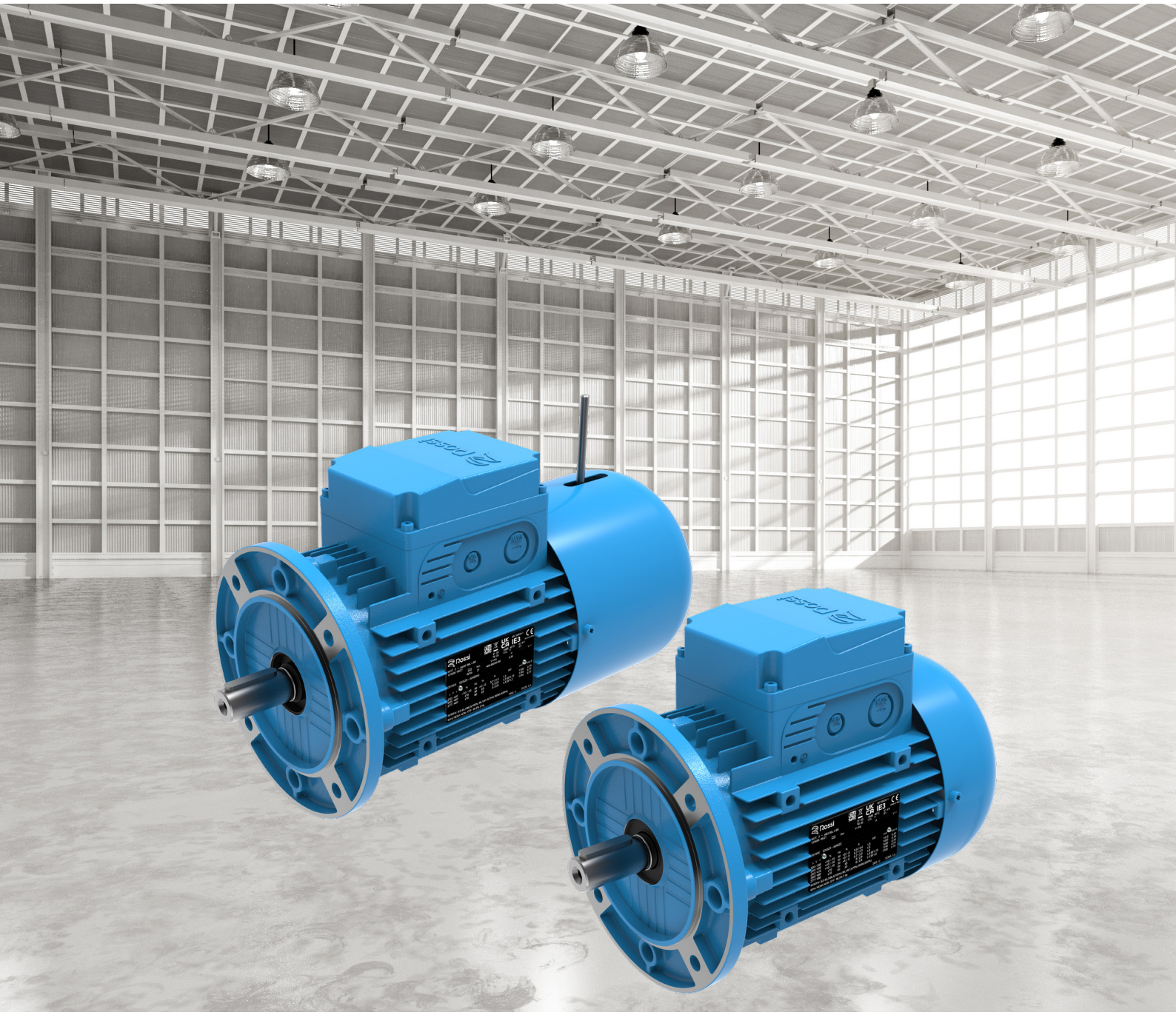
TX series



Asynchronous three-phase standard
and brake motors

Contents

1

Rossi for You

Innovation
Rossi offers a wide range of solutions for an evolving industry, flexible and innovative gearboxes and gearmotors for customer tailored solutions to maximize performance and minimize the total cost of ownership.

High quality, 3 years warranty
Our drive is to innovate and boost operations by manufacturing performing, precise, reliable and high-quality products all over the world. We are always one step forward in offering and developing solutions that can satisfy an unlimited number of application needs, even in the most demanding conditions.

Reliability
We are a reliable company with the right flexibility and know-how to respond to worldwide market requests, in all application fields, without leaving aside our commitment for the environment and value on human safety, to protect everyone's future.

Tools and processes
We continue to invest in new tools and processes, so our highly skilled specialist team in different fields are supporting you to find the best solution suitable for your demands, always by your side on every step of the project.

After-sale service
Highly trained mechanics and support teams can ensure a fast and efficient after-sale service providing support worldwide.

Digital support
Alongside our 24/7 Rossi for You support portal you have a suite of digital support tools enabling real time access to your order tracking, invoices, spare part tables download and contact to our service.

70 YEARS

Experience
Shaped by 70 years of history Rossi meets your unique needs whether you need a standard design or a customized solution.


