evox PLATFORM INCLUDED

C-A-F-S SERIES

IE2-IE3

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

Bonfiglioli

Revisions

Refer to page 680 for the catalogue revision index. Visit www.bonfiglioli.com to search for catalogues with up-to-date revisions.

GENERAL INFORMATION

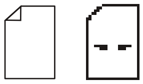
1 SYMBOLS AND UNITS OF MEASURE

Symbols	Units of Measure	Description
$A_{N\ 1,2}$	[N]	Permissible axial force
f_s	–	Service factor
f_T	–	Thermal factor
f_{TP}	–	Temperature factor
i	–	Gear ratio
I	–	Cyclic duration factor
J_C	[Kgm^2]	Mass moment of inertia to be driven
J_M	[Kgm^2]	Motor mass moment of inertia
J_R	[Kgm^2]	Mass moment of inertia for the gear unit
K	–	Mass acceleration factor
K_r	–	Transmission element factor
$M_{1,2}$	[Nm]	Torque
$M_{c\ 1,2}$	[Nm]	Calculated torque
$M_{n\ 1,2}$	[Nm]	Rated torque
$M_{r\ 1,2}$	[Nm]	Torque demand
$n_{1,2}$	[min^{-1}]	Speed

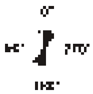
Symbols	Units of Measure	Description
$P_{1,2}$	[kW]	Power
$P_{N\ 1,2}$	[kW]	Rated power
$P_{R\ 1,2}$	[kW]	Power demand
$R_{C\ 1,2}$	[N]	Calculated radial force
$R_{N\ 1,2}$	[N]	Permissible overhung load
S	–	Safety factor
t_a	[°C]	Ambient temperature
t_s	[°C]	Surface temperature
t_o	[°C]	Oil temperature
t_f	[min]	Work time under constant load
t_r	[min]	Rest time
η_d	–	Dynamic efficiency
η_s	–	Static efficiency
φ	[']	Output shaft angular backlash (with locked input shaft)

$_1$ value applies to input shaft

$_2$ value applies to output shaft



The symbol shows the page the information can be sorted from.



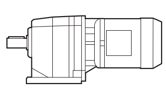
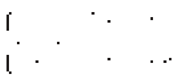
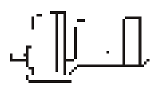
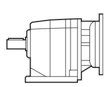
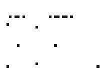
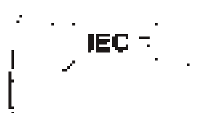
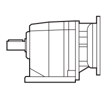
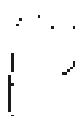
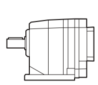
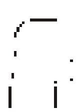
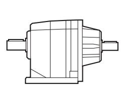
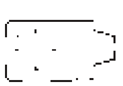
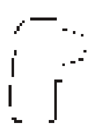
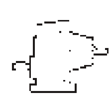
This symbol refers to the angle the overhung load applies (viewing from drive end).

Symbol refers to weight of gearmotors and speed reducers.
Figure for gearmotors incorporates the weight of the 4-pole motor and for life lubricated units, where applicable, the weight of the oil.

DANGER - WARNING
This symbol indicates situations of danger, which if ignored, may result in serious injury to the operator.

IMPORTANT
This symbol indicates important technical information.

Apply to equipment complying with "ATEX" Directive.

Series C	Series A	Series F	Series S	
				Gearmotor with compact motor.
 IEC	 IEC	 IEC	 IEC	Gearmotor with IEC motor.
 IEC	 IEC	 IEC	 IEC	Gear unit with IEC motor interface.
 SERVO	 SERVO	 SERVO		Gear unit with servomotor input adapter.
				Speed reducer with solid input shaft.

2 ALLOWED TEMPERATURE LIMITS

Symbols	Description / Condition	Value (*)	
		Synthetic Oil	Mineral Oil
t_a	Ambient temperature		
$t_{au\ min}$	Minimum operating ambient temperature	**-30°C**	**-10°C**
$t_{au\ Max}$	Maximum operating ambient temperature	**+50°C**	**+40°C**
$t_{as\ min}$	Minimum storage ambient temperature	**-40°C**	**-10°C**
$t_{as\ Max}$	Maximum storage ambient temperature	**+50°C**	**+50°C**
t_s	Surface temperature		
$t_{s\ min}$	Minimum gearbox surface temperature starting with partial load (#)	**-25°C**	**-10°C**
$t_{sc\ min}$	Minimum gearbox surface temperature starting with full load	**-10°C**	**-5°C**
$t_{s\ Max}$	Maximum casing surface temperature during continuous operation (measured next to the gearbox input)	**+100°C**	**+100°C** (@)
t_o	Oil temperature		
$t_{o\ Max}$	Maximum oil temperature during continuous operation	**+95°C**	**+95°C** (@)

(*) = Refer to the table "Selection of the optimal oil viscosity" for further information about minimum and maximum values of different oil viscosity. For values of t_a < -20°C and t_s, t_o > 80 °C, choose (as permitted in the product configuration stage) the sealing type of the most suitable material to the type of application. If needed contact Bonfiglioli Technical Service.

(@) = Continuous operation it is not advised if t_s and t_o range is 80°C to 95 °C.

(#) = For full load start-up it is recommended to ramp-up and provide for greater absorption of the motor. If needed, contact Bonfiglioli Technical Service.

3 TORQUE

3.1 Rated torque M_{n2} [Nm]

The torque that can be transmitted continuously through the output shaft, with the gear unit operated under a service factor $f_s = 1$.
Rating is speed sensitive.

3.2 Required torque M_{r2} [Nm]

The torque demand based on application requirement.
It must always be equal to or less than torque M_{n2} the gearbox under study is rated for.

3.3 Calculated torque M_{c2} [Nm]

Computational torque value to be used when selecting the gearbox. It is calculated considering the required torque M_{r2} and service factor fs , as per the equation here after:

$$M_{c2} = M_{r2} \cdot f_s < M_{n2} \quad (1)$$

4 POWER

4.1 Rated power P_{n1} [kW]

In the gearbox selection charts this is the power applicable to input shaft, based on input speed n_1 and corresponding to service factor $f_s = 1$.

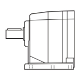
5 THERMAL CAPACITY P_t [kW]

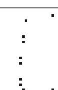
The following indications are valid for C, F and S gearboxes. For the thermal verification of the A gearboxes, refer to the indications in paragraph 48 (valid both for standard and ATEX products).

P_t is the power that can be transmitted through the gear unit, under a continuous duty and an ambient temperature of 20 °C, without resulting into damage of the inner parts or degradation of the lubricant properties. Refer to chart (A1) for specific kW ratings.
In case of intermittent duty, or an operating ambient temperature other than the rated 20°C, the P_t value should be adjusted through the factor f_t , obtained from chart (A2), as per the following equation:
$P_t = P_t \times f_t$

Gear units featuring more than 2 reductions and/or a gear ratio greater than i = 45 do not normally require the thermal limit to be checked as in these cases the thermal rating usually exceeds the mechanical rating.

(A 1)

P_t [kW] 20 °C		
	n_1 = 1400 min^{-1}	n_1 = 2800 min^{-1}
C 05 2	—	—
C 12 2	—	—
C 22 2	—	—
C 32 2	—	4.5
C 36 2	6.5	5.0
C 41 2	8.0	6.0
C 51 2	11.0	7.8
C 61 2	14.0	10.0
C 70 2	21	16.0
C 80 2	32	24
C 90 2	43	32
C 100 2	59	42

P_t [kW] 20 °C		
	n_1 = 1400 min^{-1}	n_1 = 2800 min^{-1}
F 10 2	3.8	2.7
F 20 2	9.1	6.5
F 25 2	10.2	7.4
F 31 2	11.7	8.5
F 41 2	14.3	10.4
F 51 2	21.5	15.0
F 60 3	26.0	18.9
F 70 3	36.4	26.0
F 80 3	52	36
F 90 3	75	53

P_t [kW] 20 °C		
	n_1 = 1400 min^{-1}	n_1 = 2800 min^{-1}
S 10 1	5.5	4.9
S 20 1	7.8	7.2
S 30 1	10.0	9.1
S 40 1	15.6	14.3
S 50 1	21	18.9

(A 2)

t_a [°C]	Continuous duty	f_t Intermittent duty — Degree of intermittence [I]			
		80%	**60%**	**40%**	**20%**
40	0.80	1.1	1.3	1.5	1.6
30	0.85	1.3	1.5	1.6	1.8
20	1.0	1.5	1.6	1.8	2.0
10	1.15	1.6	1.8	2.0	2.3

Where cyclic duration factor (I)% is the relationship of operating time under load t_f to total time (t_f + t_r) expressed as a percentage.

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \qquad (2)$$

The condition to be verified is:

$$P_{r1} \leq P_t \times f_t \qquad (3)$$

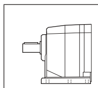
6 EFFICIENCY

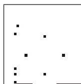
6.1 Dynamic efficiency η_d

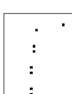
Obtained from the relationship of delivered power P_2 to input power P_1 , according to the following equation:

$$\eta_d = \frac{P_2}{P_1} \cdot 100 \qquad [\%] \qquad (4)$$

(A 3)

	**2 x**	**3 x**	**4 x**
η_d	95%	93%	90%

	**2 x**	**3 x**	**4 x**
η_d	94%	91%	89%

	**2 x**	**3 x**	**4 x**
η_d	95%	93%	90%

	**1 x**
η_d	98%

7 GEAR RATIO i

The value for the gear ratio is referred to with the letter [i] and calculated through the relationship of the input speed n_1 to the output speed n_2:

$$i = \frac{n_1}{n_2} \quad (5)$$

The gear ratio is usually a decimal number which in this catalogue is truncated at one digit after the comma (no decimals for i > 1000).
If interested in knowing the exact value see also chapters “EXACT RATIOS”.

8 ANGULAR VELOCITY

8.1 Input speed n_1 [min^{-1}]

The speed is related to the prime mover selected. Catalogue values refer to speed of either single or double speed motors that are common in the industry.
If the gearbox is driven by an external transmission it is recommended to operate it with a speed of 1400 min-1, or lower, in order to optimise operating conditions and lifetime.
Higher input speeds are permitted, however in this case consider that torque rating M_{n2} is affected adversely.
Please consult a Bonfiglioli representative.

8.2 Output speed n_2 [min^{-1}]

The output speed value n_2 is calculated from the relationship of input speed n_1 to the gear ratio i, as per the following equation:

$$n_2 = \frac{n_1}{i} \quad (6)$$

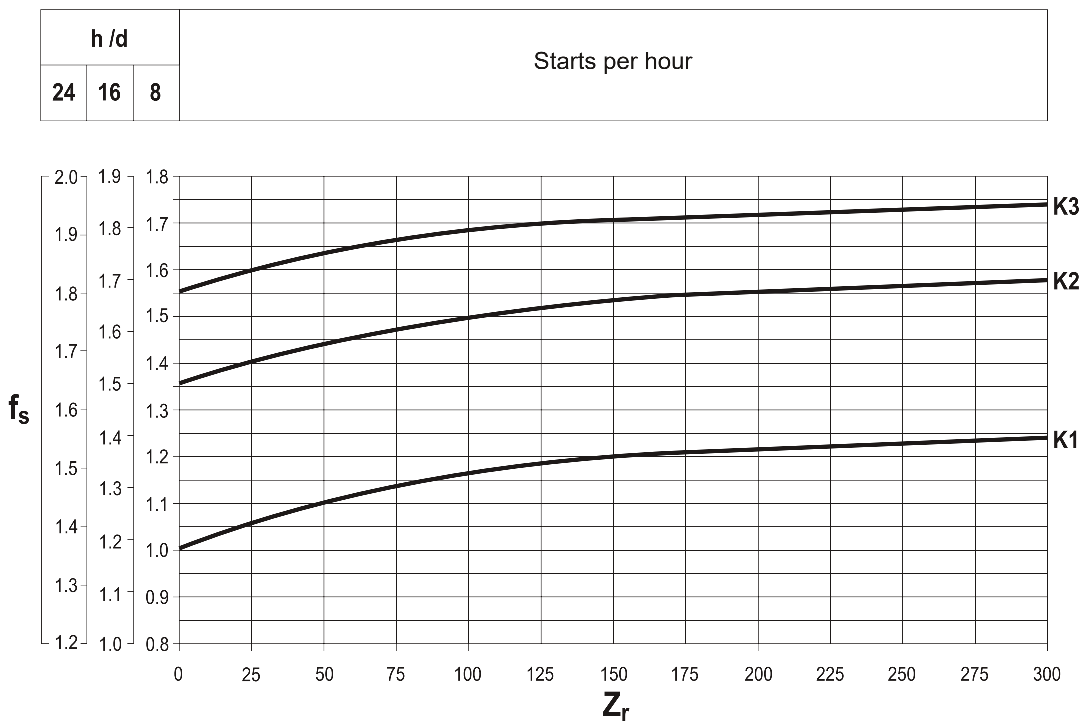
9 MOMENT OF INERTIA J_r [Kgm^2]

Moments of inertia specified in the catalogue refer to the gear unit input axis.
They are therefore related to motor speed, in the case of direct motor mounting.

10 SERVICE FACTOR f_s

This factor is the numeric value describing reducer service duty. It takes into consideration, with unavoidable approximation, daily operating conditions, load variations and overloads connected with reducer application.
In the graph (A4) below, after selecting proper "daily working hours" column, the service factor is given by intersecting the number of starts per hour and one of the K1, K2 or K3 curves.
K_ curves are linked with the service nature (approximately: uniform, medium and heavy) through the acceleration factor of masses K, connected to the ratio between driven masses and motor inertia values.
Regardless of the value given for the service factor, we would like to remind that in some applications, which for example involve lifting of parts, failure of the reducer may expose the operators to the risk of injuries. If in doubt, please contact our Technical Service Department.

(A 4)



10.1 Acceleration factor of masses K

This parameter serves for selecting the right curve for the type of load.
The value is given by the following ratio:

(A 5)

$K = \frac{J_c}{J_m}$ →	J_c =	Moment of inertia of driven masses referred to motor drive shaft
	J_m =	Motor moment of inertia

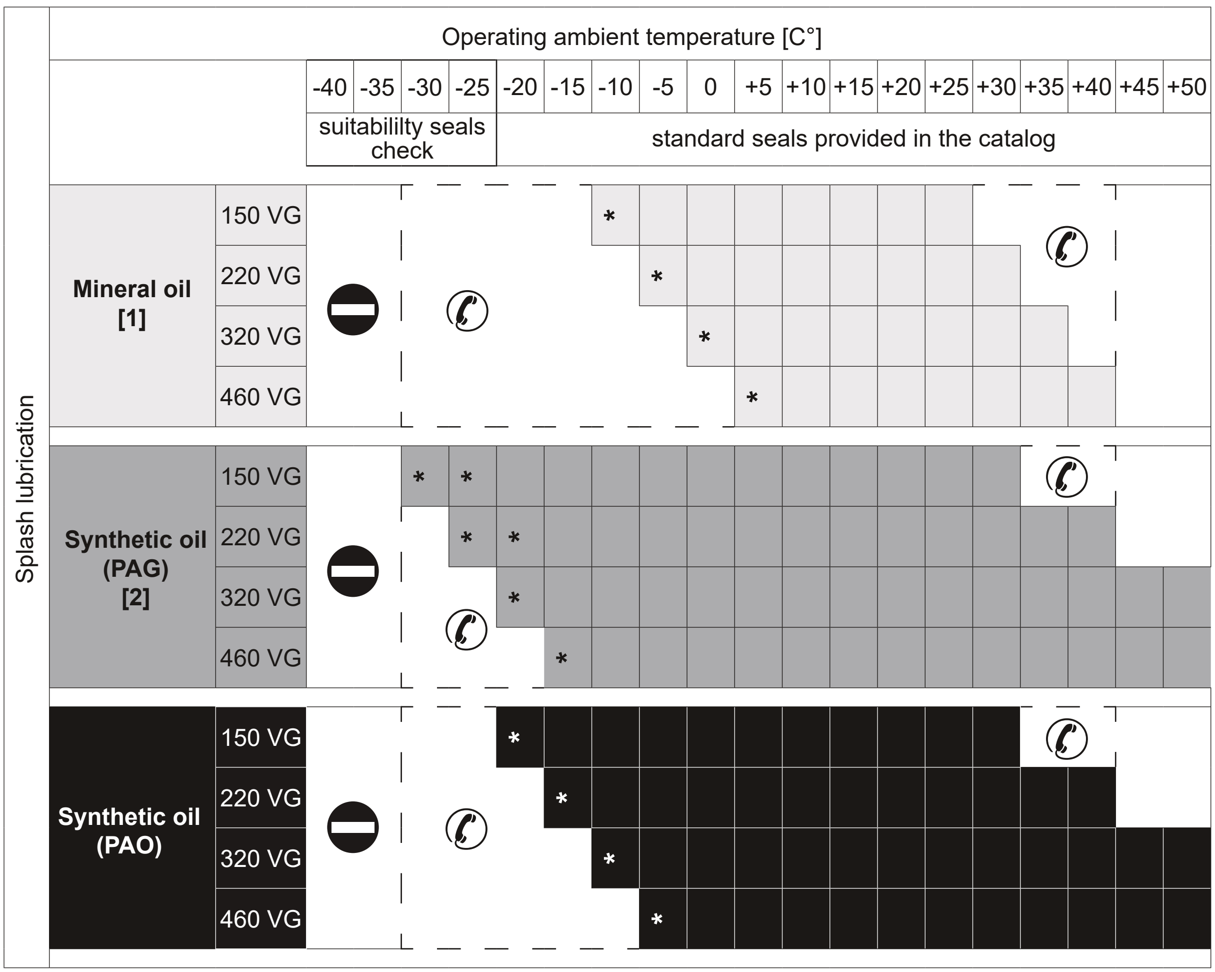
K ≤ 0,25	→ **K1**	Uniform load
0,25 < K ≤ 3	→ **K2**	Moderate shock load
3 < K ≤ 10	→ **K3**	Heavy shock load
K > 10	→	Please consult Bonfiglioli Technical Service

11 LUBRICATION

Life lubricated gearboxes do not require any periodical oil changes.
Refer to the User's Manual available at www.bonfiglioli.com for indications about checking the oil level and its replacement for other types of gearboxes.
Do not mix mineral oils with synthetic oils and/or different brands.
However, oil level should be checked at regular intervals and topped up as required.
Check monthly if unit operates under intermittent duty, more frequently if duty is continuous.

11.1 Selection of the optimal oil viscosity (data relating to Shell Oils)

(A 6)



Recommended operating limits

Allowed operating limits.

Forbidden operating limits.

* = It is recommended to ramp-up and to provide for greater absorption of the motor.
If needed and in the event of impulse loads, contact Bonfiglioli Technical Service.

[1] The use of mineral oil is permitted on gearmotors with service factor fs ≥ 1.30

[2] Gearboxes A05…60 must be used with PAG oil strictly (suggested the viscosity 320).
For different needs please contact the technical service.

11.2 Lubrication for C, A, F, S series gearboxes

The inner parts of Bonfiglioli gear units are oil-bath and splash lubricated.
Frame sizes C 05...C 41, A 05...A 41, F 10...F 41, S 10...S 40 are supplied by the factory, or by the authorized dealers, already filled with oil.
Unless otherwise specified, units size C 51, A 50, F 51, S 50 and larger are usually supplied unlubricated at it will be the customer care to fill them with oil prior to putting them into operation.
In both cases, depending on the version, prior to putting the gear unit into operation may need to replace the closed plug used for transportation purposes with breather plug supplied with.
For the reference charts of oil plugs placement and quantity of lubricant, refer to the Installation, Operation and Maintenance Manual (available on www.bonfiglioli.com).
The “long life” poliglycol-based lubricant supplied by the factory (SHELL OMALA S4 WE 320), in the absence of contamination, does not require periodical oil changes throughout the lifetime of the gear unit.

11.3 Lubrication for A-EX (Atex) gearboxes

The inner parts of Bonfiglioli gear units are oil-bath and splash lubricated.
The ATEX version gear unit (with some exceptions see Table below) are factory-charged with “long-life” lubricant SHELL OMALA S4 WE 320 in the quantity suitable for the mounting position specified in the order.

(A 7)

A 05	**A 10**	**A 20**	**A 30**	**A 35**	**A 41**	**A 50**	**A 55** (1)	**A 60 2** (2)	**A 60 3** (1)	**A 60 4** (1)	**A 70** (1)	**A 80** (1)	**A 90** (1)

Gearbox pre-filled with a synthetic “for life” lubricant (light grey: A 05 ... A 41)
Gearbox pre-filled with a synthetic lubricant (dark grey: A 50 ... A 90)

(1) Without lubricant for mounting positions B6 and B7
(2) Without lubricant for mounting positions B6, B7 and VB

Gearboxes are fitted with sealed filler plugs for transport purposes. Depending on version, they may be supplied with a vented plug which the user must fit before putting the gearbox into service.
Refer to the installation, operation and maintenance manual to replace the filler plug correctly. (These manuals are available in a number of languages and can be downloaded in pdf format from the website www.bonfiglioli.com.)
When a gearbox is supplied with no lubricant, it is recommended to fill it with a lubricant of a similar type, selected from those listed in its installation, operation and maintenance manual.

12 SELECTION

Some fundamental data are necessary to assist the correct selection of a gearbox or gearmotor. The table below (A8) briefly sums up this information.
To simplify selection, fill in the table and send a copy to our Technical Service which will select the most suitable drive unit for your application.

(A 8)

Bonfiglioli	TECHNICAL DATA REQUIRED FOR THE SELECTION OF GEARBOXS SERIES ...	Nr:	
		Date:	
		Rev_	Date:

		A)	*GENERAL DATA*				
#	1		Company / Customer				
#	2		Contact				
#	3		Branch / Distributor				
#	4		Order quantity				
	5		Delivery time				
		B_1)	*ELECTRIC MOTOR*				
	6		Motor Type				
#	7	P_{n1}	Rated motor Power		[kW]		
#	8	P_{r1}	Motor power demand		[kW]		
	9	n_1	Input speed		$[min^{-1}]$		
	10		No. of Poles				
		C)	*GEARBOX*				
#	11		Gearbox configuration				
#	12	i	Gear ratio				
#	13	n_1	Input speed		$[min^{-1}]$		
#	14	M_{r2}	Output torque demand		[Nm]		
#	15	f_S	Service factor demand				
	16		Rotation of the output shaft [frontal view]:	**CW**	**CCW**		
#	17	L_{10H}	Bearings lifetime		[h]		
	18		Gears lifetime		[h]		
	19	SF_{min}	Safety for tooth root stress		standard reference (ISO preferred)		
	20	SH_{min}	Safety for flank pressure		standard reference (ISO preferred)		
		D)	*ADDITIONAL LOADS*				
	21	R_{c2}	Radial load on output shaft		[N]	Orientation [°]	
	22	x_2	Load application distance from shaft shoulder		[mm]		
	23	R_{c1}	Radial load on input shaft		[N]	Orientation [°]	
	24	x_1	Load application distance from shaft shoulder		[mm]		
	25	A_{n2}	Thrust load on output shaft (+ / -)		[N]	+ = push	
	26	A_{n1}	Thrust load on input shaft (+ / -)		[N]	- = pull	
		E)	*APPLICATION*				
#	27		Type of application				
	28		Duty cycle	Time phase	Gearbox output torque	Gearbox output speed	
				%	[Nm]	$[min^{-1}]$	
				,,,,	,,,,		
				,,,,	,,,,		
				,,,,	,,,,		
	29		Notes about Duty Cycle:				
	30		Rating according FEM class	T-	L-	M-	
	31		Degree of intermittence		[%]		
	32	t_a	Ambient temperature range		[°C]		
#	33		Altitude a.s.l.		[m]		
	34		Type of ambient	small indoor space	large indoor space	outdoor	
		F)	*NOTES*				
	35		Notes and additional Customer requirements:				

Mandatory for the selection

For the selection of Series A gear units in Atex configuration, see also the specific chapter on page 348.

12.1 Selection of a gearmotor

a) Determine service factor f_s according to type of duty (factor K), number of starts per hour Z_r and hours of operation.

b) From values of torque M_{r2}, speed n_2 and efficiency η_d the required input power can be calculated from the equation:

$$P_{r1} = \frac{M_{r2} \cdot n_2}{9550 \cdot \eta_d} \text{ [kW]} \qquad (7)$$

Value of η_d for the captioned gear unit can be sorted out from paragraph 6.

c) Consult the gearmotor selection charts and locate the table corresponding to normalised power P_n:

$$P_n \geq P_{r1} \qquad (8)$$

Unless otherwise specified, power P_n of motors indicated in the catalogue refers to continuous duty S1. For motors used in conditions other than S1, the type of duty required by reference to CEI 2-3/IEC 34-1 Standards must be mentioned.
For duties from S2 to S8 in particular and for motor frame 132 or smaller, extra power output can be obtained with respect to continuous duty.
Accordingly the following condition must be satisfied:

$$P_n \geq \frac{P_{r1}}{f_m} \qquad (9)$$

The adjusting factor f_m can be obtained from table (A9).

12.2 Intermittence ratio

$$I = \frac{t_f}{t_f + t_r} \cdot 100 \qquad (10)$$

t_f = work time at constant load
t_r = rest time

(A 9)

	DUTY						
	S2			**S3***			**S4 - S8**
	Cycle duration [min]			Cyclic duration factor (I)			Please contact us
	10	**30**	**60**	**25%**	**40%**	**70%**	
f_m	1.35	1.15	1.05	1.25	1.15	1.1	

* Cycle duration, in any event, must be 10 minutes or less. If it is longer, please contact our Technical Service.

Next, refer to the appropriate $\mathbf{P_n}$ section within the gearmotor selection charts and locate the unit that features the desired output speed $\mathbf{n_2}$, or closest to, along with a safety factor **S** that meets or exceeds the applicable service factor $\mathbf{f_s}$.

The safety factor is so defined:

$$S = \frac{M_{n2}}{M_2} = \frac{P_{n1}}{P_1} \quad (11)$$

As standard, gear and motor combinations are implemented with 2, 4 and 6 pole motors, 50 Hz supplied.
Should the drive speed be different from 2800, 1400 or 900 min^{-1}, base the selection on the gear unit nominal rating.

12.3 Selection of speed reducer and gearbox with IEC motor adapter

a) Determine service factor f_s.

b) Assuming the required output torque for the application M_{r2} is known, the calculation torque can be then defined as:

$$M_{c2} = M_{r2} \cdot f_s \quad (12)$$

c) The gear ratio is calculated according to requested output speed n_2 and drive speed n_1:

$$i = \frac{n_1}{n_2} \quad (13)$$

Once values for M_{c2} and i are known consult the rating charts under the appropriate input speed n_1 and locate the gear unit that features the gear ratio closest to [i] and at same time offers a rated torque value M_{n2} so that:

$$M_{n2} \geq M_{c2} \quad (14)$$

If a IEC normalized motor must be fitted check geometrical compatibility with the gear unit at paragraph “MOTOR AVAILABILITY”.

13 VERIFICATION

After the selection of the speed reducer, or gearmotor, is complete it is recommended that the following verifications are conducted:

a) Thermal capacity
Make sure that the thermal capacity of the gearbox is equal to or greater than the power required by the application according to equation (3) on page 7.
If this condition is not verified, select a larger gearbox or apply a forced cooling system.

b) Maximum torque
The maximum torque (intended as instantaneous peak load) applicable to the gearbox must not, in general, exceed 200% of rated torque M_{n2}. Therefore, check that this limit is not exceeded, using suitable torque limiting devices, if necessary.
For three-phase double speed motors, it is important to pay attention to the switching torque which is generated when switching from high to low speed, because it could be significantly higher than maximum torque.
A simple, economical way to minimize overloading is to power only two phases of the motor during switch-over (power-up time on two phases can be controlled with a time-relay):

$M_{g2} = 0.5 \cdot M_{g3}$
M_{g2} = Switching torque with two-phase power-up
M_{g3} = Switching torque with three-phase power-up

We recommend, in any event, to contact our Technical Service.

c) Radial loads
Make sure that radial forces applying on input and/or output shaft are within permittend catalogue values.
If they were higher consider designing a different bearing arrangement before switching to a larger gear unit.
Catalogue values for rated overhung loads refer to mid-point of shaft under study.
Should application point of the overhung load be localised further out the revised loading capability must be adjusted as per instructions given in this manual.
Please refer to the paragraphs relating to radial loads.

d) Thrust loads
Actual thrust load must be found within 20% of the equivalent overhung load capacity.
Should an extremely high, or a combination of radial and axial load apply, consult Bonfiglioli Technical Service.

e) Starts per hour
For duties featuring a high number of switches the actual starting capability in loaded condition [Z] must be calculated.
Actual number of starts per hour must be lower than value so calculated.

14 INSTALLATION

The following installation instructions must be observed:

a) Make sure that the gearbox is correctly secured to avoid vibrations.
If shocks or overloads are expected, install hydraulic couplings, clutches, torque limiters, etc.

b) Before being paint coated, the machined surfaces and the outer face of the oil seals must be protected to prevent paint drying out the rubber and jeopardising the sealing function.

c) Parts fitted on the gearbox output shaft must be machined to ISO H7 tolerance to prevent interference fits that could damage the gearbox itself.
Further, to mount or remove such parts, use suitable pullers or extraction devices using the tapped hole located at the top of the shaft extension.

d) Mating surfaces must be cleaned and treated with suitable protective products before mounting to avoid oxidation and, as a result, seizure of parts.

e) Prior to putting the gear unit into operation make sure that the equipment that incorporates the same complies with the current revision of the Machines Directive 2006/42/EC.

f) Before starting up the machine, make sure that oil level conforms to the mounting position specified for the gear unit and the viscosity is adequate (refer to the User’s Manual available at www.bonfiglioli.com).

g) For outdoor installation provide adequate guards in order to protect the drive from rainfalls as well as direct sun radiation.

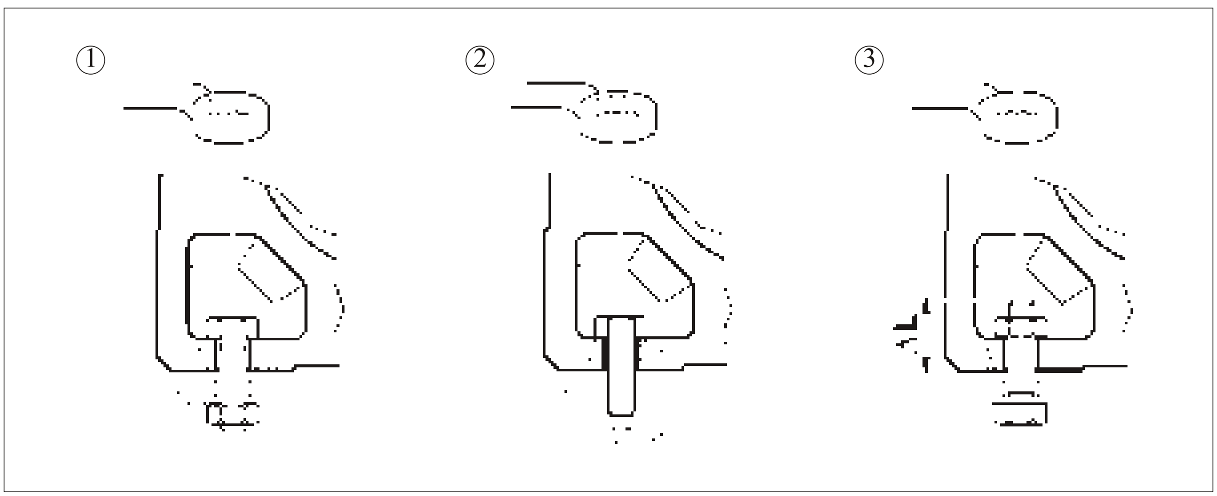
14.1 Fitting servomotors to gear heads featuring a clamping device (adapter type SC)

Turn the clamping device until its slot is aligned to those that are milled on the reducer input shaft. If the motor shaft features a key, this must be removed and the relevant keyway must also be aligned with the slots of clamping device and gear head input shaft, prior to inserting the servomotor into site. The keyway must be sitting on the same side as the locking screw. Tighten the bolts that hold the servomotor to the gear head, insert a torque wrench through the hole on the side of the flange and tighten the locking screw of the clamping device to the torque that is specified in the drawing section for the given adapter.

15 INSTALLATION INSTRUCTIONS

Schemes in table (A10) show the 3 possible installation patterns for A gear units to the machine frame. For each of these circumstances, table (A11) indicates exagonal head screw sizes to be used. Besides, to facilitate the installation, we suggest to use a wrench of the type shown in table (A10).

(A 10)



(A 11)

	Bolt type					Bolt type			
	①	②	③	ΔL (mm)		①	②	③	ΔL (mm)
A 05	M8x22	M8x20	M8x ...	22	**A 50**	M14x45	M14x40	M14x …	35
A 10	M8x25	M8x20	M8x …	20	**A 55**	M14x40	M14x40	M14x ...	35
A 20	M8x25	M8x20	M8x …	20	**A 60**	M16x50	M16x45	M16x …	40
A 30	M10x30	M10x25	M10x …	25	**A 70**	M20x60	M20x55	M20x …	45
A 35	M10x30	M10x25	M10x ...	25	**A 80**	M24x70	M24x65	M24x …	55
A 41	M12x35	M12x30	M12x …	30	**A 90**	M24x90	M24x80	M24x …	65

16 STORAGE

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

a) Do not store outdoors, in areas exposed to weather or with excessive humidity.

b) Always place boards, wood or other material between the products and the floor.
The gearboxes should not have direct contact with the floor.

c) In case of long-term storage all machined surfaces such as flanges, shafts and couplings must be coated with a suitable rust inhibiting product (Mobilarma 248 or equivalent).

d) In the cases of long-term storage defined in the order phase with the optional choice of SLM or SLP (see specific chapter for cases and times), the appropriate technical requirements are given in the User Manual available on www.bonfiglioli.com. To guarantee times, conditions and extensions, contact the Bonfiglioli Assistance Center available on the company website.

Furthermore gear units must be placed with the fill plug in the highest position and filled up with oil. Before putting the units into operation the appropriate quantity, and type, of oil must be restored (refer to the User's Manual available at www.bonfiglioli.com).

17 CONDITIONS OF SUPPLY

Gear units are supplied as follows:

a) configured for installation in the mounting position specified when ordering;

b) tested to manufacturer specifications;

c) mating machined surfaces come unpainted;

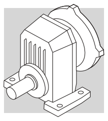
d) nuts and bolts for mounting motors are provided;

e) shafts are protected during transportation by plastic caps;

f) supplied with lifting lug (where applicable).

18 PAINT SPECIFICATIONS

Specifications for paint applied to gearboxes (where applicable) may be obtained from the branches or dealers that supplied the units.

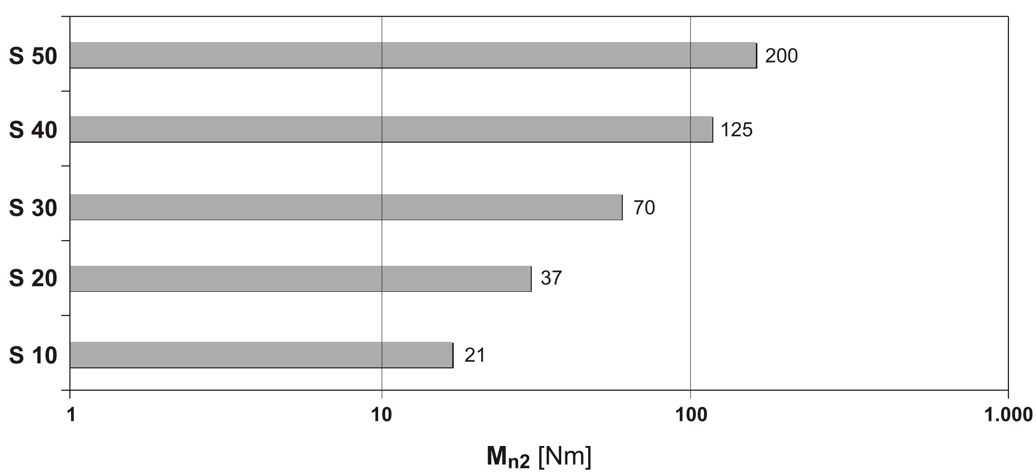


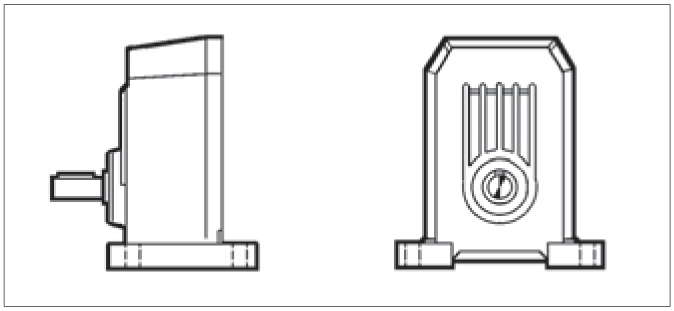
SINGLE STAGE GEARBOXES SERIES S

68 DESIGN FEATURES

The main design characteristics are:
- modularity
- space effective
- high efficiency
- quite 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)

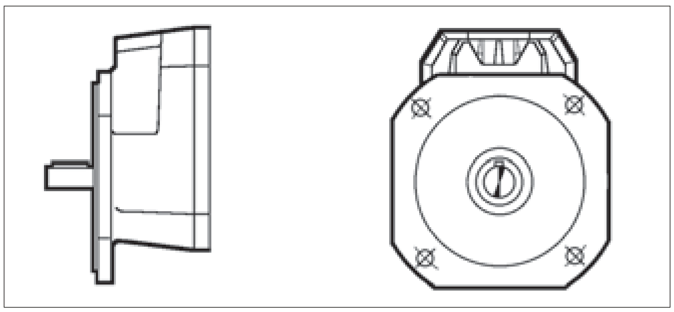




P

Foot mount

S 10 ... S 50



F

Flange mount

S 10 ... S 50

70 DESIGNATION

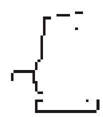
GEAR UNIT

S 10 1 P 1.4 S1 B3 .....

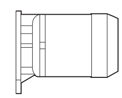
OPTIONS

MOUNTING POSITION
S...P: **B3** (Standard), **B6**, **B7**, **B8**, **V5**, **V6**
S...F: **B5** (Standard), **B51**, **B52**, **B53**, **V1**, **V3**

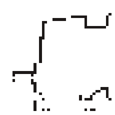
INPUT CONFIGURATION



S05	**S3**
S1	**S4**
S2	**S5**

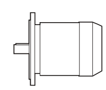


M - ME - MX - MXN

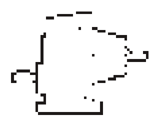


IEC_

P63	**P112**
P71	**P132**
P80	**P160**
P90	**P180**
P100	



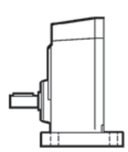
BN - BE BX - BXN



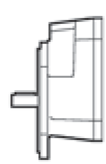
HS

GEAR RATIO

VERSION



P



F

REDUCTIONS
1

GEAR FRAME SIZE
10, **20**, **30**, **40**, **50**

TYPE: **S** = single stage gear unit

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
BX - BXN = IEC 3-phase, class IE3
ME = compact 3-phase, class IE2
BE = IEC 3-phase, class IE2
M = compact 3-phase, class IE1
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	Shell
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	KLÜBER LUBRICATION
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 fs ≥ 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.

LONG TERM STOCK
In presence of LONG TERM STOCK option the configured product is supplied without the standard lubricant oil but with an anticorrosive protective liquid to grant the integrity and full functionality of the gear unit in those cases where the unit will not be installed immediately but it has to be stocked for a long period of time (installation later than 6 months from delivery).
The warranty conditions are valid 12 months from commissioning (with commissioning within 24 months from delivery) or 24 months from delivery without commissioning.
After 2 years of stock, the unit with LONG TERM STOCK option needs to be checked by Bonfiglioli assistance center. In case of a product that is not properly preserved, an offer by Bonfiglioli will be issued for a complete restore.
With the recovery activity successfully concluded, the warranty conditions restart from the 12 months of commissioning (with commissioning within 24 months from restore date) or 24 months from restore date

Applicability of LONG TERM STOCK option:

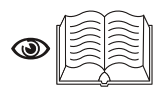
Gearbox size	Applicability of LONG TERM STOCK option
S10 ... S40	Only when oil lubrication options are not active (SO option is active)
S50	Only when oil lubrication options are not active (LO, LH, LS, LK, LA, LB, LC, LD)

The LONG TERM STOCK option can be requested in 2 versions:

- SLM Long Term Stock_Mineral Oil: option having anti-corrosive protective oil compatible with all mineral-based oil lubricants listed in the “Installation, operation and maintenance” Bonfiglioli manual (MUM).
- SLP Long Term Stock_Polyglycol Oil: option having anti-corrosive protective oil compatible with all polyglycol-based oil lubricants listed in the “Installation, operation and maintenance” Bonfiglioli manual (MUM).

Note: only one version can be selected. SLM and SLP can’t coexist.

When configuring a gear unit or gearmotor with the LONG TERM STOCK option, it is necessary to know the type of lubricating oil that will be used by the customer during the operating period (mineral or polyglycol oil).
Before commissioning a Bonfiglioli product with the LONG TERM STOCK option, make sure that the lubricating oil filling activity takes place through the specific filling plug determined by the mounting position indicated on the plate.
With regards to gear units with lifetime lubrication (see table below), the quantity of lubricating oil to top up is not indicated in the relevant “installation, use and maintenance” Bonfiglioli manual. In this case, if the STOCK LUNGO PERIODO option is active, it is therefore necessary to contact the Bonfiglioli assistance center to receive this information.

Gearbox size	Lubricant charge quantity
S10 ... S40	BONFIGLIOLI TECHNICAL SERVICE
S50	

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

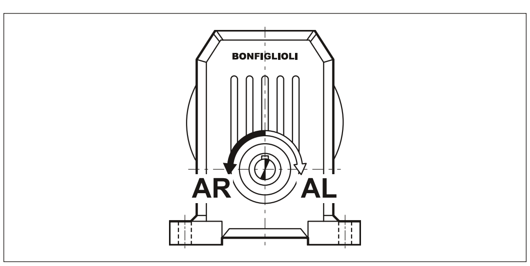
AC - Certificate of compliance
The document certifies the compliance of the product with the purchase order and the construction in conformity with the applicable procedures of the Bonfiglioli Quality System.

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)



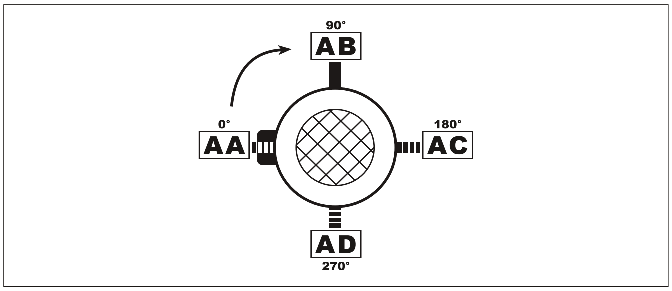
For further information on options, consult the electric motors section.

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).

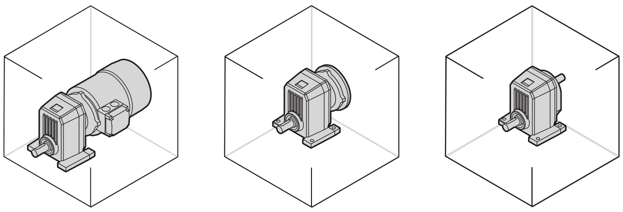
Angular position of the brake release lever.
Unless otherwise specified, brake motors have the manual device side located, 90° apart from terminal box.
Different angles can be specified through the relevant options available.

