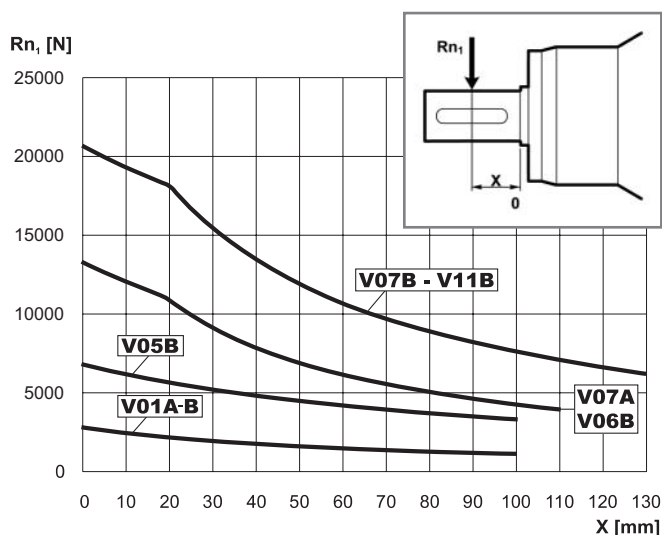
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

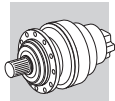
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

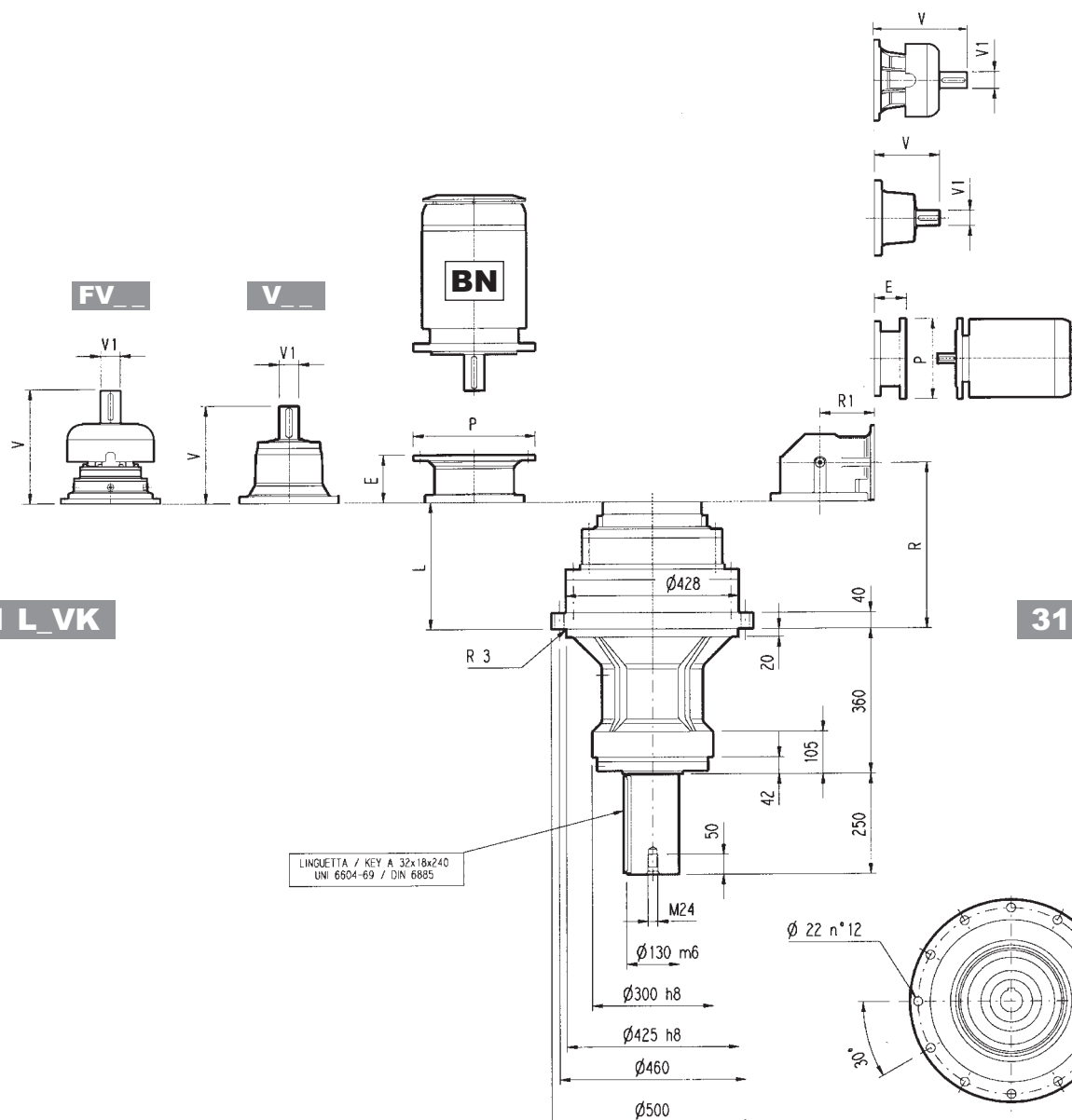
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





311_VK



311 L_VK

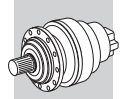
311 R_VK

	L													
			V	V1		V	V1		V	V1		V	V1	
311 L1	129	295	348	80	55	-	-	-	456	80	85	-	-	-
311 L2	262	340	315	80	35	313	60	28	375	80	48	363	60	34
311 L3	351	350	239	48	15	-	-	-	276	48	17	-	-	-
311 L4	416	360	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
311 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
311 L3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
311 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R	R1													
				V	V1		V	V1		V	V1		V	V1	
311 R2 (B)	354	345	420	307	60	23	-	-	-	357	60	28	-	-	-
311 R2 (C)	354	390	430	307	60	23	-	-	-	357	60	28	-	-	-
311 R3	381	225	385	239	48	15	-	-	-	276	48	17	-	-	-
311 R4	443	140	360	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
311 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
311 R2 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
311 R3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
311 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 311_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 311_VK, with radial force applying at a distance x from shaft shoulder.

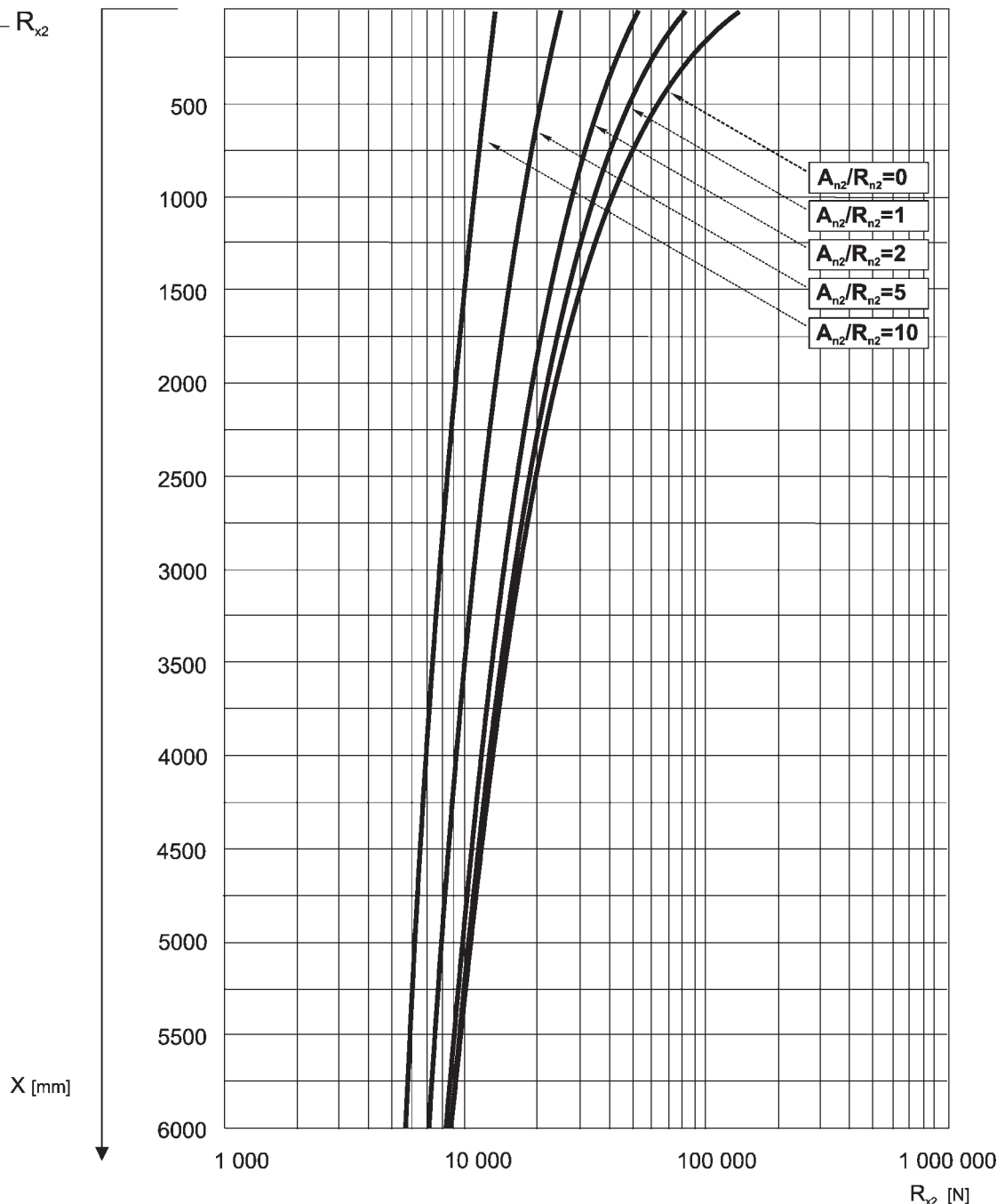
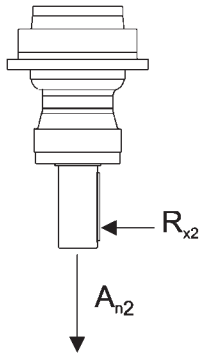
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

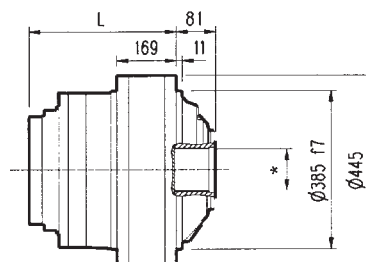
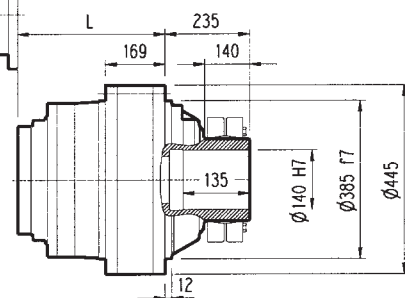
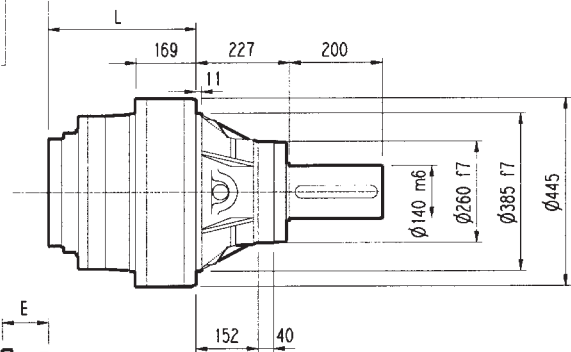
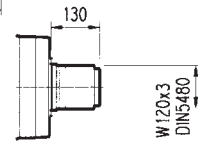
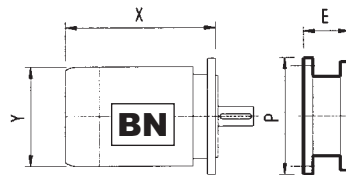
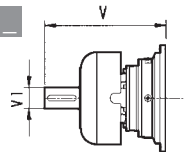
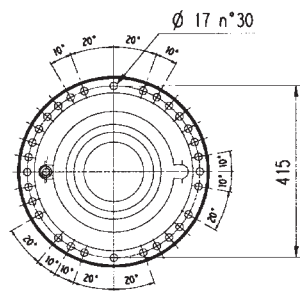
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 311_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 311_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.





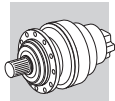
FZB

$$M_{2\max} = 66000 \text{ Nm}$$

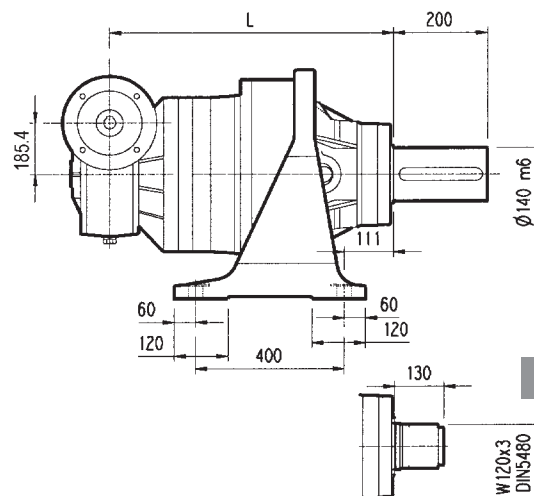
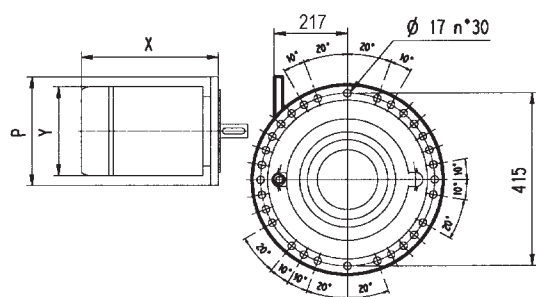
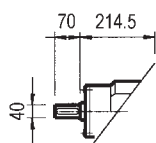
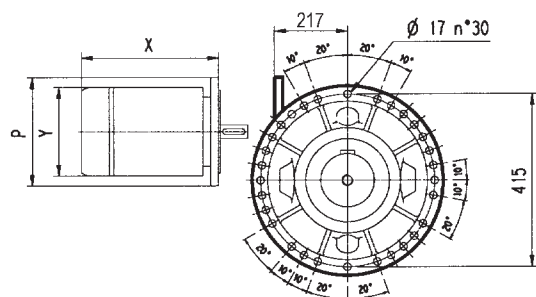
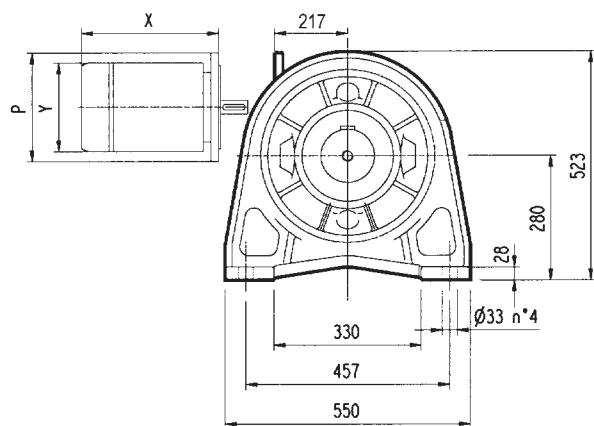
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
313 L2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	350	186	400	216	450	216	550
313 L3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	350	174	400	-	-	-	-
313 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



 Bonfiglioli
Trasmissioni



3/V 13 L3

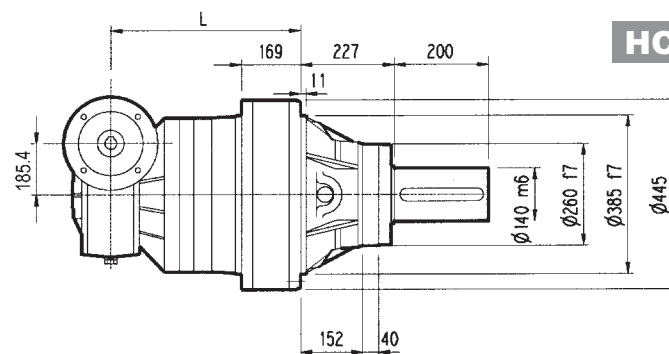


PC

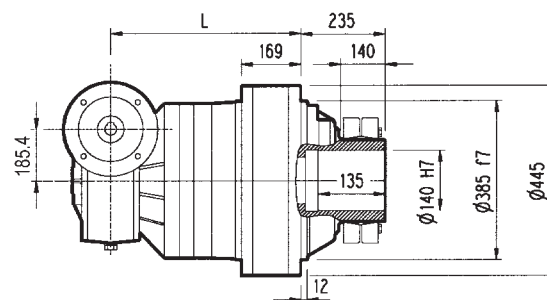
HZ

PZ

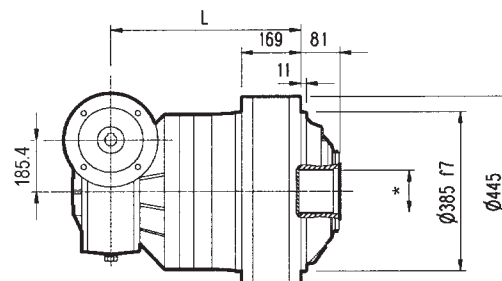
W120x3
DIN5480



HC



FP



FZ

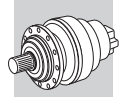
FZB

FP

$M_{2max} = 66000 \text{ Nm}$

* Per dimensioni vedere pag. 328
For dimensions, refer to page 328
Für Abmessungen finden Sie auf Seite 328
Pour les dimensions, se référer à la page 328

	L				Kg				P80	P90	P100	P112	P132	P160	P180
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	P	P	P	P	P	P	P
3/V 13 L3	732	505	505	505	475	385	355	375	-	-	250	250	300	350	350



PC

HZ

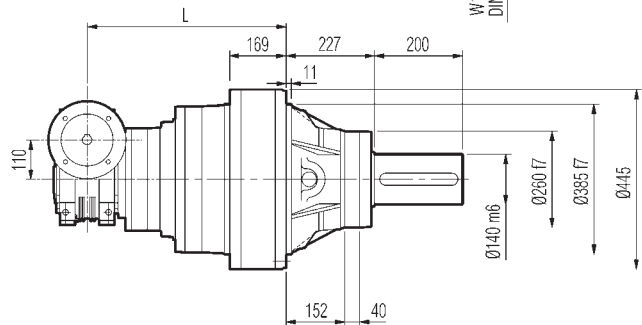
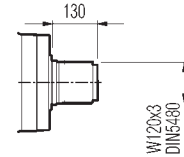
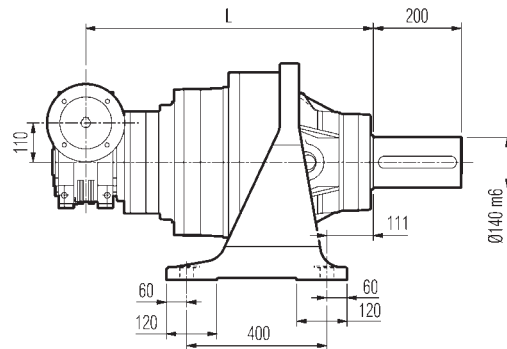
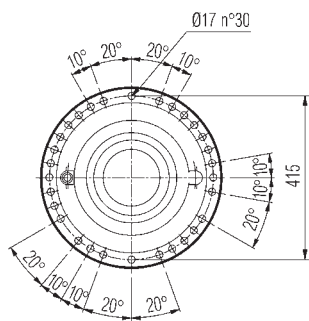
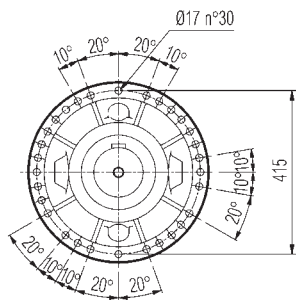
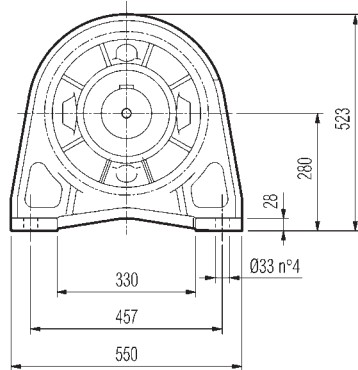
PZ

HC

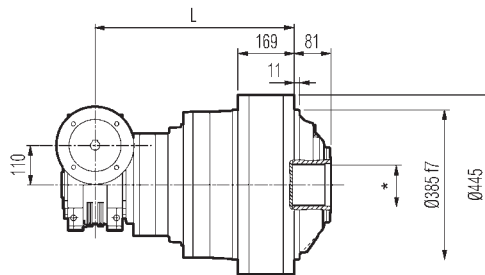
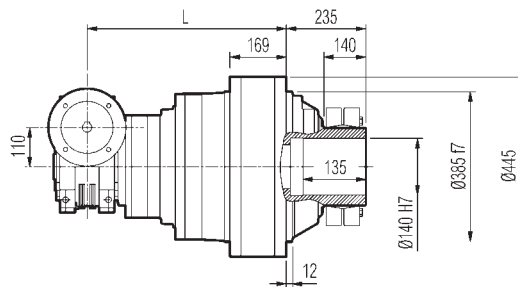
FP

FZ

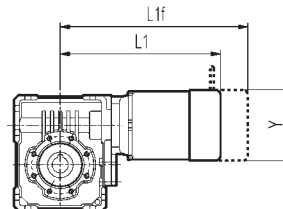
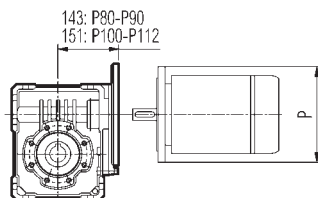
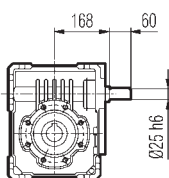
FZB



A →



Vista da
View from A



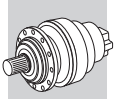
FP

$M_{2max} = 66000 \text{ Nm}$

* Per dimensioni vedere pag. 328
For dimensions, refer to page 328
Für Abmessungen finden Sie auf Seite 328
Pour les dimensions, se référer à la page 328

	L				L1	L2	L3	L4	L5	 Kg			
	PC - PZ	HC - HZ	FZ	FP						PC - PZ	HC - HZ	FZ	FP
3/V 13 L4	780	553	553	553	110.1	153	25	138	60	425	335	305	325

	P80 P	P90 P	P 100 P	P112 P	S2 + M2S			S3 + M3S			S3 + M3L		
	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	L1	L1f	Y	
3/V 13 L4	200	200	250	250	364	440	156	407	503	193	439	530	193



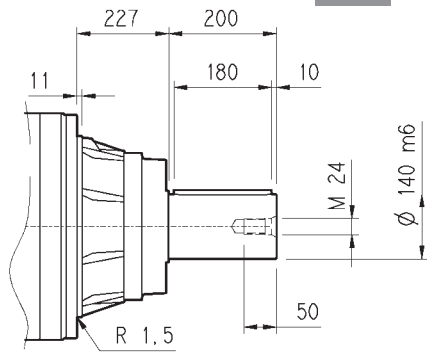
313 L

313 R

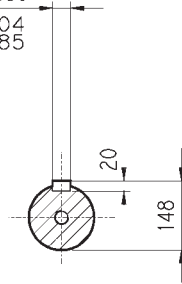
3/V 13 L3

3/V 13 L4

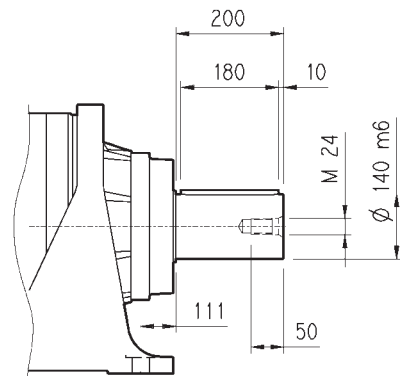
HC



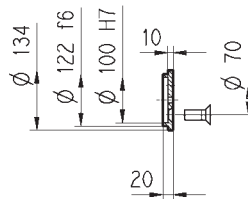
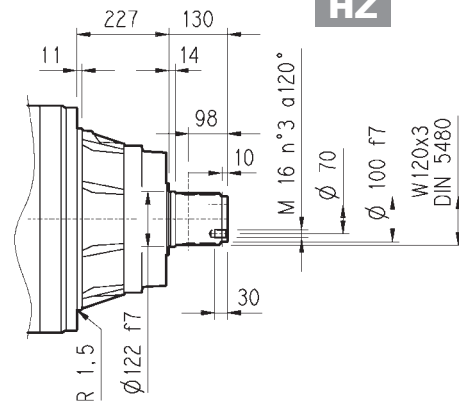
A 36x20x180
UNI 6604
DIN 6885



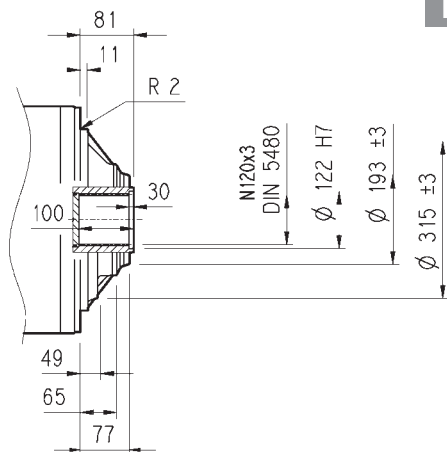
PC



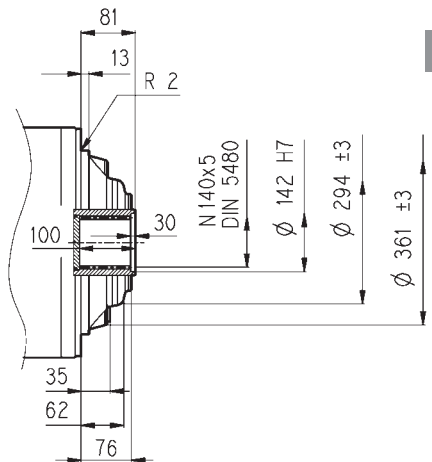
HZ



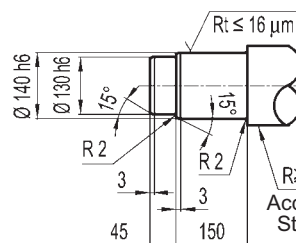
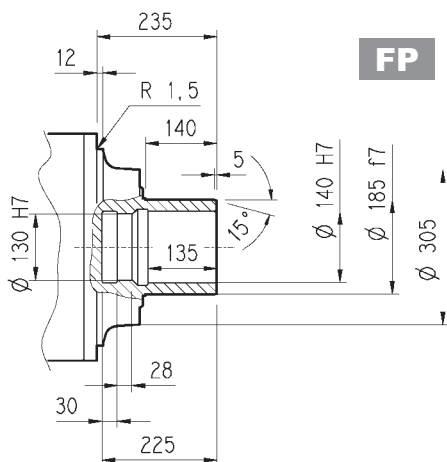
FZ



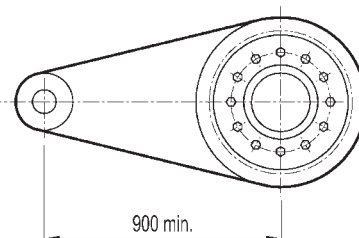
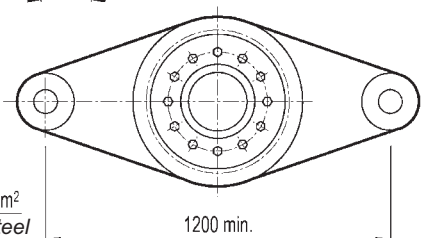
FZB



FP

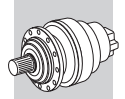
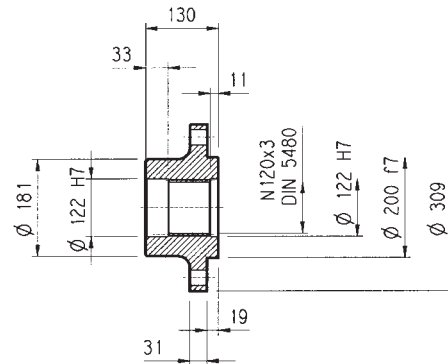
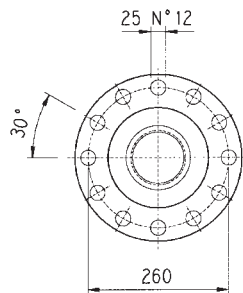
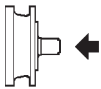


$R_t \leq 16 \mu\text{m}$
 $R \geq 60 \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier



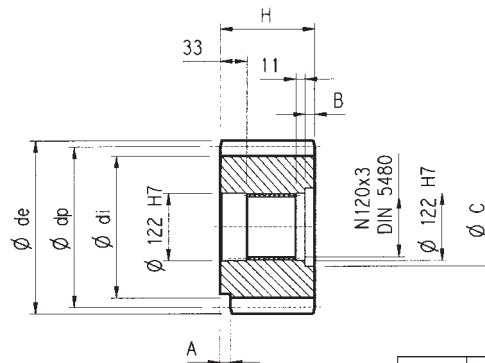
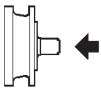
FP

$M_{2\text{max}} = 66000 \text{ Nm}$

**WOA**

Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

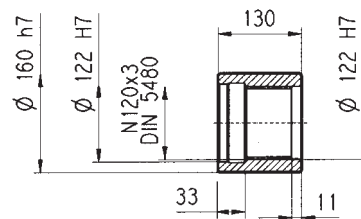
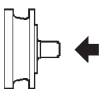
P...



	m	z	x	dp	di	de	H	A	B	C	☆
PPH	16	17	0.500	272	247	315	135	0	5	136	□
PRI	18	18	0.333	324	294	365	140	0	10	140	□

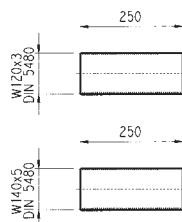
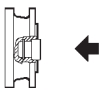
☆	Materiale / Material / Material / Matériau
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifié 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cimenté et trempé 18NiCrMo5

MOA



Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

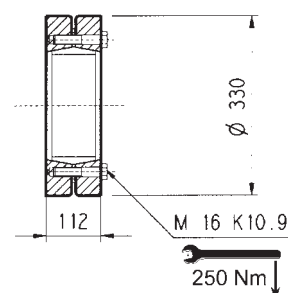
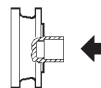
BOA

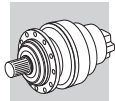
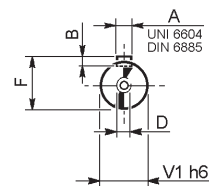
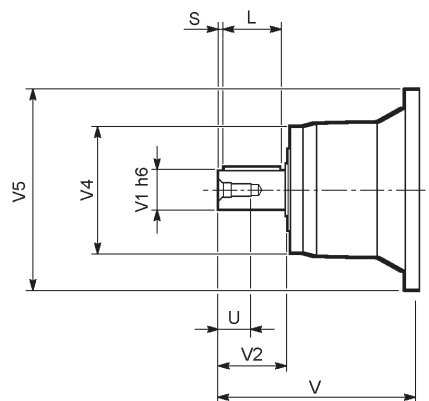
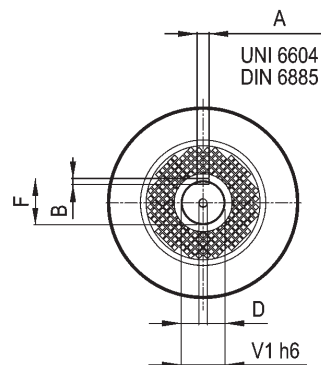
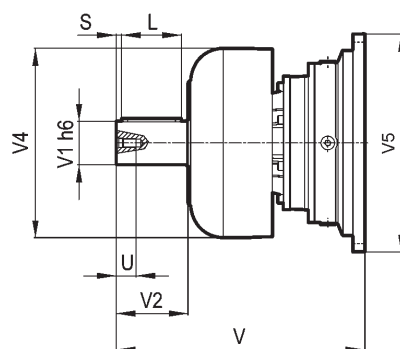


FZ

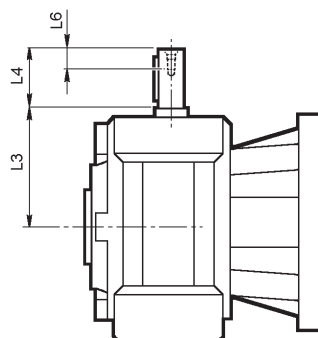
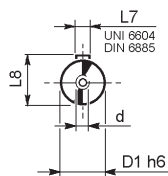
FZB

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e
temprare 50-55 HRC
*Case hardening steel 18NiCrMo5 UNI 5331 must be case
hardened to 50-55 HRC*
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet
werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

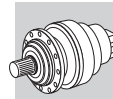
GOA


313 L
313 R
V _ _

FV _ _


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
313 L1	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36
313 L2	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
313 L3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
313 L4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28
313 R2 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
313 R3	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
313 R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 13 L3
3/V 13 L4


	D1 h6	L3	L4	L6	L7	L8	d
3/V 13 L3_HS	40	214.5	70	20	12	43	M8
3/V 13 L4_HS	25	168	60	19	8	28	M8

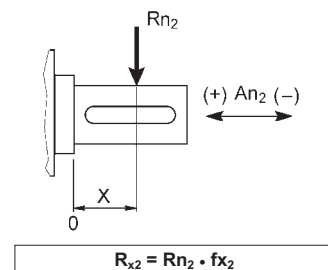
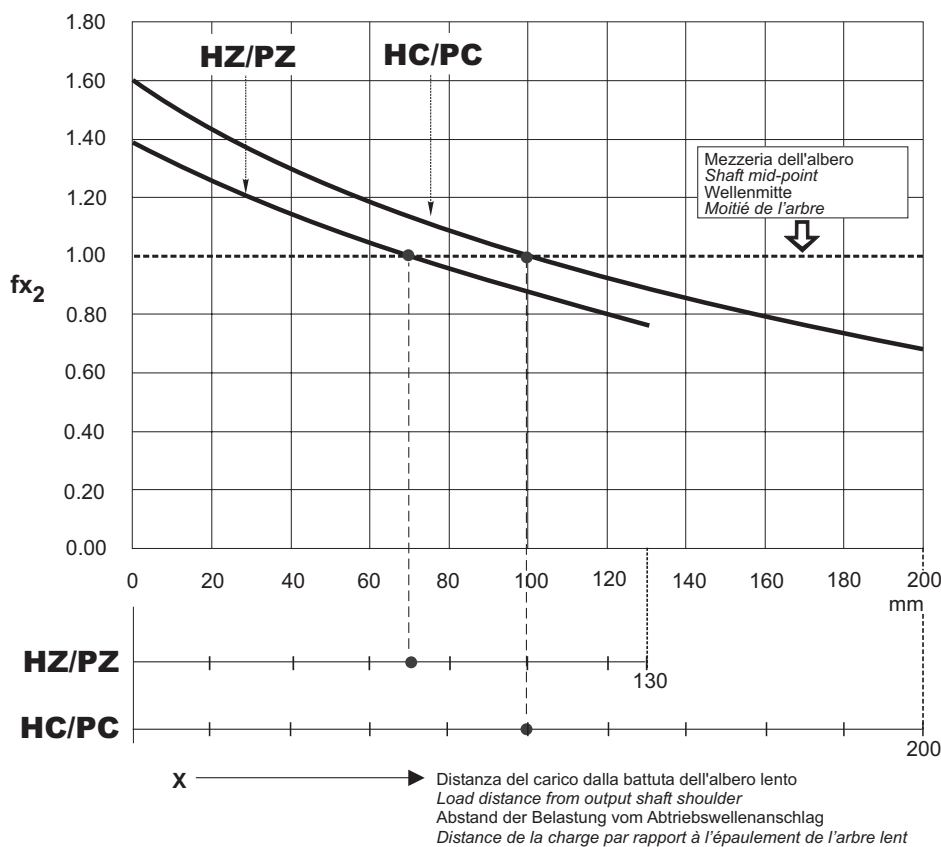


Fattore di posizione per carichi radiali sugli alberi in uscita.

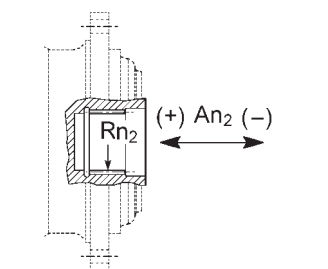
Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ/PZ	1.08	0.69
HC/PC	1.30	0.83



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	0.94	0.94

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

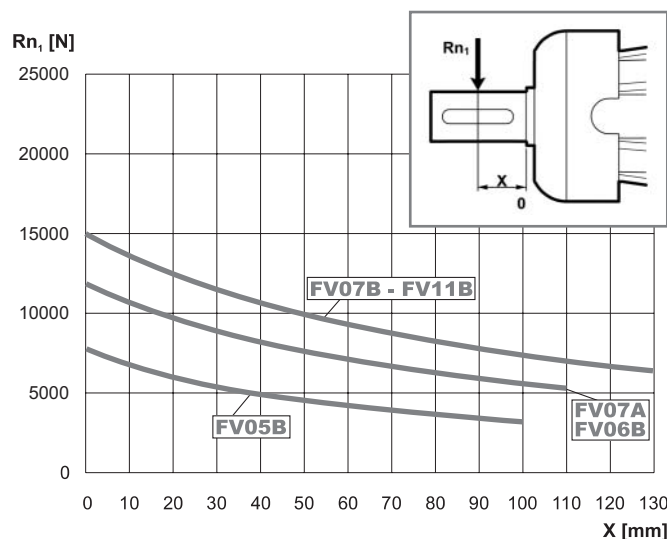
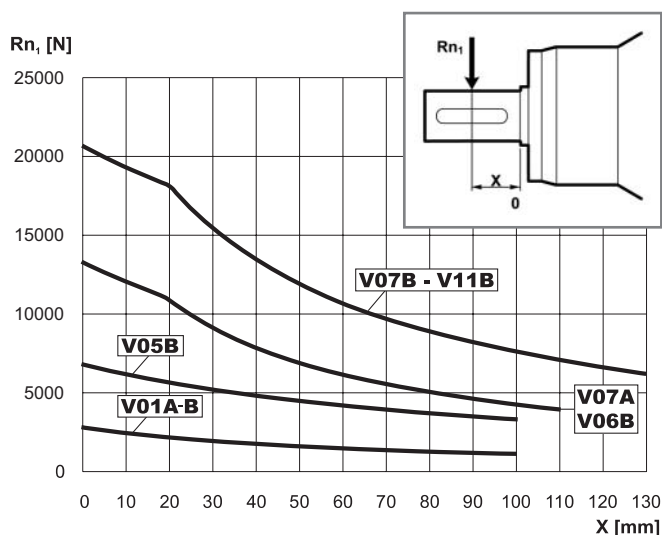
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

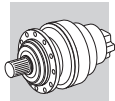
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

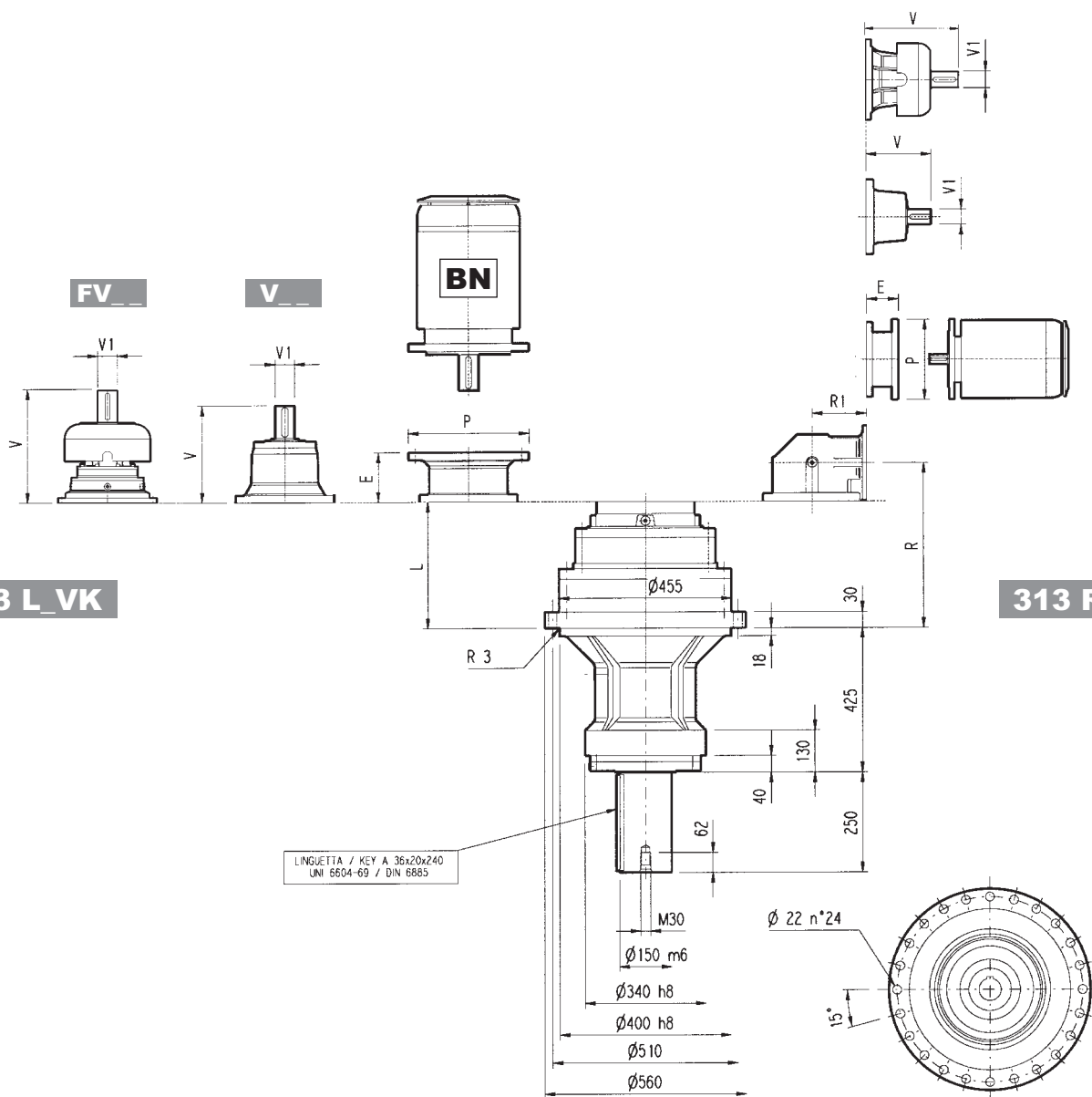
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





313_VK



313 L_VK

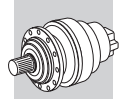
313 R_VK

	L	Kg												
			V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
313 L1	158	380	343	80	55	-	-	-	451	80	71	-	-	-
313 L2	308	440	315	80	35	313	60	28	375	80	48	363	60	34
313 L3	397	450	239	48	15	-	-	-	276	48	17	-	-	-
313 L4	462	460	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
313 L2	-	-	-	-	-	-	-	-	-	-	114	300	144	350	195	350	186	400	216	450	216	550
313 L3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	350	174	400	-	-	-	-
313 L4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-

	R	R1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
313 R2 (B)	388	345	510	307	60	23	-	-	-	357	60	28	-	-	-
313 R2 (C)	388	390	520	307	60	23	-	-	-	357	60	28	-	-	-
313 R3	427	225	490	239	48	15	-	-	-	-	-	-	-	-	-
313 R4	489	140	470	137.5	24	6	158	38	7	-	-	-	-	-	-

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
313 R2 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
313 R2 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
313 R3	-	-	-	-	-	-	-	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-
313 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 313_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 313_VK, with radial force applying at a distance x from shaft shoulder.

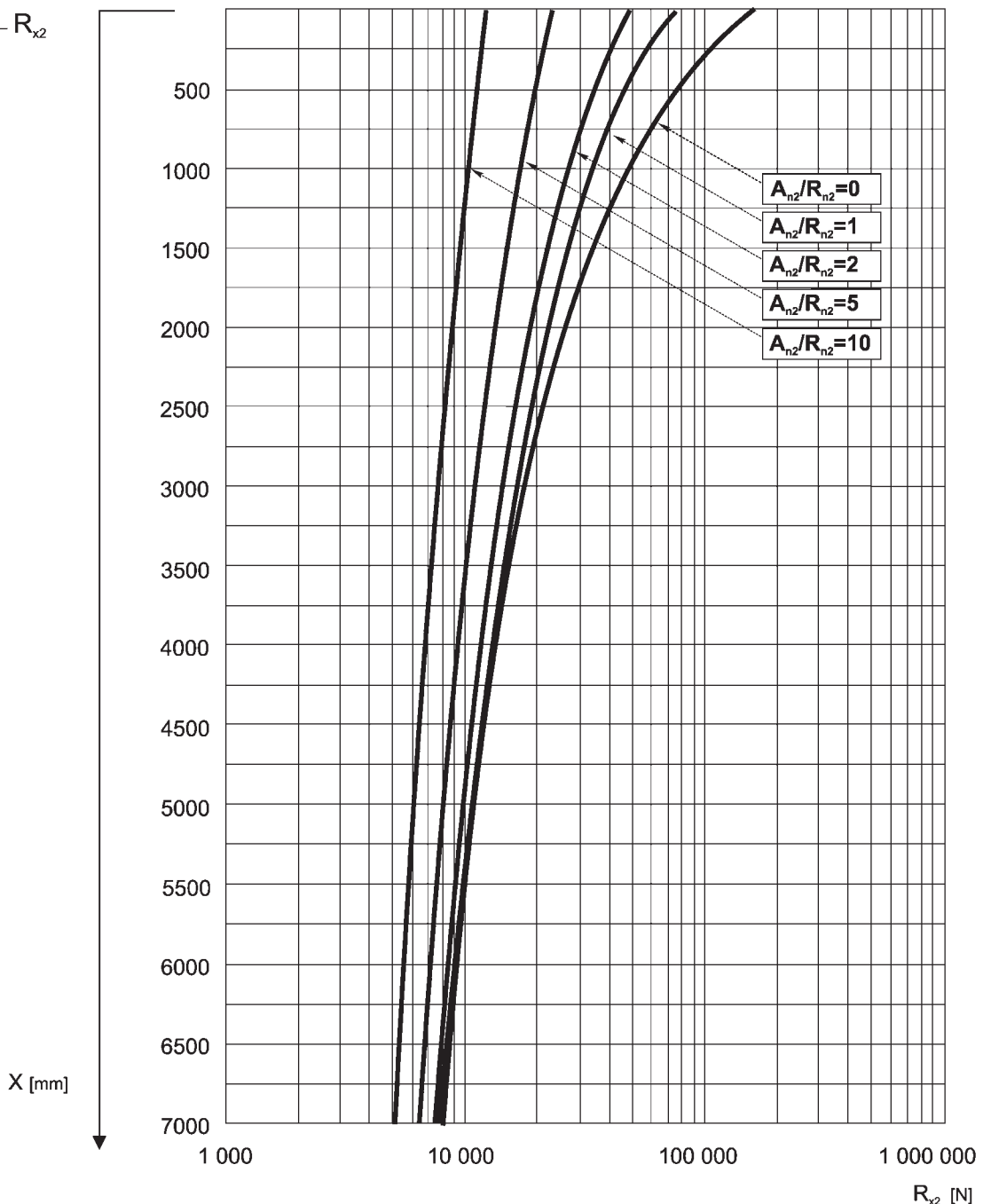
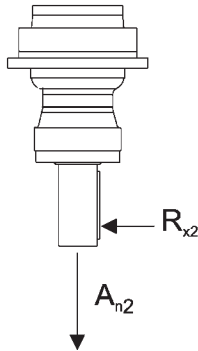
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

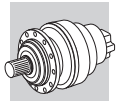
Das nachstehende Diagram ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 313_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

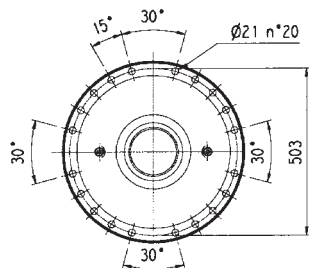
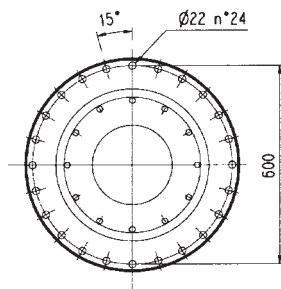
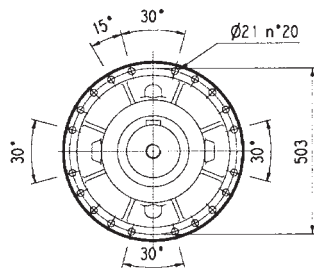
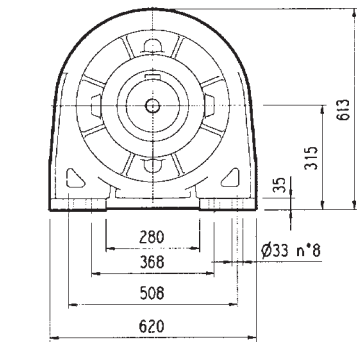
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 313_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

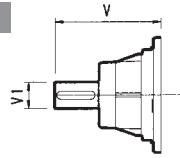




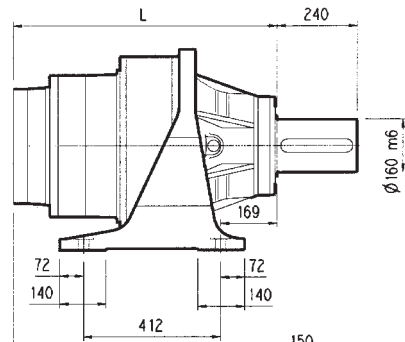
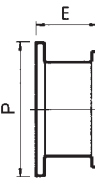
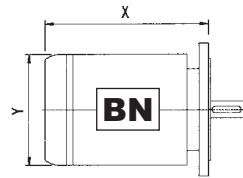
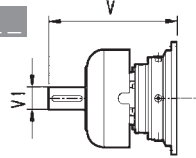
314 L



V



FV

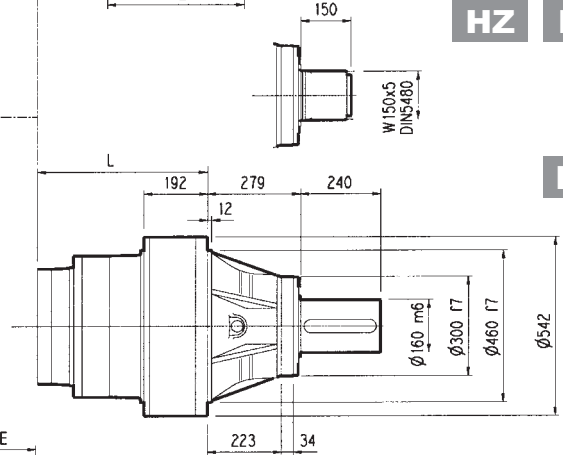


PC

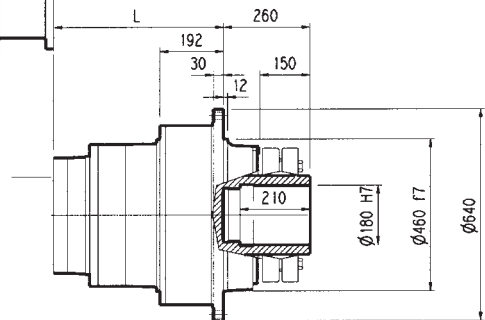
HZ

PZ

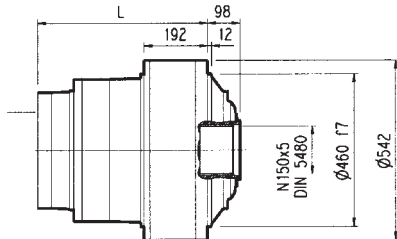
HC



FP



FZ

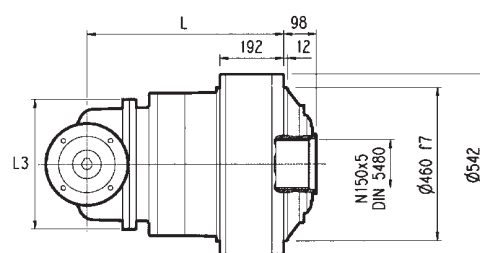


FP

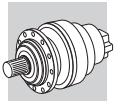
$M_{2max} = 126000 \text{ Nm}$

	L																			
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1		V	V1		V	V1		V	V1	
314 L2	641	362	362	362	545	415	325	375	377	80	50	-	-	-	457	80	63	-	-	-
314 L3	777	498	498	498	590	460	370	420	307	60	23	-	-	-	357	60	28	-	-	-
314 L4	842	563	563	563	600	470	380	430	239	48	15	-	-	-	276	48	17	-	-	-

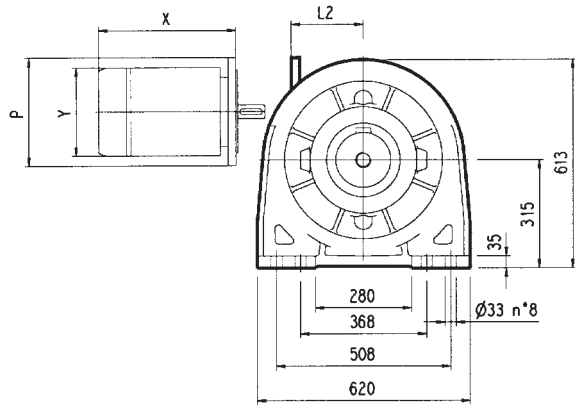
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
314 L2	-	-	-	-	-	-	271	400	301	450	281	550
314 L3	-	-	153	350	153	350	183	400	213	450	193	550
314 L4	114	300	144	350	144	350	174	400	-	-	-	-



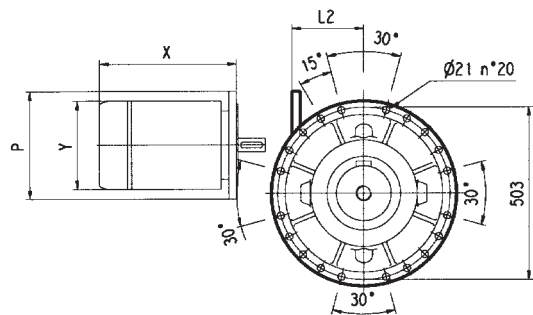
	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
314 R3 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R3 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



3/V 14 L3

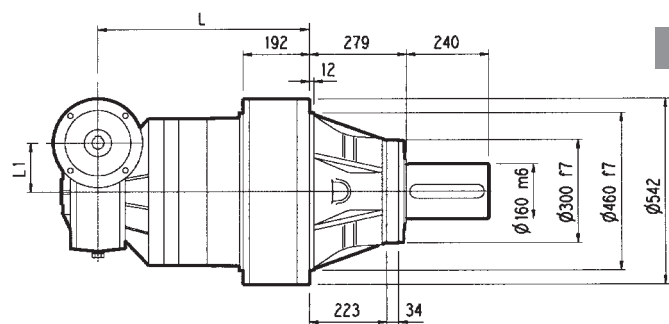


PC

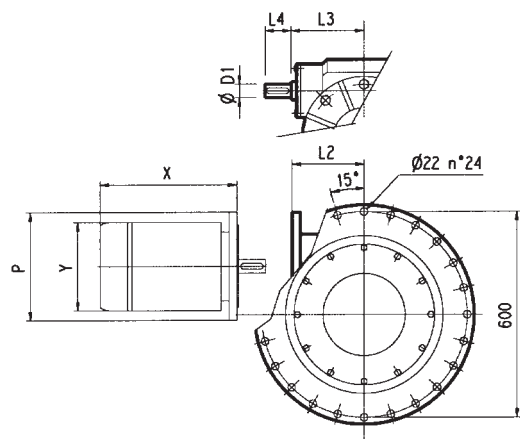


HZ

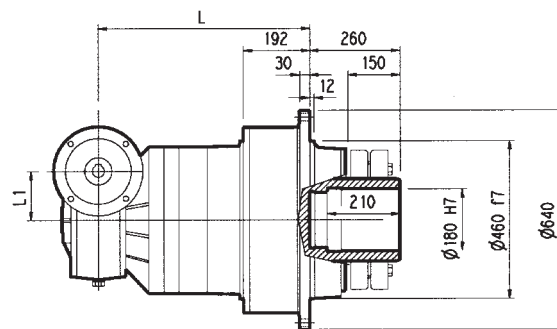
PZ



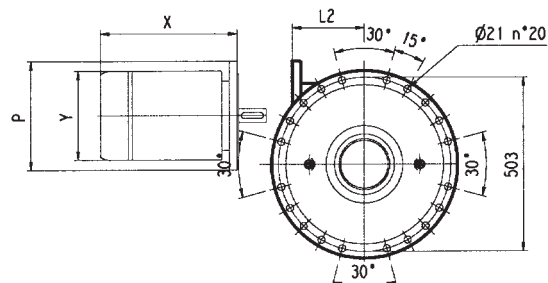
HC



FP



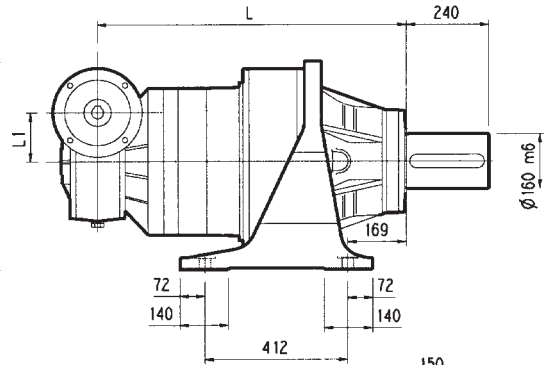
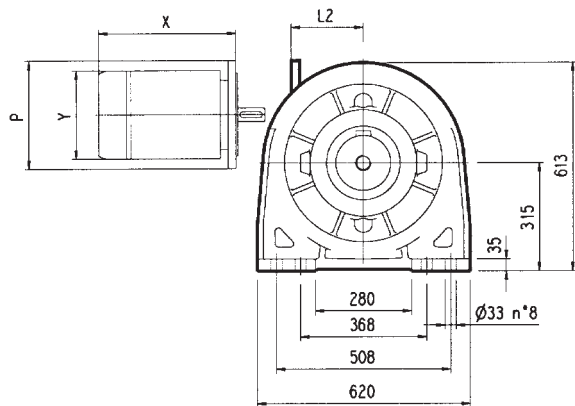
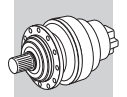
FZ



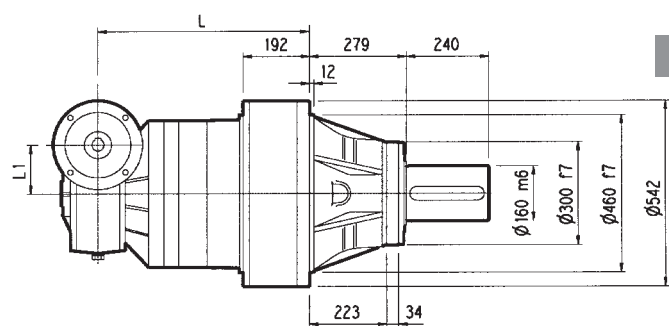
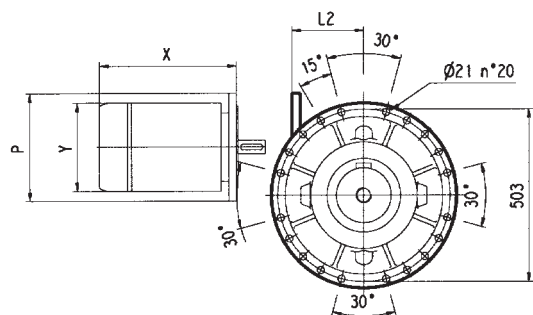
FP

$M_{2max} = 126000 \text{ Nm}$

	L				L1	L2	D1	L3	L4					
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 14 L3	920	641	641	641	185	217	40	214.5	70		665	535	445	495
	P100		P112		P132		P160		P180					
	P	P	P	P	L2	P	L2	P	L2	P				
3/V 14 L3	250	250	-	300	-	350	-	350	-	350				



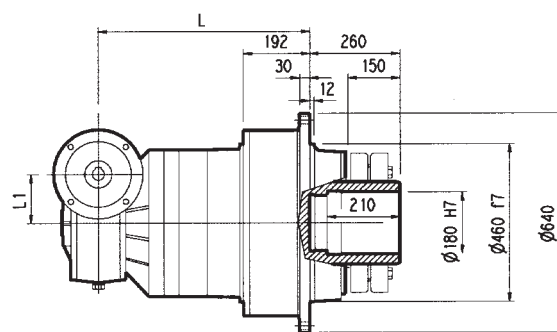
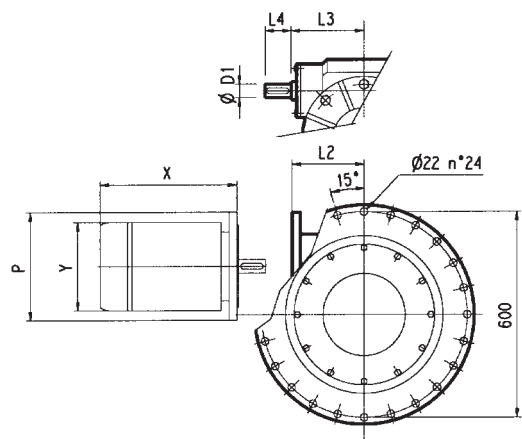
PC



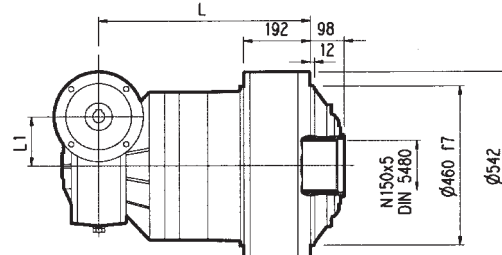
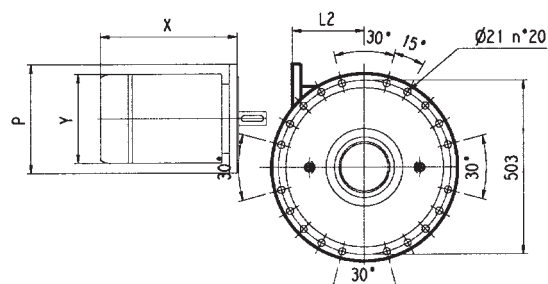
HZ

PZ

HC



FP



FZ

FP

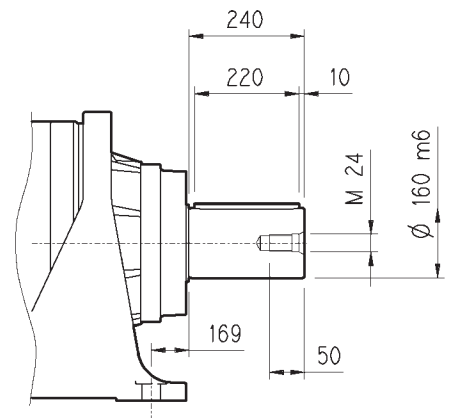
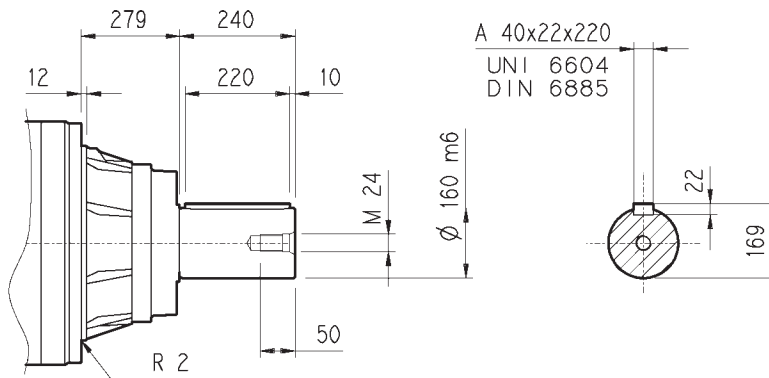
$M_{2max} = 126000 \text{ Nm}$

	L				L1	L2	D1	L3	L4		Kg			
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 14 L4	961	682	682	682	150	190	35	185	65		690	560	470	520

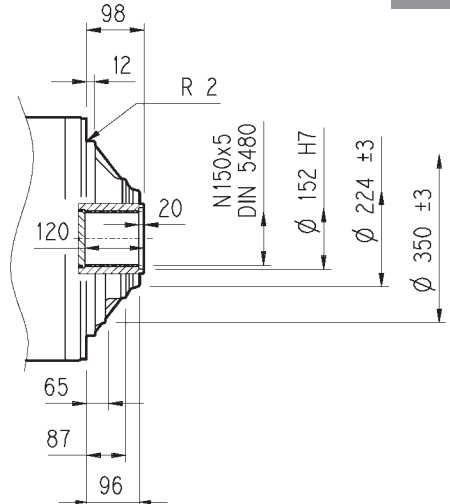
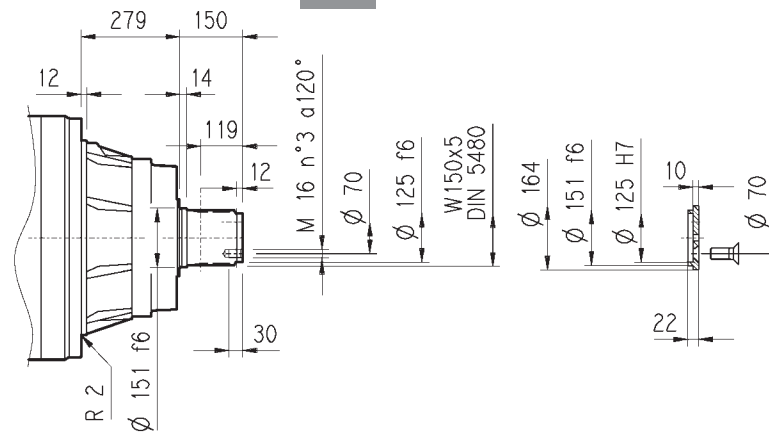
	P100	P112	P132		P160		P180	
	P	P	L2	P	L2	P	L2	P
3/V 14 L4	250	250	-	300	-	350	-	-



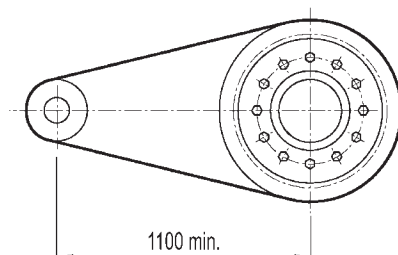
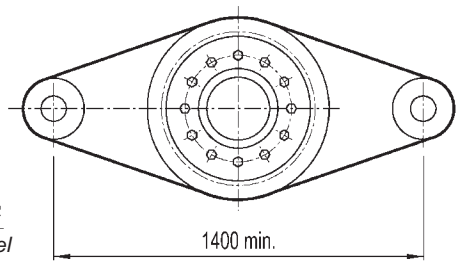
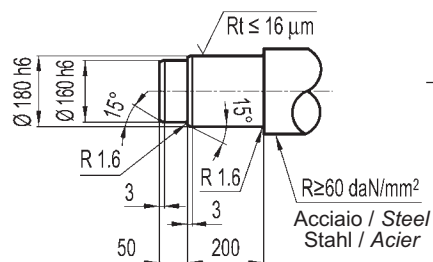
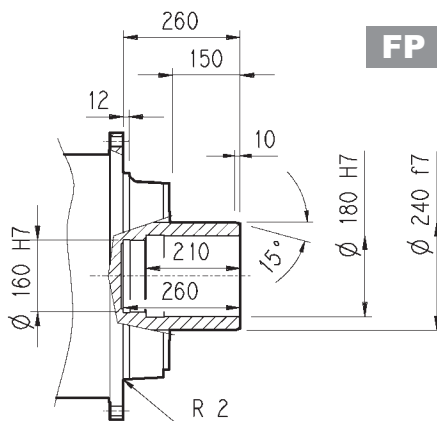
PC



FZ

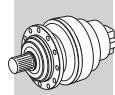


FP

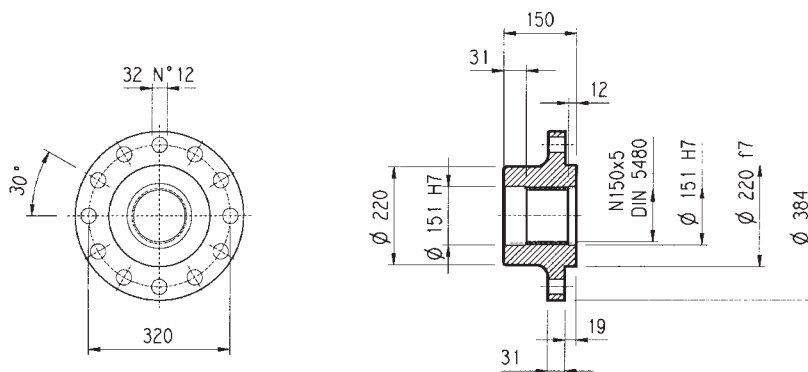
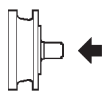


FP

$$M_{2\max} = 126000 \text{ Nm}$$

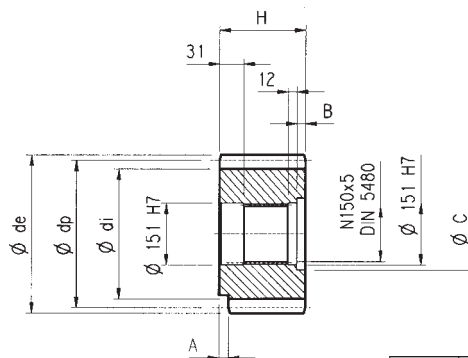
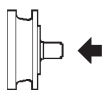
314 L**314 R****3/V 14 L3****3/V 14 L4**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

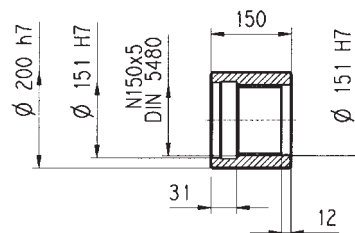
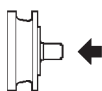
Pignoni / Pinion gears
Ritzel / Pignons

P...

	m	z	x	dp	di	de	H	A	B	C	☆
PRG1	18	16	0.500	288	261	342	160	0	10	166	■
PRG2	18	16	0.617	288	271	339	150	30	0	0	□

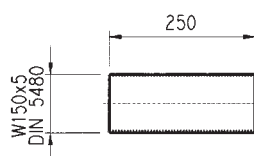
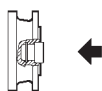
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

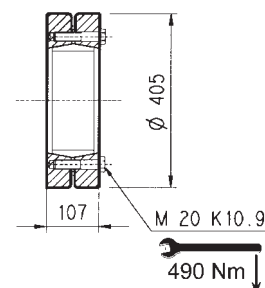
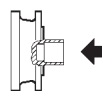
Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

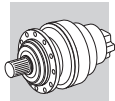
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

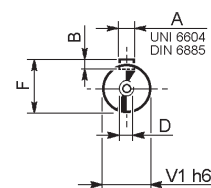
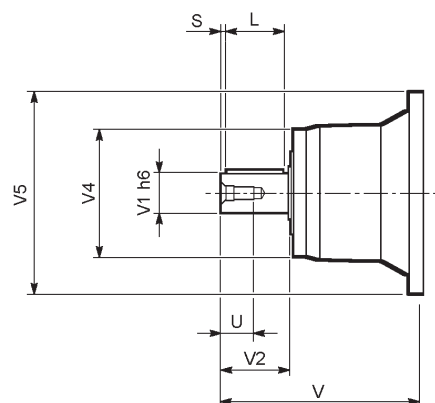
G0A



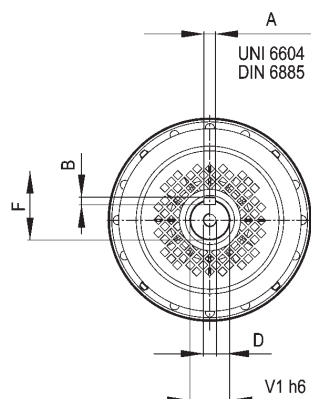
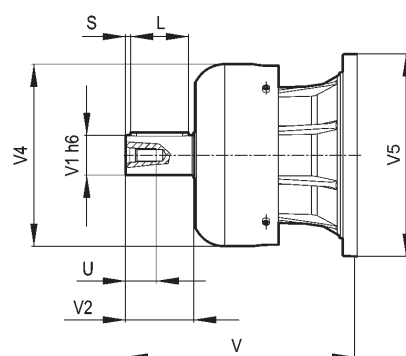
314 L

314 R

V



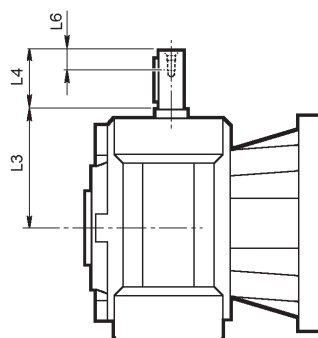
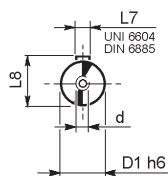
FV



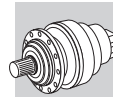
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
314 L2	V10B	377	80	130	200	400	22	14	85	110	10	M16	36
	FV10B	457	80	130	347.5	400	22	14	85	110	10	M16	36
314 L3	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
314 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
314 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
314 R4	V01A	137.5	24	36	120	186	8	7	27	30	3	M8	19
	V01B	158	38	58	120	186	10	8	41	50	4	M12	28

3/V 14 L3

3/V 14 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 14 L3 HS	40	214.5	70	20	12	43	M8
3/V 14 L4 HS	35	185	65	20	10	38	M8

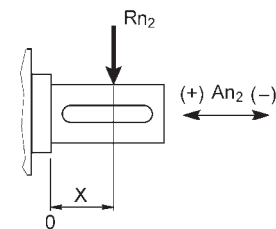
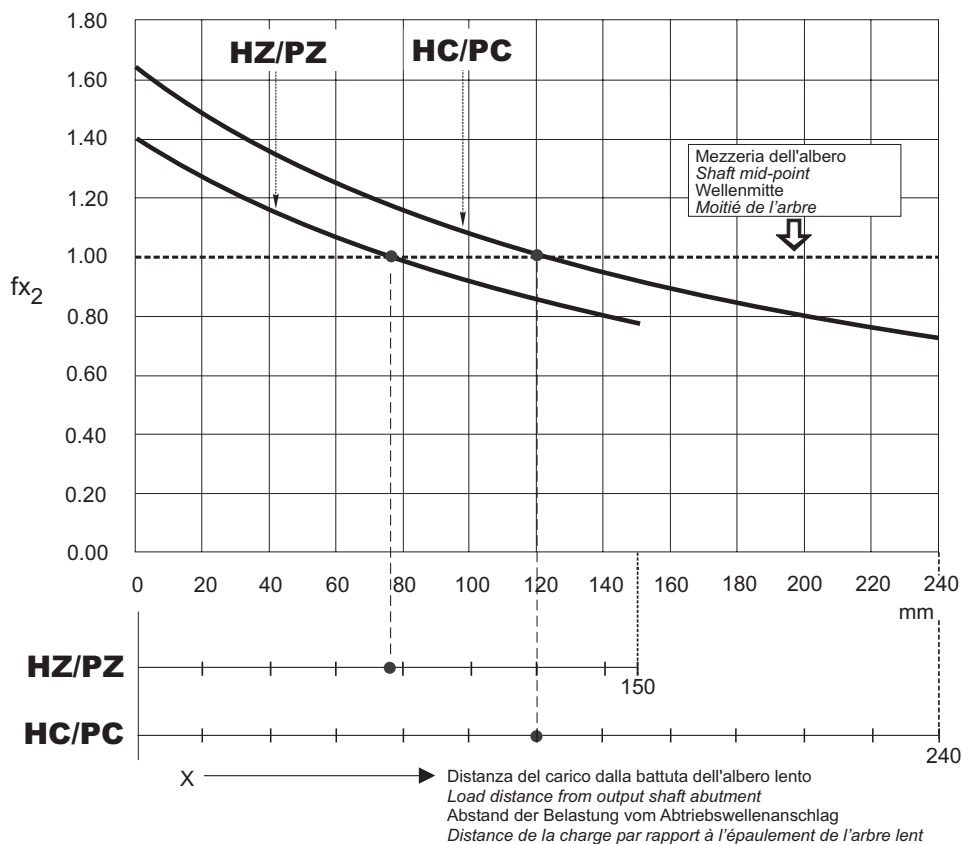


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

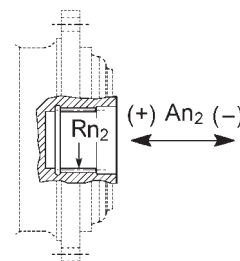
Facteur de position pour charges radiales sur les arbres en sortie.



$$R_{x2} = R_{n2} \cdot f_{x2}$$

$$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$$

	fa2 (+)	fa2 (-)
HZ/PZ	1.15	0.86
HC/PC	1.36	1.02



$$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$$

	fa2 (+)	fa2 (-)
FZ	1.00	1.00

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

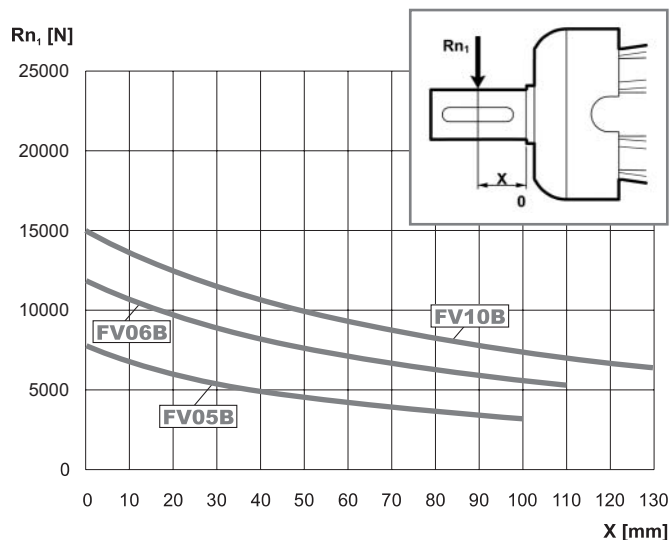
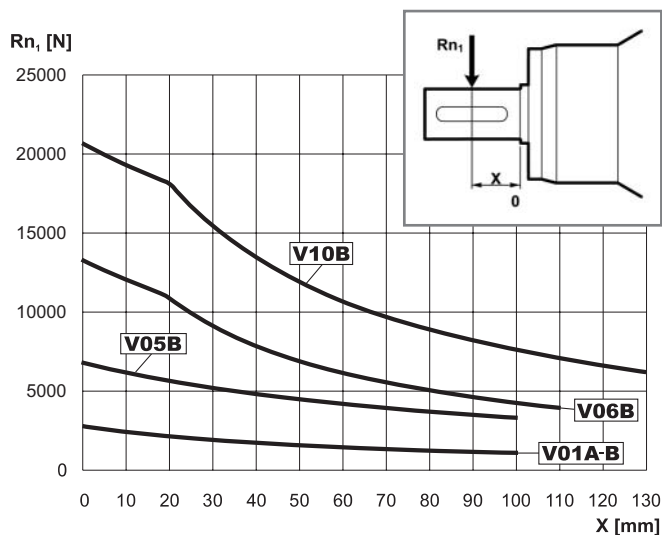
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

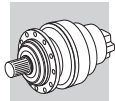
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

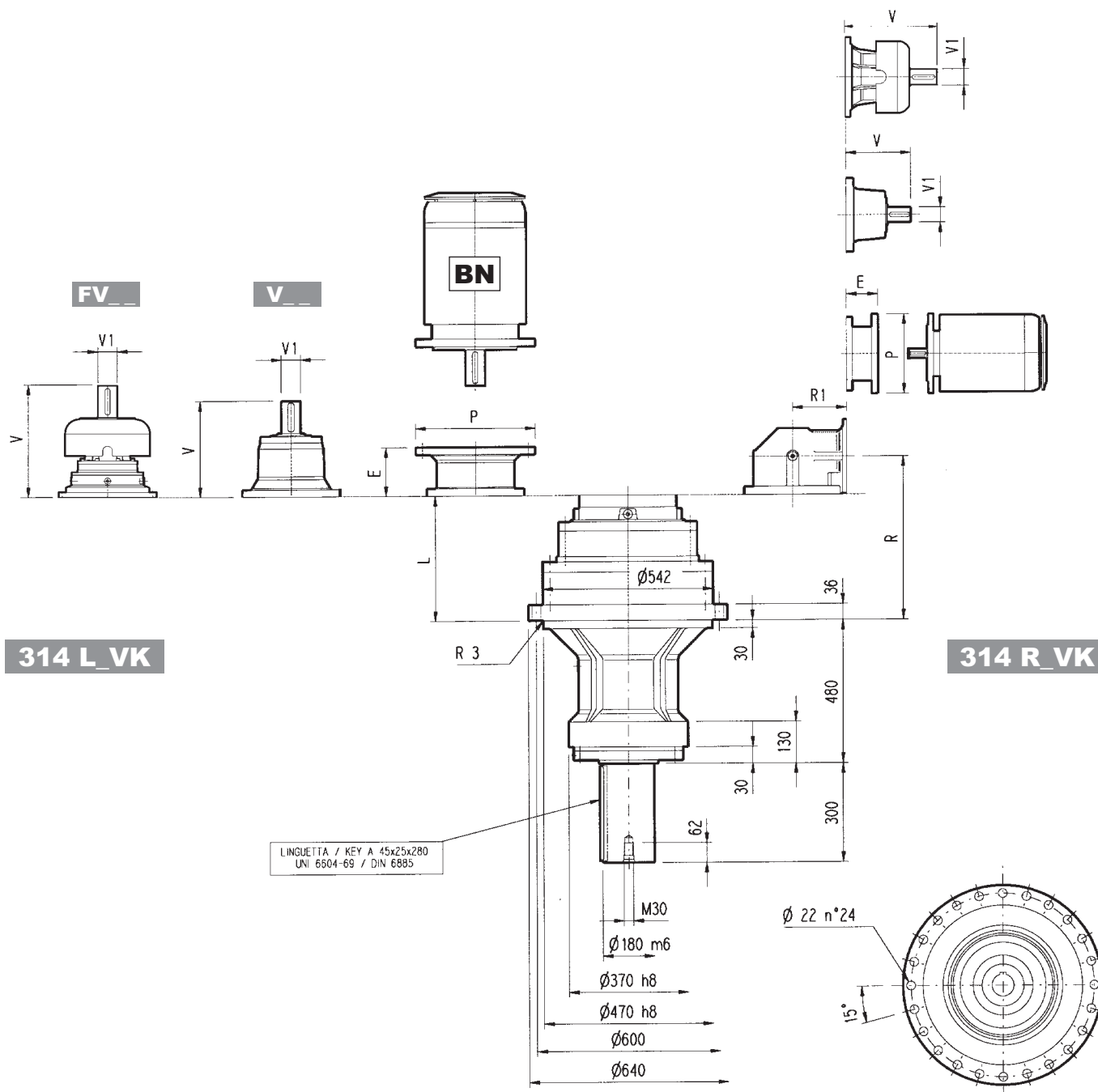
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





314_VK



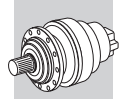
314 L_VK

314 R_VK

	L												P132		P160		P180		P200		P225		P250			
			V	V1		V	V1		V	V1		V	V1		E	P	E	P	E	P	E	P	E	P		
314 L2	386	650	348	80	55	-	-	-	457	80	63	-	-	-	-	-	-	-	271	400	301	450	281	550		
314 L3	519	700	315	80	35	313	60	28	357	60	28	-	-	-	-	-	153	350	153	350	183	400	213	450	193	550
314 L4	608	710	239	48	15	-	-	-	276	48	17	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-

	R	R1																					
				V	V1		V	V1		V	V1		V	V1		V	V1		V	V1			
314 R3 (B)	611	345	720	307	60	23	-	-	-	357	60	28	-	-	-	-	-	-	-	-	-		
314 R3 (C)	611	390	730	307	60	23	-	-	-	357	60	28	-	-	-	-	-	-	-	-	-		
314 R4	638	225	690	137.5	24	6	158	38	7	-	-	-	-	-	-	-	-	-	-	-	-		

	P71		P80		P90		P100		P112		P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P	E	P
314 R3 (B)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R3 (C)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
314 R4	65	160	84	200	84	200	94	250	94	250	114	300	144	350	-	-	-	-	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 314_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 314_VK, with radial force applying at a distance x from shaft shoulder.