Rossi

1.1

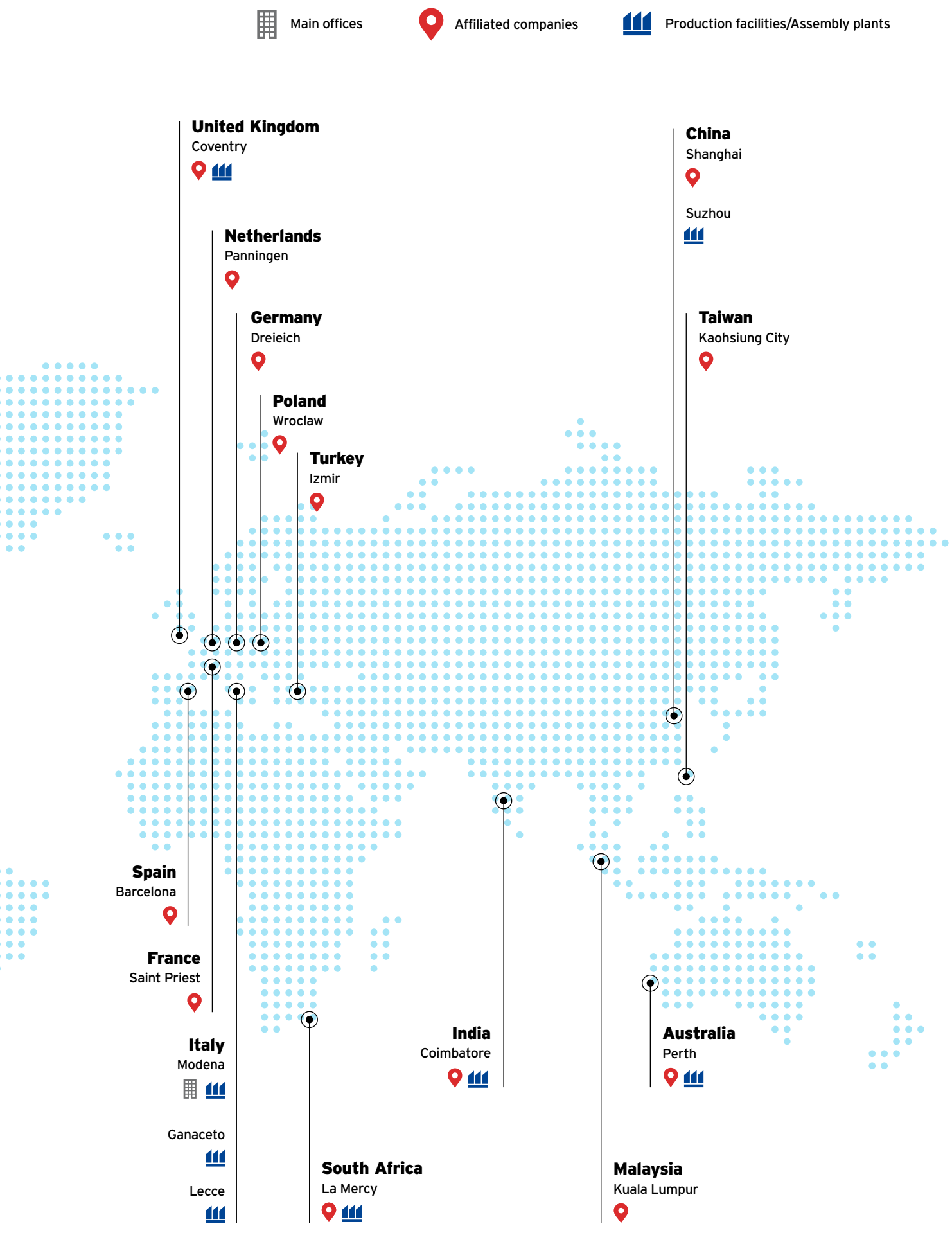
Global presence local service

Local support
Sales, customer service, technical support, spare parts

18 branches*

Worldwide distribution network*

*All contacts available on **www.rossi.com**


Main offices
Affiliated companies
Production facilities/Assembly plants
United Kingdom
Coventry
Netherlands
Panningen
Germany
Dreieich
Poland
Wroclaw
Turkey
Izmir
China
Shanghai
Suzhou
Taiwan
Kaohsiung City
Spain
Barcelona
France
Saint Priest
Italy
Modena
Ganaceto
Lecce
India
Coimbatore
South Africa
La Mercy
Malaysia
Kuala Lumpur
Australia
Perth

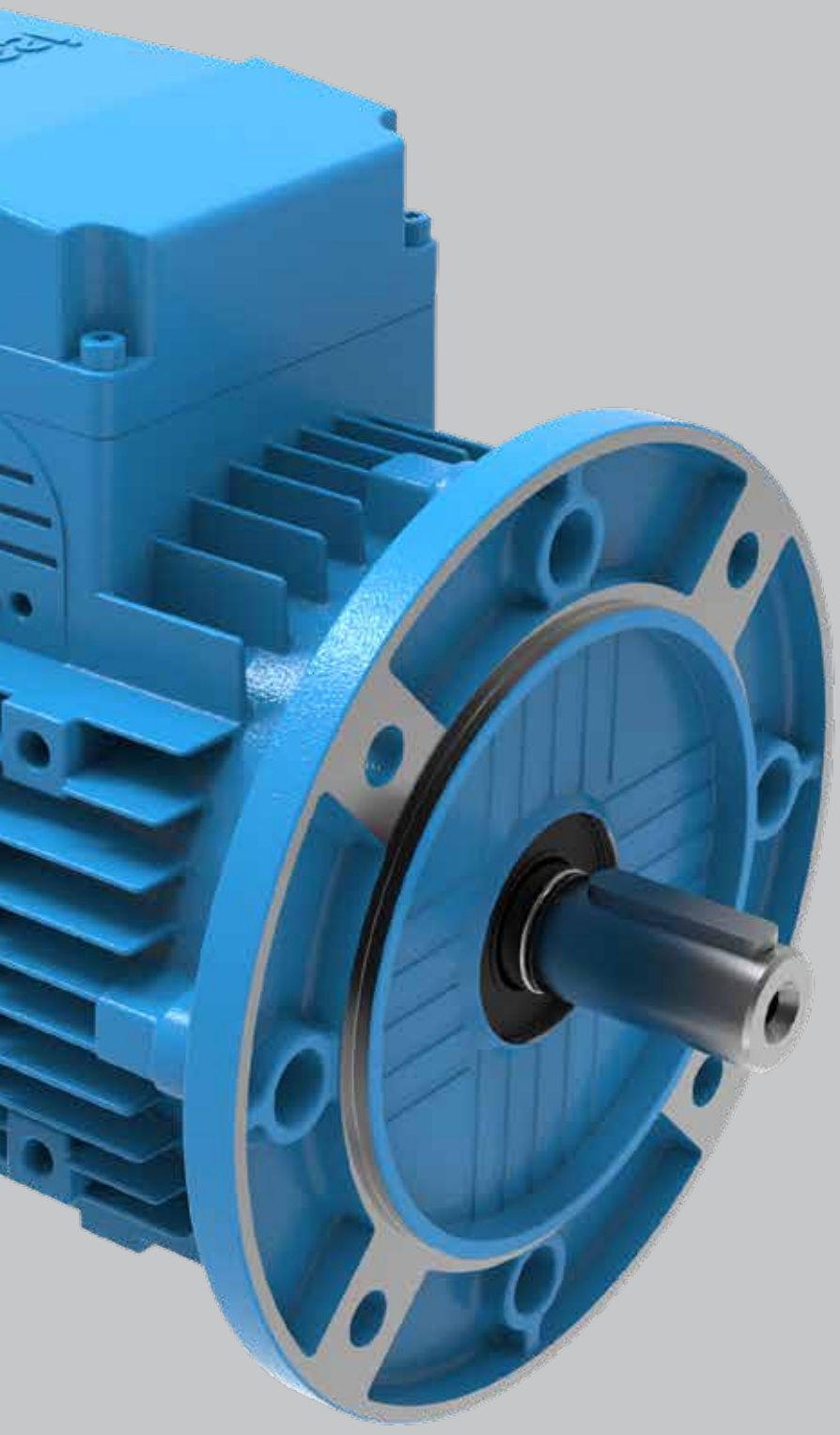
2

Product Overview

Section contents

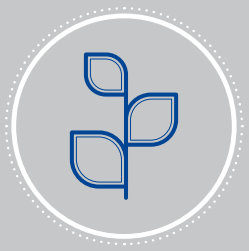
2.1

Features, benefits and range



Maximum performance

We drive the heaviest applications worldwide



Sustainability

Compliance with the latest energy efficiency regulations

Modular system

Maximum flexibility and cost efficiency

Innovation

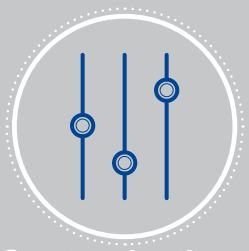
We are constantly thinking forward, solutions for an evolving industry