(E 64)

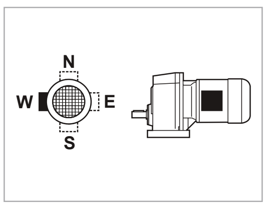


S ... P

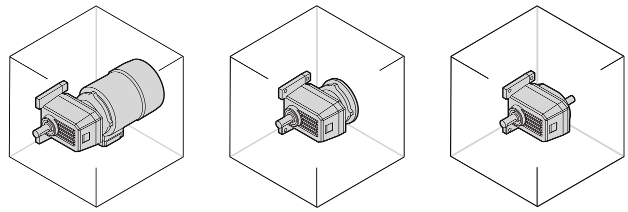
B3



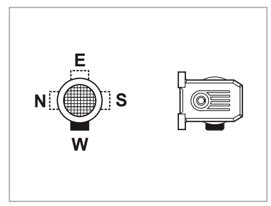
_S | _P(IEC) | _HS



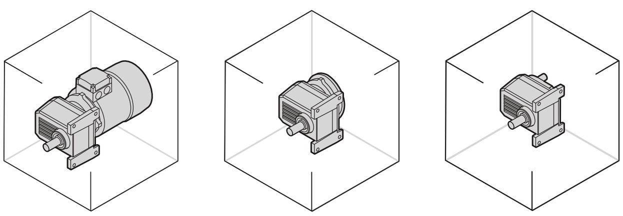
B6



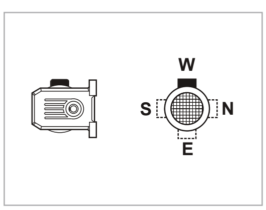
_S | _P(IEC) | _HS



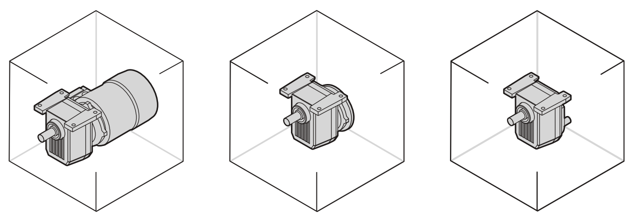
B7



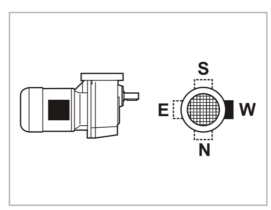
_S | _P(IEC) | _HS



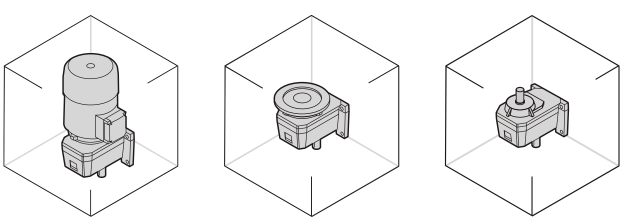
B8



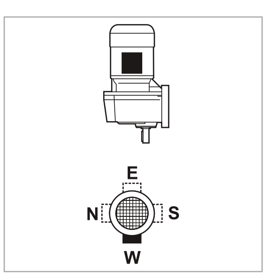
_S | _P(IEC) | _HS



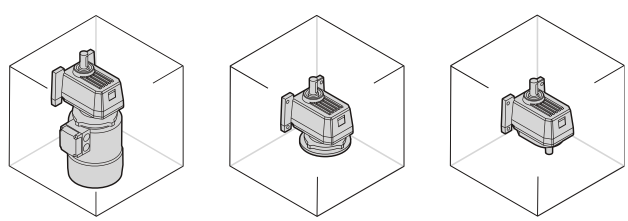
V5



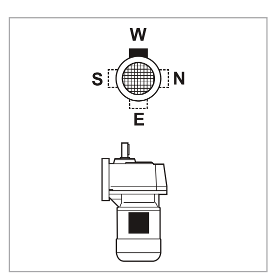
_S | _P(IEC) | _HS



V6



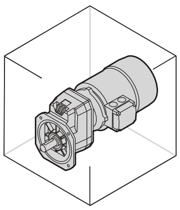
_S | _P(IEC) | _HS



W = Default

S ... F

B5



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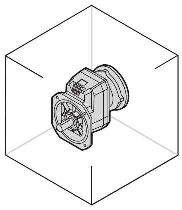

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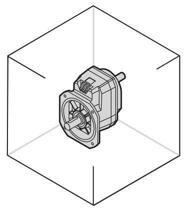

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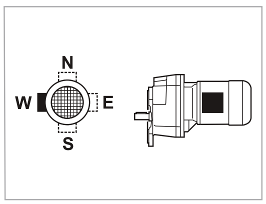

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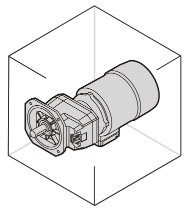

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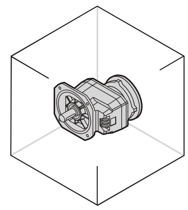

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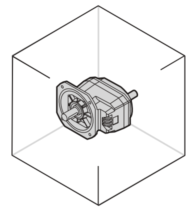

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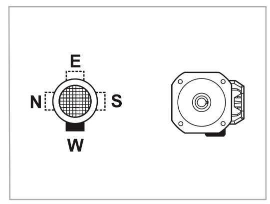

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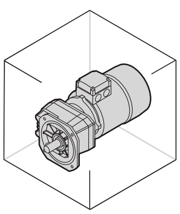

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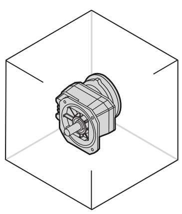

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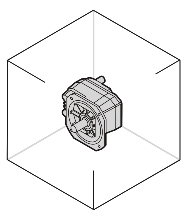

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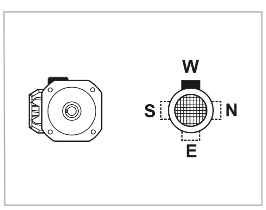

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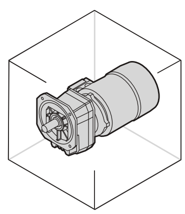

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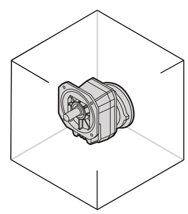

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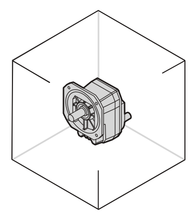

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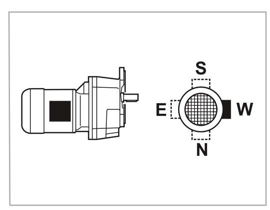
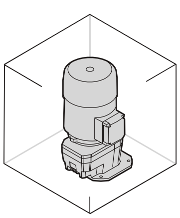


V1



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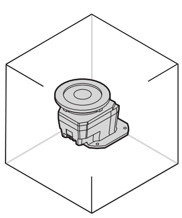

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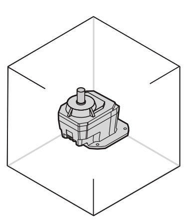

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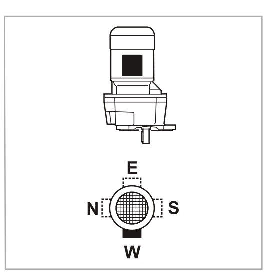
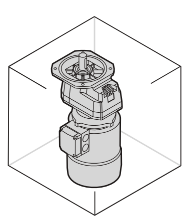


V3



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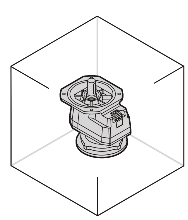

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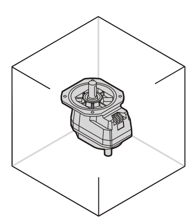

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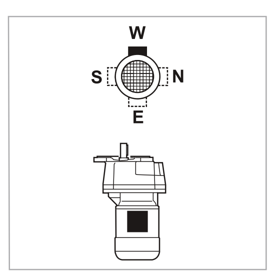


W = Default

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:

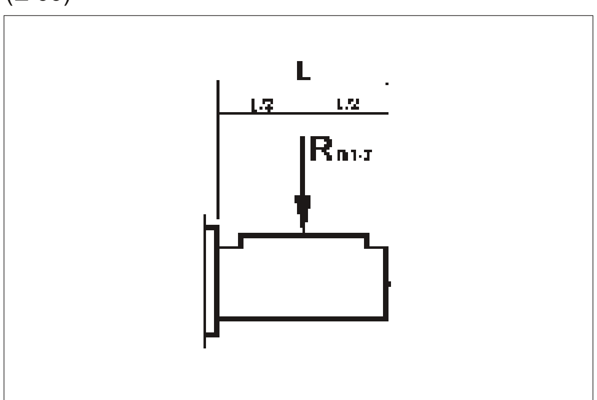
$$R_{c1}\left[N\right] = \frac{2000 \cdot M_1\left[Nm\right] \cdot K_r}{d\left[mm\right]} \quad ; \quad R_{c2}\left[N\right] = \frac{2000 \cdot M_2\left[Nm\right] \cdot K_r}{d\left[mm\right]} \qquad (44)$$

(E 65)

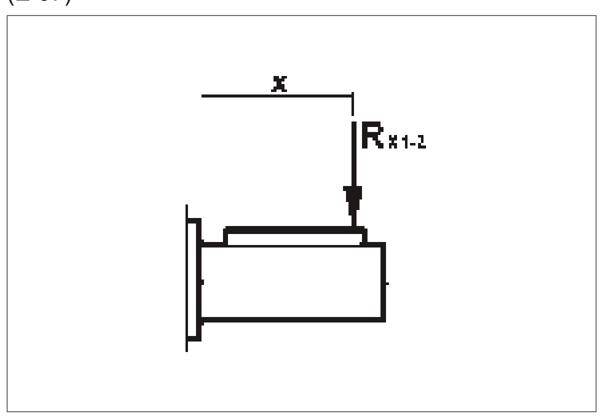
M_1 [Nm]	Torque applied to input shaft	**K_r = 1,25**	Gear transmission
M_2 [Nm]	Torque drawn at output shaft	**K_r = 1,5**	V-belt transmission
d [mm]	Pitch diameter of element keyed onto shaft	**K_r = 2,0**	Flat belt transmission
K_r = 1	Chain transmission		

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:

$Rc1 \leq Rn1$ [input shaft]

or

$Rc2 \leq Rn2$ [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 Rx1 (input) and Rx2 (output) are calculated respectively from original rated values Rn1 and Rn2 through factor:

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

(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:

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

N.B. Subject to condition:

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

Finally, the following condition must be verified:

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

OUTPUT SHAFT

1. Calculate:

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

N.B. Subject to condition:

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

Finally, the following condition must be verified:

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

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:

$$A_{n1} = R_{n1} \cdot 0.2$$
$$A_{n2} = R_{n2} \cdot 0.2 \qquad (52)$$

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.

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**	**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**		553
85	13.3	1.5	10.8	1500	**S201_10.8 S05 M05B6**		552	**S201_10.8 P63 BN63B6**		553
88	12.7	2.8	10.3	2400				**S301_10.3 P63 BN63B6**		555
88	12.7	0.9	10.3	1060	**S101_10.3 S05 M05B6**		550	**S101_10.3 P63 BN63B6**		551
102	11.0	3.2	8.9	2400				**S301_8.9 P63 BN63B6**		555
103	11.0	1.1	8.9	1030	**S101_8.9 S05 M05B6**		550	**S101_8.9 P63 BN63B6**		551
107	10.5	2.8	13.1	2400				**S301_13.1 P63 BN63B6**		555
107	10.5	1.9	8.5	1500	**S201_8.5 S05 M05B6**		552	**S201_8.5 P63 BN63B6**		553
113	10.0	1.7	12.4	1500	**S201_12.4 S05 M05A4**	**S201_12.4 S05 ME05A4**	552	**S201_12.4 P63 BN63A4**	**S201_12.4 P63 BE63A4**	553
114	9.9	1.0	12.3	1000	**S101_12.3 S05 M05A4**	**S101_12.3 S05 ME05A4**	550	**S101_12.3 P63 BN63A4**	**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**		553
130	8.6	2.0	10.8	1500	**S201_10.8 S05 M05A4**	**S201_10.8 S05 ME05A4**	552	**S201_10.8 P63 BN63A4**	**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**		551
136	8.3	1.2	10.3	960	**S101_10.3 S05 M05A4**	**S101_10.3 S05 ME05A4**	550	**S101_10.3 P63 BN63A4**	**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**		551

0.12 kW

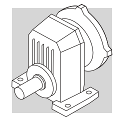
n2	M2	S	i	Rn2	IE1	IE2		IE1	IE2	
min-1	Nm			N						
158	7.1	1.4	8.9	920	**S101_8.9 S05 M05A4**	**S101_8.9 S05 ME05A4**	550	**S101_8.9 P63 BN63A4**	**S101_8.9 P63 BE63A4**	551
165	6.8	2.5	8.5	1500	**S201_8.5 S05 M05A4**	**S201_8.5 S05 ME05A4**	552	**S201_8.5 P63 BN63A4**	**S201_8.5 P63 BE63A4**	553
193	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

0.12 kW

n2	M2	S	i	Rn2	IE3		IE3	
min-1	Nm			N				
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				
130	8.6	2.0	10.8	1500	**S201_10.8 S05 MXN05A4**	552	**S201_10.8 P63 BXN63MA4**	553
132	8.5	2.0	6.9	960				
136	8.3	1.2	10.3	960	**S101_10.3 S05 MXN05A4**	550	**S101_10.3 P63 BXN63MA4**	551
149	7.5	2.3	6.1	940				
158	7.1	1.4	8.9	920	**S101_8.9 S05 MXN05A4**	550	**S101_8.9 P63 BXN63MA4**	551
165	6.8	2.5	8.5	1500	**S201_8.5 S05 MXN05A4**	552	**S201_8.5 P63 BXN63MA4**	553
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				
284	3.9	3.5	3.2	780				
296	3.8	3.2	4.7	770	**S101_4.7 S05 MXN05A4**	550	**S101_4.7 P63 BXN63MA4**	551
364	3.1	3.9	3.8	720	**S101_3.8 S05 MXN05A4**	550	**S101_3.8 P63 BXN63MA4**	551
364	3.1	3.9	2.5	720				
438	2.6	4.7	3.2	680	**S101_3.2 S05 MXN05A4**	550	**S101_3.2 P63 BXN63MA4**	551
485	2.3	5.2	1.9	660				
560	2.0	5.0	2.5	630	**S101_2.5 S05 MXN05A4**	550	**S101_2.5 P63 BXN63MA4**	551
640	1.8	6.8	1.4	600				
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

0.18 kW

n_2 min⁻¹	M_2 Nm	S	i	R_{n2} N	IE1	IE2		IE1	IE2	
69	24.6	1.4	13.1	2400				**S301_13.1 P71 BN71A6**		555
73	23.2	2.5	12.4	3800	**S401_12.4 S1 M1SC6**		556	**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 S1 M1SC6**		556	**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**		554	**S301_8.9 P71 BN71A6**		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**	**S301_13.1 P63 BE63B4**	555
112	15.1	1.1	12.4	1500	**S201_12.4 S05 M05B4**	**S201_12.4 S05 ME05B4**	552	**S201_12.4 P63 BN63B4**	**S201_12.4 P63 BE63B4**	553
112	15.0	3.3	12.4	3800				**S401_12.4 P63 BN63B4**	**S401_12.4 P63 BE63B4**	557
125	13.5	2.2	7.2	1500	**S201_7.2 S1 M1SC6**		552	**S201_7.2 P71 BN71A6**		553
129	13.0	1.3	10.8	1500	**S201_10.8 S05 M05B4**	**S201_10.8 S05 ME05B4**	552	**S201_10.8 P63 BN63B4**	**S201_10.8 P63 BE63B4**	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**	**S301_10.3 P63 BE63B4**	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**		552	**S201_5.8 P71 BN71A6**		553
156	10.8	2.8	8.9	2230				**S301_8.9 P63 BN63B4**	**S301_8.9 P63 BE63B4**	555
157	10.8	0.9	8.9	880	**S101_8.9 S05 M05B4**	**S101_8.9 S05 ME05B4**	550	**S101_8.9 P63 BN63B4**	**S101_8.9 P63 BE63B4**	551
164	10.3	1.7	8.5	1500	**S201_8.5 S05 M05B4**	**S201_8.5 S05 ME05B4**	552	**S201_8.5 P63 BN63B4**	**S201_8.5 P63 BE63B4**	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**		550	**S101_4.7 P71 BN71A6**		551
192	8.8	3.0	7.2	1500	**S201_7.2 S05 M05B4**	**S201_7.2 S05 ME05B4**	552	**S201_7.2 P63 BN63B4**	**S201_7.2 P63 BE63B4**	553
201	8.4	1.8	6.9	820	**S101_6.9 S05 M05B4**	**S101_6.9 S05 ME05B4**	550	**S101_6.9 P63 BN63B4**	**S101_6.9 P63 BE63B4**	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**		550	**S101_3.2 P71 BN71A6**		551
294	5.7	2.1	4.7	750	**S101_4.7 S05 M05B4**	**S101_4.7 S05 ME05B4**	550	**S101_4.7 P63 BN63B4**	**S101_4.7 P63 BE63B4**	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**	550	**S101_3.8 P63 BN63B4**	**S101_3.8 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**	**S101_3.2 S05 ME05B4**	550	**S101_3.2 P63 BN63B4**	**S101_3.2 P63 BE63B4**	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**	**S101_1.9 S05 ME05B4**	550	**S101_1.9 P63 BN63B4**	**S101_1.9 P63 BE63B4**	551
878	1.9	5.2	3.2	540	**S101_3.2 S05 M05A2**		550	**S101_3.2 P63 BN63A2**		551
978	1.7	5.8	1.4	520	**S101_1.4 S05 M05B4**	**S101_1.4 S05 ME05B4**	550	**S101_1.4 P63 BN63B4**	**S101_1.4 P63 BE63B4**	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



0.18 kW

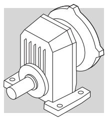
n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE3		IE3	
69	24.6	1.4	13.1	2400				
73	23.2	2.5	12.4	3800				
84	20.1	1.0	10.8	1500				
84	20.0	2.9	10.7	3800				
87	19.3	1.8	10.3	2400				
101	16.6	2.1	8.9	2400				
106	15.9	1.3	8.5	1500				
106	15.9	1.9	13.1	2400			**S301_13.1 P63 BXN63MB4**	555
112	15.1	1.1	12.4	1500	**S201_12.4 S05 MXN05B4**	552	**S201_12.4 P63 BXN63MB4**	553
112	15.0	3.3	12.4	3800			**S401_12.4 P63 BXN63MB4**	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**	553
130	12.9	1.3	6.9	910				
135	12.5	2.4	10.3	2330			**S301_10.3 P63 BXN63MB4**	555
147	11.4	1.5	6.1	890				
155	10.9	2.8	5.8	1500				
156	10.8	2.8	8.9	2230			**S301_8.9 P63 BXN63MB4**	555
157	10.8	0.9	8.9	880	**S101_8.9 S05 MXN05B4**	550	**S101_8.9 P63 BXN63MB4**	551
164	10.3	1.7	8.5	1500	**S201_8.5 S05 MXN05B4**	552	**S201_8.5 P63 BXN63MB4**	553
189	8.9	3.4	4.8	1500				
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**	553
201	8.4	1.8	6.9	820	**S101_6.9 S05 MXN05B4**	550	**S101_6.9 P63 BXN63MB4**	551
214	7.9	3.1	13.1	2020				
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**	551
228	7.4	1.1	12.3	800				
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**	551
317	5.3	1.5	8.9	730				
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**	551
407	4.1	2.9	6.9	680				
434	3.9	3.1	3.2	670	**S101_3.2 S05 MXN05B4**	550	**S101_3.2 P63 BXN63MB4**	551
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**	551
594	2.8	3.5	4.7	610				
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**	551
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**	551
1124	1.5	5.3	2.5	500				
1499	1.1	7.1	1.9	460				
1977	0.9	9.4	1.4	420			**S101_1.4 P63 BN63A2**	551

0.25 kW

n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE1	IE2		IE1	IE2	
69	34.1	1.0	13.1	2400				**S301_13.1 P71 BN71B6**		555
70	33.5	3.0	12.9	6520	**S501_12.9 S1 M1SD6**		558	**S501_12.9 P71 BN71B6**		559
73	32.2	1.8	12.4	3800	**S401_12.4 S1 M1SD6**		556	**S401_12.4 P71 BN71B6**		557
84	27.7	2.1	10.7	3800	**S401_10.7 S1 M1SD6**		556	**S401_10.7 P71 BN71B6**		557
87	26.8	1.3	10.3	2400	**S301_10.3 S1 M1SD6**		554	**S301_10.3 P71 BN71B6**		555
101	23.1	1.5	8.9	2400	**S301_8.9 S1 M1SD6**		554	**S301_8.9 P71 BN71B6**		555
104	22.5	3.1	8.6	3800	**S401_8.6 S1 M1SD6**		556	**S401_8.6 P71 BN71B6**		557
105	22.3	1.3	13.1	2400				**S301_13.1 P71 BN71A4**	**S301_13.1 P71 BE71A4**	555
106	22.1	0.9	8.5	1500	**S201_8.5 S1 M1SD6**		552	**S201_8.5 P71 BN71B6**		553
111	21.1	2.4	12.4	3800				**S401_12.4 P71 BN71A4**	**S401_12.4 P71 BE71A4**	557
125	18.8	1.6	7.2	1500	**S201_7.2 S1 M1SD6**		552	**S201_7.2 P71 BN71B6**		553
127	18.4	3.1	7.1	2340	**S301_7.1 S1 M1SD6**		554	**S301_7.1 P71 BN71B6**		555
128	18.3	0.9	10.8	1500	**S201_10.8 S05 M05C4**	**S201_10.8 S1 ME1SA4**	552	**S201_10.8 P71 BN71A4**	**S201_10.8 P71 BE71A4**	553
129	18.2	2.8	10.7	3800				**S401_10.7 P71 BN71A4**	**S401_10.7 P71 BE71A4**	557
130	17.9	0.9	6.9	850	**S101_6.9 S1 M1SD6**		550	**S101_6.9 P71 BN71B6**		551
133	17.5	1.7	10.3	2300				**S301_10.3 P71 BN71A4**	**S301_10.3 P71 BE71A4**	555
147	15.9	1.1	6.1	840	**S101_6.1 S1 M1SD6**		550	**S101_6.1 P71 BN71B6**		551
155	15.1	2.0	5.8	1500	**S201_5.8 S1 M1SD6**		552	**S201_5.8 P71 BN71B6**		553
155	15.1	2.0	8.9	2200				**S301_8.9 P71 BN71A4**	**S301_8.9 P71 BE71A4**	555
162	14.5	1.2	8.5	1500	**S201_8.5 S05 M05C4**	**S201_8.5 S1 ME1SA4**	552	**S201_8.5 P71 BN71A4**	**S201_8.5 P71 BE71A4**	553
189	12.4	2.4	4.8	1500	**S201_4.8 S1 M1SD6**		552	**S201_4.8 P71 BN71B6**		553
190	12.3	1.1	4.7	790	**S101_4.7 S1 M1SD6**		550	**S101_4.7 P71 BN71B6**		551
190	12.3	2.1	7.2	1500	**S201_7.2 S05 M05C4**	**S201_7.2 S1 ME1SA4**	552	**S201_7.2 P71 BN71A4**	**S201_7.2 P71 BE71A4**	553
199	11.7	1.3	6.9	780	**S101_6.9 S05 M05C4**	**S101_6.9 S1 ME1SA4**	550	**S101_6.9 P71 BN71A4**	**S101_6.9 P71 BE71A4**	551
214	10.9	2.2	13.1	2000				**S301_13.1 P63 BN63B2**		555
225	10.4	1.4	6.1	770	**S101_6.1 S05 M05C4**	**S101_6.1 S1 ME1SA4**	550	**S101_6.1 P71 BN71A4**	**S101_6.1 P71 BE71A4**	551
226	10.3	1.3	12.4	1450	**S201_12.4 S05 M05B2**		552	**S201_12.4 P63 BN63B2**		553
229	10.2	2.9	3.9	1440	**S201_3.9 S1 M1SD6**		552	**S201_3.9 P71 BN71B6**		553
234	10.0	1.4	3.8	750	**S101_3.8 S1 M1SD6**		550	**S101_3.8 P71 BN71B6**		551
236	9.9	2.6	5.8	1430	**S201_5.8 S05 M05C4**	**S201_5.8 S1 ME1SA4**	552	**S201_5.8 P71 BN71A4**	**S201_5.8 P71 BE71A4**	553
261	9.0	1.5	10.8	1390	**S201_10.8 S05 M05B2**		552	**S201_10.8 P63 BN63B2**		553
273	8.6	2.8	10.3	1860				**S301_10.3 P63 BN63B2**		555
273	8.6	0.9	10.3	730	**S101_10.3 S05 M05B2**		550	**S101_10.3 P63 BN63B2**		551
281	8.3	1.7	3.2	720	**S101_3.2 S1 M1SD6**		550	**S101_3.2 P71 BN71B6**		551
288	8.1	3.2	4.8	1350	**S201_4.8 S05 M05C4**	**S201_4.8 S1 ME1SA4**	552	**S201_4.8 P71 BN71A4**	**S201_4.8 P71 BE71A4**	553
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				**S301_8.9 P63 BN63B2**		555
317	7.4	1.1	8.9	710	**S101_8.9 S05 M05B2**		550	**S101_8.9 P63 BN63B2**		551
331	7.1	1.8	8.5	1300	**S201_8.5 S05 M05B2**		552	**S201_8.5 P63 BN63B2**		553
358	6.5	1.8	3.8	680	**S101_3.8 S05 M05C4**	**S101_3.8 S1 ME1SA4**	550	**S101_3.8 P71 BN71A4**	**S101_3.8 P71 BE71A4**	551
360	6.5	1.8	2.5	680	**S101_2.5 S1 M1SD6**		550	**S101_2.5 P71 BN71B6**		551
389	6.0	3.5	7.2	1240	**S201_7.2 S05 M05B2**		552	**S201_7.2 P63 BN63B2**		553
407	5.7	2.1	6.9	660	**S101_6.9 S05 M05B2**		550	**S101_6.9 P63 BN63B2**		551
430	5.4	2.2	3.2	650	**S101_3.2 S05 M05C4**	**S101_3.2 S1 ME1SA4**	550	**S101_3.2 P71 BN71A4**	**S101_3.2 P71 BE71A4**	551
460	5.1	2.4	6.1	640	**S101_6.1 S05 M05B2**		550	**S101_6.1 P63 BN63B2**		551
480	4.9	2.5	1.9	620	**S101_1.9 S1 M1SD6**		550	**S101_1.9 P71 BN71B6**		551
550	4.3	2.4	2.5	610	**S101_2.5 S05 M05C4**	**S101_2.5 S1 ME1SA4**	550	**S101_2.5 P71 BN71A4**	**S101_2.5 P71 BE71A4**	551
594	3.9	2.5	4.7	600	**S101_4.7 S05 M05B2**		550	**S101_4.7 P63 BN63B2**		551
633	3.7	3.2	1.4	580	**S101_1.4 S1 M1SD6**		550	**S101_1.4 P71 BN71B6**		551
731	3.2	3.1	3.8	560	**S101_3.8 S05 M05B2**		550	**S101_3.8 P63 BN63B2**		551
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**		550	**S101_3.2 P63 BN63B2**		551
968	2.4	4.1	1.4	510	**S101_1.4 S05 M05C4**	**S101_1.4 S1 ME1SA4**	550	**S101_1.4 P71 BN71A4**	**S101_1.4 P71 BE71A4**	551
1124	2.1	3.8	2.5	500	**S101_2.5 S05 M05B2**		550	**S101_2.5 P63 BN63B2**		551
1499	1.6	5.1	1.9	450	**S101_1.9 S05 M05B2**		550	**S101_1.9 P63 BN63B2**		551
1977	1.2	6.8	1.4	420	**S101_1.4 S05 M05B2**		550	**S101_1.4 P63 BN63B2**		551

0.25 kW

n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE3		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				



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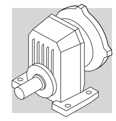
n_2 min^{-1}	M_2 Nm	S	i	R_{n2} N	IE1	IE2		IE1	IE2	
71	49.0	2.0	12.9	6420	**S501_12.9 S1 M1LA6**		558	**S501_12.9 P80 BN80A6**		559
73	47.2	1.2	12.4	3800	**S401_12.4 S1 M1LA6**		556	**S401_12.4 P80 BN80A6**		557
85	40.6	1.4	10.7	3800	**S401_10.7 S1 M1LA6**		556	**S401_10.7 P80 BN80A6**		557
87	39.8	2.9	10.5	6020	**S501_10.5 S1 M1LA6**		558	**S501_10.5 P80 BN80A6**		559
102	33.8	1.0	8.9	2400	**S301_8.9 S1 M1LA6**		554	**S301_8.9 P80 BN80A6**		555
104	33.2	0.9	13.1	2390				**S301_13.1 P71 BN71B4**	**S301_13.1 P71 BE71B4**	555
105	32.9	2.1	8.6	3800	**S401_8.6 S1 M1LA6**		556	**S401_8.6 P80 BN80A6**		557
106	32.6	3.1	12.9	5650	**S501_12.9 S1 M1SD4**	**S501_12.9 S1 ME1SB4**	558	**S501_12.9 P71 BN71B4**	**S501_12.9 P71 BE71B4**	559
110	31.3	1.6	12.4	3800	**S401_12.4 S1 M1SD4**	**S401_12.4 S1 ME1SB4**	556	**S401_12.4 P71 BN71B4**	**S401_12.4 P71 BE71B4**	557
126	27.5	1.1	7.2	1500	**S201_7.2 S1 M1LA6**		552	**S201_7.2 P80 BN80A6**		553
127	27.2	3.3	7.2	3800	**S401_7.2 S1 M1LA6**		556	**S401_7.2 P80 BN80A6**		557
128	27.0	2.1	7.1	2260	**S301_7.1 S1 M1LA6**		554	**S301_7.1 P80 BN80A6**		555
128	27.0	1.9	10.7	3800	**S401_10.7 S1 M1SD4**	**S401_10.7 S1 ME1SB4**	556	**S401_10.7 P71 BN71B4**	**S401_10.7 P71 BE71B4**	557
133	26.0	1.2	10.3	2240	**S301_10.3 S1 M1SD4**	**S301_10.3 S1 ME1SB4**	554	**S301_10.3 P71 BN71B4**	**S301_10.3 P71 BE71B4**	555
154	22.5	1.3	8.9	2150	**S301_8.9 S1 M1SD4**	**S301_8.9 S1 ME1SB4**	554	**S301_8.9 P71 BN71B4**	**S301_8.9 P71 BE71B4**	555
156	22.2	2.6	5.8	2140	**S301_5.8 S1 M1LA6**		554	**S301_5.8 P80 BN80A6**		555
156	22.1	1.4	5.8	1500	**S201_5.8 S1 M1LA6**		552	**S201_5.8 P80 BN80A6**		553
159	21.8	2.7	8.6	3610	**S401_8.6 S1 M1SD4**	**S401_8.6 S1 ME1SB4**	556	**S401_8.6 P71 BN71B4**	**S401_8.6 P71 BE71B4**	557
184	18.8	3.1	4.9	2040	**S301_4.9 S1 M1LA6**		554	**S301_4.9 P80 BN80A6**		555
190	18.3	1.4	7.2	1460	**S201_7.2 S1 M1SD4**	**S201_7.2 S1 ME1SB4**	552	**S201_7.2 P71 BN71B4**	**S201_7.2 P71 BE71B4**	553
191	18.1	1.7	4.8	1460	**S201_4.8 S1 M1LA6**		552	**S201_4.8 P80 BN80A6**		553
193	17.9	2.8	7.1	2020	**S301_7.1 S1 M1SD4**	**S301_7.1 S1 ME1SB4**	554	**S301_7.1 P71 BN71B4**	**S301_7.1 P71 BE71B4**	555
214	16.2	1.5	13.1	1960				**S301_13.1 P71 BN71A2**		555
224	15.4	1.0	6.1	710	**S101_6.1 S1 M1SD4**	**S101_6.1 S1 ME1SB4**	550	**S101_6.1 P71 BN71B4**	**S101_6.1 P71 BE71B4**	551
227	15.3	2.6	12.4	3230				**S401_12.4 P71 BN71A2**		557
231	15.0	2.0	3.9	1380	**S201_3.9 S1 M1LA6**		552	**S201_3.9 P80 BN80A6**		553
234	14.8	3.4	5.8	1900	**S301_5.8 S1 M1SD4**	**S301_5.8 S1 ME1SB4**	554	**S301_5.8 P71 BN71B4**	**S301_5.8 P71 BE71B4**	555
235	14.7	1.8	5.8	1390	**S201_5.8 S1 M1SD4**	**S201_5.8 S1 ME1SB4**	552	**S201_5.8 P71 BN71B4**	**S201_5.8 P71 BE71B4**	553
237	14.6	1.0	3.8	690	**S101_3.8 S1 M1LA6**		550	**S101_3.8 P80 BN80A6**		551
261	13.2	1.0	10.8	1350	**S201_10.8 S05 M05C2**		552	**S201_10.8 P71 BN71A2**		553
263	13.1	3.0	10.7	3080				**S401_10.7 P71 BN71A2**		557
273	12.7	1.9	10.3	1820				**S301_10.3 P71 BN71A2**		555
284	12.2	1.1	3.2	670	**S101_3.2 S1 M1LA6**		550	**S101_3.2 P80 BN80A6**		551
287	12.1	2.2	4.8	1310	**S201_4.8 S1 M1SD4**	**S201_4.8 S1 ME1SB4**	552	**S201_4.8 P71 BN71B4**	**S201_4.8 P71 BE71B4**	553
290	11.9	1.0	4.7	670	**S101_4.7 S1 M1SD4**	**S101_4.7 S1 ME1SB4**	550	**S101_4.7 P71 BN71B4**	**S101_4.7 P71 BE71B4**	551
293	11.8	2.5	3.1	1300	**S201_3.1 S1 M1LA6**		552	**S201_3.1 P80 BN80A6**		553
316	11.0	2.2	8.9	1740				**S301_8.9 P71 BN71A2**		555
331	10.5	1.2	8.5	1270	**S201_8.5 S05 M05C2**		552	**S201_8.5 P71 BN71A2**		553
348	9.9	2.6	3.9	1240	**S201_3.9 S1 M1SD4**	**S201_3.9 S1 ME1SB4**	552	**S201_3.9 P71 BN71B4**	**S201_3.9 P71 BE71B4**	553
356	9.7	1.2	3.8	640	**S101_3.8 S1 M1SD4**	**S101_3.8 S1 ME1SB4**	550	**S101_3.8 P71 BN71B4**	**S101_3.8 P71 BE71B4**	551
364	9.5	1.3	2.5	630	**S101_2.5 S1 M1LA6**		550	**S101_2.5 P80 BN80A6**		551
373	9.3	3.2	2.4	1210	**S201_2.4 S1 M1LA6**		552	**S201_2.4 P80 BN80A6**		553
389	8.9	2.4	7.2	1210	**S201_7.2 S05 M05C2**		552	**S201_7.2 P71 BN71A2**		553
407	8.5	1.4	6.9	630	**S101_6.9 S05 M05C2**		550	**S101_6.9 P71 BN71A2**		551
428	8.1	1.5	3.2	620	**S101_3.2 S1 M1SD4**	**S101_3.2 S1 ME1SB4**	550	**S101_3.2 P71 BN71B4**	**S101_3.2 P71 BE71B4**	551
440	7.9	3.3	3.1	1160	**S201_3.1 S1 M1SD4**	**S201_3.1 S1 ME1SB4**	552	**S201_3.1 P71 BN71B4**	**S201_3.1 P71 BE71B4**	553
460	7.5	1.6	6.1	610	**S101_6.1 S05 M05C2**		550	**S101_6.1 P71 BN71A2**		551
480	7.2	2.8	1.9	1130	**S201_1.9 S1 M1LA6**		552	**S201_1.9 P80 BN80A6**		553
483	7.2	2.9	5.8	1130	**S201_5.8 S05 M05C2**		552	**S201_5.8 P71 BN71A2**		553
485	7.1	1.7	1.9	590	**S101_1.9 S1 M1LA6**		550	**S101_1.9 P80 BN80A6**		551
548	6.3	1.6	2.5	580	**S101_2.5 S1 M1SD4**	**S101_2.5 S1 ME1SB4**	550	**S101_2.5 P71 BN71B4**	**S101_2.5 P71 BE71B4**	551
594	5.8	1.7	4.7	570	**S101_4.7 S05 M05C2**		550	**S101_4.7 P71 BN71A2**		551
640	5.4	2.2	1.4	550	**S101_1.4 S1 M1LA6**		550	**S101_1.4 P80 BN80A6**		551
731	4.7	2.1	3.8	540	**S101_3.8 S05 M05C2**		550	**S101_3.8 P71 BN71A2**		551
731	4.7	2.1	1.9	540	**S101_1.9 S1 M1SD4**	**S101_1.9 S1 ME1SB4**	550	**S101_1.9 P71 BN71B4**	**S101_1.9 P71 BE71B4**	551
878	3.9	2.5	3.2	520	**S101_3.2 S05 M05C2**		550	**S101_3.2 P71 BN71A2**		551
964	3.6	2.8	1.4	500	**S101_1.4 S1 M1SD4**	**S101_1.4 S1 ME1SB4**	550	**S101_1.4 P71 BN71B4**	**S101_1.4 P71 BE71B4**	551



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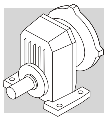
n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE1	IE2		IE1	IE2	
1124	3.1	2.6	2.5	480	**S101_2.5 S05 M05C2**		550	**S101_2.5 P71 BN71A2**		551
1499	2.3	3.5	1.9	440	**S101_1.9 S05 M05C2**		550	**S101_1.9 P71 BN71A2**		551
1977	1.8	4.6	1.4	410	**S101_1.4 S05 M05C2**		550	**S101_1.4 P71 BN71A2**		551

0.37 kW

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**	555
105	32.9	2.1	8.6	3800				
106	32.6	3.1	12.9	5650			**S501_12.9 P71 BXN71MB4**	559
110	31.3	1.6	12.4	3800			**S401_12.4 P71 BXN71MB4**	557
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**	557
133	26.0	1.2	10.3	2240	**S301_10.3 S10 MXN10B4**	554	**S301_10.3 P71 BXN71MB4**	555
154	22.5	1.3	8.9	2150	**S301_8.9 S10 MXN10B4**	554	**S301_8.9 P71 BXN71MB4**	555
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**	557
184	18.8	3.1	4.9	2040				
190	18.3	1.4	7.2	1460	**S201_7.2 S10 MXN10B4**	552	**S201_7.2 P71 BXN71MB4**	553
191	18.1	1.7	4.8	1460				
193	17.9	2.8	7.1	2020	**S301_7.1 S10 MXN10B4**	554	**S301_7.1 P71 BXN71MB4**	555
214	16.2	1.5	13.1	1960				
224	15.4	1.0	6.1	710	**S101_6.1 S10 MXN10B4**	550	**S101_6.1 P71 BXN71MB4**	551
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	**S301_5.8 P71 BXN71MB4**	555
235	14.7	1.8	5.8	1390	**S201_5.8 S10 MXN10B4**	552	**S201_5.8 P71 BXN71MB4**	553
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	**S201_4.8 P71 BXN71MB4**	553
290	11.9	1.0	4.7	670	**S101_4.7 S10 MXN10B4**	550	**S101_4.7 P71 BXN71MB4**	551
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	**S201_3.9 P71 BXN71MB4**	553
356	9.7	1.2	3.8	640	**S101_3.8 S10 MXN10B4**	550	**S101_3.8 P71 BXN71MB4**	551
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	**S101_3.2 P71 BXN71MB4**	551
440	7.9	3.3	3.1	1160	**S201_3.1 S10 MXN10B4**	552	**S201_3.1 P71 BXN71MB4**	553
460	7.5	1.6	6.1	610				



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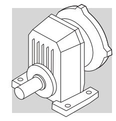
n2 min-1	M2 Nm	S	i	Rn2 N	IE3		IE3	
480	7.2	2.8	1.9	1130				
483	7.2	2.9	5.8	1130				
485	7.1	1.7	1.9	590				
548	6.3	1.6	2.5	580	S101_2.5 S10 MXN10B4	550	S101_2.5 P71 BXN71MB4	551
594	5.8	1.7	4.7	570				
640	5.4	2.2	1.4	550				
731	4.7	2.1	3.8	540				
731	4.7	2.1	1.9	540	S101_1.9 S10 MXN10B4	550	S101_1.9 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				

0.55 kW

n2 min-1	M2 Nm	S	i	Rn2 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	S501_12.9 P80 BE80A4	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	S401_12.4 P80 BE80A4	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	S401_10.7 P80 BE80A4	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	S501_10.5 P80 BE80A4	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	S301_8.9 P80 BE80A4	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	S501_8.8 P80 BE80A4	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	S401_8.6 P80 BE80A4	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	S201_7.2 P80 BE80A4	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	S401_7.2 P80 BE80A4	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	S301_7.1 P80 BE80A4	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	S301_5.8 P80 BE80A4	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	S201_5.8 P80 BE80A4	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	S301_4.9 P80 BE80A4	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	S201_4.8 P80 BE80A4	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**		556	**S401_8.6 P71 BN71B2**		557
350	14.7	3.4	3.9	1650	**S301_3.9 S1 M1LA4**	**S301_3.9 S2 ME2SA4**	554	**S301_3.9 P80 BN80A4**	**S301_3.9 P80 BE80A4**	555
351	14.7	1.8	3.9	1190	**S201_3.9 S1 M1LA4**	**S201_3.9 S2 ME2SA4**	552	**S201_3.9 P80 BN80A4**	**S201_3.9 P80 BE80A4**	553
377	13.6	2.2	2.4	1160	**S201_2.4 S2 M2SA6**		552	**S201_2.4 P80 BN80B6**		553
389	13.2	1.6	7.2	1160	**S201_7.2 S1 M1SD2**		552	**S201_7.2 P71 BN71B2**		553
396	13.0	3.1	7.1	1600	**S301_7.1 S1 M1SD2**		554	**S301_7.1 P71 BN71B2**		555
407	12.6	0.9	6.9	570	**S101_6.9 S1 M1SD2**		550	**S101_6.9 P71 BN71B2**		551
431	11.9	1.0	3.2	560	**S101_3.2 S1 M1LA4**	**S101_3.2 S2 ME2SA4**	550	**S101_3.2 P80 BN80A4**	**S101_3.2 P80 BE80A4**	551
444	11.6	2.2	3.1	1120	**S201_3.1 S1 M1LA4**	**S201_3.1 S2 ME2SA4**	552	**S201_3.1 P80 BN80A4**	**S201_3.1 P80 BE80A4**	553
460	11.2	1.1	6.1	570	**S101_6.1 S1 M1SD2**		550	**S101_6.1 P71 BN71B2**		551
483	10.7	2.0	5.8	1100	**S201_5.8 S1 M1SD2**		552	**S201_5.8 P71 BN71B2**		553
486	10.6	1.9	1.9	1080	**S201_1.9 S2 M2SA6**		552	**S201_1.9 P80 BN80B6**		553
491	10.5	1.1	1.9	540	**S101_1.9 S2 M2SA6**		550	**S101_1.9 P80 BN80B6**		551
504	10.2	3.4	1.8	1470	**S301_1.8 S2 M2SA6**		554	**S301_1.8 P80 BN80B6**		555
552	9.3	1.1	2.5	540	**S101_2.5 S1 M1LA4**	**S101_2.5 S2 ME2SA4**	550	**S101_2.5 P80 BN80A4**	**S101_2.5 P80 BE80A4**	551
566	9.1	2.9	2.4	1050	**S201_2.4 S1 M1LA4**	**S201_2.4 S2 ME2SA4**	552	**S201_2.4 P80 BN80A4**	**S201_2.4 P80 BE80A4**	553
589	8.7	2.4	4.8	1040	**S201_4.8 S1 M1SD2**		552	**S201_4.8 P71 BN71B2**		553
594	8.7	1.2	4.7	540	**S101_4.7 S1 M1SD2**		550	**S101_4.7 P71 BN71B2**		551
647	8.0	1.5	1.4	510	**S101_1.4 S2 M2SA6**		550	**S101_1.4 P80 BN80B6**		551
661	7.8	2.6	1.4	990	**S201_1.4 S2 M2SA6**		552	**S201_1.4 P80 BN80B6**		553
714	7.2	2.9	3.9	980	**S201_3.9 S1 M1SD2**		552	**S201_3.9 P71 BN71B2**		553
728	7.1	2.4	1.9	970	**S201_1.9 S1 M1LA4**	**S201_1.9 S2 ME2SA4**	552	**S201_1.9 P80 BN80A4**	**S201_1.9 P80 BE80A4**	553
731	7.0	1.4	3.8	510	**S101_3.8 S1 M1SD2**		550	**S101_3.8 P71 BN71B2**		551
736	7.0	1.4	1.9	500	**S101_1.9 S1 M1LA4**	**S101_1.9 S2 ME2SA4**	550	**S101_1.9 P80 BN80A4**	**S101_1.9 P80 BE80A4**	551
878	5.9	1.7	3.2	490	**S101_3.2 S1 M1SD2**		550	**S101_3.2 P71 BN71B2**		551
971	5.3	1.9	1.4	470	**S101_1.4 S1 M1LA4**	**S101_1.4 S2 ME2SA4**	550	**S101_1.4 P80 BN80A4**	**S101_1.4 P80 BE80A4**	551
992	5.2	3.3	1.4	890				**S201_1.4 P80 BN80A4**	**S201_1.4 P80 BE80A4**	553
1124	4.6	1.7	2.5	460	**S101_2.5 S1 M1SD2**		550	**S101_2.5 P71 BN71B2**		551
1499	3.4	2.3	1.9	430	**S101_1.9 S1 M1SD2**		550	**S101_1.9 P71 BN71B2**		551
1977	2.6	3.1	1.4	390	**S101_1.4 S1 M1SD2**		550	**S101_1.4 P71 BN71B2**		551

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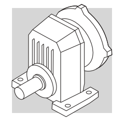
n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE3		IE3	
71	72.1	1.4	12.9	6290				
86	59.7	1.0	10.7	3800				
88	58.5	2.0	10.5	5910				
105	49.1	2.5	8.8	5600				
107	48.3	1.4	8.6	3800				
107	48.1	2.1	12.9	5560			**S501_12.9 P80 BXN80MA4**	559
111	46.3	1.1	12.4	3800			**S401_12.4 P80 BXN80MA4**	557
124	41.4	3.4	7.4	5310				
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				

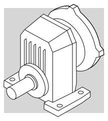
0.55 kW

n_2 min-1	M_2 Nm	S	i	R_{n2} N	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				
193	26.7	3.0	7.2	3350			S401_7.2 P80 BXN80MA4	557
195	26.4	1.9	7.1	1940			S301_7.1 P80 BXN80MA4	555
214	24.0	1.0	13.1	1900				
218	23.6	3.4	12.9	4460				
227	22.7	1.8	12.4	3190				
233	22.1	2.6	3.9	1850				
234	22.0	1.4	3.9	1300				
236	21.8	2.3	5.8	1840			S301_5.8 P80 BXN80MA4	555
237	21.7	1.2	5.8	1310	S201_5.8 S20 MXN20A4	552	S201_5.8 P80 BXN80MA4	553
263	19.5	2.0	10.7	3040				
273	18.9	1.3	10.3	1780				
280	18.4	2.7	4.9	1760			S301_4.9 P80 BXN80MA4	555
289	17.8	1.5	4.8	1250	S201_4.8 S20 MXN20A4	552	S201_4.8 P80 BXN80MA4	553
296	17.4	1.7	3.1	1230				
300	17.1	3.4	3.1	1720				
316	16.3	1.5	8.9	1700				
325	15.8	3.0	8.6	2850				
350	14.7	3.4	3.9	1650			S301_3.9 P80 BXN80MA4	555
351	14.7	1.8	3.9	1190	S201_3.9 S20 MXN20A4	552	S201_3.9 P80 BXN80MA4	553
377	13.6	2.2	2.4	1160				
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	S101_3.2 S20 MXN20A4	550	S101_3.2 P80 BXN80MA4	551
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				
552	9.3	1.1	2.5	540	S101_2.5 S20 MXN20A4	550	S101_2.5 P80 BXN80MA4	551
566	9.1	2.9	2.4	1050	S201_2.4 S20 MXN20A4	552	S201_2.4 P80 BXN80MA4	553
589	8.7	2.4	4.8	1040				
594	8.7	1.2	4.7	540				
647	8.0	1.5	1.4	510				
661	7.8	2.6	1.4	990				
714	7.2	2.9	3.9	980				
728	7.1	2.4	1.9	970	S201_1.9 S20 MXN20A4	552	S201_1.9 P80 BXN80MA4	553
731	7.0	1.4	3.8	510				
736	7.0	1.4	1.9	500	S101_1.9 S20 MXN20A4	550	S101_1.9 P80 BXN80MA4	551
878	5.9	1.7	3.2	490				
971	5.3	1.9	1.4	470	S101_1.4 S20 MXN20A4	550	S101_1.4 P80 BXN80MA4	551
992	5.2	3.3	1.4	890			S201_1.4 P80 BXN80MA4	
1124	4.6	1.7	2.5	460				
1499	3.4	2.3	1.9	430				
1977	2.6	3.1	1.4	390			S101_1.4 P71 BN71B2	551



0.75 kW

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

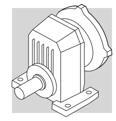


0.75 kW

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**	550	**S101_1.4 P80 BE80B4**	**S101_1.4 P80 BX80B4**	551
1028	6.8	2.5	1.4	860	**S201_1.4 S2 ME2SB4**	**S201_1.4 S2 MX2SB4**	552	**S201_1.4 P80 BE80B4**	**S201_1.4 P80 BX80B4**	553
1140	6.2	1.3	2.5	440	**S101_2.5 S2 ME2SA2**		550	**S101_2.5 P80 BE80A2**		551
1169	6.0	3.5	2.4	840	**S201_2.4 S2 ME2SA2**		552	**S201_2.4 P80 BE80A2**		553
1504	4.7	2.8	1.9	780	**S201_1.9 S2 ME2SA2**		552	**S201_1.9 P80 BE80A2**		553
1520	4.6	1.7	1.9	410	**S101_1.9 S2 ME2SA2**		550	**S101_1.9 P80 BE80A2**		551
2006	3.5	2.3	1.4	380	**S101_1.4 S2 ME2SA2**		550	**S101_1.4 P80 BE80A2**		551

0.75 kW

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**	559
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**	557
137	51	2.1	10.5	5130			**S501_10.5 P80 BXN80MB4**	559
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**	559
166	42	1.4	8.6	3460			**S401_8.6 P80 BXN80MB4**	557
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**	557
202	35	1.4	7.1	1860			**S301_7.1 P80 BXN80MB4**	555
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**	557
238	29	2.0	3.9	1780				
245	29	1.7	5.8	1780			**S301_5.8 P80 BXN80MB4**	555
246	29	0.9	5.8	1160	**S201_5.8 S20 MXN20B4**	552	**S201_5.8 P80 BXN80MB4**	553
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**	555
300	23	1.1	4.8	1180	**S201_4.8 S20 MXN20B4**	552	**S201_4.8 P80 BXN80MB4**	553
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**	555
364	19.3	1.3	3.9	1130	**S201_3.9 S20 MXN20B4**	552	**S201_3.9 P80 BXN80MB4**	553
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**	552	**S201_3.1 P80 BXN80MB4**	553
467	15.0	3.3	3.1	1490		554	**S301_3.1 P80 BXN80MB4**	555
488	14.4	2.8	5.8	1480				555
490	14.3	1.5	5.8	1060				
496	14.1	1.4	1.9	1040				
515	13.6	2.6	1.8	1440				

