

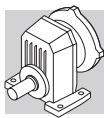
C-A-F-S Series

IE2-IE3

Helical gear units C
Helical bevel gear units A
Shaft mounted gear units F
Single stage gearboxes S



PRODUCTS &
SOLUTIONS



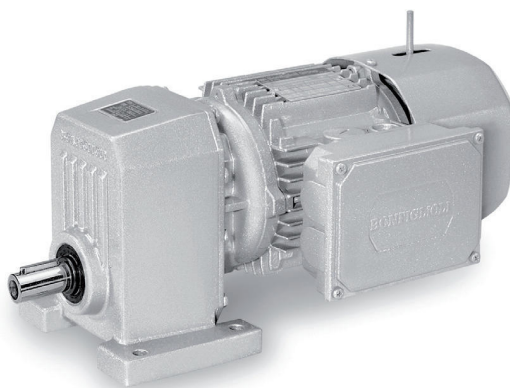
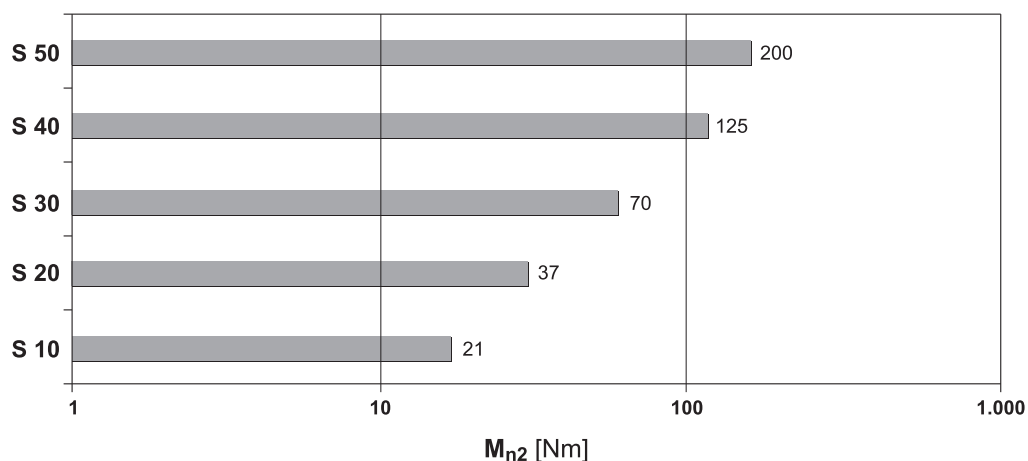
SINGLE STAGE GEARBOXES SERIES S

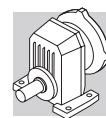
68 DESIGN FEATURES

The main design characteristics are:

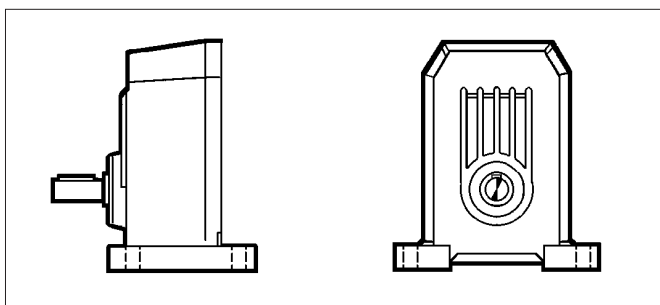
- modularity
- space effective
- high efficiency
- quiet operation
- gears in hardened and case-hardened steel
- bare aluminium housing for sizes 10, 20, 30, unpainted
high strength painted cast-iron housings for larger frame sizes
- input and output shafts from high grade steel.

(E 60)





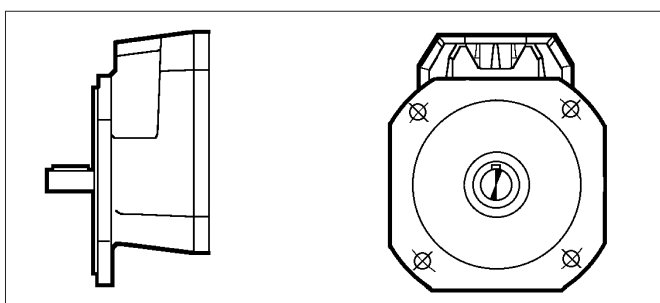
69 VERSIONS



P

Foot mount

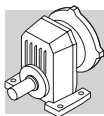
S 10 ... S 50



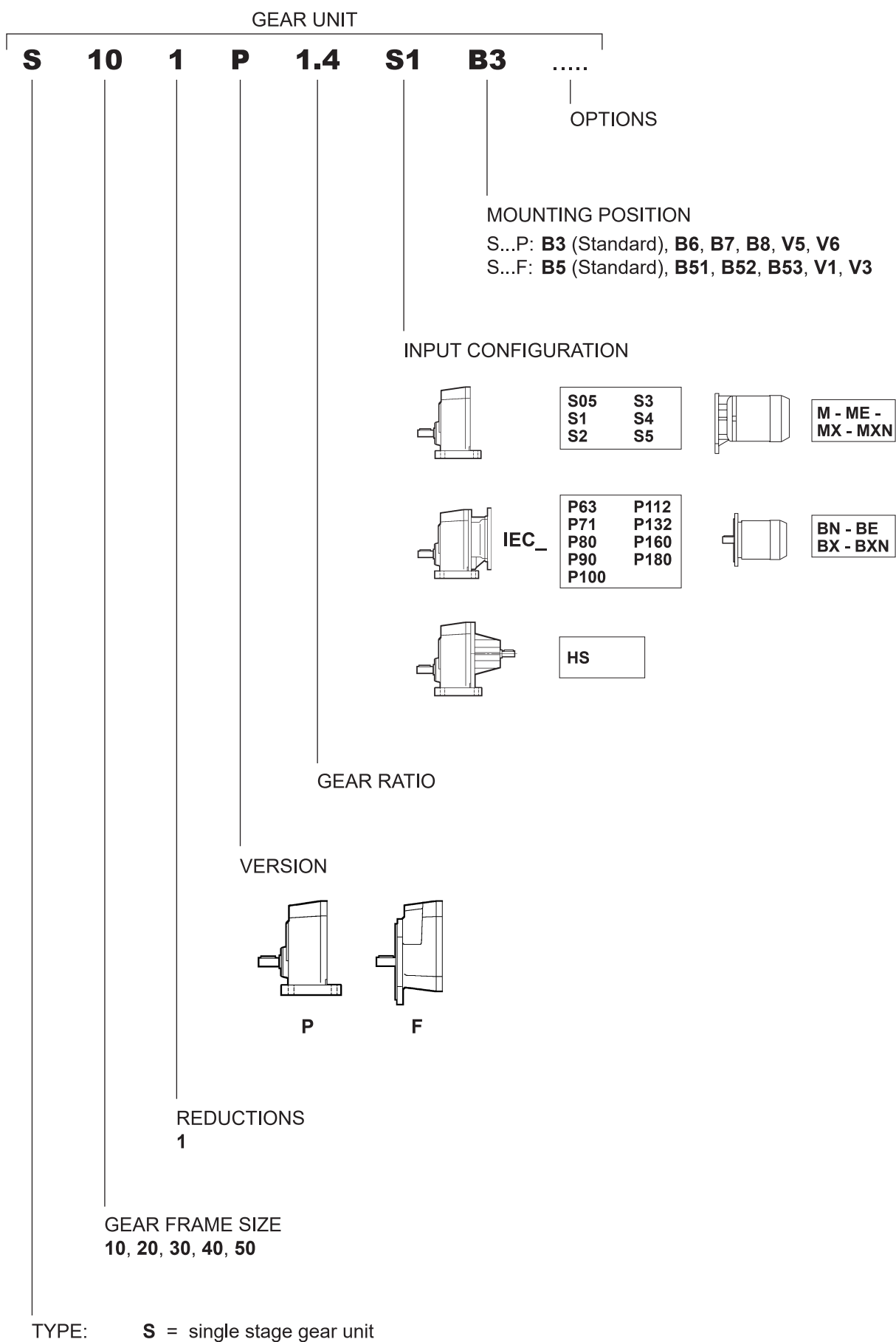
F

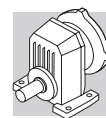
Flange mount

S 10 ... S 50

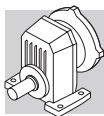


70 DESIGNATION





MOTOR					BRAKE				
M	1LA 4	230/400-50	IP54	CLF	W	FD	7.5	R SB 220 SA
									OPTIONS
									BRAKE SUPPLY
									RECTIFIER TYPE AC/DC NB, SB, NBR, SBR
									BRAKE HAND RELEASE R, RM
									BRAKE TORQUE
									BRAKE TYPE FD (d.c. brake) FA (a.c. brake)
									TERMINAL BOX POSITION W (default), N, E, S
									MOTOR MOUNTING — (compact motor) B5 (IEC - motor)
									INSULATION CLASS CL F standard CL H option
									DEGREE OF PROTECTION IP55 standard (IP54 - brake motor)
									VOLTAGE - FREQUENCY For BXN/MXN see the "Voltage & frequency" section on EVOX catalogue
									POLE NUMBER 2, 4, 6, 2/4, 2/6, 2/8, 2/12, 4/6, 4/8
									MOTOR SIZE 0B ... 5LA (compact motor) 63A ... 180L (IEC motor)
MOTOR TYPE									
MX - MXN = compact 3-phase, class IE3					ME = compact 3-phase, class IE2			M = compact 3-phase, class IE1	
BX - BXN = IEC 3-phase, class IE3					BE = IEC 3-phase, class IE2			BN = IEC 3-phase, class IE1	





70,1 Gearbox options

LUBRICATION

Gearboxes S10, S20, S30, and S40, are usually factory filled with oil in the standard version.
Gearbox S50, is usually supplied unlubricated in the standard version.

However, for all sizes of gearbox factory filled with oil, it is possible to request the supply with more types of oil, selectable according to what is defined in the following table.

LUBRIFICATION	Type	Designation	Producer
LU	PolyAlfaOlefine (PAO)	OMALA S4 GX 150	
LY	PolyAlfaOlefine (PAO)	OMALA S4 GX 220	
LV	PolyAlfaOlefine (PAO)	OMALA S4 GX 320	
LW	PolyAlfaOlefine (PAO)	OMALA S4 GX 460	
LH	PolyGlicole (PAG)	OMALA S4 WE 150	
LS	PolyGlicole (PAG)	OMALA S4 WE 220	
LO*	PolyGlicole (PAG)	OMALA S4 WE 320	
LK	PolyGlicole (PAG)	OMALA S4 WE 460	
LN ^[1]	Mineral Base EP	OMALA S2 G 150	
LZ ^[1]	Mineral Base EP	OMALA S2 G 220	
LI ^[1]	Mineral Base EP	OMALA S2 G 320	
LJ ^[1]	Mineral Base EP	OMALA S2 G 460	
LA	Food grade	KLUBERSYNTH UH1 6-150	
LB	Food grade	KLUBERSYNTH UH1 6-220	
LC	Food grade	KLUBERSYNTH UH1 6-320	
LD	Food grade	KLUBERSYNTH UH1 6-460	

* unless otherwise specified, the gearboxes S10, S20, S30 and S40 supplied with lubricant use OMALA S4 WE 320 oil.

[1] The use of mineral oil is permitted on gearmotors with service factor $f_s \geq 1.30$

SO

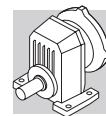
Gear units S10, S20, S30, S40, usually factory filled with oil, to be supplied unlubricated.

DV

Dual oil seals on input shaft. (Available only for compact gearmotors).

VV

Fluoro elastomer oil seal on input shaft.



PV

All oil seals in Fluoro elastomer.

BP

Gearboxes, usually supplied with open breather plug, are supplied with a valve breather plug. The calibration of the valve can vary from 0,10 to 0,15 bar depending on the plug type. The valve opens at intervals and allows venting of internal pressure keeping out foreign bodies.

For option availability see chapter "Mounting positions and service plugs" of the Installation, Operation and Maintenance Manual (available at: www.bonfiglioli.com).

If needed contact Bonfiglioli Technical Service.

SURFACE PROTECTION

When no specific protection class is requested, the painted (ferrous) surfaces of gearboxes are protected to at least corrosivity class C2 (UNI EN ISO 12944-2). For improved resistance to atmospheric corrosion, gearboxes can be delivered with **C3** and **C4** surface protection, obtained by painting the complete gearbox.

(E 61)

SURFACE PROTECTION	Typical environments	Maximum surface temperature	Corrosivity class according to UNI EN ISO 12944-2
C3	Urban and industrial environments with up to 100% relative humidity (medium air pollution)	120°C	C3
C4	Industrial areas, coastal areas, chemical plant, with up to 100% relative humidity (high air pollution)	120°C	C4

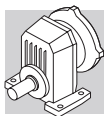
Gearboxes with optional protection to class **C3** or **C4** are available in a choice of colours.

If no specific colour is requested (see the "PAINTING" option) gearboxes are finished in RAL 7042.

Gearboxes can also be supplied with surface protection for corrosivity class **C5** according to UNI EN ISO 12944-2. Contact our Technical Service for further details.

PAINTING

Gearboxes with optional protection to class C3 or C4 are available in the colours listed in the following table.



(E 62)

PAINTING	Colour	RAL number
RAL7042*	Traffik Grey A	7042
RAL5010	Gentian Blue	5010
RAL9005	Jet Black	9005
RAL9006	White Aluminium	9006
RAL9010	Pure White	9010
RAL7035	Light Grey	7035
RAL7001	Silver Grey	7001
RAL5015	Sky Blue	5015
RAL7037	Dusty Grey	7037
RAL5024	Pastel Blue	5024

* Gearboxes are supplied in this standard colour if no other colour is specified.

NOTE – “PAINTING” options can only be specified in conjunction with “SURFACE PROTECTION” options.

CERTIFICATES

AC - Certificate of compliance

The document certifies the compliance of the product with the purchase order and the construction in conformity with the applicable procedures of the Bonfiglioli Quality System.

CC - Inspection certificate

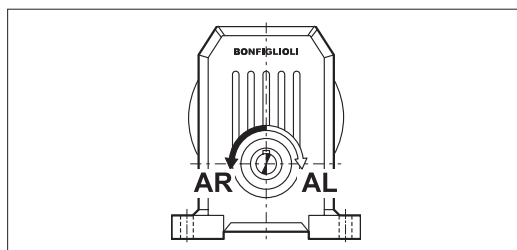
The document entails checking on order compliance, the visual inspection of external conditions and of mating dimensions. Checking on main functional parameters in unloaded conditions is also performed along with oil seal proofing, both in static and in running conditions. Units inspected are sampled within the shipping batch and marked individually.

70,2 Motor options

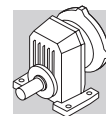
AL, AR

A backstop device on the motor itself, as described in the electric motors section of this catalogue, is available for gearmotors with integral M, ME or MX Series motors. The following table shows the direction of free rotation of the gearbox, on the basis of which the correct option must be selected.

(E 63)



For further information on options, consult the electric motors section.



71 MOUNTING POSITION AND TERMINAL BOX ANGULAR LOCATION

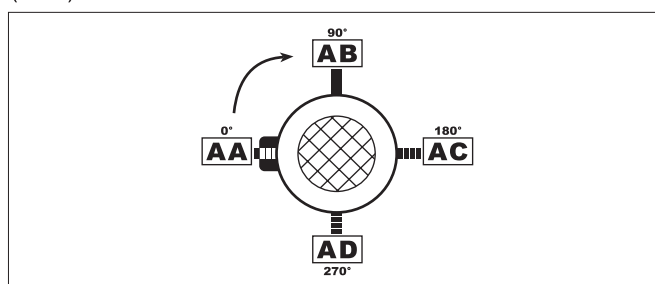
Location of motor terminal box can be specified by viewing the motor from the fan side; standard location is shown in black (W).

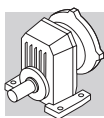
Angular position of the brake release lever.

Unless otherwise specified, brake motors have the manual device side located, 90° apart from terminal box.

Different angles can be specified through the relevant options available.

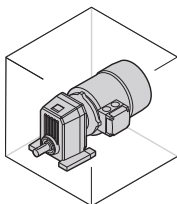
(E 64)



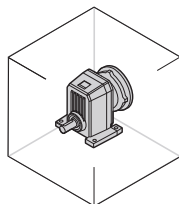


S ... P

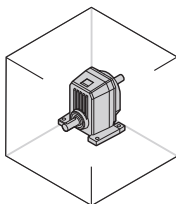
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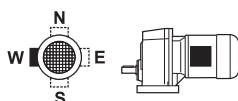
_S



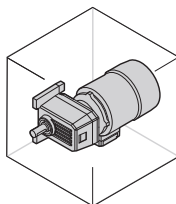
_P(IEC)



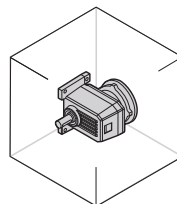
_HS



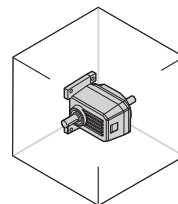
B6



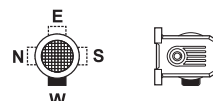
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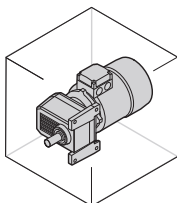
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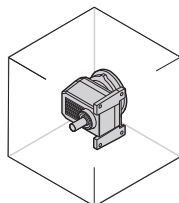
_HS



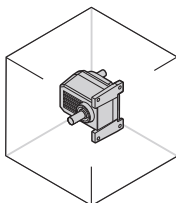
B7



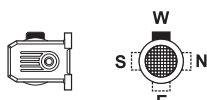
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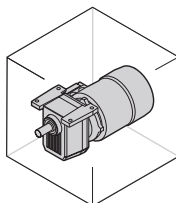
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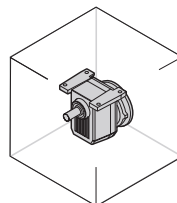
_HS



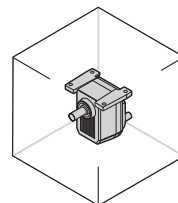
B8



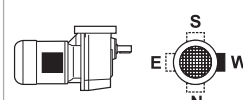
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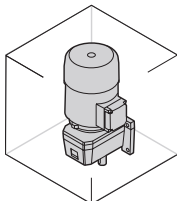
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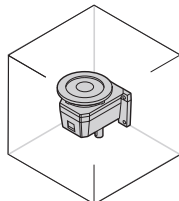
_HS



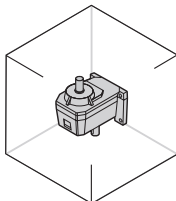
V5



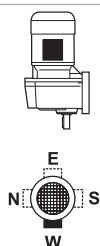
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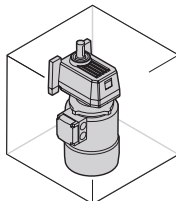
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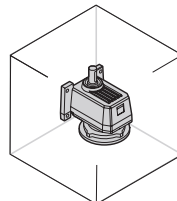
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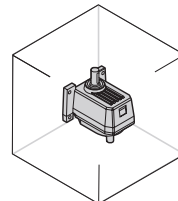
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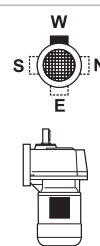
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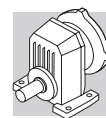
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_HS

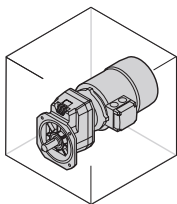


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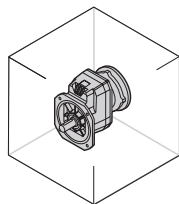


S ... F

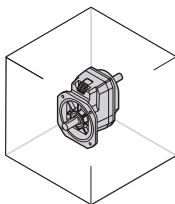
B5



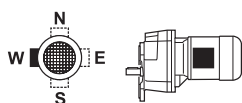
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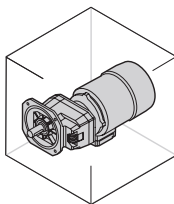
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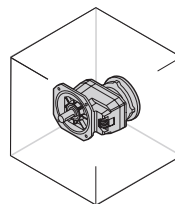
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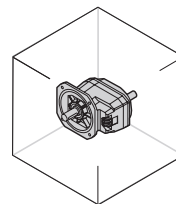
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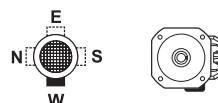
_S



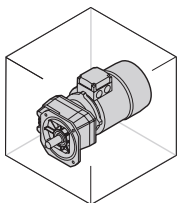
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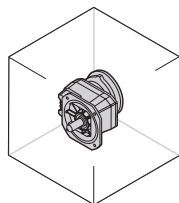
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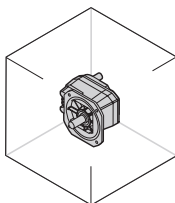
B53



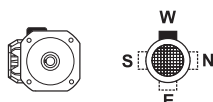
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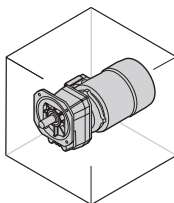
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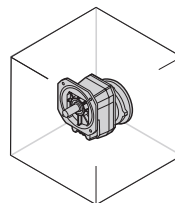
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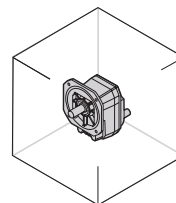
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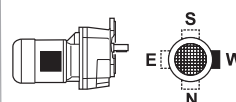
_S



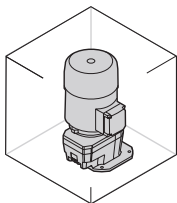
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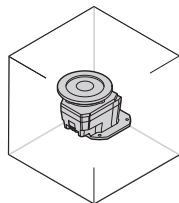
_HS



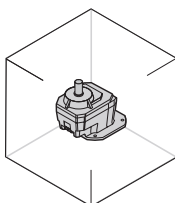
V1



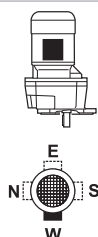
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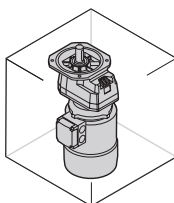
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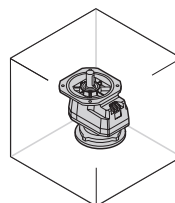
_HS



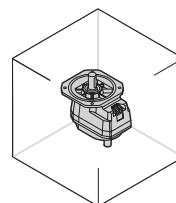
V3



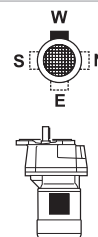
_S



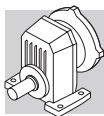
_P(IEC)



_HS



W = Default



72 OVERHUNG LOADS

External transmissions keyed onto input and/or output shaft generate loads that act radially onto same shaft.

Resulting shaft loading must be compatible with both the bearing and the shaft capacity. Namely shaft loading (R_{c1} for input shaft, R_{c2} for output shaft), must be equal or lower than admissible overhung load capacity for shaft under study (R_{n1} for input shaft, R_{n2} for output shaft). OHL capability listed in the rating chart section.

In the formulas given below, index (1) applies to parameters relating to input shaft, whereas index (2) refers to output shaft.

The load generated by an external transmission can be calculated with close approximation by the following equations:

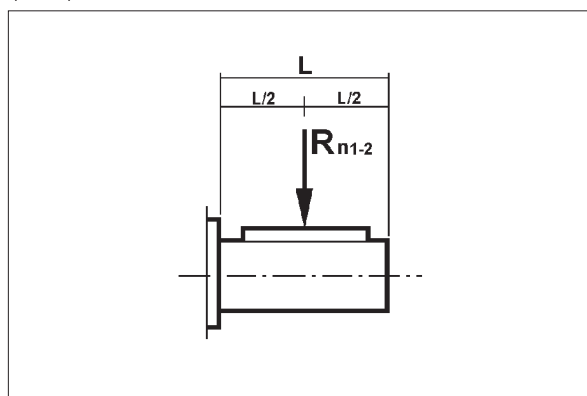
$$R_{c1} [N] = \frac{2000 \cdot M_1 [Nm] \cdot K_r}{d [mm]} ; R_{c2} [N] = \frac{2000 \cdot M_2 [Nm] \cdot K_r}{d [mm]} \quad (44)$$

(E 65)

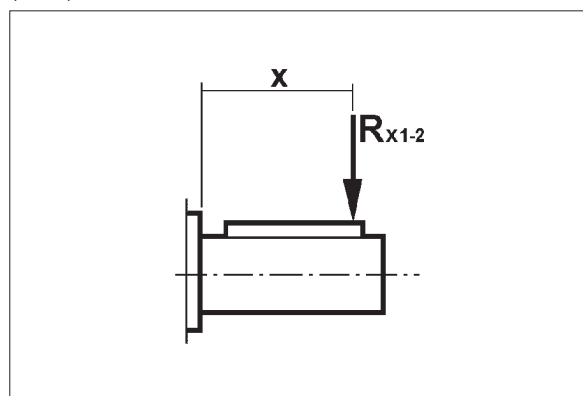
M₁ [Nm]	Torque applied to input shaft	K_r = 1,25	Gear transmission
M₂ [Nm]	Torque drawn at output shaft	K_r = 1,5	V-belt transmission
d [mm]	Pitch diameter of element keyed onto shaft	K_r = 2,0	Flat belt transmission
K_r = 1	Chain transmission		

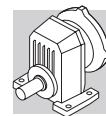
Verification of OHL capability varies depending on whether load applies at midpoint of shaft or it is shifted further out:

(E 66)



(E 67)





a) Load applied at midpoint of shaft, tab. (E66)

A comparison of shaft loading with catalogue OHL ratings should verify the following condition:

$$R_{c1} \leq R_{n1} \quad [\text{input shaft}]$$

or

$$R_{c2} \leq R_{n2} \quad [\text{output shaft}]$$

b) Load off the midpoint tab. (E67)

When load is shifted at an “x” distance from shaft shoulder, permissible load must be calculated for that distance.

Revised permissible overhung loads R_{x1} (input) and R_{x2} (output) are calculated respectively from original rated values R_{n1} and R_{n2} through factor:

$$\frac{a}{b+x} \quad (45)$$

(E 68)

	Load location factors					
	Output shaft			Input shaft		
	a	b	c	a	b	c
S 10 1	61	46	200	21	1	300
S 20 1	73.5	53.5	270	40	20	350
S 30 1	91.5	66.5	380	38.5	18.5	350
S 40 1	126.5	96.5	600	49.5	24.5	450
S 50 1	153.5	113.5	680	49.5	24.5	450

Verification procedure is described here after.

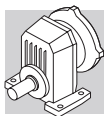
INPUT SHAFT

1. Calculate:

$$R_{x1} = R_{n1} \cdot \frac{a}{b+x} \quad (46)$$

N.B. Subject to condition:

$$\frac{L}{2} \leq x \leq c \quad (47)$$



Finally, the following condition must be verified:

$$R_{c1} \leq R_{x1} \quad (48)$$

OUTPUT SHAFT

1. Calculate:

$$R_{x2} = R_{n2} \cdot \frac{a}{b + x} \quad (49)$$

N.B. Subject to condition:

$$\frac{L}{2} \leq x \leq c \quad (50)$$

Finally, the following condition must be verified:

$$R_{c2} \leq R_{x2} \quad (51)$$

73 THRUST LOADS, A_{n1} , A_{n2}

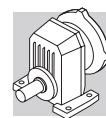
Permissible thrust loads on input [A_{n1}] and output [A_{n2}] shafts are obtained from the radial loading for the shaft under consideration [R_{n1}] and [R_{n2}] through the following equation:

$$\begin{aligned} A_{n1} &= R_{n1} \cdot 0.2 \\ A_{n2} &= R_{n2} \cdot 0.2 \end{aligned} \quad (52)$$


The thrust loads calculated through these formulas apply to thrust forces occurring at the same time as rated radial loads.

In the only case that no overhung load acts on the shaft the value of the admissible thrust load [A_n] amounts to 50% of rated OHL [R_n] on same shaft.



Where thrust loads exceed permissible value or largely prevail over radial loads, contact Bonfiglioli Riduttori for an in-depth analysis of the application.







74 GEARMOTOR RATING CHARTS

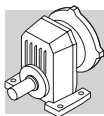
 The selection of motors takes into account the requirements of Regulation 2009/125/CE (see section M of this catalogue). When the motor rated power is below 0,12kW, **BN/M** motors can be provided. Starting from 1st July 2021 the regulation 2009/125/CE will apply also to motors equipped with brake, and 8 poles motors.

0.09 kW



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE1	 IE1
69	12.1	2.9	13.1	2400		S301_13.1 P63 BN63A6 555
73	11.5	1.7	12.4	1500	S201_12.4 S05 M05A6 552	S201_12.4 P63 BN63A6 553
74	11.4	1.1	12.3	1160	S101_12.3 S05 M05A6 550	S101_12.3 P63 BN63A6 551
85	10.0	2.0	10.8	1500	S201_10.8 S05 M05A6 552	S201_10.8 P63 BN63A6 553
88	9.5	1.3	10.3	1100	S101_10.3 S05 M05A6 550	S101_10.3 P63 BN63A6 551
103	8.2	1.5	8.9	1060	S101_8.9 S05 M05A6 550	S101_8.9 P63 BN63A6 551
107	7.9	2.5	8.5	1500	S201_8.5 S05 M05A6 552	S201_8.5 P63 BN63A6 553
132	6.4	2.7	6.9	990	S101_6.9 S05 M05A6 550	S101_6.9 P63 BN63A6 551
149	5.7	3.0	6.1	960	S101_6.1 S05 M05A6 550	S101_6.1 P63 BN63A6 551
193	4.4	3.2	4.7	890	S101_4.7 S05 M05A6 550	S101_4.7 P63 BN63A6 551
237	3.6	3.9	3.8	830	S101_3.8 S05 M05A6 550	S101_3.8 P63 BN63A6 551
284	3.0	4.7	3.2	790	S101_3.2 S05 M05A6 550	S101_3.2 P63 BN63A6 551
364	2.3	5.2	2.5	730	S101_2.5 S05 M05A6 550	S101_2.5 P63 BN63A6 551
485	1.7	6.9	1.9	670	S101_1.9 S05 M05A6 550	S101_1.9 P63 BN63A6 551
640	1.3	9.1	1.4	610	S101_1.4 S05 M05A6 550	S101_1.4 P63 BN63A6 551

0.12 kW




n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE1	 IE2	 IE1	 IE2
69	16.2	2.2	13.1	2400			S301_13.1 P63 BN63A4 555	S301_13.1 P63 BE63A4 555
73	15.3	1.3	12.4	1500	S201_12.4 S05 M05B6 552		S201_12.4 P63 BN63B6 552	S201_12.4 P63 BE63A4 553
85	13.3	1.5	10.8	1500	S201_10.8 S05 M05B6 552		S201_10.8 P63 BN63B6 552	S201_10.8 P63 BE63A4 553
88	12.7	2.8	10.3	2400			S301_10.3 P63 BN63B6 555	S301_10.3 P63 BE63A4 555
88	12.7	0.9	10.3	1060	S101_10.3 S05 M05B6 550		S101_10.3 P63 BN63B6 550	S101_10.3 P63 BE63A4 551
102	11.0	3.2	8.9	2400			S301_8.9 P63 BN63B6 555	S301_8.9 P63 BE63A4 555
103	11.0	1.1	8.9	1030	S101_8.9 S05 M05B6 550		S101_8.9 P63 BN63B6 550	S101_8.9 P63 BE63A4 551
107	10.5	2.8	13.1	2400			S301_13.1 P63 BN63B6 555	S301_13.1 P63 BE63A4 555
107	10.5	1.9	8.5	1500	S201_8.5 S05 M05B6 552		S201_8.5 P63 BN63B6 552	S201_8.5 P63 BE63A4 553
113	10.0	1.7	12.4	1500	S201_12.4 S05 M05A4 552	S201_12.4 S05 ME05A4 552	S201_12.4 P63 BN63A4 552	S201_12.4 P63 BE63A4 553
114	9.9	1.0	12.3	1000	S101_12.3 S05 M05A4 550	S101_12.3 S05 ME05A4 550	S101_12.3 P63 BN63A4 550	S101_12.3 P63 BE63A4 551
126	8.9	3.4	7.2	1500	S201_7.2 S05 M05B6 552		S201_7.2 P63 BN63B6 552	S201_7.2 P63 BE63A4 553
130	8.6	2.0	10.8	1500	S201_10.8 S05 M05A4 552	S201_10.8 S05 ME05A4 552	S201_10.8 P63 BN63A4 552	S201_10.8 P63 BE63A4 553
132	8.5	2.0	6.9	960	S101_6.9 S05 M05B6 550		S101_6.9 P63 BN63B6 550	S101_6.9 P63 BE63A4 551
136	8.3	1.2	10.3	960	S101_10.3 S05 M05A4 550	S101_10.3 S05 ME05A4 550	S101_10.3 P63 BN63A4 550	S101_10.3 P63 BE63A4 551
149	7.5	2.3	6.1	940	S101_6.1 S05 M05B6 550		S101_6.1 P63 BN63B6 550	S101_6.1 P63 BE63A4 551

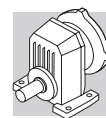


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



n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	 IE1 IE2			 IE1 IE2		
158	7.1	1.4	8.9	920	S101_8.9 S05 M05A4	S101_8.9 S05 ME05A4	550	S101_8.9 P63 BN63A4	S101_8.9 P63 BE63A4	551
165	6.8	2.5	8.5	1500	S201_8.5 S05 M05A4	S201_8.5 S05 ME05A4	552	S201_8.5 P63 BN63A4	S201_8.5 P63 BE63A4	553
193	5.8	2.4	4.7	870	S101_4.7 S05 M05B6		550	S101_4.7 P63 BN63B6		551
203	5.5	2.7	6.9	860	S101_6.9 S05 M05A4	S101_6.9 S05 ME05A4	550	S101_6.9 P63 BN63A4	S101_6.9 P63 BE63A4	551
229	4.9	3.1	6.1	830	S101_6.1 S05 M05A4	S101_6.1 S05 ME05A4	550	S101_6.1 P63 BN63A4	S101_6.1 P63 BE63A4	551
237	4.7	2.9	3.8	820	S101_3.8 S05 M05B6		550	S101_3.8 P63 BN63B6		551
284	3.9	3.5	3.2	780	S101_3.2 S05 M05B6		550	S101_3.2 P63 BN63B6		551
296	3.8	3.2	4.7	770	S101_4.7 S05 M05A4	S101_4.7 S05 ME05A4	550	S101_4.7 P63 BN63A4	S101_4.7 P63 BE63A4	551
364	3.1	3.9	3.8	720	S101_3.8 S05 M05A4	S101_3.8 S05 ME05A4	550	S101_3.8 P63 BN63A4	S101_3.8 P63 BE63A4	551
364	3.1	3.9	2.5	720	S101_2.5 S05 M05B6		550	S101_2.5 P63 BN63B6		551
438	2.6	4.7	3.2	680	S101_3.2 S05 M05A4	S101_3.2 S05 ME05A4	550	S101_3.2 P63 BN63A4	S101_3.2 P63 BE63A4	551
485	2.3	5.2	1.9	660	S101_1.9 S05 M05B6		550	S101_1.9 P63 BN63B6		551
560	2.0	5.0	2.5	630	S101_2.5 S05 M05A4	S101_2.5 S05 ME05A4	550	S101_2.5 P63 BN63A4	S101_2.5 P63 BE63A4	551
640	1.8	6.8	1.4	600	S101_1.4 S05 M05B6		550	S101_1.4 P63 BN63B6		551
747	1.5	6.6	1.9	580	S101_1.9 S05 M05A4	S101_1.9 S05 ME05A4	550	S101_1.9 P63 BN63A4	S101_1.9 P63 BE63A4	551
985	1.1	8.8	1.4	530	S101_1.4 S05 M05A4	S101_1.4 S05 ME05A4	550	S101_1.4 P63 BN63A4	S101_1.4 P63 BE63A4	551

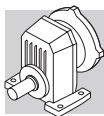
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n2 min-1	M2 Nm	S	i	Rn2 N	 IE3	 IE3		
69	16.2	2.2	13.1	2400		S301_13.1 P63 BXN63MA4	555	
73	15.3	1.3	12.4	1500				
85	13.3	1.5	10.8	1500				
88	12.7	2.8	10.3	2400				
88	12.7	0.9	10.3	1060				
102	11.0	3.2	8.9	2400				
103	11.0	1.1	8.9	1030				
107	10.5	2.8	13.1	2400				
107	10.5	1.9	8.5	1500				
113	10.0	1.7	12.4	1500				
					S201_12.4 S05 MXN05A4	552	S201_12.4 P63 BXN63MA4	553
114	9.9	1.0	12.3	1000	S101_12.3 S05 MXN05A4	550	S101_12.3 P63 BXN63MA4	551
126	8.9	3.4	7.2	1500	S201_10.8 S05 MXN05A4	552	S201_10.8 P63 BXN63MA4	553
130	8.6	2.0	10.8	1500				
132	8.5	2.0	6.9	960				
136	8.3	1.2	10.3	960				
				S101_10.3 S05 MXN05A4				
149	7.5	2.3	6.1	940		550	S101_8.9 P63 BXN63MA4	551
158	7.1	1.4	8.9	920				
165	6.8	2.5	8.5	1500				
193	5.8	2.4	4.7	870				
203	5.5	2.7	6.9	860				
				S101_6.9 S05 MXN05A4	550	S101_6.9 P63 BXN63MA4	551	
229	4.9	3.1	6.1	830	S101_6.1 S05 MXN05A4	550	S101_6.1 P63 BXN63MA4	551
237	4.7	2.9	3.8	820		550	S101_4.7 P63 BXN63MA4	551
284	3.9	3.5	3.2	780				
296	3.8	3.2	4.7	770				
364	3.1	3.9	3.8	720				
				S101_3.8 S05 MXN05A4				
364	3.1	3.9	2.5	720	S101_3.2 S05 MXN05A4	550	S101_3.2 P63 BXN63MA4	551
438	2.6	4.7	3.2	680				
485	2.3	5.2	1.9	660				
560	2.0	5.0	2.5	630				
640	1.8	6.8	1.4	600				
				S101_2.5 S05 MXN05A4	550	S101_2.5 P63 BXN63MA4	551	
747	1.5	6.6	1.9	580	S101_1.9 S05 MXN05A4	550	S101_1.9 P63 BXN63MA4	551
985	1.1	8.8	1.4	530	S101_1.4 S05 MXN05A4	550	S101_1.4 P63 BXN63MA4	551






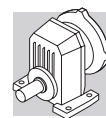
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n2 min-1	M2 Nm	S	i	Rn2 N						
					IE1	IE2		IE1	IE2	
69	24.6	1.4	13.1	2400	S401_12.4 S1 M1SC6		556	S301_13.1 P71 BN71A6		555
73	23.2	2.5	12.4	3800				S401_12.4 P71 BN71A6		557
84	20.1	1.0	10.8	1500				S201_10.8 P71 BN71A6		553
84	20.0	2.9	10.7	3800				S401_10.7 P71 BN71A6		557
87	19.3	1.8	10.3	2400	S301_10.3 S1 M1SC6		554	S301_10.3 P71 BN71A6		555
101	16.6	2.1	8.9	2400	S301_8.9 S1 M1SC6	S201_12.4 S05 ME05B4	554	S301_8.9 P71 BN71A6	S301_13.1 P63 BE63B4 S201_12.4 P63 BE63B4 S401_12.4 P63 BE63B4	555
106	15.9	1.3	8.5	1500	S201_8.5 S1 M1SC6		552	S201_8.5 P71 BN71A6		553
106	15.9	1.9	13.1	2400				S301_13.1 P63 BN63B4		555
112	15.1	1.1	12.4	1500	S201_12.4 S05 M05B4		552	S201_12.4 P63 BN63B4		553
112	15.0	3.3	12.4	3800				S401_12.4 P63 BN63B4		557
125	13.5	2.2	7.2	1500	S201_7.2 S1 M1SC6	S201_10.8 S05 ME05B4	552	S201_7.2 P71 BN71A6	S201_10.8 P63 BE63B4 S301_10.3 P63 BE63B4	553
129	13.0	1.3	10.8	1500	S201_10.8 S05 M05B4		552	S201_10.8 P63 BN63B4		553
130	12.9	1.3	6.9	910	S101_6.9 S1 M1SC6		550	S101_6.9 P71 BN71A6		551
135	12.5	2.4	10.3	2330				S301_10.3 P63 BN63B4		555
147	11.4	1.5	6.1	890	S101_6.1 S1 M1SC6		550	S101_6.1 P71 BN71A6		551
155	10.9	2.8	5.8	1500	S201_5.8 S1 M1SC6	S101_8.9 S05 ME05B4 S201_8.5 S05 ME05B4	552	S201_5.8 P71 BN71A6	S301_8.9 P63 BE63B4 S101_8.9 P63 BE63B4 S201_8.5 P63 BE63B4	553
156	10.8	2.8	8.9	2230				S301_8.9 P63 BN63B4		555
157	10.8	0.9	8.9	880	S101_8.9 S05 M05B4		550	S101_8.9 P63 BN63B4		551
164	10.3	1.7	8.5	1500	S201_8.5 S05 M05B4		552	S201_8.5 P63 BN63B4		553
189	8.9	3.4	4.8	1500	S201_4.8 S1 M1SC6		552	S201_4.8 P71 BN71A6		553
190	8.8	1.6	4.7	830	S101_4.7 S1 M1SC6	S201_7.2 S05 ME05B4 S101_6.9 S05 ME05B4	550	S101_4.7 P71 BN71A6	S201_7.2 P63 BE63B4 S101_6.9 P63 BE63B4	551
192	8.8	3.0	7.2	1500	S201_7.2 S05 M05B4		552	S201_7.2 P63 BN63B4		553
201	8.4	1.8	6.9	820	S101_6.9 S05 M05B4		550	S101_6.9 P63 BN63B4		551
214	7.9	3.1	13.1	2020				S301_13.1 P63 BN63A2		555
226	7.5	1.7	12.4	1480	S201_12.4 S05 M05A2		552	S201_12.4 P63 BN63A2		553
227	7.4	2.0	6.1	800	S101_6.1 S05 M05B4	S101_6.1 S05 ME05B4	550	S101_6.1 P63 BN63B4	S101_6.1 P63 BE63B4	551
228	7.4	1.1	12.3	800	S101_12.3 S05 M05A2		550	S101_12.3 P63 BN63A2		551
234	7.2	1.9	3.8	790	S101_3.8 S1 M1SC6		550	S101_3.8 P71 BN71A6		551
261	6.4	2.0	10.8	1420	S201_10.8 S05 M05A2		552	S201_10.8 P63 BN63A2		553
273	6.2	1.3	10.3	760	S101_10.3 S05 M05A2		550	S101_10.3 P63 BN63A2		551
281	6.0	2.3	3.2	750	S101_3.2 S1 M1SC6	S101_4.7 S05 ME05B4	550	S101_3.2 P71 BN71A6	S101_4.7 P63 BE63B4	551
294	5.7	2.1	4.7	750	S101_4.7 S05 M05B4		550	S101_4.7 P63 BN63B4		551
317	5.3	1.5	8.9	730	S101_8.9 S05 M05A2		550	S101_8.9 P63 BN63A2		551
331	5.1	2.6	8.5	1320	S201_8.5 S05 M05A2		552	S201_8.5 P63 BN63A2		553
360	4.7	2.6	2.5	700	S101_2.5 S1 M1SC6		550	S101_2.5 P71 BN71A6		551
361	4.7	2.6	3.8	700	S101_3.8 S05 M05B4	S101_3.8 S05 ME05B4 S101_3.2 S05 ME05B4	550	S101_3.8 P63 BN63B4	S101_3.8 P63 BE63B4 S101_3.2 P63 BE63B4	551
407	4.1	2.9	6.9	680	S101_6.9 S05 M05A2		550	S101_6.9 P63 BN63A2		551
434	3.9	3.1	3.2	670	S101_3.2 S05 M05B4		550	S101_3.2 P63 BN63B4		551
460	3.7	3.3	6.1	660	S101_6.1 S05 M05A2		550			
480	3.5	3.4	1.9	640	S101_1.9 S1 M1SC6		550	S101_1.9 P71 BN71A6		551
556	3.0	3.3	2.5	620	S101_2.5 S05 M05B4	S101_2.5 S05 ME05B4	550	S101_2.5 P63 BN63B4	S101_2.5 P63 BE63B4	551
594	2.8	3.5	4.7	610	S101_4.7 S05 M05A2		550	S101_4.7 P63 BN63A2		551
633	2.7	4.5	1.4	590	S101_1.4 S1 M1SC6		550	S101_1.4 P71 BN71A6		551
731	2.3	4.3	3.8	570	S101_3.8 S05 M05A2		550	S101_3.8 P63 BN63A2		551
741	2.3	4.4	1.9	570	S101_1.9 S05 M05B4		550	S101_1.9 P63 BN63B4		551
878	1.9	5.2	3.2	540	S101_3.2 S05 M05A2	S101_1.4 S05 ME05B4	550	S101_3.2 P63 BN63A2	S101_1.4 P63 BE63B4	551
978	1.7	5.8	1.4	520	S101_1.4 S05 M05B4		550	S101_1.4 P63 BN63B4		551
1124	1.5	5.3	2.5	500	S101_2.5 S05 M05A2		550	S101_2.5 P63 BN63A2		551
1499	1.1	7.1	1.9	460	S101_1.9 S05 M05A2		550	S101_1.9 P63 BN63A2		551
1977	0.9	9.4	1.4	420	S101_1.4 S05 M05A2		550	S101_1.4 P63 BN63A2		551







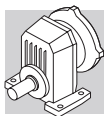
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n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IE3	
69	24.6	1.4	13.1	2400			
73	23.2	2.5	12.4	3800			
84	20.1	1.0	10.8	1500			
84	20.0	2.9	10.7	3800			
87	19.3	1.8	10.3	2400			
101	16.6	2.1	8.9	2400			
106	15.9	1.3	8.5	1500			
106	15.9	1.9	13.1	2400			
112	15.1	1.1	12.4	1500	S201_12.4 S05 MXN05B4	552	S301_13.1 P63 BXN63MB4 S201_12.4 P63 BXN63MB4 S401_12.4 P63 BXN63MB4
112	15.0	3.3	12.4	3800			555 553 557
125	13.5	2.2	7.2	1500			
129	13.0	1.3	10.8	1500	S201_10.8 S05 MXN05B4	552	S201_10.8 P63 BXN63MB4
130	12.9	1.3	6.9	910			
135	12.5	2.4	10.3	2330			S301_10.3 P63 BXN63MB4
147	11.4	1.5	6.1	890			555
155	10.9	2.8	5.8	1500			
156	10.8	2.8	8.9	2230			S301_8.9 P63 BXN63MB4
157	10.8	0.9	8.9	880	S101_8.9 S05 MXN05B4	550	S101_8.9 P63 BXN63MB4
164	10.3	1.7	8.5	1500	S201_8.5 S05 MXN05B4	552	S201_8.5 P63 BXN63MB4
189	8.9	3.4	4.8	1500			551 553
190	8.8	1.6	4.7	830			
192	8.8	3.0	7.2	1500	S201_7.2 S05 MXN05B4	552	S201_7.2 P63 BXN63MB4
201	8.4	1.8	6.9	820	S101_6.9 S05 MXN05B4	550	S101_6.9 P63 BXN63MB4
214	7.9	3.1	13.1	2020			551
226	7.5	1.7	12.4	1480			
227	7.4	2.0	6.1	800	S101_6.1 S05 MXN05B4	550	S101_6.1 P63 BXN63MB4
228	7.4	1.1	12.3	800			551
234	7.2	1.9	3.8	790			
261	6.4	2.0	10.8	1420			
273	6.2	1.3	10.3	760			
281	6.0	2.3	3.2	750			
294	5.7	2.1	4.7	750	S101_4.7 S05 MXN05B4	550	S101_4.7 P63 BXN63MB4
317	5.3	1.5	8.9	730			551
331	5.1	2.6	8.5	1320			
360	4.7	2.6	2.5	700			
361	4.7	2.6	3.8	700	S101_3.8 S05 MXN05B4	550	S101_3.8 P63 BXN63MB4
407	4.1	2.9	6.9	680			551
434	3.9	3.1	3.2	670	S101_3.2 S05 MXN05B4	550	S101_3.2 P63 BXN63MB4
460	3.7	3.3	6.1	660			
480	3.5	3.4	1.9	640			
556	3.0	3.3	2.5	620	S101_2.5 S05 MXN05B4	550	S101_2.5 P63 BXN63MB4
594	2.8	3.5	4.7	610			551
633	2.7	4.5	1.4	590			
731	2.3	4.3	3.8	570			
741	2.3	4.4	1.9	570	S101_1.9 S05 MXN05B4	550	S101_1.9 P63 BXN63MB4
878	1.9	5.2	3.2	540			
978	1.7	5.8	1.4	520	S101_1.4 S05 MXN05B4	550	S101_1.4 P63 BXN63MB4
1124	1.5	5.3	2.5	500			551
1499	1.1	7.1	1.9	460			
1977	0.9	9.4	1.4	420			S101_1.4 P63 BN63A2
							551



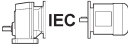



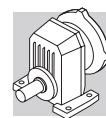
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n ₂ min-1	M ₂ Nm	S	i	R _{n2} N						
					IE1	IE2		IE1	IE2	
69	34.1	1.0	13.1	2400	S501_12.9 S1 M1SD6 S401_12.4 S1 M1SD6 S401_10.7 S1 M1SD6 S301_10.3 S1 M1SD6		558 556 556 554	S301_13.1 P71 BN71B6		555 559 557 557 555
70	33.5	3.0	12.9	6520				S501_12.9 P71 BN71B6		
73	32.2	1.8	12.4	3800				S401_12.4 P71 BN71B6		
84	27.7	2.1	10.7	3800				S401_10.7 P71 BN71B6		
87	26.8	1.3	10.3	2400				S301_10.3 P71 BN71B6		
101	23.1	1.5	8.9	2400	S301_8.9 S1 M1SD6		554 556 552 552 550	S301_8.9 P71 BN71B6	S301_13.1 P71 BE71A4 S401_12.4 P71 BE71A4	555 557 555 553 557
104	22.5	3.1	8.6	3800	S401_8.6 S1 M1SD6			S401_8.6 P71 BN71B6		
105	22.3	1.3	13.1	2400				S301_13.1 P71 BN71A4		
106	22.1	0.9	8.5	1500	S201_8.5 S1 M1SD6			S201_8.5 P71 BN71B6		
111	21.1	2.4	12.4	3800				S401_12.4 P71 BN71A4		
125	18.8	1.6	7.2	1500	S201_7.2 S1 M1SD6	S201_10.8 S1 ME1SA4	552 554 552 550	S201_7.2 P71 BN71B6	S201_10.8 P71 BE71A4 S401_10.7 P71 BE71A4	553 555 553 557 551
127	18.4	3.1	7.1	2340	S301_7.1 S1 M1SD6			S301_7.1 P71 BN71B6		
128	18.3	0.9	10.8	1500	S201_10.8 S05 M05C4			S201_10.8 P71 BN71A4		
129	18.2	2.8	10.7	3800				S401_10.7 P71 BN71A4		
130	17.9	0.9	6.9	850	S101_6.9 S1 M1SD6			S101_6.9 P71 BN71B6		
133	17.5	1.7	10.3	2300	S101_6.1 S1 M1SD6 S201_5.8 S1 M1SD6 S201_8.5 S05 M05C4	S201_8.5 S1 ME1SA4	550 552 552 552 552	S301_10.3 P71 BN71A4	S301_10.3 P71 BE71A4 S301_8.9 P71 BE71A4 S201_8.5 P71 BE71A4	555 551 553 555 553
147	15.9	1.1	6.1	840				S101_6.1 P71 BN71B6		
155	15.1	2.0	5.8	1500				S201_5.8 P71 BN71B6		
155	15.1	2.0	8.9	2200				S301_8.9 P71 BN71A4		
162	14.5	1.2	8.5	1500				S201_8.5 P71 BN71A4		
189	12.4	2.4	4.8	1500	S201_4.8 S1 M1SD6	S201_7.2 S1 ME1SA4 S101_6.9 S1 ME1SA4	552 550 552 550	S201_4.8 P71 BN71B6	S201_7.2 P71 BE71A4 S101_6.9 P71 BE71A4	553 551 553 551 555
190	12.3	1.1	4.7	790	S101_4.7 S1 M1SD6			S101_4.7 P71 BN71B6		
190	12.3	2.1	7.2	1500	S201_7.2 S05 M05C4			S201_7.2 P71 BN71A4		
199	11.7	1.3	6.9	780	S101_6.9 S05 M05C4			S101_6.9 P71 BN71A4		
214	10.9	2.2	13.1	2000				S301_13.1 P63 BN63B2		
225	10.4	1.4	6.1	770	S101_6.1 S05 M05C4	S101_6.1 S1 ME1SA4	550 552 552 550	S101_6.1 P71 BN71A4	S101_6.1 P71 BE71A4	551 553 553 551
226	10.3	1.3	12.4	1450	S201_12.4 S05 M05B2			S201_12.4 P63 BN63B2		
229	10.2	2.9	3.9	1440	S201_3.9 S1 M1SD6			S201_3.9 P71 BN71B6		
234	10.0	1.4	3.8	750	S101_3.8 S1 M1SD6			S101_3.8 P71 BN71B6		
236	9.9	2.6	5.8	1430	S201_5.8 S05 M05C4			S201_5.8 P71 BN71A4		
261	9.0	1.5	10.8	1390	S201_10.8 S05 M05B2	S201_4.8 S1 ME1SA4	552 550 550 552	S201_10.8 P63 BN63B2	S201_4.8 P71 BE71A4	553 555 551 551 553
273	8.6	2.8	10.3	1860				S301_10.3 P63 BN63B2		
273	8.6	0.9	10.3	730	S101_10.3 S05 M05B2			S101_10.3 P63 BN63B2		
281	8.3	1.7	3.2	720	S101_3.2 S1 M1SD6			S101_3.2 P71 BN71B6		
288	8.1	3.2	4.8	1350	S201_4.8 S05 M05C4			S201_4.8 P71 BN71A4		
291	8.0	1.5	4.7	720	S101_4.7 S05 M05C4	S101_4.7 S1 ME1SA4	550	S101_4.7 P71 BN71A4	S101_4.7 P71 BE71A4	551
316	7.4	3.2	8.9	1770	S101_8.9 S05 M05B2 S201_8.5 S05 M05B2 S101_3.8 S05 M05C4	S101_3.8 S1 ME1SA4	550 552 550	S301_8.9 P63 BN63B2	S101_3.8 P71 BE71A4	555 551 553 551
317	7.4	1.1	8.9	710				S101_8.9 P63 BN63B2		
331	7.1	1.8	8.5	1300				S201_8.5 P63 BN63B2		
358	6.5	1.8	3.8	680				S101_3.8 P71 BN71A4		
360	6.5	1.8	2.5	680				S101_2.5 S1 M1SD6		
389	6.0	3.5	7.2	1240	S201_7.2 S05 M05B2	S201_7.2 P63 BN63B2				
407	5.7	2.1	6.9	660	S101_6.9 S05 M05B2	S101_6.9 P63 BN63B2				
430	5.4	2.2	3.2	650	S101_3.2 S05 M05C4	S101_3.2 P71 BN71A4				
460	5.1	2.4	6.1	640	S101_6.1 S05 M05B2	S101_6.1 P63 BN63B2				
480	4.9	2.5	1.9	620	S101_1.9 S1 M1SD6	S101_2.5 S1 ME1SA4	550 550 550 550 550	S101_1.9 P71 BN71B6	S101_2.5 P71 BE71A4	551 551 551 551 551
550	4.3	2.4	2.5	610	S101_2.5 S05 M05C4			S101_2.5 P71 BN71A4		
594	3.9	2.5	4.7	600	S101_4.7 S05 M05B2			S101_4.7 P63 BN63B2		
633	3.7	3.2	1.4	580	S101_1.4 S1 M1SD6			S101_1.4 P71 BN71B6		
731	3.2	3.1	3.8	560	S101_3.8 S05 M05B2			S101_3.8 P63 BN63B2		
733	3.2	3.1	1.9	560	S101_1.9 S05 M05C4	S101_1.9 S1 ME1SA4	550	S101_1.9 P71 BN71A4	S101_1.9 P71 BE71A4	551
878	2.7	3.8	3.2	530	S101_3.2 S05 M05B2	S101_1.4 S1 ME1SA4	550 550 550 550	S101_3.2 P63 BN63B2	S101_1.4 P71 BE71A4	551 551 551 551 551
968	2.4	4.1	1.4	510	S101_1.4 S05 M05C4			S101_1.4 P71 BN71A4		
1124	2.1	3.8	2.5	500	S101_2.5 S05 M05B2			S101_2.5 P63 BN63B2		
1499	1.6	5.1	1.9	450	S101_1.9 S05 M05B2			S101_1.9 P63 BN63B2		
1977	1.2	6.8	1.4	420	S101_1.4 S05 M05B2			S101_1.4 P63 BN63B2		







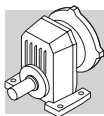
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n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IE3	 IEC IE3	
69	34.1	1.0	13.1	2400				
70	33.5	3.0	12.9	6520				
73	32.2	1.8	12.4	3800				
84	27.7	2.1	10.7	3800				
87	26.8	1.3	10.3	2400				
101	23.1	1.5	8.9	2400				
104	22.5	3.1	8.6	3800				
105	22.3	1.3	13.1	2400			S301_13.1 P71 BXN71MA4	555
106	22.1	0.9	8.5	1500				
111	21.1	2.4	12.4	3800			S401_12.4 P71 BXN71MA4	557
125	18.8	1.6	7.2	1500				
127	18.4	3.1	7.1	2340				
128	18.3	0.9	10.8	1500	S201_10.8 S10 MXN10A4	552	S201_10.8 P71 BXN71MA4	553
129	18.2	2.8	10.7	3800			S401_10.7 P71 BXN71MA4	557
130	17.9	0.9	6.9	850				
133	17.5	1.7	10.3	2300			S301_10.3 P71 BXN71MA4	555
147	15.9	1.1	6.1	840				
155	15.1	2.0	5.8	1500				
155	15.1	2.0	8.9	2200			S301_8.9 P71 BXN71MA4	555
162	14.5	1.2	8.5	1500	S201_8.5 S10 MXN10A4	552	S201_8.5 P71 BXN71MA4	553
189	12.4	2.4	4.8	1500				
190	12.3	1.1	4.7	790				
190	12.3	2.1	7.2	1500	S201_7.2 S10 MXN10A4	552	S201_7.2 P71 BXN71MA4	553
199	11.7	1.3	6.9	780	S101_6.9 S10 MXN10A4	550	S101_6.9 P71 BXN71MA4	551
214	10.9	2.2	13.1	2000				
225	10.4	1.4	6.1	770	S101_6.1 S10 MXN10A4	550	S101_6.1 P71 BXN71MA4	551
226	10.3	1.3	12.4	1450				
229	10.2	2.9	3.9	1440				
234	10.0	1.4	3.8	750				
236	9.9	2.6	5.8	1430	S201_5.8 S10 MXN10A4	552	S201_5.8 P71 BXN71MA4	553
261	9.0	1.5	10.8	1390				
273	8.6	2.8	10.3	1860				
273	8.6	0.9	10.3	730				
281	8.3	1.7	3.2	720				
288	8.1	3.2	4.8	1350	S201_4.8 S10 MXN10A4	552	S201_4.8 P71 BXN71MA4	553
291	8.0	1.5	4.7	720	S101_4.7 S10 MXN10A4	550	S101_4.7 P71 BXN71MA4	551
316	7.4	3.2	8.9	1770				
317	7.4	1.1	8.9	710				
331	7.1	1.8	8.5	1300				
358	6.5	1.8	3.8	680	S101_3.8 S10 MXN10A4	550	S101_3.8 P71 BXN71MA4	551
360	6.5	1.8	2.5	680				
389	6.0	3.5	7.2	1240				
407	5.7	2.1	6.9	660				
430	5.4	2.2	3.2	650	S101_3.2 S10 MXN10A4	550	S101_3.2 P71 BXN71MA4	551
460	5.1	2.4	6.1	640				
480	4.9	2.5	1.9	620				
550	4.3	2.4	2.5	610	S101_2.5 S10 MXN10A4	550	S101_2.5 P71 BXN71MA4	551
594	3.9	2.5	4.7	600		550		
633	3.7	3.2	1.4	580		550		
731	3.2	3.1	3.8	560		550		
733	3.2	3.1	1.9	560	S101_1.9 S10 MXN10A4	550	S101_1.9 P71 BXN71MA4	551
878	2.7	3.8	3.2	530				
968	2.4	4.1	1.4	510	S101_1.4 S10 MXN10A4	550	S101_1.4 P71 BXN71MA4	551
1124	2.1	3.8	2.5	500				
1499	1.6	5.1	1.9	450				
1977	1.2	6.8	1.4	420				