Digitalization

Rossi for You is always at your disposal for any info

Know-how

We support you through interdisciplinary know-how



Customization

Cost-effeciency starting from standard solutions

Asynchronous three-phase motor

Asynchronous three-phase brake motor

- **Advanced design offering cutting-edge solutions**
- **Competitiveness, performance, quality**
- **Enhanced efficiency**
- **Compliance with the latest standards concerning energy efficiency**
- **Maximum versatility thanks to our wide non-standard design range, the compliance to NEMA MG 1-12 as standard, and the availability of the brake motor versions**
- **Easy application in NEMA environment**
- **Five voltage values**
- **Cable glands already assembled (HE, HEZ series)**
- **Axial fastening on drive end (HE, HEZ series)**

- **Multi-voltage brake rectifier** (patent pending) generating a pre-set constant output voltage independent from input supply (and from its fluctuations) and, compared to a usual rectifier, reducing the voltage, and keeping the brake released

- **Higher steadiness of brake characteristics, lower energy consumption, lower coil heating and lower braking delay**
- **No special brake coil**
- **Ready to be used in NEMA environment**
- **Max stock availability and flexibility**

- Generous electromagnetic sizing: low loss magnetic insulated stamping, high copper volume, phase separators on head, insulation class F, overtemperature class B

IE2 - IE3 - IE4 (ErP)

- Compliance to different energy saving regulations:
- **Maximum resistance to thermal stresses** typical of brake motor applications
- **Maximum inverter duty suitability**

2.2

Asynchronous three-phase motors, brake motors

HB - HE
Asynchronous three-phase motor

HBZ - HEZ
Asynchronous three-phase **brake motor** with **d.c. brake**

HBF
Asynchronous three-phase **brake motor** with **a.c. brake**

HBV
Asynchronous three-phase **brake motor** with **d.c. safety brake**

Advanced design motors sharing the **same stator windings**, the same **rotors**, the same **housings**, the same **flanges**, the same performance, and the majority of technical solutions with its twin brake motor series **(HBZ, HEZ, HBF, and HBV)**.
The generous electromagnetic sizing allow to achieve **high efficiency values** complying **with different energy saving regulations**:
Efficiency class **IE2 - IE3 - IE4 (ErP)**;
The electric design (terminal block, name plate, etc.) has been studied to comply, as standard, also with **NEMA MG1-12** for the maximum application flexibility and facility.
The strength and the precision of mechanical construction, the generous bearings and the wide range of non-standard designs available on catalog make this motor particularly suitable for coupling with gearmotors.

Thanks to its outstanding **low noise**, **progressivity** and **dynamic** characteristics, it is specifically suitable for **coupling with gearmotor minimizing the dynamic overloads** deriving from **starting and braking phases** (especially in case of motion reversals) and maintaining a **very good braking torque value**.

The excellent **operation progressivity** - when starting and braking - is assured by the brake anchor which is less quick in the impact (compared to a.c. HBF) and by the slight quickness of d.c. brakes.

Offering a comprehensive **range of accessories and non-standard designs** in order to satisfy all possible gearmotor application fields.

The **high reactivity** typical of **a.c. brake** and the **high braking capacity** make this brake motor **particularly suitable for heavy duties** requiring **quick brakings** and a **high number of operations** (e.g.: lifts with high frequency of starting, usually for size < 132, and/or for jog operations).

Vice versa, its very **high dynamic characteristics** (rapidity and frequency of starting) **are not advisable for the use** in **gearmotor** coupling, especially when these features are not strictly necessary for the application (avoiding useless overloads on the whole transmission).

Comprehensive **range of accessories and non-standard designs** in order to satisfy all application needs of gearmotors (in particular for HBF: IP 56, IP 65, encoder, independent cooling fan, independent cooling fan and encoder, double extension shaft, etc.).

Featuring **maximum economy**, **very reduced overall dimensions and moderate braking torque**, it is suitable for the coupling with gearmotor and can be applied as brake for **safety or parking stops** (e.g. cutting machines) and for operations at deceleration ramp end **during the running with inverter**.

The standard cast iron fan supplies a flywheel effect increasing the very good progressivity of starting and braking (typical of d.c. brake) being particularly **suitable for** «**light**»[1] **traverse movements**.

1) Mechanism group M4 (max 180 starts/h) and on-load running L1 (light) or L2 (moderate) to ISO 4301/1, F.E.M./II 1997.

2.3

Symbols and units of measure

Symbols	Description	Unit of Measure SI
C	torque derating	-
C	brake disk wear (reduction of thickness)	[mm]
C_{max}	maximum brake disk wear allowed	[mm]
cosφ	power factor	-
η	efficiency = ratio between mechanic power available and electric power absorbed	-
f	frequency	[Hz]
f_{min}	minimum and maximum operating frequency	[Hz]
f_{max}	minimum and maximum operating frequency	[Hz]
I_N	nominal current	[A]
I_S	starting current	[A]
J_0	moment of inertia (of mass) of the motor	[kg m^2]
J_V	flywheel additional moment of inertia (of mass) in case of W design; value to be added to J_0 to obtain total motor moment of inertia	[kg m^2]
J	external moment of inertia (of mass) (couplings, transmission, gear reducer, driven machine) referred to motor shaft	[kg m^2]
M_N	nominal torque	[N m]
M_S	starting torque, with direct on-line start	[N m]
M_{max}	maximum torque, with direct on-line start	[N m]
M_a	mean acceleration torque	[N m]
M_f	braking torque	[N m]
$M_{required}$	torque absorbed by the machine through work and frictions	[N m]
n_N	nominal speed	[min^{-1}]
n_{min}	minimum and maximum operating speed	[min^{-1}]
n_{max}	minimum and maximum operating speed	[min^{-1}]
P_N	nominal power	[kW]
$P_{required}$	power absorbed by the machine referred to motor shaft	[kW]
R	frequency variation ratio	-
t_1	delay of anchor release	[ms]
t_2	delay of braking	[ms]
t_a	starting time	[s]
t_f	braking time	[s]
φ_a	starting rotation angle	[rad]
φ_f	braking rotation angle	[rad]
μ	friction coefficient	-
U	electric voltage	[V]
W_1	friction work generating a brake disk wear of 1 mm	[MJ/mm]
W_f	friction work dissipated for each braking	[J]
z_0	maximum number of no-load starts/h allowed by motor with cyclic duration factor 50%	[starts/h]

Energy efficiency classes

The directive 2009/125/EC for the «Ecodesign» of the Energy-related Products (directive ErP), decrees that the asynchronous three-phase electric motors addressed to the European market are in energy efficiency class **IE2/IE3** or higher, according to the 3 efficiency classes defined by **IEC 60034-30**:

IE2: high efficiency class;

IE3: premium efficiency class;

IE4: super premium efficiency class.