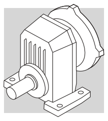


0.75 kW

n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE3		IE3	
578	12.1	3.3	4.9	1410				
587	11.9	2.2	2.4	1010	**S201_2.4 S20 MXN20B4**	552	**S201_2.4 P80 BXN80MB4**	553
591	11.9	4.2	2.4	1380			**S301_2.4 P80 BXN80MB4**	555
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				
725	9.7	2.2	3.9	960				
741	9.5	1.1	3.8	480				
755	9.3	1.8	1.9	940	**S201_1.9 S20 MXN20B4**	552	**S201_1.9 P80 BXN80MB4**	553
763	9.2	1.1	1.9	460	**S101_1.9 S20 MXN20B4**	550	**S101_1.9 P80 BXN80MB4**	551
783	8.9	3.4	1.8	1280			**S301_1.8 P80 BXN80MB4**	555
891	7.9	1.3	3.2	460				
916	7.7	2.7	3.1	900				
1006	7.0	1.4	1.4	440	**S101_1.4 S20 MXN20B4**	550	**S101_1.4 P80 BXN80MB4**	551
1028	6.8	2.5	1.4	860	**S201_1.4 S20 MXN20B4**	552	**S201_1.4 P80 BXN80MB4**	553
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**		558	**S501_10.5 P100 BE100M6**		559
108	96	1.3	8.8	5380	**S501_8.8 S3 ME3LA6**		558	**S501_8.8 P100 BE100M6**		559
111	93	1.1	12.9	5320	**S501_12.9 S3 ME3SA4**	**S501_12.9 S3 MX3SA4**	558	**S501_12.9 P90 BE90S4**	**S501_12.9 P90 BX90S4**	559
128	81	1.7	7.4	5120	**S501_7.4 S3 ME3LA6**		558	**S501_7.4 P100 BE100M6**		559
132	78	1.2	7.2	3550	**S401_7.2 S3 ME3LA6**		556	**S401_7.2 P100 BE100M6**		557
137	76	1.5	10.5	5020	**S501_10.5 S3 ME3SA4**	**S501_10.5 S3 MX3SA4**	558	**S501_10.5 P90 BE90S4**	**S501_10.5 P90 BX90S4**	559
156	66	1.6	6.1	3400	**S401_6.1 S3 ME3LA6**		556	**S401_6.1 P100 BE100M6**		557
156	66	2.3	6.1	4840	**S501_6.1 S3 ME3LA6**		558	**S501_6.1 P100 BE100M6**		559
163	64	1.7	8.8	4770	**S501_8.8 S3 ME3SA4**	**S501_8.8 S3 MX3SA4**	558	**S501_8.8 P90 BE90S4**	**S501_8.8 P90 BX90S4**	559
166	63	1.0	8.6	3350	**S401_8.6 S3 ME3SA4**	**S401_8.6 S3 MX3SA4**	556	**S401_8.6 P90 BE90S4**	**S401_8.6 P90 BX90S4**	557
192	54	1.1	4.9	1740	**S301_4.9 S3 ME3LA6**		554	**S301_4.9 P100 BE100M6**		555
193	54	2.4	7.4	4530	**S501_7.4 S3 ME3SA4**	**S501_7.4 S3 MX3SA4**	558	**S501_7.4 P90 BE90S4**	**S501_7.4 P90 BX90S4**	559
196	53	2.0	4.8	3200	**S401_4.8 S3 ME3LA6**		556	**S401_4.8 P100 BE100M6**		557
200	52	1.5	7.2	3180	**S401_7.2 S3 ME3SA4**	**S401_7.2 S3 MX3SA4**	556	**S401_7.2 P90 BE90S4**	**S401_7.2 P90 BX90S4**	557
202	51	1.0	7.1	1730	**S301_7.1 S3 ME3SA4**	**S301_7.1 S3 MX3SA4**	554	**S301_7.1 P90 BE90S4**	**S301_7.1 P90 BX90S4**	555
220	47	1.7	12.9	4350	**S501_12.9 S2 ME2SB2**		558	**S501_12.9 P80 BE80B2**		559
236	44	2.0	6.1	3040	**S401_6.1 S3 ME3SA4**	**S401_6.1 S3 MX3SA4**	556	**S401_6.1 P90 BE90S4**	**S401_6.1 P90 BX90S4**	557
236	44	3.0	6.1	4270	**S501_6.1 S3 ME3SA4**	**S501_6.1 S3 MX3SA4**	558	**S501_6.1 P90 BE90S4**	**S501_6.1 P90 BX90S4**	559
240	43	1.3	3.9	1670	**S301_3.9 S3 ME3LA6**		554	**S301_3.9 P100 BE100M6**		555
245	42	1.2	5.8	1670	**S301_5.8 S3 ME3SA4**	**S301_5.8 S3 MX3SA4**	554	**S301_5.8 P90 BE90S4**	**S301_5.8 P90 BX90S4**	555
248	42	2.5	3.8	2990	**S401_3.8 S3 ME3LA6**		556	**S401_3.8 P100 BE100M6**		557
265	39	1.0	10.7	2930	**S401_10.7 S2 ME2SB2**		556	**S401_10.7 P80 BE80B2**		557
271	38	2.2	10.5	4090	**S501_10.5 S2 ME2SB2**		558	**S501_10.5 P80 BE80B2**		559
290	36	1.4	4.9	1610	**S301_4.9 S3 ME3SA4**	**S301_4.9 S3 MX3SA4**	554	**S301_4.9 P90 BE90S4**	**S301_4.9 P90 BX90S4**	555
296	35	2.6	4.8	2850	**S401_4.8 S3 ME3SA4**	**S401_4.8 S3 MX3SA4**	556	**S401_4.8 P90 BE90S4**	**S401_4.8 P90 BX90S4**	557
309	33	1.7	3.1	1580	**S301_3.1 S3 ME3LA6**		554	**S301_3.1 P100 BE100M6**		555
310	33	3.2	3.1	2810	**S401_3.1 S3 ME3LA6**		556	**S401_3.1 P100 BE100M6**		557
323	32	2.7	8.8	3870	**S501_8.8 S2 ME2SB2**		558	**S501_8.8 P80 BE80B2**		559
328	31	1.5	8.6	2760	**S401_8.6 S2 ME2SB2**		556	**S401_8.6 P80 BE80B2**		557

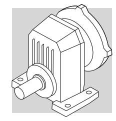


1.1 kW

n_2 min-1	M_2 Nm	S	i	R_{n2} 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		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**	559
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**	559
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**	559
166	63	1.0	8.6	3350			**S401_8.6 P90 BXN90S4**	557
192	54	1.1	4.9	1740				
193	54	2.4	7.4	4530			**S501_7.4 P90 BXN90S4**	559
196	53	2.0	4.8	3200				
200	52	1.5	7.2	3180			**S401_7.2 P90 BXN90S4**	557
202	51	1.0	7.1	1730			**S301_7.1 P90 BXN90S4**	555
220	47	1.7	12.9	4350				
236	44	2.0	6.1	3040			**S401_6.1 P90 BXN90S4**	557
236	44	3.0	6.1	4270			**S501_6.1 P90 BXN90S4**	559
240	43	1.3	3.9	1670				



1.1 kW

n2 min-1	M2 Nm	S	i	Rn2 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

n2 min-1	M2 Nm	S	i	Rn2 N	IE2	IE3		IE2	IE3	
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	S501_10.5 P90 BX90LA4	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	S501_8.8 P90 BX90LA4	559
193	73	1.8	7.4	4440	S501_7.4 S3 ME3SB4	S501_7.4 S3 MX3SB4	558	S501_7.4 P90 BE90LA4	S501_7.4 P90 BX90LA4	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	S401_7.2 P90 BX90LA4	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	S401_6.1 P90 BX90LA4	557

1.5 kW

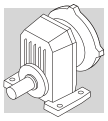
n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE2	IE3		IE2	IE3	
236	59	2.2	6.1	4190	**S501_6.1 S3 ME3SB4**	**S501_6.1 S3 MX3SB4**	558	**S501_6.1 P90 BE90LA4**	**S501_6.1 P90 BX90LA4**	559
248	57	1.9	3.8	2880	**S401_3.8 S3 ME3LB6**		556	**S401_3.8 P100 BE100LA6**		557
273	51	1.7	10.5	4020	**S501_10.5 S3 ME3SA2**		558	**S501_10.5 P90 BE90SA2**		559
290	48	1.0	4.9	1500	**S301_4.9 S3 ME3SB4**	**S301_4.9 S3 MX3SB4**	554	**S301_4.9 P90 BE90LA4**	**S301_4.9 P90 BX90LA4**	555
296	47	1.9	4.8	2770	**S401_4.8 S3 ME3SB4**	**S401_4.8 S3 MX3SB4**	556	**S401_4.8 P90 BE90LA4**	**S401_4.8 P90 BX90LA4**	557
301	47	3.2	4.8	3890	**S501_4.8 S3 ME3SB4**	**S501_4.8 S3 MX3SB4**	558	**S501_4.8 P90 BE90LA4**	**S501_4.8 P90 BX90LA4**	559
309	45	1.3	3.1	1470	**S301_3.1 S3 ME3LB6**		554	**S301_3.1 P100 BE100LA6**		555
310	45	2.3	3.1	2720	**S401_3.1 S3 ME3LB6**		556	**S401_3.1 P100 BE100LA6**		557
326	43	2.0	8.8	3820	**S501_8.8 S3 ME3SA2**		558	**S501_8.8 P90 BE90SA2**		559
331	42	1.1	8.6	2700	**S401_8.6 S3 ME3SA2**		556	**S401_8.6 P90 BE90SA2**		557
363	39	1.3	3.9	1440	**S301_3.9 S3 ME3SB4**	**S301_3.9 S3 MX3SB4**	554	**S301_3.9 P90 BE90LA4**	**S301_3.9 P90 BX90LA4**	555
375	37	2.4	3.8	2590	**S401_3.8 S3 ME3SB4**	**S401_3.8 S3 MX3SB4**	556	**S401_3.8 P90 BE90LA4**	**S401_3.8 P90 BX90LA4**	557
386	36	2.7	7.4	3630	**S501_7.4 S3 ME3SA2**		558	**S501_7.4 P90 BE90SA2**		559
390	36	1.6	2.4	1400	**S301_2.4 S3 ME3LB6**		554	**S301_2.4 P100 BE100LA6**		555
395	36	3.0	2.4	2540	**S401_2.4 S3 ME3LB6**		556	**S401_2.4 P100 BE100LA6**		557
399	35	1.8	7.2	2560	**S401_7.2 S3 ME3SA2**		556	**S401_7.2 P90 BE90SA2**		557
403	35	1.1	7.1	1420	**S301_7.1 S3 ME3SA2**		554	**S301_7.1 P90 BE90SA2**		555
467	30	1.7	3.1	1360	**S301_3.1 S3 ME3SB4**	**S301_3.1 S3 MX3SB4**	554	**S301_3.1 P90 BE90LA4**	**S301_3.1 P90 BX90LA4**	555
468	30	3.0	3.1	2430	**S401_3.1 S3 ME3SB4**	**S401_3.1 S3 MX3SB4**	556	**S401_3.1 P90 BE90LA4**	**S401_3.1 P90 BX90LA4**	557
471	30	2.3	6.1	2440	**S401_6.1 S3 ME3SA2**		556	**S401_6.1 P90 BE90SA2**		557
488	29	1.4	5.8	1360	**S301_5.8 S3 ME3SA2**		554	**S301_5.8 P90 BE90SA2**		555
510	28	2.5	1.9	2350	**S401_1.9 S3 ME3LB6**		556	**S401_1.9 P100 BE100LA6**		557
518	27	1.3	1.8	1310	**S301_1.8 S3 ME3LB6**		554	**S301_1.8 P100 BE100LA6**		555
579	24	1.6	4.9	1310	**S301_4.9 S3 ME3SA2**		554	**S301_4.9 P90 BE90SA2**		555
587	24	1.1	2.4	870	**S201_2.4 S3 ME3SB4**	**S201_2.4 S3 MX3SB4**	552	**S201_2.4 P90 BE90LA4**	**S201_2.4 P90 BX90LA4**	553
591	24	2.1	2.4	1290	**S301_2.4 S3 ME3SB4**	**S301_2.4 S3 MX3SB4**	554	**S301_2.4 P90 BE90LA4**	**S301_2.4 P90 BX90LA4**	555
598	23	3.8	2.4	2200	**S401_2.4 S3 ME3SB4**	**S401_2.4 S3 MX3SB4**	556	**S401_2.4 P90 BE90LA4**	**S401_2.4 P90 BX90LA4**	557
671	21	1.7	1.4	1230	**S301_1.4 S3 ME3LB6**		554	**S301_1.4 P100 BE100LA6**		555
679	21	1.0	1.4	830	**S201_1.4 S3 ME3LB6**		552	**S201_1.4 P100 BE100LA6**		553
693	20	3.5	1.4	2150	**S401_1.4 S3 ME3LB6**		556	**S401_1.4 P100 BE100LA6**		557
724	19.4	2.1	3.9	1240	**S301_3.9 S3 ME3SA2**		554	**S301_3.9 P90 BE90SA2**		555
755	18.6	0.9	1.9	830	**S201_1.9 S3 ME3SB4**	**S201_1.9 S3 MX3SB4**	552	**S201_1.9 P90 BE90LA4**	**S201_1.9 P90 BX90LA4**	553
772	18.1	3.3	1.9	2090	**S401_1.9 S3 ME3SB4**	**S401_1.9 S3 MX3SB4**	556	**S401_1.9 P90 BE90LA4**	**S401_1.9 P90 BX90LA4**	557
783	17.9	1.7	1.8	1200	**S301_1.8 S3 ME3SB4**	**S301_1.8 S3 MX3SB4**	554	**S301_1.8 P90 BE90LA4**	**S301_1.8 P90 BX90LA4**	555
918	15.3	1.4	3.1	810	**S201_3.1 S3 ME3SA2**		552	**S201_3.1 P90 BE90SA2**		553
932	15.1	2.7	3.1	1160	**S301_3.1 S3 ME3SA2**		554	**S301_3.1 P90 BE90SA2**		555
1016	13.8	2.2	1.4	1110	**S301_1.4 S3 ME3SB4**	**S301_1.4 S3 MX3SB4**	554	**S301_1.4 P90 BE90LA4**	**S301_1.4 P90 BX90LA4**	555
1028	13.6	1.2	1.4	780	**S201_1.4 S3 ME3SB4**	**S201_1.4 S3 MX3SB4**	552	**S201_1.4 P90 BE90LA4**	**S201_1.4 P90 BX90LA4**	553
1171	12.0	1.8	2.4	770	**S201_2.4 S3 ME3SA2**		552	**S201_2.4 P90 BE90SA2**		553
1507	9.3	1.4	1.9	720	**S201_1.9 S3 ME3SA2**		552	**S201_1.9 P90 BE90SA2**		553
1563	9.0	2.7	1.8	1000	**S301_1.8 S3 ME3SA2**		554	**S301_1.8 P90 BE90SA2**		555
2009	7.0	1.1	1.4	320	**S101_1.4 S3 ME3SA2**		550	**S101_1.4 P90 BE90SA2**		551
2029	6.9	3.5	1.4	920	**S301_1.4 S3 ME3SA2**		554	**S301_1.4 P90 BE90SA2**		555
2052	6.8	1.9	1.4	670	**S201_1.4 S3 ME3SA2**		552	**S201_1.4 P90 BE90SA2**		553

1.5 kW

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**	559
193	73	1.8	7.4	4440			**S501_7.4 P90 BXN90L4**	559

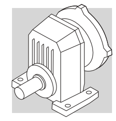
1.5 kW

n_2 min⁻¹	M_2 Nm	S	i	R_{n2} N	IE3		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

n2	M2	S	i	Rn2	IE2	IE3		IE2	IE3	
min-1	Nm			N						
201	140	1.3	4.8	4040	**S501_4.8 S4 ME4SB6**		558	**S501_4.8 P132 BE132S6**		559
238	119	1.1	6.1	3910	**S501_6.1 S3 ME3LB4**	**S501_6.1 S3 MX3LB4**	558	**S501_6.1 P100 BE100LB4**	**S501_6.1 P100 BX100LB4**	559
249	113	1.5	3.8	3840	**S501_3.8 S4 ME4SB6**		558	**S501_3.8 P132 BE132S6**		559
298	95	1.0	4.8	2490	**S401_4.8 S3 ME3LB4**	**S401_4.8 S3 MX3LB4**	556	**S401_4.8 P100 BE100LB4**	**S401_4.8 P100 BX100LB4**	557
303	93	1.6	4.8	3670	**S501_4.8 S3 ME3LB4**	**S501_4.8 S3 MX3LB4**	558	**S501_4.8 P100 BE100LB4**	**S501_4.8 P100 BX100LB4**	559
313	90	1.2	3.1	2440	**S401_3.1 S4 ME4SB6**		556	**S401_3.1 P132 BE132S6**		557
314	89	1.8	3.0	3630	**S501_3.0 S4 ME4SB6**		558	**S501_3.0 P132 BE132S6**		559
328	85	1.0	8.8	3600	**S501_8.8 S3 ME3LB2**		558	**S501_8.8 P100 BE100L2**		559
375	75	2.0	3.8	3470	**S501_3.8 S3 ME3LB4**	**S501_3.8 S3 MX3LB4**	558	**S501_3.8 P100 BE100LB4**	**S501_3.8 P100 BX100LB4**	559
378	75	1.2	3.8	2370	**S401_3.8 S3 ME3LB4**	**S401_3.8 S3 MX3LB4**	556	**S401_3.8 P100 BE100LB4**	**S401_3.8 P100 BX100LB4**	557
389	72	1.4	7.4	3440	**S501_7.4 S3 ME3LB2**		558	**S501_7.4 P100 BE100L2**		559
397	71	2.1	2.4	3390	**S501_2.4 S4 ME4SB6**		558	**S501_2.4 P132 BE132S6**		559
399	70	1.5	2.4	2320	**S401_2.4 S4 ME4SB6**		556	**S401_2.4 P132 BE132S6**		557
472	60	1.5	3.1	2250	**S401_3.1 S3 ME3LB4**	**S401_3.1 S3 MX3LB4**	556	**S401_3.1 P100 BE100LB4**	**S401_3.1 P100 BX100LB4**	557
473	60	2.3	3.0	3260	**S501_3.0 S3 ME3LB4**	**S501_3.0 S3 MX3LB4**	558	**S501_3.0 P100 BE100LB4**	**S501_3.0 P100 BX100LB4**	559
516	54	1.3	1.9	2170	**S401_1.9 S4 ME4SB6**		556	**S401_1.9 P132 BE132S6**		557
534	53	2.4	1.8	3120	**S501_1.8 S4 ME4SB6**		558	**S501_1.8 P132 BE132S6**		559
595	47	1.1	2.4	1080	**S301_2.4 S3 ME3LB4**	**S301_2.4 S3 MX3LB4**	554	**S301_2.4 P100 BE100LB4**	**S301_2.4 P100 BX100LB4**	555
596	47	1.5	4.8	2130	**S401_4.8 S3 ME3LB2**		556	**S401_4.8 P100 BE100L2**		557
598	47	2.8	2.4	3040	**S501_2.4 S3 ME3LB4**	**S501_2.4 S3 MX3LB4**	558	**S501_2.4 P100 BE100LB4**	**S501_2.4 P100 BX100LB4**	559
602	47	1.9	2.4	2120	**S401_2.4 S3 ME3LB4**	**S401_2.4 S3 MX3LB4**	556	**S401_2.4 P100 BE100LB4**	**S401_2.4 P100 BX100LB4**	557
606	46	2.6	4.8	3030	**S501_4.8 S3 ME3LB2**		558	**S501_4.8 P100 BE100L2**		559
672	42	3.0	1.4	2920	**S501_1.4 S4 ME4SB6**		558	**S501_1.4 P132 BE132S6**		559
700	40	1.7	1.4	2010	**S401_1.4 S4 ME4SB6**		556	**S401_1.4 P132 BE132S6**		557
730	38	1.0	3.9	1070	**S301_3.9 S3 ME3LB2**		554	**S301_3.9 P100 BE100L2**		555
755	37	1.9	3.8	2000	**S401_3.8 S3 ME3LB2**		556	**S401_3.8 P100 BE100L2**		557
778	36	1.7	1.9	1970	**S401_1.9 S3 ME3LB4**	**S401_1.9 S3 MX3LB4**	556	**S401_1.9 P100 BE100LB4**	**S401_1.9 P100 BX100LB4**	557
789	36	0.8	1.8	900	**S301_1.8 S3 ME3LB4**	**S301_1.8 S3 MX3LB4**	554	**S301_1.8 P100 BE100LB4**	**S301_1.8 P100 BX100LB4**	555
805	35	3.1	1.8	2780	**S501_1.8 S3 ME3LB4**	**S501_1.8 S3 MX3LB4**	558	**S501_1.8 P100 BE100LB4**	**S501_1.8 P100 BX100LB4**	559
940	30	1.3	3.1	1020	**S301_3.1 S3 ME3LB2**		554	**S301_3.1 P100 BE100L2**		555
943	30	2.4	3.1	1880	**S401_3.1 S3 ME3LB2**		556	**S401_3.1 P100 BE100L2**		557
1023	28	1.1	1.4	980	**S301_1.4 S3 ME3LB4**	**S301_1.4 S3 MX3LB4**	554	**S301_1.4 P100 BE100LB4**	**S301_1.4 P100 BX100LB4**	555
1056	27	2.2	1.4	1820	**S401_1.4 S3 ME3LB4**	**S401_1.4 S3 MX3LB4**	556	**S401_1.4 P100 BE100LB4**	**S401_1.4 P100 BX100LB4**	557
1190	24	1.7	2.4	980	**S301_2.4 S3 ME3LB2**		554	**S301_2.4 P100 BE100L2**		555
1204	23	3.0	2.4	1760	**S401_2.4 S3 ME3LB2**		556	**S401_2.4 P100 BE100L2**		557
1555	18.1	2.7	1.9	1630	**S401_1.9 S3 ME3LB2**		556	**S401_1.9 P100 BE100L2**		557
1577	17.8	1.3	1.8	910	**S301_1.8 S3 ME3LB2**		554	**S301_1.8 P100 BE100L2**		555
2046	13.7	1.7	1.4	850	**S301_1.4 S3 ME3LB2**		554	**S301_1.4 P100 BE100L2**		555
2070	13.6	1.0	1.4	580	**S201_1.4 S3 ME3LB2**		552	**S201_1.4 P100 BE100L2**		553

4 kW

n2	M2	S	i	Rn2	IE2	IE3		IE2	IE3	
min-1	Nm			N						
203	184	0.9	4.8	3810	**S501_4.8 S4 ME4LA6**		558	**S501_4.8 P132 BE132MA6**		559
251	149	1.2	3.8	3650	**S501_3.8 S4 ME4LA6**		558	**S501_3.8 P132 BE132MA6**		559
303	126	1.2	4.8	3530	**S501_4.8 S4 ME4SA4**	**S501_4.8 S4 MX4SA4**	558	**S501_4.8 P112 BE112M4**	**S501_4.8 P112 BX112M4**	559
317	118	1.4	3.0	3470	**S501_3.0 S4 ME4LA6**		558	**S501_3.0 P132 BE132MA6**		559
375	102	1.5	3.8	3360	**S501_3.8 S4 ME4SA4**	**S501_3.8 S4 MX4SA4**	558	**S501_3.8 P112 BE112M4**	**S501_3.8 P112 BX112M4**	559
392	96	1.0	7.4	3320	**S501_7.4 S4 ME4SA2**		558	**S501_7.4 P112 BE112M2**		559
401	93	1.6	2.4	3270	**S501_2.4 S4 ME4LA6**		558	**S501_2.4 P132 BE132MA6**		559
472	81	1.1	3.1	2130	**S401_3.1 S4 ME4SA4**	**S401_3.1 S4 MX4SA4**	556	**S401_3.1 P112 BE112M4**	**S401_3.1 P112 BX112M4**	557
473	81	1.7	3.0	3170	**S501_3.0 S4 ME4SA4**	**S501_3.0 S4 MX4SA4**	558	**S501_3.0 P112 BE112M4**	**S501_3.0 P112 BX112M4**	559
479	78	1.3	6.1	3160	**S501_6.1 S4 ME4SA2**		558	**S501_6.1 P112 BE112M2**		559
521	72	1.0	1.9	2050	**S401_1.9 S4 ME4LA6**		556	**S401_1.9 P132 BE132MA6**		557

4 kW

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**		558	**S501_1.8 P132 BE132MA6**		559
598	64	2.0	2.4	2970	**S501_2.4 S4 ME4SA4**	**S501_2.4 S4 MX4SA4**	558	**S501_2.4 P112 BE112M4**	**S501_2.4 P112 BX112M4**	559
602	63	1.4	2.4	2030	**S401_2.4 S4 ME4SA4**	**S401_2.4 S4 MX4SA4**	556	**S401_2.4 P112 BE112M4**	**S401_2.4 P112 BX112M4**	557
611	61	2.0	4.8	2960	**S501_4.8 S4 ME4SA2**		558	**S501_4.8 P112 BE112M2**		559
679	55	2.3	1.4	2830	**S501_1.4 S4 ME4LA6**		558	**S501_1.4 P132 BE132MA6**		559
708	53	1.3	1.4	1920	**S401_1.4 S4 ME4LA6**		556	**S401_1.4 P132 BE132MA6**		557
755	50	2.4	3.8	2790	**S501_3.8 S4 ME4SA2**		558	**S501_3.8 P112 BE112M2**		559
761	49	1.4	3.8	1930	**S401_3.8 S4 ME4SA2**		556	**S401_3.8 P112 BE112M2**		557
778	49	1.2	1.9	1900	**S401_1.9 S4 ME4SA4**	**S401_1.9 S4 MX4SA4**	556	**S401_1.9 P112 BE112M4**	**S401_1.9 P112 BX112M4**	557
805	47	2.3	1.8	2730	**S501_1.8 S4 ME4SA4**	**S501_1.8 S4 MX4SA4**	558	**S501_1.8 P112 BE112M4**	**S501_1.8 P112 BX112M4**	559
953	39	2.8	3.0	2610	**S501_3.0 S4 ME4SA2**		558	**S501_3.0 P112 BE112M2**		559
950	39	1.8	3.1	1820	**S401_3.1 S4 ME4SA2**		556	**S401_3.1 P112 BE112M2**		557
1013	38	2.9	1.4	2560	**S501_1.4 S4 ME4SA4**	**S501_1.4 S4 MX4SA4**	558	**S501_1.4 P112 BE112M4**	**S501_1.4 P112 BX112M4**	559
1056	36	1.7	1.4	1760	**S401_1.4 S4 ME4SA4**	**S401_1.4 S4 MX4SA4**	556	**S401_1.4 P112 BE112M4**	**S401_1.4 P112 BX112M4**	557
1198	31	1.3	2.4	910	**S301_2.4 S4 ME4SA2**		554	**S301_2.4 P112 BE112M2**		555
1213	31	2.3	2.4	1710	**S401_2.4 S4 ME4SA2**		556	**S401_2.4 P112 BE112M2**		557
1566	24	2.0	1.9	1590	**S401_1.9 S4 ME4SA2**		556	**S401_1.9 P112 BE112M2**		557
1588	24	1.0	1.8	860	**S301_1.8 S4 ME4SA2**		554	**S301_1.8 P112 BE112M2**		555
2061	18.2	1.3	1.4	810	**S301_1.4 S4 ME4SA2**		554	**S301_1.4 P112 BE112M2**		555
2127	17.6	2.7	1.4	1460	**S401_1.4 S4 ME4SA2**		556	**S401_1.4 P112 BE112M2**		557

5.5 kW

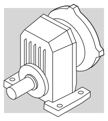
n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE2	IE3		IE2	IE3	
317	162	1.0	3.0	3260	**S501_3.0 S5 ME5SA6**		558	**S501_3.0 P160 BE160MA6**		559
380	136	1.1	3.8	3150	**S501_3.8 S4 ME4SB4**	**S501_3.8 S4 MX4SB4**	558	**S501_3.8 P132 BE132S4**	**S501_3.8 P132 BX132SB4**	559
401	128	1.2	2.4	3090	**S501_2.4 S5 ME5SA6**		558	**S501_2.4 P160 BE160MA6**		559
480	107	1.3	3.0	3000	**S501_3.0 S4 ME4SB4**	**S501_3.0 S4 MX4SB4**	558	**S501_3.0 P132 BE132S4**	**S501_3.0 P132 BX132SB4**	559
540	95	1.3	1.8	2880	**S501_1.8 S5 ME5SA6**		558	**S501_1.8 P160 BE160MA6**		559
606	85	1.5	2.4	2830	**S501_2.4 S4 ME4SB4**	**S501_2.4 S4 MX4SB4**	558	**S501_2.4 P132 BE132S4**	**S501_2.4 P132 BX132SB4**	559
611	84	1.1	2.4	1870	**S401_2.4 S4 ME4SB4**	**S401_2.4 S4 MX4SB4**	556	**S401_2.4 P132 BE132S4**	**S401_2.4 P132 BX132SB4**	557
616	84	1.4	4.8	2840	**S501_4.8 S4 ME4SB2**		558	**S501_4.8 P132 BE132SA2**		559
679	76	1.6	1.4	2720	**S501_1.4 S5 ME5SA6**		558	**S501_1.4 P160 BE160MA6**		559
708	73	1.0	1.4	1780				**S401_1.4 P160 BE160MA6**		557
761	68	1.8	3.8	2690	**S501_3.8 S4 ME4SB2**		558	**S501_3.8 P132 BE132SA2**		559
767	67	1.0	3.8	1810	**S401_3.8 S4 ME4SB2**		556	**S401_3.8 P132 BE132SA2**		557
788	65	0.9	1.9	1770	**S401_1.9 S4 ME4SB4**	**S401_1.9 S4 MX4SB4**	556	**S401_1.9 P132 BE132S4**	**S401_1.9 P132 BX132SB4**	557
817	63	1.7	1.8	2610	**S501_1.8 S4 ME4SB4**	**S501_1.8 S4 MX4SB4**	558	**S501_1.8 P132 BE132S4**	**S501_1.8 P132 BX132SB4**	559
958	54	1.3	3.1	1730	**S401_3.1 S4 ME4SB2**		556	**S401_3.1 P132 BE132SA2**		557
961	54	2.1	3.0	2530	**S501_3.0 S4 ME4SB2**		558	**S501_3.0 P132 BE132SA2**		559
1027	50	2.2	1.4	2450	**S501_1.4 S4 ME4SB4**	**S501_1.4 S4 MX4SB4**	558	**S501_1.4 P132 BE132S4**	**S501_1.4 P132 BX132SB4**	559
1071	48	1.2	1.4	1660	**S401_1.4 S4 ME4SB4**	**S401_1.4 S4 MX4SB4**	556	**S401_1.4 P132 BE132S4**	**S401_1.4 P132 BX132SB4**	557
1215	42	2.4	2.4	2370	**S501_2.4 S4 ME4SB2**		558	**S501_2.4 P132 BE132SA2**		559
1223	42	1.7	2.4	1640	**S401_2.4 S4 ME4SB2**		556	**S401_2.4 P132 BE132SA2**		557
1580	33	1.5	1.9	1530	**S401_1.9 S4 ME4SB2**		556	**S401_1.9 P132 BE132SA2**		557
1636	31	2.7	1.8	2170	**S501_1.8 S4 ME4SB2**		558	**S501_1.8 P132 BE132SA2**		559
2058	25	3.4	1.4	2030	**S501_1.4 S4 ME4SB2**		558	**S501_1.4 P132 BE132SA2**		559
2145	24	2.0	1.4	1410	**S401_1.4 S4 ME4SB2**		556	**S401_1.4 P132 BE132SA2**		557

7.5 kW

n_2 min-1	M_2 Nm	S	i	R_{n2} N	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

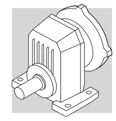
n_2 min-1	M_2 Nm	S	i	R_{n2} N	IE2	IE3		IE2	IE3	
602	144	0.9	2.4	2530	**S501_2.4 S4 ME4LB4**	**S501_2.4 S5 MX5SA4**	558	**S501_2.4 P132 BE132MB4**	**S501_2.4 P160 BX160MA4**	559
760	113	1.1	3.8	2470	**S501_3.8 S4 ME4LB2**		558	**S501_3.8 P132 BE132MB2**		559
811	107	1.0	1.8	2390	**S501_1.8 S4 ME4LB4**	**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



S 10 — 21 Nm

	i	n_1 = 2800 min^{-1} n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_1 = 1400 min^{-1} 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	

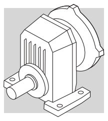
	i	n_1 = 900 min^{-1} n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_1 = 500 min^{-1} n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
S 10 1_1.4	1.4	634	12.0	0.81	800	450	352	14.0	0.53	800	560	551
S 10 1_1.9	1.9	479	12.0	0.61	800	520	266	14.0	0.40	800	640	
S 10 1_2.5	2.5	360	12.0	0.46	800	600	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	
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	553
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	

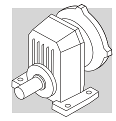
	i	n_1 = 900 min^{-1}					n_1 = 500 min^{-1}					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
S 20 1_1.4	1.4	647	20	1.4	1000	850	360	24	0.92	1000	1040	
S 20 1_1.9	1.9	476	20	1.0	1000	990	265	24	0.68	1000	1210	
S 20 1_2.4	2.4	369	30	1.2	990	990	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	553
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	



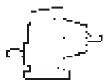
S 30 — 70 Nm

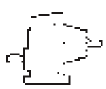
	i	n_1 = 2800 min^{-1}					n_1 = 1400 min^{-1}					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
S 30 1_1.4	1.4	1986	24	5.1	1500	770	993	30	3.2	1500	970	
S 30 1_1.8	1.8	1530	24	3.9	1500	870	765	30	2.5	1500	1090	
S 30 1_2.4	2.4	1157	40	4.9	1270	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	555
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	

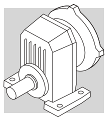
	i	n_1 = 900 min^{-1}					n_1 = 500 min^{-1}					
		n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	n_2 min^{-1}	M_{n2} Nm	P_{n1} kW	R_{n1} N	R_{n2} N	
S 30 1_1.4	1.4	638	35	2.4	1500	1120	355	42	1.6	1500	1360	
S 30 1_1.8	1.8	492	35	1.8	1500	1260	273	42	1.2	1500	1540	
S 30 1_2.4	2.4	372	58	2.3	1500	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	555
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	
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	557
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	
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	557
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	
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	559
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	
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	559
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.

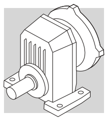
When selecting a gearmotor, refer to procedure specified at paragraph 12 and observe particularly the condition $S \geq f_s$.

(E 69)

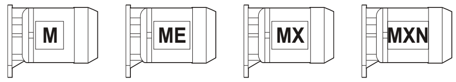
		IEC_ BN BE BX BXN (IM B5)													
		BN	BE	BXN	BN	BE	BXN	BN	BE	BX	BXN	BN	BE	BX	BXN
P_{n1}(#) [kW]	2p	0.37	—	—	0.75	—	—	1.5	1.1	—	—	2.2	2.2	—	—
	4p	0.25	0.18	0.18	0.55	0.37	0.37	1.1	0.75	0.75	0.75	1.85	1.5	1.5	1.5
	6p	0.12	—	—	0.37	—	—	0.75	—	—	—	1.1	0.75	—	—
		P63			**P71**			**P80**				**P90**			
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_ BN BE BX (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 Jr [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) [kgm²]							
		[compact]	IEC						[gearbox]
			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) [kgm2]							
			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

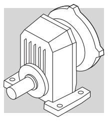
	i	J (•10-4) [kgm2]								
			IEC							
			63	71	80	90	100	112	132	
S 30 1_1.4	1.4	1.5	—	—	4.3	4.3	5.6	5.6	18	3.8
S 30 1_1.8	1.8	1.1	—	—	3.9	3.8	5.1	5.1	18	3.4
S 30 1_2.4	2.4	0.59	2.1	2.0	3.4	3.4	4.7	4.7	17	2.9
S 30 1_3.1	3.1	0.45	1.9	1.9	3.3	3.2	4.5	4.5	17	2.8
S 30 1_3.9	3.9	0.33	1.8	1.8	3.2	3.1	4.4	4.4	17	2.7
S 30 1_4.9	4.9	0.24	1.7	1.7	3.1	3.0	4.3	4.3	17	2.6
S 30 1_5.8	5.8	0.19	1.7	1.7	3.0	3.0	4.3	4.3	—	2.6
S 30 1_7.1	7.1	0.14	1.6	1.6	3.0	2.9	4.2	4.2	—	2.5
S 30 1_8.9	8.9	0.10	1.6	1.6	2.9	2.9	4.2	4.2	—	2.5
S 30 1_10.3	10.3	0.08	1.5	1.5	2.9	2.9	4.2	4.2	—	2.4
S 30 1_13.1	13.1	0.05	1.5	1.5	2.9	2.8	4.1	4.1	—	2.4

S 40

	i	J (•10-4) [kgm2]								
			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

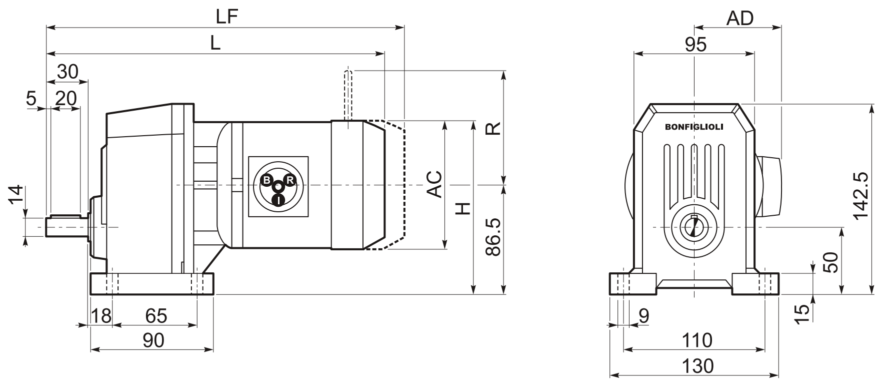
	i	J (•10-4) [kgm2]										
			IEC									
			63	71	80	90	100	112	132	160	180	
S 50 1_1.4	1.4	8.2	—	—	11	11	12	12	27	86	84	19
S 50 1_1.8	1.8	5.9	—	—	8.8	8.7	10	10	25	84	82	16
S 50 1_2.4	2.4	3.9	—	—	6.8	6.7	8.0	8.0	23	82	80	14
S 50 1_3.0	3.0	2.7	—	—	5.5	5.5	6.8	6.8	22	81	79	13
S 50 1_3.8	3.8	1.9	3.3	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

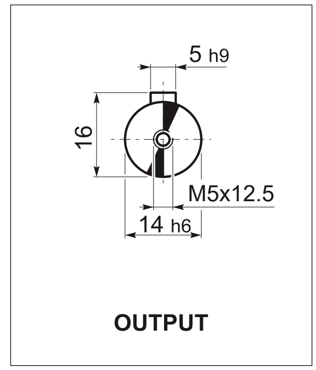


78 DIMENSIONS

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

P





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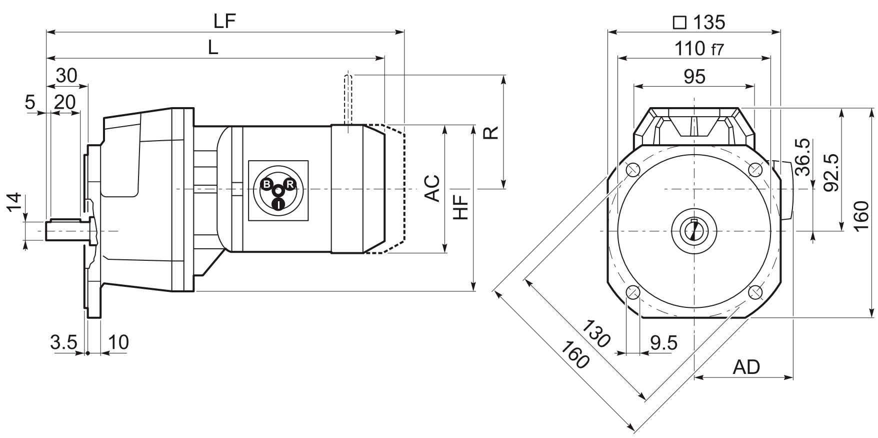
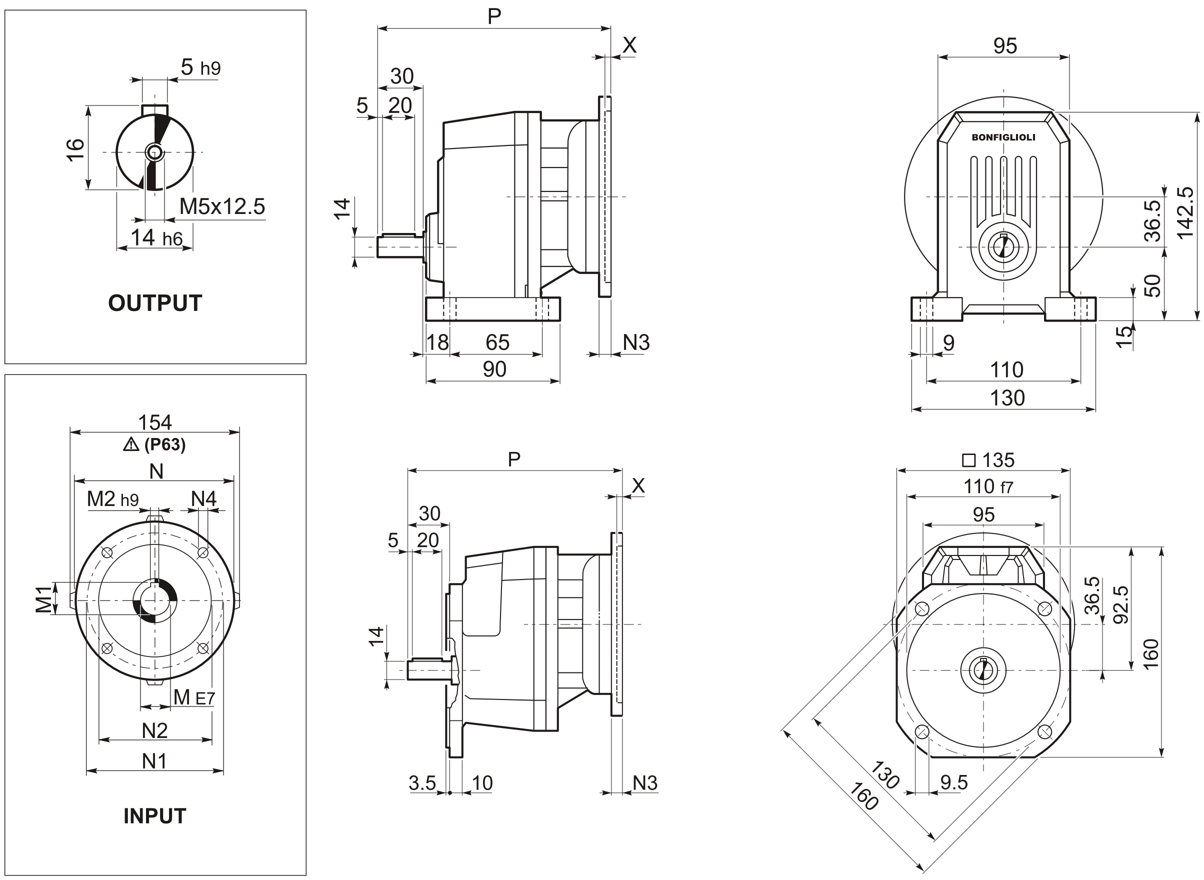


			AC	H	HF	L	AD	kg	M...FD M...FA LF	kg	M...FD R	M...FD AD	M...FA R	M...FA AD
S 10 1	S05	M05	121	147	143	315	95	8	381	11	96	122	116	95
S 10 1	S05	ME05	121	147	143	315	95	8	381	11	96	119	116	119
S 10 1	S05	MXN05	123	148	143	361.5	136	9.8	408.5	10.9	96	136	116	136
S 10 1	S1	M1	137	155	151	344	102	10	405	13	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)

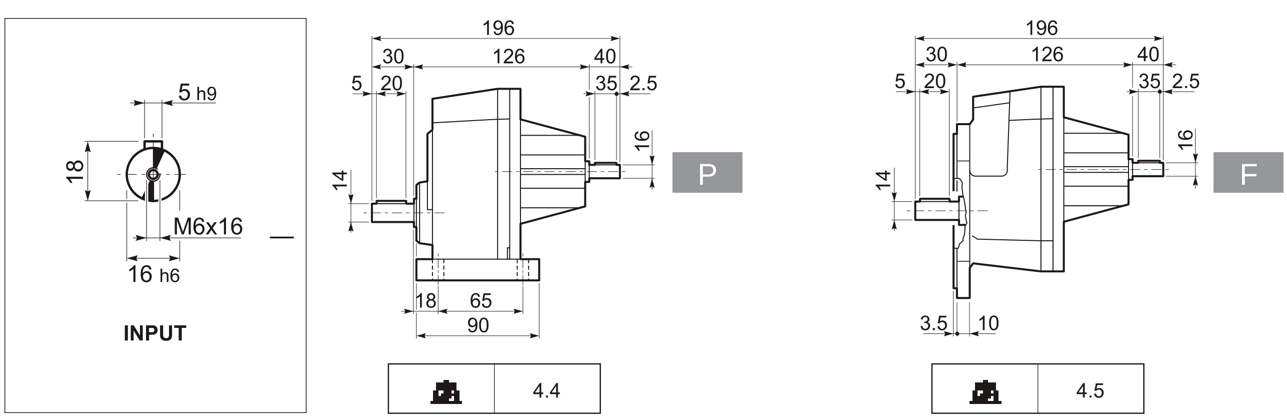


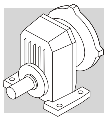
P

F

		M	M1	M2	N	N1	N2	N3	N4	P	X	
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

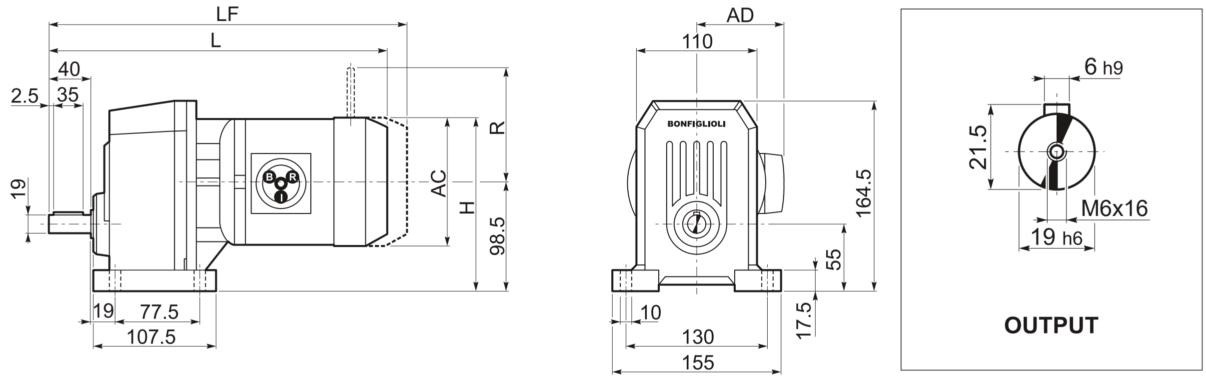
S 10...HS





S 20...M/ME/MX/MXN

P



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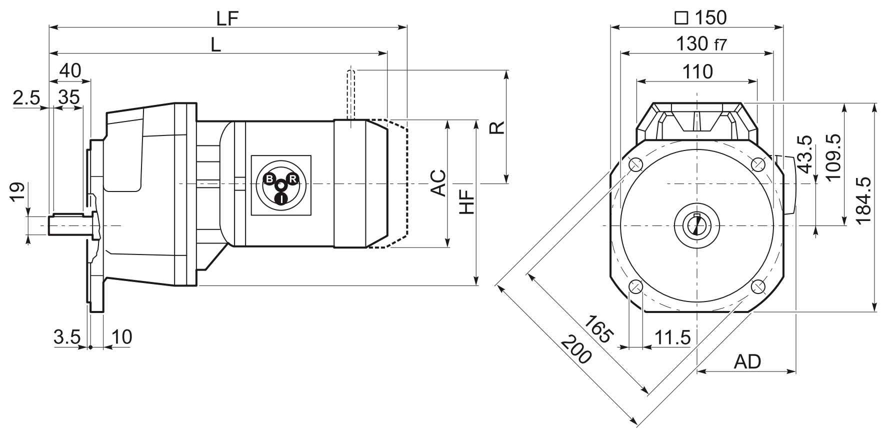
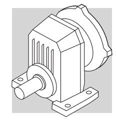
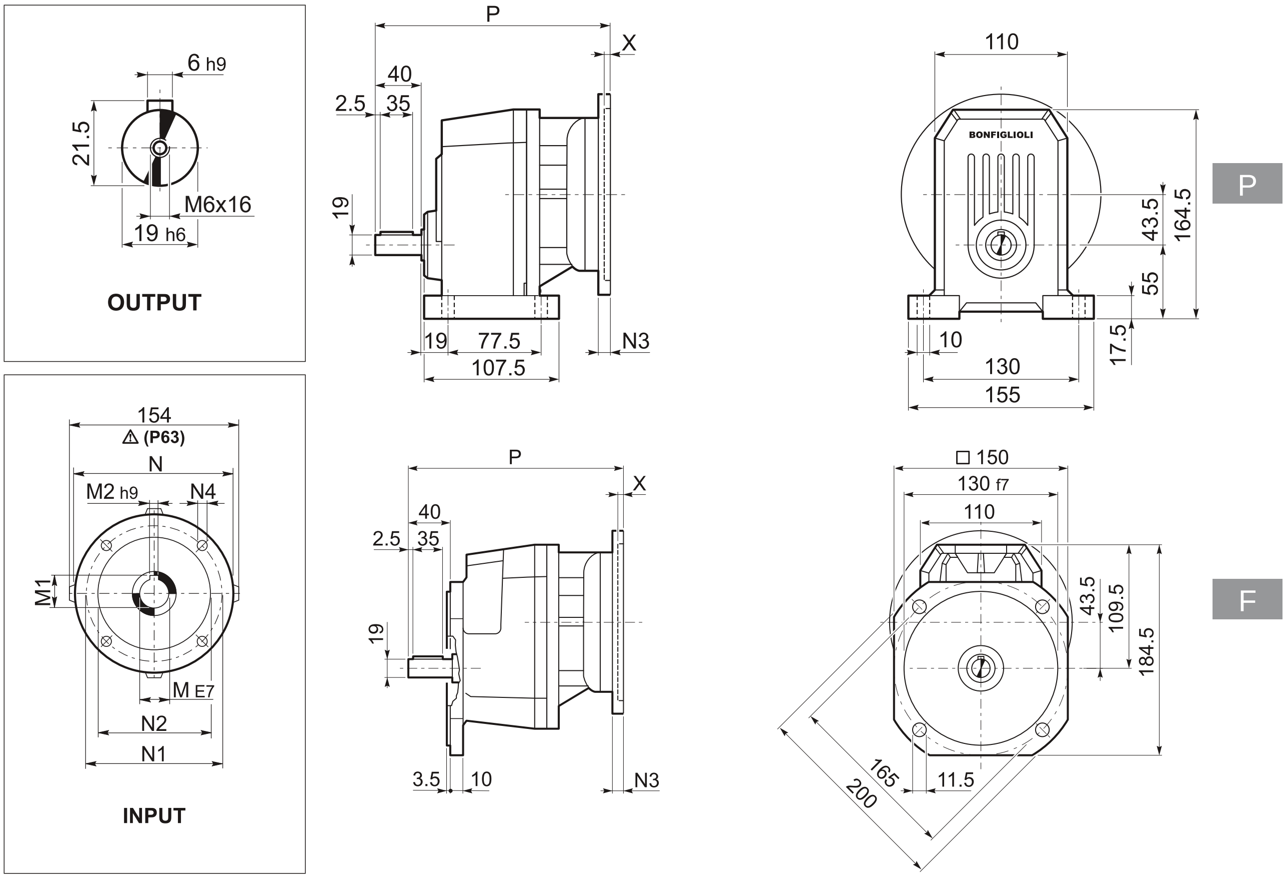