0.37 kW

n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	 IE1	 IE2	 IEC	
71	49.0	2.0	12.9	6420	S501_12.9 S1 M1LA6		S501_12.9 P80 BN80A6	
73	47.2	1.2	12.4	3800	S401_12.4 S1 M1LA6		S401_12.4 P80 BN80A6	
85	40.6	1.4	10.7	3800	S401_10.7 S1 M1LA6		S401_10.7 P80 BN80A6	
87	39.8	2.9	10.5	6020	S501_10.5 S1 M1LA6		S501_10.5 P80 BN80A6	
102	33.8	1.0	8.9	2400	S301_8.9 S1 M1LA6		S301_8.9 P80 BN80A6	
104	33.2	0.9	13.1	2390			S301_13.1 P71 BN71B4	S301_13.1 P71 BE71B4
105	32.9	2.1	8.6	3800	S401_8.6 S1 M1LA6		S401_8.6 P80 BN80A6	
106	32.6	3.1	12.9	5650	S501_12.9 S1 M1SD4	S501_12.9 S1 ME1SB4	S501_12.9 P71 BN71B4	S501_12.9 P71 BE71B4
110	31.3	1.6	12.4	3800	S401_12.4 S1 M1SD4	S401_12.4 S1 ME1SB4	S401_12.4 P71 BN71B4	S401_12.4 P71 BE71B4
126	27.5	1.1	7.2	1500	S201_7.2 S1 M1LA6		S201_7.2 P80 BN80A6	
127	27.2	3.3	7.2	3800	S401_7.2 S1 M1LA6		S401_7.2 P80 BN80A6	
128	27.0	2.1	7.1	2260	S301_7.1 S1 M1LA6		S301_7.1 P80 BN80A6	
128	27.0	1.9	10.7	3800	S401_10.7 S1 M1SD4	S401_10.7 S1 ME1SB4	S401_10.7 P71 BN71B4	S401_10.7 P71 BE71B4
133	26.0	1.2	10.3	2240	S301_10.3 S1 M1SD4	S301_10.3 S1 ME1SB4	S301_10.3 P71 BN71B4	S301_10.3 P71 BE71B4
154	22.5	1.3	8.9	2150	S301_8.9 S1 M1SD4	S301_8.9 S1 ME1SB4	S301_8.9 P71 BN71B4	S301_8.9 P71 BE71B4
156	22.2	2.6	5.8	2140	S301_5.8 S1 M1LA6		S301_5.8 P80 BN80A6	
156	22.1	1.4	5.8	1500	S201_5.8 S1 M1LA6		S201_5.8 P80 BN80A6	
159	21.8	2.7	8.6	3610	S401_8.6 S1 M1SD4	S401_8.6 S1 ME1SB4	S401_8.6 P71 BN71B4	S401_8.6 P71 BE71B4
184	18.8	3.1	4.9	2040	S301_4.9 S1 M1LA6		S301_4.9 P80 BN80A6	
190	18.3	1.4	7.2	1460	S201_7.2 S1 M1SD4	S201_7.2 S1 ME1SB4	S201_7.2 P71 BN71B4	S201_7.2 P71 BE71B4
191	18.1	1.7	4.8	1460	S201_4.8 S1 M1LA6		S201_4.8 P80 BN80A6	
193	17.9	2.8	7.1	2020	S301_7.1 S1 M1SD4	S301_7.1 S1 ME1SB4	S301_7.1 P71 BN71B4	S301_7.1 P71 BE71B4
214	16.2	1.5	13.1	1960			S301_13.1 P71 BN71A2	
224	15.4	1.0	6.1	710	S101_6.1 S1 M1SD4	S101_6.1 S1 ME1SB4	S101_6.1 P71 BN71B4	S101_6.1 P71 BE71B4
227	15.3	2.6	12.4	3230			S401_12.4 P71 BN71A2	
231	15.0	2.0	3.9	1380	S201_3.9 S1 M1LA6		S201_3.9 P80 BN80A6	
234	14.8	3.4	5.8	1900	S301_5.8 S1 M1SD4	S301_5.8 S1 ME1SB4	S301_5.8 P71 BN71B4	S301_5.8 P71 BE71B4
235	14.7	1.8	5.8	1390	S201_5.8 S1 M1SD4	S201_5.8 S1 ME1SB4	S201_5.8 P71 BN71B4	S201_5.8 P71 BE71B4
237	14.6	1.0	3.8	690	S101_3.8 S1 M1LA6		S101_3.8 P80 BN80A6	
261	13.2	1.0	10.8	1350	S201_10.8 S05 M05C2		S201_10.8 P71 BN71A2	
263	13.1	3.0	10.7	3080			S401_10.7 P71 BN71A2	
273	12.7	1.9	10.3	1820			S301_10.3 P71 BN71A2	
284	12.2	1.1	3.2	670	S101_3.2 S1 M1LA6		S101_3.2 P80 BN80A6	
287	12.1	2.2	4.8	1310	S201_4.8 S1 M1SD4	S201_4.8 S1 ME1SB4	S201_4.8 P71 BN71B4	S201_4.8 P71 BE71B4
290	11.9	1.0	4.7	670	S101_4.7 S1 M1SD4	S101_4.7 S1 ME1SB4	S101_4.7 P71 BN71B4	S101_4.7 P71 BE71B4
293	11.8	2.5	3.1	1300	S201_3.1 S1 M1LA6		S201_3.1 P80 BN80A6	
316	11.0	2.2	8.9	1740			S301_8.9 P71 BN71A2	
331	10.5	1.2	8.5	1270	S201_8.5 S05 M05C2		S201_8.5 P71 BN71A2	
348	9.9	2.6	3.9	1240	S201_3.9 S1 M1SD4	S201_3.9 S1 ME1SB4	S201_3.9 P71 BN71B4	S201_3.9 P71 BE71B4
356	9.7	1.2	3.8	640	S101_3.8 S1 M1SD4	S101_3.8 S1 ME1SB4	S101_3.8 P71 BN71B4	S101_3.8 P71 BE71B4
364	9.5	1.3	2.5	630	S101_2.5 S1 M1LA6		S101_2.5 P80 BN80A6	
373	9.3	3.2	2.4	1210	S201_2.4 S1 M1LA6		S201_2.4 P80 BN80A6	
389	8.9	2.4	7.2	1210	S201_7.2 S05 M05C2		S201_7.2 P71 BN71A2	
407	8.5	1.4	6.9	630	S101_6.9 S05 M05C2		S101_6.9 P71 BN71A2	
428	8.1	1.5	3.2	620	S101_3.2 S1 M1SD4	S101_3.2 S1 ME1SB4	S101_3.2 P71 BN71B4	S101_3.2 P71 BE71B4
440	7.9	3.3	3.1	1160	S201_3.1 S1 M1SD4	S201_3.1 S1 ME1SB4	S201_3.1 P71 BN71B4	S201_3.1 P71 BE71B4
460	7.5	1.6	6.1	610	S101_6.1 S05 M05C2		S101_6.1 P71 BN71A2	
480	7.2	2.8	1.9	1130	S201_1.9 S1 M1LA6		S201_1.9 P80 BN80A6	
483	7.2	2.9	5.8	1130	S201_5.8 S05 M05C2		S201_5.8 P71 BN71A2	
485	7.1	1.7	1.9	590	S101_1.9 S1 M1LA6		S101_1.9 P80 BN80A6	
548	6.3	1.6	2.5	580	S101_2.5 S1 M1SD4	S101_2.5 S1 ME1SB4	S101_2.5 P71 BN71B4	S101_2.5 P71 BE71B4
594	5.8	1.7	4.7	570	S101_4.7 S05 M05C2		S101_4.7 P71 BN71A2	
640	5.4	2.2	1.4	550	S101_1.4 S1 M1LA6		S101_1.4 P80 BN80A6	
731	4.7	2.1	3.8	540	S101_3.8 S05 M05C2		S101_3.8 P71 BN71A2	
731	4.7	2.1	1.9	540	S101_1.9 S1 M1SD4	S101_1.9 S1 ME1SB4	S101_1.9 P71 BN71B4	S101_1.9 P71 BE71B4
878	3.9	2.5	3.2	520	S101_3.2 S05 M05C2		S101_3.2 P71 BN71A2	
964	3.6	2.8	1.4	500	S101_1.4 S1 M1SD4	S101_1.4 S1 ME1SB4	S101_1.4 P71 BN71B4	S101_1.4 P71 BE71B4

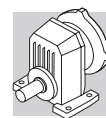


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



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	IE1	IE2	IE1	IE2
1124	3.1	2.6	2.5	480	S101_2.5 S05 M05C2		550	S101_2.5 P71 BN71A2
1499	2.3	3.5	1.9	440	S101_1.9 S05 M05C2		550	S101_1.9 P71 BN71A2
1977	1.8	4.6	1.4	410	S101_1.4 S05 M05C2		550	S101_1.4 P71 BN71A2

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




n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	IE3	IE3
71	49.0	2.0	12.9	6420		
73	47.2	1.2	12.4	3800		
85	40.6	1.4	10.7	3800		
87	39.8	2.9	10.5	6020		
102	33.8	1.0	8.9	2400		
104	33.2	0.9	13.1	2390		S301_13.1 P71 BXN71MB4
105	32.9	2.1	8.6	3800		
106	32.6	3.1	12.9	5650		S501_12.9 P71 BXN71MB4
110	31.3	1.6	12.4	3800		S401_12.4 P71 BXN71MB4
126	27.5	1.1	7.2	1500		
127	27.2	3.3	7.2	3800		
128	27.0	2.1	7.1	2260		
128	27.0	1.9	10.7	3800		S401_10.7 P71 BXN71MB4
133	26.0	1.2	10.3	2240	S301_10.3 S10 MXN10B4	554
154	22.5	1.3	8.9	2150	S301_8.9 S10 MXN10B4	554
156	22.2	2.6	5.8	2140		
156	22.1	1.4	5.8	1500		
159	21.8	2.7	8.6	3610		S401_8.6 P71 BXN71MB4
184	18.8	3.1	4.9	2040		
190	18.3	1.4	7.2	1460	S201_7.2 S10 MXN10B4	552
191	18.1	1.7	4.8	1460		
193	17.9	2.8	7.1	2020	S301_7.1 S10 MXN10B4	554
214	16.2	1.5	13.1	1960		
224	15.4	1.0	6.1	710	S101_6.1 S10 MXN10B4	550
227	15.3	2.6	12.4	3230		
231	15.0	2.0	3.9	1380		
234	14.8	3.4	5.8	1900	S301_5.8 S10 MXN10B4	554
235	14.7	1.8	5.8	1390	S201_5.8 S10 MXN10B4	552
237	14.6	1.0	3.8	690		
261	13.2	1.0	10.8	1350		
263	13.1	3.0	10.7	3080		
273	12.7	1.9	10.3	1820		
284	12.2	1.1	3.2	670		
287	12.1	2.2	4.8	1310	S201_4.8 S10 MXN10B4	552
290	11.9	1.0	4.7	670	S101_4.7 S10 MXN10B4	550
293	11.8	2.5	3.1	1300		
316	11.0	2.2	8.9	1740		
331	10.5	1.2	8.5	1270		
348	9.9	2.6	3.9	1240	S201_3.9 S10 MXN10B4	552
356	9.7	1.2	3.8	640	S101_3.8 S10 MXN10B4	550
364	9.5	1.3	2.5	630		
373	9.3	3.2	2.4	1210		
389	8.9	2.4	7.2	1210		
407	8.5	1.4	6.9	630		
428	8.1	1.5	3.2	620	S101_3.2 S10 MXN10B4	550
440	7.9	3.3	3.1	1160	S201_3.1 S10 MXN10B4	552
460	7.5	1.6	6.1	610		

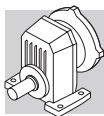


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

n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IE3	 IE3	
480	7.2	2.8	1.9	1130				
483	7.2	2.9	5.8	1130				
485	7.1	1.7	1.9	590				
548	6.3	1.6	2.5	580	S101_2.5 S10 MXN10B4	550	S101_2.5 P71 BXN71MB4	551
594	5.8	1.7	4.7	570				
640	5.4	2.2	1.4	550				
731	4.7	2.1	3.8	540				
731	4.7	2.1	1.9	540	S101_1.9 S10 MXN10B4	550	S101_1.9 P71 BXN71MB4	551
878	3.9	2.5	3.2	520				
964	3.6	2.8	1.4	500	S101_1.4 S10 MXN10B4	550		
1124	3.1	2.6	2.5	480				
1499	2.3	3.5	1.9	440				
1977	1.8	4.6	1.4	410				

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

n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE1	 IE2	 IE1	 IE2	
71	72.1	1.4	12.9	6290	S501_12.9 S2 M2SA6		558	S501_12.9 P80 BN80B6	559
86	59.7	1.0	10.7	3800	S401_10.7 S2 M2SA6		556	S401_10.7 P80 BN80B6	557
88	58.5	2.0	10.5	5910	S501_10.5 S2 M2SA6		558	S501_10.5 P80 BN80B6	559
105	49.1	2.5	8.8	5600	S501_8.8 S2 M2SA6		558	S501_8.8 P80 BN80B6	559
107	48.3	1.4	8.6	3800	S401_8.6 S2 M2SA6		556	S401_8.6 P80 BN80B6	557
107	48.1	2.1	12.9	5560	S501_12.9 S1 M1LA4	S501_12.9 S2 ME2SA4	558	S501_12.9 P80 BN80A4	559
111	46.3	1.1	12.4	3800	S401_12.4 S1 M1LA4	S401_12.4 S2 ME2SA4	556	S401_12.4 P80 BN80A4	557
124	41.4	3.4	7.4	5310	S501_7.4 S2 M2SA6		558	S501_7.4 P80 BN80B6	559
129	40.0	2.2	7.2	3780	S401_7.2 S2 M2SA6		556	S401_7.2 P80 BN80B6	557
129	39.8	1.3	10.7	3770	S401_10.7 S1 M1LA4	S401_10.7 S2 ME2SA4	556	S401_10.7 P80 BN80A4	557
130	39.7	1.5	7.1	2150	S301_7.1 S2 M2SA6		554	S301_7.1 P80 BN80B6	555
132	39.0	2.8	10.5	5220	S501_10.5 S1 M1LA4	S501_10.5 S2 ME2SA4	558	S501_10.5 P80 BN80A4	559
152	33.9	3.1	6.1	3600	S401_6.1 S2 M2SA6		556	S401_6.1 P80 BN80B6	557
155	33.2	0.9	8.9	2060	S301_8.9 S1 M1LA4	S301_8.9 S2 ME2SA4	554	S301_8.9 P80 BN80A4	555
157	32.7	1.8	5.8	2050	S301_5.8 S2 M2SA6		554	S301_5.8 P80 BN80B6	555
157	32.7	3.4	8.8	4940	S501_8.8 S1 M1LA4	S501_8.8 S2 ME2SA4	558	S501_8.8 P80 BN80A4	559
158	32.6	0.9	5.8	1420	S201_5.8 S2 M2SA6		552	S201_5.8 P80 BN80B6	553
160	32.2	1.9	8.6	3540	S401_8.6 S1 M1LA4	S401_8.6 S2 ME2SA4	556	S401_8.6 P80 BN80A4	557
186	27.6	2.1	4.9	1960	S301_4.9 S2 M2SA6		554	S301_4.9 P80 BN80B6	555
191	26.9	1.0	7.2	1370	S201_7.2 S1 M1LA4	S201_7.2 S2 ME2SA4	552	S201_7.2 P80 BN80A4	553
193	26.7	1.1	4.8	1370	S201_4.8 S2 M2SA6		552	S201_4.8 P80 BN80B6	553
193	26.7	3.0	7.2	3350	S401_7.2 S1 M1LA4	S401_7.2 S2 ME2SA4	556	S401_7.2 P80 BN80A4	557
195	26.4	1.9	7.1	1940	S301_7.1 S1 M1LA4	S301_7.1 S2 ME2SA4	554	S301_7.1 P80 BN80A4	555
214	24.0	1.0	13.1	1900				S301_13.1 P71 BN71B2	555
218	23.6	3.4	12.9	4460	S501_12.9 S1 M1SD2		558	S501_12.9 P71 BN71B2	559
227	22.7	1.8	12.4	3190	S401_12.4 S1 M1SD2		556	S401_12.4 P71 BN71B2	557
233	22.1	2.6	3.9	1850	S301_3.9 S2 M2SA6		554	S301_3.9 P80 BN80B6	555
234	22.0	1.4	3.9	1300	S201_3.9 S2 M2SA6		552	S201_3.9 P80 BN80B6	553
236	21.8	2.3	5.8	1840	S301_5.8 S1 M1LA4	S301_5.8 S2 ME2SA4	554	S301_5.8 P80 BN80A4	555
237	21.7	1.2	5.8	1310	S201_5.8 S1 M1LA4	S201_5.8 S2 ME2SA4	552	S201_5.8 P80 BN80A4	553
263	19.5	2.0	10.7	3040	S401_10.7 S1 M1SD2		556	S401_10.7 P71 BN71B2	557
273	18.9	1.3	10.3	1780	S301_10.3 S1 M1SD2		554	S301_10.3 P71 BN71B2	555
280	18.4	2.7	4.9	1760	S301_4.9 S1 M1LA4	S301_4.9 S2 ME2SA4	554	S301_4.9 P80 BN80A4	555
289	17.8	1.5	4.8	1250	S201_4.8 S1 M1LA4	S201_4.8 S2 ME2SA4	552	S201_4.8 P80 BN80A4	553
296	17.4	1.7	3.1	1230	S201_3.1 S2 M2SA6		552	S201_3.1 P80 BN80B6	553
300	17.1	3.4	3.1	1720	S301_3.1 S2 M2SA6		554	S301_3.1 P80 BN80B6	555
316	16.3	1.5	8.9	1700	S301_8.9 S1 M1SD2		554	S301_8.9 P71 BN71B2	555

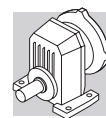


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

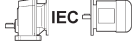

n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	 IE1 IE2		 IE1 IE2	
325	15.8	3.0	8.6	2850	S401_8.6 S1 M1SD2		S401_8.6 P71 BN71B2	
350	14.7	3.4	3.9	1650	S301_3.9 S1 M1LA4	S301_3.9 S2 ME2SA4	S301_3.9 P80 BN80A4	S301_3.9 P80 BE80A4
351	14.7	1.8	3.9	1190	S201_3.9 S1 M1LA4	S201_3.9 S2 ME2SA4	S201_3.9 P80 BN80A4	S201_3.9 P80 BE80A4
377	13.6	2.2	2.4	1160	S201_2.4 S2 M2SA6		S201_2.4 P80 BN80B6	
389	13.2	1.6	7.2	1160	S201_7.2 S1 M1SD2		S201_7.2 P71 BN71B2	
396	13.0	3.1	7.1	1600	S301_7.1 S1 M1SD2		S301_7.1 P71 BN71B2	
407	12.6	0.9	6.9	570	S101_6.9 S1 M1SD2		S101_6.9 P71 BN71B2	
431	11.9	1.0	3.2	560	S101_3.2 S1 M1LA4	S101_3.2 S2 ME2SA4	S101_3.2 P80 BN80A4	S101_3.2 P80 BE80A4
444	11.6	2.2	3.1	1120	S201_3.1 S1 M1LA4	S201_3.1 S2 ME2SA4	S201_3.1 P80 BN80A4	S201_3.1 P80 BE80A4
460	11.2	1.1	6.1	570	S101_6.1 S1 M1SD2		S101_6.1 P71 BN71B2	
483	10.7	2.0	5.8	1100	S201_5.8 S1 M1SD2		S201_5.8 P71 BN71B2	
486	10.6	1.9	1.9	1080	S201_1.9 S2 M2SA6		S201_1.9 P80 BN80B6	
491	10.5	1.1	1.9	540	S101_1.9 S2 M2SA6		S101_1.9 P80 BN80B6	
504	10.2	3.4	1.8	1470	S301_1.8 S2 M2SA6		S301_1.8 P80 BN80B6	
552	9.3	1.1	2.5	540	S101_2.5 S1 M1LA4	S101_2.5 S2 ME2SA4	S101_2.5 P80 BN80A4	S101_2.5 P80 BE80A4
566	9.1	2.9	2.4	1050	S201_2.4 S1 M1LA4	S201_2.4 S2 ME2SA4	S201_2.4 P80 BN80A4	S201_2.4 P80 BE80A4
589	8.7	2.4	4.8	1040	S201_4.8 S1 M1SD2		S201_4.8 P71 BN71B2	
594	8.7	1.2	4.7	540	S101_4.7 S1 M1SD2		S101_4.7 P71 BN71B2	
647	8.0	1.5	1.4	510	S101_1.4 S2 M2SA6		S101_1.4 P80 BN80B6	
661	7.8	2.6	1.4	990	S201_1.4 S2 M2SA6		S201_1.4 P80 BN80B6	
714	7.2	2.9	3.9	980	S201_3.9 S1 M1SD2		S201_3.9 P71 BN71B2	
728	7.1	2.4	1.9	970	S201_1.9 S1 M1LA4	S201_1.9 S2 ME2SA4	S201_1.9 P80 BN80A4	S201_1.9 P80 BE80A4
731	7.0	1.4	3.8	510	S101_3.8 S1 M1SD2		S101_3.8 P71 BN71B2	
736	7.0	1.4	1.9	500	S101_1.9 S1 M1LA4	S101_1.9 S2 ME2SA4	S101_1.9 P80 BN80A4	S101_1.9 P80 BE80A4
878	5.9	1.7	3.2	490	S101_3.2 S1 M1SD2		S101_3.2 P71 BN71B2	
971	5.3	1.9	1.4	470	S101_1.4 S1 M1LA4	S101_1.4 S2 ME2SA4	S101_1.4 P80 BN80A4	S101_1.4 P80 BE80A4
992	5.2	3.3	1.4	890			S201_1.4 P80 BN80A4	S201_1.4 P80 BE80A4
1124	4.6	1.7	2.5	460	S101_2.5 S1 M1SD2		S101_2.5 P71 BN71B2	
1499	3.4	2.3	1.9	430	S101_1.9 S1 M1SD2		S101_1.9 P71 BN71B2	
1977	2.6	3.1	1.4	390	S101_1.4 S1 M1SD2		S101_1.4 P71 BN71B2	

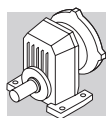
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n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	 IE3		 IE3	
71	72.1	1.4	12.9	6290				
86	59.7	1.0	10.7	3800				
88	58.5	2.0	10.5	5910				
105	49.1	2.5	8.8	5600				
107	48.3	1.4	8.6	3800				
107	48.1	2.1	12.9	5560			S501_12.9 P80 BXN80MA4	559
111	46.3	1.1	12.4	3800			S401_12.4 P80 BXN80MA4	557
124	41.4	3.4	7.4	5310				
129	40.0	2.2	7.2	3780				
129	39.8	1.3	10.7	3770			S401_10.7 P80 BXN80MA4	557
130	39.7	1.5	7.1	2150				
132	39.0	2.8	10.5	5220			S501_10.5 P80 BXN80MA4	559
152	33.9	3.1	6.1	3600				
155	33.2	0.9	8.9	2060			S301_8.9 P80 BXN80MA4	555
157	32.7	1.8	5.8	2050				
157	32.7	3.4	8.8	4940			S501_8.8 P80 BXN80MA4	559
158	32.6	0.9	5.8	1420				
160	32.2	1.9	8.6	3540			S401_8.6 P80 BXN80MA4	557
186	27.6	2.1	4.9	1960				







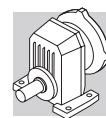
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n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IE3	 IE3	
191	26.9	1.0	7.2	1370	S201_7.2 S20 MXN20A4	552	S201_7.2 P80 BXN80MA4	553
193	26.7	1.1	4.8	1370			S401_7.2 P80 BXN80MA4 S301_7.1 P80 BXN80MA4	557 555
193	26.7	3.0	7.2	3350				
195	26.4	1.9	7.1	1940				
214	24.0	1.0	13.1	1900				
218	23.6	3.4	12.9	4460				
227	22.7	1.8	12.4	3190	S201_5.8 S20 MXN20A4	552	S301_5.8 P80 BXN80MA4 S201_5.8 P80 BXN80MA4	555 553
233	22.1	2.6	3.9	1850				
234	22.0	1.4	3.9	1300				
236	21.8	2.3	5.8	1840				
237	21.7	1.2	5.8	1310				
263	19.5	2.0	10.7	3040	S201_4.8 S20 MXN20A4	552	S301_4.9 P80 BXN80MA4 S201_4.8 P80 BXN80MA4	555 553
273	18.9	1.3	10.3	1780				
280	18.4	2.7	4.9	1760				
289	17.8	1.5	4.8	1250				
296	17.4	1.7	3.1	1230				
300	17.1	3.4	3.1	1720	S201_3.9 S20 MXN20A4	552	S301_3.9 P80 BXN80MA4 S201_3.9 P80 BXN80MA4	555 553
316	16.3	1.5	8.9	1700				
325	15.8	3.0	8.6	2850				
350	14.7	3.4	3.9	1650				
351	14.7	1.8	3.9	1190				
377	13.6	2.2	2.4	1160	S101_3.2 S20 MXN20A4	550	S101_3.2 P80 BXN80MA4	551
389	13.2	1.6	7.2	1160				
396	13.0	3.1	7.1	1600				
407	12.6	0.9	6.9	570				
431	11.9	1.0	3.2	560				
444	11.6	2.2	3.1	1120	S201_3.1 S20 MXN20A4	552	S201_3.1 P80 BXN80MA4	553
460	11.2	1.1	6.1	570				
483	10.7	2.0	5.8	1100				
486	10.6	1.9	1.9	1080				
491	10.5	1.1	1.9	540				
504	10.2	3.4	1.8	1470	S101_2.5 S20 MXN20A4 S201_2.4 S20 MXN20A4	550 552	S101_2.5 P80 BXN80MA4 S201_2.4 P80 BXN80MA4	551 553
552	9.3	1.1	2.5	540				
566	9.1	2.9	2.4	1050				
589	8.7	2.4	4.8	1040				
594	8.7	1.2	4.7	540				
647	8.0	1.5	1.4	510	S201_1.9 S20 MXN20A4	552	S201_1.9 P80 BXN80MA4	553
661	7.8	2.6	1.4	990				
714	7.2	2.9	3.9	980				
728	7.1	2.4	1.9	970				
731	7.0	1.4	3.8	510				
736	7.0	1.4	1.9	500	S101_1.9 S20 MXN20A4 S101_1.4 S20 MXN20A4	550 550	S101_1.9 P80 BXN80MA4 S101_1.4 P80 BXN80MA4 S201_1.4 P80 BXN80MA4	551 551
878	5.9	1.7	3.2	490				
971	5.3	1.9	1.4	470				
992	5.2	3.3	1.4	890				
1124	4.6	1.7	2.5	460				
1499	3.4	2.3	1.9	430			S101_1.4 P71 BN71B2	551
1977	2.6	3.1	1.4	390				







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

n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N						
					IE2	IE3		IE2	IE3	
73	96	1.0	12.9	6170	S501_12.9 S3 ME3SA6		558	S501_12.9 P90 BE90S6		559
90	78	1.5	10.5	5810	S501_10.5 S3 ME3SA6		558	S501_10.5 P90 BE90S6		559
107	65	1.9	8.8	5520	S501_8.8 S3 ME3SA6		558	S501_8.8 P90 BE90S6		559
111	63	1.6	12.9	5460	S501_12.9 S2 ME2SB4	S501_12.9 S2 MX2SB4	558	S501_12.9 P80 BE80B4	S501_12.9 P80 BX80B4	559
127	55	2.5	7.4	5240	S501_7.4 S3 ME3SA6		558	S501_7.4 P90 BE90S6		559
131	53	1.7	7.2	3700	S401_7.2 S3 ME3SA6		556	S401_7.2 P90 BE90S6		557
134	52	1.0	10.7	3670	S401_10.7 S2 ME2SB4	S401_10.7 S2 MX2SB4	556	S401_10.7 P80 BE80B4	S401_10.7 P80 BX80B4	557
137	51	2.1	10.5	5130	S501_10.5 S2 ME2SB4	S501_10.5 S2 MX2SB4	558	S501_10.5 P80 BE80B4	S501_10.5 P80 BX80B4	559
155	45	2.3	6.1	3530	S401_6.1 S3 ME3SA6		556	S401_6.1 P90 BE90S6		557
161	44	1.3	5.8	1960	S301_5.8 S3 ME3SA6		554	S301_5.8 P90 BE90S6		555
163	43	2.6	8.8	4870	S501_8.8 S2 ME2SB4	S501_8.8 S2 MX2SB4	558	S501_8.8 P80 BE80B4	S501_8.8 P80 BX80B4	559
166	42	1.4	8.6	3460	S401_8.6 S2 ME2SB4	S401_8.6 S2 MX2SB4	556	S401_8.6 P80 BE80B4	S401_8.6 P80 BX80B4	557
191	37	1.6	4.9	1880	S301_4.9 S3 ME3SA6		554	S301_4.9 P90 BE90S6		555
194	36	2.9	4.8	3300	S401_4.8 S3 ME3SA6		556	S401_4.8 P90 BE90S6		557
200	35	2.3	7.2	3280	S401_7.2 S2 ME2SB4	S401_7.2 S2 MX2SB4	556	S401_7.2 P80 BE80B4	S401_7.2 P80 BX80B4	557
202	35	1.4	7.1	1860	S301_7.1 S2 ME2SB4	S301_7.1 S2 MX2SB4	554	S301_7.1 P80 BE80B4	S301_7.1 P80 BX80B4	555
221	32	2.5	12.9	4420	S501_12.9 S2 ME2SA2		558	S501_12.9 P80 BE80A2		559
230	31	1.3	12.4	3150	S401_12.4 S2 ME2SA2		556	S401_12.4 P80 BE80A2		557
236	30	3.0	6.1	3120	S401_6.1 S2 ME2SB4	S401_6.1 S2 MX2SB4	556	S401_6.1 P80 BE80B4	S401_6.1 P80 BX80B4	557
238	29	2.0	3.9	1780	S301_3.9 S3 ME3SA6		554	S301_3.9 P90 BE90S6		555
245	29	1.7	5.8	1780	S301_5.8 S2 ME2SB4	S301_5.8 S2 MX2SB4	554	S301_5.8 P80 BE80B4	S301_5.8 P80 BX80B4	555
246	29	0.9	5.8	1160	S201_5.8 S2 ME2SB4	S201_5.8 S2 MX2SB4	552	S201_5.8 P80 BE80B4	S201_5.8 P80 BX80B4	553
267	26	1.5	10.7	3000	S401_10.7 S2 ME2SA2		556	S401_10.7 P80 BE80A2		557
273	26	3.3	10.5	4140	S501_10.5 S2 ME2SA2		558	S501_10.5 P80 BE80A2		559
277	25	0.9	10.3	1730	S301_10.3 S2 ME2SA2		554	S301_10.3 P80 BE80A2		555
290	24	2.1	4.9	1700	S301_4.9 S2 ME2SB4	S301_4.9 S2 MX2SB4	554	S301_4.9 P80 BE80B4	S301_4.9 P80 BX80B4	555
300	23	1.1	4.8	1180	S201_4.8 S2 ME2SB4	S201_4.8 S2 MX2SB4	552	S201_4.8 P80 BE80B4	S201_4.8 P80 BX80B4	553
302	23	1.3	3.1	1160	S201_3.1 S3 ME3SA6		552	S201_3.1 P90 BE90S6		553
307	23	2.5	3.1	1670	S301_3.1 S3 ME3SA6		554	S301_3.1 P90 BE90S6		555
321	22	1.1	8.9	1660	S301_8.9 S2 ME2SA2		554	S301_8.9 P80 BE80A2		555
330	21	2.3	8.6	2820	S401_8.6 S2 ME2SA2		556	S401_8.6 P80 BE80A2		557
363	19.3	2.6	3.9	1600	S301_3.9 S2 ME2SB4	S301_3.9 S2 MX2SB4	554	S301_3.9 P80 BE80B4	S301_3.9 P80 BX80B4	555
364	19.3	1.3	3.9	1130	S201_3.9 S2 ME2SB4	S201_3.9 S2 MX2SB4	552	S201_3.9 P80 BE80B4	S201_3.9 P80 BX80B4	553
386	18.2	1.6	2.4	1110	S201_2.4 S3 ME3SA6		552	S201_2.4 P90 BE90S6		553
388	18.1	3.2	2.4	1560	S301_2.4 S3 ME3SA6		554	S301_2.4 P90 BE90S6		555
395	17.8	1.2	7.2	1120	S201_7.2 S2 ME2SA2		552	S201_7.2 P80 BE80A2		553
402	17.5	2.3	7.1	1560	S301_7.1 S2 ME2SA2		554	S301_7.1 P80 BE80A2		555
460	15.2	1.7	3.1	1070	S201_3.1 S2 ME2SB4	S201_3.1 S2 MX2SB4	552	S201_3.1 P80 BE80B4	S201_3.1 P80 BX80B4	553
467	15.0	3.3	3.1	1490	S301_3.1 S2 ME2SB4	S301_3.1 S2 MX2SB4	554	S301_3.1 P80 BE80B4	S301_3.1 P80 BX80B4	555
488	14.4	2.8	5.8	1480	S301_5.8 S2 ME2SA2		554	S301_5.8 P80 BE80A2		555
490	14.3	1.5	5.8	1060	S201_5.8 S2 ME2SA2		552	S201_5.8 P80 BE80A2		553
496	14.1	1.4	1.9	1040	S201_1.9 S3 ME3SA6		552	S201_1.9 P90 BE90S6		553
515	13.6	2.6	1.8	1440	S301_1.8 S3 ME3SA6		554	S301_1.8 P90 BE90S6		555
578	12.1	3.3	4.9	1410	S301_4.9 S2 ME2SA2		554	S301_4.9 P80 BE80A2		555
587	11.9	2.2	2.4	1010	S201_2.4 S2 ME2SB4	S201_2.4 S2 MX2SB4	552	S201_2.4 P80 BE80B4	S201_2.4 P80 BX80B4	553
591	11.9	4.2	2.4	1380	S301_2.4 S2 ME2SB4	S301_2.4 S2 MX2SB4	554	S301_2.4 P80 BE80B4	S301_2.4 P80 BX80B4	555
598	11.7	1.8	4.8	1010	S201_4.8 S2 ME2SA2		552	S201_4.8 P80 BE80A2		553
661	10.6	1.1	1.4	460	S101_1.4 S3 ME3SA6		550	S101_1.4 P90 BE90S6		551
668	10.5	3.3	1.4	1330	S301_1.4 S3 ME3SA6		554	S301_1.4 P90 BE90S6		555
676	10.4	1.9	1.4	960	S201_1.4 S3 ME3SA6		552	S201_1.4 P90 BE90S6		553
725	9.7	2.2	3.9	960	S201_3.9 S2 ME2SA2		552	S201_3.9 P80 BE80A2		553
741	9.5	1.1	3.8	480	S101_3.8 S2 ME2SA2		550	S101_3.8 P80 BE80A2		551
755	9.3	1.8	1.9	940	S201_1.9 S2 ME2SB4	S201_1.9 S2 MX2SB4	552	S201_1.9 P80 BE80B4	S201_1.9 P80 BX80B4	553
763	9.2	1.1	1.9	460	S101_1.9 S2 ME2SB4	S101_1.9 S2 MX2SB4	550	S101_1.9 P80 BE80B4	S101_1.9 P80 BX80B4	551
783	8.9	3.4	1.8	1280	S301_1.8 S2 ME2SB4	S301_1.8 S2 MX2SB4	554	S301_1.8 P80 BE80B4	S301_1.8 P80 BX80B4	555
891	7.9	1.3	3.2	460	S101_3.2 S2 ME2SA2		550	S101_3.2 P80 BE80A2		551
916	7.7	2.7	3.1	900	S201_3.1 S2 ME2SA2		552	S201_3.1 P80 BE80A2		553

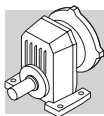


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

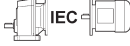
n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE2	 IE3	 IE2	 IE3
1006	7.0	1.4	1.4	440	S101_1.4 S2 ME2SB4	S101_1.4 S2 MX2SB4	S101_1.4 P80 BE80B4	S101_1.4 P80 BX80B4
1028	6.8	2.5	1.4	860	S201_1.4 S2 ME2SB4	S201_1.4 S2 MX2SB4	S201_1.4 P80 BE80B4	S201_1.4 P80 BX80B4
1140	6.2	1.3	2.5	440	S101_2.5 S2 ME2SA2		S101_2.5 P80 BE80A2	
1169	6.0	3.5	2.4	840	S201_2.4 S2 ME2SA2		S201_2.4 P80 BE80A2	
1504	4.7	2.8	1.9	780	S201_1.9 S2 ME2SA2		S201_1.9 P80 BE80A2	
1520	4.6	1.7	1.9	410	S101_1.9 S2 ME2SA2		S101_1.9 P80 BE80A2	
2006	3.5	2.3	1.4	380	S101_1.4 S2 ME2SA2		S101_1.4 P80 BE80A2	

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



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IE3
73	96	1.0	12.9	6170		
90	78	1.5	10.5	5810		
107	65	1.9	8.8	5520		
111	63	1.6	12.9	5460		S501_12.9 P80 BXN80MB4
127	55	2.5	7.4	5240		
131	53	1.7	7.2	3700		
134	52	1.0	10.7	3670		S401_10.7 P80 BXN80MB4
137	51	2.1	10.5	5130		S501_10.5 P80 BXN80MB4
155	45	2.3	6.1	3530		
161	44	1.3	5.8	1960		
163	43	2.6	8.8	4870		S501_8.8 P80 BXN80MB4
166	42	1.4	8.6	3460		S401_8.6 P80 BXN80MB4
191	37	1.6	4.9	1880		
194	36	2.9	4.8	3300		
200	35	2.3	7.2	3280		S401_7.2 P80 BXN80MB4
202	35	1.4	7.1	1860		S301_7.1 P80 BXN80MB4
221	32	2.5	12.9	4420		
230	31	1.3	12.4	3150		
236	30	3.0	6.1	3120		S401_6.1 P80 BXN80MB4
238	29	2.0	3.9	1780		
245	29	1.7	5.8	1780		S301_5.8 P80 BXN80MB4
246	29	0.9	5.8	1160	S201_5.8 S20 MXN20B4	S201_5.8 P80 BXN80MB4
267	26	1.5	10.7	3000		
273	26	3.3	10.5	4140		
277	25	0.9	10.3	1730		
290	24	2.1	4.9	1700		S301_4.9 P80 BXN80MB4
300	23	1.1	4.8	1180	S201_4.8 S20 MXN20B4	S201_4.8 P80 BXN80MB4
302	23	1.3	3.1	1160		
307	23	2.5	3.1	1670		
321	22	1.1	8.9	1660		
330	21	2.3	8.6	2820		
363	19.3	2.6	3.9	1600		S301_3.9 P80 BXN80MB4
364	19.3	1.3	3.9	1130	S201_3.9 S20 MXN20B4	S201_3.9 P80 BXN80MB4
386	18.2	1.6	2.4	1110		
388	18.1	3.2	2.4	1560		
395	17.8	1.2	7.2	1120		
402	17.5	2.3	7.1	1560		
460	15.2	1.7	3.1	1070	S201_3.1 S20 MXN20B4	S201_3.1 P80 BXN80MB4
467	15.0	3.3	3.1	1490		S301_3.1 P80 BXN80MB4
488	14.4	2.8	5.8	1480		
490	14.3	1.5	5.8	1060		
496	14.1	1.4	1.9	1040		
515	13.6	2.6	1.8	1440		

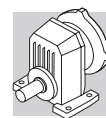


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




n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IE3	 IE3
578	12.1	3.3	4.9	1410	S201_2.4 S20 MXN20B4	552	S201_2.4 P80 BXN80MB4
587	11.9	2.2	2.4	1010			
591	11.9	4.2	2.4	1380			
598	11.7	1.8	4.8	1010			
661	10.6	1.1	1.4	460			
668	10.5	3.3	1.4	1330			
676	10.4	1.9	1.4	960	S201_1.9 S20 MXN20B4 S101_1.9 S20 MXN20B4	552 550	S201_1.9 P80 BXN80MB4 S101_1.9 P80 BXN80MB4 S301_1.8 P80 BXN80MB4
725	9.7	2.2	3.9	960			
741	9.5	1.1	3.8	480			
755	9.3	1.8	1.9	940			
763	9.2	1.1	1.9	460			
783	8.9	3.4	1.8	1280			
891	7.9	1.3	3.2	460	S101_1.4 S20 MXN20B4 S201_1.4 S20 MXN20B4	550 552	S101_1.4 P80 BXN80MB4 S201_1.4 P80 BXN80MB4
916	7.7	2.7	3.1	900			
1006	7.0	1.4	1.4	440			
1028	6.8	2.5	1.4	860			
1140	6.2	1.3	2.5	440			
1169	6.0	3.5	2.4	840			
1504	4.7	2.8	1.9	780			
1520	4.6	1.7	1.9	410			
2006	3.5	2.3	1.4	380			

1.1 kW




n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE2	 IE3	 IE2	 IE3
90	114	1.0	10.5	5650	S501_10.5 S3 ME3LA6	S501_12.9 S3 MX3SA4	558	S501_10.5 P100 BE100M6
108	96	1.3	8.8	5380	S501_8.8 S3 ME3LA6		558	S501_8.8 P100 BE100M6
111	93	1.1	12.9	5320	S501_12.9 S3 ME3SA4		558	S501_12.9 P90 BE90S4
128	81	1.7	7.4	5120	S501_7.4 S3 ME3LA6		558	S501_7.4 P100 BE100M6
132	78	1.2	7.2	3550	S401_7.2 S3 ME3LA6		556	S401_7.2 P100 BE100M6
137	76	1.5	10.5	5020	S501_10.5 S3 ME3SA4	S501_10.5 S3 MX3SA4	558	S501_10.5 P90 BE90S4
156	66	1.6	6.1	3400	S401_6.1 S3 ME3LA6	S501_8.8 S3 MX3SA4 S401_8.6 S3 MX3SA4	556	S401_6.1 P100 BE100M6
156	66	2.3	6.1	4840	S501_6.1 S3 ME3LA6		558	S501_6.1 P100 BE100M6
163	64	1.7	8.8	4770	S501_8.8 S3 ME3SA4		558	S501_8.8 P90 BE90S4
166	63	1.0	8.6	3350	S401_8.6 S3 ME3SA4		556	S401_8.6 P90 BE90S4
192	54	1.1	4.9	1740	S301_4.9 S3 ME3LA6		554	S301_4.9 P100 BE100M6
193	54	2.4	7.4	4530	S501_7.4 S3 ME3SA4	S501_7.4 S3 MX3SA4	558	S501_7.4 P90 BE90S4
196	53	2.0	4.8	3200	S401_4.8 S3 ME3LA6	S401_7.2 S3 MX3SA4 S301_7.1 S3 MX3SA4	556	S401_4.8 P100 BE100M6
200	52	1.5	7.2	3180	S401_7.2 S3 ME3SA4		556	S401_7.2 P90 BE90S4
202	51	1.0	7.1	1730	S301_7.1 S3 ME3SA4		554	S301_7.1 P90 BE90S4
220	47	1.7	12.9	4350	S501_12.9 S2 ME2SB2		558	S501_12.9 P80 BE80B2
236	44	2.0	6.1	3040	S401_6.1 S3 ME3SA4	S401_6.1 S3 MX3SA4	556	S401_6.1 P90 BE90S4
236	44	3.0	6.1	4270	S501_6.1 S3 ME3SA4	S501_6.1 S3 MX3SA4	558	S501_6.1 P90 BE90S4
240	43	1.3	3.9	1670	S301_3.9 S3 ME3LA6	S301_5.8 S3 MX3SA4	554	S301_3.9 P100 BE100M6
245	42	1.2	5.8	1670	S301_5.8 S3 ME3SA4		554	S301_5.8 P90 BE90S4
248	42	2.5	3.8	2990	S401_3.8 S3 ME3LA6		556	S401_3.8 P100 BE100M6
265	39	1.0	10.7	2930	S401_10.7 S2 ME2SB2		556	S401_10.7 P80 BE80B2
271	38	2.2	10.5	4090	S501_10.5 S2 ME2SB2		558	S501_10.5 P80 BE80B2
290	36	1.4	4.9	1610	S301_4.9 S3 ME3SA4	S301_4.9 S3 MX3SA4	554	S301_4.9 P90 BE90S4
296	35	2.6	4.8	2850	S401_4.8 S3 ME3SA4	S401_4.8 S3 MX3SA4	556	S401_4.8 P90 BE90S4
309	33	1.7	3.1	1580	S301_3.1 S3 ME3LA6		554	S301_3.1 P100 BE100M6
310	33	3.2	3.1	2810	S401_3.1 S3 ME3LA6		556	S401_3.1 P100 BE100M6
323	32	2.7	8.8	3870	S501_8.8 S2 ME2SB2		558	S501_8.8 P80 BE80B2
328	31	1.5	8.6	2760	S401_8.6 S2 ME2SB2		556	S401_8.6 P80 BE80B2

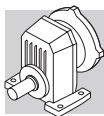


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


n2 min-1	M2 Nm	S	i	Rn2 N						
					IE2	IE3				
					IE2	IE3				
363	29	1.7	3.9	1530	S301_3.9 S3 ME3SA4	S301_3.9 S3 MX3SA4	554	S301_3.9 P90 BE90S4	S301_3.9 P90 BX90S4	555
364	29	0.9	3.9	950	S201_3.9 S3 ME3SA4	S201_3.9 S3 MX3SA4	552	S201_3.9 P90 BE90S4	S201_3.9 P90 BX90S4	553
375	28	3.3	3.8	2650	S401_3.8 S3 ME3SA4	S401_3.8 S3 MX3SA4	556	S401_3.8 P90 BE90S4	S401_3.8 P90 BX90S4	557
390	26	2.2	2.4	1490	S301_2.4 S3 ME3LA6		554	S301_2.4 P100 BE100M6		555
396	26	2.4	7.2	2610	S401_7.2 S2 ME2SB2		556	S401_7.2 P80 BE80B2		557
399	26	1.6	7.1	1500	S301_7.1 S2 ME2SB2		554	S301_7.1 P80 BE80B2		555
460	23	1.2	3.1	990	S201_3.1 S3 ME3SA4	S201_3.1 S3 MX3SA4	552	S201_3.1 P90 BE90S4	S201_3.1 P90 BX90S4	553
467	22	2.3	3.1	1430	S301_3.1 S3 ME3SA4	S301_3.1 S3 MX3SA4	554	S301_3.1 P90 BE90S4	S301_3.1 P90 BX90S4	555
484	21	1.9	5.8	1420	S301_5.8 S2 ME2SB2		554	S301_5.8 P80 BE80B2		555
499	21	1.0	1.9	960	S201_1.9 S3 ME3LA6		552	S201_1.9 P100 BE100M6		553
510	20	3.5	1.9	2420	S401_1.9 S3 ME3LA6		556	S401_1.9 P100 BE100M6		557
518	19.9	1.8	1.8	1380	S301_1.8 S3 ME3LA6		554	S301_1.8 P100 BE100M6		555
574	17.9	2.2	4.9	1360	S301_4.9 S2 ME2SB2		554	S301_4.9 P80 BE80B2		555
587	17.7	1.5	2.4	940	S201_2.4 S3 ME3SA4	S201_2.4 S3 MX3SA4	552	S201_2.4 P90 BE90S4	S201_2.4 P90 BX90S4	553
591	17.6	2.8	2.4	1340	S301_2.4 S3 ME3SA4	S301_2.4 S3 MX3SA4	554	S301_2.4 P90 BE90S4	S301_2.4 P90 BX90S4	555
593	17.3	1.2	4.8	950	S201_4.8 S2 ME2SB2		552	S201_4.8 P80 BE80B2		553
671	15.3	2.3	1.4	1290	S301_1.4 S3 ME3LA6		554	S301_1.4 P100 BE100M6		555
679	15.2	1.3	1.4	900	S201_1.4 S3 ME3LA6		552	S201_1.4 P100 BE100M6		553
717	14.3	2.8	3.9	1280	S301_3.9 S2 ME2SB2		554	S301_3.9 P80 BE80B2		555
719	14.3	1.5	3.9	910	S201_3.9 S2 ME2SB2		552	S201_3.9 P80 BE80B2		553
755	13.7	1.2	1.9	890	S201_1.9 S3 ME3SA4	S201_1.9 S3 MX3SA4	552	S201_1.9 P90 BE90S4	S201_1.9 P90 BX90S4	553
783	13.2	2.3	1.8	1240	S301_1.8 S3 ME3SA4	S301_1.8 S3 MX3SA4	554	S301_1.8 P90 BE90S4	S301_1.8 P90 BX90S4	555
910	11.3	1.9	3.1	860	S201_3.1 S2 ME2SB2		552	S201_3.1 P80 BE80B2		553
1006	10.3	1.0	1.4	390	S101_1.4 S3 ME3SA4	S101_1.4 S3 MX3SA4	550	S101_1.4 P90 BE90S4	S101_1.4 P90 BX90S4	551
1016	10.2	2.9	1.4	1150	S301_1.4 S3 ME3SA4	S301_1.4 S3 MX3SA4	554	S301_1.4 P90 BE90S4	S301_1.4 P90 BX90S4	555
1028	10.1	1.7	1.4	820	S201_1.4 S3 ME3SA4	S201_1.4 S3 MX3SA4	552	S201_1.4 P90 BE90S4	S201_1.4 P90 BX90S4	553
1161	8.9	2.4	2.4	810	S201_2.4 S2 ME2SB2		552	S201_2.4 P80 BE80B2		553
1494	6.9	1.9	1.9	750	S201_1.9 S2 ME2SB2		552	S201_1.9 P80 BE80B2		553
1509	6.8	1.2	1.9	380	S101_1.9 S2 ME2SB2		550	S101_1.9 P80 BE80B2		551
1991	5.2	1.5	1.4	350	S101_1.4 S2 ME2SB2		550	S101_1.4 P80 BE80B2		551
2034	5.1	2.6	1.4	690	S201_1.4 S2 ME2SB2		552	S201_1.4 P80 BE80B2		553

1.1 kW






n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	 IE3	 IEC	 IE3
90	114	1.0	10.5	5650			
108	96	1.3	8.8	5380			
111	93	1.1	12.9	5320			S501_12.9 P90 BXN90S4
128	81	1.7	7.4	5120			
132	78	1.2	7.2	3550			
137	76	1.5	10.5	5020			S501_10.5 P90 BXN90S4
156	66	1.6	6.1	3400			
156	66	2.3	6.1	4840			
163	64	1.7	8.8	4770			S501_8.8 P90 BXN90S4
166	63	1.0	8.6	3350			S401_8.6 P90 BXN90S4
192	54	1.1	4.9	1740			
193	54	2.4	7.4	4530			S501_7.4 P90 BXN90S4
196	53	2.0	4.8	3200			
200	52	1.5	7.2	3180			S401_7.2 P90 BXN90S4
202	51	1.0	7.1	1730			S301_7.1 P90 BXN90S4
220	47	1.7	12.9	4350			
236	44	2.0	6.1	3040			S401_6.1 P90 BXN90S4
236	44	3.0	6.1	4270			S501_6.1 P90 BXN90S4
240	43	1.3	3.9	1670			

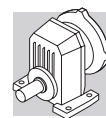


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

n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IE3	
245	42	1.2	5.8	1670		S301_5.8 P90 BXN90S4	555
248	42	2.5	3.8	2990			
265	39	1.0	10.7	2930			
271	38	2.2	10.5	4090			
290	36	1.4	4.9	1610		S301_4.9 P90 BXN90S4	555
296	35	2.6	4.8	2850		S401_4.8 P90 BXN90S4	557
309	33	1.7	3.1	1580			
310	33	3.2	3.1	2810			
323	32	2.7	8.8	3870			
328	31	1.5	8.6	2760			
363	29	1.7	3.9	1530		S301_3.9 P90 BXN90S4	555
364	29	0.9	3.9	950		S201_3.9 P90 BXN90S4	553
375	28	3.3	3.8	2650		S401_3.8 P90 BXN90S4	557
390	26	2.2	2.4	1490			
396	26	2.4	7.2	2610			
399	26	1.6	7.1	1500			
460	23	1.2	3.1	990		S201_3.1 P90 BXN90S4	553
467	22	2.3	3.1	1430		S301_3.1 P90 BXN90S4	555
484	21	1.9	5.8	1420			
499	21	1.0	1.9	960			
510	20	3.5	1.9	2420			
518	19.9	1.8	1.8	1380			
574	17.9	2.2	4.9	1360			
587	17.7	1.5	2.4	940		S201_2.4 P90 BXN90S4	553
591	17.6	2.8	2.4	1340		S301_2.4 P90 BXN90S4	555
593	17.3	1.2	4.8	950			
671	15.3	2.3	1.4	1290			
679	15.2	1.3	1.4	900			
717	14.3	2.8	3.9	1280			
719	14.3	1.5	3.9	910			
755	13.7	1.2	1.9	890		S201_1.9 P90 BXN90S4	553
783	13.2	2.3	1.8	1240		S301_1.8 P90 BXN90S4	555
910	11.3	1.9	3.1	860			
1006	10.3	1.0	1.4	390		S101_1.4 P90 BXN90S4	551
1016	10.2	2.9	1.4	1150		S301_1.4 P90 BXN90S4	555
1028	10.1	1.7	1.4	820		S201_1.4 P90 BXN90S4	553
1161	8.9	2.4	2.4	810			
1494	6.9	1.9	1.9	750			
1509	6.8	1.2	1.9	380			
1991	5.2	1.5	1.4	350			
2034	5.1	2.6	1.4	690			

1.5 kW



n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE2	 IE3		 IEC	
108	130	1.0	8.8	5190	S501_8.8 S3 ME3LB6		558	S501_8.8 P100 BE100LA6	559
128	110	1.3	7.4	4960	S501_7.4 S3 ME3LB6		558	S501_7.4 P100 BE100LA6	559
137	102	1.1	10.5	4880	S501_10.5 S3 ME3SB4	S501_10.5 S3 MX3SB4	558	S501_10.5 P90 BE90LA4	559
156	90	1.7	6.1	4700	S501_6.1 S3 ME3LB6		558	S501_6.1 P100 BE100LA6	559
163	86	1.3	8.8	4660	S501_8.8 S3 ME3SB4	S501_8.8 S3 MX3SB4	558	S501_8.8 P90 BE90LA4	559
193	73	1.8	7.4	4440	S501_7.4 S3 ME3SB4	S501_7.4 S3 MX3SB4	558	S501_7.4 P90 BE90LA4	559
196	72	1.5	4.8	3070	S401_4.8 S3 ME3LB6		556	S401_4.8 P100 BE100LA6	557
199	71	2.5	4.8	4380	S501_4.8 S3 ME3LB6		558	S501_4.8 P100 BE100LA6	559
200	70	1.1	7.2	3070	S401_7.2 S3 ME3SB4	S401_7.2 S3 MX3SB4	556	S401_7.2 P90 BE90LA4	557
222	63	1.3	12.9	4270	S501_12.9 S3 ME3SA2		558	S501_12.9 P90 BE90SA2	559
236	59	1.5	6.1	2940	S401_6.1 S3 ME3SB4	S401_6.1 S3 MX3SB4	556	S401_6.1 P90 BE90LA4	557

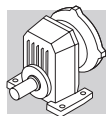


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


n ₂ min-1	M ₂ Nm	S	i	R _{n2} N				
					IE2	IE3	IE2	IE3
236	59	2.2	6.1	4190	S501_6.1 S3 ME3SB4	S501_6.1 S3 MX3SB4	S501_6.1 P90 BE90LA4	S501_6.1 P90 BX90LA4
248	57	1.9	3.8	2880	S401_3.8 S3 ME3LB6		S401_3.8 P100 BE100LA6	
273	51	1.7	10.5	4020	S501_10.5 S3 ME3SA2		S501_10.5 P90 BE90SA2	
290	48	1.0	4.9	1500	S301_4.9 S3 ME3SB4	S301_4.9 S3 MX3SB4	S301_4.9 P90 BE90LA4	S301_4.9 P90 BX90LA4
296	47	1.9	4.8	2770	S401_4.8 S3 ME3SB4	S401_4.8 S3 MX3SB4	S401_4.8 P90 BE90LA4	S401_4.8 P90 BX90LA4
301	47	3.2	4.8	3890	S501_4.8 S3 ME3SB4	S501_4.8 S3 MX3SB4	S501_4.8 P90 BE90LA4	S501_4.8 P90 BX90LA4
309	45	1.3	3.1	1470	S301_3.1 S3 ME3LB6		S301_3.1 P100 BE100LA6	
310	45	2.3	3.1	2720	S401_3.1 S3 ME3LB6		S401_3.1 P100 BE100LA6	
326	43	2.0	8.8	3820	S501_8.8 S3 ME3SA2		S501_8.8 P90 BE90SA2	
331	42	1.1	8.6	2700	S401_8.6 S3 ME3SA2		S401_8.6 P90 BE90SA2	
363	39	1.3	3.9	1440	S301_3.9 S3 ME3SB4	S301_3.9 S3 MX3SB4	S301_3.9 P90 BE90LA4	S301_3.9 P90 BX90LA4
375	37	2.4	3.8	2590	S401_3.8 S3 ME3SB4	S401_3.8 S3 MX3SB4	S401_3.8 P90 BE90LA4	S401_3.8 P90 BX90LA4
386	36	2.7	7.4	3630	S501_7.4 S3 ME3SA2		S501_7.4 P90 BE90SA2	
390	36	1.6	2.4	1400	S301_2.4 S3 ME3LB6		S301_2.4 P100 BE100LA6	
395	36	3.0	2.4	2540	S401_2.4 S3 ME3LB6		S401_2.4 P100 BE100LA6	
399	35	1.8	7.2	2560	S401_7.2 S3 ME3SA2		S401_7.2 P90 BE90SA2	
403	35	1.1	7.1	1420	S301_7.1 S3 ME3SA2		S301_7.1 P90 BE90SA2	
467	30	1.7	3.1	1360	S301_3.1 S3 ME3SB4	S301_3.1 S3 MX3SB4	S301_3.1 P90 BE90LA4	S301_3.1 P90 BX90LA4
468	30	3.0	3.1	2430	S401_3.1 S3 ME3SB4	S401_3.1 S3 MX3SB4	S401_3.1 P90 BE90LA4	S401_3.1 P90 BX90LA4
471	30	2.3	6.1	2440	S401_6.1 S3 ME3SA2		S401_6.1 P90 BE90SA2	
488	29	1.4	5.8	1360	S301_5.8 S3 ME3SA2		S301_5.8 P90 BE90SA2	
510	28	2.5	1.9	2350	S401_1.9 S3 ME3LB6		S401_1.9 P100 BE100LA6	
518	27	1.3	1.8	1310	S301_1.8 S3 ME3LB6		S301_1.8 P100 BE100LA6	
579	24	1.6	4.9	1310	S301_4.9 S3 ME3SA2		S301_4.9 P90 BE90SA2	
587	24	1.1	2.4	870	S201_2.4 S3 ME3SB4	S201_2.4 S3 MX3SB4	S201_2.4 P90 BE90LA4	S201_2.4 P90 BX90LA4
591	24	2.1	2.4	1290	S301_2.4 S3 ME3SB4	S301_2.4 S3 MX3SB4	S301_2.4 P90 BE90LA4	S301_2.4 P90 BX90LA4
598	23	3.8	2.4	2200	S401_2.4 S3 ME3SB4	S401_2.4 S3 MX3SB4	S401_2.4 P90 BE90LA4	S401_2.4 P90 BX90LA4
671	21	1.7	1.4	1230	S301_1.4 S3 ME3LB6		S301_1.4 P100 BE100LA6	
679	21	1.0	1.4	830	S201_1.4 S3 ME3LB6		S201_1.4 P100 BE100LA6	
693	20	3.5	1.4	2150	S401_1.4 S3 ME3LB6		S401_1.4 P100 BE100LA6	
724	19.4	2.1	3.9	1240	S301_3.9 S3 ME3SA2		S301_3.9 P90 BE90SA2	
755	18.6	0.9	1.9	830	S201_1.9 S3 ME3SB4	S201_1.9 S3 MX3SB4	S201_1.9 P90 BE90LA4	S201_1.9 P90 BX90LA4
772	18.1	3.3	1.9	2090	S401_1.9 S3 ME3SB4	S401_1.9 S3 MX3SB4	S401_1.9 P90 BE90LA4	S401_1.9 P90 BX90LA4
783	17.9	1.7	1.8	1200	S301_1.8 S3 ME3SB4	S301_1.8 S3 MX3SB4	S301_1.8 P90 BE90LA4	S301_1.8 P90 BX90LA4
918	15.3	1.4	3.1	810	S201_3.1 S3 ME3SA2		S201_3.1 P90 BE90SA2	
932	15.1	2.7	3.1	1160	S301_3.1 S3 ME3SA2		S301_3.1 P90 BE90SA2	
1016	13.8	2.2	1.4	1110	S301_1.4 S3 ME3SB4	S301_1.4 S3 MX3SB4	S301_1.4 P90 BE90LA4	S301_1.4 P90 BX90LA4
1028	13.6	1.2	1.4	780	S201_1.4 S3 ME3SB4	S201_1.4 S3 MX3SB4	S201_1.4 P90 BE90LA4	S201_1.4 P90 BX90LA4
1171	12.0	1.8	2.4	770	S201_2.4 S3 ME3SA2		S201_2.4 P90 BE90SA2	
1507	9.3	1.4	1.9	720	S201_1.9 S3 ME3SA2		S201_1.9 P90 BE90SA2	
1563	9.0	2.7	1.8	1000	S301_1.8 S3 ME3SA2		S301_1.8 P90 BE90SA2	
2009	7.0	1.1	1.4	320	S101_1.4 S3 ME3SA2		S101_1.4 P90 BE90SA2	
2029	6.9	3.5	1.4	920	S301_1.4 S3 ME3SA2		S301_1.4 P90 BE90SA2	
2052	6.8	1.9	1.4	670	S201_1.4 S3 ME3SA2		S201_1.4 P90 BE90SA2	

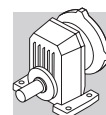
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n ₂ min-1	M ₂ Nm	S	i	R _{n2} N		
					IE3	IE3
108	130	1.0	8.8	5190		
128	110	1.3	7.4	4960		
137	102	1.1	10.5	4880		
156	90	1.7	6.1	4700		
163	86	1.3	8.8	4660		S501_8.8 P90 BXN90L4
193	73	1.8	7.4	4440		S501_7.4 P90 BXN90L4







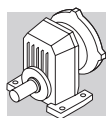
1.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N	 IE3	 IEC IE3	
196	72	1.5	4.8	3070			
199	71	2.5	4.8	4380			
200	70	1.1	7.2	3070		S401_7.2 P90 BXN90L4	557
222	63	1.3	12.9	4270			
236	59	1.5	6.1	2940		S401_6.1 P90 BXN90L4	557
236	59	2.2	6.1	4190		S501_6.1 P90 BXN90L4	559
248	57	1.9	3.8	2880			
273	51	1.7	10.5	4020			
290	48	1.0	4.9	1500		S301_4.9 P90 BXN90L4	555
296	47	1.9	4.8	2770		S401_4.8 P90 BXN90L4	557
301	47	3.2	4.8	3890		S501_4.8 P90 BXN90L4	559
309	45	1.3	3.1	1470			
310	45	2.3	3.1	2720			
326	43	2.0	8.8	3820			
331	42	1.1	8.6	2700			
363	39	1.3	3.9	1440		S301_3.9 P90 BXN90L4	555
375	37	2.4	3.8	2590		S401_3.8 P90 BXN90L4	557
386	36	2.7	7.4	3630			
390	36	1.6	2.4	1400			
395	36	3.0	2.4	2540			
399	35	1.8	7.2	2560			
403	35	1.1	7.1	1420			
467	30	1.7	3.1	1360		S301_3.1 P90 BXN90L4	555
468	30	3.0	3.1	2430		S401_3.1 P90 BXN90L4	557
471	30	2.3	6.1	2440			
488	29	1.4	5.8	1360			
510	28	2.5	1.9	2350			
518	27	1.3	1.8	1310			
579	24	1.6	4.9	1310			
587	24	1.1	2.4	870		S201_2.4 P90 BXN90L4	553
591	24	2.1	2.4	1290		S301_2.4 P90 BXN90L4	555
598	23	3.8	2.4	2200		S401_2.4 P90 BXN90L4	557
671	21	1.7	1.4	1230			
679	21	1.0	1.4	830			
693	20	3.5	1.4	2150			
724	19.4	2.1	3.9	1240			
755	18.6	0.9	1.9	830		S201_1.9 P90 BXN90L4	553
772	18.1	3.3	1.9	2090		S401_1.9 P90 BXN90L4	557
783	17.9	1.7	1.8	1200		S301_1.8 P90 BXN90L4	555
918	15.3	1.4	3.1	810			
932	15.1	2.7	3.1	1160			
1016	13.8	2.2	1.4	1110		S301_1.4 P90 BXN90L4	555
1028	13.6	1.2	1.4	780		S201_1.4 P90 BXN90L4	553
1171	12.0	1.8	2.4	770			
1507	9.3	1.4	1.9	720			
1563	9.0	2.7	1.8	1000			
2009	7.0	1.1	1.4	320			
2029	6.9	3.5	1.4	920			
2052	6.8	1.9	1.4	670			