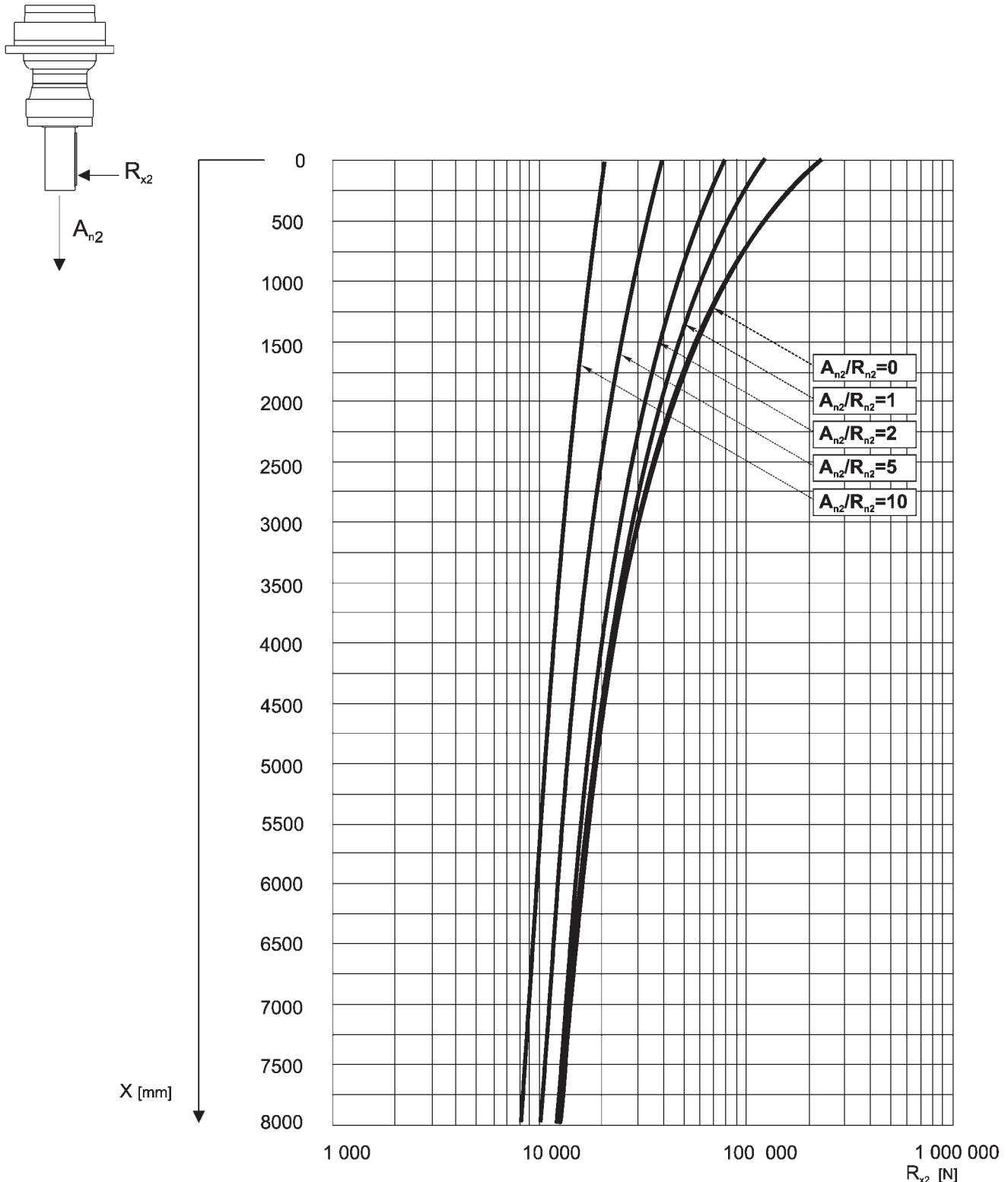
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

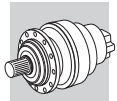
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 314_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

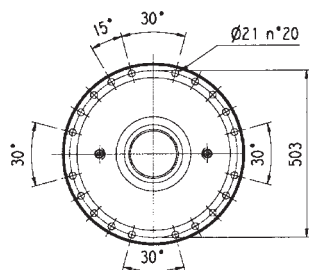
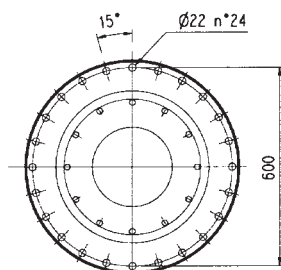
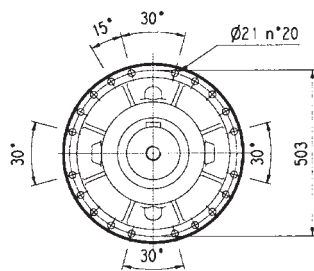
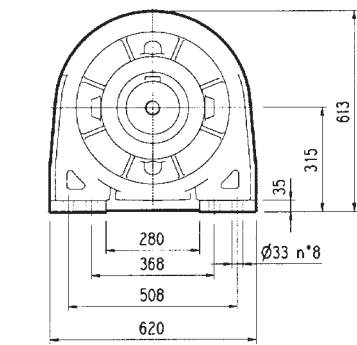
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 314_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

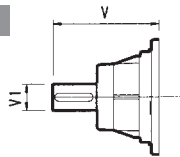




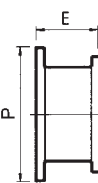
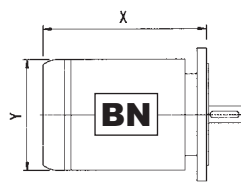
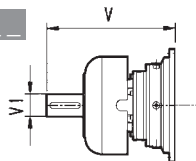
315 L



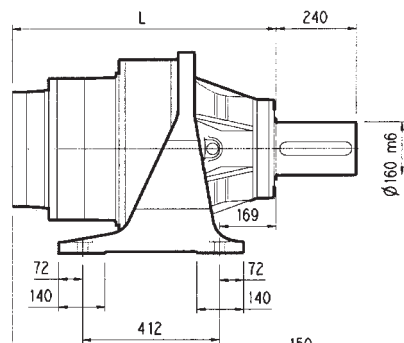
V



FV

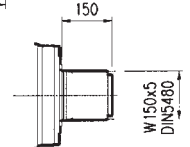


PC

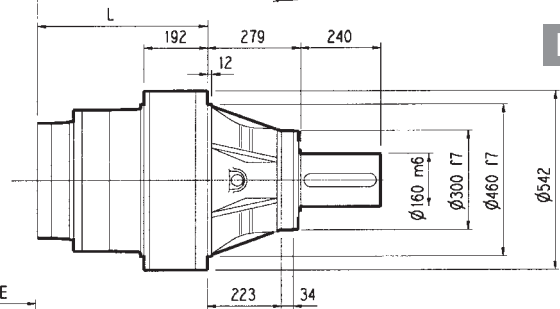


HZ

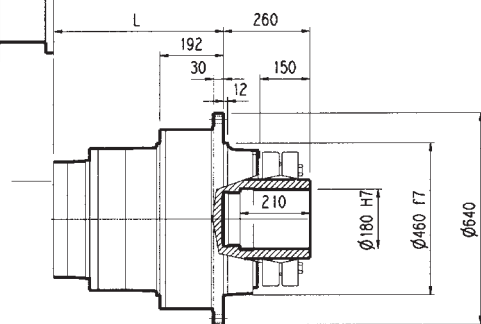
PZ



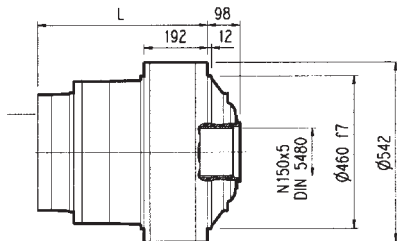
HC



FP



FZ

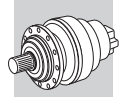


FP

M_{2max} = 126000 Nm

	L				Kg															
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
315 L2	665	386	386	386	585	455	365	415	348	80	55	-	-	-	456	80	85	-	-	-
315 L3	798	519	519	519	630	500	410	460	315	80	35	313	60	28	375	80	48	363	60	34
315 L4	887	608	608	608	642	512	422	472	239	48	15	-	-	-	276	48	17	-	-	-

	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
315 L3	-	-	-	-	195	350	186	400	216	450	215	550
315 L4	114	300	144	350	144	350	174	400	-	-	-	-



PC

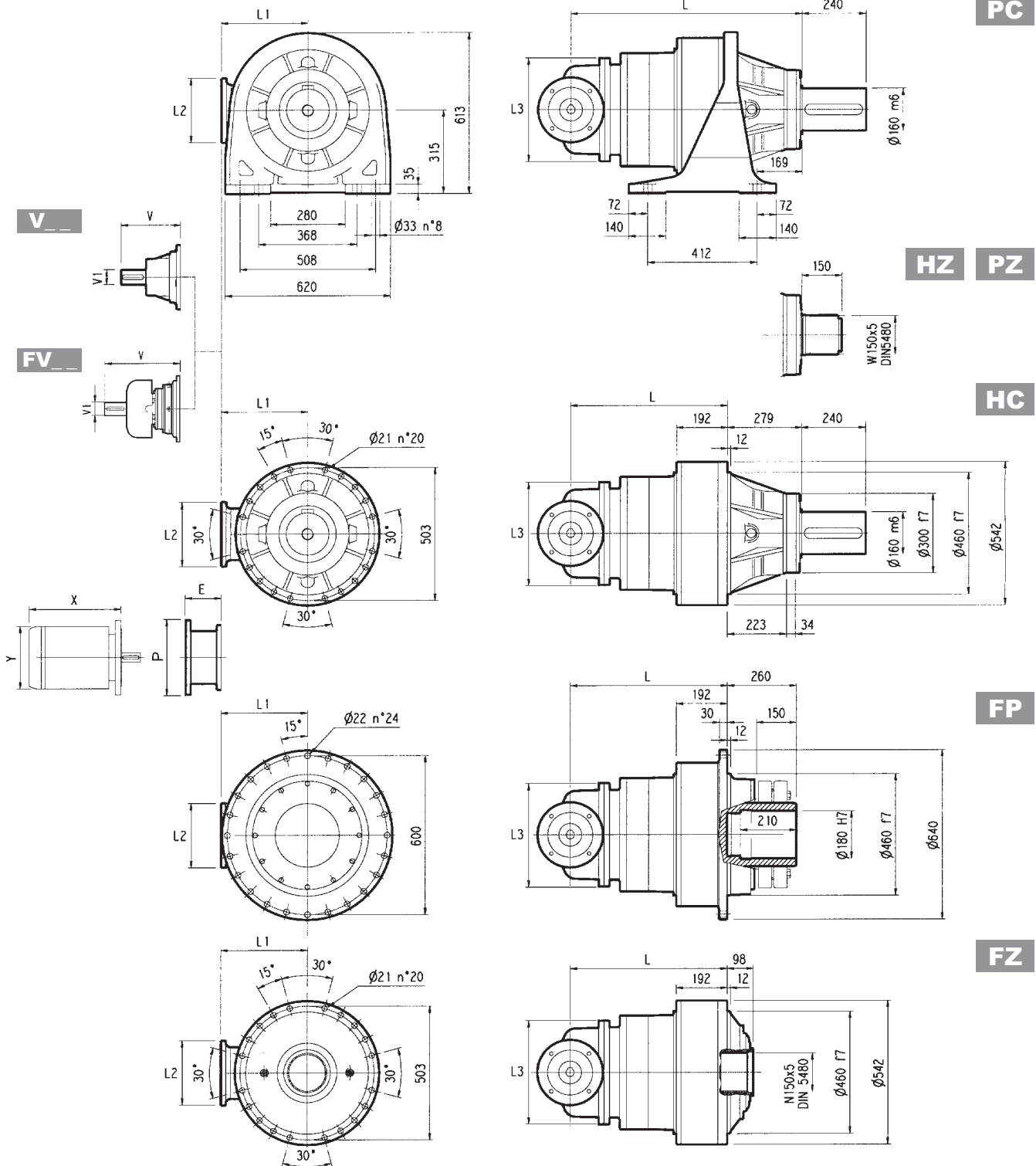
HZ

PZ

HC

FP

FZ

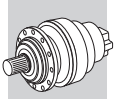


FP

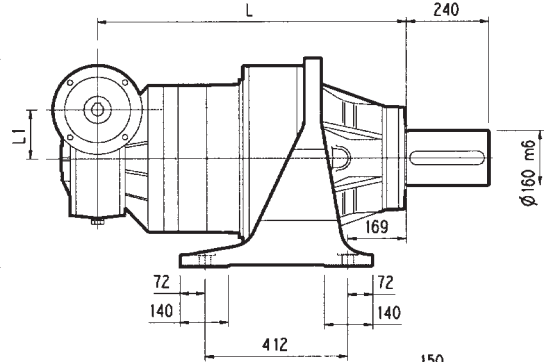
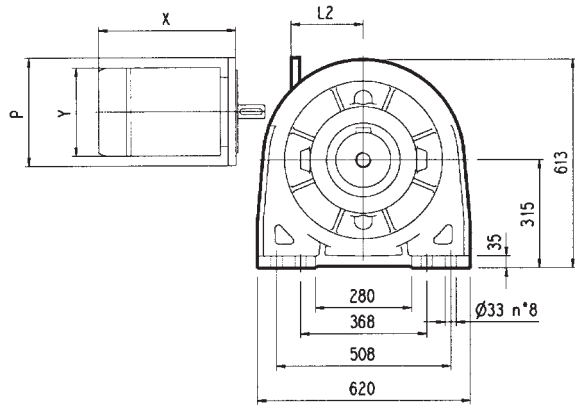
$M_{2max} = 126000 \text{ Nm}$

	L				L1	L2	L3																
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1		V	V1		V	V1		V	V1	
315 R3 (B)	890	611	611	611	345	292	400	720	590	500	550	307	60	23	-	-	-	357	60	28	-	-	-
315 R3 (C)	890	611	611	611	390	292	480	730	600	510	560	307	60	23	-	-	-	357	60	28	-	-	-
315 R4	917	638	638	638	225	245	345	680	550	460	510	239	48	15	-	-	-	276	48	17	-	-	-

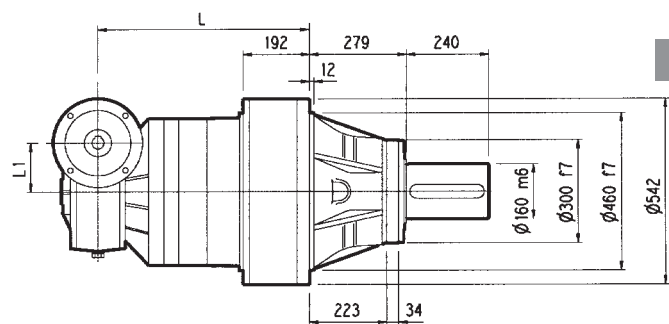
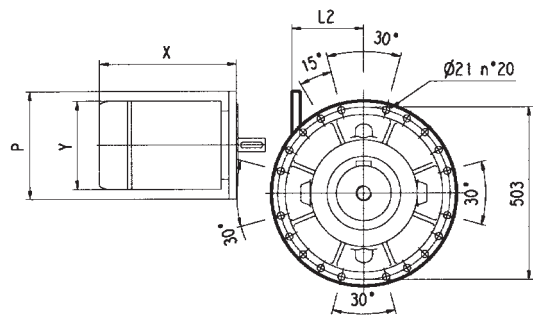
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
315 R3 (B)	-	-	-	-	152	350	182	400	212	450	193	550
315 R3 (C)	-	-	-	-	152	350	182	400	212	450	193	550
315 R4	114	300	144	350	144	350	174	400	-	-	-	-



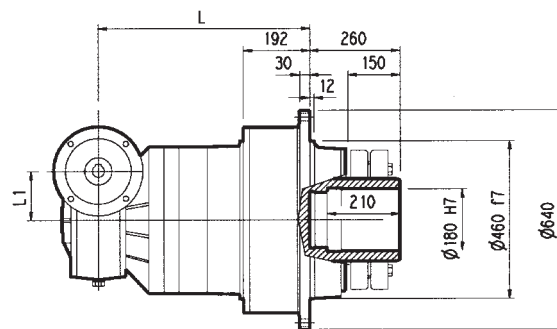
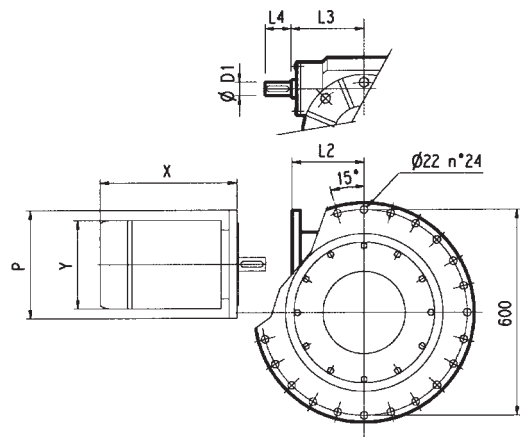
3/V 15 L3



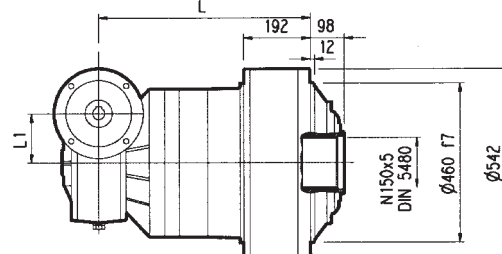
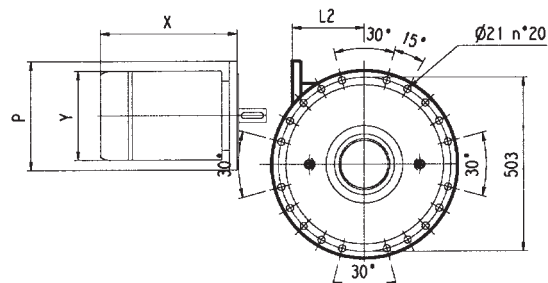
PC



HC



FP

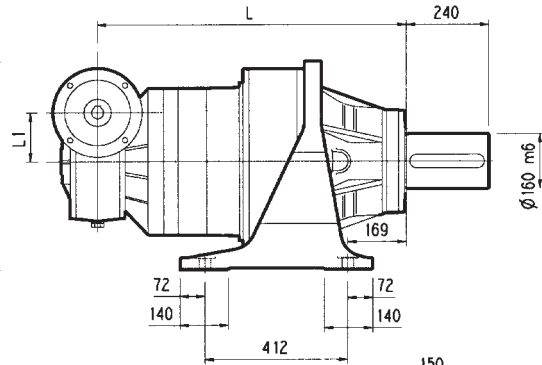
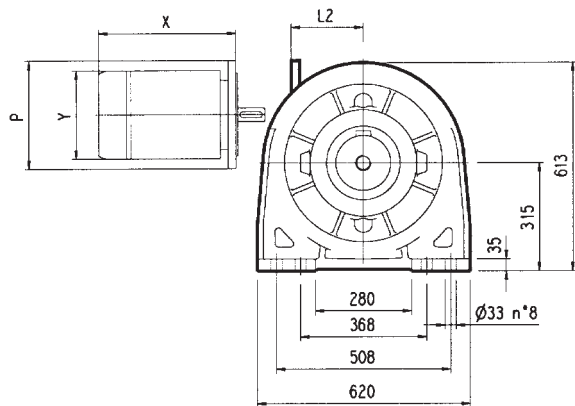
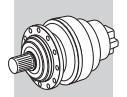


FZ

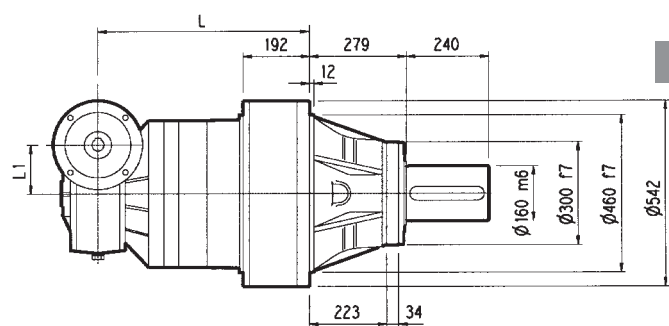
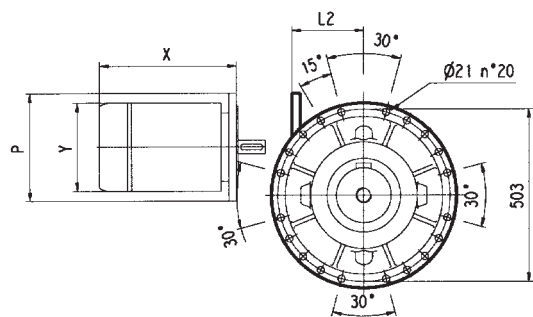
FP

$M_{2max} = 126000 \text{ Nm}$

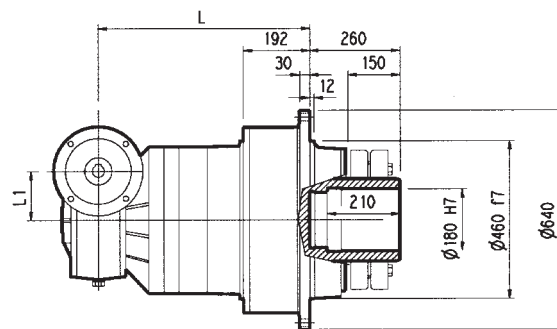
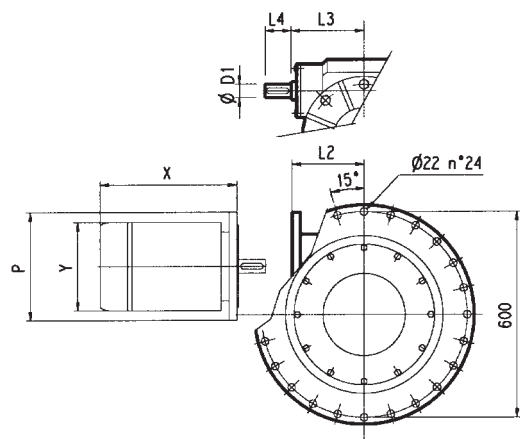
	L				L1	L2	D1	L3	L4					
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 15 L3	885	606	606	606	210	-	48	230	110		800	670	575	625
	P100 P	P112 P	P132		P160		P180		P200		P225			
			L2	P	L2	P	L2	P	L2	P	L2	P		
3/V 15 L3	-	-	485	300	460	350	460	350	485	400	490	450		



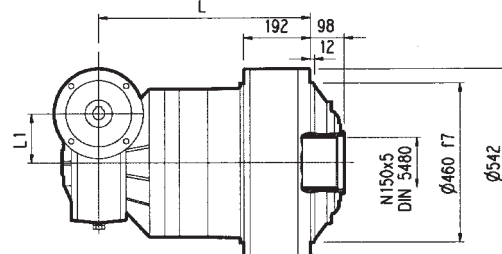
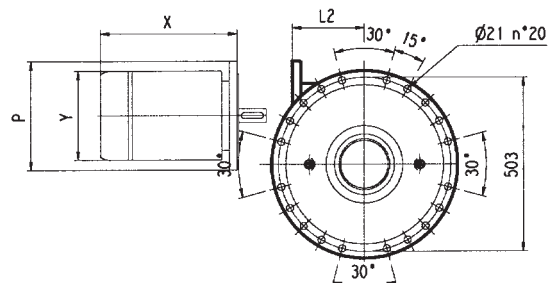
PC



HC



FP



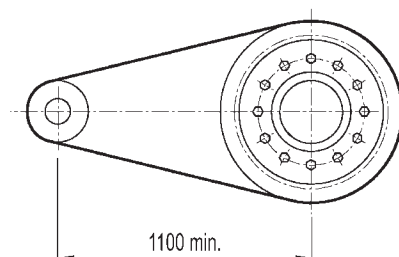
FZ

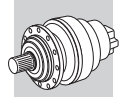
FP

$M_{2max} = 126000 \text{ Nm}$

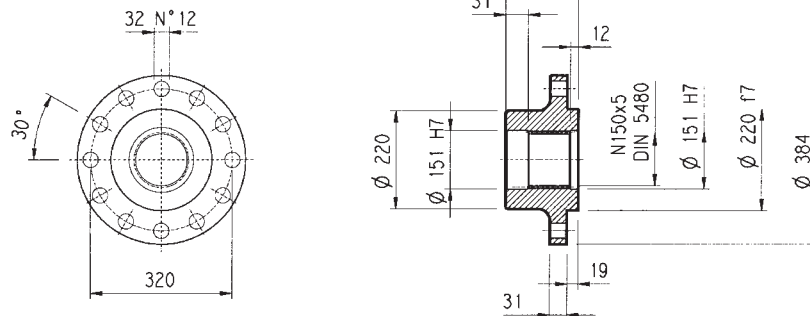
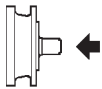
	L				L1	L2	D1	L3	L4		Kg			
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 15 L4	989	710	710	710	150	190	35	185	65		690	560	470	520

	P100	P112	P132		P160		P180		P200		P225	
	P	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 15 L4	250	250	-	300	-	350	-	-	-	-	-	-


$$M_{2\max} = 126000 \text{ Nm}$$

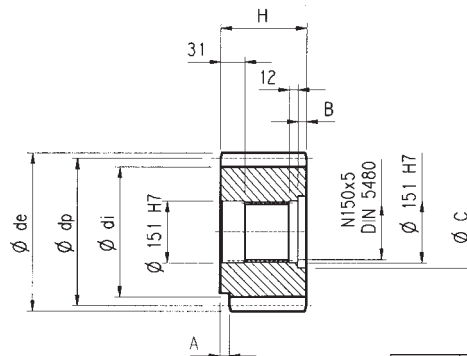
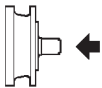
315 L**315 R****3/V 15 L3****3/V 15 L4**

Flangia / Flange
Flansch / Brides

W0A

Materiale : Acciaio C40
Material : Steel C40
Material : Stahl C40
Màterial : Acier C40

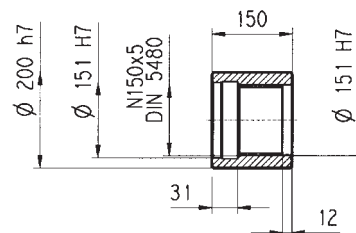
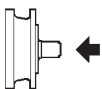
Pignoni / Pinion gears
Ritzel / Pignons

P...

	m	z	x	dp	di	de	H	A	B	C	☆
PRG1	18	16	0.500	288	261	342	160	0	10	166	■
PRG2	18	16	0.617	288	271	339	150	30	0	0	□

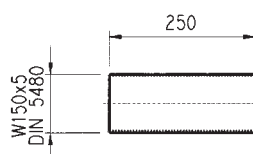
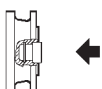
☆	Materiale / Material / Material / Matière
□	Acciaio 39NiCrMo3 Bonificato Steel 39NiCrMo3 hardened and tempered Vergüteter Stahl 39NiCrMo3 Acier bonifiée 39NiCrMo3
■	Acciaio 18NiCrMo5 Cementato e temprato Steel 18NiCrMo5 Case hardened Einsatzstahl 18NiCrMo5 Einsatzgehärtet Acier cémenté et trempé 18NiCrMo5

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

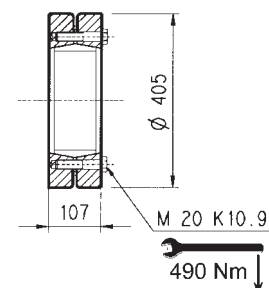
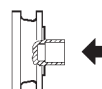
Materiale : Acciaio 16CrNi4
Material : Steel 16CrNi4
Material : Stahl 16CrNi4
Màterial : Acier 16CrNi4

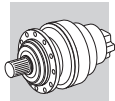
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

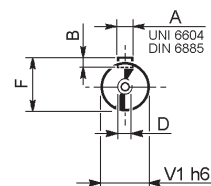
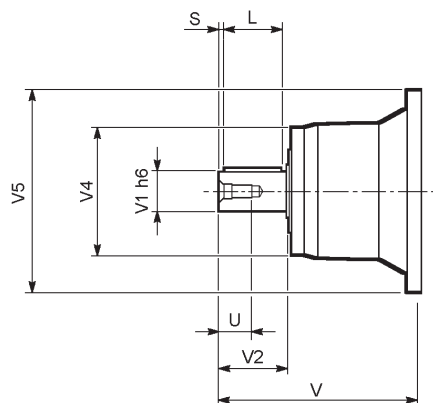
G0A



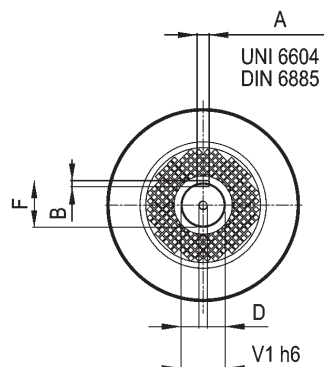
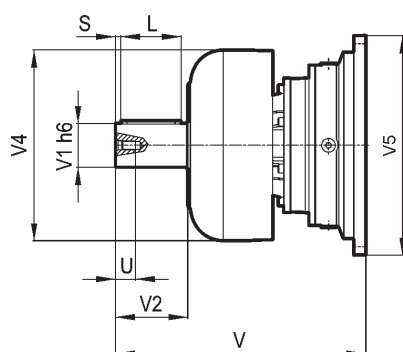
315 L

315 R

V



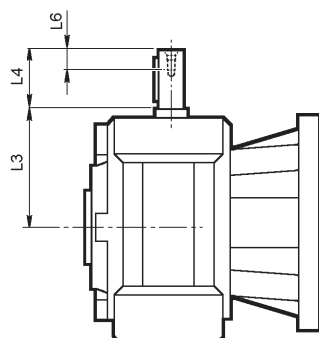
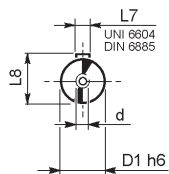
FV



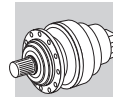
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
315 L2	V11B	348	80	130	200	418	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
315 L3	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
315 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
315 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
315 R4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36

3/V 15 L3

3/V 15 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 15 L3 HS	48	230	110	40	14	51.5	M16
3/V 15 L4 HS	35	185	65	20	10	38	M8

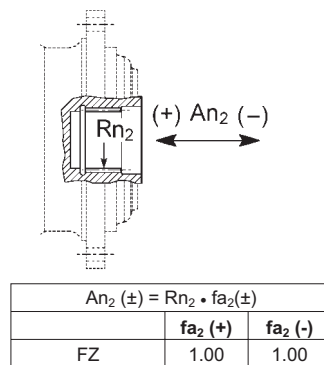
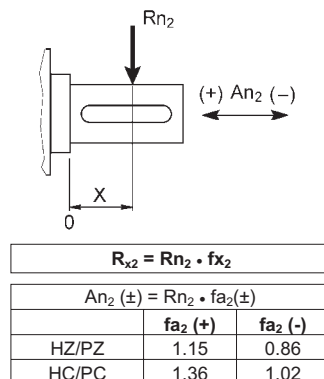
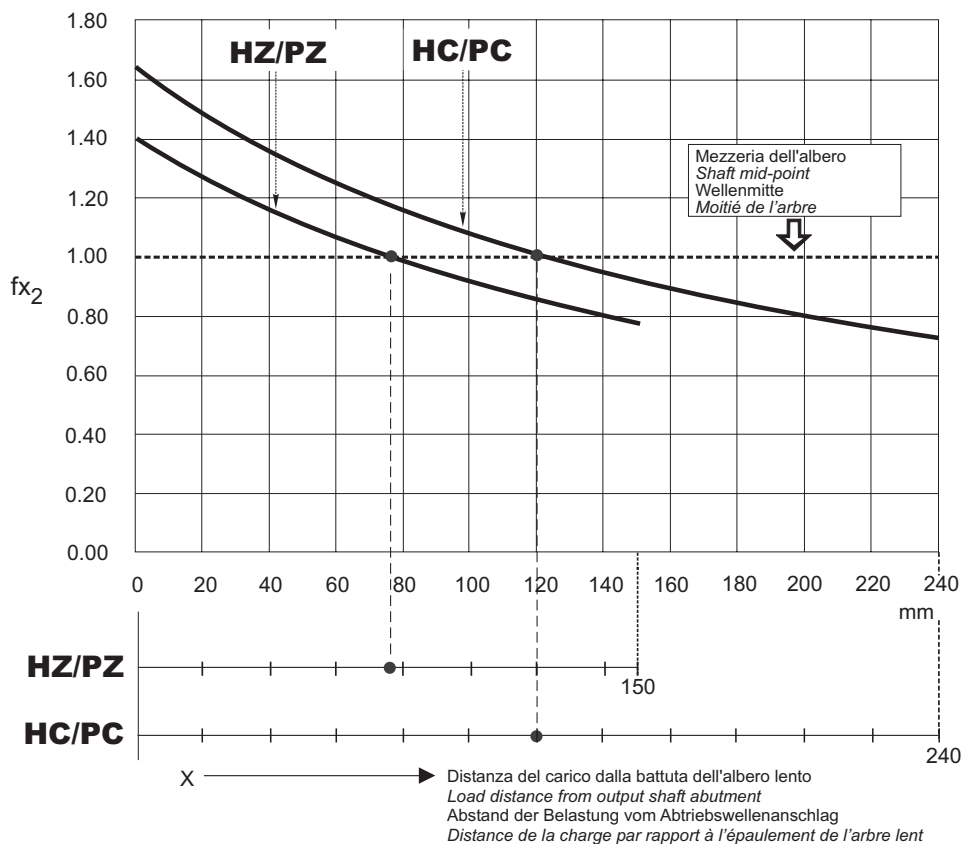


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

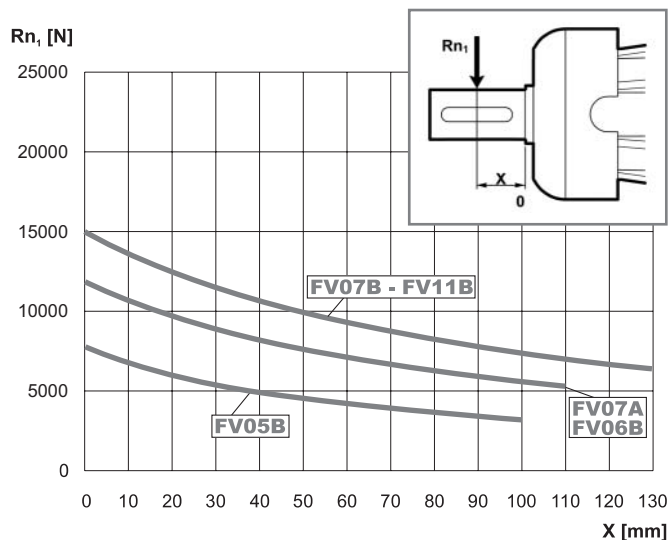
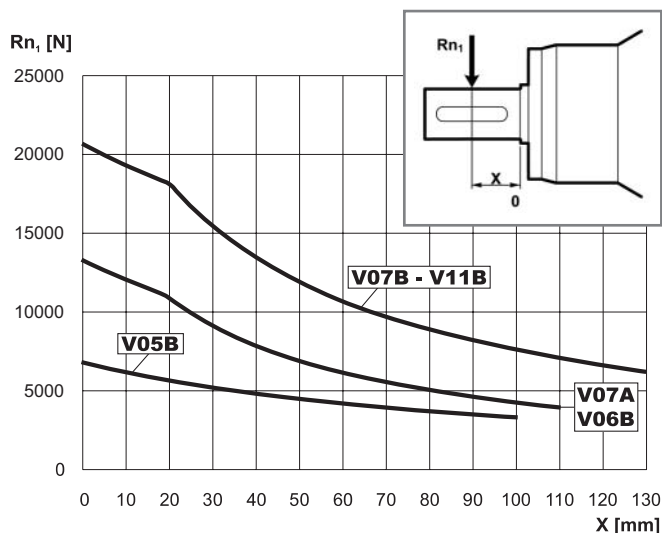
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

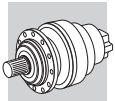
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

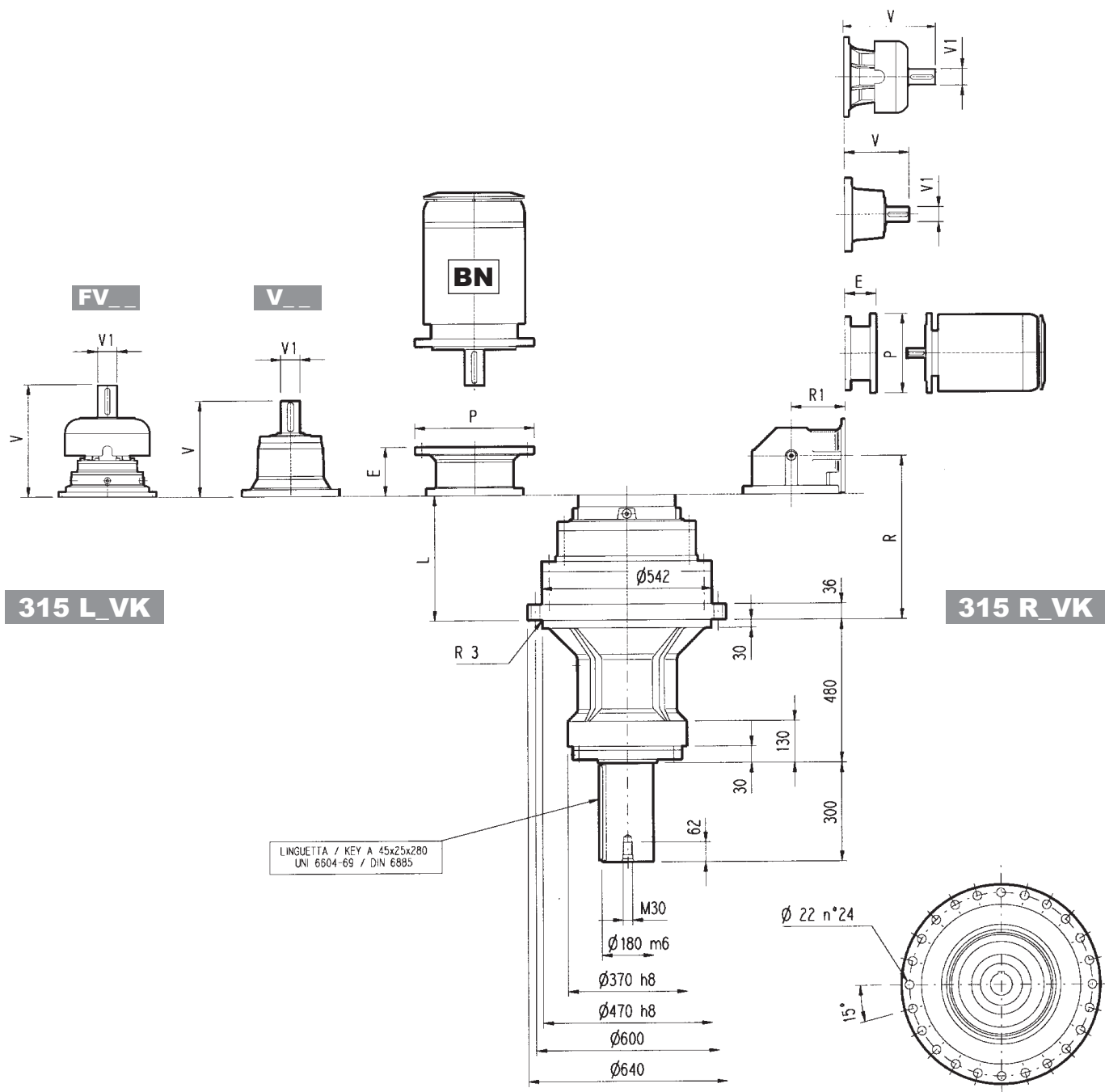
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.



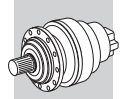


315_VK



	L																P132		P160		P180		P200		P225		P250	
	V	V1		V	V1		V	V1		V	V1		V	V1		E	P	E	P	E	P	E	P	E	P	E	P	
315 L2	386	650	348	80	55	-	-	-	-	456	80	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
315 L3	519	700	315	80	35	313	60	28	375	80	48	363	60	34	-	-	-	-	195	350	186	400	216	450	215	550		
315 L4	608	710	239	48	15	-	-	-	276	48	17	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-		

	R	R1														P132		P160		P180		P200		P225		P250	
	V	V1		V	V1		V	V1		V	V1		V	V1		E	P	E	P	E	P	E	P	E	P	E	P
315 R3 (B)	611	345	720	307	60	23	-	-	-	357	60	28	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
315 R3 (C)	611	390	730	307	60	23	-	-	-	357	60	28	-	-	-	-	-	-	-	152	350	182	400	212	450	193	550
315 R4	638	225	690	239	48	15	-	-	-	276	48	17	-	-	-	114	300	144	350	144	350	174	400	-	-	-	-



Il diagramma seguente consente di ricavare il carico radiale ammissibile R_{x2} quando questo è applicato alla distanza x dallo spallamento dell'albero lento del riduttore 315_VK.

Le curve si riferiscono al valore risultante dal rapporto fra il carico assiale A_{n2} e il carico radiale R_{n2} , entrambi riferiti a $n_2 = 10 \text{ min}^{-1}$ e durata teorica di 10000 h.

The diagram below allows the calculation of permitted overhung load R_{x2} on the output shaft of gearbox type 315_VK, with radial force applying at a distance x from shaft shoulder.

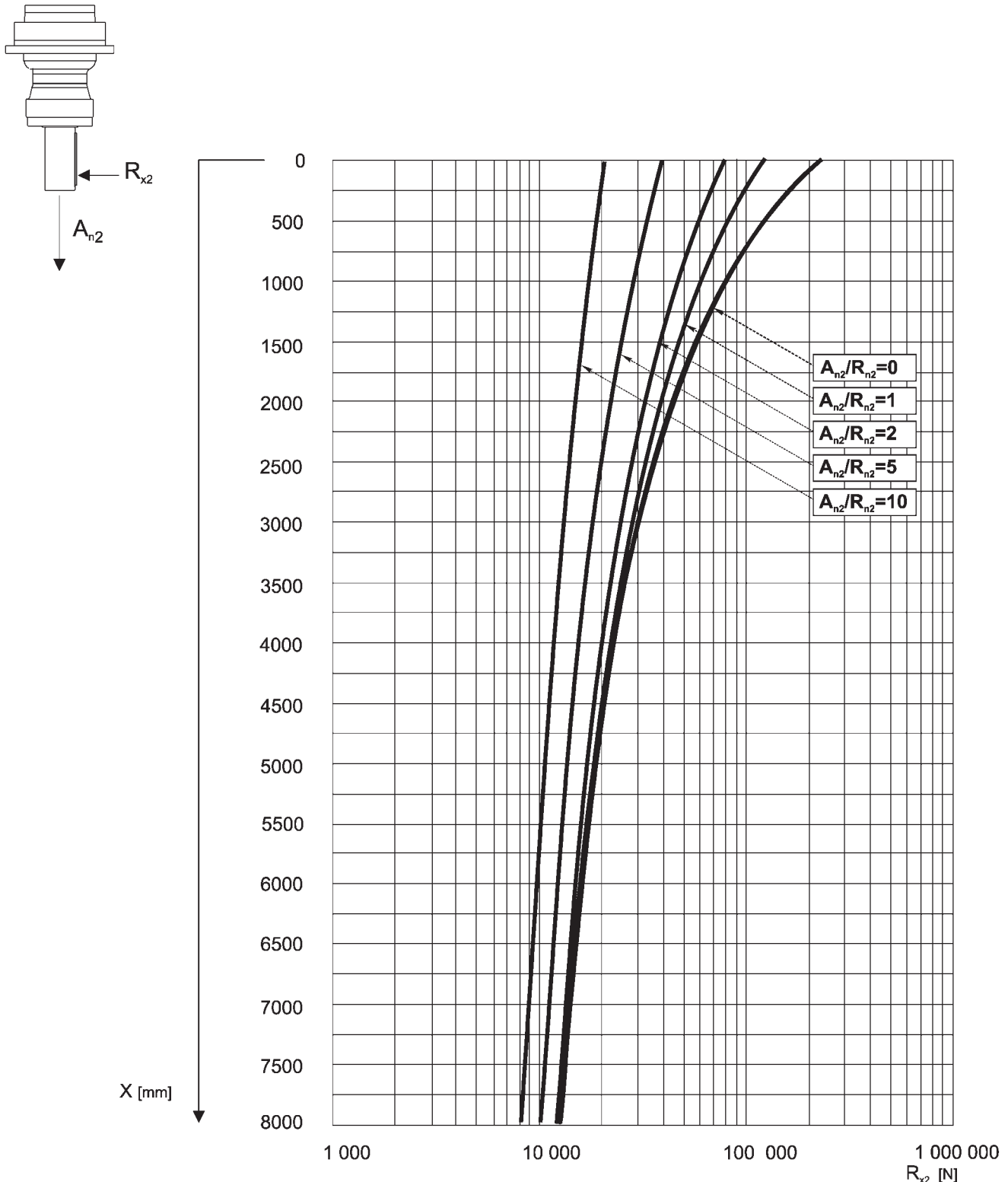
The curves are relevant to value resulting from the relationship of trust load A_{n2} to radial load R_{n2} , based on $n_2 = 10 \text{ min}^{-1}$ and 10000 hrs theoretical lifetime.

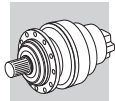
Das nachstehende Diagramm ermöglicht das Individuieren der zulässigen, auf die Welle des Getriebes 315_VK einwirkenden Radialkraft, die auf der Distanz x vom Anschlag der Welle selbst appliziert wird.

Die Kurven beziehen sich auf den Wert, der sich aus dem Verhältnis zwischen der Axialkraft A_{n2} und der Radialkraft R_{n2} für $n_2 = 10 \text{ min}^{-1}$ und einer Dauer von 10000 Std. ergibt.

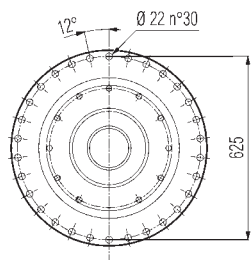
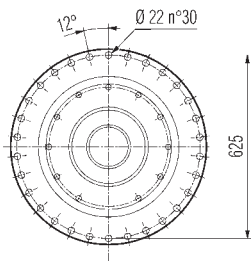
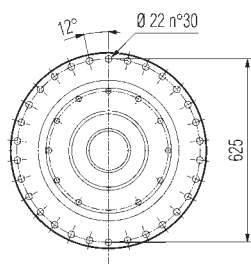
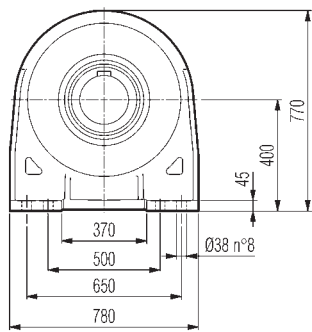
Le diagramme suivant permet de déterminer la charge radiale admissible R_{x2} sur l'arbre lent du réducteur 315_VK appliqué à la distance x de l'épaule de l'arbre.

Les courbes se réfèrent à la valeur résultant de l'équation entre la charge axiale A_{n2} et la charge radiale R_{n2} pour $n_2 = 10 \text{ min}^{-1}$ et durée de 10000 h.

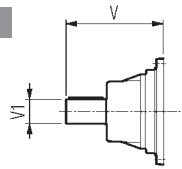




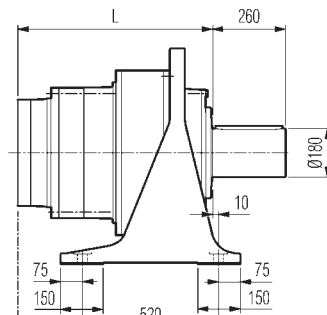
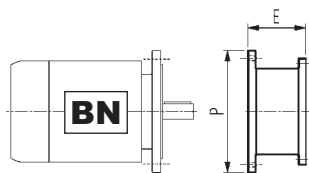
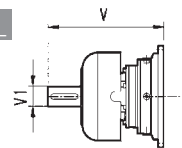
316 L



V



FV

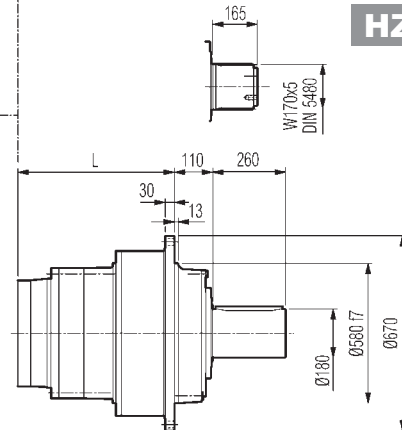


PC

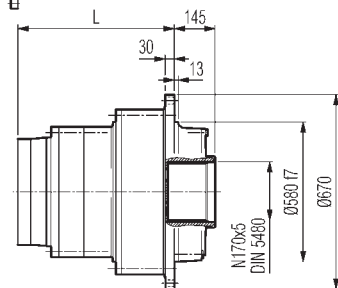
HZ

PZ

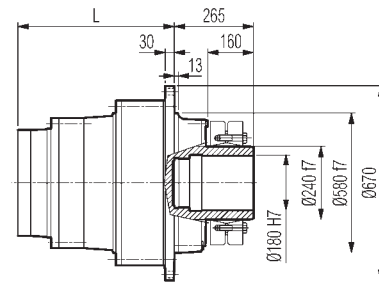
HC



FZ



FP

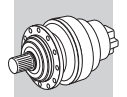


FP

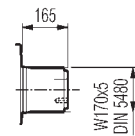
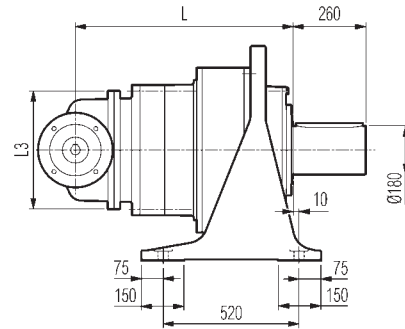
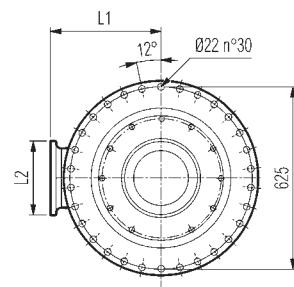
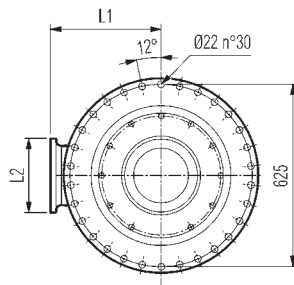
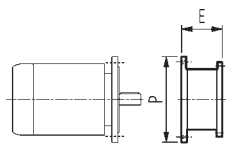
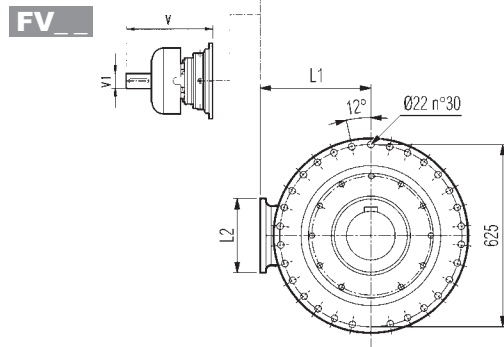
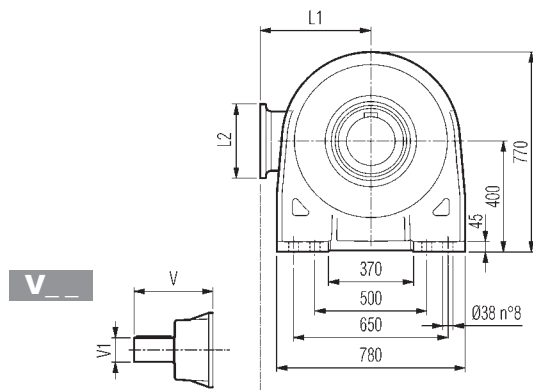
M_{2max} = 162000 Nm

	L				Kg															
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
316 L2	541	431	431	431	790	590	520	540	348	80	55	-	-	-	456	80	85	-	-	-
316 L3	674	564	564	564	840	640	570	590	315	80	35	313	60	28	375	80	48	363	60	34
316 L4	763	653	653	653	860	660	590	610	239	48	15	-	-	-	276	48	17	-	-	-

	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
316 L3	-	-	-	-	195	350	186	400	216	450	215	550
316 L4	114	300	144	350	144	350	174	400	-	-	-	-

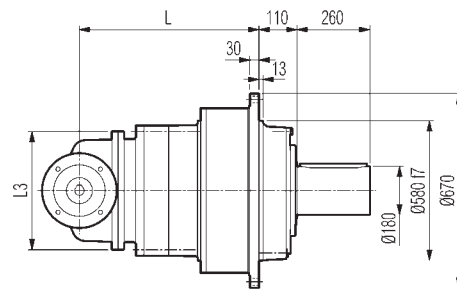


PC

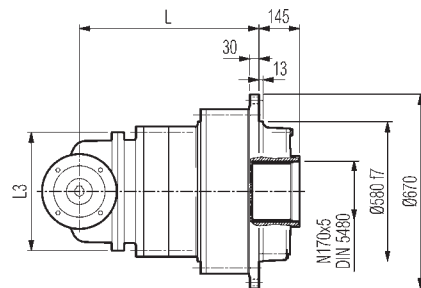


HZ

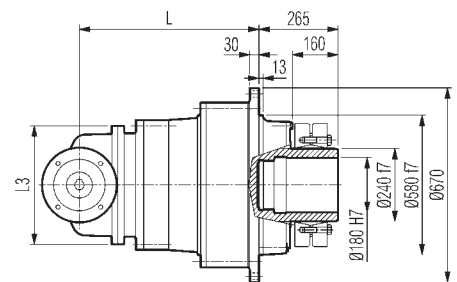
PZ



HC



FZ



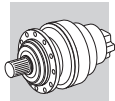
FP

FP

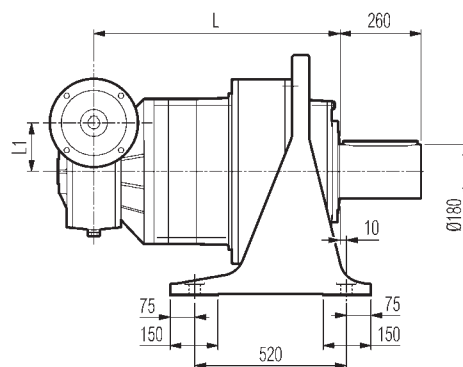
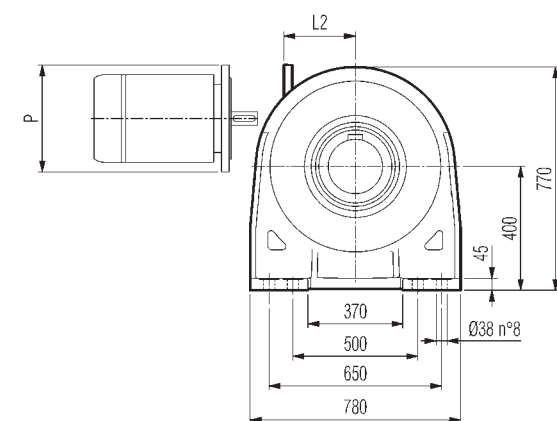
$M_{2max} = 162000 \text{ Nm}$

	L				L1	L2	L3	Kg				Kg				Kg				Kg			
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
316 R3 (B)	766	656	656	656	345	292	400	910	710	640	660	307	60	23	-	-	-	357	60	28	-	-	-
316 R3 (C)	766	656	656	656	390	292	480	920	720	650	670	307	60	23	-	-	-	357	60	28	-	-	-
316 R4	793	683	683	683	225	245	345	890	690	620	640	239	48	15	-	-	-	276	48	17	-	-	-

	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
316 R3 (B)	-	-	-	-	152	350	182	400	212	450	193	550
316 R3 (C)	-	-	-	-	152	350	182	400	212	450	193	550
316 R4	114	300	144	350	144	350	174	400	-	-	-	-



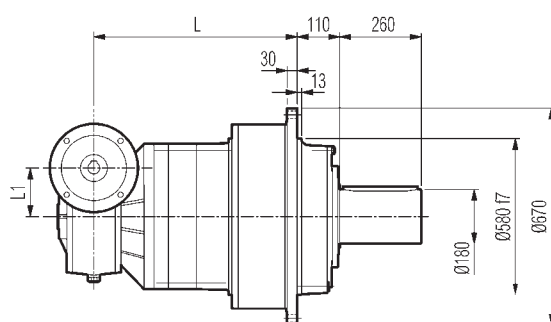
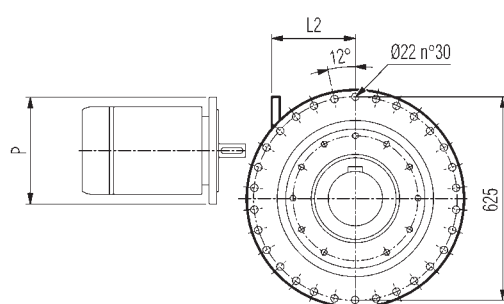
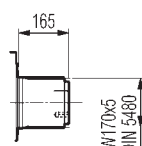
3/V 16 L3



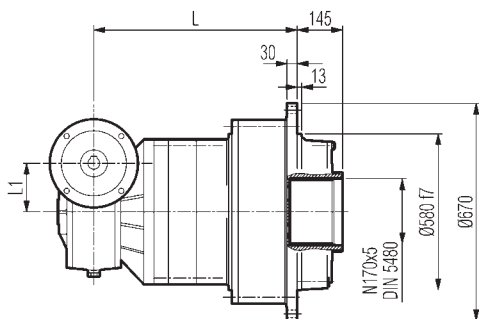
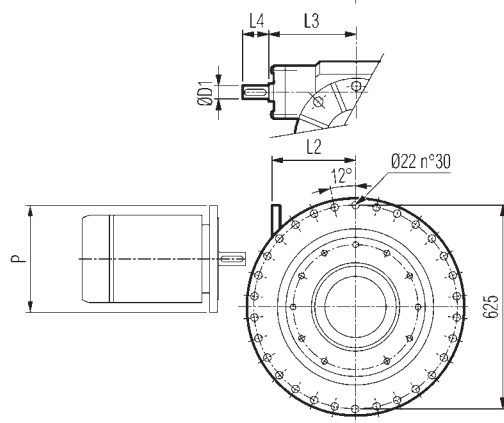
PC

HZ

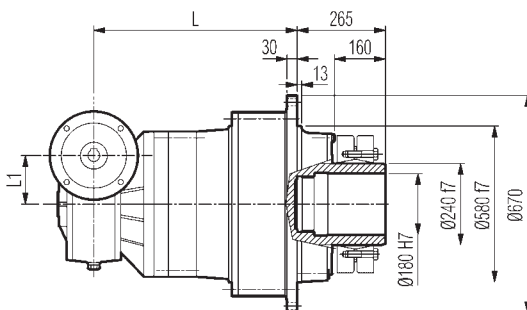
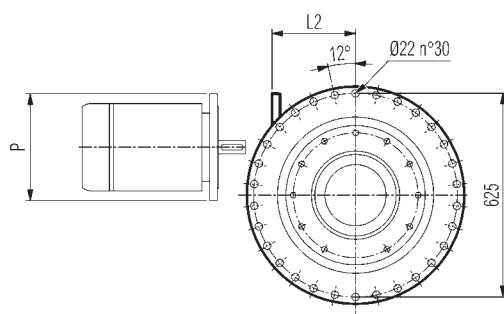
PZ



HC



FZ

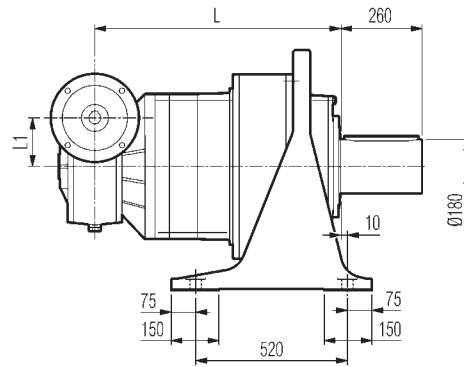
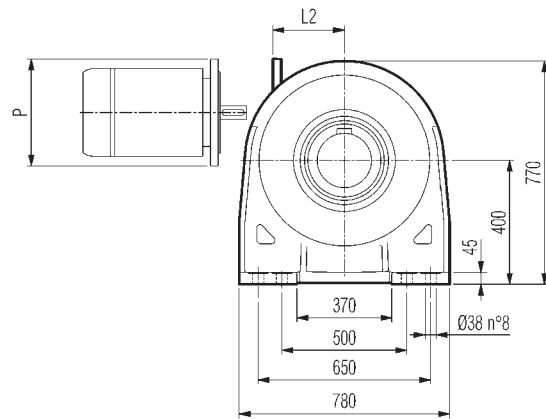
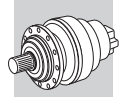


FP

FP

$M_{2max} = 162000 \text{ Nm}$

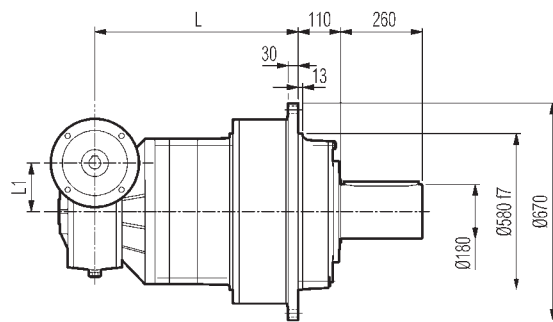
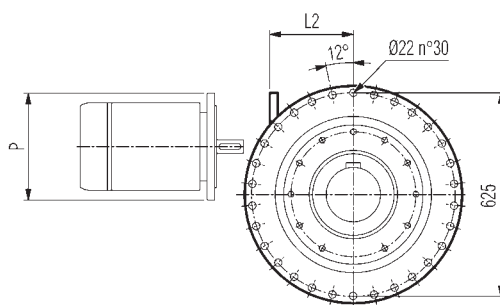
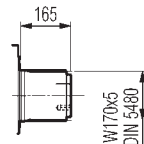
	L				L1	D1	L3	L4	Kg			
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 16 L3	812	702	702	702	250	55	274	110	1100	900	830	850
	P132		P160		P180		P200		P225			
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 16 L3	531	300	506	350	506	350	531	400	536	450		



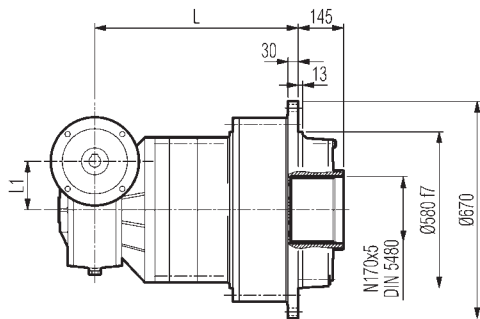
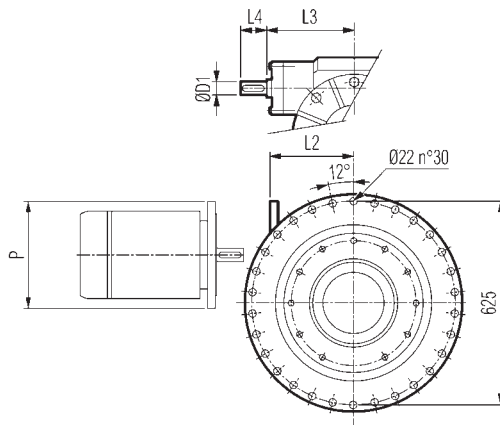
PC

HZ

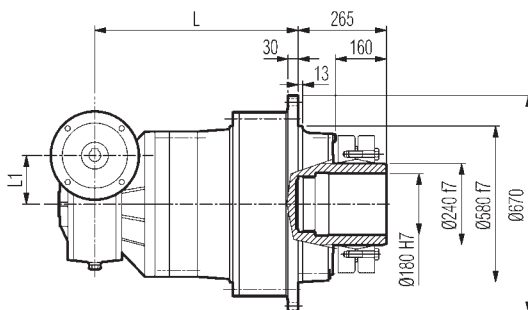
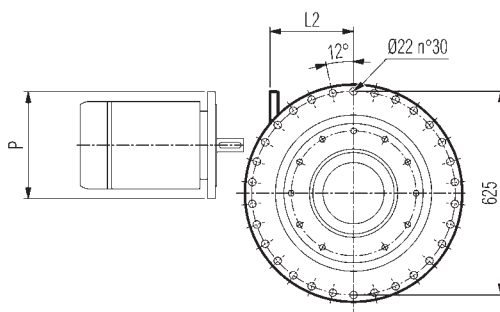
PZ



HC



FZ

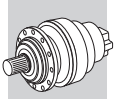


FP

FP

$M_{2max} = 162000 \text{ Nm}$

	L				L1	D1	L3	L4		Kg		
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ
3/V 16 L4	865	755	755	755	150	35	185	65	900	700	630	650
	P100		P112		P132		P160					
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 16 L4	190	250	190	250	190	300	190	350				



316 L

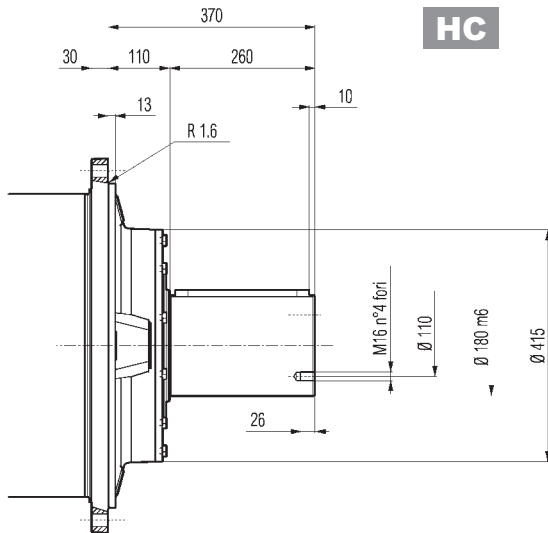
316 R

3/V 16 L3

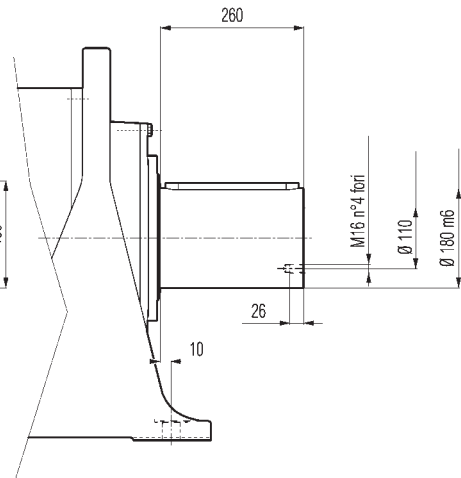
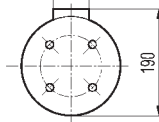
3/V 16 L4

HC

PC

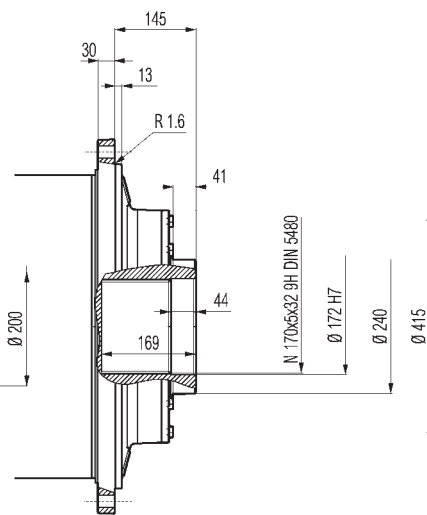
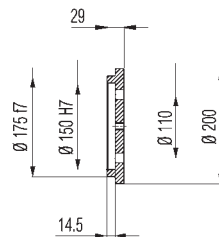
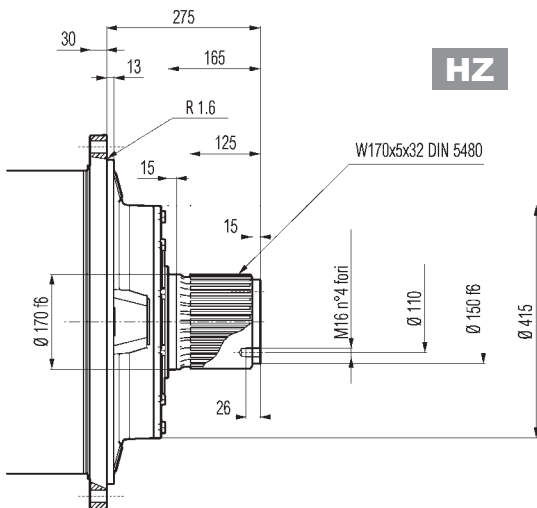