The applicability limits of IEC 60034-30 are:

- asynchronous three-phase motors at 50 or 60 Hz;
- one-speed: 2, 4, 6 e 8 poles;
- supply voltage max 1000 V;
- power range 0,12 ... 375 kW;
- continuous or intermittent duty S3 80% or higher.

Excluding some motor types, such as:

- motors based on a **non-continuous running duty** (e.g. duty S3 < 80%)
- motors for **ambient temperature > 60°C**;
- **Totally Enclosed Non-Ventilated** motors (TENV, Totally Enclosed Non-Ventilated);
- motors **integrated** in machines which cannot be tested separately.

For further excluded categories refer to the official European regulation.

Similar regulations concerning energy saving are in force for the markets of the United States, Canada, China, Mexico, Brazil, etc.

P_N		Efficiency class definition $\eta_N \geq$																						
		2 poles							4 poles							6 poles								
		400V - 50Hz				460V - 60Hz			400V - 50Hz				460V - 60Hz			400V - 50Hz				460V - 60Hz			
kW	hp	IE1	IE2	IE3	IE4	IE2	IE3 NEMA premium	IE4	IE1	IE2	IE3	IE4	IE2	IE3 NEMA premium	IE4	IE1	IE2	IE3	IE4	IE2	IE3 NEMA premium	IE4
0,12	**0,16**	45,0	53,6	60,8	66,5	59,5	62,0	66,0	50,0	59,1	64,8	69,8	64,0	66,0	70,0	38,3	50,6	57,7	64,9	50,5	64,0	68,0
0,15	**0,20**	49,5[1)]	57,6[1)]	63,7[1)]	68,9[1)]	64,0	65,6	70,0	54,1[1)]	62,3[1)]	67,7[1)]	72,7[1)]	68,0	69,5	74,0	42,1[1)]	53,8[1)]	61,1[1)]	67,8[1)]	55,0	67,5	72,0
0,18	**0,25**	52,8	60,4	65,9	70,8	64,0	65,6	70,0	57,0	64,7	69,9	74,7	68,0	69,5	74,0	45,5	56,6	63,9	70,1	55,0	67,5	72,0
0,25	**0,33**	58,2	64,8	69,7	74,3	68,0	69,5	74,0	61,5	68,5	73,5	77,9	70,0	73,4	77,0	52,1	61,6	68,6	74,1	59,5	71,4	75,5
0,37	**0,5**	63,9	69,5	73,8	78,1	72,0	73,4	77,0	66,0	72,7	77,3	81,1	72,0	78,2	81,5	59,7	67,6	73,5	78,0	64,0	75,3	78,5
0,55	**0,75**	69,0	74,1	77,8	81,5	74,0	76,8	80,0	70,0	77,1	80,8	83,9	75,5	81,1	84,0	65,8	73,1	77,2	80,9	68,0	81,7	82,5
0,75	**1**	72,1	77,4	80,7	83,5	75,5	77,0	82,5	72,1	79,6	82,5	85,7	78,0	85,5	85,5	70,0	75,9	78,9	82,7	73,0	82,5	84,0
1,1	**1,5**	75,0	79,6	82,7	85,2	82,5	84,0	85,5	75,0	81,4	84,1	87,2	84,0	86,5	87,5	72,9	78,1	81,0	84,5	85,5	87,5	88,5
1,5	**2**	77,2	81,3	84,2	86,5	84,0	85,5	86,5	77,2	82,8	85,3	88,2	84,0	86,5	88,5	75,2	79,8	82,5	85,9	86,5	88,5	89,5
1,85	**2,5**	78,6[1)]	82,3[1)]	85,1[1)]	87,4[1)]	85,5[1)]	86,5[1)]	88,5	78,6[1)]	83,6[1)]	86,1[1)]	88,9[1)]	87,5[1)]	89,5[1)]	91,0	76,6[1)]	80,9[1)]	83,5[1)]	86,8[1)]	87,5[1)]	89,5[1)]	90,2
2,2	**3**	79,7	83,2	85,9	88,0	85,5	86,5	88,5	79,7	84,3	86,7	89,5	87,5	89,5	91,0	77,7	81,8	84,3	87,4	87,5	89,5	90,2
3	**4**	81,5	84,6	87,1	89,1	87,5[1)]	88,5[1)]	89,5	81,5	85,5	87,7	90,4	87,5[1)]	89,5[1)]	91,0	79,7	83,3	85,6	88,6	87,5[1)]	89,5[1)]	90,2
4	**5,4**	83,1	85,8	88,1	90,0	87,5[1)]	88,5[1)]	89,5	83,1	86,6	88,6	91,1	87,5[1)]	89,5[1)]	91,0	81,4	84,6	86,8	89,5	87,5[1)]	89,5[1)]	90,2
5,5	**7,5**	84,7	87,0	89,2	90,9	88,5	89,5	90,2	84,7	87,7	89,6	91,9	89,5	91,7	92,4	83,1	86,0	88,0	90,5	89,5	91,0	91,7
7,5	**10**	86,0	88,1	90,1	91,7	89,5	90,2	91,7	86,0	88,7	90,4	92,6	89,5	91,7	92,4	84,7	87,2	89,1	91,3	89,5	91,0	92,4
9,2	**12,5**	86,9[1)]	88,8[1)]	90,7[1)]	92,2[1)]	89,5[1)]	90,2[1)]	91,7	86,9[1)]	89,3[1)]	91[1)],0	93,0[1)]	89,5	91,7[1)]	92,4	85,6[1)]	88[1)]	89,7[1)]	91,9[1)]	89,5[1)]	91[1)],0	92,4
11	**15**	87,6	89,4	91,2	92,6	90,2	91,0	92,4	87,6	89,8	91,4	93,3	91,0	92,4	93,6	86,4	88,7	90,3	92,3	90,2	91,7	93,0
15	**20**	88,7	90,3	91,9	93,3	90,2	91,0	92,4	88,7	90,6	92,1	93,9	91,0	93,0	94,1	87,7	89,7	91,2	92,9	90,2	91,7	93,0
18,5	**25**	89,3	90,9	92,4	93,7	91,0	91,7	93,0	89,3	91,2	92,6	94,2	92,4	93,6	94,5	88,6	90,4	91,7	93,4	92,4	93,0	94,1
22	**30**	89,9	91,3	92,7	94,0	91,0	91,7	93,0	89,9	91,6	93,0	94,5	92,4	93,6	94,5	89,2	90,9	92,2	93,7	92,4	93,0	94,1
30	**40**	90,7	92,0	93,3	94,5	91,7	92,4	93,6	90,7	92,3	93,6	94,9	93,0	94,1	95,0	90,2	91,7	92,9	94,2	93,0	94,1	95,0
37	**50**	91,2	92,5	93,7	94,8	92,4	93,0	94,1	91,2	92,7	93,9	95,2	93,0	94,5	95,4	90,8	92,2	93,3	94,5	93,0	94,1	95,0
45	**60**	91,7	92,9	94,0	95,0	93,0	93,6	94,5	91,7	93,1	94,2	95,4	93,6	95,0	95,4	91,4	92,7	93,7	94,8	93,6	94,5	95,4
55	**75**	92,1	93,2	94,3	95,3	93,0	94,1	94,5	92,1	93,5	94,6	95,7	94,1	95,4	95,8	91,9	93,1	94,1	95,1	93,6	94,5	95,4
75	**100**	92,7	93,8	94,7	95,6	93,6	95,0	95,0	92,7	94,0	95,0	96,0	94,5	95,4	96,2	92,6	93,7	94,6	95,4	94,1	95,0	95,8
90	**125**	93,0	94,1	95,0	95,8	94,5	95,0	95,4	93,0	94,2	95,2	96,1	94,5	95,4	96,2	92,9	94,0	94,9	95,6	94,1	95,8	95,8
110	**150**	93,3	94,3	95,2	96,0	94,5	95,0	95,4	93,3	94,5	95,4	96,3	95,0	95,8	96,2	93,3	94,3	95,1	95,8	95,0	95,8	96,2
132	**180**	93,5	94,6	95,4	96,2	95,0	95,4	95,8	93,5	94,7	95,6	96,4	95,0	96,2	96,5	93,5	94,6	95,4	96,0	95,0	95,8	96,2
150	**200**	93,7[1)]	94,7[1)]	95,5[1)]	96,3[1)]	95,0	95,4	95,8	93,7[1)]	94,9[1)]	95,8[1)]	96,5[1)]	95,0	96,2	96,5	93,7[1)]	94,7[1)]	95,5[1)]	96,1[1)]	95,0	95,8	96,2
160	**215**	93,8	94,8	95,6	96,3	95,0	95,4	95,8	93,8	94,9	95,8	96,6	95,0	96,2	96,5	93,8	94,8	95,6	96,2	95,0	95,8	96,2
185	**250**	93,9[1)]	95,0[1)]	95,7[1)]	96,5[1)]	95,4	95,8	96,2	93,9[1)]	95,1[1)]	95,9[1)]	96,7[1)]	95,0	96,2	96,5	93,9[1)]	94,9[1)]	95,7[1)]	96,3[1)]	95,0	95,8	96,2
200	**270**	94,0	95,0	95,8	96,5	95,4	95,8	96,2	94,0	95,1	96,0	96,7	95,0	96,2	96,5	94,0	95,0	95,8	96,3	95,0	95,8	96,2