2.2 kW

n ₂ min-1	M ₂ Nm	S	i	R _{n2} N						
					IE2	IE3		IE2	IE3	
158	131	1.1	6.1	4520	S501_6.1 S4 ME4SA6		558	S501_6.1 P112 BE112M6		559
193	107	1.2	7.4	4280	S501_7.4 S3 ME3LA4	S501_7.4 S3 MX3LA4	558	S501_7.4 P100 BE100LA4	S501_7.4 P100 BX100LA4	559
201	102	1.7	4.8	4230	S501_4.8 S4 ME4SA6		558	S501_4.8 P112 BE112M6		559
236	87	1.0	6.1	2790	S401_6.1 S3 ME3LA4	S401_6.1 S3 MX3LA4	556	S401_6.1 P100 BE100LA4	S401_6.1 P100 BX100LA4	557
236	87	1.5	6.1	4060	S501_6.1 S3 ME3LA4	S501_6.1 S3 MX3LA4	558	S501_6.1 P100 BE100LA4	S501_6.1 P100 BX100LA4	559
249	83	2.1	3.8	4000	S501_3.8 S4 ME4SA6		558	S501_3.8 P112 BE112M6		559
250	82	1.3	3.8	2730	S401_3.8 S4 ME4SA6		556	S401_3.8 P112 BE112M6		557
274	75	1.1	10.5	3910	S501_10.5 S3 ME3LA2		558	S501_10.5 P90 BE90L2		559
296	70	1.3	4.8	2640	S401_4.8 S3 ME3LA4	S401_4.8 S3 MX3LA4	556	S401_4.8 P100 BE100LA4	S401_4.8 P100 BX100LA4	557
301	68	2.2	4.8	3790	S501_4.8 S3 ME3LA4	S501_4.8 S3 MX3LA4	558	S501_4.8 P100 BE100LA4	S501_4.8 P100 BX100LA4	559
313	66	1.6	3.1	2590	S401_3.1 S4 ME4SA6		556	S401_3.1 P112 BE112M6		557
314	66	2.4	3.0	3750	S501_3.0 S4 ME4SA6		558	S501_3.0 P112 BE112M6		559
327	63	1.3	8.8	3730	S501_8.8 S3 ME3LA2		558	S501_8.8 P90 BE90L2		559
372	55	2.7	3.8	3570	S501_3.8 S3 ME3LA4	S501_3.8 S3 MX3LA4	558	S501_3.8 P100 BE100LA4	S501_3.8 P100 BX100LA4	559
375	55	1.6	3.8	2490	S401_3.8 S3 ME3LA4	S401_3.8 S3 MX3LA4	556	S401_3.8 P100 BE100LA4	S401_3.8 P100 BX100LA4	557
387	53	1.9	7.4	3540	S501_7.4 S3 ME3LA2		558	S501_7.4 P90 BE90L2		559
394	52	1.1	2.4	1260	S301_2.4 S4 ME4SA6		554	S301_2.4 P112 BE112M6		555
399	52	2.0	2.4	2450	S401_2.4 S4 ME4SA6		556	S401_2.4 P112 BE112M6		557
400	51	1.2	7.2	2460	S401_7.2 S3 ME3LA2		556	S401_7.2 P90 BE90L2		557
467	44	1.1	3.1	1240	S301_3.1 S3 ME3LA4	S301_3.1 S3 MX3LA4	554	S301_3.1 P100 BE100LA4	S301_3.1 P100 BX100LA4	555
468	44	2.0	3.1	2340	S401_3.1 S3 ME3LA4	S401_3.1 S3 MX3LA4	556	S401_3.1 P100 BE100LA4	S401_3.1 P100 BX100LA4	557
470	44	3.2	3.0	3340	S501_3.0 S3 ME3LA4	S501_3.0 S3 MX3LA4	558	S501_3.0 P100 BE100LA4	S501_3.0 P100 BX100LA4	559
472	44	1.6	6.1	2360	S401_6.1 S3 ME3LA2		556	S401_6.1 P90 BE90L2		557
473	44	2.3	6.1	3340	S501_6.1 S3 ME3LA2		558	S501_6.1 P90 BE90L2		559
490	42	1.0	5.8	1250	S301_5.8 S3 ME3LA2		554	S301_5.8 P90 BE90L2		555
516	40	1.8	1.9	2280	S401_1.9 S4 ME4SA6		556	S401_1.9 P112 BE112M6		557
534	39	3.2	1.8	3210	S501_1.8 S4 ME4SA6		558	S501_1.8 P112 BE112M6		559
581	35	1.1	4.9	1220	S301_4.9 S3 ME3LA2		554	S301_4.9 P90 BE90L2		555
591	35	1.4	2.4	1190	S301_2.4 S3 ME3LA4	S301_2.4 S3 MX3LA4	554	S301_2.4 P100 BE100LA4	S301_2.4 P100 BX100LA4	555
593	35	2.0	4.8	2210	S401_4.8 S3 ME3LA2		556	S401_4.8 P90 BE90L2		557
598	34	2.6	2.4	2200	S401_2.4 S3 ME3LA4	S401_2.4 S3 MX3LA4	556	S401_2.4 P100 BE100LA4	S401_2.4 P100 BX100LA4	557
679	30	1.2	1.4	1140	S301_1.4 S4 ME4SA6		554	S301_1.4 P112 BE112M6		555
700	29	2.4	1.4	2090	S401_1.4 S4 ME4SA6		556	S401_1.4 P112 BE112M6		557
726	28	1.4	3.9	1160	S301_3.9 S3 ME3LA2		554	S301_3.9 P90 BE90L2		555
751	27	2.6	3.8	2070	S401_3.8 S3 ME3LA2		556	S401_3.8 P90 BE90L2		557
772	27	2.2	1.9	2040	S401_1.9 S3 ME3LA4	S401_1.9 S3 MX3LA4	556	S401_1.9 P100 BE100LA4	S401_1.9 P100 BX100LA4	557
783	26	1.1	1.8	1120	S301_1.8 S3 ME3LA4	S301_1.8 S3 MX3LA4	554	S301_1.8 P100 BE100LA4	S301_1.8 P100 BX100LA4	555
921	22	0.9	3.1	730	S201_3.1 S3 ME3LA2		552	S201_3.1 P90 BE90L2		553
936	22	1.8	3.1	1100	S301_3.1 S3 ME3LA2		554	S301_3.1 P90 BE90L2		555
1016	20	1.5	1.4	1050	S301_1.4 S3 ME3LA4	S301_1.4 S3 MX3LA4	554	S301_1.4 P100 BE100LA4	S301_1.4 P100 BX100LA4	555
1049	19.6	3.1	1.4	1860	S401_1.4 S3 ME3LA4	S401_1.4 S3 MX3LA4	556	S401_1.4 P100 BE100LA4	S401_1.4 P100 BX100LA4	557
1175	17.5	1.2	2.4	710	S201_2.4 S3 ME3LA2		552	S201_2.4 P90 BE90L2		553
1183	17.4	2.3	2.4	1030	S301_2.4 S3 ME3LA2		554	S301_2.4 P90 BE90L2		555
1512	13.6	1.0	1.9	670	S201_1.9 S3 ME3LA2		552	S201_1.9 P90 BE90L2		553
1569	13.1	1.8	1.8	960	S301_1.8 S3 ME3LA2		554	S301_1.8 P90 BE90L2		555
2036	10.1	2.4	1.4	890	S301_1.4 S3 ME3LA2		554	S301_1.4 P90 BE90L2		555
2059	10.0	1.3	1.4	630	S201_1.4 S3 ME3LA2		552	S201_1.4 P90 BE90L2		553

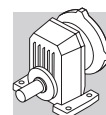


3 kW



n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	IE2	IE3	IE2	IE3
201	140	1.3	4.8	4040	S501_4.8 S4 ME4SB6		S501_4.8 P132 BE132S6	
238	119	1.1	6.1	3910	S501_6.1 S3 ME3LB4	S501_6.1 S3 MX3LB4	S501_6.1 P100 BE100LB4	S501_6.1 P100 BX100LB4
249	113	1.5	3.8	3840	S501_3.8 S4 ME4SB6		S501_3.8 P132 BE132S6	
298	95	1.0	4.8	2490	S401_4.8 S3 ME3LB4	S401_4.8 S3 MX3LB4	S401_4.8 P100 BE100LB4	S401_4.8 P100 BX100LB4
303	93	1.6	4.8	3670	S501_4.8 S3 ME3LB4	S501_4.8 S3 MX3LB4	S501_4.8 P100 BE100LB4	S501_4.8 P100 BX100LB4
313	90	1.2	3.1	2440	S401_3.1 S4 ME4SB6		S401_3.1 P132 BE132S6	
314	89	1.8	3.0	3630	S501_3.0 S4 ME4SB6		S501_3.0 P132 BE132S6	
328	85	1.0	8.8	3600	S501_8.8 S3 ME3LB2		S501_8.8 P100 BE100L2	
375	75	2.0	3.8	3470	S501_3.8 S3 ME3LB4	S501_3.8 S3 MX3LB4	S501_3.8 P100 BE100LB4	S501_3.8 P100 BX100LB4
378	75	1.2	3.8	2370	S401_3.8 S3 ME3LB4	S401_3.8 S3 MX3LB4	S401_3.8 P100 BE100LB4	S401_3.8 P100 BX100LB4
389	72	1.4	7.4	3440	S501_7.4 S3 ME3LB2		S501_7.4 P100 BE100L2	
397	71	2.1	2.4	3390	S501_2.4 S4 ME4SB6		S501_2.4 P132 BE132S6	
399	70	1.5	2.4	2320	S401_2.4 S4 ME4SB6		S401_2.4 P132 BE132S6	
472	60	1.5	3.1	2250	S401_3.1 S3 ME3LB4	S401_3.1 S3 MX3LB4	S401_3.1 P100 BE100LB4	S401_3.1 P100 BX100LB4
473	60	2.3	3.0	3260	S501_3.0 S3 ME3LB4	S501_3.0 S3 MX3LB4	S501_3.0 P100 BE100LB4	S501_3.0 P100 BX100LB4
516	54	1.3	1.9	2170	S401_1.9 S4 ME4SB6		S401_1.9 P132 BE132S6	
534	53	2.4	1.8	3120	S501_1.8 S4 ME4SB6		S501_1.8 P132 BE132S6	
595	47	1.1	2.4	1080	S301_2.4 S3 ME3LB4	S301_2.4 S3 MX3LB4	S301_2.4 P100 BE100LB4	S301_2.4 P100 BX100LB4
596	47	1.5	4.8	2130	S401_4.8 S3 ME3LB2		S401_4.8 P100 BE100L2	
598	47	2.8	2.4	3040	S501_2.4 S3 ME3LB4	S501_2.4 S3 MX3LB4	S501_2.4 P100 BE100LB4	S501_2.4 P100 BX100LB4
602	47	1.9	2.4	2120	S401_2.4 S3 ME3LB4	S401_2.4 S3 MX3LB4	S401_2.4 P100 BE100LB4	S401_2.4 P100 BX100LB4
606	46	2.6	4.8	3030	S501_4.8 S3 ME3LB2		S501_4.8 P100 BE100L2	
672	42	3.0	1.4	2920	S501_1.4 S4 ME4SB6		S501_1.4 P132 BE132S6	
700	40	1.7	1.4	2010	S401_1.4 S4 ME4SB6		S401_1.4 P132 BE132S6	
730	38	1.0	3.9	1070	S301_3.9 S3 ME3LB2		S301_3.9 P100 BE100L2	
755	37	1.9	3.8	2000	S401_3.8 S3 ME3LB2		S401_3.8 P100 BE100L2	
778	36	1.7	1.9	1970	S401_1.9 S3 ME3LB4	S401_1.9 S3 MX3LB4	S401_1.9 P100 BE100LB4	S401_1.9 P100 BX100LB4
789	36	0.8	1.8	900	S301_1.8 S3 ME3LB4	S301_1.8 S3 MX3LB4	S301_1.8 P100 BE100LB4	S301_1.8 P100 BX100LB4
805	35	3.1	1.8	2780	S501_1.8 S3 ME3LB4	S501_1.8 S3 MX3LB4	S501_1.8 P100 BE100LB4	S501_1.8 P100 BX100LB4
940	30	1.3	3.1	1020	S301_3.1 S3 ME3LB2		S301_3.1 P100 BE100L2	
943	30	2.4	3.1	1880	S401_3.1 S3 ME3LB2		S401_3.1 P100 BE100L2	
1023	28	1.1	1.4	980	S301_1.4 S3 ME3LB4	S301_1.4 S3 MX3LB4	S301_1.4 P100 BE100LB4	S301_1.4 P100 BX100LB4
1056	27	2.2	1.4	1820	S401_1.4 S3 ME3LB4	S401_1.4 S3 MX3LB4	S401_1.4 P100 BE100LB4	S401_1.4 P100 BX100LB4
1190	24	1.7	2.4	980	S301_2.4 S3 ME3LB2		S301_2.4 P100 BE100L2	
1204	23	3.0	2.4	1760	S401_2.4 S3 ME3LB2		S401_2.4 P100 BE100L2	
1555	18.1	2.7	1.9	1630	S401_1.9 S3 ME3LB2		S401_1.9 P100 BE100L2	
1577	17.8	1.3	1.8	910	S301_1.8 S3 ME3LB2		S301_1.8 P100 BE100L2	
2046	13.7	1.7	1.4	850	S301_1.4 S3 ME3LB2		S301_1.4 P100 BE100L2	
2070	13.6	1.0	1.4	580	S201_1.4 S3 ME3LB2		S201_1.4 P100 BE100L2	

4 kW



n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	IE2	IE3	IE2	IE3
203	184	0.9	4.8	3810	S501_4.8 S4 ME4LA6		S501_4.8 P132 BE132MA6	
251	149	1.2	3.8	3650	S501_3.8 S4 ME4LA6		S501_3.8 P132 BE132MA6	
303	126	1.2	4.8	3530	S501_4.8 S4 ME4SA4	S501_4.8 S4 MX4SA4	S501_4.8 P112 BE112M4	S501_4.8 P112 BX112M4
317	118	1.4	3.0	3470	S501_3.0 S4 ME4LA6		S501_3.0 P132 BE132MA6	
375	102	1.5	3.8	3360	S501_3.8 S4 ME4SA4	S501_3.8 S4 MX4SA4	S501_3.8 P112 BE112M4	S501_3.8 P112 BX112M4
392	96	1.0	7.4	3320	S501_7.4 S4 ME4SA2		S501_7.4 P112 BE112M2	
401	93	1.6	2.4	3270	S501_2.4 S4 ME4LA6		S501_2.4 P132 BE132MA6	
472	81	1.1	3.1	2130	S401_3.1 S4 ME4SA4	S401_3.1 S4 MX4SA4	S401_3.1 P112 BE112M4	S401_3.1 P112 BX112M4
473	81	1.7	3.0	3170	S501_3.0 S4 ME4SA4	S501_3.0 S4 MX4SA4	S501_3.0 P112 BE112M4	S501_3.0 P112 BX112M4
479	78	1.3	6.1	3160	S501_6.1 S4 ME4SA2		S501_6.1 P112 BE112M2	
521	72	1.0	1.9	2050	S401_1.9 S4 ME4LA6		S401_1.9 P132 BE132MA6	

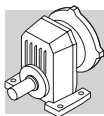


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



n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	 IE2 IE3		 IE2 IE3	
540	69	1.8	1.8	3020	S501_1.8 S4 ME4LA6		S501_1.8 P132 BE132MA6	
598	64	2.0	2.4	2970	S501_2.4 S4 ME4SA4	S501_2.4 S4 MX4SA4	S501_2.4 P112 BE112M4	S501_2.4 P112 BX112M4
602	63	1.4	2.4	2030	S401_2.4 S4 ME4SA4	S401_2.4 S4 MX4SA4	S401_2.4 P112 BE112M4	S401_2.4 P112 BX112M4
611	61	2.0	4.8	2960	S501_4.8 S4 ME4SA2		S501_4.8 P112 BE112M2	
679	55	2.3	1.4	2830	S501_1.4 S4 ME4LA6		S501_1.4 P132 BE132MA6	
708	53	1.3	1.4	1920	S401_1.4 S4 ME4LA6		S401_1.4 P132 BE132MA6	
755	50	2.4	3.8	2790	S501_3.8 S4 ME4SA2		S501_3.8 P112 BE112M2	
761	49	1.4	3.8	1930	S401_3.8 S4 ME4SA2		S401_3.8 P112 BE112M2	
778	49	1.2	1.9	1900	S401_1.9 S4 ME4SA4	S401_1.9 S4 MX4SA4	S401_1.9 P112 BE112M4	S401_1.9 P112 BX112M4
805	47	2.3	1.8	2730	S501_1.8 S4 ME4SA4	S501_1.8 S4 MX4SA4	S501_1.8 P112 BE112M4	S501_1.8 P112 BX112M4
953	39	2.8	3.0	2610	S501_3.0 S4 ME4SA2		S501_3.0 P112 BE112M2	
950	39	1.8	3.1	1820	S401_3.1 S4 ME4SA2		S401_3.1 P112 BE112M2	
1013	38	2.9	1.4	2560	S501_1.4 S4 ME4SA4	S501_1.4 S4 MX4SA4	S501_1.4 P112 BE112M4	S501_1.4 P112 BX112M4
1056	36	1.7	1.4	1760	S401_1.4 S4 ME4SA4	S401_1.4 S4 MX4SA4	S401_1.4 P112 BE112M4	S401_1.4 P112 BX112M4
1198	31	1.3	2.4	910	S301_2.4 S4 ME4SA2		S301_2.4 P112 BE112M2	
1213	31	2.3	2.4	1710	S401_2.4 S4 ME4SA2		S401_2.4 P112 BE112M2	
1566	24	2.0	1.9	1590	S401_1.9 S4 ME4SA2		S401_1.9 P112 BE112M2	
1588	24	1.0	1.8	860	S301_1.8 S4 ME4SA2		S301_1.8 P112 BE112M2	
2061	18.2	1.3	1.4	810	S301_1.4 S4 ME4SA2		S301_1.4 P112 BE112M2	
2127	17.6	2.7	1.4	1460	S401_1.4 S4 ME4SA2		S401_1.4 P112 BE112M2	

5.5 kW






n ₂ min-1	M ₂ Nm	S	i	R _{n2} N	 IE2 IE3		 IE2 IE3	
317	162	1.0	3.0	3260	S501_3.0 S5 ME5SA6		S501_3.0 P160 BE160MA6	
380	136	1.1	3.8	3150	S501_3.8 S4 ME4SB4	S501_3.8 S4 MX4SB4	S501_3.8 P132 BE132S4	S501_3.8 P132 BX132SB4
401	128	1.2	2.4	3090	S501_2.4 S5 ME5SA6		S501_2.4 P160 BE160MA6	
480	107	1.3	3.0	3000	S501_3.0 S4 ME4SB4	S501_3.0 S4 MX4SB4	S501_3.0 P132 BE132S4	S501_3.0 P132 BX132SB4
540	95	1.3	1.8	2880	S501_1.8 S5 ME5SA6		S501_1.8 P160 BE160MA6	
606	85	1.5	2.4	2830	S501_2.4 S4 ME4SB4	S501_2.4 S4 MX4SB4	S501_2.4 P132 BE132S4	S501_2.4 P132 BX132SB4
611	84	1.1	2.4	1870	S401_2.4 S4 ME4SB4	S401_2.4 S4 MX4SB4	S401_2.4 P132 BE132S4	S401_2.4 P132 BX132SB4
616	84	1.4	4.8	2840	S501_4.8 S4 ME4SB2		S501_4.8 P132 BE132SA2	
679	76	1.6	1.4	2720	S501_1.4 S5 ME5SA6		S501_1.4 P160 BE160MA6	
708	73	1.0	1.4	1780			S401_1.4 P160 BE160MA6	
761	68	1.8	3.8	2690	S501_3.8 S4 ME4SB2		S501_3.8 P132 BE132SA2	
767	67	1.0	3.8	1810	S401_3.8 S4 ME4SB2		S401_3.8 P132 BE132SA2	
788	65	0.9	1.9	1770	S401_1.9 S4 ME4SB4	S401_1.9 S4 MX4SB4	S401_1.9 P132 BE132S4	S401_1.9 P132 BX132SB4
817	63	1.7	1.8	2610	S501_1.8 S4 ME4SB4	S501_1.8 S4 MX4SB4	S501_1.8 P132 BE132S4	S501_1.8 P132 BX132SB4
958	54	1.3	3.1	1730	S401_3.1 S4 ME4SB2		S401_3.1 P132 BE132SA2	
961	54	2.1	3.0	2530	S501_3.0 S4 ME4SB2		S501_3.0 P132 BE132SA2	
1027	50	2.2	1.4	2450	S501_1.4 S4 ME4SB4	S501_1.4 S4 MX4SB4	S501_1.4 P132 BE132S4	S501_1.4 P132 BX132SB4
1071	48	1.2	1.4	1660	S401_1.4 S4 ME4SB4	S401_1.4 S4 MX4SB4	S401_1.4 P132 BE132S4	S401_1.4 P132 BX132SB4
1215	42	2.4	2.4	2370	S501_2.4 S4 ME4SB2		S501_2.4 P132 BE132SA2	
1223	42	1.7	2.4	1640	S401_2.4 S4 ME4SB2		S401_2.4 P132 BE132SA2	
1580	33	1.5	1.9	1530	S401_1.9 S4 ME4SB2		S401_1.9 P132 BE132SA2	
1636	31	2.7	1.8	2170	S501_1.8 S4 ME4SB2		S501_1.8 P132 BE132SA2	
2058	25	3.4	1.4	2030	S501_1.4 S4 ME4SB2		S501_1.4 P132 BE132SA2	
2145	24	2.0	1.4	1410	S401_1.4 S4 ME4SB2		S401_1.4 P132 BE132SA2	

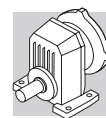


7.5 kW

n ₂ min ⁻¹	M ₂ Nm	S	i	R _{n2} N				 IEC		
					IE2	IE3		IE2	IE3	
478	146	1.0	3.0	2810	S501_3.0 S4 ME4LA4	S501_3.0 S4 MX4LA4	558	S501_3.0 P132 BE132MA4	S501_3.0 P132 BX132MA4	559
540	130	1.0	1.8	2690	S501_1.8 S5 ME5SB6		558	S501_1.8 P160 BE160MB6		559
604	116	1.1	2.4	2670	S501_2.4 S4 ME4LA4	S501_2.4 S4 MX4LA4	558	S501_2.4 P132 BE132MA4	S501_2.4 P132 BX132MA4	559
679	103	1.2	1.4	2560	S501_1.4 S5 ME5SB6		558	S501_1.4 P160 BE160MB6		559
761	92	1.3	3.8	2570	S501_3.8 S4 ME4LA2		558	S501_3.8 P132 BE132SB2		559
814	86	1.3	1.8	2490	S501_1.8 S4 ME4LA4	S501_1.8 S4 MX4LA4	558	S501_1.8 P132 BE132MA4	S501_1.8 P132 BX132MA4	559
958	73	1.0	3.1	1610	S401_3.1 S4 ME4LA2		556	S401_3.1 P132 BE132SB2		557
961	73	1.5	3.0	2440	S501_3.0 S4 ME4LA2		558	S501_3.0 P132 BE132SB2		559
1024	68	1.6	1.4	2350	S501_1.4 S4 ME4LA4	S501_1.4 S4 MX4LA4	558	S501_1.4 P132 BE132MA4	S501_1.4 P132 BX132MA4	559
1067	65	0.9	1.4	1540	S401_1.4 S4 ME4LA4	S401_1.4 S4 MX4LA4	556	S401_1.4 P132 BE132MA4	S401_1.4 P132 BX132MA4	557
1215	58	1.7	2.4	2290	S501_2.4 S4 ME4LA2		558	S501_2.4 P132 BE132SB2		559
1223	57	1.2	2.4	1540	S401_2.4 S4 ME4LA2		556	S401_2.4 P132 BE132SB2		557
1580	44	1.1	1.9	1450	S401_1.9 S4 ME4LA2		556	S401_1.9 P132 BE132SB2		557
1636	43	2.0	1.8	2110	S501_1.8 S4 ME4LA2		558	S501_1.8 P132 BE132SB2		559
2058	34	2.5	1.4	1980	S501_1.4 S4 ME4LA2		558	S501_1.4 P132 BE132SB2		559
2145	33	1.5	1.4	1350	S401_1.4 S4 ME4LA2		556	S401_1.4 P132 BE132SB2		557

9.2 kW

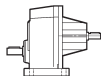

n ₂ min-1	M ₂ Nm	S	i	R _{n2} N				 IEC 		
					IE2	IE3		IE2	IE3	
602	144	0.9	2.4	2530	S501_2.4 S4 ME4LB4	S501_2.4 S5 MX5SA4	558	S501_2.4 P132 BE132MB4	S501_2.4 P160 BX160MA4	559
760	113	1.1	3.8	2470	S501_3.8 S4 ME4LB2		558	S501_3.8 P132 BE132MB2		559
811	107	1.0	1.8	2390	S501_1.8 S4 ME4LB4	S501_1.8 S5 MX5SA4	558	S501_1.8 P132 BE132MB4	S501_1.8 P160 BX160MA4	559
959	90	1.2	3.0	2360	S501_3.0 S4 ME4LB2		558	S501_3.0 P132 BE132MB2		559
1020	85	1.3	1.4	2270	S501_1.4 S4 ME4LB4	S501_1.4 S5 MX5SA4	558	S501_1.4 P132 BE132MB4	S501_1.4 P160 BX160MA4	559
1213	71	1.4	2.4	2220	S501_2.4 S4 ME4LB2		558	S501_2.4 P132 BE132MB2		559
1221	71	1.0	2.4	1460	S401_2.4 S4 ME4LB2		556	S401_2.4 P132 BE132MB2		557
1633	53	1.6	1.8	2060	S501_1.8 S4 ME4LB2		558	S501_1.8 P132 BE132MB2		559
2055	42	2.0	1.4	1930	S501_1.4 S4 ME4LB2		558	S501_1.4 P132 BE132MB2		559
2141	40	1.2	1.4	1300	S401_1.4 S4 ME4LB2		556	S401_1.4 P132 BE132MB2		557

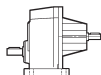



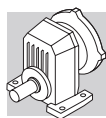
75 GEARBOX RATING CHARTS

S 10

21 Nm

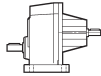

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 10 1_1.4	1.4	1972	8.0	1.7	800	310	986	10.0	1.1	800	390	551
S 10 1_1.9	1.9	1489	8.0	1.3	800	360	745	10.0	0.80	800	460	
S 10 1_2.5	2.5	1120	8.0	0.96	800	420	560	10.0	0.60	800	520	
S 10 1_3.2	3.2	875	10.0	0.93	800	440	438	12.0	0.56	800	560	
S 10 1_3.8	3.8	727	10.0	0.78	800	480	364	12.0	0.47	800	610	
S 10 1_4.7	4.7	592	10.0	0.63	800	520	296	12.0	0.38	800	660	
S 10 1_6.1	6.1	458	12.0	0.59	800	560	229	15.0	0.37	800	710	
S 10 1_6.9	6.9	406	12.0	0.52	800	580	203	15.0	0.33	800	740	
S 10 1_8.9	8.9	315	8.0	0.27	800	700	158	10.0	0.17	800	880	
S 10 1_10.3	10.3	272	8.0	0.23	800	740	136	10.0	0.15	800	930	
S 10 1_12.3	12.3	227	8.0	0.19	800	800	114	10.0	0.12	800	1000	

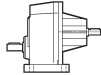

	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 10 1_1.4	1.4	634	12.0	0.81	800	450	352	14.0	0.53	800	560	551
S 10 1_1.9	1.9	479	12.0	0.61	800	520	266	14.0	0.40	800	640	
S 10 1_2.5	2.5	360	12.0	0.46	800	600	200	14.0	0.30	800	740	
S 10 1_3.2	3.2	281	14.0	0.42	800	650	156	17.0	0.28	800	790	
S 10 1_3.8	3.8	234	14.0	0.35	800	700	130	17.0	0.24	800	850	
S 10 1_4.7	4.7	190	14.0	0.28	800	770	106	17.0	0.19	800	930	
S 10 1_6.1	6.1	147	17.0	0.27	800	820	82	21	0.18	800	1000	
S 10 1_6.9	6.9	130	17.0	0.24	800	860	72	21	0.16	800	1040	
S 10 1_8.9	8.9	101	12.0	0.13	800	1020	56	14.0	0.08	800	1200	
S 10 1_10.3	10.3	87	12.0	0.11	800	1080	49	14.0	0.07	800	1200	
S 10 1_12.3	12.3	73	12.0	0.09	800	1160	41	14.0	0.06	800	1200	

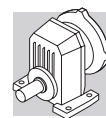


S 20

37 Nm

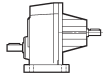

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 20 1_1.4	1.4	2014	13.0	2.8	1000	590	1007	17.0	1.8	1000	740	553
S 20 1_1.9	1.9	1481	13.0	2.1	1000	680	741	17.0	1.3	1000	860	
S 20 1_2.4	2.4	1148	21	2.6	640	680	574	26	1.6	850	860	
S 20 1_3.1	3.1	900	21	2.0	730	750	450	26	1.3	960	950	
S 20 1_3.9	3.9	712	21	1.6	820	840	356	26	0.99	1000	1060	
S 20 1_4.8	4.8	587	21	1.3	910	920	294	26	0.82	1000	1160	
S 20 1_5.8	5.8	481	21	1.1	960	1000	241	26	0.67	1000	1260	
S 20 1_7.2	7.2	388	21	0.87	980	1090	194	26	0.54	1000	1370	
S 20 1_8.5	8.5	329	13.0	0.46	1000	1240	165	17.0	0.30	1000	1500	
S 20 1_10.8	10.8	260	13.0	0.36	1000	1350	130	17.0	0.24	1000	1500	
S 20 1_12.4	12.4	225	13.0	0.31	1000	1430	113	17.0	0.20	1000	1500	

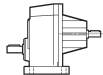

	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 20 1_1.4	1.4	647	20	1.4	1000	850	360	24	0.92	1000	1040	553
S 20 1_1.9	1.9	476	20	1.0	1000	990	265	24	0.68	1000	1210	
S 20 1_2.4	2.4	369	30	1.2	990	990	205	37	0.81	1000	1200	
S 20 1_3.1	3.1	289	30	0.93	1000	1110	161	37	0.64	1000	1340	
S 20 1_3.9	3.9	229	30	0.73	1000	1230	127	37	0.50	1000	1490	
S 20 1_4.8	4.8	189	30	0.60	1000	1350	105	37	0.41	1000	1500	
S 20 1_5.8	5.8	155	30	0.50	1000	1460	86	37	0.34	1000	1500	
S 20 1_7.2	7.2	125	30	0.40	1000	1500	69	37	0.27	1000	1500	
S 20 1_8.5	8.5	106	20	0.23	1000	1500	59	24	0.15	1000	1500	
S 20 1_10.8	10.8	84	20	0.18	1000	1500	47	24	0.12	1000	1500	
S 20 1_12.4	12.4	72	20	0.15	1000	1500	40	24	0.10	1000	1500	

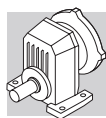


S 30

70 Nm

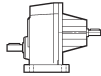

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 30 1_1.4	1.4	1986	24	5.1	1500	770	993	30	3.2	1500	970	555
S 30 1_1.8	1.8	1530	24	3.9	1500	870	765	30	2.5	1500	1090	
S 30 1_2.4	2.4	1157	40	4.9	1270	850	579	50	3.1	1500	1070	
S 30 1_3.1	3.1	915	40	3.9	1470	950	458	50	2.4	1500	1200	
S 30 1_3.9	3.9	711	40	3.0	1500	1070	355	50	1.9	1500	1360	
S 30 1_4.9	4.9	568	40	2.4	1500	1190	284	50	1.5	1500	1500	
S 30 1_5.8	5.8	479	40	2.0	1500	1280	239	50	1.3	1500	1610	
S 30 1_7.1	7.1	395	40	1.7	1500	1390	197	50	1.1	1500	1750	
S 30 1_8.9	8.9	315	24	0.81	1500	1650	157	30	0.50	1500	2080	
S 30 1_10.3	10.3	272	24	0.70	1500	1740	136	30	0.44	1500	2190	
S 30 1_13.1	13.1	213	24	0.55	1500	1900	107	30	0.34	1500	2400	

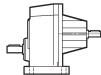

	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 30 1_1.4	1.4	638	35	2.4	1500	1120	355	42	1.6	1500	1360	555
S 30 1_1.8	1.8	492	35	1.8	1500	1260	273	42	1.2	1500	1540	
S 30 1_2.4	2.4	372	58	2.3	1500	1240	207	70	1.5	1500	1510	
S 30 1_3.1	3.1	294	58	1.8	1500	1390	163	70	1.2	1500	1700	
S 30 1_3.9	3.9	228	58	1.4	1500	1570	127	70	0.95	1500	1920	
S 30 1_4.9	4.9	183	58	1.1	1500	1740	101	70	0.76	1500	2120	
S 30 1_5.8	5.8	154	58	0.95	1500	1870	85	70	0.64	1500	2280	
S 30 1_7.1	7.1	127	58	0.79	1500	2030	71	62	0.47	1500	2400	
S 30 1_8.9	8.9	101	35	0.38	1500	2400	56	42	0.25	1500	2400	
S 30 1_10.3	10.3	87	35	0.33	1500	2400	49	42	0.22	1500	2400	
S 30 1_13.1	13.1	69	35	0.26	1500	2400	38	37	0.15	1500	2400	

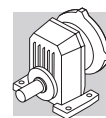


S 40

125 Nm

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 40 1_1.4	1.4	2059	48	10.6	2000	1270	1029	60	6.6	2000	1600	557
S 40 1_1.9	1.9	1514	48	7.8	2000	1450	757	60	4.9	2000	1830	
S 40 1_2.4	2.4	1172	70	8.8	1860	1490	586	90	5.6	2000	1870	
S 40 1_3.1	3.1	918	70	6.9	2000	1660	459	90	4.4	2000	2080	
S 40 1_3.8	3.8	735	70	5.5	2000	1830	367	90	3.5	2000	2290	
S 40 1_4.8	4.8	580	70	4.3	2000	2020	290	90	2.8	2000	2530	
S 40 1_6.1	6.1	461	70	3.5	2000	2220	231	90	2.2	2000	2790	
S 40 1_7.2	7.2	392	63	2.6	2000	2410	196	80	1.7	2000	3030	
S 40 1_8.6	8.6	324	48	1.7	2000	2670	162	60	1.0	2000	3370	
S 40 1_10.7	10.7	262	40	1.1	2000	2930	131	50	0.70	2000	3690	
S 40 1_12.4	12.4	226	40	1.0	2000	3100	113	50	0.60	2000	3800	

	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 40 1_1.4	1.4	662	70	4.9	2000	1850	368	85	3.3	2000	2250	557
S 40 1_1.9	1.9	486	70	3.6	2000	2120	270	85	2.5	2000	2580	
S 40 1_2.4	2.4	377	105	4.2	2000	2160	209	125	2.8	2000	2650	
S 40 1_3.1	3.1	295	105	3.3	2000	2400	164	125	2.2	2000	2940	
S 40 1_3.8	3.8	236	105	2.7	2000	2650	131	125	1.8	2000	3240	
S 40 1_4.8	4.8	186	105	2.1	2000	2930	104	125	1.4	2000	3580	
S 40 1_6.1	6.1	148	105	1.7	2000	3220	82	110	1.0	2000	3800	
S 40 1_7.2	7.2	126	90	1.2	2000	3530	70	90	0.67	2000	3800	
S 40 1_8.6	8.6	104	70	0.78	2000	3800	58	85	0.53	2000	3800	
S 40 1_10.7	10.7	84	58	0.52	2000	3800	47	70	0.35	2000	3800	
S 40 1_12.4	12.4	73	58	0.45	2000	3800	40	70	0.30	2000	3800	

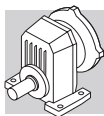


S 50

200 Nm

	i	n ₁ = 2800 min ⁻¹					n ₁ = 1400 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 50 1_1.4	1.4	1972	85	17.9	730	1720	986	110	11.6	730	2150	559
S 50 1_1.8	1.8	1564	85	14.2	1220	1920	782	110	9.2	1370	2400	
S 50 1_2.4	2.4	1162	100	12.4	930	2110	581	130	8.1	970	2640	
S 50 1_3.0	3.0	921	110	10.8	860	2300	461	140	6.9	1020	2880	
S 50 1_3.8	3.8	729	120	9.3	640	2480	365	150	5.8	860	3130	
S 50 1_4.8	4.8	589	120	7.6	880	2710	295	150	4.7	1160	3420	
S 50 1_6.1	6.1	462	100	4.9	1980	3100	231	130	3.2	2330	3880	
S 50 1_7.4	7.4	378	100	4.0	2060	3340	189	130	2.6	2400	4190	
S 50 1_8.8	8.8	319	85	2.9	2400	3640	160	110	1.9	2400	4570	
S 50 1_10.5	10.5	268	85	2.4	2400	3880	134	110	1.6	2400	4870	
S 50 1_12.9	12.9	217	80	1.9	2400	4200	109	100	1.2	2400	5300	

	i	n ₁ = 900 min ⁻¹					n ₁ = 500 min ⁻¹					
		n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	n ₂ min ⁻¹	M _{n2} Nm	P _{n1} kW	R _{n1} N	R _{n2} N	
S 50 1_1.4	1.4	634	125	8.5	1010	2510	352	155	5.8	1040	3040	559
S 50 1_1.8	1.8	503	125	6.7	1730	2790	279	155	4.6	1940	3380	
S 50 1_2.4	2.4	373	150	6.0	1160	3060	207	180	4.0	1530	3730	
S 50 1_3.0	3.0	296	160	5.1	1290	3350	164	200	3.5	1310	4050	
S 50 1_3.8	3.8	234	175	4.4	940	3620	130	200	2.8	1740	4460	
S 50 1_4.8	4.8	189	175	3.5	1290	3960	105	180	2.0	2400	4970	
S 50 1_6.1	6.1	149	150	2.4	2400	4500	83	150	1.3	2400	5620	
S 50 1_7.4	7.4	122	140	1.8	2400	4900	68	140	1.0	2400	6100	
S 50 1_8.8	8.8	103	125	1.4	2400	5310	57	125	0.80	2400	6580	
S 50 1_10.5	10.5	86	115	1.1	2400	5700	48	115	0.60	2400	7050	
S 50 1_12.9	12.9	70	100	0.70	2400	6210	39	100	0.40	2400	7200	










76 MOTOR AVAILABILITY

Please be aware that motor-gearbox combinations resulting from the following charts are purely based on geometrical compatibility.

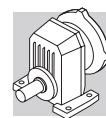
When selecting a gearmotor, refer to procedure specified at paragraph 12 and observe particularly the condition $S \geq f_s$.

(E 69)





		<div>IEC_     (IM B5)</div>													
		BN	BE	BXN	BN	BE	BXN	BN	BE	BX	BXN	BN	BE	BX	BXN
P _{n1} ^(#) [kW]	2p	0.37	—	—	0.75	—	—	1.5	1.1	—	—	2.2	2.2	—	—
	4p	0.25	0.18	0.18	0.55	0.37	0.37	1.1	0.75	0.75	0.75	1.85	1.5	1.5	1.5
	6p	0.12	—	—	0.37	—	—	0.75	—	—	—	1.1	0.75	—	—
		P63			P71			P80				P90			
S 10 1	i =	1.4_12.3			1.4_12.3			1.4_8.9				1.4_8.9			
S 20 1		1.9_12.4			1.9_12.4			1.4_10.8				1.4_10.8			
S 30 1		2.4_13.1			2.4_13.1			1.4_13.1				1.4_13.1			
S 40 1		3.1_12.4			3.1_12.4			1.4_12.4				1.4_12.4			
S 50 1		3.8_12.9			3.8_12.9			1.4_12.9				1.4_12.9			

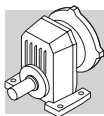
		IEC_    (IM B5)														
		BN	BE	BX	BN	BE	BX	BN	BE	BX	BN	BE	BX	BN	BE	BX
P _{n1} (#) [kW]	2p	4	3	—	4	4	—	9.2	9.2	—	18.5	18.5	—	22	—	—
	4p	3	3	3	4	4	4	9.2	9.2	7.5	15	15	15	22	22	22
	6p	1.85	1.5	—	2.2	2.2	—	5.5	4	—	11	7.5	—	15	—	—
		P100			P112			P132			P160			P180		
S 10 1	i =	1.4_8.9			1.4_8.9											
S 20 1		1.4_10.8			1.4_10.8											
S 30 1		1.4_13.1			1.4_13.1			1.4_4.9								
S 40 1		1.4_12.4			1.4_12.4			1.4_6.1								
S 50 1		1.4_12.9			1.4_12.9			1.4_7.4			1.4_7.4			1.4_7.4		

(#) P_{n1} = maximum installable power on input P_-



(E 70)

		   					
		M05 - ME05 - MXN05	M1 - ME1 - MXN10	ME2-MX2- MXN20	ME3 - MX3	ME4 - MX4	ME5 - MX5
S 10 1	i =	1.4_12.3	1.4_6.9	1.4_8.9	1.4_8.9		
S 20 1		1.9_12.4	1.9_8.5	1.4_10.8	1.4_10.8		
S 30 1			2.4_10.3	1.4_13.1	1.4_13.1	1.4_4.9	
S 40 1			3.1_12.4	1.4_12.4	1.4_12.4	1.4_6.1	
S 50 1			3.8_12.9	1.4_12.9	1.4_12.9	1.4_7.4	1.4_7.4



77 MOMENT OF INERTIA

The following charts indicate moment of inertia values J_r [kgm²] referred to the gear unit high speed shaft. A key to the symbols used follows:



Values under this icon refer to compact gear units, without motor. To obtain the overall moment of inertia for the gearmotor just add the value of the inertia for the specific compact motor, given in the relevant rating chart.



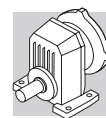
IEC Values under this symbol refer to gearboxes with IEC motor adaptor (IEC size...).






This symbol refers to gearbox values.

S 10




	i	J (•10 ⁻⁴) [kgm ²]							
			IEC						
			63	71	80	90	100	112	
S 10 1_1.4	1.4	0.33	1.8	1.8	3.2	3.1	4.4	4.4	1.2
S 10 1_1.9	1.9	0.22	1.7	1.7	3.1	3.0	4.3	4.3	1.1
S 10 1_2.5	2.5	0.16	1.6	1.6	3.0	2.9	4.2	4.2	1.0
S 10 1_3.2	3.2	0.10	1.6	1.6	3.0	2.9	4.2	4.2	0.97
S 10 1_3.8	3.8	0.08	1.5	1.5	2.9	2.9	4.2	4.2	0.95
S 10 1_4.7	4.7	0.06	1.5	1.5	2.9	2.8	4.1	4.1	0.93
S 10 1_6.1	6.1	0.04	1.5	1.5	2.9	2.8	4.1	4.1	0.92
S 10 1_6.9	6.9	0.03	1.5	1.5	2.9	2.8	4.1	4.1	0.91
S 10 1_8.9	8.9	0.02	1.5	1.5	2.9	2.8	4.1	4.1	0.90
S 10 1_10.3	10.3	0.02	1.5	1.5	—	—	—	—	0.89
S 10 1_12.3	12.3	0.01	1.5	1.5	—	—	—	—	0.89

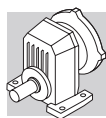


S 20




	i	J (•10 ⁻⁴) [kgm ²]							
			IEC 						
			63	71	80	90	100	112	
S 20 1_1.4	1.4	0.73	—	—	3.6	3.5	4.8	4.8	2.7
S 20 1_1.9	1.9	0.48	1.9	1.9	3.3	3.3	4.6	4.6	2.4
S 20 1_2.4	2.4	0.34	1.8	1.8	3.2	3.1	4.4	4.4	2.3
S 20 1_3.1	3.1	0.20	1.7	1.7	3.0	3.0	4.3	4.3	2.1
S 20 1_3.9	3.9	0.14	1.6	1.6	3.0	2.9	4.2	4.2	2.1
S 20 1_4.8	4.8	0.12	1.6	1.6	3.0	2.9	4.2	4.2	2.0
S 20 1_5.8	5.8	0.08	1.6	1.5	2.9	2.9	4.2	4.2	2.0
S 20 1_7.2	7.2	0.06	1.5	1.5	2.9	2.8	4.1	4.1	2.0
S 20 1_8.5	8.5	0.05	1.5	1.5	2.9	2.8	4.1	4.1	2.0
S 20 1_10.8	10.8	0.03	1.5	1.5	2.9	2.8	4.1	4.1	1.9
S 20 1_12.4	12.4	0.02	1.5	1.5	—	—	—	—	1.9

S 30




	i	J (•10 ⁻⁴) [kgm ²]							
			IEC 						
			63	71	80	90	100	112	132
S 30 1_1.4	1.4	1.5	—	—	4.3	4.3	5.6	5.6	18
S 30 1_1.8	1.8	1.1	—	—	3.9	3.8	5.1	5.1	18
S 30 1_2.4	2.4	0.59	2.1	2.0	3.4	3.4	4.7	4.7	17
S 30 1_3.1	3.1	0.45	1.9	1.9	3.3	3.2	4.5	4.5	17
S 30 1_3.9	3.9	0.33	1.8	1.8	3.2	3.1	4.4	4.4	17
S 30 1_4.9	4.9	0.24	1.7	1.7	3.1	3.0	4.3	4.3	17
S 30 1_5.8	5.8	0.19	1.7	1.7	3.0	3.0	4.3	4.3	—
S 30 1_7.1	7.1	0.14	1.6	1.6	3.0	2.9	4.2	4.2	—
S 30 1_8.9	8.9	0.10	1.6	1.6	2.9	2.9	4.2	4.2	—
S 30 1_10.3	10.3	0.08	1.5	1.5	2.9	2.9	4.2	4.2	—
S 30 1_13.1	13.1	0.05	1.5	1.5	2.9	2.8	4.1	4.1	—

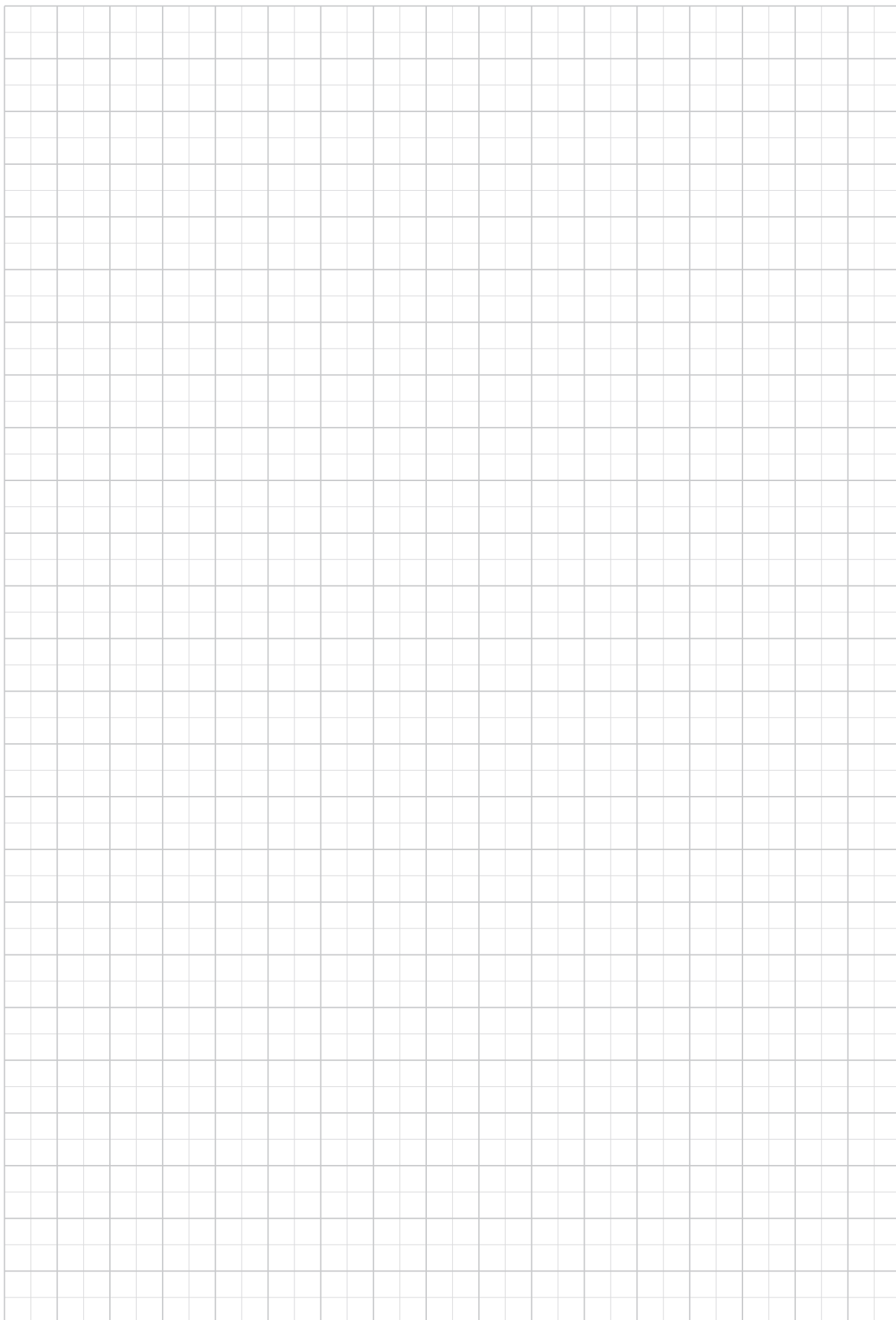
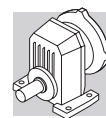


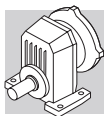
S 40

	i	J (•10 ⁻⁴) [kgm ²]								
			IEC 							
			63	71	80	90	100	112	132	
S 40 1_1.4	1.4	3.7	—	—	6.5	6.5	7.8	7.8	23	14
S 40 1_1.9	1.9	2.4	—	—	5.2	5.2	6.5	6.5	21	13
S 40 1_2.4	2.4	1.6	—	—	4.4	4.4	5.7	5.7	21	12
S 40 1_3.1	3.1	1.1	2.6	2.6	4.0	3.9	5.2	5.2	20	12
S 40 1_3.8	3.8	0.82	2.3	2.3	3.7	3.6	4.9	4.9	18	11
S 40 1_4.8	4.8	0.50	2.0	2.0	3.3	3.3	4.6	4.6	18	11
S 40 1_6.1	6.1	0.39	1.8	1.8	3.2	3.2	4.5	4.5	18	11
S 40 1_7.2	7.2	0.30	1.8	1.8	3.1	3.1	4.4	4.4	—	11
S 40 1_8.6	8.6	0.22	1.7	1.7	3.1	3.0	4.3	4.3	—	11
S 40 1_10.7	10.7	0.15	1.6	1.6	3.0	2.9	4.2	4.2	—	11
S 40 1_12.4	12.4	0.12	1.6	1.6	3.0	2.8	4.2	4.2	—	11

S 50

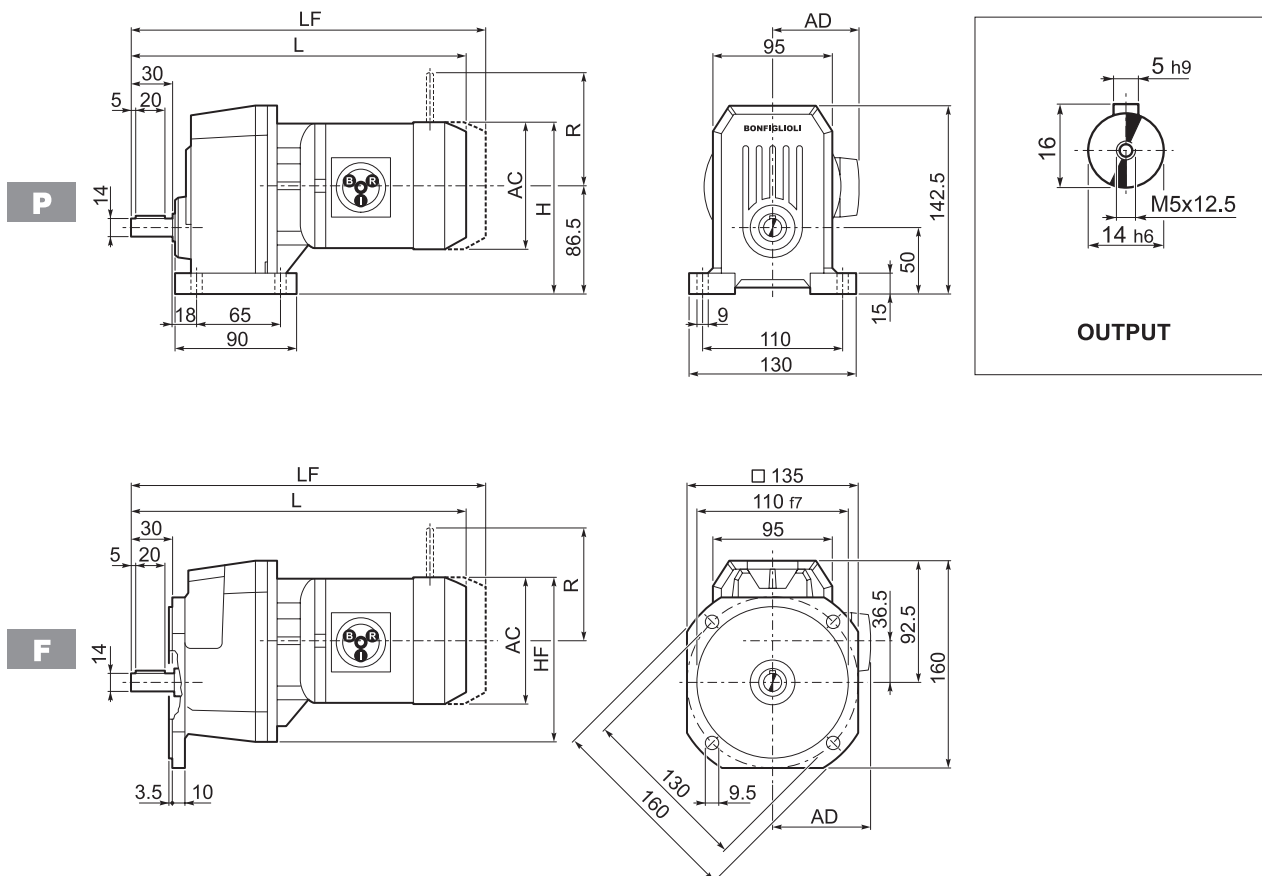
	i	J (•10 ⁻⁴) [kgm ²]										
			IEC 									
			63	71	80	90	100	112	132	160	180	
S 50 1_1.4	1.4	8.2	—	—	11	11	12	12	27	86	84	19
S 50 1_1.8	1.8	5.9	—	—	8.8	8.7	10	10	25	84	82	16
S 50 1_2.4	2.4	3.9	—	—	6.8	6.7	8.0	8.0	23	82	80	14
S 50 1_3.0	3.0	2.7	—	—	5.5	5.5	6.8	6.8	22	81	79	13
S 50 1_3.8	3.8	1.9	3.3	3.3	4.7	4.6	5.9	5.9	21	80	78	12
S 50 1_4.8	4.8	1.4	2.8	2.8	4.2	4.1	5.4	5.4	21	79	77	12
S 50 1_6.1	6.1	0.89	2.4	2.4	3.7	3.7	5.0	5.0	21	79	77	11
S 50 1_7.4	7.4	0.63	2.1	2.1	3.5	3.4	4.7	4.7	20	79	77	11
S 50 1_8.8	8.8	0.50	2.0	2.0	3.4	3.3	4.6	4.6	—	—	—	11
S 50 1_10.5	10.5	0.36	1.8	1.8	3.2	3.1	4.4	4.4	—	—	—	11
S 50 1_12.9	12.9	0.25	1.7	1.7	3.1	3.0	4.3	4.3	—	—	—	11








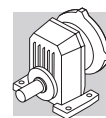


78 DIMENSIONS

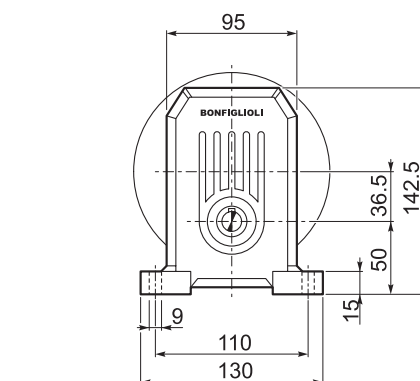
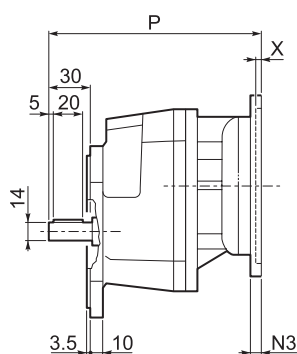
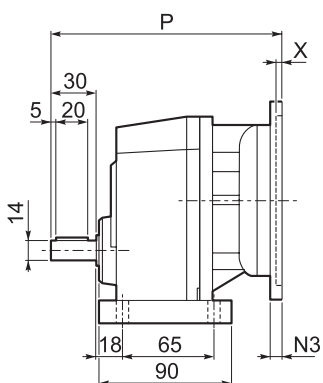
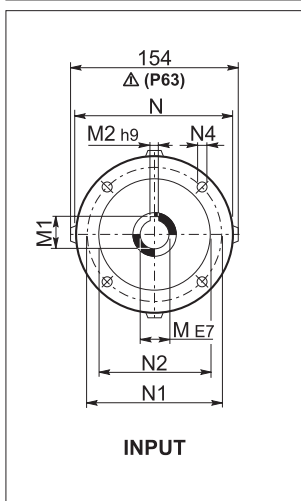
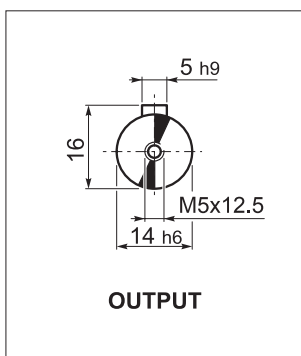
S 10...M/ME/MX/MXN



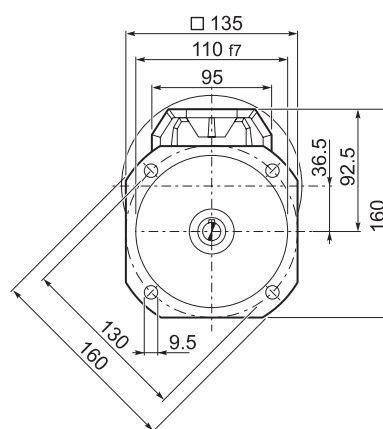
									M...FD M...FA		M...FD		M...FA	
			AC	H	HF	L	AD	 Kg	LF	 Kg	R	AD	R	AD
S 10 1	S05	M05	121	147	143	315	95	8	381	11	96	122	116	95
S 10 1	S05	ME05	121	147	143	315	95	8	381	11	96	119	116	119
S 10 1	S05	MXN05	123	148	143	361.5	136	9.8	408.5	10.9	96	136	116	136
S 10 1	S1	M1	137	155	151	344	102	10	405	13	103	135	124	108
S 10 1	S1	ME1	137	155	151	344	102	10	405	13	103	135	124	135
S 10 1	S10	MXN10	138	155.5	151	373	137	12.4	432	14.8	103	138	121	138
S 10 1	S2	M2S	156	164	160	367	111	13	443	17	129	146	134	119
S 10 1	S2	ME2S	156	164	160	367	111	13	443	19.1	129	143	134	143
S 10 1	S2	MX2S	156	164	160	411	111	18.1	501	26.3	129	143	134	143
S 10 1	S20	MXN20	158	165	160	434.5	146	20.3	505.5	22.5	129	148	131	148
S 10 1	S3	ME3S	195	184	180	416	135	20.5	512	28.4	160	155	160	155
S 10 1	S3	MX3S	195	184	180	448	135	23.5	540	33.4	160	155	160	155
S 10 1	S3	ME3L	195	184	180	448	135	21	539	34.9	160	155	160	155
S 10 1	S3	MX3L	195	184	180	492	135	27	584	42.4	160	155	160	155



S 10...P (IEC)



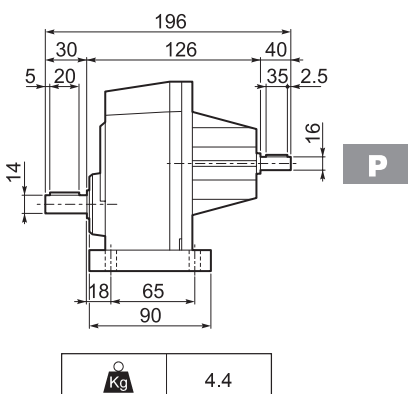
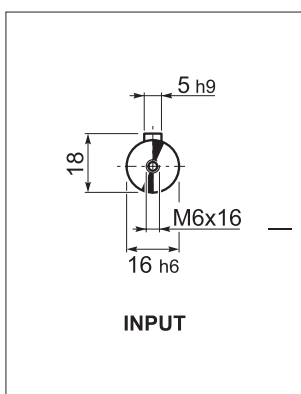
P



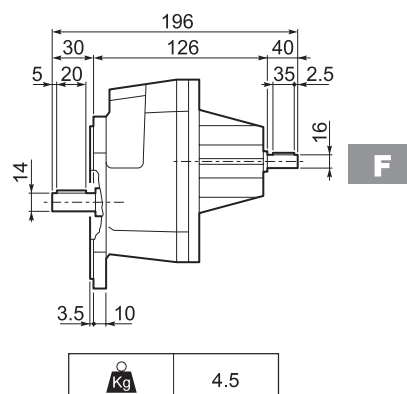
F

		M	M1	M2	N	N1	N2	N3	N4	P	X	Kg
S 10 1	P63	11	12.8	4	140	115	95	—	M8x10	189	4	5
S 10 1	P71	14	16.3	5	160	130	110	—	M8x10	189	4.5	5
S 10 1	P80	19	21.8	6	200	165	130	—	M10x14.5	208	4	6
S 10 1	P90	24	27.3	8	200	165	130	—	M10x14.5	208	4	6
S 10 1	P100	28	31.3	8	250	215	180	—	M12x16	218	4.5	10
S 10 1	P112	28	31.3	8	250	215	180	—	M12x16	218	4.5	10

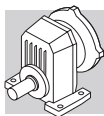
S 10...HS



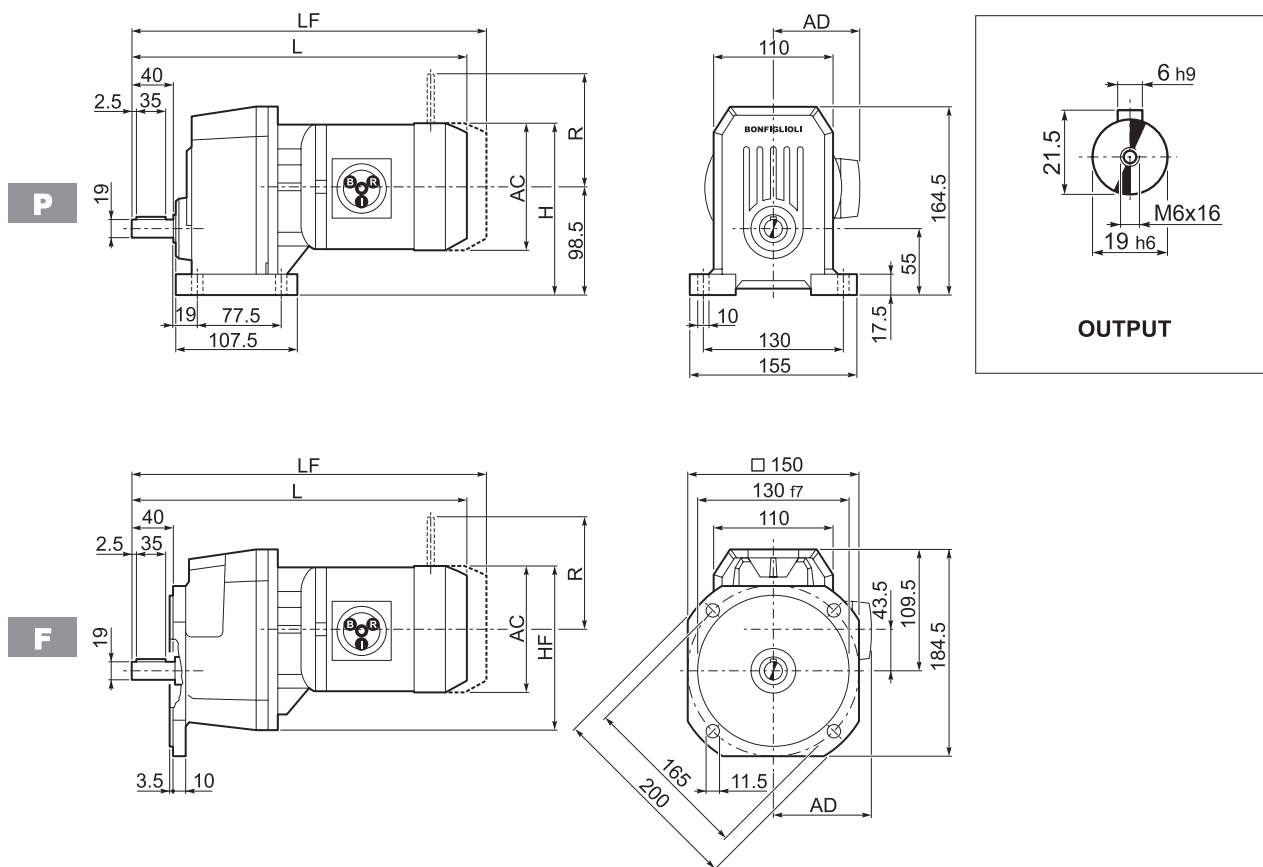
Kg	4.4
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Kg	4.5
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S 20...M/ME/MX/MXN