									M...FD M...FA		M...FD		M...FA	
			AC	H	HF	L	AD	kg	LF	kg	R	AD	R	AD
S 20 1	S05	M05	121	159	153	333.5	95	10	399.5	12	96	122	116	95
S 20 1	S05	ME05	121	159	153	333.5	95	10	399.5	12	96	119	116	119
S 20 1	S05	MXN05	123	160	153	380	136	11.8	427	12.9	96	136	116	136
S 20 1	S1	M1	137	167	161	362.5	102	12	423.5	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

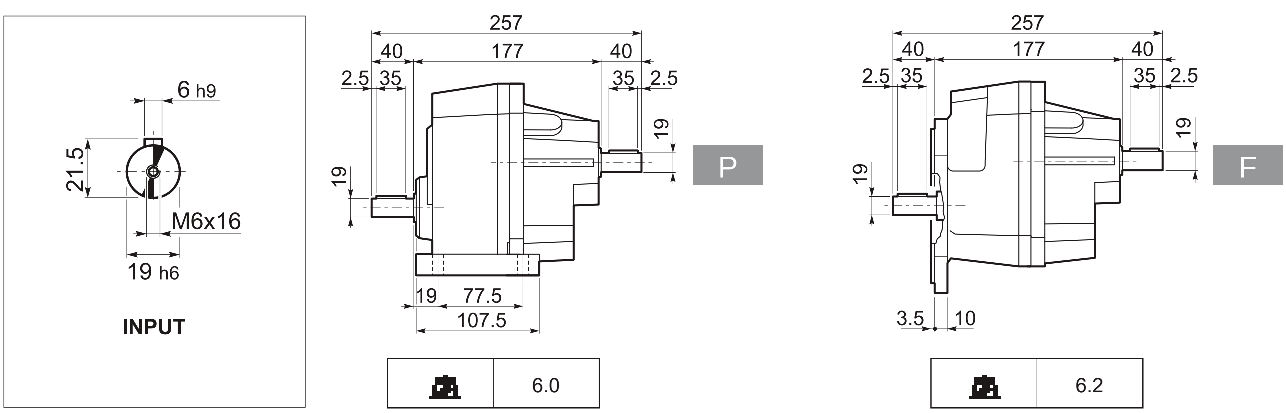


S 20...P(IEC)



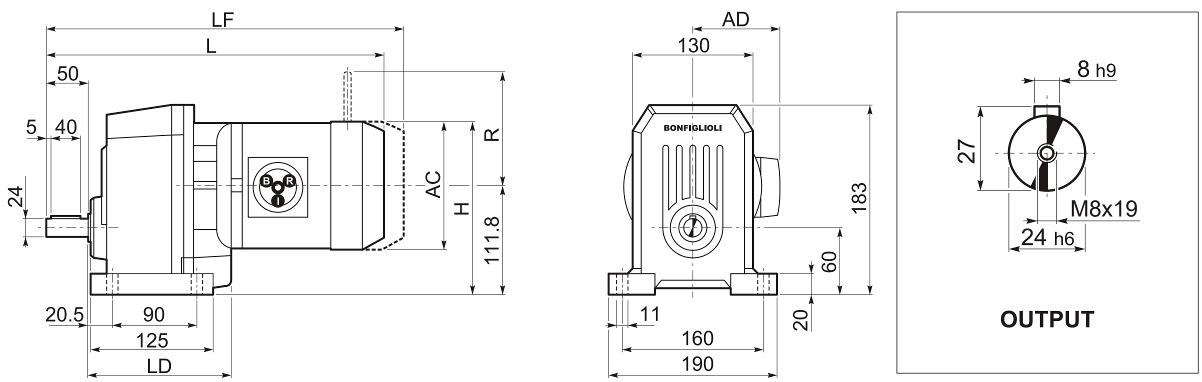
		M	M1	M2	N	N1	N2	N3	N4	P	X	
S 20 1	**P63**	11	12.8	4	140	115	95	—	M8x10	207	4	6
S 20 1	**P71**	14	16.3	5	160	130	110	—	M8x10	207	4.5	6
S 20 1	**P80**	19	21.8	6	200	165	130	—	M10x14.5	227	4	7
S 20 1	**P90**	24	27.3	8	200	165	130	—	M10x14.5	227	4	7
S 20 1	**P100**	28	31.3	8	250	215	180	—	M12x16	237	4.5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

P



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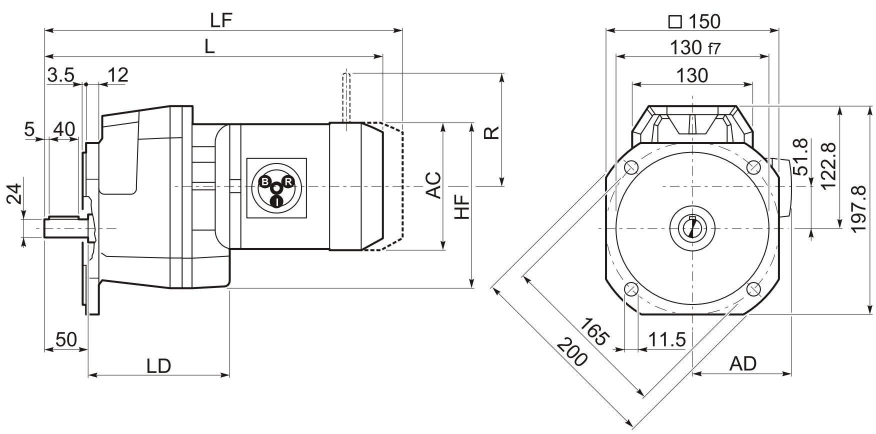
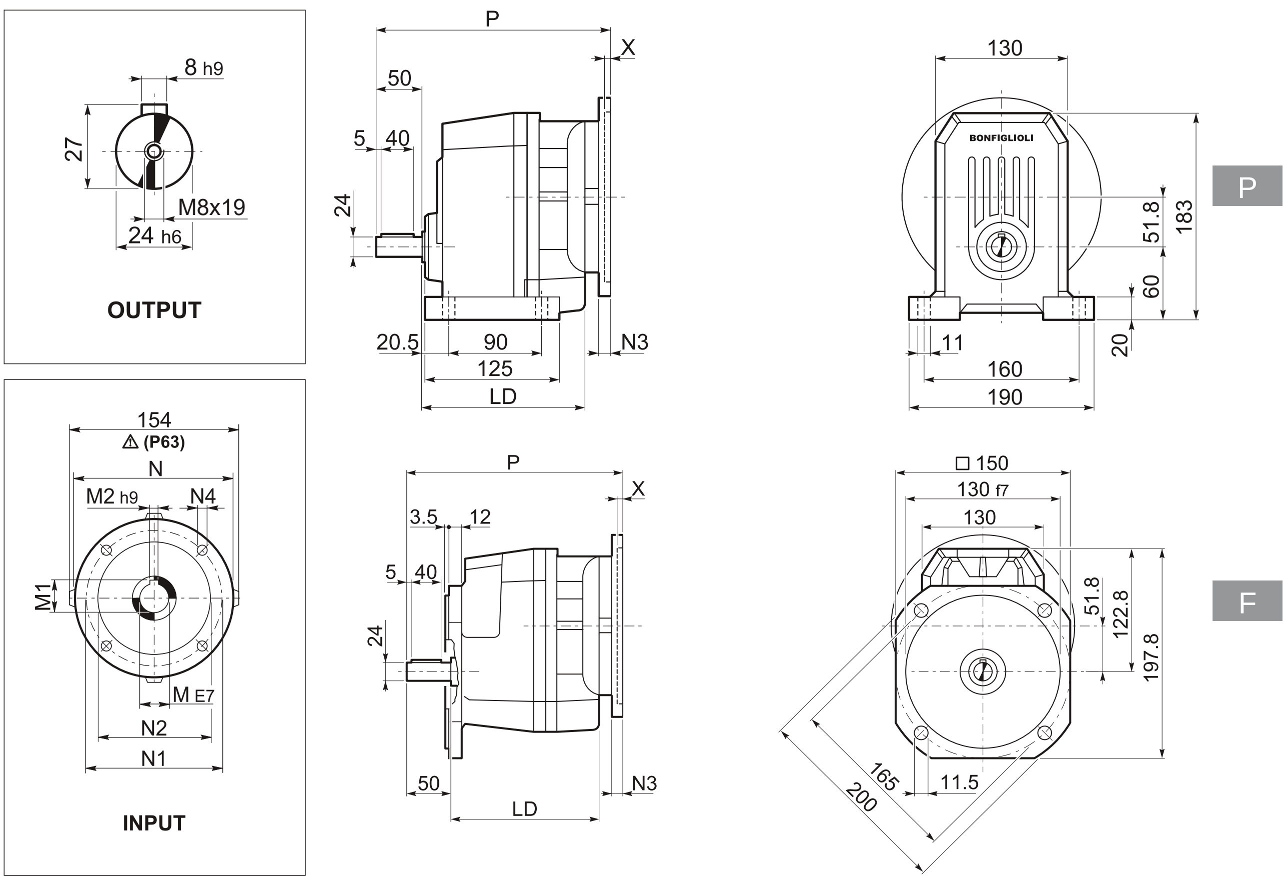


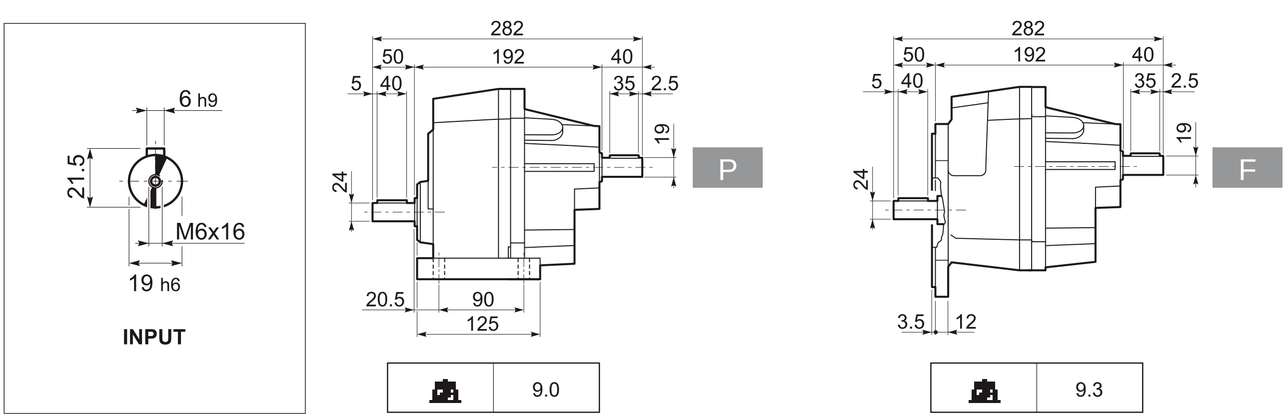
				AC	H	HF	L	LD	AD		M...FD M...FA LF		M...FD R	M...FD AD	M...FA R	M...FA AD
S 30 1	**S1**	**M1**		137	180	177	387.5	140.5	102	14	448.5	16	103	135	124	108
S 30 1	**S1**	**ME1**		137	180	177	387.5	140.5	102	14	448.5	16	103	135	124	135
S 30 1	**S10**	**MXN10**		138	180	177.5	416.5	140.5	137	16.4	475.5	18.8	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)



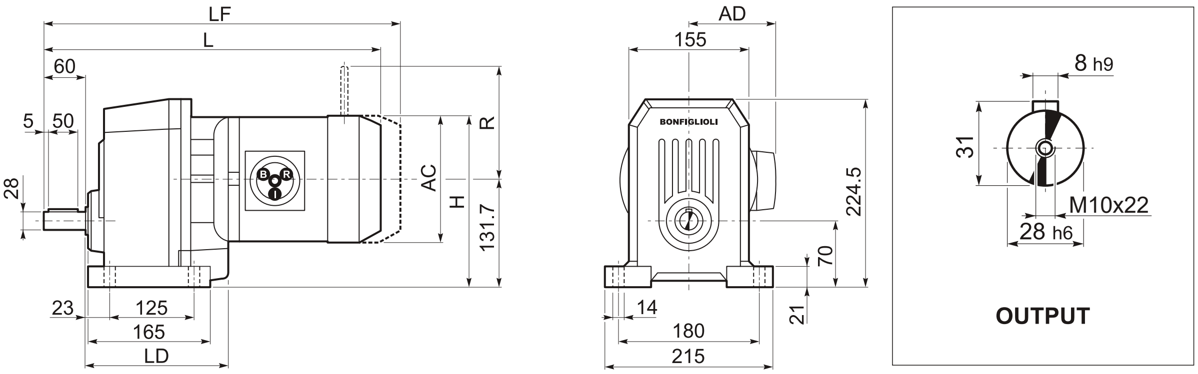
		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	
S 30 1	**P63**	152.5	11	12.8	4	140	115	95	—	M8x10	232	4	8
S 30 1	**P71**	152.5	14	16.3	5	160	130	110	—	M8x10	232	4.5	8
S 30 1	**P80**	162.5	19	21.8	6	200	165	130	—	M10x14.5	252	4	9
S 30 1	**P90**	162.5	24	27.3	8	200	165	130	—	M10x14.5	252	4	9
S 30 1	**P100**	162.5	28	31.3	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



S 40...M/ME/MX

P



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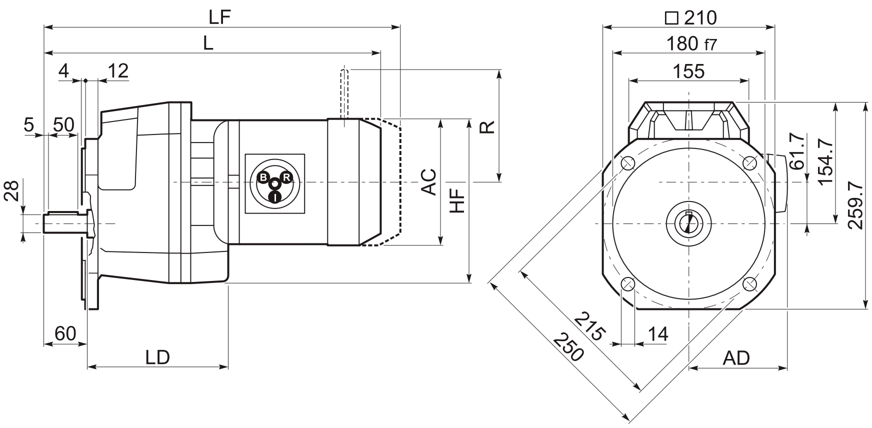
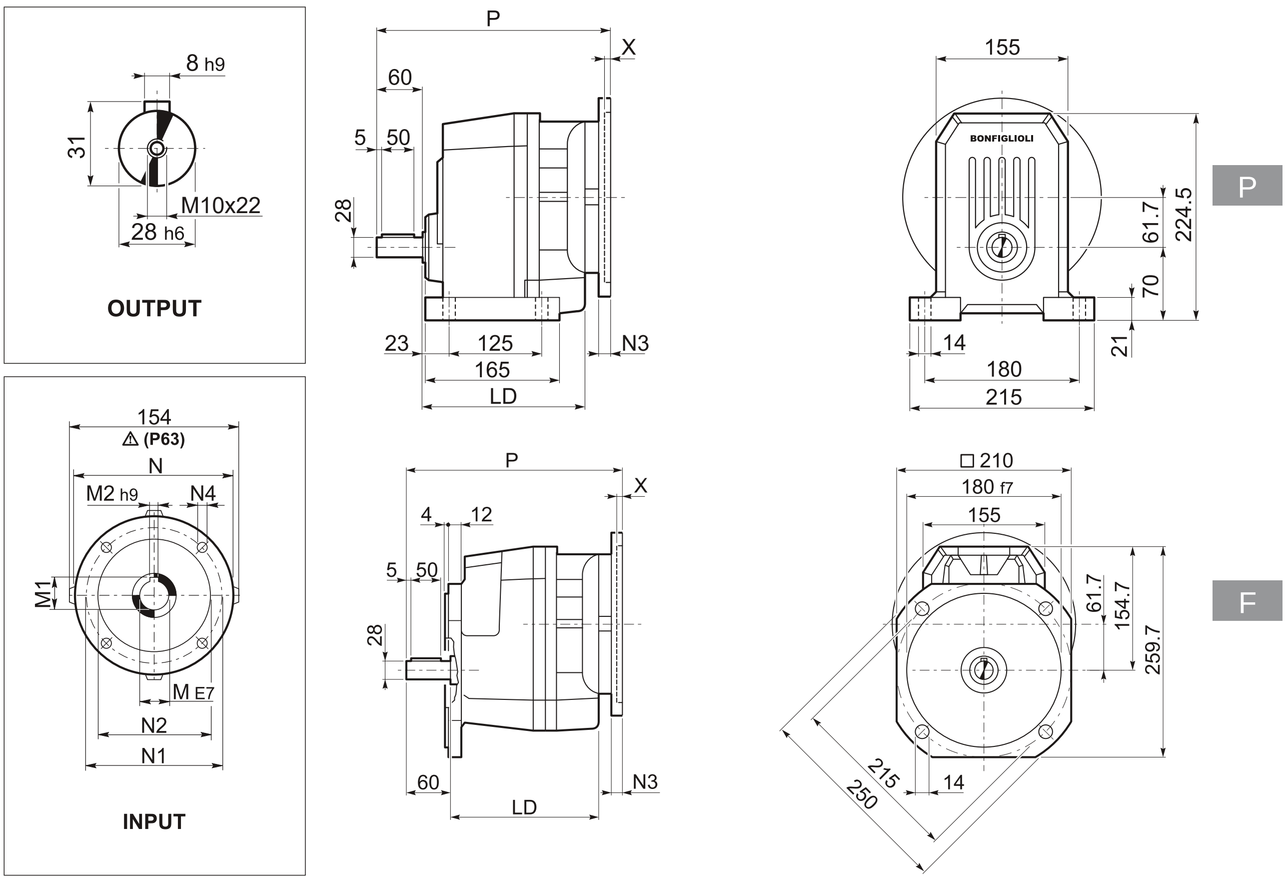


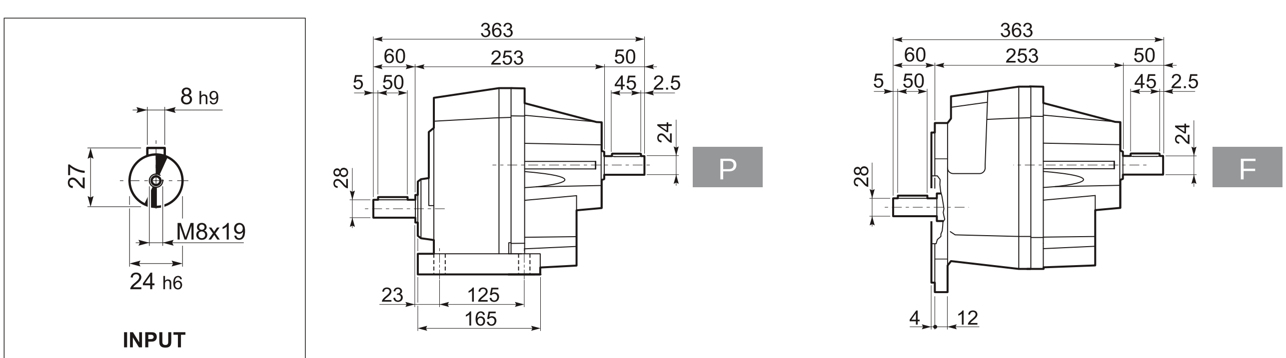
				AC	H	HF	L	LD	AD		M...FD M...FA		M...FD		M...FA	
											LF		R	AD	R	AD
S 40 1	**S1**	**M1**		137	200	197	429.5	168	102	28	490.5	31	103	135	124	108
S 40 1	**S1**	**ME1**		137	200	197	429.5	168	102	28	490.5	31	103	135	124	135
S 40 1	**S2**	**M2S**		156	210	206	452.5	183.5	111	34	528.5	37	129	146	134	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)



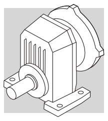
		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	kg
S 40 1	**P63**	183.5	11	12.8	4	140	115	95	—	M8x10	274	4	25
S 40 1	**P71**	183.5	14	16.3	5	160	130	110	—	M8x10	274	4.5	26
S 40 1	**P80**	199.5	19	21.8	6	200	165	130	—	M10x14.5	294	4	26
S 40 1	**P90**	199.5	24	27.3	8	200	165	130	—	M10x14.5	294	4	30
S 40 1	**P100**	—	28	31.3	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



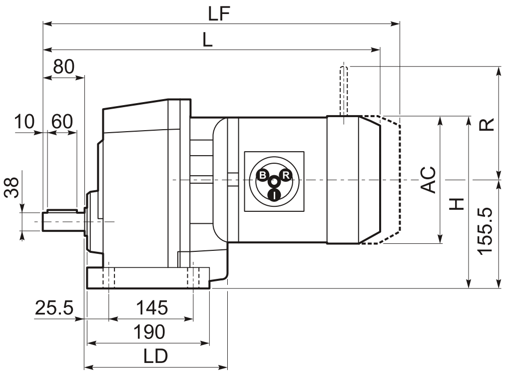
kg	26.0

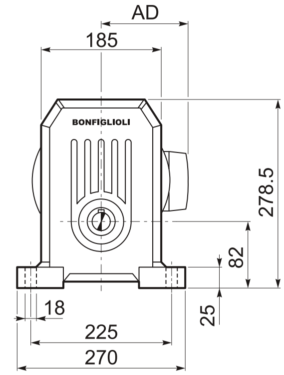
kg	27.7

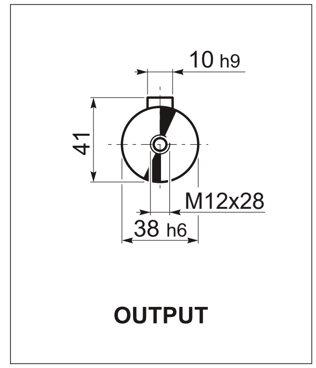


S 50...M/ME/MX

P







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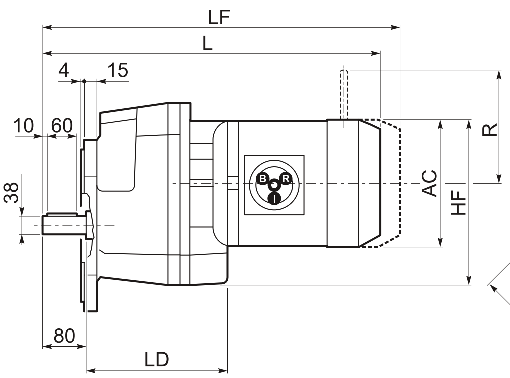
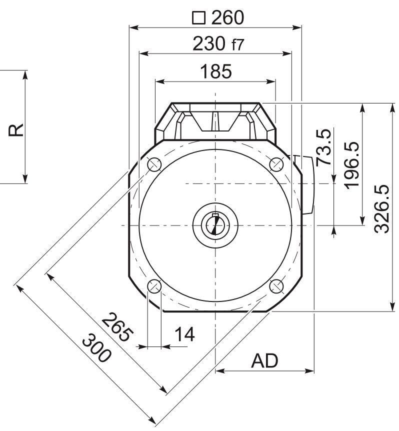
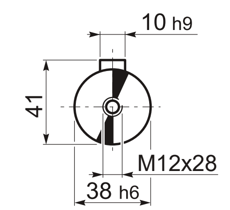


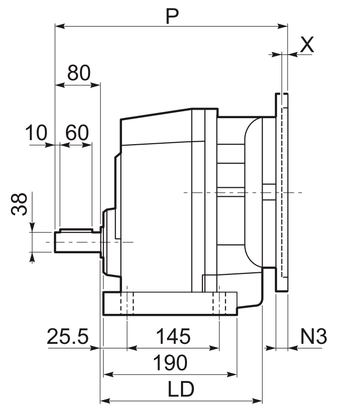


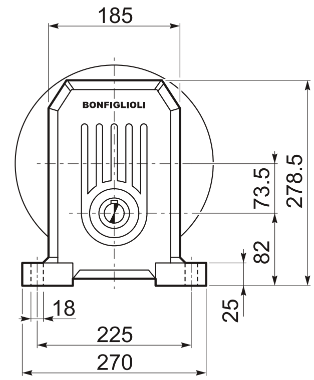
											M...FD M...FA		M...FD		M...FA	
				AC	H	HF	L	LD	AD	[kg]	LF	[kg]	R	AD	R	AD
S 50 1	S1	M1		137	225	222	469	—	102	40	530	42	103	135	124	108
S 50 1	S1	ME1		137	225	222	469	—	102	40	530	42	103	135	124	135
S 50 1	S2	M2S		156	233	230	492.5	204.5	111	44	568.5	47	129	146	134	119
S 50 1	S2	ME2S		156	233	230	492.5	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)



OUTPUT





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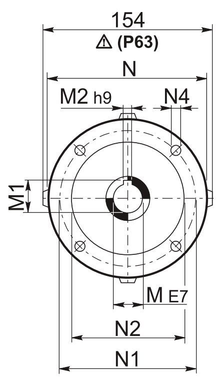
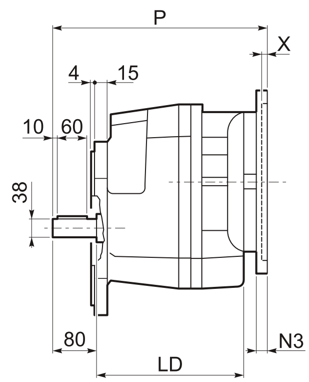
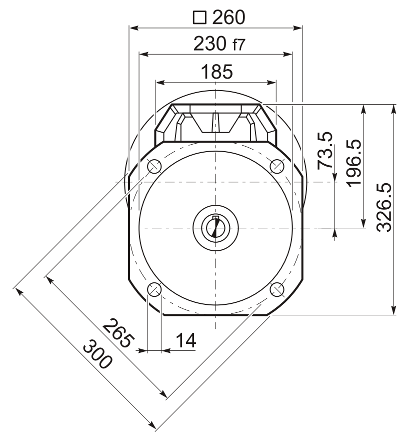


INPUT





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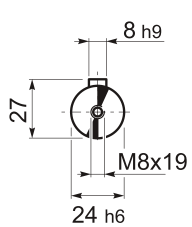
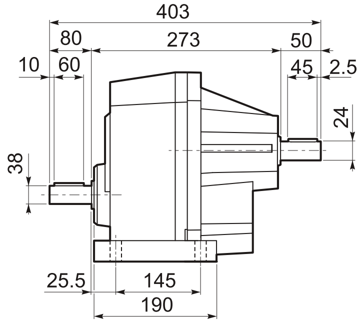
		LD	M	M1	M2	N	N1	N2	N3	N4	P	X	
S 50 1	**P63**	204.5	11	12.8	4	140	115	95	—	M8x10	314	4	35
S 50 1	**P71**	204.5	14	12.8	4	160	130	110	—	M8x10	314	4.5	35
S 50 1	**P80**	219.5	19	16.3	5	200	165	130	—	M10x14.5	314	4	37
S 50 1	**P90**	219.5	24	21.8	6	200	165	130	—	M10x14.5	334	4	37
S 50 1	**P100**	204.5	28	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



INPUT



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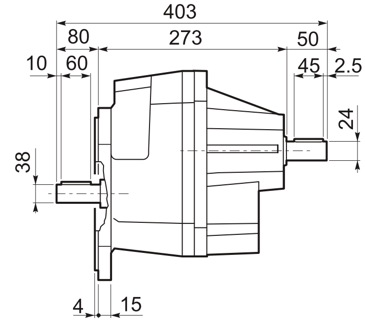

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ELECTRIC MOTORS

M1 SYMBOLS AND UNITS OF MEASUREMENT

Symbols	Units of Measure	Description
cosφ	–	Power factor
η	–	Efficiency
f_m	–	Power adjusting factor
I	–	Cyclic duration factor
I_N	[A]	Rated current
I_S	[A]	Locked rotor current
J_C	[Kgm^2]	Load moment of inertia
J_M	[Kgm^2]	Moment of inertia
K_c	–	Torque factor
K_d	–	Load factor
K_J	–	Inertia factor
M_A	[Nm]	Mean breakaway torque
M_B	[Nm]	Brake torque
M_N	[Nm]	Rated torque
M_L	[Nm]	Counter-torque during acceleration
M_S	[Nm]	Starting torque

Symbols	Units of Measure	Description
n	[min^{-1}]	Rated speed
P_B	[W]	Power drawn by the brake at 20°C
P_n	[kW]	Motor rated power
P_r	[kW]	Required power
t_1	[ms]	Brake response time with one-way rectifier
t_{1s}	[ms]	Brake response time with electronic-controlled rectifier
t_2	[ms]	Brake reaction time with a.c. disconnect
t_{2c}	[ms]	Brake reaction time with a.c. and d.c. disconnect
t_a	[°C]	Ambient temperature
t_f	[min]	Work time at constant load
t_r	[min]	Rest time
W	[J]	Braking work between service interval
W_{max}	[J]	Maximum brake work for each braking
Z	[1/h]	Permissible starting frequency, loaded
Z_0	[1/h]	Max. permissible unloaded starting frequency (I = 50%)

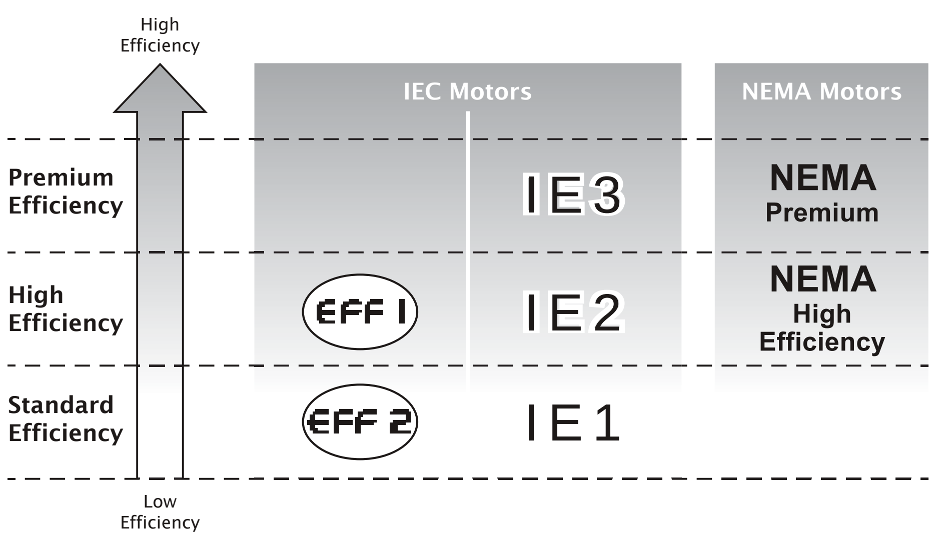
M2 INTRODUCTION

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 RIDUTTORI's production, are available in basic design IMB5 and derived versions.
Motors are the enclosed type with outer fan and cage-tipe 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 ±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 ±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 ±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.

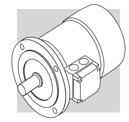
M3.5 Tolerances

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

(F03)

-0.15 (1 - η) P ≤ 50kW	Efficiency
-(1 - cosφ)/6 min 0.02 max 0.07	Power factor
±20% *	Slip
+20%	Locked rotor current
-15% +25%	Locked rotor torque
-10%	Max. torque

(*) ± 30% for motors with Pn < 1 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

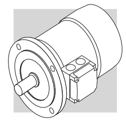
DEGREE OF PROTECTION
IP55 standard (IP56 - option)
IP54, **IP55** brake motor

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

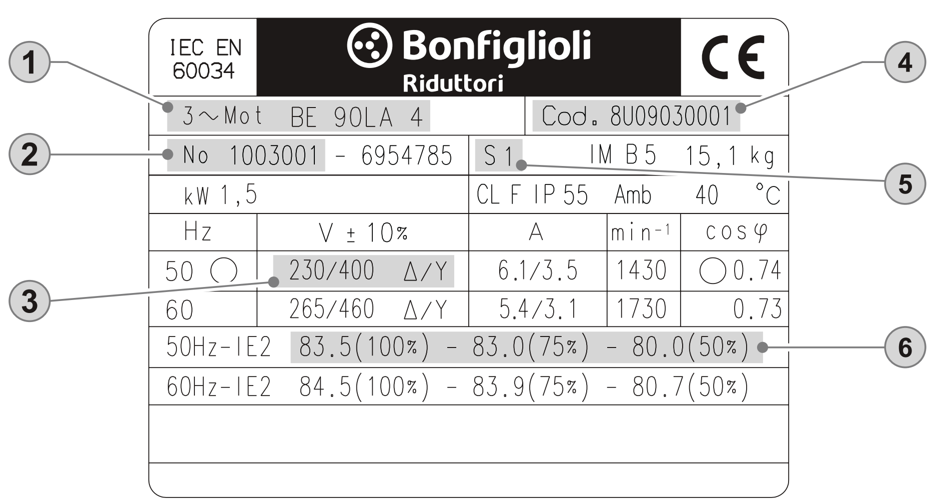
(F06)

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"

[grey box] Default values.

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



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 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

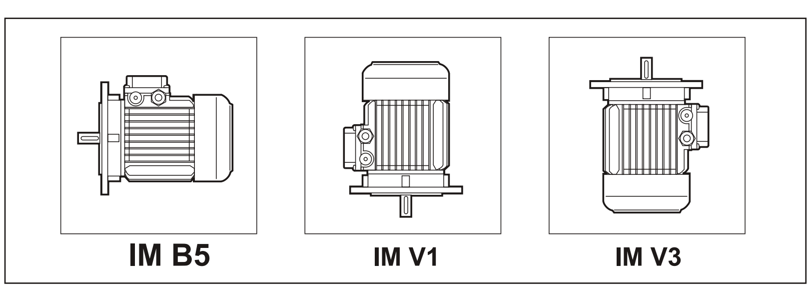
M6.1 Versions

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)

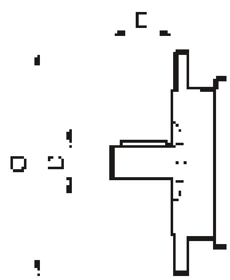


For Motor BX≥200 and BX≥200K it is necessary to select VM options when vertically mounted.

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
1	∅ 50 mm	Protected against extraneous solid bodies having Ø ≥ 50 mm
2	∅ 12 mm	Protected against extraneous solid bodies having Ø ≥ 12.5 mm
3	∅ 2,5 mm	Protected against extraneous solid bodies having Ø ≥ 2.5 mm
4	∅ 1 mm	Protected against extraneous solid bodies having Ø ≥ 1.0 mm
5		Protected against dust
6		No dust ingress

0		Not protected
1		Protected against vertical water drips
2	15°	Protected against vertical water drips inclined up to 15°
3	60°	Protected against rain
4		Protected against water splashes
5		Protected against jets of water
6		Protected against powerful jets of water
7	0,15 m; 1 m	Protected against the effects of temporary immersion
8	...m	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		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		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

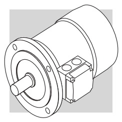
(F12)

	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 ± 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 ± 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 pubblication IEC 60038.

The table below shows the wiring options available.

(F13)

BN - M motor power supply voltages (IE1)

Single speed motors at 50Hz

Motor power supply voltage	— (CE) STD	— (CE) FD / FA	CCC	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	✓	✓	✗	✓

Double speed motors at 50Hz

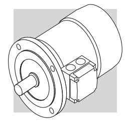
Motor power supply voltage	— (CE)	CCC	CUS
380 - 50	✓	✗	✓
400 - 50	✓	✓	✓
415 - 50	✓	✗	✓
500 - 50	✓	✗	✓

Single speed motors at 60Hz

Motor power supply voltage	— (CE) STD	— (CE) FD / FA	CCC	CUS
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)

BE - ME motor power supply voltages (IE2)

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	✓	✓	✗	✗	✓

BX - MX motor power supply voltages (IE3)

Single speed motors at 50Hz

Motor power supply voltage	— (CE)	CCC	CEL	NBR	BIS	CUS
230/400-50	✓ (1)	✗	✓ (6)	✗	✗	✗
290/500-50	✓	✗	✗	✗	✗	✗
380/660-50	✗	✗	✓ (4)	✗	✗	✗
400/690-50	✓ (2)	✗	✓ (2) (3)	✗	✗	✗

Single speed motors at 60Hz

Motor power supply voltage	— (CE)		CCC	CEL	NBR (*)	BIS	CUS
	STD	FD / FA					
220/380-60	✗	✗	✗	✗	✓ (3)	✗	✓
265/460-60	✗	✓ (1)	✗	✗	✗	✗	✓
330/575-60	✗	✓ (3)	✗	✗	✗	✗	✓
380/660-60	✗	✗	✗	✗	✓ (5)	✗	✓
440/760-60	✗	✗	✗	✗	✓ (4)	✗	✓
460/800-60	✗	✓ (2) (3)	✗	✗	✗	✗	✓
220/440-60	✗	✗	✗	✗	✓ (3)	✗	✓
230/460-60	✗	✗	✗	✗	✗	✗	✓

(1) only for motor size ≤132
(2) only for motor size ≥160
(3) only for motor size ≤180
(4) only for motor size ≥200
(5) only for motor size 180
(6) only for motor size ≥100

M7.2 Frequency

(F15)

Number of poles			Winding connection
2	**BE 80 … BE 160, BN 63 … BN 200**	**ME2 ... ME5, M05 ... M5**	Δ / 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**	
4/8	**BN 80 … BN 132**	**M2 ... M4**	Δ / YY (Dahlander)

(²) Motors with voltage in ratio 2 (ex. 230/460 - 60) will be equipped with a 9 pin terminal box with winding connection either Δ Δ/ Δ 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]			
		2P	**4P**	**6P**	**8P (*)**
BN 56A	**–**	–	0.07	–	–
BN 56B	**M0B**	–	0.1	–	–
BN 63A	**M05A**	0.21	0.14	0.1	–
BN 63B	**M05B**	0.3	0.21	0.14	–
BN 63C	**M05C**	0.45	0.3	–	–
BN 71A	**–**	0.45	0.3	0.21	0.1
–	**M1SC**	–	–	0.21	–
BN 71B	**M05SD**	0.65	0.45	0.3	0.14
BN 71C	**M1LA**	0.9	0.65	0.45	–
BN 80A	**–**	0.9	0.65	0.45	0.21
BN 80B	**M2SA**	1.3	0.9	0.65	0.30
BN 80C	**M2SB**	1.8	1.3	0.9	–
BN 90S	**–**	–	1.3	0.9	0.45
BN 90SA		1.8	–	–	–
BN 90SB		2.2	–	–	–
BN 90L	**M3SA**	2.5	–	1.3	0.65
BN 90LA		–	1.8	–	–
BN 90LB	**–**	–	2.2	–	–

		P_n [kW]			
		2P	**4P**	**6P**	**8P (*)**
BN 100L	**M3LA**	3.5	–	–	–
BN 100LA		–	2.5	1.8	0.9
BN 100LB	**M3LB**	4.7	3.5	2.2	1.3
BN 112M	**–**	4.7	4.7	2.5	1.8
–	**M3LC**	–	4.7	2.5	–
BN 132S	**M4SA**	–	6.5	3.5	2.5
BN 132SA		6.5	–	–	–
BN 132SB	**M4SB**	8.7	–	–	–
BN 132M	**M4LA**	11	–	–	3.5
BN 132MA		–	8.7	4.7	–
BN 132MB	**M4LB**	–	11	6.5	–
BN 160MR	**M4LC**	12.5	12.5	–	–
BN 160M	**M5SA**	–	–	8.7	–
BN 160MB	**–**	17.5	–	–	–
–	**M5SB**	17.5	17.5	–	–
BN 160L	**–**	21.5	17.5	12.5	–
–	**M5SC**	21.5	–	–	–
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	**Pn** - 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 >= 0,75kW and BX/MX >= 0,75kW 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≥200K 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≥200K.
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 ≤ 132	265/460 - 60 Hz
BX ≤ 180	230/460 - 60 Hz 330/575 - 60 Hz
BX ≥ 160 BX ≥ 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 ≥0.12kW 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 3.7kW included, are avaiable 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 ≥0.75kW 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 applyed to the motor:

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

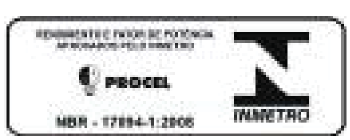
(F21)

	V_{mot}
BX ≥ 200	380/660 - 50 Hz

M7.9 Motors certified for Brazil

NBR

Brazilan 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 ≥ 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 ≥ 200K	400/690 - 50 Hz

M7.11 Insulation class

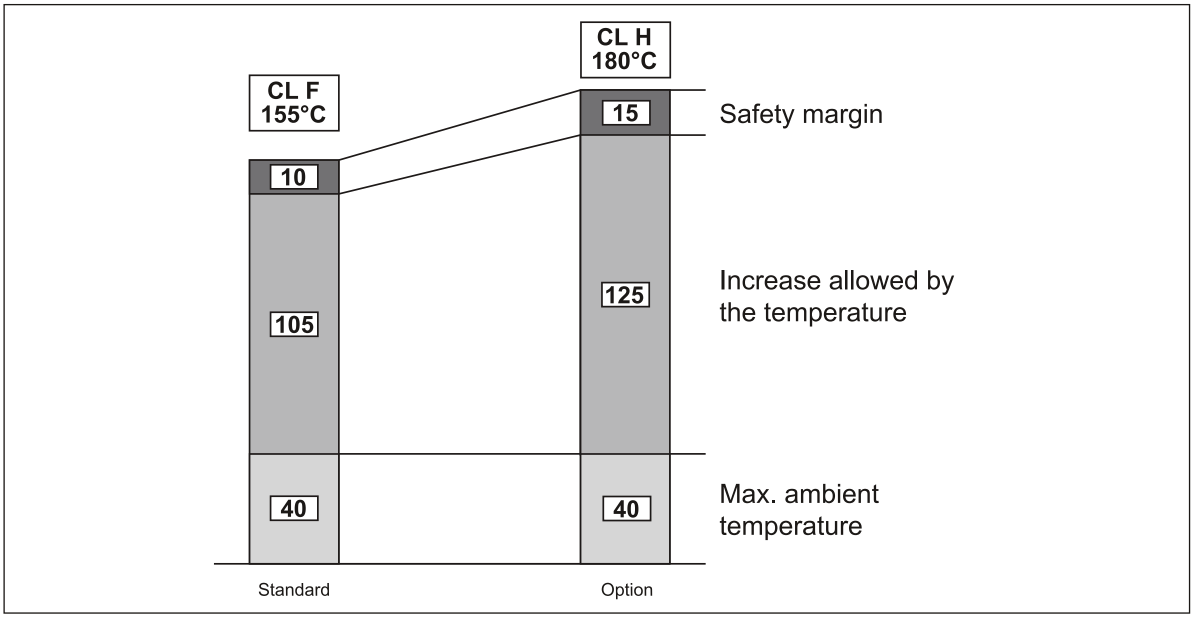
CL F

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≥200 and BX≥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).

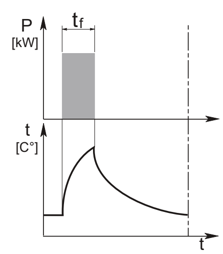
Cyclic duration factor:

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

t_f = work time under constant load
t_r = rest time

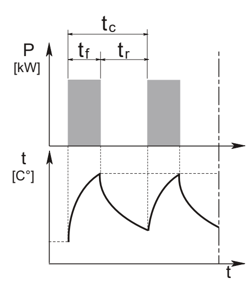
Limited duration duty S2

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.



Periodical intermittent duty S3:

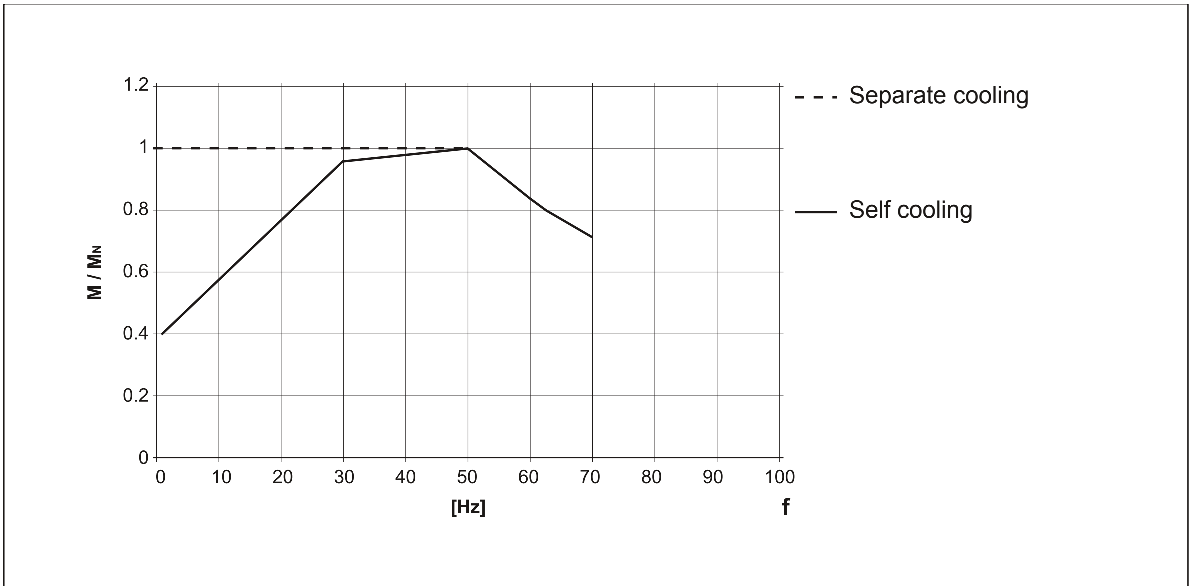
This type of duty is characterized by a sequence of identical operation cycles, each including a constant load operation period and a rest period.
For this type of duty, the starting current does not significantly influence overtemperature.