A45x25x240
UNI 6604
DIN 6885

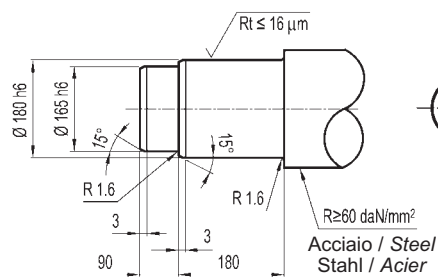
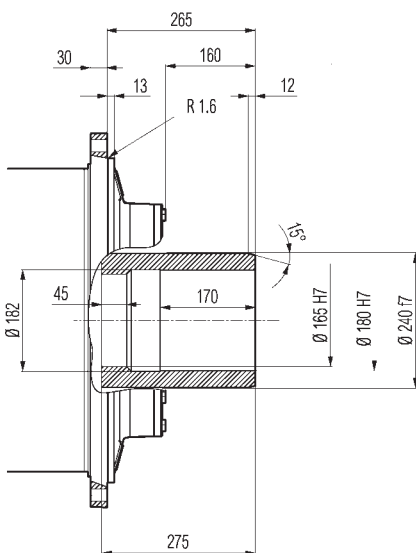


HZ

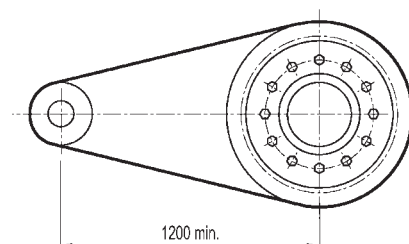
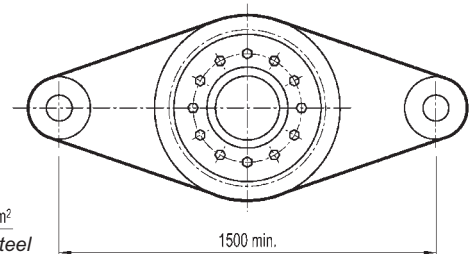
FZ



FP

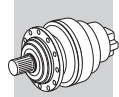


Acciaio / Steel
Stahl / Acier

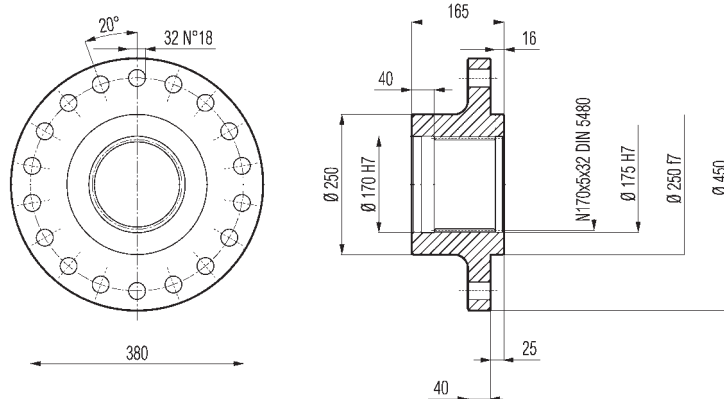
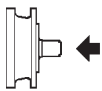


FP

M_{2max} = 162000 Nm

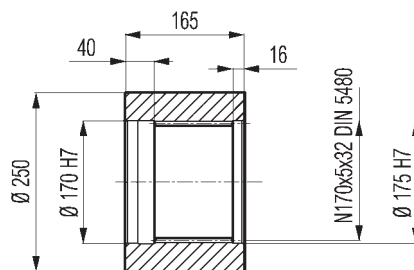
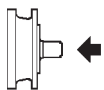
316 L**316 R****3/V 16 L3****3/V 16 L4**

Flangia / Flange
Flansch / Brides

W0A

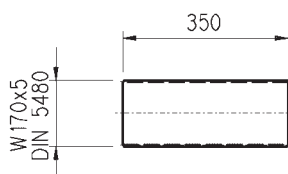
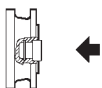
Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a canneleure interieure

MOA

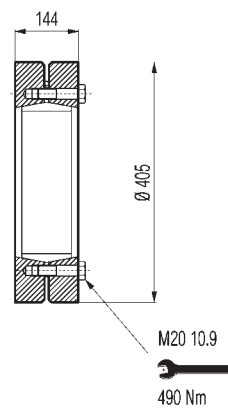
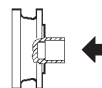
Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

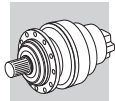
Barre scanalate / Splined bars
Vielkeilwellen / Barre cannelée

B0A

Mat. acciaio 18NiCrMo5 UNI 5331 da cementare e temprare 50-55 HRC
 Case hardening steel 18NiCrMo5 UNI 5331 must be case hardened to 50-55 HRC
 Material: Einsatzstahl 18NiCrMo5 UNI 5331 muss einsatzgehärtet werden 50-55 HRC
 Acier 18 NiCrMo5 UNI 5331 doit être cémenté trempé 50-55 HRC

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

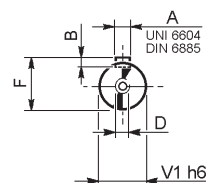
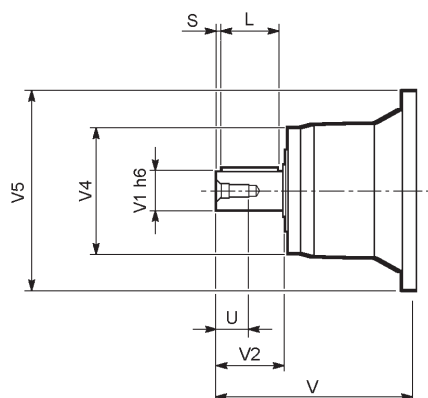
G0A



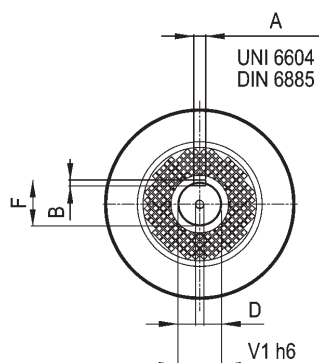
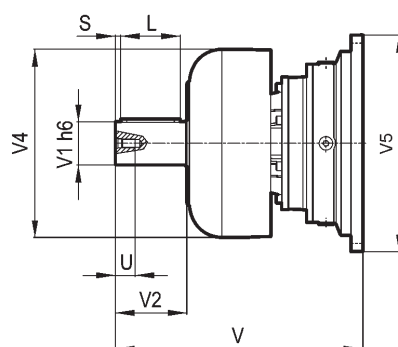
316 L

316 R

V _ _



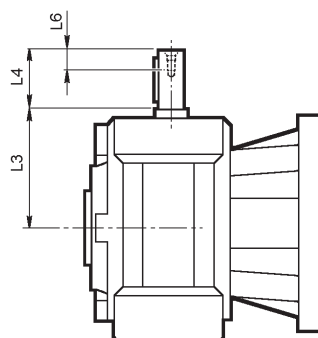
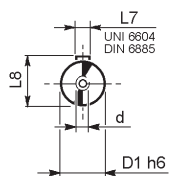
FV _ _



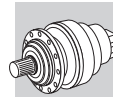
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
316 L2	V11B	348	80	130	200	418	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
316 L3	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
316 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
316 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
316 R4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36

3/V 16 L3

3/V 16 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 16 L3 HS	55	274	110	40	16	59	M16
3/V 16 L4 HS	35	185	65	20	10	38	M8

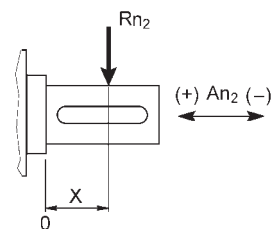
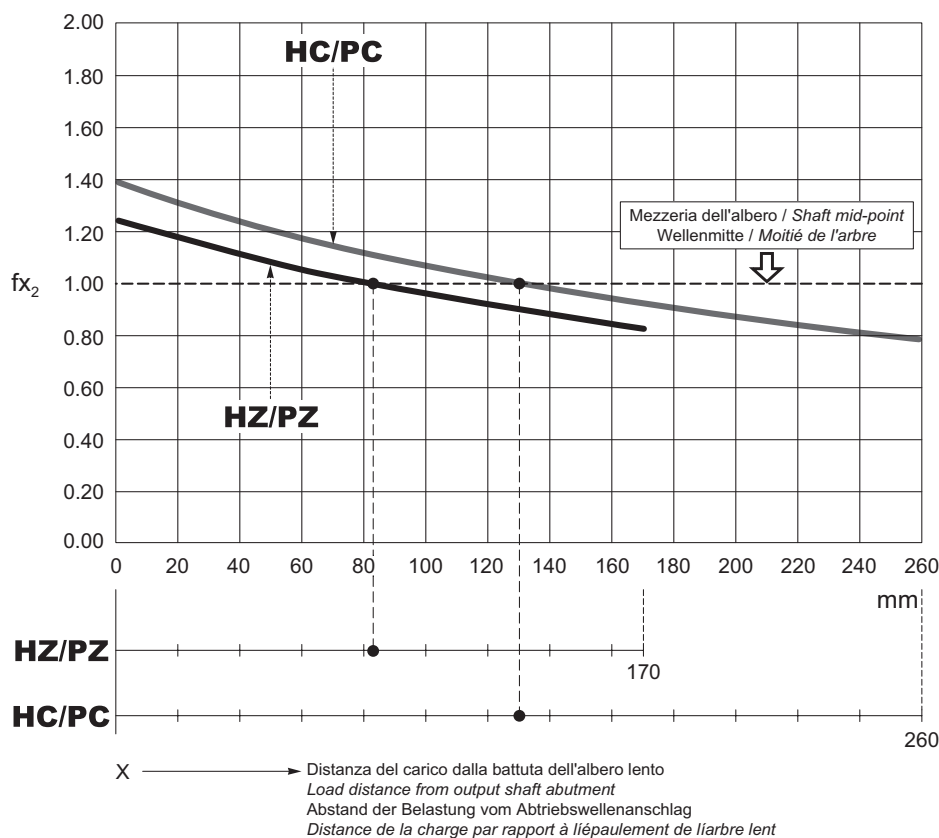


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

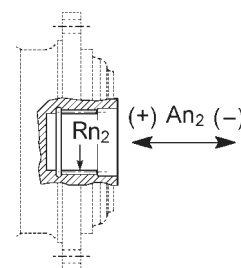
Facteur de position pour charges radiales sur les arbres en sortie.



$$R_{x2} = R_{n2} \cdot f_{x2}$$

$$A_{n2} (\pm) = R_{n2} \cdot f_{a2} (\pm)$$

	$f_{a2} (+)$	$f_{a2} (-)$
HZ/PZ	0.81	0.76
HC/PC	0.73	0.69



$$A_{n2} (\pm) = R_{n2} \cdot f_{a2} (\pm)$$

	$f_{a2} (+)$	$f_{a2} (-)$
FZ	0.92	0.92

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

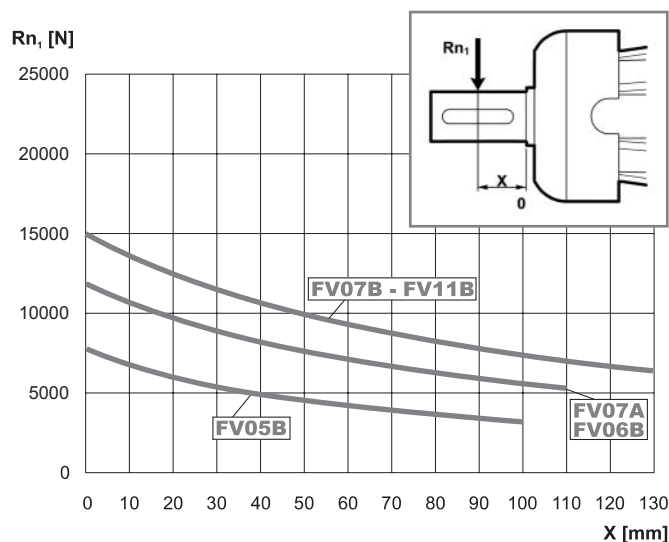
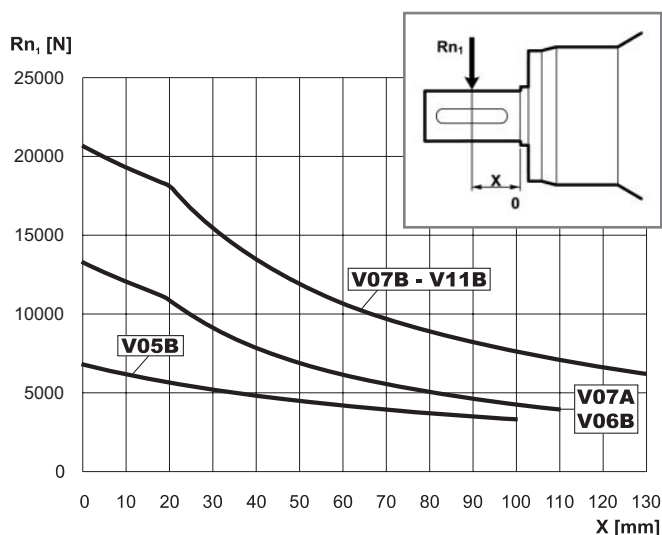
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

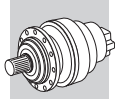
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

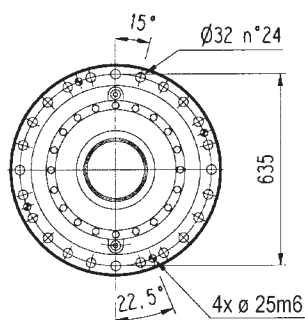
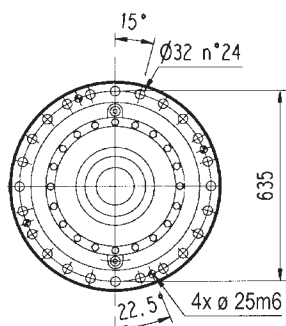
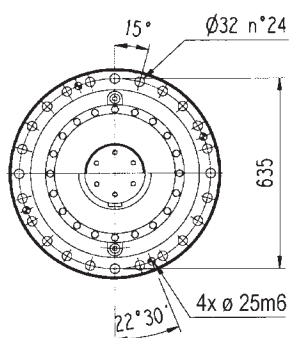
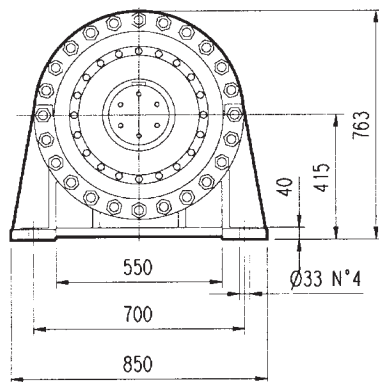
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.

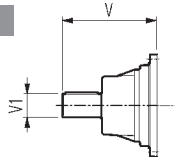




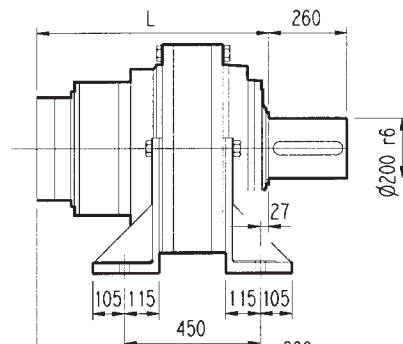
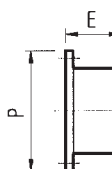
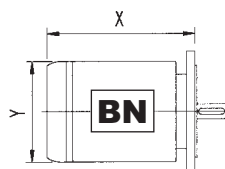
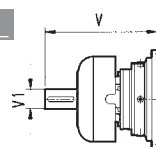
317 L



V



FV

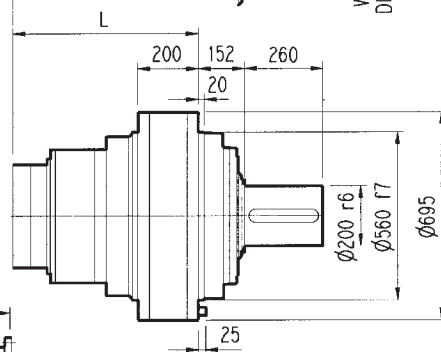


PC

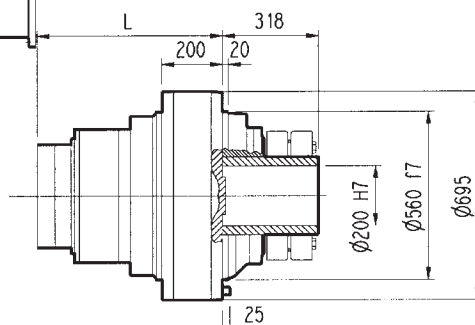
HZ

PZ

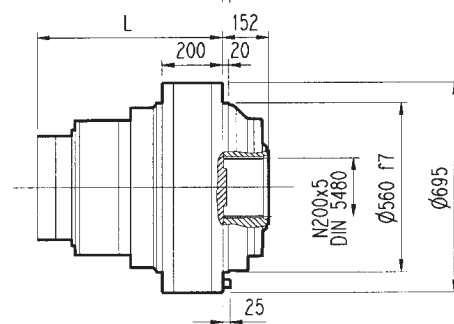
HC



FP



FZ

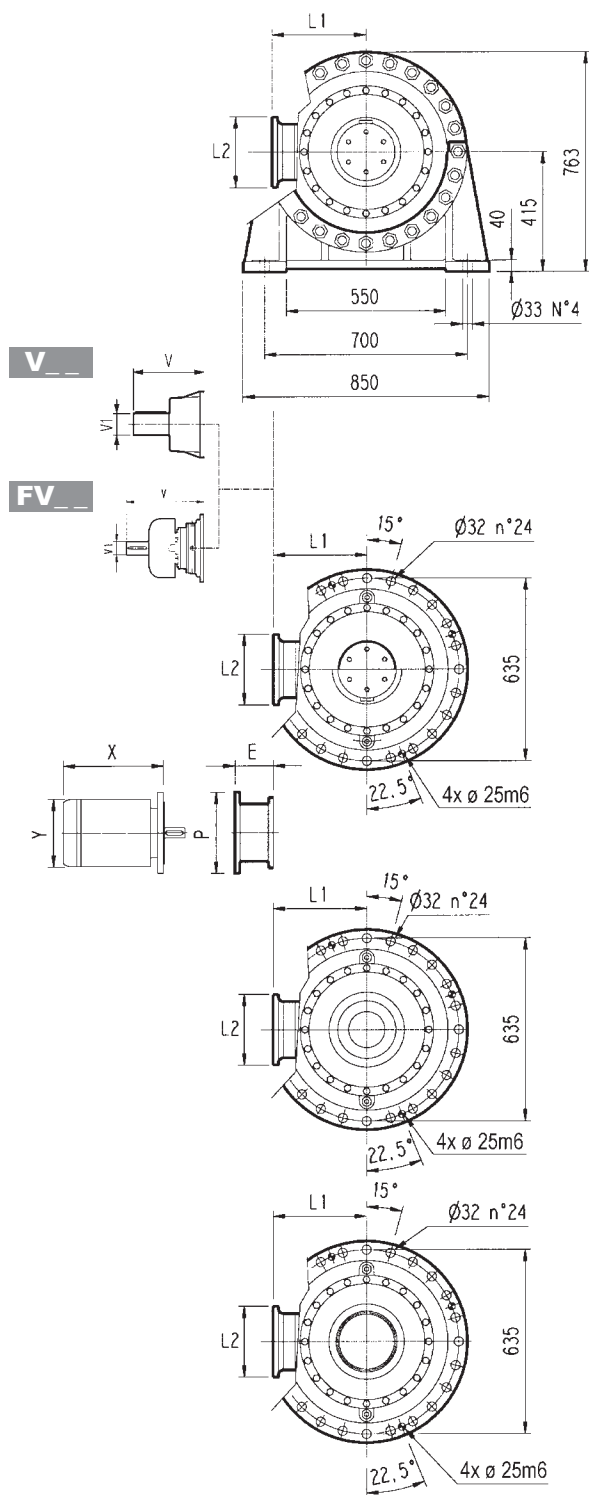
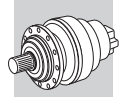


FP

M_{2max} = 216000 Nm

	L				Kg															
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
317 L2	624	475	475	475	1080	930	880	930	343	80	55	-	-	-	451	80	71	-	-	-
317 L3	774	622	622	622	1140	990	940	990	315	80	35	313	60	28	375	80	48	363	60	34
317 L4	862	710	710	710	1152	1000	952	1000	239	48	15	-	-	-	276	48	17	-	-	-

	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
317 L3	-	-	-	-	196	350	186	400	216	450	216	550
317 L4	114	300	144	350	144	350	174	400	-	-	-	-



PC

HZ PZ

HC

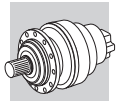
FP

FZ

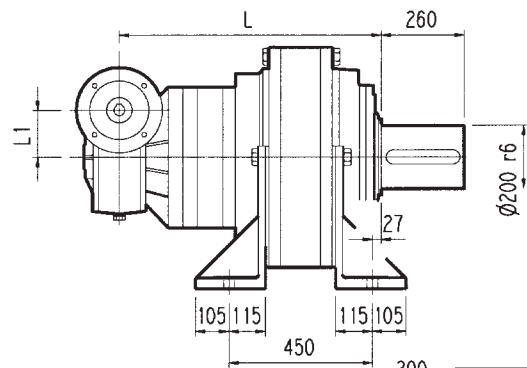
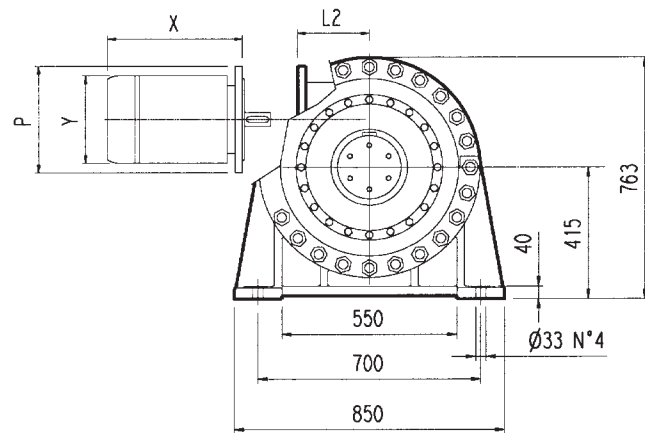
FP	$M_{2max} = 216000 \text{ Nm}$

	L				L1	L2	L3																
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1		V	V1		V	V1		V	V1	
317 R3 (B)	853	701	701	701	345	292	400	1210	1060	1010	1060	307	60	23	-	-	-	357	60	28	-	-	-
317 R3 (C)	853	701	701	701	390	292	480	1220	1070	1020	1070	307	60	23	-	-	-	357	60	28	-	-	-
317 R4	892	740	740	740	225	245	345	1190	1040	990	1040	239	48	15	-	-	-	276	48	17	-	-	-

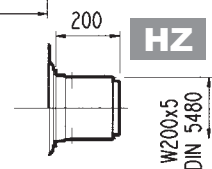
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
317 R3 (B)	-	-	-	-	152	350	182	400	212	450	193	550
317 R3 (C)	-	-	-	-	152	350	182	400	212	450	193	550
317 R4	114	300	144	350	144	350	174	400	-	-	-	-



3/V 17 L3

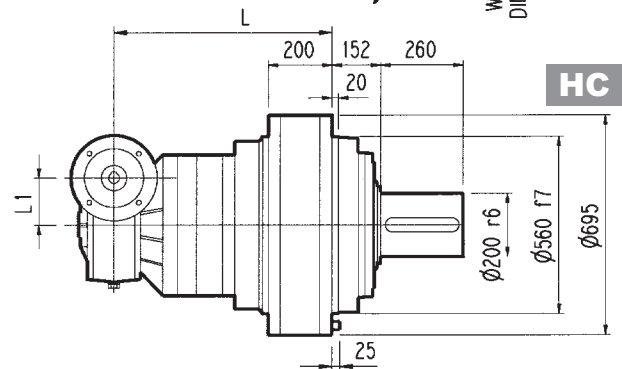
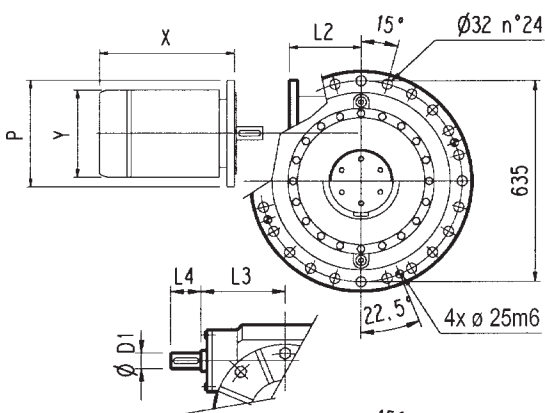


PC

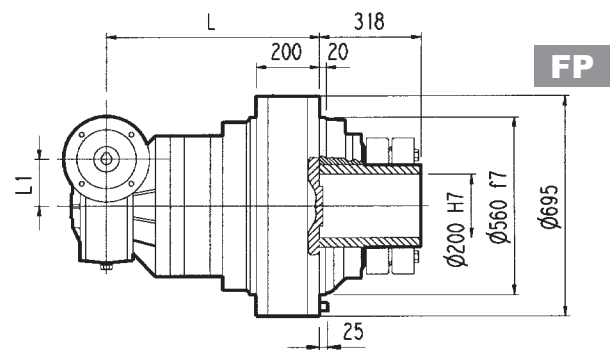
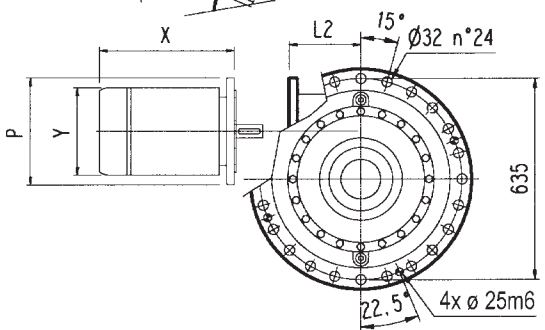


HZ

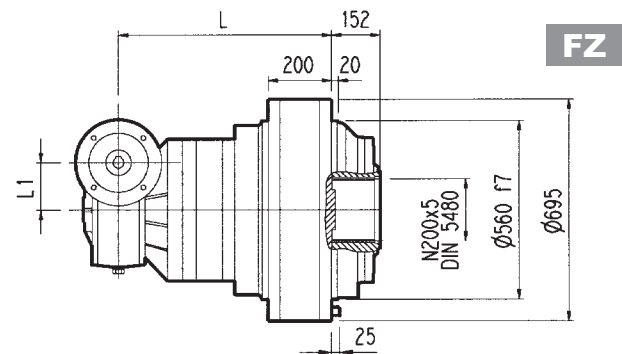
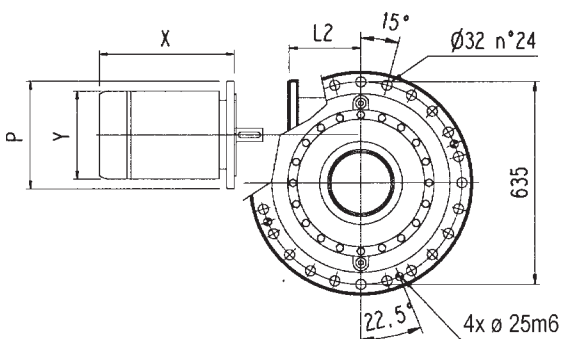
PZ



HC



FP



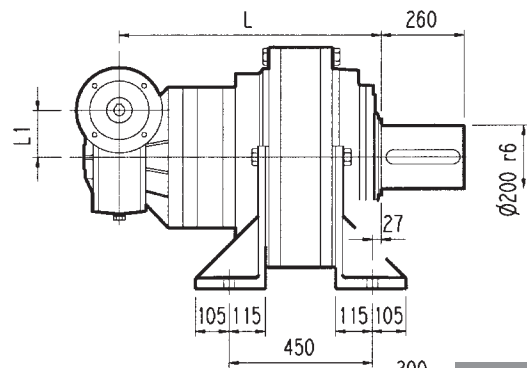
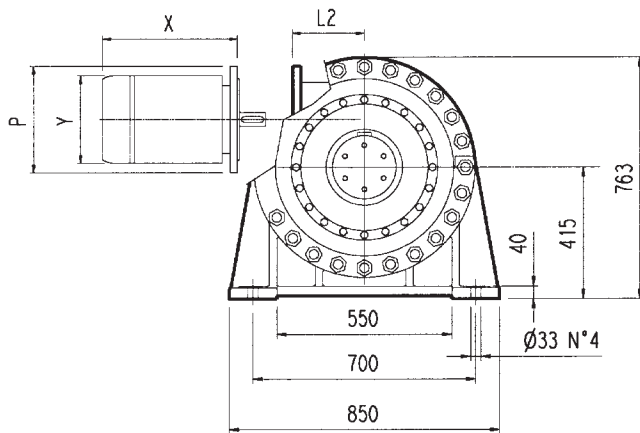
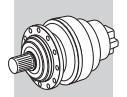
FZ

FP

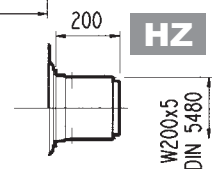
M_{2max} = 216000 Nm

	L				L1	D1	L3	L4				
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 17 L3	894	745	745	745	250	55	276	110	1400	1250	1200	1250

	P132		P160		P180		P200		P225	
	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 17 L3	531	300	506	350	506	350	531	400	536	450

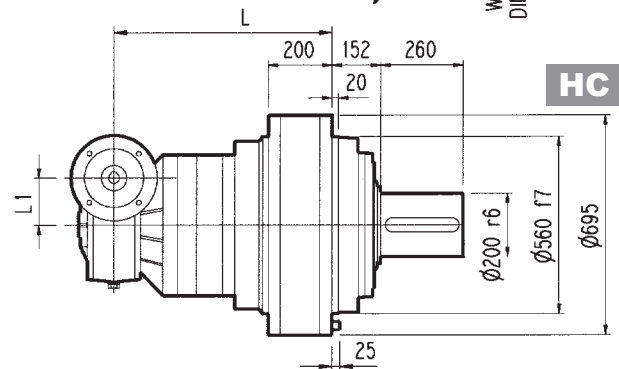
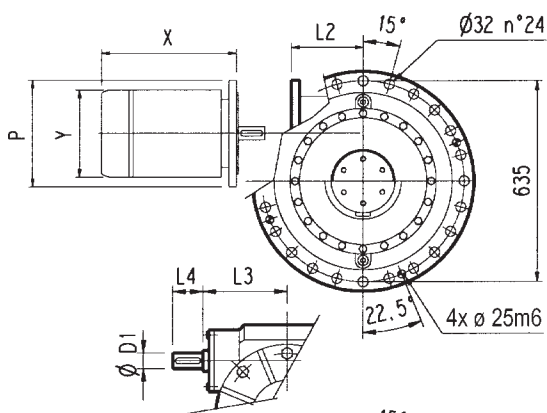


PC

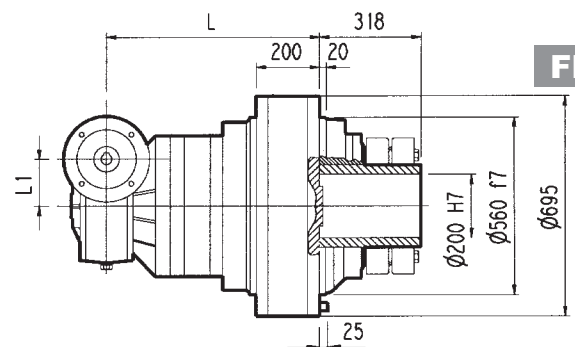
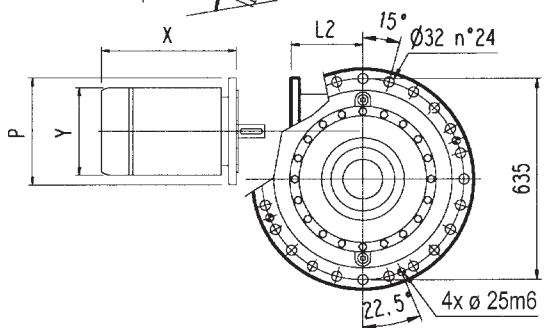


HZ

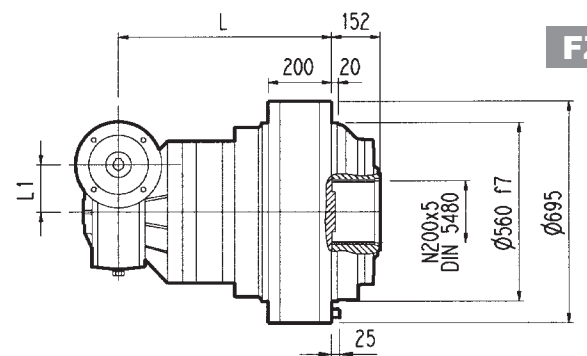
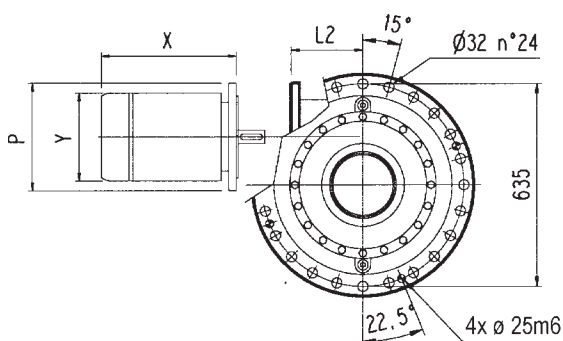
PZ



HC



FP

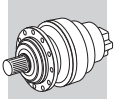


FZ

FP

$M_{2max} = 216000 \text{ Nm}$

	L				L1	D1	L3	L4		Kg			
	PC - PZ	HC - HZ	FZ	FP						PC - PZ	HC - HZ	FZ	FP
3/V 17 L4	975	823	823	823	185.4	40	214.5	70		1250	1090	1040	1090
	P100		P112		P132		P160			P180		P	
	P		P		L2	P	L2	P		L2		P	
3/V 17 L4	250		250		217	300	217	350		217		350	



317 L

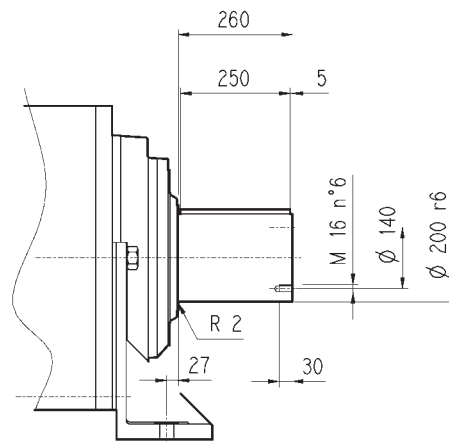
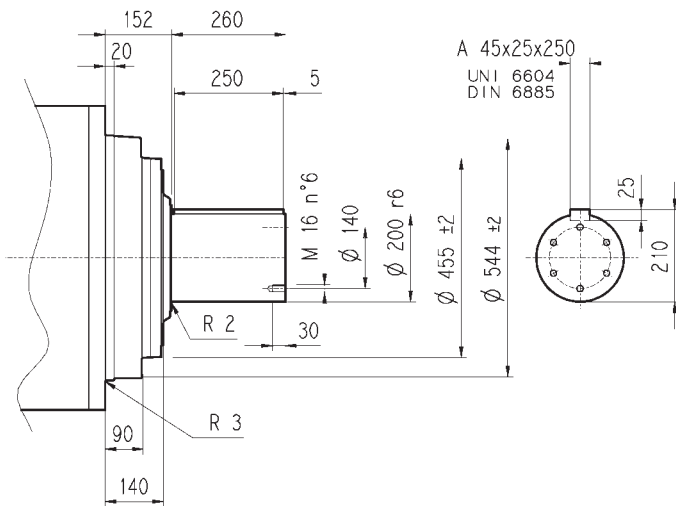
317 R

3/V 17 L3

3/V 17 L4

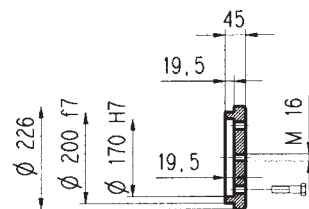
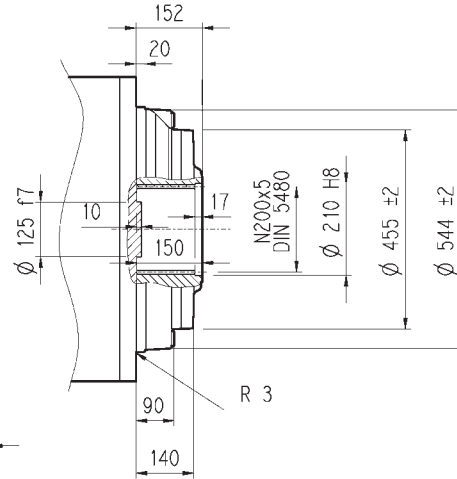
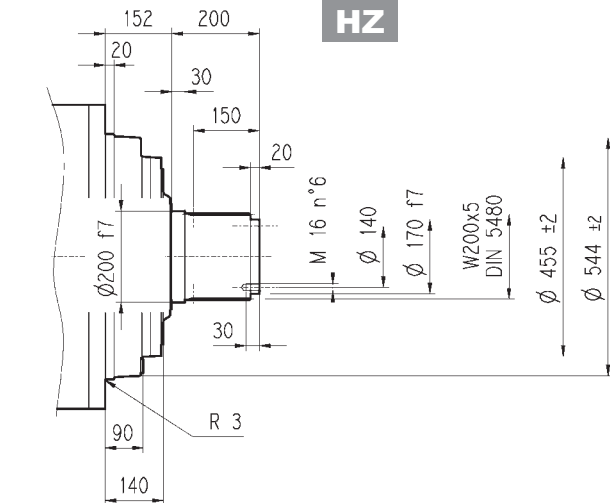
HC

PC

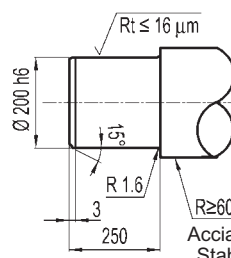
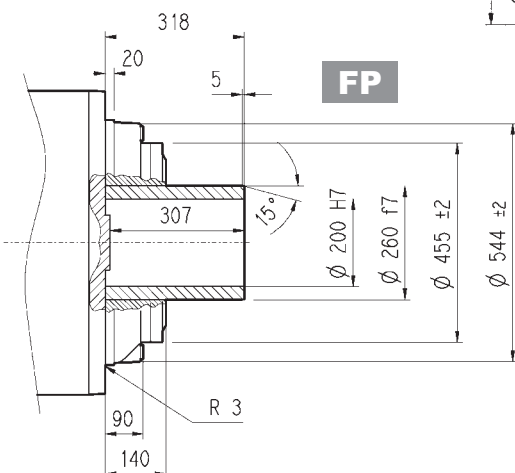


HZ

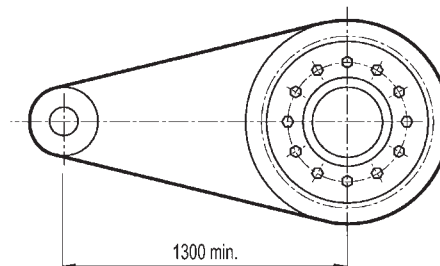
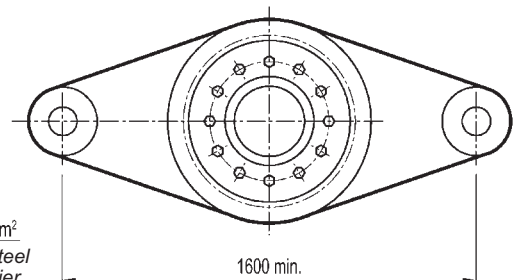
FZ



FP

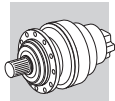


$R \geq 60 \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier



FP

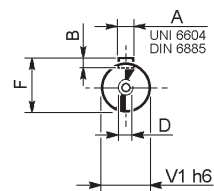
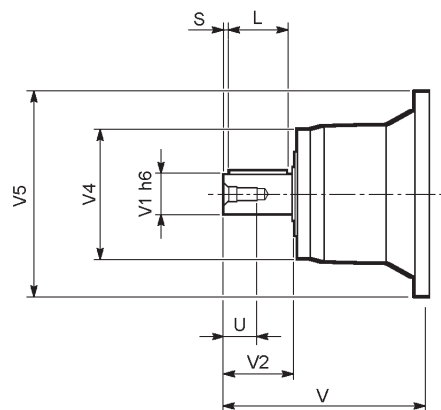
$M_{2\max} = 216000 \text{ Nm}$



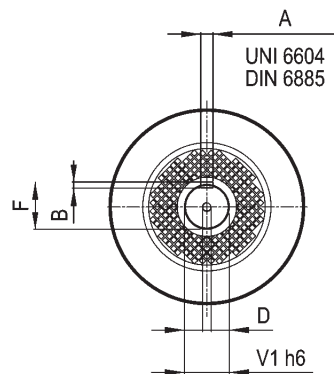
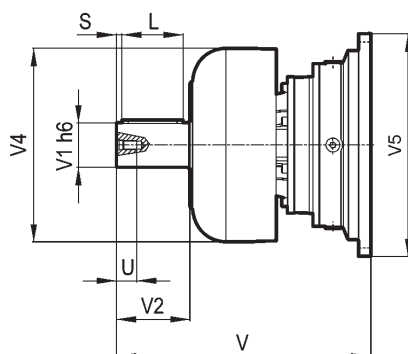
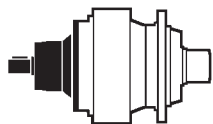
317 L

317 R

V _ _



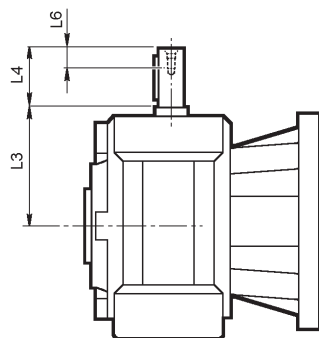
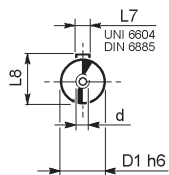
FV _ _



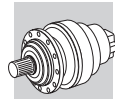
	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
317 L2	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36
317 L3	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
317 L4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36
317 R3 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	40
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36
317 R4	V05B	239	48	82	155	245	14	9	51.5	70	6	M16	36
	FV05B	276	48	82	219.5	244	14	9	51.5	70	6	M16	36

3/V 17 L3

3/V 17 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 17 L3 HS	55	276	110	40	16	59	M16
3/V 17 L4 HS	40	214.5	70	20	12	43	M8

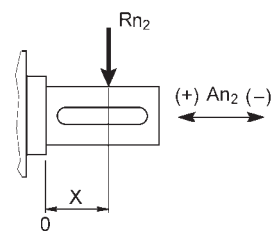
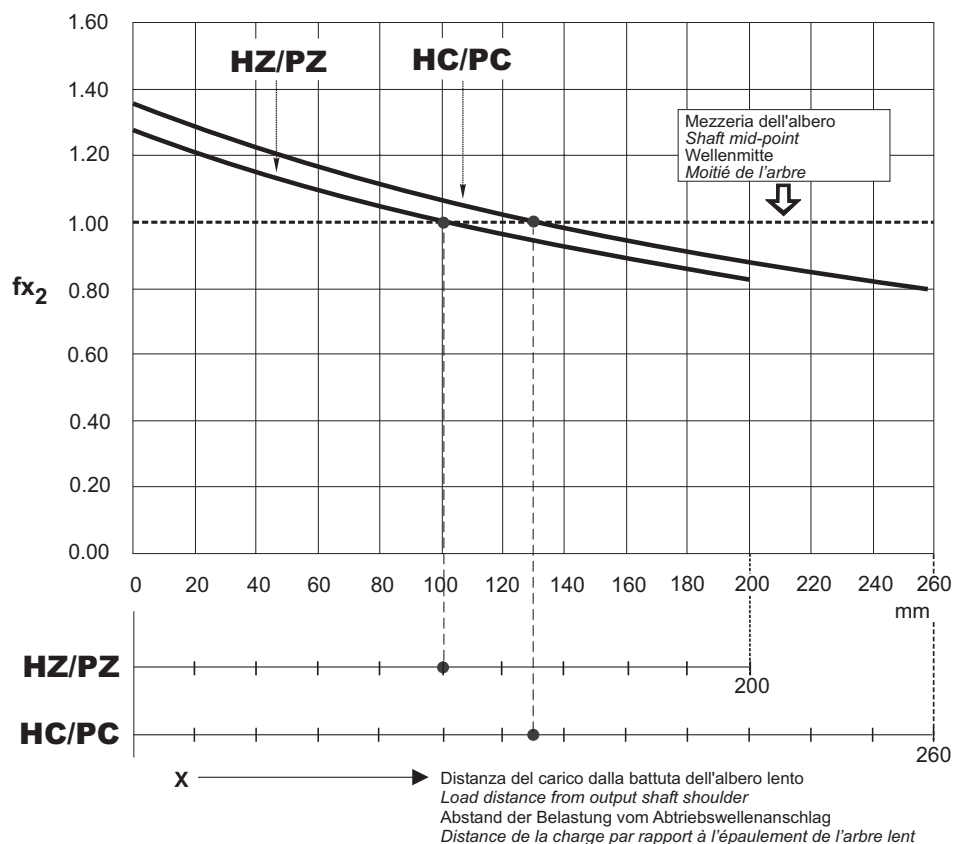


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

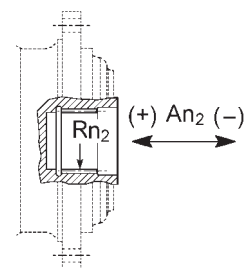
Facteur de position pour charges radiales sur les arbres en sortie.



$$R_{x2} = R_{n2} \cdot f_{x2}$$

$$A_{n2} (\pm) = R_{n2} \cdot f_{a2} (\pm)$$

	$f_{a2} (+)$	$f_{a2} (-)$
HZ/PZ	0.77	0.64
HC/PC	0.81	0.68



$$A_{n2} (\pm) = R_{n2} \cdot f_{a2} (\pm)$$

	$f_{a2} (+)$	$f_{a2} (-)$
FZ	1.00	1.00

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

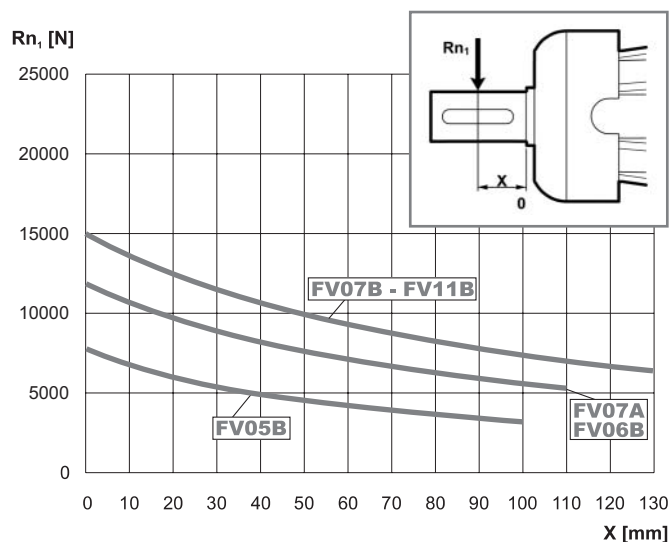
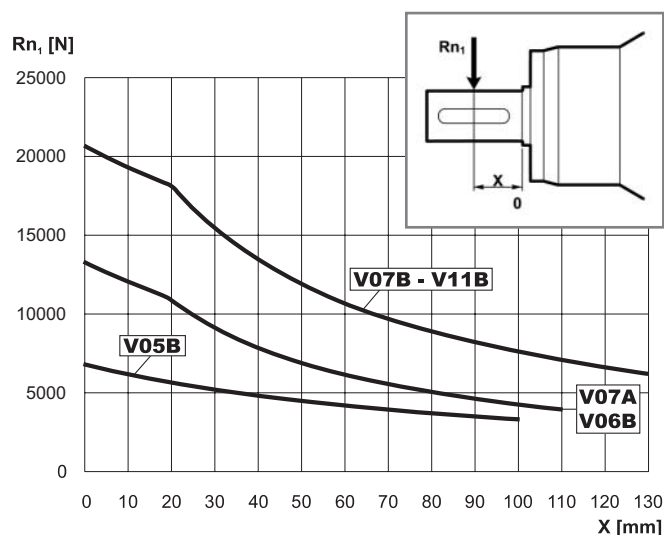
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

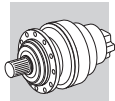
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

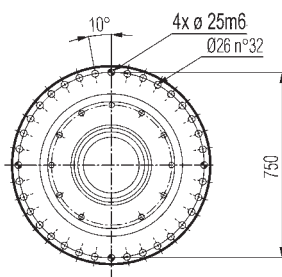
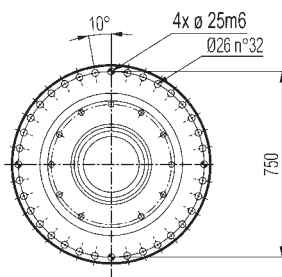
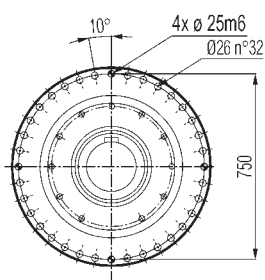
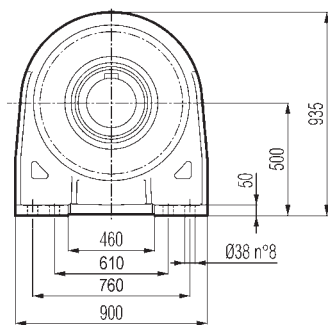
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.

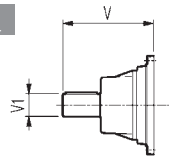




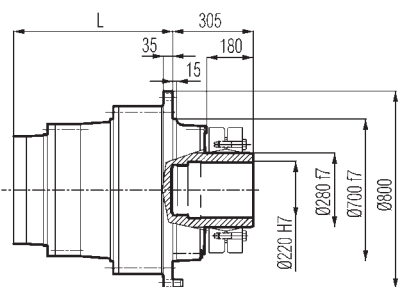
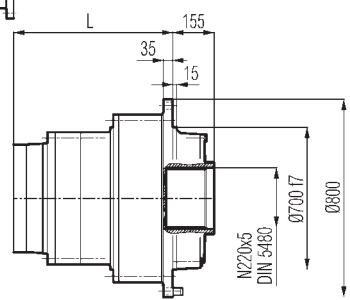
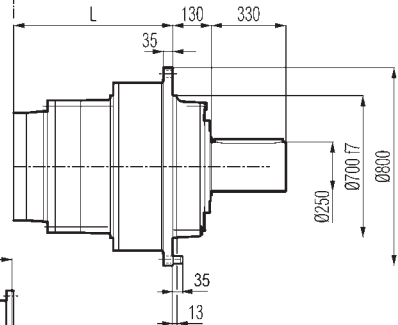
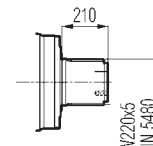
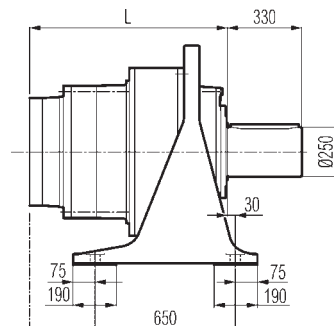
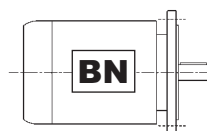
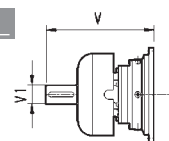
318 L



V__



FV__



PC

HZ

PZ

HC

FZ

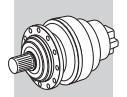
FP

FP

M_{2max} = 300000 Nm

	L																			
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
318 L3	889	759	759	759	1600	1300	1150	1180	348	80	55	-	-	-	456	80	85	-	-	-
318 L4	1022	892	892	892	1650	1350	1200	1230	315	80	35	313	60	28	375	80	48	363	60	34

	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
318 L4	195	350	186	400	216	450	215	550



PC

HZ

PZ

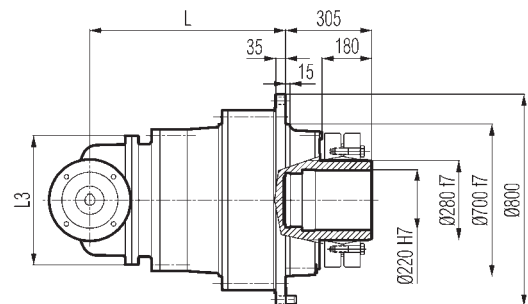
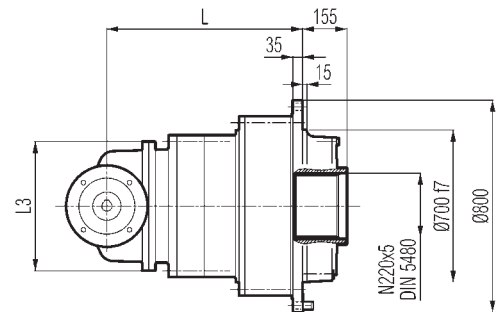
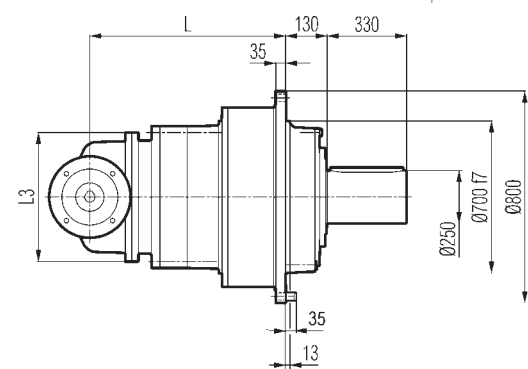
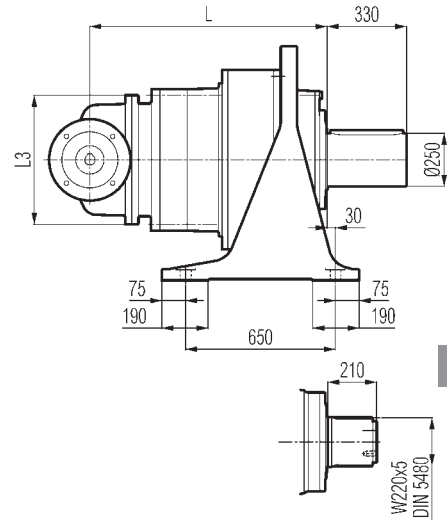
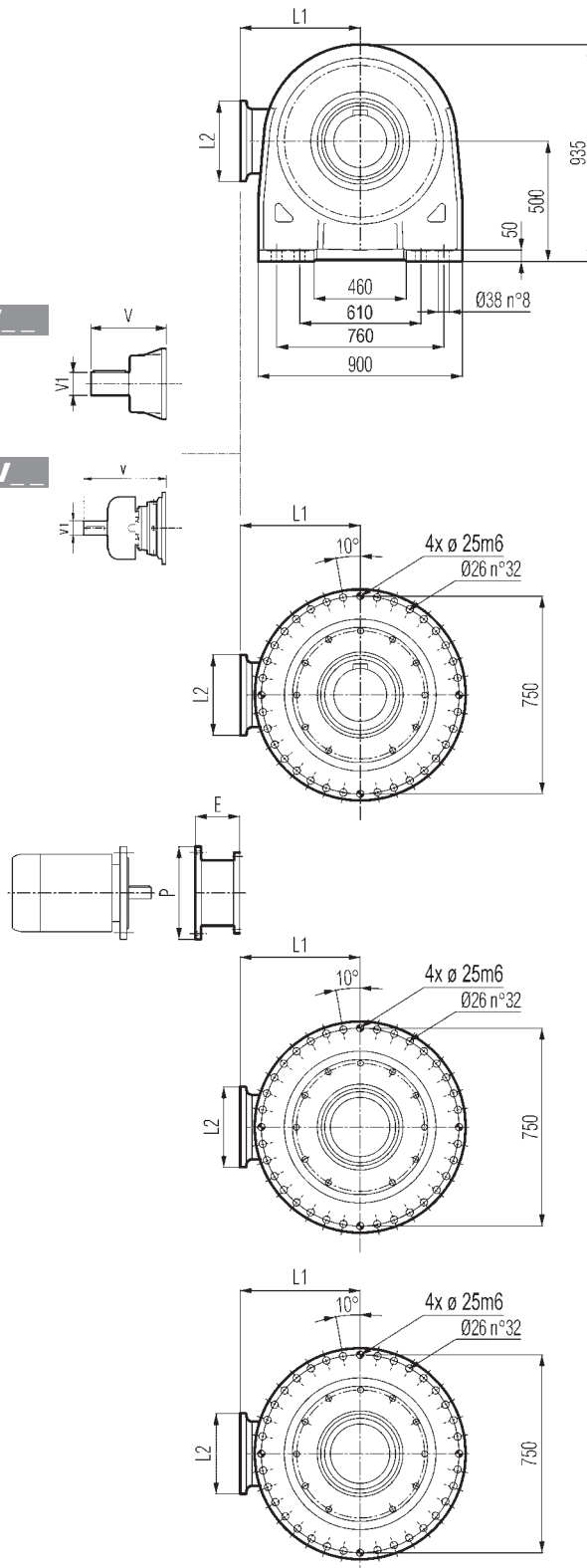
HC

FZ

FP

V

FV

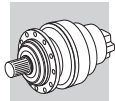


FP

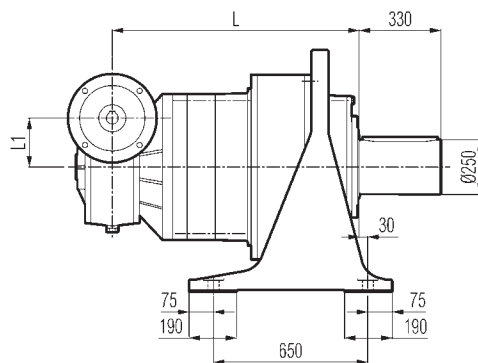
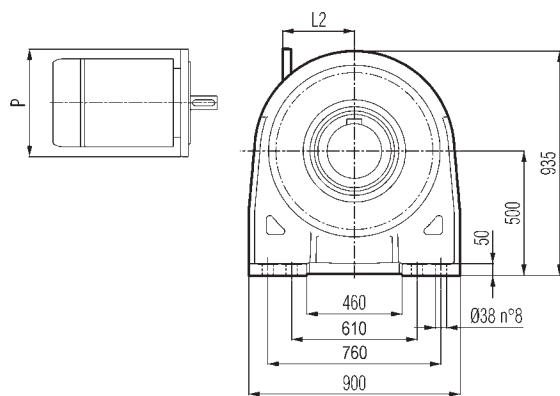
$M_{2max} = 300000 \text{ Nm}$

	L				L1	L2	L3																
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1		V	V1		V	V1		V	V1	
318 R4 (B)	1115	985	985	985	345	292	400	1720	1420	1270	1300	307	60	23	-	-	-	357	60	28	-	-	-
318 R4 (C)	1115	985	985	985	390	292	480	1730	1430	1280	1310	307	60	23	-	-	-	357	60	28	-	-	-

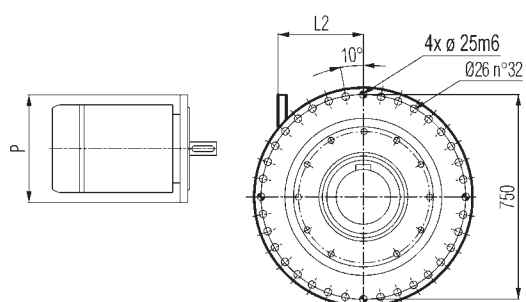
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
318 R4 (B)	-	-	-	-	152	350	182	400	212	450	193	550
318 R4 (C)	-	-	-	-	152	350	182	400	212	450	193	550



3/V 18 L4

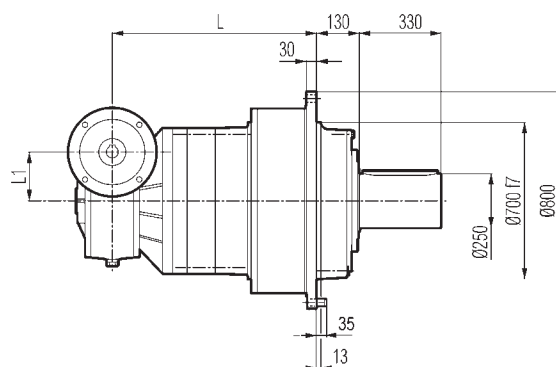
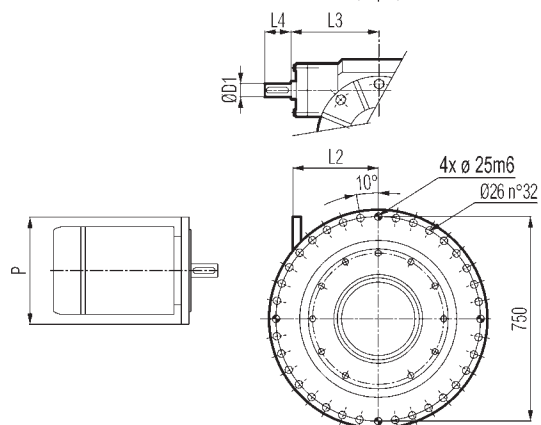


PC

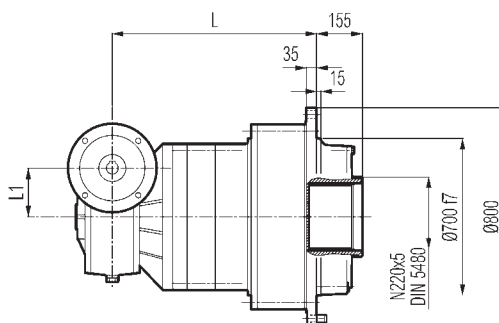
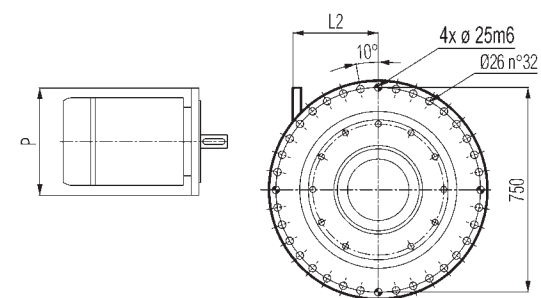


HZ

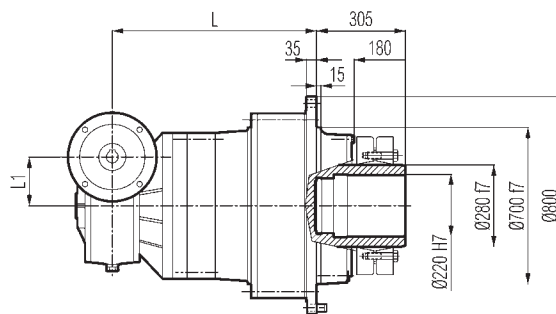
PZ



HC



FZ



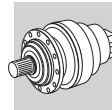
FP

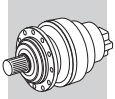
FP

$M_{2max} = 300000 \text{ Nm}$

	L				L1	D1	L3	L4	Kg			
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 18 L4	1114	984	984	984	210	48	230	110	1810	1510	1360	1390

	P132		P160		P180		P200		P225	
	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 18 L4	485	300	460	350	460	350	485	400	490	450





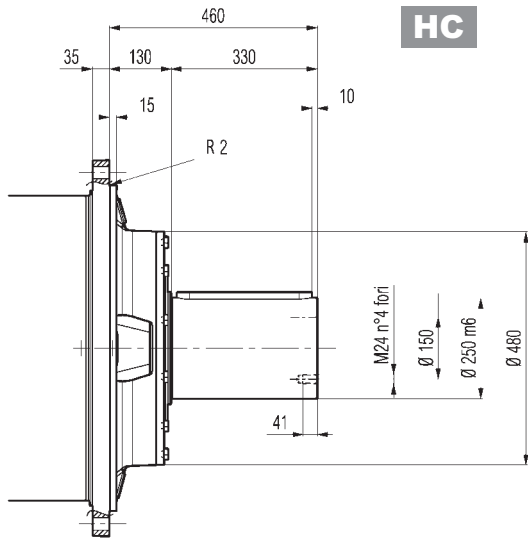
318 L

318 R

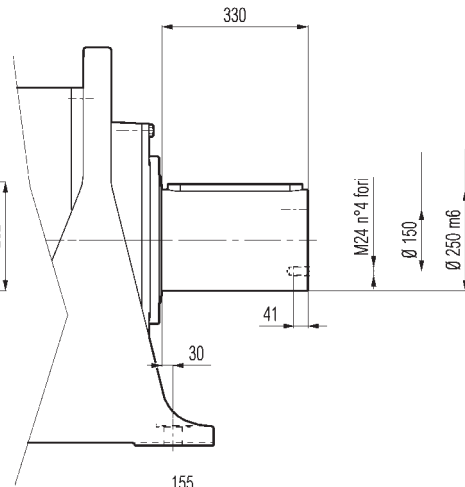
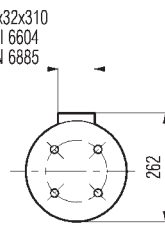
3/V 18 L4

HC

PC

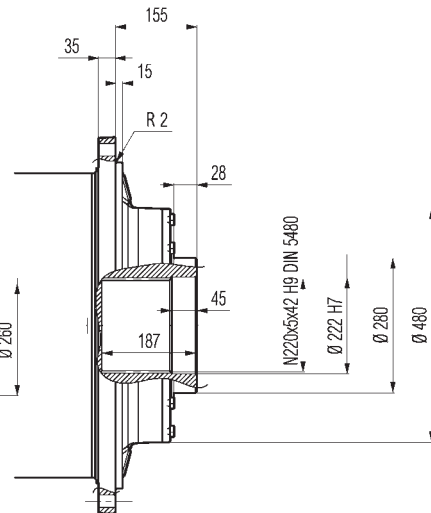
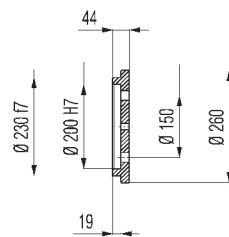
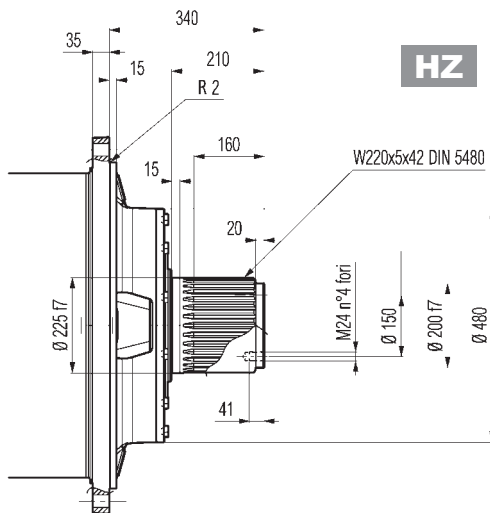


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UNI 6604
DIN 6885

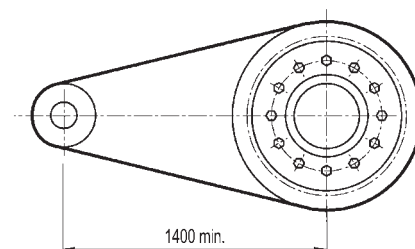
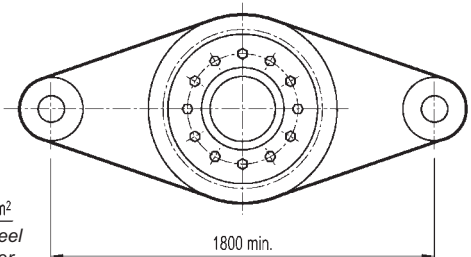
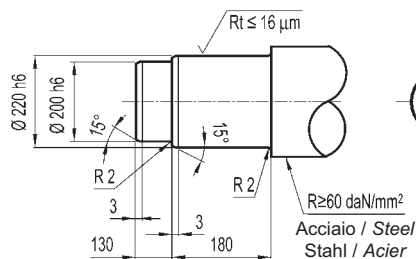
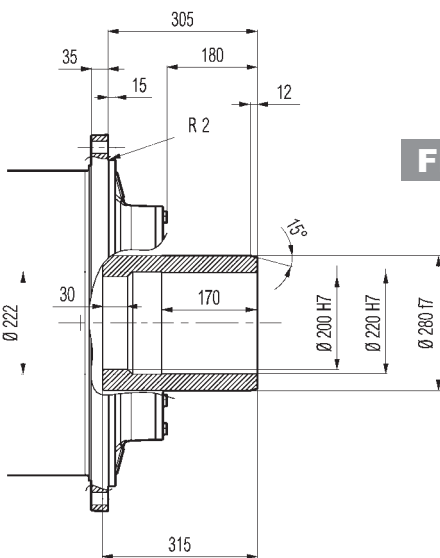


HZ

FZ

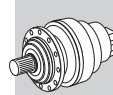


FP

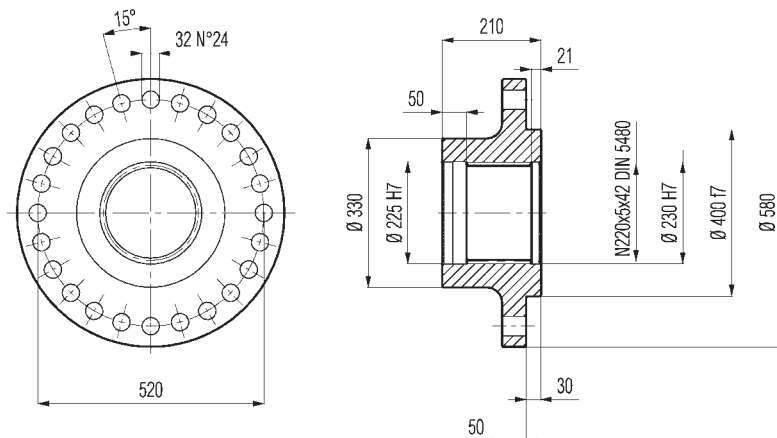
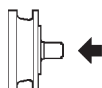


FP

M_{2max} = 300000 Nm

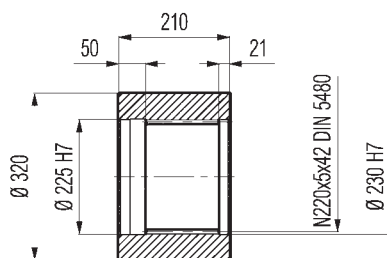
318 L**318 R****3/V 18 L4**

Flangia / Flange
Flansch / Brides

W0A

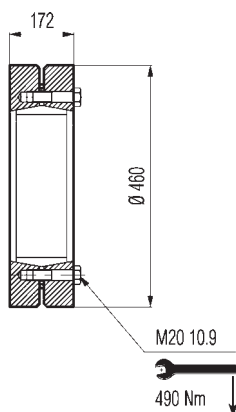
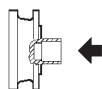
Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

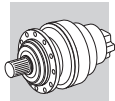
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

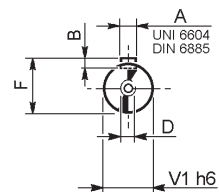
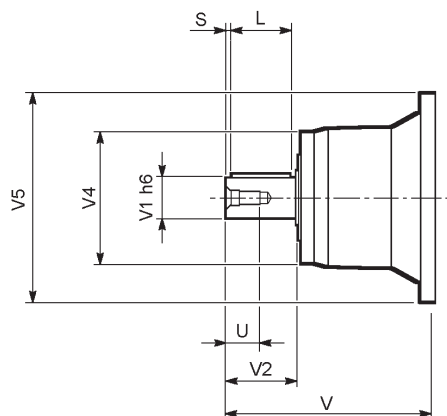
G0A



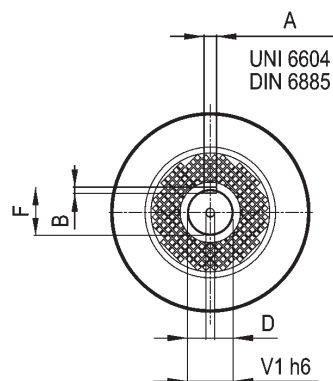
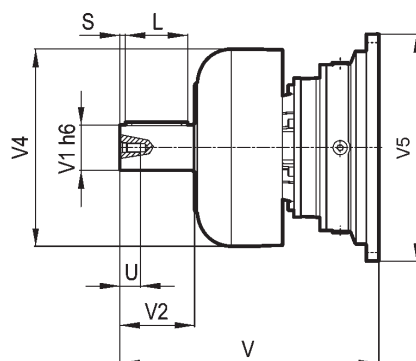
318 L

318 R

V _ _

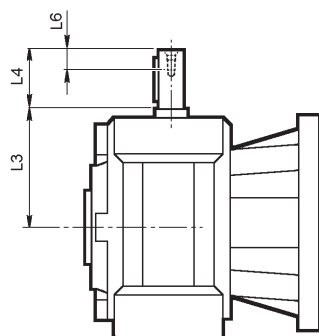
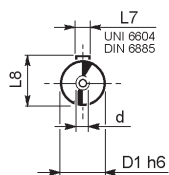


FV _ _

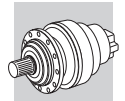


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
318 L3	V11B	348	80	130	200	428	22	14	85	110	10	M16	36
	FV11B	456	80	130	347.5	428	22	14	85	110	10	M16	36
318 L4	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
318 R4 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36

3/V 18 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 18 L4 HS	48	230	110	40	14	51.5	M16

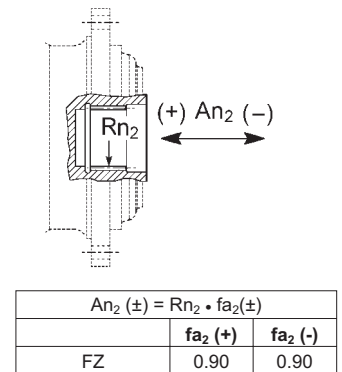
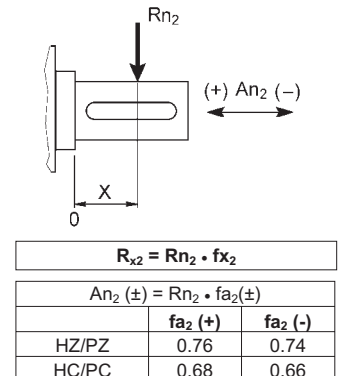
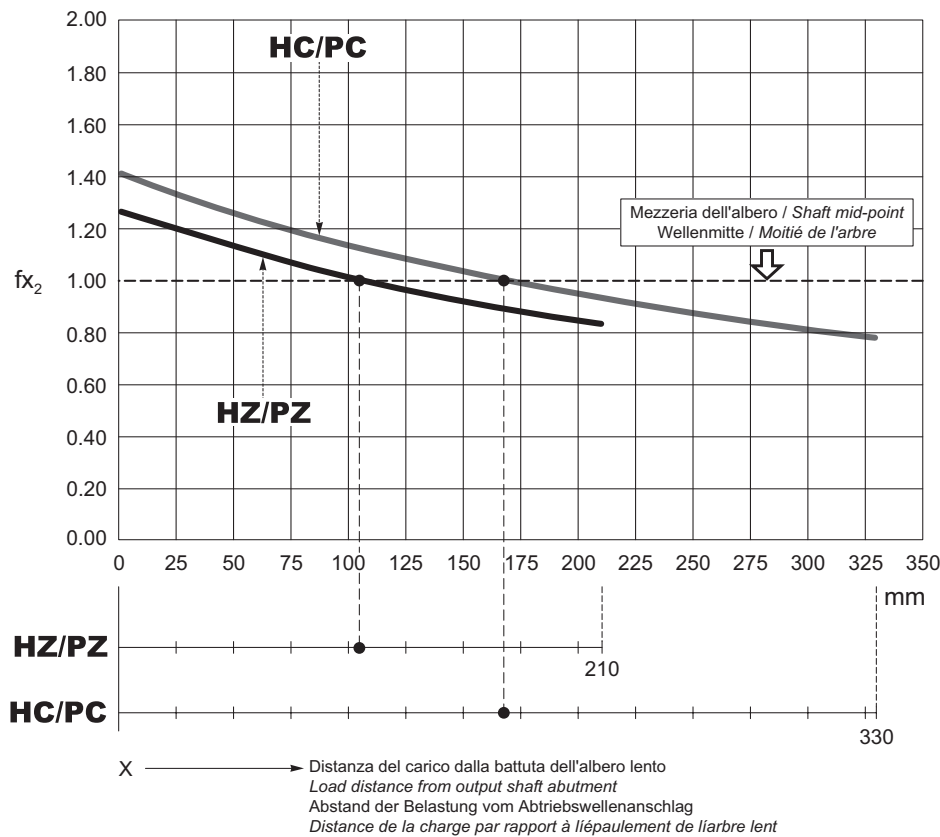


Fattore di posizione per carichi radiali sugli alberi in uscita.