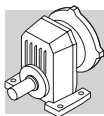
									M...FD M...FA		M...FD		M...FA	
			AC	H	HF	L	AD		LF		R	AD	R	AD
S 20 1	S05	M05	121	159	153	333.5	95	10	399.5	12	96	122	116	95
S 20 1	S05	ME05	121	159	153	333.5	95	10	399.5	12	96	119	116	119
S 20 1	S05	MXN05	123	160	153	380	136	11.8	427	12.9	96	136	116	136
S 20 1	S1	M1	137	167	161	362.5	102	12	423.5	14	103	135	124	108
S 20 1	S1	ME1	137	167	161	362.5	102	12	423.5	14	103	135	124	135
S 20 1	S10	MXN10	138	167.5	161	391.5	137	14.4	450.5	16.8	103	138	121	138
S 20 1	S2	M2S	156	176	170	385.5	111	16	461.5	19	129	146	134	119
S 20 1	S2	ME2S	156	176	170	385.5	111	16	461.5	21.1	129	143	134	143
S 20 1	S2	MX2S	156	176	170	429.5	111	21.1	501.5	28.3	129	143	134	143
S 20 1	S20	MXN20	158	177	170	483	146	23.3	554	25.5	129	148	131	148
S 20 1	S3	ME3S	195	196	190	434.5	135	21.5	530.5	30.4	160	155	160	155
S 20 1	S3	MX3S	195	196	190	466.5	135	24.5	556.5	35.4	160	155	160	155
S 20 1	S3	ME3L	195	196	190	466.5	135	26	557.5	36.9	160	155	160	155
S 20 1	S3	MX3L	195	196	190	510.5	135	32	602.5	44.4	160	155	160	155



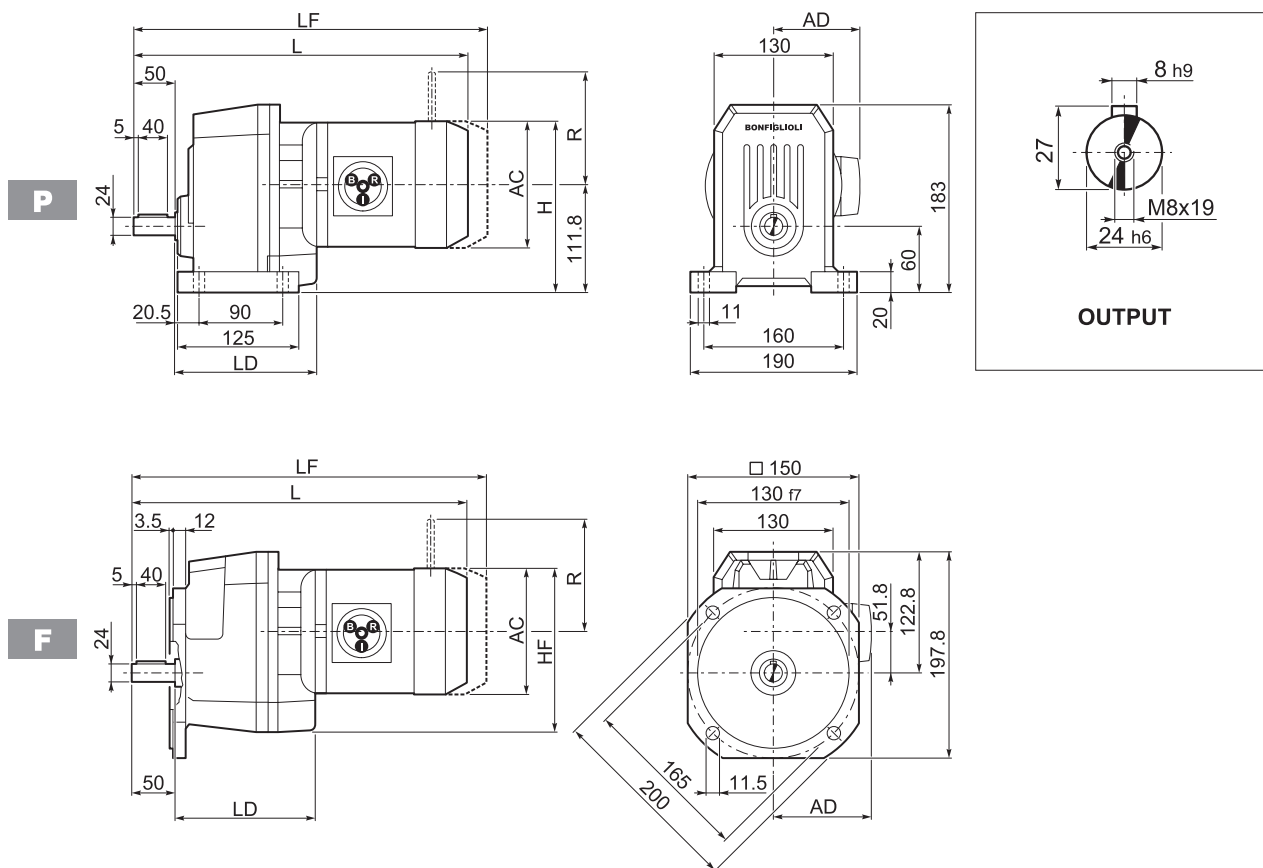
		M	M1	M2	N	N1	N2	N3	N4	P	X	
S 20 1	P63	11	12.8	4	140	115	95	—	M8x10	207	4	6
S 20 1	P71	14	16.3	5	160	130	110	—	M8x10	207	4.5	6
S 20 1	P80	19	21.8	6	200	165	130	—	M10x14.5	227	4	7
S 20 1	P90	24	27.3	8	200	165	130	—	M10x14.5	227	4	7
S 20 1	P100	28	31.3	8	250	215	180	—	M12x16	237	4.5	11
S 20 1	P112	28	31.3	8	250	215	180	—	M12x16	237	4.5	11






S 20...HS

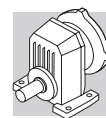




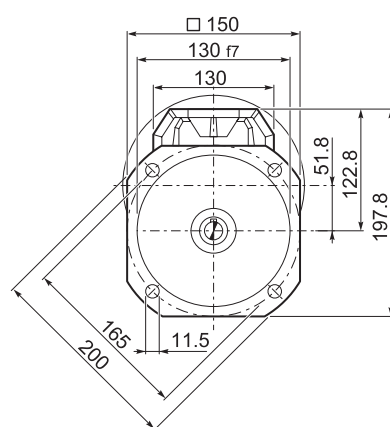
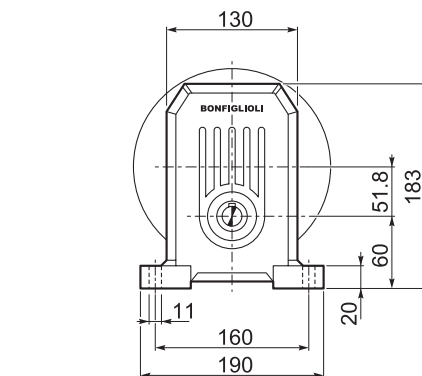
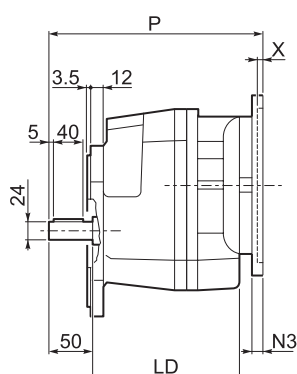
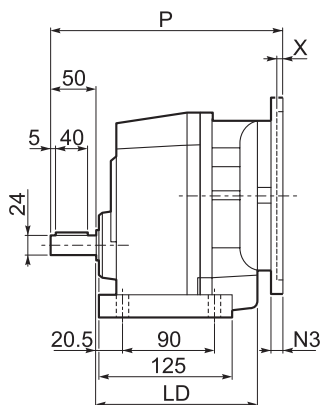
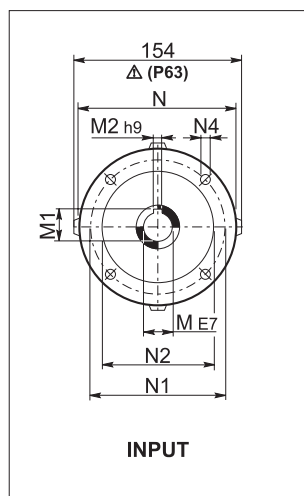
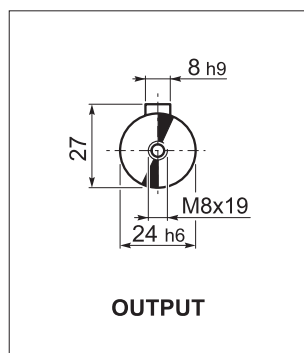
S 30...M/ME/MX/MXN



											M...FD M...FA		M...FD		M...FA	
				AC	H	HF	L	LD	AD		LF		R	AD	R	AD
S 30 1	S1	M1		137	180	177	387.5	140.5	102	14	448.5	16	103	135	124	108
S 30 1	S1	ME1		137	180	177	387.5	140.5	102	14	448.5	16	103	135	124	135
S 30 1	S10	MXN10		138	180	177.5	416.5	140.5	137	16.4	475.5	18.8	103	138	121	138
S 30 1	S1	M2S		156	190	186	410.5	152.5	111	18	486.5	21	129	146	134	119
S 30 1	S2	ME2S		156	190	186	410.5	152.5	111	18	486.5	23.1	129	143	134	143
S 30 1	S2	MX2S		156	190	186	454.5	152.5	111	23.1	526.5	30.3	129	143	134	143
S 30 1	S3	ME3S		195	209	206	459.5	162.5	135	24.5	555.5	32.4	160	155	160	155
S 30 1	S3	MX3S		195	209	206	491.5	162.5	135	27.5	569.5	37.4	160	155	160	155
S 30 1	S3	ME3L		195	209	206	491.5	162.5	135	32	582.5	38.9	160	155	160	155
S 30 1	S3	MX3L		195	209	206	535.5	162.5	135	38	611.5	46.4	160	155	160	155
S 30 1	S4	ME4	MX4	258	240.8	237	599.5	—	193	71	684.5	58.4	204	210	200	210
S 30 1	S4	ME4LB	MX4LA	258	240.8	237	634.5	—	193	79	709.5	76.4	226	210	217	210

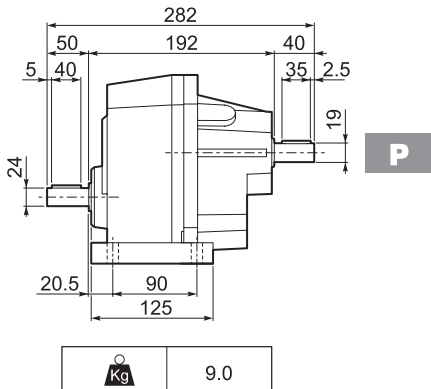
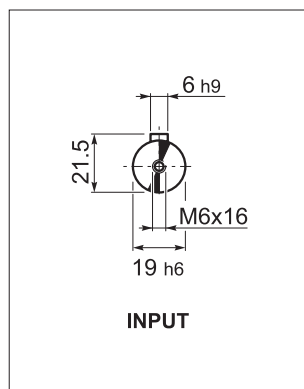


S 30...P(IEC)

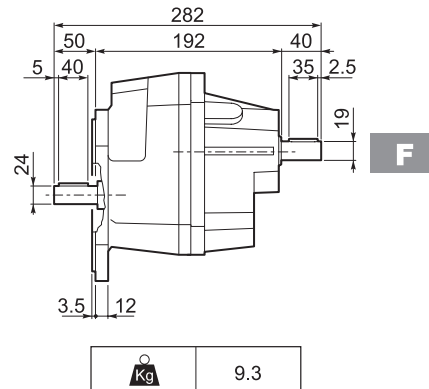


		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	Kg
S 30 1	P63	152.5	11	12.8	4	140	115	95	—	M8x10	232	4	8
S 30 1	P71	152.5	14	16.3	5	160	130	110	—	M8x10	232	4.5	8
S 30 1	P80	162.5	19	21.8	6	200	165	130	—	M10x14.5	252	4	9
S 30 1	P90	162.5	24	27.3	8	200	165	130	—	M10x14.5	252	4	9
S 30 1	P100	162.5	28	31.3	8	250	215	180	—	M12x16	262	4.5	13
S 30 1	P112	162.5	28	31.3	8	250	215	180	—	M12x16	262	4.5	13
S 30 1	P132	—	38	41.3	10	300	265	230	16	14	298.5	5	21

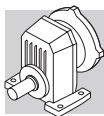
S 30...HS



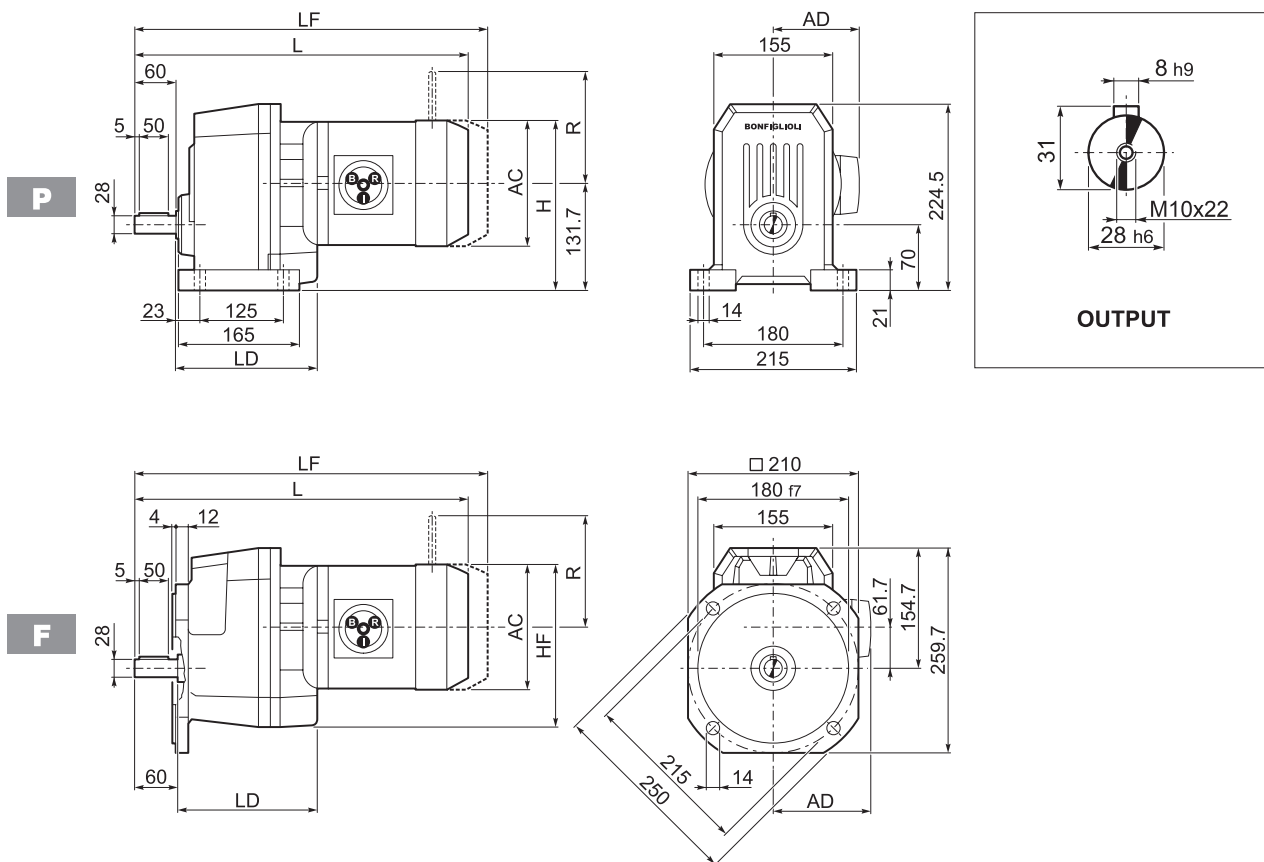
Kg	9.0
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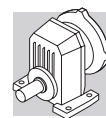
Kg	9.3
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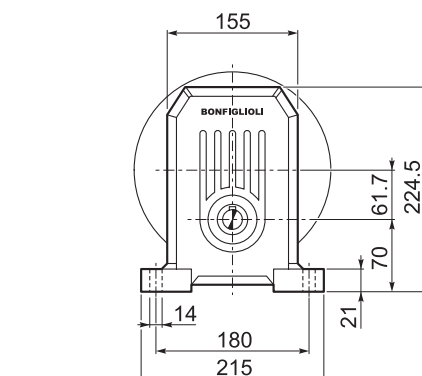
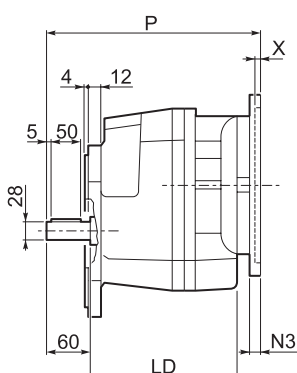
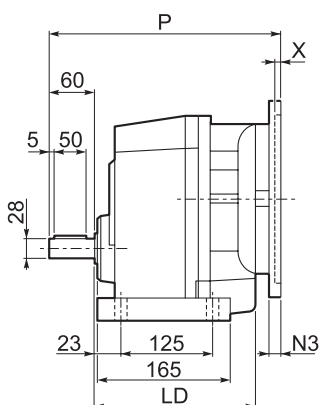
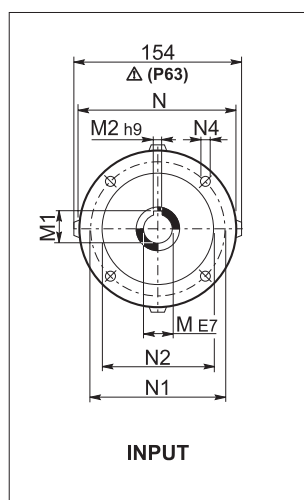
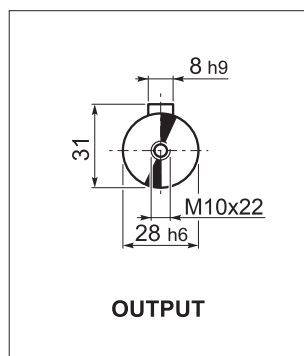
S 40...M/ME/MX



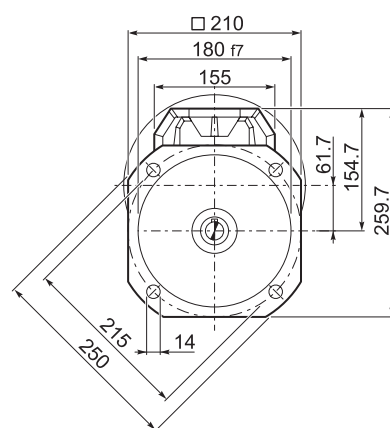
				AC	H	HF	L	LD	AD	Kg	M...FD M...FA		M...FD		M...FA	
											LF	Kg	R	AD	R	AD
S 40 1	S1	M1		137	200	197	429.5	168	102	28	490.5	31	103	135	124	108
S 40 1	S1	ME1		137	200	197	429.5	168	102	28	490.5	31	103	135	124	135
S 40 1	S2	M2S		156	210	206	452.5	183.5	111	34	528.5	37	129	146	134	119
S 40 1	S2	ME2S		156	210	206	452.5	183.5	111	34	528.5	39.1	129	143	134	143
S 40 1	S2	MX2S		156	210	206	496.5	183.5	111	39.1	568.5	46.3	129	143	134	143
S 40 1	S3	ME3S		195	229	226	501.5	199.5	135	40.5	597.5	48.5	160	155	160	155
S 40 1	S3	MX3S		195	229	226	533.5	199.5	135	43.5	623.5	53.4	160	155	160	155
S 40 1	S3	ME3L		195	229	226	533.5	199.5	135	48	624.5	54.9	160	155	160	155
S 40 1	S3	MX3L		195	229	226	577.5	199.5	135	54	669.5	62.4	160	155	160	155
S 40 1	S4	ME4	MX4	258	261	257	641.5	—	193	82	726.5	74.4	204	210	200	210
S 40 1	S4	ME4LB	MX4LA	258	261	257	676.5	—	193	90	751.5	96.4	226	210	217	210



S 40...P(IEC)



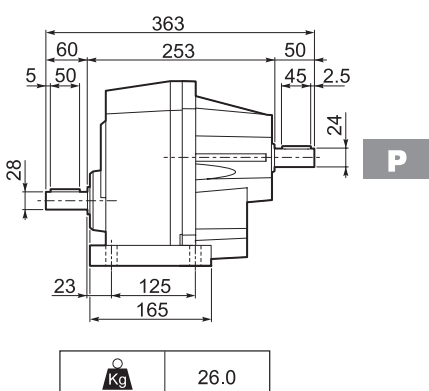
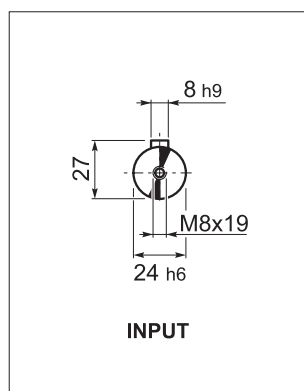
P



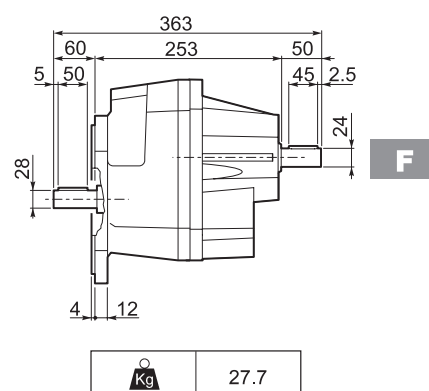
F

		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	kg
S 40 1	P63	183.5	11	12.8	4	140	115	95	—	M8x10	274	4	25
S 40 1	P71	183.5	14	16.3	5	160	130	110	—	M8x10	274	4.5	26
S 40 1	P80	199.5	19	21.8	6	200	165	130	—	M10x14.5	294	4	26
S 40 1	P90	199.5	24	27.3	8	200	165	130	—	M10x14.5	294	4	30
S 40 1	P100	—	28	31.3	8	250	215	180	—	M12x16	304	4.5	30
S 40 1	P112	—	28	31.3	8	250	215	180	—	M12x16	304	4.5	30
S 40 1	P132	—	38	41.3	10	300	265	230	16	14	340	5	32

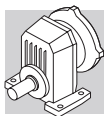
S 40...HS



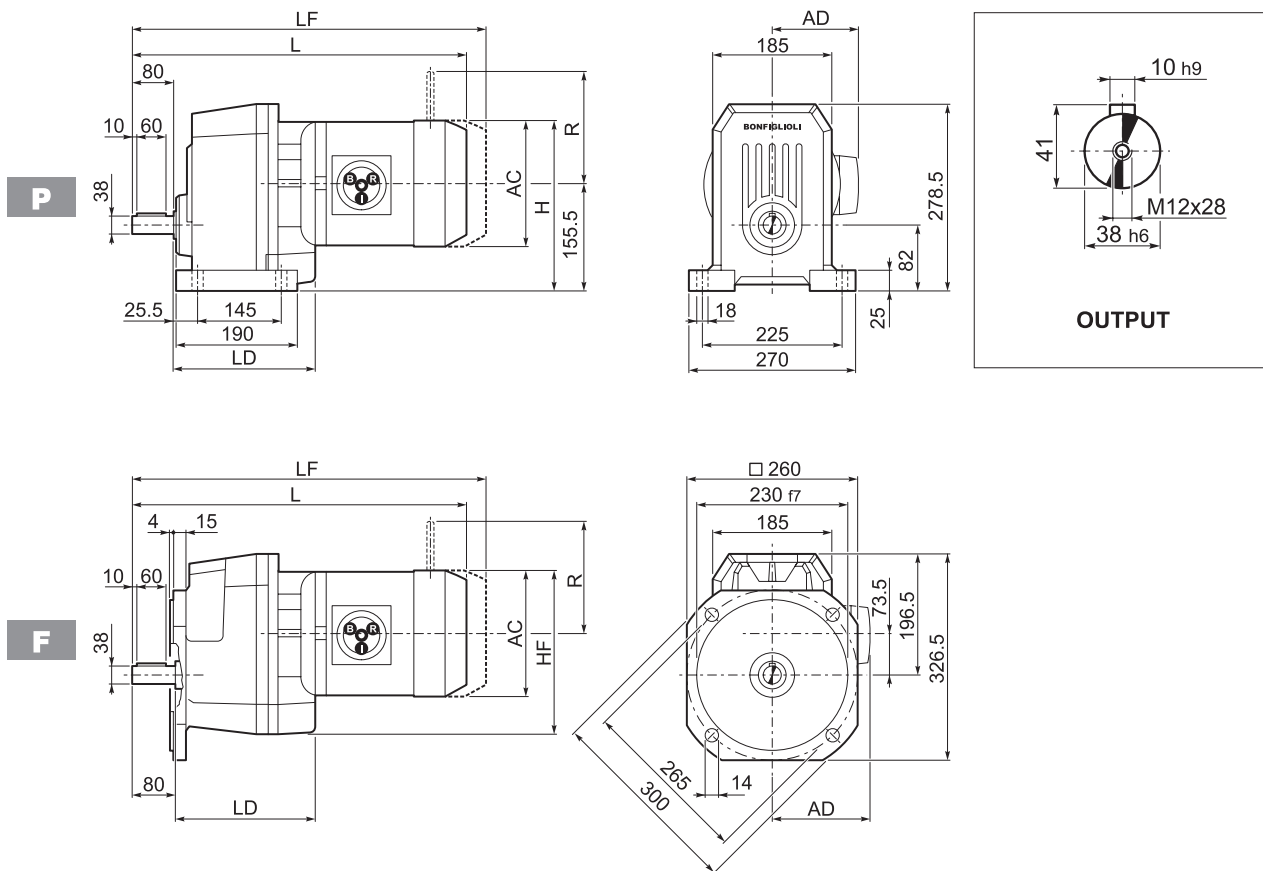
kg	26.0
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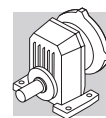
kg	27.7
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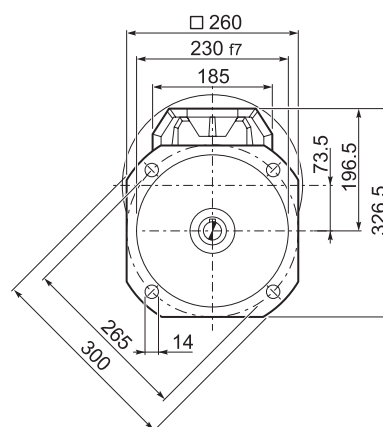
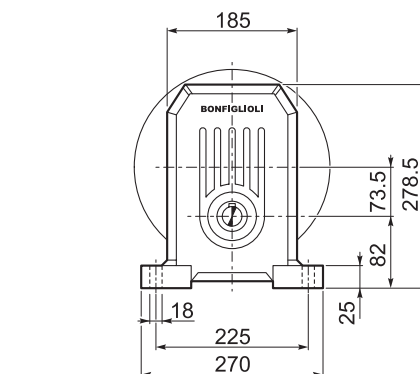
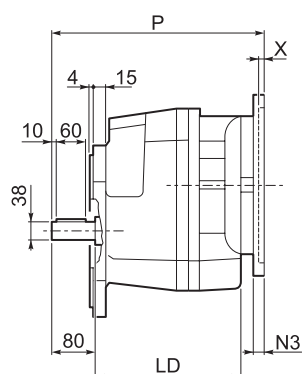
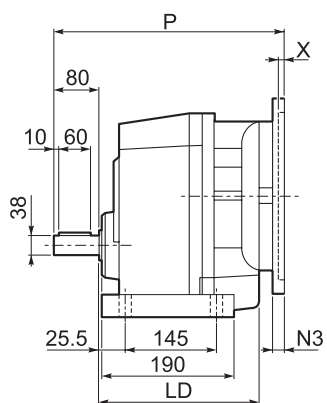
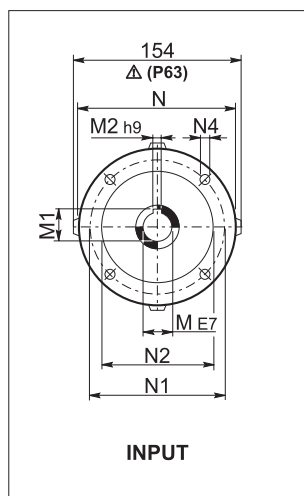
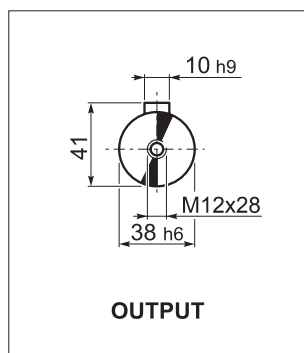
S 50...M/ME/MX



				AC	H	HF	L	LD	AD	Kg	M...FD M...FA		M...FD		M...FA	
											LF	Kg	R	AD	R	AD
S 50 1	S1	M1		137	225	222	469	—	102	40	530	42	103	135	124	108
S 50 1	S1	ME1		137	225	222	469	—	102	40	530	42	103	135	124	135
S 50 1	S2	M2S		156	233	230	492.5	204.5	111	44	568.5	47	129	146	134	119
S 50 1	S2	ME2S		156	233	230	492.5	204.5	111	44	568.5	49.1	129	143	134	143
S 50 1	S2	MX2S		156	233	230	536.5	204.5	111	49.1	608.5	56.3	129	143	134	143
S 50 1	S3	ME3S		195	253	250	541.5	219.5	135	52.5	637.5	58.4	160	155	160	155
S 50 1	S3	MX3S		195	253	250	573.5	219.5	135	55.5	663.5	63.4	160	155	160	155
S 50 1	S3	ME3L		195	253	250	573.5	219.5	135	60	664.5	64.9	160	155	160	155
S 50 1	S3	MX3L		195	253	250	617.5	219.5	135	66	709.5	72.4	160	155	160	155
S 50 1	S4	ME4	MX4	258	284	281	681.5	204.5	193	86	784.5	106.4	204	210	200	210
S 50 1	S4	ME4LB	MX4LA	258	284	281	716.5	204.5	193	94	809.5	116.4	226	210	217	210
S 50 1	S5	ME5S	MX5S	310	310.5	307	768	—	245	114	872.5	176.4	266	245	247	245
S 50 1	S5	ME5L	MX5L	310	310.5	307	812	—	245	130	916.5	187.4	266	245	247	245



S 50...P(IEC)

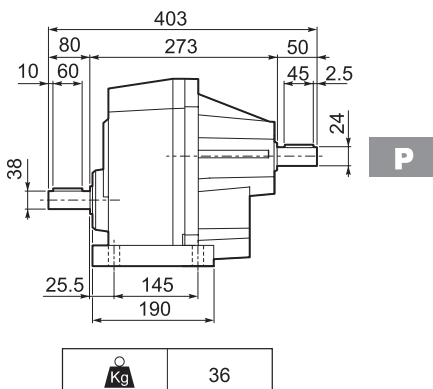
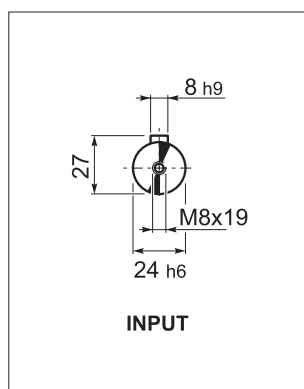


P

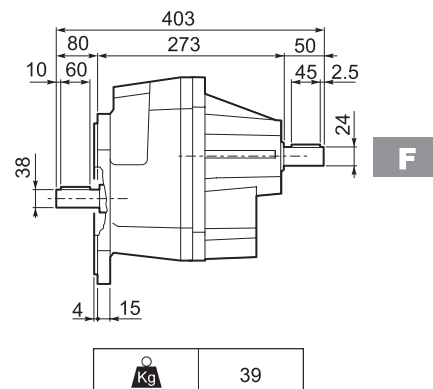
F

		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	Kg
S 50 1	P63	204.5	11	12.8	4	140	115	95	—	M8x10	314	4	35
S 50 1	P71	204.5	14	12.8	4	160	130	110	—	M8x10	314	4.5	35
S 50 1	P80	219.5	19	16.3	5	200	165	130	—	M10x14.5	314	4	37
S 50 1	P90	219.5	24	21.8	6	200	165	130	—	M10x14.5	334	4	37
S 50 1	P100	204.5	28	27.3	8	250	215	180	—	M12x16	344	4.5	41
S 50 1	P112	204.5	28	31.3	8	250	215	180	—	M12x16	344	4.5	41
S 50 1	P132	204.5	38	41.3	10	300	265	230	16	14	380	5	44
S 50 1	P160	—	42	45.3	12	350	300	250	23	18	431	5.5	48
S 50 1	P180	—	48	51.8	14	350	300	250	23	18	431	5.5	48

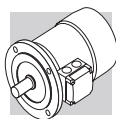
S 50...HS



Kg	36
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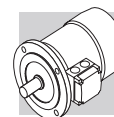
Kg	39
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ELECTRIC MOTORS

M1 SYMBOLS AND UNITS OF MEASUREMENT

Symbols	Units of Measure	Description	Symbols	Units of Measure	Description
$\cos\varphi$	—	Power factor	n	$[\text{min}^{-1}]$	Rated speed
η	—	Efficiency	P_B	[W]	Power drawn by the brake at 20°C
f_m	—	Power adjusting factor	P_n	[kW]	Motor rated power
I	—	Cyclic duration factor	P_r	[kW]	Required power
I_N	[A]	Rated current	t_1	[ms]	Brake response time with one-way rectifier
I_s	[A]	Locked rotor current	t_{1s}	[ms]	Brake response time with electronic-controlled rectifier
J_C	[Kgm ²]	Load moment of inertia	t_2	[ms]	Brake reaction time with a.c. disconnect
J_M	[Kgm ²]	Moment of inertia	t_{2c}	[ms]	Brake reaction time with a.c. and d.c. disconnect
K_c	—	Torque factor	t_a	[°C]	Ambient temperature
K_d	—	Load factor	t_f	[min]	Work time at constant load
K_J	—	Inertia factor	t_r	[min]	Rest time
M_A	[Nm]	Mean breakaway torque	W	[J]	Braking work between service interval
M_B	[Nm]	Brake torque	W_{\max}	[J]	Maximum brake work for each braking
M_N	[Nm]	Rated torque	Z	[1/h]	Permissible starting frequency, loaded
M_L	[Nm]	Counter-torque during acceleration	Z_0	[1/h]	Max. permissible unloaded starting frequency ($I = 50\%$)
M_S	[Nm]	Starting torque			



M2 INTRODUCTION

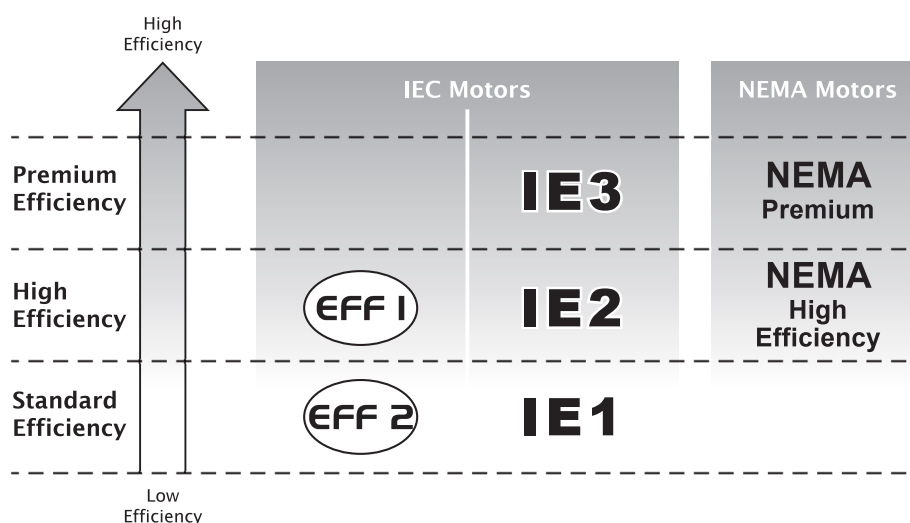
Efficiency classes and test methods

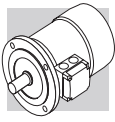
Efficiency classes characterise the efficiency with which an electric motor converts electrical energy into mechanical energy. In Europe, the energy efficiency of low voltage electric motors used to be classified using the voluntary Eff1/Eff2/Eff3 system. Outside Europe, other countries used to apply their own national systems, often very different to the European system. This uncertainty in standards led manufacturers to develop a harmonised international standard, and push for the issue of IEC (International Electrotechnical Commission) standard IEC 60034-30-1, "Efficiency classes of single-speed, three-phase, cage-induction motors (IE code)".

This new standard:

- defines new classes of efficiency
- **IE1** (standard efficiency)
- **IE2** (high efficiency)
- **IE3** (premium efficiency)
- provides a common, international reference system for the classification of electric motors
- and for national legislation
- introduces a new efficiency measurement method in conformity with standard IEC 60034-1-2:2007

The following table shows the correspondence among the main classes.





European Commission regulation 640/2009

IEC standard 60034-30-1 establishes technical guidelines for efficiency classification but does not impose any legal requirements for the adoption of any particular efficiency class. These are laid down by European Directives and national laws.

The EC Regulation applying Directive 2005/32/EC was adopted on the 22nd July 2009. This establishes the legal requirements and eco-compatible design criteria for electric motors, and imposes minimum efficiency limits according to the following schedule:

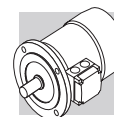
- **16/06/2011:** Electric motors must have a minimum efficiency level equivalent to class **IE2**
- **01/01/2015:** Electric motors with a rated power output between 7.5 kW and 375 kW must have a minimum efficiency level corresponding to **IE3**, or to **IE2** if controlled by an inverter.
- **01/01/2017:** Electric motors with a rated power output between 0.75 kW and 375 kW must have a minimum efficiency level corresponding to **IE3**, or to **IE2** if controlled by an inverter.

Scope and exclusions

EC Regulation 640/2009 applies to 2, 4, and 6 pole, single-speed, three-phase, 50 Hz or 60 Hz, cage-induction motors with rated outputs of 0.75 kW to 375 kW, and rated voltage up to 1000 V, designed for continuous duty (S1).

The regulation does not apply to:

- brakemotors
- motors designed to function immersed in liquid
- motors that are fully integrated in a product (like a gearbox, pump, fan), so that it is not possible to test the performance of the motor independently of that of the product.
- motors expressly designed to function:
 - at altitudes above 4000 metres a.s.l.;
 - in ambient temperatures above 60 °C;
 - at maximum operating temperatures above 400 °C;
 - in ambient temperatures below -30 °C (all motors) or below 0 °C (water-cooled motors);
 - with incoming liquid coolants at temperatures below 0 °C or above 32 °C;
 - in potentially explosive atmospheres as defined by Directive 2014/34/EU.



M3 GENERAL CHARACTERISTICS

M3.1 Production range

The asynchronous three-phase electric motors BXN, BX, BE, BN, MXN, MX, ME and M of BONFIGLIOLI RIDOTTORI's production, are available in basic design IMB5 and derived versions. Motors are the enclosed type with outer fan and cage-type rotor for use in industrial environments. Standard versions of BX-BE/MX-ME motors are 230/400V Δ/Y (400/690V Δ/Y in sizes BX-BE 160 and BX-BE 180), 50 Hz motors, with a tolerance of $\pm 10\%$. Standard BN/M motors are designed to operate from a rated voltage 230/400V Δ/Y (400/690V Δ/Y for frame sizes BN 160 through BN 200) 50 Hz, with $\pm 10\%$ tolerance. On the BXN/MXN motors, it is present a terminal box with 9 PIN connection + 12 wires winding that makes it easy to obtain the right voltage for most countries as standard. The Standard versions is identified as WD1 and makes it possible to obtain the following voltages/frequency (115/200/230/400V-50Hz and 132/230/265/460V-60Hz). For the BXN/MXN motors the voltage tolerance is reduced to $\pm 5\%$.

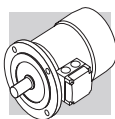
M3.2 Standards

The motors described in this catalogue are manufactured to the applicable standards shown in the following table.

(F01)	Title	CEI	IEC
	General requirements for rotating electrical machines	CEI EN 60034-1	IEC 60034-1
	Terminal markings and direction of rotation of rotating machines	CEI 2-8	IEC 60034-8
	Methods of cooling for electrical machines	CEI EN 60034-6	IEC 60034-6
	Dimensions and output ratings for rotating electrical machines	EN 50347	IEC 60072
	Classification of degree of protection provided by enclosures for rotating machines	CEI EN 60034-5	IEC 60034-5
	Noise limits	CEI EN 60034-9	IEC 60034-9
	Classification of type of construction and mounting arrangements	CEI EN 60034-7	IEC 60034-7
	Rated voltage for low voltage mains power	CEI 8-6	IEC 60038
	Vibration level of electric machines	CEI EN 60034-14	IEC 60034-14
	Efficiency classes of single-speed, three-phase, cage-induction motors (IE code)	CEI EN 60034-30-1	IEC 60034-30-1
	Standard method for determining losses and efficiency from tests	CEI EN 60034-2-1	IEC 60034-2-1

The motors also comply with foreign standards adapted to IEC 60034-1 as shown here below.

(F02)	DIN VDE 0530	Germany
	BS5000 / BS4999	Great Britain
	AS 1359	Australia
	NBNC 51 - 101	Belgium
	NEK - IEC 34	Norway
	NF C 51	France
	OEVE M 10	Austria
	SEV 3009	Switzerland
	NEN 3173	Netherlands
	SS 426 01 01	Sweden



M3.3 Directives 2006/95/EC (LVD) and 2004/108/EC (EMC)

BXN, BX, BE, BN, MXN, MX, ME and M motors meet the requirements of Directives 2014/35/UE (LVD - Low Voltage Directive), the 2014/30/UE (EMC - Electromagnetic Compatibility Directive), the 2009/125/CE (ERP - Energy Related Products Directive) and 2011/65/UE (RoHS – Restriction of Hazardous Substances) and their nameplates bear the CE mark.

As for the EMC Directive, construction is in accordance with standards CEI EN 60034-1 (Rotating electrical machines Part 1: Rating and performance), CEI EN 61000-6-2 (Generic standards - Immunity for industrial environments), CEI EN 61000-6-4 (Generic standards - Emission standard for industrial environments).

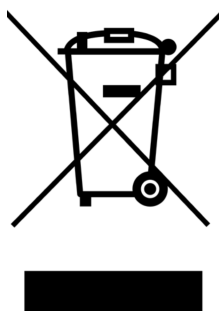
Motors with FD brakes, when fitted with the suitable capacitive filter at rectifier input (option **CF**), meet the emission limits required by Standards CEI EN 61000-6-3 and CEI EN 60204-1.

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.

UKCA mark as standard In UK, the CE mark will be replaced by the UKCA (United Kingdom Conformity Assessed mark) mark, due to Brexit, starting from 1st January 2022. All

Bonfiglioli motors are already compliant with UKCA requirements.

M3.4 EU Directive 2012/19/EU - Information on disposal



This product should not be mixed with general household waste. Disposal has to be carried out in conformity with EU Directive 2012/19/EU where established, and in accordance to national regulations.

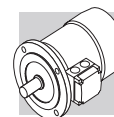
Fulfill disposal in accordance with any other legislation in force throughout the country.

M3.5 Tolerances

As per the Norms CEI EN 60034-1, applicable the tolerances here below apply to the following quantities.

(F03)	-0.15 (1 - η) $P \leq 50\text{kW}$	Efficiency
	$-(1 - \cos\phi)/6$ min 0.02 max 0.07	Power factor
	$\pm 20\%$ *	Slip
	+20%	Locked rotor current
	-15% +25%	Locked rotor torque
	-10%	Max. torque

(*) $\pm 30\%$ for motors with $P_n < 1\text{ kW}$

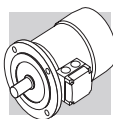


M4 MOTOR DESIGNATION

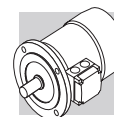
MOTOR						BRAKE					
BXN 80	4	WD1 60	IP55	CLF	B5	W FD	7.5	R	AA	SB	SA 220
						OPTIONS					
						BRAKE SUPPLY					
						RECTIFIER TYPE AC/DC NB, SB					
						RELEASE LEVER ORIENTATION AA, AB (standard), AC, AD					
						BRAKE HAND RELEASE R, RM					
						BRAKE TORQUE					
						BRAKE TYPE FD (d.c. brake) FA (a.c. brake)					
						TERMINAL BOX POSITION W (default), N, E, S					
						MOTOR MOUNTING – compact motor IM B5 - IEC motor					
						INSULATION CLASS CL F standard CL H option					
						DEGREE OF PROTECTION IP55 standard (IP56 - option) IP54, IP55 brake motor					
						VOLTAGE - FREQUENCY (See Paragraph M7.1)					
						POLE NUMBER 4					
						MOTOR SIZE 63MA ... 90L (IEC motor) 05MA...25L (Compact motor)					

MOTOR TYPE

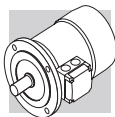
BXN = IEC 3-phase, class IE3 **MXN** = compact 3-phase, class IE3



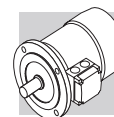
MOTOR					BRAKE				
BX 132SB 4	230/400-50	IP55	CLF	B5	W FD	7.5	R	AA	SB SA 220
									OPTIONS
									BRAKE SUPPLY
									RECTIFIER TYPE AC/DC NB, SB, NBR, SBR
									RELEASE LEVER ORIENTATION AA, AB (standard), AC, AD
									BRAKE HAND RELEASE R, RM
									BRAKE TORQUE
									BRAKE TYPE FD (d.c. brake) FA (a.c. brake)
									TERMINAL BOX POSITION (compact motor only) W (default), N, E, S
									MOTOR MOUNTING - compact motor IM B5 - IEC motor
									INSULATION CLASS CL F standard CL H option
									DEGREE OF PROTECTION IP55 standard (IP56 - option) IP54, IP55 brake motor
									VOLTAGE - FREQUENCY (See Paragraph M7.1)
									POLE NUMBER 4
									MOTOR SIZE 80B ... 355 (IEC motor) 2SB ... 5LA (compact motor)
MOTOR TYPE									
BX = IEC 3-phase, class IE3					MX = compact 3-phase, class IE3				



MOTORE										BRAKE				
BE	90LA	4	230/400-50	IP55	CLF	B5	W	FD	7.5	R	AA	SB	SA	220
														OPTIONS
														BRAKE SUPPLY
														RECTIFIER TYPE AC/DC NB, SB, NBR, SBR
														RELEASE LEVER ORIENTATION AA, AB (standard), AC, AD
														BRAKE HAND RELEASE R, RM
														BRAKE TORQUE
														BRAKE TYPE FD (d.c. brake) FA (a.c. brake)
														TERMINAL BOX POSITION (compact motor only) W (default), N, E, S
														MOTOR MOUNTING – compact motor IM B5 - IEC motor
														INSULATION CLASS CL F standard CL H option
														DEGREE OF PROTECTION IP55 standard (IP56 - option) IP54, IP55 brake motor
														VOLTAGE - FREQUENCY (See Paragraph M7.1)
														POLE NUMBER 2, 4, 6
														MOTOR SIZE 63A ... 180L (IEC motor) 05A ... 5L (compact motor)
MOTOR TYPE BE = IEC 3-phase, class IE2 ME = compact 3-phase, class IE2														



MOTOR							BRAKE				
BN 90LA 4							230/400-50 IP55 CLF B5 W FD 7.5 R AA SB SA 220				
							OPTIONS				
							BRAKE SUPPLY				
							RECTIFIER TYPE AC/DC NB, SB, NBR, SBR				
							RELEASE LEVER ORIENTATION AA, AB (standard), AC, AD				
							BRAKE HAND RELEASE R, RM				
							BRAKE TORQUE				
							BRAKE TYPE FD (d.c. brake) FA (a.c. brake)				
							TERMINAL BOX POSITION (compact motor only) W (default), N, E, S				
							MOTOR MOUNTING – compact motor IM B5 - IEC motor				
							INSULATION CLASS CL F standard CL H option				
							DEGREE OF PROTECTION IP55 standard (IP56 - option) IP54, IP55 brake motor				
							VOLTAGE - FREQUENCY (See Paragraph M7.1)				
							POLE NUMBER 2, 4, 6, 2/4, 2/6, 2/8, 2/12, 4/6, 4/8				
							MOTOR SIZE 56A ... 200LA (IEC motor) 0B ... 5SB (compact motor)				
							MOTOR TYPE BN = IEC 3-phase M = IEC compact 3-phase				



M5 VARIANTS AND OPTIONS

M5.1 Variants

(F04)

Description		Default	Option	Page
Voltage (BN - BE - BX) ≤ 132		230/400/50		576
Voltage (BN - BE - BX) ≥ 160		400/690/50		
Voltage (BXN)		WD1		EVOX*
Protection class	BXN - BX - BE - BN - MXN - MX - ME - M	IP 55	IP 56	572
	BXN - BX - BE - BN/FA-FD MXN - MX - ME - M/FA-FD	IP 54	IP 55	
	BX_FD ≥ 200	IP 55		
	BX...K - BX... K_FDK	IP 55	IP 56	
Insulation class		CLF	CLH	583
Design version	BX - BE - BN	B5 B5 R		571
	BXN	B5		EVOX*

Default values.

* See EVOX specific catalogue

M5.2 Options

(F05)

Description	Catalogue numbers								Availability	Page
Thermal protective devices	D3	K1	E3	PT1000°°					BXN-BX-BE-BN-MXN-MX-ME-M	602
50 Hz normalized power	PN								BN - M	579
Feedback devices	EN1	EN2	EN3	EN4	EN5	EN6	EN7*	EN8*	BXN-BX-BE-BN-MX-ME-M	610-612
Anti-condensate heaters	H1	NH1							BXN-BX-BE-BN-MXN-MX-ME-M	605
Tropicalized windings	TP								BXN-BX-BE-BN-MXN-MX-ME-M	606
Double-extended shaft	PS								BXN-BX-BE-BN-MXN-MX-ME-M	606
Rotor balancing grade B	RV								BX - BE - BN MX - ME - M	607
External mechanical protections	RC	TC***	EC°°						BXN-BX-BE-BN-MXN-MX-ME-M	610
Forced ventilation	U1	U2**							BX - BE - BN MX - ME - M	608
Insulated Bearings	IB*								BX - MX	612
Certification CSA/UL	CUS°								BXN-BX-BE-BN-MXN-MX-ME-M	580
Bureau of Indian Standard Certification	BIS								BE - ME	581
China Compulsory Certification	CCC								BX - BE - BN MX - ME - M	581
China Energy Label	CEL								BX - MX	582
NBR Certification	NBR								BX - MX	582
EECA Ceertification	EECA								BX - MX	583
Plug connector	CON								BX - BE - BN MX - ME - M	602
Surface protection	C_								BXN-BX-BE-BN-MXN-MX-ME-M	613
Painting	RAL								BXN-BX-BE-BN-MXN-MX-ME-M	614
Certificates	ACM								BXN-BX-BE-BN-MXN-MX-ME-M	614
Inspection certificate	CC								BXN-BX-BE-BN-MXN-MX-ME-M	614
Vertical Mounting	VM*								BX - MX	613
Backstop device	AL	AR							MX - ME - M	607
Type of duty	S2	S3	S9						BN - M	584
	S2-10	S2-30	S2-60	S3=25%	S3=40%	S3=70%			BXN - MXN	

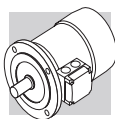
*Only for BX ≥ 280 and BX ≥ 280K

** Only for motors BN

*** Not for motors BX - MX

° Standard on BXN/MXN not an option

°° Only for motors BXN/MXN







M5.3 Brake-related options

(F06)	Description	Catalogue numbers				Availability	Page
	Brake torque	Refer to the specific brake type					593-596
	Manual release lever	R	RM			BXN - BX - BE - BN MXN - MX - ME - M	599
	Release lever orientation	AB	AA	AC	AD	BXN - BX - BE - BN MXN - MX - ME - M	600
	DC brake rectifier	NB	NBR°	SB	SBR°	BXN - BX - BE - BN MXN - MX - ME - M	591
	Soft-start flywheel	F1				BE - BN ME - M	601
	Capacitive filter	CF				BXN - BX - BE - BN MXN - MX - ME - M	601
	Brake separate power supply (*)	...SA	...SD	DIR°°		BXN - BX - BE - BN MXN - MX - ME - M	600
	Brake functionality check	MSW				BX - BE - BN MX - ME - M	605
	Additional cable entry for brake motors	IC				BN M	605

(*) Specify voltage. (°) Not for BXN/MXN (°°) Only for BXN/MXN - means "without separate power supply"

Default values.

M5.4 Example of identification nameplate for legacy motors (BX - BE - BN)

1	IEC EN 60034		 Bonfiglioli Riduttori				4
	3~Mot BE 90LA 4			Cod. 8U09030001			
2	No 1003001 - 6954785		S 1	IM B5 15,1 kg			5
	kW 1,5		CL F IP 55		Amb	40 °C	
	Hz	V ± 10%	A	min ⁻¹	cos φ		
	50 	230/400 Δ/Y	6.1/3.5	1430	 0.74		
3	60	265/460 Δ/Y	5.4/3.1	1730	0.73		
	50Hz-IE2	83.5(100%) - 83.0(75%) - 80.0(50%)					6
	60Hz-IE2	84.5(100%) - 83.9(75%) - 80.7(50%)					

① BONFIGLIOLI
Motor type

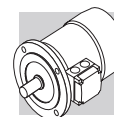
② Serial number

③ Rated voltage

④ Motor code

⑤ Type of duty: S1
Continuous duty

⑥ IE Class, Efficiency at:
4/4 - 3/4 - 2/4 load



M5.4.1 Example of identification nameplate for EVOX motors (BXN)

1										
2	3~Mot BXN 90L 4 FD					TEFC IMB14 IP55 22,6 kg				
3	Cod. xxxxxxxxxx					No xxxxxxxx - xxxxxxxx				
4	kW 1.5 HP 2					Amb 40 °C CLF S1				
5	Hz	V	A	min ⁻¹	cos φ					
6	50	115/200 ΔΔ/YY	11.9/6.88	1441	0.75					
7	50	230/400 Δ/Y	5.96/3.44	1441	0.75					
8	60	132/230 ΔΔ/YY	10.1/5.84	1750	0.74					
9	60	265/460 Δ/Y	5.6/2.92	1750	0.74					
10	50Hz IE3 - 85.3 (100%) 84.3 (75%) 81.7 (50%) - KWA code J									
	60Hz IE3 - 86.5 (100%) 86.5 (75%) 83.4 (50%) - KWA code L									
	H1 1~ 230V ± 10% 10W									
	VB = 230V MB = 26Nm NB SA									
	Bonfiglioli Riduttori S.p.A.					Made in Italy				

- ① Motor designation and general information
- ② Serial codes
- ③ Environment & application compliancy
- ④ Rated performances function of voltages/frequencies
- ⑤ Motor performances @ 50 Hz
- ⑥ Motor performances @ 60 Hz
- ⑦ Thermal protection and Servo ventilation information
- ⑧ Brake information
- ⑨ Certifications
- ⑩ Manufactory information

M6 MECHANICAL FEATURES

M6.1 Versions

EC-normalised BXN, BX, BE and BN motors are available in the design versions as indicated in the table below here after as per Standards EN 60034-7 (BX/BE), CEI EN 60034-14 (BN).

Mounting versions are:

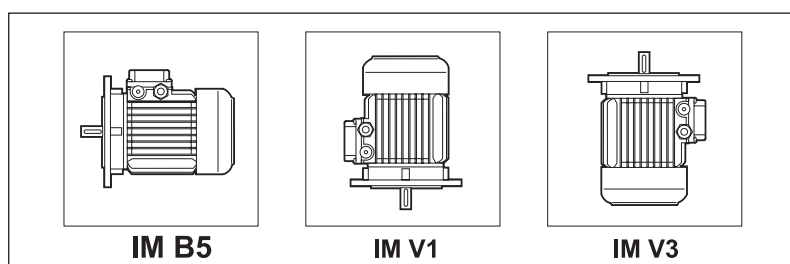
IM B5 (basic)

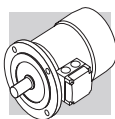
IM V1, IM V3 (derived)

IM B5 design motors can be installed in positions IM V1 and IM V3; in such cases, the basic design IM B5 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

(F07)





For Motor **BX≥200** and **BX≥200K** it is necessary to select VM options when vertically mounted.

If the motor will be mounted with DE facing downwards, selection of RC option is recommended. This has to be specified during the ordering phase because not present in standard motor version.

Flange output motors are also available with reduced coupling dimensions, as indicated in the table below - executions **B5R**. Their use in combination with gearboxes must be however coherent with the maximum installable power on gearboxes themselves (see chapters “Motors availability”). In case this condition is not met need to contact the Technical Service for the checking of the combination.

(F08)

	BN/BE 71	BX/BE/BN 80	BX/BE/BN 90	BX/BE/BN 100	BX/BE/BN 112	BX/BE/BN 132
	DxE - Ø					
B5R⁽¹⁾	11x23 - 140	14x30 - 160	19x40 - 200	24x50 - 200	24x50 - 200	28x60 - 250

(1) flange with through holes

M6.2 Degree of protection

IP..

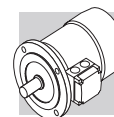
The following chart provides an overview of the degrees of protection available.























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**).

(F09)

		IP 54	IP 55	IP 56
BXN- BX-BE-BN	MXN-MX-ME-M		standard	 on request
BXN-BX-BE-BN/ FD*-FA	MXN-MX-ME-M/ FD-FA	standard	 on request	
BX ≥ 200_FD BX ≥ 200K_FD			standard	
BX ≥ 280K_FD			standard	 on request

(*) BX ≤ 180_FD



IP			5			5		
0		Not protected	0		Not protected	0		Not protected
1		Protected against extraneous solid bodies having $\varnothing \geq 50$ mm	1		Protected against vertical water drips	1		Protected against vertical water drips
2		Protected against extraneous solid bodies having $\varnothing \geq 12.5$ mm	2		Protected against vertical water drips inclined up to 15°	2		Protected against vertical water drips inclined up to 15°
3		Protected against extraneous solid bodies having $\varnothing \geq 2.5$ mm	3		Protected against rain	3		Protected against rain
4		Protected against extraneous solid bodies having $\varnothing \geq 1.0$ mm	4		Protected against water splashes	4		Protected against water splashes
5		Protected against dust	5		Protected against jets of water	5		Protected against jets of water
6		No dust ingress	6		Protected against powerful jets of water	6		Protected against powerful jets of water
			7		Protected against the effects of temporary immersion	7		Protected against the effects of temporary immersion
			8		Protected against the effects of continuous immersion	8		Protected against the effects of continuous immersion

M6.3 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 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**).

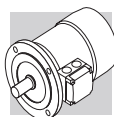
This solution enables to increase the motor duty factor when driven by an inverter and operating at reduced speed.

M6.4 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.

M6.5 Noise

Noise levels, measured using the method prescribed by ISO 1680 Standards, are within the maximum levels specified by Standards CEI EN 60034-9.





M6.6 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.

M6.7 Terminal box

Legacy motors (BN/M - BE/ME - BX/MX) terminal board features 6 studs for eyelet terminal connection while EVOX BXN and MXN motors have always 9 studs as standard. When a legacy motor have UL option active the terminal board features 9 studs execution (for US voltage "Dual Voltage"). A ground terminal is also supplied for earthing of the equipment. Terminals number and type are shown in the following table. For brake power supply, please read par. M9 (brake FD), M10 (brake FA). 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.



(F10)

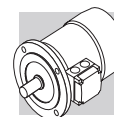
		No. of terminals	Terminal threads
BXN 63 ... BXN 90	MXN05 ... MXN25	9	M4
BX 80, BX 90 BE 63 ... BE 90 BN 56 ... BN 90	MX2, MX3 ME05 ... ME3 M05 ... M2	6	M4
BX 100 ... BX 132 BE 100 ... BE 132 BN 100 ... BN 160MR	MX3, MX4 ME3, ME4 M3 ... M4	6	M5
BX 160 - BE 160 ... BE 180M BN 160M ... BN 180M	ME5 MX5 - M5	6	M6
BX 180 - BE 180L BN 180L ... BN 200L	—	6	M8
BX 200 ... BX 250 BX 200K ... BX 250K	—	6	M10
BX 280 ... BX 355 BX 280K ... BX 355K	—	6	M12
BX 80 ... BX 132 BE 71 ... BE 132 BN 63 ... BN 160MR	MX2 ... MX4 ME2 ... ME4 M05 ... M4	9	M4
BX 160 ... BX 180 BE 160 ... BE 180 BN 160M ... BN 200L	MX5 ME5 M5	9	M6

M6.8 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.

(F11)

		Cable gland and dimensions		Maximum cable diameter allowed [mm]
BXN 63	MXN 05	2 x M20 x 1.5	1+1 Hole on each side	13
		2 x M16 x 1.5		11
BXN 71 ... BXN 90	MXN 10 ... MXN 25	2 x M25 x 1.5	1+1 Hole on each side	17
		2 x M16 x 1.5		11
BN 63 - BE 63	M05 - ME05	2 x M20 x 1.5	1 Hole on each side	13
BN71 ... BN90, BE71 ... BE90, BX80 ... BX90	M1 - M2, ME1 - ME2, MX2	2 x M25 x 1.5		17
BN100 - BN112, BE100 - BE112, BX100 - BX112	MX3, MX4 - ME3 M3	2 x M32 x 1.5	2 Holes on each side	21
		2 x M25 x 1.5		17
BN132 ... BN160MR, BE132, BX132	M4, ME4, MX4	4 x M32 x 1.5	2 Holes on each side	21
BN160M ... BN200L, BE160 - BE180, BX160 - BX180	M5, ME5, MX5	2 x M40 x 1.5	Pivoting, 4 x 90°	28
BX 200 ... BX 355 BX 200K ... BX 355K	—	2 x M63 x 1.5	Pivoting, 4 x 90°	45




M6.9 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

(F12)

	DE	NDE	
		Without Brake	With Brake
MXN 05 - ME05 - M05	6004 2Z C3	6201 2Z C3	6201 2RS C3
MXN 10 - ME1 - M1	6004 2Z C3	6202 2Z C3	6202 2RS C3
MXN 20 - MX2 - ME2 - M2	6007 2Z C3	6204 2Z C3	6204 2RS C3
MXN 25 - MX3 - ME3 - M3	6207 2Z C3	6206 2Z C3	6206 2RS C3
MX4 - ME4 - M4	6309 2Z C3	6308 2Z C3	6308 2RS C3
MX5 - ME5 - M5	6309 2Z C3	6309 2Z C3	6309 2RS C3

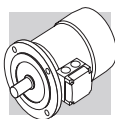
	DE	NDE	
		Without Brake	With Brake
BN 56	6201 2Z C3	6201 2Z C3	—
BXN 63 - BE 63 BN 63	6201 2Z C3	6201 2Z C3	6201 2RS C3
BXN 71 - BE 71 BN 71	6202 2Z C3	6202 2Z C3	6202 2RS C3
BXN 80 - BX 80 BE 80 - BN 80	6204 2Z C3	6204 2Z C3	6204 2RS C3
BXN 90 - BX 90 BE 90 - BN 90	6205 2Z C3	6205 2Z C3	6305 2RS C3
BX 100 - BE 100 - BN 100	6206 2Z C3	6206 2Z C3	6206 2RS C3
BX 112 - BE 112 - BN 112	6306 2Z C3	6306 2Z C3	6306 2RS C3
BX 132 - BE 132 - BN 132	6308 2Z C3	6308 2Z C3	6308 2RS C3
BN 160MR	6309 2Z C3	6308 2Z C3	6308 2RS C3
BX 160M/L - BE 160M/L - BN 160M/L	6309 2Z C3	6309 2Z C3	6309 2RS C3
BN 180M	6310 2Z C3	6309 2Z C3	6309 2RS C3
BX 180M/L - BE 180M/L - BN 180L	6310 2Z C3	6310 2Z C3	6310 2RS C3

	DE	NDE	
		Without Brake	With Brake
BN 200L - BX 200 - BX 200K	6312 2Z C3 6312/C3	6310 2Z C3 6210/C3*	6310 2RS C3
BX 225 - BX 225K	6313/C3*	6212/C3*	-
BX 250 - BX 250K	6315/C3*	6213/C3*	-
BX 280 - BX 280K	6316/C3*	6316/C3*	-
BX 315 - BX 315K	6319/C3**	6316/C3**	-
BX 355 - BX 355K	6322/C3**	6316/C3**	-

*Regreasable bearings with M6x1 Greasing Device

**Regreasable bearings with M10x1 Greasing Device

Note: BX and BXN motors have high efficiency bearings



M7 ELECTRICAL CHARACTERISTICS

M7.1 Voltage

Single speed motors are provided in standard execution either for nominal voltage 230 / 400 V Δ/Y , 50 Hz, or 400 / 690 V Δ/Y , 50 Hz, with a voltage tolerance of $\pm 10\%$.