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 > 0.1µs at motor terminals). Typical torque/speed curves referred to S1 duty for motors with base frequency f_b = 50 Hz is 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 $(f/_{fb})$. As motor maximum torque decreases with $(f/_{fb})^2$, 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

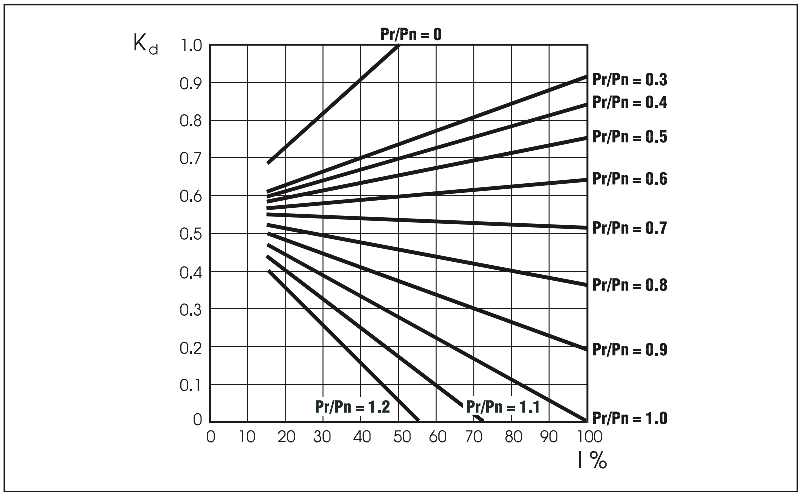
The rating charts of brakemotors lend the permitted number of starts Z_0, based on 50% intermittence and for unloaded operation.
The catalogue value represents the maximum number of starts per hour for the motor without exceeding the rated temperature for the insulation class F.
To give a practical example 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:

$K_J = \dfrac{J_m + J_c}{J_m}$	inertia factor
$K_c = \dfrac{M_a - M_L}{M_a}$	torque factor
$K_d =$	load factor, see the following table

(F28)



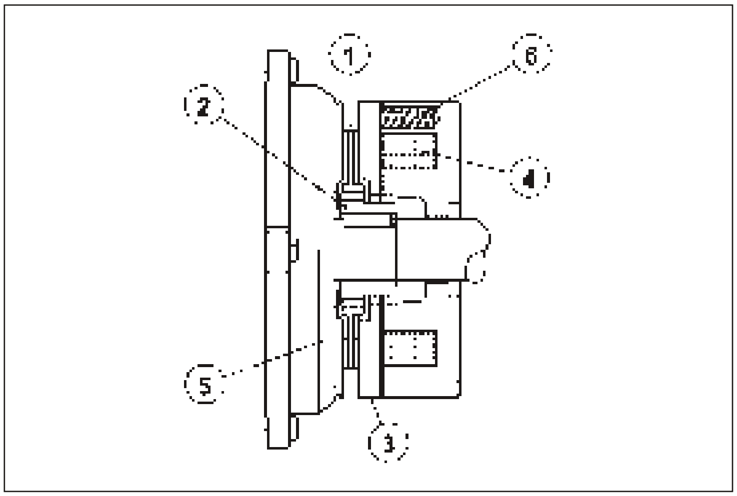
If actual starts per hour is within permitted value (Z) it may be worth checking that braking work is compatible with brake (thermal) capacity Wmax also given in tables (F38), (F41) and dependent on the number of switches (c/h).

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.

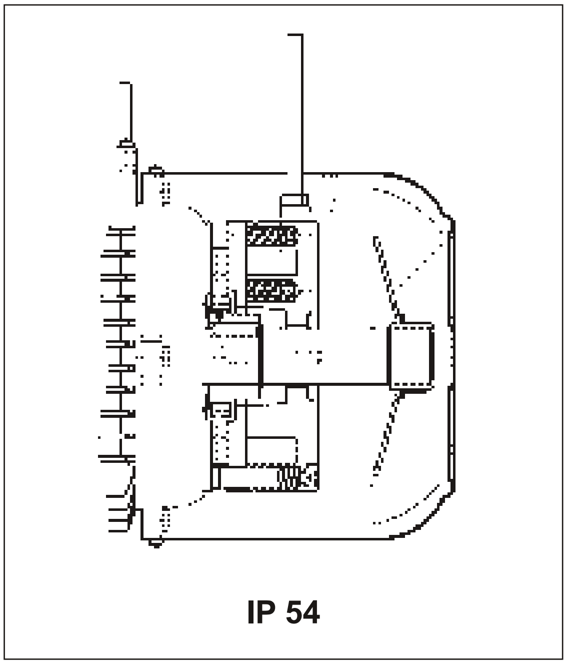
M8.2 Most significant features

- 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.

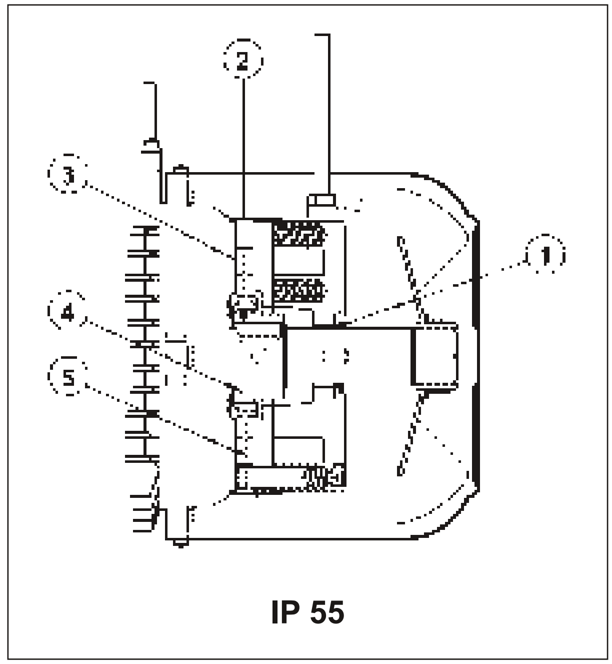
M9 DC BRAKE MOTORS TYPE BXN-BX-BE-BN_FD and MXN-MX-ME-M_FD

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 degtree 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 shieldand brake disc
④ stainless steel hub
⑤ stainless steel brake disc

M9.2 FD brake power supply

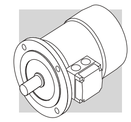
A rectifier accommodated inside the terminal box feeds the DC brake coil. Wiring connection across rectifier and brake coil is performed at the factory.
Brake power supply voltage V_B is as indicated in the following table, regardless of mains frequency:

(F32)

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

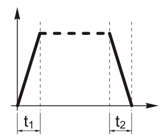
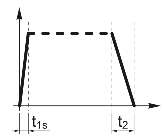
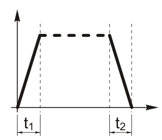
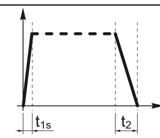
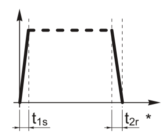
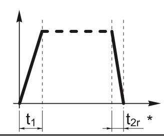
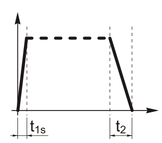
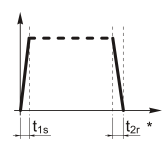
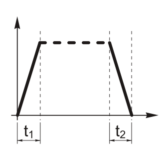
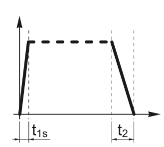
NOTE: For BXN and MXN motors refer to EVOX specific catalogue

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



The diode half-wave rectifier (VDC ≈ 0,45 x VAC) 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**  **SBR**  **NBR** 
BE 71 - BN 71	**ME1 - M1**	**FD 03** **FD 53**		
BX 80 - BE 80 - BN 80	**MX2 - ME2 - M2**	**FD 04**		
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**		
BX 200LA	**—**	**FD 20**	**NB** 	**SB** 
BX 225SA	**—**	**FD 25**		
BX 250M - BX 315SA	**—**	**FD 30**		
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 ±10%, 400Vac ± 10%, 50/60 Hz (with power supply); 100Vdc ±10%, 180Vdc ± 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
				t_1	$t_{1\,s}$	t_2	t_{2c}					
	6	4	2	[ms]	[ms]	[ms]	[ms]	10 s/h	100 s/h	1000 s/h	[MJ]	[W]
FD02	–	3.5	1.75	30	15	80	9	4500	1400	180	15	17
FD03	5	3.5	1.75	50	20	100	12	7000	1900	230	25	24
FD53	7.5	5	2.5	60	30	100	12					
FD04	15	10	5	80	35	140	15	10000	3100	350	30	33
FD14												
FD05	40	26	13	130	65	170	20	18000	4500	500	50	45
FD15	40	26	13	130	65	170	20					
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 (±15%
s/h = starts per hour

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

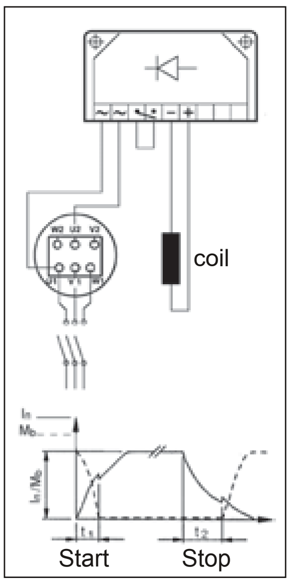
M9.4 FD brake connections

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.

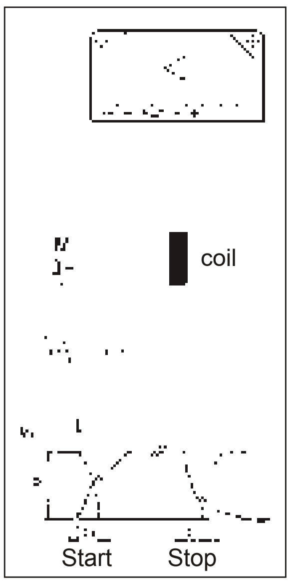
Table (F35+F39) – Brake coil with power supply from motor terminals (DIR) and AC line interruption.
Delayed stop time t_2 and function of motor time constants.
Mandatory when soft-start/stops are required.
Table (F36+F40) – Brake coil with separate power supply (SA) and AC line interruption.
Normal stop 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.

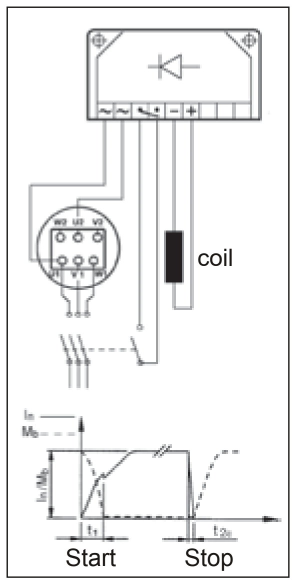
(F35)



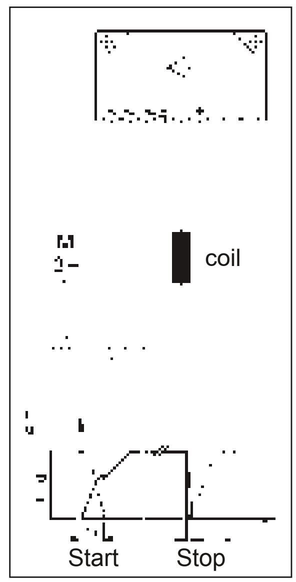
(F36)



(F37)

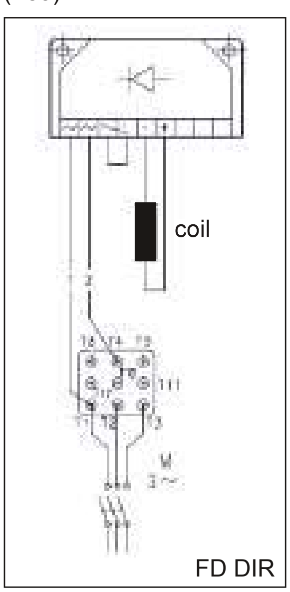


(F38)

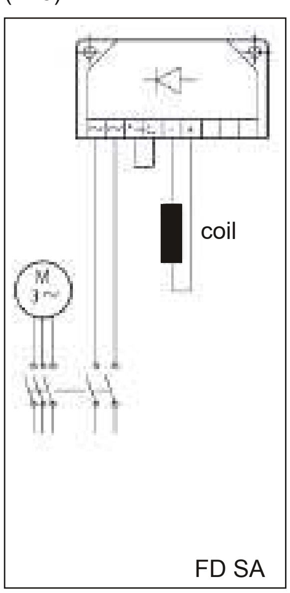


For BXN and MXN motors the FD brake connection scheme is as follows:

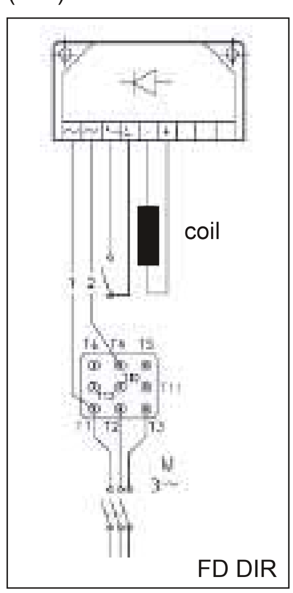
(F39)



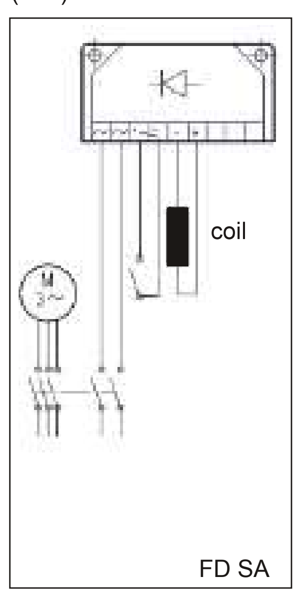
(F40)



(F41)



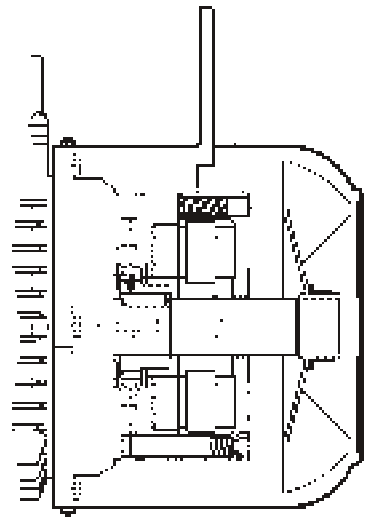
(F42)



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

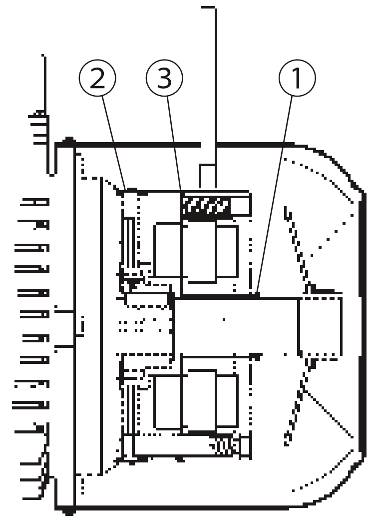
Frame sizes: BXN 63 ... BXN 90, BX 80 ... BX 160L - BE 63 … BE 160L - BN 63 … BN 180M / MXN 05 ... MXN 25 - MX2SB ... MX5LA - ME05 … ME5 - M05 ... M5

(F43)



IP 54

(F44)



IP 55

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:

① V-ring at N.D.E. of motor shaft

② dust and water-proof rubber boot

③ O-ring

M10.2 FA brake power supply

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 (±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

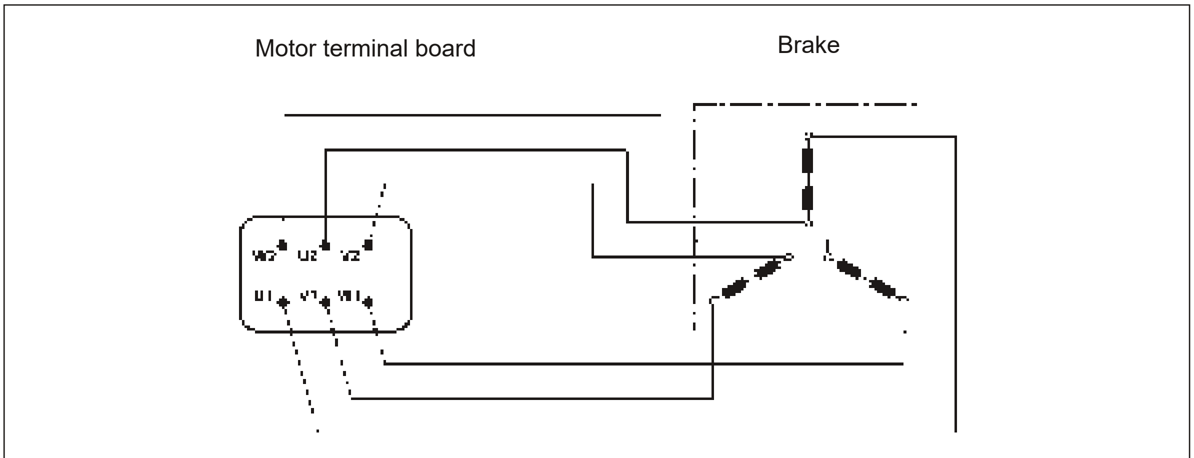
NOTE
Values t_1 and t_2 in the table refer to a brake set at rated torque, medium air gap and rated voltage.

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

M10.4 FA brake connections

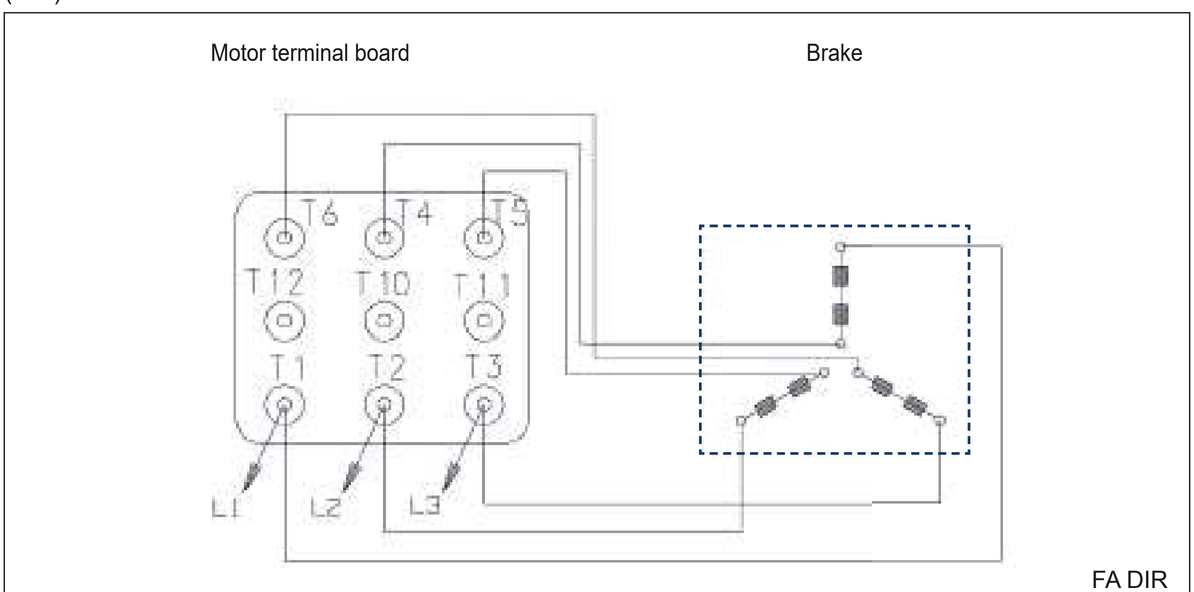
The diagram below shows the wiring when brake is connected directly to same power supply of the motor:

(F47)



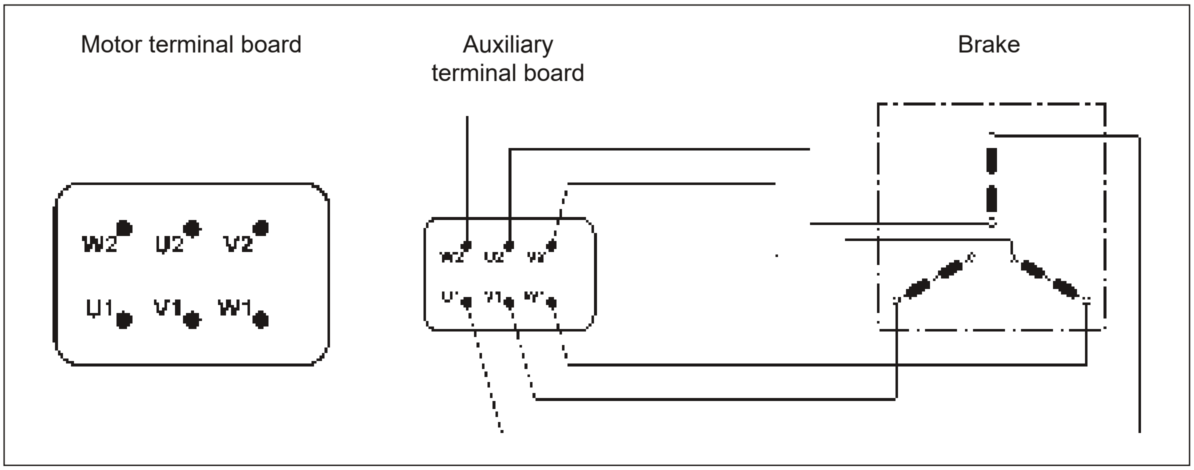
For BXN and MXN motors the FA brake connection scheme is as follows:

(F48)



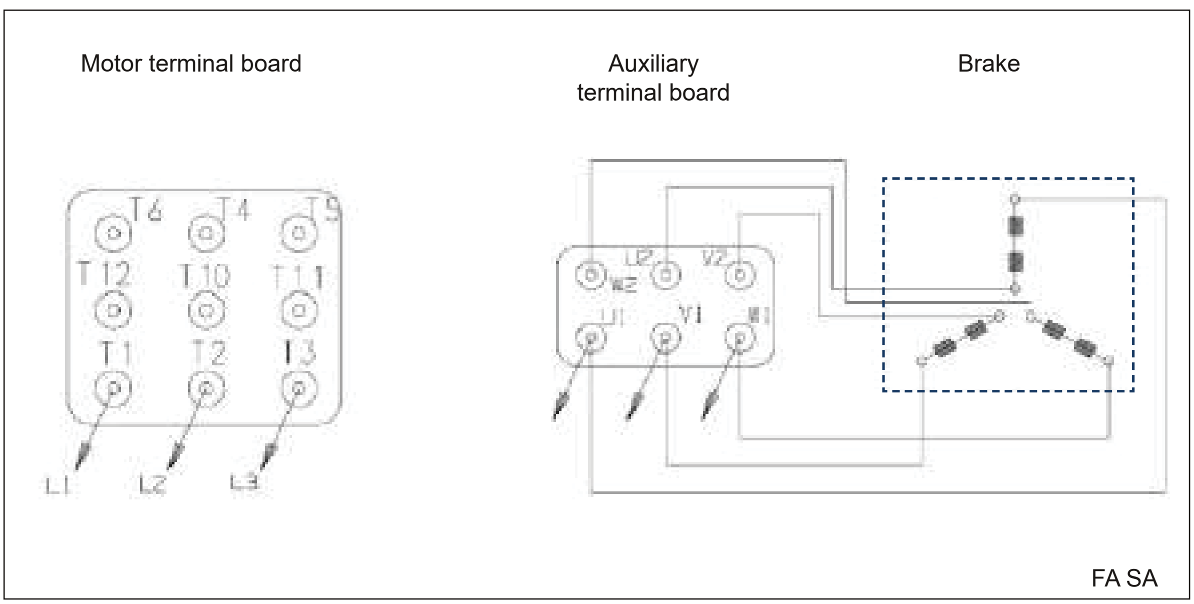
Switch-pole motors and, at request, single-pole motors with separate power supply are equipped with an auxiliary terminal board with 6 terminals for brake connection.
In this version, motors feature a larger terminal box. See diagram below:

(F49)



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

(F50)

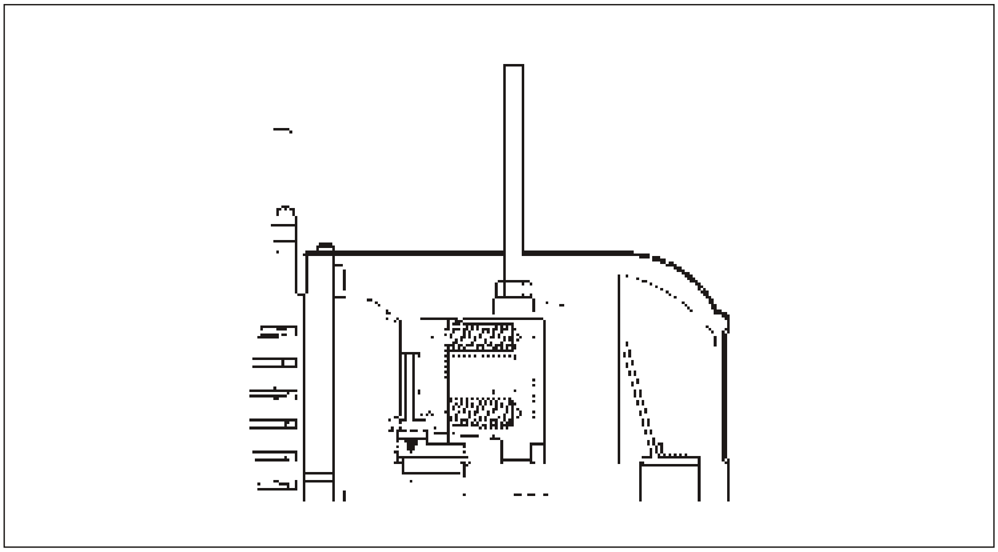


M11 BRAKE RELEASE SYSTEMS

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.

(F51)

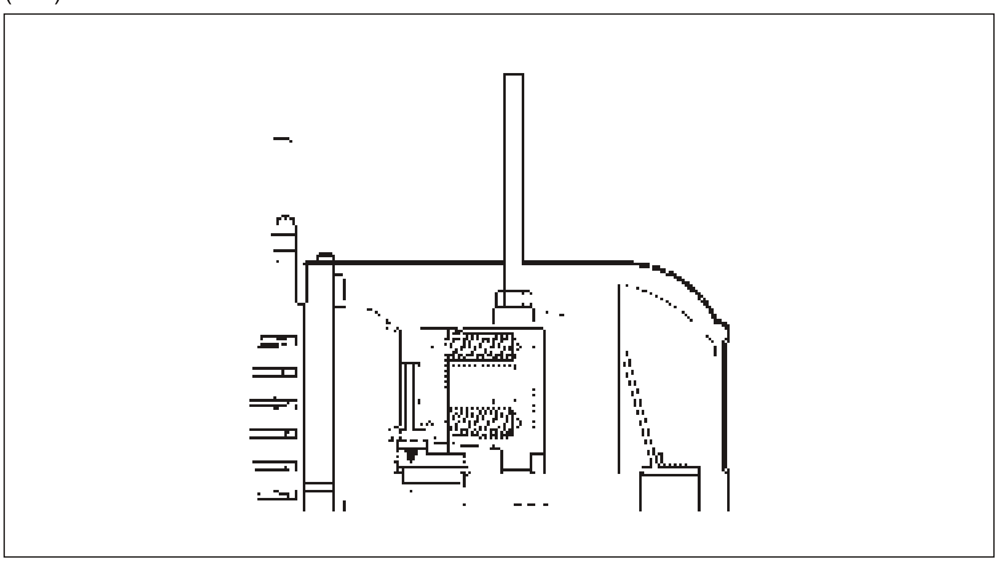
R



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

(F52)

RM



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

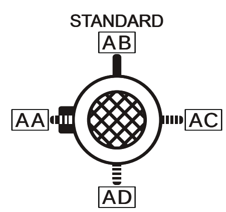
Unless otherwise specified, the release lever is located 90° away from the terminal box – identified by letters [**AB**] in the diagram below – in a clockwise direction on both options **R** and **RM**. Alternative lever positions [**AA**], [**AC**] and [**AD**] are also possible when the corresponding option is specified:

(F54)

AA

AC

AD



M11.2 Separate brake supply

DIR

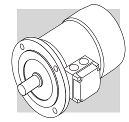
Direct brake supply
The brake system is directly powered through the electric motor terminal board power supply. When a legacy motor is configured with a direct brake supply no option need to be selected, while for EVOX motors DIR option must be selected.

...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** [Kgm²]
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 servoventilated 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 +-0,3°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.

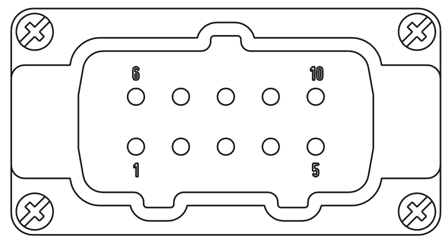
M12.7 Plug connector

CON

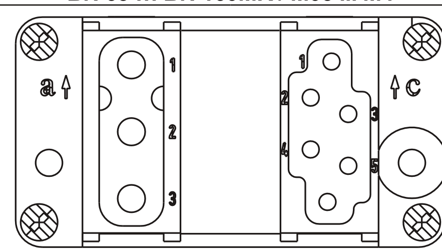
Three types of connectors (CON 1, CON 2, CON 3) are provided; they can be mounted in two different positions: right side of terminal box cover (C1D, C2D, C3D); left side of terminal box cover (C1S, C2S, C3S).
The option CON is applicable to single speed BN and M motors (2, 4, 6, 8 poles), and BX / BE 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

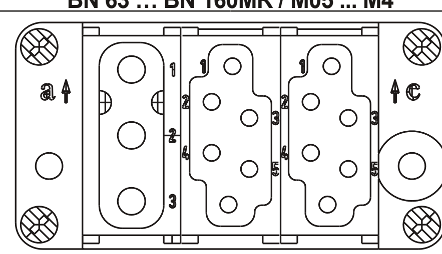
(F56)

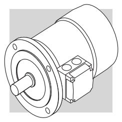
Option	CON 1
Motor size	**BX 80 ... BX 112 / MX2, MX3 / BE 63 ... BE 112 / ME05 ... ME4** **BN 63 … BN 112 / M05 ... M3**
Connector view	
Type of connector	Harting Han 10ES
Housing	Han EMC 10B with 2 levers
Numbers of pins - nominal current	10 x 16A
Voltage	500 Vac
Contact connection	Screw terminals

(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

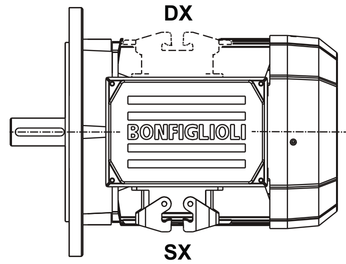
(F58)

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



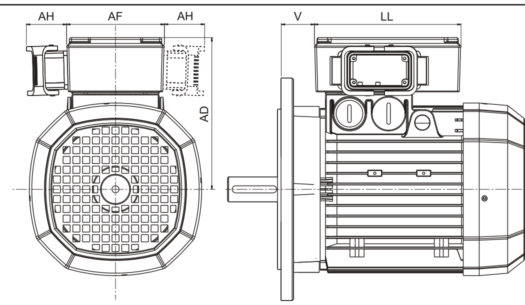
(F59)

Connector orientation



(F60)

Motors without brake dimensions

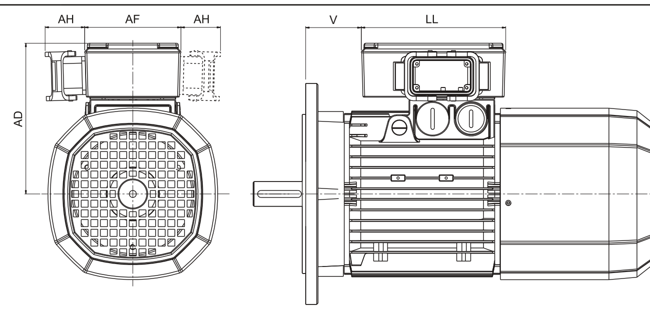


[illegible]	[illegible]	**AD** (mm)	**AF** (mm)	**AH** (mm)	**LL** (mm)	**V**(*) (mm)
BE 63 - BN 63	**ME05 - M05**	136	110	45	165	4.5
BE 71 - BN 71	**ME1 - M1**	149	110	45	165	15.5
BX 80 - BE 80 - BN 80	**MX2 - ME2 - M2**	160	110	45	165	16.5
BX 90 - BE 90 - BN 90	**MX3**	162	110	45	165	31.5
BX 100 - 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



[illegible]	[illegible]	**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

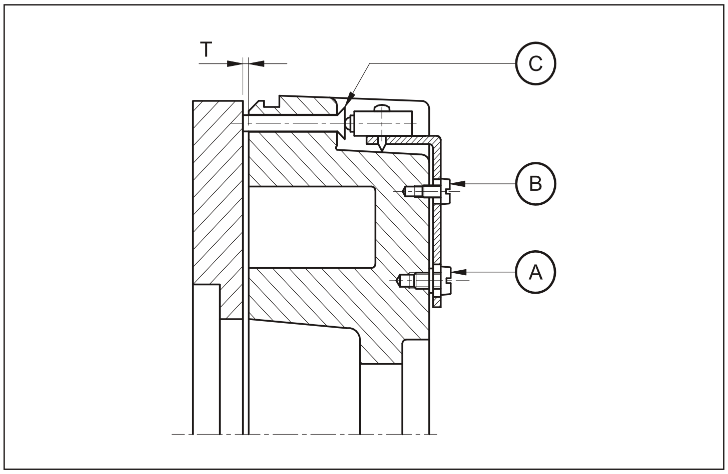
(*) Dimension valid only for motors BN.and BX

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.

(F62)



A: Plate f xing 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 1~ 230V ± 10% P [W]	NH1 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

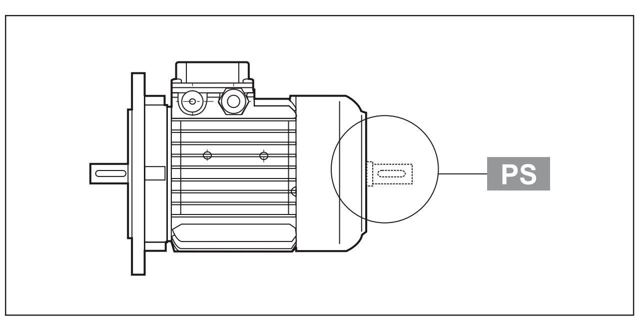
When option **TP** is specified, motor windings receive additional protection for operation in high humidity and temperature conditions.

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

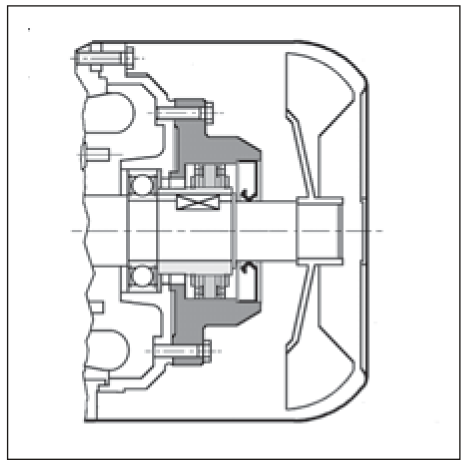
AL **AR**

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 dimensis 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

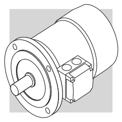
RV

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			
		Δ L_1	**Δ L_2**
BE 71 - BN 71	**ME1 - M1**	93	32
BX 80	**MX2**	80	67
BE 80 - BN 80	**ME2 - M2**	125	55
BX 90	**—**	133	85
BE 90 - BN 90	**—**	133	49
BX 100	**MX3**	135	88
BE 100 - BN 100	**ME3 - M3**	119	30
BX 112	**—**	136	90
BE 112 - BN 112	**—**	130	33
BX 132	**MX4**	123	24
BE 132 - BN 132	**ME4 - M4**	160	51
BX 160 - BX 180 **BE 160 - BE 180** **BN 160 - BN 180 - BN 200**	**MX5** **ME5** **M5**	184	184
BX 200	**—**	260	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 ≥ 200K.

(F69) [illegible]

[illegible]	[illegible]	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	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**		50	180	1.25 / 0.72
BX 180 - BE 180 BN 180L ... BN 200L	–			250	1.51 / 0.87
BX 200 ... BX 250 BX 200K ... BX 250K	–	3 ~ 400Δ / 690Y		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) [illegible]

[illegible]	[illegible]	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		40	0.26 / 0.09
BN 112	–			50	0.26 / 0.15
BN 132 ... BN 160MR	**M4L**			110	0.38 / 0.22

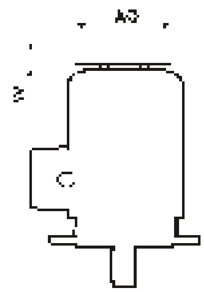
M12.16 Rain canopy

RC

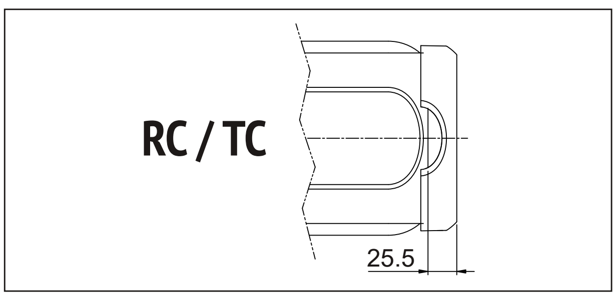
The rain canopy protects the motor from dripping and avoids the ingress of solid bodies. It is recommended when motor is installed in a vertical position with the shaft downwards.
Relevant dimensions are indicated in the table below.
The drip cover is not compatible with variants PS, EN1, EN2, EN3, EN4, 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.



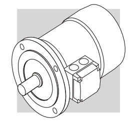
M12.17 Textile canopy

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 V, line-driver output RS 422.

EN2

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

EN3

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

EN4

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

EN5

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

EN6

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

EN7

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

EN8

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

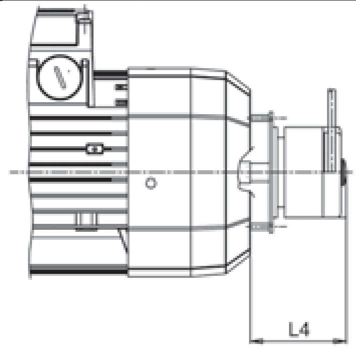
Note: EN7 and EN8 available only for BX≥200

(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, $\bar{Z}$)	—	—	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)

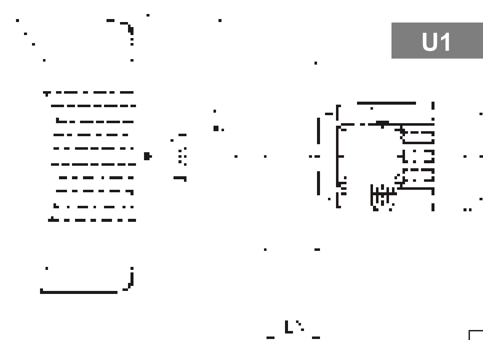
EN1, EN2, EN3, EN4, EN5, EN6, EN7, EN8



		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)

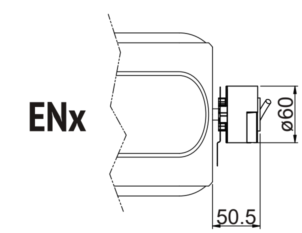
EN_ + U1



		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.

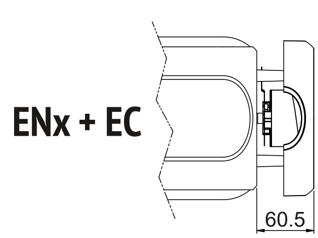
For EN on BXN/MXN motors see the scheme below.



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

When IB option is selected the motor is equipped with insulated bearings at drive end. This prevent early bearings failures due to high frequency circulation currents.
NOTE: This option is available only for BX ≥ 280 and BX ≥ 280K, and it is mandatory when the motor is operated through a variable speed drive.

M12.21 Vertical Mounting

VM

NOTE: This option is mandatory for BX ≥ 200 and BX ≥ 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≤180/MX and in Munsell blue 8B 4.5/3.25 for BX≥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 ≥ 200 and BX ≥ 200K Motors are standardly supplied in this colour with C3 protection unless specified diffrently.

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≥200 and BX≥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	BE 80A 2		M 1LA 2	ME 2SA 2	
		BN 80A 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	BE 160MA 2		M 4LC 2	ME 5SA 2	
		BN 160M 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				M 05C 4			
		BN 71A 4	BE 71A 4		BXN 71MA 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				M 1LA 4			
		BN 80A 4	BE 80A 4		BXN 80MA 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	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	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	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 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

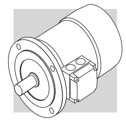
(F79)

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					

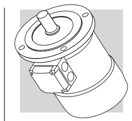


(F81)

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
	0.55	BN 71C 4				M 1LA 4			
		BN 80A 4	BE 80A 4		BXN 80MA 4				MXN 20MA 4
	0.75	BN 80B 4	BE 80B 4	BX 90SR 4	BXN 80MB 4	M 2SA 4	ME 2SB 4	MX 2SB 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	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	
	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

CE

P_n			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%						kgm^2			Nm	NB	SB	kgm^2			Nm		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

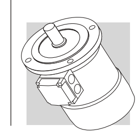
Note: for more details on the available energy certifications look at the catalog's dedicated section.

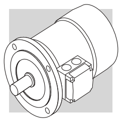
4 P	1500 min^{-1} - S1	50 Hz - IE3

CE

P_n		n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
kW		min^{-1}	Nm	A	100%	75%	50%						kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.12	**MXN 05MA 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	**MXN 05MB 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	**MXN 10MA 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	**MXN 10MB 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	**MXN 20MA 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	**MXN 20MB 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

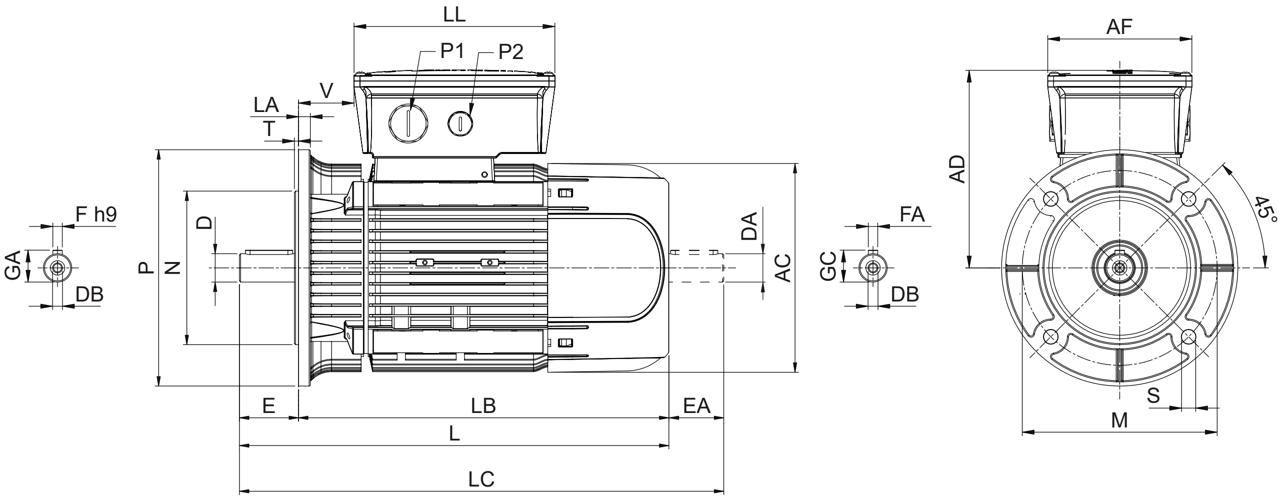
Note: for more details on the available energy certifications look at the catalog’s dedicated section.





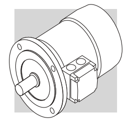
M15 MOTORS DIMENSIONS BXN-MXN

BXN - IM B5 - CE CUS/UKCA

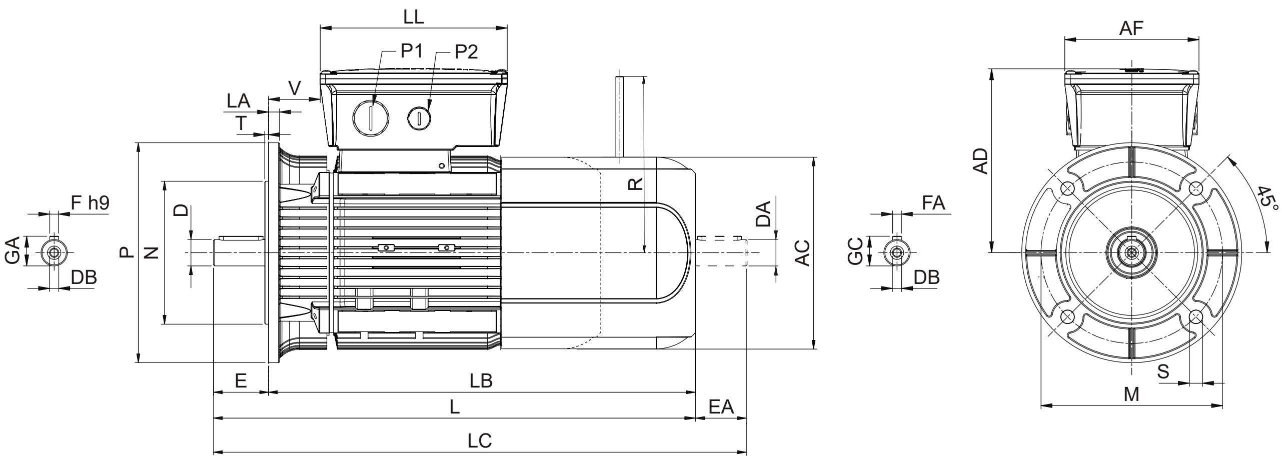


	Shaft					Housing						Motor							
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V
BXN 63	11 9[1]	23 20[1]	M4 M3[1]	12.5 10.2[1]	4 3[1]	115	95	140	9.5	3	9	122	281	258	301	136	112	165	37
BXN 71	14 11[1]	30 23[1]	M5 M4[1]	16 12.5[1]	5 4[1]	130	110	160		3.5		138	292	262	315	138			34
BXN 80	19 14[1]	40 30[1]	M6 M5[1]	21.5 16[1]	6 5[1]	165	130	200	11.5		10	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



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<tr><th rowspan="2"></th><th colspan="5">Shaft</th><th colspan="6">Housing</th><th colspan="10">Motor</th></tr>
<tr><th>D
DA</th><th>E
EA</th><th>DB</th><th>GA
GC</th><th>F
FA</th><th>M</th><th>N</th><th>P</th><th>S</th><th>T</th><th>LA</th><th>AC</th><th>L</th><th>LB</th><th>LC</th><th>AD</th><th>AF</th><th>LL</th><th>V</th><th>R
FD</th><th>R
FA</th></tr>
<tr><td>BXN 63</td><td>11
9(1)</td><td>23
20(1)</td><td>M4
M3(1)</td><td>12.5
10.2(1)</td><td>4
3(1)</td><td>115</td><td>95</td><td>140</td><td rowspan="2">9.5</td><td>3</td><td rowspan="2">9</td><td>122</td><td>328</td><td>305</td><td>352</td><td>136</td><td rowspan="4">112</td><td rowspan="3">165</td><td>37</td><td>96</td><td>116</td></tr>
<tr><td>BXN 71</td><td>14
11(1)</td><td>30
23(1)</td><td>M5
M4(1)</td><td>16
12.5(1)</td><td>5
4(1)</td><td>130</td><td>110</td><td>160</td><td rowspan="3">3.5</td><td>138</td><td>351</td><td>321</td><td>380</td><td>138</td><td>34</td><td>103</td><td>121</td></tr>
<tr><td>BXN 80</td><td>19
14(1)</td><td>40
30(1)</td><td>M6
M5 1)</td><td>21.5
16(1)</td><td>6
5(1)</td><td rowspan="2">165</td><td rowspan="2">130</td><td rowspan="2">200</td><td rowspan="2">11.5</td><td rowspan="2">10</td><td>158</td><td>417</td><td>377</td><td>448</td><td>148</td><td>40</td><td>129</td><td>131</td></tr>
<tr><td>BXN 90</td><td>24
19(1)</td><td>50
40(1)</td><td>M8
M6(1)</td><td>27
21.5(1)</td><td>8
6(1)</td><td>177</td><td>433</td><td>383</td><td>451</td><td>170</td><td>170</td><td>43</td><td>160</td><td>160</td></tr>
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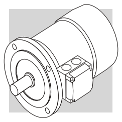
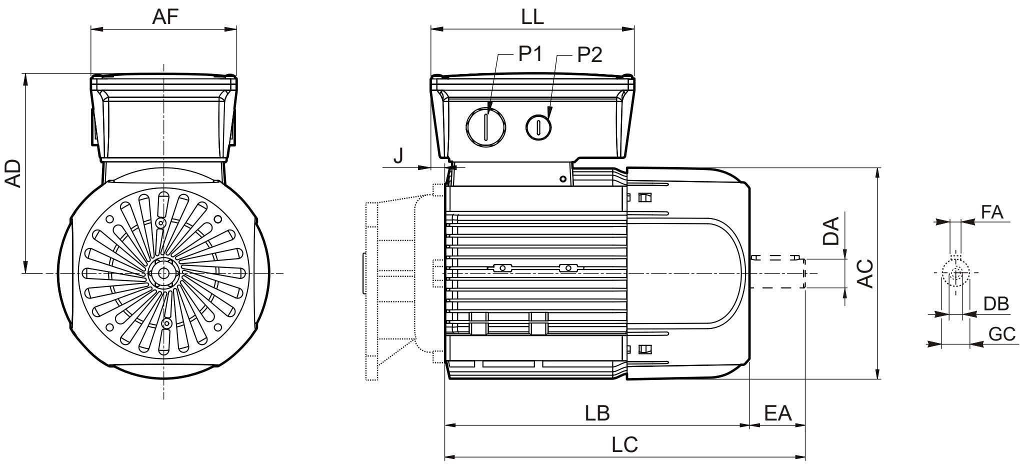
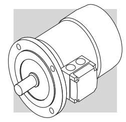
N.B.: 1) These values refer to the rear shaft end (PS).