1) Efficiency limit value obtained through interpolation.

2.5

Duty types

Rated motor powers stated in the catalog are referred to S1 continuous running duty (except where differently stated). In case of a duty-requirement type S2 ... S10 the motor power can be increased as per the following table; starting torque keeps unchanged. If the application requires a higher starting torque, a dedicated winding is required. In that case please contact us.

Continuous running duty (S1). – Operation at a constant load maintained for sufficient time to allow the motor to reach thermal equilibrium.

Short time duty (S2). – Running at constant load for a given period of time less than that necessary to reach normal running temperature, followed by a rest period long enough for motor's return to ambient temperature.

Intermittent periodic duty (S3). – Succession of identical work cycles consisting of a period of running at constant load and a rest period. Current peaks on starting are not to be of an order that will influence motor heat to any significant extent.

Cyclic duration factor = $\frac{N}{N+R} \cdot 100\%$

N being running time at constant load,
R the rest period and $N + R$ = 10 min (if longer consult us).

Duty			Motor size [1]		
			63 ... 90	**100 ... 160S**	**160M ... 315**
S1			1	1	1
S2	duration of running	**90 min**	1	1	1,06
		60 min	1	1,06	1,12
		30 min	1,12	1,18	1,25
		10 min	1,25	1,25	1,32
S3	cyclic duration factor	**70%**	1,10		
		60%	1,12		
		40%	1,18		
		25%	1,25		
		15%	1,32		
S4 ... S10			Consult Rossi S.p.A.		

1) For motors identified by symbol □ at ch. 3.11, 4.12, 5.12, 6.11, 7.5, 8.6 consult Rossi S.p.A..

2.6

Verifying and evaluating calculations

Main necessary verifications so that motor and brake can satisfy application needs are:

- given required torque and applied inertiae, **frequency of starting** has not to exceed maximum value permissible by motor windings without overheatings;
- given number of brakings/h, **work of friction for each braking** has not to exceed maximum permissible value of friction surface.

See below verification modalities.

Maximum frequency of starting *z*

As a guide, maximum frequency of starting *z*, for a starting time 0,5 ÷ 1 s and with direct on-line start, is 125 starts/h for sizes 63 ... 90, 63 starts/h for sizes 100 ... 160S, 16 starts/h for sizes 160M ... 315; halve the values for motors with flywheel (see non-standard design 4.(23)), which, having a higher J_0 (to get progressive starts and stops), can have a lower number of starts at the same conditions.

When it is necessary to have a higher frequency of starting, verify that:

$$z \leq z_0 \cdot \frac{J_0}{J_0 + J} \cdot K \cdot \left[1 - \left(\frac{P_{\text{richiesta}}}{P_N}\right)^2 \cdot 0{,}6\right]$$

K = 1 if motor, during the starting, must only overcome inertial loads;

K = 0,63 if motor, during the starting, must also overcome resistent friction, work, lifting loads, etc.

Where results are unsatisfactory or where frequent hypersynchronous brakings occur, more detailed verification formulae can be utilised: **consult Rossi S.p.A.**

Maximum work of friction for each braking W_f

In case of a high number of brakings/h ($z > 0{,}2\ z_0$) or very high inertiae applied ($J > 10\ J_0$) it is necessary to verify that work of friction for each braking does not exceed maximum permissible value of W_{fmax} as shown at points 4.5, 5.5 according to frequency of braking (for intermediate values of frequency apply the lowest value and interpolate, if necessary):

$$W_{fmax} \geq M_f \cdot \varphi_f \quad [J]$$

for the calculation of φ_f see below.

Starting time t_a and motor rotation angle φ_a

$$t_a = \frac{(J_0 + J) \cdot n_N}{9{,}55 \cdot (M_S - M_{required})} \ [s] \qquad \varphi_a = \frac{t_a \cdot n_N}{19{,}1} \ [rad]$$

For more accurate calculations replace M_S with a mean acceleration torque, usually $M_a \approx 0{,}85 \cdot M_S$.