Note: Motor nominal voltage/frequency also depends on the selection of options related to energy certifications for specific markets. Table below, then, has to be intended only as a guideline, for more details on the available Voltages/Frequencies as a function of the selected certification, please refer to paragraph M7.5 - M7.10.

On all the motors, whose voltage / frequency configuration is not as indicated above, the voltage tolerance is reduced down to $\pm 5\%$.

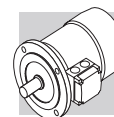
For the operation out of the tolerance boundaries, the temperature may exceed by 10 K the limit provided by the adopted insulation class.

The motors are suitable for operation on distribution European grid with voltage complying with the publication IEC 60038.

The table below shows the wiring options available.

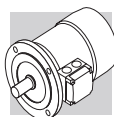
(F13)

IE1 motor power supply voltages BN - M				
Single speed motors at 50Hz				
Motor power supply voltage	— (CE)		CCC	CUS
	STD	FD / FA		
220/380 - 50	✗	✓	✗	✓
230/400 - 50	✓	✓	✓	✓
240/415 - 50	✗	✓	✗	✓
290/500 - 50	✓	✓	✗	✓
380/660 - 50	✗	✓	✗	✓
400/690 - 50	✓	✓	✗	✓
415/720 - 50	✗	✓	✗	✓
500/865 - 50	✓	✓	✗	✓
Double speed motors at 50Hz				
Motor power supply voltage	— (CE)	CCC	CUS	
380 - 50	✓	✗	✓	
400 - 50	✓	✓	✓	
415 - 50	✓	✗	✓	
500 - 50	✓	✗	✓	
Single speed motors at 60Hz				
Motor power supply voltage	— (CE)		CCC	CUS
	STD	FD / FA		
208/360 - 60	✓	✓	✗	✓
220/380 - 60	✓	✓	✗	✓
230/400 - 60	✓	✓	✗	✓
255/440 - 60	✗	✓	✗	✓
265/460 - 60	✗	✓	✓	✓
280/480 - 60	✗	✓	✗	✓
330/575 - 60	✓	✓	✗	✓
380/660 - 60	✓	✓	✗	✓
400/690 - 60	✓	✓	✗	✓
440/760 - 60	✗	✓	✗	✓
460/800 - 60	✗	✓	✗	✓
480/830 - 60	✗	✓	✗	✓
575/995 - 60	✓	✓	✗	✓
220/440 - 60	✓	✓	✗	✓
230/460 - 60	✓	✓	✗	✓
240/480 - 60	✓	✓	✗	✓
Double speed motors at 60Hz				
Motor power supply voltage	— (CE)	CCC	CUS	
208 - 60	✓	✗	✓	
220 - 60	✓	✗	✓	
230 - 60	✓	✗	✓	
240 - 60	✓	✗	✓	
380 - 60	✓	✗	✓	
400 - 60	✓	✗	✓	
440 - 60	✓	✗	✓	
460 - 60	✓	✗	✓	
480 - 60	✓	✗	✓	
575 - 60	✓	✗	✓	





(F14)

IE2 motor power supply voltages BE - ME					
Single speed motors at 50Hz					
Motor power supply voltage	— (CE)		CCC	BIS	CUS
220/380 - 50	✓		✗	✓	✓
230/400 - 50	✓		✓	✓	✓
240/415 - 50	✓		✗	✓	✓
290/500 - 50	✓		✗	✓	✓
380/660 - 50	✓		✗	✓	✓
400/690 - 50	✓		✗	✓	✓
415/720 - 50	✓		✗	✓	✓
500/865 - 50	✓		✗	✓	✓
Single speed motors at 60Hz					
Motor power supply voltage	— (CE)		CCC	BIS	CUS
	STD	FD / FA			
208/360 - 60	✓	✓	✗	✗	✓
220/380 - 60	✓	✓	✗	✗	✓
230/400 - 60	✓	✓	✗	✗	✓
255/440 - 60	✓	✓	✗	✗	✓
265/460 - 60	✗	✓	✗	✗	✓
280/480 - 60	✓	✓	✗	✗	✓
330/575 - 60	✗	✓	✗	✗	✓
380/660 - 60	✓	✓	✗	✗	✓
400/690 - 60	✓	✓	✗	✗	✓
440/760 - 60	✓	✓	✗	✗	✓
460/800 - 60	✗	✓	✗	✗	✓
480/830 - 60	✓	✓	✗	✗	✓
575/995 - 60	✓	✓	✗	✗	✓
220/440 - 60	✓	✓	✗	✗	✓
230/460 - 60	✓	✓	✗	✗	✓
240/480 - 60	✓	✓	✗	✗	✓



M7.2 Frequency

(F15)





Number of poles			Winding connection
2	BE 80 ... BE 160, BN 63 ... BN 200	ME2 ... ME5, M05 ... M5	$\Delta / Y^{(2)}$
4	BXN 63 ... BXN 90, BX 80 ... BX 355 BX 200LAK ... BX 355MCK BE 63 ... BE 180, BN 56 ... BN 200	MXN05 ... MXN25, MX2 ... MX5 — ME05 ... ME5, M05 ... M5	
6	BE 90 ... BE 160, BN 63 ... BN 200	ME3 ... ME5, M05 ... M5	
8	BN 71 ... BN 132	M1 ... M4	
2/4	BN 63 ... BN 132	M05 ... M4	Δ / YY (Dahlander)
2/6	BN 71 ... BN 132	M1 ... M4	Y / Y (Two windings)
2/8	BN 71 ... BN 132	M1 ... M4	
2/12	BN 80 ... BN 132	M2 ... M4	
4/6	BN 71 ... BN 132	M1 ... M4	Δ / YY (Dahlander)
4/8	BN 80 ... BN 132	M2 ... M4	

⁽²⁾ Motors with voltage in ratio 2 (ex. 230/460 - 60) will be equipped with a 9 pin terminal box with winding connection either $\Delta \Delta / \Delta$ or YY / Y (except 6 pole BN 63 Δ / Y)

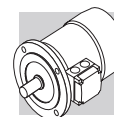
NOTE: For BXN and MXN motors refer to EVOX specific catalogue

Rated output power BN / M for 60 Hz operation is shown in the following diagram.

(F16)

		P_n [kW]						P_n [kW]			
		2P	4P	6P	8P (*)			2P	4P	6P	8P (*)
BN 56A	—	—	0.07	—	—	BN 100L	M3LA	3.5	—	—	—
BN 56B	M0B	—	0.1	—	—	BN 100LA	M3LA	—	2.5	1.8	0.9
BN 63A	M05A	0.21	0.14	0.1	—	BN 100LB	M3LB	4.7	3.5	2.2	1.3
BN 63B	M05B	0.3	0.21	0.14	—	BN 112M	—	4.7	4.7	2.5	1.8
BN 63C	M05C	0.45	0.3	—	—	—	M3LC	—	4.7	2.5	—
BN 71A	—	0.45	0.3	0.21	0.1	BN 132S	M4SA	—	6.5	3.5	2.5
—	M1SC	—	—	0.21	—	BN 132SA	M4SA	6.5	—	—	—
BN 71B	M05SD	0.65	0.45	0.3	0.14	BN 132SB	M4SB	8.7	—	—	—
BN 71C	M1LA	0.9	0.65	0.45	—	BN 132M	M4LA	11	—	—	3.5
BN 80A	—	0.9	0.65	0.45	0.21	BN 132MA	M4LA	—	8.7	4.7	—
BN 80B	M2SA	1.3	0.9	0.65	0.30	BN 132MB	M4LB	—	11	6.5	—
BN 80C	M2SB	1.8	1.3	0.9	—	BN 160MR	M4LC	12.5	12.5	—	—
BN 90S	—	—	1.3	0.9	0.45	BN 160M	M5SA	—	—	8.7	—
BN 90SA	—	1.8	—	—	—	BN 160MB	—	17.5	—	—	—
BN 90SB	—	2.2	—	—	—	—	M5SB	17.5	17.5	—	—
BN 90L	M3SA	2.5	—	1.3	0.65	BN 160L	—	21.5	17.5	12.5	—
BN 90LA		—	1.8	—	—	—	M5SC	21.5	—	—	—
BN 90LB	—	—	2.2	—	—	BN 180M	M5LA	24.5	21.5	—	—
						BN 180L	—	—	25.3	17.5	—
						BN 200L	—	—	34	—	—
						BN 200LA	—	34	—	22	—

(*) Excluded M_ motors



BXN / BX / BE / MXN / MX / ME motors are available at 60 Hz on a 4 pole configuration only, and their power rating is the same as their 50 Hz counterpart. Double speed BN / M motors supplied at 60 Hz will have an increase of nominal power, referred to 50 Hz, equal to 15%, whereas double speed BXN / BX / BE / MXN / MX / ME motors are not available. If a nominal power rating, equal to the normalised nominal power rating at 50 Hz, was requested to be on a nameplate of a motor meant to be voltage supplied at 60 Hz, the PN option shall be specified on the motor designation. Motors normally designed for a 50 Hz frequency may be used on a 60 Hz operating grid, but the related data shall be updated according to the following table. Motors designated for 50 Hz operation show on the nameplate also the values for 60 Hz operation (excluding motors in CUS execution and brake motors). See the following table.

(F17)

	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
BXN / MXN BX / MX BE / ME	230/400 Δ/Y	265 - 460 Δ Y	1	0.83	1.2
	400/690 Δ/Y	460 Δ			
BN / M	230/400 Δ/Y	220 - 240 Δ			
		380 - 415 Y			
	400/690 Δ/Y	380 - 415 Δ			
BN / M	230/400 Δ/Y	265 - 280 Δ	1.15	1	1.2
		440 - 480 Y			
	400/690 Δ/Y	440 - 480 Δ			

NOTE: For BXN and MXN motors refer to EVOX specific catalogue

M7.3 Ambient temperature

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 table below.

(F18)

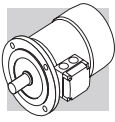
Ambient temperature (°C)	40°	45°	50°	55°	60°
Permitted power as a % of rated power	100%	95%	90%	85%	80%

Should a derating factor higher than 15% apply please consult factory.

M7.4 50 HZ normalized power

PN

With this option, motor name plate includes 50 Hz normalized power information even when motor is designated for operation with 60 Hz power mains. For 60 Hz supplies along with voltages 230/460V and 575V the PN option is applied by default.



M7.5 Motors for USA and Canada

CUS

CUS option is available in NEMA Design C execution for BN, BE, M, ME motors, and NEMA Design B for BX motors, with regards to the electrical features. The BXN and MXN motors are CUS certified as standard. Motors are certified in compliance with CSA (Canadian Standard) C22.2 N° 100 and UL (Underwriters Laboratory) UL 1004-1 standards, as stated on UL file E308649.

All powers BN-BE-M-ME and BXN-MXN with powers between 0,12 and 0,55kW included motors nameplates show the below marks:



BXN/MXN $\geq 0,75$ kW and BX/MX $\geq 0,75$ kW motors nameplates show the below marks and are certified in compliance with the energy efficiency standards in effect in the USA and Canada, respectively provided by DOE (10 CFR Part 431) and NRCAN (Energy Efficiency Regulations), tested according to CSA C390 standard.



BX 100 motors are available for the USA only and not for Canada, and the related marks reported on the nameplates are the following:



BX ≥ 200 K motors shows on nameplate the logo reported below and are compliant to energy efficiency regulations of USA and Canada, respectively established from DOE (10 CFR Part 431) and from NRCAN (Energy Efficiency Regulations), and tested in accordance to CSA C390.



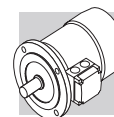
NOTES:

Starting from **June, 1st 2016**, CUS motors whose efficiency is below IE3 (i.e. "Premium Efficiency") cannot be any longer sold in the USA and Canada, unless one or more of the following conditions apply:

- Double speed motors;
- Motors plated for a non - continuous duty ($<80\%$);
- Motors intended to be operated through variable frequency drive only (properly equipped with "Inverter Duty Only" label, or similar).

CUS option is selectable in combination to U1 or U2 only for BX ≥ 200 K.

US power mains voltages and the corresponding rated voltages to be specified for the motor are indicated in the following table:




(F19)

Frequency	Mains voltage	V_{mot}
60 Hz	208 V	200 V
	240 V	230 V
	480 V	460 V
	600 V	575 V

BX motor with CUS option are available with the following nominal Voltage/Frequency combinations:

(F20)

	V_{mot}
BX \leq 132	265/460 - 60 Hz
BX \leq 180	230/460 - 60 Hz 330/575 - 60 Hz
BX \geq 160 BX \geq 200K	460/800 - 60 Hz

CUS option is applicable onto 50 Hz operating motors as well (motors BX, MX excluded).

M7.6 Motors certified for India

BIS

Low voltage motors ≥ 0.12 kW manufactured or imported in India must be certified from Bureau of Indian Standard and provided with a mark certifying motor compliance to IS 12615 standard.

BE - ME motors with power up to 3.7 kW included, are available with the above mentioned certification and, when BIS option is selected, are provided with the nameplate reporting the following logo:



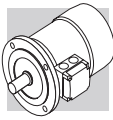
M7.7 China Compulsory Certification

CCC

Electric motors destined for sale in the People's Republic of China have to be certified under the CCC (China Compulsory Certification) system. BN/M and BE/ME motors of up to 7 Nm in rated torque are available with CCC certification and a special nameplate bearing the mark shown below:



CCC option is not currently available for IE3 motors and will be available starting from end 2021.
CCC option is not currently available for servo - ventilated motors.



M7.8 Motor certified for China (China Energy Label)


CEL

Low voltage motors $\geq 0.75\text{kW}$ manufactured or imported in China must be certified and registered by the label office and provided with an energy label certifying they meet the energy efficiency levels as defined in GB18613-2012.

BX motors with power from 30 to 355kW included are available with the above mentioned certification and, when CEL option is selected, are provided with the following sticker applied to the motor:



BX motors with CEL option are available with the following nominal Voltage/Frequency combinations:

(F21)		V_{mot}
	BX ≥ 200	380/660 - 50 Hz

M7.9 Motors certified for Brazil

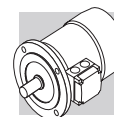
NBR

Brazilian laws regulamentates the manufacturing and importation of electric motor in the country. These have to be approved by NBR trough a declaration of the motor efficiency level at INMETRO. Motor compliant to NBR must report the declared efficiency value and have to be provided with a specific NBR nameplate and the additional mark shown in picture below.




The NBR option is available for motors:

- BX with powers from 0.75 to 22 kW included
- BX... K with powers from 30 to 355 kW included



BX motors with NBR option are available with the following nominal Voltage/Frequency combinations:

(F22)

	V_{mot}
BX90SR ... BX160	220/380 - 60 Hz 220/440 - 60 Hz
BX 180	220/380 - 60 Hz 220/440 - 60 Hz 380/660 - 60 Hz
BX \geq 200K	440/760 - 60 HZ

M7.10 Motors certified for Australia


EECA

Electric motor covered by Australian/NewZeland's energy regulation must be listed in the national database Energyratig. Mootr with EECA option are registered in the previously mentioned database and can be sold in Australia and New Zeland.

EECA option is available for BX ... K motor with power from 30 to 355kW included.

BX motors with EECA option are available with the following nominal Voltage/Frequency combinations:

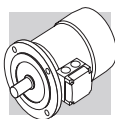
(F23)

	V_{mot}
BX \geq 200K	400/690 - 50 Hz

M7.11 Insulation class

CL F

Bonfiglioli motors use class **F** insulating materials (enamelled wire, insulators, impregnation resins) as compare to the standard motor. In standard motors, stator windings over temperature normally stays below the 80 K limit corresponding to class B over temperature. 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.



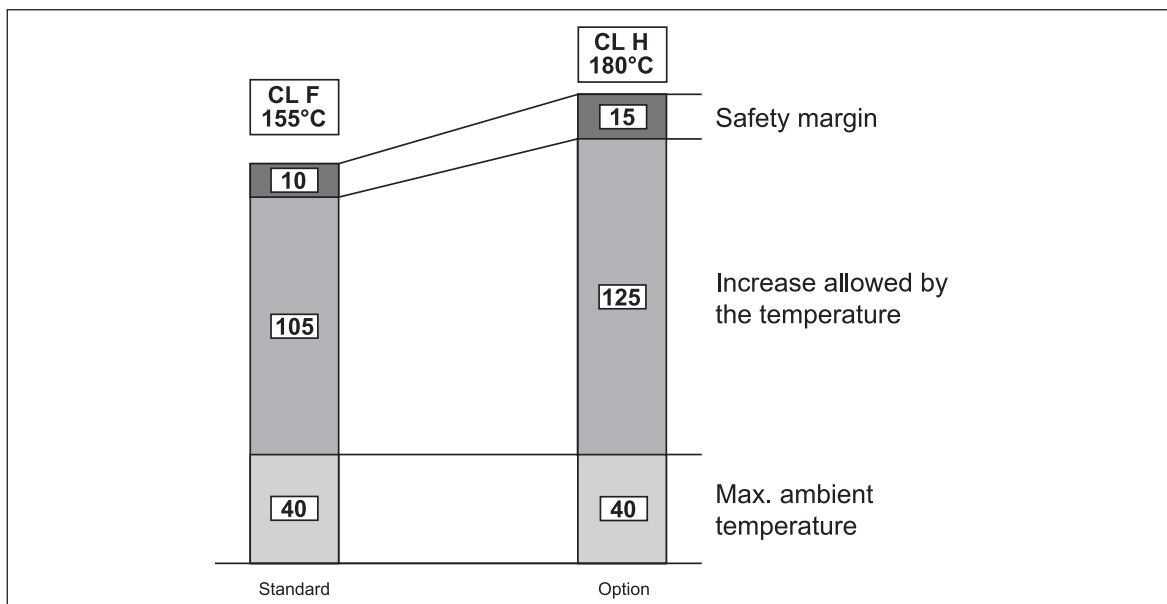
CL H

Motors manufactured in insulation class **H** are available at request.

This option can be selected for motors compliant with CSA and UL standards (CUS option), only for BX \geq 200 and BX \geq 200K.

CLH can't be selected on BXN motors because are CUS standard. If necessary contact technical office.

(F25)



M7.12 Type of duty

Unless otherwise specified, catalogue motor power refers to continuous duty S1. Any operating conditions other than S1 duty must be identified in accordance with duty cycle definitions laid down in standards CEI EN 60034-1. For duty cycles S2 and S3, the power increase co-efficient reported in the following table may be used. Please note that the table provided below applies to single-speed motors. As an alternative to S1 continuous duty, one of the following values can be specified at the product configuration stage (single speed motors only): S2, S3 or S9. The motor nameplate will be marked with an increased power rating to suit the type of duty, and with specific electrical data and a duty type of S2-30 min, S3-70% or S9 respectively. For further details, contact Bonfiglioli's Technical Service. Please contact Bonfiglioli Engineering for the power increase coefficients applicable to switch-pole motors.

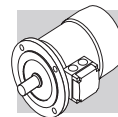
BN and M motors can be configured for operation at duty cycle S2(30min) and S3(70%) as standard option, Other requests which are different in terms of % or min are considered a speciality. BXN and MXN motors can be configured as standard at S2=10min, S2=30min, S2=60min or S3=25%, S3=40%, S3=70%.

(F24)

	Type of duty						
	S2			S3 *			S4 - S9
	Duration (min)			Intermittence (I)			Contact us
	10	30 (*)	60	25%	40%	70% (*)	
f _m	1.35	1.15	1.05	1.25	1.15	1.1	

* Cycle duration must, in any event, be equal to or less than 10 minutes; if this time is exceeded, please contact our Technical Service.

(*) Default values from options (tab. F05).



M7.12.1 Cyclic duration factor:

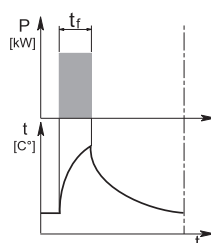
$$I = \frac{t_f}{t_f + t_r} \cdot 100 \quad (01)$$

t_f = work time under constant load

t_r = rest time

M7.12.2 Limited duration duty S2

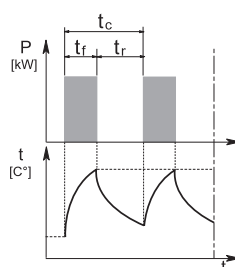
This type of duty is characterized by operation at constant load for a limited time, which is shorter than the time required to reach thermal equilibrium, followed by a rest period of sufficient duration to restore ambient temperature in the motor.



M7.12.3 Periodical intermittent duty S3:

This type of duty is characterized by a sequence of identical operation cycles, each including a constant load operation period and a rest period.

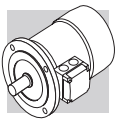
For this type of duty, the starting current does not significantly influence overtemperature.



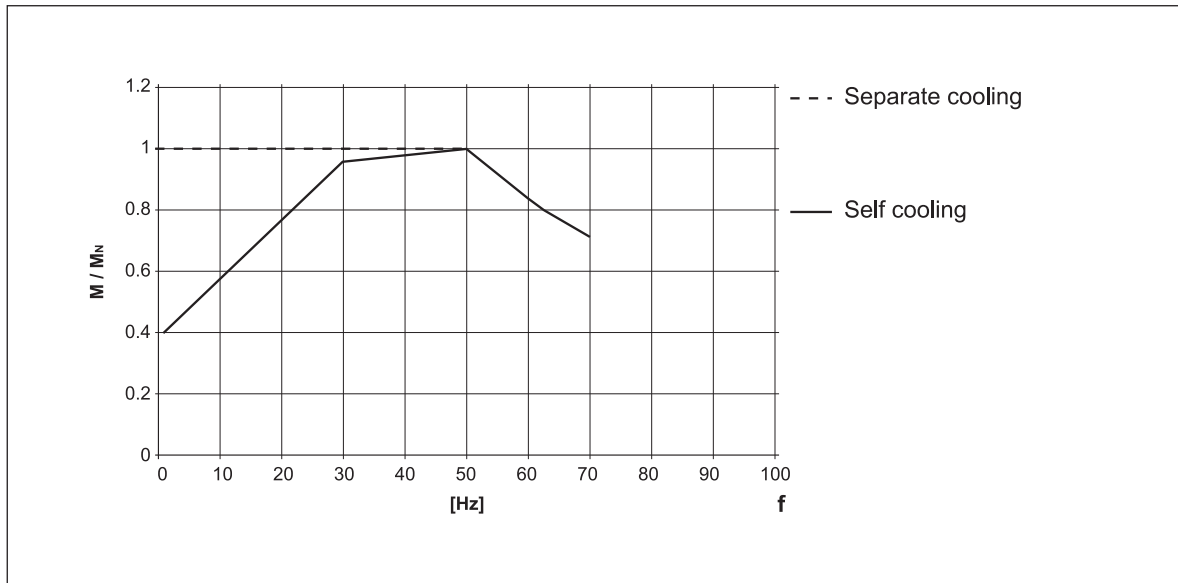
M7.13 Inverter-controlled motors

The electric motors Bonfiglioli 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). Typical torque/speed curves referred to S1 duty for motors with base frequency $f_b = 50$ Hz are reported in the table below. 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) . As motor maximum torque decreases with $(f/f_b)^2$, the allowed overloading must be reduced progressively.



(F26)



The following table reports the mechanical speed limit for motors operating above rated frequency:

(F27)

		n [min ⁻¹]		
		2p	4p	6p
≤ BE 112 - BN 112	ME2, ME3 M05 ... M3	5200	4000	3000
≥ BE 132 - BN 132	ME4, ME5 M4, M5	4500	4000	3000
BXN 63 ... BXN 90	MXN 05 ... MXN 25		4000	
BX 80 ... BX 180	MX2 ... MX5		4000	

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. Remote-controlled fan and brake (if fitted) must always be connected direct to mains power supply.

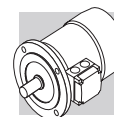
M7.14 Permissible starts per hour, Z

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:

$$Z = \frac{Z_0 \cdot K_c \cdot K_d}{K_J} \quad (02)$$



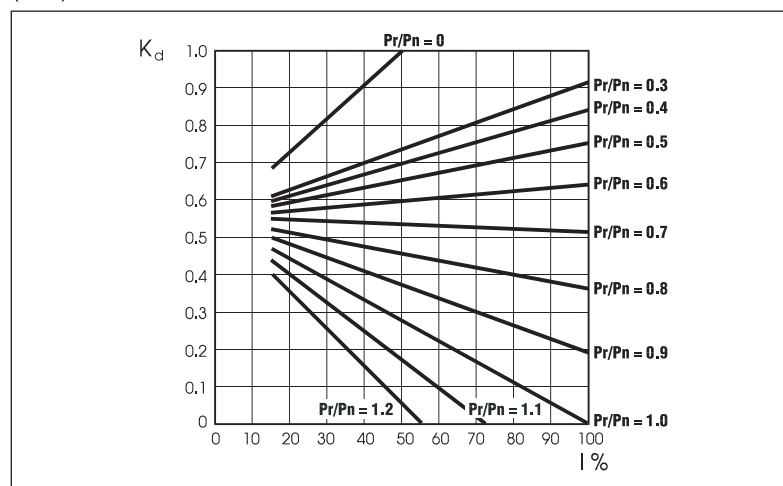
where:

$$K_J = \frac{J_m + J_c}{J_m} \quad \text{inertia factor}$$

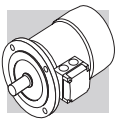
$$K_c = \frac{M_a - M_L}{M_a} \quad \text{torque factor}$$

$$K_d = \quad \text{load factor, see the following table}$$

(F28)



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 tables (F38), (F41) and dependent on the number of switches (c/h).

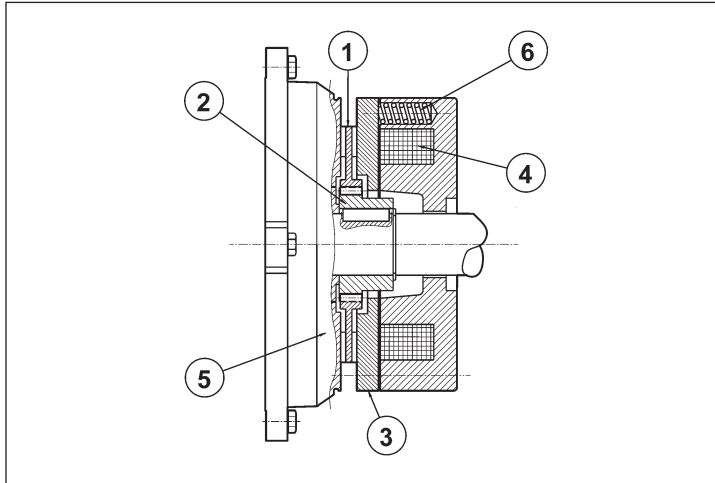


M8 ASYNCHRONOUS BRAKE MOTORS

M8.1 Operation

Versions with incorporated brake use spring-applied DC (FD option) or AC (FA 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.

(F29)



Key:

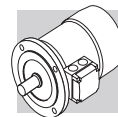
- ① brake disc
- ② disc carrier
- ③ pressure plate
- ④ brake coil
- ⑤ motor rear shield
- ⑥ brake springs

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.

M8.2 Most significant features

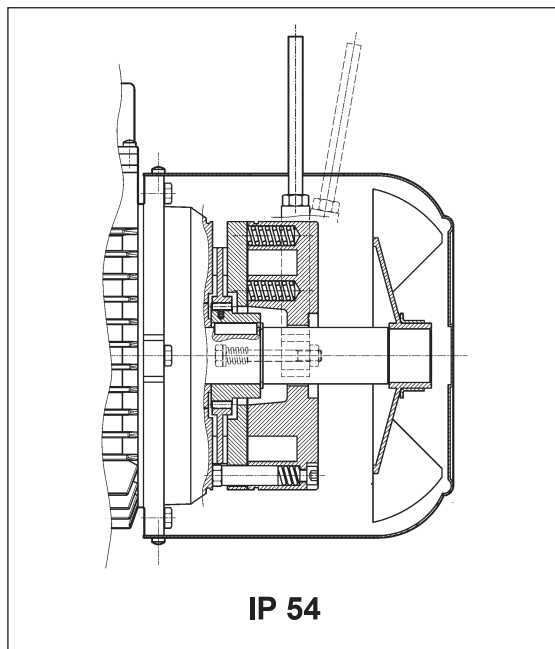
- High braking torques (normally $M_b \approx 2 M_n$), braking torque adjustment.
- Steel brake disc with double friction lining (low-wear, asbestos-free lining).
- Hexagonal seat on motor shaft fan end (N.D.E.) for manual rotation (not compatible with options PS, RC, TC, U1, U2, EN1, EN2, EN3, EN4, EN5, EN6).
- Manual release lever (options **R** and **RM** for FD; option **R** for FA).
- Corrosion-proof treatment on all brake surfaces.
- Insulation class F.



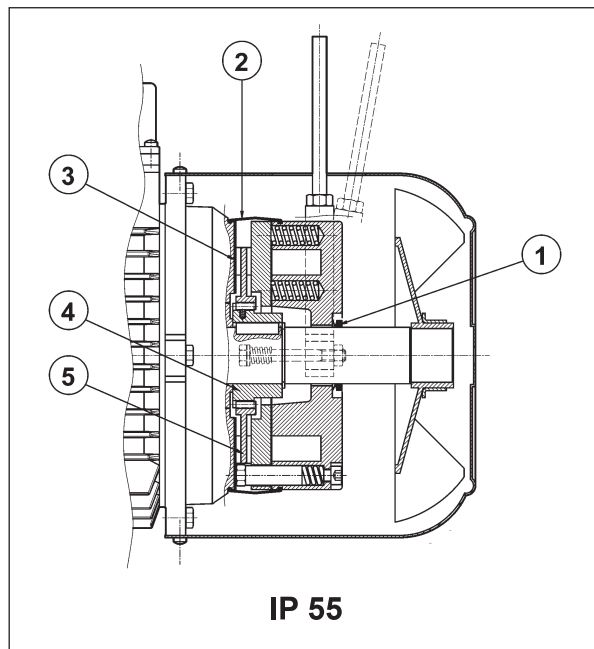
M9 DC BRAKE MOTORS TYPE BXN-BX-BE-BN_FD and MXN-MX-ME-M_FD

Frame sizes: BXN 63 ... BXN 90, BX 80 ... BX 355M, BX200LAK ... BX 355MCK - BE 63 ... BE 180L - BN 63 ... BN 200L / MXN 05 ... MXN 25 - MX2SB ... MX5LA - ME05 ... ME5 - M05 ... M5

(F30)



(F31)



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 device.

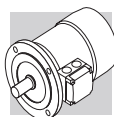
Brake torque factory setting is indicated in the corresponding motor rating charts. Braking torque may be modified by changing the type and/or number of springs.

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 paragraph "BRAKE RELEASE SYSTEMS" 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.

For applications involving lifting and/or high hourly energy dissipation, contact Bonfiglioli's Technical Service.



M9.1 Degree of protection

The standard protection degree for BN - M, BE - ME, BX≤180 - MX≤5 and BXN - MXN, while for BX≥200 and BX≥200K standard protection degree is IP55.

BN - M, BE - ME, BX≤180 - MX≤5 and BXN - MXN brakemotor with a standard protection degree IP54 can be requested with a protection degree IP55. If **IP55** is selected the following construction variants will be applied:

- ① V-ring at N.D.E. of motor shaft
- ② dust and water-proof rubber boot
- ③ stainless steel ring placed between motor shield and brake disc
- ④ stainless steel hub
- ⑤ stainless steel brake disc

M9.2 FD brake power supply

A rectifier accommodated inside the terminal box feeds the DC brake coil. Wiring connection across rectifier and brake coil is performed at the factory.

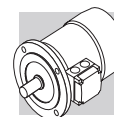
Brake power supply voltage V_B is as indicated in the following table, regardless of mains frequency:

(F32)

Brake power supply voltage V	FD brake supply voltages		
	Power supply from the motor with rectifier	Separate power supply with rectifier	Power supply without rectifier
24	X	X	✓
100	X	X	✓
110	X	✓	X
115	X	✓	X
120	X	✓	X
127	X	✓	X
180	X	X	✓
208	✓	✓	X
220	✓	✓	X
230	✓	✓	✓
240	✓	✓	X
255	✓	X	X
265	✓	X	X
280	✓	X	X
290	✓	X	X
330	✓	X	X
380	✓	✓	X
400	✓	✓	X
415	✓	✓	X
440	✓	✓	X
460	✓	✓	X
480	✓	✓	X
500	✓	✓	X

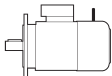



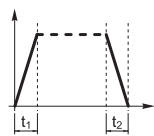
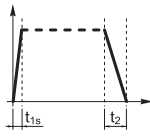
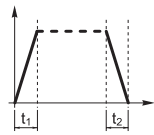
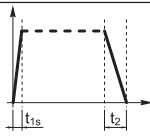
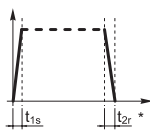
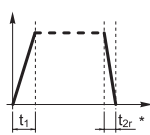
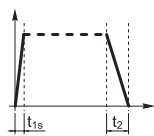
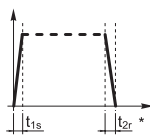
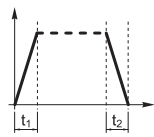
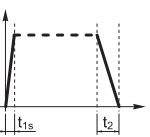


NOTE: For BXN and MXN motors refer to EVOX specific catalogue

For switch-pole motors the brake power supply is compulsorily from a separate line:



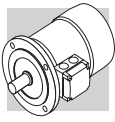
The diode half-wave rectifier ($V_{DC} \approx 0,45 \times V_{AC}$) is available in versions **NB**, **SB**, **NBR** e **SBR**, as detailed in the table below:

(F33)

		brake	 standard	 on request
BXN 63	MXN05	FD 02	NB 	SB 
BXN 71	MXN10	FD 53		
BXN 80	MXN20	FD 04		
BXN 90	—	FD 05		
BE 63 - BN 63	ME05 - M05	FD 02	NB 	SB 
BE 71 - BN 71	ME1 - M1	FD 03 FD 53		SBR 
BX 80 - BE 80 - BN 80	MX2 - ME2 - M2	FD 04		NBR 
BX 90S - BE 90S - BN 90S	—	FD 14		
BX 90L - BE 90L - BN 90L	—	FD 05		
BX 100 - BE 100 - BN 100	MX3 - ME3 - M3	FD 15		
—		FD 55	SB 	SBR 
BX 112 - BE 112 - BN 112	—	FD 06S		
BX 132 - BE 132 - BN 132 - BN 160MR	MX4 - ME4 - M4	FD 56 FD 06 FD 07		
BX 160 - BE 160L - BN 160L - BN 180M	MX5 - ME5 - M5	FD 08		
BX 180 - BE 180L - BN 180L - BN 200M	—	FD 09	NB 	
BX 200LA	—	FD 20		
BX 225SA	—	FD 25		
BX 250M - BX 315SA	—	FD 30		SB 
BX 315SB - BX 315SC	—	FD 160		
BX 315MA - BX 355MA	—	FD 250		
BX 355MB - BX 355MC	—	FD 400		
BX 200LAK	—	FD 8		
BX 225SAK - BX 225SBK	—	FD 9		
BX 250MAK	—	FD 10		
BX 280SAK - BX 315SAK	—	FD 1000		
BX 315SBK - BX 315SCK	—	FD 1600		
BX 355SAK - BX 355MCK	—	FD 2500		
				

(*) $t_{2c} < t_{2r} < t_2$

For BXN motors see the “Brake section” on the EVOX catalogue.



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

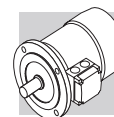
Rectifiers **NBR** or **SBR** are available for applications requiring quick brake intervention (braking condition reinstatement) response.

These rectifiers complement the **NB** and **SB** types as their electronic 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.

Versions available: 230Vac $\pm 10\%$, 400Vac $\pm 10\%$, 50/60 Hz (with power supply); 100Vdc $\pm 10\%$, 180Vdc $\pm 10\%$ (with SD option).



M9.3 FD brake technical specifications

The table below reports the technical specifications of DC brakes FD.

(F34)

Brake	Brake torque M_b [Nm] springs			Release		Braking		W_{max} per brake operation [J]			W	P
	6	4	2	t_1	t_{1s}	t_2	t_{2c}	10 s/h	100 s/h	1000 s/h	[MJ]	[W]
				[ms]	[ms]	[ms]	[ms]					
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					
FD06S	60	40	20	—	80	220	25	20000	4800	550	70	55
FD56	—	75	37	—	90	250	20	29000	7400	800	80	65
FD06		100	50		100	250	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
FD20	260			100	170	340	-	80000	1700	1800	-	100
FD25	400			120	195	390	-	120000	19000	2000	-	110
FD30	1000			180	210	420	-	200000	28000	2900	-	200
FD160	1600			360	245	490	-	240000	36000	2600	-	336
FD250	2500			420	343	685	-	280000	47000	3700	-	400
FD400	4000			530	455	910	-	325000	51000	4500	-	420
FD8	400			176	78	236	-	65000	7000	650	-	85
FD9	600			324	138	176	-	120000	12000	1200	-	100
FD10	800			480	194	172	-	100000	16000	2000	-	150
FD1000	1000			252	-	375	-	220000	27000	2700	-	300
FD1600	1600			366	-	498	-	230000	35000	3500	-	340
FD2500	2500			660	-	880	-	590000	61000	6100	-	530

* brake torque values obtained with 9, 7 and 6 springs, respectively

** brake torque values obtained with 12, 9 and 6 springs, respectively

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. (F34) 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

The brake pad wear depends on the operating/ambient conditions (temperature, humidity, angular speed, specific pressure); Therefore the declared wear rate must be considered as indicative.

M9.4 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 VB 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.

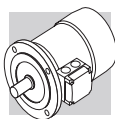


Table (F35+F39) – Brake coil with power supply from motor terminals (DIR) and AC line interruption. Delayed stop time t_2 and function of motor time constants.

Mandatory when soft-start/stops are required.

Table (F36+F40) – Brake coil with separate power supply (SA) and AC line interruption.

Normal stop time independent of motor.

Achieved stop times t_2 are indicated in the table (F34).

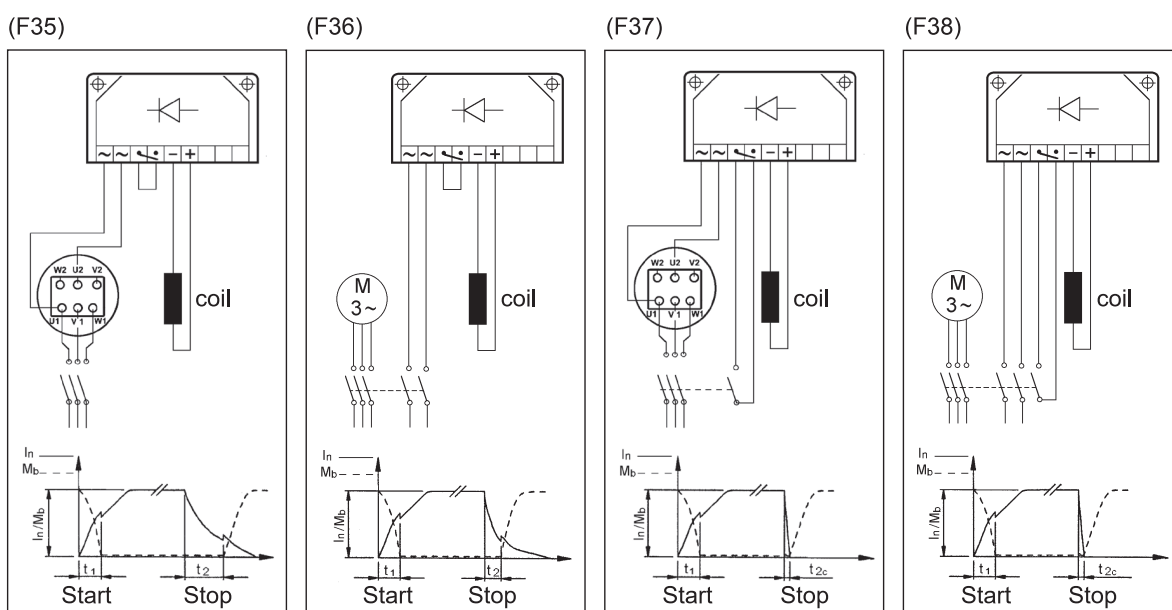
Table (F37+F41) – Brake coil with power supply from motor terminals (DIR) and AC/DC line interruption.

Quick stop with operation times t_{2c} as per table (F34).

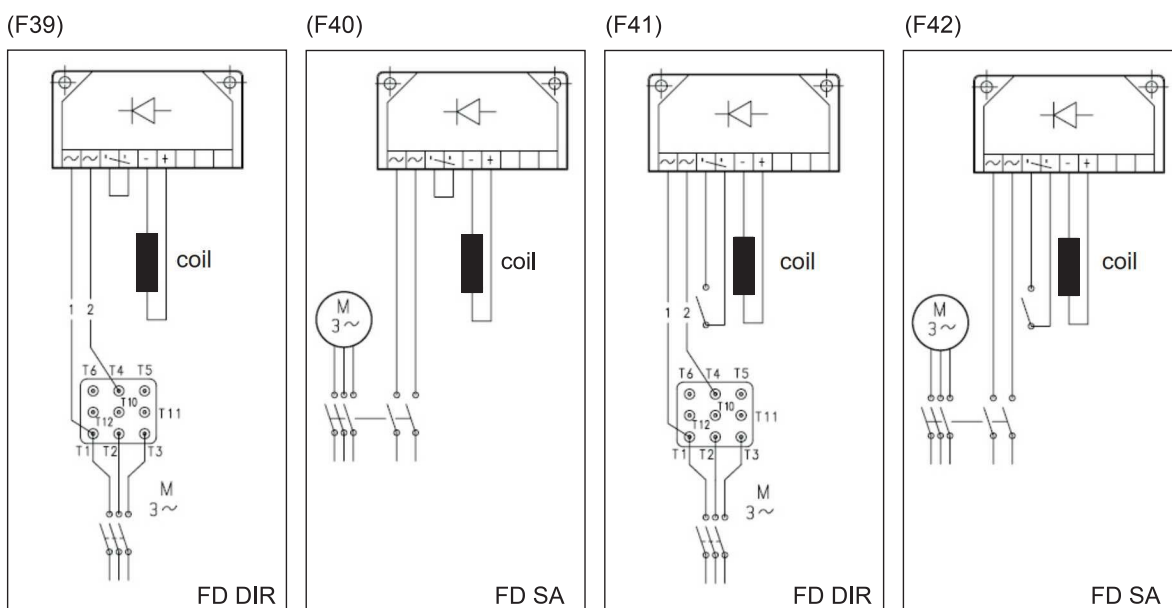
Table (F38+F42) – Brake coil with separate power supply (SA) and AC/DC line interruption.

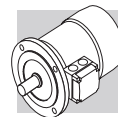
Stop time decreases by values t_{2c} indicated in the table (F34).

The brake may be voltage supplied directly from the motor terminal box (tab. F35-F39 and tab. F37-F41) only if the nominal voltage of the brake is the same as the smaller voltage of the motor.



For BXN and MXN motors the FD brake connection scheme is as follows:

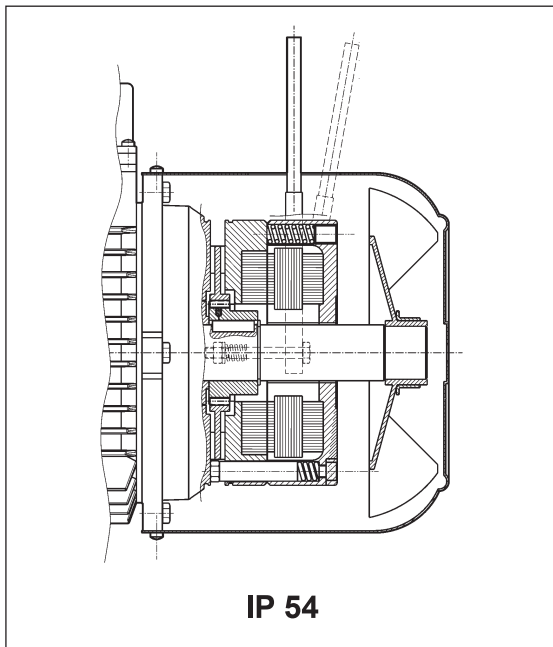




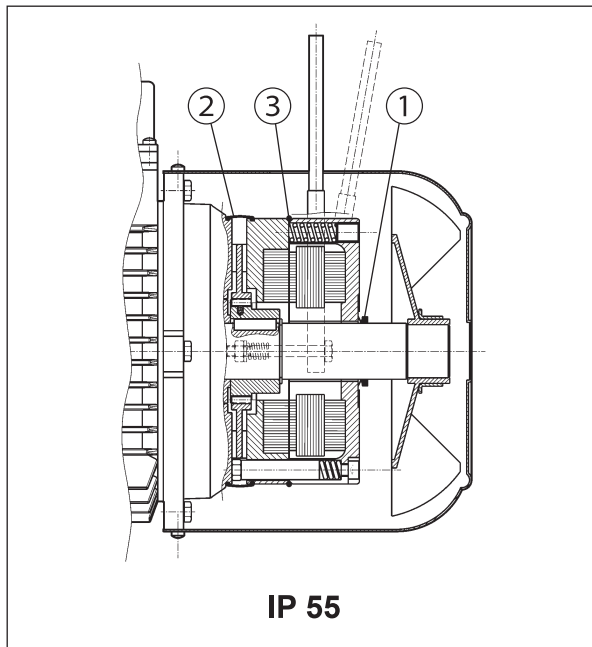
M10 AC BRAKE MOTORS TYPE BXN-BX-BE-BN_FA and MXN-MX-ME-M_FA

Frame sizes: BXN 63 ... BXN 90, BX 80 ... BX 160L - BE 63 ... BE 160L - BN 63 ... BN 180M / MXN 05 ... MXN 25 - MX2SB ... MX5LA - ME05 ... ME5 - M05 ... M5

(F43)



(F44)



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 device. 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. (F45).

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 variant at paragraph "BRAKE RELEASE SYSTEMS" for available release lever locations.

For applications involving lifting and/or high hourly energy dissipation, contact Bonfiglioli's Technical Service.

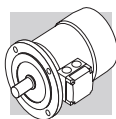
M10.1 Degree of protection

Standard protection class is IP54.

Brake motor FA is also available in protection class **IP55**, which mandates the following variants:

M10.2 FA brake power supply

- ① V-ring at N.D.E. of motor shaft
- ② dust and water-proof rubber boot
- ③ O-ring



In single speed motors, power supply may be brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same.

Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In all 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:

(F45)

FA brake supply voltages		
Brake power supply voltage V	FA brake	
	Motor power supply at 50Hz	Motor power supply at 60Hz
208	✗	✓
220	✗	✓
230	✓	✓
240	✗	✓
380	✓	✓
400	✓	✓
415	✓	✗
440	✗	✓
460	✗	✓
480	✗	✓
500	✓	✗
575	✗	✓

NOTE: For BXN and MXN motors refer to EVOX specific catalogue

Special voltages are available at request.

M10.3 Technical specifications of FA brakes

(F46)

Brake	Brake torque M_b [Nm]	Release t_1 [ms]	Braking t_2 [ms]	W_{max} [J]			W [MJ]	P [VA]
				10 s/h	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

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)

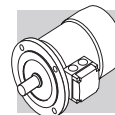
W = braking energy between two successive air gap adjustments

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.

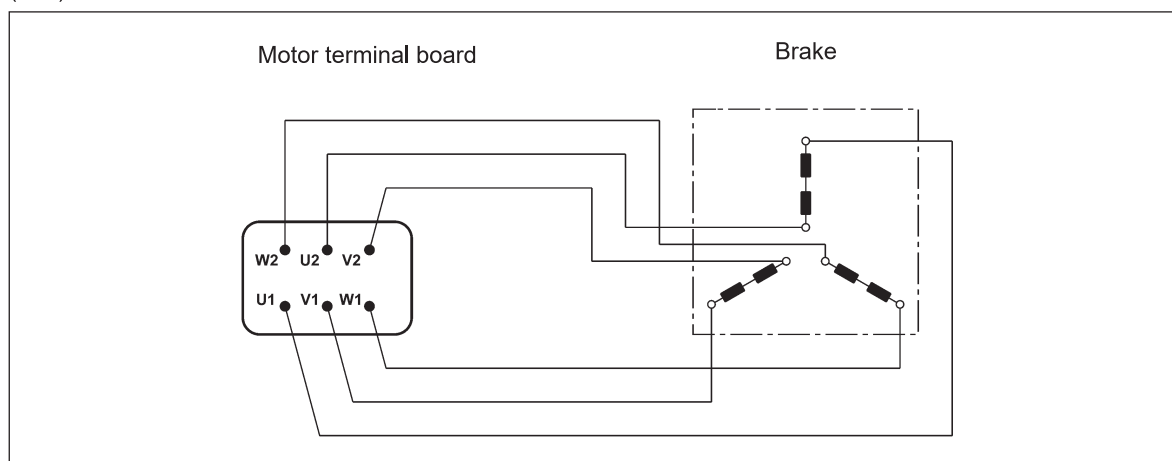


The brake pad wear depends on the operating/ambient conditions (temperature, humidity, angular speed, specific pressure); Therefore the declared wear rate must be considered as indicative.

M10.4 FA brake connections

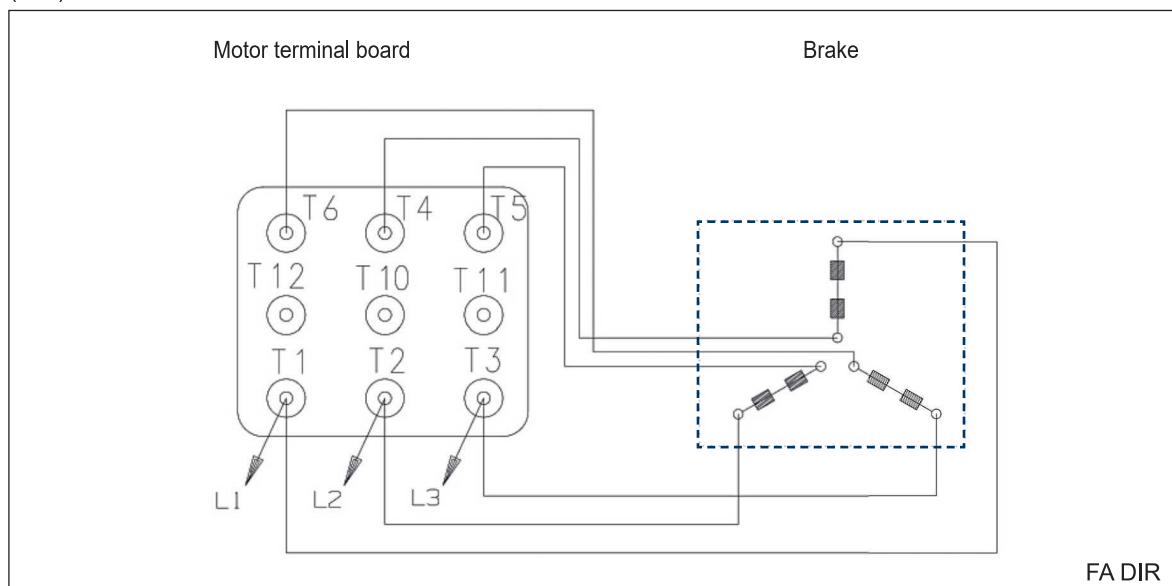
The diagram below shows the wiring when brake is connected directly to same power supply of the motor:

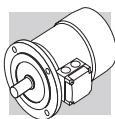
(F47)



For BXN and MXN motors the FA brake connection scheme is as follows:

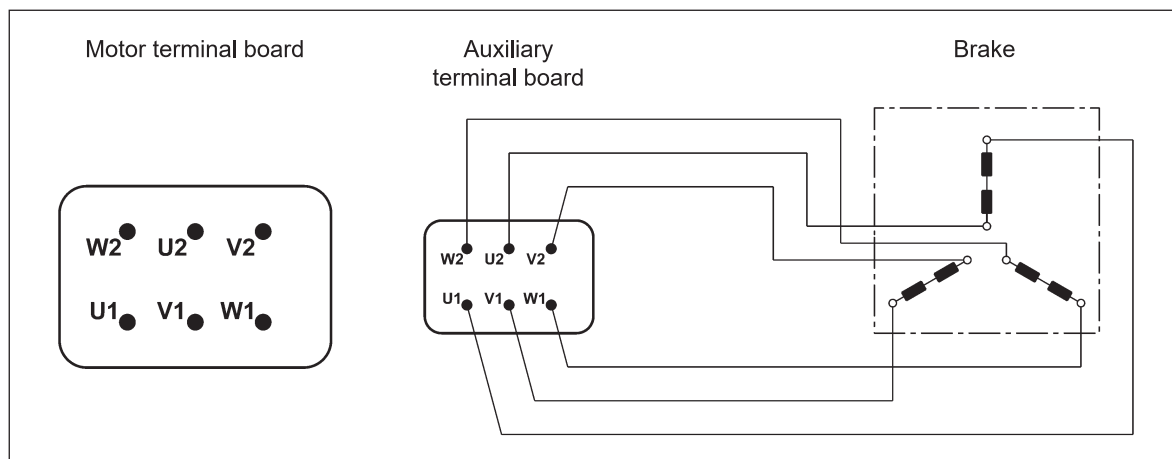
(F48)





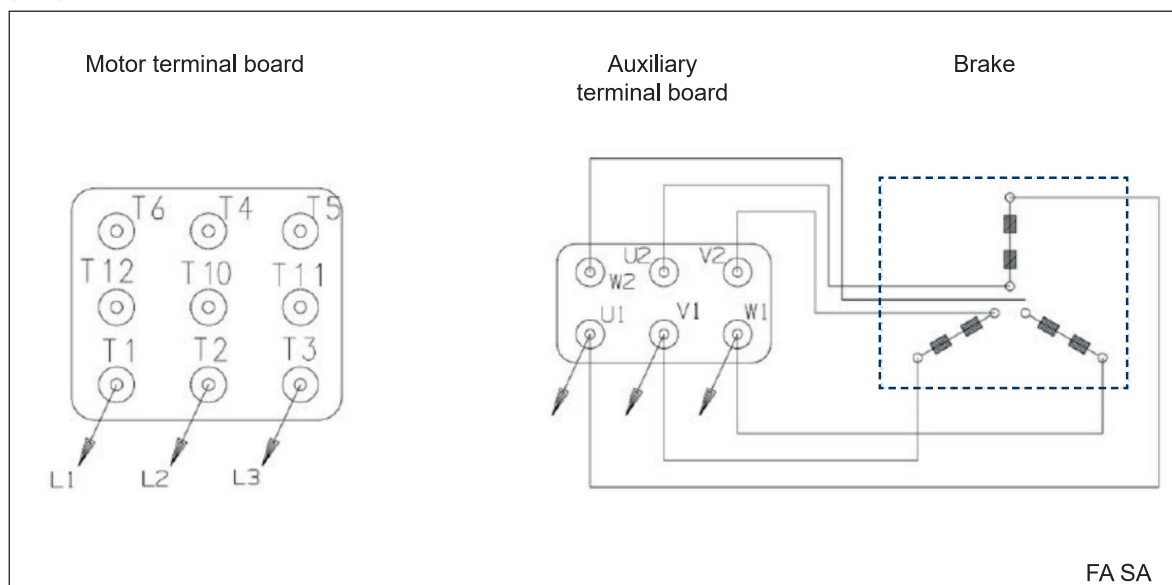
Switch-pole motors and, at request, single-pole motors with separate power supply are equipped with an auxiliary terminal board with 6 terminals for brake connection. In this version, motors feature a larger terminal box. See diagram below:

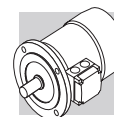
(F49)



For BXN and MXN motors the FA brake connection scheme is as follows:

(F50)



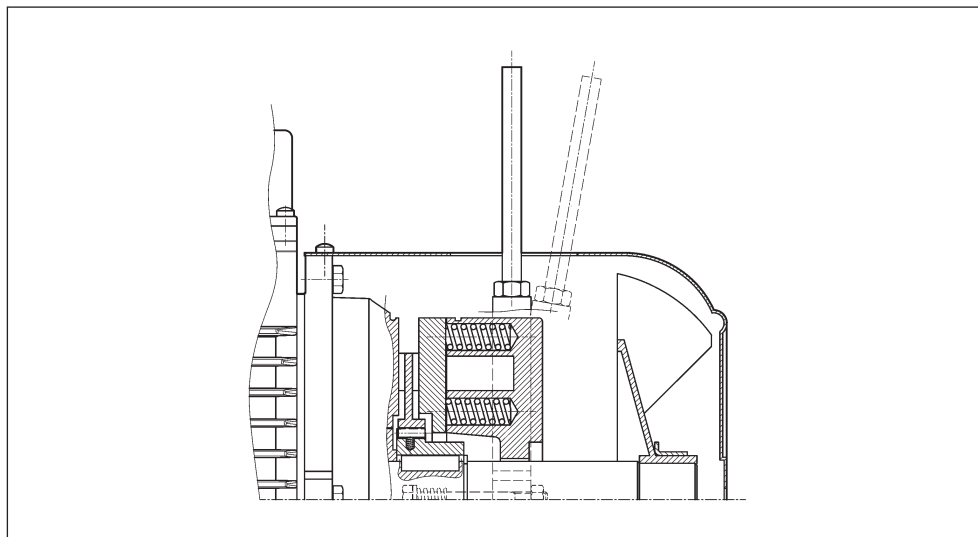


M11 BRAKE RELEASE SYSTEMS

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.

R

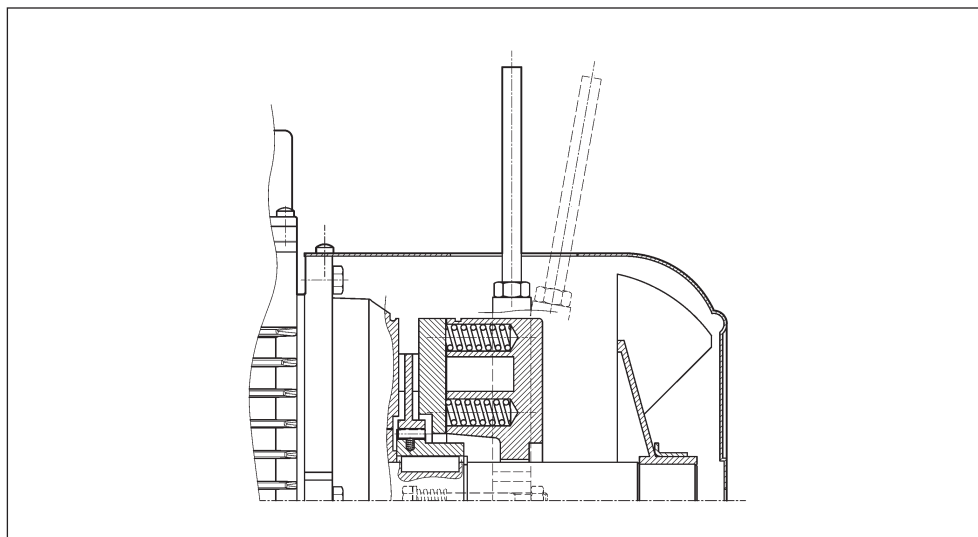
(F51)



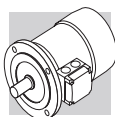
A return spring brings the release lever back in the original position.

RM

(F52)



On brake motors type 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. The availability for the various disengagement devices is charted here below:



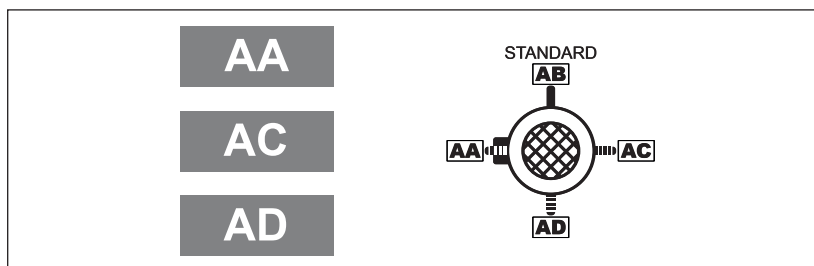
(F53)

	R	RM
BXN_FD BX_FD BE_FD BN_FD	BXN 63 ... BXN 90 BX 80 ... BX 180 BX 200K ... BX 315K BE 63 ... BE 180 BN 63 ... BN 200	BXN 63 ... BXN 90 BX 80 ... BX 132 BE 63 ... BE 132 BN 63 ... BN 132 FD07
MXN_FD MX_FD ME_FD M_FD	MXN05 ... MXN20 MX2 ... MX5 ME05 ... ME5 M05 ... M5	MXN05 ... MXN20 MX2 ... MX4 ME05 ... ME4 M05 ... M4LA
BXN_FA BX_FA BE_FA BN_FA	BXN 63 ... BXN 90 BX 80 ... BX 160 BE 63 ... BE 160L BN 63 ... BN 180M	
MXN_FA MX_FA ME_FA M_FA	MXN05 ... MXN20 MX2 ... MX5 ME05 ... ME5 M05 ... M5	

M11.1 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:

(F54)



M11.2 Separate brake supply

DIR

Direct brake supply

The brake system is directly powered through the electric motor terminal board power supply. When a legacy motor is configured with a direct brake supply no option need to be selected, while for EVOX motors DIR option must be selected.

...SA

Separate AC brake supply

The brake coil is directly powered through an independent line, separated from the motor one.

FA-SA: the rated AC voltage must be specified. SA 230 (V AC).

FD-NB/SB-SA: the rated AC voltage which power the rectifier must be specified. E.G. SA 400 (V AC).

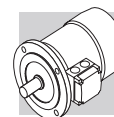
...SD

Separate DC brake supply

The brake coil is directly powered with a DC current and the rectifier is not present.

The rated coil voltage must be specified, E.G. SD 24 (V DC).

Note: for BX≥200 and BX≥200K it is not possible to directly feed the brake from the motor terminal box, it is then necessary to select option SA or SD.





M12 OPTIONS

M12.1 Soft-start / stop

F1

An optional flywheel - option F1 - is available for applications requiring soft starting or stopping. The flywheel's added inertia uses up kinetic energy during starting and returns it back during braking, thus catering for more progressive and gradual shock loads. The optional flywheel is available for brake motors type BN-BE_FD and M-ME_FD with specific characteristics as detailed in the table below:

(F55)

Main data for flywheel of motore type: BN-BE_FD, M-ME_FD			
		Fly-wheel weight [Kg]	Fly-wheel inertia [Kgm ²]
BN 63 - BE 63	M05 - ME05	0.69	0.00063
BN 71 - BE 71	M1 - ME1	1.13	0.00135
BN 80 - BE 80	M2 - ME2	1.67	0.00270
BN 90 S - BN 90 L BE 90 S - BE 90 LA	—	2.51	0.00530
BN 100 - BE 100	M3 - ME3	3.48	0.00840
BN 112 - BE 112	—	4.82	0.01483
BN 132 S - BN 132 M BE 132 S - BE 132 M	M4 - ME4	6.19	0.02580

M12.2 Capacitive filter

CF

An optional capacitive filter is available for brake motors type FD only. When the suitable capacitive filter is installed upstream of the rectifier (option CF), motors comply with the emission limits required by standard EN61000-6-3:2007 "Electromagnetic Compatibility – Generic Emission Standard – Part 6-3: Residential, commercial and light industrial environment".