Load location factor for radial loading on output shaft.

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Facteur de position pour charges radiales sur les arbres en sortie.



Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

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Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

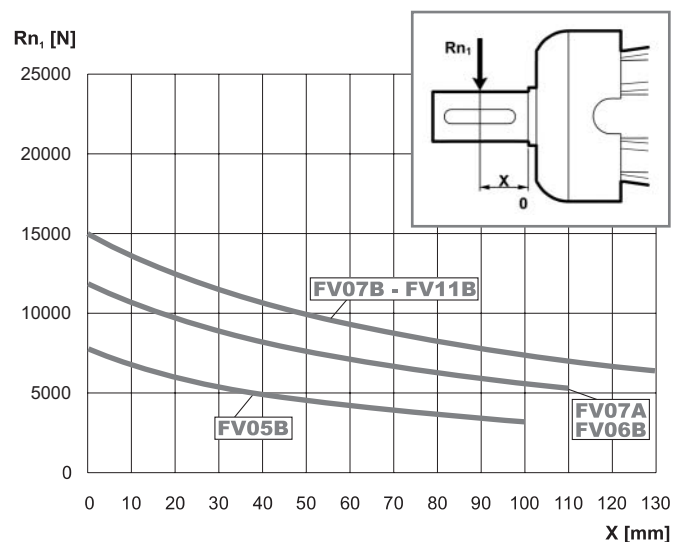
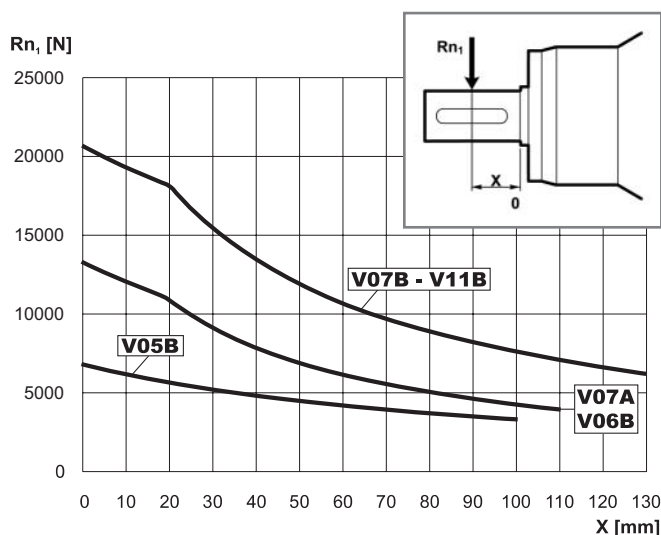
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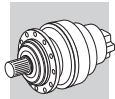
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

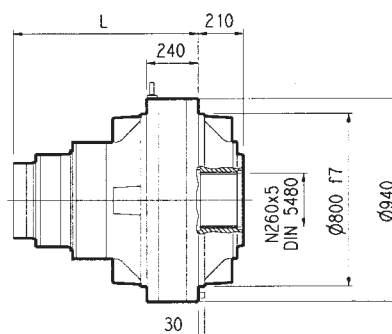
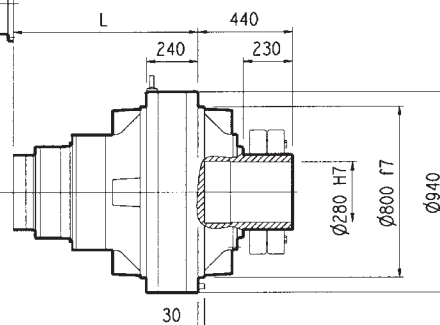
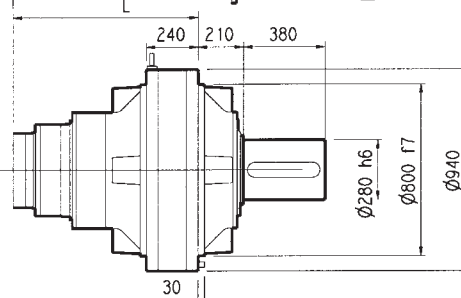
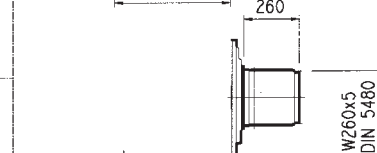
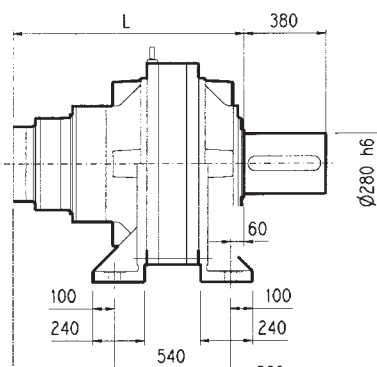
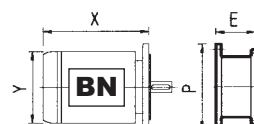
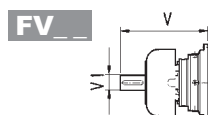
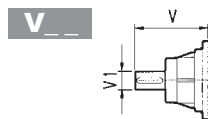
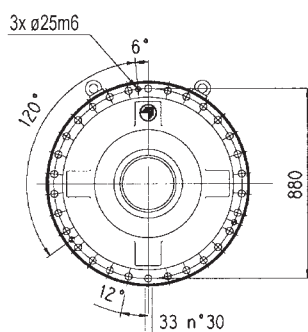
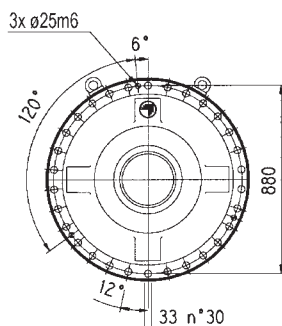
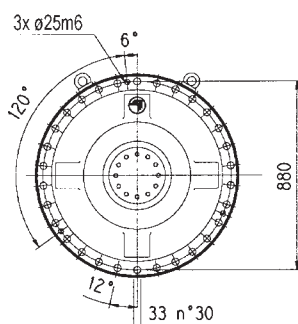
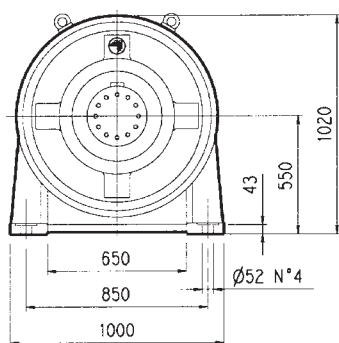
Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





319 L



PC

HZ

PZ

HC

FP

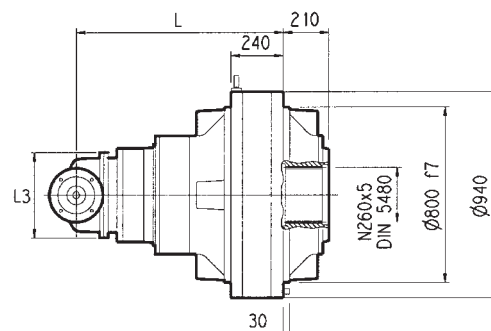
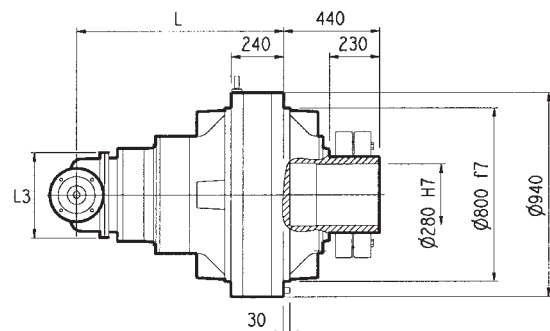
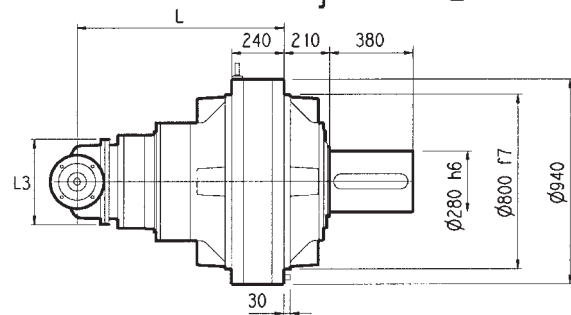
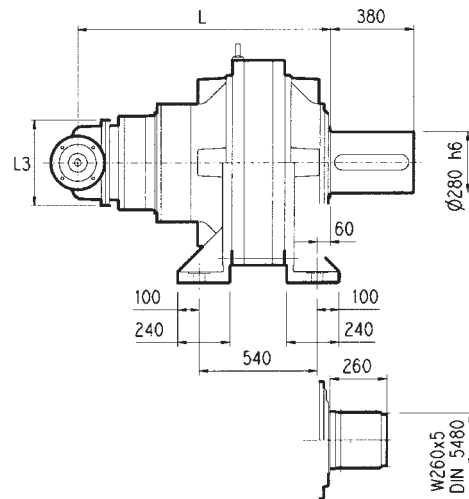
FZ

FP

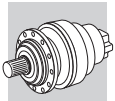
$M_{2max} = 420000 \text{ Nm}$

	L				Kg															
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
319 L3	990	780	780	780	2435	2135	2035	2035	348	80	55	-	-	-	456	80	85	-	-	-
319 L4	1123	913	913	913	2480	2180	2080	2080	315	80	35	313	60	28	375	80	48	363	60	34

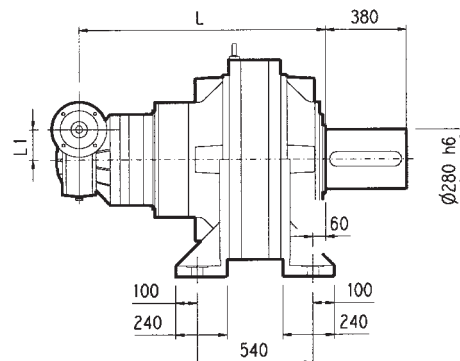
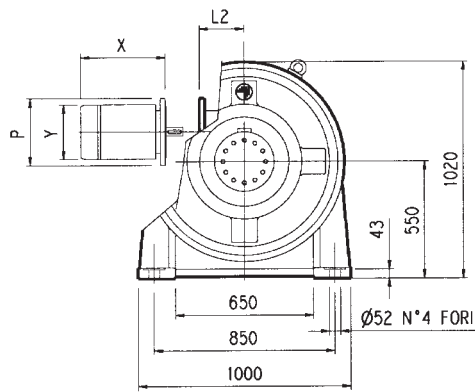
	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
319 L4	195	350	186	400	216	450	216	550



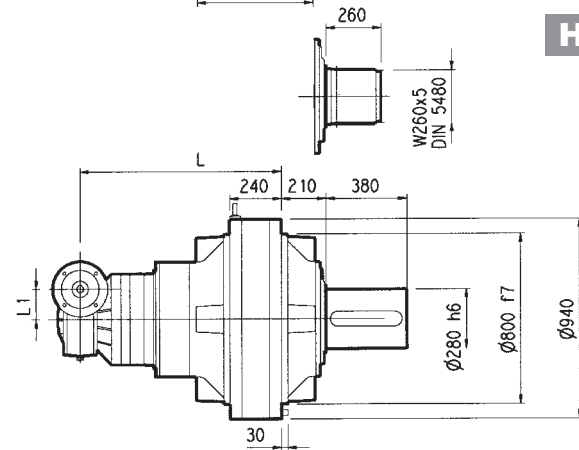
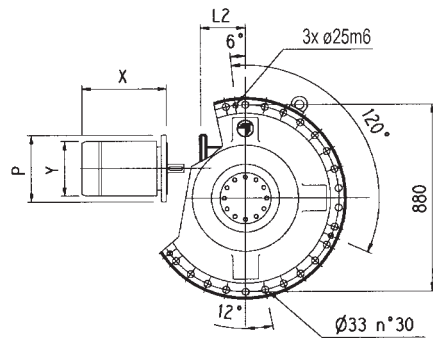
Bonfiglioli
Trasmital



3/V 19 L4



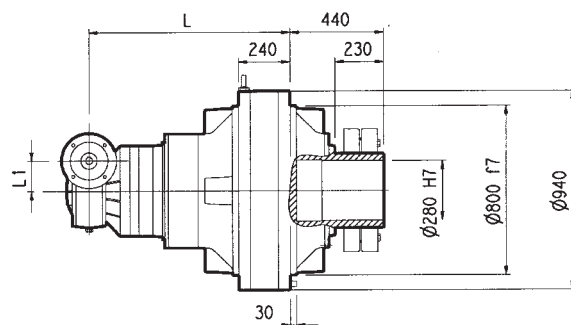
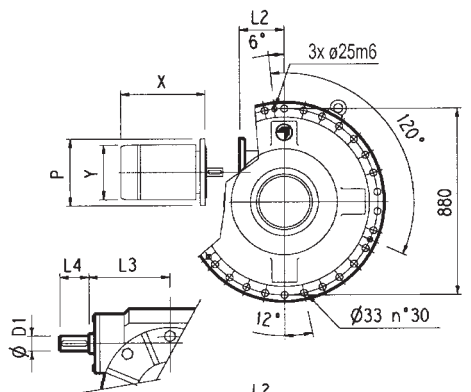
PC



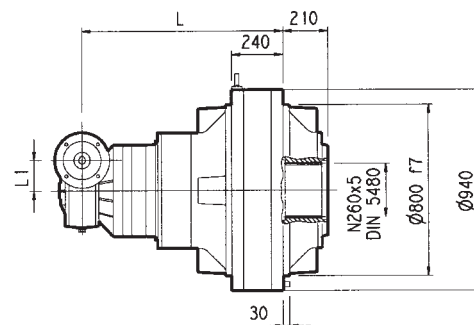
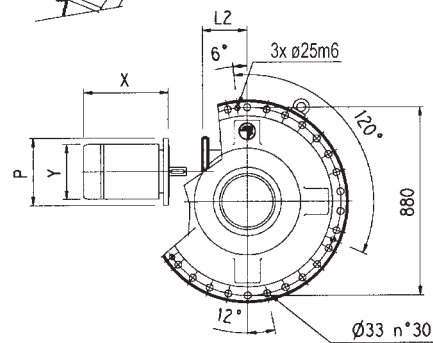
HZ

PZ

HC



FP

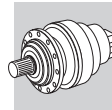


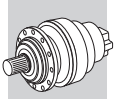
FZ

FP

$M_{2max} = 420000 \text{ Nm}$

	L				L1	D1	L3	L4	 Kg			
	PC - PZ	HC - HZ	FZ	FP					PC - PZ	HC - HZ	FZ	FP
3/V 19 L4	1210	1000	1000	1000	210	48	230	110	2650	2350	2250	2250
	P132		P160		P180		P200		P225			
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 19 L4	485	300	460	350	460	350	485	400	490	450		





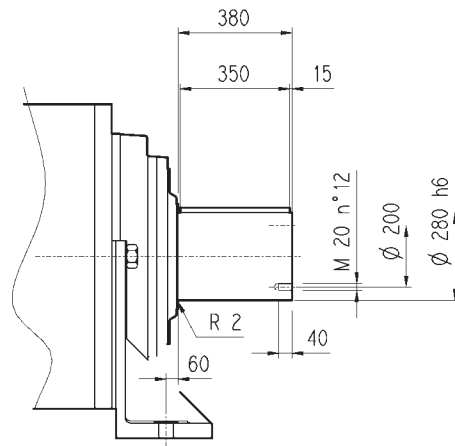
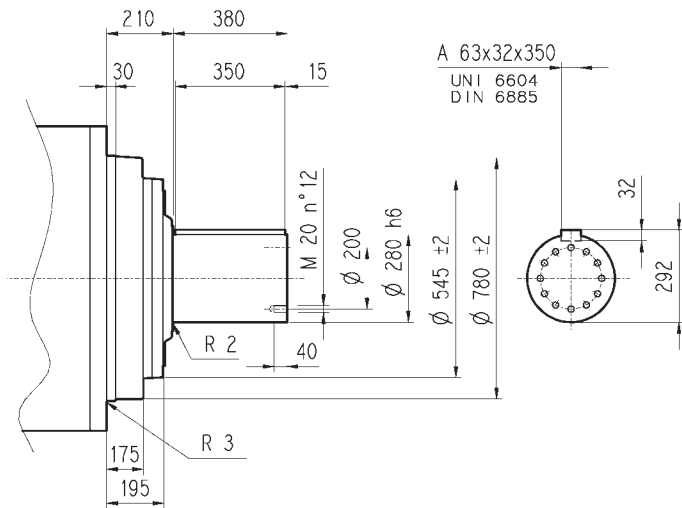
319 L

319 R

3/V 19 L4

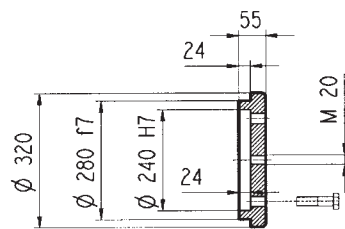
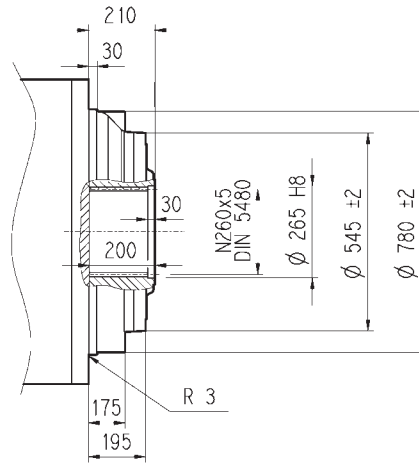
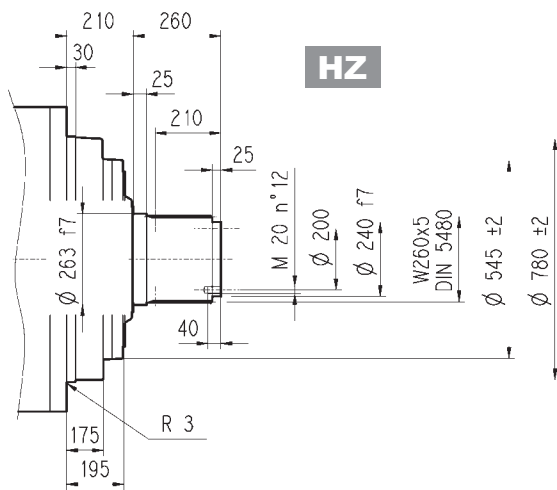
HC

PC

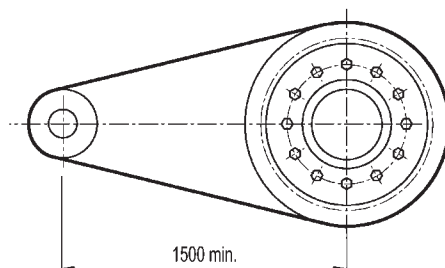
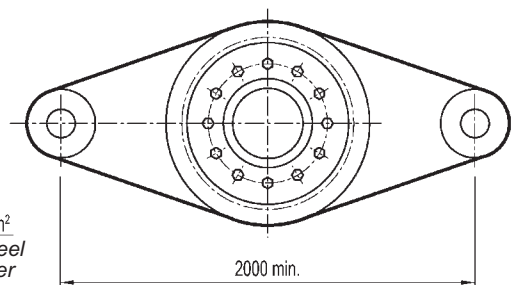
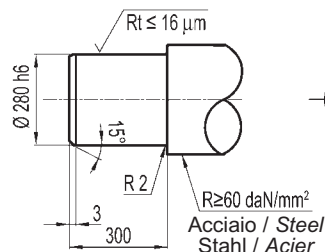
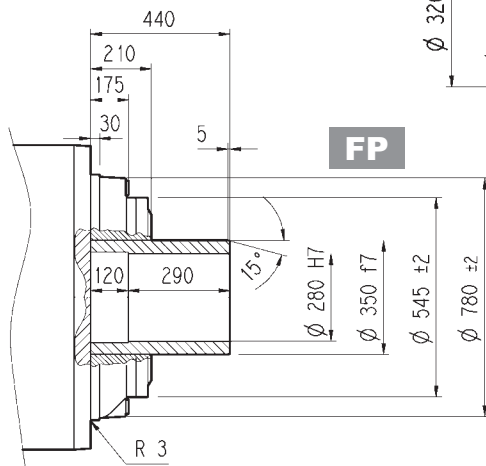


HZ

FZ

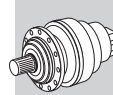


FP

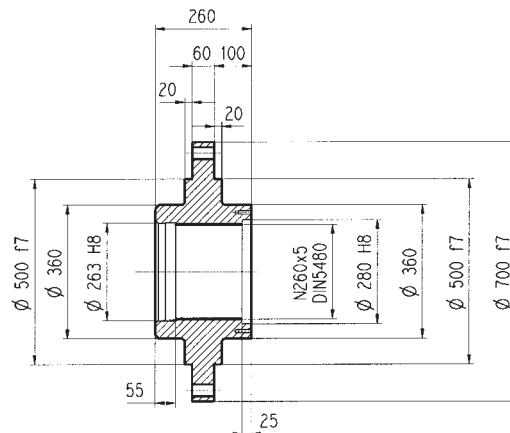
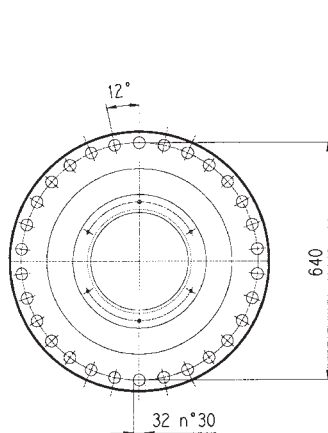


FP

M_{2max} = 420000 Nm

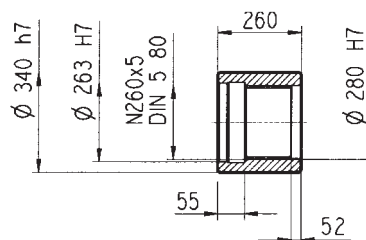
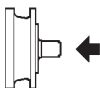
319 L**319 R****3/V 19 L4**

Flangia / Flange
Flansch / Brides

W0A

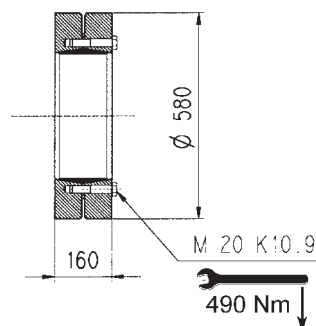
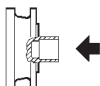
Materiale : Acciaio C40
 Material : Steel C40
 Material : Stahl C40
 Matière : Acier C40

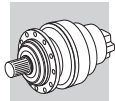
Manicotti lisci / Sleeve couplings
Naben / Manchons lisses a cannelure interieure

MOA

Materiale : Acciaio 16CrNi4
 Material : Steel 16CrNi4
 Material : Stahl 16CrNi4
 Matière : Acier 16CrNi4

Giunto ad attrito / Shrink disc
Schrumpfscheibe / Frette de serrage

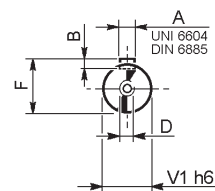
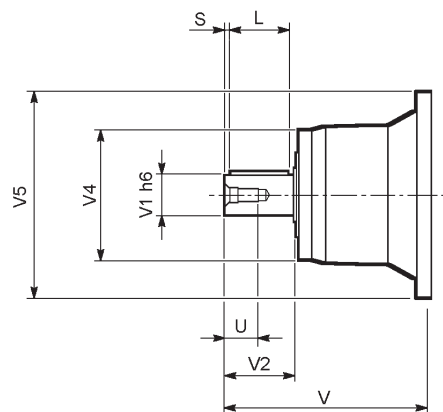
G0A



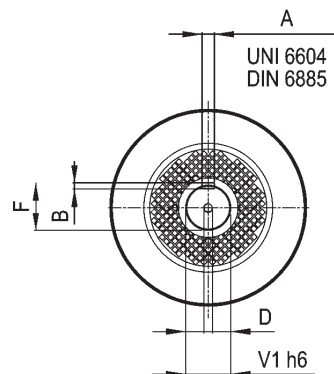
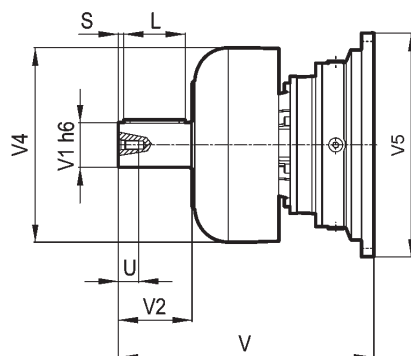
319 L

319 R

V

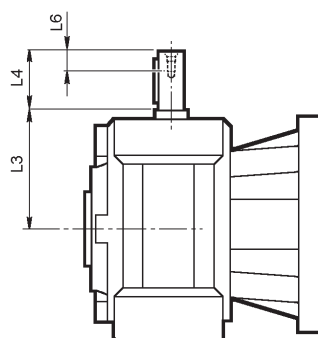
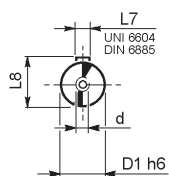


FV

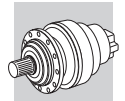


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319 L3	V11B	348	80	130	200	428	22	14	85	110	10	M16	36
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	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36

3/V 19 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 19 L4 HS	48	230	110	40	14	51.5	M16

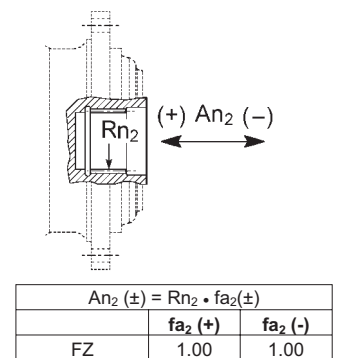
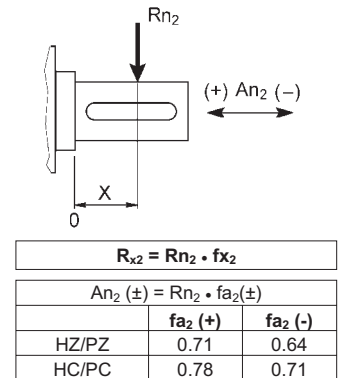
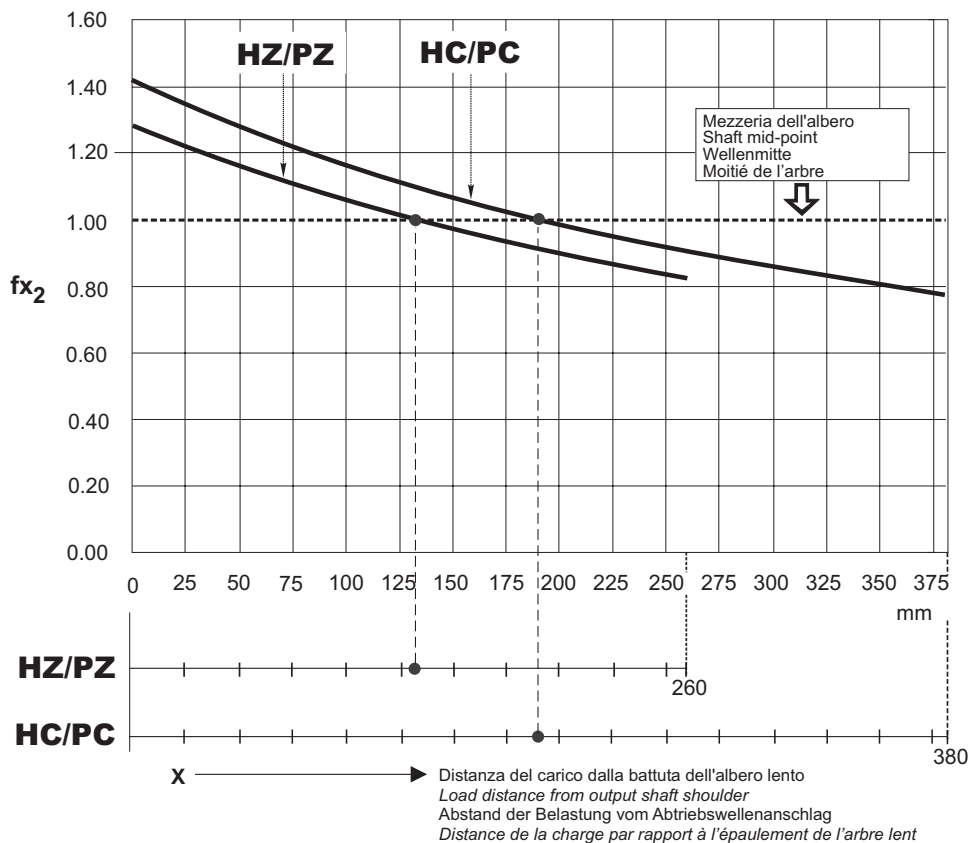


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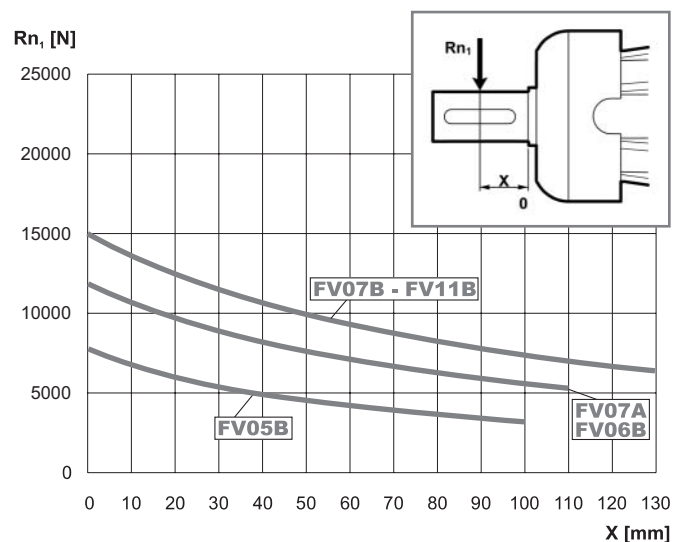
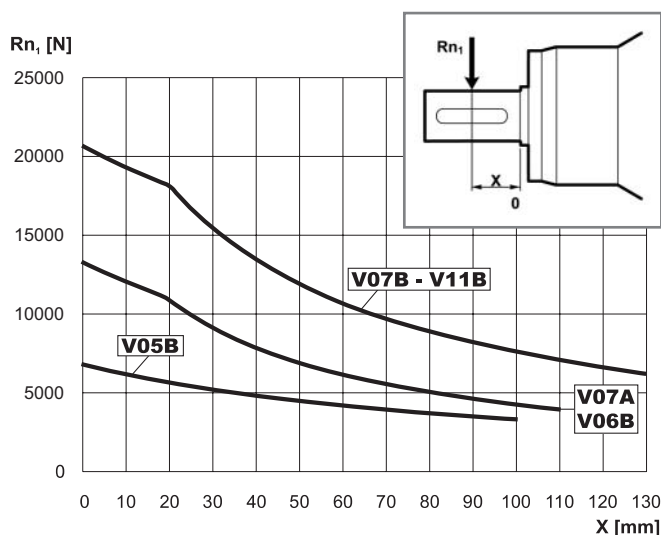
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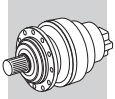
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Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

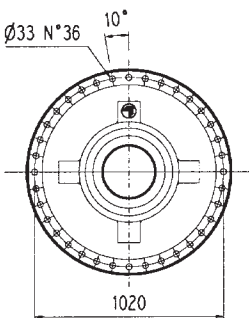
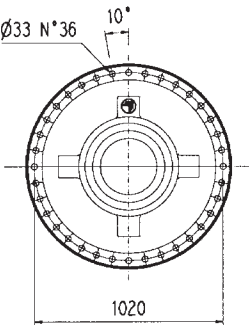
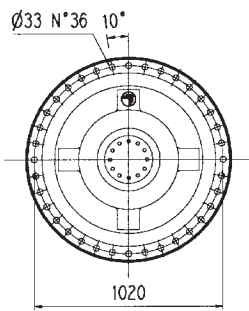
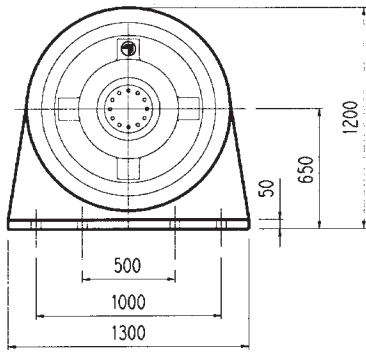
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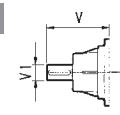




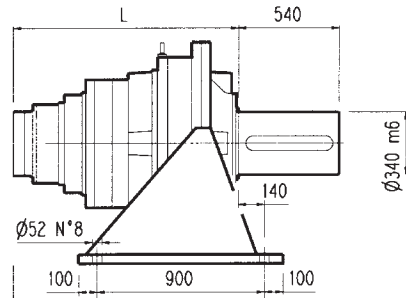
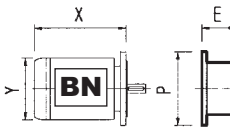
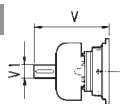
321 L



V



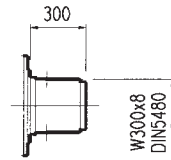
FV



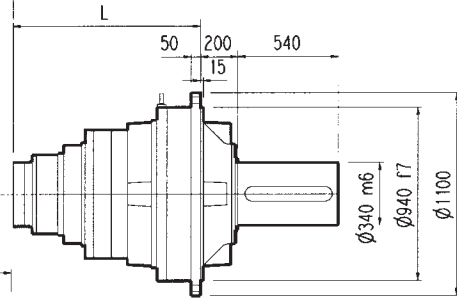
PC

HZ

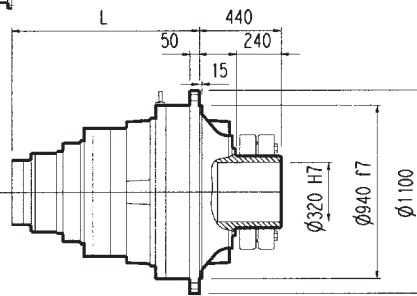
PZ



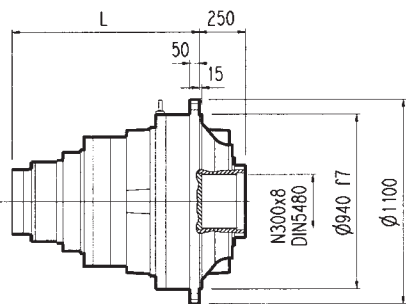
HC



FP



FZ

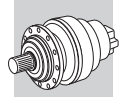


FP

$M_{2max} = 648000 \text{ Nm}$

	L				Kg															
	PC - PZ	HC - HZ	FZ	FP	PC - PZ	HC - HZ	FZ	FP	V	V1	Kg	V	V1	Kg	V	V1	Kg	V	V1	Kg
321 L3	1104	904	904	904	3120	2820	2720	2720	343	80	55	-	-	-	451	80	71	-	-	-
321 L4	1253	1053	1053	1053	3180	2880	2780	2780	315	80	35	313	60	28	375	80	48	363	60	34

	P180		P200		P225		P250	
	E	P	E	P	E	P	E	P
321 L4	195	350	186	400	216	450	216	550



PC

V

FV

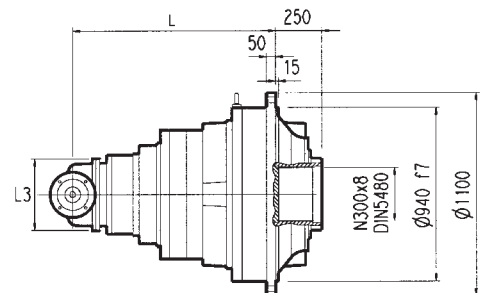
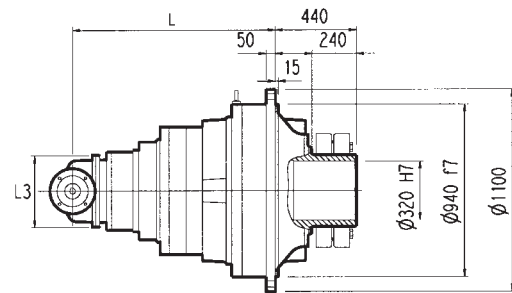
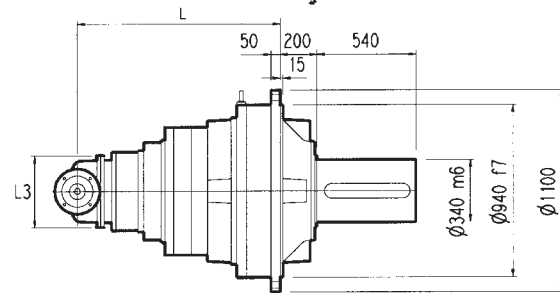
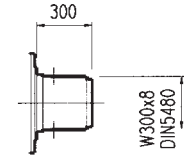
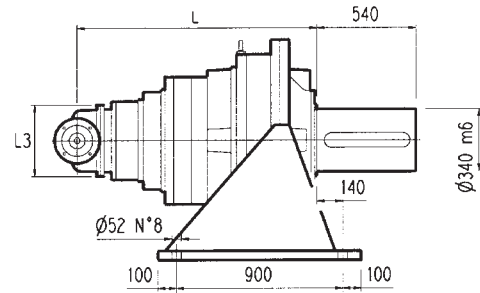
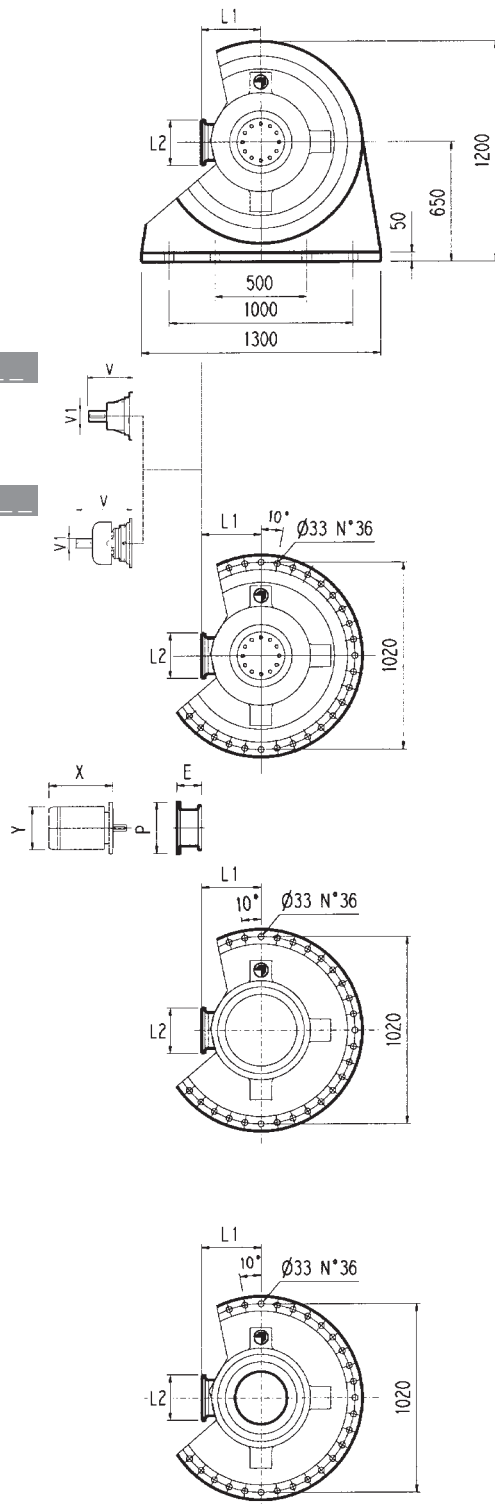
HZ

PZ

HC

FP

FZ

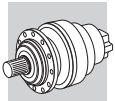


FP

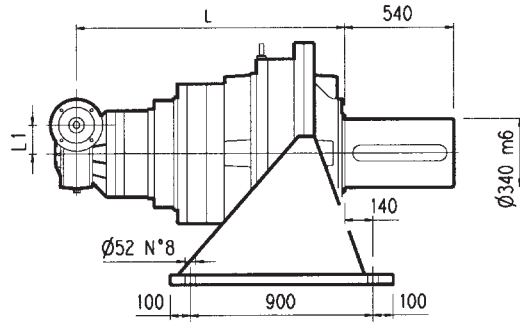
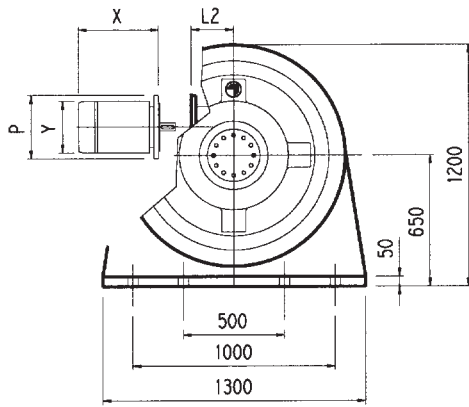
$M_{2\max} = 648000 \text{ Nm}$

	L				L1	L2	L3																
	PC-PZ	HC-HZ	FZ	FP				PC-PZ	HC-HZ	FZ	FP	V	V1		V	V1		V	V1		V	V1	
321 R4 (B)	1334	1134	1134	1134	345	292	400	3250	2950	2850	2850	307	60	23	-	-	-	357	60	28	-	-	-
321 R4 (C)	1334	1134	1134	1134	390	292	480	3260	2960	2860	2860	307	60	23	-	-	-	357	60	28	-	-	-

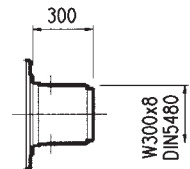
	P132		P160		P180		P200		P225		P250	
	E	P	E	P	E	P	E	P	E	P	E	P
321 R4 (B)	-	-	-	-	152	350	182	400	212	450	193	550
321 R4 (C)	-	-	-	-	152	350	182	400	212	450	193	550



3/V 21 L4

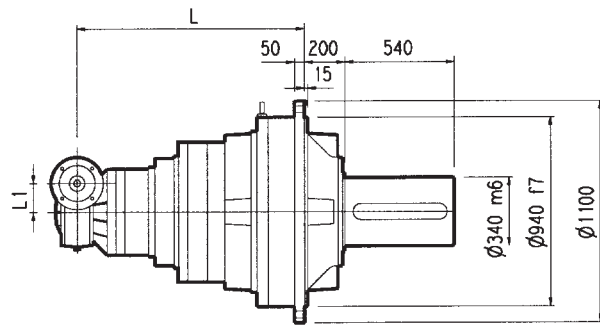
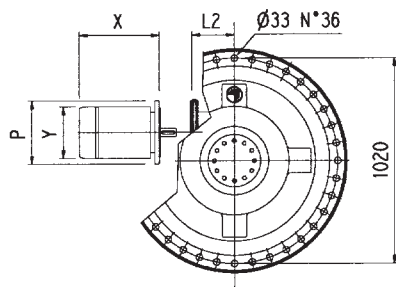


PC

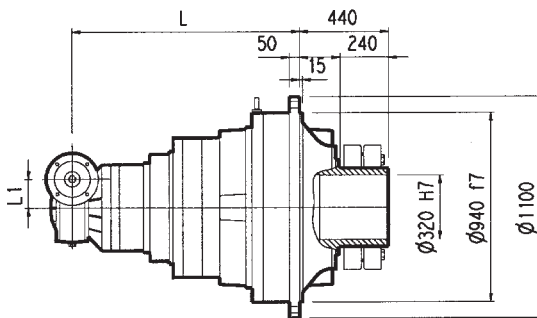
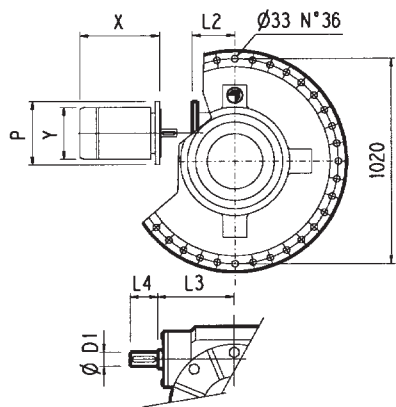


HZ

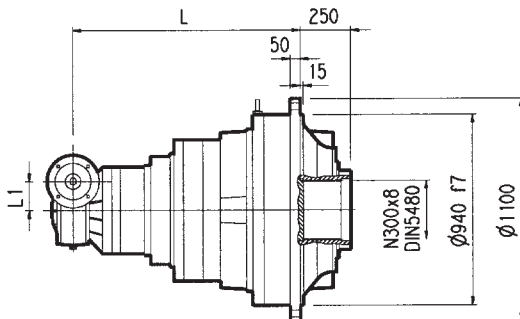
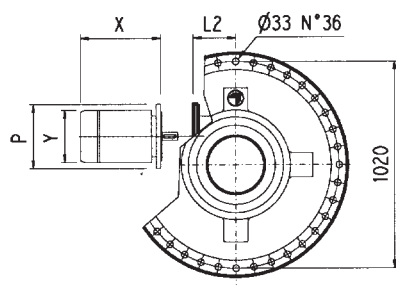
PZ



HC



FP

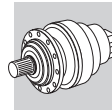


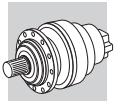
FZ

FP

$M_{2max} = 648000 \text{ Nm}$

	L				L1	L2	D1	L3	L4		Kg			
	PC - PZ	HC - HZ	FZ	FP							PC - PZ	HC - HZ	FZ	FP
3/V 21 L4	1374	1174	1174	1174	250	-	55	276	110		3430	3130	3030	3030
	P132		P160		P180		P200		P225					
	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P	L2	P
3/V 21 L4	531	300	506	350	506	350	531	400	536	450				





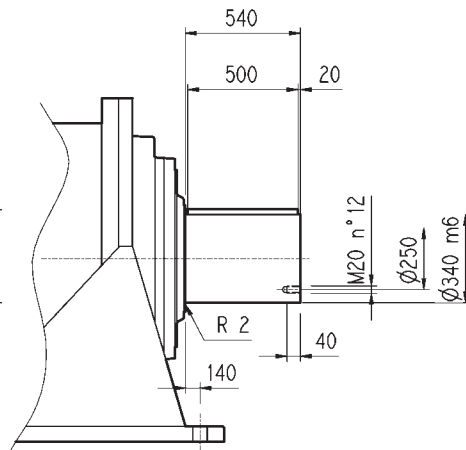
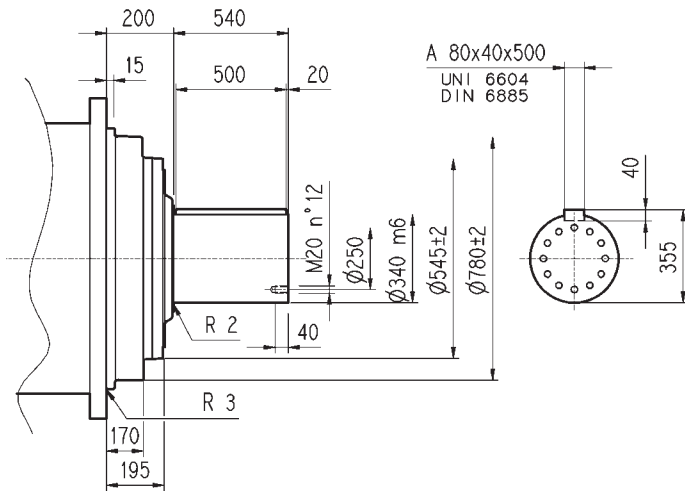
321 L

321 R

3/V 21 L4

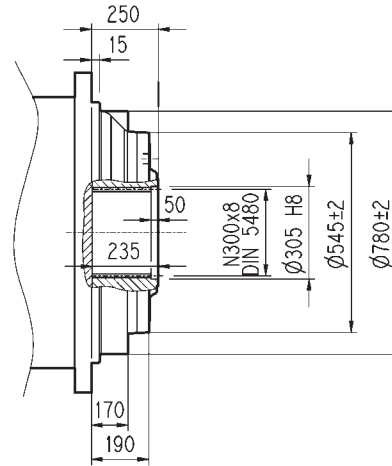
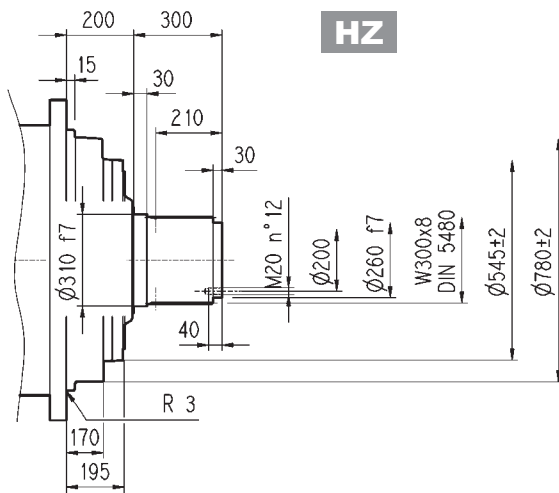
HC

PC

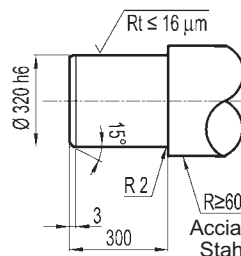
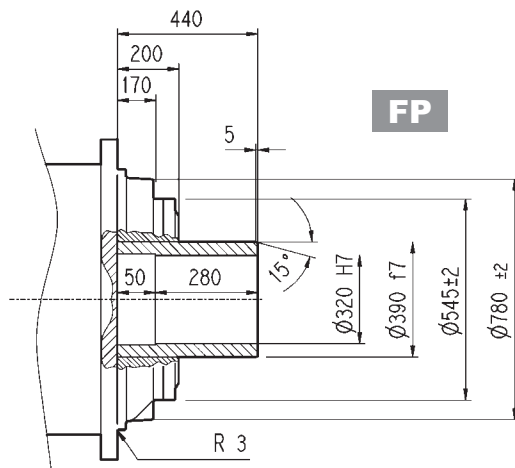


HZ

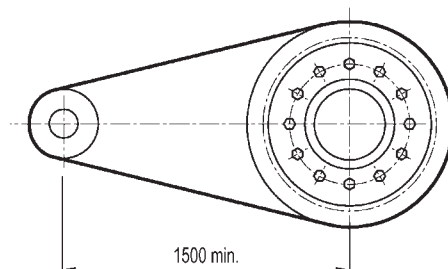
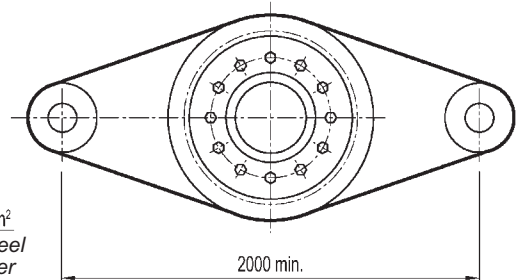
FZ



FP

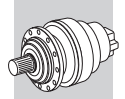


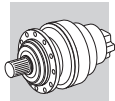
$R_{\geq 60} \text{ daN/mm}^2$
Acciaio / Steel
Stahl / Acier



FP

$M_{2\max} = 648000 \text{ Nm}$

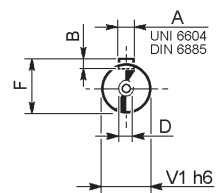
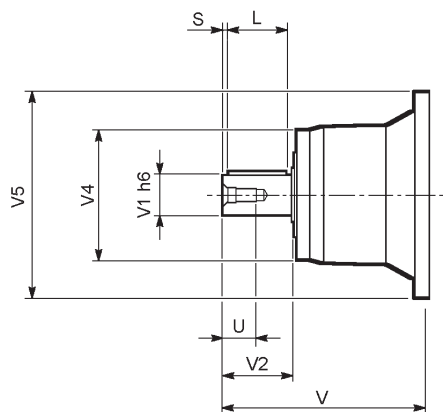




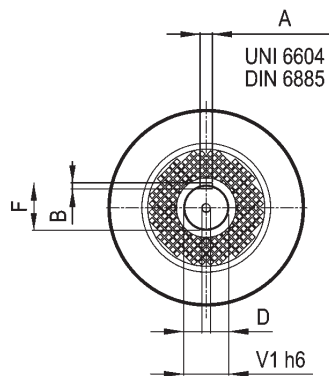
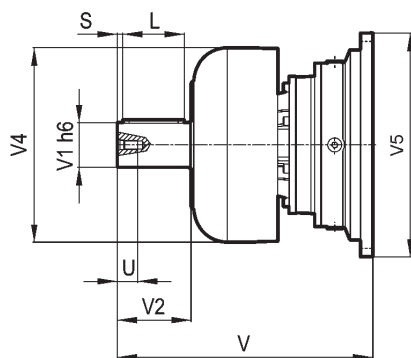
321 L

321 R

V _ _

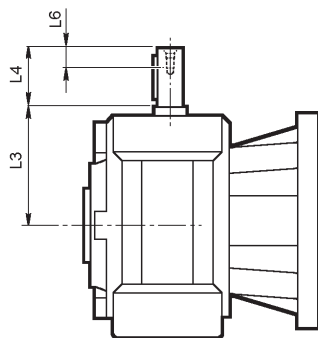
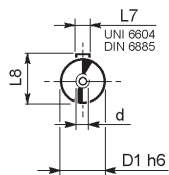


FV _ _

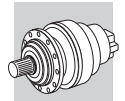


	input	V	V1	V2	V4	V5	A	B	F	L	S	D	U
321 L3	V11B	343	80	130	200	445	22	14	85	110	10	M16	36
	FV11B	451	80	130	347.5	445	22	14	85	110	10	M16	36
321 L4	V07B	315	80	130	200	345	22	14	85	110	10	M16	36
	FV07B	375	80	130	347.5	348	22	14	85	110	10	M16	36
	V07A	313	60	105	155	345	18	11	64	90	7.5	M16	36
	FV07A	363	60	105	309	348	18	11	64	90	7.5	M16	36
321 R4 (B) (C)	V06B	307	60	105	155	292	18	11	64	90	7.5	M16	36
	FV06B	357	60	105	309	292	18	11	64	90	7.5	M16	36

3/V 21 L4



	D1 h6	L3	L4	L6	L7	L8	d
3/V 21 L4 HS	55	276	110	40	16	59	M16

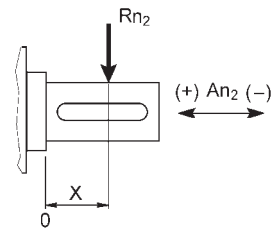
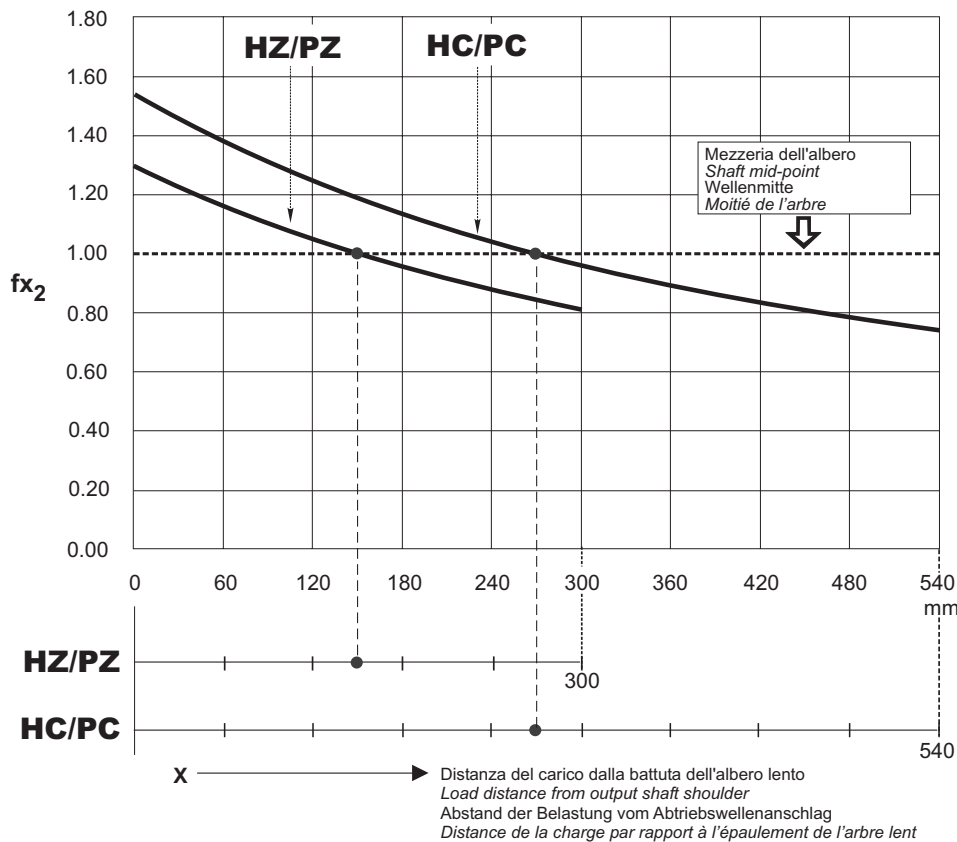


Fattore di posizione per carichi radiali sugli alberi in uscita.

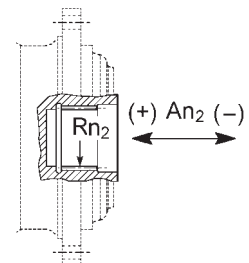
Load location factor for radial loading on output shaft.

Positionsfaktor für Radialkräfte an der Abtriebswelle.

Facteur de position pour charges radiales sur les arbres en sortie.



$R_{x2} = R_{n2} \cdot f_{x2}$		
$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
HZ/PZ	0.20	0.26
HC/PC	0.23	0.31



$An_2 (\pm) = R_{n2} \cdot fa_2 (\pm)$		
	$fa_2 (+)$	$fa_2 (-)$
FZ	0.15	0.15

Carichi radiali ammissibili sull'albero veloce per $n_1 = 1000 \text{ min}^{-1}$ e 10000 h di vita teorica.

Per velocità di comando e/o durate diverse vedi il capitolo: Verifiche.

Permitted overhung loads on input shaft when $n_1 = 1000 \text{ min}^{-1}$ and theoretical lifetime = 10000 h.

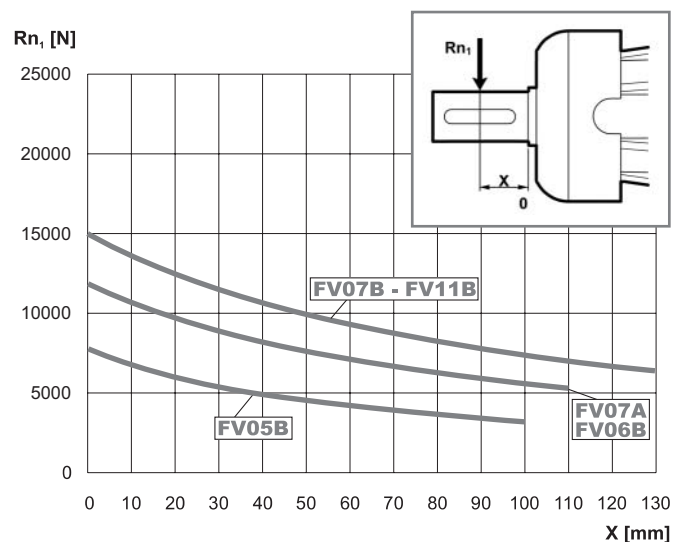
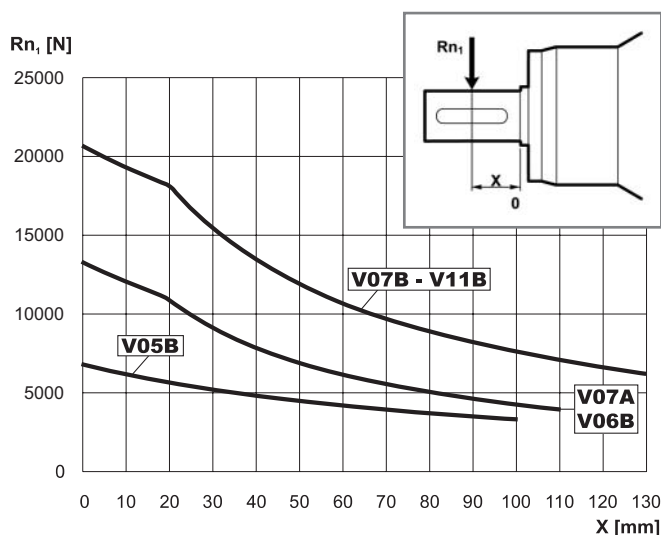
For drive speed and/or lifetimes other than those specified here, see Chapter: Verifications.

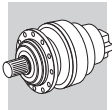
Zulässige Radialkräfte an den Antriebswellen für $n_1 = 1000 \text{ min}^{-1}$ und 10000 std.

Im Hinblick auf Geschwindigkeit und/oder anderweitige Dauern verweisen wir auf Par: Prüfungen

Charges radiales admissibles sur les arbres d'entrée pour $n_1 = 1000 \text{ min}^{-1}$ et 10000 h.

Pour des vitesses et/ou durées différentes, voir par. Vérifications.





29.0 - SISTEMI AUSILIARI DI RAFFREDDAMENTO

Qualora la potenza meccanica trasmessa sia superiore a quella termica trasmissibile (vedi tabelle dati tecnici motoriduttori e riduttori), è possibile fornire il riduttore corredato di centralina di raffreddamento.

29.0 - SUPPLEMENTARY COOLING SYSTEMS

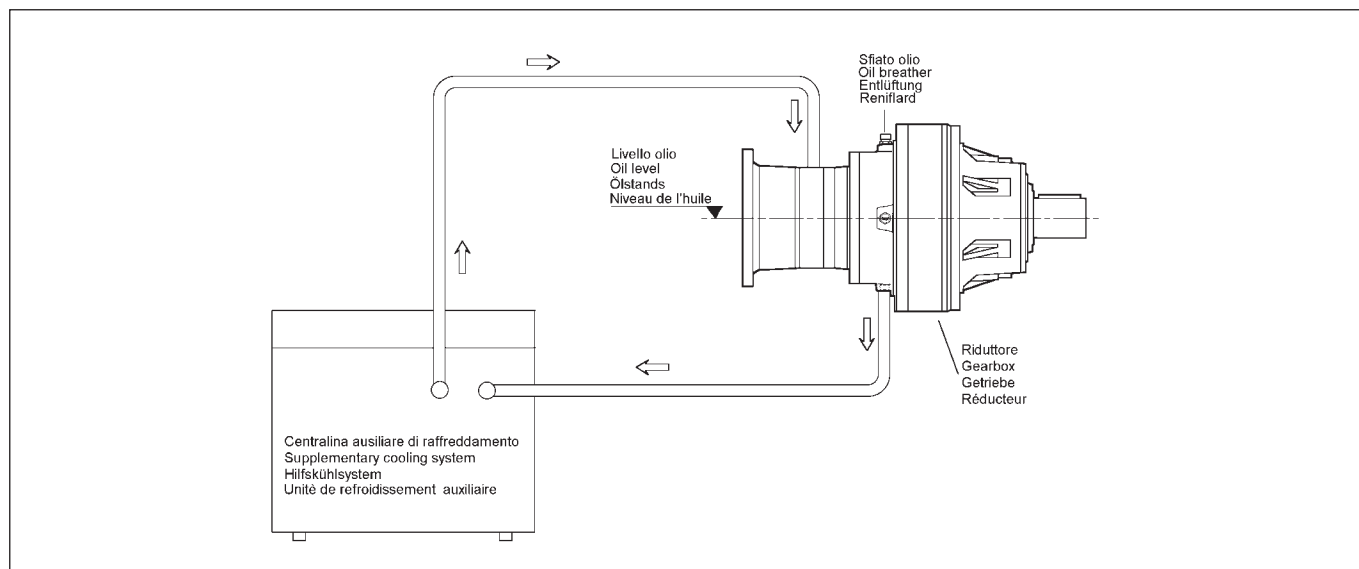
Should the transmitted mechanical power be greater than the thermal capacity the unit is rated for, supplementary cooling systems can be specified.

29.0 - HILFSKÜHLSYSTEME

Sollte die übertragende mechanische Leistung über der übertragbaren Wärmeleistung liegen (siehe Tabelle mit technischen Getriebedaten), ist die Lieferung eines, mit einem Kühlsystem ausgestatteten Getriebe möglich.

29.0 - SYSTEMES AUXILIAIRES DE REFROIDISSEMENT

Au cas où la puissance mécanique transmise serait supérieure à celle thermique transmissible (confronter tableaux données techniques réducteurs), il est possible de d'équiper le réducteur d'une unité de refroidissement.



Le centraline autonome di raffreddamento sono unità composte da uno scambiatore di calore aria-olio, una motopompa, un filtro dell'olio da raffreddare, un elettroventilatore ed un impianto elettrico comprendente la protezione termica dei motori elettrici. Caratteristica delle centraline è il basso livello di rumorosità.

Independent cooling systems are made up of an air-oil heat exchanger, a motor pump, a filter and an electric system that incorporates a thermostatic sensor that protects the electric motor.

Cooling units are particularly quite in operation.

Die autonomen Kühlsysteme sind Einheiten, die sich aus einem Luft-Öl-Wärmeaustauscher, einer Motorpumpe, einem Filter für das zu kühlende Öl, einem Elektroventilator und einer elektrischen Anlage, welche den Wärmeschutz der Elektromotoren enthält, zusammensetzen.

Les unités indépendantes de refroidissement sont des sous-ensembles se composant d'un échangeur de chaleur air/huile, d'une motopompe, d'un filtre pour l'huile à refroidir, d'un électroventilateur et d'un système électrique incluant une protection thermique des moteurs électriques. Cette unité est caractérisée par un bas niveau de nuisance sonore.

29.1 Dati tecnici

29.1 Technical data

29.1 Technische daten

29.1 Donnée techniques

		CR1	CR2	CR3
Potenza assorbita / Absorbed power Leistungsaufn / Puissance absorbée	[kW]	0.55	0.75	1.1
Portata pompa / Oil flow rate Pumpeausflussmenge / Débit de pompe	[l/min]	13	22	34
Portata aria / Air flow rate Luftausflussmenge / Débit d'air	[m³/h]	850	1500	2000
Livello di rumorosità a 1 metro / Noise level at 1m Geräuschpegel / Niveau sonore à 1 mètre	[dB(A)]	68	70	75
Peso / Weight Gewicht / Poids	[Kg]	24	36	58

29.2 Criteri di scelta

29.2 Selection criteria

29.2 Auswahlkriterien

29.2 Critères de sélection

Nota la potenza da trasmettere P e verificato che questa sia superiore alla potenza termica Pt, calcolare la potenza da smaltire Ps con la formula:

If the mechanical power P is greater than the thermal rating Pt, the heating to be dissipated [Ps] can be calculated through the following equation:

Hat man einmal die Date der zu übertragenden Leistung P zur Verfügung stehen und überprüft, ob diese über der Wärmeleistung Pt liegt, muß man die Überleistung Ps unter Anwendung der folgenden Formel berechnen:

La puissance P à transmettre connue, et une fois vérifié que celle-ci est supérieure à la puissance thermique Pt, calculer la puissance à éliminer Ps par la formule :

$$P_s = 0.1 \times (P_{r1} - P_t)$$

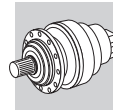
(28)

Selezionare la grandezza della centralina sul diagramma (D01)

Select cooling system size in chart (D01) according to ambi-

Die Größe des Systems auf dem Diagramm (D01) in Anbetracht

Sélectionner la taille de l'unité sur le diagramme (D01), se rap-



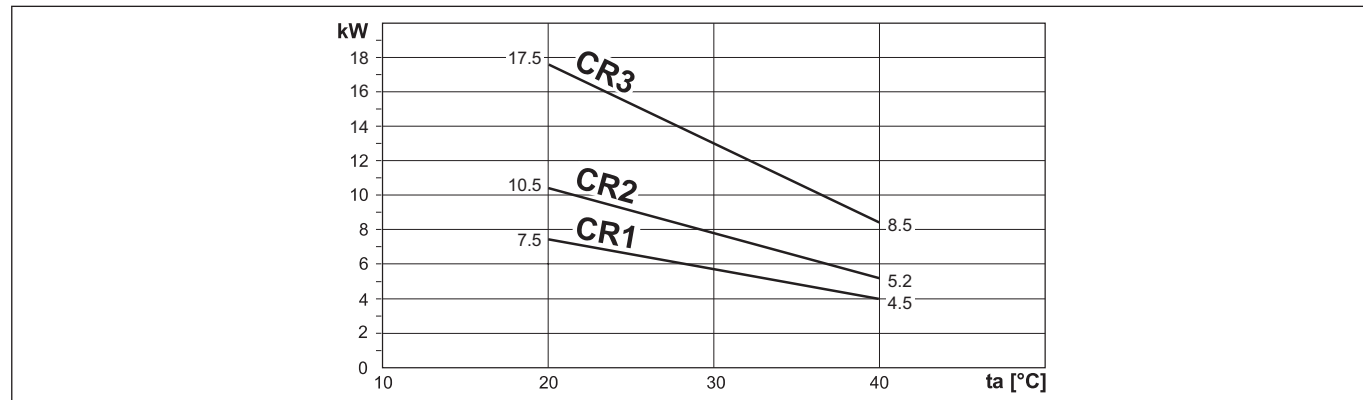
in funzione della temperatura ambiente t_a (20° - 40°C). Verificare che la centralina sia installabile sul riduttore selezionato (vedi tabella D02). In caso contrario, contattare la ns. Organizzazione di vendita.

ent temperature t_a (20° - 40°C). Check that the cooling system you have selected will fit the gearbox (see table D02). If this is not the case, contact our sales organization.

der Umgebungstemperatur t_a (20° - 40°C) auswählen. Überprüfen, ob die Zentrale auch auf dem ausgewählten Getriebe installierbar ist (siehe Tabelle D02). Ist dies nicht der Fall, müssen Sie sich mit unserem Verkaufsnetz in Verbindung setzen.

portant à la température ambiante (20° - 40°C). Veiller à ce que l'unité puisse être installée sur le réducteur sélectionné (voir tableau D02). Vice versa, contacter notre réseau de vente.

(D01)



(D02)

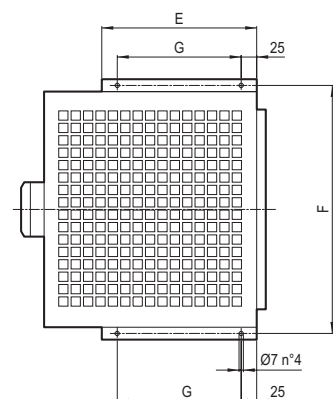
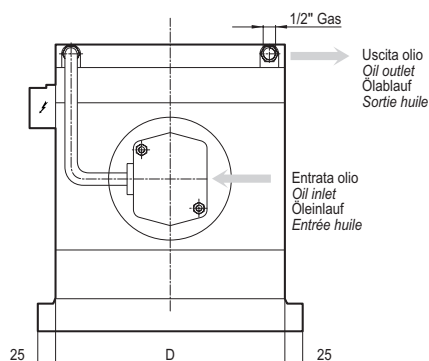
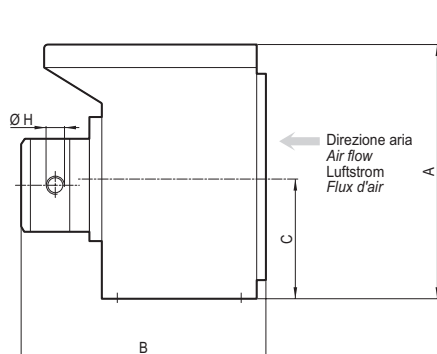
Riduttore / Gearbox Getriebe / Réducteur	L1	L2	L3	L4	R2	R3	R4
306	CR1	CR1	—	—	—	—	—
307	CR1	CR1	—	—	CR1	—	—
309	CR1	CR1	CR1	—	CR1	—	—
310	CR2	CR1	CR1	—	—	CR1	—
311	CR2	CR1	CR1	—	CR1	CR1	—
313	CR2	CR1	CR1	—	CR1	CR1	—
314	CR2	CR1	CR1	—	CR1	CR1	—
315	CR3	CR2	CR1	—	CR1	CR1	—
316	CR3	CR2	CR1	—	CR1	CR1	—
317	CR3	CR2	CR2	CR1	—	—	—
318	CR3	CR2	CR2	CR1	—	—	—
319	CR3	CR2	CR2	CR1	—	—	—
321	CR3	CR2	CR2	CR2	—	—	—

29.3 Dimensioni

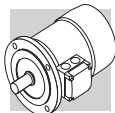
29.3 Dimensions

29.3 Abmessungen

29.3 Dimensions



	A	B	C	D	E	F	G	H
CR1	410	395	193	370	250	400	200	1/2" Gas
CR2	450	405	203	470	250	500	200	3/4" Gas
CR3	495	455	225	520	290	550	240	3/4" Gas



MOTORI ELETTRICI

ELECTRIC MOTORS

ELEKTROMOTOREN

MOTEURS ELECTRIQUES

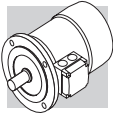
M1 - SIMBOLOGIA E UNITÀ DI MISURA

M1 - SYMBOLS AND UNITS OF MEASUREMENT

M1 - SYMBOLE UND MAßEINHEITEN

M1 - SYMBOLES ET UNITES DE MESURE

Simb. Symb.	U.m. Einheit	Descrizione	Description	Beschreibung	Description
$\cos\varphi$	—	Fattore di potenza	Power factor	Leistungsfaktor	Facteur de puissance
η	—	Rendimento	Efficiency	Wirkungsgrad	Rendement
f_m	—	Fattore correttivo della potenza	Power adjusting factor	Leistungskorrekturfaktor	Facteur de correction de la puissance
I	—	Rapporto di intermittenza	Cyclic duration factor	Relative Einschaltdauer	Rapport d'intermittence
I_N	[A]	Corrente nominale	Rated current	Nennstrom	Courant nominal
I_S	[A]	Corrente di spunto	Locked rotor current	Kurzschlußstrom	Courant de démarrage
J_C	[Kgm ²]	Momento di inerzia del carico	Load moment of inertia	Massenträgheitsmoment der externen Massen	Moment d'inertie de la charge
J_M	[Kgm ²]	Momento di inerzia motore	Moment of inertia	Trägheitsmoment	Moment d'inertie du moteur
K_C	—	Fattore di coppia	Torque factor	Drehmomentfaktor	Facteur de couple
K_d	—	Fattore di carico	Load factor	Lastfaktor	Facteur de charge
K_J	—	Fattore di inerzia	Inertia factor	Trägheitsfaktor	Facteur d'inertie
M_A	[Nm]	Coppia accelerante media	Mean breakaway torque	Losbrechmoment	Couple d'accélération moyen
M_B	[Nm]	Coppia frenante	Brake torque	Bremsemoment	Couple du frein
M_N	[Nm]	Coppia nominale	Rated torque	Nennmoment	Couple nominal
M_L	[Nm]	Coppia resistente media	Counter-torque during acceleration	Lastmoment	Couple résistant moyen
M_S	[Nm]	Coppia di spunto	Starting torque	Startmoment	Couple de démarrage
n	[min ⁻¹]	Velocità nominale	Rated speed	Nenndrehzahl	Vitesse nominale
P_B	[W]	Potenza assorbita dal freno a 20°C	Power drawn by the brake at 20°C	Leistungsaufnahme der Bremse bei 20°C	Puissance absorbée par le frein à 20°C
P_n	[kW]	Potenza nominale	Motor rated power	Nennleistung	Puissance nominale
P_r	[kW]	Potenza richiesta	Required power	Benötigte Leistung	Puissance nécessaire
t_1	[ms]	Ritardo di sblocco del freno con alimentatore a semionda	Brake response time with one-way rectifier	Ansprechzeit Bremse mit Einweg-Gleichrichter	Temps de déblocage du frein avec alimentation à demi-onde
t_{1s}	[ms]	Tempo di sblocco del freno con alimentatore a controllo elettronico	Brake response time with electronic-controlled rectifier	Ansprechzeit Bremse mit elektronisch gesteuertem Gleichrichter	Temps de déblocage du frein avec alimentation à contrôle électronique
t_2	[ms]	Ritardo di frenatura con disgiunzione lato c.a.	Brake reaction time with a.c. disconnect	Einfallzeit Bremse bei Unterbrechung der Stromversorgung WS	Retard de freinage avec coupure coté c.a.
t_{2c}	[ms]	Ritardo di frenatura con disgiunzione circuito c.a. e c.c.	Brake reaction time with a.c. and d.c. disconnect	Einfallzeit Bremse bei Unterbrechung der Stromversorgung WS und GS	Retard de freinage avec coupure coté c.a. et c.c.
t_a	[°C]	Temperatura ambiente	Ambient temperature	Umgebungstemperatur	Température ambiante
t_f	[min]	Tempo di funzionamento a carico costante	Work time at constant load	Betriebsdauer unter Nennbelastung	Temps de fonctionnement à charge constante
t_r	[min]	Tempo di riposo	Rest time	Aussetzzeit	Temps de repos
W	[J]	Lavoro di frenatura accumulato tra due regolazioni del traferro	Braking work between service interval	Bremsenergie zwischen zwei Einstellungen	Energie de freinage accumulée entre deux réglages de l'entrefer
W_{max}	[J]	Energia massima per singola frenatura	Maximum brake work for each braking	Max. Bremsarbeit pro Bremsvorgang	Energie maxi par freinage
Z	[1/h]	N° di avviamenti ammissibili, a carico	Permissible starting frequency, loaded	Schalthäufigkeit Nennbetrieb	Nombre de démarrages admissibles en charge
Z_0	[1/h]	N° di avviamenti ammissibili a vuoto (I = 50%)	Max. permissible unloaded starting frequency (I = 50%)	Max. Schalthäufigkeit im Leerlauf (relative Einschalt-dauer I = 50%)	Nombre de démarrages admissible à vide (I = 50%)



M2 - CARATTERISTICHE GENERALI

Programma di produzione

I motori elettrici asincroni trifase del programma di produzione della BONFIGLIOLI RIDUTTORI sono previsti nelle forme costruttive base IMB5, IMB14 e loro derivate con le seguenti polarità: 2, 4, 6, 2/4, 2/6, 2/8, 2/12. Nel presente catalogo sono evidenziate inoltre, le caratteristiche tecniche dei motori in versione integrata, tipo M.