Braking time t_f and motor rotation angle φ_f

$$t_f = \frac{(J_0 + J) \cdot n_N}{9{,}55 \cdot (M_f + M_{required})} \ [s] \qquad \varphi_f = \frac{t_f \cdot n_N}{19{,}1} \ [rad]$$

If $M_{required}$ tends to pull the motor (e.g. overhung load) introduce a negative number in the formulae.

Assuming a regular air-gap and ambient humidity and utilising suitable electrical equipment, repetition of the braking action, as affected by variaton in temperature of the brake and by the state of wear of friction surface, is approx. $\pm\ 0{,}1 \cdot \varphi_f$.

Duration of friction surface

As a guide, the number of **brakings** permissible **between successive adjustments** of the air-gap is given by the formula:

$$\frac{W_1 \cdot C \cdot 10^6}{M_f \cdot \varphi_f}$$

for the calculation of **periodical air-gap adjustment**, C value is given by the difference between max and min values of the air-gap; for **total brake disk life calculation**, C value is given by the maximum wear value C_{max} (see points 4.5, 5.5).

2.7 Variations of nominal specifications

Supply differs from nominal values

Functional specifications of a three-phase motor **supplied at voltage and/or frequency differing** from the nominal ones can be obtained approximately by multiplying nominal data of technical data by correction factors stated in the table valid for the motor only.

Nominal supply	Alternative supply [2]		Multiplicative factors of catalog value					
	Frequency [Hz]	**Voltage** [V]	P_N	n_N	I_N	M_N	I_S	M_S, M_{max}
Δ230 Y400 V 50 Hz	50	Δ220 Y380	1	1	0,95 ÷ 1,05	1	0,96	0,9
		Δ240 Y415	1	1	0,95 ÷ 1,05	1	1,04	1,08
	60	Δ220 Y380[1]	1	1,19	0,95 ÷ 1,05	0,83	0,79	0,63
		Δ255 Y440[1) 2)]	1,1	1,2	0,95 ÷ 1	0,92	0,92	0,84
		Δ265 Y460[2)]	1,15÷1,1[3)]	1,2	0,95 ÷ 1,05	0,96 ÷ 0,92[3)]	0,96	0,92
		Δ277 Y480[2)]	1,2 ÷1,15[4)]	1,2	1	1 ÷ 0,96[4)]	1	1
Δ400 V 50 Hz	50	Δ380	1	1	0,95 ÷ 1,05	1	0,96	0,9
		Δ415	1	1	0,95 ÷ 1,05	1	1,04	1,08
	60	Δ380[1]	1	1,19	0,95 ÷ 1,05	0,83	0,79	0,63
		Δ440[1) 2)]	1,1	1,2	0,95 ÷ 1	0,92	0,92	0,84
		Δ460[2)]	1,15÷1,1[3)]	1,2	0,95 ÷ 1,05	0,96 ÷ 0,92[3)]	0,96	0,92
		Δ480[2)]	1,2 ÷1,15[4)]	1,2	1	1 ÷ 0,96[4)]	1	1

1) Up to size 132MB, standard motor can also operate with this supply provided that higher temperature rise values are acceptable without on-load starts and that the power requirement is not unduly demanding (P_N in the table); this supply is not shown on motor name plate.
2) For brake voltage value, see ch. 4.14 (1), 5.14 (1), 6.13 (1).
3) Value valid for size ≥160M.
4) Value valid for sizes 160L 4, 180M 4, 200L 4 and 250M 4.

2.8

Sound levels

The sound power emission level L_{WA} relevant to the motor of this catalog comply with the limits settled by EN 60034-9.

2.9

Running with inverter

Rossi motors are suitable for operation with PWM inverters as they incorporate design solutions and features that are also suitable for this application: phase separators, double-layer enameled wire in class H (200 °C), dynamically balanced rotor, wide range of models available in the catalog specifically for operation with inverters (independent cooling fan, additional impregnation of windings, bimetal or thermistor temperature probes, encoders, etc.).

Torque *M* available on motor

The inverter supplies the motor at variable voltage *U* and frequency *f* by keeping constant the *U*/*f* ratio (which can be calculated with the values on name plate). For $U \leq U$ mains, with constant *U*/*f*, motor changes its speed in proportion to frequency f and, if loaded with nominal torque M_N, absorbs a current $I \approx I_N$.
When *f* increases, since the inverter cannot produce an output voltage higher than the input one, when *U* reaches the mains value the *U*/*f* ratio decreases (motor runs under-voltage supplied) and at the same time, with the same absorbed current, *M* proportionately decreases.

Asynchronous three-phase motor supplied by inverter provides, at low frequency for thermal reasons, at high frequency for electrical reasons (*U*/*f* lower than name plate data) a torque *M* **lower than the nominal one** M_N, according to running **frequency** and to **cooling** (self-cooled or independently cooled motor).
For running at $2{,}5 \leq f \leq 5$ Hz it is necessary to have a **vector inverter** (to avoid any irregular running and anomalous absorption).
For motor wound for **Δ230 Y400 V 50 Hz** and three-phase supply inverter **400 V 50 Hz it is possible to have two running types**.

A) Running with *U*/*f* ≈ constant up to 50 Hz (Y-connected motor; it is the most common one):

$P_{a\,n\,max} \approx P_N$, $I = I_{N\,400\,V}$.

For supply frequency:

- **5**[1] **÷ 25 Hz**, since self-cooled motor is slightly cooled, *M* is decreased by decreasing speed (*M* keeps constant for independently cooled motor or for intermittent duty; see short dashed line);
- **25 ÷ 50 Hz**, motor runs at constant *M* ($\approx M_N$);
- **> 50 Hz**, motor runs at constant *P* ($\approx P_N$) with progressively decreased *U*/*f* ratio (frequency increases while voltage keeps unchanged) and following proportional decrease of *M* at the same current absorbed.

Motors wound for Δ400 V 50 Hz (standard for sizes ≥ 160M) can only have this running type and must be Δ-connected.

B) Running with *U*/*f* ≈ constant up to 87 Hz (Δ-connected motor); it allows to increase the motor power, to run at higher frequency with the same frequency variation ratio or to increase the frequency variation ratio at the same derating coefficient **C**, etc.):

$P_{a\,n\,max} \approx \mathbf{1{,}73}\ P_N$, $I \approx \mathbf{1{,}73}\ I_{N\,400\,V} \approx I_{N\,230\,V}$