BX≥200LA and BX≥200LAK motors comply with the emission limits required by standard EN 61000-6-3:2007 "Electromagnetic Compatibility - Generic Emission Standard - Part 6-3: residential, commercial and light industrial environment."

M12.3 Thermal protective devices

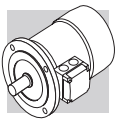
In addition to the standard protection provided by the magneto-thermal device, motors can be supplied with built-in thermal probes to protect the winding against overheating caused, by insufficient ventilation or by an intermittent duty.

This additional protection should always be specified for servoverventilated motors (IC416).

M12.4 Thermistors

E3

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. Positive temperature coefficient thermistors are normally used (also known as PTC "cold conductor resistors"). Thermistors cannot control relays directly and must be connected to a suitable disconnect device. Thus protected, three PTCs connected in series are installed in the winding, the terminals of which are located on the auxiliary terminal-board.



K1

The design characteristics of this sub-group of PTC thermistors allow them to be used as positive temperature coefficient sensors with variable resistance.

Functioning temperature range: 0°C ... +260°C.

Thermistors cannot control relays directly and must be connected to a suitable disconnect device.

Terminals (polarised) for 1 x KTY 84-130 are provided on an auxiliary terminal strip.

M12.5 Bimetallic thermostates

D3

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.

M12.6 Resistance thermometer

Pt1000

The resistance thermometer has a chip for a temperature sensor, the resistance of which changes in relation to temperature according to a series of reproducible basic values. The changes in resistance are transferred as changes in current.

At 0°C, the measurement resistances are adjusted to 1000 ohm for the Pt1000 and correspond to the accuracy class B (i.e. the relationship between resistance and temperature). The limit deviation is $\pm 0,3^{\circ}\text{C}$, and the admissible deviations are defined in EN 60751. The Pt1000 resistance thermometer will, in the future, gradually replace the KTY84-130 temperature available today. The relationship between the temperature and the electrical resistance of conductors is utilized in the Pt1000 to measure the temperature, just like with the additional resistance thermometers described above. Pure metals undergo larger changes in resistance than alloys and have a relatively constant temperature coefficient.

M12.7 Plug connector

CON

Three types of connectors (CON 1, CON 2, CON 3) are provided; they can be mounted in two different positions: right side of terminal box cover (C1D, C2D, C3D); left side of terminal box cover (C1S, C2S, C3S).

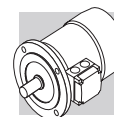
The option CON is applicable to single speed BN and M motors (2, 4, 6, 8 poles), and BX / BE and MX / ME motors on the sizes specified on the following table. All double speed motors are excluded. The connectors CON 1 / CON 2 are available for BX-BE/MX-ME and BN/M motors without brake and for brakemotors equipped with DC brake type FD, for the motor sizes listed below.

The male connector (with pins) is mounted on the motor, the female connector is not provided. With CON option, the winding connection is always Y.

With option U1 "forced ventilation", the fan unit supply is available inside the separate terminal box fixed to fan cover. With options EN1...EN6, the encoder connection is made by a cable not connected to the motor plug connector.

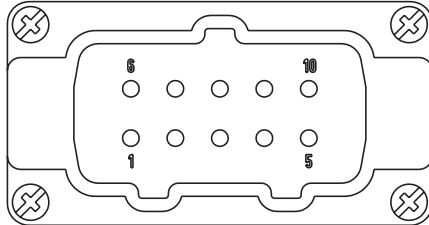
The CON option is not applicable to brakemotors equipped with AC brake type FA.

The CON option is not available when at least one of the next options are selected: the U2, CUS, IC.

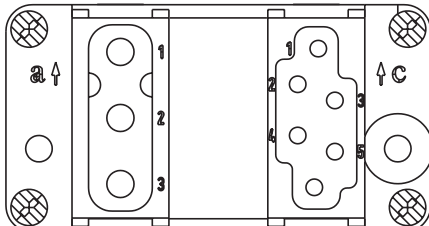


Specifications

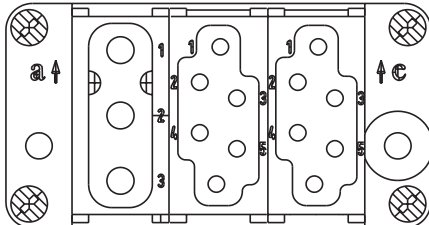
(F56)

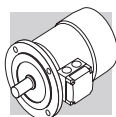
Option	CON 1
Motor size	BX 80 ... BX 112 / MX2, MX3 / BE 63 ... BE 112 / ME05 ... ME4 BN 63 ... BN 112 / M05 ... M3
Connector view	
Type of connector	Harting Han 10ES
Housing	Han EMC 10B with 2 levers
Numbers of pins - nominal current	10 x 16A
Voltage	500 Vac
Contact connection	Screw terminals

(F57)

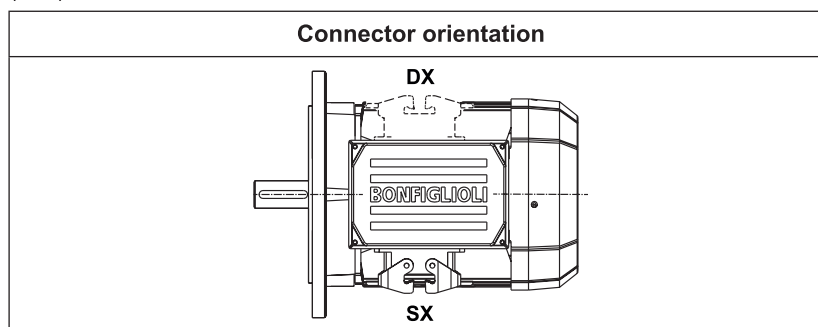
Option	CON 2
Motor size	BX 80 ... BX 132 / MX2, MX3 / BE 63 ... BE 132 / ME05 ... ME4 BN 63 ... BN 160MR / M05 ... M4
Connector view	
Type of connector	Harting Han Modular
Housing	Han EMC 10B with 2 levers
Module type	Module C + Module E + Module E
Numbers of pins - nominal current	3 x 36A / 6 x 16A
Voltage	500 Vac
Contact connection	Crimping contacts

(F58)

Option	CON 3
Motor size	BX 80 ... BX 132M / MX2, MX3 / BE 63 ... BE 132 / ME05 ... ME4 / BN 63 ... BN 160MR / M05 ... M4
Connector view	
Type of connector	Harting Han Modular
Housing	Han EMC 10B with 2 levers
Module type	Module C + Module E + Module E
Numbers of pins - nominal current	3 x 36A / 6 + 6 x 16A
Voltage	500 Vac
Contact connection	Crimping contacts



(F59)



(F60)

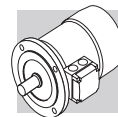
Motors without brake dimensions						
		AD (mm)	AF (mm)	AH (mm)	LL (mm)	V ^(*) (mm)
BE 63 - BN 63	ME05 - M05	136	110	45	165	4.5
BE 71 - BN 71	ME1 - M1	149	110	45	165	15.5
BX 80 - BE 80 - BN 80	MX2 - ME2 - M2	160	110	45	165	16.5
BX 90 - BE 90 - BN 90	MX3	162	110	45	165	31.5
BX 100 - BE 100 - BN 100	MX3 - ME3 - M3	171	110	45	165	37.5
BX 112 - BE 112 - BN 112	MX4	186	110	45	165	39
BX 132 - BE 132 - BN 132	MX4 - ME4 - M4	210	140	45	188	45.5
BN 160MR	—	210	140	45	188	161

(*) Dimension valid only for motors BX, BE and BN.

(F61)

Motors with FD brake dimensions						
		AD (mm)	AF (mm)	AH (mm)	LL (mm)	V ^(*) (mm)
BE 63 - BN 63	ME05 - M05	136	110	45	165	4.5
BE 71 - BN 71	ME1 - M1	149	110	45	165	1.5
BX 80 - BE 80 - BN 80	MX2 - ME2 - M2	160	110	45	165	18.5
BX 90 - BE 90 - BN 90	—	162	110	45	165	39.5
BX 100 - BE 100 - BN 100	MX3 - ME3 - M3	171	110	45	165	63.5
BX 112 - BE 112 - BN 112	—	186	110	45	165	75
BX 132 - BE 132 - BN 132	MX4 - ME4 - M4	210	140	45	188	122
BN 160MR	—	210	140	45	188	161

(*) Dimension valid only for motors BN and BX



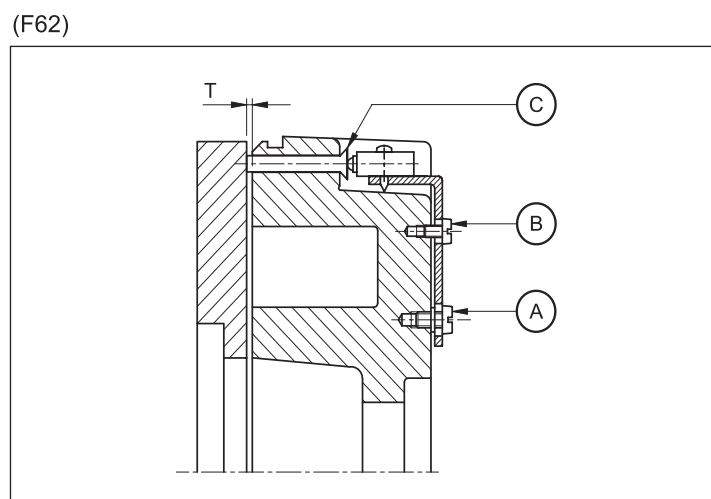
M12.8 Control of brake operation

MSW

The microswitch can be set in order to obtain from it a signal related to the attraction/release of anchor plate, or it can be set in order to give feedback when the air gap reaches the maximum value.

MSW option is available for brakes FD03...FD09.

The microswitch is provided with three lead wires (NC, NO, COM). The next figure shown the main components of the brake equipped with microswitch.



- A: Plate fixing screws
- B: Setting screws
- C: Actuator control pin

M12.9 Additional cable entry for brakemotors

IC

The terminal box cover of brakemotors BN 63 ... BN 160MR - M05 ... M4L is provided with two additional cable entry M16 x 1.5 (one cable entry per side).

The terminal box cover of brakemotors BN 160 ... BN 200 - M5 is provided with an additional cable entry M16 x 1.5 next to the cable entry used for the brake.

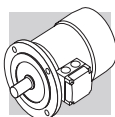
M12.10 Anti-condensation heaters

H1


NH1

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:



(F63)

	H1	NH1
	1~ 230V ± 10% P [W]	1~ 115V ± 10% P [W]
BXN 63 ... BXN 80 BX 80 BE 63 ... BE 80 BN 56 ... BN 80	10	10
BXN 90 BX 90 ... BX 132 BE 90 ... BE 132MB BN 90 ... BN 160MR	25	25
BX 160...BX 250 BX 160 ... BX 250K BX 160, BX 180 BE 160, BE 180 BN 160, BN 200	50	50
BX 280 BX 280K	60	60
BX 315 ... BX 355 BX 315K ... BX 355K	120	120

Warning!

Always remove power supply to the anti-condensante heater before operating the motor.

M12.11 Tropicalization

TP

When option **TP** is specified, motor windings receive additional protection for operation in high humidity and temperature conditions.

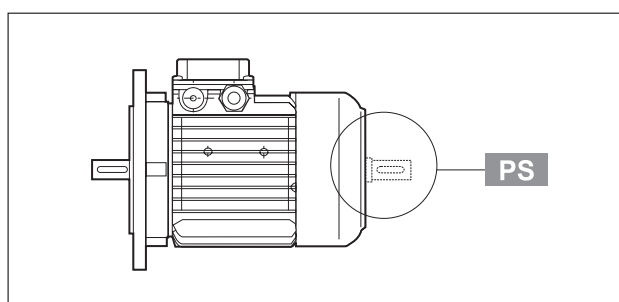
M12.12 Second shaft extension

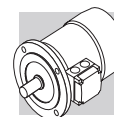
PS

This option is not compatible with variants RC, TC, U1, U2, EN1, EN2, EN3, EN4, EN5, EN6, EN7, EN8.

For shaft dimensions please see motor dimensions tables.

(F64)





M12.13 Backstop device


AL

AR

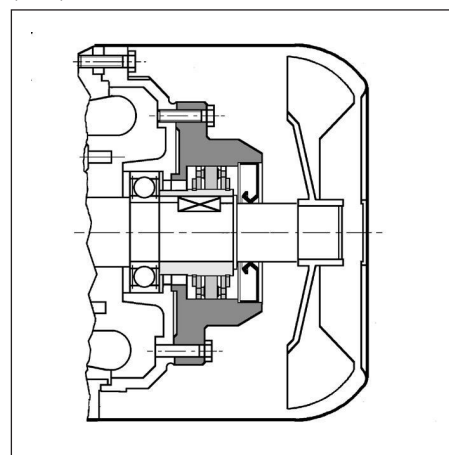
For applications where backdriving must be avoided, motors equipped with an anti run-back device can be used (available for the MX/ME and M series only). While allowing rotation in the direction required, this device operates instantaneously in case of a power failure, preventing the shaft from running 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 (F62) shows rated and maximum locking torques for the anti run-back devices. A diagram of the device can be seen in Table (F63). Overall dimensions are same as the corresponding brake motor. The direction of free rotation is described in the "MOTOR OPTIONS" section of specifically dedicated sections to gear units.

(F65)

	Rated locking torque [Nm]	Max. locking torque [Nm]	Release speed [min ⁻¹]
ME1 - M1	6	10	750
MX2 - ME2 M2	16	27	650
MX3 - ME3 M3	54	92	520
MX4 - ME4 M4	110	205	430

(F66)



M12.14 Rotor balancing

RV

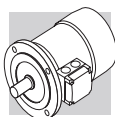
Where low noise is a priority requirement, the option RV ensures reduced vibration in accordance with vibration class B.

The table below reports effective velocity of vibration for normal (A) and B grade balancing.

(F67)

Vibration level	Angular velocity n [min ⁻¹]	Limits of the vibration velocity (mm/s) BX 80 ≤ H ≤ BX 335M ≤ BX 355MK BE 63 ≤ H ≤ BE 180L BN 56 ≤ H ≤ BN 200
A	600 < n < 3600	1.6
B	600 < n < 3600	0.70

Values are obtained from measurements on freely suspended motor during noload operation; tolerance ±10%.



M12.15 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.



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 motors with rear shaft projection (PS option) are excluded.

This variant has two different models, called **U1** and **U2**, having the same longitudinal size. Longer side of fan cover (**DL**) is specified for both models in the table below. Overall dimension can be reckoned from motor size table.

(F68)

Extra length for servoventilated motors			
		ΔL_1	ΔL_2
BE 71 - BN 71	ME1 - M1	93	32
BX 80 - BE 80 - BN 80	MX2 - ME2 - M2	127	55
BX 90 - BE 90 - BN 90	—	131	48
BX 100 - BE 100 - BN 100	MX3 - ME3 - M3	119	28
BX 112 - BE 112 - BN 112	—	130	31
BX 132 - BE 132 - BN 132	MX4 - ME4 - M4	161	51
BX 160 ... BX 180 BE 160 ... BE 180 BN 160 ... BN 200L	MX5 ME5 M5	184	184
BX 200	—	250	260
BX 225 - BX 250	—	320	320
BX 280 - BX 315	—	430	430
BX 355	—	640	640

ΔL_1 = extra length to LB value of corresponding standard motor.

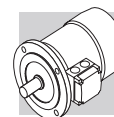
ΔL_2 = extra length to LB value of corresponding brake motor.

U1

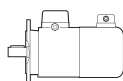
Fan wiring terminals are housed in a separate terminal box.



In brake motors of size BX 132 ... BX 160 - BE 71 ... BE 160 - BN 71 ... BN 160MR, MX4, MX5 - ME05 ... ME5 - M05 ... M5 with **U1** model, the release lever cannot be positioned to AA.

This option can be selected for motors compliant with CSA and UL standards (CUS option), only for BX ≥ 200 and BX $\geq 200K$.



(F69)



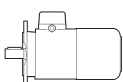
		V a.c. ±10%	Hz	P [W]	I [A]
BN 71 - BE 71	ME1 - M1	1 ~ 230	50 / 60	22	0.12
BX 80 - BE 80 BN 80	MX2 - ME2 M2			22	0.12
BX 90 - BE 90 BN 90	—			40	0.30
BX 100 - BE 100 BN 100	MX3 - ME3 M3			50	0.25
BX 112 - BE 112 BN 112	—	3 ~ 230Δ / 400Y	50 / 60	50	0.26 / 0.15
BX 132 - BE 132 BN 132 ... BN 160MR	MX4 - ME4 M4L			110	0.38 / 0.22
BX 160 - BE 160 BN 160M ... BN 180M	MX5 - ME5 M5			180	1.25 / 0.72
BX 180 - BE 180 BN 180L ... BN 200L	—	3 ~ 400Δ / 690Y	50	250	1.51 / 0.87
BX 200 ... BX 250 BX 200K ... BX 250K	—			250	0.64
BX 280 ... BX 315M BX 280K ... BX 315MK	—			750	1.7
BX 315 ... BX 355S BX 315LK ... BX 355SK	—			1500	3.3
BX 355M BX 355MK	—			3000	6.1



U2

Fan terminals are wired in the motor terminal box.

The **U2** option does not apply to motors BX, BE, MX, ME and to motors with option CUS (compliant to norms CSA and UL).

(F70)



		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	3 ~ 230Δ / 400Y	50 / 60	40	0.26 / 0.09
BN 112	—			50	0.26 / 0.15
BN 132 ... BN 160MR	M4L			110	0.38 / 0.22

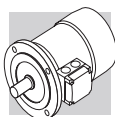
M12.16 Rain canopy

RC



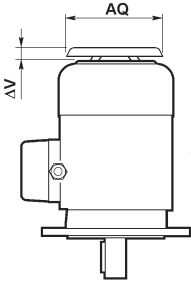
The rain canopy protects the motor from dripping and avoids the ingress of solid bodies. It is recommended when motor is installed in a vertical position with the shaft downwards.

Relevant dimensions are indicated in the table below.

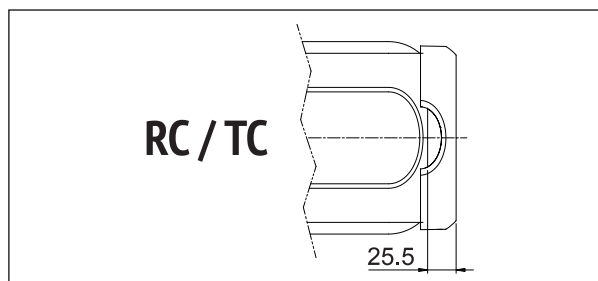
The drip cover is not compatible with variants PS, EN1, EN2, EN3, EN4, EN5, EN6.



(F71)

		AQ	ΔV	
BE 63 - BN 63	ME05 - M05	118	24	
BN 71 - BE 71	ME1 - M1	134	27	
BX 80 - BE 80 BN 80	MX2 - ME2 M2	152	25	
BX 90 - BE 90 BN 90	—	168	30	
BX 100 - BE 100 BN 100	MX3 - ME3 M3	190	28	
BX 112 - BE 112 BN 112	—	211	32	
BX 132 - BE 132 BN 132 ... BN 160MR	MX4 - ME4 M4	254	32	
BX 160 - BE 160 BN 160M ... BN 180M	MX5 - ME5 M5	302	36	
BX 180 - BE 180 BN 180L ... BN 200L	—	340	36	
BX 200	—	423	55	
BX 225	—	465	55	
BX 250	—	514	55	
BX 280	—	567	100	
BX 315	—	645	100	
BX 355	—	740	120	

For RC/TC on BXN/MXN motors see the scheme below.



M12.17 Textile canopy

TC

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, EN4, EN5, EN6, PS, U1, U2.

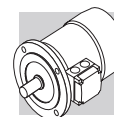
Overall dimensions are the same as drip cover type RC.

TC option is not available for BX motors.

M12.18 Feedback units

Motors may be combined with six 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.



EN1

Incremental encoder, $V_{IN} = 5\text{ V}$, line-driver output RS 422.

EN2

Incremental encoder, $V_{IN} = 10\text{-}30\text{ V}$, line-driver output RS 422.

EN3

Incremental encoder, $V_{IN} = 12\text{-}30\text{ V}$, push-pull output 12-30 V

EN4

Encoder sin/cos, $V_{IN} = 4.5\text{-}5.5\text{ V}$, output Sinus $0.5V_{PP}$.

EN5

Absolute encoder singleturn, HIPERFACE® interface, $V_{IN} = 7\text{-}12\text{ V}$.

EN6

Absolute encoder multiturn, HIPERFACE® interface, $V_{IN} = 7\text{-}12\text{ V}$.

EN7

Incremental encoder Heavy Duty, $V_{IN} = 12\text{-}30\text{ V}$, push-pull output 12-30 V.

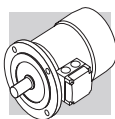
EN8

Incremental encoder Heavy Duty, $V_{IN} = 12\text{-}30\text{ V}$, push-pull output 9-30 V.

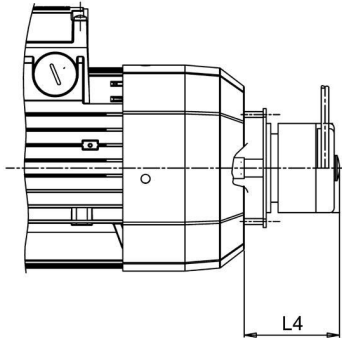
Note: EN7 and EN8 available only for $BX \geq 200$

(F72)

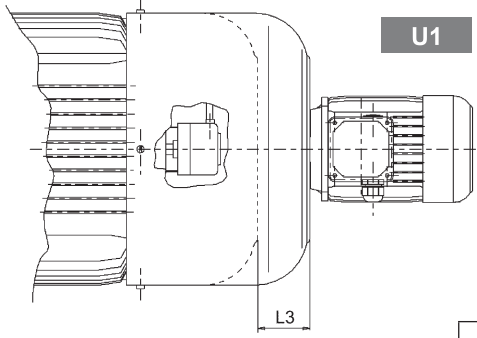
	EN1	EN2	EN3	EN4	EN5	EN6	EN7	EN8
Interface	TTL/RS 422	TTL/RS 422	HTL push-pull	Sinus 0.5 VPP	HIPERFACE®	HIPERFACE®	HTL push-pull	HTL push-pull
Power supply voltage [V]	4...6	10...30	12...30	4.4...5.5	7...12	7...12	9...30	
Output voltage [V]	5	5	12...30	—	—	—	9...30	
No-load operating current [mA]	120	100	100	40	80	80	80	
No. of pulses per revolution	1024							2048
Steps per revolution	—	—	—	—	15 bit	15 bit	-	-
Revolutions	—	—	—	—	—	12 bit	-	-
No. of signals	6 (A, B, Z + inverted signals)			6 (cos-, cos+, sin-, sin+, Z, Z̄)	—	—	6	6
Max. output frequency [kHz]	600			200			200	
Max. speed [min ⁻¹]	6000 (9000 min ⁻¹ for 10 s)						6000	
Temperature range [°C]	-30 ... +100						-20 ... +85	
Protection class	IP 65						IP67	



(F73)

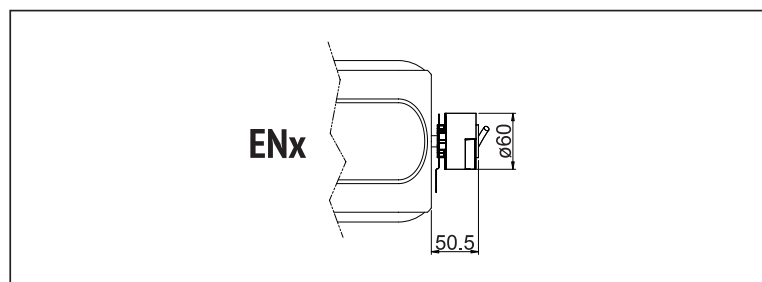
EN1, EN2, EN3, EN4, EN5, EN6, EN7, EN8		
		L4
BN 63 ... BN 200	M05 ... M5	65
BE 63... BE180	ME05 ... ME5L	65
BX 80 ... BX 180	MX2 ... MX5L	65
BX 200 ... BX 280	—	100
BX 315 ... BX 355	—	100

(F74)

EN_ + U1		
		L3
BX 160 - BE 160 BN 160M...BN 180M	MX5 - ME5 M5	72
BX 160 - BE 180 BN 180L...BN 200L	—	82
BX 160_FD BN 160M_FD...BN 180M_FD	MX5_FD M5_FD	35
BX 180_FD BN 180L_FD...BN 200L_FD	—	41
BX 200 - BX 225 - BX 250	—	100
BX 280 - BX 315 - BX 355	—	150

If the encoder device (option EN_) is specified on motors BX 80 ... BX 132 - MX2 ... MX4 - BE 63 ... BE 132 - ME05 ... ME4 - BN 71 ... BN 160MR - 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.

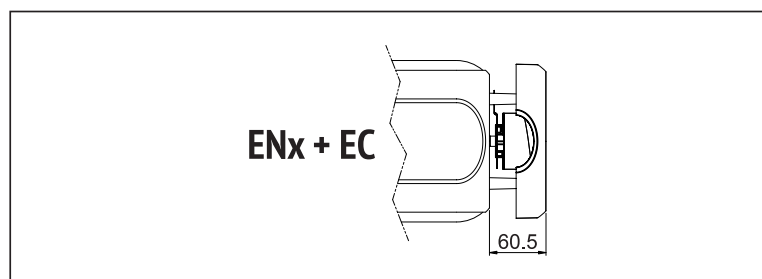
For EN on BXN/MXN motors see the scheme below.

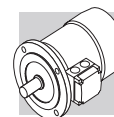


M12.19 EC - Encoder canopy

EC

Option EC is a cover variant specifically made for our encoders. It protects them from impacts and may help in prolonging their productive life.





M12.20 Insulated Bearings

IB

NOTE: This option is available for BX and BX K \geq 280, and it is mandatory when the motor is operated through a variable speed drive.

When IB option is selected the motor is equipped with insulated bearings at drive end. This prevents early bearings failures due to high frequency circulation currents.

M12.21 Vertical Mounting

VM

NOTE: This option is mandatory for BX \geq 200 and BX \geq 200K, when vertically mounted.

When VM is selected the motor is delivered with specific arrangements.

Furthermore, the vertical mounting position will also be reported on motor nameplate.

M12.22 Surface protection

C_

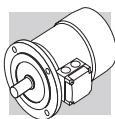
When no specific protection class is requested, the painted (ferrous) surfaces of motors are protected to at least corrosivity class C2 (UNI EN ISO 12944-2). For improved resistance to atmospheric corrosion, motors can be delivered with C3 and C4 surface protection.

(F75)

SURFACE PROTECTION	Typical environments	Maximum surface temperature	Corrosivity class according to UNI EN ISO 12944-2
C3	Urban and industrial environments with up to 100% relative humidity (medium air pollution)	120°C	C3
C4	Industrial areas, coastal areas, chemical plant, with up to 100% relative humidity (high air pollution)	120°C	C4
C5M	Coast and offshore areas with high salt content.	120°C	C5M

Motors with optional protection to class C3 or C4 are available in a choice of colours. If no specific colour is requested (see the "PAINTING" option) motors are finished in RAL 7042 for BN/M, BE/ME and BX \leq 180/MX and in Munsell blue 8B 4.5/3.25 for BX \geq 200.

Motors can also be supplied with surface protection for corrosivity class C5 according to UNI EN ISO 12944-2. Contact our Technical Service for further details.



M12.23 Painting

RAL

Gearboxes with optional protection to class C3 or C4 are available in the colours listed in the following table.

(F76)

PAINTING	Colour	RAL number
RAL7042	Traffic Grey A	7042
RAL5010	Gentian Blue	5010
RAL9005	Jet Black	9005
RAL9006	White Aluminium	9006
RAL9010	Pure White	9010
Munsell blue 8B* 4.5/3.25	Blue	MUNSELL 8B 4.5/3.25
RAL7035	Light Grey	7035
RAL7001	Silver Grey	7001
RAL5015	Sky Blue	5015
RAL7037	Dusty Grey	7037
RAL5024	Pastel Blue	5024

* BX \geq 200 and BX \geq 200K Motors are standardly supplied in this colour with C3 protection unless specified differently.

NOTE – “PAINTING” options can only be specified in conjunction with “SURFACE PROTECTION” options.

M12.24 Certificates

ACM

Certificate of compliance of motors

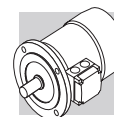
The document certifies the compliance of the product with the purchase order and the construction in conformity with the applicable procedures of the Bonfiglioli Quality System.

Note: Not available for BX \geq 200 and BX \geq 200K

CC

Inspection certificate



The document entails checking on order compliance, the visual inspection of external conditions and instrumental testing of the electrical characteristics in unloaded conditions. Units inspected are sampled within the shipping batch and marked individually.





M13 TABLES OF MOTORS CORRELATION

M13.1 50 Hz Motors

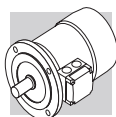
(F77)

2 pole							
Efficiency class		IE1	IE2	IE3	IE1	IE2	IE3
Pn [kW]	0.06						
	0.09						
	0.12						
	0.18	BN 63A 2			M 05A 2		
	0.25	BN 63B 2			M 05B 2		
	0.37	BN 71A 2			M 05C 2		
	0.55	BN 71B 2			M 1SD 2		
	0.75	BN 71C 2 BN 80A 2	BE 80A 2		M 1LA 2	ME 2SA 2	
	1.1	BN 80B 2	BE 80B 2		M 2SA 2	ME 2SB 2	
	1.5	BN 90SA 2	BE 90SA 2		M 2SB 2		
	1.85	BN 90SB 2					
	2.2	BN 90L 2	BE 90L 2		M 3SA 2		
	3	BN 100L 2	BE 100L 2		M 3LA 2	ME 3LB 2	
	4	BN 112M 2	BE 112M 2		M 3LB 2		
	5.5	BN 132SA 2	BE 132SA 2		M 4SA 2	ME 4SA 2	
	7.5	BN 132SB 2	BE 132SB 2		M 4SB 2	ME 4LA 2	
	9.2	BN 132M 2	BE 132MB 2		M 4LA 2	ME 4LB 2	
	11	BN 160MR 2 BN 160M 2	BE 160MA 2		M 4LC 2	ME 5SA 2	
	15	BN 160MB 2	BE 160MB 2		M 5SB 2	ME 5SB 2	
	18.5	BN 160L 2	BE 160L 2		M 5SC 2	ME 5LA 2	
	22	BN 180M 2			M 5LA 2		
	30	BN 200LA 2					

(F78)

4 pole							
Efficiency class		IE1	IE2	IE3	IE1	IE2	IE3
Pn [kW]	0.06	BN 56A 4					
	0.09	BN 56B 4			M 0B 4		
	0.12	BN 63A 4	BE 63A 4	BXN 63MA 4	M 05A 4	ME 05A 4	MXN 05MA 4
	0.18	BN 63B 4	BE 63B 4	BXN 63MB 4	M 05B 4	ME 05B 4	MXN 05MB 4
	0.25	BN 63C 4 BN 71A 4	BE 71A 4	BXN 71MA 4	M 05C 4	ME 1SA 4	MXN 10MA 4
	0.37	BN 71B 4	BE 71B 4	BXN 71MB 4	M 1SD 4	ME 1SB 4	MXN 10MB 4
	0.55	BN 71C 4 BN 80A 4	BE 80A 4	BXN 80MA 4	M 1LA 4		MXN 20MA 4
	0.75	BN 80B 4	BE 80B 4	BX 80B 4 BXN 80MB 4	M 2SA 4	ME 2SB 4	MX 2SB 4 MXN 20MB 4
	1.1	BN 80C 4 BN 90S 4	BE 90S 4	BX 90S 4 BXN 90S 4	M 2SB 4	ME 3SA 4	MX 3SA 4
	1.5	BN 90LA 4	BE 90LA 4	BX 90LA 4 BXN 90L 4	M 3SA 4	ME 3SB 4	MX 3SB 4
	1.85	BN 90LB 4					
	2.2	BN 100LA 4	BE 100LA 4	BX 100LA 4	M 3LA 4	ME 3LA 4	MX 3LA 4
	3	BN 100LB 4	BE 100LB 4	BX 100LB 4	M 3LB 4	ME 3LB 4	MX 3LB 4
	4	BN 112M 4	BE 112M 4	BX 112M 4	M 3LC 4	ME 4SA 4	MX 4SA 4
	5.5	BN 132S 4	BE 132S 4	BX 132SB 4	M 4SA 4	ME 4SB 4	MX 4SB 4
	7.5	BN 132MA 4	BE 132MA 4	BX 132MA 4	M 4LA 4	ME 4LA 4	MX 4LA 4
	9.2	BN 132MB 4	BE 132MB 4	BX 160MA 4	M 4LB 4	ME 4LB 4	MX 5SA 4
	11	BN 160MR 4 BN 160M 4	BE 160M 4	BX 160MB 4	M 4LC 4	ME 5SA 4	MX 5SB 4
	15	BN 160L 4	BE 160L 4	BX 160L 4	M 5SB 4	ME 5LA 4	MX 5LA 4
	18.5	BN 180M 4	BE 180M 4	BX 180M 4	M 5LA 4		
	22	BN 180L 4	BE 180L 4	BX 180L 4			
	30	BN 200L 4		BX 200LA 4*			
	37			BX 225SA 4*			
	45			BX 225SB 4*			
	55			BX 250MA 4*			
	75			BX 280SA 4*			
	90			BX 280SB 4*			
	110			BX 315SA 4*			
	132			BX 315SB 4*			
	160			BX 315SC 4*			
	200			BX 315MA 4*			
	250			BX 355MA 4*			
	315			BX 355MB 4*			
	355			BX 355MC 4*			

Note: For the Australian market these motor has to be selected in the BX ... K 4 Version



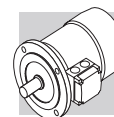
(F79)

6 pole							
Efficiency class		IE1	IE2	IE3	IE1	IE2	IE3
Pn [kW]	0.06						
	0.09	BN 63A 6			M 05A 6		
	0.12	BN 63B 6			M 05B 6		
	0.18	BN 71A 6			M 1SC 6		
	0.25	BN 71B 6			M 1SD 6		
		BN 71C 6					
	0.37	BN 80A 6			M 1LA 6		
	0.55	BN 80B 6			M 2SA 6		
	0.75	BN 80C 6	BE 90S 6		M 2SB 6		
		BN 90S 6					
	1.1	BN 90L 6	BE 100M 6		M 3SA 6	ME 3LA 6	
	1.5	BN 100LA 6	BE 100LA 6		M 3LA 6	ME 3LB 6	
	1.85	BN 100LB 6			M 3LB 6		
	2.2	BN 112M 6	BE 112M 6		M 3LC 6		
	3	BN 132S 6	BE 132S 6		M 4SA 6	ME 4SB 6	
	4	BN 132MA 6	BE 132MA 6		M 4LA 6	ME 4LA 6	
	5.5	BN 132MB 6	BE 160MA 6		M 4LB 6	ME 5SA 6	
	7.5	BN 160M 6	BE 160MB 6		M 5SA 6	ME 5SB 6	
	9.2						
	11	BN 160L 6			M 5SB 6		
	15	BN 180L 6					
	18.5	BN 200LA 6					
	22						
	30						



M13.2 60 Hz Motors

(F80)



2 pole							
Efficiency class		IE1	IE2	IE3	IE1	IE2	IE3
Pn [kW]	0.06						
	0.09						
	0.12						
	0.18	BN 63A 2			M 05A 2		
	0.25	BN 63B 2			M 05B 2		
	0.37	BN 71A 2			M 05C 2		
	0.55	BN 71B 2			M 1SD 2		
	0.75	BN 71C 2			M 1LA 2		
		BN 80A 2					
	1.1	BN 80B 2			M 2SA 2		
	1.5	BN 90SA 2			M 2SB 2		
	1.85	BN 90SB 2					
	2.2	BN 90L 2			M 3SA 2		
	3	BN 100L 2			M 3LA 2		
	3.7	BN 112M 2			M 3LB 2		
	5.5	BN 132SA 2			M 4SA 2		
	7.5	BN 132SB 2			M 4SB 2		
	9.2	BN 132M 2			M 4LA 2		
	11	BN 160MR 2			M 4LC 2		
		BN 160M 2					
	15	BN 160MB 2			M 5SB 2		
	18.5	BN 160L 2			M 5SC 2		
	22	BN 180M 2			M 5LA 2		
	30	BN 200LA 2					

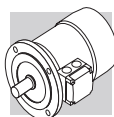


(F81)

4 pole							
Efficiency class		IE1	IE2	IE3	IE1	IE2	IE3
Pn [kW]	0.06	BN 56A 4					
	0.09	BN 56B 4			M 0B 4		
	0.12	BN 63A 4	BE 63A 4	BXN 63MA 4	M 05A 4		MXN 05MA 4
	0.18	BN 63B 4	BE 63B 4	BXN 63MB 4	M 05B 4		MXN 05MB 4
	0.25	BN 63C 4			M 05C 4		
		BN 71A 4	BE 71A 4	BXN 71MA 4			MXN 10MA 4
	0.37	BN 71B 4	BE 71B 4	BXN 71MB 4	M 1SD 4		MXN 10MB 4
		BN 71C 4					
	0.55	BN 80A 4	BE 80A 4	BXN 80MA 4	M 1LA 4		MXN 20MA 4
		BN 80B 4	BE 80B 4	BX 90SR 4	M 2SA 4	ME 2SB 4	MX 2SB 4
				BXN 80MB 4			MXN 20MB 4
	1.1	BN 80C 4	BE 90S 4	BX 90S 4	M 2SB 4	ME 3SA 4	MX 3SA 4
		BN 90S 4		BXN 90S 4			
	1.5	BN 90LA 4	BE 90LA 4	BX 90LA 4	M 3SA 4	ME 3SB 4	MX 3SB 4
	1.85	BN 90LB 4					
	2.2	BN 100LA 4	BE 100LA 4	BX 100LA 4	M 3LA 4	ME 3LA 4	MX 3LA 4
	3	BN 100LB 4	BE 100LB 4	BX 100LB 4	M 3LB 4	ME 3LB 4	MX 3LB 4
	3.7	BN 112M 4	BE 112M 4	BX 112M 4	M 3LC 4	ME 4SA 4	MX 4SA 4
	5.5	BN 132S 4	BE 132S 4	BX 132SB 4	M 4SA 4	ME 4SB 4	MX 4SB 4
	7.5	BN 132MA 4	BE 132MA 4	BX 132MA 4	M 4LA 4	ME 4LA 4	MX 4LA 4
	9.2	BN 132MB 4	BE 132MB 4	BX 160MA 4	M 4LB 4	ME 4LB 4	MX 5SA 4
	11	BN 160MR 4	BE 160M 4	BX 160MB 4	M 4LC 4	ME 5SA 4	MX 5SB 4
		BN 160M 4					
	15	BN 160L 4	BE 160L 4	BX 160L 4	M 5SB 4	ME 5LA 4	MX 5LA 4
	18.5	BN 180M 4	BE 180M 4	BX 180M 4	M 5LA 4		
	22	BN 180L 4	BE 180L 4	BX 180L 4			
	30	BN 200L 4		BX 200LAK 4			
	37			BX 225SAK 4			
	45			BX 225SBK 4			
	55			BX 280SAK 4			
	75			BX 280SBK 4			
	90			BX 315SAK 4			
	110			BX 315SBK 4			
	132			BX 315SCK 4			
	160			BX 355SAK 4			
	200			BX 355SBK 4			
	250			BX 355SCK 4			
	315			BX 355MBK 4			
	355			BX 355MCK 4			

(F82)

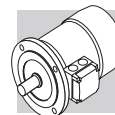
6 pole							
Efficiency class		IE1	IE2	IE3	IE1	IE2	IE3
Pn [kW]	0.06						
	0.09	BN 63A 6			M 05A 6		
	0.12	BN 63B 6			M 05B 6		
	0.18	BN 71A 6			M 1SC 6		
	0.25	BN 71B 6			M 1SD 6		
		BN 71C 6					
	0.37	BN 80A 6			M 1LA 6		
	0.55	BN 80B 6			M 2SA 6		
	0.75	BN 80C 6			M 2SB 6		
		BN 90S 6					
	1.1	BN 90L 6			M 3SA 6		
	1.5	BN 100LA 6			M 3LA 6		
	1.85	BN 100LB 6			M 3LB 6		
	2.2	BN 112M 6			M 3LC 6		
	3	BN 132S 6			M 4SA 6		
	3.7	BN 132MA 6			M 4LA 6		
	5.5	BN 132MB 6			M 4LB 6		
	7.5	BN 160M 6			M 5SA 6		
	9.2						
	11	BN 160L 6			M 5SB 6		
	15	BN 180L 6					
	18.5	BN 200LA 6					
	22						
	30						



M14 MOTOR RATING CHARTS BXN-MXN

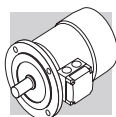
4 P		1500 min ⁻¹ - S1												50 Hz - IE3											
<div>CE</div>		d.c. brake																			a.c. brake				
		FD												IM B5			FA								
		Mod	M _b	Z ₀ 1/h	NB	SB	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 							
P _n		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 							
kW		min ⁻¹	Nm	A	100%	75%	50%								Nm	1/h	kgm ²								
0.12	BXN 63MA 4	1407	0.8	0.47	64.8	60.3	52.5	0.58	3.4	2.9	1.7	H	1.82	4.6	FD 02	1.8	8900	11000	2.4	6.3	FA 02	1.8	11000	2.4	6.1
0.18	BXN 63MB 4	1373	1.3	0.61	69.9	68.8	63.3	0.61	3.5	3.1	1.8	G	2.92	5.7	FD 02	3.5	7000	9000	3.5	7.4	FA 02	3.5	9000	3.5	7.2
0.25	BXN 71MA 4	1388	1.7	0.67	73.5	72.8	67.9	0.74	4.8	1.6	2.4	H	6.28	6.5	FD 53	5	5700	8100	7.4	9.2	FA 03	5	8100	7.4	8.9
0.37	BXN 71MB 4	1429	2.5	1.05	77.3	76.0	70.8	0.66	6.3	2.6	2.5	L	9.70	8.3	FD 53	5	6400	9900	10.8	11.0	FA 03	5	9900	10.8	10.7
0.55	BXN 80MA 4	1447	3.6	1.31	80.8	80.9	77.4	0.75	6.1	1.9	1.6	J	17.78	10.7	FD 04	10	2500	5200	19.8	14.6	FA 04	10	5200	19.8	14.5
0.75	BXN 80MB 4	1451	4.9	1.63	82.5	85.1	82.5	0.78	7.4	2.4	2.0	K	28.89	14.4	FD 04	15	2000	4100	30.8	18.3	FA 04	15	4100	30.8	18.2
1.1	BXN 90S 4	1448	7.3	2.38	84.1	85.9	83.5	0.78	7.3	2.4	3.4	J	31.76	15.6	FD 05	26	2800	6600	35.8	21.6	FA 05	26	6600	35.8	22.3
1.5	BXN 90L 4	1441	9.9	3.44	85.3	84.3	81.7	0.75	6.7	2.6	2.4	J	34.96	16.6	FD 05	26	1400	3100	39.1	22.6	FA 05	26	3100	39.1	23.3

Note: for more details on the available energy certifications look at the catalog's dedicated section.

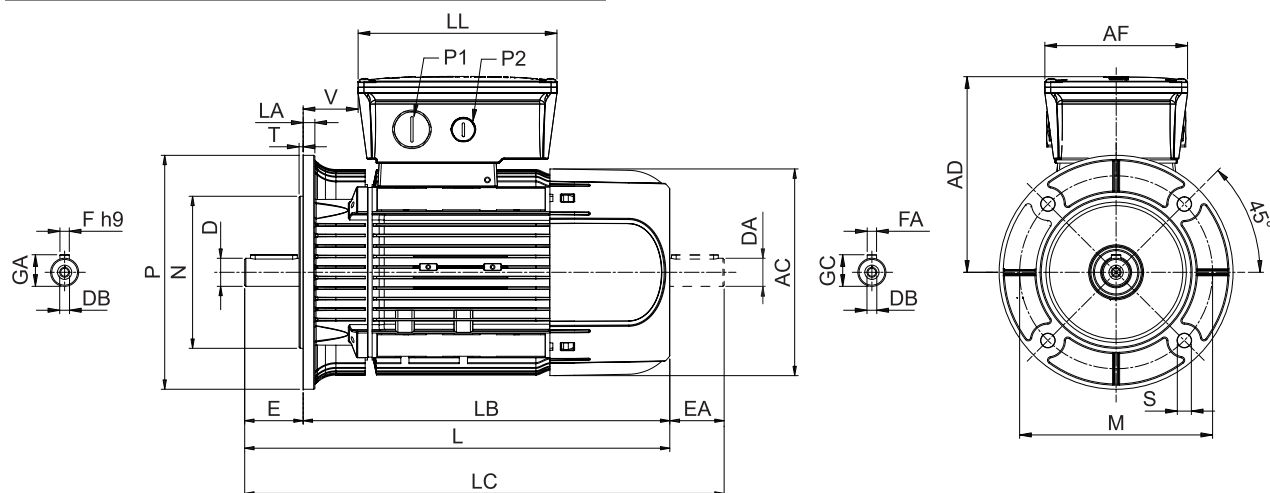


4 P		1500 min ⁻¹ - S1										50 Hz - IE3												
<div>CE</div>		d.c. brake																		a.c. brake				
		FD														FA								
		Mod	M _b	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	cos φ	η%	In 400V	M _n	n min ⁻¹		P _n kW					
Mod	M _b	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	cos φ	η%	In 400V	M _n	n min ⁻¹		P _n kW							
0.12	MXN 05MA 4	1407	0.8	0.47	64.8	60.3	52.5	3.4	2.9	1.7	H	1.82	4.6	FD 02	1.8	8900	11000	2.4	6.3	FA 02	1.8	11000	2.4	6.1
0.18	MXN 05MB 4	1373	1.3	0.61	69.9	68.8	63.3	3.5	3.1	1.8	G	2.92	5.7	FD 02	3.5	7000	9000	3.5	7.4	FA 02	3.5	9000	3.5	7.2
0.25	MXN 10MA 4	1388	1.7	0.67	73.5	72.8	67.9	4.8	1.6	2.4	H	6.28	6.5	FD 53	5	5700	8100	7.4	9.2	FA 03	5	8100	7.4	8.9
0.37	MXN 10MB 4	1429	2.5	1.05	77.3	76.0	70.8	6.3	2.6	2.5	L	9.70	8.3	FD 53	5	6400	9900	10.8	11.0	FA 03	5	9900	10.8	10.7
0.55	MXN 20MA 4	1447	3.6	1.31	80.8	80.9	77.4	6.1	1.9	1.6	J	17.78	10.7	FD 04	10	2500	5200	19.8	14.6	FA 04	10	5200	19.8	14.5
0.75	MXN 20MB 4	1451	4.9	1.63	82.5	85.1	82.5	7.4	2.4	2.0	K	28.89	14.4	FD 04	15	2000	4100	30.8	18.3	FA 04	15	4100	30.8	18.2

Note: for more details on the available energy certifications look at the catalog's dedicated section.

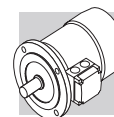


BXN - IM B5 - CE CUS/UKCA



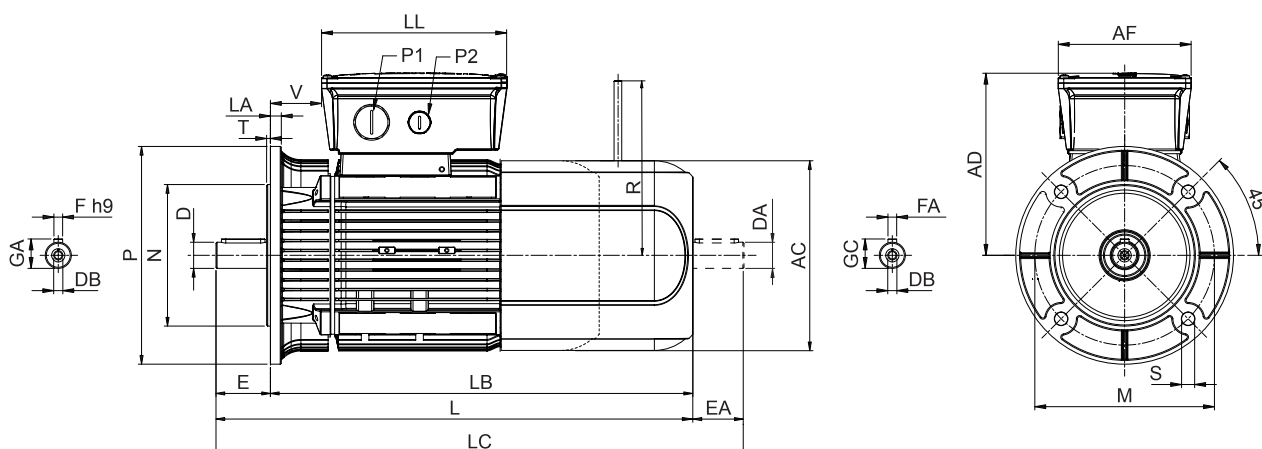
	Shaft					Housing						Motor								
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	
BXN 63	11 9 ⁽¹⁾	23 20 ⁽¹⁾	M4 M3 ⁽¹⁾	12.5 10.2 ⁽¹⁾	4 3 ⁽¹⁾	115	95	140	9.5	3	9	122	281	258	301	136	112	165	37	
BXN 71	14 11 ⁽¹⁾	30 23 ⁽¹⁾	M5 M4 ⁽¹⁾	16 12.5 ⁽¹⁾	5 4 ⁽¹⁾	130	110	160		3.5		10	138	292	262	315			138	34
BXN 80	19 14 ⁽¹⁾	40 30 ⁽¹⁾	M6 M5 ⁽¹⁾	21.5 16 ⁽¹⁾	6 5 ⁽¹⁾	165	130	200	11.5		158		346	306	376	148			40	
BXN 90	24 19 ⁽¹⁾	50 40 ⁽¹⁾	M8 M6 ⁽¹⁾	27 21.5 ⁽¹⁾	8 6 ⁽¹⁾					177	365	315	405	170	170	43				

N.B.: 1) These values refer to the rear shaft end (PS).



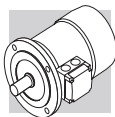
BXN - IM B5 - FD/FA - CE - CUS/UKCA

BXN-MXN

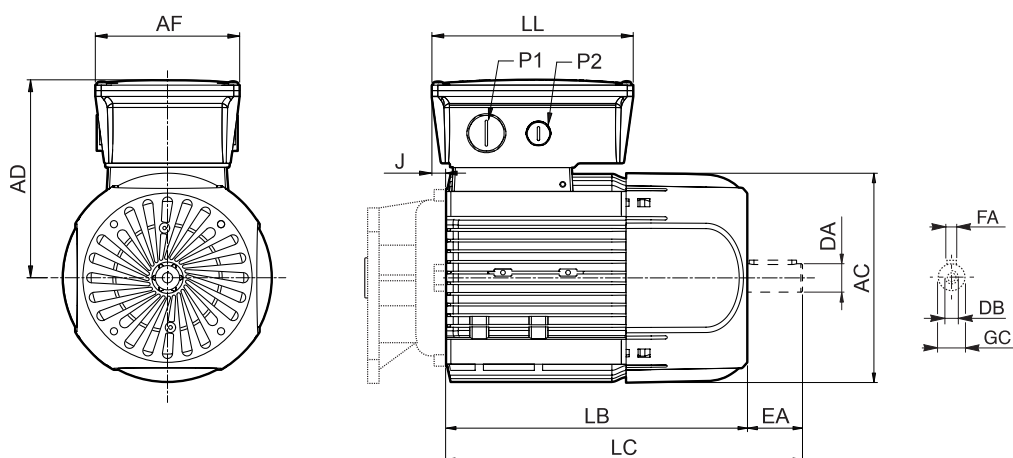


	Shaft					Housing						Motor									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	
																				FD	FA
BXN 63	11 9 ⁽¹⁾	23 20 ⁽¹⁾	M4 M3 ⁽¹⁾	4 3 ⁽¹⁾	12.5 10.2 ⁽¹⁾	115	95	140	9.5	3	9	122	281	258	305	136	112	165	37	96	116
BXN 71	14 11 ⁽¹⁾	30 23 ⁽¹⁾	M5 M4 ⁽¹⁾	5 4 ⁽¹⁾	16 12.5 ⁽¹⁾	130	110	160		138		292	262	321	138	112	34		103	121	
BXN 80	19 14 ⁽¹⁾	40 30 ⁽¹⁾	M6 M5 ⁽¹⁾	6 5 ⁽¹⁾	21.5 16 ⁽¹⁾	165	130	200	11.5	3.5	10	158	346	306	377	148	112		40	129	131
BXN 90	24 19 ⁽¹⁾	50 40 ⁽¹⁾	M8 M6 ⁽¹⁾	8 6 ⁽¹⁾	27 21.5 ⁽¹⁾					177		365	315	383	170	122	170	43	160	160	

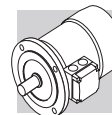
N.B.: 1) These values refer to the rear shaft end (PS).



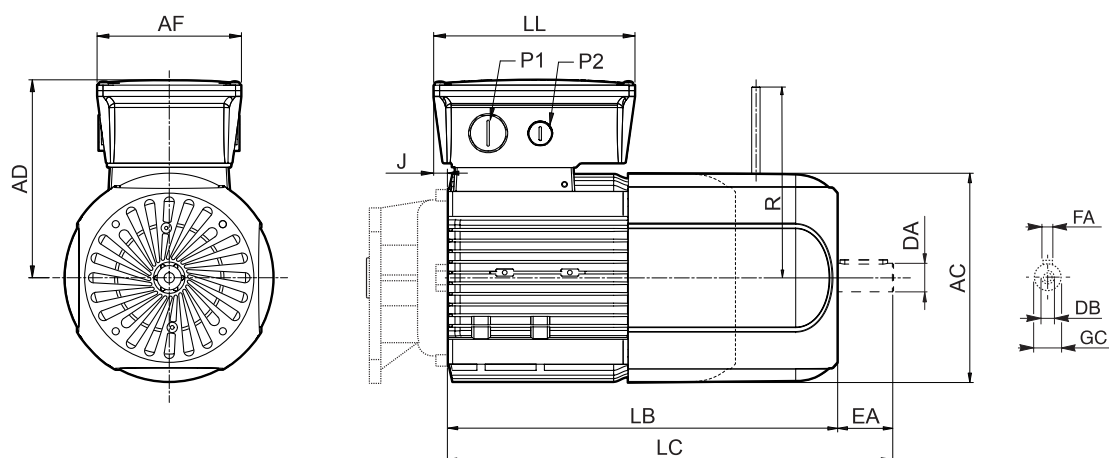
MXN



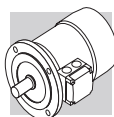
	Rear shaft end					Motor						
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD
MXN 05	9	20	M3	3	10.2	123	211.5	231.5	112	165	9.5	136
MXN 10	11	23	M4	4	12.5	138	216	239	112	165	11.5	137
MXN 20	14	30	M5	5	16	158	255.5	285.5	112	165	10.5	146










MXN_FD/FA



	Rear shaft end					Motor								
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD	R	
													FD	FA
MXN 05	9	20	M3	3	10.2	122	211.5	258.5	112	165	9.5	136	96	116
MXN 10	11	23	M4	4	12.5	138	216	275	112	165	11.5	138	103	121
MXN 20	14	30	M5	5	16	158	255.5	326.5	112	165	10.5	148	129	131



M16 MOTOR RATING CHARTS BX-MX

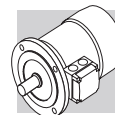
4 P		1500 min ⁻¹ - S1														50 Hz - IE3								
<div>CE</div>		d.c. brake																		a.c. brake				
		FD														FA								
		P _n		n	M _n	In 400V	η%			cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 
kW		min ⁻¹	Nm	A	100%	75%	50%							Nm	kgm ²			Nm	kgm ²			Nm	kgm ²	
0.75	BX 80B	4	1425	1.61	82.5	83.9	83.2	0.81	6.5	2.0	1.8	J	35	16	FD 04	15	37	19.9	FA 04	15	37	19.8		
1.1	BX 90S	4	1425	2.44	84.1	84.1	82.0	0.77	6.9	3.4	2.2	J	27	16	FD 14	15	29	20.2	FA 14	15	29	20.1		
1.5	BX 90LA	4	1420	3.3	85.3	86.2	84.9	0.78	6.3	3.1	1.9	J	31	17	FD 05	26	35	23	FA 05	26	35	23.7		
2.2	BX 100LA	4	1445	5.1	86.7	86.2	84.0	0.72	7.2	3.6	2.4	K	58	24	FD 15	40	62	31	FA 15	40	62	31		
3	BX 100LB	4	1445	6.7	87.7	87.7	86.0	0.74	7.6	3.9	2.6	K	73	29	FD 15	40	77	36	FA 15	40	77	36		
4	BX 112M	4	1445	8.1	88.6	88.9	87.6	0.8	8.1	3.8	2.5	J	130	38	FD 06S	60	139	48	FA 06S	60	139	50		
5.5	BX 132SB	4	1460	10.6	89.6	89.2	88.8	0.83	8.2	3.6	2.3	J	310	57	FD 56	75	320	70	FA 06	75	320	71		
7.5	BX 132MA	4	1460	15.0	90.4	90.9	90.2	0.80	8.4	3.8	2.5	K	360	67	FD 06	100	370	80	FA 07	100	370	85		
9.2	BX 160MA	4	1465	17.8	91.0	92.1	91.7	0.82	7.9	3.6	2.1	J	650	95	FD 08	170	725	125	FA 08	170	725	124		
11	BX 160MB	4	1465	20.5	91.4	92.9	92.5	0.84	7.8	3.4	1.9	J	780	110	FD 08	170	855	140	FA 08	170	855	139		
15	BX 160L	4	1465	28.1	92.1	93.2	92.6	0.82	9.0	4.1	2.3	K	890	121	FD 08	200	965	151	FA 08	200	965	150		
18.5	BX 180M	4	1480	32.9	92.6	94.1	93.1	0.85	11.3	2.6	2.3	M	1560	155	FD 09	300	1760	195						
22	BX 180L	4	1475	38.2	93.0	93.6	92.8	0.88	10.2	2.5	2.0	L	1660	163	FD 09	300	1860	203						

Note: for more details on the available energy certifications look at the catalog's dedicated section.

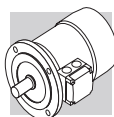
4 P		1500 min ⁻¹ - S1										50 Hz - IE3			
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Note: for more details on the available energy certifications look at the catalog's dedicated section.



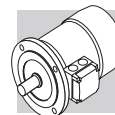
BX-MX







4 P		1500 min ⁻¹ - S1														50 Hz - IE3						
P _n		n	M _n	In 400V	η%			cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	d.c. brake				a.c. brake			
					100%	75%	50%								FD				FA			
															Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 
30	BX 200LAK 4	1483	193	55.7	94.7	95.1	95	0.82	8.3	3	3.3	N/A	3660	319	FD 8	400	3940	337				
37	BX 225SAK 4	1482	238	65.9	95.1	95.5	95.4	0.85	7.7	2.8	3.1	N/A	5360	398	FD 9	600	5720	426				
45	BX 225SBK 4	1481	290	80.4	95.2	95.6	95.6	0.85	7.9	2.8	3.2	N/A	5360	398	FD 9	600	5720	426				
55	BX 250MAK 4	1485	354	98.9	95.6	95.8	95.5	0.84	7.9	3	3.3	N/A	9330	476	FD 10	800	10080	521				
75	BX 280SAK 4	1487	482	134	95.9	96.2	96.1	0.84	7.3	2.5	2.8	N/A	15000	665	FD 1000	1000	15360	771				
90	BX 280SBK 4	1487	578	161	96.2	96.4	96.1	0.84	7.9	2.9	3	N/A	18500	725	FD 1000	1000	18860	831				
110	BX 315SAK 4	1491	704	194	96.8	97	96.7	0.84	8.3	2.4	3.1	N/A	29000	1000	FD 1000	1000	29360	1106				
132	BX 315SBK 4	1490	846	234	96.9	97.1	96.8	0.84	8.1	2.6	3.2	N/A	32000	1065	FD 1600	1600	32500	1233				
160	BX 315SCK 4	1490	1025	279	96.7	96.9	96.6	0.86	8.2	2.7	3	N/A	39000	1220	FD 1600	1600	39500	1388				
200	BX 355SAK 4	1491	1281	345	96.6	96.7	96.4	0.87	7.3	2.1	2.7	N/A	59000	1610	FD 2500	2500	59500	1778				
250	BX 355MAK 4	1491	1601	435	96	96	95.6	0.86	6.4	2.1	2.9	N/A	69000	1780	FD 2500	2500	69500	1948				
315	BX 355MBK 4	1491	2017	550	96	96.1	95.7	0.85	7.3	2.4	3.3	N/A	72000	1820	FD 2500	2500	72500	1988				
355	BX 355MCK 4	1490	2275	616	96	96.2	95.8	0.86	6.3	2.3	2.8	N/A	84000	2140	FD 2500	2500	84500	2308				

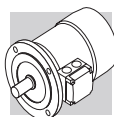






Note: for more details on the available energy certifications look at the catalog's dedicated section.



4 P		1800 min ⁻¹ - S1												60 Hz - Nema Premium											
ENERGY C [®] PI US		<div><div><div><div><div><div></div><div>PROCEL</div><div>INMETRO</div></div><div>APPROVED BY ORDER OF THE PRESIDENT OF THE REPUBLIC OF BRAZIL</div><div>APPROVED BY ORDER OF THE PRESIDENT OF THE REPUBLIC OF BRAZIL</div></div><div>1000 - 1700A-1</div></div></div></div>												d.c. brake						a.c. brake					
		FD						FA																	
P _n		n	M _n	In 460V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 				
0.75	BX 90SR	4	1755	4.1	1.48	85.5	86.4	83.9	0.73	8.0	3.7	2.5	L	27	16	FD 14	15	29	20.2	FA 14	15	29	20.1		
1.1	BX 90S	4	1740	6.0	2.15	86.5	85.9	83.0	0.74	8.2	4.1	2.8	K	27	16	FD 14	15	29	20.2	FA 14	15	29	20.1		
1.5	BX 90LA	4	1735	8.3	2.91	86.5	86.5	84.4	0.75	7.4	3.6	2.5	K	31	17	FD 05	26	35	23	FA 05	26	35	23.7		
2.2	BX 100LA	4	1760	11.9	4.4	89.5	88.6	86.2	0.71	9.9	4.8	3.6	N	73	29	FD 15	40	77	36	FA 15	40	77	36		
3	BX 100LB	4	1750	16.4	5.9	89.5	88.9	86.7	0.71	9.1	4.4	3.3	M	73	29	FD 15	40	77	36	FA 15	40	77	36		
3.7	BX 112M	4	1760	20	6.7	89.5	89.5	89.1	0.77	10.4	4.7	3.4	M	130	38	FD 06S	60	139	48	FA 06S	60	139	50		
5.5	BX 132SB	4	1770	30	9.9	91.7	92.0	90.2	0.76	10.7	5.1	4.6	N	410	77	FD 56	75	420	90	FA 06	75	420	91		
7.5	BX 132MA	4	1770	41	13.4	91.7	91.3	89.7	0.76	11.0	4.9	4.4	N	410	77	FD 06	100	420	90	FA 07	100	420	95		
9.2	BX 160MA	4	1770	50	15.6	92.4	92.5	91.6	0.8	9.1	4.1	2.6	L	650	95	FD 08	170	725	125	FA 08	170	725	124		
11	BX 160MB	4	1770	59	18.2	92.4	92.9	92.0	0.82	9.3	4.0	2.4	L	780	110	FD 08	170	855	140	FA 08	170	855	139		
15	BX 160L	4	1770	81	24.5	93.0	93.5	92.5	0.81	10.9	4.8	2.8	M	890	121	FD 08	200	965	151	FA 08	200	965	150		
18.5	BX 180M	4	1780	99	28.6	93.6	94.5	93.2	0.85	13.0	2.9	2.7	N	1560	155	FD 09	300	1760	195						
22	BX 180L	4	1775	118	33.1	93.6	94.2	93.1	0.87	11.5	2.8	2.4	M	1660	163	FD 09	300	1860	203						

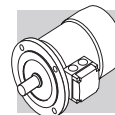
Note: for more details on the available energy certifications look at the catalog's dedicated section.