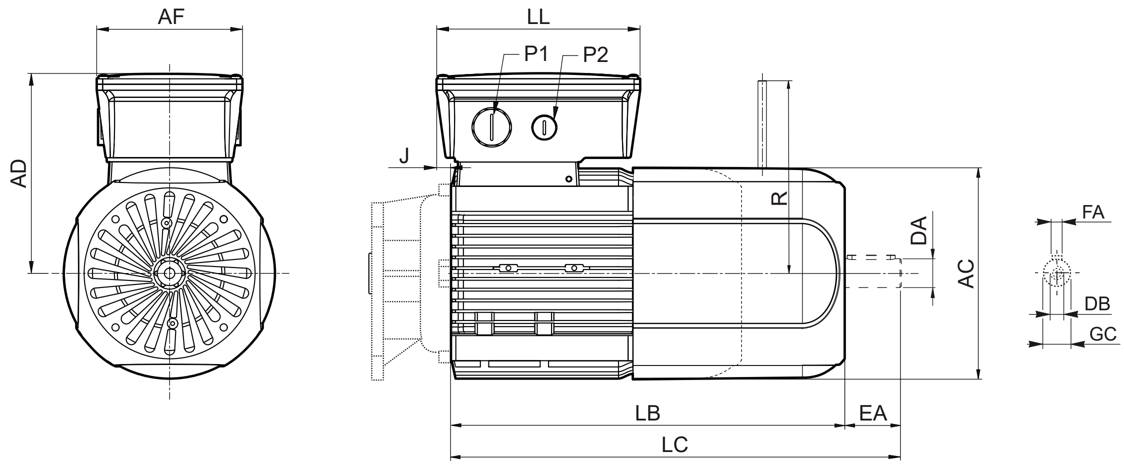
MXN



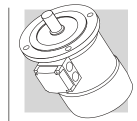
	Rear shaft end					Motor						
	DA	**EA**	**DB**	**FA**	**GC**	**AC**	**LB**	**LC**	**AF**	**LL**	**J**	**AD**
MXN 05	9	20	M3	3	10.2	123	211.5	231.5	112	165	9.5	136
MXN 10	11	23	M4	4	12.5	138	216	239	112	165	11.5	137
MXN 20	14	30	M5	5	16	158	255.5	285.5	112	165	10.5	146



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



4 P	1500 min^{-1} - S1	50 Hz - IE3

CE

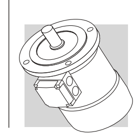
P_n kW			n min^{-1}	M_n Nm	In 400V A	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4} kgm^2	IM B5	d.c. brake FD Mod	M_b Nm	J_m x 10^{-4} kgm^2	IM B5	a.c. brake FA Mod	M_b Nm	J_m x 10^{-4} kgm^2	IM B5
0.75	**BX 80B**	**4**	1425	5.0	1.61	82.5	83.9	83.2	0.81	6.5	2.0	1.8	J	35	16	**FD 04**	15	37	19.9	**FA 04**	15	37	19.8
1.1	**BX 90S**	**4**	1425	7.4	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	10.1	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	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	**BX 100LB**	**4**	1445	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	**BX 112M**	**4**	1445	26	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	36	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	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	**BX 160MA**	**4**	1465	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	**BX 160MB**	**4**	1465	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	**BX 160L**	**4**	1465	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
18.5	**BX 180M**	**4**	1480	119	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	142	38.2	93.0	93.6	92.8	0.88	10.2	2.5	2.0	L	1660	163	**FD 09**	300	1860	203				

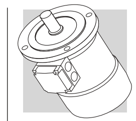
Note: for more details on the available energy certifications look at the catalog's dedicated section.

4 P	1500 min^{-1} - S1	50 Hz - IE3

P_n			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4}	IM B5	d.c. brake FD				a.c. brake FA			
																Mod	M_b	J_m x 10^{-4}	IM B5	Mod	M_b	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%						kgm^2			Nm	kgm^2			Nm	kgm^2	
30	**BX 200LA**	**4**	1483	193.2	54.8	93.6	93.9	93.4	0.84	7.5	2.7	3.2	N/A	3850	292	**FD20**	260	3910	317				
37	**BX 225SA**	**4**	1482	238.6	68.9	93.9	94.1	93.8	0.83	7.2	3.1	3.1	N/A	4270	322	**FD25**	400	4450	356				
45	**BX 225SB**	**4**	1482	290	82.3	94.2	94.4	94	0.84	8	3.2	3.5	N/A	5250	357	**FD25**	400	5430	391				
55	**BX 250MA**	**4**	1482	354.2	100	94.6	94.7	94	0.84	7.1	2.9	3.4	N/A	6940	406	**FD30**	1000	7540	452				
75	**BX 280SA**	**4**	1485	483	133	95	95.2	94.8	0.86	6.4	2.3	2.8	N/A	13800	645	**FD30**	1000	14400	691				
90	**BX 280SB**	**4**	1485	578	158	95.2	95.5	95.2	0.86	7.1	2.5	2.9	N/A	17300	700	**FD30**	1000	17900	746				
110	**BX 315SA**	**4**	1489	705	198	95.4	95.5	95	0.84	7	2.1	3	N/A	24300	930	**FD30**	1000	24900	976				
132	**BX 315SB**	**4**	1488	847	231	95.6	95.9	95.5	0.86	6.7	2.2	2.9	N/A	29000	1000	**FD160**	1600	30500	1121				
160	**BX 315SC**	**4**	1488	1026	282	95.8	96	95.8	0.85	6.9	2.2	3	N/A	32000	1065	**FD160**	1600	33500	1186				
200	**BX 315MA**	**4**	1487	1284	351	96	96.4	96.4	0.86	6.8	2.4	3	N/A	39000	1220	**FD250**	2500	41400	1390				
250	**BX 355MA**	**4**	1491	1601	435	96	96	95.6	0.86	6.4	2.1	2.9	N/A	59000	1610	**FD250**	2500	61400	1780				
315	**BX 355MB**	**4**	1491	2018	550	96	96.1	95.7	0.85	7.3	2.4	3.3	N/A	69000	1780	**FD400**	4000	73300	2000				
355	**BX 355MC**	**4**	1490	2273	616	96	96.2	95.8	0.86	6.3	2.3	2.8	N/A	72000	1820	**FD400**	4000	76300	2040				

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

EECA

P_n		n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	J_m x 10^{-4}	IM B5
kW	.	min^{-1}	Nm	A	100%	75%	50%						kgm^2			Nm	kgm^2			Nm	kgm^2	
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

P_n			n	M_n	In 460V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%						kgm^2			Nm	kgm^2			Nm	kgm^2	
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.

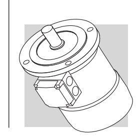
4 P	1800 min⁻¹ - S1	60 Hz - Nema Premium

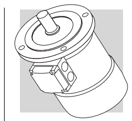
P_n		n	M_n	In 460V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	J_m x 10^{-4}	IM B5
kW		min^{-1}	Nm	A	100%	75%	50%						kgm^2	kg		Nm	kgm^2	kg		Nm	kgm^2	kg
30	**BX 200LAK 4**	1786	160	47.9	94.7	94.8	94.1	0.83	9.4	3.3	3.7	N/A	3660	319	**FD 8**	400	3940	337				
37	**BX 225SAK 4**	1784	198	57.3	95.3	95.5	94.9	0.85	8.8	2.9	3.4	N/A	5360	398	**FD 9**	600	5720	426				
45	**BX 225SBK 4**	1785	240	70.5	95.3	95.4	94.8	0.84	8.9	3	3.6	N/A	5360	398	**FD 9**	600	5720	426				
55	**BX 250MAK 4**	1787	293	85.8	95.7	95.8	95.2	0.84	9.1	3.3	3.7	N/A	9330	476	**FD 10**	800	10080	521				
75	**BX 280SAK 4**	1788	401	117	95.9	95.7	94.7	0.84	8.4	2.7	3.1	N/A	15000	665	**FD 1000**	1000	15360	771				
90	**BX 280SBK 4**	1788	481	140	96.1	95.9	95	0.84	9	3.1	3.3	N/A	18500	725	**FD 1000**	1000	18860	831				
110	**BX 315SAK 4**	1792	586	172	96.1	96	95.3	0.84	8.8	2.6	3.4	N/A	29000	1000	**FD 1000**	1000	29360	1106				
132	**BX 315SBK 4**	1791	704	206	96.4	96.3	95.6	0.84	9	2.8	3.6	N/A	32000	1065	**FD 1600**	1600	32500	1233				
160	**BX 315SCK 4**	1791	853	241	96.4	96.4	95.9	0.86	9	2.9	3.3	N/A	39000	1220	**FD 1600**	1600	39500	1388				
200	**BX 355SAK 4**	1792	1065	301	96.4	96.2	95.4	0.87	8.3	2.2	3	N/A	59000	1610	**FD 2500**	2500	59500	1778				
250	**BX 355MAK 4**	1792	1332	381	96.7	96.6	96	0.86	8.8	2.7	3.2	N/A	69000	1780	**FD 2500**	2500	69500	1948				
315	**BX 355MBK 4**	1791	1679	479	96.7	96.6	96.1	0.85	8.5	3.1	3.2	N/A	72000	1820	**FD 2500**	2500	72500	1988				
355	**BX 355MCK 4**	1792	1893	541	96.7	96.5	96.9	0.86	7.2	2.4	3.1	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	**1500 min^{-1}** - S1	**50 Hz - IE3**

P_n			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%						kgm^2			Nm	kgm^2			Nm	kgm^2	
0.75	**MX 2SB**	**4**	1425	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**	1445	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**	1445	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**	1445	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**	1445	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**	1460	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**	1460	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**	1460	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**	1465	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**	1465	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**	1465	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



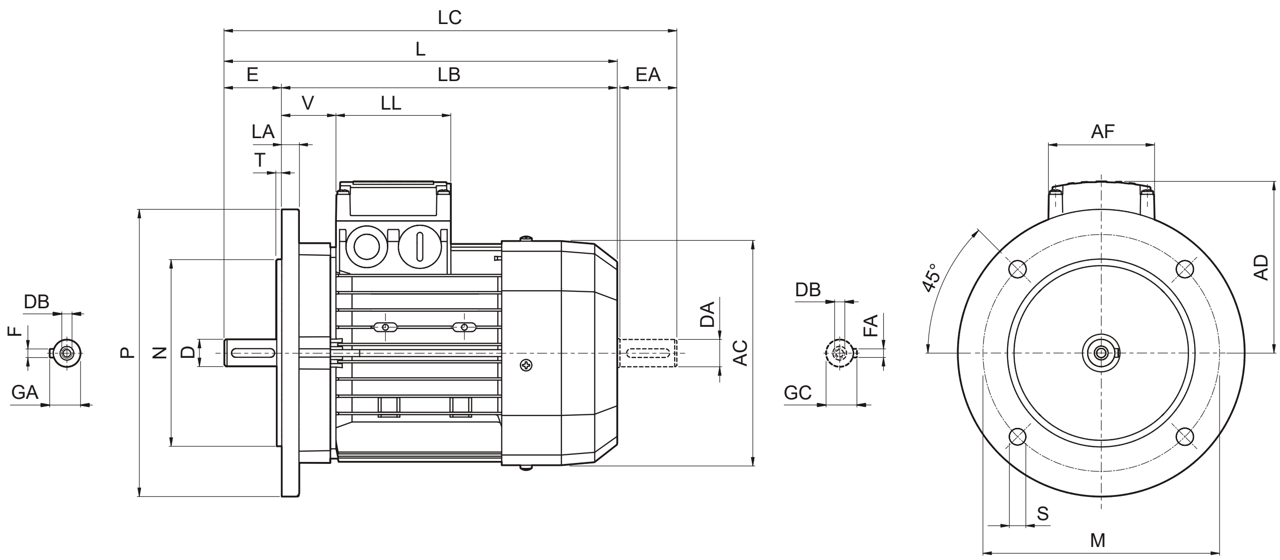


4 P	1800 min^{-1} - S1	60 Hz - IE3

P_n kW			n min^{-1}	M_n Nm	In 460V A	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA code	J_m x 10^{-4} kgm^2	IM B5 (kg)	d.c. brake FD Mod	FD M_b Nm	FD J_m x 10^{-4} kgm^2	FD IM B5 (kg)	a.c. brake FA Mod	FA M_b Nm	FA J_m x 10^{-4} kgm^2	FA IM B5 (kg)
0.75	**MX 2SB**	**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	**MX 3SA**	**4**	1755	6.0	2.19	86.5	86.0	83.0	0.73	7.9	3.3	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	3.7	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	4.8	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	4.4	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	4.7	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	5.1	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	4.9	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	2.6	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	2.4	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	2.8	M	890	121	**FD 08**	200	965	151	**FA 08**	200	965	150

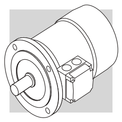
M17 MOTORS DIMENSIONS BX-MX

BX - IM B5 - CE/CCC

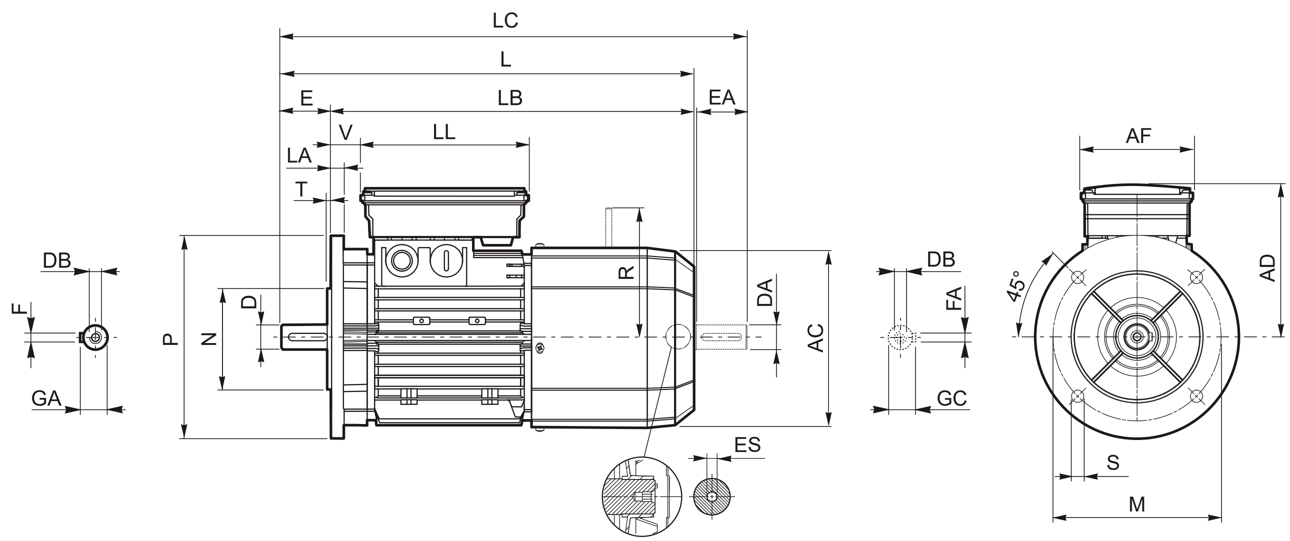


	Shaft					Flange						Motor							
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V
BX 80 B	19 14(1)	40 30(1)	M6 M5(1)	21.5 16(1)	6 5(1)	165	130	200	11.5	3.5	11.5	156	320	280	351	119	74	80	38
BX 90 S	24 19(1)	50 40(1)	M8 M6(1)	27 21.5 (1)	8 6(1)							176	326	276	368	133	98	98	44
BX 90 LA																			
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																			
BX 112 M											15	219	430	370	482	157			52
BX 132 SB	38 28(1)	80 60(1)	M12 M10(1)	41 31(1)	10 8(1)	265	230	300			20	258	493	413	556	193	118	118	58
BX 132 MA													528	448	591				
BX 160 MA	42 38(1)	110 80(1)	M16 M12(1)	45 41(1)	12 10(1)	300	250	350	18.5	5	15	310	596	486	680	245	187	187	51
BX 160 MB													640	530	724				
BX 160 L																			
BX 180 M	48 42(1)	110 110(1)	M16 M16(1)	51.5 45(1)	14 12(1)						18	348	708	598	823	261			52
BX 180 L																			
BX 200LA	55 45(1)		M20 M20(1)	59 48.5(1)	16 14(1)	350	300	400	19		20	423	821	711	934	328	300	311	55
BX 225SA	60 55(1)	140 110(1)		64 59(1)	18 16(1)	400	350	450				465	879	739	1001	348			48
BX 225SB																			
BX 250MA	65 55(1)			69 59(1)		500	450	550			24	514	884	744	1010	376			
BX 280SA	75 65(1)	140 140(1)		79.5 69(1)	20 18(1)				18		23	567	1088	948	1238	482	434	306	43
BX 280SB																			
BX 315SA	80 75(1)	170 140(1)		85 79.5(1)	22 20(1)	600	550	660	23	6	25	645	1204	1034	1352	537	473	347	42
BX 315SB																			
BX 315SC																			
BX 315MA	90 75(1)		M24 M20(1)	95 79.5(1)	25 20(1)								1315	1145	1463				
BX 355MA	100 75(1)	210 170(1)		106 79.5(1)	28 20(1)	740	680	800				740	1479	1269	1659	603	694	413	50
BX 355MB																			
BX 355MC																			

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

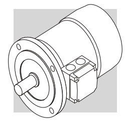


BX - IM B5 - FD/FA - CE/CCC



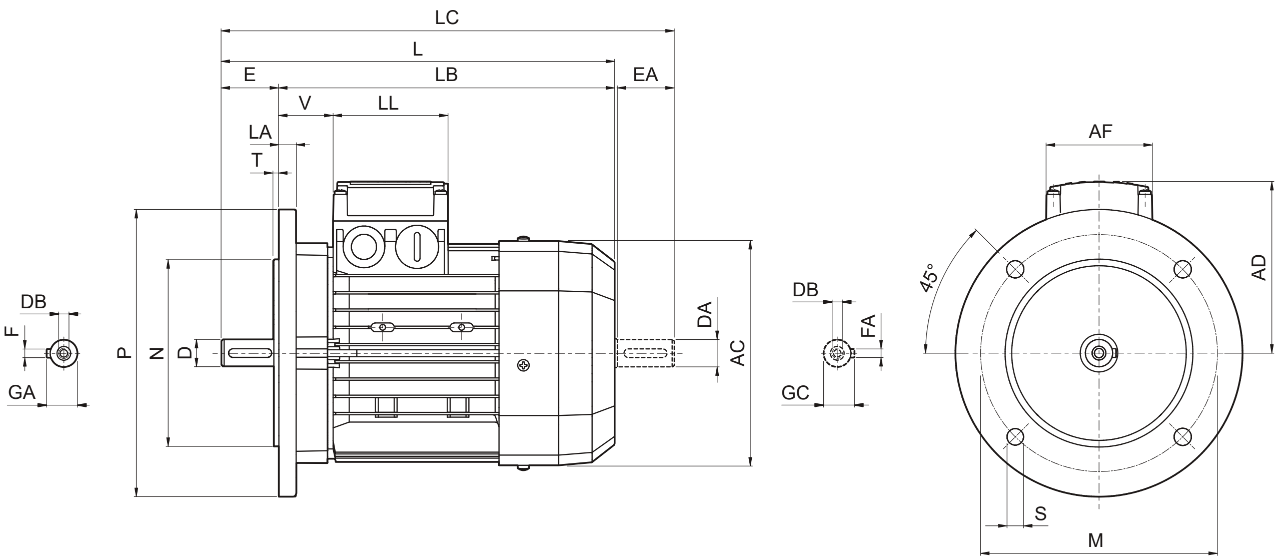
	Shaft					Flange						Motor										
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R		ES (2)
																				FD	FA	
BX 80 B	19 14(1)	40 30(1)	M6 M5(1)	21.5 16(1)	6 5(1)							156	392	352	423	143	98	133	25			5
BX 90 S	24 19(1)	50 40(1)	M8 M6(1)	27 21.5(1)	8 6(1)	165	130	200	11.5	3.5	11.5	176	410	360	452	146			32	129	134	
BX 90 LA																						
BX 100 LA											14	195	502	442	554	155	110	165	37	160	160	
BX 100 LB	28 24(1)	60 50(1)	M10 M8(1)	31 27(1)	8 8(1)	215	180	250														6
BX 112 M									14	4	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													736	626	820							
BX 160 MB	42 38(1)	110 80(1)	M16 M12(1)	45 41(1)	12 10(1)						15	310	780	670	864	245			51	266	247	
BX 160 L						300	250	350	18.5	5							187	187				
BX 180 M	48 42(1)		M16 M16(1)	51.5 45(1)	14 12(1)						18	348	866	756	981	261			52	305		
BX 180 L		110 110(1)																				
BX 200LA	55 45(1)			59 48.5(1)	16 14(1)	350	300	400				423	982	872	1095	328			55	275		
BX 225SA	60 55(1)			64 59(1)		400	350	450	19		20	465	1058	918	1180	348	300	311		308		
BX 225SB		140 110(1)			18 16(1)														48			
BX 250MA	65 55(1)			69 59(1)						5	24	514	1099	959	1225	376				313		
BX 280SA	75 65(1)	140 140(1)	M20 M20(1)	79.5 69(1)	20 18(1)	500	450	550	18		23	567	1340	1200	1490	482	434	306	43			—
BX 280SB																					—	
BX 315SA													1452	1282	1600					500		
BX 315SB	80 75(1)			85 79.5(1)	22 20(1)	600	550	660				645	1497	1327	1645	537	473	347	42			
BX 315SC		170 140(1)																				
BX 315MA	90 75(1)			95 79.5(1)	25 20(1)				23	6	25		1607	1437	1755							
BX 355MA													1790	1580	1970							
BX 355MB	100 75(1)	210 170(1)	M24 M20(1)	106 79.5(1)	28 20(1)	740	680	800				740	1825	1615	2005	603	694	413	50	—		
BX 355MC																						

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



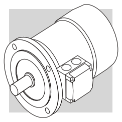
BX-MX

BX - IM B5 - CUS/NBR/EECA

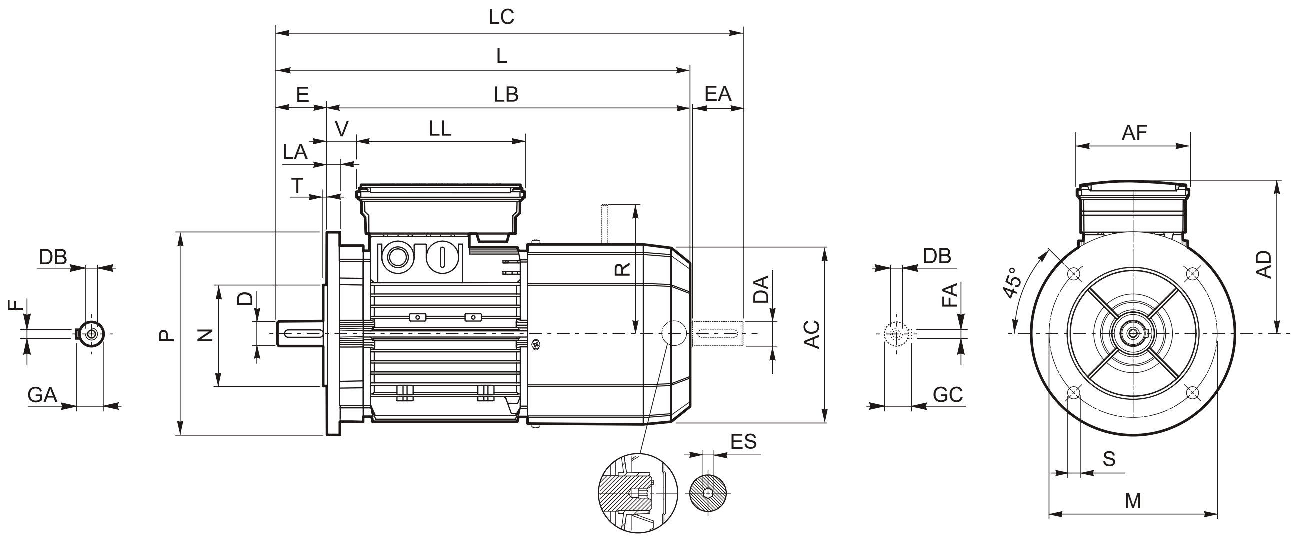


	Shaft					Flange						Motor							
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V
BX 90 SR	19 19[1]	40 40[1]	M6 M6[1]	21.5 21.5[1]	6 6[1]	165	130	200	11.5	3.5	11.5	176	316	276	358	133	98	98	44
BX 90 S	24 19[1]	50 40[1]	M8 M6[1]	27 21.5[1]	8 6[1]								326		368				
BX 90 LA																			
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																			
BX 112 M											15	219	430	370	482	157			52
BX 132 SB	38 28[1]	80 60[1]	M12 M10[1]	41 31[1]	10 8[1]	265	230	300			20	258	552	472	615	193	118	118	58
BX 132 MA																			
BX 160 MA	42 38[1]	110 80[1]	M16 M12[1]	45 41[1]	12 10[1]	300	250	350	18.5	5	15	310	596	486	680	245	187	187	51
BX 160 MB													640	530	724				
BX 160 L																			
BX 180 M	48 42[1]	110 110[1]	M16 M16[1]	51.5 45[1]	14 12[1]						18	348	708	598	823	261			52
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	423	821	711	934	328	300	311	55
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	48
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	
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	43
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).

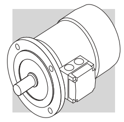


BX - IM B5 - FD/FA - CUS/NBR/EECA

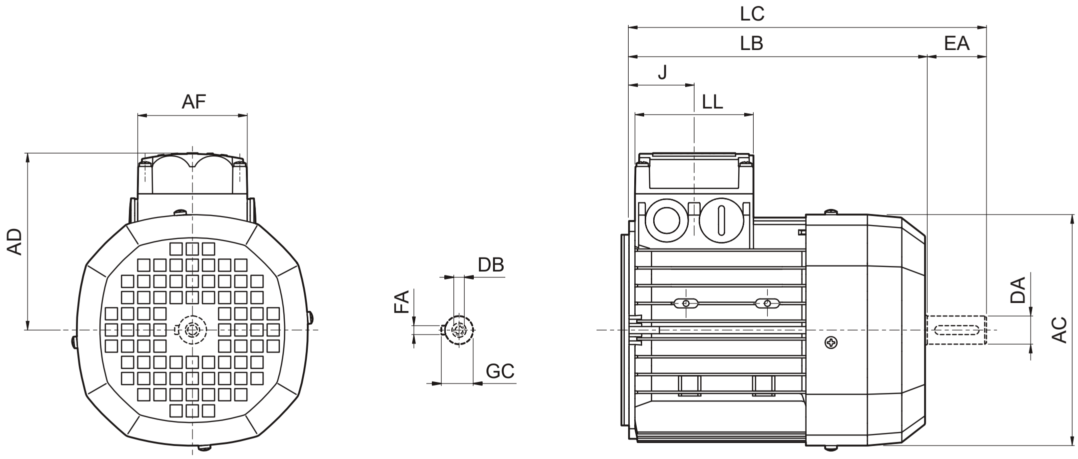


	Shaft					Flange						Motor								R		ES
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	FD	FA	(2)
BX 90 SR	19 19[1]	40 40[1]	M6 M6[1]	21.5 21.5[1]	6 6[1]								400		442					129	134	
BX 90 S	24 19[1]	50 40[1]	M8 M6[1]	27 21.5[1]	8 6[1]	165	130	200	11.5	3.5	11.5	176	410	360	452	146			32			
BX 90 LA																	110	165		160	160	
BX 100 LA											14	195	502	442	554	155			37			
BX 100 LB	28 24[1]	60 50[1]	M10 M8[1]	31 27[1]	8 8[1]	215	180	250														6
BX 112 M									14	4	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													736	626	820							
BX 160 MB	42 38[1]	110 80[1]	M16 M12[1]	45 41[1]	12 10[1]						15	310	780	670	864	245			51	266	247	
BX 160 L						300	250	350	18.5	5							187	187				
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	275		
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										5												
BX 250MAK	65 55[1]			69 59[1]							24	510	1070	930	1240	376				313		
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			—
BX 280SBK																					—	
BX 315SAK													1493	1323	1643					500		
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			
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



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<tr><th>DA</th><th>EA</th><th>DB</th><th>GC</th><th>FA</th><th>AC</th><th>LB</th><th>LC</th><th>AF</th><th>LL</th><th>J</th><th>AD</th></tr>
<tr><td>MX 2SB</td><td>14</td><td>30</td><td>M5</td><td>16</td><td>5</td><td>156</td><td>246</td><td>278</td><td>74</td><td>80</td><td>44</td><td>119</td></tr>
<tr><td>MX 3SA</td><td rowspan="4">24</td><td rowspan="4">50</td><td rowspan="4">M8</td><td rowspan="4">27</td><td rowspan="7">8</td><td rowspan="4">195</td><td rowspan="2">265</td><td rowspan="2">317</td><td rowspan="4">98</td><td rowspan="4">98</td><td rowspan="4">53.5</td><td rowspan="4">142</td></tr>
<tr><td>MX 3SB</td></tr>
<tr><td>MX 3LA</td><td rowspan="2">305</td><td rowspan="2">357</td></tr>
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<tr><td>MX 4SA</td><td rowspan="3">28</td><td rowspan="3">60</td><td rowspan="3">M10</td><td rowspan="3">31</td><td rowspan="3">258</td><td rowspan="2">361</td><td rowspan="2">424</td><td rowspan="3">118</td><td rowspan="3">118</td><td rowspan="3">64.5</td><td rowspan="3">193</td></tr>
<tr><td>MX 4SB</td></tr>
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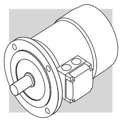
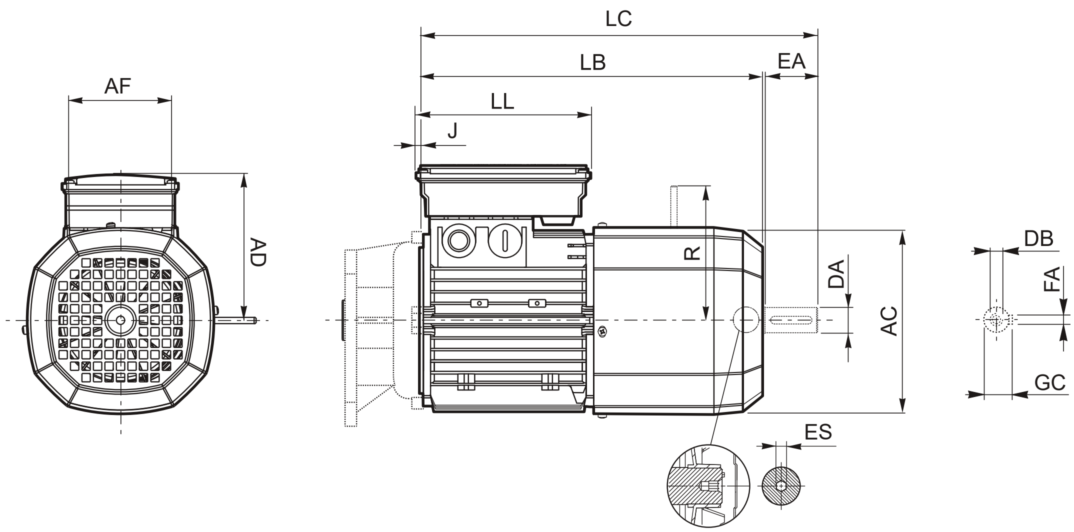


BX-MX

MX_FD/FA



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<tr><th>DA</th><th>EA</th><th>DB</th><th>GC</th><th>FA</th><th>AC</th><th>LB</th><th>LC</th><th>AF</th><th>LL</th><th>J</th><th>AD</th><th colspan="2">R
FD FA</th><th>ES (1)</th></tr>
<tr><td>MX 2SB</td><td>14</td><td>30</td><td>M5</td><td>16</td><td>5</td><td>156</td><td>318</td><td>349</td><td>98</td><td>133</td><td>9</td><td>143</td><td>129</td><td>134</td><td>5</td></tr>
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<tr><td>MX 4SB</td></tr>
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<tr><td>MX 5SA</td><td rowspan="3">38</td><td rowspan="3">80</td><td rowspan="3">M12</td><td rowspan="3">41</td><td rowspan="3">10</td><td rowspan="3">310</td><td>558</td><td>644</td><td rowspan="3">187</td><td rowspan="3">187</td><td rowspan="3">17</td><td rowspan="3">245</td><td rowspan="3">266</td><td rowspan="3">247</td><td rowspan="3">—</td></tr>
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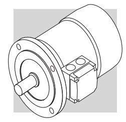
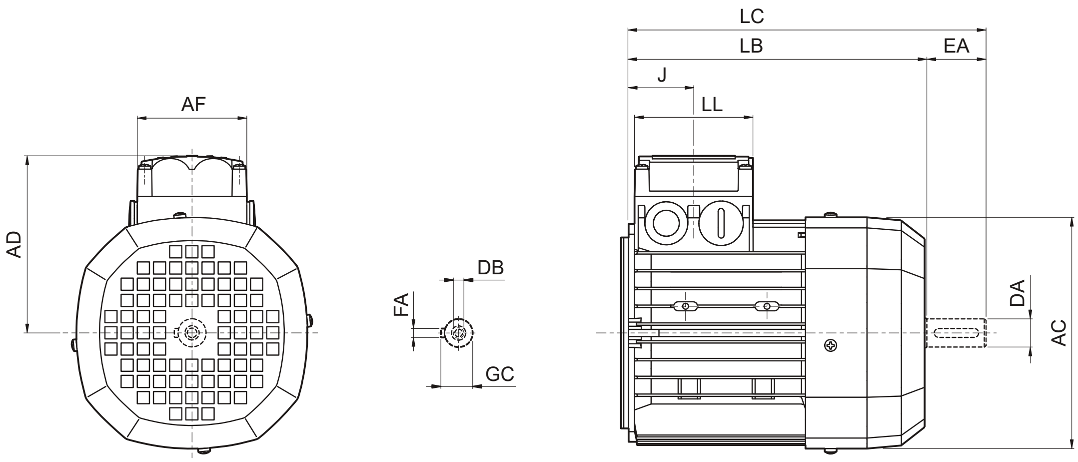
N.B.:
1) “ES” hexagon is not present with PS option



MX CUS



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<tr><th>DA</th><th>EA</th><th>DB</th><th>GC</th><th>FA</th><th>AC</th><th>LB</th><th>LC</th><th>AF</th><th>LL</th><th>J</th><th>AD</th></tr>
<tr><td>MX 2SB</td><td>14</td><td>30</td><td>M5</td><td>16</td><td>5</td><td>176</td><td>262</td><td>293</td><td rowspan="5">98</td><td rowspan="5">98</td><td>79</td><td>133</td></tr>
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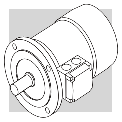
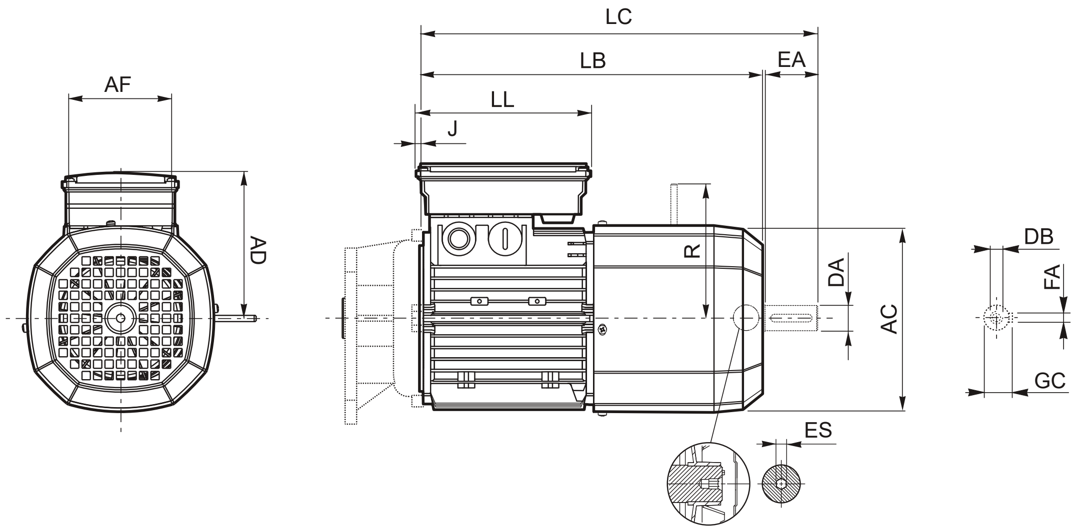


MX_FD/FA CUS



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

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

M18 MOTOR RATING CHARTS BE-ME

2 P	3000 min^{-1} - S1	50 Hz - IE2

P_n (kW)			n (min^{-1})	M_n (Nm)	In 400V (A)	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4} (kgm^2)	IM B5	d.c. brake FD Mod	M_b (Nm)	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} (kgm^2)	IM B5	a.c. brake FA Mod	M_b (Nm)	Z_o 1/h	J_m x 10^{-4} (kgm^2)	IM B5
0.75	**BE 80A**	**2**	2860	2.5	1.65	80	79.6	76.4	0.83	6.8	3.8	3.5	9	9.5	**FD 04**	5	1700	3200	9.4	13.4	**FA 04**	5	3200	9.4	13.3
1.1	**BE 80B**	**2**	2845	3.7	2.35	81.5	82.2	79.9	0.83	6.9	3.8	3.1	11.4	11.3	**FD 04**	10	1500	3000	10.6	15.2	**FA 04**	10	3000	10.6	15.1
1.5	**BE 90SA**	**2**	2865	5	3.2	81.3	80.7	78.1	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	80.8	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	**BE 100L**	**2**	2880	9.9	6.2	84.6	84.6	83.7	0.83	7.3	3.5	3.1	39	23	**FD 15**	26	700	1600	35	29	**FA 15**	26	1600	35	30
4	**BE 112M**	**2**	2920	13.1	8.2	85.8	85.5	84.3	0.82	7.9	3.5	3.1	57	28	**FD 06S**	40	—	950	66	39	**FA 06S**	40	950	66	40
5.5	**BE 132SA**	**2**	2925	18	10.6	87	85	81.7	0.86	8.5	3.6	3.3	145	42	**FD 06**	50	—	600	112	55	**FA 06**	50	600	112	56
7.5	**BE 132SB**	**2**	2935	24	14.3	88.1	87.4	84.7	0.86	8.8	3.9	3.6	178	53	**FD 06**	50	—	550	154	66	**FA 06**	50	550	154	67
9.2	**BE 132MB**	**2**	2920	30	16.4	88.8	86.5	84.2	0.91	8.4	3.7	3.3	210	65	**FD 56**	75	—	430	189	78	**FA 06**	75	430	189	79
11	**BE 160MA**	**2**	2940	36	20	89.4	89.5	88	0.89	8.1	3	2.9	340	84	**—**	—	—	—	—	—	**—**	—	—	—	—
15	**BE 160MB**	**2**	2950	49	27.2	90.5	90.5	89.5	0.88	8.5	3	2.8	420	97	**—**	—	—	—	—	—	**—**	—	—	—	—
18.5	**BE 160L**	**2**	2945	60	32	90.9	90.5	89.8	0.91	7.7	2.9	2.7	490	109	**—**	—	—	—	—	—	**—**	—	—	—	—

4 P	1500 min^{-1} - S1	50 Hz - IE2

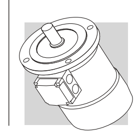
CE CCC A068744

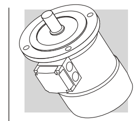
P_n (kW)	.		n (min^{-1})	M_n (Nm)	In 400V (A)	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4} (kgm^2)	IM B5 (kg)	d.c. brake FD Mod	M_b (Nm)	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} (kgm^2)	IM B5 (kg)	a.c. brake FA Mod	M_b (Nm)	Z_o 1/h	J_m x 10^{-4} (kgm^2)	IM B5 (kg)
0.12	**BE 63A**	**4**	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	5.1	**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	72.7	69.3	64.2	0.75	4.0	2.3	2.2	6.9	5.9											
0.55	**BE 80A**	**4**	1430	3.7	1.38	77.1	73.4	68	0.77	6	2.2	1.9	15	8.2	**FD 04**	10	4100	8000	16.6	13.8	**FA 04**	10	8000	16.6	13.7
0.75	**BE 80B**	**4**	1430	5	1.76	79.6	78.5	75.1	0.78	6.1	3.2	3	28	12.2	**FD 04**	15	4100	7800	22	16.1	**FA 04**	15	7800	22	16
1.1	**BE 90S**	**4**	1430	7.4	2.53	81.4	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	82.8	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	84.3	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	86.6	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	**—**	—	—	—	—

6 P	1000 min^{-1} - S1	50 Hz - IE2

P_n			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%					kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.75	**BE 90S**	**6**	935	7.7	2.06	75.9	75.9	73	0.69	5.1	3.1	2.9	33	15	**FD 14**	15	3400	6500	28	19.2	**FA 14**	15	6500	28	19.1
1.1	**BE 100M**	**6 (*)**	945	11.1	2.75	78.1	76.2	73	0.74	4.9	2.2	1.9	82	22	**FD 15**	26	2500	4800	58	30	**FA 15**	26	4800	58	31
1.5	**BE 100LA**	**6**	945	15.2	3.9	79.8	77.5	74	0.72	5.6	2.5	2.3	95	24	**FD 15**	40	1900	4100	86	30	**FA 15**	40	4100	86	31
2.2	**BE 112M**	**6**	950	22	5.2	81.8	81.8	79.3	0.74	5.2	2.6	2.3	168	32	**FD 06S**	60	—	2100	177	42	**FA 06S**	60	2100	177	44
3	**BE 132S**	**6**	955	30	6.6	83.3	83.3	82.4	0.79	6.1	2.1	1.9	295	44	**FD 56**	75	—	1400	226	57	**FA 06**	75	1400	226	58
4	**BE 132MA**	**6**	965	40	8.7	84.6	85	83.1	0.79	6.9	2.2	2	383	56	**FD 06**	100	—	1200	305	69	**FA 07**	100	1200	318	74
5.5	**BE 160MA**	**6 (*)**	965	54	11.6	87	87	86.4	0.79	6.6	2.5	2.3	740	83	**FD 08**	170	—	1000	700	112	**FA 08**	170	1000	700	113
7.5	**BE 160MB**	**6 (*)**	965	74	15	88	88	87.2	0.82	6.6	2.3	2.1	970	103	**FD 08**	170	—	900	815	132	**FA 08**	170	900	815	133

(*) Power /size relation not standardized



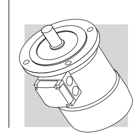


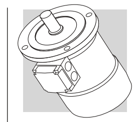
2 P	3000 min^{-1} - S1	50 Hz - IE2

P_n			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4}	IM B5	d.c. brake FD						a.c. brake FA				
															Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	Mod	M_b	Z_o 1/h	J_m x 10^{-4}	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	76.4	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	79.9	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	78.1	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	80.8	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	85.5	83	81.2	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			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4}	IM B5	d.c. brake FD						a.c. brake FA				
															Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%					kgm^2	Kg		Nm	NB	SB	kgm^2	Kg		Nm		kgm^2	Kg
0.37	**BE 71B**	**4**	1385	2.55	1.05	72.7	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**	1430	3.7	1.38	77.1	73.4	68	0.77	6	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	1.76	79.6	78.5	75.1	0.78	6.1	3.2	3	28	12.2	**FD 04**	15	4100	7800	22	16.1	**FA 04**	15	7800	22	16
1.1	**BE 90S**	**4**	1430	7.4	2.53	81.4	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	82.8	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	84.3	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**	1445	27	8.2	86.3	87	84.3	0.76	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

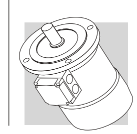
P_n			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%					kgm^2	kg		Nm	NB	SB	kgm^2	kg		Nm		kgm^2	kg
0.75	**BE 90S**	**6**	935	7.7	2.06	75.9	75.9	73	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	73	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	74	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	79.3	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	84.3	83.6	81.3	0.76	6.9	2.2	2	383	56	**FD 06**	100	—	1200	305	58	**FA 07**	100	1200	318	63

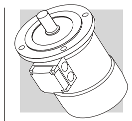
(*) Power /size relation not standardized

4 P	1800 min^{-1} - S1	60 Hz - IE2

c US

																	d.c. brake						a.c. brake				
																	FD						FA				
P_n				n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA Code	J_m x 10^{-4}	IM B5	Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
HP	kW	.		min^{-1}	Nm	A	100%	75%	50%						kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.75	0.55	**BE 80A**	**4**	1740	3	1.23	75.5	73.1	66.8	0.74	8.7	3.8	3.0	N	19	9.9	**FD 04**	10	4100	8000	16.6	13.8	**FA 04**	10	8000	16.6	13.7
1	0.75	**BE 80B**	**4**	1745	4.1	1.46	82.5	81.1	77.6	0.78	7.6	3.5	3.2	K	28	12.2	**FD 04**	15	4100	7800	22	16.1	**FA 04**	15	7800	22	16
1.5	1.1	**BE 90S**	**4**	1740	6	2.25	84	82.7	79	0.73	7.7	3.5	3.2	L	28	13.6	**FD 14**	15	4800	8000	32	17.8	**FA 14**	15	8000	32	17.7
2	1.5	**BE 90LA**	**4**	1740	8.2	3.1	84.5	83.9	80.7	0.73	7.1	3.6	3.4	K	34	15.1	**FD 05**	26	3400	6000	34	21.1	**FA 05**	26	6000	34	21.8
3	2.2	**BE 100LA**	**4**	1745	12	4.2	87.5	85.5	83.2	0.76	7	3.3	2.9	J	54	22	**FD 15**	40	2600	4700	44	29	**FA 15**	40	4700	44	29
4	3	**BE 100LB**	**4**	1735	16.5	5.9	87.5	87.7	86.3	0.76	7	3.2	2.9	K	61	24	**FD 15**	40	2400	4400	58	31	**FA 15**	40	4400	58	31
5	3.7	**BE 112M**	**4**	1750	20	6.6	87.5	87.5	86.1	0.8	7.8	3.3	3.2	K	105	32	**FD 06S**	60	—	1400	107	42	**FA 06S**	60	2100	107	44
7.5	5.5	**BE 132S**	**4**	1760	30	9.3	89.5	89.5	87.7	0.83	8.7	3.5	3.5	K	270	53	**FD 56**	75	—	1050	223	66	**FA 06**	75	1200	223	67
10	7.5	**BE 132MA**	**4**	1760	43	12.7	89.5	89.5	87.9	0.83	8	3.4	3.3	K	319	59	**FD 06**	100	—	950	280	72	**FA 06**	100	1000	280	77
12.5	9.2	**BE 132MB**	**4**	1760	50	15.6	90	90	88.6	0.82	8.3	3.5	3.6	K	360	70	**FD 07**	150	—	900	342	86	**FA 07**	150	900	342	87
15	11	**BE 160M**	**4**	1765	60	18.7	91	91	90	0.81	7.7	2.9	2.8	J	650	99	**FD 08**	170	—	800	655	129	**FA 08**	170	800	655	128
20	15	**BE 160L**	**4**	1770	81	25.5	91	90.5	89.5	0.81	7.1	3.1	2.7	J	790	115	**FD 08**	200	—	750	725	129	**FA 08**	200	750	710	128
25	18.5	**BE 180M**	**4**	1765	100	30.3	92.4	91.9	90.5	0.83	7.3	2.7	2.5	H	1250	135	**FD 09**	300	—	400	1450	175	**—**	—	—	—	—
30	22	**BE 180L**	**4**	1770	119	36	92.4	92.5	92.2	0.83	8.1	3.3	3.2	J	1650	157	**FD 09**	300	—	300	1850	197	**—**	—	—	—	—