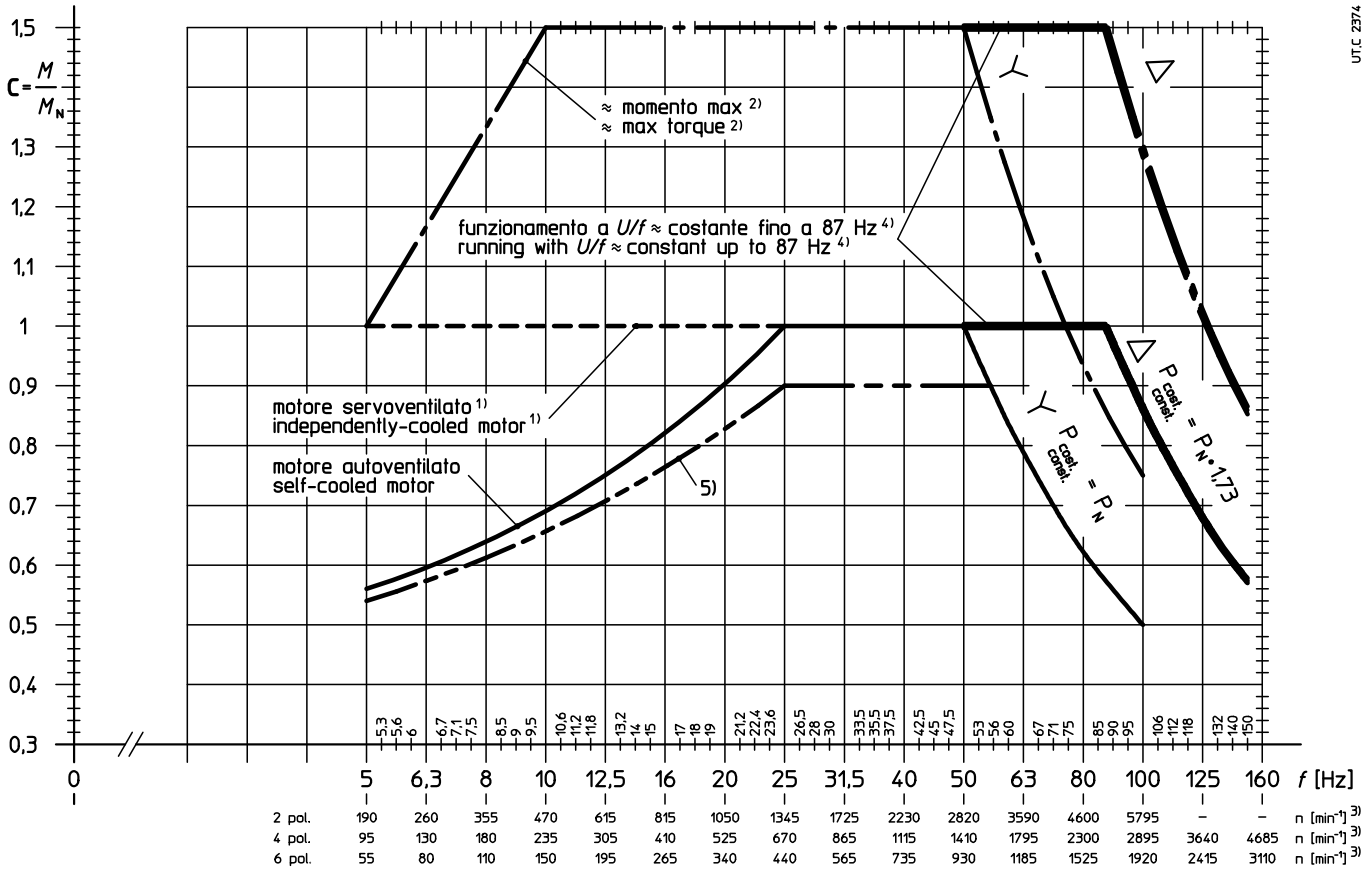
For supply frequency:

- **5**[1] **÷ 25 Hz**, since self-cooled motor is slightly cooled, *M* is decreased by decreasing speed (M keeps constant for independently cooled motor or for intermittent duty; see short dashed line);
- **25 ÷ 87 Hz**, motor runs at constant *M* ($\approx M_N$);
- **> 87 Hz**, motor runs at constant *P* ($\approx 1{,}73\ P_N$) with progressively decreased *U*/*f* ratio (frequency increases while voltage keeps unchanged) and following proportional decrease of *M* at the same current absorbed.

The derating **coefficient C** = M/M_N to be applied to nominal torque in order to achieve the torque provided by motor is given by the following diagram (see also note 5).

The max torque depends on the inverter features and on the max **limitation current setting**. Usually, the values deducible from the diagram are not exceeded. With vector inverter, the torque reduction is slighter at low frequencies (e.g.: $M_{max} / M_N \approx 1{,}5 \div 1{,}3$ for $f = 5 \div 2{,}5$ Hz).

1) In case of motor supply using vector inverter, for continuous duty torque *M* keeps constant down to about 2,5 Hz.



1) Curve valid for independently cooled motor or for intermittent duty.
2) Curve valid for max M for short times (accelerations, decelerations, short time overloads).
3) Approximate real speed refers both to slipping at nominal torque and to voltage «boost» at low frequency (with vector control, **slip** can be slightly lower).
4) Δ-connection and running with U/f ≈ constant up to 87 Hz.
5) **IMPORTANT**: curve valid for motor size ≥ 160M, motors signed in the selection tables by symbol □ or in case of inverter with low quality wave shape.

Motor selection

Polarity. **2-poles** motor is advisable when high speeds are requested since it is less suitable to transmit the torque in a regular way at low supply frequency, but it allows to achieve higher powers at the same size; on the contrary **6-poles** motor is advisable when very low continuous speeds are requested. **Usually, 4-poles motor represents the best compromise**.

Cooling.
For running at frequency < 25 Hz it is necessary to evaluate the opportunity (both from a thermal and economical point of view) to apply an axial independent cooling fan (according to load entity and duration and to ambient temperature) in order to avoid any excessive oversizing of motor-inverter.

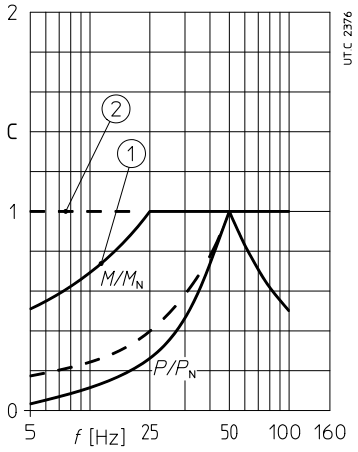
Frequency range.
At the same frequency variation ratio **R**[1)] = f_{max} / f_{min} at constant torque, max and min running frequencies must be selected in order to minimize the derating coefficient **C** (max possible **C**).

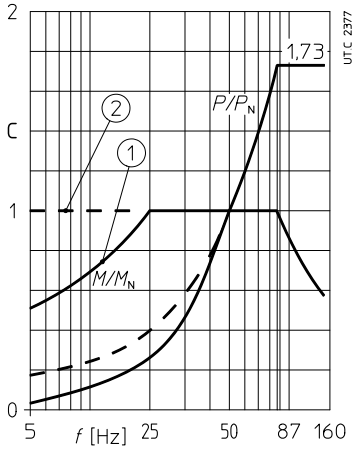
The min and max running frequencies f_{min} and f_{max} and the **derating C** are stated in the following table, according to frequency variation ratio **R** required at constant *M*, to **running** (A, B) and **motor cooling type**.