M2 - GENERAL CHARACTERISTICS

Production range

The asynchronous three-phase electric motors of BONFIGLIOLI RIDUTTORI's production, are available in basic designs IMB5 and IMB14 and derived versions, with the following polarities: 2, 4, 6, 2/4, 2/6, 2/8, 2/12. The technical characteristics of compact motors, M type, are also supplied in this manual.

M2 - ALLGEMEINE EIGENSCHAFTEN

Produktprogramm

Die Dreiphasen-Asynchronmotoren aus dem Produktprogramm von BONFIGLIOLI RIDUTTORI gibt es in den Grundbauformen IMB5, IMB14 und deren Ableitungen mit folgenden Polzahlen: 2, 4, 6, 2/4, 2/6, 2/8 und 2/12. Im vorliegenden Katalog sind außerdem die technischen Eigenschaften der Motoren in Kompaktausführung hervorgehoben.

M2 - CARACTERISTIQUES GENERALES

Programme de production

Les moteurs électriques asynchrones triphasés du programme de production de BONFIGLIOLI RIDUTTORI sont prévus dans les formes de construction de base IMB5, IMB14 et leur dérivés avec les polarités suivantes: 2, 4, 6, 2/4, 2/6, 2/8, 2/12. Dans le présent catalogue sont également mises en évidence les caractéristiques techniques des moteurs en version compacte, type M.

Normative

I motori descritti in questo catalogo sono costruiti in accordo alle Norme ed unificazioni applicabili evidenziate nella tabella seguente.

Standards

The motors described in this catalogue are manufactured to the applicable standards shown in the following table.

Normen

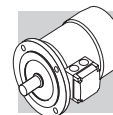
Die in diesem Katalog beschriebenen Motoren sind in Übereinstimmung mit den in der folgenden Tabelle angegebenen einschlägigen Normen und Vereinheitlichungsrichtlinien konstruiert worden.

Réglementations

Les moteurs décrits dans ce catalogue sont construits en accord avec les Normes et standardisations applicables mises en évidence dans le tableau ci-dessous.

(A26)

Titolo / Title / Titel / Titre	CEI	IEC
Prescrizioni generali per macchine elettriche rotanti <i>General requirements for rotating electrical machines</i> Allgemeine Vorschriften für umlaufende elektrische Maschinen <i>Prescriptions générales pour machines électriques tournantes</i>	CEI EN 60034-1	IEC 60034-1
Marcatura dei terminali e senso di rotazione per macchine elettriche rotanti <i>Terminal markings and direction of rotation of rotating machines</i> Kennzeichnung der Anschlußklemmen und Drehrichtung von umlaufenden elektrischen Maschinen <i>Définitions des bornes et sens de rotation pour machines électriques tournantes</i>	CEI 2-8	IEC 60034-8
Metodi di raffreddamento delle macchine elettriche <i>Methods of cooling for electrical machines</i> Verfahren zur Kühlung von elektrischen Maschinen <i>Méthodes de refroidissement des machines électriques</i>	CEI EN 60034-6	IEC 60034-6
Dimensioni e potenze nominali per macchine elettriche rotanti <i>Dimensions and output ratings for rotating electrical machines</i> Auslegung der Nennleistung von umlaufenden elektrischen Maschinen <i>Dimensions, puissances nominales pour machines électriques tournantes</i>	EN 50347	IEC 60072
Classificazione dei gradi di protezione delle macchine elettriche rotanti <i>Classification of degree of protection provided by enclosures for rotating machines</i> Klassifizierung der Schutzart von umlaufenden elektrischen Maschinen <i>Classification des degrés de protection des machines électriques tournantes</i>	CEI EN 60034-5	IEC 60034-5
Limiti di rumorosità <i>Noise limits</i> Geräuschgrenzwerte <i>Limites de bruit</i>	CEI EN 60034-9	IEC 60034-9
Sigle di designazione delle forme costruttive e dei tipi di installazione <i>Classification of type of construction and mounting arrangements</i> Abkürzungen zur Kennzeichnung der Bauform und der Einbaulagen <i>Sigles de dénomination des formes de construction et des types d'installation</i>	CEI EN 60034-7	IEC 60034-7
Tensione nominale per i sistemi di distribuzione pubblica dell'energia elettrica a bassa tensione <i>Rated voltage for low voltage mains power</i> Nennspannung für öffentliche NS-Stromverteilungssysteme <i>Tension nominale pour les systèmes de distribution publique de l'énergie électrique en basse tension</i>	CEI 8-6	IEC 60038
Grado di vibrazione delle macchine elettriche <i>Vibration level of electric machines</i> Schwingstärke bei elektrischen Maschinen <i>Degré de vibration des machines électriques</i>	CEI EN 60034-14	IEC 60034-14



I motori corrispondono inoltre alle Norme straniere adeguate alle IEC 60034-1 e qui riportate.

The motors also comply with foreign standards adapted to IEC 60034-1 as shown here below.

Die Motoren entsprechen außerdem den an die IEC-Norm 60034-1 angepaßten ausländischen Normen, die in der folgenden Tabelle genannt werden.

En outre, les moteurs correspondent aux Normes étrangères adaptées aux IEC 60034-1 indiquées dans le tableau ci-dessous.

(A27)

DIN VDE 0530	Germania	Germany	Deutschland	Allemagne
BS5000 / BS4999	Gran Bretagna	Great Britain	Großbritannien	Grande Bretagne
AS 1359	Australia	Australia	Australien	Australie
NBNC 51 - 101	Belgio	Belgium	Belgien	Belgique
NEK - IEC 34	Norvegia	Norway	Norwegen	Norvège
NF C 51	Francia	France	Frankreich	France
OEVE M 10	Austria	Austria	Österreich	Autriche
SEV 3009	Svizzera	Switzerland	Schweiz	Suisse
NEN 3173	Paesi Bassi	Netherlands	Niederlande	Pays Bas
SS 426 01 01	Svezia	Sweden	Schweden	Suède

CUS

MOTORI PER USA E CANADA

I motori BN ed M sono disponibili in esecuzione NEMA Design C (per le caratteristiche elettriche), certificata in conformità alle norme CSA (Canadian Standard) C22.2 N° 100 e UL (Underwriters Laboratory) UL 1004 con targhetta riportante entrambi i marchi sotto illustrati, specificare in questo caso l'opzione CUS.

MOTORS FOR USA AND CANADA

BN and M motors are available in NEMA Design C configuration (concerning electrical characteristics), certified to CSA (Canadian standard) C22.2 No. 100 and UL (Underwriters Laboratory) UL 1004. By specifying the option CUS the name plate is marked with both symbols shown here below.

MOTOREN FÜR DIE USA UND KANADA

Die BN/M-Motoren sind in der Ausführung NEMA, Design C (aufgrund der elektrischen Eigenschaften), den Normen CSA (Canadian Standard) C22.2 Nr 100 und UL (Underwriters Laboratory) UL 1004 gemäß zertifiziert. Durch Spezifizieren der Option CUS wird das Typenschild mit den nachstehend aufgeführten Symbolen gekennzeichnet.

MOTEURS POUR ETATS-UNIS ET CANADA

Les moteurs BN et M sont disponibles en exécution NEMA Design C (pour les caractéristiques électriques), certifiée conforme aux normes CSA (Canadian Standard) C22.2 N°100 et UL (Underwriters Laboratory) UL 1004 avec une plaque signalétique indiquant chacun des symboles ci-dessous, dans ce cas, spécifier l'option CUS.



Le tensioni delle reti di distribuzione americane e le corrispondenti tensioni nominali da specificare per il motore sono indicate nella tabella seguente:

US power mains voltages and the corresponding rated voltages to be specified for the motor are indicated in the following table:

Die Spannungen der amerikanischen Verteilernetze und die entsprechenden tens-Nennspannungen, die bei den Motoren angegeben werden müssen, können der folgenden Tabelle entnommen werden:

Les tensions des réseaux de distribution américains ainsi que les tensions nominales à spécifier par le moteur sont indiquées dans le tableau suivant :

(A28)

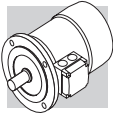
Frequenza / Frequency Frequenz / Fréquence	Tensione di rete / Mains voltage Netzspannung / Tension de réseau	V _{mot}
60 Hz	208 V	200 V
	240 V	230 V
	480 V	460 V
	600 V	575 V

I motori dotati di collegamento YY/Y (es. 230/460-60; 220/440-60) presentano di serie una morsettiera a 9 terminali.

Motors with YY/Y connection (e.g. 230/460-60; 220/440-60) feature, as standard, a 9-stud terminal board. For same exe-

Motoren mit YY/Y-Anschluss (z.B. 230/460-60; 220/440-60) sind standardmäßig mit 9 Pins auf dem Klemmbrett ausgeführt.

Les moteurs avec connexion YY/Y (ex. 230/460-60; 220/440-60) présentent, en standard, une plaque à borne avec 9 bornes. Pour les me-



Per le stesse esecuzioni, e inoltre per l'alimentazione 575V-60Hz, la potenza di targa corrisponde a quella normalizzata a 50Hz.

Per i motori autofrenanti con freno in c.c. tipo BN_FD l'alimentazione del raddrizzatore è da morsetti motore con tensione 230V a.c. monofase.

Per i motori autofrenanti l'alimentazione del freno è così predisposta:

cutions, as well as for 575V-60Hz supply, the nominal rating is coincident with the corresponding 50Hz rating.

For DC brake motors type BN_FD, the rectifier is connected to a single-phase 230 VAC supply voltage in the motor terminal box.

Brake power supply for brake motors is as follows:

Für gleiche Ausführungen, ebenso wie für 575V-60Hz, die Nennleistung ist gleich mit der entsprechenden 50 Hz-Leistung. Für Bremsmotoren mit Gleichstrombremse vom Typ BN_FD erfolgt die Versorgung des Gleichrichters über den Motorklemmenkasten mit einer Spannung von 230V (einphasiger Wechselstrom). Bei Bremsmotoren stellt sich die **Versorgung der Bremse** wie folgt dar:

mes executions, et aussi pour l'alimentation 575V-60Hz, la puissance de plaque correspond à celle normalisée à 50Hz.

Pour les moteurs frein avec frein en c.c. type BN_FD, l'alimentation du redresseur provient de la boîte à bornes moteur avec une tension 230V c.a. monophasée. Pour les moteurs frein l'alimentation du frein est la suivante :

BN_FD M_FD	BN_FA ; BN_BA M_FA	Specificare / Specify Bitte angeben / Spécifier
Da morsetti motore 1~230V c.a. <i>Wired to terminal box 1~230V a.c.</i> Vom Motorklemmenkasten 1~230V W.S. <i>Depuis boîte à bornes moteur 1~230V c.a.</i>	Alimentazione separata / <i>Separate power supply</i> Fremdversorgung / <i>Alimentation séparée</i> 230V Δ - 60Hz	230SA
	Alimentazione separata / <i>Separate power supply</i> Fremdversorgung / <i>Alimentation séparée</i> 460V Y - 60Hz	460SA

L'opzione CUS non è applicabile ai motori dotati di servoventilazione.

The option CUS does not apply to servo-ventilated motors.

Die CUS-Option ist für die Fremdlüftermotoren nicht anwendbar.

L'option CUS n'est pas applicable aux moteurs doués de ventilation forcée.

Direttive 2006/95/CE (LVD) e 2004/108/CE (EMC)

I motori delle serie BN ed M sono conformi ai requisiti delle Direttive 2006/95/CE (Direttiva Bassa Tensione) e 2004/108/CE (Direttiva Compatibilità Elettromagnetica), e riportano in targa la marcatura CE.

Per quanto riguarda la Direttiva EMC, la costruzione è in accordo alle Norme CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

I motori con freno in c.c. tipo FD, se corredati dell'opportuno filtro capacitivo in ingresso al raddrizzatore (opzione **CF**), rientrano nei limiti di emissione previsti dalla Norma EN 61000-6-3 "Compatibilità elettromagnetica - Norma Generica sull'emissione - Parte 1: Ambienti residenziali, commerciali e dell'industria leggera". I motori soddisfano inoltre le prescrizioni della Norma CEI EN 60204-1 "Equipaggiamento elettrico delle macchine".

È responsabilità del costruttore o dell'assemblatore dell'apparecchiatura che incorpora i motori come componenti garantire la sicurezza e la conformità alle direttive del prodotto finale.

Directives 2006/95/EC (LVD) and 2004/108/EC (EMC)

BN motors meet the requirements of Directives 2006/95/EC (Low Voltage Directive) and 2004/108/EC (Electromagnetic Compatibility Directive) and their name plates bear the CE mark. As for the EMC Directive, construction is in accordance with standards CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

Motors with FD brakes, when fitted with the suitable capacitive filter at rectifier input (option CF), meet the emission limits required by Standard EN 61000-6-3 "Electromagnetic compatibility - Generic Emission Standard - Part 1: Residential, commercial and light industrial environment".

Motors also meet the requirements of standard CEI EN 60204-1 "Electrical equipment of machines".

The responsibility for final product safety and compliance with applicable directives rests with the manufacturer or the assembler who incorporate the motors as component parts.

Richtlinien 2006/95/EG (LVD) und 2004/108/EG (EMC)

Die Motoren der Serie BN entsprechen den Anforderungen der Richtlinien 2006/95/EG (Richtlinie - Niederspannung) und 2004/108/EG (Richtlinie - elektromagnetische Kompatibilität) und sind mit dem CE-Zeichen ausgestattet.

Im Hinblick auf die Richtlinie EMC entspricht die Konstruktion den Normen CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

Die Motoren mit dem Bremstyp FD fallen, falls mit dem entsprechenden kapazitiven Filter am Eingang des Gleichrichters ausgestattet (Option **CF**), unter die Emissionsgrenzwerte, die von der Norm EN 61000-6-3 "Elektromagnetische Kompatibilität - Allgemeine Norm für Emissionen - Teil 1: Wohngebiete, Handels- und Leichtinduszriezonen" vorgesehen werden.

Die Motoren entsprechen darüber hinaus den von der Norm CEI EN 60204-1 "Elektrische Maschinenausstattung" gegebenen Vorschriften.

Es liegt in der Verantwortung des Herstellers oder es Monteurs der Ausrüstung, in der die Motoren als Komponenten montiert werden, die Sicherheit und die Übereinstimmung mit den Richtlinien des Endprodukts zu gewährleisten.

Directives 2006/95/CE (LVD) et 2004/108/CE (EMC)

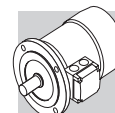
Les moteurs de la série BN sont conformes aux conditions requises par les Directives 2006/95/CE (Directive Basse Tension) et 2004/108/CE (Directive Compatibilité Electromagnétique), et le marquage CE est indiqué sur la plaque signalétique.

En ce qui concerne la Directive EMC, la fabrication répond aux Normes CEI EN 60034-1, EN 61000-6-2, EN 61000-6-4.

Les moteurs avec frein FD, s'ils sont équipés du frein capacitif approprié en entrée du redresseur (option CF), rentrent dans les limites d'émission prévues par la Norme EN 61000-6-3 "Compatibilité électromagnétique - Norme Générique sur l'émission - Partie 1 : Milieux résidentiels, commerciaux et de l'industrie légère".

Les moteurs répondent aussi aux prescriptions de la Norme CEI EN 60204-1 "Equipement électrique des machines".

Le fabricant ou le monteur de la machine qui comprend les moteurs comme composant est responsable et doit se charger de garantir la sécurité et la conformité aux directives du produit final.



Tolleranze

Secondo le Norme sono ammesse le tolleranze indicate nella tabella seguente sulle grandezze garantite.

Tolerances

As per the Norms applicable the tolerances here below apply to the following quantities.

Toleranzen

Die Normen lassen die in folgenden Tabelle genannten Toleranzen bei den garantierten Größen zu.

Tolérances

Selon les Normes, les tolérances indiquées dans le tableau ci-dessous sont admises sur les tailles garanties.

(A29)

-0.15 (1 - η) $P \leq 50$ kW	Rendimento	Efficiency	Wirkungsgrad	Rendement
$-(1 - \cos\varphi)/6$ min 0.02 max 0.07	Fattore di potenza	Power factor	Leistungsfaktor	Facteur de puissance
$\pm 20\%$ *	Scorrimento	Slip	Schlupf	Glissement
+20%	Corrente a rotore bloccato	Locked rotor current	Strom bei blockiertem Läufer	Courant à rotor bloqué
-15% +25%	Coppia a rotore bloccato	Locked rotor torque	Drehmoment bei blockiertem Läufer	Couple à rotor bloqué
-10%	Coppia max	Max. torque	Max. Drehmoment	Couple max

* $\pm 30\%$ per motori con $P_n < 1$ kW

* $\pm 30\%$ for motors with $P_n < 1$ kW

* $\pm 30\%$ für Motoren mit $P_n < 1$ kW

* $\pm 30\%$ pour moteurs avec $P_n < 1$ kW

M3 - CARATTERISTICHE MECCANICHE

Forme costruttive

I motori serie BN sono previsti nelle forme costruttive indicate in tabella (A30) secondo le Norme CEI EN 60034-14.

Le forme costruttive sono le seguenti:

IM B5 (base)
IM V1, IM V3 (derivate)
IM B14 (base)
IM V18, IM V19 (derivate)

I motori in forma costruttiva IM B5 possono essere installati nelle posizioni IM V1 e IM V3; i motori in forma costruttiva IM B14 possono essere installati nelle posizioni IM V18 e IM V19. In questi casi, sulla targa del motore sarà indicata la forma costruttiva base IM B5 o IM B14. Nelle forme costruttive dove il motore assume una posizione verticale con albero in basso, si consiglia di richiedere l'esecuzione con tettuccio parapioggia (da prevedere sempre nel caso di motori autofrenanti). Tale esecuzione, pressente nelle opzioni, va richiesta espressamente in fase di ordine in quanto non è prevista nella versione base.

M3 - MECHANICAL FEATURES

Versions

IEC-normalised BN motors are available in the design versions indicated in table (A30) as per Standards CEI EN 60034-14.

Mounting versions are:

IM B5 (basic)
IM V1, IM V3 (derived)
IM B14 (basic)
IM V18, IM V19 (derived)

IM B5 design motors can be installed in positions IM V1 and IM V3; IM B14 design motors can be installed in positions IM V18 and IM V19. In such cases, the basic design IM B5 or IM B14 is indicated on the motor name plate. In design versions with a vertically located motor and shaft downwards, it is recommended to request the drip cover (always necessary for brake motors). This facility, included in the option list should be specified when ordering as it does not come as a standard device.

M3 - MECHANISCHE EIGENSCHAFTEN

Bauformen

Die Motoren der Serie BN weisen die in der Abbildung (A30) angegebene Bauform gemäß den Normen CEI EN 60034-14 auf.

Die Bauformen sind:

IM B5 (Grundmodell)
IM V1, IM V3 (Ableitungen)
IM B14 (Grundmodell)
IM V18, IM V19 (Ableitungen)

Die Motoren mit der Bauform IM B5 können mit den Einbaulagen IM V1 und IM V3 eingebaut werden; die Motoren mit der Bauform IM B14 können mit den Einbaulagen IM V18 und IM V19 eingebaut werden. In diesen Fällen ist auf dem Leistungsschild des Motors die Bauform IM B5 oder IM B14 angegeben. Bei Bauformen mit vertikaler Lage des Motors und nach unten gerichteter Welle wird die Ausführung mit Regenschutzabdeckung empfohlen (bei Bremsmotoren stets vorzusehen). Dieses wahlweise Zubehör muß ausdrücklich zum Zeitpunkt der Bestellung verlangt werden, da es bei der Grundausführung nicht vorgesehen ist.

M3 - CARACTERISTIQUES MECANIKES

Formes de construction

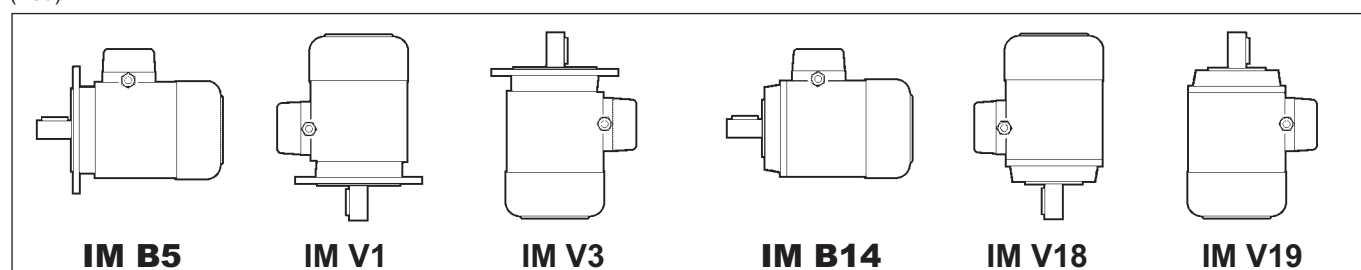
Les moteurs série BN sont prévus dans les formes de construction indiquées sur le tableau (A30) selon les normes CEI EN 60034-14.

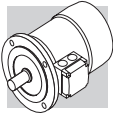
Les formes de construction sont les suivantes:

IM B5 (base)
IM V1, IM V3 (dérivées)
IM B14 (base)
IM V18, IM V19 (dérivées)

Les moteurs en forme de construction IM B5 peuvent être installés dans les positions IM V1 et IM V3; les moteurs en forme de construction IM B14 peuvent être installés dans les positions IM V18 et IM V19. Dans ces cas, la forme de construction base IM B5 ou IM B14 sera indiquée sur la plaque du moteur. Dans les formes de construction où le moteur présente une position verticale avec arbre vers le bas, nous conseillons de demander l'exécution avec capot de protection contre la pluie (à prévoir toujours dans le cas de moteurs freins). Cette exécution, prévue dans les options, doit être expressément demandée en phase de commande étant donné qu'elle n'est pas prévue dans la version de base.

(A30)





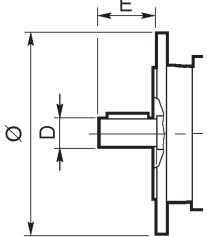
I motori in forma flangiata possono essere forniti con dimensioni di accoppiamento ridotte, come riportato in tabella (A31) - esecuzioni **B5R**, **B14R**.

Flanged motors can be supplied with a reduced mounting interface, as shown in chart (A31) below.

Die Motoren in der Auslegung mit Flansch können mit reduzierten Passmassen gemäß Tabelle (A31) - Versionen **B5R**, **B14R** geliefert werden.

*Les moteurs avec forme à bride peuvent être fournis avec des tailles d'accouplement réduites, comme indiqué dans le tableau (A31) - exécutions **B5R**, **B14R**.*

(A31)

						
	BN 71	BN 80	BN 90	BN 100	BN 112	BN 132
	DxE - Ø					
B5R ⁽¹⁾	11x23 - 140	14x30 - 160	19x40 - 200	24x50 - 200	24x50 - 200	28x60 - 250
B14R ⁽²⁾	11x23 - 90	14x30 - 105	19x40 - 120	24x50 - 140	—	—

⁽¹⁾ flangia con fori passanti

⁽¹⁾ flange with through holes

⁽¹⁾ Flansch mit durchgehenden Bohrungen

⁽¹⁾ bride avec orifices passants

⁽²⁾ flangia con fori filettati

⁽²⁾ flange with threaded holes

⁽²⁾ Flansch mit Gewindebohrungen

⁽²⁾ bride avec orifices filetés

IP..

Grado di protezione

La tabella sottostante riassume la disponibilità dei vari gradi di protezione. Indipendentemente dal grado di protezione specificato, per installazione all'aperto i motori devono essere protetti dall'irraggiamento diretto e, nel caso d'installazione con albero rivolto verso il basso, è necessario specificare ulteriormente il tettuccio di protezione contro l'ingresso di acqua e corpi solidi (opzione **RC**).

Degree of protection

*The following chart provides an overview of the degrees of protection available. In addition to the degree of protection specified when ordering, motors to be installed outdoors require protection against direct sunlight and also – when they are to be installed vertically down – a drip cover to prevent the ingress of water and solid particles (option **RC**).*

Schutzart

In der nachstehenden Tabelle werden die jeweils zur Verfügung stehenden Schutzarten zusammengefasst. Unabhängig von der spezifischen Schutzart müssen die im Freien installierten Motoren vor direkten Strahlungen geschützt werden. Im Fall einer senkrechten Montage, in der die Welle nach unten gerichtet ist, sollte darüber hinaus das Schutzdach bestellt werden, das vor dem Eindringen von Wasser und festen Fremdkörpern schützt (Option **RC**).

Degré de protection

*Le tableau ci-dessous résume la disponibilité des différents degrés de protection. Indépendamment du degré de protection spécifié, en cas d'installation en plein air, les moteurs doivent être protégés des rayons directs du soleil et, en cas d'installation avec l'arbre dirigé vers le bas, il est nécessaire de spécifier ultérieurement le capot de protection contre la pénétration de l'eau et des corps solides (option **RC**).*

(A32)

		IP 54	IP 55	IP 56
BN	M		standard	
BN_FD BN_FA	M_FD M_FA	standard		
BN_BA	—		standard	

Ventilazione

I motori sono raffreddati mediante ventilazione esterna (IC 411 secondo CEI EN 60034-6) e sono provvisti di ventola radiale in plastica che funziona in entrambi i sensi di rotazione. L'installazione deve assicurare

Cooling

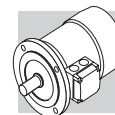
The motors are externally ventilated (IC 411 to CEI EN 60034-6) and are equipped with a plastic fan working in both directions. The motors must be installed allowing sufficient space between fan cowl and the nearest wall to

Lüftung

Die Motoren sind eigenbelüftet (IC 411 gemäß CEI EN 60034-6) und verfügen über ein Radiallüfterrad aus Kunststoff, das in beiden Drehrichtungen arbeiten kann. Bei der Installation muß sichergestellt werden, daß die Lüfter-

Ventilation

Les moteurs sont refroidis à l'aide d'une ventilation extérieure (IC 411 selon CEI EN 60034-6) et sont dotés d'un ventilateur à ailettes en plastique qui fonctionne dans les deux sens de rotation.



una distanza minima dalla calotta copriventola alla parete in modo da non avere impedimenti all'ingresso aria e permettere la possibilità di eseguire l'opportuna manutenzione del motore e, se previsto, del freno.

Su richiesta è possibile prevedere una ventilazione forzata indipendente (opzione U1). Questa soluzione consente di aumentare il fattore di utilizzo del motore nel caso di alimentazione da inverter e funzionamento a giri ridotti.

ensure free air intake and allow access for maintenance purposes on motor and brake, if supplied.

Independent, forced air ventilation (IC 416) can be supplied on request (option U1).

This solution enables to increase the motor duty factor when driven by an inverter and operating at reduced speed.

radabdeckung soweit von der Wand entfernt ist, daß der Luft-eintritt nicht behindert wird, und daß der Motor und (falls vorhanden) die Bremse problemlos gewartet werden können.

Auf Wunsch können die Motoren mit Fremdbelüftung geliefert werden (Option U1). Diese Lösung ermöglicht das Motorbetriebsfaktor zu erhöhen, wenn vom Frequenzumrichter gesteuert und zu niedrigen Geschwindigkeit betrieben.

L'installation doit assurer une distance minimum entre le capot de protection du ventilateur et la paroi afin de permettre une bonne circulation de l'air et rendre plus aisé l'entretien du moteur et si prévu, du frein.

Sur demande, il est possible de prévoir une ventilation forcée indépendante (option U1).

Cette solution permet d'augmenter le facteur d'utilisation du moteur en cas d'alimentation, via un variateur de fréquence, et pour un fonctionnement à faible vitesse.

Senso di rotazione

È possibile il funzionamento in entrambi i sensi di rotazione.

Con collegamento dei morsetti U1,V1,W1 alle fasi di linea L1,L2,L3 si ha rotazione oraria vista dal lato accoppiamento, mentre la marcia antioraria si ottiene scambiando fra loro due fasi.

Direction of rotation

Rotation is possible in both directions. If terminals U1, V1, and W1 are connected to line phases L1, L2 and L3, clockwise rotation (looking from drive end) is obtained. For counterclockwise rotation, switch two phases.

Drehrichtung

Der Betrieb in beiden Drehrichtungen ist möglich.

Schließt man die Klemmen U1, V1, W1 an die Phasen L1, L2, L3 an, dreht sich der Motor im Uhrzeigersinn (von der Verbindungsseite her betrachtet); die Drehung im Gegenuhzeigersinn erhält man, indem man zwei Phasen vertauscht.

Sens de rotation

Un fonctionnement dans les deux sens de rotation est possible. Avec raccordement des bornes U1, V1, W1 aux phases de ligne L1, L2, L3, on a la rotation dans le sens des aiguilles d'une montre vue du côté liaison alors que le sens inverse s'obtient en intervertissant les deux phases entre elles.

Rumorosità

I valori di rumorosità, rilevati secondo il metodo previsto dalle Norme ISO 1680, sono contenuti entro i livelli massimi previsti dalle Norme CEI EN 60034-9.

Noise

Noise levels, measured using the method prescribed by ISO 1680 Standards, are within the maximum levels specified by Standards CEI EN 60034-9.

Geräuschpegel

Die mit der von der ISO-Norm 1680 vorgesehenen Methoden gemessenen Lärmstärkewerte liegen innerhalb der gemäß den Normen CEI EN 60034-9 zulässigen Höchstgrenzen.

Niveau de bruit

Les valeurs relevées selon la méthode prévue par les normes ISO 1680 sont situées sous les niveaux maximums prévus par les normes CEI EN 60034-9.

Vibrazioni ed equilibratura

Tutti i rotor sono equilibrati con mezza linguetta e rientrano nei limiti di intensità di vibrazione previsti dalle Norme CEI EN 60034-14.

Per particolari esigenze di silenziosità potrà essere previsto, a richiesta, un'esecuzione antivibrante in grado ridotto B.

La tabella seguente riporta i valori della velocità efficace di vibrazione per equilibratura standard (A) e incrementata (B).

Vibrations and balancing

Rotor shafts are balanced with half key fitted and fall within the vibration class N, as per Standard CEI EN 60034-14.

If a further reduced noise level is required improved balancing can be optionally requested (class B).

Table below shows the value for the vibration velocity for standard (A) and improved (B) balancing.

Schwingungen und Ausgleich

Alle Rotoren werden durch einen halben Federkeil ausgeglichen und fallen somit unter die, von den Normen CEI EN 60034-14 vorgesehenen Schwingungsgradgrenzen.

Bei besonderen Anforderungen an die Laufruhe kann auf Anfrage eine schwingungsdämpfende Ausführung in der reduzierten Klasse (B) geliefert werden.

Die folgende Tabelle führt die Werte der Ist-Schwingungsgeschwindigkeit für einen normalen (A) und verbesserten (B) Ausgleich auf.

Vibrations et équilibrage

Tous les rotors sont équilibrés avec une demi languette et rentrent dans les limites d'intensité de vibration prévues par les Normes CEI EN 60034-14.

En cas d'exigences particulière concernant le niveau de bruit, sur demande, il est possible de réaliser une exécution anti-vibrante, de degré réduit (B).

Le tableau ci-dessous indique les valeurs de la vitesse efficace de vibration pour un équilibrage standard (A) et améliorée (B).

(A33)

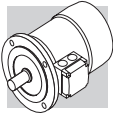
Grado di vibrazione Vibration class Schwingungsklasse Degré de vibration	Velocità di rotazione Angular velocity Drehungsgeschwindigkeit Vitesse de rotation	Limiti della velocità di vibrazione Limits of the vibration velocity Grenzen der Schwingungsgeschwindigkeit Limites de la vitesse de vibration [mm/s]
	$n \text{ [min}^{-1}\text{]}$	BN 56 ≤ H ≤ BN 200 M05 ≤ H ≤ M5
A	$600 \leq n \leq 3600$	1.6
B	$600 \leq n \leq 3600$	0.70

I valori si riferiscono a misure con motore liberamente sospeso e funzionamento a vuoto.

Values refer to measures with freely suspended motor in unloaded conditions.

Die Werte beziehen sich auf die Abmessungen mit stehendem Motor, ohne Getriebe und Leerlauf.

Les valeurs se réfèrent à des mesures avec moteur librement suspendu et fonctionnement à vide.



Morsettiera motore

La morsettiera principale è a sei morsetti per collegamento con capicorda. All'interno della scatola è previsto un morsetto per il conduttore di terra.

Le dimensioni dei perni di attacco sono riportate nella tabella seguente.

Nel caso di motori autofrenanti, il raddrizzatore per l'alimentazione del freno è fissato all'interno della scatola e provvisto di adeguati morsetti di collegamento.

Eseguire i collegamenti secondo gli schemi riportati all'interno della scatola coprimorsetti o nei manuali d'uso.

Terminal box

Terminal board features 6 studs for eyelet terminal connection. A ground terminal is also supplied for earthing of the equipment.

Terminals number and type are shown in the following table.

Brakemotors house the a.c./d.c. rectifier (factory pre-wired) inside the terminal box.

Wiring instructions are provided either in the box or in the user manual.

Motorklemmenkasten

Die Hauptklemmleiste hat 6 Klemmen für den Anschluß mit Kabelschuhen. Im Innern des Klemmenkastens befindet sich eine Klemme für den Erdleiter.

Die Abmessungen der Anschlüsse sind in der folgenden Tabelle angegeben.

Bei den Bremsmotoren befindet sich auch der mit den erforderlichen Anschlußklemmen ausgestattete Gleichrichter für die Stromversorgung der Bremse im Klemmenkasten.

Die Anschlüsse müssen gemäß den Diagrammen im Klemmkasten oder in den Betriebsanweisungen durchgeführt werden.

Bornier moteur

Le bornier principal prévoit six bornes pour raccordement avec cosses. Dans le boîtier se trouve une borne pour le conducteur de terre.

Les dimensions des axes de fixation sont reportées dans le tableau ci-dessous.

Dans le cas de moteurs freins, le redresseur pour l'alimentation du frein est fixé à l'intérieur du boîtier et est doté de bornes de raccordement.

Effectuer les connexions selon les schémas indiqués à l'intérieur du bornier, ou dans les manuels d'utilisation.

(A34)

		N° terminali No. of terminals Klemmen N° bornes	Filettatura terminali Terminal threads Gewinde Filetage bornes	Sezione max del conduttore Wire max cross section area Max. leiterquerschnitt Section max du conducteur mm ²
BN 56...BN 71	M05, M1	6	M4	2.5
BN 80, BN 90	M2	6	M4	2.5
BN 100...BN 112	M3	6	M5	6
BN 132...BN 160MR	M4	6	M5	6
BN 160M...BN 180M	M5	6	M6	16
BN 180L...BN 200L	—	6	M8	25

Ingresso cavi

Nel rispetto della Norma EN 50262, i fori di ingresso cavi nelle scatole morsettiera presentano filettature metriche della misura indicata nella tabella seguente.

Cable entry

The holes used to bring cables to terminal boxes use metric threads in accordance with standard EN 50262 as indicated in the table here after.

Kabeleingang

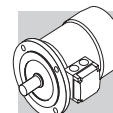
Unter Berücksichtigung der Norm EN 50262 verfügen die Kabeleingänge in die Klemmenkästen über metrische Gewinde, deren Maße, der nachstehenden Tabelle entnommen werden können.

Entrée câbles

Dans le respect de la Norme EN 50262, les orifices d'entrée câbles dans les boîtes à bornes présentent des filetages métriques de la taille indiquée dans le tableau ci-dessous.

(A35)

		Ingresso cavi / Cable entry kabeldurchführung / Entrée câbles	Diametro max. cavo allacciabile / Max. cable diameter allowed Max. zulässiger Kabeldurchmesser / Diam. maxi câble [mm]
BN 63	M05	2 x M20 x 1.5	13
BN 71	M1	2 x M25 x 1.5	17
BN 80 - BN 90	M2	2 x M25 x 1.5	17
BN 100	M3	2 x M32 x 1.5	21
		2 x M25 x 1.5	17
BN 112	—	2 x M32 x 1.5 4 x M25 x 1.5	17
BN 132...BN 160MR	M4	4 x M32 x 1.5	21
BN 160M...BN 200L	M5	2 x M40 x 1.5	29



Cuscinetti

I cuscinetti previsti sono del tipo radiale a sfere con lubrificazione permanente precaricati assialmente.

I tipi utilizzati sono indicati nelle tabelle seguenti. La durata nominale a fatica L_{10h} dei cuscinetti, in assenza di carichi esterni applicati è superiore a 40.000 ore, calcolata secondo ISO 281.

DE = lato comando

NDE = lato opposto comando

Bearings

Life lubricated preloaded radial ball bearings are used, types are shown in the chart here under. Calculated endurance lifetime L_{10h} as per ISO 281, in unloaded condition, exceeds 40000 hrs.

DE = drive end

NDE = non drive end

Lager

Bei den Lagern handelt es sich um Radialkugellager mit Dauerschmierung.

Die verwendeten Typen sind in den folgenden Tabellen angegeben.

Die Lebensdauer der Lager bei einer Beanspruchung L_{10h} ist, sofern keine externen Kräfte wirken, über 40.000 Stunden (Berechnung gemäß ISO 281).

DE = Wellenseite

NDE = Lüfterseite

Roulements

Les roulements prévus sont du type radial à billes avec lubrification permanente.

Les types utilisés sont indiqués dans les tableaux ci-dessous.

La résistance à la déformation L_{10h} des roulements en absence de charges extérieures appliquées est supérieure à 40.000 heures calculée selon ISO 281.

DE = sortie arbre

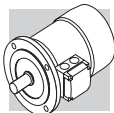
NDE = côté ventilateur

(A36)

	DE	NDE	
	M, M_FD, M_FA	M	M_FD; M_FA
M05	6004 2Z C3	6201 2Z C3	6201 2RS C3
M1	6004 2Z C3	6202 2Z C3	6202 2RS C3
M2	6007 2Z C3	6204 2Z C3	6204 2RS C3
M3	6207 2Z C3	6206 2Z C3	6206 2RS C3
M4	6309 2Z C3	6308 2Z C3	6308 2RS C3
M5	6309 2Z C3	6309 2Z C3	6309 2RS C3

(A37)

	DE	NDE	
	BN, BN_FD, BN_FA, BN_BA	BN, BN_BA	BN_FD; BN_FA
BN 56	6201 2Z C3	6201 2Z C3	—
BN 63	6201 2Z C3	6201 2Z C3	6201 2RS C3
BN 71	6202 2Z C3	6202 2Z C3	6202 2RS C3
BN 80	6204 2Z C3	6204 2Z C3	6204 2RS C3
BN 90	6205 2Z C3	6205 2Z C3	6305 2RS C3
BN 100	6206 2Z C3	6206 2Z C3	6206 2RS C3
BN 112	6306 2Z C3	6306 2Z C3	6306 2RS C3
BN 132	6308 2Z C3	6308 2Z C3	6308 2RS C3
BN 160MR	6309 2Z C3	6308 2Z C3	6308 2RS C3
BN 160M/L	6309 2Z C3	6309 2Z C3	6309 2RS C3
BN 180M	6310 2Z C3	6309 2Z C3	6309 2RS C3
BN 180L	6310 2Z C3	6310 2Z C3	6310 2RS C3
BN 200L	6312 2Z C3	6310 2Z C3	6310 2RS C3



M4 - CARATTERISTICHE ELETTRICHE

Tensione

I motori a una velocità sono previsti nell'esecuzione normale per tensione nominale 230V Δ / 400V Y, 50 Hz con tolleranza di tensione $\pm 10\%$ (escluso i tipi M3LC4 e M3LC6).

In targa sono indicati oltre alla tensione nominale i campi di funzionamento consentiti, p.e.:

220 - 240V Δ

380 - 415V Y / 50 Hz.

In accordo alle Norme CEI EN 60034-1 i motori possono funzionare alle tensioni sopra indicate con tolleranza del $\pm 5\%$.

Per funzionamento ai limiti di tolleranza la temperatura può superare di 10 K il limite previsto dalla classe di isolamento adottata.

Ad eccezione dei motori autofrenanti tipo BN_FD in targa vengono indicati anche i valori corrispondenti al funzionamento a 60 Hz (p.e. 460Y, 60 Hz) ed il relativo campo di tensione:

440 - 480VY, 60 Hz.

Per i motori autofrenanti con freno tipo FD le tensioni standard sono:

220V - 240V Δ - 50 Hz

380V - 415V Y - 50 Hz

con tensione di alimentazione freno 230V $\pm 10\%$.

La tabella seguente riporta le tensioni previste per i motori.

M4 - ELECTRICAL CHARACTERISTICS

Voltage

Single speed motors are rated for 230/400 V - 50 Hz.

A tolerance of $\pm 10\%$ applies to nominal voltage, with the exception of motors type M3LC4 and M3LC6.

In addition to nominal voltage-frequency values the name plate also shows voltage ranges the motor can operate under, e.g.:

220-240V Δ - 50 Hz

380-415V Y - 50 Hz

As per Norms CEI EN 60034-1 on above voltage values the $\pm 5\%$ tolerance applies.

When operating close to the tolerance limit values the winding temperature can exceed by 10 K the rated temperature for the given insulation class.

With the exception of BN_FD brakemotors, the rated voltage values for operation under 60 Hz mains are also shown on the nameplate, e.g. 460Y-60 Hz along with related tolerance field, e.g. 440-480V Y-60 Hz.

For brakemotors, FD type, rated voltage is:

220-240V Δ - 50 Hz

380-415V Y - 50 Hz

Brake supply is a.c. 230V $\pm 10\%$ single phase.

Chart below shows standard and optional wiring of motors.

M4 - ELEKTRISCHE EIGENSCHAFTEN

Spannung

Die eintourigen Motoren müssen in der Standardausführung mit einer Spannung von 230 V Δ / 400 V Y, 50 Hz mit einer Toleranz von $\pm 10\%$ gespeist werden (Type M3LC4 und M3LC6 ausgenommen).

Auf dem Schild werden die Nennspannung hinaus, auch die zulässigen Ansprehbereiche angegeben, z.B.:

220-240V Δ

380-415V Y/50 Hz.

Gemäß den Normen CEI EN 60034-1 können die Motoren auf die oben genannten Spannungen mit Toleranzen von $\pm 5\%$ arbeiten.

Bei Betrieb an den Spannungsgrenzen, kann die Temperatur bis zum 10K die für die verwendeten Isolierstoffklasse angegebenen Grenze überschreiten.

Darüber hinaus wird auf den Typenschild die dem 60 Hz-Betrieb entsprechenden Werte angegeben (d.h. 460 Y, 60 Hz) und das entsprechende Spannungsfeld, 440-480VY, 60 Hz.

Für die selbstbremsenden Motoren mit dem Bremstyp FD sind die Standardspannungen folgende:

220V - 240V Δ - 50 Hz

380V - 415V Y - 50 Hz

mit Bremsspannungsversorgung von 230V $\pm 10\%$.

Die folgende Tabelle für die Motoren vorgesehenen Spannungen auf.

M4 - CARACTERISTIQUES ELECTRIQUES

Tension

Les moteurs à polarité unique sont prévus dans l'exécution normale pour tension 230V Δ / 400V Y, 50 Hz avec tolérance de tension $\pm 10\%$ (sauf les types M3LC4 et M3LC6).

Outre la tension nominale, les plages de fonctionnement permises sont indiquées sur la plaque signalétique, à savoir:

220-240V Δ

380-415V Y/50 Hz.

Selon les normes CEI EN 60034-1 les moteurs peuvent fonctionner aux tension indiquées ci-dessus avec une tolérance de $\pm 5\%$.

Pour un fonctionnement à la limite de tolérance, la température peut dépasser les 10K, la limite prévue de la classe d'isolation choisie.

Sur la plaque marque sont de plus indiqués les valeurs correspondantes au fonctionnement en 60 Hz (ex.460Y, 60 Hz) et la relative plage de tension: 440 - 480VY, 60 Hz.

En ce qui concerne les moteurs autofrenants avec frein de type FD, les tensions standard sont les suivantes :

220V - 240V Δ - 50 Hz

380V - 415V Y - 50 Hz

avec tension d'alimentation du frein 230V $\pm 10\%$.

La tableau ci-dessous indique les tensions prévues pour les moteurs.

(A38)

		BN M	BN_FD M_FD		BN_FA / BN_BA M_FA		Esecuzione Configuration Version Execution
		$V_{mot} \pm 10\%$ 3~	$V_{mot} \pm 10\%$ 3~	$V_B \pm 10\%$ 1~	$V_{mot} \pm 10\%$ 3~	$V_B \pm 10\%$ 3~	
BN 56 - BN 132	M05...M4	230/400 - 50Hz 460 - 60Hz	230/400V Δ /Y- 50 Hz	230V	230/400V Δ /Y- 50 Hz 460V Y - 60Hz	230/400V Δ /Y- 50 Hz 460V Y - 60Hz	Standard
BN 100 - BN 132	M3 - M4	400/690 - 50Hz 460 - 60Hz	400/690V Δ /Y- 50 Hz	400V	400/690V Δ /Y- 50 Hz 460V Y - 60Hz	400/690V Δ /Y- 50 Hz 460V Y - 60Hz	A richiesta, senza sovrapprezzo On request at no extra charge Auf Anfrage, ohne Aufpreis Sur demande, sans majoration de prix

I motori a due velocità 400V/50Hz, sono previsti per tensione nominale standard 400V; tolleranze applicabili secondo CEI EN 60034-1.

Nella tabella seguente sono indicati i vari tipi di collegamenti previsti per i motori in funzione della polarità.

The only rated voltage for motors type 400V/50Hz and all double speed motors is 400V. Applicable tolerances as per CEI EN 60034-1.

The table below shows the wiring options available.

Alle polumschaltbaren Motoren, die Typen 400V/50Hz, sind nicht umschaltbar, standard-mäßig nur für ein Spannung 400V vorgesehen; geltenden Toleranzen gemäß CEI EN 60034-1.

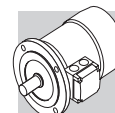
Auf die folgende Tabelle werden die verschiedenen für die Motoren vorgesehenen Anschlußtypen angegeben.

Tous les moteur à deux vitesses, les types 400V/50Hz, sont prévus pour une tension nominale standard de 400V; tolérances applicables selon CEI EN 60034-1.

Dans le tableau ci-dessous sont indiqués les différents types de connexion prévus pour les moteurs.

(A39)

		Poli / Pole / Polig / Pôles	Collegamento avvolgimento / Wiring options Wicklungsanschluß / Connexion du bobinage
BN 56...BN 200	M05...M5	2, 4, 6	Δ / Y
		2/4	Δ / YY (Dahlander)
		2/6, 2/8, 2/12	Y / Y (due avvolgimenti / Two windings zwei Wicklungen / Deux bobinage)



Frequenza

I motori ad una velocità nell'esecuzione standard riportano in targa oltre alle tensioni del funzionamento a 50 Hz il campo di tensione 440 - 480V 60 Hz (escluso motori autofrenanti con freno FD) con potenza aumentata di circa il 20%.

La potenza di targa dei motori a 60Hz corrisponde a quanto riportato nella tabella (A40) seguente:

Frequency

With the exception of brakemotors, name plate of standard single speed motors shows, besides the 50 Hz voltage ratings, also the rated power output for 60 Hz operation in the 440-480 V range.

Power output is increased by approx 20%.

Rated output power for 60 Hz operation is shown in the following diagram.

Frequenz

Bei eintourigen Motoren in der Standardausführung wird außer den 50 Hz-Betriebsspannungen auch den Spannungsfeld 440 - 480V 60 Hz angegeben (mit Ausnahme von Bremsmotoren mit Bremsentyp FD) mit einer erhöhten Leistung von ungefähr 20%.

Die Leistung auf das Namensschild von 60 Hz-Motoren entspricht den Daten aus der folgenden Tabelle (A40):

Fréquence

Les moteurs à une vitesse en exécution standard reportent sur la plaque marque en plus des tension du fonctionnement à 50 Hz la plage de tension 440 - 480V 60 Hz (moteurs freins avec frein FD exclus) avec puissance augmentée de 20% env.

La puissance sur la plaque marque des moteurs à 60 Hz correspond à celle indiquée au tableau (A40) suivant :

(A40)

		2P	4P	6P
		P _n [kW]		
BN 56A	—	—	0.06	—
BN 56B	M0B	—	0.10	—
BN 63A	M05A	0.21	0.14	0.10
BN 63B	M05B	0.30	0.21	0.14
BN 71A	M05C	0.45	0.30	0.21
BN 71B	M1SD	0.65	0.45	0.30
BN 80A	M1LA	0.90	0.65	0.45
BN 80B	M2SA	1.30	0.90	0.65
BN 90S	M2SB	—	1.30	0.90
BN 90SA	M2SB	1.8	—	—
BN 90L	M3SA	2.5	—	1.3
BN 90LA	M3SA	—	1.8	—
BN 100L	M3LA	3.5	—	—
BN 100LA	M3LA	—	2.5	1.8
BN 100LB	M3LB	4.7	3.5	2.2
BN 112M	M3LB	4.7	4.7	2.5
	M3LC	—	4.7	2.5
BN 132S	M4SA	—	6.5	3.5
BN 132SA	M4SA	6.3	—	—
BN 132SB	M4SB	8.7	—	—
BN 132M	M4LA	11	—	—
BN 132MA	M4LA	—	8.7	4.6
BN 132MB	M4LB	—	11	6.5
BN 160MR	M4LC	12.5	12.5	—
BN 160MB	M5SB	17.5	—	—
BN 160M	M5SA	—	—	8.6
BN 160L	M5S	21.5	17.5	12.6
BN 180M	M5LA	24.5	21.5	—
BN 180L	—	—	25.3	17.5
BN 200L	—	34	34	22

Motori a doppia polarità alimentati a 60 Hz avranno un aumento della potenza nominale, riferita a 50 Hz, pari al 15%.

Qualora sulla targhetta di un motore destinato ad essere alimentato a 60 Hz sia richiesto un valore di potenza nominale pari a quello normalizzato a 50 Hz specificare in designazione l'opzione PN.

For two-speed motors operated under 60 Hz supply the rated power output is increased by 15% as compared to same motor with 50 Hz supply.

If same IEC-normalised 50 Hz power rating value is desired on name plate of a 60 Hz operated motor specify option PN in the ordering code.

Standard motors wound for 50

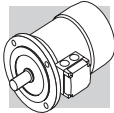
Für polumschaltbare Motoren mit 60 Hz Spannungsversorgung ist die vorgesehene Leistungserhöhung gemäß den Datenblätter von 15%.

Wenn die angefragte 60 Hz-Leistung der normierten 50 Hz-Leistung entspricht, geben bei der Bezeichnung das Option PN an. Die Motoren mit einer Wicklung für eine Frequenz von 50 Hz

Pour les moteurs à deux vitesses avec alimentation 60 Hz l'augmentation de puissance prévue par rapport aux valeurs indiquées dans les tableaux techniques, sera de 15%.

Si la puissance requise à 60 Hz correspond à la puissance normalisée à 50 Hz on devra indiquer l'option PN.

Les moteurs bobinés pour fré-



I motori normalmente avvolti per frequenza 50 Hz possono essere usati in reti a 60 Hz con i loro dati che saranno corretti come da tabella seguente.
I freni, se presenti, dovranno sempre essere alimentati alla tensione V_b , riportata in targa.

Hz supply can be operated under 60 Hz with main data corrected as per chart below: Brakes, if fitted, must be supplied with the voltage value V_b that is stated on the nameplate.

können entsprechend den Angaben von Tabelle (A41) an Netze mit 60 Hz angeschlossen werden.
Die Bremse muss, falls angebaut, mit der auf dem Typenschild angegebenen Spannung V_b betrieben werden.

quence 50 Hz peuvent être utilisés sur réseau à 60 Hz selon les indications du tableau (A41). Les freins, si présents, devront toujours être alimentés avec la tension V_b rapportée sur la plaque.

(A41)

50 Hz	60 Hz			
V - 50 Hz	V - 60 Hz	P _n - 60 Hz	M _n , M _a /M _n - 60 Hz	n [min ⁻¹] - 60 Hz
230/400 Δ/Y	220 - 240 Δ 380 - 415 Y	1	0.83	1.2
400/690 Δ/Y	380 - 415 Δ			
230/400 Δ/Y	265 - 280 Δ 440 - 480 Y	1.15	1	1.2
400/690 Δ/Y	440 - 480 Δ			

Potenza nominale

Le tabelle dei dati tecnici del catalogo riportano le caratteristiche funzionali a 50 Hz in condizioni ambientali standard secondo le Norme CEI EN 60034-1 (temperatura 40 °C e altitudine <1000 m s.l.m.).
I motori possono essere impiegati a temperature comprese tra 40 °C e 60 °C applicando i declassamenti di potenza indicati nelle tabelle seguenti.

Rated power

Catalogue rating values are calculated for 50 Hz operation and for standard ambient conditions (temperature 40 °C; elevation <1000 m a.s.l.) as per the CEI EN 60034-1 Standards. The motors can be used within the 40 - 60 °C temperature range with rated power output adjusted by factors given in the following charts.

Nennleistung

Die Betriebsdatentabellen des Katalogs enthalten die technischen Daten bei einer Frequenz von 50 Hz bei normalen Umgebungsbedingungen gemäß den Normen CEI EN 60034-1 (Temperatur 40°C und Höhe <1000 m ü.d.M.). Die Motoren können in größeren Temperaturen zwischen 40°C und 60°C betrieben werden, wenn man die in den Tabellen (A41) angegebenen Rückstufungen anwendet.

Puissance nominale

Les tableaux fonctionnels du catalogue présentent les caractéristiques techniques à 50 Hz dans des conditions ambiantes standard selon les normes CEI EN 60034-1 (température 40°C et altitude <1000 m). Les moteurs peuvent être employés à des températures comprises entre 40°C et 60°C en appliquant les déclassements de puissance indiqués dans les tableaux suivantes.

(A42)

Temperatura ambiente / Ambient temperature / Umgebungstemperatur / Température ambiante(°C)	40°	45°	50°	55°	60°
Potenza ammissibile in % della potenza nominale / Permitted power as a % of rated power Zulässige Leistung in % der Nennleistung / Puissance admissible en % de la puissance nominale	100%	95%	90%	85%	80%

Quando è richiesto un declassamento del motore superiore al 15%, contattare il ns. Servizio Tecnico.

Should a derating factor higher than 15% apply please consult factory.

Wenn eine Motordeklassierung höher als 15% gefragt ist, wir bitten um Rückfrage.

Si un déclassement du moteur supérieur à 15% est requis, on devra contacter notre Service Technique.

Classe d'isolamento

Insulation class

Isolationsklasse

Classes d'isolation

CL F

I motori di produzione Bonfiglioli impiegano, di serie, materiali isolanti (filo smaltato, isolanti, resine d'impregnazione) in classe **F**.

*Bonfiglioli motors use class **F** insulating materials (enamelled wire, insulators, impregnation resins) as compare to the standard motor.*

Die Motoren von Bonfiglioli sind serienmäßig mit Isolierstoffen (Emaildraht, Isolierstoffen, Imprägnierharzen) der Klasse **F** ausgestattet.

*De série, les moteurs fabriqués par Bonfiglioli utilisent des matériaux isolants (fil émaillé, isolants, résines d'impregnation) en classe **F**.*

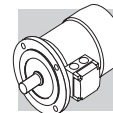
CL H

Su richiesta può venire specificata la classe di isolamento **H**.
In genere, per i motori in esecuzione standard la sovratemperatura dell'avvolgimento statore è contenuta entro il limite di 80 K, corrispondente alla sovratemperatura di classe **B**.

*Motors manufactured in insulation class **H** are available at request. In standard motors, stator windings over temperature normally stays below the 80 K limit corresponding to class **B** over temperature.*

Auf Anfrage können sie auch in der Klasse **H** geliefert werden.
Allgemein hält sich die Übertemperatur der Motoren in der Standardausführung innerhalb des Grenzwerts von 80 K, der einer Übertemperatur der Klasse **B** entspricht.

*Sur demande, la classe d'isolation **H** peut être spécifiée. En général, pour les moteurs en exécution standard, l'échauffement de l'enroulement du stator se situe dans la limite de 80 K, correspondant à un échauffement de classe **B**.*



L'accurata scelta dei componenti del sistema isolante consente l'impiego dei motori anche in climi tropicali ed in presenza di vibrazioni normali.

Per applicazioni in presenza di sostanze chimiche aggressive, o di elevata umidità, è consigliabile contattare il Servizio Tecnico Bonfiglioli per la selezione del prodotto più idoneo.

A careful selection of insulating components makes the motors compatible with tropical climates and normal vibration.

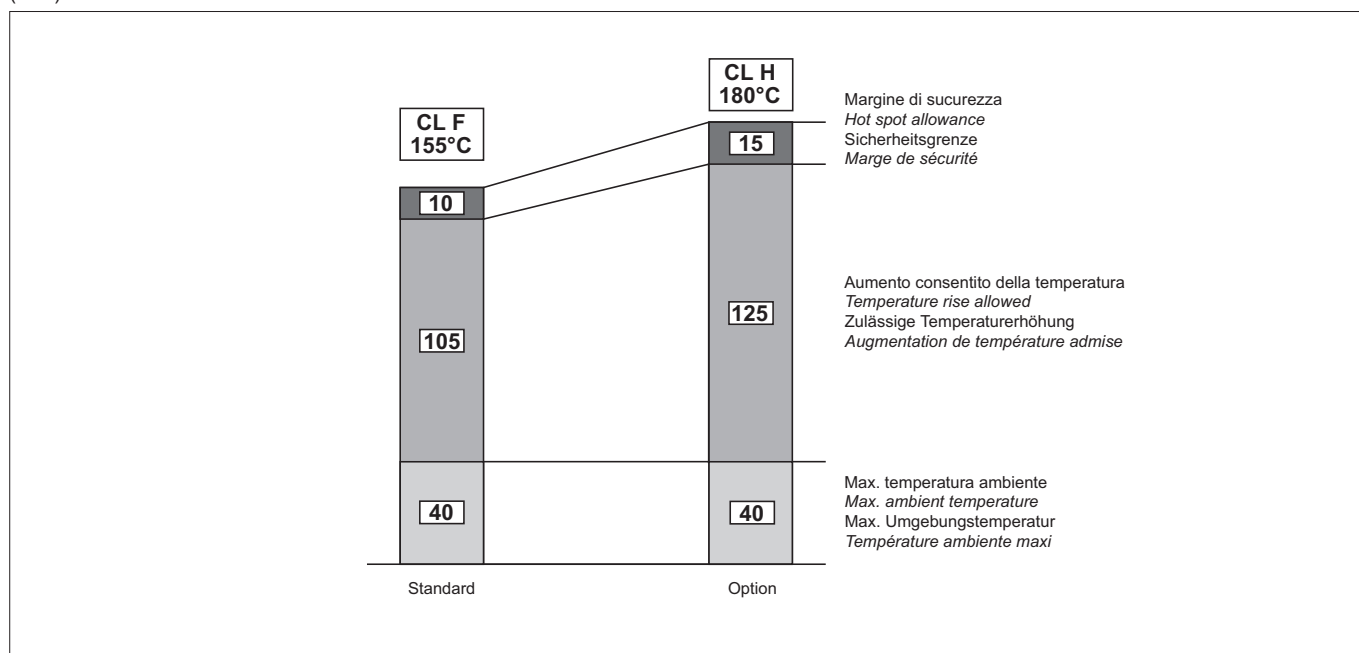
For applications involving the presence of aggressive chemicals or high humidity, contact Bonfiglioli Engineering for assistance with product selection.

Die sorgfältig Wahl der Komponenten des Isoliersystem gestatten den Einsatz dieser Motoren auch unter tropischen Klimabedingungen und bei Vorliegen normaler Schwingungen.

Für den Einsatz in in der Nähe aggressiv wirkenden chemischen Substanzen oder bei hoher Luftfeuchtigkeit, wird empfohlen sich zur Wahl eines passenden Produktes mit unserem Technischen Kundendienst in Verbindung zu setzen.

Le choix soigné des composants du système d'isolation permet d'utiliser également les moteurs dans des climats tropicaux et en présence de vibrations normales. Pour des applications en présence de substances chimiques agressives, ou d'humidité élevée, il est conseillé de contacter le Service Technique Bonfiglioli pour sélectionner le produit le plus adapté.

(A43)



Tipo di servizio

Se non indicato diversamente la potenza dei motori riportata a catalogo si riferisce al servizio continuo S1.

Per i motori utilizzati in condizioni diverse da S1 sarà necessario identificare il tipo di servizio previsto con riferimento alle Norme CEI EN 60034-1.

In particolare, per i servizi S2 ed S3, è possibile ottenere una maggiorazione della potenza termica rispetto a quella prevista per il servizio continuo secondo quanto indicato nella tabella (A44) valida per motori ad una velocità. Per motori a doppia polarità interpellare il nostro Servizio Tecnico.

Type of duty

Unless otherwise indicated, the power of motors specified in the catalogue refers to continuous duty S1.

For motors used under conditions other than S1, the type of duty required must be adjusted with reference to CEI EN 60034-1 Standards.

In particular, for duties S2 and S3, power can be adjusted with respect to continuous duty according to data in table (A44) applicable to single speed motors. For double speed motors, contact our Technical Service.

Betriebsart

Sofern nicht anders angegeben, bezieht sich die im Katalog angegebene Motorleistung auf den Dauerbetrieb S1.

Bei den Motoren, die für eine andere Betriebsart als S1 vorgesehen sind, muß man die Betriebsart unter Bezugnahme auf die Normen CEI EN 60034-1 identifizieren.

Insbesondere kann man für die Betriebsarten S2 und S3 nach der für Motoren mit einer Drehzahl. Gültigen Tabelle (A44) eine Überdimensionierung der Leistung für den Dauerbetrieb im Vergleich zur vorgesehenen Betriebsart erreichen. Für polumschaltbaren Motoren, bitte Rückfrage.

Type de service

Sauf indication contraire, la puissance des moteurs reportée dans le catalogue se réfère au service continu S1.

Pour les moteurs utilisés dans des conditions différentes de S1, il sera nécessaire d'identifier le type de service prévu en se référant aux normes CEI EN 60034-1.

En particulier, pour les services S2 et S3, il est possible d'obtenir une majoration de la puissance par rapport à celle prévue pour le service continu selon ce qui est indiqué dans le tableau (A44) valable pour les moteurs à une vitesse. Pour les moteurs à double polarité, contacter notre Service Technique.

(A44)

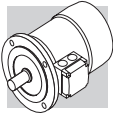
	Servizio / Duty / Betriebsart / Service					
	S2			S3 *		
	Durata del ciclo (min) / Cycle duration (min) Zyklusdauer (min) / Durée du cycle (min)			Rapporto di intermittenza (I) / Cyclic duration factor (I) Relative Einschaltdauer (I) / Rapport d'intermittence (I)		
	10	30	60	25%	40%	60%
f _m	1.35	1.15	1.05	1.25	1.15	1.1

* La durata del ciclo dovrà comunque essere uguale o inferiore a 10 minuti; se superiore interpellare il nostro Servizio Tecnico.

** Cycle duration must, in any event, be equal to or less than 10 minutes; if this time is exceeded, please contact our Technical Service.*

* Die Zyklusdauer muß in jedem Fall kleiner oder gleich 10 Minuten sein. Wenn sie darüber liegt, unseren Technischen Kundendienst zu Rate ziehen.

** La durée du cycle devra être inférieure ou égale à 10 minutes. Si supérieure, contacter notre Service Technique.*

**Rapporto di intermittenza:****Cyclic duration factor:****Relative Einschaltdauer:****Rapport d'intermittence:**

$$I = \frac{t_f}{t_f + t_r} \cdot 100$$

(23)

t_f = tempo di funzionamento a carico costante
 t_r = tempo di riposo

t_f = work time under constant load
 t_r = rest time

t_f = Betriebszeit mit konstanter Last
 t_r = Aussetzzeit

t_f = temps de fonctionnement à charge constante
 t_r = temps de repos

Servizio di durata limitata S2**Limited duration duty S2****Kurzzeitbetrieb S2****Service de durée limitée S2**

Caratterizzato da un funzionamento a carico costante per un periodo di tempo limitato, inferiore a quello richiesto per raggiungere l'equilibrio termico, seguito da un periodo di riposo di durata sufficiente a ristabilire, nel motore, la temperatura ambiente.

This type of duty is characterized by operation at constant load for a limited time, which is shorter than the time required to reach thermal equilibrium, followed by a rest period of sufficient duration to restore ambient temperature in the motor.

Betrieb mit konstanter Last für eine begrenzte Zeit, die unter der Zeit liegt, die zum Erreichen des thermischen Gleichgewichts benötigt wird, gefolgt von einer Aussetzzeit, die so lang ist, daß der Motor wieder auf die Umgebungstemperatur abkühlen kann.

Caractérisé par un fonctionnement à charge constante pour une période de temps limitée, inférieure à celle nécessaire pour atteindre l'équilibre thermique, suivie par une période de repos de durée suffisante pour rétablir, dans le moteur, la température ambiante.

Servizio intermittente periodico S3:**Periodical intermittent duty S3:****Periodische Einschaltsdauer S3:****Service intermittent périodique S3**

Caratterizzato da una sequenza di cicli di funzionamento identici, ciascuno comprendente un periodo di funzionamento a carico costante ed un periodo di riposo. In questo servizio, la corrente di avviamento non influenza la sovratemperatura in modo significativo.

This type of duty is characterized by a sequence of identical operation cycles, each including a constant load operation period and a rest period. For this type of duty, the starting current does not significantly influence overtemperature.

Betrieb mit aufeinanderfolgenden identischen Betriebszyklen, die alle einen kurzzeitigen Betrieb mit konstanter Belastung und eine Aussetzzeit einschließen. Bei dieser Betriebsart beeinflusst der Anlaufstrom die Übertemperatur nicht in signifikanter Weise.

Caractérisé par une séquence de cycles de fonctionnement identiques, comprenant chacun une période de fonctionnement à charge constante et une période de repos. Dans ce service, le courant de démarrage n'influence pas l'excès de température de façon significative.

Funzionamento con alimentazione da inverter**Inverter-controlled motors****Betrieb mit Versorgung über Inverter****Fonctionnement avec alimentation par variateur de vitesse**

I motori elettrici della serie BN ed M possono essere utilizzati con alimentazione da inverter PWM, e tensione nominale all'ingresso del convertitore fino a 500 V.

Il sistema isolante sui motori di serie prevede l'isolamento di fase con separatori, l'utilizzo di filo smaltato in grado 2 e resine d'impregnazione in classe H (limite di tenuta all'impulso di tensione 1600V picco-picco e fronte di salita $t_s > 0.1\mu s$ ai morsetti motore).

Le caratteristiche tipiche coppia/velocità in servizio S1 per motore con frequenza base $f_b = 50$ Hz sono riportate in tab. (A54). Per frequenze di funzionamento inferiori a circa 30 Hz, a causa della diminuzione della ventilazione, i motori standard autoventilati (IC411) devono essere opportunamente declassati in coppia o, in alternativa, devono essere provvisti di servoventilatore indipendente.

Per frequenze maggiori alla frequenza base, raggiunto il valore massimo di tensione di uscita dell'inverter, il motore lavora in un

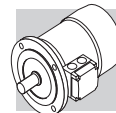
The electric motors of series BN and M may be used in combination with PWM inverters with rated voltage at transformer input up to 500 V. Standard motors use a phase insulating system with separators, class 2 enamelled wire and class H impregnation resins (1600V peak-to-peak voltage pulse capacity and rise edge $t_s > 0.1\mu s$ at motor terminals). Table (A54) shows the typical torque/speed curves referred to S1 duty for motors with base frequency $f_b = 50$ Hz.

Because ventilation is somewhat impaired in operation at lower frequencies (about 30 Hz), standard motors with incorporated fan (IC411) require adequate torque derating or - alternately - the addition of a separate supply fan cooling. Above base frequency, upon reaching the maximum output voltage of the inverter, the motor enters a steady-power field of operation, and shaft torque drops with ratio (f/f_b) .

Die Elektromotoren der Serie BN und M können über einen Inverter PWM und mit einer Nennspannung am Wandlereingang bis zu 500 V versorgt werden. Das an den Serienmotoren angewendete System sieht eine Phasenisolierung mittels Trennvorrichtungen vor, ebenso wie einen Emailldraht mit Grad 2 und Imprägnierungsharze in der Klasse H vor (Abdichtungsgrenze bei Spannungsimpuls 1600V Spitze-Spitze und Anstiegsfront $t_s > 0.1\mu s$ an den Motorklemmen). Die typischen Merkmale von Drehmoment/Geschwindigkeit im Betrieb S1 für Motoren mit einer Grundfrequenz $f_b = 50$ Hz werden in der Tab. (A54) angegeben. Bei Betriebsfrequenzen unter ungefähr 30 Hz müssen die selbstlüftenden Standardmotoren (IC411) aufgrund der in diesem Fall abnehmenden Belüftung entsprechend paarweise deklassiert, oder in Alternative, mit unabhängigen Servoventilatoren ausgestattet werden. Bei über der Grundfrequenz liegenden Frequenzen arbeitet der Motor,

Les moteurs électriques de la série BN et M peuvent être utilisés avec alimentation par variateur PWM, et tension nominale en entrée du convertisseur jusqu'à 500V. Le système adopté sur les moteurs de série prévoit l'isolation de phase avec des séparateurs, l'utilisation de fil émaillé niveau 2 et résines d'impregnation de classe H (limite de maintien à l'impulsion de tension 1600V pic-pic et front de montée $t_s > 0.1\mu s$ aux bornes moteur). Les caractéristiques typiques couple/vitesse en service S1 pour moteur avec fréquence de base $f_b = 50$ Hz sont indiquées dans le tab. (A54).

Pour des fréquences de fonctionnement inférieures à environ 30 Hz, à cause de la diminution de la ventilation, les moteurs standards autoventilés (IC411) doivent être opportunément déclassés au niveau du couple ou, en alternative, doivent être équipés de servoventilateur indépendant. Pour des fréquences supérieures à la fréquence de base, une fois



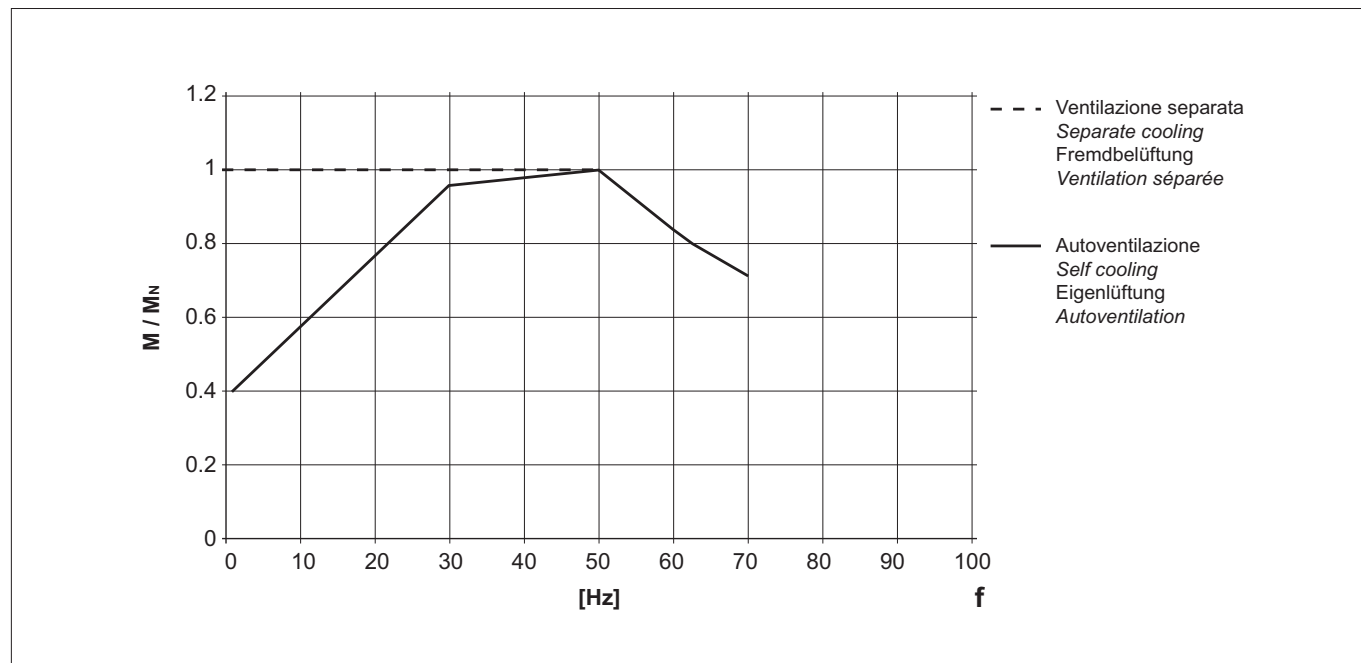
campo di funzionamento a potenza costante, con coppia all'albero che si riduce ca. con il rapporto (f/f_b) . Poiché la coppia massima del motore decresce ca. con $(f/f_b)^2$, il margine di sovraccarico ammesso dovrà essere progressivamente ridotto.

As motor maximum torque decreases with $(f/f_b)^2$, the allowed overloading must be reduced progressively.

nach Erreichen des max. Spannungswerts am Inverterausgang in einem Betriebsbereich unter konstanter Leistung mit einem Drehmoment an der Welle, der sich ungefähr im Verhältnis (f/f_b) reduziert. Da das max. Drehmoment des Motors mit ungefähr $(f/f_b)^2$ abnimmt, muss auch der zulässige Überbelastungsgrenzwert progressiv reduziert werden.

la valeur maximale de tension de sortie du variateur atteinte, le moteur fonctionne dans une plage de fonctionnement à puissance constante, avec couple à l'arbre qui se réduit avec le rapport (f/f_b) . Dans la mesure où le couple maximal du moteur diminue avec $(f/f_b)^2$, la marge de surcharge admise doit être progressivement réduite.