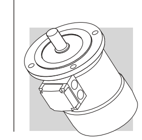


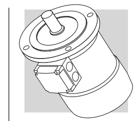
2 P	3000 min^{-1} - S1	50 Hz - IE2

P_n kW			n min^{-1}	M_n Nm	In 400V A	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4} kgm^2	IM B5 (kg)	d.c. brake FD Mod	FD M_b Nm	FD Z_o 1/h NB	FD Z_o 1/h SB	FD J_m x 10^{-4} kgm^2	FD IM B5 (kg)	a.c. brake FA Mod	FA M_b Nm	FA Z_o 1/h	FA J_m x 10^{-4} kgm^2	FA IM B5 (kg)
0.75	**ME 2SA**	**2**	2860	2.5	1.63	80	79.6	76.4	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**	2845	3.7	2.35	81.5	82.2	79.9	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**	2845	5.0	3.2	81.3	79	76	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**	2895	7.3	4.7	83.2	83.1	80.8	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**	2880	9.9	6.2	84.6	84.6	83.7	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**	2900	13.2	7.8	85.8	84.5	82.2	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**	2925	18.0	10.6	87.0	85.0	81.7	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**	2935	24	14.3	88.1	87.4	84.7	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**	2920	30	16.4	88.8	86.5	84.2	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**	2940	36	20.0	90.5	90.5	88.0	0.89	8.1	3.0	2.9	340	70											
15	**ME 5SB**	**2**	2950	49	27.2	90.9	90.5	89.5	0.88	8.5	3.0	2.8	420	83											
18.5	**ME 5LA**	**2**	2945	60	32	90.4	90.1	89.8	0.91	7.7	2.9	2.7	490	95											

4 P	1500 min^{-1} - S1	50 Hz - IE2

P_n (kW)	Type	Poles	n (min^{-1})	M_n (Nm)	In 400V (A)	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4} (kgm^2)	IM B5	d.c. brake FD Mod	M_b (Nm)	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} (kgm^2)	IM B5	a.c. brake FA Mod	M_b (Nm)	Z_o 1/h	J_m x 10^{-4} (kgm^2)	IM B5
0.12	**ME 05A**	**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	**ME 05B**	**4**	1370	1.25	0.64	64.7	65.1	59.8	0.62	3.5	2.3	2.5	3.3	5.1	**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	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	**ME 1SB**	**4**	1385	2.55	1.05	72.7	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**	1430	3.7	1.38	77.1	73.4	68	0.77	6	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	1.76	79.6	78.5	75.1	0.78	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	2.53	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	3.5	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	4.9	84.3	85	84	0.76	5.8	3	2.8	54	21	**FD 15**	40	2600	4700	44	27	**FA 15**	40	4700	44	28
3	**ME 3LB**	**4**	1420	20	6.6	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	8.3	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	11.1	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	14.8	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	18.1	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	21.5	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	28.7	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



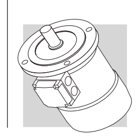


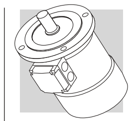
6 P	1000 min^{-1} - S1	50 Hz - IE2

P_n kW			n min^{-1}	M_n Nm	In 400V A	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4} kgm^2	IM B5	d.c. brake FD Mod	M_b Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} kgm^2	IM B5	a.c. brake FA Mod	M_b Nm	Z_o 1/h	J_m x 10^{-4} kgm^2	IM B5
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 kW			n min^{-1}	M_n Nm	In 400V A	η% 100%	η% 75%	η% 50%	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 FD Mod	M_b Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} kgm^2	IM B5	a.c. brake FA Mod	M_b Nm	Z_o 1/h	J_m x 10^{-4} kgm^2	IM B5
0.75	**ME 2SA**	**2**	2860	2.5	1.63	80	79.6	76.4	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**	2845	3.7	2.35	81.5	82.2	79.9	0.83	6.9	3.8	3.1	11.4	10.6	**FD 04**	10	1500	3000	10.6	14.5	**FA 04**	10	3000	10.6	14.4
1.5	**ME 3SA**	**2**	2845	5	3.2	81.3	79	76	0.81	6.1	2.9	2.7	24	15.5	**FD 15**	13	4800	8000	32	22.5	**FA 15**	26	8000	32	22.5
2.2	**ME 3LA**	**2**	2895	7.3	4.7	83.2	83.1	80.8	0.82	6.9	3.1	2.9	16.7	18.7	**FD 15**	26	3400	6000	34	25.7	**FA 15**	26	6000	34	25.7
3.7	**ME 4SA**	**2**	2930	12.1	7.8	84.7	83	81.2	0.79	7.9	3.5	3.1	57	33	**FD 56**	75	—	1400	107	46	**FA 06**	75	2100	107	47



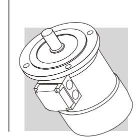


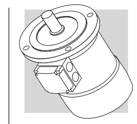
4 P	1500 min^{-1} - S1	50 Hz - IE2

															d.c. brake FD						a.c. brake FA				
P_n			n	M_n	In 400V	η%			cos φ	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4}	IM B5	Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%					kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.37	**ME 1SB**	**4**	1385	2.55	1.05	72.7	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	**ME 2SA**	**4**	1430	3.7	1.38	77.1	73.4	68	0.77	6	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	1.76	79.6	78.5	75.1	0.78	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**	1430	7.4	2.6	82.5	82	79	0.74	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**	1420	10.1	3.48	84	84	83	0.74	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**	1430	14.7	4.9	84.3	85	84	0.76	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**	1440	27	8.25	87.5	86.8	84	0.80	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	I_s/I_n	M_s/M_n	M_a/M_n	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	M_b	Z_o 1/h		J_m x 10^{-4}	IM B5	a.c. brake FA Mod	M_b	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	A	100%	75%	50%					kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.75	**ME 3SA**	**6**	940	7.6	1.98	75.9	75	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	0.74	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	0.72	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	0.8	5.7	1.9	1.7	216	34	**FD 56**	75	—	2100	177	47	**FA 06**	60	2100	177	48
3.7	**ME 4LA**	**6**	970	36.1	8.3	83.5	83.6	81.3	0.76	6.9	2.2	2	383	54	**FD 06**	100	—	1200	305	70	**FA 06**	100	1200	305	72

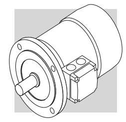




4 P	1800 min^{-1} - S1	60 Hz - IE2

cULus

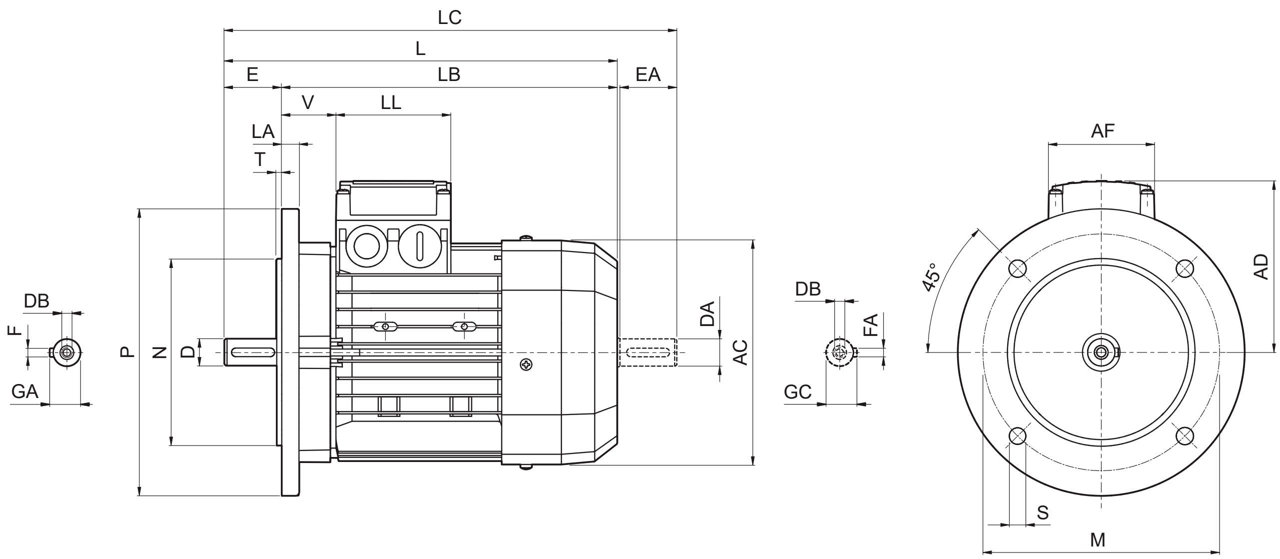
P_n HP	P_n kW			n min^{-1}	M_n Nm	In 400V A	η% 100%	η% 75%	η% 50%	cos φ	I_s/I_n	M_s/M_n	M_a/M_n	KVA Code	J_m x 10^{-4} kgm^2	IM B5 (kg)	d.c. brake FD Mod	FD M_b Nm	FD Z_0 1/h NB	FD Z_0 1/h SB	FD J_m x 10^{-4} kgm^2	FD IM B5 (kg)	a.c. brake FA Mod	FA M_b Nm	FA Z_0 1/h	FA J_m x 10^{-4} kgm^2	FA IM B5 (kg)
0.75	0.55	**ME 2SA**	**4**	1740	3	1.23	75.5	73.1	66.8	0.74	8.7	3.8	3.0	N	19	9.9	**FD 04**	10	4100	8000	16.6	13.8	**FA 04**	10	8000	16.6	13.7
1	0.75	**ME 2SB**	**4**	1745	4.1	1.46	82.5	81.1	77.6	0.78	7.6	3.5	3.2	K	28	12.2	**FD 04**	15	4100	7800	22	16.1	**FA 04**	15	7800	22	16
1.5	1.1	**ME 3SA**	**4**	1740	6	2.25	84	82.7	79	0.73	7.7	3.5	3.2	J	28	15.5	**FD 15**	26	4800	8000	32	21.5	**FA 15**	26	8000	32	22.5
2	1.5	**ME 3SB**	**4**	1740	8.2	3.1	84.5	83.9	80.7	0.73	7.1	3.6	3.4	K	34	17	**FD 15**	26	3400	6000	34	23	**FA 15**	26	6000	34	24
3	2.2	**ME 3LA**	**4**	1745	12	4.2	87.5	85.5	83.2	0.76	7	3.3	2.9	J	54	21	**FD 15**	40	2600	4700	44	27	**FA 15**	40	4700	44	28
4	3	**ME 3LB**	**4**	1735	16.5	5.9	87.5	87.7	86.3	0.76	7	3.2	2.9	K	61	23	**FD 15**	40	2400	4400	58	29	**FA 15**	40	4400	58	30
5	3.7	**ME 4SA**	**4**	1750	20	6.6	87.5	87.5	86.1	0.8	7.8	3.3	3.2	J	105	42	**FD 56**	75	—	1400	107	55	**FA 06**	75	2100	107	56
7.5	5.5	**ME 4SB**	**4**	1760	30	9.3	89.5	89.5	87.7	0.83	8.7	3.5	3.5	K	270	51	**FD 56**	75	—	1050	223	64	**FA 06**	75	1200	223	65
10	7.5	**ME 4LA**	**4**	1760	43	12.7	89.5	89.5	87.9	0.83	8	3.4	3.3	K	319	57	**FD 06**	100	—	950	280	70	**FA 07**	100	1000	280	75
12.5	9.2	**ME 4LB**	**4**	1760	50	15.6	90	90	88.6	0.82	8.3	3.5	3.6	K	360	65	**FD 07**	150	—	900	342	81	**FA 07**	150	900	342	83
15	11	**ME 5SA**	**4**	1765	60	18.7	91	91	90	0.81	7.7	2.9	2.8	J	650	85	**FD 08**	170	—	800	655	115	**FA 08**	170	800	655	114
20	15	**ME 5LA**	**4**	1770	81	25.5	91	90.5	89.5	0.81	7.1	3.1	2.7	J	790	101	**FD 08**	200	—	750	725	131	**FA 08**	200	750	710	130



M19 MOTORS DIMENSIONS BE-ME

BE-ME

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



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<tr><th rowspan="2"></th><th colspan="5">Shaft</th><th colspan="6">Flange</th><th colspan="8">Motor</th></tr>
<tr><th>D
DA</th><th>E
EA</th><th>DB</th><th>GA
GC</th><th>F
FA</th><th>M</th><th>N</th><th>P</th><th>S</th><th>T</th><th>LA</th><th>AC</th><th>L</th><th>LB</th><th>LC</th><th>AD</th><th>AF</th><th>LL</th><th>V</th></tr>
<tr><td>BE 63</td><td>11</td><td>23</td><td>M4</td><td>12.5</td><td>4</td><td>115</td><td>95</td><td>140</td><td rowspan="2">9.5</td><td>3</td><td rowspan="2">10</td><td>121</td><td>207</td><td>184</td><td>232</td><td>95</td><td rowspan="3">74</td><td rowspan="3">80</td><td>26</td></tr>
<tr><td>BE 71</td><td>14</td><td>30</td><td>M5</td><td>16</td><td>5</td><td>130</td><td>110</td><td>160</td><td rowspan="4">3.5</td><td>138</td><td>249</td><td>219</td><td>281</td><td>108</td><td>37</td></tr>
<tr><td>BE 80</td><td>19</td><td>40</td><td>M6</td><td>21.5</td><td>6</td><td rowspan="3">165</td><td rowspan="3">130</td><td rowspan="3">200</td><td rowspan="3">11.5</td><td rowspan="3">11.5</td><td>156</td><td>274</td><td>234</td><td>315</td><td>119</td><td>38</td></tr>
<tr><td>BE 90 S</td><td rowspan="2">24</td><td rowspan="2">50</td><td rowspan="2">M8</td><td rowspan="2">27</td><td rowspan="4">8</td><td rowspan="2">176</td><td rowspan="2">326</td><td rowspan="2">276</td><td rowspan="2">378</td><td rowspan="2">133</td><td rowspan="4">98</td><td rowspan="4">98</td><td rowspan="2">44</td></tr>
<tr><td>BE 90 L</td></tr>
<tr><td>BE 100</td><td rowspan="2">28</td><td rowspan="2">60</td><td rowspan="2">M10</td><td rowspan="2">31</td><td rowspan="2">215</td><td rowspan="2">180</td><td rowspan="2">250</td><td rowspan="5">14</td><td rowspan="5">4</td><td>14</td><td>195</td><td>367</td><td>307</td><td>429</td><td>142</td><td>50</td></tr>
<tr><td>BE 112</td><td>15</td><td>219</td><td>385</td><td>325</td><td>448</td><td>157</td><td>52</td></tr>
<tr><td>BE 132 S</td><td rowspan="3">38</td><td rowspan="3">80</td><td rowspan="3">M12</td><td rowspan="3">41</td><td rowspan="3">10</td><td rowspan="3">265</td><td rowspan="3">230</td><td rowspan="3">300</td><td rowspan="3">20</td><td rowspan="3">258</td><td rowspan="2">493</td><td rowspan="2">413</td><td rowspan="2">576</td><td rowspan="3">193</td><td rowspan="3">118</td><td rowspan="3">118</td><td rowspan="3">58</td></tr>
<tr><td>BE 132 MA</td></tr>
<tr><td>BE 132 MB</td><td>528</td><td>448</td><td>611</td></tr>
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38[1]</td><td rowspan="2">110
80[1]</td><td rowspan="2">M16
M12[1]</td><td rowspan="2">45
41[1]</td><td rowspan="2">12
10[1]</td><td rowspan="4">300</td><td rowspan="4">250</td><td rowspan="4">350</td><td rowspan="4">18.5</td><td rowspan="4">5</td><td rowspan="2">15</td><td rowspan="2">310</td><td>596</td><td>486</td><td>680</td><td rowspan="2">245</td><td rowspan="4">187</td><td rowspan="4">187</td><td rowspan="2">51</td></tr>
<tr><td>BE 160 L</td><td>640</td><td>530</td><td>724</td></tr>
<tr><td>BE 180 M</td><td rowspan="2">48
42[1]</td><td rowspan="2">110
110[1]</td><td rowspan="2">M16
M16[1]</td><td rowspan="2">51.5
45[1]</td><td rowspan="2">14
12[1]</td><td rowspan="2">18</td><td rowspan="2">348</td><td rowspan="2">708</td><td rowspan="2">598</td><td rowspan="2">823</td><td rowspan="2">261</td><td rowspan="2">52</td></tr>
<tr><td>BE 180 L</td></tr>
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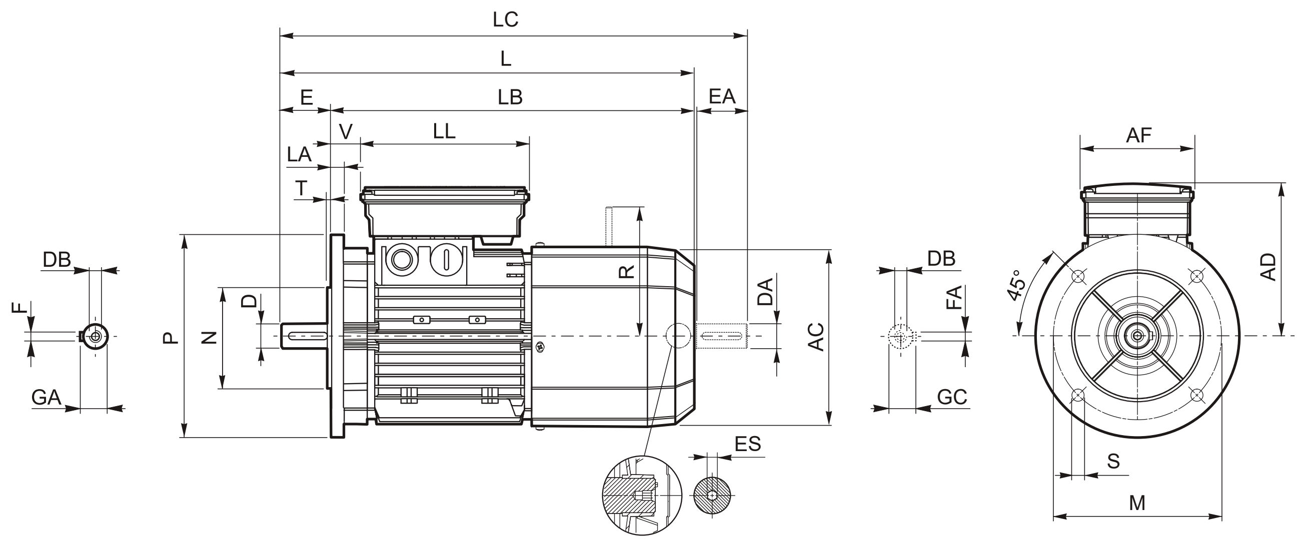
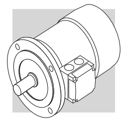
N.B.:
1) These values refer to the rear shaft end.

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



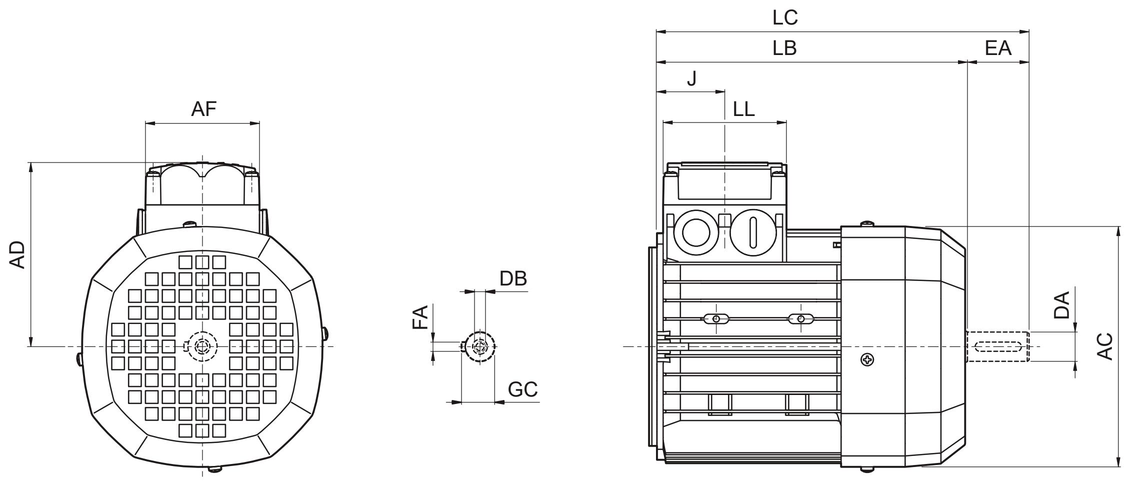
	Shaft					Flange						Motor										
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R FD	R FA	ES [2]
BE 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	122	98	133	14	96	116	5
BE 71	14	30	M5	16	5	130	110	160	9.5	3.5	10	138	313	283	345	135	98	133	24	103	124	5
BE 80	19	40	M6	21.5	6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

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

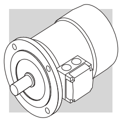


ME - CE/CUS/BIS/CCC

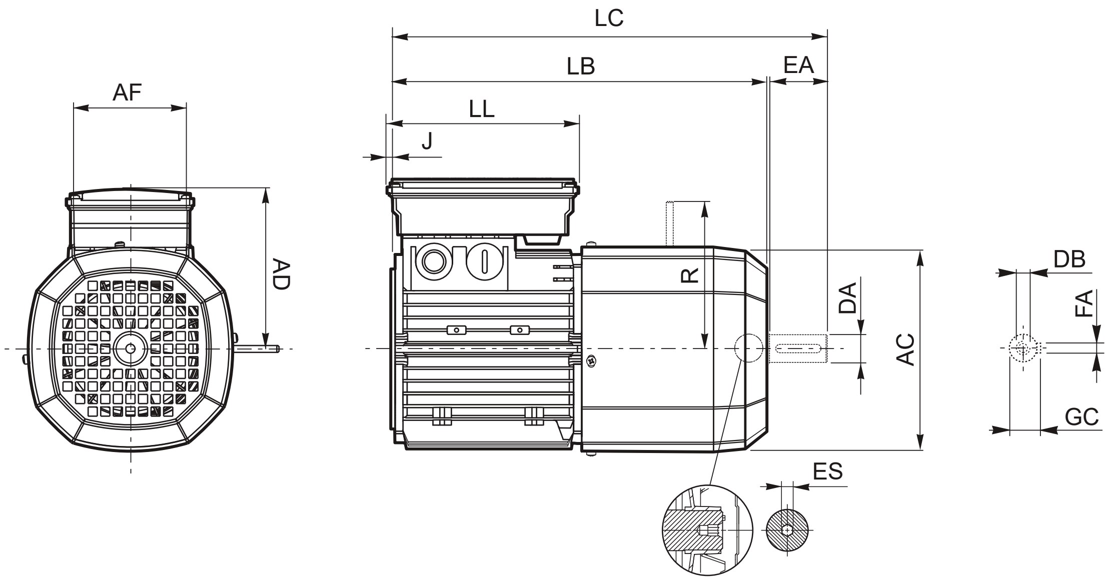
BE-ME



	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												
ME 4LB							396	479				
ME 5S	38	80	M12	41	10	310	418	502	187	187	77	245
ME 5L							462	546				

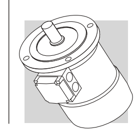


ME_FD/FA - CE/CUS/BIS



	Rear shaft end					Motor									
	DA	**EA**	**DB**	**GC**	**FA**	**AC**	**LB**	**LC**	**AF**	**LL**	**J**	**AD**	**R FD**	**R FA**	**ES** (1)
ME 05	11	23	M4	12.5	4	121	231	256			-4.5	119	96	116	
ME 1S	14	30	M5	16	5	138	248	280	98	133	-8	135	103	124	5
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	
ME 3L							353	416							
ME 4S							470	553					204	200	6
ME 4LA	38	80	M12	41	10	258			140	188	7	210			
ME 4LB							495	578					226	217	
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

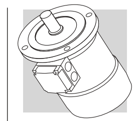


2P — 3000 min^{-1} - S1 — 50 Hz

P_n kW	Motor	Poles	n min^{-1}	M_n Nm	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	d.c. brake FD Mod	FD Mb Nm	FD Z_o 1/h NB	FD Z_o 1/h SB	FD J_m x 10^{-4} kgm^2	FD IM B5	a.c. brake FA Mod	FA Mb Nm	FA Z_o 1/h	FA J_m x 10^{-4} kgm^2	FA IM B5
0.18	**BN 63A**	**2**	2730	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	2.6	5.2	**FA 02**	1.75	4800	2.6	5.0
0.25	**BN 63B**	**2**	2740	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	3.0	5.6	**FA 02**	1.75	4800	3.0	5.4
0.37	**BN 63C**	**2**	2800	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	3.9	6.8	**FA 02**	3.5	4500	3.9	6.6
0.37	**BN 71A**	**2**	2820	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	4.6	8.1	**FA 03**	3.5	4200	4.6	7.8
0.55	**BN 71B**	**2**	2820	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	5.3	8.9	**FA 03**	5	4200	5.3	8.6
0.75	**BN 71C**	**2**	2810	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	6.1	10.0	**FA 03**	5	3600	6.1	9.7
0.75	**BN 80A**	**2**	2810	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	9.4	12.5	**FA 04**	5	3200	9.4	12.4
1.1	**BN 80B**	**2**	2800	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	10.6	13.4	**FA 04**	10	3000	10.6	13.3
1.5	**BN 80C**	**2**	2800	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	13.0	15.2	**FA 04**	15	2600	13.0	15.1
1.5	**BN 90SA**	**2**	2870	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	14.1	16.5	**FA 14**	15	2200	14.1	16.4
1.85	**BN 90SB**	**2**	2880	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	18.3	18.2	**FA 14**	15	2200	18.3	18.1
2.2	**BN 90L**	**2**	2880	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	21	20	**FA 05**	26	2200	21	20.7
3	**BN 100L**	**2**	2860	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	35	26	**FA 15**	26	1600	35	27
4	**BN 100LB**	**2**	2870	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	43	29	**FA 15**	40	1000	43	30
4	**BN 112M**	**2**	2900	13.2	•	85.5	84.5	83.0	0.82	8.2	6.9	3.0	2.9	57	28	**FD 06S**	40	—	950	66	39	**FA 06S**	40	950	66	40
5.5	**BN 132SA**	**2**	2890	18.2	•	84.7	84.5	81.2	0.84	11.2	5.9	2.6	2.2	101	35	**FD 06**	50	—	600	112	48	**FA 06**	50	600	112	49
7.5	**BN 132SB**	**2**	2900	25	•	86.5	86.3	84.4	0.85	14.7	6.4	2.6	2.2	145	42	**FD 06**	50	—	550	154	55	**FA 06**	50	550	154	56
9.2	**BN 132M**	**2**	2930	30	•	87.0	86.5	83.6	0.86	17.7	6.7	2.8	2.3	178	53	**FD 56**	75	—	430	189	66	**FA 06**	75	430	189	67
11	**BN 160MR**	**2**	2920	36	•	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	65											
15	**BN 160MB**	**2**	2930	49	•	89.6	89.4	88.0	0.86	28.1	7.1	2.6	2.3	340	84											
18.5	**BN 160L**	**2**	2930	60	•	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	97											
22	**BN 180M**	**2**	2930	72	•	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	109											
30	**BN 200LA**	**2**	2930	98	•	90.7	90.1	87.6	0.89	54	7.8	2.7	2.9	770	140											

○ = n.a. • = IE1

BN-M



4P — 1500 min⁻¹ - S1 — 50 Hz

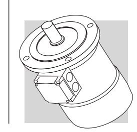
P_n kW			n min⁻¹	M_n Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10⁻⁴ kgm²	IM B5	d.c. brake FD Mod	FD Mb Nm	FD Z_o 1/h NB	FD Z_o 1/h SB	FD J_m x 10⁻⁴ kgm²	FD IM B5	a.c. brake FA Mod	FA Mb Nm	FA Z_o 1/h	FA J_m x 10⁻⁴ kgm²	FA IM B5
0.06	**BN 56A**	**4**	1340	0.43	○	46.8	44.2	41.3	0.65	0.28	2.6	2.3	2.0	1.5	3.1											
0.09	**BN 56B**	**4**	1350	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**	1350	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**	1320	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**	1340	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**	1380	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**	1370	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**	1380	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**	1390	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**	1400	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**	1400	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**	1390	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**	1410	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**	1390	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**	1410	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**	1410	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**	1430	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**	1440	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**	1440	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**	1440	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**	1440	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**	1460	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**	1460	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**	1460	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**	1460	196	●	91.4	91.7	91.0	0.80	59	7.1	2.7	2.8	1650	157	**FD 09**	400	—	300	1850	197					

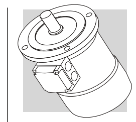
○ = n.a. ● = IE1

6P	1000 min^{-1} - S1	50 Hz

P_n			n	M_n	IE1	η	η	η	cosφ	In	Is/In	Ms/Mn	Ma/Mn	J_m	IM B5	d.c. brake FD						a.c. brake FA				
						(100%)	(75%)	(50%)		400V				x 10^{-4}		Mod	Mb	Z_o 1/h		J_m x 10^{-4}	IM B5	Mod	Mb	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm		%	%	%		A				kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.09	**BN 63A**	**6**	880	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**	870	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**	900	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**	900	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**	910	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**	910	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**	920	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**	920	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**	920	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**	920	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**	940	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**	930	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**	940	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**	940	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**	950	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**	945	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**	955	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**	960	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**	970	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**	960	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

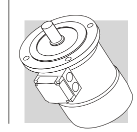


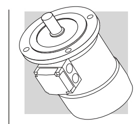


8P						750 min^{-1} - S1																	50 Hz
													d.c. brake						a.c. brake				
													FD						FA				
P_n kW			n min^{-1}	M_n Nm	η %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4} kgm^2	IM B5	Mod	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} kgm^2	IM B5	Mod	Mb Nm	Z_o 1/h	J_m x 10^{-4} kgm^2	IM B5
0.09	**BN 71A**	**8**	680	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**	680	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**	690	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**	680	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**	675	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**	670	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**	700	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**	700	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**	710	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**	710	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**	710	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

P_n kW			n min^{-1}	M_n Nm	η %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4} kgm^2	IM B5	d.c. brake FD Mod	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} kgm^2	IM B5	a.c. brake FA Mod	Mb Nm	Z_o 1/h	J_m x 10^{-4} kgm^2	IM B5
0.20	**BN 63B**	**2**	2700	0.71	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	1.06	49	0.67	0.66	2.6	1.8	1.7					4000	5100					5100		
0.28	**BN 71A**	**2**	2700	0.99	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	1.39	59	0.72	0.68	3.1	1.8	1.7					3800	4800					4800		
0.37	**BN 71B**	**2**	2740	1.29	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	1.72	60	0.73	0.82	3.3	2.0	1.9					2900	4200					4200		
0.45	**BN 71C**	**2**	2780	1.55	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	2.0	63	0.73	0.94	3.6	2.0	1.9					2900	4200					4200		
0.55	**BN 80A**	**2**	2800	1.9	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	4.1	1.8	1.9					3000	4000					4000		
0.75	**BN 80B**	**2**	2780	2.6	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	3.9	1.7	1.7					2700	3600					3600		
1.1	**BN 90S**	**2**	2790	3.8	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	2.1	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	1.9	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	2.1	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	30	**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	44	**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	53	**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	59	**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		



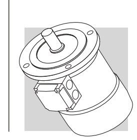


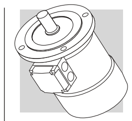
2/6P — 3000/1000 min^{-1} - S3 60/40% — 50 Hz

P_n			n	M_n	η	cosφ	In	Is/In	Ms/Mn	Ma/Mn	J_m	IM B5	FD Mod	FD Mb	FD Z_o		FD J_m	FD IM B5	FA Mod	FA Mb	FA Z_o	FA J_m	FA IM B5
							400V				x 10^{-4}		d.c. brake		1/h		x 10^{-4}		a.c. brake		1/h	x 10^{-4}	
kW			min^{-1}	Nm	%		A				kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.25	**BN 71A**	**2**	2850	0.84	60	0.82	0.73	4.3	1.9	1.8	6.9	5.9	**FD 03**	1.75	1500	1700	8.0	8.6	**FA 03**	2.5	1700	8.0	8.3
0.08		**6**	910	0.84	43	0.70	0.38	2.1	1.4	1.5					10000	13000					13000		
0.37	**BN 71B**	**2**	2880	1.23	62	0.80	1.08	4.4	1.9	1.8	9.1	7.3	**FD 03**	3.5	1000	1300	10.2	10.0	**FA 03**	3.5	1300	10.2	9.7
0.12		**6**	900	1.27	44	0.73	0.54	2.4	1.4	1.5					9000	11000					11000		
0.55	**BN 80A**	**2**	2800	1.88	63	0.86	1.47	4.5	1.9	1.7	20	9.9	**FD 04**	5.0	1500	1800	22	13.8	**FA 04**	5.0	1800	22	13.7
0.18		**6**	930	1.85	52	0.65	0.77	3.3	2.0	1.9					4100	6300					6300		
0.75	**BN 80B**	**2**	2800	2.6	66	0.87	1.89	4.3	1.8	1.6	25	11.3	**FD 04**	5.0	1700	1900	27	15.2	**FA 04**	5.0	1900	27	15.1
0.25		**6**	930	2.6	54	0.67	1.00	3.2	1.7	1.8					3800	6000					6000		
1.10	**BN 90L**	**2**	2860	3.7	67	0.84	2.82	4.7	2.1	1.9	28	14.0	**FD 05**	13	1400	1600	32	20	**FA 05**	13	1600	32	21
0.37		**6**	920	3.8	59	0.71	1.27	3.3	1.6	1.6					3400	5200					5200		
1.5	**BN 100LA**	**2**	2880	5	73	0.84	3.53	5.1	1.9	2.0	40	18.3	**FD 15**	13	1000	1200	44	24	**FA 15**	13	1200	44	25
0.55		**6**	940	5.6	64	0.67	1.85	3.5	1.7	1.8					2900	4000					4000		
2.2	**BN 100LB**	**2**	2900	7.2	77	0.85	4.9	5.9	2.0	2.0	61	25	**FD 15**	26	700	900	65	31	**FA 15**	26	900	65	32
0.75		**6**	950	7.5	67	0.64	2.5	3.3	1.9	1.8					2100	3000					3000		
3	**BN 112M**	**2**	2900	9.9	78	0.87	6.4	6.3	2.0	2.1	98	30	**FD 06S**	40	—	1000	107	40	**FA 06S**	40	1000	107	32
1.1		**6**	950	11.1	72	0.64	3.4	3.9	1.8	1.8					—	2600					2600		
4.5	**BN 132S**	**2**	2910	14.8	78	0.84	9.9	5.8	1.9	1.8	213	44	**FD 56**	37	—	500	223	57	**FA 06**	37	500	223	58
1.5		**6**	960	14.9	74	0.67	4.4	4.2	1.9	2.0					—	2100					2100		
5.5	**BN 132M**	**2**	2920	18.0	78	0.87	11.7	6.2	2.1	1.9	270	53	**FD 56**	50	—	400	280	66	**FA 06**	50	400	280	67
2.2		**6**	960	22	77	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 FD						a.c. brake FA				
P_n			n	M_n	η	cosφ	In 400V	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4}	IM B5	Mod	Mb	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4}	IM B5	Mod	Mb	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	%		A				kgm^2			Nm			kgm^2			Nm		kgm^2	
0.25	**BN 71A**	**2**	2790	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**	680	0.84	31	0.61	0.46	2.0	1.8	1.9					10000	13000					13000		
0.37	**BN 71B**	**2**	2800	1.26	63	0.86	0.99	3.9	1.8	1.9	12.9	7.7	**FD 03**	3.5	1200	1300	14	10.4	**FA 03**	3.5	1300	14	10.1
0.09		**8**	670	1.28	34	0.75	0.51	1.8	1.4	1.5					9500	13000					13000		
0.55	**BN 80A**	**2**	2830	1.86	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**	690	1.80	41	0.64	0.72	2.3	1.6	1.7					5600	8000					8000		
0.75	**BN 80B**	**2**	2800	2.6	68	0.88	1.81	4.6	2.1	2.0	25	11.3	**FD 04**	10	1700	1900	27	15.2	**FA 04**	10	1900	27	15.1
0.18		**8**	690	2.5	43	0.66	0.92	2.3	1.6	1.7					4800	7300					7300		
1.10	**BN 90L**	**2**	2830	3.7	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	3.9	48	0.63	1.34	2.4	1.8	1.9					3400	5100					5100		
1.5	**BN 100LA**	**2**	2880	5.0	69	0.85	3.69	4.7	1.9	1.8	40	18.3	**FD 15**	13	1000	1200	44	25	**FA 15**	13	1200	44	25
0.37		**8**	690	5.1	46	0.63	1.84	2.1	1.6	1.6					3300	5000					5000		
2.4	**BN 100LB**	**2**	2900	7.9	75	0.82	5.6	5.4	2.1	2.0	61	25	**FD 15**	26	550	700	65	31	**FA 15**	26	700	65	32
0.55		**8**	700	7.5	54	0.58	2.5	2.6	1.8	1.8					2000	3500					3500		
3	**BN 112M**	**2**	2900	9.9	76	0.87	6.5	6.3	2.1	1.9	98	30	**FD 06S**	40	—	900	107	40	**FA 06S**	40	900	107	42
0.75		**8**	690	10.4	60	0.65	2.8	2.5	1.6	1.6					—	2900					2900		
4	**BN 132S**	**2**	2870	13.3	73	0.84	9.4	5.6	2.3	2.4	213	44	**FD 56**	37	—	500	223	57	**FA 06**	37	500	223	58
1		**8**	690	13.8	66	0.62	3.5	2.9	1.9	1.8					—	3500					3500		
5.5	**BN 132M**	**2**	2870	18.3	75	0.84	12.6	6.1	2.4	2.5	270	53	**FD 06**	50	—	400	280	66	**FA 06**	50	400	280	67
1.5		**8**	690	21	68	0.63	5.1	2.9	1.9	1.9					—	2400					2400		



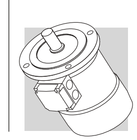


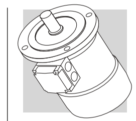
2/12P — 3000/500 min^{-1} - S3 60/40% — 50 Hz

P_n kW	Motor	Poles	n min^{-1}	M_n Nm	η %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4} kgm²	IM B5	d.c. brake FD Mod	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} kgm²	IM B5	a.c. brake FA Mod	Mb Nm	Z_o 1/h	J_m x 10^{-4} kgm²	IM B5
0.55	**BN 80B**	**2**	2820	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	2.0	30	0.63	0.69	1.8	1.9	1.8					8000	12000					12000		
0.75	**BN 90L**	**2**	2790	2.6	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	2.7	26	0.63	1.06	1.7	1.4	1.6					4600	6300					6300		
1.10	**BN 100LA**	**2**	2850	3.7	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	4.0	26	0.54	1.85	1.5	1.3	1.5					4000	6000					6000		
1.5	**BN 100LB**	**2**	2900	4.9	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	5.4	36	0.46	2.18	1.8	1.7	1.8					3800	5000					5000		
2	**BN 112M**	**2**	2900	6.6	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	6.2	46	0.43	2.19	2.0	2.1	2.0					—	3400					3400		
3	**BN 132S**	**2**	2920	9.8	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	10.2	51	0.43	3.3	2.0	1.7	1.6					—	3000					3000		
4	**BN 132M**	**2**	2920	13.1	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	14.5	53	0.44	4.3	1.9	1.7	1.6					—	2800					2800		

4/6P — 1500/1000 min^{-1} - S1 — 50 Hz

P_n kW			n min^{-1}	M_n Nm	η %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4} kgm^2	IM B5	d.c. brake FD Mod	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} kgm^2	IM B5	a.c. brake FA Mod	Mb Nm	Z_o 1/h	J_m x 10^{-4} kgm^2	IM B5
0.22	**BN 71B**	**4**	1410	1.5	64	0.74	0.67	3.9	1.8	1.9	9.1	7.3	**FD 03**	3.5	2500	3500	10.2	10.0	**FA 03**	3.5	3500	10.2	9.7
0.13		**6**	920	1.4	43	0.67	0.65	2.3	1.6	1.7					5000	9000					9000		
0.30	**BN 80A**	**4**	1410	2.0	61	0.82	0.87	3.5	1.3	1.5	15	8.2	**FD 04**	5.0	2500	3100	16.6	12.1	**FA 04**	5.0	3100	16.6	12.0
0.20		**6**	930	2.1	54	0.66	0.81	3.2	1.9	2.0					4000	6000					6000		
0.40	**BN 80B**	**4**	1430	2.7	63	0.75	1.22	3.9	1.8	1.8	20	9.9	**FD 04**	10	1800	2300	22	13.8	**FA 04**	10	2300	22	13.7
0.26		**6**	930	2.7	55	0.70	0.97	2.7	1.5	1.6					3600	5500					5500		
0.55	**BN 90S**	**4**	1420	3.7	70	0.78	1.45	4.5	2.0	1.9	21	12.2	**FD 14**	10	1500	2100	23	16.1	**FA 14**	10	2100	23	16.3
0.33		**6**	930	3.4	62	0.70	1.10	3.7	2.3	2.0					2500	4100					4100		
0.75	**BN 90L**	**4**	1420	5.0	74	0.78	1.88	4.3	1.9	1.8	28	14	**FD 05**	13	1400	2000	32	20	**FA 05**	13	2000	32	21
0.45		**6**	920	4.7	66	0.71	1.39	3.3	2.0	1.9					2300	3600					3600		
1.1	**BN 100LA**	**4**	1450	7.2	74	0.79	2.72	5.0	1.7	1.9	82	22	**FD 15**	26	1400	2000	86	28	**FA 15**	26	2000	86	29
0.8		**6**	950	8.0	65	0.69	2.57	4.1	1.9	2.1					2100	3300					3300		
1.5	**BN 100LB**	**4**	1450	9.9	75	0.79	3.65	5.1	1.7	1.9	95	25	**FD 15**	26	1300	1800	99	31	**FA 15**	26	1800	99	32
1.1		**6**	950	11.1	72	0.68	3.24	4.3	2.0	2.1					2000	3000					3000		
2.3	**BN 112M**	**4**	1450	15.2	75	0.78	5.7	5.2	1.8	1.9	168	32	**FD 06S**	40	—	1600	177	42	**FA 06S**	40	1600	177	44
1.5		**6**	960	14.9	73	0.72	4.1	4.9	2.0	2.0					—	2400					2400		
3.1	**BN 132S**	**4**	1460	20	83	0.83	6.5	5.9	2.1	2.0	213	44	**FD 56**	37	—	1200	223	57	**FA 06**	37	1200	223	58
2		**6**	960	20	77	0.75	4.9	4.5	2.1	2.1					—	1900					1900		
4.2	**BN 132MA**	**4**	1460	27	84	0.82	8.8	5.9	2.1	2.2	270	53	**FD 06**	50	—	900	280	66	**FA 06**	50	900	280	67
2.6		**6**	960	26	79	0.72	6.6	4.3	2.0	2.0					—	1500					1500		





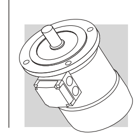
4/8P — 1500/750 min^{-1} - S1 — 50 Hz

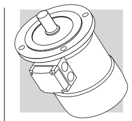
P_n			n	M_n	η	cosφ	In 400V	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4}	IM B5	d.c. brake FD Mod	Mb	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4}	IM B5	a.c. brake FA Mod	Mb	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm	%		A				kgm^2			Nm			kgm^2			Nm		kgm^2	
0.37	**BN 80A**	**4**	1400	2.5	63	0.82	1.03	3.3	1.4	1.4	15	8.2	**FD 04**	10	2300	3500	16.6	12.1	**FA 04**	10	3500	16.6	12.0
0.18		**8**	690	2.5	44	0.60	0.98	2.2	1.5	1.6					4500	7000					7000		
0.55	**BN 80B**	**4**	1390	3.8	65	0.86	1.42	3.8	1.7	1.6	20	9.9	**FD 04**	10	2200	2900	22	13.8	**FA 04**	10	2900	22	13.7
0.30		**8**	670	4.3	49	0.65	1.36	2.3	1.7	1.8					4200	6500					6500		
0.65	**BN 90S**	**4**	1390	4.5	73	0.85	1.51	4.0	1.9	1.9	28	13.6	**FD 14**	15	2300	2800	30	17.8	**FA 14**	15	2800	30	17.7
0.35		**8**	690	4.8	49	0.57	1.81	2.5	2.1	2.2					3500	6000					6000		
0.9	**BN 90L**	**4**	1370	6.3	73	0.87	2.05	3.8	1.8	1.8	30	15.1	**FD 05**	26	1700	2100	34	21	**FA 05**	26	2100	34	22
0.5		**8**	670	7.1	57	0.62	2.04	2.4	2.1	2.0					2500	4200					4200		
1.30	**BN 100LA**	**4**	1420	8.7	72	0.83	3.14	4.3	1.7	1.8	82	22	**FD 15**	40	1300	1700	86	28	**FA 15**	40	1700	86	29
0.70		**8**	700	9.6	58	0.64	2.72	2.8	1.8	1.8					2000	3400					3400		
1.8	**BN 100LB**	**4**	1420	12.1	69	0.87	4.3	4.2	1.6	1.7	95	25	**FD 15**	40	1200	1700	99	31	**FA 15**	40	1700	99	32
0.9		**8**	700	12.3	62	0.63	3.3	3.2	1.7	1.8					1600	2600					2600		
2.2	**BN 112M**	**4**	1440	14.6	77	0.85	4.9	5.3	1.8	1.8	168	32	**FD 06S**	60	—	1200	177	42	**FA 06S**	60	1200	177	43
1.2		**8**	710	16.1	70	0.63	3.9	3.3	1.9	1.8					—	2000					2000		
3.6	**BN 132S**	**4**	1440	24	80	0.82	7.9	6.5	2.1	1.9	295	45	**FD 56**	75	—	1000	305	58	**FA 06**	75	1000	305	59
1.8		**8**	720	24	72	0.55	6.6	4.6	1.9	2.0					—	1400					1400		
4.6	**BN 132M**	**4**	1450	30	81	0.83	9.9	6.5	2.2	1.9	383	56	**FD 06**	100	—	1000	393	69	**FA 07**	100	1000	406	74
2.3		**8**	720	31	73	0.54	8.4	4.4	2.3	2.0					—	1300					1300		

2P	3000 min^{-1} - S1	50 Hz

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}	IM B5	d.c. brake FD Mod	Mb	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4}	IM B5	a.c. brake FA Mod	Mb	Z_o 1/h	J_m x 10^{-4}	IM B5
kW			min^{-1}	Nm		%	%	%		A				kgm^2			Nm			kgm^2			Nm		kgm^2	
0.18	**M 05A**	**2**	2730	0.63	○	59.9	56.9	51.9	0.77	0.56	3.0	2.1	2.0	2.0	3.2	**FD 02**	1.75	3900	4800	2.6	4.9	**FA 02**	1.75	4800	2.6	4.7
0.25	**M 05B**	**2**	2740	0.87	○	66.0	64.8	64.8	0.76	0.72	3.3	2.3	2.3	2.3	3.6	**FD 02**	1.75	3900	4800	3.0	5.3	**FA 02**	1.75	4800	3.0	5.1
0.37	**M 05C**	**2**	2800	1.26	○	69.1	66.8	66.8	0.78	0.99	3.9	2.6	2.6	3.3	4.8	**FD 02**	3.5	3600	4500	3.9	6.5	**FA 02**	3.5	4500	3.9	6.3
0.55	**M 1SD**	**2**	2820	1.86	○	76.0	75.8	74.8	0.76	1.37	5.0	2.9	2.8	4.1	5.8	**FD 03**	5	2900	4200	5.3	8.5	**FA 03**	5	4200	5.3	8.2
0.75	**M 1LA**	**2**	2810	2.6	○	76.6	76.2	76.2	0.76	1.86	5.1	3.1	2.8	5.0	6.9	**FD 03**	5	1900	3300	6.1	9.6	**FA 03**	5	3300	6.1	9.3
1.1	**M 2SA**	**2**	2800	3.8	•	76.4	76.2	75.0	0.81	2.57	4.8	2.8	2.4	9.0	8.8	**FD 04**	10	1500	3000	10.6	11.9	**FA 04**	10	3000	10.6	12.6
1.5	**M 2SB**	**2**	2800	5.1	•	79.1	79.5	77.2	0.81	3.4	4.9	2.7	2.4	11.4	10.6	**FD 04**	15	1300	2600	13.0	9.9	**FA 04**	15	2600	13.0	14.4
2.2	**M 3SA**	**2**	2880	7.3	•	82.7	82.1	81.0	0.80	4.8	6.3	2.9	2.7	24	15.5	**FD 15**	26	1100	2400	28	22	**FA 15**	26	2400	28	23
3	**M 3LA**	**2**	2860	10.0	•	81.5	81.3	77.4	0.79	6.7	5.6	2.6	2.2	31	18.7	**FD 15**	26	700	1600	35	25	**FA 15**	26	1600	35	26
4	**M 3LB**	**2**	2870	13.3	•	83.1	83.0	77.8	0.80	8.7	5.8	2.7	2.5	39	22	**FD 15**	40	450	900	43	28	**FA 15**	40	900	43	29
5.5	**M 4SA**	**2**	2890	18.2	•	84.7	84.5	81.2	0.84	11.2	5.9	2.6	2.2	101	33	**FD 06**	50	—	600	112	46	**FA 06**	50	600	112	47
7.5	**M 4SB**	**2**	2900	25	•	86.5	86.3	84.4	0.85	14.7	6.4	2.6	2.2	145	40	**FD 06**	50	—	550	154	53	**FA 06**	50	550	154	54
9.2	**M 4LA**	**2**	2930	30	•	87.0	86.5	83.6	0.86	17.7	6.7	2.8	2.3	178	51	**FD 56**	75	—	430	189	64	**FA 06**	75	430	189	65
11	**M 4LC**	**2**	2920	36	•	87.6	87.0	86.0	0.88	20.6	6.9	2.9	2.5	210	60											
15	**M 5SB**	**2**	2930	49	•	89.6	89.4	88.0	0.86	28.1	7.1	2.6	2.3	340	70											
18.5	**M 5SC**	**2**	2930	60	•	90.4	90.1	89.0	0.86	34	7.6	2.7	2.3	420	83											
22	**M 5LA**	**2**	2930	72	•	89.9	89.7	89.5	0.88	40	7.8	2.6	2.4	490	95											