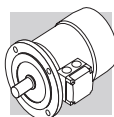
4 P		1800 min ⁻¹ - S1										60 Hz - Nema Premium																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
P _n		n min ⁻¹	M _n	In 460V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	d.c. brake			a.c. brake																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
					100%	75%								Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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kW			Nm	A		50%						Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm	Nm</







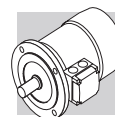
Note: for more details on the available energy certifications look at the catalog's dedicated section.



4 P		1500 min ⁻¹ - S1										50 Hz - IE3												
															d.c. brake					a.c. brake				
P _n		n	M _n	In 400V	η%			cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	FD				FA					
					100%	75%	50%								Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 		
kW		min ⁻¹	Nm	A									Nm	kgm ²	Nm	kgm ²	Nm	kgm ²	Nm	kgm ²	Nm	kgm ²	kg	kg
0.75	MX 2SB	4	5.0	1.61	82.5	83.9	83.2	0.81	6.5	2.0	1.8	J	35	16	FD 04	15	37	19.9	FA 04	15	37	19.8		
1.1	MX 3SA	4	7.3	2.46	84.1	85.5	83.5	0.75	6.7	3.0	2.0	J	35	17	FD 15	15	26	24	FA 15	15	26	24		
1.5	MX 3SB	4	9.9	3.3	85.3	86.8	85.4	0.75	6.7	3.1	2.0	J	43	20	FD 15	26	47	27	FA 15	26	47	27		
2.2	MX 3LA	4	14.5	5.1	86.7	86.2	84.0	0.72	7.2	3.6	2.4	K	58	24	FD 15	40	62	31	FA 15	40	62	31		
3	MX 3LB	4	19.8	6.7	87.7	87.7	86.0	0.74	7.6	3.9	2.6	K	73	29	FD 15	40	77	36	FA 15	40	77	36		
4	MX 4SA	4	26	7.8	88.6	89.9	88.7	0.82	8.1	3.7	2.5	J	225	45	FD 56	75	235	58	FA 06	75	235	59		
5.5	MX 4SB	4	36	10.6	89.6	89.9	88.8	0.83	8.2	3.6	2.3	J	310	57	FD 56	75	320	70	FA 06	75	320	71		
7.5	MX 4LA	4	49	15.0	90.4	90.9	90.2	0.80	8.4	3.8	2.5	K	360	67	FD 06	100	370	80	FA 07	100	370	85		
9.2	MX 5SA	4	60	17.8	91.0	92.1	91.7	0.82	7.9	3.6	2.1	J	650	95	FD 08	170	725	125	FA 08	170	725	124		
11	MX 5SB	4	72	20.5	91.4	92.9	92.5	0.84	7.8	3.4	1.9	J	780	110	FD 08	170	855	140	FA 08	170	855	139		
15	MX 5LA	4	98	28.1	92.1	93.2	92.6	0.82	9.0	4.1	2.3	K	890	121	FD 08	200	965	151	FA 08	200	965	150		



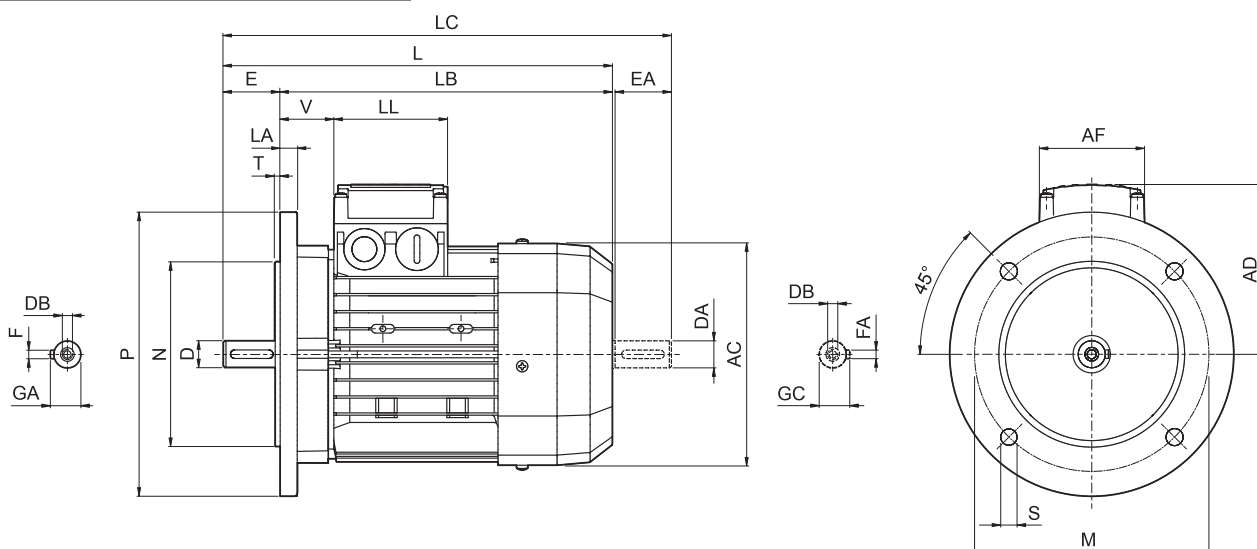
4 P		1800 min ⁻¹ - S1												60 Hz - IE3									
d.c. brake																		a.c. brake					
P _n		n	M _n	In 460V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA code	J _m x 10 ⁻⁴ kgm ²	IM B5 	FD				FA					
					100%	75%								Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	J _m x 10 ⁻⁴ kgm ²	IM B5 		
kW		min ⁻¹	Nm	A								Nm	kgm ²	Nm	kgm ²	Nm	kgm ²	Nm	kgm ²	Nm	kgm ²	Nm	kgm ²
0.75	MX 2SB	4	1755	4.1	1.48	85.5	86.4	83.9	0.73	8.0	2.5	L	27	16	FD 14	15	29	20.2	FA 14	15	29	20.1	
1.1	MX 3SA	4	1755	6.0	2.19	86.5	86.0	83.0	0.73	7.9	2.5	L	35	17	FD 15	15	26	24	FA 15	15	26	24	
1.5	MX 3SB	4	1755	8.2	2.96	86.5	87.2	85.0	0.72	8.5	2.9	L	43	20	FD 15	26	47	27	FA 15	26	47	27	
2.2	MX 3LA	4	1760	11.9	4.4	89.5	88.6	86.2	0.71	9.9	3.6	N	73	29	FD 15	40	77	36	FA 15	40	77	36	
3	MX 3LB	4	1750	16.4	5.9	89.5	88.9	86.7	0.71	9.1	3.3	M	73	29	FD 15	40	77	36	FA 15	40	77	36	
3.7	MX 4SA	4	1770	20.0	6.6	89.5	89.8	87.7	0.78	9.9	3.4	M	225	45	FD 56	75	235	58	FA 06	75	235	59	
5.5	MX 4SB	4	1770	30	9.9	91.7	92.0	90.2	0.76	10.7	4.6	N	410	77	FD 56	75	420	90	FA 06	75	420	91	
7.5	MX 4LA	4	1770	41	13.4	91.7	91.3	89.7	0.76	11.0	4.4	N	410	77	FD 06	100	420	90	FA 07	100	420	95	
9.2	MX 5SA	4	1770	50	15.6	92.4	92.5	91.6	0.8	9.1	4.1	L	650	95	FD 08	170	725	125	FA 08	170	725	124	
11	MX 5SB	4	1770	59	18.2	92.4	92.9	92.0	0.82	9.3	4.0	L	780	110	FD 08	170	855	140	FA 08	170	855	139	
15	MX 5LA	4	1770	81	24.5	93.0	93.5	92.5	0.81	10.9	4.8	M	890	121	FD 08	200	965	151	FA 08	200	965	150	



M17 MOTORS DIMENSIONS BX-MX

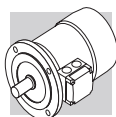
BX - IM B5 - CE/CCC

BX-MX



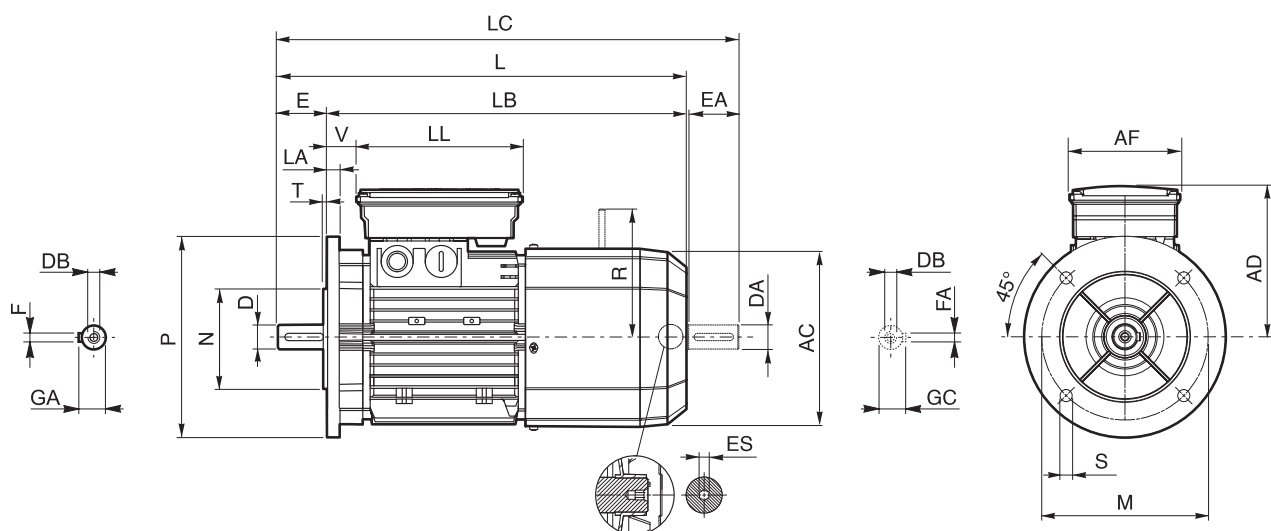
	Shaft					Flange						Motor											
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V				
BX 80 B	19 14 ⁽¹⁾	40 30 ⁽¹⁾	M6 M5 ⁽¹⁾	21.5 16 ⁽¹⁾	6 5 ⁽¹⁾	165	130	200	11.5	3.5	11.5	156	320	280	351	119	74	80	38				
BX 90 S	24 19 ⁽¹⁾	50 40 ⁽¹⁾	M8 M6 ⁽¹⁾	27 21.5 ⁽¹⁾	8 6 ⁽¹⁾							176	326	276	368	133	98	98	44				
BX 90 LA																							
BX 100 LA	28 24 ⁽¹⁾	60 50 ⁽¹⁾	M10 M8 ⁽¹⁾	31 27 ⁽¹⁾	8 8 ⁽¹⁾	215	180	250	14	4	14	195	410	350	462	142			50				
BX 100 LB											15	219	430	370	482	157	52						
BX 112 M											20	258	493	413	556	193	118	118	58				
BX 132 SB	38 28 ⁽¹⁾	80 60 ⁽¹⁾	M12 M10 ⁽¹⁾	41 31 ⁽¹⁾	10 8 ⁽¹⁾	265	230	300	18.5	5	15	310	528	448	591	245	187	187	51				
BX 132 MA													596	486	680								
BX 160 MA	42 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾	300	250	350					18	348	708					598	823	261	52
BX 160 MB																							
BX 160 L																							
BX 180 M	48 42 ⁽¹⁾	110 110 ⁽¹⁾	M16 M16 ⁽¹⁾	51.5 45 ⁽¹⁾	14 12 ⁽¹⁾	350	300	400	19	20	423	821	711	934	328	300	311	48					
BX 180 L													400	350	450				465	879	739	1001	348
BX 200LA	55 45 ⁽¹⁾										59 48.5 ⁽¹⁾	16 14 ⁽¹⁾							24	514	884	744	1010
BX 225SA	60 55 ⁽¹⁾	140 110 ⁽¹⁾	M20 M20 ⁽¹⁾	64 59 ⁽¹⁾	18 16 ⁽¹⁾	500	450	550	18	23	567	1088	948	1238	482	434	306	43					
BX 225SB						69 59 ⁽¹⁾																	
BX 250MA	65 55 ⁽¹⁾					79.5 69 ⁽¹⁾	20 18 ⁽¹⁾																
BX 280SA	75 65 ⁽¹⁾	140 140 ⁽¹⁾	M24 M20 ⁽¹⁾	85 79.5 ⁽¹⁾	22 20 ⁽¹⁾	600	550	660	23	6	25	645	1204	1034	1352	537	473	347	42				
BX 315SA	80 75 ⁽¹⁾	170 140 ⁽¹⁾		95 79.5 ⁽¹⁾	25 20 ⁽¹⁾								1315	1145	1463								
BX 315SB																							
BX 315SC																							
BX 315MA	90 75 ⁽¹⁾	210 170 ⁽¹⁾		M24 M20 ⁽¹⁾	106 79.5 ⁽¹⁾	28 20 ⁽¹⁾	740	680	800	23	6	25	740	1479	1269	1659	603	694	413	50			
BX 355MA																							
BX 355MB	100 75 ⁽¹⁾																						
BX 355MC																							

N.B.: 1) These values refer to the rear shaft end (PS).



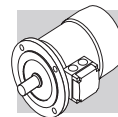
BX - IM B5 - FD/FA - CE/CCC

BX-MX

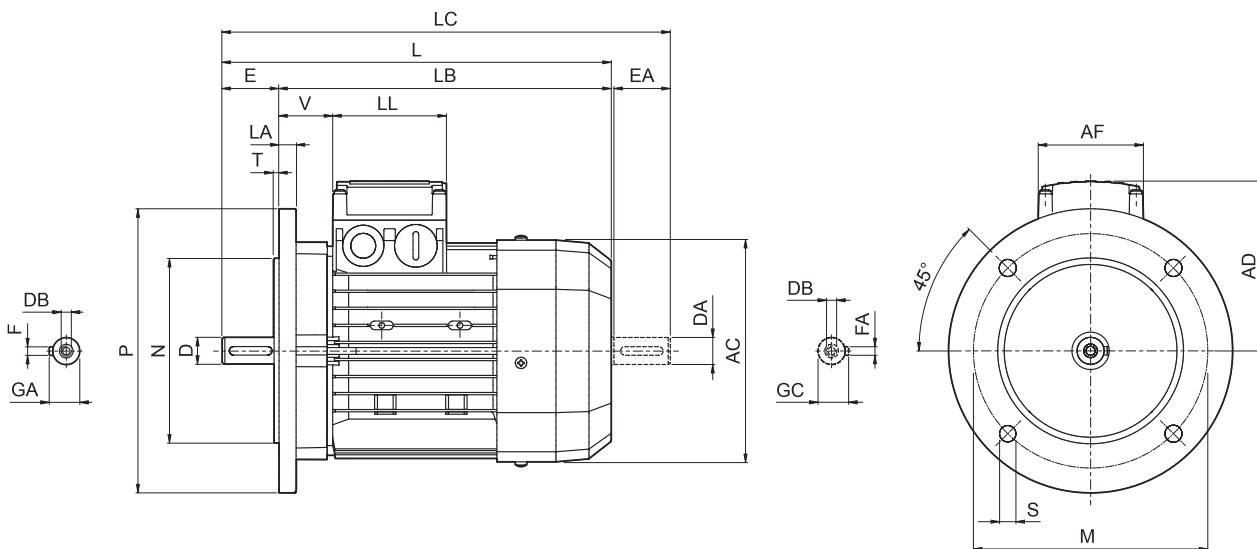


	Shaft					Flange						Motor											ES (2)																
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R																			
																				FD	FA																		
BX 80 B	19 14 ⁽¹⁾	40 30 ⁽¹⁾	M6 M5 ⁽¹⁾	21.5 16 ⁽¹⁾	6 5 ⁽¹⁾	165	130	200	11.5	3.5	11.5	156	392	352	423	143	98	133	25	129	134	5																	
BX 90 S	24 19 ⁽¹⁾	50 40 ⁽¹⁾	M8 M6 ⁽¹⁾	27 21.5 ⁽¹⁾	8 6 ⁽¹⁾							176	410	360	452	146	110	165	32				160	160	6														
BX 90 LA																																							
BX 100 LA																																							
BX 100 LB	28 24 ⁽¹⁾	60 50 ⁽¹⁾	M10 M8 ⁽¹⁾	31 27 ⁽¹⁾	8 8 ⁽¹⁾	215	180	250	14	4	14	195	502	442	554	155	110	165	37	160	160	6																	
BX 112 M											15	219	527	467	579	170								39	199	198													
BX 132 SB	38 28 ⁽¹⁾	80 60 ⁽¹⁾	M12 M10 ⁽¹⁾	41 31 ⁽¹⁾	10 8 ⁽¹⁾	265	230	300			16	258	603	523	667	210			140				188	46	204	200													
BX 132 MA											627	547	690							226																			
BX 160 MA						300	250	350	18.5	5	15	310	736	626	820	245	187	187	51	266	247																		
BX 160 MB	42 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾																																		
BX 160 L																											780	670	864										
BX 180 M	48 42 ⁽¹⁾	110 110 ⁽¹⁾	M16 M16 ⁽¹⁾	51.5 45 ⁽¹⁾	14 12 ⁽¹⁾	500	450	550	18		18	348	866	756	981	261	434	306	43	832																			
BX 180 L																																							
BX 200LA	55 45 ⁽¹⁾		M20 M20 ⁽¹⁾	59 48.5 ⁽¹⁾	16 14 ⁽¹⁾	350	300	400	19	5	20	423	982	872	1095	328	300	311	48	445	832																		
BX 225SA	60 55 ⁽¹⁾	140 110 ⁽¹⁾		64 59 ⁽¹⁾	18 16 ⁽¹⁾	400	350	450							465	1058							918	1180	348														
BX 225SB																																							
BX 250MA	65 55 ⁽¹⁾			69 59 ⁽¹⁾						18		24	514	1099	959	1225	376	434	306	43	832																		
BX 280SA	75 65 ⁽¹⁾	140 140 ⁽¹⁾		79.5 69 ⁽¹⁾	20 18 ⁽¹⁾	500	450	550					23	567	1340	1200	1490						482																
BX 280SB																																							
BX 315SA		170 140 ⁽¹⁾	M20 M20 ⁽¹⁾	85 79.5 ⁽¹⁾	22 20 ⁽¹⁾	600	550	660	23	6	25	645	1452	1282	1600	537	473	347	42	832																			
BX 315SB	80 75 ⁽¹⁾																																						
BX 315SC																															1497	1327	1645						
BX 315MA	90 75 ⁽¹⁾																														1607	1437	1755						
BX 355MA		210 170 ⁽¹⁾	M24 M20 ⁽¹⁾	95 79.5 ⁽¹⁾	25 20 ⁽¹⁾	740	680	800				740	1790	1580	1970	603	694	413	50																				
BX 355MB	100 75 ⁽¹⁾																																						
BX 355MC																															1825	1615	2005						

N.B.: 1) These values refer to the rear shaft end (PS). 2) "ES" hexagon is not present with PS option



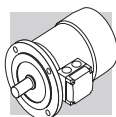
BX - IM B5 - CUS/NBR/EECA



BX-MX

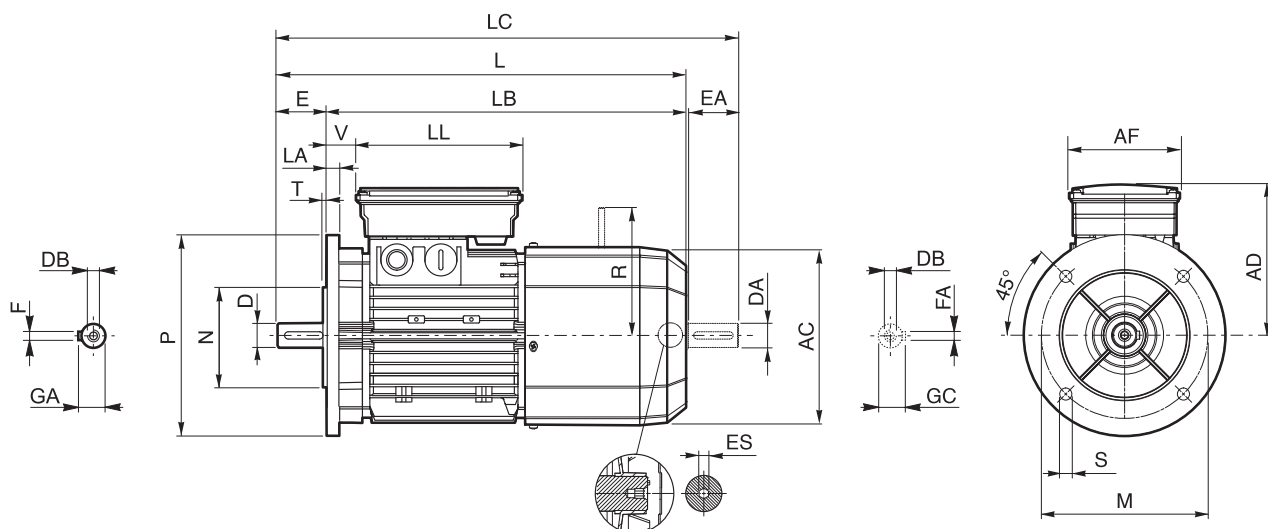
	Shaft					Flange						Motor																												
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V																					
BX 90 SR	19 19 ⁽¹⁾	40 40 ⁽¹⁾	M6 M6 ⁽¹⁾	21.5 21.5 ⁽¹⁾	6 6 ⁽¹⁾	165	130	200	11.5	3.5	11.5	176	316	276	358	133	98	98	44																					
BX 90 S	24 19 ⁽¹⁾	50 40 ⁽¹⁾	M8 M6 ⁽¹⁾	27 21.5 ⁽¹⁾	8 6 ⁽¹⁾								326		368					142																				
BX 90 LA																																								
BX 100 LA	28 24 ⁽¹⁾	60 50 ⁽¹⁾	M10 M8 ⁽¹⁾	31 27 ⁽¹⁾	8 8 ⁽¹⁾	215	180	250	14	4	14	195	410	350	462	157																								
BX 100 LB											15	219	430	370	482																									
BX 112 M											20	258	552	472	615		193	118	118	58																				
BX 132 SB	38 28 ⁽¹⁾	80 60 ⁽¹⁾	M12 M10 ⁽¹⁾	41 31 ⁽¹⁾	10 8 ⁽¹⁾	265	230	300	18.5	5	15	310	596	486	680	245	187	187	51																					
BX 132 MA	42 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾	300	250	350					640	530	724																									
BX 160 MA													48 42 ⁽¹⁾	110 110 ⁽¹⁾	M16 M16 ⁽¹⁾					51.5 45 ⁽¹⁾	14 12 ⁽¹⁾	350	300	400	19	5	24	514	884	744	1010	376	300	311						
BX 160 MB																																								
BX 160 L																																								
BX 180 M	48 42 ⁽¹⁾	110 110 ⁽¹⁾	M16 M16 ⁽¹⁾	51.5 45 ⁽¹⁾	14 12 ⁽¹⁾	300	250	350	19	5	20	423	821	711	934	328	300	311	55																					
BX 180 L																																								
BX 200LAK	55 45 ⁽¹⁾	110 110 ⁽¹⁾	M20 M20 ⁽¹⁾	59 48.5 ⁽¹⁾	16 14 ⁽¹⁾	350	300	400	19	5	20	465	879	739	1001	348	300	311	48																					
BX 225SAK	60 55 ⁽¹⁾	140 110 ⁽¹⁾	M20 M20 ⁽¹⁾	64 59 ⁽¹⁾	18 16 ⁽¹⁾	400	350	450	19	5	20	465	879	739	1001	348	300	311																						
BX 225SBK																																								
BX 250MAK	65 55 ⁽¹⁾	140 110 ⁽¹⁾	M20 M20 ⁽¹⁾	69 59 ⁽¹⁾	18 16 ⁽¹⁾	500	450	550	19	5	24	514	884	744	1010	376	300	311	43																					
BX 280SAK	75 65 ⁽¹⁾	140 140 ⁽¹⁾	M20 M20 ⁽¹⁾	79.5 69 ⁽¹⁾	20 18 ⁽¹⁾	500	450	550	18	5	23	567	1088	948	1238	482	434	306																						
BX 280SBK																																								
BX 315SAK	80 75 ⁽¹⁾	170 140 ⁽¹⁾	M20 M20 ⁽¹⁾	85 79.5 ⁽¹⁾	22 20 ⁽¹⁾	600	550	660	23	6	25	645	1204	1034	1352	537	473	347	42																					
BX 315SBK																																								
BX 315SCK													1315	1145	1453																									
BX 355SAK	100 75 ⁽¹⁾	210 170 ⁽¹⁾	M24 M20 ⁽¹⁾	106 79.5 ⁽¹⁾	28 20 ⁽¹⁾	740	680	800	23	6	25	740	1479	1269	1659	603	694	413	50																					
BX 355MAK																																								
BX 355MBK																																								
BX 355MCK													1584	1374	1764																									

N.B.: 1) These values refer to the rear shaft end (PS).



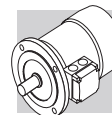
BX - IM B5 - FD/FA - CUS/NBR/EECA

BX-MX



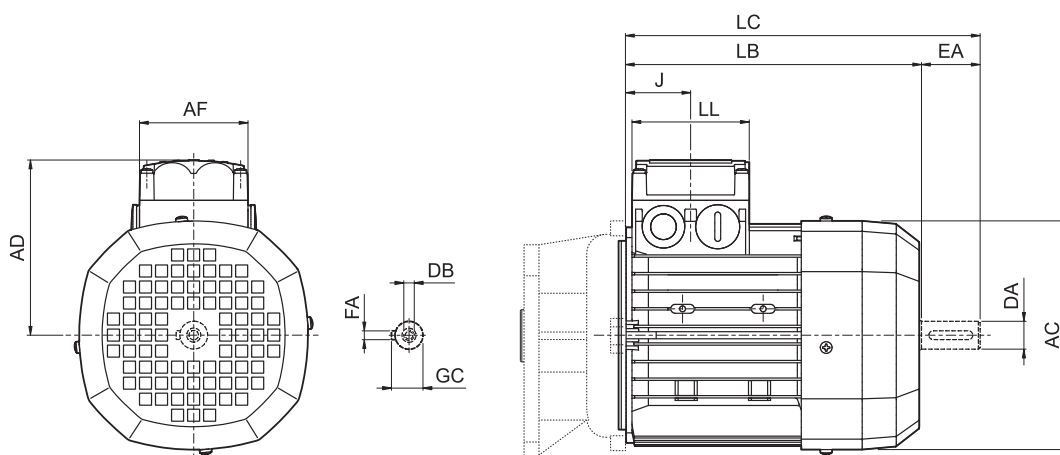
	Shaft					Flange						Motor										
	D	E	DB	GA	F	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R		ES
	DA	EA		GC	FA															FD	FA	(2)
BX 90 SR	19 19 ⁽¹⁾	40 40 ⁽¹⁾	M6 M6 ⁽¹⁾	21.5 21.5 ⁽¹⁾	6 6 ⁽¹⁾								400		442					129	134	
BX 90 S	24 19 ⁽¹⁾	50 40 ⁽¹⁾	M8 M6 ⁽¹⁾	27 21.5 ⁽¹⁾	8 6 ⁽¹⁾	165	130	200	11.5	3.5	11.5	176	410	360	452	146			32			
BX 90 LA																	110	165		160	160	6
BX 100 LA	28 24 ⁽¹⁾	60 50 ⁽¹⁾	M10 M8 ⁽¹⁾	31 27 ⁽¹⁾	8 8 ⁽¹⁾	215	180	250			14	195	502	442	554	155			37			
BX 100 LB									14	4												
BX 112 M											15	219	527	467	579	170			39	199	198	
BX 132 SB	38 28 ⁽¹⁾	80 60 ⁽¹⁾	M12 M10 ⁽¹⁾	41 31 ⁽¹⁾	10 8 ⁽¹⁾	265	230	300			16	258	661	581	724	210	140	188	46	204	200	
BX 132 MA																				226		
BX 160 MA	42 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾						15	310	736	626	820				51	266	247	
BX 160 MB						300	250	350	18.5	5			780	670	864	245	187	187				
BX 160 L																						
BX 180 M	48 42 ⁽¹⁾	110 110 ⁽¹⁾	M16 M16 ⁽¹⁾	51.5 45 ⁽¹⁾	14 12 ⁽¹⁾						18	348	866	756	981	261			52	305		
BX 180 L																						
BX 200LAK	55 45 ⁽¹⁾		M20 M16 ⁽¹⁾	59 48.5 ⁽¹⁾	16 14 ⁽¹⁾	350	300	400				417	967	857	1082	328			55	323		
BX 225SAK	60 55 ⁽¹⁾	140 110 ⁽¹⁾		64 59 ⁽¹⁾	18 16 ⁽¹⁾	400	350	450	19		20	460	1065	925	1180	348	300	311	48	308		
BX 225SBK																						
BX 250MAK	65 55 ⁽¹⁾			69 59 ⁽¹⁾							24	510	1070	930	1240	376				363		
BX 280SAK	75 65 ⁽¹⁾	140 140 ⁽¹⁾	M20 M20 ⁽¹⁾	79.5 69 ⁽¹⁾	20 18 ⁽¹⁾	500	450	550	18		23	564	1284	1144	1379	482	434	306	43	500	—	
BX 280SBK																						
BX 315SAK													1493	1323	1643							
BX 315SBK	80 75 ⁽¹⁾	170 140 ⁽¹⁾		85 79.5 ⁽¹⁾	22 20 ⁽¹⁾	600	550	660				639	1530	1360	1680	537	473	347	42	678		
BX 315SCK													1604	1434	1791							
BX 355SAK									23	6	25											
BX 355MAK	100 90 ⁽¹⁾	210 170 ⁽¹⁾	M24 M24 ⁽¹⁾	106 95 ⁽¹⁾	28 25 ⁽¹⁾	740	680	800				725	1722	1512	1902	603	694	413	50	—		
BX 355MBK																						
BX 355MCK													1827	1617	2082							

N.B.: 1) These values refer to the rear shaft end (PS). 2) "ES" hexagon is not present with PS option

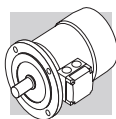


MX

BX-MX

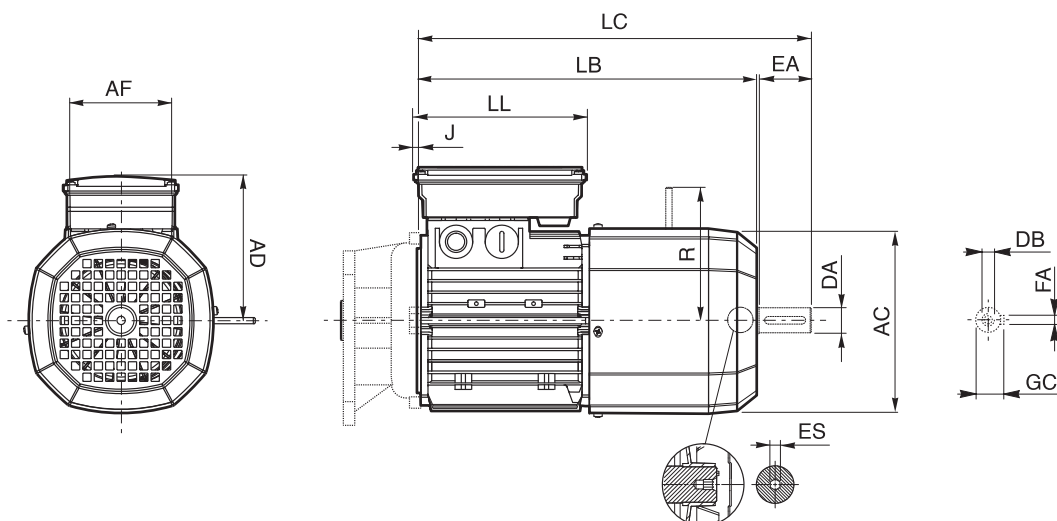


	Rear shaft end					Motor						
	DA	EA	DB	GC	FA	AC	LB	LC	AF	LL	J	AD
MX 2SB	14	30	M5	16	5	156	246	278	74	80	44	119
MX 3SA	24	50	M8	27	8	195	265	317	98	98	53.5	142
MX 3SB							305	357				
MX 3LA												
MX 3LB												
MX 4SA	28	60	M10	31	258	361	424	118	118	64.5	193	
MX 4SB						396	459					
MX 4LA												
MX 5SA	38	80	M12	41	10	310	418	502	187	187	77	245
MX 5SB							462	546				
MX 5LA												



MX_FD/FA

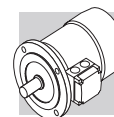
BX-MX



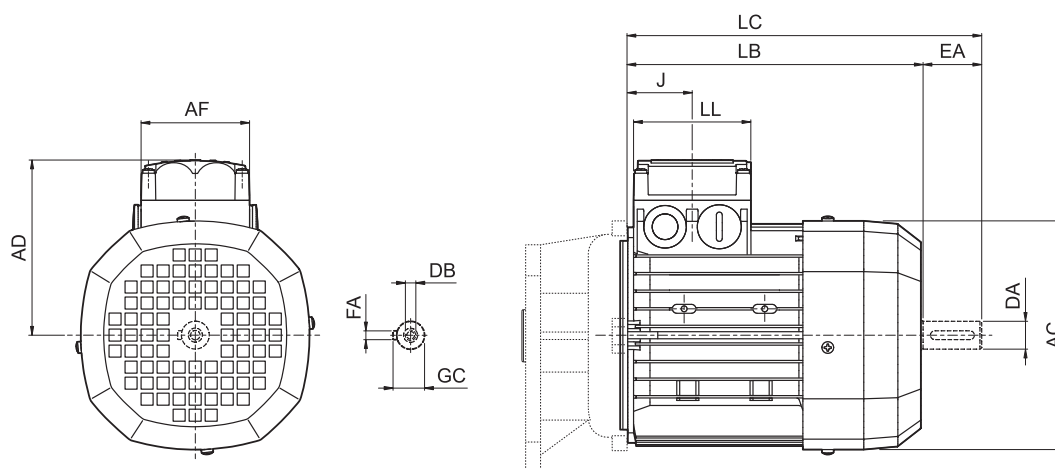
	Rear shaft end					Motor									
	DA	EA	DB	GC	FA	AC	LB	LC	AF	LL	J	AD	R FD FA	ES ⁽¹⁾	
MX 2SB	14	30	M5	16	5	156	318	349	98	133	9	143	129	134	5
MX 3SA	24	50	M8	27	8	195	355	407	110	165	7	155	160	160	6
MX 3SB							397	450							
MX 3LA															
MX 3LB															
MX 4SA	28	60	M10	31		258	470	534	140	188		210	204	200	
MX 4SB							494	558						226	
MX 4LA															
MX 5SA	38	80	M12	41			10	310	558	644				187	
MX 5SB					602	686									
MX 5LA															

N.B.:

1) "ES" hexagon is not present with PS option

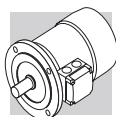


MX CUS



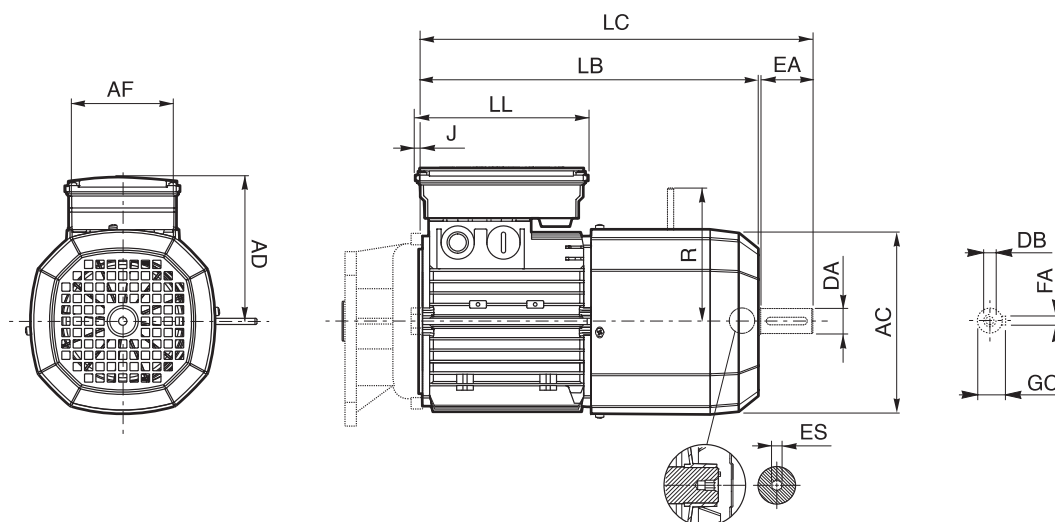
BX-MX

	Rear shaft end					Motor							
	DA	EA	DB	GC	FA	AC	LB	LC	AF	LL	J	AD	
MX 2SB	14	30	M5	16	5	176	262	293	98	98	79	133	
MX 3SA	24	50	M8	27	8	195	265	317			53.5	142	
MX 3SB							305	357					
MX 3LA													
MX 3LB						MX 4SA	28	60					M10
MX 4SB	420	483											
MX 4LA													
MX 5SA	38	80	M12	41	10	310	418	502	187	187	77	245	
MX 5SB							462	546					
MX 5LA													



MX_FD/FA CUS

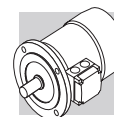
BX-MX










	Rear shaft end					Motor										
	DA	EA	DB	GC	FA	AC	LB	LC	AF	LL	J	AD	R FD FA	ES ⁽¹⁾		
MX 2SB	14	30	M5	16	5	176	347	379	110	165	-17	146	129	134	6	
MX 3SA	24	50	M8	27	8	195	355	407			7	155	160	160		
MX 3SB							397	450								
MX 3LA																
MX 3LB																
MX 4SA	28	60	M10	31	10	258	470	534	140	188	210	204	200	—		
MX 4SB							528	592					226			
MX 4LA																
MX 5SA	38	80	M12	41	10	310	558	644	187	187	17	245	266	247	—	
MX 5SB							602	686								
MX 5LA																

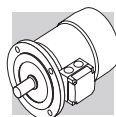
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






1) "ES" hexagon is not present with PS option



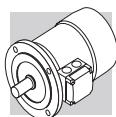
M18 MOTOR RATING CHARTS BE-ME









2 P		3000 min ⁻¹ - S1										50 Hz - IE2													
<div><div><div></div><div></div><div></div></div><div>A068744</div></div>		d.c. brake															a.c. brake								
		FD										FA													
P _n		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	NB	SB	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	
kW		min ⁻¹	Nm	A	100%	75%	50%				kgm ²			Nm				kgm ²			Nm			kgm ²	
0.75	BE 80A	2	2860	1.65	80	79.6	76.4	0.83	6.8	3.8	9	9.5	FD 04	5	1700	3200	3200	9.4	13.4	FA 04	5	3200	9.4	13.3	
1.1	BE 80B	2	2845	2.35	81.5	82.2	79.9	0.83	6.9	3.8	11.4	11.3	FD 04	10	1500	3000	3000	10.6	15.2	FA 04	10	3000	10.6	15.1	
1.5	BE 90SA	2	2865	3.2	81.3	80.7	78.1	0.82	6.8	3.6	12.5	12.3	FD 14	15	900	2200	2200	14.1	16.5	FA 14	15	2200	14.1	16.4	
2.2	BE 90L	2	2870	4.7	83.2	83.1	80.8	0.82	6.9	3.1	16.7	14	FD 05	26	900	2200	2200	21	20	FA 05	26	2200	21	20.7	
3	BE 100L	2	2880	6.2	84.6	84.6	83.7	0.83	7.3	3.5	39	23	FD 15	26	700	1600	1600	35	29	FA 15	26	1600	35	30	
4	BE 112M	2	2920	8.2	85.8	85.5	84.3	0.82	7.9	3.5	57	28	FD 06S	40	—	950	66	66	39	FA 06S	40	950	66	40	
5.5	BE 132SA	2	2925	10.6	87	85	81.7	0.86	8.5	3.6	145	42	FD 06	50	—	600	112	112	55	FA 06	50	600	112	56	
7.5	BE 132SB	2	2935	14.3	88.1	87.4	84.7	0.86	8.8	3.9	178	53	FD 06	50	—	550	154	154	66	FA 06	50	550	154	67	
9.2	BE 132MB	2	2920	16.4	88.8	86.5	84.2	0.91	8.4	3.7	210	65	FD 56	75	—	430	189	189	78	FA 06	75	430	189	79	
11	BE 160MA	2	2940	20	89.4	89.5	88	0.89	8.1	3	340	84	—	—	—	—	—	—	—	—	—	—	—	—	
15	BE 160MB	2	2950	27.2	90.5	90.5	89.5	0.88	8.5	3	420	97	—	—	—	—	—	—	—	—	—	—	—	—	
18.5	BE 160L	2	2945	32	90.9	90.5	89.8	0.91	7.7	2.9	490	109	—	—	—	—	—	—	—	—	—	—	—	—	

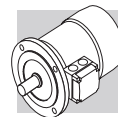






4 P		1500 min ⁻¹ - S1										50 Hz - IE2													
<div><div><div></div><div></div><div></div></div><div>A068744</div></div>		d.c. brake										a.c. brake													
		FD										FA													
		P _n		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h NB	Z ₀ 1/h SB	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 
kW		min ⁻¹	Nm	A	100%	75%	50%					kgm ²			Nm			kgm ²			Nm		kgm ²		
0.12	BE 63A	4	1360	0.84	0.45	59.1	59.6	53.5	0.65	3	2	2.2	2.3	3.5	FD 02	1.75	10000	13000	2.6	5.2	FA 02	1.75	13000	2.6	5
0.18	BE 63B	4	1370	1.25	0.64	64.7	65.1	59.8	0.62	3.5	2.3	2.5	3.3	3.9	FD 02	3.5	10000	13000	3	5.6	FA 02	3.5	13000	3	5.4
0.25	BE 71A	4	1380	1.73	0.68	68.5	68	62	0.78	4	2.3	2.5	5.8	5.1	FD 03	3.5	7700	11000	6.9	7.8	FA 03	3.5	11000	6.9	7.5
0.37	BE 71B	4	1385	2.55	1.05	70.1	69.3	64.2	0.75	4.0	2.3	2.2	6.9	5.9											
0.55	BE 80A	4	1405	3.7	1.41	75.1	74.9	71.2	0.76	4.3	2.2	1.9	15	9.9	FD 04	10	4100	8000	16.6	13.8	FA 04	10	8000	16.6	13.7
0.75	BE 80B	4	1430	5	1.65	81	80.5	78	0.81	6.1	3.2	3	28	12.2	FD 04	15	4100	7800	22	16.1	FA 04	15	7800	22	16
1.1	BE 90S	4	1430	7.4	2.53	82.5	82	79.5	0.76	6.3	2.9	2.8	28	13.6	FD 14	15	4800	8000	32	17.8	FA 14	15	8000	32	17.7
1.5	BE 90LA	4	1430	10	3.5	83.5	83	80	0.74	5.9	3.1	3	34	15.1	FD 05	26	3400	6000	34	21.1	FA 05	26	6000	34	21.8
2.2	BE 100LA	4	1430	14.7	4.9	85.4	85	84	0.76	5.8	3	2.8	54	22	FD 15	40	2600	4700	44	29	FA 15	40	4700	44	29
3	BE 100LB	4	1420	20	6.6	85.5	86	85.5	0.77	5.9	2.8	2.6	61	24	FD 15	40	2400	4400	58	31	FA 15	40	4400	58	31
4	BE 112M	4	1440	27	8.3	87	87	86	0.8	6.5	2.8	2.8	105	32	FD 06S	60	—	1400	107	42	FA 06S	60	2100	107	44
5.5	BE 132S	4	1460	36	11.1	88.5	88.5	87.5	0.81	7.3	2.9	2.9	270	53	FD 56	75	—	1050	223	66	FA 06	75	1200	223	67
7.5	BE 132MA	4	1460	49	14.8	89	89	88.5	0.82	6.9	2.9	2.8	319	59	FD 06	100	—	950	280	72	FA 06	100	1000	280	77
9.2	BE 132MB	4	1460	60	18.1	89.5	89.5	88.5	0.82	6.9	2.9	3	360	70	FD 07	150	—	900	342	86	FA 07	150	900	342	87
11	BE 160M	4	1465	72	21.5	91	91.3	90.5	0.81	6.5	2.8	2.6	650	99	FD 08	170	—	800	655	129	FA 08	170	800	655	128
15	BE 160L	4	1465	98	28.7	90.8	91	90.5	0.83	6.5	2.6	2.3	790	115	FD 08	200	—	750	725	129	FA 08	200	750	710	128
18.5	BE 180M	4	1465	121	35	91.6	92	91.3	0.83	6.5	2.6	2.5	1250	135	FD 09	300	—	400	1450	175	—	—	—	—	—
22	BE 180L	4	1465	143	41	91.6	91.8	91.4	0.84	6.8	2.7	2.6	1650	157	FD 09	300	—	300	1850	197	—	—	—	—	—

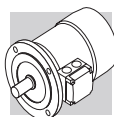
(*) Power /size relation not standardized











2 P		3000 min ⁻¹ - S1										50 Hz - IE2												
<div></div>		d.c. brake															a.c. brake							
		FD															FA							
		P _n		n	M _n	In 400V	η%	cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	
kW		min ⁻¹	Nm	A	100%	75%	50%				kgm ²			Nm	NB	SB	kgm ²			Nm		kgm ²		
0.75	BE 80A	2	2860	2.5	1.65	80	79.6	0.83	6.8	3.8	3.5	9	9.5	FD 04	5	1700	3200	9.4	12.5	FA 04	5	3200	9.4	12.4
1.1	BE 80B	2	2845	3.7	2.35	81.5	82.2	0.83	6.9	3.8	3.1	11.4	11.3	FD 04	10	1500	3000	10.6	13.4	FA 04	10	3000	10.6	13.3
1.5	BE 90SA	2	2865	5	3.2	81.3	80.7	0.82	6.8	3.6	2.8	12.5	12.3	FD 14	15	900	2200	14.1	16.5	FA 14	15	2200	14.1	16.4
2.2	BE 90L	2	2870	7.3	4.7	83.2	83.1	0.82	6.9	3.1	2.9	16.7	14	FD 05	26	900	2200	21	20	FA 05	26	2200	21	20.7
3.7	BE 112M	2	2930	12.1	7.8	84.7	83	0.79	7.9	3.5	3.1	57	28	FD 06S	40	—	950	66	39	FA 06S	40	950	66	40

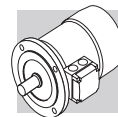







4 P		1500 min ⁻¹ - S1										50 Hz - IE2												
P _n kW		n min ⁻¹	M _n Nm	In 400V A	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	d.c. brake					a.c. brake						
					100%	75%							FD					FA						
													Mod	M _b Nm	Z _o 1/h	NB	SB	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b Nm	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 
0.37	BE 71B	4	2.55	1.05	70.1	69.3	64.2	0.75	4.0	2.3	2.2	6.9	5.9	FD 03	5	6000	9400	8	8.6	FA 03	5	9400	8	8.3
0.55	BE 80A	4	3.7	1.41	75.1	74.9	71.2	0.76	4.3	2.2	1.9	15	9.9	FD 04	10	4100	8000	16.6	13.8	FA 04	10	8000	16.6	13.7
0.75	BE 80B	4	5	1.65	81	80.5	78	0.81	6.1	3.2	3	28	12.2	FD 04	15	4100	7800	22	16.1	FA 04	15	7800	22	16
1.1	BE 90S	4	7.4	2.53	82.5	82	79.5	0.76	6.3	2.9	2.8	28	13.6	FD 14	15	4800	8000	32	17.8	FA 14	15	8000	32	17.7
1.5	BE 90LA	4	10	3.5	83.5	83	80	0.74	5.9	3.1	3	34	15.1	FD 05	26	3400	6000	34	21.1	FA 05	26	6000	34	21.8
2.2	BE 100LA	4	14.7	4.9	85.4	85	84	0.76	5.8	3	2.8	54	22	FD 15	40	2600	4700	44	29	FA 15	40	4700	44	29
3.7	BE 112M	4	27	8.3	87	87	86	0.80	6.5	2.8	2.8	105	32	FD 06S	60	—	1400	107	42	FA 06S	60	2100	107	44

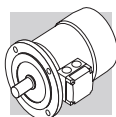











6 P		1000 min ⁻¹ - S1										50 Hz - IE2												
<div></div>		d.c. brake															a.c. brake							
		FD															FA							
		P _n		n	M _n	In 400V	η%	cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	
kW		min ⁻¹	Nm	A	100%	75%					kgm ²			Nm	NB	SB	kgm ²			Nm		kgm ²		
0.75	BE 90S	6	935	7.7	2.06	75.9	75.9	0.69	5.1	3.1	2.9	33	15	FD 14	15	3400	6500	28	16.8	FA 14	15	6500	28	16.7
1.1	BE 100M	6 (*)	945	11.1	2.75	78.1	76.2	0.74	4.9	2.2	1.9	82	22	FD 15	40	1900	4100	86	28	FA 15	40	4100	86	29
1.5	BE 100LA	6	945	15.2	3.9	79.8	77.5	0.72	5.6	2.5	2.3	95	24	FD 15	40	1700	3600	99	30	FA 15	40	3600	99	31
2.2	BE 112M	6	950	22	5.2	81.8	81.8	0.74	5.2	2.6	2.3	168	32	FD 06S	60	—	2100	177	42	FA 06S	60	2100	177	44
3.7	BE 132MA	6	970	36.1	8.3	83.5	83.6	0.76	6.9	2.2	2	383	56	FD 06	100	—	1200	305	58	FA 07	100	1200	318	63

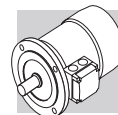
(*) Power /size relation not standardized







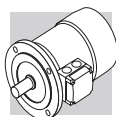
4 P			1800 min ⁻¹ - S1													60 Hz - IE2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
<div><div><div><div><div></div></div></div><div><div><div>HP</div><div>P_n</div></div></div><div><div><div>kW</div></div></div></div></div>			d.c. brake													a.c. brake																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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			Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5  Kg	KVA Code	J _m x 10 ⁻⁴ kgm ²	IM B5  Kg	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5  Kg	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5  Kg																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
n	M _n	I _n 400V	η%		cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I _s I _n	M _s M _n	M _a M _n	n	M _n	I _n 400V	100%	75%	50%	cos φ	I







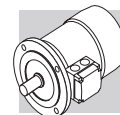
2 P		3000 min ⁻¹ - S1										50 Hz - IE2																			
<div><div></div><div>A068744</div></div>																	d.c. brake										a.c. brake				
P _n		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	FD				FA														
					100%	75%							Mod	M _b	Z ₀ 1/h NB	Z ₀ 1/h SB	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 								
kW		min ⁻¹	Nm	A							kgm ²		Mod	M _b	NB	SB	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 								
0.75	ME 2SA	2	2.5	1.63	80	79.6	0.83	6.8	3.8	3.5	9	8.8	FD 04	5	1700	3200	9.4	12.7	FA 04	5	3200	9.4	12.6								
1.1	ME 2SB	2	3.7	2.35	81.5	82.2	0.83	6.9	3.8	3.1	11.4	10.6	FD 04	10	1500	3000	13	14.5	FA 04	10	3000	13	14.4								
1.5	ME 3SA	2	5.0	3.2	81.3	79	0.81	6.1	2.9	2.7	24	15.5	FD 15	13	1300	2600	22	22	FA 15	26	2600	22	23								
2.2	ME 3LA	2	7.3	4.7	83.2	83.1	0.82	6.9	2.7	2.5	31	18.7	FD 15	26	1100	2400	28	25.2	FA 15	26	2400	28	26.2								
3	ME 3LB	2	9.9	6.2	84.6	84.6	0.83	7.3	3.5	3.1	39	22	FD 15	26	700	1600	35	28.5	FA 15	26	1600	35	29.5								
4	ME 4SA	2	13.2	7.8	85.8	84.5	0.87	7.0	2.9	2.8	101	33	FD 06	50	—	1400	107	46	FA 06	50	2100	107	47								
5.5	ME 4SB	2	18.0	10.6	87.0	85.0	0.86	8.5	3.6	3.3	145	40	FD 06	50	—	600	112	48	FA 06	50	600	112	49								
7.5	ME 4LA	2	24	14.3	88.1	87.4	0.86	8.8	3.9	3.6	178	51	FD 06	50	—	550	154	55	FA 06	50	550	154	56								
9.2	ME 4LB	2	30	16.4	88.8	86.5	0.91	8.4	3.7	3.3	210	60	FD 56	75	—	430	189	66	FA 06	75	430	189	67								
11	ME 5SA	2	36	20.0	90.5	90.5	0.89	8.1	3.0	2.9	340	70																			
15	ME 5SB	2	49	27.2	90.9	90.5	0.88	8.5	3.0	2.8	420	83																			
18.5	ME 5LA	2	60	32	90.4	90.1	0.91	7.7	2.9	2.7	490	95																			







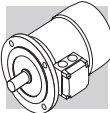
4 P		1500 min ⁻¹ - S1										50 Hz - IE2												
<div><div><div><div></div></div><div><div></div></div></div><div><div>CE</div><div>A068744</div></div></div>																								
		FD										FA												
P _n		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 		
kW		min ⁻¹	Nm	A	100%	75%	50%							Nm	NB	SB			Nm					
0.12	ME 05A	4	1360	0.45	59.1	59.6	53.5	0.65	3	2	2.2	2.3	3.5	FD 02	1.75	10000	13000	2.6	5.2	FA 02	1.75	13000	2.6	5
0.18	ME 05B	4	1370	1.25	64.7	65.1	59.8	0.62	3.5	2.3	2.5	3.3	3.9	FD 02	3.5	10000	13000	3	5.6	FA 02	3.5	13000	3	5.4
0.25	ME 1SA	4	1380	1.73	68.5	68	62	0.78	4	2.3	2.5	5.8	5.1	FD 03	3.5	7700	11000	6.9	7.8	FA 03	3.5	11000	6.9	7.5
0.37	ME 1SB	4	1385	2.55	70.1	69.3	64.2	0.75	4.0	2.3	2.2	6.9	5.9	FD 03	5	6000	9400	8.0	8.6	FA 03	5	9400	8.0	8.3
0.55	ME 2SA	4	1405	3.7	75.1	74.9	71.2	0.76	4.3	2.2	1.9	15	9.9	FD 04	10	4100	8000	16.6	13.8	FA 04	10	8000	16.6	13.7
0.75	ME 2SB	4	1430	5	81.0	80.5	78.0	0.81	6.1	3.2	3.0	28	12.2	FD 04	15	4100	7800	22	16.1	FA 04	15	7800	22	16
1.1	ME 3SA	4	1430	7.4	82.5	82.0	79.5	0.76	6.3	2.9	2.8	28	15.5	FD 15	26	4800	8000	32	21.5	FA 15	26	8000	32	22.5
1.5	ME 3SB	4	1420	10	83.5	83.0	80.0	0.74	5.9	3.1	3.0	34	17	FD 15	26	3400	6000	34	23	FA 15	26	6000	34	24
2.2	ME 3LA	4	1430	14.7	85.4	85.0	84.0	0.76	5.8	3.0	2.8	54	21	FD 15	40	2600	4700	44	27	FA 15	40	4700	44	28
3	ME 3LB	4	1420	20	85.5	86.0	85.5	0.77	5.9	2.8	2.6	61	23	FD 15	40	2400	4400	58	29	FA 15	40	4400	58	30
4	ME 4SA	4	1440	27	87.0	87.0	86.0	0.80	6.5	2.8	2.8	105	42	FD 56	75	—	1400	107	55	FA 06	75	2100	107	56
5.5	ME 4SB	4	1460	36	88.5	88.5	87.5	0.81	7.3	2.9	2.9	270	51	FD 56	75	—	1050	223	64	FA 06	75	1200	223	65
7.5	ME 4LA	4	1460	49	89.0	89.0	88.5	0.82	6.9	2.9	2.8	319	57	FD 06	100	—	950	280	70	FA 07	100	1000	280	75
9.2	ME 4LB	4	1460	60	89.5	89.5	88.5	0.82	6.9	2.9	3.0	360	65	FD 07	150	—	900	342	81	FA 07	150	900	342	83
11	ME 5SA	4	1465	72	91.0	91.3	90.5	0.81	6.5	2.8	2.6	650	85	FD 08	170	—	800	655	115	FA 08	170	800	655	114
15	ME 5LA	4	1465	98	90.8	91.0	90.5	0.83	6.5	2.6	2.3	790	101	FD 08	200	—	750	725	131	FA 08	200	750	710	130








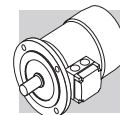
6 P		1000 min ⁻¹ - S1										50 Hz - IE2																					
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div></div><div></div></div><div>A068744</div></div></div>																																	
P _n	kW		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h		J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 									
						100%	75%									NB	SB																
0.75	ME 3SA	6	940	7.6	1.98	75.9	75.0	70.7	0.72	4.7	2.2	2	33	17	FD 15	26	3400	6500	28	21	FA 15	26	6500	28	22								
1.1	ME 3LA	6 (*)	945	11.1	2.75	78.1	76.2	73.0	0.74	4.9	2.2	1.9	82	21	FD 15	26	2700	5000	37	27	FA 15	26	5000	37	28								
1.5	ME 3LB	6	945	15.2	3.8	79.8	77.5	74.0	0.72	5.6	2.5	2.3	95	23	FD 15	40	1900	4100	86	29	FA 15	40	4100	86	30								
2.2	ME 4SA	6	955	22	4.9	81.8	81.8	80.0	0.80	5.7	1.9	1.7	216	34	FD 06	50	—	2100	177	47	FA 06	50	2100	177	48								
3	ME 4SB	6	955	30	6.6	83.3	83.3	82.4	0.79	6.1	2.1	1.9	295	43	FD 56	75	—	1400	226	56	FA 06	75	1400	226	57								
4	ME 4LA	6	965	40	8.6	84.6	85.0	83.1	0.79	6.9	2.2	2.0	383	54	FD 06	100	—	1200	305	70	FA 07	100	1200	305	72								
5.5	ME 5SA	6 (*)	965	54	11.6	87.0	87.0	86.4	0.79	6.6	2.5	2.3	740	69	FD 08	170	—	1050	406	99	FA 08	170	1050	406	98								
7.5	ME 5SB	6 (*)	965	74	15.0	88.0	88.0	87.2	0.82	6.6	2.3	2.1	970	89	FD 08	170	—	900	815	119	FA 08	170	900	815	118								








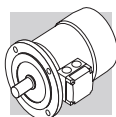
2 P		3000 min ⁻¹ - S1										50 Hz - IE2									
																					
P _n		n	M _n	I _n 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	FD				FA				
					100%	75%							Mod	M _b	NB	SB	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b
0.75	ME 2SA	2	2.5	1.63	80	79.6	0.83	6.8	3.8	3.5	9	8.8	FD 04	5	1700	3200	9.4	5	3200	9.4	12.6
1.1	ME 2SB	2	3.7	2.35	81.5	82.2	0.83	6.9	3.8	3.1	11.4	10.6	FD 04	10	1500	3000	10.6	10	3000	10.6	14.4
1.5	ME 3SA	2	5	3.2	81.3	79	0.81	6.1	2.9	2.7	24	15.5	FD 15	13	4800	8000	32	26	8000	32	22.5
2.2	ME 3LA	2	7.3	4.7	83.2	83.1	0.82	6.9	3.1	2.9	16.7	18.7	FD 15	26	3400	6000	34	26	6000	34	25.7
3.7	ME 4SA	2	12.1	7.8	84.7	83	0.79	7.9	3.5	3.1	57	33	FD 56	75	—	1400	107	75	2100	107	47








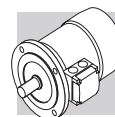
4 P		1500 min ⁻¹ - S1										50 Hz - IE2												
																								
		FD										FA												
P _n		n	M _n	In 400V	η%	cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z _o 1/h NB	S _B	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	M _b	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 		
0.37	ME 1SB	4	2.55	1.05	70.1	69.3	64.2	50%	4.0	2.3	2.2	6.9	5.9	FD 03	5	6000	9400	8	8.6	FA 03	5	9400	8	8.3
0.55	ME 2SA	4	3.7	1.41	75.1	74.9	71.2		4.3	2.2	1.9	15	9.9	FD 04	10	4100	8000	16.6	13.8	FA 04	10	8000	16.6	13.7
0.75	ME 2SB	4	5	1.65	81	80.5	78		6.1	3.2	3	28	12.2	FD 04	15	4100	7800	22	16.1	FA 04	15	7800	22	16
1.1	ME 3SA	4	7.4	2.6	82.5	82	79		5.5	2.5	2.8	34	15.5	FD 15	26	4800	8000	32	22.5	FA 15	26	8000	32	22.5
1.5	ME 3SB	4	10.1	3.48	84	84	83		6.2	2.9	2.9	40	17	FD 15	26	3400	6000	34	24	FA 15	26	6000	34	24
2.2	ME 3LA	4	14.7	4.9	85.4	85	84		5.8	3	2.8	54	21	FD 15	40	2600	4700	44	28	FA 15	40	4700	44	28
3.7	ME 4SA	4	27	8.25	87.5	86.8	84		7.1	3	3.1	213	42	FD 56	75	—	1400	107	55	FA 06	75	2100	107	56



6 P		1000 min ⁻¹ - S1										50 Hz - IE2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
P _n		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	FD				FA				IM B5 																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
					100%	75%							Mod	M _b	Z ₀ 1/h	NB	SB	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod		M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
kW		min ⁻¹	Nm	A			50%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

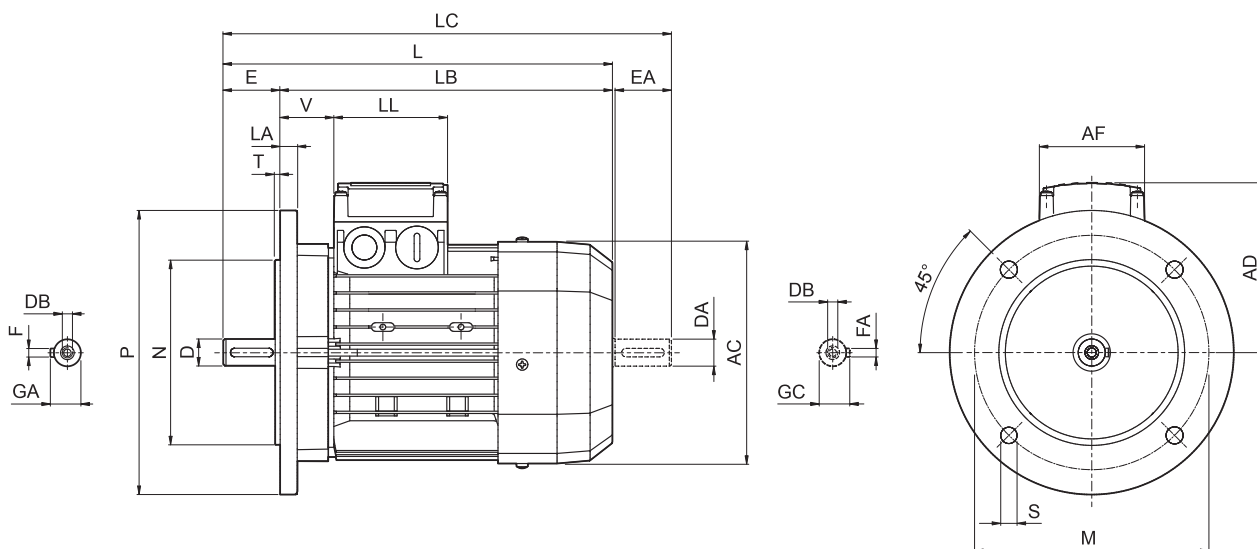


4 P		1800 min ⁻¹ - S1										60 Hz - IE2														
																										
P _n		n	M _n	In 400V	η%		cos φ	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	KVA Code	J _m x 10 ⁻⁴ kgm ²	IM B5 	FD				FA				IM B5 				
					100%	75%								Mod	M _b	Z ₀ 1/h	NB	SB	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 		Mod	M _b	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²
0.75	0.55	ME 2SA	4	3	1.23	75.5	73.1	0.74	8.7	3.8	3.0	N	19	9.9	FD 04	10	4100	8000	8000	16.6	13.8	FA 04	10	8000	16.6	13.7
1	0.75	ME 2SB	4	4.1	1.46	82.5	81.1	0.78	7.6	3.5	3.2	K	28	12.2	FD 04	15	4100	7800	7800	22	16.1	FA 04	15	7800	22	16
1.5	1.1	ME 3SA	4	6	2.25	84	82.7	0.73	7.7	3.5	3.2	J	28	15.5	FD 15	26	4800	8000	8000	32	21.5	FA 15	26	8000	32	22.5
2	1.5	ME 3SB	4	8.2	3.1	84.5	83.9	0.73	7.1	3.6	3.4	K	34	17	FD 15	26	3400	6000	6000	34	23	FA 15	26	6000	34	24
3	2.2	ME 3LA	4	12	4.2	87.5	85.5	0.76	7	3.3	2.9	J	54	21	FD 15	40	2600	4700	4700	44	27	FA 15	40	4700	44	28
4	3	ME 3LB	4	16.5	5.9	87.5	87.7	0.76	7	3.2	2.9	K	61	23	FD 15	40	2400	4400	4400	58	29	FA 15	40	4400	58	30
5	3.7	ME 4SA	4	20	6.6	87.5	87.5	0.8	7.8	3.3	3.2	J	105	42	FD 56	75	—	1400	1400	107	55	FA 06	75	2100	107	56
7.5	5.5	ME 4SB	4	30	9.3	89.5	89.5	0.83	8.7	3.5	3.5	K	270	51	FD 56	75	—	1050	1050	223	64	FA 06	75	1200	223	65
10	7.5	ME 4LA	4	43	12.7	89.5	89.5	0.83	8	3.4	3.3	K	319	57	FD 06	100	—	950	950	280	70	FA 07	100	1000	280	75
12.5	9.2	ME 4LB	4	50	15.6	90	90	0.82	8.3	3.5	3.6	K	360	65	FD 07	150	—	900	900	342	81	FA 07	150	900	342	83
15	11	ME 5SA	4	60	18.7	91	91	0.81	7.7	2.9	2.8	J	650	85	FD 08	170	—	800	800	655	115	FA 08	170	800	655	114
20	15	ME 5LA	4	81	25.5	91	90.5	0.81	7.1	3.1	2.7	J	790	101	FD 08	200	—	750	750	725	131	FA 08	200	750	710	130



M19 MOTORS DIMENSIONS BE-ME

BE - IM B5- CE/CUS/BIS/CCC

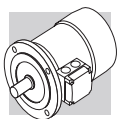


BE-ME

	Shaft					Flange						Motor																						
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V															
BE 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	207	184	232	95	74	80	26															
BE 71	14	30	M5	16	5	130	110	160		3.5		11.5	138	249	219	281			108	37														
BE 80	19	40	M6	21.5	6	165	130	200					11.5	156	274	234			315	119	38													
BE 90 S	24	50	M8	27	8				215		180			250	14	176	326	276	378	133	98	98	44											
BE 90 L										28		60				M10	31	15	195	367				307	429	142	50							
BE 100	BE 112	38	80	M12		41	10	265					230						300	14				20	258	493	413	576	193	118	118	58		
BE 132 S	42 38 ⁽¹⁾				110 80 ⁽¹⁾				M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾	300		250	350	18.5	5	15			310	528	448			611	245	187					187	51
BE 132 MA																						BE 132 MB	596			486								
BE 160 M	48 42 ⁽¹⁾	110 110 ⁽¹⁾	M16 M16 ⁽¹⁾	51.5 45 ⁽¹⁾	14 12 ⁽¹⁾	300	250	350	18.5	5	18	348	708	598	823	261				52														
BE 160 L																					BE 180 M	BE 180 L												

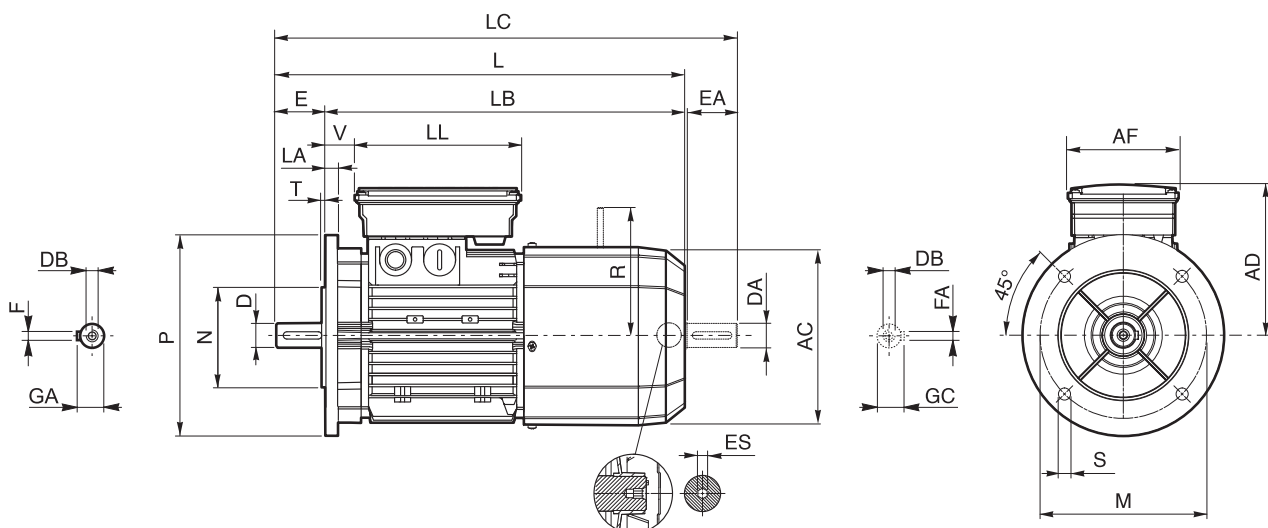
N.B.:

1) These values refer to the rear shaft end.