(A45)



Per funzionamento oltre la frequenza nominale, la velocità limite meccanica dei motori è riportata in tabella (A46):

Table (A46) reports the mechanical limit speed for motor operation above rated frequency:

Für einen Betrieb, der über die Nennfrequenz hinausgeht, wird die Geschwindigkeitsbegrenzung der Motoren in der Tabelle (A46) angegeben:

En cas de fonctionnement au-delà de la fréquence nominale, la vitesse limite mécanique des moteurs est indiquée dans le tableau (A46):

(A46)

		n [min ⁻¹]		
		2p	4p	6p
≤ BN 112	M05...M3	5200	4000	3000
BN 132...BN 200L	M4, M5	4500	4000	3000

A velocità superiori alla nominale i motori presentano maggiori vibrazioni meccaniche e rumorosità di ventilazione; è consigliabile, per queste applicazioni, un bilanciamento del rotore in grado B e l'eventuale montaggio del servoventilatore indipendente.

Above rated speed, motors generate increased mechanical vibration and fan noise. Class B rotor balancing is highly recommended in these applications. Installing a separate supply fan cooling may also be advisable.

Bei Geschwindigkeiten über die Nennwerte hinaus, weisen die Motoren höhere mechanische Schwingungen und mehr Funktionsgeräusche bei der Belüftung auf. Bei diesen Applikationen wird ein Auswuchten des Rotors im Grad B und eine eventuelle Montage des unabhängig funktionierenden Servoventilators empfohlen.

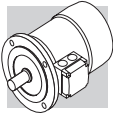
A des vitesses supérieures à la vitesse nominale, les moteurs présentent plus de vibrations mécaniques et de bruit de ventilation ; pour ces applications, il est conseillé d'effectuer un équilibrage du rotor en niveau B et de monter éventuellement un servoventilateur indépendant.

Il servoventilatore e, se presente, il freno elettromagnetico devono sempre essere alimentati direttamente da rete.

Remote-controlled fan and brake (if fitted) must always be connected direct to mains power supply.

Der Servoventilator und, falls vorhanden, die elektromagnetische Bremse müssen immer direkt über das Netz gespeist werden.

Le servoventilateur et, si présent, le frein électromagnétique doivent toujours être alimentés directement par le réseau.



Frequenza massima di avviamento Z

Nelle tabelle dei dati tecnici motori è indicata la max frequenza di inserzione a vuoto Z_0 con $I = 50\%$ riferita alla versione autofrenante. Questo valore definisce il numero max di avviamenti orari a vuoto che il motore può sopportare senza superare la max temperatura ammessa dalla classe di isolamento F.

Nel caso pratico di motore accoppiato ad un carico esterno con potenza assorbita P_r , massa inerziale J_c e coppia resistente media durante l'avviamento M_L , il numero di avviamenti ammissibile si può calcolare in modo approssimato con la seguente formula:

Permissible starts per hour, Z

The rating charts of brakemotors lend the permitted number of starts Z_0 , based on 50% intermittence and for unloaded operation.

The catalogue value represents the maximum number of starts per hour for the motor without exceeding the rated temperature for the insulation class F.

To give a practical example for an application characterized by inertia J_c , drawing power P_r and requiring mean torque at start-up M_L the actual number of starts per hour for the motor can be calculated approximately through the following equation:

Maximale Schaltungshäufigkeit Z

In den Tabellen mit den Technischen Daten der Motoren ist die maximale Schaltungshäufigkeit im Leerlauf Z_0 bei relativer Einschaltdauer $I = 50\%$ bezüglich auf die Bremsausführung. Dieser Wert definiert die maximale Anzahl von Anfahrten im Leerlauf pro Stunde, die der Motor ertragen kann, ohne die durch die Isolierstoffklasse F festgelegte maximal zulässige Temperatur zu überschreiten.

Im praktischen Fall eines mit einer externen Last verbundenen Motors mit einer Leistungsaufnahme von P_r , Trägheitsmasse J_c und mittlerem Gegenmoment während des Anfahrens von M_L kann die zulässige Anzahl Anfahrten mit folgender Formel approximativ berechnet werden:

Fréquence maximum de démarrage Z

Dans les tableaux des caractéristiques techniques des moteurs se trouve la fréquence maximum d'insertion à vide Z_0 avec intermittence $I = 50\%$ référée à la version frein. Cette valeur définit un nombre maximum de démarrages horaires à vide que le moteur peut supporter sans dépasser la température maximum admise par la classe d'isolation F.

Dans le cas pratique de moteur accouplé à une charge extérieure avec puissance absorbée P_r , masse inertielle J_c et couple résistant moyen pendant le démarrage M_L , le nombre de démarrages admissible peut se calculer de façon approximative avec la formule suivante :

$$Z = \frac{Z_0 \cdot K_c \cdot K_d}{K_j}$$

dove:

$$K_j = \frac{J_m + J_c}{J_m} = \text{fattore di inerzia}$$

$$K_c = \frac{M_a - M_L}{M_a} = \text{fattore di coppia}$$

$$K_d = \text{fattore di carico}$$

vedi tabella (A47)

where:

$$K_j = \frac{J_m + J_c}{J_m} = \text{inertia factor}$$

$$K_c = \frac{M_a - M_L}{M_a} = \text{torque factor}$$

$$K_d = \text{load factor}$$

see table (A47)

wobei gilt:

$$K_j = \frac{J_m + J_c}{J_m} = \text{Trägheitsfaktor}$$

$$K_c = \frac{M_a - M_L}{M_a} = \text{Drehmomentsfaktor}$$

$$K_d = \text{Lastfaktor}$$

siehe Tabelle (A47)

où:

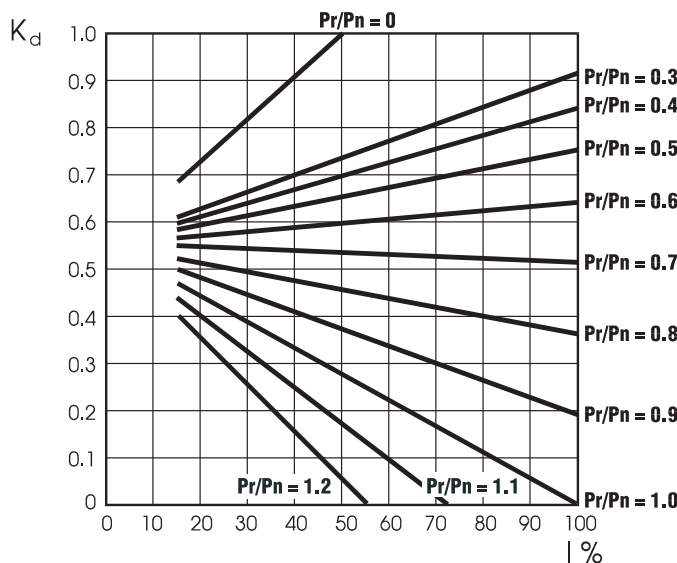
$$K_j = \frac{J_m + J_c}{J_m} = \text{facteur d'inertie}$$

$$K_c = \frac{M_a - M_L}{M_a} = \text{facteur de couple}$$

$$K_d = \text{facteur de charge}$$

voir tableau (A47)

(A47)

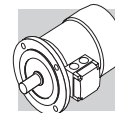


Con il numero di avviamenti così ottenuto si dovrà in seguito verificare che il massimo lavoro di frenatura sia compatibile con la capacità termica del freno W_{max} indicata nella tabella (A54).

If actual starts per hour is within permitted value (Z) it may be worth checking that braking work is compatible with brake (thermal) capacity W_{max} also given in table (A54) and dependent on the number of switches (c/h).

Auf Grundlage der so berechneten Anzahl Schaltungen muß man dann prüfen, ob die maximale Bremsarbeit mit der Wärmegrenzleistung der Bremse W_{max} kompatibel ist, die in die Tabelle (A54) angegeben ist.

Avec le nombre de démarrages ainsi obtenu, il faudra ensuite vérifier que le travail maximum de freinage soit compatible avec la capacité thermique du frein W_{max} indiquée dans le table (A54).



M5 - MOTORI ASINCRONI AUTOFRENANTI

M5 - ASYNCHRONOUS BRAKE MOTORS

M5 - DREHSTROMBREMS- MOTOREN

M5 - MOTEURS FREIN ASYNCHRONES

Funzionamento

L'esecuzione autofrenante prevede l'impiego di freni a pressione di molle alimentati in c.c. (tipo FD) o in c.a. (tipo FA, BA). Tutti i freni funzionano secondo il principio di sicurezza, ossia intervengono in seguito alla pressione esercitata dalle molle, in mancanza di alimentazione.

Operation

Versions with incorporated brake use spring-applied DC (FD option) or AC (FA, BA options) brakes. All brakes are designed to provide fail-safe operation, meaning that they are applied by spring-action in the event of power failure.

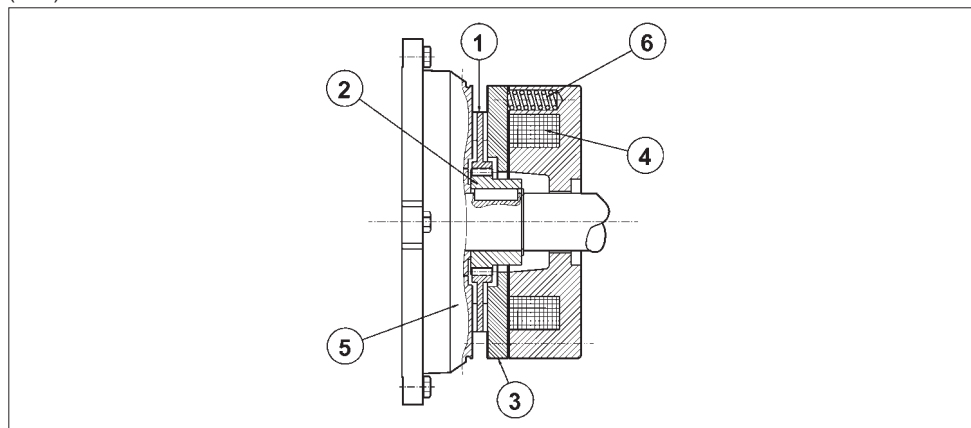
Betriebsweise

Die selbstbremsende Ausführung der Motoren sieht den Einsatz von Federdruckbremsen vor, die mit Gleichstrom (Typ FD) oder mit Wechselstrom (Typ FA, BA) gespeist werden. Alle Bremsen arbeiten gemäß dem Sicherheitsprinzip, d.h. sie greifen, im Fall eines Stromausfalls in Folge eines auf die Feder ausgeübten Drucks ein.

Fonctionnement

L'exécution avec frein prévoit l'utilisation de freins à pression de ressorts alimentés en c.c. (type FD) ou en c.a. (type FA, BA). Tous les freins fonctionnent selon le principe de sécurité, c'est-à-dire qu'ils interviennent suite à la pression exercée par les ressorts, en cas de coupure d'alimentation.

(A48)



Legenda:

- ① disco
- ② mozzo
- ③ ancora mobile
- ④ bobina
- ⑤ scudo post.motore
- ⑥ molle

Key:

- ① brake disc
- ② disc carrier
- ③ pressure plate
- ④ brake coil
- ⑤ motor rear shield
- ⑥ brake springs

Zeichenerklärung:

- ① Brems scheibe
- ② Nabe
- ③ Beweglicher Anker
- ④ Ringspule
- ⑤ Motorschild
- ⑥ Schußfedern

Légende:

- ① disque
- ② moyeu d'entraînement
- ③ disque de freinage
- ④ bobine de frein
- ⑤ flasque-frein
- ⑥ ressort de frein

In mancanza di tensione, l'ancora mobile spinta dalle molle di pressione blocca il disco freno tra la superficie dell'ancora stessa e lo scudo motore impedendo la rotazione dell'albero. Quando la bobina viene eccitata, l'attrazione magnetica esercitata sull'ancora mobile vince la reazione elastica delle molle e libera il disco freno, e conseguentemente l'albero motore con esso solidale.

When voltage is interrupted, pressure springs push the armature plate against the brake disc. The disc becomes trapped between the armature plate and motor shield and stops the shaft from rotation. When the coil is energized, a magnetic field strong enough to overcome spring action attracts the armature plate, so that the brake disc – which is integral with the motor shaft – is released.

Wenn die Spannungsversorgung abfällt, sorgt der bewegliche, von den Druckfedern geschobene Anker für die Blockierung der Bremsscheibe zwischen der Ankerfläche und dem Motorschild und blockiert damit den Rotor. Wird die Spule erregt, kommt es durch den magnetischen auf den beweglichen Anker wirkenden Anzug zur Überwindung der elastischen Federkraft und zum Lösen der Bremsscheibe, wodurch der rotor wieder freigegeben wird.

En cas de coupure de courant, l'armature mobile, poussée par les ressorts, bloque le disque de frein entre la surface de l'armature et le bouclier moteur en empêchant la rotation de l'arbre. Lorsque la bobine est excitée, l'attraction magnétique exercée sur l'armature mobile annule la réaction élastique des ressorts et libère le disque de frein, et par conséquent l'arbre moteur, qui est solidaire.

Caratteristiche generali

Most significant features

Allgemeine Eigenschaften

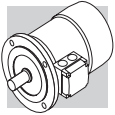
Caractéristiques générales

- Coppie frenanti elevate (generalmente $M_b \approx 2 M_n$) e regolabili.
- Disco freno con anima in acciaio a doppia guarnizione d'attrito (materiale a bassa usura, senza amianto).
- Cava esagonale sull'albero motore, lato ventola (NDE), per rotazione manuale (non prevista quando sono presenti le opzioni PS, RC, TC, U1, U2, EN1, EN2, EN3).
- Sblocco meccanico manuale.
- Trattamento anticorrosivo di tutte la superfici del freno.
- Isolamento in classe F

- High braking torques (normally $M_b \approx 2 M_n$), braking torque adjustment.
- Steel brake disc with double friction lining (low-wear, asbestos-free lining).
- Hexagonal seat on motor shaft fan end (N.D.E.) for manual rotation (not compatible with options PS, RC, TC, U1, U2, EN1, EN2, EN3).
- Manual release lever.
- Corrosion-proof treatment on all brake surfaces.
- Insulation class F

- Hohe und regulierbare Bremsmomente (allgemein $M_b \approx 2 M_n$).
- Bremsscheibe mit Stahlkern und doppeltem Bremsbelag (Material mit geringem Verschleiß, asbestfrei).
- Sechskant hinten an der Motorwelle, auf Lüfterradseite (N.D.E.), für eine manuelle Drehung des Rotors mit einem Inbusschlüssel. (nicht lieferbar, wenn die Optionen PS, RC, TC, U1, U2, EN1, EN2, EN3) bestellt wurden.
- Manuell zu betätigende, mechanische Bremslüftvorrichtung.
- Korrosionsschutzbehandlung an allen Flächen der Bremse.
- Isolierung in Klasse F

- Couples de freinage élevés (généralement $M_b \approx 2 M_n$) et réglables.
- Disque de frein avec structure en acier à double garniture de frottement (matière à faible usure, sans amiante).
- Empreinte hexagonale sur l'arbre moteur, côté ventilateur (N.D.E.), pour la rotation manuelle (non prévue en cas de présence des options PS, RC, TC, U1, U2, EN1, EN2, EN3).
- Déblocage mécanique manuel.
- Traitement anticorrosion sur toute la surface du frein.
- Isolation en classe F



**M6 - MOTORI
AUTOFRENANTI IN C.C.,
TIPO BN_FD**

**M6 - DC BRAKE MOTORS
TYPE BN_FD**

**M6 - DREHSTROMBREMS-
MOTOREN MIT GLEICH-
STROMBREMSE: TYP
BN_FD**

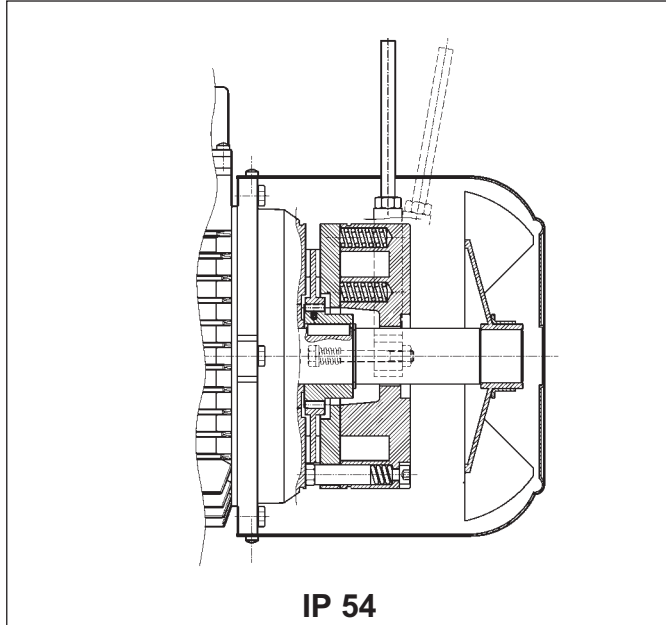
**M6 - MOTEURS FREIN EN
C.C., TYPE BN_FD**

Frame sizes: BN 63 ... BN 200L

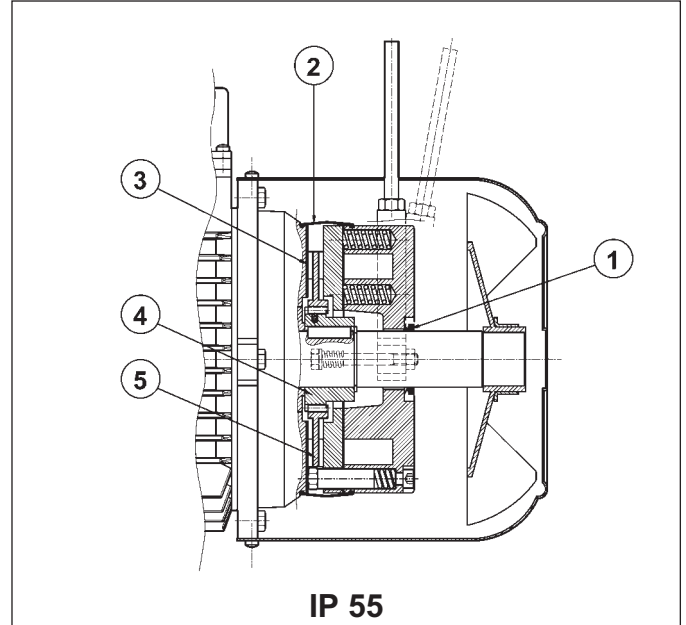
Baugrößen: BN 63 ... BN 200L

Tailles : BN 63 ... BN 200L

(A49)



(A50)



Freno elettromagnetico con bobina toroidale in **corrente continua** fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete.

Il disco freno è scorrevole sul mozzo trascinatore in acciaio calettato sull'albero e previsto di molla antivibrazione.

I motori sono forniti con freno tarato in fabbrica al valore di coppia riportato nelle tabelle dati tecnici; la coppia frenante può essere regolata modificando il tipo e/o il numero delle molle.

A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (R) o con mantenimento della posizione di rilascio freno (RM); per la posizione angolare della leva di sblocco vedi descrizione della relativa variante alla pag. 426.

Il freno FD garantisce elevate prestazioni dinamiche e bassa rumorosità; le caratteristiche d'intervento del freno in corrente continua possono essere ottimizzate in funzione dell'applicazione, utilizzando i vari tipi di alimentatore disponibili e/o realizzando l'opportuno cablaggio.

Direct current toroidal-coil electromagnetic brake bolted onto motor shield. Preloading springs provide axial positioning of magnet body.

Brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration spring.

Brake torque factory setting is indicated in the corresponding motor rating charts. Braking torque may be modified by changing the type and/or number of springs.

At request, motors may be equipped with manual release lever with automatic return (R) or system for holding brake in the released position (RM).

See variant at page 426 for available release lever locations.

FD brakes ensure excellent dynamic performance with low noise. DC brake operating characteristics may be optimized to meet application requirements by choosing from the various rectifier/power supply and wiring connection options available.

Elektromagnetische Bremse mit Ringwicklungsspule für **Gleichstromspannung**, die mittels Schrauben am hinteren Motorschild befestigt ist. Die Federn sorgen für die axiale Ausrichtung des Magnetkörpers.

Die Bremsscheibe gleitet axial auf der Mitnehmersnabe aus Stahl, die über eine Paßfeder mit der Motorwelle verbunden und mit einer Schwingungsdämpfung ausgestattet ist.

Die Motoren werden vom Hersteller auf den in der Tabelle der technischen Daten angegebenen Bremsmoment eingestellt; das Bremsmoment kann durch das Ändern des Typs und/oder der Anzahl der Federn reguliert werden.

Auf Anfrage können die Motoren mit einem Bremslüfthebel für die manuelle Lüftung der Bremse mit selbstständiger Rückstellung (R) ohne Arretierung oder mit arretierbarem Lüfthebel (RM) geliefert werden. Die Festlegung der Position des Bremslüfthebel in Abhängigkeit von der Klemmkastenlage erfolgt durch die Option auf Seite 426.

Die Bremse vom Typ FD garantiert hohe dynamische Leistungen und niedrige Laufgeräusche. Die Ansprechigenschaften der Bremse unter Gleichstrom können in Abhängigkeit zur jeweiligen Anwendung durch den Einsatz der verschiedenen verfügbaren Gleichrichter oder durch eine entsprechenden Anschluß der Bremse optimiert werden.

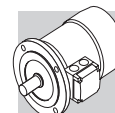
Frein électromagnétique avec bobine toroïdale en **courant continu**, fixé avec des vis au bouclier moteur; les ressorts de précharge réalisent le positionnement axial de la bobine.

Le disque frein coulisse de façon axiale sur le moyeu d'entraînement en acier calé sur l'arbre et doté de ressort antivibration.

Les moteurs sont fournis avec frein préréglé en usine à la valeur de couple indiquée dans les tableaux des caractéristiques techniques; le couple de freinage peut être réglé en modifiant le type et/ou le nombre de ressorts.

Sur demande, les moteurs peuvent être équipés de levier pour le déblocage manuel avec retour automatique (R) ou avec maintien de la position de déblocage frein (RM); pour la position angulaire du levier de déblocage, voir description de la variante correspondante à la page 426.

Le frein FD garantit des performances dynamiques élevées et un faible niveau de bruit; les caractéristiques d'intervention du frein en courant continu peuvent être optimisées en fonction de l'application en utilisant les différents types de dispositifs d'alimentation disponibles et/ou en réalisant un câblage approprié.



Grado di protezione	Degree of protection	Schutzart	Degré de protection
L'esecuzione standard prevede il grado di protezione IP54. In opzione il motore autofrenante tipo FD viene fornito con grado di protezione IP 55 , prevedendo le seguenti varianti costruttive:	<i>Standard protection class is IP54. Brake motor FD is also available in protection class IP 55, which mandates the following variants:</i>	Die Standardausführung ist Schutzart IP54 vor. Optional kann der Bremsmotor vom Typ FD in der Schutzart IP 55 geliefert werden, wobei sind folgende Komponenten eingesetzt werden:	<i>L'exécution standard prévoit le degré de protection IP54. En option, le moteur frein type FD est fourni avec degré de protection IP 55, en prévoyant les variantes de construction suivantes :</i>
① anello V-ring posizionato sull'albero motore N.D.E.	① V-ring at N.D.E. of motor shaft	① V-Ring an der Motorwelle N.D.E.	① bague V-ring positionnées sur l'arbre moteur N.D.E.
② fascia di protezione in gomma	② dust and water-proof rubber boot	② Schutzring aus Gummi	② bande de protection en caoutchouc
③ anello in acciaio inox interposto tra scudo motore e disco freno	③ stainless steel ring placed between motor shield and brake disc	③ Ring aus rostfreiem Stahl zwischen Motorschild und	③ bague en acier inox interposée entre le bouclier moteur et le disque de frein
④ mozzo trascinatore in acciaio inox	④ stainless steel hub	④ Bremsscheibe Mitnehmer-nabe aus rostfreiem Stahl	④ moyeu d'entraînement en acier inox
⑤ disco freno in acciaio inox	⑤ stainless steel brake disc	⑤ Bremsscheibe aus rostfreiem Stahl	⑤ disque frein en acier inox

Alimentazione freno FD	FD brake power supply	Spannungsversorgung der Bremse FD	Alimentation frein FD
L'alimentazione della bobina freno in c.c. è prevista per mezzo di opportuno raddrizzatore montato all'interno della scatola coprimorsetti e già cablato alla bobina del freno. Per motori a singola polarità è inoltre previsto di serie il collegamento del raddrizzatore alla morsettiera motore. Indipendentemente dalla frequenza di rete, la tensione standard di alimentazione del raddrizzatore V_B ha il valore indicato nella tabella (A51) qui di seguito:	<i>A rectifier accommodated inside the terminal box feeds the DC brake coil. Wiring connection across rectifier and brake coil is performed at the factory. On all single-pole motors, rectifier is connected to the motor terminal board. Rectifier standard power supply voltage V_B is as indicated in the following table (A51), regardless of mains frequency:</i>	Die Versorgung der Gleichstrombremsspule erfolgt über einen Gleichrichter im Klemmenkasten der bei Lieferung, wenn nicht anders bestellt, bereits mit der Bremsspule verkabelt ist. Bei den einpoligen Motoren ist serienmäßig der Anschluss des Gleichrichters an die Motorspannung vorgesehen. Unabhängig von der Netzfrequenz erfolgt die Versorgung des Gleichrichters V_B über die in der nachstehenden Tabelle (A51) angegebenen Standardspannung:	<i>L'alimentation de la bobine de frein en c.c. est prévue au moyen d'un redresseur approprié monté à l'intérieur de la boîte à bornes et déjà câblé à la bobine de frein. De plus, pour les moteurs à simple polarité, le raccordement du redresseur au bornier moteur est prévu de série. Indépendamment de la fréquence du réseau, la tension standard d'alimentation du redresseur V_B correspond à la valeur indiquée dans le tableau (A51) ci-dessous :</i>

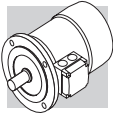
(A51)

2, 4, 6 P				1 speed	
		BN_FD / M_FD $V_{mot} \pm 10\%$ 3 ~ $V_B \pm 10\%$ 1 ~		alimentazione freno da morsettiera brake connected to terminal board power supply Bremsversorgung über die Motorspannung Alimentation frein depuis boîte à bornes	alimentazione separata separate power supply Separate Versorgung Alimentation séparée
BN 63...BN 132	M05...M4LB	230/400 V – 50 Hz	230 V	standard	specificare V_B SA o V_B SD specify V_B SA or V_B SD V_B SA oder V_B SD angeben spécifier V_B SA ou V_B SD
BN 160...BN 200	M4LC...M5	400/690 V – 50 Hz	400 V	standard	specificare V_B SA o V_B SD specify V_B SA or V_B SD V_B SA oder V_B SD angeben spécifier V_B SA ou V_B SD

Per i motori a doppia polarità l'alimentazione standard del freno è da linea separata con tensione d'ingresso al raddrizzatore V_B come indicato in tabella (A52):	<i>Switch-pole motors feature a separate power supply line for the brake with rectifier input voltage V_B as indicated in the table (A52):</i>	Die polumschaltbaren Motoren müssen immer mit separater Bremsversorgungsspannung betrieben werden, deshalb erfolgt die Lieferung standardmäßig ohne Anschluß der Bremse an die Motorspannung, da diese mit einer am Eingang des Gleichrichters V_B anliegenden Spannung versorgt werden muß, entsprechend Werte in der nachstehenden Tabelle (A52):	<i>Pour les moteurs à double polarité, l'alimentation standard du frein dérive d'une ligne séparée avec tension d'entrée au redresseur V_B comme indiqué dans le tableau (A52) :</i>

(A52)

2/4, 2/6, 2/8, 2/12, 4/6, 4/8 P				2 speed	
		BN_FD / M_FD $V_{mot} \pm 10\%$ 3 ~ $V_B \pm 10\%$ 1 ~		alimentazione freno da morsettiera brake powered via terminal board Bremsversorgung über die Motorspannung Alimentation frein depuis boîte à bornes	alimentazione separata separate power supply Separate Versorgung Alimentation séparée
BN 63...BN 132	M05...M4LB	400 V – 50 Hz	230 V		specificare V_B SA o V_B SD specify V_B SA or V_B SD V_B SA oder V_B SD angeben spécifier V_B SA ou V_B SD



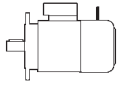
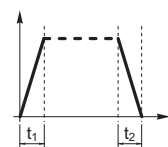
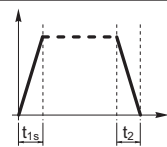
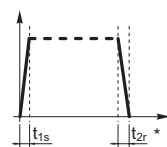
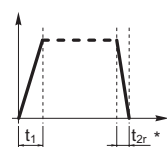
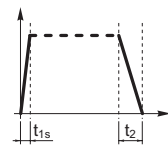
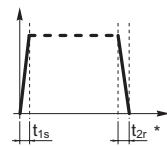
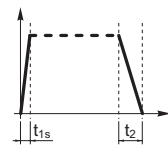
Il raddrizzatore è del tipo a diodi a semionda ($V_{c.c} \approx 0,45 \times V_{c.a.}$) ed è disponibile nelle versioni **NB**, **SB**, **NBR** e **SBR**, come dettagliato nella tabella (A53) seguente:

The diode half-wave rectifier ($V_{DC} \approx 0,45 \times V_{AC}$) is available in versions **NB**, **SB**, **NBR** e **SBR**, as detailed in the table (A53) below:

Bei dem Gleichrichter handelt es sich um einen Typ mit Halbwel-lendioden ($V_{c.c} \approx 0,45 V_{c.a.}$). Er ist in den Versionen **NB**, **SB**, **NBR** und **SBR**, gemäß den Details in der nachstehenden Tabelle (A53), verfügbar:

Le redresseur est du type à diodes à demi-onde ($V_{c.c} \approx 0,45 \times V_{c.a.}$) et il est disponible dans les versions **NB**, **SB**, **NBR** et **SBR**, comme indiqué de façon détaillée dans le tableau (A53) suivant :

(A53)

		freno brake Bremsse frein		
			standard	a richiesta at request auf Anfrage Sur demande
BN 63	M05	FD 02		
BN 71	M1	FD 03		SB
		FD 53		
BN 80	M2	FD 04		SBR
BN 90S	—	FD 14		
BN 90L	—	FD 05		NBR
BN 100	M3	FD 15		
—		FD 55		
BN 112	—	FD 06S		
BN 132...160MR	M4	FD 56		
BN 160L - BN 180M	M5	FD 06		
BN 180L - NM 200L	—	FD 07		

(*) $t_{2c} < t_{2r} < t_2$

Il raddrizzatore **SB** a controllo elettronico dell'eccitazione, riduce i tempi di sblocco del freno sovraccitando l'elettromagnete nei primi istanti d'inserzione, per passare poi al normale funzionamento a semionda a distacco del freno avvenuto.

L'impiego del raddrizzatore tipo **SB** è sempre da prevedere nei casi di:

- elevato numero di interventi orari
- tempi di sblocco freno ridotti
- elevate sollecitazioni termiche del freno

Per applicazioni dove è richiesto un rapido rilascio del freno sono disponibili a richiesta i raddrizzatori **NBR** o **SBR**. Questi raddrizzatori completano i tipi **NB** e **SB**, integrando nel cir-

Rectifier **SB** with electronic energizing control over-energizes the electromagnet upon power-up to cut brake release response time and then switches to normal half-wave operation once the brake has been released.

Use of the **SB** rectifier is mandatory in the event of:

- high number of operations per hour
- reduced brake release response time
- brake is exposed to extreme thermal stress

Rectifiers **NBR** or **SBR** are available for applications requiring quick brake release response. These rectifiers complement the **NB** and **SB** types as their elec-

Der Gleichrichter **SB** mit elektronischer Kontrolle der Erregung reduziert die Bremslösezeiten, indem er die Bremsspule in den ersten Momenten der Einschaltung übermäßig erregt, um dann, nach erfolgter Bremslösung, in die normale Halbwellenfunktion umzuschalten.

Der Einsatz eines Gleichrichters vom Typ **SB** wird in folgenden Fällen empfohlen:

- hohe Anzahl von Schaltungen pro Stunde
- schnelle Bremsansprechzeiten
- starke thermische Beanspruchungen der Bremse

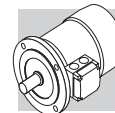
Für die Anwendungen, bei denen eine schnelle Ansprechzeit der Bremse gefordert wird, können auf Anfrage die Gleichrichter **NBR** oder **SBR** geliefert werden. Diese Gleichrichter erweitern die

Le redresseur **SB** à contrôle électronique de l'excitation réduit les temps de déblocage du frein en surexcitant l'électro-aimant durant les premiers instants d'enclenchement pour passer ensuite au fonctionnement normal à demi-onde une fois le frein désactivé.

L'utilisation du redresseur type **SB** doit toujours être prévue dans les cas suivants :

- nombre d'interventions horaires élevé
- temps de déblocage frein réduits
- sollicitations thermiques du frein élevées

Pour les applications nécessitant un déblocage rapide du frein, sur demande les redresseurs **NBR** ou **SBR** sont disponibles. Ces redresseurs complètent les types **NB** et **SB**, en intégrant



cuito elettronico un interruttore statico che interviene diseccando rapidamente il freno in caso di mancanza di tensione. Questa soluzione consente di ridurre i tempi di rilascio del freno evitando ulteriori cablaggi e contatti esterni. Per il migliore utilizzo dei raddrizzatori **NBR** e **SBR** è richiesta l'alimentazione separata del freno. Tensioni disponibili: 230V $\pm$ 10%, 400V $\pm$ 10%, 50/60 Hz.

*tronic circuit incorporates a static switch that de-energizes the brake quickly in the event voltage is missing. This arrangement ensures short brake release response time with no need for additional external wiring and contacts. Optimum performance of rectifiers **NBR** and **SBR** is achieved with separate brake power supply. Available voltages: 230V $\pm$ 10%, 400V $\pm$ 10%, 50/60 Hz.*

Funktion der Typen **NB** und **SB**, indem in dem elektronischen Schaltkreis ein statischen Schalter integriert ist, durch dessen Auslösen die Bremse im Fall eines Spannungsausfalls schnell abgeregt wird. Diese Lösung ermöglicht eine Verringerung der Ansprechzeiten der Bremse, wodurch weitere Schaltungen und externe Sensoren vermieden werden können. Im Hinblick auf einen besseren Einsatz der Gleichrichter **NBR** und **SBR** ist bei der Bremse eine separate Versorgung erforderlich. Verfügbare Spannungen: 230V $\pm$ 10%, 400V $\pm$ 10%, 50/60 Hz.

*dans le circuit électronique un interrupteur statique qui intervient en désexcitant rapidement le frein en cas de coupure de tension. Cette solution permet de réduire les temps de déblocage du frein en évitant d'autres câblages et contacts extérieurs. Pour une meilleure utilisation des redresseurs **NBR** et **SBR** l'alimentation séparée du frein est nécessaire. Tensions disponibles : 230V $\pm$ 10%, 400V $\pm$ 10%, 50/60 Hz.*

Dati tecnici freni FD

Nella tabella (A54) sottostante sono riportati i dati tecnici dei freni in c.c. tipo FD.

(A54)

FD brake technical specifications

The table (A54) below reports the technical specifications of DC brakes FD.

Technische Daten - Bremstyp FD

In der nachstehenden Tabelle (A54) werden die technischen Daten der Gleichstrombremsen vom Typ FD angegeben.

Caractéristiques techniques freins FD

Le tableau (A54) suivant indique les caractéristiques techniques des freins en c.c. type FD.

Freno Brake Bremsen Frein	Coppia frenante M _b [Nm] Brake torque M _b [Nm] Bremsmoment M _b [Nm] Couple de freinage M _b [Nm]			Rilascio Release Ansprechzeit Déblocage		Frenatura Braking Bremsung Freinage		Wmax per frenata Wmax per brake operation Wmax pro Bremsung Wmax par freinage			W	P
	molle / springs feder / ressorts			t ₁	t _{1s}	t ₂	t _{2c}	[J]				
	6	4	2	[ms]	[ms]	[ms]	[ms]	10 s/h	100 s/h	1000 s/h	[MJ]	[W]
FD02	—	3.5	1.75	30	15	80	9	4500	1400	180	15	17
FD03	5	3.5	1.75	50	20	100	12	7000	1900	230	25	24
FD53	7.5	5	2.5	60	30	100	12					
FD04	15	10	5	80	35	140	15	10000	3100	350	30	33
FD14												
FD05	40	26	13	130	65	170	20	18000	4500	500	50	45
FD15	40	26	13	130	65	170	20					
FD55	55	37	18	—	65	170	20					
FD06S	60	40	20	—	80	220	25	20000	4800	550	70	55
FD56	—	75	37	—	90	150	20	29000	7400	800	80	65
FD06		100	50		100	150	20					
FD07	150	100	50	—	120	200	25	40000	9300	1000	130	65
FD08*	250	200	170	—	140	350	30	60000	14000	1500	230	100
FD09**	400	300	200	—	200	450	40	70000	15000	1700	230	120

* valori di coppia frenante ottenuti con n° 9, 7, 6 molle rispettivamente

* brake torque values obtained with 9, 7 and 6 springs, respectively

* Werte, der durch den Einsatz von jeweils 9, 7, 6 Federn erreichten Bremsmomente

* valeurs de couple de freinage obtenues respectivement avec n° 9, 7, 6 ressorts

** valori di coppia frenante ottenuti con n° 12, 9, 6 molle rispettivamente

** brake torque values obtained with 12, 9 and 6 springs, respectively

** Werte, der durch den Einsatz von jeweils 12, 9, 6 Federn erreichten Bremsmomente

** valeurs de couple de freinage obtenues respectivement avec n° 12, 9, 6 ressorts

Legenda:

t_1 = tempo di rilascio del freno con alimentatore a semionda
 t_{1s} = tempo di rilascio del freno con alimentatore a controllo elettronico dell'eccitazione
 t_2 = ritardo di frenatura con interruzione lato c.a. e alimentazione separata
 t_{2c} = ritardo di frenatura con interruzione lato c.a. e c.c. — I valori di t_1 , t_{1s} , t_2 , t_{2c} indicati nella tab. (A54) sono riferiti al freno tarato alla coppia massima, trafero medio e tensione nominale
 W_{max} = energia max per frenata
 W = energia di frenatura tra due regolazioni successive del trafero
 P_b = potenza assorbita dal freno a 20°C
 M_b = coppia frenante statica ($\pm 15\%$)
s/h = avviamenti orari

Key:

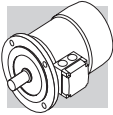
t_1 = brake release time with half-wave rectifier
 t_{1s} = brake release time with over-energizing rectifier
 t_2 = brake engagement time with AC line interruption and separate power supply
 t_{2c} = brake engagement time with AC and DC line interruption — Values for t_1 , t_{1s} , t_2 , t_{2c} indicated in the tab. (A54) are referred to brake set at maximum torque, medium air gap and rated voltage
 W_{max} = max energy per brake operation
 W = braking energy between two successive air gap adjustments
 P_b = brake power absorption at 20°C
 M_b = static braking torque ($\pm 15\%$)
s/h = starts per hour

Zeichenerklärung:

t_1 = Ansprechzeit der Bremse mit Halbwellengleichrichter
 t_{1s} = Ansprechzeit der Bremse mit elektronisch gesteuerten Erregungsgleichrichter
 t_2 = Bremsverzögerung mit Unterbrechung auf Wechselstromseite und Fremdversorgung
 t_{2c} = Bremsverzögerung mit Unterbrechung auf Wechselstrom- und Gleichstromseite — Die in der Tab. (A54) angegebenen Werte t_1 , t_{1s} , t_2 , t_{2c} beziehen sich auf eine auf das max. Bremsmoment geeichte Bremse, mit mittlerem Luftspalt und Nennspannung
 W_{max} = max. Energie pro Bremsung
 W = Bremsenergie zwischen zwei Einstellungen des Luftspalts
 P_b = bei 20°C von der Bremse aufgenommene Leistung (50 Hz)
 M_b = statisches Bremsmoment ($\pm 15\%$)
s/h = Einschaltungen pro stunde

Légende:

t_1 = temps de déblocage du frein avec dispositif d'alimentation à demi-onde
 t_{1s} = temps de déblocage du frein avec dispositif d'alimentation à contrôle électronique de l'excitation
 t_2 = retard de freinage avec interruption côté c.a. et alimentation séparée
 t_{2c} = retard de freinage avec interruption côté c.a. et c.c. — Les valeurs de t_1 , t_{1s} , t_2 , t_{2c} indiquées dans la tab. (A54) se réfèrent au frein étaloné au couple maximal, entrefer moyen et tension nominale
 W_{max} = énergie max. par freinage
 W = énergie de freinage entre deux réglages successifs de l'entrefer
 P_b = puissance absorbée par le frein à 20°C
 M_b = couple de freinage statique ($\pm 15\%$)
s/h = démarrages horaires



Collegamenti freno FD

I motori standard ad una velocità sono forniti con il collegamento del raddrizzatore alla morsetteria motore già realizzato in fabbrica. Per motori a 2 velocità, e dove è richiesta l'alimentazione del freno separata, prevedere il collegamento al raddrizzatore in accordo alla tensione freno V_B indicata nella targhetta del motore. **Data la natura induttiva del carico, per il comando del freno e per l'interruzione lato corrente continua devono essere utilizzati contatti con categoria d'impiego AC-3 secondo IEC 60947-4-1.**

Tabella (A55) - Alimentazione freno dai morsetti motore ed interruzione lato a.c.
Tempo di arresto t_2 ritardato e funzione delle costanti di tempo del motore. Da prevedere quando sono richiesti avviamenti/arresti progressivi.

Tabella (A56) - Bobina freno con alimentazione separata ed interruzione lato c.a.
Tempo di arresto normale ed indipendente dal motore. Si realizzano i tempi di arresto t_2 indicati nella tabella (A54).

Tabella (A57) - Bobina freno con alimentazione dai morsetti motore ed interruzione lato c.a. e c.c.
Arresto rapido con i tempi d'intervento t_{2c} indicati in tabella (A54).

Tabella (A58) - Bobina freno con alimentazione separata ed interruzione lato c.a. e c.c.
Tempo di arresto ridotto secondo i valori t_{2c} indicati in tabella (A54).

FD brake connections

On standard single-pole motors, the rectifier is connected to the motor terminal board at the factory.

For switch-pole motors and where a separate brake power supply is required, connection to rectifier must comply with brake voltage V_B stated in motor name plate.

Because the load is of the inductive type, brake control and DC line interruption must use contacts from the usage class AC-3 to IEC 60947-4-1.

Table (A55) - Brake power supply from motor terminals and AC line interruption
Delayed stop time t_2 and function of motor time constants. Mandatory when soft-start/stops are required.

Table (A56) - Brake coil with separate power supply and AC line interruption
Normal stop time independent of motor. Achieved stop times t_2 are indicated in the table (A54).

Table (A57) - Brake coil power supply from motor terminals and AC/DC line interruption.
Quick stop with operation times t_{2c} as per table (A54).

Table (A58) - Brake coil with separate power supply and AC/DC line interruption.
Stop time decreases by values t_{2c} indicated in the table (A54).

Anschlüsse - Bremstyp FD

Die einpoligen Motoren werden vom Werk ab mit an die Motorspannung angeschlossenem Gleichrichter geliefert.

Für die polumschaltbaren Motoren, und Bremse mit separater Versorgung, wird in Übereinstimmung mit der auf dem Typenschild des Motors angegebenen Bremsspannung V_B der Anschluss an den Gleichrichter vorgesehen.

Da es sich bei der Bremsleistung um eine induktive Kraft handelt, müssen gemäß IEC 60947-4-1 für die Steuerung der Bremse und die Unterbrechung der Gleichstromseite Kontakte der Kategorie AC-3 verwendet werden.

Tabelle (A55) - Bremsversorgung über die Motorspannung und Unterbrechung der Wechselstromseite.
Verzögerter und von den Zeitkonstanten des Motors abhängige Haltezeit t_2 . Vorzusehen, wenn progressive Starts/Stops erforderlich sind.

Tabelle (A56) - Bremsspule mit separater Spannungsversorgung und Unterbrechung der Wechselstromseite. Normale und vom Motor unabhängige Stoppzeiten. Es werden die in der Tabelle (A54) angegebenen Stoppzeiten t_2 realisiert.

Tabelle (A57) - Bremsspule mit Versorgung über die Motorspannung und Unterbrechung der Gleich- und der Wechselstromseite. Schneller Stopp mit den in der Tabelle (A54) angegebenen Ansprechzeiten t_{2c} .

Tabelle (A58) - Bremsspule mit separater Spannungsversorgung und Unterbrechung der Gleich- und der Wechselstromseite. Reduzierte Stoppzeiten der in der Tabelle (A54) angegebenen Werte t_{2c} .

Raccordements frein FD

Les moteurs standard à une vitesse sont fournis avec le raccordement du redresseur au bornier moteur déjà réalisé en usine.

Pour les moteurs à 2 vitesses, et lorsqu'une alimentation séparée du frein est requise, prévoir le raccordement au redresseur conformément à la tension frein V_B indiquée sur la plaque signalétique du moteur.

Etant donné la nature inductive de la charge, pour la commande du frein et l'interruption côté courant continu, il est nécessaire d'utiliser des contacts avec catégorie d'utilisation AC-3 selon la norme IEC 60947-4-1.

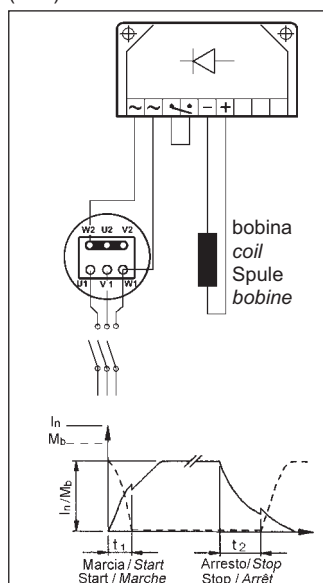
Tableau (A55) - Alimentation frein depuis bornes moteur et interruption côté c.a.
Temps d'arrêt t_2 retardé et fonction des constantes de temps du moteur.

A prévoir lorsque des démarrages/arrests progressifs sont requis.
Tableau (A56) - Bobine de frein avec alimentation séparée et interruption côté c.a.
Temps d'arrêt normal et indépendant du moteur. Les temps d'arrêts t_2 sont ceux indiqués dans le tableau (A54).

Tableau (A57) - Bobine de frein avec alimentation depuis les bornes moteur et interruption côté c.a. et c.c.
Arrêt rapide avec les temps d'intervention t_{2c} indiqués dans le tableau (A54).

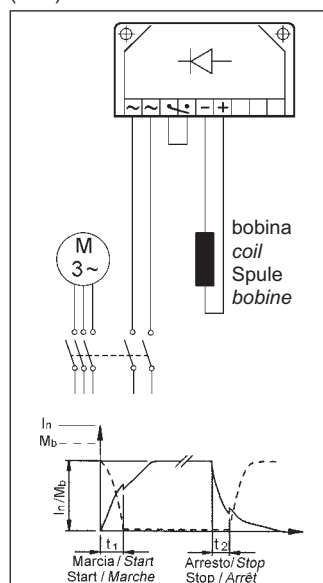
Tableau (A58) - Bobine de frein avec alimentation séparée et interruption côté c.a. et c.c.
Temps d'arrêt réduit selon les valeurs t_{2c} indiquées dans le tableau (A54).

(A55)



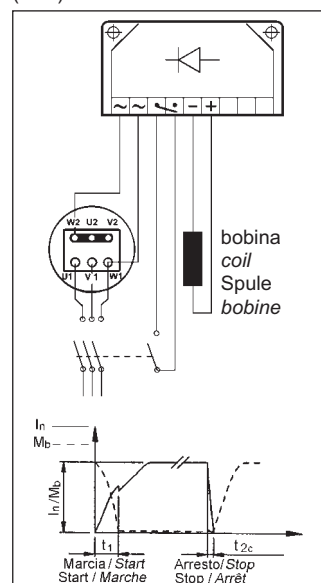
Le tabelle da (A55) a (A58) riportano gli schemi tipici di collegamento per alimentazione 400 V, motori 230/400V collegati a stella e freno 230 V.

(A56)



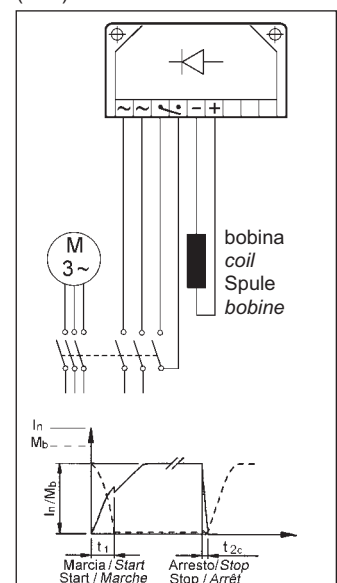
Tables (A55) through (A58) show the typical connection diagrams for 400 V power supply, star-connected 230/400V motors and 230 V brake.

(A57)

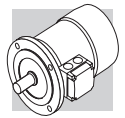


In den Tabellen (A55) bis (A58) werden die typischen Schaltungen für Versorgung mit 400 V, Motoren 230/400V mit Sternschaltung und einer Bremsspannung von 230 V wiedergegeben.

(A58)



Les tableaux de (A55) à (A58) indiquent les schémas typiques de branchement pour une alimentation de 400 V, moteurs 230/400V raccordés en étoile et frein 230 V.



**M7 - MOTORI
AUTOFRENANTI IN C.A.,
TIPO BN_FA**

**M7 - AC BRAKE MOTORS
TYPE BN_FA**

**M7 - WECHSELSTROM-
BREMSMOTOREN-TYP
BN_FA**

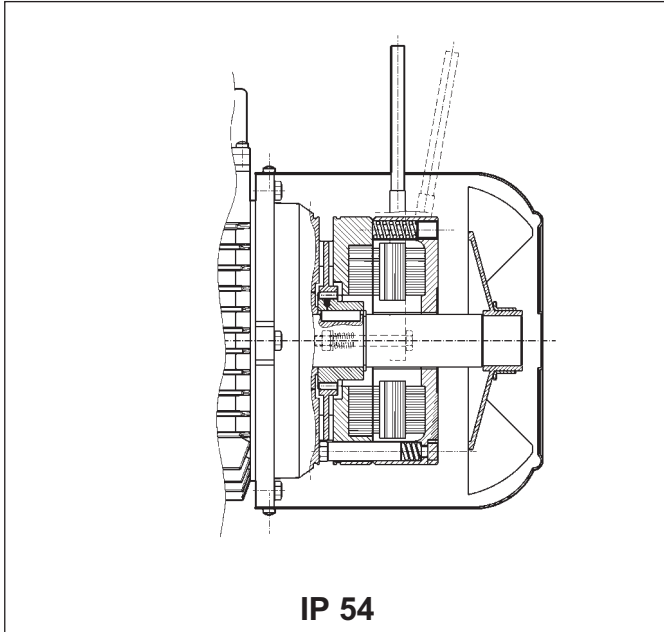
**M7 - MOTEURS FREIN EN
C.A., TYPE BN_FA**

Frame sizes: BN 63 ... BN 180M

Baugrößen: BN 63 ... BN 180M

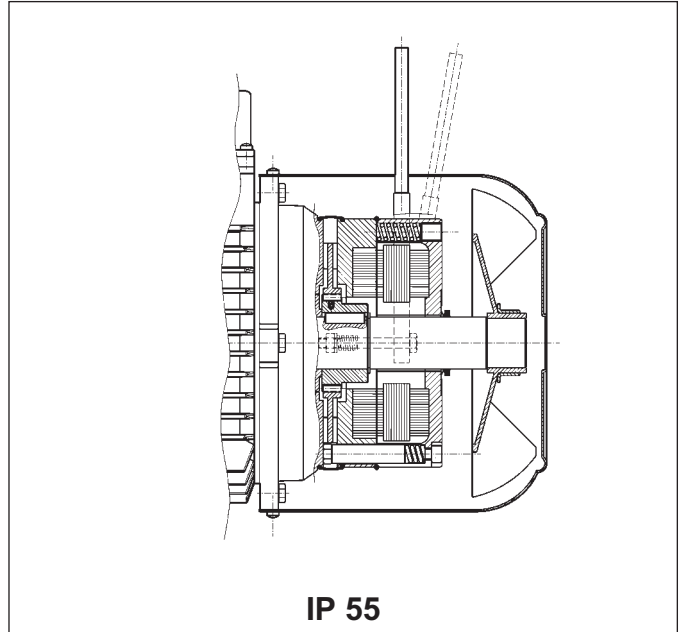
Tailles : BN 63 ... BN 180M

(A59)



IP 54

(A60)



IP 55

Freno elettromagnetico con alimentazione in **corrente alternata** trifase, fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete.

Il disco freno è scorrevole assialmente sul mozzo trascinatore in acciaio calettato sull'albero e provvisto di molla antivibrazione. La coppia frenante è pre-impostata in fabbrica su valori che sono indicati nelle tabelle dati tecnici dei relativi motori.

L'azione del freno è inoltre modulabile, regolando con continuità la coppia frenante, tramite le viti che realizzano il precarico delle molle; il campo di regolazione della coppia è: $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} è il momento frenante max riportato in tab. (A62).

Il freno tipo FA presenta dinamiche molto elevate che lo rendono idoneo in applicazioni dove sono richieste frequenze di avviamento elevate con tempi d'intervento molto rapidi.

A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (R). Per la specifica della posizione angolare della leva vedi relativa variante alla pag. 426.

*Electromagnetic brake operates from three-phase **alternated current** power supply and is bolted onto conveyor shield. Preloading springs provide axial positioning of magnet body.*

Steel brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration spring. Brake torque factory setting is indicated in the corresponding motor rating charts.

Spring preloading screws provide stepless braking torque adjustment.

Torque adjustment range is $30\% M_{bMAX} < M_b < M_{bMAX}$ (where M_{bMAX} is maximum braking torque as shown in tab. (A62). Thanks to their high dynamic characteristics, FA brakes are ideal for heavy-duty applications as well as applications requiring frequent stop/starts and very fast response time.

Motors may be equipped with manual release lever with automatic return (R) at request. See variants at page 426 for available lever locations.

Elektomagnetische Bremse mit **Drehstromversorgung**, die mittels Schrauben am hinteren Motorschild befestigt ist. Die Federn sorgen dabei für die axiale Ausrichtung des Magnetkörpers.

Die Bremsscheibe (Stahl) gleitet axial auf dem sich auf dem Rotor befindlichen Mitnehmer, der über eine Paßfeder mit Motorwelle verbunden und mit einer Schwingungsdämpffeder ausgestattet ist.

Das Bremsmoment wird auf das entsprechende Motormoment eingestellt (siehe Tabelle der technischen Daten der entsprechenden Motoren).

Das Bremsmoment ist stufenlos durch über die Schrauben die die Federvorspannung einstellbar. Der Einstellbereich beträgt $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} steht für den max. Bremsmoment, der in der Tab (A62) angegeben wird).

Die Bremse vom Typ FA zeichnet sich durch ihre hohen Dynamik aus, weshalb sie für Anwendungen geeignet sind, in denen hohe Schaltfrequenzen und schnelle Ansprechzeiten gefordert werden.

Auf Anfrage können die Motoren mit einem Lüfterhebel für die manuelle Lüftung der Bremse mit automatischer Rückstellung (R) geliefert werden. Die Angabe der Montageposition erfolgt über die Angabe der Option auf Seite 426.

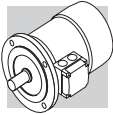
Frein électromagnétique avec alimentation en **courant alternatif** triphasé, fixé avec des vis au bouclier; les ressorts de précharge réalisent le positionnement axial de la bobine.

Le disque frein coulisse de façon axiale sur le moyeu d'entraînement en acier, calé sur l'arbre et doté de ressort antivibration.

Le couple de freinage est pré-réglé en usine aux valeurs qui sont indiquées dans les tableaux des caractéristiques techniques des moteurs correspondants. De plus, l'action du frein est modulable, en réglant le couple de freinage en continu au moyen des vis qui réalisent la précharge des ressorts; la plage de réglage du couple est de $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} est le couple de freinage maximum indiqué dans le tab. (A62).

Le frein type FA présente des caractéristiques dynamiques très élevées, il est donc adapté pour des applications nécessitant des fréquences de démarrage élevées et des temps d'intervention très rapides.

Sur demande, les moteurs peuvent être prévus avec levier pour le déblocage manuel avec retour automatique (R). Pour la spécification de la position angulaire du levier, voir variante page 426.



Grado di protezione

L'esecuzione standard prevede il grado di protezione IP54. In opzione, il motore autofrenante BN_FA viene fornito con grado di protezione **IP 55** prevedendo le seguenti varianti costruttive:

- anello V-ring posizionato sull'albero motore NDE.
- fascia di protezione in gomma
- anello O-ring

Degree of protection

Standard protection class is IP54. Brake motor BN_FA is also available in protection class **IP 55**, which mandates the following variants:

- V-ring at N.D.E. of motor shaft
- rubber protection sleeve
- O-ring

Schutzart

Die Standardausführung ist Schutzart IP54 vor. Optional kann der Bremsmotor BN_FA auch in der Schutzart **IP 55** geliefert werden, was durch die folgenden zusätzlichen Bauteile erreicht wird:

- V-Ring an der Motorwelle N.D.E.
- Schutzring aus Gummi
- O-Ring

Degré de protection

L'exécution standard prévoit le degré de protection IP54. En option, le moteur frein BN_FA est fourni avec degré de protection **IP 55**, les variations de construction suivantes sont prévues :

- bague V-ring positionné sur l'arbre moteur N.D.E.
- bande de protection en caoutchouc
- joint torique

Alimentazione freno FA

Nei motori a singola polarità l'alimentazione della bobina freno è derivata direttamente dalla morsettiera motore e la tensione del freno quindi coincide con la tensione del motore. In questo caso la tensione del freno può essere omessa dalla designazione.

Per i motori a doppia polarità, e per i motori con alimentazione separata del freno, è presente una morsettiera ausiliaria con 6 terminali per il collegamento alla linea del freno. In entrambi i casi il valore di tensione del freno dovrà essere specificato in designazione.

Nella tabella seguente sono riportate le condizioni di alimentazione standard del freno in c.a. per i motori a singola e doppia polarità:

FA brake power supply

In single speed motors, power supply is brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same. In this case, brake voltage indication may be omitted in the designation.

Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In both cases, brake voltage indication in the designation is mandatory. The following table reports standard AC brake power supply ratings for single- and switch-pole motors:

Stromversorgung - Bremstyp FA

Bei den einpoligen Motoren wird die Versorgung der Bremsspule direkt vom Motorklemmenkasten abgenommen, das bedeutet, dass die Spannung der Bremse mit der Motorspannung übereinstimmt. In diesem Fall braucht die Bremsenspannung nicht extra angegeben werden.

Für die polumschaltbaren Motoren und für eine separate Bremsversorgung ist eine Hilfsklemmenleiste mit 6 Anschlüssen vorgesehen, die einen Anschluß der Bremse ermöglichen. In beiden Fällen muss die Bremsenspannung in der Bestellung angegeben werden.

In der nachstehenden Tabelle werden für die einpoligen und die polumschaltbaren Motoren die Standardspannungen der Wechselstrombremsen angegeben.

Alimentation frein FA

Sur les moteurs à simple polarité, l'alimentation de la bobine frein dérive directement du bornier moteur, par conséquent, la tension du frein coïncide avec la tension du moteur. Dans ce cas, la tension du frein peut être omise de la désignation.

Pour les moteurs à double polarité et les moteurs avec alimentation séparée du frein, une boîte à bornes auxiliaire avec 6 bornes pour le raccordement à la ligne du frein, est présente. Dans les deux cas, la valeur de tension du frein doit être spécifiée dans la désignation.

Le tableau suivant indique les conditions d'alimentation standard du frein en c.a. pour les moteurs à simple et double polarité :

(A61)

motori a singola polarità <i>single-pole motor</i> Einpolige Motoren <i>Moteurs à simple polarité</i>	BN 63...BN 132	BN 160...BN 180
	M05...M4LB	M4LC...M5
	230Δ / 400Y V ±10% – 50 Hz	400Δ/ 690Y V ±10% – 50 Hz
	265Δ / 460Y ±10% - 60 Hz	460Y – 60 Hz

motori a doppia polarità (alimentazione da linea separata) <i>switch-pole motors (separate power supply line)</i> Polumschaltbare Motoren (separate Versorgung) <i>Moteurs à double polarité (alimentation depuis ligne séparée)</i>	BN 63...BN 132
	M05...M4
	230Δ / 400Y V ±10% – 50 Hz
	460Y - 60 Hz

Se non diversamente specificato, l'alimentazione standard del freno è 230Δ / 400Y V - 50 Hz.

Su richiesta, sono disponibili tensioni speciali, nel campo 24...690 V, 50-60 Hz.

Unless otherwise specified, standard brake power supply is 230Δ / 400Y V - 50 Hz.

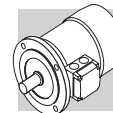
Special voltages in the 24...690 V, 50-60 Hz range are available at request.

Falls nicht anderweitig angegeben, beträgt die Standardversorgung der Bremse 230Δ / 400Y V - 50 Hz.

Auf Anfrage können Sonderspannungen von 24...690 V, 50-60 Hz geliefert werden.

Sauf spécification contraire, l'alimentation standard du frein est 230Δ / 400Y V - 50 Hz.

Sur demande, des tensions spéciales sont disponibles dans la plage 24...690 V, 50-60 Hz.



Dati tecnici freni FA

Technical specifications of FA brakes

Technische Daten der Bremsen vom Typ FA

Caractéristiques techniques freins FA

(A62)

Freno Brake Bremsse Frein	Coppia frenante Brake torque Bremsmoment Couple de freinage M_b [Nm]	Rilascio Release Ansprechzeit Déblocage t_1 [ms]	Frenatura Braking Bremsung Freinage t_2 [ms]	Wmax			W [MJ]	P_b [VA]
				10 s/h	[J] 100 s/h	1000 s/h		
FA 02	3.5	4	20	4500	1400	180	15	60
FA 03	7.5	4	40	7000	1900	230	25	80
FA 04	15	6	60	10000	3100	350	30	110
FA 14								
FA 05	40	8	90	18000	4500	500	50	250
FA 15								
FA 06S	60	16	120	20000	4800	550	70	470
FA 06	75	16	140	29000	7400	800	80	550
FA 07	150	16	180	40000	9300	1000	130	600
FA 08	250	20	200	60000	14000	1500	230	1200

Legenda:

M_b = max coppia frenante statica ($\pm 15\%$)

t_1 = tempo di rilascio freno

t_2 = ritardo di frenatura

W_{max} = energia max per frenata (capacità termica del freno)

W = energia di frenatura tra due regolazioni successive del traferro

P_b = potenza assorbita dal freno a 20° (50 Hz)

s/h = avviamenti orari

N.B.

I valori di t_1 e t_2 riportati in tabella sono riferiti al freno tarato alla coppia nominale, traferro medio e tensione nominale.

Key:

M_b = max static braking torque ($\pm 15\%$)

t_1 = brake release time

t_2 = brake engagement time

W_{max} = max energy per brake operation (brake thermal capacity)

W = braking energy between two successive air gap adjustments

P_b = power drawn by brake at 20° (50 Hz)

s/h = starts per hour

NOTE

Values t_1 and t_2 in the table refer to a brake set at rated torque, medium air gap and rated voltage.

Legende:

M_b = statisches max. Bremsmoment ($\pm 15\%$)

t_1 = Bremsenansprechzeit

t_2 = Bremsverzögerung

W_{max} = max. Energie pro Bremsung (Wärmeleistung der Bremse)

W = Bremsenergie zwischen zwei Einstellungen des Luftspalts

P_b = bei 20° von der Bremse aufgenommene Leistung (50 Hz)

s/h = Einschaltungen pro stunde

HINWEIS:

Die in der Tabelle angegebenen Werte t_1 und t_2 beziehen sich auf eine Bremse, die auf das Nenndrehmoment, einen mittleren Luftspalt und die Standardspannung eingestellt ist.

Légende:

M_b = couple de freinage statique max ($\pm 15\%$)

t_1 = temps de déblocage frein

t_2 = retard de freinage

W_{max} = énergie max par freinage (capacité thermique du frein)

W = énergie de freinage entre deux réglages successifs de l'entrefer

P_b = puissance absorbée par le frein à 20° (50 Hz)

s/h = démarrages horaires

N.B.

Les valeurs de t_1 et t_2 indiquées dans le tableau se réfèrent au frein étalonné au couple nominal, entrefer moyen et tension nominale.

Collegamenti freno FA

Per i motori con alimentazione del freno derivata direttamente dall'alimentazione motore i collegamenti alla morsettiera corrispondono a quanto riportato nello schema (A63):

FA brake connections

The diagram (A63) shows the wiring when brake is connected directly to same power supply of the motor:

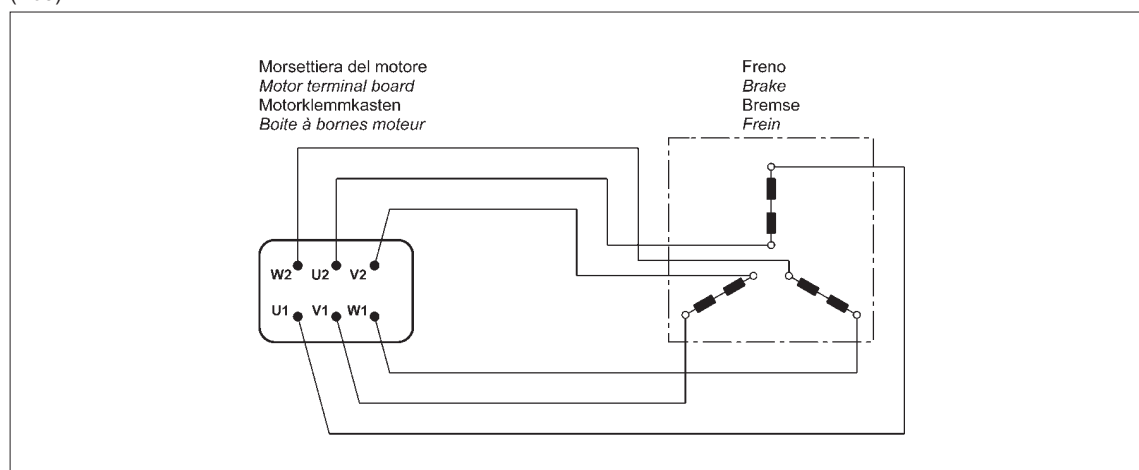
Abschlüsse - Bremstyp FA

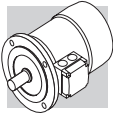
Bei den Motoren mit direkter Bremsspannungsversorgung müssen die Anschlüsse im Klemmenkasten entsprechend den Angaben im Schema (A63) angeschlossen werden:

Raccordements frein FA

Pour les moteurs avec alimentation du frein dérivant directement de l'alimentation moteur, les raccordements à la boîte à bornes correspondent aux indications du schéma (A63) :

(A63)





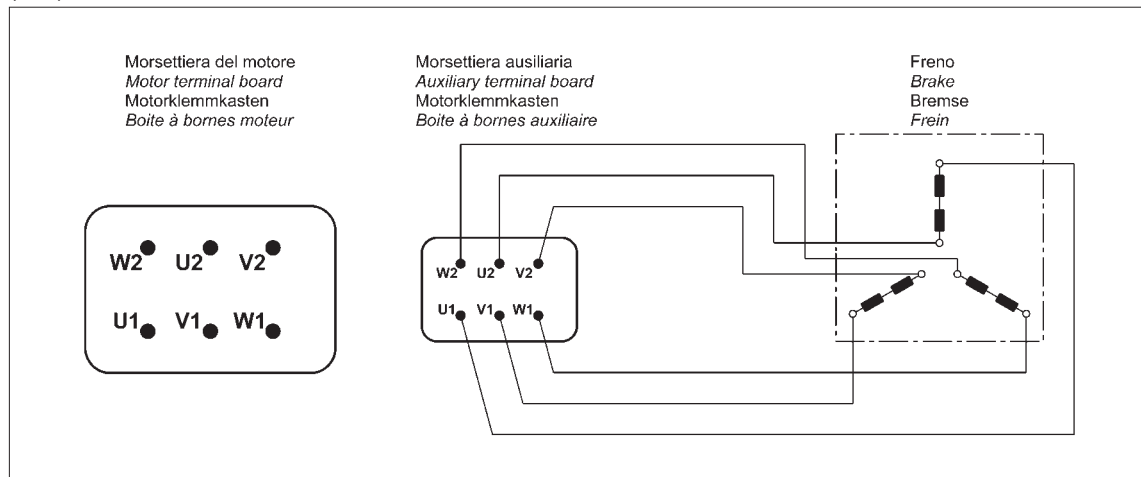
Per i motori a doppia polarità e, quando richiesto, per i motori ad una velocità con alimentazione da linea separata è prevista una morsettiera ausiliaria a 6 morsetti per il collegamento del freno; in questa esecuzione i motori prevedono la scatola coprimorsetti maggiorata. Vedi schema (A64):

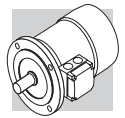
Switch-pole motors and, at request, single-pole motors with separate power supply are equipped with an auxiliary terminal board with 6 terminals for brake connection.
In this version, motors feature a larger terminal box. See diagram (A64):

Bei den polumschaltbaren Motoren und, auf Anfrage, auch bei den einpoligen Motoren mit separater Bremsversorgung ist für den Anschluss der Bremse ein Hilfsklemmenkasten mit 6 Klemmen vorgesehen. In diesen Ausführungen haben die Motoren einen größeren Klemmenkasten. Siehe Schema (A64):

Pour les moteurs à double polarité et, lorsque cela est requis, pour les moteurs à une vitesse avec alimentation depuis ligne séparée, une boîte à bornes auxiliaire à 6 bornes est prévue pour le raccordement du frein ; dans cette exécution les moteurs prévoient un couvercle bornier majoré. Voir schéma (A64) :

(A64)





**M8 - MOTORI
AUTOFRENTI IN C.A.,
TIPO BN_BA**

**M8 - AC BRAKE MOTORS
TYPE BN_BA**

**M8 - DREHSTROM-BREMS-
MOTOREN MIT WECH-
SELS- TROMBREMSE
VOM TYP BN_BA**

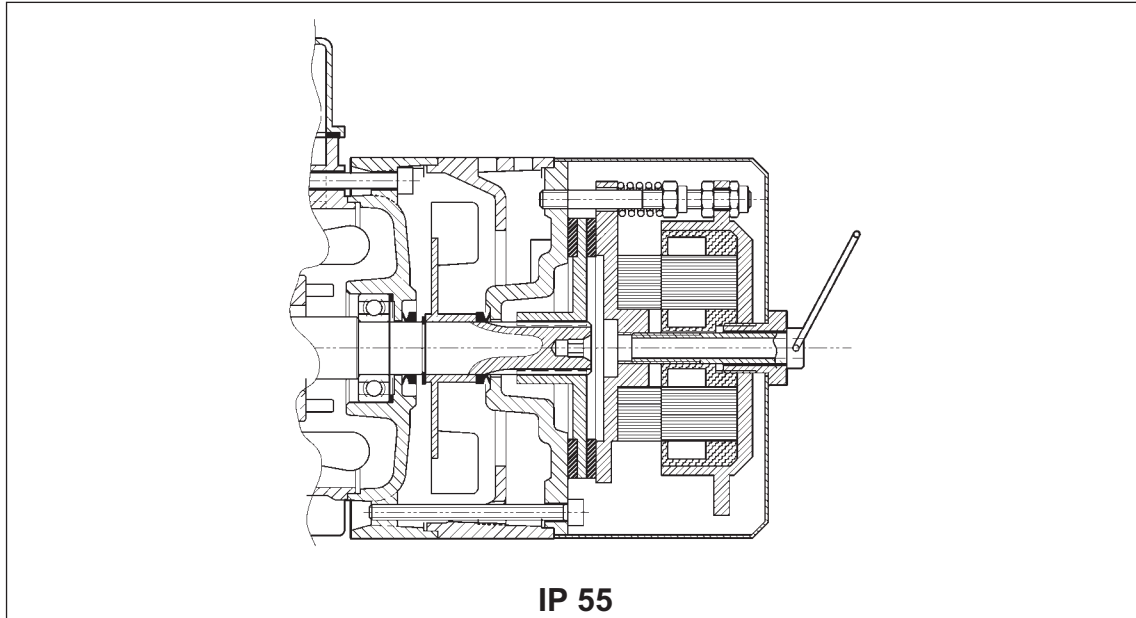
**M8 - MOTEURS FREIN EN
C.A., TYPE BN_BA**

Frame sizes: BN 63 ... BN 132M

Baugrößen: BN 63 ... BN 132M

Tailles : BN 63 ... BN 132M

(A65)



IP 55

Freno elettromagnetico con alimentazione in **corrente alternata** trifase, fissato con viti allo scudo convogliatore.

Disco freno in acciaio scorrevole assialmente sull'albero motore scanalato (mozzo trascinatore in acciaio calettato sull'albero per grandezza 244).

I motori sono forniti con freno tarato alla massima coppia.

La coppia freno è regolabile con continuità agendo sulle viti di compressione delle molle; il campo di regolazione consentito è $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} è il momento frenante massimo riportato in tab. (A66)). Di serie i motori sono forniti completi di vite per lo sblocco manuale del freno, con mantenimento della posizione di rilascio per consentire la rotazione dell'albero motore.

La vite di sblocco deve essere smontata dopo l'utilizzo per assicurare il corretto funzionamento del freno, ed evitare situazioni potenzialmente pericolose.

Il freno BA, oltre alle elevate caratteristiche dinamiche tipiche dei freni in corrente alternata, presenta una costruzione robusta con energia di frenatura aumentata che lo rendono particolarmente idoneo a servizi pesanti, oltre che in applicazioni dove sono richieste frequenze di manovra elevate e tempi d'intervento molto rapidi.

*Electromagnetic brake operates from three-phase **alternated current** power supply and is bolted onto conveyor shield.*

Steel brake disc slides axially on splined motor shaft (steel drive hub is shrunk onto shaft on frame size 244).

Factory setting is maximum brake torque.

Step less braking torque adjustment by screws which compress the brake springs. Allowed adjustment range is $30\% M_{bMAX} < M_b < M_{bMAX}$ (where M_{bMAX} is maximum braking torque as shown in tab. (A66)).

Motors are supplied complete with manual brake release screw as standard. Screw may be locked in the release position to allow for motor shaft rotation.

The brake release screw must be removed after use to ensure proper brake operation and avoid potentially dangerous conditions.

In addition to the high dynamic characteristics typical of AC brakes, a sturdy design and increased braking energy make the BA brake ideal for heavy-duty applications as well as applications requiring frequent stop/starts and very fast response time.

Elektromagnetische Bremse mit **Drehstromversorgung**, die mittels Schrauben am Motorschild des Motors befestigt ist.

Die Bremsscheibe (Stahl) gleitet axial auf der Rotorwelle (bei Baugröße 244 über einem auf die Welle aufgezogenem Mitnehmer aus Stahl).

Die Motoren werden mit einer auf das maximale Drehmoment des Motors eingestellten Bremse geliefert.

Das Bremsdrehmoment ist durch Betätigen der Federdruckschrauben stufenlos regelbar. Der zulässige Einstellbereich beträgt $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} steht für den max. Bremsmoment, das in der Tab. (A66) angegeben wird).

Die Motoren werden serienmäßig mit einer Schraube zur manuelle Bremslüftung geliefert; die arretierbar ist, um ein Drehen der Motorwelle zu ermöglichen.

Diese Schraube muss im Betrieb des Motors wieder abmontiert werden, damit die korrekte Funktion der Bremse gesichert ist.

Die Bremse vom Typ BA zeichnet sich durch ihre dynamischen Eigenschaften und die robuste Bauweise aus, durch die sie eine erhöhte Bremsenergie abzugeben kann. Diese Bremstypen eignen sich besonders für einen Einsatz unter harten Bedingungen und überall dort, wo häufige Schaltfrequenzen und schnelle Ansprechzeiten gefordert werden.

*Frein électromagnétique avec alimentation en **courant alternatif** triphasé, fixé avec des vis au bouclier.*

Disque frein en acier coulissant de façon axiale sur l'arbre moteur rainuré (moyeu d'entraînement en acier calé sur l'arbre pour la taille 244).

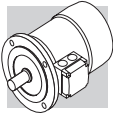
Les moteurs sont fournis avec frein étalonné au couple maximal.

Le couple de freinage est réglable en continu en intervenant sur les vis de compression des ressorts; la plage de réglage autorisé est de $30\% M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} étant le couple de freinage maximum indiqué dans le tab. (A66)).

De série, les moteurs sont fournis avec vis de déblocage manuel du frein, avec maintien de la position de relâchement afin de permettre la rotation de l'arbre moteur.