○ = n.a. • = IE1





4P	1500 min⁻¹ - S1	50 Hz

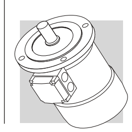
P_n			n	M_n	IE1	η	η	η	cosφ	In	Is/In	Ms/Mn	Ma/Mn	J_m	IM B5	d.c. brake FD Mod	Mb	Z_o		J_m	IM B5	a.c. brake FA Mod	Mb	Z_o	J_m	IM B5
						(100%)	(75%)	(50%)		400V				x 10⁻⁴				1/h		x 10⁻⁴				1/h	x 10⁻⁴	
kW			min⁻¹	Nm		%	%	%		A				kgm²			Nm	NB	SB	kgm²			Nm		kgm²	
0.09	**M 0B**	**4**	1350	0.64	○	51.7	47.6	42.9	0.60	0.42	2.6	2.5	2.4	1.5	2.9											
0.12	**M 05A**	**4**	1350	0.85	○	59.8	56.2	47.0	0.62	0.47	2.6	1.9	1.8	2.0	3.2	**FD 02**	1.75	10000	13000	2.6	4.9	**FA 02**	1.75	13000	2.6	4.7
0.18	**M 05B**	**4**	1320	1.30	○	54.8	52.9	52.5	0.67	0.71	2.6	2.2	2.0	2.3	3.6	**FD 02**	3.5	10000	13000	3.0	5.3	**FA 02**	3.5	13000	3.0	5.1
0.25	**M 05C**	**4**	1340	1.78	○	65.3	65.0	57.9	0.69	0.80	2.7	2.1	1.9	3.3	4.8	**FD 02**	3.5	7800	10000	3.9	6.5	**FA 02**	3.5	10000	3.9	6.3
0.37	**M 1SD**	**4**	1370	2.6	○	66.8	66.7	63.0	0.76	1.05	3.7	2.0	1.9	6.9	5.5	**FD 03**	5	6000	9400	8.0	8.2	**FA 03**	5	9400	8.0	7.9
0.55	**M 1LA**	**4**	1380	3.8	○	69.0	68.9	68.8	0.74	1.55	4.1	2.3	2.3	9.1	6.9	**FD 53**	7.5	4300	8700	10.2	9.6	**FA 03**	7.5	8700	10.2	9.3
0.75	**M 2SA**	**4**	1400	5.1	●	75.0	74.5	69.3	0.78	1.85	4.9	2.7	2.5	20	9.2	**FD 04**	15	4100	7800	22	13.1	**FA 04**	15	7800	22	13.0
1.1	**M 2SB**	**4**	1400	7.5	●	76.4	76.2	70.4	0.78	2.66	5.1	2.8	2.5	25	10.6	**FD 04**	15	2600	5300	27	14.5	**FA 04**	15	5300	27	14.4
1.5	**M 3SA**	**4**	1410	10.2	●	79.6	80.5	79.3	0.77	3.5	4.6	2.1	2.1	34	15.5	**FD 15**	26	2800	4900	38	22	**FA 15**	26	4900	38	23
2.2	**M 3LA**	**4**	1410	14.9	●	81.1	81.4	79.9	0.75	5.2	4.5	2.2	2.0	40	17	**FD 15**	40	2600	4700	44	24	**FA 15**	40	4700	44	24
3	**M 3LB**	**4**	1410	20	●	82.6	83.8	83.7	0.77	6.8	5.0	2.3	2.2	54	21	**FD 15**	40	2400	4400	58	27	**FA 15**	40	4400	58	28
4	**M 3LC**	**4**	1400	27	○	82.7	83.1	80.5	0.78	9.0	4.7	2.3	2.2	61	23	**FD 55**	55	—	1300	65	29	**FA 15**	40	1300	65	30
5.5	**M 4SA**	**4**	1440	36	●	84.7	84.8	82.5	0.81	11.6	5.5	2.3	2.2	213	42	**FD 56**	75	—	1050	223	55	**FA 06**	75	1050	223	56
7.5	**M 4LA**	**4**	1440	50	●	86.0	86.3	85.3	0.81	15.5	5.7	2.5	2.4	270	51	**FD 06**	100	—	950	280	64	**FA 07**	100	950	280	65
9.2	**M 4LB**	**4**	1440	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**	1440	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**	1460	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**	1460	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

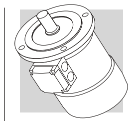
○ = n.a. ● = IE1

6P	**1000 min⁻¹** - S1	**50 Hz**

P_n kW			n min⁻¹	M_n Nm	IE1	η (100%) %	η (75%) %	η (50%) %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10⁻⁴ kgm²	IM B5	d.c. brake FD Mod	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10⁻⁴ kgm²	IM B5	a.c. brake FA Mod	Mb Nm	Z_o 1/h	J_m x 10⁻⁴ kgm²	IM B5
0.09	**M 05A**	**6**	880	0.98	○	41.0	41.0	32.9	0.53	0.60	2.1	2.1	1.8	3.4	4.3	**FD 02**	3.5	9000	14000	4.0	6.0	**FA 02**	3.5	14000	4.0	5.8
0.12	**M 05B**	**6**	870	1.32	○	45.0	44.0	41.8	0.60	0.64	2.1	1.9	1.7	3.7	4.6	**FD 02**	3.5	9000	14000	4.3	6.3	**FA 02**	3.5	14000	4.3	6.1
0.18	**M 1SC**	**6**	900	1.91	○	55.0	55.5	51.0	0.69	0.68	2.6	1.9	1.7	8.4	5.1	**FD 03**	5	8100	13500	9.5	7.8	**FA 03**	5	13500	9.5	7.5
0.25	**M 1SD**	**6**	900	2.7	○	62.0	58.5	51.4	0.71	0.82	2.6	1.9	1.7	10.9	6.3	**FD 03**	5	7800	13000	12	9.0	**FA 03**	5	13000	12	8.7
0.37	**M 1LA**	**6**	910	3.9	○	66.0	60.0	53.3	0.69	1.17	3.0	2.4	2.0	12.9	7.3	**FD 53**	7.5	5100	9500	14	10.0	**FA 03**	7.5	9500	14	9.7
0.55	**M 2SA**	**6**	920	5.7	○	70.0	69.8	64.3	0.68	1.67	3.9	2.6	2.2	25	10.6	**FD 04**	15	4800	7200	27	14.5	**FA 04**	15	7200	27	14.4
0.75	**M 2SB**	**6**	920	7.8	•	70.0	70.0	64.4	0.65	2.38	3.8	2.5	2.2	28	11.5	**FD 04**	15	3400	6400	30	15.4	**FA 04**	15	6400	30	15.3
1.1	**M 3SA**	**6**	920	11.4	•	75.0	74.0	72.0	0.72	2.9	4.3	2.0	1.8	33	17	**FD 15**	26	2700	5000	37	23	**FA 15**	26	5000	37	24
1.5	**M 3LA**	**6**	940	15.2	•	75.2	74.2	70.3	0.72	4.0	4.1	2.1	2.0	82	21	**FD 15**	40	1900	4100	86	27	**FA 15**	40	4100	86	28
1.85	**M 3LB**	**6**	930	19.0	•	76.6	72.8	62.6	0.73	4.8	4.6	2.1	2.0	95	23	**FD 15**	40	1700	3600	99	29	**FA 15**	40	3600	99	30
2.2	**M 3LC**	**6**	930	23	•	77.7	76.8	72.4	0.71	5.8	4.7	2.3	2.1	95	23	**FD 55**	55	—	1900	99	29	**FA 15**	40	1900	99	30
3	**M 4SA**	**6**	940	30	•	79.7	77.0	75.1	0.76	7.1	5.1	1.9	1.8	216	34	**FD 56**	75	—	1400	226	47	**FA 06**	75	1400	226	48
4	**M 4LA**	**6**	950	40	•	81.4	81.5	79.5	0.77	9.2	5.5	2.0	1.8	295	43	**FD 06**	100	—	1200	305	56	**FA 07**	100	1200	305	57
5.5	**M 4LB**	**6**	945	56	•	83.1	80.9	79.1	0.78	12.2	6.1	2.1	1.9	383	54	**FD 07**	150	—	1050	406	70	**FA 07**	150	1050	406	72
7.5	**M 5SA**	**6**	955	75	•	85.0	85.0	84.8	0.81	15.7	5.9	2.2	2.0	740	69	**FD 08**	170	—	900	815	98	**FA 08**	170	900	800	98
11	**M 5SB**	**6**	960	109	•	86.4	86.5	85.9	0.81	22.7	6.6	2.5	2.3	970	89	**FD 08**	200	—	800	1045	119	**FA 08**	200	800	1030	118

○ = n.a. • = IE1



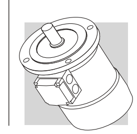


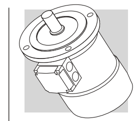
2/4P — 3000/1500 min^{-1} - S1 — 50 Hz

P_n			n	M_n	η	cosφ	In	Is/In	Ms/Mn	Ma/Mn	J_m	IM B5	d.c. brake FD Mod	Mb	Z_o		J_m	IM B5	a.c. brake FA Mod	Mb	Z_o	J_m	IM B5
							400V				$x 10^{-4}$				1/h		$x 10^{-4}$				1/h	$x 10^{-4}$	
kW			min^{-1}	Nm	%		A				kgm^2			Nm	NB	SB	kgm^2			Nm		kgm^2	
0.20	**M 05A**	**2**	2700	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	3.5	5.6
0.15		**4**	1350	1.06	49	0.67	0.66	2.6	1.8	1.7					4000	5100					5100		
0.28	**M 1SB**	**2**	2700	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	5.8	6.4
0.20		**4**	1370	1.39	59	0.68	1.02	3.1	1.8	1.7					3800	4800					4800		
0.37	**M 1SC**	**2**	2740	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	6.9	7.1
0.25		**4**	1390	1.72	60	0.73	0.82	3.3	2.0	1.9					2900	4200					4200		
0.45	**M 1SD**	**2**	2780	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	8.0	7.9
0.30		**4**	1400	2.0	63	0.74	0.93	3.8	2.1	1.9					2900	4200					4200		
0.55	**M 1LA**	**2**	2800	1.9	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	10.2	9.3
0.37		**4**	1400	2.5	68	0.72	1.09	3.9	2.2	2.0					3300	4600					4600		
0.75	**M 2SA**	**2**	2780	2.6	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	22	13.0
0.55		**4**	1400	3.8	68	0.81	1.44	3.9	1.7	1.7					2700	3600					3600		
1.1	**M 2SB**	**2**	2730	3.9	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	27	14.5
0.75		**4**	1410	5.1	75	0.81	1.78	4.5	2.1	2.0					2300	3100					3100		
1.5	**M 3SA**	**2**	2830	5.1	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	38	23
1.1		**4**	1420	7.4	77	0.78	2.6	4.3	2.1	2.0					1600	2600					2600		
2.2	**M 3LA**	**2**	2800	7.5	72	0.85	5.2	4.5	2.0	1.9	40	17	**FD 15**	26	600	900	44	24	**FA 15**	26	900	44	24
1.5		**4**	1410	10.2	73	0.79	3.8	4.7	2.0	2.0					1300	2300					2300		
3.5	**M 3LB**	**2**	2850	11.7	80	0.84	7.5	5.4	2.2	2.1	61	23	**FD 15**	40	500	900	65	29	**FA 15**	40	900	65	30
2.5		**4**	1420	16.8	82	0.80	5.5	5.2	2.2	2.2					1000	2100					2100		
4.8	**M 4 SA**	**2**	2900	15.8	81	0.88	9.7	6.0	2.0	1.9	213	42	**FD 06**	50	—	400	233	55	**FA 06**	50	400	233	56
3.8		**4**	1430	25.4	81	0.84	8.1	5.2	2.1	2.1					—	950					950		
5.5	**M 4SB**	**2**	2890	18.2	80	0.87	11.4	5.9	2.4	2.0	213	42	**FD 56**	75	—	350	223	55	**FA 06**	75	350	223	56
4.4		**4**	1440	29	82	0.84	9.2	5.3	2.2	2.0					—	900					900		
7.5	**M 4LA**	**2**	2900	25	82	0.87	15.2	6.5	2.4	2.0	270	51	**FD 06**	100	—	350	280	64	**FA 07**	100	350	280	65
6		**4**	1430	40	84	0.85	12.1	5.8	2.3	2.1					—	950					950		
9.2	**M 4LB**	**2**	2920	30	83	0.86	18.6	6.0	2.6	2.2	319	57	**FD 07**	150	—	300	342	73	**FA 07**	150	300	342	75
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

P_n kW	Motor	Poles	n min^{-1}	M_n Nm	η %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4} kgm²	IM B5 (kg)	d.c. brake FD Mod	FD Mb Nm	FD Z_o 1/h NB	FD Z_o 1/h SB	FD J_m x 10^{-4} kgm²	FD IM B5 (kg)	a.c. brake FA Mod	FA Mb Nm	FA Z_o 1/h	FA J_m x 10^{-4} kgm²	FA IM B5 (kg)
0.25	**M 1SA**	**2**	2850	0.84	60	0.82	0.73	4.3	1.9	1.8	6.9	5.5	**FD 03**	1.75	1500	1700	8.0	8.2	**FA 03**	1.75	1700	8.0	7.9
0.08		**6**	910	0.84	43	0.70	0.38	2.1	1.4	1.5					10000	13000					13000		
0.37	**M 1LA**	**2**	2880	1.23	62	0.80	1.08	4.4	1.9	1.8	9.1	6.9	**FD 03**	3.5	1000	1300	10.2	9.6	**FA 03**	3.5	1300	10.2	9.3
0.12		**6**	900	1.27	44	0.73	0.54	2.4	1.4	1.5					9000	11000					11000		
0.55	**M 2SA**	**2**	2800	1.88	63	0.86	1.47	4.5	1.9	1.7	20	9.2	**FD 04**	5	1500	1800	22	13.1	**FA 04**	5	1800	22	13.0
0.18		**6**	930	1.85	52	0.65	0.77	3.3	2.0	1.9					4100	6300					6300		
0.75	**M 2SB**	**2**	2800	2.6	66	0.87	1.89	4.3	1.8	1.6	25	10.6	**FD 04**	5	1700	1900	27	14.5	**FA 04**	5	1900	27	14.4
0.25		**6**	930	2.6	54	0.67	1.00	3.2	1.7	1.8					3800	6000					6000		
1.1	**M 3SA**	**2**	2870	3.7	71	0.82	2.73	4.9	1.8	1.9	34	15.5	**FD 15**	13	1000	1300	38	22	**FA 15**	13	1300	38	23
0.37		**6**	930	3.8	63	0.70	1.21	3.1	1.5	1.8					3500	5000					5000		
1.5	**M 3LA**	**2**	2880	5.0	73	0.84	3.53	5.1	1.9	2.0	40	17	**FD 15**	13	1000	1200	44	24	**FA 15**	13	1200	44	24
0.55		**6**	940	5.6	64	0.67	1.85	3.5	1.7	1.8					2900	4000					4000		
2.2	**M 3LB**	**2**	2900	7.2	77	0.85	4.9	5.9	2.0	2.0	61	23	**FD 15**	26	700	900	65	29	**FA 15**	26	900	65	30
0.75		**6**	950	7.5	67	0.64	2.5	3.3	1.9	1.8					2100	3000					3000		
3	**M 4SA**	**2**	2910	9.9	74	0.88	6.6	5.6	2.0	2.1	170	36	**FD 56**	37	—	600	182	48	**FA 06**	37	600	182	50
1.1		**6**	960	10.9	73	0.68	3.2	4.5	2.2	2.0					—	2200					2200		
4.5	**M 4SB**	**2**	2910	14.8	78	0.84	9.9	5.8	1.9	1.8	213	42	**FD 56**	37	—	500	223	55	**FA 06**	37	500	223	56
1.5		**6**	960	14.9	74	0.67	4.4	4.2	1.9	2.0					—	2100					2100		
5.5	**M 4LA**	**2**	2920	18.0	78	0.87	11.7	6.2	2.1	1.9	270	51	**FD 06**	50	—	400	280	64	**FA 06**	50	400	280	65
2.2		**6**	960	22	77	0.71	5.8	4.3	2.1	2.0					—	1900					1900		



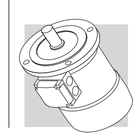


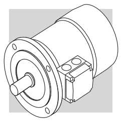
2/8P — 3000/750 min^{-1} - S3 60/40% — 50 Hz

													d.c. brake FD						a.c. brake FA				
P_n kW			n min^{-1}	M_n Nm	η %	cosφ	In 400V A	Is/In	Ms/Mn	Ma/Mn	J_m x 10^{-4} kgm^2	IM B5	Mod	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	J_m x 10^{-4} kgm^2	IM B5	Mod	Mb Nm	Z_o 1/h	J_m x 10^{-4} kgm^2	IM B5
0.37	**M 1LA**	**2**	2800	1.26	63	0.86	0.99	3.9	1.8	1.9	12.9	7.3	**FD 03**	3.5	1200	1300	14	10.0	**FA 03**	3.5	1300	14	9.7
0.09		**8**	670	1.28	34	0.75	0.51	1.8	1.4	1.5					9500	13000					13000		
0.55	**M 2SA**	**2**	2830	1.86	66	0.86	1.40	4.4	2.1	2.0	20	9.2	**FD 04**	5	1500	1800	22	13.1	**FA 04**	5	1800	22	13.0
0.13		**8**	690	1.80	41	0.64	0.72	2.3	1.6	1.7					5600	8000					8000		
0.75	**M 2SB**	**2**	2800	2.6	68	0.88	1.81	4.6	2.1	2.0	25	10.6	**FD 04**	10	1700	1900	27	14.5	**FA 04**	10	1900	27	14.4
0.18		**8**	690	2.5	43	0.66	0.92	2.3	1.6	1.7					4800	7300					7300		
1.1	**M 3SA**	**2**	2870	3.7	69	0.84	2.74	4.6	1.8	1.7	34	15.5	**FD 15**	13	1000	1300	38	22	**FA 15**	13	1300	38	23
0.28		**8**	690	3.9	44	0.56	1.64	2.3	1.4	1.7					3400	5000					5000		
1.5	**M 3LA**	**2**	2880	5.0	69	0.85	3.69	4.7	1.9	1.8	40	17	**FD 15**	13	1000	1200	44	24	**FA 15**	13	1200	44	24
0.37		**8**	690	5.1	46	0.63	1.84	2.1	1.6	1.6					3300	5000					5000		
2.4	**M 3LB**	**2**	2900	7.9	75	0.82	5.6	5.4	2.1	2.0	61	23	**FD 15**	26	550	700	65	29	**FA 15**	26	700	65	30
0.55		**8**	700	7.5	54	0.58	2.5	2.6	1.8	1.8					2000	3500					3500		
3	**M 4SA**	**2**	2920	9.8	72	0.85	7.1	5.6	2.0	1.8	162	36	**FD 56**	37	—	600	182	48	**FA 06**	37	600	182	50
0.75		**8**	710	10.1	61	0.64	2.8	3.0	1.7	1.8					—	3400					3400		
4	**M 4SB**	**2**	2870	13.3	73	0.84	9.4	5.6	2.3	2.4	213	42	**FD 56**	37	—	500	223	55	**FA 06**	37	500	223	56
1		**8**	690	13.8	66	0.62	3.5	2.9	1.9	1.8					—	3500					3500		
5.5	**M 4LA**	**2**	2870	18.3	75	0.84	12.6	6.1	2.4	2.5	270	51	**FD 06**	50	—	400	280	64	**FA 06**	50	400	280	65
1.5		**8**	690	21	68	0.63	5.1	2.9	1.9	1.9					—	2400					2400		

2/12P — 3000/500 min^{-1} - S3 60/40% — 50 Hz

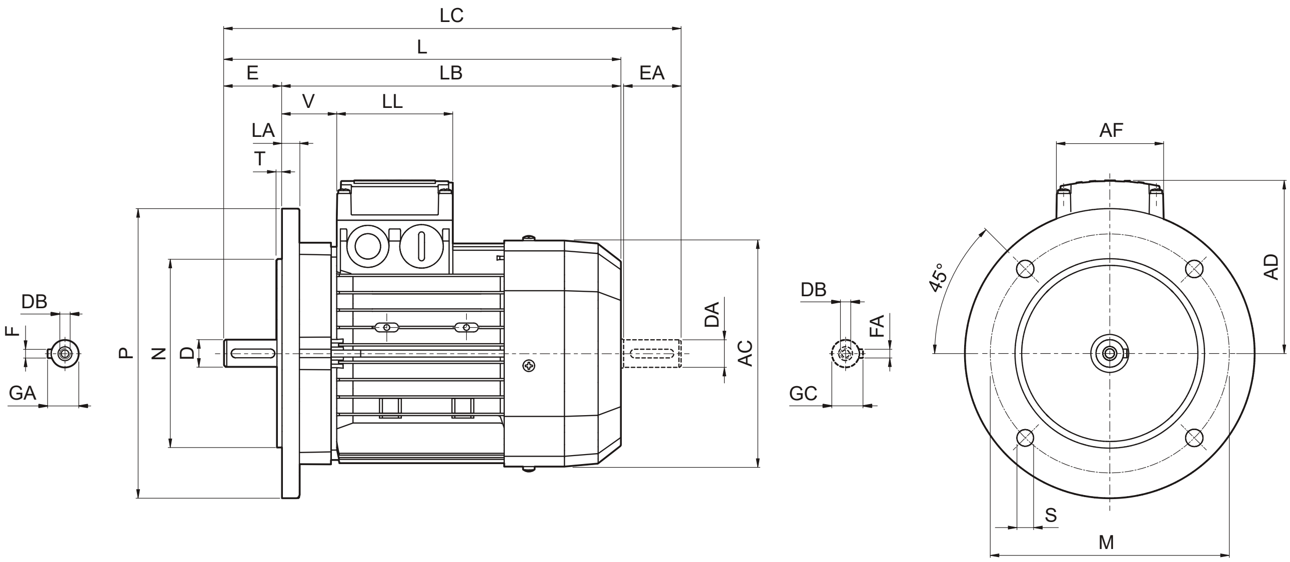
P_n			n	M_n	η	cosφ	In	Is/In	Ms/Mn	Ma/Mn	J_m	IM B5	d.c. brake FD Mod	Mb	Z_o		J_m	IM B5	a.c. brake FA Mod	Mb	Z_o	J_m	IM B5
							400V				x 10^{-4}				1/h		x 10^{-4}				1/h	x 10^{-4}	
kW			min^{-1}	Nm	%		A				kgm²			Nm	NB	SB	kgm²			Nm		kgm²	
0.55	**M 2SA**	**2**	2820	1.86	64	0.89	1.39	4.2	1.6	1.7	25	10.6	**FD 04**	5	1000	1300	27	14.5	**FA 04**	5	1300	27	14.4
0.09		**12**	430	2.0	30	0.63	0.69	1.8	1.9	1.8					8000	12000					12000		
0.75	**M 3SA**	**2**	2900	2.5	65	0.81	2.06	5.2	1.9	2.1	34	15.5	**FD 15**	13	700	900	38	22	**FA 15**	13	900	38	23
0.12		**12**	460	2.5	33	0.43	1.22	1.9	1.3	1.6					5000	7000					7000		
1.1	**M 3LA**	**2**	2850	3.7	65	0.85	2.87	4.5	1.6	1.8	40	17	**FD 15**	13	700	900	44	24	**FA 15**	13	900	44	24
0.18		**12**	430	4.0	26	0.54	1.85	1.5	1.3	1.5					4000	6000					6000		
1.5	**M 3LB**	**2**	2900	4.9	67	0.86	3.76	5.6	1.9	1.9	54	21	**FD 15**	13	700	900	58	27	**FA 15**	13	900	58	28
0.25		**12**	440	5.4	36	0.46	2.18	1.8	1.7	1.8					3800	5000					5000		
2	**M 3LC**	**2**	2850	6.7	70	0.84	4.9	4.9	1.8	1.7	61	23	**FD 55**	18	—	700	65	29	**FA 15**	18	700	65	30
0.3		**12**	450	6.4	38	0.47	2.4	1.7	1.6	1.7					—	3500					3500		
3	**M 4SA**	**2**	2920	9.8	74	0.87	6.7	6.8	2.3	1.9	213	42	**FD 56**	37	—	450	223	55	**FA 06**	37	450	223	56
0.5		**12**	470	10.2	51	0.43	3.3	2.0	1.7	1.6					—	3000					3000		
4	**M 4LA**	**2**	2920	13.1	75	0.89	8.6	5.9	2.4	2.3	270	51	**FD 56**	37	—	400	280	64	**FA 06**	37	400	280	65
0.7		**12**	460	14.5	53	0.44	4.3	1.9	1.7	1.6					—	2800					2800		





M21 MOTORS DIMENSIONS BN-M

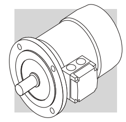
BN - IM B5



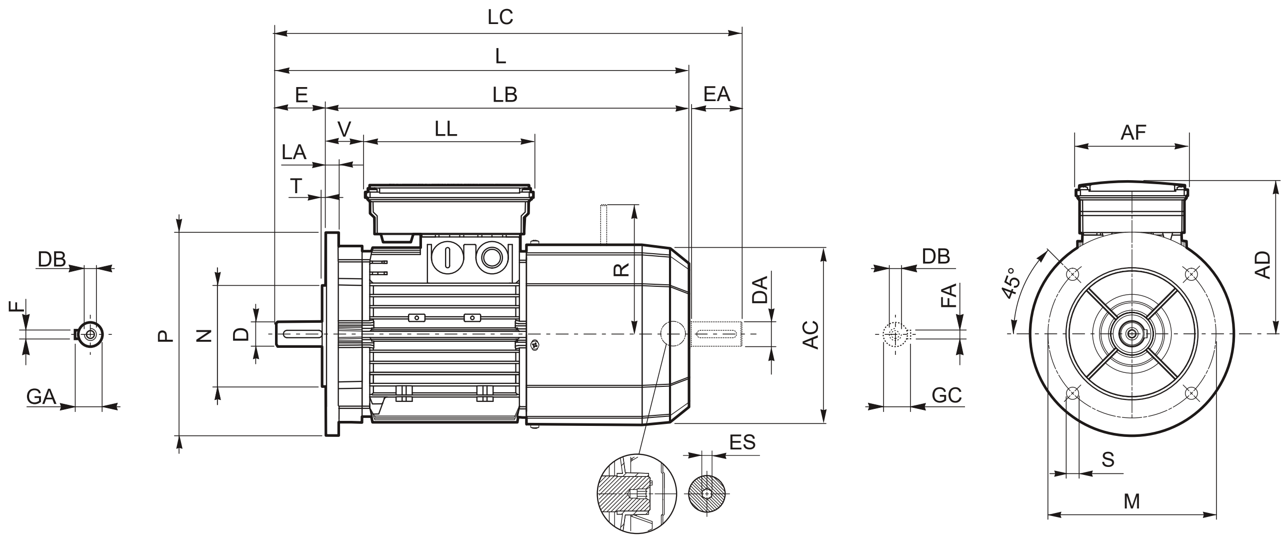
BN-M

	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		3.5		138	249	219	281	108			37
BN 80	19	40	M6	21.5	6	165	130	200	11.5		11.5	156	274	234	315	119			38
BN 90	24	50	M8	27	8							176	326	276	378	133	98	98	44
BN 100	28	60	M10	31		215	180	250	14	4	14	195	367	307	429	142			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	118	118	58
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	187	187	51
BN 160 L																			
BN 180 M	48 38(1)	110 110(1)		51.5 41(1)	14 10(1)							310	640	530	724				
BN 180 L	48 42(1)		M16 M16(1)	51.5 45(1)	14 12(1)						18	348	708	598	823	261			52
BN 200 L	55 42(1)		M20 M16(1)	59 45(1)	16 12(1)	350	300	400					722	612	837				66

NOTE:
1) These values refer to the rear shaft end.



BN_FD ; IM B5



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<tr><th>D
DA</th><th>E
EA</th><th>DB</th><th>GA
GC</th><th>F
FA</th><th>M</th><th>N</th><th>P</th><th>S</th><th>T</th><th>LA</th><th>AC</th><th>L</th><th>LB</th><th>LC</th><th>AD</th><th>AF</th><th>LL</th><th>V</th><th>R</th><th>ES</th></tr>
<tr><td>BN 63</td><td>11</td><td>23</td><td>M4</td><td>12.5</td><td>4</td><td>115</td><td>95</td><td>140</td><td>9.5</td><td>3</td><td rowspan="2">10</td><td>121</td><td>272</td><td>249</td><td>297</td><td>122</td><td rowspan="3">98</td><td rowspan="3">133</td><td>14</td><td>96</td><td rowspan="3">5</td></tr>
<tr><td>BN 71</td><td>14</td><td>30</td><td>M5</td><td>16</td><td>5</td><td>130</td><td>110</td><td>160</td><td>9.5</td><td rowspan="4">3.5</td><td>138</td><td>310</td><td>280</td><td>342</td><td>135</td><td>25</td><td>103</td></tr>
<tr><td>BN 80</td><td>19</td><td>40</td><td>M6</td><td>21.5</td><td>6</td><td rowspan="3">165</td><td rowspan="3">130</td><td rowspan="3">200</td><td rowspan="3">11.5</td><td rowspan="3">11.5</td><td>156</td><td>346</td><td>306</td><td>388</td><td>146</td><td>41</td><td rowspan="2">129</td></tr>
<tr><td>BN 90 S</td><td rowspan="2">24</td><td rowspan="2">50</td><td rowspan="2">M8</td><td rowspan="2">27</td><td rowspan="4">8</td><td rowspan="2">176</td><td rowspan="2">409</td><td rowspan="2">359</td><td rowspan="2">461</td><td>149</td><td rowspan="4">110</td><td rowspan="2">165</td><td rowspan="2">39</td><td rowspan="6">6</td></tr>
<tr><td>BN 90 L</td><td>146</td><td rowspan="2">160</td></tr>
<tr><td>BN 100</td><td rowspan="2">28</td><td rowspan="2">60</td><td rowspan="2">M10</td><td rowspan="2">31</td><td rowspan="2">215</td><td rowspan="2">180</td><td rowspan="2">250</td><td rowspan="3">14</td><td rowspan="3">4</td><td>14</td><td>195</td><td>458</td><td>398</td><td>521</td><td>158</td><td>165</td><td>62</td></tr>
<tr><td>BN 112</td><td>15</td><td>219</td><td>484</td><td>424</td><td>547</td><td>173</td><td>165</td><td>73</td><td>199</td></tr>
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<tr><td>BN 160 MR</td><td rowspan="2">42
38[1]</td><td rowspan="4">110
80[1]</td><td rowspan="4">M16
M12[1]</td><td rowspan="3">45
41[1]</td><td rowspan="3">12
10[1]</td><td rowspan="5">300</td><td rowspan="5">250</td><td rowspan="5">350</td><td rowspan="5">18.5</td><td rowspan="6">5</td><td rowspan="4">15</td><td>672</td><td>562</td><td>755</td><td>161</td><td>226</td></tr>
<tr><td>BN 160 M</td><td rowspan="3">310</td><td rowspan="2">736</td><td rowspan="2">626</td><td rowspan="2">820</td><td rowspan="3">245</td><td rowspan="6">187</td><td rowspan="6">187</td><td rowspan="3">51</td><td rowspan="3">266</td><td rowspan="6">—</td></tr>
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38[1]</td></tr>
<tr><td>BN 180 M</td><td>48
38[1]</td><td>51.5
41[1]</td><td>14
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42[1]</td><td rowspan="2">110
110[1]</td><td>M16
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45[1]</td><td>14
12[1]</td><td rowspan="2">18</td><td rowspan="2">348</td><td>866</td><td>756</td><td>981</td><td rowspan="2">261</td><td>52</td><td rowspan="2">305</td></tr>
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42[1]</td><td>M20
M16[1]</td><td>59
45[1]</td><td>16
12[1]</td><td>350</td><td>300</td><td>400</td><td>18.5</td><td>878</td><td>768</td><td>993</td><td>64</td></tr>
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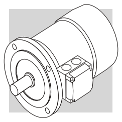
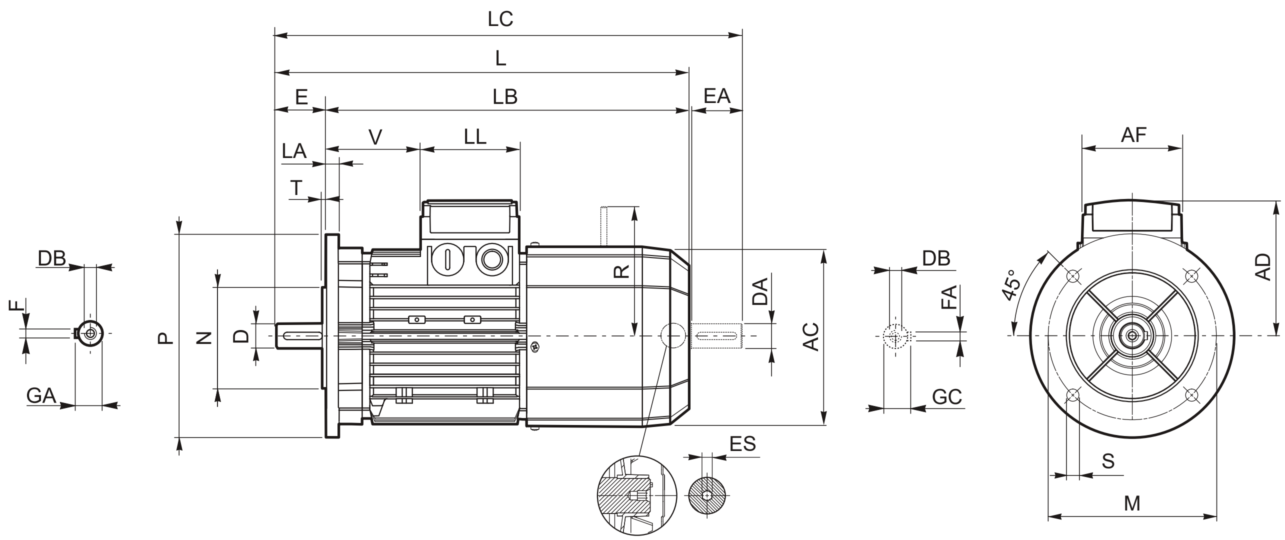
NOTE:
1) These values refer to the rear shaft end.
2) For FD07 brake value R=226.

ES hexagon is not supplied with PS option.



BN_FA - IM B5



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<tr><th>D
DA</th><th>E
EA</th><th>DB</th><th>GA
GC</th><th>F
FA</th><th>M</th><th>N</th><th>P</th><th>S</th><th>T</th><th>LA</th><th>AC</th><th>L</th><th>LB</th><th>LC</th><th>AD</th><th>AF</th><th>LL</th><th>V</th><th>R</th><th>ES</th></tr>
<tr><td>BN 63</td><td>11</td><td>23</td><td>M4</td><td>12.5</td><td>4</td><td>115</td><td>95</td><td>140</td><td rowspan="2">9.5</td><td>3</td><td rowspan="2">10</td><td>121</td><td>272</td><td>249</td><td>297</td><td>95</td><td rowspan="3">74</td><td rowspan="3">80</td><td>26</td><td>116</td><td rowspan="3">5</td></tr>
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<tr><td>BN 80</td><td>19</td><td>40</td><td>M6</td><td>21.5</td><td>6</td><td rowspan="2">165</td><td rowspan="2">130</td><td rowspan="2">200</td><td rowspan="2">11.5</td><td rowspan="2">11.5</td><td>156</td><td>346</td><td>306</td><td>388</td><td>119</td><td>83</td><td>134</td></tr>
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38[1]</td><td rowspan="4">110
80[1]</td><td rowspan="4">M16
M12[1]</td><td rowspan="3">45
41[1]</td><td rowspan="3">12
10[1]</td><td rowspan="4">300</td><td rowspan="4">250</td><td rowspan="4">350</td><td rowspan="4">18.5</td><td rowspan="4">5</td><td rowspan="4">15</td><td>672</td><td>562</td><td>755</td><td>193</td><td>118</td><td>118</td><td>218</td><td>217</td></tr>
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<tr><td>BN 160 L</td></tr>
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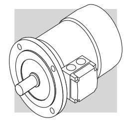
38[1]</td><td>51.5
41[1]</td><td>14
10[1]</td><td>780</td><td>670</td><td>864</td></tr>
</table>

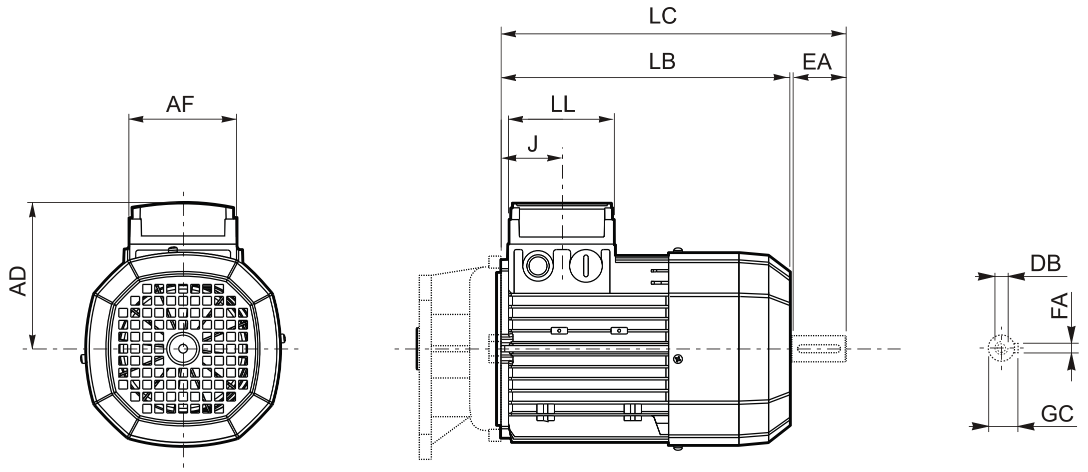
NOTE:
1) These values refer to the rear shaft end.
2) For FA07 brake value R=217.

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

<table>
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<tr><th>DA</th><th>EA</th><th>DB</th><th>FA</th><th>GC</th><th>AC</th><th>LB</th><th>LC</th><th>AF</th><th>LL</th><th>J</th><th>AD</th></tr>
<tr><td>M 0</td><td>9</td><td>20</td><td>M3</td><td>3</td><td>10.2</td><td>110</td><td>133</td><td>155</td><td rowspan="4">74</td><td rowspan="4">80</td><td>42</td><td>91</td></tr>
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<tr><td>M 1</td><td>14</td><td>30</td><td>M5</td><td>5</td><td>16</td><td>138</td><td>187</td><td>219</td><td>45</td><td>108</td></tr>
<tr><td>M 2 S</td><td>19</td><td>40</td><td>M6</td><td>6</td><td>21.5</td><td>156</td><td>202</td><td>245</td><td>44</td><td>119</td></tr>
<tr><td>M 3 S</td><td rowspan="2">28</td><td rowspan="2">60</td><td rowspan="2">M10</td><td rowspan="2">8</td><td rowspan="2">31</td><td rowspan="2">195</td><td>230</td><td>293</td><td rowspan="2">98</td><td rowspan="2">98</td><td rowspan="2">53.5</td><td rowspan="2">142</td></tr>
<tr><td>M 3 L</td><td>262</td><td>325</td></tr>
<tr><td>M 4</td><td rowspan="4">38</td><td rowspan="4">80</td><td rowspan="4">M12</td><td rowspan="4">10</td><td rowspan="4">41</td><td rowspan="2">258</td><td>361</td><td>444</td><td rowspan="2">118</td><td rowspan="2">118</td><td rowspan="2">64.5</td><td rowspan="2">193</td></tr>
<tr><td>M 4 LC</td><td>396</td><td>479</td></tr>
<tr><td>M 5 S</td><td rowspan="2">310</td><td>418</td><td>502</td><td rowspan="2">187</td><td rowspan="2">187</td><td rowspan="2">77</td><td rowspan="2">245</td></tr>
<tr><td>M 5 L</td><td>462</td><td>546</td></tr>
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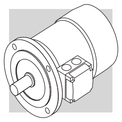
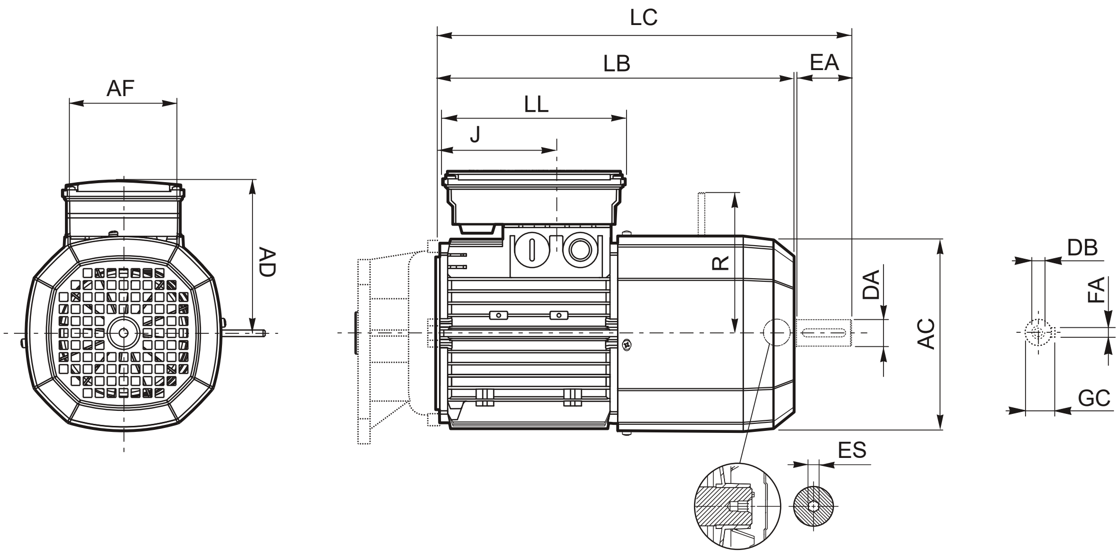


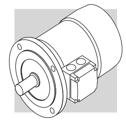
M_FD



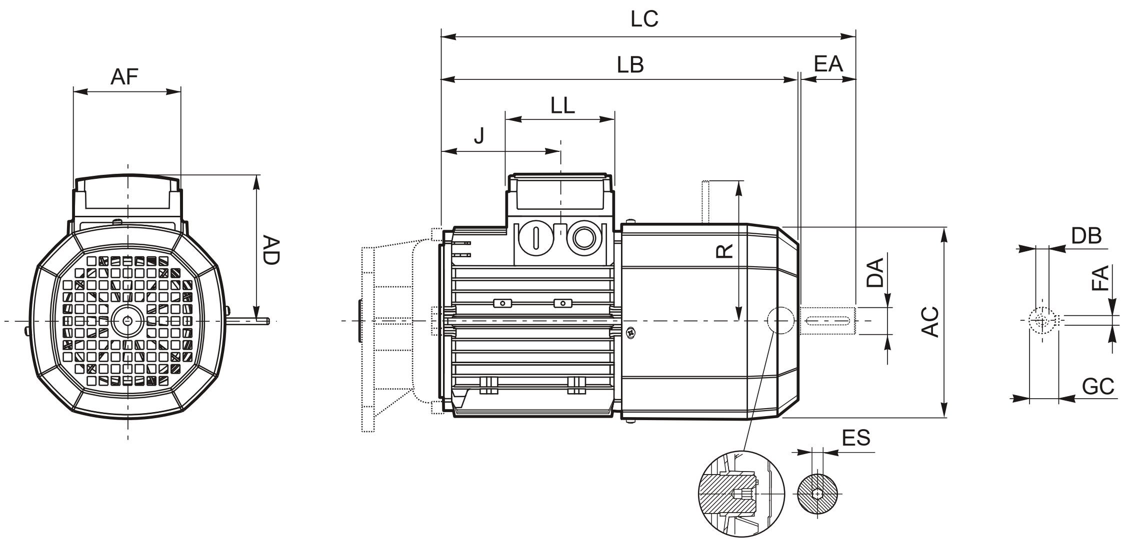
	Rear shaft end					Motor								
	DA	EA	DB	FA	GC	AC	LB	LC	AF	LL	J	AD	R	ES
M 05	11	23	M4	4	12.5	121	231	256	98	133	48	122	96	5
M 1	14	30	M5	5	16	138	248	280			73	135	103	
M 2 S	19	40	M6	6	21.5	156	272	314			88	146	129	
M 3 S	28	60	M10	8	31	195	326	389	110	165	124.5	158	160	6
M 3 L							353	416						
M 4	38	80	M12	10	41	258	470	553	140	188	185.5	210	204 (1)	
M 4 LC							495	578			64.5		226	
M 5 S						310	558	642	187	187	77	245	266	—
M 5 L							602	686						

NOTE:
1) For FD07 brake value R=226.

ES hexagon is not supplied with PS option.



M_FA



<table>
<tr><th rowspan="2"></th><th colspan="5">Rear shaft end</th><th colspan="9">Motor</th></tr>
<tr><th>DA</th><th>EA</th><th>DB</th><th>FA</th><th>GC</th><th>AC</th><th>LB</th><th>LC</th><th>AF</th><th>LL</th><th>J</th><th>AD</th><th>R</th><th>ES</th></tr>
<tr><td>M 05</td><td>11</td><td>23</td><td>M4</td><td>4</td><td>12.5</td><td>121</td><td>231</td><td>256</td><td rowspan="3">74</td><td rowspan="3">80</td><td>48</td><td>95</td><td>116</td><td rowspan="3">5</td></tr>
<tr><td>M 1</td><td>14</td><td>30</td><td>M5</td><td>5</td><td>16</td><td>138</td><td>248</td><td>280</td><td>73</td><td>108</td><td>124</td></tr>
<tr><td>M 2 S</td><td>19</td><td>40</td><td>M6</td><td>6</td><td>21.5</td><td>156</td><td>272</td><td>314</td><td>88</td><td>119</td><td>134</td></tr>
<tr><td>M 3 S</td><td rowspan="2">28</td><td rowspan="2">60</td><td rowspan="2">M10</td><td rowspan="2">8</td><td rowspan="2">31</td><td rowspan="2">195</td><td>326</td><td>389</td><td rowspan="2">98</td><td rowspan="2">98</td><td rowspan="2">124.5</td><td rowspan="2">142</td><td rowspan="2">160</td><td rowspan="4">6</td></tr>
<tr><td>M 3 L</td><td>353</td><td>416</td></tr>
<tr><td>M 4</td><td rowspan="4">38</td><td rowspan="4">80</td><td rowspan="2">M14</td><td rowspan="4">10</td><td rowspan="4">41</td><td rowspan="2">258</td><td>470</td><td>553</td><td rowspan="2">140</td><td rowspan="2">188</td><td>185.5</td><td rowspan="2">210</td><td>200 (1)</td></tr>
<tr><td>M 4 LC</td><td>495</td><td>578</td><td>64.5</td><td>217</td></tr>
<tr><td>M 5 S</td><td rowspan="2">M12</td><td rowspan="2">310</td><td>558</td><td>642</td><td rowspan="2">187</td><td rowspan="2">187</td><td rowspan="2">77</td><td rowspan="2">245</td><td rowspan="2">247</td><td rowspan="2">—</td></tr>
<tr><td>M 5 L</td><td>602</td><td>686</td></tr>
</table>

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_R13_0	
	Description
…	Added availability of BXN and MXN electric motors.
26, 190, 364, 509	IHB and Long Term Stock Options added.
560…679	“Electric motors” section updated.

2022 09 30

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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