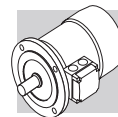
BE - IM B5 - FD/FA - CE/CUS/BIS

BE-ME

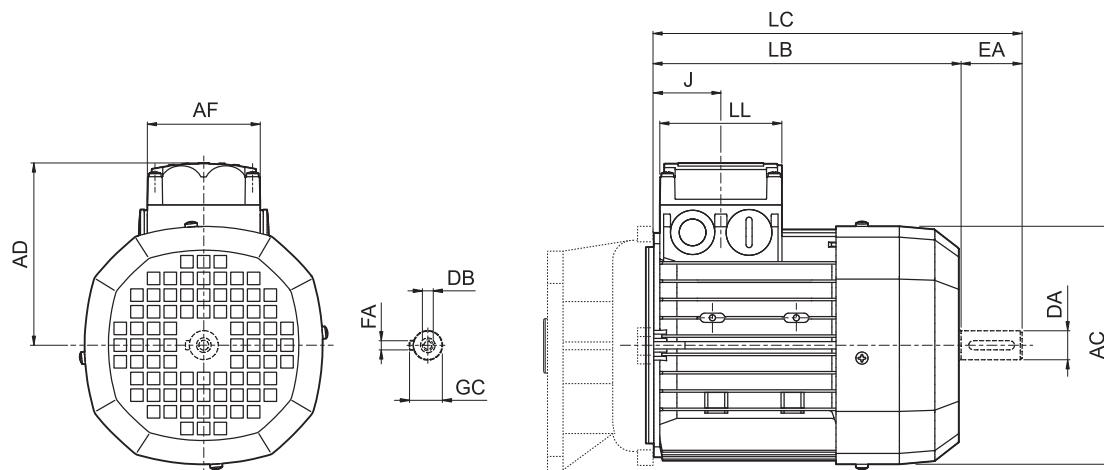


	Shaft					Flange						Motor													
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R		ES (2)			
																				FD	FA				
BE 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	122	98	133	14	96	116	5			
BE 71	14	30	M5	16	5	130	110	160		138		313	283	345	135	24			103	124					
BE 80	19	40	M6	21.5	6	165	130	200		11.5		3.5	11.5	156	348	308			390	143	25		129	134	
BE 90 S	24	50	M8	27	8				176		411			361	463	146	110	165	32	160	160	6			
BE 90 L									37		199			198											
BE 100	28	60	M10	31	215	180	250	14	4	14	195	458	398	521	155	39	199	198							
BE 112										15	219	484	424	547	170										
BE 132 S	38	80	M12	41	10	265	230			300	20	258	603	523	686	193	140	188	46	204	200	—			
BE 132 MA								628	548				711	226	217										
BE 132 MB																									
BE 160 M	42	110	M16	45	12	300	250	350	18.5	5	15	310	736	626	820	245	187	187	51	266	247	—			
BE 160 L	38 ⁽¹⁾	80 ⁽¹⁾	M12 ⁽¹⁾	41 ⁽¹⁾	10 ⁽¹⁾								780	670	864				52	305	—				
BE 180 M	48	110	M16	51.5	14						18	348	866	756	981	261									
BE 180 L																							42 ⁽¹⁾	110 ⁽¹⁾	M16 ⁽¹⁾

N.B.: 1) These values refer to the rear shaft end (PS). 2) "ES" hexagon is not present with PS option

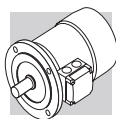


ME - CE/CUS/BIS/CCC



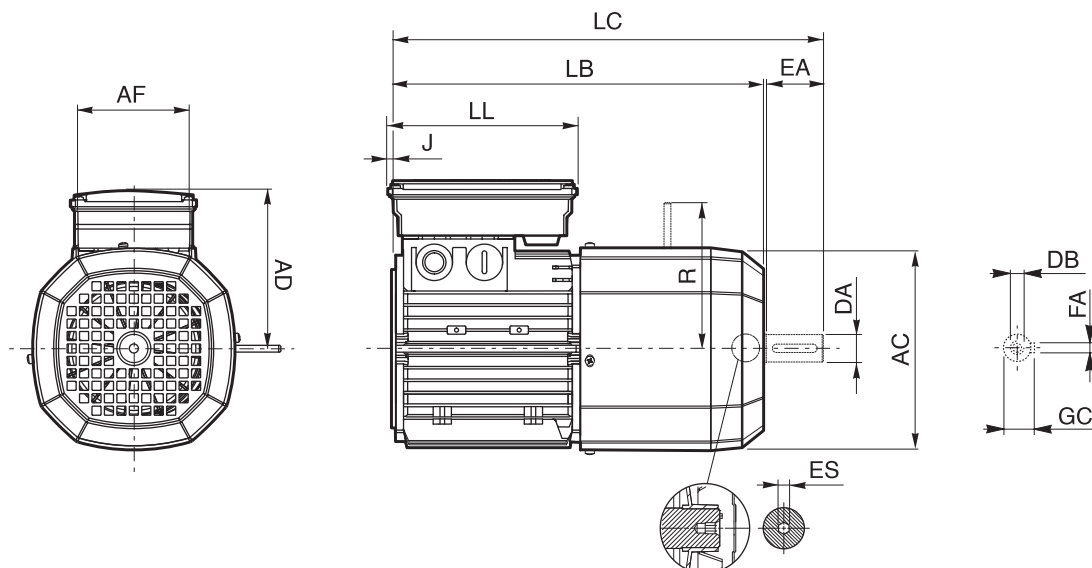
BE-ME

	Rear shaft end					Motor						
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD
ME 05	11	23	M4	12.5	4	121	165	191	74	80	48	95
ME 1S	14	30	M5	16	5	138	187	219			45	108
ME 2S	19	40	M6	21.5	6	156	202	245			44	119
ME 3S	28	60	M10	31	8	195	230	293	98	98	53.5	142
ME 3L							262	325				
ME 4S	38	80	M12	41	10	258	361	444	118	118	64.5	193
ME 4L							396	479				
ME 4LB							418	502				
ME 5S	38	80	M12	41	10	310	462	546	187	187	77	245
ME 5L												



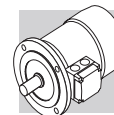
ME_FD/FA - CE/CUS/BIS

BE-ME







	Rear shaft end					Motor									
	DA	EA	DB	GC	FA	AC	LB	LC	AF	LL	J	AD	R FD FA		ES ⁽¹⁾
ME 05	11	23	M4	12.5	4	121	231	256	98	133	-4.5	119	96	116	5
ME 1S	14	30	M5	16	5	138	248	280			-8	135	103	124	
ME 2S	19	40	M6	21.5	6	156	272	314			-17	143	129	134	
ME 3S	28	60	M10	31	8	195	326	389	110	165	7	155	160	160	6
ME 3L							353	416							
ME 4S	38	80	M12	41	10	258	470	553	140	188	7	210	204	200	
ME 4LA							495	578					226	217	
ME 4LB															
ME 5S	38	80	M12	41	10	310	558	642	187	187	17	245	266	247	---
ME 5L							602	686							

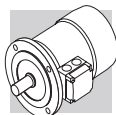
N.B.: 1) "ES" hexagon is not present with PS option







M20 MOTOR RATING CHARTS BN-M

2P			3000 min ⁻¹ - S1										50 Hz												
P _n kW		n min ⁻¹	M _n Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cosφ	I _n 400V A	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	d.c. brake				a.c. brake						
															Mod	Mb Nm	Z ₀ 1/h		J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb Nm	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 
																	NB	SB							
0.18	BN 63A	2	0.63	○	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	FA 02	1.75	4800	2.6	5.0		
0.25	BN 63B	2	0.87	○	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	FA 02	1.75	4800	3.0	5.4		
0.37	BN 63C	2	1.26	○	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	FA 02	3.5	4500	3.9	6.6		
0.37	BN 71A	2	1.25	○	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	FA 03	3.5	4200	4.6	7.8		
0.55	BN 71B	2	1.86	○	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	FA 03	5	4200	5.3	8.6		
0.75	BN 71C	2	2.6	○	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	FA 03	5	3600	6.1	9.7		
0.75	BN 80A	2	2.6	●	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	FA 04	5	3200	9.4	12.4		
1.1	BN 80B	2	3.8	●	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	FA 04	10	3000	10.6	13.3		
1.5	BN 80C	2	5.1	●	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	FA 04	15	2600	13.0	15.1		
1.5	BN 90SA	2	5.0	●	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	FA 14	15	2200	14.1	16.4		
1.85	BN 90SB	2	6.1	●	82.5	82.0	75.4	0.80	4.0	6.2	2.9	2.6	16.7	14	FD 14	15	900	2200	FA 14	15	2200	18.3	18.1		
2.2	BN 90L	2	7.3	●	82.7	82.1	80.8	0.80	4.8	6.3	2.9	2.7	16.7	14	FD 05	26	900	2200	FA 05	26	2200	21	20.7		
3	BN 100L	2	10.0	●	81.5	81.3	77.4	0.79	6.7	5.6	2.6	2.2	31	20	FD 15	26	700	1600	FA 15	26	1600	35	27		
4	BN 100LB	2	13.3	●	83.1	83.0	77.8	0.80	8.7	5.8	2.7	2.5	39	23	FD 15	40	450	900	FA 15	40	1000	43	30		
4	BN 112M	2	13.2	●	85.5	84.5	83.0	0.82	8.2	6.9	3.0	2.9	57	28	FD 06S	40	—	950	FA 06S	40	950	66	40		
5.5	BN 132SA	2	18.2	●	84.7	84.5	81.2	0.84	11.2	5.9	2.6	2.2	101	35	FD 06	50	—	600	FA 06	50	600	112	49		
7.5	BN 132SB	2	25	●	86.5	86.3	84.4	0.85	14.7	6.4	2.6	2.2	145	42	FD 06	50	—	550	FA 06	50	550	154	56		
9.2	BN 132M	2	30	●	87.0	86.5	83.6	0.86	17.7	6.7	2.8	2.3	178	53	FD 56	75	—	430	FA 06	75	430	189	67		
11	BN 160MR	2	36	●	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	65											
15	BN 160MB	2	49	●	89.6	89.4	88.0	0.86	28.1	7.1	2.6	2.3	340	84											
18.5	BN 160L	2	60	●	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	97											
22	BN 180M	2	72	●	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	109											
30	BN 200LA	2	98	●	90.7	90.1	87.6	0.89	54	7.8	2.7	2.9	770	140											

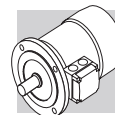
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








1500 min ⁻¹ - S1														50 Hz														
a.c. brake																												
d.c. brake														a.c. brake														
FD														FA														
P _n		n	M _n	IE1	η (100%)	η (75%)	η (50%)	cosφ	In 400V	Is In	Ms Mn	Ma Mn	J _m x 10 ⁻⁴ kgm ²	IM B5  kg	Mod	Mb	Z ₀ 1/h	NB	SB	J _m x 10 ⁻⁴ kgm ²	IM B5  kg	Mod	Mb	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5  kg		
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														
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														
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	10000	13000			2.6	5.2	FA 02	1.75	13000	2.6	5.0	
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	10000	13000			3.0	5.6	FA 02	3.5	13000	3.0	5.4	
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	
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	
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	6000	9400			8.0	8.6	FA 03	5.0	9400	8.0	8.3	
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	10.0	FA 03	7.5	8700	10.2	9.7	
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	
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	
1.1	BN 80C	4	7.5	●	75.5	76.2	70.4	0.78	2.7	5.1	2.8	2.5	25	11.3	FD 04	15	2600	5300			27	15.2	FA 04	15	5300	27	15.1	
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	
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	
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	
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	FD 15	40	2600	4700			44	25	FA 15	40	4700	44	25	
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	
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	
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	
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 07	100	1000	280	71	
9.2	BN 132MB	4	61	●	88.4	88.6	87.5	0.81	18.8	5.9	2.7	2.5	319	59	FD 07	150	—	900			342	75	FA 07	150	900	342	77	
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						
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						

○ = n.a.

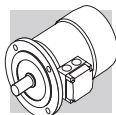
● = IE1







6P														1000 min ⁻¹ - S1														50 Hz													
														d.c. brake														a.c. brake													
P _n		n	M _n	IE1	η (100%)	η (75%)	η (50%)	cosφ	I _n 400V	I _s I _n	M _s M _n	M _a M _n	J _m x 10 ⁻⁴ kgm ²		Mod	Mb	Z ₀ 1/h		J _m x 10 ⁻⁴ kgm ²		Mod	Mb	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²																	
																	NB	SB																							
kW			Nm		%	%	%		A				kgm ²			Nm						Nm																			
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	8100	13500	9.5	8.2	FA 03	5.0	13500	9.5	7.9																
0.25	BN 71B	6	2.70	○	62.0	58.5	51.4	0.71	0.82	2.6	1.9	1.7	10.9	6.7	FD 03	5	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	—	—	—	—	—																




○ = n.a. ● = IE1

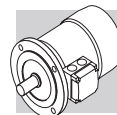
BN-M

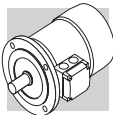






750 min ⁻¹ - S1													50 Hz									
													a.c. brake									
													d.c. brake					FA				
P _n		n	M _n	η	cosφ	I _n	I _s	M _s	M _a	J _m	IM B5	Mod	Mb	Z ₀		J _m	IM B5	Mod	Mb	Z ₀	J _m	IM B5
														NB	SB							
kW		min ⁻¹	Nm	%		A				kgm ²			Nm		1/h	kgm ²			Nm	1/h	kgm ²	
0.09	BN 71A	8	1.26	47	0.59	0.47	2.3	2.4	2.3	10.9	6.7	FD 03	3.5	9000	16000	12.0	9.4	FA 03	3.5	16000	12.0	9.1
0.12	BN 71B	8	1.69	51	0.59	0.58	2.1	2.3	2.2	12.9	7.7	FD 03	5.0	9000	16000	14.0	10.4	FA 03	5.0	16000	14.0	10.1
0.18	BN 80A	8	2.49	51	0.60	0.85	2.4	2.2	2.2	15	8.2	FD 04	5.0	6500	11000	16.6	12.1	FA 04	5.0	11000	16.6	12.0
0.25	BN 80B	8	3.51	54	0.63	1.06	2.4	2.0	1.9	20	9.9	FD 04	10.0	6000	10000	22	13.8	FA 04	10.0	10000	23	13.7
0.37	BN 90S	8	5.2	58	0.60	1.53	2.6	2.3	2.1	26	12.6	FD 14	15.0	4800	7500	28	16.8	FA 14	15.0	7500	28	16.7
0.55	BN 90L	8	7.8	62	0.60	2.13	2.6	2.2	2.0	33	15	FD 05	26	4000	6400	37	21	FA 05	26	6400	37	22
0.75	BN 100LA	8	10.2	68	0.63	2.53	3.4	1.9	1.7	82	22	FD 15	26	2800	4800	86	28	FA 15	26	4800	86	29
1.1	BN 100LB	8	15.0	68	0.64	3.65	3.2	1.7	1.7	95	24	FD 15	40	2500	4000	99	30	FA 15	40	4000	99	31
1.5	BN 112M	8	20.2	71	0.66	4.6	3.7	1.8	1.9	168	32	FD 06S	60	—	3000	177	42	FA 06S	60	3000	177	44
2.2	BN 132S	8	29.6	75	0.66	6.4	3.8	1.8	2.0	295	45	FD 56	75	—	2300	305	58	FA 06	75	2300	305	56
3	BN 132MA	8	40.4	76	0.69	8.3	3.9	1.6	1.8	370	53	FD 06	100	—	1900	394	69	FA 07	100	1900	406	74

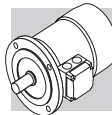
2/4P	3000/1500 min⁻¹ - S1	50 Hz
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d.c. brake														a.c. brake									
FD														FA									
P _n		n min ⁻¹	M _n Nm	η	cosφ	I _n 400V A	$\frac{I_s}{I_n}$	$\frac{M_s}{M_n}$	$\frac{M_a}{M_n}$	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z _o 1/h		J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	
												Nm	Nm	NB	SB	kgm ²	kgm ²	Nm	Nm	1/h	kgm ²	kgm ²	
0.20	BN 63B	2	2700	55	0.82	0.64	3.5	2.1	1.9	2.9	4.4	FD 02	3.5	2200	2600	3.5	6.1	FA 02	3.5	2600	3.5	5.9	
0.15		4	1350	49	0.67	0.66	2.6	1.8	1.7					4000	5100					5100			
0.28	BN 71A	2	2700	56	0.82	0.88	2.9	1.9	1.7	4.7	4.4	FD 03	3.5	2100	2400	5.8	7.1	FA 03	3.5	2400	5.8	6.8	
0.20		4	1370	59	0.72	0.68	3.1	1.8	1.7					3800	4800					4800			
0.37	BN 71B	2	2740	56	0.82	1.16	3.5	1.8	1.8	5.8	5.1	FD 03	5.0	1400	2100	6.9	7.8	FA 03	5.0	2100	6.9	7.5	
0.25		4	1390	60	0.73	0.82	3.3	2.0	1.9					2900	4200					4200			
0.45	BN 71C	2	2780	63	0.85	1.21	3.8	1.8	1.8	6.9	5.9	FD 03	5.0	1400	2100	8.0	8.6	FA 03	5.0	2100	8.0	8.3	
0.30		4	1400	63	0.73	0.94	3.6	2.0	1.9					2900	4200					4200			
0.55	BN 80A	2	2800	63	0.85	1.48	3.9	1.7	1.7	15	8.2	FD 04	5.0	1600	2300	17	12.1	FA 04	5.0	2300	16.6	12.0	
0.37		4	1400	2.5	67	0.79	1.01	1.8	1.9					3000	4000					4000			
0.75	BN 80B	2	2780	65	0.85	1.96	3.8	1.9	1.8	20	9.9	FD 04	10	1400	1600	22	13.8	FA 04	10	1600	22	13.7	
0.55		4	1400	3.8	68	0.81	1.44	1.7	1.7					2700	3600					3600			
1.1	BN 90S	2	2790	71	0.82	2.73	4.7	2.3	2.0	21	12.2	FD 14	10	1500	1600	23	16.4	FA 14	10	1600	23	16.3	
0.75		4	1390	5.2	66	0.79	2.08	4.6	2.4	2.2				2300	2800					2800			
1.5	BN 90L	2	2780	5.2	70	0.85	3.64	4.5	2.4	28	14.0	FD 05	26	1050	1200	32	20	FA 05	26	1200	32	21	
1.1		4	1390	7.6	73	0.81	2.69	4.7	2.5	2.2				1600	2000					2000			
2.2	BN 100LA	2	2800	7.5	72	0.85	5.2	4.5	2.0	40	18.3	FD 15	26	600	900	44	25	FA 15	26	900	44	25	
1.5		4	1410	10.2	73	0.79	3.8	4.7	2.0	2.0				1300	2300					2300			
3.5	BN 100LB	2	2850	11.7	80	0.84	7.5	5.4	2.2	61	25	FD 15	40	500	900	65	31	FA 15	40	900	65	32	
2.5		4	1420	16.8	82	0.80	5.5	5.2	2.2	2.2				1000	2100					2100			
4	BN 112M	2	2880	13.3	79	0.83	8.8	6.1	2.4	2.0	98	FD 06S	60	—	700	107	40	FA 06S	60	700	107	42	
3.3		4	1420	22.2	80	0.80	7.4	5.1	2.1	2.0				—	1200					1200			
5.5	BN 132S	2	2890	18.2	80	0.87	11.4	5.9	2.4	2.0	213	FD 56	75	—	350	223	57	FA 06	75	350	223	58	
4.4		4	1440	29	82	0.84	9.2	5.3	2.2	2.0				—	900					900			
7.5	BN 132MA	2	2900	25	82	0.87	15.2	6.5	2.4	2.0	270	FD 06	100	—	350	280	66	FA 07	100	350	293	71	
6		4	1430	40	84	0.85	12.1	5.8	2.3	2.1				—	900					900			
9.2	BN 132MB	2	2920	30	83	0.86	18.6	6.0	2.6	2.2	319	FD 07	150	—	300	342	75	FA 07	150	300	342	77	
7.3		4	1440	48	85	0.85	14.6	5.5	2.3	2.1				—	800					800			






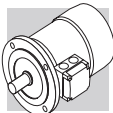


2/6P																										3000/1000 min ⁻¹ - S3 60/40%																										50 Hz																									
																										d.c. brake													a.c. brake																																						
																										FD													FA																																						
P _n		n	M _n	η	cosφ	In	Is	Ms	Ma	J _m	IM B5	Mod	Mb	Z _o	J _m	IM B5	Mod	Mb	Z _o	J _m	IM B5																																																								
kW		min ⁻¹	Nm	%		A				kgm ²			Nm	1/h	kgm ²			Nm	1/h	kgm ²																																																									
0.25	BN 71A	2	2850	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																																																							
0.08		6	910	43	0.70	0.38	2.1	1.4	1.5					10000	13000				13000																																																										
0.37	BN 71B	2	2880	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																																																							
0.12		6	900	44	0.73	0.54	2.4	1.4	1.5					9000	11000				11000																																																										
0.55	BN 80A	2	2800	63	0.86	1.47	4.5	1.9	1.7	20	9.9	FD 04	5.0	1500	1800	22	13.8	FA 04	5.0	1800	22	13.7																																																							
0.18		6	930	52	0.65	0.77	3.3	2.0	1.9					4100	6300				6300																																																										
0.75	BN 80B	2	2800	66	0.87	1.89	4.3	1.8	1.6	25	11.3	FD 04	5.0	1700	1900	27	15.2	FA 04	5.0	1900	27	15.1																																																							
0.25		6	930	54	0.67	1.00	3.2	1.7	1.8					3800	6000				6000																																																										
1.10	BN 90L	2	2860	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																																																							
0.37		6	920	59	0.71	1.27	3.3	1.6	1.6					3400	5200				5200																																																										
1.5	BN 100LA	2	2880	5	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																																																							
0.55		6	940	5.6	0.67	1.85	3.5	1.7	1.8					2900	4000				4000																																																										
2.2	BN 100LB	2	2900	7.2	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																																																							
0.75		6	950	7.5	0.64	2.5	3.3	1.9	1.8					2100	3000				3000																																																										
3	BN 112M	2	2900	9.9	0.87	6.4	6.3	2.0	2.1	98	30	FD 06S	40	—	1000	107	40	FA 06S	40	1000	107	32																																																							
1.1		6	950	11.1	0.64	3.4	3.9	1.8	1.8					—	2600				2600																																																										
4.5	BN 132S	2	2910	14.8	0.84	9.9	5.8	1.9	1.8	213	44	FD 56	37	—	500	223	57	FA 06	37	500	223	58																																																							
1.5		6	960	14.9	0.67	4.4	4.2	1.9	2.0					—	2100				2100																																																										
5.5	BN 132M	2	2920	18.0	0.87	11.7	6.2	2.1	1.9	270	53	FD 56	50	—	400	280	66	FA 06	50	400	280	67																																																							
2.2		6	960	22	0.71	5.8	4.3	2.1	2.0					—	1900				1900																																																										









2/8P 3000/750 min⁻¹ - S3 60/40% 50 Hz

d.c. brake														a.c. brake								
P _n kW		n min ⁻¹	M _n Nm	η	cosφ	I _n 400V A	Is In	Ms Mn	Ma Mn	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb Nm	FD			FA					
														Mod	Mb Nm	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb Nm	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²
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
0.06		8	0.84	31	0.61	0.46	2.0	1.8	1.9					10000	13000				13000			
0.37	BN 71B	2	2800	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
0.09		8	1.28	34	0.75	0.51	1.8	1.4	1.5					9500	13000				13000			
0.55	BN 80A	2	2830	66	0.86	1.40	4.4	2.1	2.0	20	9.9	FD 04	5.0	1500	1800	22	13.8	FA 04	5.0	1800	22	13.7
0.13		8	1.80	41	0.64	0.72	2.3	1.6	1.7					5600	8000				8000			
0.75	BN 80B	2	2800	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
0.18		8	690	43	0.66	0.92	2.3	1.6	1.7					4800	7300				7300			
1.10	BN 90L	2	2830	63	0.84	3.00	4.5	2.1	1.9	28	14.0	FD 05	13	1400	1600	32	20	FA 05	13	1600	32	21
0.28		8	690	48	0.63	1.34	2.4	1.8	1.9					3400	5100				5100			
1.5	BN 100LA	2	2880	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
0.37		8	690	46	0.63	1.84	2.1	1.6	1.6					3300	5000				5000			
2.4	BN 100LB	2	2900	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
0.55		8	700	54	0.58	2.5	2.6	1.8	1.8					2000	3500				3500			
3	BN 112M	2	2900	9.9	0.87	6.5	6.3	2.1	1.9	98	30	FD 06S	40	—	900	107	40	FA 06S	40	900	107	42
0.75		8	690	10.4	0.65	2.8	2.5	1.6	1.6					—	2900				2900			
4	BN 132S	2	2870	13.3	0.84	9.4	5.6	2.3	2.4	213	44	FD 56	37	—	500	223	57	FA 06	37	500	223	58
1		8	690	13.8	0.62	3.5	2.9	1.9	1.8					—	3500				3500			
5.5	BN 132M	2	2870	18.3	0.84	12.6	6.1	2.4	2.5	270	53	FD 06	50	—	400	280	66	FA 06	50	400	280	67
1.5		8	690	21	0.63	5.1	2.9	1.9	1.9					—	2400				2400			



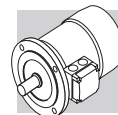
2/12P	3000/500 min ⁻¹ - S3 60/40%	50 Hz
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d.c. brake															a.c. brake							
FD															FA							
P _n		n	M _n	η	cosφ	I _n 400V	Is In	Ms Mn	Ma Mn	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	
kW		min ⁻¹	Nm	%		A				kgm ²			Nm	NB	SB	kgm ²		Nm	Nm	1/h	kgm ²	
0.55	BN 80B	2	1.86	64	0.89	1.39	4.2	1.6	1.7	25	11.3	FD 04	5.0	1000	1300	27	15.2	FA 04	5.0	1300	27	15.1
0.09		12	430	30	0.63	0.69	1.8	1.9	1.8					8000	12000				12000			
0.75	BN 90L	2	2.790	56	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
0.12		12	430	26	0.63	1.06	1.7	1.4	1.6					4600	6300				6300			
1.10	BN 100LA	2	2850	65	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
0.18		12	430	26	0.54	1.85	1.5	1.3	1.5					4000	6000				6000			
1.5	BN 100LB	2	2900	67	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
0.25		12	440	36	0.46	2.18	1.8	1.7	1.8					3800	5000				5000			
2	BN 112M	2	2900	74	0.88	4.43	6.5	2.1	2.0	98	30	FD 06S	20	—	800	107	40	FA 06S	20	800	107	42
0.3		12	460	46	0.43	2.19	2.0	2.1	2.0					—	3400				3400			
3	BN 132S	2	2920	74	0.87	6.7	6.8	2.3	1.9	213	44	FD 56	37	—	450	223	57	FA 06	37	450	223	58
0.5		12	470	51	0.43	3.3	2.0	1.7	1.6					—	3000				3000			
4	BN 132M	2	2920	75	0.89	8.6	5.9	2.4	2.3	270	53	FD 56	37	—	400	280	66	FA 06	37	400	280	67
0.7		12	460	53	0.44	4.3	1.9	1.7	1.6					—	2800				2800			



 **Bonfiglioli**
Riduttori

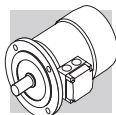
666 / 680







2P				3000 min ⁻¹ - S1														50 Hz							
		d.c. brake														a.c. brake									
P _n		n	M _n	IE1	η (100%)	η (75%)	η (50%)	cosφ	In 400V	Is In	Ms Mn	Ma Mn	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z ₀ 1/h		J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z ₀ 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 
																	NB	SB							
0.18	M 05A	2	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	4800	2.6	4.9	FA 02	1.75	4800	2.6	4.7
0.25	M 05B	2	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	4800	3.0	5.3	FA 02	1.75	4800	3.0	5.1
0.37	M 05C	2	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	4500	3.9	6.5	FA 02	3.5	4500	3.9	6.3
0.55	M 1SD	2	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	4200	5.3	8.5	FA 03	5	4200	5.3	8.2
0.75	M 1LA	2	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	3300	6.1	9.6	FA 03	5	3300	6.1	9.3
1.1	M 2SA	2	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	3000	10.6	11.9	FA 04	10	3000	10.6	12.6
1.5	M 2SB	2	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	2600	13.0	9.9	FA 04	15	2600	13.0	14.4
2.2	M 3SA	2	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	2400	28	22	FA 15	26	2400	28	23
3	M 3LA	2	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	1600	35	25	FA 15	26	1600	35	26
4	M 3LB	2	13.3	●	83.1	83.0	77.8	0.80	8.7	5.8	2.7	2.5	39	22	FD 15	40	450	900	43	28	FA 15	40	900	43	29
5.5	M 4SA	2	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	FA 06	50	600	112	47
7.5	M 4SB	2	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	FA 06	50	550	154	54
9.2	M 4LA	2	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	FA 06	75	430	189	65
11	M 4LC	2	36	●	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	60											
15	M 5SB	2	49	●	89.6	89.4	88.0	0.86	28.1	7.1	2.6	2.3	340	70											
18.5	M 5SC	2	60	●	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	83											
22	M 5LA	2	72	●	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	95											

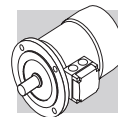
○ = n.a. ● = IE1





BN-M



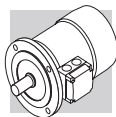
1500 min ⁻¹ - S1														50 Hz												
		d.c. brake														a.c. brake										
		FD														FA										
P _n		n	M _n	IE1	η (100%) %	η (75%) %	η (50%) %	cosφ	In 400V A	Is In	Ms Mn	Ma Mn	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 	Mod	Mb	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5 		
0.09	M 0B	4	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	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	13000	2.6	4.9	FA 02	1.75	13000	2.6	4.7	
0.18	M 05B	4	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	13000	3.0	5.3	FA 02	3.5	13000	3.0	5.1	
0.25	M 05C	4	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	10000	3.9	6.5	FA 02	3.5	10000	3.9	6.3	
0.37	M 1SD	4	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	9400	8.0	8.2	FA 03	5	9400	8.0	7.9	
0.55	M 1LA	4	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	8700	10.2	9.6	FA 03	7.5	8700	10.2	9.3	
0.75	M 2SA	4	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	7800	22	13.1	FA 04	15	7800	22	13.0	
1.1	M 2SB	4	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	5300	27	14.5	FA 04	15	5300	27	14.4	
1.5	M 3SA	4	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	4900	38	22	FA 15	26	4900	38	23	
2.2	M 3LA	4	14.9	●	81.1	81.4	79.9	0.75	5.2	4.5	2.2	2.0	40	17	FD 15	40	2600	4700	44	24	FA 15	40	4700	44	24	
3	M 3LB	4	20	●	82.6	83.8	83.7	0.77	6.8	5.0	2.3	2.2	54	21	FD 15	40	2400	4400	58	27	FA 15	40	4400	58	28	
4	M 3LC	4	27	○	82.7	83.1	80.5	0.78	9.0	4.7	2.3	2.2	61	23	FD 55	55	—	1300	65	29	FA 15	40	1300	65	30	
5.5	M 4SA	4	36	●	84.7	84.8	82.5	0.81	11.6	5.5	2.3	2.2	213	42	FD 56	75	—	1050	223	55	FA 06	75	1050	223	56	
7.5	M 4LA	4	50	●	86.0	86.3	85.3	0.81	15.5	5.7	2.5	2.4	270	51	FD 06	100	—	950	280	64	FA 07	100	950	280	65	
9.2	M 4LB	4	61	●	88.4	88.6	87.5	0.81	18.8	5.9	2.7	2.5	319	57	FD 07	150	—	900	342	73	FA 07	150	900	342	75	
11	M 4LC	4	73	●	87.6	87.8	86.0	0.81	22.4	6.0	2.7	2.5	360	65	FD 07	150	—	850	382	81	FA 07	150	850	382	83	
15	M 5SB	4	98	●	88.7	88.5	88.4	0.81	30.1	6.0	2.3	2.1	650	85	FD 08	200	—	750	725	115	FA 08	200	750	710	114	
18.5	M 5LA	4	121	●	89.3	89.5	89.2	0.81	37	6.2	2.6	2.5	790	101	FD 08	250	—	700	865	131	FA 08	250	700	850	130	




○ = n.a. ● = IE1



6P														1000 min ⁻¹ - S1										50 Hz					
														d.c. brake										a.c. brake					
														FD						IM B5				FA				IM B5	
P _n		n	M _n	IE1	η (100%)	η (75%)	η (50%)	cosφ	I _n 400V	Is I _n	M _s M _n	Ma M _n	J _m x 10 ⁻⁴	IM B5	Mod	Mb	Z ₀ 1/h	J _m x 10 ⁻⁴	IM B5	Mod	Mb	Z ₀ 1/h	J _m x 10 ⁻⁴	IM B5					
kW		min ⁻¹	Nm		%	%	%		A				kgm ²			Nm	NB	SB			Nm	1/h	kgm ²						
0.09	M 05A	6	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	14000	6.0	FA 02	3.5	14000	4.0	5.8					
0.12	M 05B	6	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	14000	6.3	FA 02	3.5	14000	4.3	6.1					
0.18	M 15C	6	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	13500	7.8	FA 03	5	13500	9.5	7.5					
0.25	M 15D	6	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	13000	9.0	FA 03	5	13000	12	8.7					
0.37	M 15A	6	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	9500	14	FA 03	7.5	9500	14	9.7					
0.55	M 25A	6	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	7200	27	FA 04	15	7200	27	14.4					
0.75	M 25B	6	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	6400	30	FA 04	15	6400	30	15.3					
1.1	M 35A	6	11.4	●	75.0	74.0	72.0	0.72	2.9	4.3	2.0	1.8	33	17	FD 15	26	2700	5000	37	FA 15	26	5000	37	24					
1.5	M 35A	6	15.2	●	75.2	74.2	70.3	0.72	4.0	4.1	2.1	2.0	82	21	FD 15	40	1900	4100	86	FA 15	40	4100	86	28					
1.85	M 35B	6	19.0	●	76.6	72.8	62.6	0.73	4.8	4.6	2.1	2.0	95	23	FD 15	40	1700	3600	99	FA 15	40	3600	99	30					
2.2	M 35C	6	23	●	77.7	76.8	72.4	0.71	5.8	4.7	2.3	2.1	95	23	FD 55	55	—	1900	99	FA 15	40	1900	99	30					
3	M 45A	6	30	●	79.7	77.0	75.1	0.76	7.1	5.1	1.9	1.8	216	34	FD 56	75	—	1400	226	FA 06	75	1400	226	48					
4	M 45A	6	40	●	81.4	81.5	79.5	0.77	9.2	5.5	2.0	1.8	295	43	FD 06	100	—	1200	305	FA 07	100	1200	305	57					
5.5	M 45B	6	56	●	83.1	80.9	79.1	0.78	12.2	6.1	2.1	1.9	383	54	FD 07	150	—	1050	406	FA 07	150	1050	406	72					
7.5	M 55A	6	75	●	85.0	85.0	84.8	0.81	15.7	5.9	2.2	2.0	740	69	FD 08	170	—	900	815	FA 08	170	900	800	98					
11	M 55B	6	109	●	86.4	86.5	85.9	0.81	22.7	6.6	2.5	2.3	970	89	FD 08	200	—	800	1045	FA 08	200	800	1030	118					

○ = n.a. ● = IE1



3000/1500 min ⁻¹ - S1																					50 Hz			
2/4P		d.c. brake														a.c. brake								
P _n		n	M _n	η	cosφ	I _n 400V	Is In	Ms Mn	Ma Mn	J _m x 10 ⁻⁴ kgm ²	IM B5  Kg	FD					FA							
												Mod	Mb	Z _o 1/h	NB	SB	Mod	Mb	Z _o 1/h	J _m x 10 ⁻⁴ kgm ²	IM B5  Kg			
kW			Nm	%		A							Nm					Nm						
0.20	M 05A	2	0.71	55	0.82	0.64	3.5	2.1	1.9	2.9	4.1	FD 02	3.5	2200	2600	3.5	5.8	FA 02	3.5	2600				
0.15		4	1.06	49	0.67	0.66	2.6	1.8	1.7					4000	5100					5100				
0.28	M 15B	2	0.99	56	0.82	0.88	2.9	1.9	1.7	4.7	4.0	FD 03	3.5	2100	2400	5.8	6.7	FA 03	3.5	2400				
0.20		4	1.370	59	0.68	1.02	3.1	1.8	1.7					3800	4800					4800				
0.37	M 15C	2	1.29	56	0.82	1.16	3.5	1.8	1.8	5.8	4.7	FD 03	5	1400	2100	6.9	7.4	FA 03	5	2100				
0.25		4	1.72	60	0.73	0.82	3.3	2.0	1.9					2900	4200					4200				
0.45	M 15D	2	1.55	63	0.85	1.21	3.8	1.8	1.8	6.9	5.5	FD 03	5	1400	2100	8.0	8.2	FA 03	5	2100				
0.30		4	2.0	63	0.74	0.93	3.8	2.1	1.9					2900	4200					4200				
0.55	M 1LA	2	2.800	73	0.79	1.38	4.2	2.0	1.8	9.1	6.9	FD 03	5	1600	2200	10.2	9.6	FA 03	5	2200				
0.37		4	2.5	68	0.72	1.09	3.9	2.2	2.0					3300	4600					4600				
0.75	M 2SA	2	2.780	65	0.85	1.96	3.8	1.9	1.8	20	9.2	FD 04	10	1400	1600	22	13.1	FA 04	10	1600				
0.55		4	3.8	68	0.81	1.44	3.9	1.7	1.7					2700	3600					3600				
1.1	M 2SB	2	2.730	65	0.86	2.84	3.9	2.0	1.9	25	10.7	FD 04	10	1200	1500	27	14.5	FA 04	10	1500				
0.75		4	5.1	75	0.81	1.78	4.5	2.1	2.0					2300	3100					3100				
1.5	M 3SA	2	2830	74	0.83	3.5	4.7	2.1	2.0	34	15.5	FD 15	26	700	1000	38	22	FA 15	26	1000				
1.1		4	7.4	77	0.78	2.6	4.3	2.1	2.0					1600	2600					2600				
2.2	M 3LA	2	2800	72	0.85	5.2	4.5	2.0	1.9	40	17	FD 15	26	600	900	44	24	FA 15	26	900				
1.5		4	10.2	73	0.79	3.8	4.7	2.0	2.0					1300	2300					2300				
3.5	M 3LB	2	2850	80	0.84	7.5	5.4	2.2	2.1	61	23	FD 15	40	500	900	65	29	FA 15	40	900				
2.5		4	16.8	82	0.80	5.5	5.2	2.2	2.2					1000	2100					2100				
4.8	M 4 SA	2	2900	81	0.88	9.7	6.0	2.0	1.9	213	42	FD 06	50	—	400	233	55	FA 06	50	400				
3.8		4	25.4	81	0.84	8.1	5.2	2.1	2.1					—	950					950				
5.5	M 4SB	2	2890	80	0.87	11.4	5.9	2.4	2.0	213	42	FD 56	75	—	350	223	55	FA 06	75	350				
4.4		4	29	82	0.84	9.2	5.3	2.2	2.0					—	900					900				
7.5	M 4LA	2	2900	82	0.87	15.2	6.5	2.4	2.0	270	51	FD 06	100	—	350	280	64	FA 07	100	350				
6		4	40	84	0.85	12.1	5.8	2.3	2.1					—	950					950				
9.2	M 4LB	2	2920	83	0.86	18.6	6.0	2.6	2.2	319	57	FD 07	150	—	300	342	73	FA 07	150	300				
7.3		4	48	85	0.85	14.6	5.5	2.3	2.1					—	800					800				

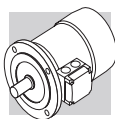


 **Bonfiglioli**
Riduttori

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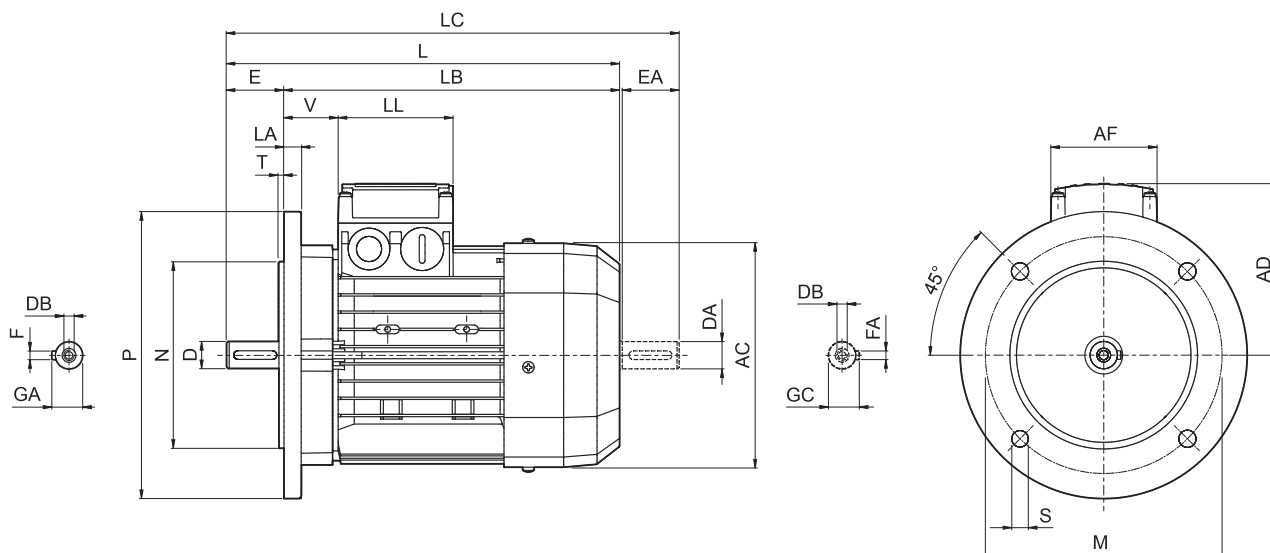


 **Bonfiglioli**
Riduttori



M21 MOTORS DIMENSIONS BN-M

BN - IM B5

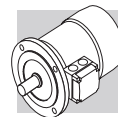


BN-M

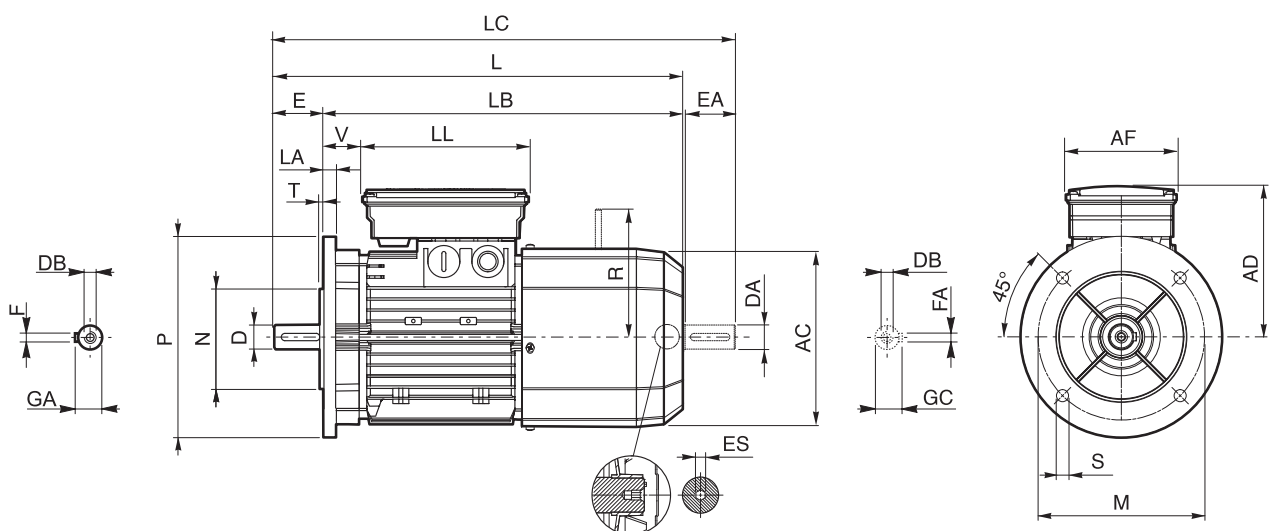
	Shaft					Flange						Motor								
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	
BN 56	9	20	M3	10.2	3	100	80	120	7	3	8	110	185	165	207	91	74	80	34	
BN 63	11	23	M4	12.5	4	115	95	140	9.5		10	121	207	184	232	95			26	
BN 71	14	30	M5	16	5	130	110	160				138	249	219	281	108			37	
BN 80	19	40	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							176	326	276	378	133			44	
BN 100	28	60	M10	31		8	215	180	250	14	4	14	195	367	307	429	142	118	118	50
BN 112					15							219	385	325	448	157	52			
BN 132	38	80	M12	41	10	265	230	300	20			258	493	413	576	193	187			187
BN 160 MR	42 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾	300	250	350	18.5	5	15		562	452	645			218		
BN 160 M												310	596	486	680	245	51			
BN 160 L											310							640	530	724
BN 180 M	48 38 ⁽¹⁾	110 110 ⁽¹⁾	M16 M16 ⁽¹⁾	51.5 41 ⁽¹⁾	14 10 ⁽¹⁾	350	300	400	18	348		708	598	823	261	66				
BN 180 L	48 42 ⁽¹⁾			722	612						837	66								
BN 200 L	55 42 ⁽¹⁾			M20 M16 ⁽¹⁾	59 45 ⁽¹⁾						16 12 ⁽¹⁾	350	300	400	66					

NOTE:

1) These values refer to the rear shaft end.



BN_FD ; IM B5



BN-M

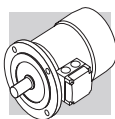
	Shaft					Flange						Motor									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	122	98	133	14	96	5
BN 71	14	30	M5	16	5	130	110	160	9.5	3.5		138	310	280	342	135			25	103	
BN 80	19	40	M6	21.5	6	165	130	200	11.5		11.5	156	346	306	388	146			41	129	
BN 90 S	24	50	M8	27	8					176		409	359	461	149	110	165	39	160		
BN 90 L															146						
BN 100	28	60	M10	31	215	180	250	14	4	14		195	458	398	521	158	165	62	160		
BN 112										15	219	484	424	547	173	165				73	199
BN 132	38	80	M12	41	10	265	230	300	5	15	20	258	603	523	686	210	140	188	46	204 ⁽²⁾	6
BN 160 MR	42 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾	300	250	350			18.5		672	562	755				245	187	
BN 160 M												42 38 ⁽¹⁾	310	736	626	820	51	266			
BN 160 L	48 38 ⁽¹⁾																		M16 M16 ⁽¹⁾	51.5 45 ⁽¹⁾	
BN 180 M	48 42 ⁽¹⁾	M20 M16 ⁽¹⁾	59 45 ⁽¹⁾	16 12 ⁽¹⁾	350	300	400	18.5			18	348	878	768	993	64					
BN 180 L	55 42 ⁽¹⁾																				
BN 200 L																					

NOTE:

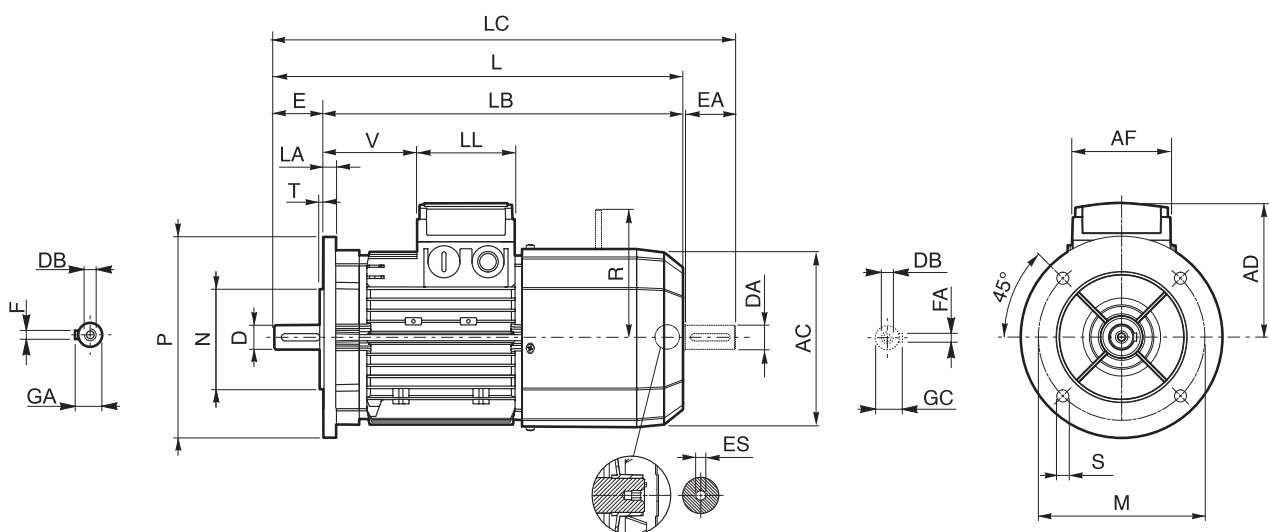
1) These values refer to the rear shaft end.

2) For FD07 brake value R=226.

ES hexagon is not supplied with PS option.



BN_FA - IM B5



BN-M

	Shaft					Flange						Motor											
	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		138		310	280	342	108	68			124				
BN 80	19	40	M6	21.5	6	165	130	200		11.5		3.5	11.5	156	346	306			388	119		83	134
BN 90	24	50	M8	27	8				215		180			250	14	4	176	409	359	461	133	98	98
BN 100	28	60	M10	31		14	195	458		398		521	142				119	128	198				
BN 112						15	219	484		424		547	157				128	198					
BN 132	38	80	M12	41	10	265	230	300	18.5	5	15	20	258	603	523	686	210	140	188	46	200 ⁽²⁾	—	
BN 160 MR	42 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	45 41 ⁽¹⁾	12 10 ⁽¹⁾	300	250	350				258		672	562	755	193	118	118	218	217		
BN 160 M												310		736	626	820	245	187	187	51	247		
BN 160 L														780	670	864							
BN 180 M	48 38 ⁽¹⁾	110 80 ⁽¹⁾	M16 M12 ⁽¹⁾	51.5 41 ⁽¹⁾	14 10 ⁽¹⁾	300	250	350	18.5	5	15	310	736	626	820	245	187	187	51	247	—		

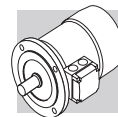
NOTE:

1) These values refer to the rear shaft end.

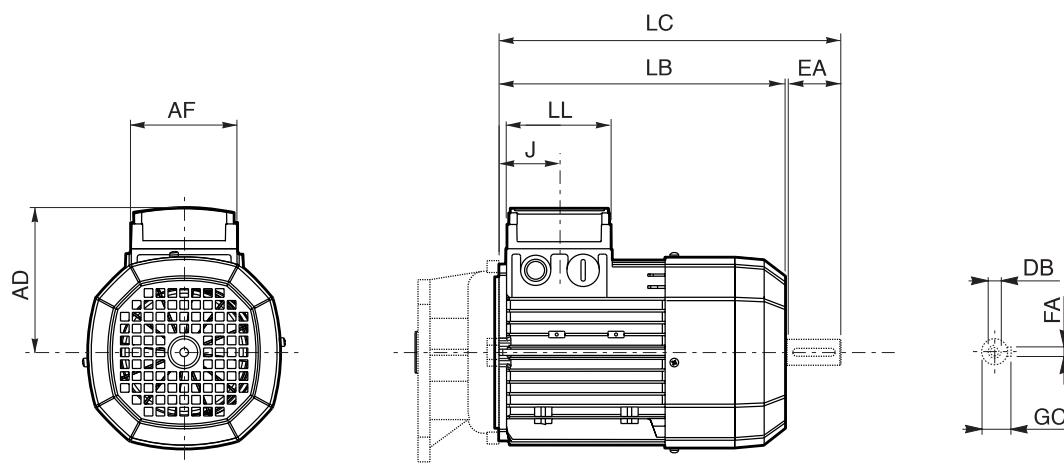
2) For FA07 brake value R=217.

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

ES hexagon is not supplied with PS option.

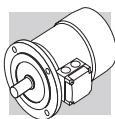


M

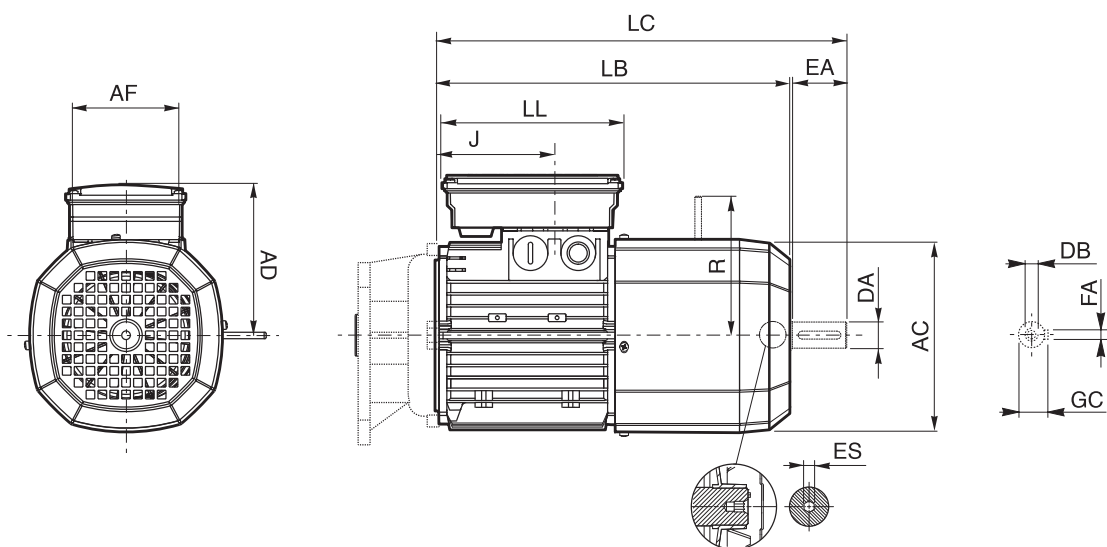


BN-M

	Rear shaft end					Motor						
	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



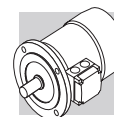
BN-M

	Rear shaft end					Motor								
	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	122	96	5
M 1	14	30	M5	5	16	138	248	280			73	135	103	
M 2 S	19	40	M6	6	21.5	156	272	314			88	146	129	
M 3 S	28	60	M10	8	31	195	326	389	110	165	124.5	158	160	6
M 3 L							353	416					204 (1)	
M 4	38	80	M12	10	41	258	470	553	140	188	185.5	210	226	
M 4 LC							495	578					226	
M 5 S						310	558	642	187	187	77	245	266	—
M 5 L							602	686						

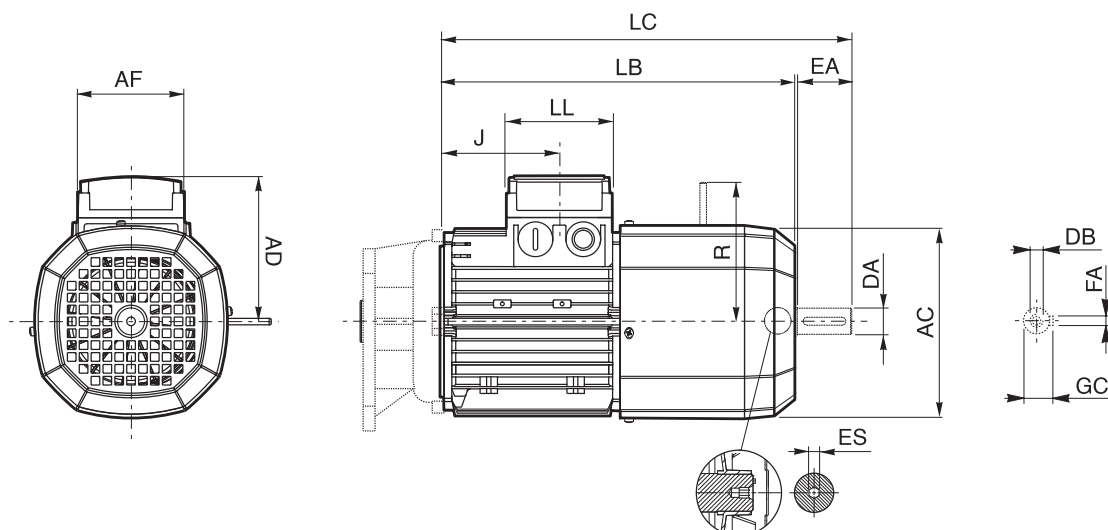
NOTE:

1) For FD07 brake value R=226.

ES hexagon is not supplied with PS option.



M_FA



BN-M

	Rear shaft end					Motor									
	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	140	188	185.5	210	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							

NOTE:


1) For FA07 brake value R=217.

Dimensions AD, AF, LL and V, relevant to terminal box of motors M...FA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size M...FD motors

ES hexagon is not supplied with PS option.



INDEX OF REVISIONS

BR_CAT_CAFS_IE2-IE3_ENG_R12_0	
	Description
...	Added availability of BXN and MXN electric motors.
560...679	"Electric motors" section updated.

2021 11 29

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We have a relentless commitment to excellence, innovation & sustainability. Our team creates, distributes and services world-class power transmission & drive solutions to keep the world in motion.

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