La vis de déblocage doit être démontée après utilisation afin de garantir le fonctionnement correct du frein et d'éviter les situations potentiellement dangereuses.

Le frein BA, outre les caractéristiques dynamiques élevées typiques des freins en courant alternatif, est de fabrication robuste avec énergie de freinage majorée, ce qui le rend particulièrement adapté pour les services difficiles ainsi que pour les applications nécessitant des fréquences de manœuvre élevées et des temps d'intervention très rapides.



Grado di protezione

È disponibile un'unica esecuzione, con grado di protezione IP55.

Protection class

Only available in protection class IP55.

Schutzart

Es ist eine nur die Ausführung in Schutzklasse IP55 verfügbar.

Degré de protection

Il est disponible en une exécution unique, avec degré de protection IP55.

Alimentazione freno BA

Nei motori a singola polarità l'alimentazione della bobina freno è derivata direttamente dalla morsettiera motore e la tensione del freno quindi coincide con la tensione del motore. In questo caso la tensione del freno può essere omessa dalla designazione.

Per i motori a doppia polarità, e per i motori con alimentazione separata del freno, è presente una morsettiera ausiliaria con 6 terminali per il collegamento alla linea del freno. In entrambi i casi il valore di tensione del freno dovrà essere specificato in designazione.

Nella tabella seguente sono riportate le condizioni di alimentazione standard del freno in c.a. per i motori a singola e doppia polarità:

BA brake power supply

In single speed motors, power supply is brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same. In this case, brake voltage indication may be omitted in the designation.

Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In both cases, brake voltage indication in the designation is mandatory. The following table reports standard AC brake power supply ratings for single- and switch-pole motors:

Stromversorgung - Bremstyp BA

Bei den einpoligen Motoren wird die Versorgung der Bremsspule direkt vom Motorklemmenkasten abgezweigt, das bedeutet also, dass die Spannung der Bremse mit der Motorspannung übereinstimmt. In diesem Fall braucht die Bremsenspannung nicht extra angegeben werden.

Für polumschaltbaren Motoren und für eine separate Bremsversorgung ist eine Hilfsklemmenleiste mit 6 Anschlüssen vorgesehen, die einen Anschluss der Bremse ermöglichen. In beiden Fällen muss die Bremsspannung bei der Bestellung angegeben werden.

In der nachstehenden Tabelle werden für die einpoligen und die polumschaltbaren Motoren die Standardversorgung der Wechselstrombremsen angegeben.

Alimentation frein BA

Sur les moteurs à simple polarité, l'alimentation de la bobine frein dérive directement du bornier moteur, par conséquent, la tension du frein coïncide avec la tension du moteur. Dans ce cas, la tension du frein peut être omise de la désignation.

Pour les moteurs à double polarité et les moteurs avec alimentation séparée du frein, un boîte à bornes auxiliaire avec 6 bornes pour le raccordement au réseau du frein, est présente. Dans les deux cas, la valeur de tension du frein doit être spécifiée dans la désignation.

Le tableau suivant indique les conditions d'alimentation standard du frein en c.a. pour les moteurs à simple et double polarité :

(A65)

motori a singola polarità <i>single-pole motor</i> Einpolige Motoren <i>Moteurs à simple polarité</i>	BN 63 ... BN 132
	230Δ / 400Y V ±10% – 50 Hz
	265Δ / 460Y ±10% - 60 Hz
motori a doppia polarità (alimentazione da linea separata) <i>switch-pole motors (separate power supply line)</i> Polumschaltbare Motoren (separate Versorgung) <i>Moteurs à double polarité (alimentation depuis ligne séparée)</i>	BN 63 ... BN 132
	230Δ / 400Y V ±10% – 50 Hz
	460Y - 60 Hz

Se non diversamente specificato, l'alimentazione standard del freno è 230Δ / 400Y V - 50 Hz.

Unless otherwise specified, standard brake power supply is 230Δ / 400Y V - 50 Hz.

Falls nicht anderweitig angegeben, beträgt die Standardversorgung der Bremse 230Δ / 400Y V - 50 Hz.

Sauf spécification contraire, l'alimentation standard du frein est 230Δ / 400Y V - 50 Hz.

Su richiesta, sono disponibili tensioni speciali, nel campo 24...690 V, 50-60 Hz.

Special voltages in the 24...690 V, 50-60 Hz range are available at request.

Auf Anfrage können Sonderspannungen von 24...690 V, 50-60 Hz geliefert werden.

Sur demande, des tensions spéciales sont disponibles dans la plage 24...690 V, 50-60 Hz.

Dati tecnici freni BA

Nella tabella (A66) sottostante sono riportati i dati tecnici dei freni in c.a., tipo BA.

BA brake technical specifications

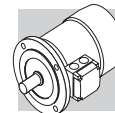
The table (A66) below reports the technical specifications for AC brakes type BA.

Technische Daten der Bremsen vom Typ BA

In der nachstehenden Tabelle (A66) werden die technischen Daten der Wechselstrombremsen vom Typ BA angegeben:

Caractéristiques techniques freins BA

Le tableau (A66) ci-dessous indique les caractéristiques techniques des freins en c.a., type BA.



(A66)

Freno Brake Bremse Frein	Coppia frenante Brake torque Bremsmoment Couple de freinage M_b [Nm]	Rilascio Release Ansprechzeit Déblocage t_1 [ms]	Frenatura Braking Bremsung Freinage t_2 [ms]	W _{max} [J]			W [MJ]	P _b [VA]
				10 s/h	100 s/h	1000 s/h		
BA 60	5	5	20	4000	1500	180	30	60
BA 70	8	6	25	7000	2700	300	60	75
BA 80	18	6	25	10000	3100	350	80	110
BA 90	35	8	35	13000	3600	400	88	185
BA 100	50	8	35	18000	4500	500	112	225
BA 110	75	8	35	28000	6800	750	132	270
BA 140	150	15	60	60000	14000	1500	240	530

Legenda:

M_b = max coppia frenante statica (±15%)

t_1 = tempo di rilascio freno

t_2 = ritardo di frenatura

W_{max} = energia max per frenata (capacità termica del freno)

W = energia di frenatura tra due regolazioni successive del traferro

P_b = potenza assorbita dal freno a 20° (50 Hz)

s/h = avviamenti orari

Key:

M_b = max static braking torque (±15%)

t_1 = brake release time

t_2 = brake engagement time

W_{max} = max energy per brake operation (brake thermal capacity)

W = braking energy between two successive air gap adjustments

P_b = brake power absorption at 20° (50 Hz)

s/h = starts per hour

Legende:

M_b = statisches max. Bremsmoment (±15%)

t_1 = Bremsenansprechzeit

t_2 = Bremsverzögerung

W_{max} = max. Energie pro Bremsung (Wärmeleistung der Bremse)

W = Bremsenergie zwischen zwei Einstellungen des Luftspalts

P_b = bei 20° von der Bremse aufgenommene Leistung (50 Hz)

s/h = Einschaltungen pro stunde

Légende:

M_b = couple de freinage statique max (±15%)

t_1 = temps de déblocage frein

t_2 = retard de freinage

W_{max} = énergie max par freinage (capacité thermique du frein)

W = énergie de freinage entre deux réglages successifs de l'entrefer

P_b = puissance absorbée par le frein à 20° (50 Hz)

s/h = démarrages horaires

N.B.

I valori di t_1 e t_2 riportati in tabella sono riferiti al freno tarato alla coppia nominale, traferro medio e tensione nominale.

NOTE

Values t_1 and t_2 in the table refer to a brake set at rated torque, medium air gap and rated voltage.

HINWEIS:

Die in der Tabelle angegebenen Werte t_1 und t_2 beziehen sich auf eine Bremse, die auf das Nenndrehmoment, einen mittleren Luftspalt und die Standardspannung eingestellt ist.

N.B.

Les valeurs de t_1 et t_2 indiquées dans le tableau se réfèrent au frein étaloné au couple nominal, entrefer moyen et tension nominale.

Collegamenti freno BA

Per i motori con alimentazione del freno derivata direttamente dall'alimentazione motore i collegamenti alla morsettiera corrispondono a quanto riportato nello schema (A67):

BA brake connections

The diagram (A67) shows the required connections to terminal box when brake is to be connected directly to motor power supply:

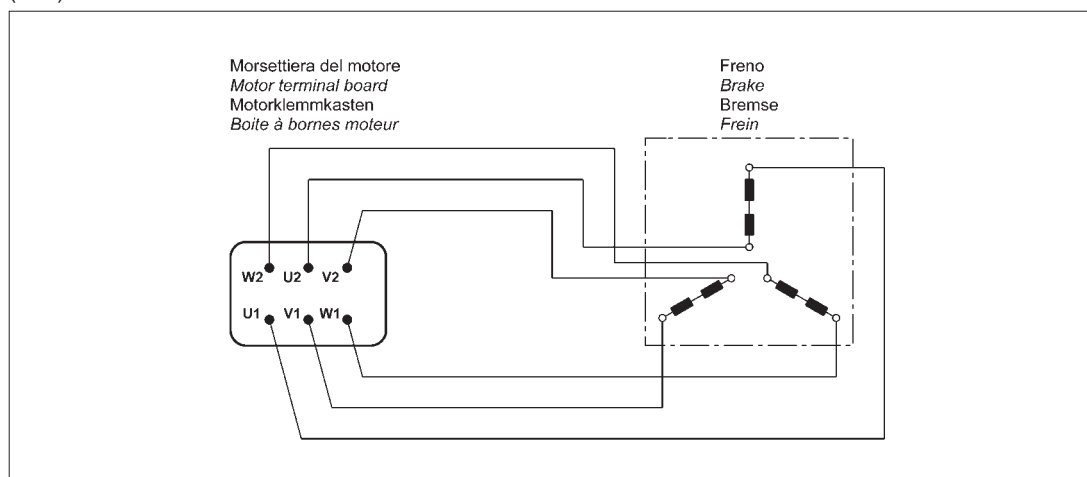
Abschlüsse - Bremstyp BA

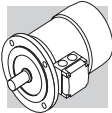
Bei den Motoren mit direkter Bremsspannungsversorgung müssen die Anschlüsse im Klemmenkasten entsprechend den Angaben im Schema (A67) angeschlossen werden:

Raccordements frein BA

Pour les moteurs avec alimentation du frein dérivant directement de l'alimentation moteur, les raccordements à la boîte à bornes correspondent aux indications du schéma (A67) :

(A67)





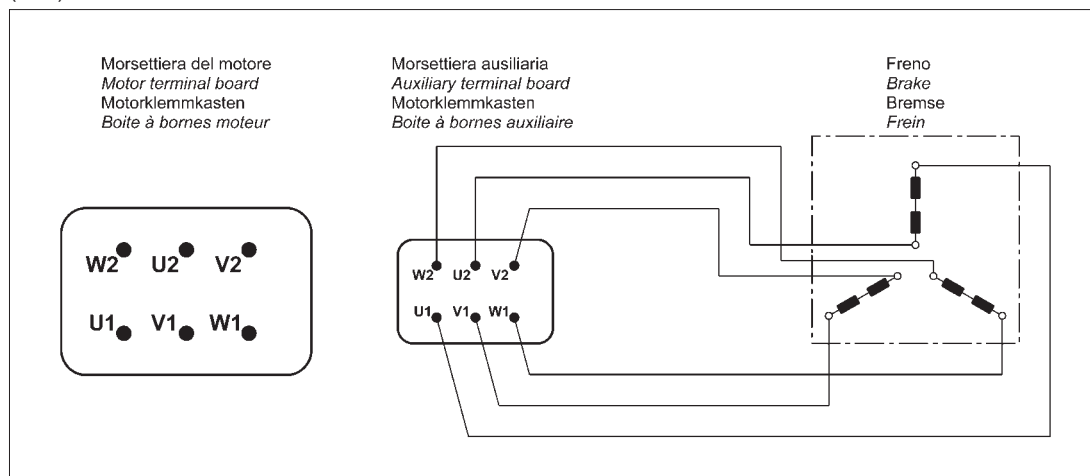
Per i motori a doppia polarità e, quando richiesto, per i motori ad una velocità con alimentazione da linea separata è prevista una morsettiera ausiliaria a 6 morsetti per il collegamento del freno; in questa esecuzione i motori prevedono la scatola coprimorsetti maggiorata. Vedi schema (A68):

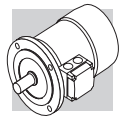
Switch-pole motors and, at request, single-pole motors with separate power supply line are equipped with an auxiliary terminal board with 6 terminals for brake connection. In this version, motors feature a larger terminal box. See diagram (A68):

Bei den polumschaltbaren Motoren und, auf Anfrage, auch bei den einpoligen Motoren mit separater Bremsversorgung ist für den Anschluss der Bremse ein Hilfsklemmenkasten mit 6 Klemmen vorgesehen. In diesen Ausführungen haben die Motoren einen größeren Klemmenkasten. Siehe Schema (A68):

Pour les moteurs à double polarité et, lorsque cela est requis, pour les moteurs à une vitesse avec alimentation depuis ligne séparée, une boîte à bornes auxiliaire à 6 bornes est prévue pour le raccordement du frein ; dans cette exécution les moteurs prévoient un couvercle bornier majoré. Voir schéma (A68) :

(A68)





M9 - SISTEMI DI SBLOCCO FRENO

I freni a pressione di molle tipo **FD** e **FA** possono essere dotati opzionalmente di dispositivi per lo sblocco manuale del freno, normalmente utilizzati per condurre interventi di manutenzione sulle parti di macchina, o dell'impianto, comandate dal motore.

M9 - BRAKE RELEASE SYSTEMS

*Spring-applied brakes type **FD** and **FA** may be equipped with optional manual release devices. These are typically used for manually releasing the brake before servicing any machine or plant parts operated by the motor.*

M9 - BREMSLÜFTHEBEL

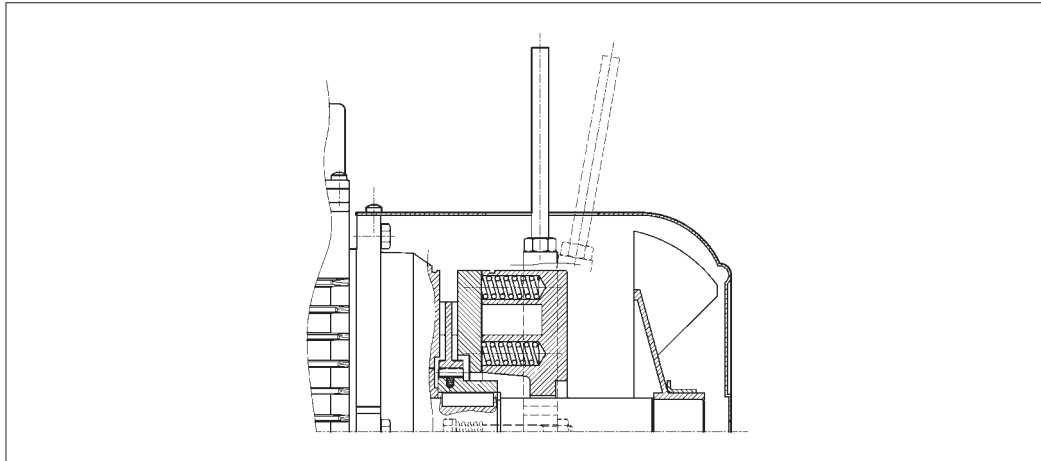
Die Federdruckbremsen vom Typ **FD** und **FA** können Optional mit Bremslüfthebeln geliefert werden, die ein manuelles Lüften der Bremse ermöglichen. Diese Lüftungseinrichtungen können bei Instandhaltungsarbeiten an vom Motor betriebenen Maschinen- oder Anlagenteilen verwendet werden.

M9 - SYSTEMES DE DEBLOCAGE FREIN

*Les freins à pression de ressorts type **FD** et **FA** peuvent, en option, être dotés de dispositifs de déblocage manuel du frein, normalement utilisés pour effectuer des interventions d'entretien sur les composants de la machine, ou de l'installation commandée par le moteur.*

(A69)

R



La leva di sblocco è dotata di ritorno automatico, tramite dispositivo a molla.

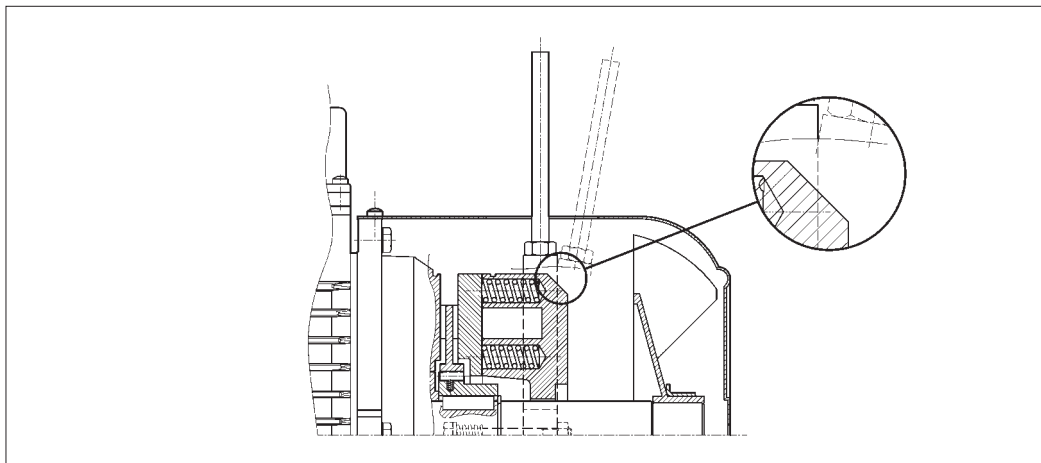
A return spring brings the release lever back in the original position.

Bremslüfthebel mit automatischer Rückstellung durch Federkraft.

Le levier de déblocage est doté de retour automatique, au moyen d'un dispositif à ressort.

(A70)

RM

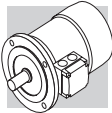


Sui motori tipo BN_FD la leva di sblocco può essere temporaneamente bloccata in posizione di rilascio del freno, avvitando la stessa fino ad impegnarne l'estremità in un risalto del corpo del freno.

On motors type BN_FD, if the option RM is specified, the release device may be locked in the "release" position by tightening the lever until its end becomes engaged with a brake housing projection.

Der Bremslüfthebel kann zeitweise in der Bremslüftposition arretiert werden, indem man ihn so lange einschraubt, bis die Bremse arretiert ist. Für die unterschiedlichen Motor-

Levier de déblocage peut être temporairement bloqué en position de déblocage du frein en le vissant jusqu'à engager l'extrémité dans une saillie du corps du frein. La disponibilité des systèmes de

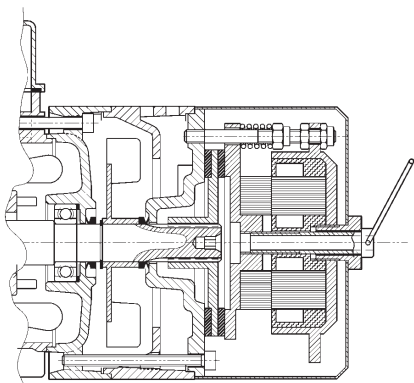


La disponibilità dei sistemi di sblocco freno è diversa per i vari tipi di motore, ed è descritta dalla tabella seguente:

The availability for the various disengagement devices is charted here below:

typen sind ebenso verschiedene Bremslüftsysteme verfügbar, die Sie der folgenden Tabelle entnehmen können:

débloccage du frein est différente en fonction des types de moteur et figure dans le tableau suivant :

(A71)	R	RM
BN_FD	BN 63...BN 200	2p 63A2 ≤ H ≤ 132M2 4p 63A4 ≤ H ≤ 132MA4 6p 63A6 ≤ H ≤ 132MA6
M_FD	M 05...M 5	M 05...M 4LA
BN_FA	BN 63...BN 180M	
M_FA	M 05...M 5	
BN_BA	 di serie std. supply serienmäßig de série	

Orientamento della leva di sblocco

Per entrambe le opzioni **R** e **RM**, la leva di sblocco del freno viene collocata, se non diversamente specificato, con orientamento di 90° in senso orario, rispetto alla posizione della morsetteria - riferimento **[AB]** nel disegno sottostante.

Orientamenti alternativi, tipo **[AA]**, **[AC]** e **[AD]** possono essere richiesti citandone la relativa specifica:

Release lever orientation

Unless otherwise specified, the release lever is located 90° away from the terminal box – identified by letters [AB] in the diagram below – in a clockwise direction on both options R and RM.

Alternative lever positions [AA], [AC] and [AD] are also possible when the corresponding option is specified:

Ausrichtung des Bremslüfthebels

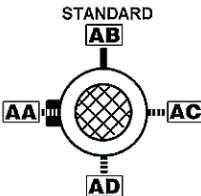
Bei beiden Optionen, **R** und **RM**, wird der Bremslüfthebel, falls nicht anderweitig festgelegt, um 90° im Uhrzeigersinn zur Position des Klemmenkastens montiert (Position **[AB]** in der nachfolgenden Zeichnung).

Andere Positionen: **AA** (0° zum Klemmenkasten), **AC** (180° zum Klemmenkasten) oder **AD** (270° zum Klemmenkasten, im Uhrzeigersinn vom Lüfter aus gesehen) können unter Angabe der entsprechenden Spezifikation bestellt werden:

Orientation du levier de déblocage

Pour les deux options R et RM, le levier de déblocage du frein est positionné, sauf spécification contraire, avec une orientation de 90° dans le sens des aiguilles d'une montre par rapport à la position de la boîte à bornes - référence [AB] sur le dessin ci-dessous.

Des orientations différentes, type [AA], [AC] et [AD] peuvent être demandées à condition de préciser la position correspondante :

(A72)	AA AC AD 

Caratteristiche volani (F1)

La tabella seguente riporta il peso e l'inerzia aggiuntiva del volani che possono essere richiesti tramite l'opzione F1. Le dimensioni complessive rimangono invariate.

Fly-wheel data (F1)

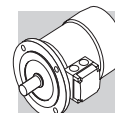
The table below shows values of weight and inertia of flywheel (option F1). Overall dimensions of motors remain unchanged.

Eigenschaften der Schwungräder (F1)

Die folgende Tabelle gibt das Gewicht und das Trägheitsmoment der Zusatzschwungräder an (Option F1). Die Gesamtabmessungen bleiben unverändert.

Caractéristiques volants (F1)

Le tableau suivante indique le poids et l'inertie des volants supplémentaires sans variations de l'encombrement moteur.



(A73)

Dati tecnici volano per motori tipo: / Main data for flywheel of motore type: / Eigenschaften der Schwungräder für Motoren typ: / Données volant pour moteurs type: BN_FD, M_FD			
		Peso volano / Fly-wheel weight Gewicht Schwungrad / Poids volant [Kg]	Inerzia volano / Fly-wheel inertia Trägheitsmoment Schwungrad / Inertie volant [Kgm ²]
BN 63	M05	0.69	0.00063
BN 71	M1	1.13	0.00135
BN 80	M2	1.67	0.00270
BN 90 S - BN 90 L	—	2.51	0.00530
BN 100	M3	3.48	0.00840
BN 112	—	4.82	0.01483
BN 132 S - BN 132 M	M4	6.19	0.02580

M10 - OPZIONI**M10 - OPTIONS****M10 - OPTIONEN****M10 - OPTIONS****Protezioni termiche****Thermal protective devices****Thermische Schutzeinrichtungen****Protections thermiques**

Oltre alla protezione garantita dall'interruttore magnetotermico, i motori possono essere provvisti di sonde termiche incorporate per proteggere l'avvolgimento da eccessivo riscaldamento dovuto a scarsa ventilazione o servizio intermittente.

Questa protezione dovrebbe sempre essere prevista per motori servoventilati (IC416).

In addition to the standard protection provided by the magneto-thermal device, motors can be supplied with built-in thermal probes to protect the winding against overheating caused, by insufficient ventilation or by an intermittent duty.

This additional protection should always be specified for servoventilated motors (IC416).

Abgesehen von den Motorschutzschaltern mit thermischem und elektromagnetischem Auslöser können die Motoren mit integrierten Temperaturfühlern zum Schutz der Wicklung vor Überhitzung z.B. wegen unzureichender Lüftung oder Aussetzbetriebs ausgestattet werden.

Diese Schutzeinrichtung muß bei fremdbelüfteten Motoren stets vorgesehen werden (IC416).

Outre la protection garantie par l'interrupteur magnétothermique, les moteurs peuvent être équipés de sondes thermiques incorporées pour protéger le bobinage contre une surchauffe excessive due par exemple à une ventilation insuffisante ou un service intermittent.

Cette protection devrait toujours être prévue pour les moteurs servoventilés (IC416).

E3**Sonde termiche a termistori****Thermistors****Temperaturfühler und Thermistoren****Sondes thermométriques**

Sono dei semiconduttori che presentano una rapida variazione di resistenza in prossimità della temperatura nominale di intervento (150 °C).

L'andamento della caratteristica $R = f(T)$ è normalizzato dalle Norme DIN 44081, IEC 34-11. Questi sensori presentano il vantaggio di avere ingombri ridotti, un tempo di risposta molto contenuto e, dato che il funzionamento avviene senza contatti, sono completamente esenti da usura.

In genere vengono impiegati termistori a coefficiente di temperatura positivo denominati anche "resistori a conduttore freddo" PTC.

A differenza delle sonde termiche bimetalliche, non possono intervenire direttamente sulle correnti delle bobine di eccitazione e devono pertanto essere collegati ad una speciale unità di controllo (apparecchio di sgancio) da interfacciare alle connessioni esterne.

Con questa protezione vengono inseriti tre PTC, (collegati in serie), nell'avvolgimento con terminali disponibili in morsettiera ausiliaria.

These are semi-conductors having rapid resistance variation when they are close to the rated switch off temperature (150 °C). Variations of the $R = f(T)$ characteristic are specified under DIN 44081, IEC 34-11 Standards.

These elements feature several advantages: compact dimensions, rapid response time and, being contact-free, absolutely no wear.

Positive temperature coefficient thermistors are normally used (also known as PTC "cold conductor resistors").

Contrary to bimetallic thermostats, they cannot directly intervene on currents of energizing coils, and must therefore be connected to a special control unit (triggering apparatus) to be interfaced with the external connections.

Thus protected, three PTCs connected in series are installed in the winding, the terminals of which are located on the auxiliary terminal-board.

Hierbei handelt es sich um Halbleiter, die eine schnelle Änderung des Widerstands in der Nähe der Nennansprechtemperatur (150 °C) zeigen.

Der Verlauf der Kennlinie $R = f(T)$ ist durch die DIN-Normen 44081 und IEC 34-11 festgelegt.

Diese Sensoren haben folgende Vorteile: sie weisen geringe Außenmaße und eine äußerst kurze Ansprechzeit auf und sind vollkommen verschleißfrei, da sie berührungslos arbeiten.

Im allgemeinen werden Thermistoren mit positivem Temperaturkoeffizienten verwendet, die auch als "Kaltleiter" (PTC-Widerstände) bezeichnet werden.

Im Unterschied zu Bimetall-Temperaturfühlern können sie nicht direkt auf die Erregungsströme der Spulen wirken, sondern müssen an eine spezielle Steuereinheit (Auslösegerät) angeschlossen werden, die mit den externen Anschlüssen kompatibel ist.

Mit dieser Schutzeinrichtung werden drei in Reihe geschaltete PTC-Widerstände in die Wicklung eingesetzt, deren Endanschlüsse an einer Zusatzklemmleiste verfügbar sind.

Ce sont des semiconducteurs qui présentent une variation rapide de résistance à proximité de la température nominale d'intervention (150 °C).

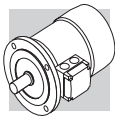
L'évolution de la caractéristique $R = f(T)$ est défini par les Normes DIN 44081, IEC 34-11.

Ces capteurs présentent l'avantage d'avoir des encombrements réduits, un temps de réponse très bref et, du fait que le fonctionnement a lieu sans contact, il sont exempts d'usure.

En général, on utilise des thermistors à coefficient de température positif dénommés également "résistors à conducteur froid" PTC.

Contrairement aux sondes thermiques bimétalliques, ils ne peuvent intervenir directement sur les courants des bobines d'excitation et doivent par conséquent être reliés à une unité spéciale de contrôle (appareil de déconnexion) à interfacer aux connexions extérieures.

Avec cette protection, trois sondes, (reliées en série), sont insérées dans le bobinage avec extrémités disponibles dans le bornier auxiliaire.



D3

Sonde termiche bimetalliche

I protettori di questo tipo contengono all'interno di un involucro un disco bimetallico che, raggiunta la temperatura nominale di intervento (150 °C), commuta i contatti dalla posizione di riposo. Con la diminuzione della temperatura, il disco e i contatti riprendono automaticamente la posizione di riposo. Normalmente si impiegano tre sonde bimetalliche in serie con contatti normalmente chiusi e terminali disponibili in una morsettiera ausiliaria.

Bimetallic thermostates

These types of protective devices house a bimetal disk. When the rated switch off temperature (150 °C) is reached, the disk switches the contacts from their initial rest position. As temperature falls, the disk and the contacts automatically return to rest position. Three bimetallic thermostates connected in series are usually employed, with normally closed contacts. The terminals are located on an auxiliary terminal-board.

Bimetall-Temperaturfühler

Diese Schutzeinrichtungen bestehen aus einer Kapsel, in der sich eine Bimetallscheibe befindet, die bei Erreichen der Nennansprechtemperatur (150 °C) anspricht. Nach Absenkung der Temperatur geht der Schaltkontakt automatisch in Ruhestellung zurück. Normalerweise werden drei in Reihe geschaltete Bimetallfühler mit Öffnern verwendet, deren Endverschlüsse an einer Zusatzklemmleiste verfügbar sind.

Sondes thermiques bimétalliques

Les protecteurs de ce type contiennent, dans une enveloppe interne, un disque bimétallique qui, lorsque la température nominale d'intervention (150 °C) est atteinte, commute les contacts de la position de repos. Avec la diminution de la température, le disque et les contacts reprennent automatiquement la position de repos. Normalement, on utilise trois sondes bimétalliques en série avec contacts normalement fermés et extrémités disponibles dans un bornier auxiliaire.

H1

Riscaldatori anticondensa

I motori funzionanti in ambienti molto umidi e/o in presenza di forti escursioni termiche, possono essere equipaggiati con una resistenza anti-condensa. L'alimentazione monofase è prevista da morsettiera ausiliaria posta nella scatola principale. Le potenze assorbite dalla resistenza elettrica sono elencate qui di seguito:

Anti-condensation heaters

Where an application involves high humidity or extreme temperature fluctuation, motors may be equipped with an anti-condensate heater. A single-phase power supply is available in the auxiliary terminal board inside the main terminal box. Values for the absorbed power are listed here below:

Wicklungsheizung

Die Motoren, die in besonders feuchten Umgebungen und/oder unter starken Temperaturschwankungen eingesetzt werden, können mit einem Heizelement als Kondenwasserschutz ausgestattet werden. Die einphasige Versorgung erfolgt über eine Zusatzklemmleiste, die sich im Klemmenkasten befindet. Werte fuer die Leistungsaufnahme sind in folgender Tabelle aufgeführt.

Rechauffeurs anticondensation

Les moteurs fonctionnant dans des milieux très humides et/ou en présence de fortes plages thermiques peuvent être équipés d'une résistance anticondensation. L'alimentation monophasée est prévue par l'intermédiaire d'une boîte à bornes auxiliaire située dans la boîte principale. Les puissances absorbées sont indiqués de suite :

(A74)

		H1
		1~ 230V ± 10% P [W]
BN 56...BN 80	M0...M2	10
BN 90...BN 160MR	M3 - M4	25
BN 160M...BN 180M	M5	50
BN 180L...BN 200L	—	50

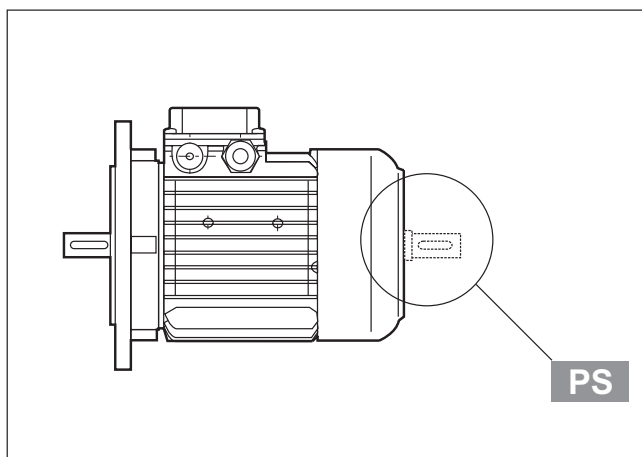
Importante!
Durante il funzionamento del motore la resistenza anticondensa non deve mai essere inserita.

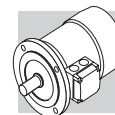
Warning!
Always remove power supply to the anti-condensate heater before operating the motor.

Warnung!
Während des Motorbetriebs darf die Wicklungsheizung nie gespeist werden.

Avertissement!
Durant le fontionnement du moteur, la résistance anticondensation ne doit jamais être alimentée.

PS





Seconda estremità d'albero

L'opzione esclude le varianti RC, TC, U1, U2, EN1, EN2, EN3 – non applicabile ai motori con freno tipo BA. Le dimensioni sono reperibili nelle tavole dimensionali dei motori.

Second shaft extension

This option is not compatible with variants RC, TC, U1, U2, EN1, EN2, EN3 – and is not feasible on motors equipped with BA brake. For shaft dimensions please see motor dimensions tables.

Zweites Wellenende

Diese Option schließt die Optionen RC, TC, U1, U2, EN1, EN2, EN3 aus – sie kann nicht außerdem nicht an Motoren, die mit einer Bremse vom Typ BA ausgestattet sind, angebaut werden. Die entsprechenden Maße können den Maßtabellen der Motoren entnommen werden.

Arbre à double extrémité

L'option exclut les variantes RC, TC, U1, U2, EN1, EN2, EN3 – non applicables aux moteurs avec frein type BA. Les dimensions figurent sur les planches de dimensions des moteurs.

AL

AR

Dispositivo antiritorno

Nelle applicazioni dove è necessario impedire la rotazione inversa del motore dovuta all'azione del carico, è possibile impiegare motori provvisti di un dispositivo antiritorno (disponibile solo sulla serie M). Questo dispositivo, pur consentendo la libera rotazione nel senso di marcia, interviene istantaneamente in caso di mancanza di alimentazione bloccando la rotazione dell'albero nel senso inverso.

Il dispositivo antiritorno è lubrificato a vita con grasso specifico per questa applicazione.

In fase di ordine dovrà essere indicato chiaramente il senso di marcia previsto.

In nessun caso il dispositivo antiritorno dovrà essere utilizzato per impedire la rotazione inversa nel caso di collegamento elettrico errato.

Nella tabella (A75) sono indicate le coppie nominale e massima di bloccaggio attribuite ai dispositivi antiritorno utilizzati, mentre la raffigurazione schematica del dispositivo è inserita nella tabella (A76).

Le dimensioni sono le stesse del motore autofrenante.

Per il senso di rotazione libera contattare il Servizio Tecnico di Bonfiglioli Riduttori.

Backstop device

For applications where backdriving must be avoided, motors equipped with an anti run-back device can be used (available for the M series only). While allowing rotation in the direction required, this device operates instantaneously in case of a power failure, preventing the shaft from running back. The anti run-back device is life lubricated with special grease for this specific application.

When ordering, customers should indicate the required rotation direction, AL or AR. Never use the anti run-back device to prevent reverse rotation caused by faulty electrical connection.

Table (A75) shows rated and maximum locking torques for the anti run-back devices. A diagram of the device can be seen in Table (A76).

Overall dimensions are same as the corresponding brake motor.

For the direction of free rotation contact Bonfiglioli's Technical Service.

For the direction of free rotation contact Bonfiglioli's Technical Service.

For the direction of free rotation contact Bonfiglioli's Technical Service.

Rücklaufsperre

Für Anwendungen, bei denen ein durch die Last verursachtes Rücklaufen des Motors verhindert werden soll, können Motoren installiert werden, die über eine Rücklaufsperre verfügen (nur bei Serie M verfügbar).

Diese Vorrichtung, die eine völlig unbehinderte Drehung des Motors in Laufrichtung gestattet, greift sofort ein, wenn die Spannung fehlt, und verhindert die Drehung der Welle in die Gegenrichtung.

Die Rücklaufsperre verfügt über eine Dauer - Schmierung mit einem speziell für diese Anwendung geeigneten Fett.

Bei der Bestellung muß die vorgesehene Drehrichtung des Motors genau angegeben werden.

Die Rücklaufsperre darf keinesfalls verwendet werden, um im Falle eines fehlerhaften elektrischen Anschlusses die Drehung in die Gegenrichtung zu verhindern. In Tabelle (A75) sind die Nenndrehmomente und Höchst Drehmomente für die verwendeten Rücklaufsperren angegeben; Abbildung (A76) zeigt eine schematische Darstellung der Vorrichtung.

Die Abmessungen sind ähnlich denen der Bremsmotoren.

Für die freie Drehrichtung eingehend bitte an den technischen Service von Bonfiglioli Riduttori.

Für die freie Drehrichtung eingehend bitte an den technischen Service von Bonfiglioli Riduttori.

Dispositif anti-retour

Pour les applications où il est nécessaire d'empêcher la rotation inverse du moteur à cause de l'action de la charge, il est possible d'utiliser des moteurs dotés d'un dispositif anti-retour (disponible seulement sur la série M).

Ce dispositif, bien que permettant la libre rotation dans le sens de marche, intervient instantanément en cas de manque d'alimentation en bloquant la rotation de l'arbre dans le sens inverse. Le dispositif anti-retour est lubrifié à vie avec une graisse spécifique pour cette application.

En phase de commande, il faudra indiquer clairement le sens de marche prévu. En aucun cas, le dispositif anti-retour ne devra être utilisé pour empêcher la rotation inverse en cas de branchement électrique erroné.

Le tableau (A75) indique le couple nominal et le couple maximum de blocage attribués aux dispositifs anti-retour utilisés alors que la représentation schématique du dispositif se trouve dans le tableau (A76).

Les dimensions sont le même du moteur frein.

Le tableau (A75) indique le couple nominal et le couple maximum de blocage attribués aux dispositifs anti-retour utilisés alors que la représentation schématique du dispositif se trouve dans le tableau (A76).

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Le tableau (A75) indique le couple nominal et le couple maximum de blocage attribués aux dispositifs anti-retour utilisés alors que la représentation schématique du dispositif se trouve dans le tableau (A76).

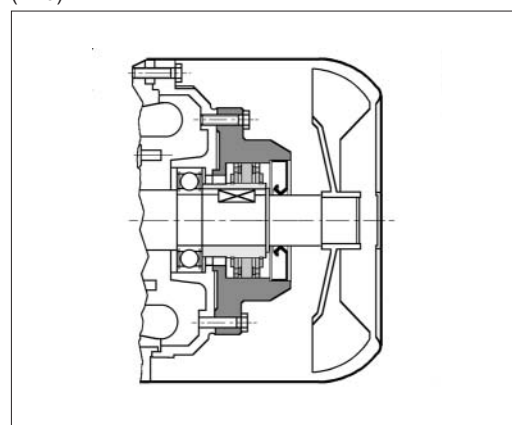
Le tableau (A75) indique le couple nominal et le couple maximum de blocage attribués aux dispositifs anti-retour utilisés alors que la représentation schématique du dispositif se trouve dans le tableau (A76).

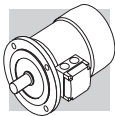
Le tableau (A75) indique le couple nominal et le couple maximum de blocage attribués aux dispositifs anti-retour utilisés alors que la représentation schématique du dispositif se trouve dans le tableau (A76).

(A75)

	Coppia nominale di bloccaggio <i>Rated locking torque</i> Nenndrehmoment der Sperre <i>Couple nominal de blocage</i>	Coppia max. di bloccaggio <i>Max. locking torque</i> Max. Drehmoment der Sperre <i>Couple maxi. de blocage</i>	Velocità di distacco <i>Release speed</i> Ausrückgeschwindigkeit <i>Vitesse de décollement</i>
	[Nm]	[Nm]	[min ⁻¹]
M1	6	10	750
M2	16	27	650
M3	54	92	520
M4	110	205	430

(A76)





Ventilazione

I motori sono raffreddati mediante ventilazione esterna (IC 411 secondo CEI EN 60034-6) e sono provvisti di ventola radiale in plastica, funzionante in entrambi i versi di rotazione.

L'installazione dovrà assicurare una distanza minima della calotta copriventola dalla parete più vicina, in modo da non creare impedimento alla circolazione dell'aria, oltre che permettere l'esecuzione della manutenzione ordinaria del motore e, se presente, del freno.

Su richiesta, a partire dalle grandezze BN 71, oppure M1, i motori possono essere forniti con ventilazione forzata ad alimentazione indipendente. Il raffreddamento è realizzato per mezzo di un ventilatore assiale con alimentazione indipendente, montato sulla calotta copriventola (metodo di raffreddamento IC 416).

Questa esecuzione è utilizzata in caso di alimentazione del motore tramite inverter allo scopo di estendere il campo di funzionamento a coppia costante anche a bassa velocità, o quando per lo stesso sono richieste elevate frequenze di avviamento.

Da questa opzione sono esclusi i motori autofrenanti tipo BN_BA e tutti i motori con doppia sporgenza d'albero (opzione PS).

Ventilation

Motors are cooled through outer air blow (IC 411 according to CEI EN 60034-6) and are equipped with a plastic radial fan, which operates in both directions.

Ensure that fan cover is installed at a suitable distance from the closest wall so to allow air circulation and servicing of motor and brake, if fitted.

On request, motors can be supplied with independently power-supplied forced ventilation system starting from BN 71 or M1 size.

Motor is cooled by an axial fan with independent power supply and fitted on the fan cover (IC 416 cooling system).

This version is used in case of motor driven by inverter so that steady torque operation is possible even at low speed or when high starting frequencies are needed.

Brake motors of BN_BA type and all motors with rear shaft projection (PS option) are excluded.

Belüftung

Die Motoren werden mittels Fremdbelüftung gekühlt (IC 411 gemäß CEI EN 60034-6) und sind mit einem Radiallüfterrad aus Kunststoff ausgestattet, das in beide Richtungen dreht.

Die Installation muss zwischen Lüfterradkappe und der nächstliegenden Wand einen Mindestabstand berücksichtigen, so dass der Luftumlauf nicht behindert werden kann. Dieser Abstand ist jedoch ebenso für die regelmäßige Instandhaltung des Motors und, falls vorhanden, der Bremse erforderlich.

Ab der Baugröße BN 71 oder M1 können die Motoren auf Anfrage mit einer unabhängig gespeisten Zwangsbelüftung geliefert werden. Die Kühlung erfolgt hierdurch einen unabhängig gespeisten Axialventilator, der auf die Lüfterradkappe (Kühlmethode IC 416) montiert wird.

Diese Ausführung wird im Fall eines über einen Frequenzumrichter versorgten Motor verwendet, so dass der Betriebsbereich bei konstantem Drehmoment auch auf die niedrige Drehzahl ausgedehnt wird, oder im Fall von hohen Anlauf Frequenzen.

Von dieser Option ausgeschlossen sind die Bremsmotoren BN_BA und Motoren mit beidseitig herausragender Welle (Option PS).

Ventilation

Les moteurs sont refroidis par ventilation externe (IC 411 selon CEI EN 60034-6) et sont équipés de ventilateur radial en plastique fonctionnant dans les deux sens de rotation.

L'installation doit garantir une distance minimum de la calotte cache-ventilateur par rapport au mur le plus proche de façon à ne pas créer d'empêchement à la circulation de l'air ainsi que pour permettre les interventions d'entretien ordinaire du moteur et, si présent, du frein.

Sur demande, à partir de la taille BN 71, ou M1, les moteurs peuvent être fournis avec ventilation forcée à alimentation indépendante. Le refroidissement est réalisé au moyen d'un ventilateur axial avec alimentation indépendante monté sur la calotte cache-ventilateur (méthode de refroidissement IC 416).

Cette exécution est utilisée en cas d'alimentation du moteur par variateur dans le but d'étendre aussi la plage de fonctionnement à couple constant aux faibles vitesses ou lorsque des fréquences de démarrage élevées sont nécessaire à celui-ci.

Les moteurs frein type BN_BA et les moteurs avec arbre sortant des deux côtés (option PS) SP sont exclus de cette option.

(A77)

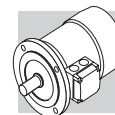
Dati di alimentazione / Power supply / Daten der Stromversorgung / Données d'alimentation					
		V a.c. ± 10%	Hz	P [W]	I [A]
BN 71	M1	1~ 230	50 / 60	22	0.12
BN 80	M2			22	0.12
BN 90	—			40	0.30
BN 100 (*)	M3			50	0.25
BN 112	—			50	0.26 / 0.15
BN 132S	M4S	3~ 230 Δ / 400Y	50	110	0.38 / 0.22
BN 132M...BN 160MR	M4L				
BN 160...BN 180M	M5			180	1.25 / 0.72

Per la variante sono disponibili due esecuzioni alternative, denominate **U1** e **U2**, aventi lo stesso ingombro in senso longitudinale. Per entrambe le esecuzioni, la maggiore lunghezza della calotta copriventola (ΔL) è riportata nella tabella che segue. Dimensioni complessive ricavabili dalle tavole dimensionali dei motori.

*This variant has two different models, called **U1** and **U2**, having the same longitudinal size. Longer side of fan cover (ΔL) is specified for both models in the table below. Overall dimension can be reckoned from motor size table.*

Für die Varianten sind als Alternative zwei Ausführungen verfügbar: **U1** und **U2** mit dem gleichen Längsmaßen. Für beide Ausführungen wird die Verlängerung der Lüfterradkappe (ΔL) in der nachstehenden Tabelle wiedergegeben. Gesamtmaße können den Tabellen entnommen werden, in denen die Motormaße angegeben werden.

*Pour la variante sont disponibles deux exécutions alternatives, dénommées **U1** et **U2**, ayant le même encombrement dans le sens longitudinal. Pour les deux exécutions, la majoration de la longueur de la calotte cache-ventilateur (ΔL) est indiquée dans le tableau suivant. Dimensions totales à calculer d'après les planches de dimensions des moteurs.*



(A78)

Tabella maggiorazione lunghezze motore / Extra length for servoventilated motors Tabelle - Motorverlängerung / Tableau majoration longueurs moteur			
		ΔL_1	ΔL_2
BN 71	M1	93	32
BN 80	M2	127	55
BN 90	—	131	48
BN 100	M3	119	28
BN 112	—	130	31
BN 132S	M4S	161	51
BN 132M	M4L	161	51

ΔL_1 = variazione dimensionale rispetto alla quota LB del motore standard corrispondente

ΔL_1 = extra length to LB value of corresponding standard motor

ΔL_1 = Maßänderung gegenüber Maß LB des entsprechenden Standardmotors

ΔL_1 = variation de dimension par rapport à la cote LB du moteur standard correspondant

ΔL_2 = variazione dimensionale rispetto alla quota LB del motore autofrenante corrispondente

ΔL_2 = extra length to LB value of corresponding brake motor

ΔL_2 = Maßänderung gegenüber Maß LB des entsprechenden Bremsmotors

ΔL_2 = variation de dimension par rapport à la cote LB du moteur frein correspondant

U1



Terminali di alimentazione del ventilatore in scatola morsetti separata.

Nei motori autofrenanti grandezza BN 71...BN 160MR, con variante **U1**, la leva di sblocco non è collocabile nella posizione AA. L'opzione non è disponibile per i motori conformi alle norme CSA e UL (opzione CUS).

Fan wiring terminals are housed in a separate terminal box.

*In brake motors of size BN 71...BN 160MR, with **U1** model, the release lever cannot be positioned to AA.*

The option is not applicable to motors compliant with the CSA and UL norms (option CUS).

Versorgungsanschlüsse des Ventilators im Zusatzklemmenkasten.

Bei den Bremsmotoren in der Baugröße BN 71...BN 160MR, mit Variante **U1** kann der Bremslösehebel nicht in der Position AA. Die Option ist nicht anwendbar für die Motoren entsprechend den Normen CSA und UL (Option CUS).

Bornes d'alimentation du ventilateur dans un bornier séparé.

Pour les moteurs frein taille BN 71...BN 160MR, avec variante **U1**, le levier de déblocage ne peut être installé en position AA. L'option n'est pas disponible pour les moteurs conformes aux normes CSA et UL (option CUS).

U2



I terminali del ventilatore sono collocati nella scatola morsetti principale del motore.

L'opzione U2 non è applicabile ai motori da BN 160 a BN 200L, con eccezione dei motori BN 160MR, per i quali l'opzione è disponibile e ai motori con opzione CUS (conformi alle norme CSA e UL).

Fan terminals are wired in the motor terminal box.

The U2 option does not apply to motors BN 160 through BN 200L, with the only exception of motor BN 160MR for which the option is available instead and to motors with option CUS (compliant to norms CSA and UL).

Versorgungsanschlüsse des Ventilators befinden sich im Hauptklemmenkasten des Motors.

Die Option U2 ist nicht anwendbar bei den Motoren BN160M...BN200L, außer den Motoren BN160MR wofür die Option verfügbar ist, und bei den Motoren mit der CUS-Option (entsprechend den Normen CSA und UL).

Bornes d'alimentation du ventilateur dans le bornier principal du moteur.

L'option n'est pas applicable aux moteurs BN 160...BN 200L, sauf pour les moteurs BN 160MR, pour lesquels l'option est disponible et aux moteurs avec l'option CUS (conforme aux normes CSA et UL).

(A79)

(*)			V a.c. $\pm 10\%$	Hz	P [W]	I [A]
	BN 100_U2	M3	3~ 230 Δ / 400Y	50 / 60	40	0.12 / 0.09

RC

Tettuccio parapigioggia

Il dispositivo parapigioggia, che è raccomandato quando il motore è montato verticalmente con l'albero verso il basso, serve a proteggere il motore stesso dall'ingresso di corpi solidi e dallo stillicidio.

Drip cover

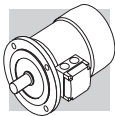
The drip cover protects the motor from dripping and avoids the ingress of solid bodies. It is recommended when motor is installed in a vertical position with the shaft downwards.

Schutzdach

Das Schutzdach, dessen Montage dann empfohlen wird, wenn der Motor senkrecht mit einer nach unten gerichteten Welle ausgerichtet wird, dient dem Schutz des Motors vor einem Eindringen von festen Fremdkörpern und Tropfwasser.

Capot de protection anti-pluie

Le capot de protection anti-pluie est recommandé lorsque le moteur est monté verticalement avec l'arbre vers le bas, il sert à protéger le moteur contre l'introduction de corps solides et le suintement.



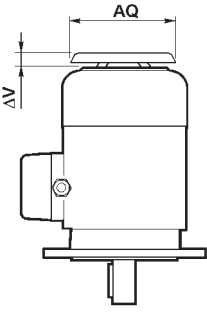
Le dimensioni aggiuntive sono indicate nella tabella (A80). Il tettuccio esclude le varianti PS, EN1, EN2, EN3 e non è applicabile ai motori con freno tipo BA

Relevant dimensions are indicated in the table (A80). The drip cover is not compatible with variants PS, EN1, EN2, EN3 and will not fit motors equipped with a BA brake.

Die Maßerweiterungen werden in der Tabelle (A80) angegeben. Das Schutzdach schließt die Möglichkeit der Varianten PS, EN1, EN2, EN3 und kann bei Motoren mit dem Bremstyp BA nicht montiert werden.

Les dimensions à ajouter sont indiquées dans le tableau (A80). Le capot antipluie exclue les variantes PS, EN1, EN2, EN3 et n'est pas applicable aux moteurs avec frein type BA.

(A80)

		AQ	ΔV	
BN 63	M05	118	24	
BN 71	M1	134	27	
BN 80	M2	152	25	
BN 90	—	168	30	
BN 100	M3	190	28	
BN 112	—	211	32	
BN 132...BN 160MR	M4	254	32	
BN 160M...BN 180M	M5	302	36	
BN 180L...BN 200L	—	340	36	

TC

Tettuccio tessile

La variante del tettuccio tipo TC è da specificare quando il motore è installato in ambienti dell'industria tessile, dove sono presenti filamenti che potrebbero ostruire la griglia del copriven-tola, impedendo il regolare flusso dell'aria di raffreddamento. L'opzione esclude le varianti EN1, EN2, EN3 e non è applicabile ai motori con freno tipo BA. L'ingombro complessivo è lo stesso del tettuccio tipo RC.

Textile canopy

Option TC is a cover variant for textile industry environments, where lint may obstruct the fan grid and prevent a regular flow of cooling air. This option is not compatible with variants EN1, EN2, EN3 and will not fit motors equipped with a BA brake. Overall dimensions are the same as drip cover type RC.

Schutzdach

Die Variante des Schutzdachs vom Typ TC muss dann spezifiziert werden, wenn der Motor in Bereichen der Textilindustrie installiert wird, in denen Stofffusseln das Lüfterradgitter verstopfen und so einen regulären Kühlluftfluss verhindern könnten. Diese Option schließt die Möglichkeit der Varianten EN1, EN2, EN3 aus und kann bei Motoren mit einer Bremse vom Typ BA nicht appliziert werden. Die Gesamtmaße entsprechen denen des Schutzdachs vom Typ RC.

Capot textile

La variante du capot type TC est à spécifier lorsque le moteur est installé dans des sites de l'industrie textile, où sont présents des filaments qui pourraient obstruer la grille du cache-ventilateur et empêcher le flux régulier de l'air de refroidissement. L'option exclue les variantes EN1, EN2, EN3 et n'est pas applicable aux moteurs avec frein type BA. L'encombrement total est identique à celui du capot type RC.

Dispositivi di retroazione

I motori possono essere dotati di tre diversi tipi di encoder, qui di seguito descritti. Il montaggio dell'encoder esclude le esecuzioni con doppia estremità d'albero (PS) e tettuccio di protezione (RC, TC). Il dispositivo non è applicabile ai motori dotati del freno im c.a., tipo BA.

Feedback units

Motors may be combined with three different types of encoders to achieve feedback circuits. Configurations with double-extended shaft (PS) and rain canopy (RC, TC) are not compatible with encoder installation. Also not compatible are motors equipped with a.c. brakes, type BA.

Geber-anschluß

Die Motoren können mit drei unterschiedlichen Encodertypen ausgestattet werden. Nachstehend finden Sie die entsprechenden Beschreibungen. Die Montage des Encoders schließt die Version mit zweitem Wellenende (PS) und Schutzdach (RC, TC) aus. Die Vorrichtung kann an Motoren mit Bremse vom Typ BA nicht angebaut werden.

Dispositifs de retroaction

Pour moteurs peuvent être dotés de trois types de codeurs différents, décrits ci-après. Le montage du codeur exclu les exécutions avec arbre à double extrémité (PS) et le capot de protection (RC, TC). Le dispositif n'est pas applicable aux moteurs avec frein en c.a., type BA.

EN1

Encoder incrementale, $V_{IN}=5\text{ V}$, uscita line-driver RS 422.

Incremental encoder, $V_{IN}=5\text{ V}$, line-driver output RS 422.

Inkremental-Encoder, $V_{IN}=5\text{ V}$, Ausgang „line-driver“ RS 422.

Codeur incrémental, $V_{IN}=5\text{ V}$, sortie line-driver RS 422.

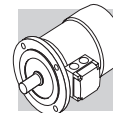
EN2

Encoder incrementale, $V_{IN}=10-30\text{ V}$, uscita line driver RS 422.

Incremental encoder, $V_{IN}=10-30\text{ V}$, line-driver output RS 422.

Inkremental-Encoder, $V_{IN}=10-30\text{ V}$, Ausgang „line driver“ RS 422.

Codeur incrémental, $V_{IN}=10-30\text{ V}$, sortie line-driver RS 422.



EN3

Encoder incrementale, $V_{IN}=12-30$
V, uscita push-pull 12-30 V

Incremental encoder, $V_{IN}=12-30$
V, push-pull output 12-30 V

Inkremental-Encoder, $V_{IN}=12-30$
V, Ausgang „push-pull“ 12-30 V

Codeur incrémental, $V_{IN}=12-30$
V, sortie push-pull 12-30 V

(A81)

		EN1	EN2	EN3
interfaccia / Interface Schnittstelle / interface		RS 422	RS 422	push-pull
tensione alimentazione / Power supply voltage Versorgungsspannung / tension d'alimentation	[V]	4...6	10...30	12...30
tensione di uscita / Output voltage Ausgangsspannung / tension de sortie	[V]	5	5	12...30
corrente di esercizio senza carico / No-load operating current Betriebsstrom ohne Belastung / courant d'utilisation sans charge	[mA]	120	100	100
n° di impulsi per giro / No. of pulses per revolution Impulse pro Drehung / nbre d'impulsions par tour		1024		
n° segnali / No. of signals Signale / nbre de signaux		6 (A, B, C + segnali invertiti / inverted signals invertierte Signale / signaux inversés)		
max. frequenza di uscita / Max. output frequency Max. Ausgangsfrequenz / fréquence max. de sortie	[kHz]	300	300	200
max. velocità / Max. speed Max. Drehzahl / vitesse max.	[min ⁻¹]	6000 (9000 min ⁻¹) x 10s		
campo di temperatura / Temperature range Temperaturbereich / plage de température	[°C]	-20...+70		
grado di protezione / Protection class Schutzgrad / degré de protection		IP 65		

EN1, EN2, EN3	
BN 63...BN 200L	M05...M5
BN 63_FD...BN 200L_FD	M05_FD...M5_FD
BN 63_FA...BN 200L_FA	M05_FA...M5_FA

Se l'opzione EN_ è richiesta per motori di grandezza BN71...BN160MR e M1...M4, contemporaneamente all'opzione U1/U2, le variazioni dimensionali coincidono con quelle dell'opzione U1/U2.

If the encoder device (options EN1, EN2, EN3) is specified on motors BN71...BN160MR and M1...M4, along with the independent fan cooling (options U1, U2), the extra length of motor is coincident with that of the correspondent U1 and U2 execution.

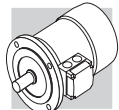
EN_ + U1		
		L3
BN 160M...BN 180M	M5	72
BN 180L...BN 200L	-	82
BN 160M_FD...BN 180M_FD	M5_FD	35
BN 180L_FD...BN 200L_FD	-	41

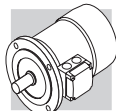
Wenn der Encoder (Optionen EN1, EN2, EN3) für Motoren der Baugrößen BN71...BN160MR und M1...M4 zusammen mit Fremdlüftung (Optionen U1, U2) ausgelegt ist, stimmen die Maßänderungen des Motors mit jenen der entsprechenden Ausführungen U1 und U2 überein.

Si un codeur (option EN1, EN2, EN3) est nécessaire sur les moteurs de tailles BN71...BN160MR et M1...M4, en association avec la ventilation forcée (options U1, U2), la variation de dimensions du moteur coïncide avec celle des exécutions U1 et U2 correspondantes.

2 P		3000 min⁻¹ - S1										50 Hz				

freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.														
FD															FA					BA									
Pn		n	Mn	IE1	η (100%)	η (75%)	η (50%)	cos φ	In	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	$J_m \times 10^{-4}$ kgm ²	IM B5 	Mod.	Mb	Z _o	$J_m \times 10^{-4}$ kgm ²	IM B5 	Mod.	Mb max	Z _o	$J_m \times 10^{-4}$ kgm ²	IM B5 					
0.18	BN 63A	2	2730		59.9	56.9	51.9	0.77	0.56	3.0	2.1	2.0	2.0	3.5	FD 02	1.75	3900	4800	2.6	5.2	FA 02	1.75	5	3500	4.0	5.8			
0.25	BN 63B	2	2740		66.0	64.8	64.8	0.76	0.72	3.3	2.3	2.3	2.3	3.9	FD 02	1.75	3900	4800	3.0	5.4	BA 60	5	3600	4.3	6.2				
0.37	BN 63C	2	2800		69.1	66.8	66.8	0.78	0.99	3.9	2.6	2.6	3.3	5.1	FD 02	3.5	3600	4500	3.9	6.6	BA 60	5	3500	5.3	7.4				
0.37	BN 71A	2	2820		73.8	73.0	70.6	0.76	0.95	4.8	2.8	2.6	3.5	5.4	FD 03	3.5	3000	4100	4.6	8.1	BA 70	8	3500	5.5	9.3				
0.55	BN 71B	2	2820		76.0	75.8	74.8	0.76	1.37	5.0	2.9	2.8	4.1	6.2	FD 03	5	2900	4200	5.3	8.9	BA 70	8	3600	6.1	10.1				
0.75	BN 71C	2	2810		76.6	76.2	76.2	0.76	1.86	5.1	3.1	2.8	5.0	7.3	FD 03	5	1900	3300	6.1	9.7	BA 70	8	3200	7.0	11.2				
0.75	BN 80A	2	2810	●	76.2	75.5	68.3	0.81	1.75	4.8	2.6	2.2	7.8	8.6	FD 04	5	1700	3200	9.4	12.5	BA 80	18	2800	10.8	13.9				
1.1	BN 80B	2	2800	●	76.4	76.2	75.0	0.81	2.57	4.8	2.8	2.4	9.0	9.5	FD 04	10	1500	3000	10.6	13.4	BA 80	18	2700	12.0	14.8				
1.5	BN 80C	2	2800	●	79.1	79.5	77.2	0.81	3.4	4.9	2.7	2.4	11.4	11.3	FD 04	15	1300	2600	13.0	15.2	BA 80	18	2400	14.4	16.6				
1.5	BN 90SA	2	2870	●	82.0	81.5	78.1	0.80	3.4	5.9	2.7	2.6	12.5	12.3	FD 14	15	900	2200	14.1	16.5	BA 90	35	1600	19.5	19.6				
1.85	BN 90SB	2	2880	●	82.5	82.0	75.4	0.80	4.0	6.2	2.9	2.6	16.7	14	FD 14	15	900	2200	18.3	18.2	BA 90	35	1700	23.7	21.3				
2.2	BN 90L	2	2880	●	82.7	82.1	80.8	0.80	4.8	6.3	2.9	2.7	16.7	14	FD 05	26	900	2200	21	20.7	BA 90	35	1700	24	21.3				
3	BN 100L	2	2860	●	81.5	81.3	77.4	0.79	6.7	5.6	2.6	2.2	31	20	FD 15	26	700	1600	35	26	BA 100	50	1300	43	30				
4	BN 100LB	2	2870	●	83.1	83.0	77.8	0.80	8.7	5.8	2.7	2.5	39	23	FD 15	40	450	900	43	29	BA 100	50	850	51	33				
4	BN 112M	2	2900	●	85.5	84.5	83.0	0.82	8.2	6.9	3.0	2.9	57	28	FD 06S	40	—	950	66	40	BA 110	75	850	73	41				
5.5	BN 132SA	2	2890	●	84.7	84.5	81.2	0.84	11.2	5.9	2.6	2.2	101	35	FD 06	50	—	600	112	49	BA 140	150	500	151	67				
7.5	BN 132SB	2	2900	●	86.5	86.3	84.4	0.85	14.7	6.4	2.6	2.2	145	42	FD 06	50	—	550	154	56	BA 140	150	450	195	74				
9.2	BN 132M	2	2930	●	87.0	86.5	83.6	0.86	17.7	6.7	2.8	2.3	178	53	FD 56	75	—	430	189	67	BA 140	150	400	228	85				
11	BN 160MR	2	2920	●	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	65															
15	BN 160MB	2	2930	●	89.6	89.4	88.0	0.86	28.1	7.1	2.6	2.3	340	84															
18.5	BN 160L	2	2930	●	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	97															
22	BN 180M	2	2930	●	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	109															
30	BN 200LA	2	2930	●	90.7	90.1	87.6	0.89	54	7.8	2.7	2.9	770	140															





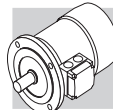
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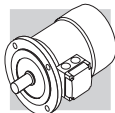
1500 min⁻¹ - S1

50 Hz

freno c.c. / d.c. brake G.S.-bremse / frein c.c.														freno c.a. / a.c. brake W.S.-bremse / frein c.a.														
FD														FA					BA									
Pn		n	Mn	IE1	η (100%)	η (75%)	η (50%)	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z _o	Mb	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 		
kW		min ⁻¹	Nm		%	%	%		A				kgm ²			Nm	NB	SB	Nm	1/h	kgm ²			Nm	1/h	kgm ²		
0.06	BN 56A	4	0.43		46.8	44.2	41.3	0.65	0.28	2.6	2.3	2.0	1.5	3.1				10000	13000	2.6	5.2	FA 02	1.75		13000	2.6	5.0	5.8
0.09	BN 56B	4	0.64		51.7	47.6	42.9	0.60	0.42	2.6	2.5	2.4	1.5	3.1				10000	13000	3.0	5.6	FA 02	3.5		13000	3.0	5.4	6.2
0.12	BN 63A	4	0.85		59.8	56.2	47.0	0.62	0.47	2.6	1.9	1.8	2.0	3.5	FD 02	1.75		7800	10000	3.9	6.8	FA 02	3.5		10000	3.9	6.6	7.4
0.18	BN 63B	4	1.30		54.8	52.9	52.5	0.67	0.71	2.6	2.2	2.0	2.3	3.9	FD 02	3.5		7800	10000	3.9	6.8	FA 02	3.5		10000	3.9	6.6	7.4
0.25	BN 63C	4	1.78		65.3	65.0	57.9	0.69	0.80	2.7	2.1	1.9	3.3	5.1	FD 02	3.5		7800	10000	3.9	6.8	FA 02	3.5		10000	3.9	6.6	7.4
0.25	BN 71A	4	1.73		63.7	62.2	59.1	0.73	0.78	3.3	1.9	1.7	5.8	5.1	FD 03	3.5		7700	11000	6.9	7.8	FA 03	3.5		11000	6.9	7.5	9.0
0.37	BN 71B	4	2.6		66.8	66.7	63.0	0.76	1.05	3.7	2.0	1.9	6.9	5.9	FD 03	5.0		6000	9400	8.0	8.6	FA 03	5.0		9400	8.0	8.3	9.8
0.55	BN 71C	4	3.8		69.0	68.9	68.8	0.74	1.55	4.1	2.3	2.3	9.1	7.3	FD 53	7.5		4300	8700	10.2	10	FA 03	7.5		8700	10.2	9.7	11.2
0.55	BN 80A	4	3.8		72.0	71.3	69.7	0.77	1.43	4.1	2.3	2.0	15	8.2	FD 04	10		4100	8000	16.6	12.1	FA 04	10		8000	16.6	12.0	13.5
0.75	BN 80B	4	5.1	●	75.0	74.5	69.3	0.78	1.85	4.9	2.7	2.5	20	9.9	FD 04	15		4100	7800	22	13.8	FA 04	15		7800	22	13.7	15.2
1.1	BN 80C	4	7.5	●	75.5	76.2	70.4	0.78	2.70	5.1	2.8	2.5	25	11.3	FD 04	15		2600	5300	27	15.2	FA 04	15		5300	27	15.1	16.6
1.1	BN 90S	4	7.6	●	76.5	76.2	72.2	0.77	2.70	4.6	2.6	2.2	21	12.2	FD 14	15		4800	8000	23	16.4	FA 14	15		8000	23	16.3	19.5
1.5	BN 90LA	4	10.2	●	78.7	78.5	74.9	0.77	3.6	5.3	2.8	2.4	28	13.6	FD 05	26		3400	6000	32	19.6	FA 05	26		6000	32	20.3	21
1.85	BN 90LB	4	12.7	●	78.6	78.9	77.2	0.79	4.3	5.1	2.8	2.6	30	15.1	FD 05	26		3200	5900	34	21.1	FA 05	26		5900	34	21.8	22.5
2.2	BN 100LA	4	14.9	●	81.1	81.4	79.9	0.75	5.2	4.5	2.2	2.0	40	18.3	FD 15	40		2600	4700	44	25	FA 15	40		4700	44	25	29
3	BN 100LB	4	20	●	82.6	83.8	83.7	0.77	6.8	5.0	2.3	2.2	54	22	FD 15	40		2400	4400	58	28	FA 15	40		4400	58	29	32
4	BN 112M	4	27	●	84.4	84.2	81.6	0.81	8.4	5.6	2.7	2.5	98	30	FD 06S	60		—	1400	107	40	FA 06S	60		2100	107	42	43
5.5	BN 132S	4	36	●	84.7	84.8	82.5	0.81	11.6	5.5	2.3	2.2	213	44	FD 56	75		—	1050	223	57	FA 06	75		1200	223	58	76
7.5	BN 132MA	4	50	●	86.0	86.3	85.3	0.81	15.5	5.7	2.5	2.4	270	53	FD 06	100		—	950	280	66	FA 06	100		1000	280	71	85
9.2	BN 132MB	4	61	●	88.4	88.6	87.5	0.80	18.8	5.9	2.7	2.5	319	59	FD 07	150		—	900	342	75	FA 07	150		900	342	77	91
11	BN 160MR	4	73	●	87.6	87.8	86.0	0.81	22.4	6.0	2.7	2.5	360	70	FD 07	150		—	850	382	86	FA 07	150		850	382	88	
15	BN 160L	4	98	●	88.7	88.5	88.4	0.81	30	6.0	2.3	2.1	650	99	FD 08	200		—	750	725	129	FA 08	200		750	710	128	
18.5	BN 180M	4	121	●	89.3	89.5	89.2	0.81	37	6.2	2.6	2.5	790	115	FD 08	250		—	700	865	145	FA 08	250		700	850	144	
22	BN 180L	4	144	●	89.9	90.0	90.0	0.80	44	6.4	2.5	2.5	1250	135	FD 09	300		—	400	1450	175		FA 08	250		700	850	
30	BN 200L	4	196	●	91.4	91.7	91.0	0.80	59	7.1	2.7	2.8	1650	157	FD 09	400		—	300	1850	197							

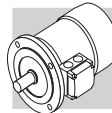
freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.																			
FD															FA															BA				
Pn		n	Mn	IE1	η (100%)	η (75%)	η (50%)	cos φ	In	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	$\frac{J_m}{x 10^{-4}}$ kgm ²	IM B5 	Mod.	Mb	Z _o	$\frac{J_m}{x 10^{-4}}$ kgm ²	IM B5 	Mod.	Mb	Z _o	$\frac{J_m}{x 10^{-4}}$ kgm ²	IM B5 										
kW		min ⁻¹	Nm		%	%	%		A				kgm ²			Nm	NB	SB	kgm ²			Nm	1/h	kgm ²										
0.09	BN 63A	6	0.98		41.0	41.0	32.9	0.53	0.60	2.1	2.1	1.8	3.4	4.6	FD 02	3.5	9000	14000	4.0	6.3	FA 02	3.5	14000	4.0	6.1									
0.12	BN 63B	6	1.32		45.0	44.0	41.8	0.60	0.64	2.1	1.9	1.7	3.7	4.9	FD 02	3.5	9000	14000	4.3	6.6	FA 02	3.5	14000	4.3	6.4									
0.18	BN 71A	6	1.91		55.0	55.5	51.0	0.69	0.68	2.6	1.9	1.7	8.4	5.5	FD 03	5.0	8100	13500	9.5	8.2	FA 03	5.0	13500	9.5	7.9									
0.25	BN 71B	6	2.7		62.0	58.5	51.4	0.71	0.82	2.6	1.9	1.7	10.9	6.7	FD 03	5.0	7800	13000	12	9.4	FA 03	5.0	13000	12	9.1									
0.37	BN 71C	6	3.9		66.0	60.0	53.3	0.69	1.17	3.0	2.4	2.0	12.9	7.7	FD 53	7.5	5100	9500	14	10.4	FA 03	7.5	9500	14	10.1									
0.37	BN 80A	6	3.9		68.0	67.4	63.3	0.68	1.15	3.2	2.2	2.0	21	9.9	FD 04	10	5200	8500	23	13.8	FA 04	10	8500	23	13.7									
0.55	BN 80B	6	5.7		70.0	69.8	64.3	0.68	1.67	3.9	2.6	2.2	25	11.3	FD 04	15	4800	7200	27	15.2	FA 04	15	7200	27	15.1									
0.75	BN 80C	6	7.8	●	70.0	70.0	64.4	0.65	2.38	3.8	2.5	2.2	28	12.2	FD 04	15	3400	6400	30	16.1	FA 04	15	6400	30	16.0									
0.75	BN 90S	6	7.8	●	70.0	69.0	64.2	0.68	2.27	3.8	2.4	2.2	26	12.6	FD 14	15	3400	6500	28	16.8	FA 14	15	6500	28	16.7									
1.1	BN 90L	6	11.4	●	72.9	72.6	69.1	0.69	3.2	3.9	2.3	2.0	33	15	FD 05	26	2700	5000	37	21	FA 05	26	5000	37	22									
1.5	BN 100LA	6	15.2	●	75.2	74.2	70.3	0.72	4.0	4.1	2.1	2.0	82	22	FD 15	40	1900	4100	86	28	FA 15	40	4100	86	29									
1.85	BN 100LB	6	19.0	●	76.6	72.8	62.6	0.73	4.8	4.6	2.1	2.0	95	24	FD 15	40	1700	3600	99	30	FA 15	40	3600	99	31									
2.2	BN 112M	6	22	●	78.5	79.0	76.5	0.73	5.5	4.8	2.2	2.0	168	32	FD 06S	60	—	2100	177	42	FA 06S	60	2100	177	44									
3	BN 132S	6	30	●	79.7	77.0	75.1	0.76	7.1	5.1	1.9	1.8	216	36	FD 56	75	—	1400	226	49	FA 06	75	1400	226	50									
4	BN 132MA	6	40	●	81.4	81.5	79.5	0.77	9.2	5.5	2.0	1.8	295	45	FD 06	100	—	1200	305	58	FA 07	100	1200	318	63									
5.5	BN 132MB	6	56	●	83.1	80.9	79.1	0.78	12.2	6.1	2.1	1.9	383	56	FD 07	150	—	1050	406	72	FA 07	150	1050	406	74									
7.5	BN 160M	6	75	●	85.0	85.0	84.8	0.81	15.7	5.9	2.2	2.0	740	83	FD 08	170	—	900	815	112	FA 08	170	900	815	113									
11	BN 160L	6	109	●	86.4	86.5	85.9	0.81	22.7	6.6	2.5	2.3	970	103	FD 08	200	—	800	1045	133	FA 08	200	800	1045	133									
15	BN 180L	6	148	●	87.7	88.0	87.3	0.82	30	6.2	2.0	2.4	1550	130	FD 09	300	—	600	1750	170														
18.5	BN 200LA	6	184	●	88.6	88.0	87.3	0.81	37	5.9	2.0	2.3	1700	145	FD 09	400	—	450	1900	185														

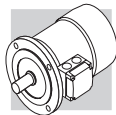




		freno c.c. / d.c. brake G.S.-bremse / frein c.c.										freno c.a. / a.c. brake W.S.-bremse / frein c.a.					
		FD										FA					
Pn		n	Mn	η	cos φ	In	Is	Ms	Ma	Jm	IM B5	Mod.	Mb	Zo	Mb	Zo	IM B5
kW		min ⁻¹	Nm	%		A	[400V]	Mn	Mn	x 10 ⁻⁴ kgm ²	Kg		Nm	1/h	Nm	1/h	Kg
0.20	BN 63B	2	0.71	55	0.82	0.64	3.5	2.1	1.9	2.9	4.4	FD 02	3.5	2200	3.5	2600	5.9
0.15		4	1.06	49	0.67	0.66	2.6	1.8	1.7	4.7	4.4		4000	5100	5	2000	5.9
0.28	BN 71A	2	0.99	56	0.82	0.88	2.9	1.9	1.7	4.7	4.4	FD 03	3.5	2100	3.5	2400	6.8
0.20		4	1.39	59	0.72	0.68	3.1	1.8	1.7	5.8	7.1		3800	4800	8	2100	6.8
0.37	BN 71B	2	1.29	56	0.82	1.16	3.5	1.8	1.8	5.8	5.1	FD 03	5	1400	5	2100	7.5
0.25		4	1.72	60	0.73	0.82	3.3	2.0	1.9	6.9	7.8		2900	4200	8	1800	7.5
0.45	BN 71C	2	1.55	63	0.85	1.21	3.8	1.8	1.8	6.9	8.6	FD 03	5	1400	5	2100	8.3
0.30		4	2.0	63	0.73	0.94	3.6	2.0	1.9	8.0	8.6		2900	4200	8	1800	8.3
0.55	BN 80A	2	1.9	63	0.85	1.48	3.9	1.7	1.7	15	8.2	FD 04	5	1600	5	2300	12.0
0.37		4	2.5	67	0.79	1.01	4.1	1.8	1.9	22	13.8		3000	4000	18	2100	12.0
0.75	BN 80B	2	2.6	65	0.85	1.96	3.8	1.9	1.8	20	9.9	FD 04	10	1400	10	1600	13.7
0.55		4	3.8	68	0.81	1.44	3.9	1.7	1.7	21	12.2		2700	3600	18	1500	13.7
1.1	BN 90S	2	3.8	71	0.82	2.73	4.7	2.3	2.0	21	14.0	FD 14	10	1500	10	1600	16.3
0.75		4	5.2	66	0.79	2.08	4.6	2.4	2.2	28	16.4		2300	2800	35	1300	16.3
1.5	BN 90L	2	5.2	70	0.85	3.64	4.5	2.4	2.1	28	14.0	FD 05	26	1050	26	1200	21
1.1		4	7.6	73	0.81	2.69	4.7	2.5	2.2	40	18.3		1600	2000	50	1100	21
2.2	BN 100LA	2	7.5	72	0.85	5.2	4.5	2.0	1.9	40	18.3	FD 15	26	600	26	900	25
1.5		4	10.2	73	0.79	3.8	4.7	2.0	2.0	61	25		1300	2300	50	750	25
3.5	BN 100LB	2	11.7	80	0.84	7.5	5.4	2.2	2.1	61	25	FD 15	40	500	40	900	32
2.5		4	16.8	82	0.80	5.5	5.2	2.2	2.2	98	30		1000	2100	75	1800	32
4	BN 112M	2	13.3	79	0.83	8.8	6.1	2.4	2.0	98	30	FD 06S	60	—	60	700	42
3.3		4	22.2	80	0.80	7.4	5.1	2.1	2.0	213	44		—	1200	75	1200	58
5.5	BN 132S	2	18.2	80	0.87	11.4	5.9	2.4	2.0	270	53	FD 06	75	—	100	350	71
4.4		4	29	82	0.84	9.2	5.3	2.2	2.0	319	59		—	900	150	300	77
7.5	BN 132MA	2	25	82	0.87	15.2	6.5	2.4	2.0	319	59	FD 07	150	—	150	300	77
6		4	40	84	0.85	12.1	5.8	2.3	2.1	319	59		—	900	150	300	77
9.2	BN 132MB	2	30	83	0.86	18.6	6.0	2.6	2.2	319	59		—	800	150	300	77
7.3		4	48	85	0.85	14.6	5.5	2.3	2.1	319	59		—	800	150	300	77

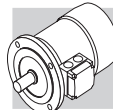
freno c.c. / d.c. brake G.S.-bremse / frein c.c.																	freno c.a. / a.c. brake W.S.-bremse / frein c.a.																
FD																	FA						BA										
Pn		n	Mn	η	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 	FA						BA										
kW		min ⁻¹	Nm	%	A	[400V]							Nm	1/h	kgm ²		Mod.	Nm	1/h	kgm ²	Mod.	Mb max	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 								
0.25	BN 71A	2	2850	0.84	60	0.82	0.73	4.3	1.9	1.8	6.9	5.9	FD 03	1.75	1500	1700	8.0	8.6	FA 03	2.5	1700	8.0	8.3	BA 70	8	1500	8.9	9.8					
0.08		6	910	0.84	43	0.70	0.38	2.1	1.4	1.5				10000	13000					13000					11000								
0.37	BN 71B	2	2880	1.23	62	0.80	1.08	4.4	1.9	1.8	9.1	7.3	FD 03	3.5	1000	1300	10.2	10.0	FA 03	3.5	1300	10.2	9.7	BA 70	8	1200	11.1	11.2					
0.12		6	900	1.27	44	0.73	0.54	2.4	1.4	1.5				9000	11000					11000					10000								
0.55	BN 80A	2	2800	1.88	63	0.86	1.47	4.5	1.9	1.7	20	9.9	FD 04	5	1500	1800	22	13.8	FA 04	5	1800	22	13.7	BA 80	18	1700	23	15.2					
0.18		6	930	1.85	52	0.65	0.77	3.3	2	1.9				4100	6300					6300					6000								
0.75	BN 80B	2	2800	2.6	66	0.87	1.89	4.3	1.8	1.6	25	11.3	FD 04	5	1700	1900	27	15.2	FA 04	5	1900	27	15.1	BA 80	18	1800	28	16.6					
0.25		6	930	2.6	54	0.67	1.00	3.2	1.7	1.8				3800	6000					6000					5600								
1.1	BN 90L	2	2860	3.7	67	0.84	2.82	4.7	2.1	1.9	28	14.0	FD 05	13	1400	1600	32	20	FA 05	13	1600	32	21	BA 90	35	1500	35	21					
0.37		6	920	3.8	59	0.71	1.27	3.3	1.6	1.6				3400	5200					5200					4700								
1.5	BN 100LA	2	2880	5.0	73	0.84	3.53	5.1	1.9	2.0	40	18.3	FD 15	13	1000	1200	44	24	FA 15	13	1200	44	25	BA 100	50	1050	51	29					
0.55		6	940	5.6	64	0.67	1.85	3.5	1.7	1.8				2900	4000					4000					3500								
2.2	BN 100LB	2	2900	7.2	77	0.85	4.9	5.9	2.0	2.0	61	25	FD 15	26	700	900	65	31	FA 15	26	900	65	32	BA 100	50	800	72	36					
0.75		6	950	7.5	67	0.64	2.5	3.3	1.9	1.8				2100	3000					3000					2700								
3	BN 112M	2	2900	9.9	78	0.87	6.4	6.3	2.0	2.1	98	30	FD 06S	40	—	1000	107	40	FA 06S	40	1000	107	32	BA 110	75	930	114	43					
1.1		6	950	11.1	72	0.64	3.4	3.9	1.8	1.8				—	2600					2600					2400								
4.5	BN 132S	2	2910	14.8	78	0.84	9.9	5.8	1.9	1.8	213	44	FD 56	37	—	500	223	57	FA 06	37	500	223	58	BA 140	150	400	263	76					
1.5		6	960	14.9	74	0.67	4.4	4.2	1.9	2.0				—	2100					2100					1700								
5.5	BN 132M	2	2920	18.0	78	0.87	11.7	6.2	2.1	1.9	270	53	FD 56	50	—	400	280	66	FA 06	50	400	280	67	BA 140	150	350	320	85					
2.2		6	960	22	77	0.71	5.8	4.3	2.1	2.0				—	1900					1900					1600								

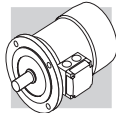




freno c.c. / d.c. brake G.S.-bremse / frein c.c.														freno c.a. / a.c. brake W.S.-bremse / frein c.a.																	
FD														FA														BA			
Pn		n	Mn	η	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb	Zo	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb max	Zo	Jm x 10 ⁻⁴ kgm ²	IM B5 										
0.25	BN 71A	2	0.86	61	0.87	0.68	3.9	1.8	1.9	10.9	6.7	FD 03	1.75	1300	1400	12	9.4	FA 03	2.5	1400	12	9.1	BA 70	8	1300	12.9	10.6				
0.06		8	0.84	31	0.61	0.46	2	1.8	1.9					10000	13000					13000				12000							
0.37	BN 71B	2	1.26	63	0.86	0.99	3.9	1.8	1.9	12.9	7.7	FD 03	3.5	1200	1300	14	10.4	FA 03	3.5	1300	14	10.1	BA 70	8	1200	14.9	11.6				
0.09		8	1.28	34	0.75	0.51	1.8	1.4	1.5					9500	13000					13000				12000							
0.55	BN 80A	2	1.86	66	0.86	1.40	4.4	2.1	2.0	20	9.9	FD 04	5	1500	1800	22	13.8	FA 04	5	1800	22	13.7	BA 80	18	1700	23	15.2				
0.13		8	1.80	41	0.64	0.72	2.3	1.6	1.7					5600	8000					8000				7500							
0.75	BN 80B	2	2.6	68	0.88	1.81	4.6	2.1	2.0	25	11.3	FD 04	10	1700	1900	27	15.2	FA 04	10	1900	27	15.1	BA 80	18	1800	28	16.6				
0.18		8	2.5	43	0.66	0.92	2.3	1.6	1.7					4800	7300					7300				7000							
1.1	BN 90L	2	3.7	63	0.84	3.00	4.5	2.1	1.9	28	14	FD 05	13	1400	1600	32	20	FA 05	13	1600	32	21	BA 90	35	1400	35	21				
0.28		8	3.9	48	0.63	1.34	2.4	1.8	1.9					3400	5100					5100				4500							
1.5	BN 100LA	2	5.0	69	0.85	3.69	4.7	1.9	1.8	40	18.3	FD 15	13	1000	1200	44	25	FA 15	13	1200	44	25	BA 100	50	1000	52	29				
0.37		8	5.1	46	0.63	1.84	2.1	1.6	1.6					3300	5000					5000				4200							
2.4	BN 100LB	2	7.9	75	0.82	5.6	5.4	2.1	2.0	61	25	FD 15	26	550	700	65	31	FA 15	26	700	65	32	BA 100	50	600	72	36				
0.55		8	7.5	54	0.58	2.5	2.6	1.8	1.8					2000	3500					3500				3100							
3	BN 112M	2	9.9	76	0.87	6.5	6.3	2.1	1.9	98	30	FD 06S	40	—	900	107	40	FA 06S	40	900	107	42	BA 110	75	800	114	43				
0.75		8	10.4	60	0.65	2.8	2.5	1.6	1.6					—	2900					2900				2700							
4	BN 132S	2	13.3	73	0.84	9.4	5.6	2.3	2.4	213	44	FD 56	37	—	500	223	57	FA 06	37	500	223	58	BA 140	150	400	263	76				
1		8	13.8	66	0.62	3.5	2.9	1.9	1.8					—	3500					3500				3000							
5.5	BN 132M	2	18.3	75	0.84	12.6	6.1	2.4	2.5	270	53	FD 06	50	—	400	280	66	FA 06	50	400	280	67	BA 140	150	350	320	85				
1.5		8	21	68	0.63	5.1	2.9	1.9	1.9					—	2400					2400				2100							

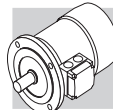
freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.																			
FD															FA															BA				
Pn		n	Mn	η	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb max	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 								
0.55		2	2820	1.86	0.89	1.39	4.2	1.6	1.7	25	11.3	FD 04	5	1000	1300	27	15.2	FA 04	5	1300	27	15.1	BA 80	18	1200	28	16.6							
0.09		12	430	2.0	0.63	0.69	1.8	1.9	1.8				8000	12000						12000					11000									
0.75		2	2790	2.6	0.89	2.17	4.2	1.8	1.7	26	12.6	FD 05	13	1000	1150	30	18.6	FA 05	13	1150	30	19.3	BA 90	35	1050	33	19.9							
0.12		12	430	2.7	0.63	1.06	1.7	1.4	1.6				4600	6300						6300					5700									
1.1		2	2850	3.7	0.85	2.87	4.5	1.6	1.8	40	18.3	FD 15	13	700	900	44	25	FA 15	13	900	44	25	BA 100	50	750	52	29							
0.18		12	430	4.0	0.26	0.54	1.85	1.5	1.3	1.5				4000	6000					6000					5000									
1.5		2	2900	4.9	0.86	3.76	5.6	1.9	1.9	54	22	FD 15	13	700	900	58	28	FA 15	13	900	58	29	BA 100	50	800	66	32							
0.25		12	440	5.4	0.36	0.46	2.18	1.8	1.7	1.8				3800	5000					5000					4300									
2		2	2900	6.6	0.88	4.43	6.5	2.1	2	98	30	FD 06S	20	—	800	107	40	FA 06S	20	800	107	42	BA 110	75	750	114	43							
0.3		12	460	6.2	0.46	0.43	2.19	2	2.1	2										3400					3200									
3		2	2920	9.8	0.87	6.7	6.8	2.3	1.9	213	44	FD 56	37	—	450	223	57	FA 06	37	450	223	58	BA 140	150	380	263	76							
0.5		12	470	10.2	0.51	0.43	3.3	2	1.7	1.6										3000					2500									
4		2	2920	13.1	0.89	8.6	5.9	2.4	2.3	270	53	FD 56	37	—	400	280	66	FA 06	37	400	280	67	BA 140	150	350	320	85							
0.7		12	460	14.5	0.53	0.44	4.3	1.9	1.7	1.6										2800					2500									

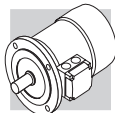


**4/6 P****1500/1000 min⁻¹ - S1****50 Hz**

freno c.c. / d.c. brake G.S.-bremse / frein c.c.														freno c.a. / a.c. brake W.S.-bremse / frein c.a.																	
FD														FA														BA			
Pn		n	Mn	η	cos φ	In	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb	Z _o	NB	SB	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 	Mod.	Mb max	Z _o	Jm x 10 ⁻⁴ kgm ²	IM B5 			
kW		min ⁻¹	Nm	%	A									Nm	1/h						Nm	1/h				Nm	1/h				
0.22	BN 71B	4	1410	1.5	64	0.74	3.9	1.8	1.9	9.1	7.3	FD 03	3.5	2500	3500	10.2	10		FA 03	3.5	3500	10.2	9.7	BA 70	8	3200	11.1	11.2			
0.13		6	920	1.4	43	0.67	2.3	1.6	1.7				5000	9000							8200				8200						
0.30	BN 80A	4	1410	2.0	61	0.82	3.5	1.3	1.5	15	8.2	FD 04	5	2500	3100	16.6	12.1		FA 04	5	3100	16.6	12.0	BA 80	18	2800	18	13.5			
0.20		6	930	2.1	54	0.66	3.2	1.9	2.0				4000	6000							5500				5500						
0.40	BN 80B	4	1430	2.7	63	0.75	3.9	1.8	1.8	20	9.9	FD 04	10	1800	2300	22	13.8		FA 04	10	2300	22	13.7	BA 80	18	2200	23	15.2			
0.26		6	930	2.7	55	0.70	2.7	1.5	1.6				3600	5500							5200				5200						
0.55	BN 90S	4	1420	3.7	70	0.78	4.5	2.0	1.9	21	12.2	FD 14	10	1500	2100	23	16.1		FA 14	10	2100	23	16.3	BA 90	35	1700	28	19.5			
0.33		6	930	3.4	62	0.70	3.7	2.3	2.0				2500	4100							3300				3300						
0.75	BN 90L	4	1420	5.0	74	0.78	4.3	1.9	1.8	28	14	FD 05	13	1400	2000	32	20		FA 05	13	2000	32	21	BA 90	35	1800	35	21			
0.45		6	920	4.7	66	0.71	3.3	2.0	1.9				2300	3600							3300				3300						
1.1	BN 100LA	4	1450	7.2	74	0.79	5.0	1.7	1.9	82	22	FD 15	26	1400	2000	86	28		FA 15	26	2000	86	29	BA 100	50	1800	94	32			
0.8		6	950	8.0	65	0.69	4.1	1.9	2.1				2100	3300							3000				3000						
1.5	BN 100LB	4	1450	9.9	75	0.79	5.1	1.7	1.9	95	25	FD 15	26	1300	1800	99	31		FA 15	26	1800	99	32	BA 100	50	1600	107	34			
1.1		6	950	11.1	72	0.68	4.3	2.0	2.1				2000	3000							2800				2800						
2.3	BN 112M	4	1450	15.2	75	0.78	5.7	1.8	1.9	168	32	FD 06S	40	—	1600	177	42		FA 06S	40	1600	177	44	BA 110	75	1500	184	45			
1.5		6	960	14.9	73	0.72	4.1	4.9	2.0	2.0				—	—	2400					2400				2300						
3.1	BN 132S	4	1460	20	83	0.83	6.5	2.1	2.0	213	44	FD 56	37	—	1200	223	57		FA 06	37	1200	223	58	BA 140	150	1000	263	76			
2		6	960	20	77	0.75	4.9	4.5	2.1	2.1				50	—	1900					1900				1600						
4.2	BN 132MA	4	1460	27	84	0.82	8.8	2.1	2.2	270	53	FD 06	50	—	900	280	66		FA 06	50	900	280	67	BA 140	150	800	320	85			
2.6		6	960	26	79	0.72	6.6	4.3	2.0	2.0				—	—	1500					1500				1300						

freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.														
FD															FA					BA									
Pn		n	Mn	η	cos φ	In	Is	Ms	Ma	Jm	IM B5	Mod.	Mb	Zo	Jm	IM B5	Mod.	Mb	Zo	Jm	IM B5								
kW		min ⁻¹	Nm	%		A		Mn	Mn	kgm ⁻²			Nm	1/h	kgm ⁻²			Nm	1/h	kgm ⁻²									
0.37	BN 80A	4	2.5	63	0.82	1.03	3.3	1.4	1.4	15	8.2	FD 04	10	2300	3500	16.6	12.1	FA 04	10	3500	16.6	12.0							
0.18		8	2.5	44	0.60	0.98	2.2	1.5	1.6					4500	7000					7000									
0.55	BN 80B	4	3.8	65	0.86	1.42	3.8	1.7	1.6	20	9.9	FD 04	10	2200	2900	22	13.8	FA 04	10	2900	22	13.7							
0.30		8	4.3	49	0.65	1.36	2.3	1.7	1.8					4200	6500					6500									
0.65	BN 90S	4	4.5	73	0.85	1.51	4.0	1.9	1.9	28	13.6	FD 14	15	2300	2800	30	17.8	FA 14	15	2800	30	17.7							
0.35		8	4.8	49	0.57	1.81	2.5	2.1	2.2					3500	6000					6000									
0.9	BN 90L	4	6.3	73	0.87	2.05	3.8	1.8	1.8	30	15.1	FD 05	26	1700	2100	34	21	FA 05	26	2100	34	22							
0.5		8	7.1	57	0.62	2.04	2.4	2.1	2					2500	4200					4200									
1.3	BN 100LA	4	8.7	72	0.83	3.14	4.3	1.7	1.8	82	22	FD 15	40	1300	1700	86	28	FA 15	40	1700	86	29							
0.7		8	9.6	58	0.64	2.72	2.8	1.8	1.8					2000	3400					3400									
1.8	BN 100LB	4	12.1	69	0.87	4.3	4.2	1.6	1.7	95	25	FD 15	40	1200	1700	99	31	FA 15	40	1700	99	32							
0.9		8	12.3	62	0.63	3.3	3.2	1.7	1.8					1600	2600					2600									
2.2	BN 112M	4	14.6	77	0.85	4.9	5.3	1.8	1.8	168	32	FD 06S	60	—	—	177	42	FA 06S	60	1200	177	43							
1.2		8	16.1	70	0.63	3.9	3.3	1.9	1.8					—	2000					2000									
3.6	BN 132S	4	24	80	0.82	7.9	6.5	2.1	1.9	295	45	FD 56	75	—	—	305	58	FA 06	75	1000	305	59							
1.8		8	24	72	0.55	6.6	4.6	1.9	2					—	1400					1400									
4.6	BN 132M	4	30	81	0.83	9.9	6.5	2.2	1.9	383	56	FD 06	100	—	—	393	69	FA 07	100	1000	406	74							
2.3		8	31	73	0.54	8.4	4.4	2.3	2					—	1300					1300									





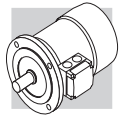
freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.				
FD															FA				
Pn		n	Mn	IE1	η (100%)	η (75%)	η (50%)	cos φ	In [400V]	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B9 
0.18	M 05A 2	2730	0.63		59.9	56.9	51.9	0.77	0.56	3.0	2.1	2.0	2.0	3.2	FD 02	1.75	3900	2.6	4.9
0.25	M 05B 2	2740	0.87		66.0	64.8	64.8	0.76	0.72	3.3	2.3	2.3	2.3	3.6	FD 02	1.75	3900	3.0	5.3
0.37	M 05C 2	2800	1.26		69.1	66.8	66.8	0.78	0.99	3.9	2.6	2.6	3.3	4.8	FD 02	3.5	3600	3.9	6.5
0.55	M 1SD 2	2820	1.86		76.0	75.8	74.8	0.76	1.37	5.0	2.9	2.8	4.1	5.8	FD 03	5	2900	5.3	8.5
0.75	M 1LA 2	2810	2.6		76.6	76.2	76.2	0.76	1.86	5.1	3.1	2.8	5.0	6.9	FD 03	5	1900	6.1	9.6
1.1	M 2SA 2	2800	3.8	●	76.4	76.2	75.0	0.81	2.57	4.8	2.8	2.4	9.0	8.8	FD 04	10	1500	10.6	11.9
1.5	M 2SB 2	2800	5.1	●	79.1	79.5	77.2	0.81	3.4	4.9	2.7	2.4	11.4	10.6	FD 04	15	1300	13.0	9.9
2.2	M 3SA 2	2880	7.3	●	82.7	82.1	81.0	0.80	4.8	6.3	2.9	2.7	24	15.5	FD 15	26	1100	28	22
3	M 3LA 2	2860	10.0	●	81.5	81.3	77.4	0.79	6.7	5.6	2.6	2.2	31	18.7	FD 15	26	700	35	25
4	M 3LB 2	2870	13.3	●	83.1	83.0	77.8	0.80	8.7	5.8	2.7	2.5	39	22	FD 15	40	450	43	28
5.5	M 4SA 2	2890	18.2	●	84.7	84.5	81.2	0.84	11.2	5.9	2.6	2.2	101	33	FD 06	50	600	112	46
7.5	M 4SB 2	2900	25	●	86.5	86.3	84.4	0.85	14.7	6.4	2.6	2.2	145	40	FD 06	50	550	154	53
9.2	M 4LA 2	2930	30	●	87.0	86.5	83.6	0.86	17.7	6.7	2.8	2.3	178	51	FD 56	75	430	189	64
11	M 4LC 2	2920	36	●	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	60					
15	M 5SB 2	2930	49	●	89.6	89.4	88.0	0.86	28.1	7.1	2.6	2.3	340	70					
18.5	M 5SC 2	2930	60	●	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	83					
22	M 5LA 2	2930	72	●	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	95					

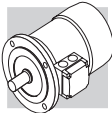
4 P

1500 min⁻¹ - S1

50 Hz

freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.										
FD															FA										
Pn		n	Mn	IE1	η (100%)	η (75%)	η (50%)	cos φ	In [400V] A	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod	Mb Nm	Zo 1/h NB SB	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb Nm	Zo 1/h	Jm x 10 ⁻⁴ kgm ²	IM B9 	
0.09	M 0B 4	1350	0.64		51.7	47.6	42.9	0.60	0.42	2.6	2.5	2.4	1.5	2.9											
0.12	M 05A 4	1350	0.85		59.8	56.2	47.0	0.62	0.47	2.6	1.9	1.8	2.0	3.2		FD 02	1.75	10000	2.6	4.9	FA 02	1.75	13000	2.6	4.7
0.18	M 05B 4	1320	1.30		54.8	52.9	52.5	0.67	0.71	2.6	2.2	2.0	2.3	3.6		FD 02	3.5	10000	3.0	5.3	FA 02	3.5	13000	3.0	5.1
0.25	M 05C 4	1340	1.78		65.3	65.0	57.9	0.69	0.80	2.7	2.1	1.9	3.3	4.8		FD 02	3.5	7800	3.9	6.5	FA 02	3.5	10000	3.9	6.3
0.37	M 1SD 4	1370	2.6		66.8	66.7	63.0	0.76	1.05	3.7	2.0	1.9	6.9	5.5		FD 03	5	6000	8.0	8.2	FA 03	5	9400	8.0	7.9
0.55	M 1LA 4	1380	3.8		69.0	68.9	68.8	0.74	1.55	4.1	2.3	2.3	9.1	6.9		FD 53	7.5	4300	10.2	9.6	FA 03	7.5	8700	10.2	9.3
0.75	M 2SA 4	1400	5.1	●	75.0	74.5	69.3	0.78	1.85	4.9	2.7	2.5	20	9.2		FD 04	15	4100	22	13.1	FA 04	15	7800	22	13
1.1	M 2SB 4	1400	7.5	●	76.4	76.2	70.4	0.78	2.66	5.1	2.8	2.5	25	10.6		FD 04	15	2600	27	14.5	FA 04	15	5300	27	14.4
1.5	M 3SA 4	1410	10.2	●	79.6	80.5	79.3	0.77	3.5	4.6	2.1	2.1	34	15.5		FD 15	26	2800	38	22	FA 15	26	4900	38	23
2.2	M 3LA 4	1410	14.9	●	81.1	81.4	79.9	0.75	5.2	4.5	2.2	2.0	40	17		FD 15	40	2600	44	24	FA 15	40	4700	44	24
3	M 3LB 4	1410	20	●	82.6	83.8	83.7	0.77	6.8	5.0	2.3	2.2	54	21		FD 15	40	2400	58	27	FA 15	40	4400	58	28
4	M 3LC 4	1400	27		82.7	83.1	80.5	0.78	9.0	4.7	2.3	2.2	61	23		FD 55	55	—	65	29	FA 15	40	1300	65	30
5.5	M 4SA 4	1440	36	●	84.7	84.8	82.5	0.81	11.6	5.5	2.3	2.2	213	42		FD 56	75	—	223	55	FA 06	75	1050	223	56
7.5	M 4LA 4	1440	50	●	86.0	86.3	85.3	0.81	15.5	5.7	2.5	2.4	270	51		FD 06	100	—	280	64	FA 07	100	950	280	65
9.2	M 4LB 4	1440	61	●	88.4	88.6	87.5	0.80	18.8	5.9	2.7	2.5	319	57		FD 07	150	—	342	73	FA 07	150	900	342	75
11	M 4LC 4	1440	73	●	87.6	87.8	86.0	0.81	22.4	6.0	2.7	2.5	360	65		FD 07	150	—	382	81	FA 07	150	850	382	83
15	M 5SB 4	1460	98	●	88.7	88.5	88.4	0.81	30.1	6.0	2.3	2.1	650	85		FD 08	200	—	725	115	FA 08	200	750	710	114
18.5	M 5LA 4	1460	121	●	89.3	89.5	89.2	0.81	37	6.2	2.6	2.5	790	101		FD 08	250	—	865	131	FA 08	250	700	850	130





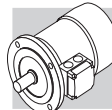
6 P

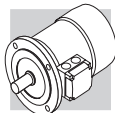
1000 min⁻¹ - S1

50 Hz

freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.														
FD															FA														
Pn		n	Mn	IE1	η (100%)	η (75%)	η (50%)	cos φ	In	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	$J_m \times 10^{-4}$ kgm ²	IM B9 	Mod.	Mb	Z _o	$J_m \times 10^{-4}$ kgm ²	IM B9 										
kW		min ⁻¹	Nm		%	%	%		A				kgm ²			Nm	1/h	kgm ²											
0.09	M 05A 6	880	0.98		41.0	41.0	32.9	0.53	0.60	2.1	2.1	1.8	3.4	4.3	FD 02	3.5	9000	4.0	6.0										
0.12	M 05B 6	870	1.32		45.0	44.0	41.8	0.60	0.64	2.1	1.9	1.7	3.7	4.6	FD 02	3.5	9000	4.3	6.3										
0.18	M 15C 6	900	1.91		55.0	55.5	51.0	0.69	0.68	2.6	1.9	1.7	8.4	5.1	FD 03	5	8100	9.5	7.8										
0.25	M 15D 6	900	2.7		62.0	58.5	51.4	0.71	0.82	2.6	1.9	1.7	10.9	6.3	FD 03	5	7800	12	9										
0.37	M 15A 6	910	3.9		66.0	60.0	53.3	0.69	1.17	3.0	2.4	2.0	12.9	7.3	FD 53	7.5	5100	14	10										
0.55	M 25A 6	920	5.7		70.0	69.8	64.3	0.68	1.67	3.9	2.6	2.2	25	10.6	FD 04	15	4800	27	14.5										
0.75	M 25B 6	920	7.8	●	70.0	70.0	64.4	0.65	2.38	3.8	2.5	2.2	28	11.5	FD 04	15	3400	30	15.4										
1.1	M 35A 6	920	11.4	●	75.0	74.0	72.0	0.72	2.9	4.3	2.0	1.8	33	17	FD 15	26	2700	37	23										
1.5	M 35A 6	940	15.2	●	75.2	74.2	70.3	0.72	4.0	4.1	2.1	2.0	82	21	FD 15	40	1900	86	27										
1.85	M 35B 6	930	19.0	●	76.6	72.8	62.6	0.73	4.8	4.6	2.1	2.0	95	23	FD 15	40	1700	99	29										
2.2	M 35C 6	930	23	●	77.7	76.8	72.4	0.71	5.8	4.7	2.3	2.1	95	23	FD 55	55	1900	99	29										
3	M 45A 6	940	30	●	79.7	77.0	75.1	0.76	7.1	5.1	1.9	1.8	216	34	FD 56	75	1400	226	47										
4	M 45A 6	950	40	●	81.4	81.5	79.5	0.77	9.2	5.5	2.0	1.8	295	43	FD 06	100	1200	305	56										
5.5	M 45B 6	945	56	●	83.1	80.9	79.1	0.78	12.2	6.1	2.1	1.9	383	54	FD 07	150	1050	406	70										
7.5	M 55A 6	955	75	●	85.0	85.0	84.8	0.81	15.7	5.9	2.2	2.0	740	69	FD 08	170	900	815	98										
11	M 55B 6	960	109	●	86.4	86.5	85.9	0.81	22.7	6.6	2.5	2.3	970	89	FD 08	200	800	1045	119										

freno c.c. / d.c. brake G.S.-bremse / frein c.c.																			freno c.a. / a.c. brake W.S.-bremse / frein c.a.									
FD																			FA									
Pn		n	Mn	η	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb	Zo 1/h NB SB	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb	Zo	Jm x 10 ⁻⁴ kgm ²	IM B9 							
0.20	M 05A	2	2700	55	0.82	0.64	3.5	2.1	1.9	2.9	4.1	FD 02	3.5	2200 4000	2600 5100	3.5	5.8	FA 02	3.5	2600 5100	3.5	5.6						
0.15	4	4	1350	49	0.67	0.66	2.6	1.8	1.7																			
0.28	M 15B	2	2700	56	0.82	0.88	2.9	1.9	1.7	4.7	4	FD 03	3.5	2100 3800	2400 4800	5.8	6.7	FA 03	3.5	2400 4800	5.8	6.4						
0.20	4	4	1370	59	0.68	1.02	3.1	1.8	1.7																			
0.37	M 15C	2	2740	56	0.82	1.16	3.5	1.8	1.8	5.8	4.7	FD 03	5	1400 2900	2100 4200	6.9	7.4	FA 03	5	2100 4200	6.9	7.1						
0.25	4	4	1390	60	0.73	0.82	3.3	2	1.9																			
0.45	M 15D	2	2780	63	0.85	1.21	3.8	1.8	1.8	6.9	5.5	FD 03	5	1400 2900	2100 4200	8	8.2	FA 03	5	2100 4200	8	7.9						
0.30	4	4	1400	63	0.74	0.93	3.8	2.1	1.9																			
0.55	M 1LA	2	2800	73	0.79	1.38	4.2	2	1.8	9.1	6.9	FD 03	5	1600 3300	2200 4600	10.2	9.6	FA 03	5	2200 4600	10.2	9.3						
0.37	4	4	1400	68	0.72	1.09	3.9	2.2	2																			
0.75	M 25A	2	2780	65	0.85	1.96	3.8	1.9	1.8	20	9.2	FD 04	10	1400 2700	1600 3600	22	13.1	FA 04	10	1600 3600	22	13						
0.55	4	4	1400	68	0.81	1.44	3.9	1.7	1.7																			
1.1	M 25B	2	2730	65	0.86	2.84	3.9	2	1.9	25	10.7	FD 04	10	1200 2300	1500 3100	27	14.5	FA 04	10	1500 3100	27	14.5						
0.75	4	4	1410	75	0.81	1.78	4.5	2.1	2																			
1.5	M 35A	2	2830	74	0.83	3.5	4.7	2.1	2	34	15.5	FD 15	26	700 1600	1000 2600	38	22	FA 15	26	1000 2600	38	23						
1.1	4	4	1420	74	0.78	2.6	4.3	2.1	2																			
2.2	M 3LA	2	2800	72	0.85	5.2	4.5	2	1.9	40	17	FD 15	26	600 1300	900 2300	44	24	FA 15	26	900 2300	44	24						
1.5	4	4	1410	73	0.79	3.8	4.7	2	2																			
3.5	M 3LB	2	2850	80	0.84	7.5	5.4	2.2	2.1	61	23	FD 15	40	500 1000	900 2100	65	29	FA 15	40	900 2100	65	30						
2.5	4	4	1420	82	0.80	5.5	5.2	2.2	2.2																			
4.8	M 4 SA	2	2900	81	0.88	9.7	6	2	1.9	213	42	FD 06	50	— —	400 950	233	55	FA 06	50	400 950	233	56						
3.8	4	4	1430	81	0.84	8.1	5.2	2.1	2.1																			
5.5	M 45B	2	2890	80	0.87	11.4	5.9	2.4	2	213	42	FD 56	75	— —	350 900	223	55	FA 06	75	350 900	223	56						
4.4	4	4	1440	82	0.84	9.2	5.3	2.2	2																			
7.5	M 4LA	2	2900	82	0.87	15.2	6.5	2.4	2	270	51	FD 06	100	— —	350 950	280	64	FA 07	100	350 950	280	65						
6	4	4	1430	84	0.85	12.1	5.8	2.3	2.1																			
9.2	M 4LB	2	2920	83	0.86	18.6	6	2.6	2.2	319	57	FD 07	150	— —	300 800	342	73	FA 07	150	300 800	342	75						
7.3	4	4	1440	85	0.85	14.6	5.5	2.3	2.1																			





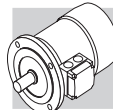
freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.							
FD															FA							
Pn		n	Mn	η	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb	Zo 1/h NB SB	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb	Zo	Jm x 10 ⁻⁴ kgm ²	IM B9 	
kW		min ⁻¹	Nm	%		A							Nm						Nm			
0.25	M 1SA	2	0.84	60	0.82	0.73	4.3	1.9	1.8	6.9	5.5	FD 03	1.75	1500	8	8.2	FA 03	1.75	1700	8	7.9	
0.08		6	0.84	43	0.70	0.38	2.1	1.4	1.5					10000					13000			
0.37	M 1LA	2	1.23	62	0.80	1.08	4.4	1.9	1.8	9.1	6.9	FD 03	3.5	1000	10.2	9.6	FA 03	3.5	1300	10.2	9.3	
0.12		6	1.27	44	0.73	0.54	2.4	1.4	1.5					9000					11000			
0.55	M 2SA	2	1.88	63	0.86	1.47	4.5	1.9	1.7	20	9.2	FD 04	5	1500	22	13.1	FA 04	5	1800	22	13	
0.18		6	1.85	52	0.65	0.77	3.3	2.0	1.9					4100					6300			
0.75	M 2SB	2	2.6	66	0.87	1.89	4.3	1.8	1.6	25	10.6	FD 04	5	1700	27	14.5	FA 04	5	1900	27	14.4	
0.25		6	2.6	54	0.67	1.00	3.2	1.7	1.8					3800					6000			
1.1	M 3SA	2	3.7	71	0.82	2.73	4.9	1.8	1.9	34	15.5	FD 15	13	1000	38	22	FA 15	13	1300	38	23	
0.37		6	3.8	63	0.70	1.21	3.1	1.5	1.8					3500					5000			
1.5	M 3LA	2	5.0	73	0.84	3.53	5.1	1.9	2.0	40	17	FD 15	13	1000	44	24	FA 15	13	1200	44	24	
0.55		6	5.6	64	0.67	1.85	3.5	1.7	1.8					2900					4000			
2.2	M 3LB	2	7.2	77	0.85	4.9	5.9	2.0	2.0	61	23	FD 15	26	700	65	29	FA 15	26	900	65	30	
0.75		6	7.5	67	0.64	2.5	3.3	1.9	1.8					2100					3000			
3	M 4SA	2	9.9	74	0.88	6.6	5.6	2.0	2.1	170	36	FD 56	37	—	182	48	FA 06	37	600	182	50	
1.1		6	10.9	73	0.68	3.2	4.5	2.2	2					—					2200			
4.5	M 4SB	2	14.8	78	0.84	9.9	5.8	1.9	1.8	213	42	FD 56	37	—	223	55	FA 06	37	500	223	56	
1.5		6	14.9	74	0.67	4.4	4.2	1.9	2.0					—					2100			
5.5	M 4LA	2	18.0	78	0.87	11.7	6.2	2.1	1.9	270	51	FD 06	50	—	280	64	FA 06	50	400	280	65	
2.2		6	22	77	0.71	5.8	4.3	2.1	2.0					—					1900			

2/8 P

3000/750 min⁻¹ - S3 60/40%

50 Hz

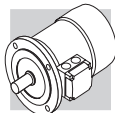
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		FD											FA			
Pn		n	Mn	η	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb	Zo	Jm x 10 ⁻⁴ kgm ²	IM B9 
0.37	M 1LA	2800	1.26	63	0.86	0.99	3.9	1.8	1.9	12.9	7.3	FD 03	3.5	1200	14	10
0.09	8	670	1.28	34	0.75	0.51	1.8	1.4	1.5				9500	13000		
0.55	M 2SA	2830	1.86	66	0.86	1.40	4.4	2.1	2	20	9.2	FD 04	5	1500	22	13.1
0.13	8	690	1.80	41	0.64	0.72	2.3	1.6	1.7				5600	8000		
0.75	M 2SB	2800	2.6	68	0.88	1.81	4.6	2.1	2	25	10.6	FD 04	10	1700	27	14.5
0.18	8	690	2.5	43	0.66	0.92	2.3	1.6	1.7				4800	7300		
1.1	M 3SA	2870	3.7	69	0.84	2.74	4.6	1.8	1.7	34	15.5	FD 15	13	1000	38	22
0.28	8	690	3.9	44	0.56	1.64	2.3	1.4	1.7				3400	5000		
1.5	M 3LA	2880	5.0	69	0.85	3.69	4.7	1.9	1.8	40	17	FD 15	13	1000	44	24
0.37	8	690	5.1	46	0.63	1.84	2.1	1.6	1.6				3300	5000		
2.4	M 3LB	2900	7.9	75	0.82	5.6	5.4	2.1	2	61	23	FD 15	26	550	65	29
0.55	8	700	7.5	54	0.58	2.5	2.6	1.8	1.8				2000	3500		
3	M 4SA	2920	9.8	72	0.85	7.1	5.6	2	1.8	162	36	FD 56	37	—	182	48
0.75	8	710	10.1	61	0.64	2.8	3	1.7	1.8				—	3400		
4	M 4SB	2870	13.3	73	0.84	9.4	5.6	2.3	2.4	213	42	FD 56	37	—	223	55
1	8	690	13.8	66	0.62	3.5	2.9	1.9	1.8				—	3500		
5.5	M 4LA	2870	18.3	75	0.84	12.6	6.1	2.4	2.5	270	51	FD 06	50	—	280	64
1.5	8	690	21	68	0.63	5.1	2.9	1.9	1.9				—	2400		



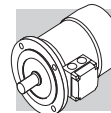
2/12 P

3000/500 min⁻¹ - S3 60/40%

50 Hz



freno c.c. / d.c. brake G.S.-bremse / frein c.c.															freno c.a. / a.c. brake W.S.-bremse / frein c.a.														
FD															FA														
Pn		n	Mn	η	cos φ	In	Is In	Ms Mn	Ma Mn	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb	Zo 1/h NB SB	Jm x 10 ⁻⁴ kgm ²	IM B9 	Mod.	Mb	Zo	Jm x 10 ⁻⁴ kgm ²	IM B9 								
kW		min ⁻¹	Nm	%		A				kgm ²			Nm	1/h	kgm ²			Nm	1/h	kgm ²									
0.55	M 2SA	2820	1.86	64	0.89	1.39	4.2	1.6	1.7	25	10.6	FD 04	5	1000	27	14.5	FA 04	5	1300	27	14.4								
0.09	12	430	2.0	30	0.63	0.69	1.8	1.9	1.8					8000	12000				12000										
0.75	M 3SA	2900	2.5	65	0.81	2.06	5.2	1.9	2.1	34	15.5	FD 15	13	700	38	22	FA 15	13	900	38	23								
0.12	12	460	2.5	33	0.43	1.22	1.9	1.3	1.6					5000	7000				7000										
1.1	M 3LA	2850	3.7	65	0.85	2.87	4.5	1.6	1.8	40	17	FD 15	13	700	44	24	FA 15	13	900	44	24								
0.18	12	430	4.0	26	0.54	1.85	1.5	1.3	1.5					4000	6000				6000										
1.5	M 3LB	2900	4.9	67	0.86	3.76	5.6	1.9	1.9	54	21	FD 15	13	700	58	27	FA 15	13	900	58	28								
0.25	12	440	5.4	36	0.46	2.18	1.8	1.7	1.8					3800	5000				5000										
2	M 3LC	2850	6.7	70	0.84	4.9	4.9	1.8	1.7	61	23	FD 55	18	—	65	29	FA 15	18	700	65	30								
0.3	12	450	6.4	38	0.47	2.4	1.7	1.6	1.7					—	3500				3500										
3	M 4SA	2920	9.8	74	0.87	6.7	6.8	2.3	1.9	213	42	FD 56	37	—	223	55	FA 06	37	450	223	56								
0.5	12	470	10.2	51	0.43	3.3	2	1.7	1.6					—	3000				3000										
4	M 4LA	2920	13.1	75	0.89	8.6	5.9	2.4	2.3	270	51	FD 56	37	—	280	64	FA 06	37	400	280	65								
0.7	12	460	14.5	53	0.44	4.3	1.9	1.7	1.6					—	2800				2800										

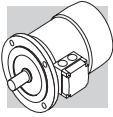


**M12 - DIMENSIONI
MOTORI**

***M12 - MOTORS
DIMENSIONS***

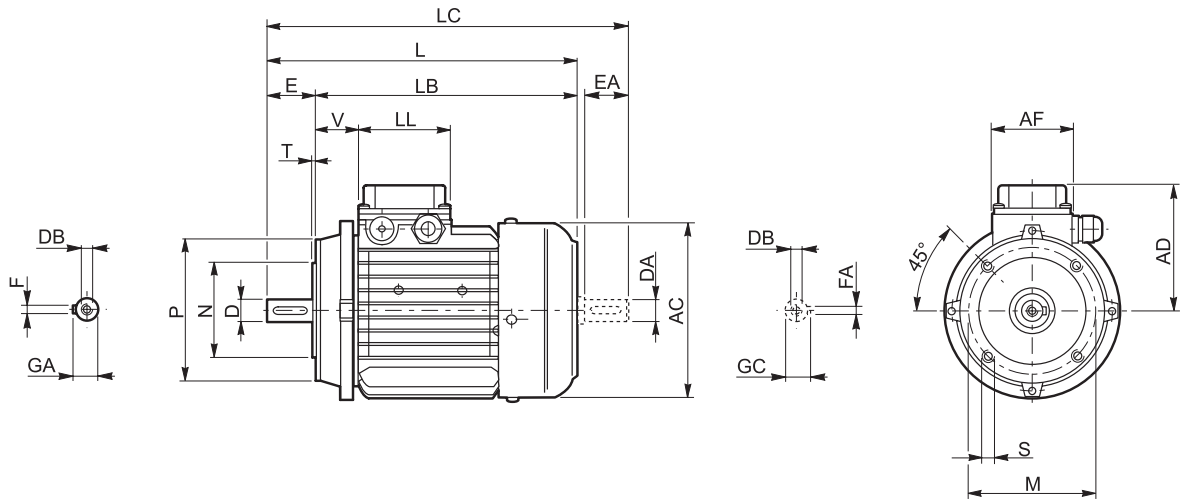
**M12 - MOTORENABMES-
SUNGEN**

***M12 - DIMENSIONS
MOTEURS***

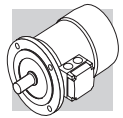


BN

IM B14

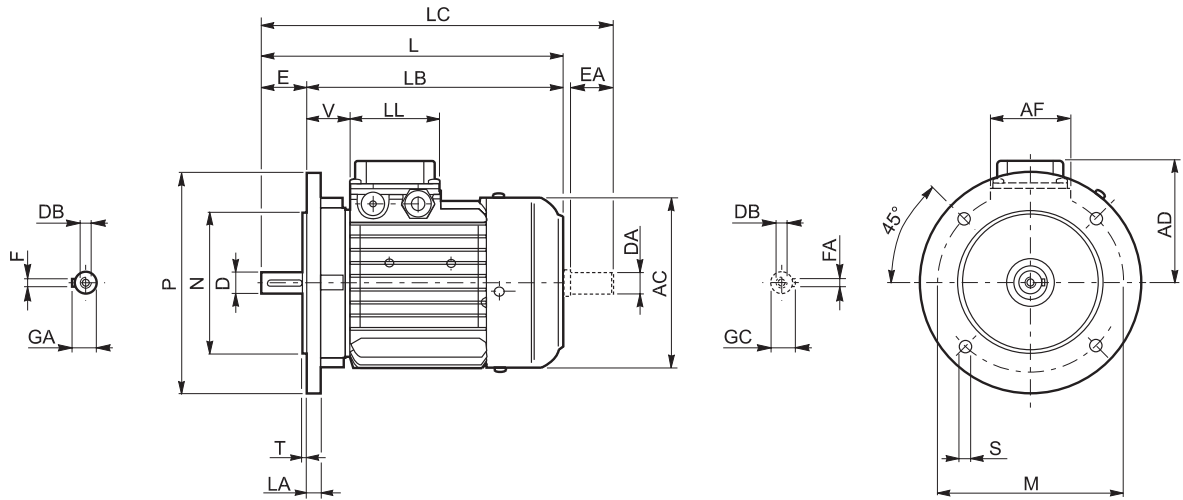


	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur							
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V
BN 56	9	20	M3	10.2	3	65	50	80	M5	2.5	110	185	165	207	91	74	80	34
BN 63	11	23	M4	12.5	4	75	60	90			121	207	184	232	95			26
BN 71	14	30	M5	16	5	85	70	105	M6		138	249	219	281	108			37
BN 80	19	40	M6	21.5	6	100	80	120		3	156	274	234	315	119	38		
BN 90	24	50	M8	27	8	115	95	140	M8		176	326	276	378	133	98	98	44
BN 100	28	60	M10	31		130	110	160			3.5	195	366	306	429			142
BN 112									219	385		325	448	157	52			
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	493	413	576	193	118	118	58



BN

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur								
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	
BN 56	9	20	M3	10.2	3	100	80	120	7	3	8	110	185	165	207	91	74	80	34	
BN 63	11	23	M4	12.5	4	115	95	140	9.5		10	121	207	184	232	95			26	
BN 71	14	30	M5	16	5	130	110	160				138	249	219	281	108			37	
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	274	234	315	119	98	98	38	
BN 90	24	50	M8	27	8							215	180	250	14	15			176	326
BN 100	28	60	M10	31		14	4	15	195	367	307								429	142
BN 112									20	219	385	325	448	157	52					
BN 132	38	80	M12	41	10	265	230	300	18.5	5	15	258	493	413	576	193	118	118	58	
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350				310	562	452	645				245	218
BN 160 M													596	486	680				261	51
BN 160 L	48 38 (1)	110 110 (1)		51.5 41 (1)	14 10 (1)						348	640				530	724	52		
BN 180 M			708			598	823	66												
BN 180 L	48 42 (1)		M20 M16 (1)	59 45 (1)	16 12 (1)	350	300	400			18	348	722	612	837	261	187	187	66	
BN 200 L	55 42 (1)	722							612	837										

N.B.:

1) Queste dimensioni sono riferite alla seconda estremità d'albero.

NOTE:

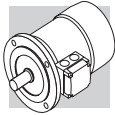
1) These values refer to the rear shaft end.

HINWEIS:

1) Diese Maße betreffen das zweite Wellenende.

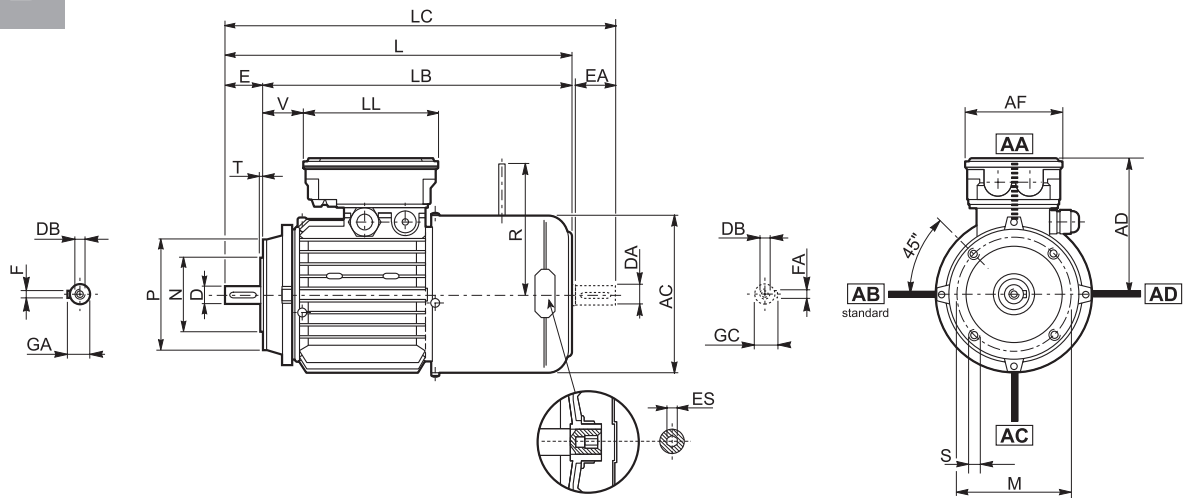
REMARQUE :

1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre.



BN_FD

IM B14



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	121	272	249	297	119	98	133	14	96	5
BN 71	14	30	M5	16	5	85	70	105	M6		138	310	280	342	132			25	103	
BN 80	19	40	M6	21.5	6	100	80	120		3	156	346	306	388	143			41	129	
BN 90 S	24	50	M8	27	8	115	95	140	M8		3.5	176	409	359	461	146	110	165	39	160
BN 90 L										195		458	398	521	155	62			160	
BN 100	28	60	M10	31		130	110	160	4	219	484	424	547	170	73	199				
BN 112										258	603	523	686	210	140	188	122	204 (1)		
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	603	523	686	210	140	188	122	204 (1)	

N.B.:

1) Per freno FD07 quota R=226.

NOTE:

1) For FD07 brake value R=226.

HINWEIS:

1) Für Bremse FD07, Maß R=226.

REMARQUE :

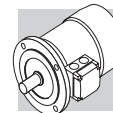
1) Pour frein FD07 valeur R=226.

L'esagono ES non è presente con l'opzione PS.

ES hexagon is not supplied with PS option.

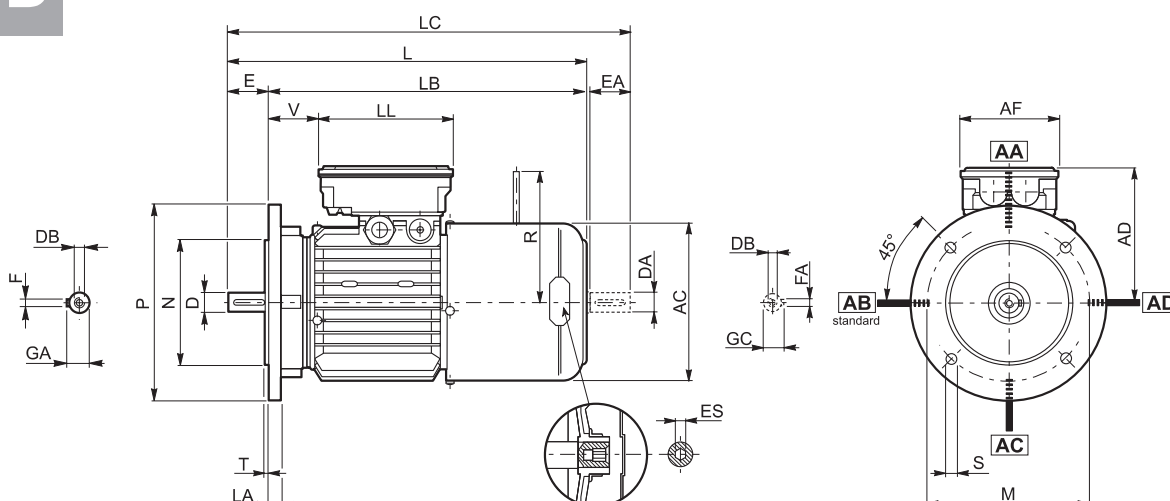
Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_FD

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur																						
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	ES													
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	119	98	133	14	96	5													
BN 71	14	30	M5	16	5	130	110	160		138		310	280	342	132	25			103															
BN 80	19	40	M6	21.5	6					156		346	306	388	143	41			129															
BN 90 S	24	50	M8	27	8	165	130	200	11.5	3.5	11.5	176	409	359	461	146	110	165	39	160	6													
BN 90 L												215	180	250	15	219			484			424	547	170	62	199								
BN 100	28	60	M10	31		265	230	300	14	4	20	258	603	523	686	210			140	188		122	204 (2)											
BN 112																						672	562	755	161	226								
BN 132	38	80	M12	41	10				18.5	5	15	310	736	626	820	245	187	187	51	266	—													
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350					18	348	780				670	864		261	866	756	981	52	305							
BN 160 M																																		
BN 160 L	48 38 (1)			110 110 (1)	M16 M16 (1)	51.5 41 (1)	14 10 (1)	350				300	400	18	348	878			768	993		64	878	768	993	64	878	768	993					
BN 180 M																																		
BN 180 L	48 42 (1)																																	
BN 200 L	55 42 (1)																																	

N.B.:

1) Queste dimensioni sono riferite alla seconda estremità d'albero.

2) Per freno FD07 quota R=226.

NOTE:

1) These values refer to the rear shaft end.

2) For FD07 brake value R=226.

HINWEIS:

1) Diese Maße betreffen das zweite Wellenende.

2) Für Bremse FD07, Maß R=226.

REMARQUE :

1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre.

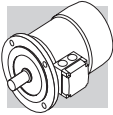
2) Pour frein FD07 valeur R=226.

L'esagono ES non è presente con l'opzione PS.

ES hexagon is not supplied with PS option.

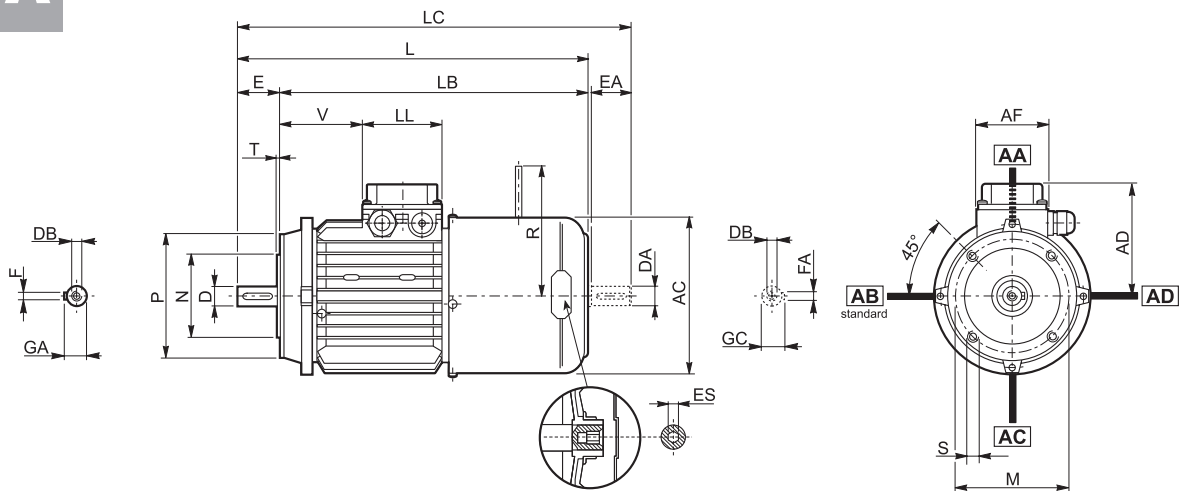
Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_FA

IM B14



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	121	272	249	119	95	74	80	26	116	5
BN 71	14	30	M5	16	5	85	70	105	M6		138	310	280	342	108			68	124	
BN 80	19	40	M6	21.5	6	100	80	120		3	156	346	306	388	119			83	134	
BN 90	24	50	M8	27	8	115	95	140	M8		3.5	176	409	359	461	133	98	98	95	160
BN 100	28	60	M10	31		130	110	160		195		458	398	521	142	119			198	
BN 112						219	484	424		547	157	128	198							
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	603	523	686	193	118	118	180	200 (1)	

N.B.:

1) Per freno FD07 quota R=226.

Per la versione BN..FA le dimensioni della scatola morsettieria AD, AF, LL, V sono uguali al tipo BN..FD.

L'esagono ES non è presente con l'opzione PS.

NOTE:

1) For FD07 brake value R=226.

For motors type BN..FA, the terminal box sizes AD, AF, LL, V are the same as for BN..FD.

ES hexagon is not supplied with PS option.

HINWEIS:

1) Für Bremse FD07, Maß R=226.

Bei der Motor typ BN..FA sind die Maße des Klemmenkastens AD, AF, LL, V denen der Version BN..FD gleich.

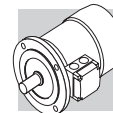
Der Sechskant ES ist bei der Option PS nicht vorhanden.

REMARQUE :

1) Pour frein FD07 valeur R=226.

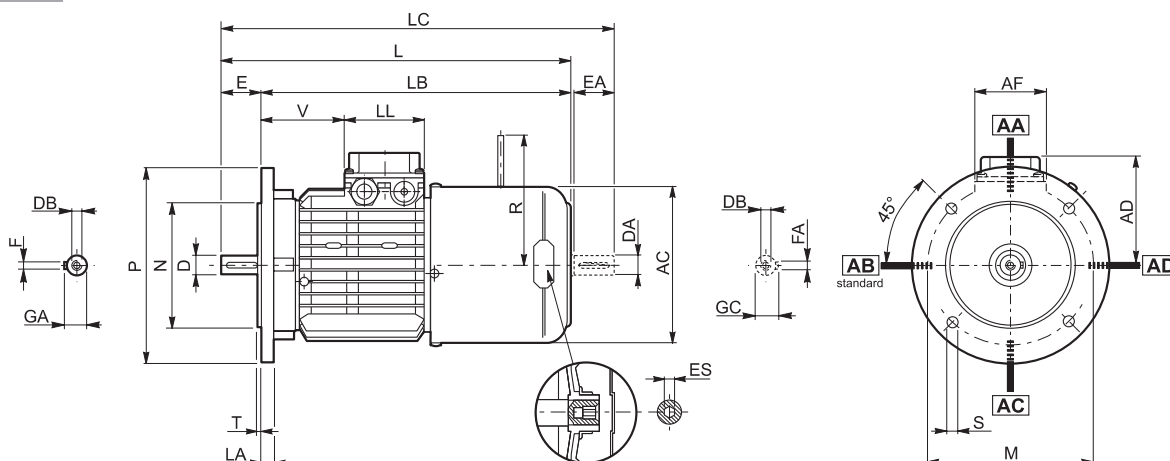
Pour moteurs type BN..FA les dimensions de la boîte à bornes AD, AF, LL, V sont les mêmes de BN..FD.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_FA

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur																	
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	ES								
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	95	74	80	26	116	5								
BN 71	14	30	M5	16	5	130	110	160		3.5		11.5	138	310	280	342			108	68		124							
BN 80	19	40	M6	21.5	6	165	130	200	11.5		14		4	156	346	306			388	119		83	134						
BN 90	24	50	M8	27	8	215	180	250	14	4		15		176	409	359	461	133	98	98	95	160	6						
BN 100	28	60	M10	31										10	265	230	300	18.5			5			15	195	458	398	521	142
BN 112											219		484												424	547	157	128	198
BN 132	38	80	M12	41	10	265	230	300	18.5	5	15	258	603	523	686	193	118	118	180	200 (2)	—								
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45	12	300	250	350					672	562	755				245	218		217							
BN 160 M				41 (1)	10 (1)							736	626	820	245	51	247												
BN 160 L				48	38 (1)							51.5	14	780	670	864	245	51	247										
BN 180 M	48 38 (1)			41 (1)	10 (1)																								

N.B.:

- 1) Queste dimensioni sono riferite alla seconda estremità d'albero.
- 2) Per freno FD07 quota R=226.

NOTE:

- 1) These values refer to the rear shaft end.
- 2) For FD07 brake value R=226.

HINWEIS:

- 1) Diese Maße betreffen das zweite Wellenende.
- 2) Für Bremse FD07, Maß R=226.

REMARQUE :

- 1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre.
- 2) Pour frein FD07 valeur R=226.

Le dimensioni AD, AF, LL e V relative alla scatola morsetti dei motori BN...FA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

Dimensions AD, AF, LL and V, relevant to terminal box of motors BN...FA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN...FD motors.

Die Abmessungen des Klemmenkastens der Motoren BN ... FA AD, AF, LL und V in Bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

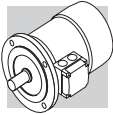
Les dimensions AD, AF, LL et V relatives à la boîte à borne des moteurs BN...FA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN...FD de la même taille.

L'esagono ES non è presente con l'opzione PS.

ES hexagon is not supplied with PS option.

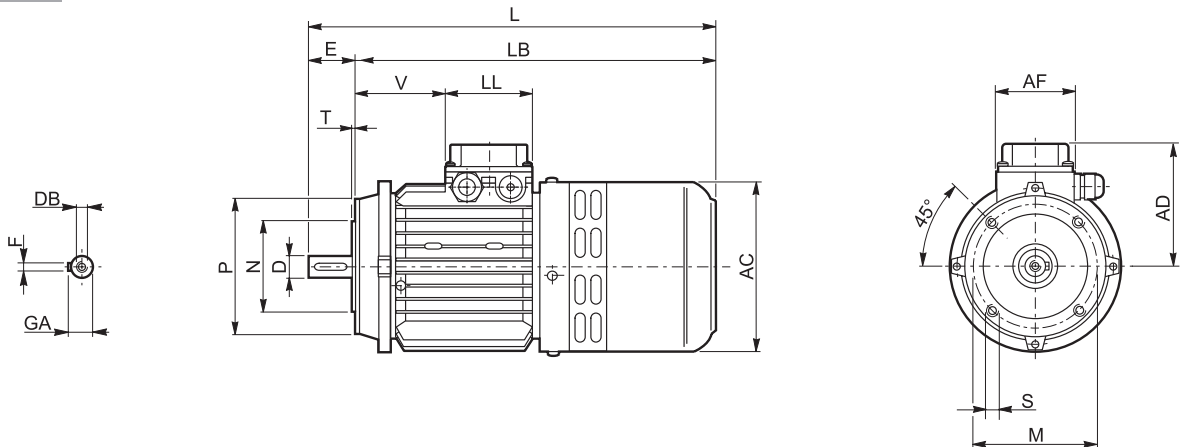
Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



BN_BA

IM B14



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride					Motore / Motor / Motor / Moteur						
	D	E	DB	GA	F	M	N	P	S	T	AC	L	LB	AD	AF	LL	V
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	124	298	275	95	74	80	28
BN 71	14	30	M5	16	5	85	70	105	M6		138	327	297	108			68
BN 80	19	40	M6	21.5	6	100	80	120		3	156	372	332	119			83
BN 90	24	50	M8	27	8	115	95	140	M8		3.5	176	425	375	133	98	98
BN 100	28	60	M10	31		130	110	160		195		477	417	142	119		
BN 112										219		500	440	157	128		
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	638	558	193	118	118	180

N.B.:

Le dimensioni AD, AF, LL e V relative alla scatola morsetti dei motori BN...BA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

NOTE:

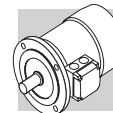
Dimensions AD, AF, LL and V, relevant to terminal box of motors BN...BA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN...FD motors

HINWEIS:

Die Abmessungen des Klemmkastens der Motoren BN ... BA AD, AF, LL und V in Bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

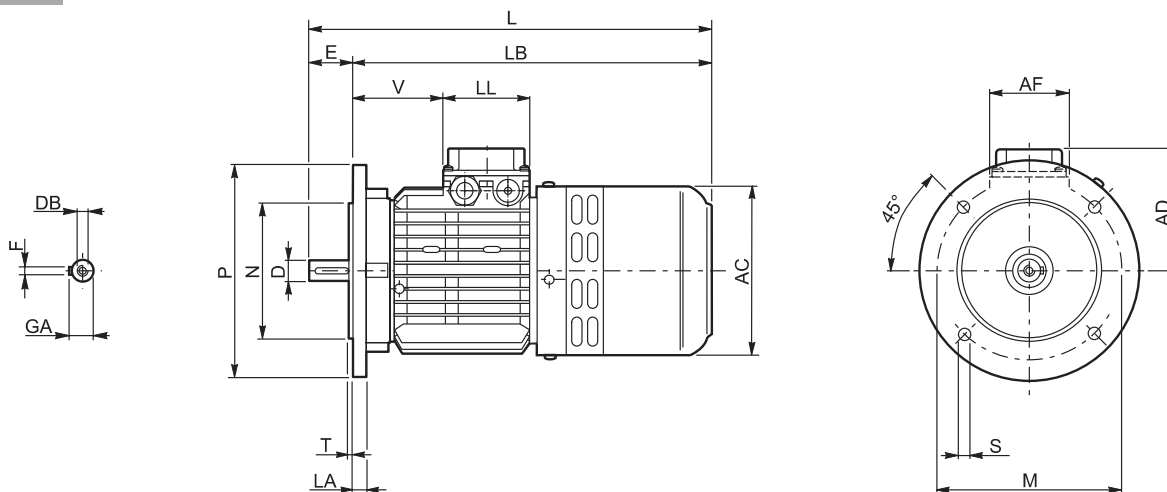
REMARQUE :

Les dimensions AD, AF, LL et V relatives à la boîte à borne des moteurs BN...BA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN...FD de la même taille.



BN_BA

IM B5



	Albero / Shaft / Welle / Arbre					Flangia / Flange / Flansch / Bride						Motore / Motor / Motor / Moteur							
	D	E	DB	GA	F	M	N	P	S	T	LA	AC	L	LB	AD	AF	LL	V	
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	124	298	275	95	74	80	28	
BN 71	14	30	M5	16	5	130	110	160		3.5		11.5	138	327	297			108	68
BN 80	19	40	M6	21.5	6	165	130	200	11.5		4		11.5	156	372	332	119	98	98
BN 90	24	50	M8	27	8					215		180		250	14	4	14		
BN 100	28	60	M10	31		265	230	300	20		195		477					417	142
BN 112					15					219	500	440	157						
BN 132	38	80	M12	41	10														

N.B.:

Le dimensioni AD, AF, LL e V relative alla scatola morsettiera dei motori BN...BA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

NOTE:

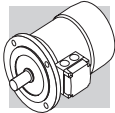
Dimensions AD, AF, LL and V, relevant to terminal box of motors BN...BA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN...FD motors

HINWEIS:

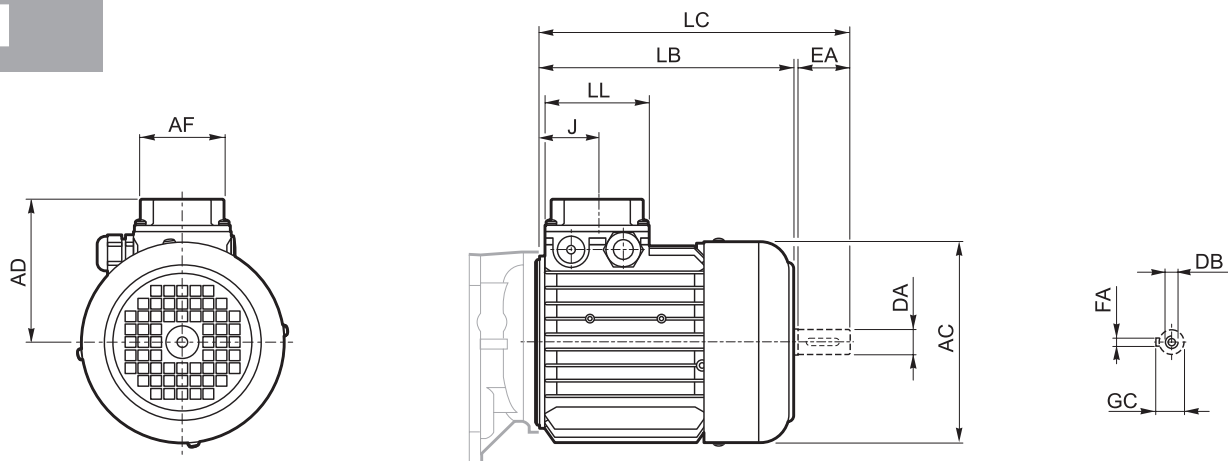
Die Abmessungen des Klemmkastens der Motoren BN ... BA AD, AF, LL und V in Bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

REMARQUE :

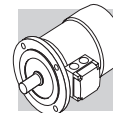
Les dimensions AD, AF, LL et V relatives à la boîte à borne des moteurs BN...BA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN...FD de la même taille.



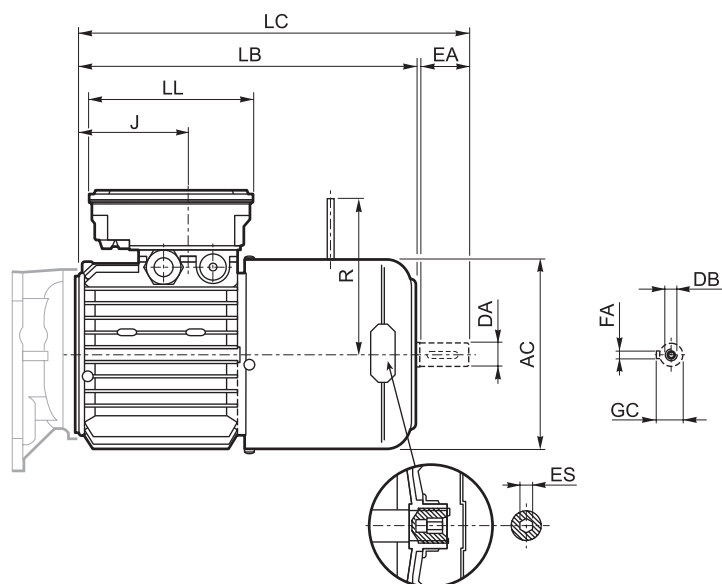
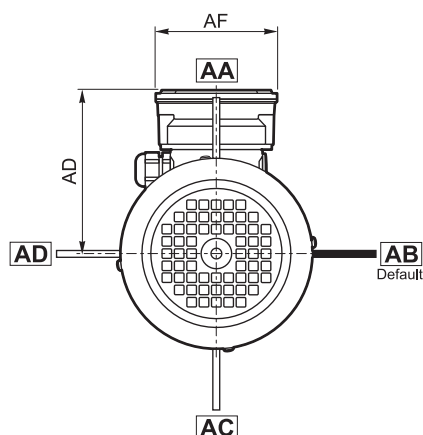
M



	Seconda estremità albero / Rear shaft end Zweite Wellenende / Deuxième extrémité de l'arbre					Motore / Motor / Motor / Moteur						
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD
M 0	9	20	M3	3	10.2	110	133	155	74	80	42	91
M 05	11	23	M4	4	12.5	121	165	191			48	95
M 1	14	30	M5	5	16	138	187	219			45	108
M 2 S	19	40	M6	6	21.5	156	202	245			44	119
M 3 S	28	60	M10	8	31	195	230	293	98	98	53.5	142
M 3 L							262	325				
M 4	38	80	M12	10	41	258	361	444	118	118	64.5	193
M 4 LC							396	479				
M 5 S						310	418	502	187	187	77	245
M 5 L							462	546				



M_FD



	Seconda estremità albero / Rear shaft end Zweite Wellenende / Deuxième extrémité de l'arbre					Motore / Motor / Motor / Moteur								
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD	R	ES
M 05	11	23	M4	4	12.5	121	231	256	98	133	48	119	96	5
M 1	14	30	M5	5	16	138	248	280			73	132	103	
M 2 S	19	40	M6	6	21.5	156	272	314			88	143	129	
M 3 S	28	60	M10	8	31	195	326	389	110	165	124.5	155	160	6
M 3 L							353	416			124.5	155	160	
M 4	38	80	M12	10	41	258	470	553	140	188	185.5	210	204 (1)	
M 4 LC							495	578			64.5		226	
M 5 S						310	558	642	187	187	77	245	266	—
M 5 L							602	686					266	

N.B.:

1) Per freno FD07 quota R=226.

NOTE:

1) For FD07 brake value R=226.

HINWEIS:

1) Für Bremse FD07, Maß R=226.

REMARQUE :

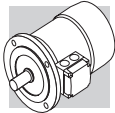
1) Pour frein FD07 valeur R=226.

L'esagono ES non è presente con l'opzione PS.

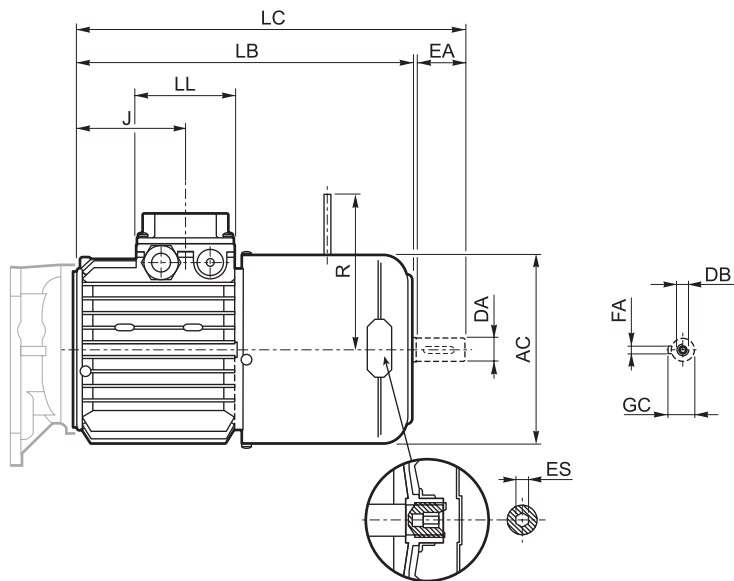
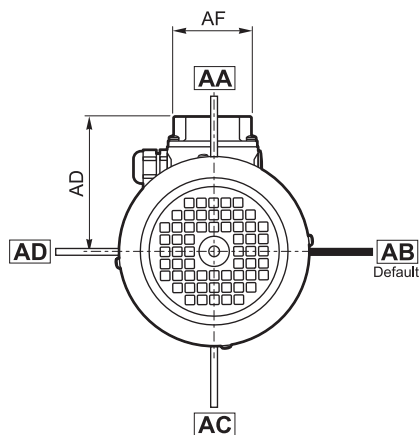
ES hexagon is not supplied with PS option.

Der Sechskant ES ist bei der Option PS nicht vorhanden.

L'hexagone ES n'est pas disponible avec l'option PS.



M_FA



	Seconda estremità albero / Rear shaft end Zweite Wellenende / Deuxième extrémité de l'arbre					Motore / Motor / Motor / Moteur									
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD	R	ES	
M 05	11	23	M4	4	12.5	121	231	256	74	80	48	95	116	5	
M 1	14	30	M5	5	16	138	248	280			73	108	124		
M 2 S	19	40	M6	6	21.5	156	272	314			88	119	134		
M 3 S	28	60	M10	8	31	195	326	389	98	98	124.5	142	160	6	
M 3 L							353	416							
M 4	38	80	M14	10	41	258	470	553	118	118	185.5	193	200 (1)		
M 4 LC							495	578			64.5		217		
M 5 S			M12			310	558	642	187	187	77	245	247		—
M 5 L							602	686							

N.B.:

1) Per freno FD07 quota R=226.

L'esagono ES non è presente con l'opzione PS.

NOTE:

1) For FD07 brake value R=226.

ES hexagon is not supplied with PS option.

HINWEIS:

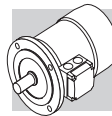
1) Für Bremse FD07, Maß R=226.

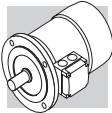
Der Sechskant ES ist bei der Option PS nicht vorhanden.

REMARQUE :

1) Pour frein FD07 valeur R=226.

L'hexagone ES n'est pas disponible avec l'option PS.





R9				
	Descrizione	Description	Beschreibung	Description
396 ... 462	Aggiornato sezione "Motori elettrici".	"Electric motors" section updated.	Abschnitt "Elektromotoren" aktualisiert.	Mise à jour de la section «Moteurs électriques».

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