1) It is necessary to consider only the frequency (i.e. speed) values relevant to the application and not the (usually low) ones characteristic of transients.

Motor wound for Δ230 Y400 V 50 Hz and three-phase supply 400 V 50 Hz.

Operation type	Motor cooling		Nominal frequency variation ratio *R*[1]												
			≤2	2,6	3,3	4,5	6	7,1	8,3	11,3	13,5	18	20	25	30
A) **Y400 V/50 Hz** $P_{a/at\ n\ max} = P_N$ $I = I_{N\ 400\ V}$	① Self-cooled	f_{max}	50	54,5	60	63	67	71	75	80	85	90	—	—	—
		f_{min}	25	21,2	18	14	11,2	10	9	7,1	6,3	5	—	—	—
		C[4)]	**1**	**0,91**	**0,85**	**0,79**	**0,74**	**0,7**	**0,66**	**0,62**	**0,59**	**0,56**	**—**	**—**	**—**
		$n_{max\ 2}$[2) 3)]	2 820	3 105	3 440	3 630	3 880	4 125	4 370	4 675	4 980	5 285	—	—	—
		$n_{min\ 2}$[2) 3)]	1 345	1 120	930	715	540	470	410	310	260	190	—	—	—
		$n_{max\ 4}$[2)]	1 410	1 550	1 720	1 815	1 940	2 060	2 185	2 340	2 490	2 645	—	—	—
		$n_{min\ 4}$[2)]	670	560	470	360	270	235	210	155	130	95	—	—	—
		$n_{max\ 6}$[2)]	930	1 025	1 140	1 200	1 285	1 365	1 450	1 550	1 655	1 755	—	—	—
		$n_{min\ 6}$[2)]	440	365	305	230	170	150	130	95	80	55	—	—	—
	② Independently cooled	f_{max}	For **R** <10 choose f_{max} ≤ 50 and f_{min} ≥ 5 according to speed and torque application requirements (always **C** = 1); consult us.							50	63	80	100	—	
		f_{min}								5	5	5	5	—	
		C[4)]								**1**	**0,79**	**0,62**	**0,5**	**—**	
		$n_{max\ 2}$[2) 3)]								2 820	3 630	4 675	5 895	—	
		$n_{min\ 2}$[2) 3)]								190	210	230	245	—	
		$n_{max\ 4}$[2)]								1 410	1 815	2 340	2 950	—	
		$n_{min\ 4}$[2)]								95	105	115	120	—	
		$n_{max\ 6}$[2)]								930	1 200	1 550	1 960	—	
		$n_{min\ 6}$[2)]								55	65	75	80	—	
B) **Δ400 V/87 Hz** $P_{a/at\ n\ max} = 1{,}73\ P_N$ $I = 1{,}73\ I_{N\ 400\ V}$	① Self-cooled	f_{max}	87	90	95	100	106	112	118	125	140	150	—		
		f_{min}	25	21,2	18	14	11,2	10	9	7,1	6,3	5	—		
		C[4)]	**1**	**0,91**	**0,85**	**0,79**	**0,74**	**0,7**	**0,66**	**0,62**	**0,59**	**0,56**	**—**		
		$n_{max\ 2}$[2) 3)]	5 020	5 215	5 525	5 835	—	—	—	—	—	—	—		
		$n_{min\ 2}$[2) 3)]	1 345	1 120	930	715	—	—	—	—	—	—	—		
		$n_{max\ 4}$[2)]	2 510	2 610	2 765	2 920	3 105	3 285	3 470	3 685	4 135	4 435	—		
		$n_{min\ 4}$[2)]	670	560	470	360	270	235	210	155	130	95	—		
		$n_{max\ 6}$[2)]	1 660	1 730	1 835	1 935	2 060	2 180	2 305	2 450	2 750	2 950	—		
		$n_{min\ 6}$[2)]	440	365	305	230	170	150	130	95	80	55	—		
	② Independently cooled	f_{max}	For **R** <16 choose f_{max} ≤ 87 and f_{min} ≥ 5 according to speed and torque application requirements (always **C** = 1); consult us.									87	100	125	
		f_{min}										5	5	5	
		C[4)]										**1**	**0,79**	**0,62**	
		$n_{max\ 2}$[2) 3)]										5 020	5 835	—	
		$n_{min\ 2}$[2) 3)]										190	210	—	
		$n_{max\ 4}$[2)]										2 510	2 920	3 685	
		$n_{min\ 4}$[2)]										95	105	115	
		$n_{max\ 6}$[2)]										1 660	1 935	2 450	
		$n_{min\ 6}$[2)]										55	65	75	





1) Nominal frequency variation ratio **R** = f_{max} / f_{min} is always lower than real variation ratio (n_{max} / n_{min}).
2) Approx. real speed refers both to **slipping** at nominal torque and to voltage boost at low frequency (2 = 2 poles motor; 4 = 4 poles motor; 6 = 6 poles motor).
3) Values valid for sizes ≤160S.
4) **Important**: for motor sizes ≥ 160M or signed in the manufacturing programme by symbol □ or in case of inverter with low quality wave shape, consider **more prudential C** values, e.g. **0,9 · C**.

Not advisable for economic reasons.
Usually not advisable both for technical and economic reasons.

Motor power.
Proceed as follows:

- make available all necessary data of driven machine: max and min running speed[1)], n_{max} and n_{min} respectively; constant torque $M_{required}$[2)] requested in the speed variation range considered;
- determine f_{max}, f_{min} and **C** coefficient according to motor cooling, to running type (A, B) and to a frequency variation ratio

$$\mathbf{R} \geq \frac{n_{max}}{n_{min}};$$

- choose motor polarity and then calculate transmission ratio according to

$$i = \frac{n_{max\ 2,\ 4,\ 6}}{n_{max\ running}}$$

where $n_{max\ 2,\ 4,\ 6}$ is the motor speed at max frequency f_{max} (see table);

- choose a motor power

$$P_N \geq \frac{M_{required} \cdot n_N}{9550 \cdot \mathbf{C} \cdot \boldsymbol{\eta} \cdot i}$$

where n_N is the motor nominal speed (2 poles: 2800 min^{-1}; 4 poles: 1400 min^{-1}; 6 poles: 900 min^{-1}), η is the total **efficiency** of the transmission between motor and driven machine and **C** is the derating coefficient which is given by previous table.

Important: for motor sizes ≥ 160 or signed in the selection tables by symbol □ or in case of inverter with low quality wave shape, consider **more prudential C** values, e.g. **0,9 · C**.

1) It is necessary to consider only the frequency (i.e. speed) values relevant to the application and not the (usually low) ones characteristic of transients.
2) If not constant, consider its maximum value (in the frequency variation range relevant to a continuous duty); for very wide variations directly refer to diagram and/or consult us.

Inverter selection and programming

Requisites for the inverter: **good concept and quality**, **adequate nominal current**, **correct setting of *U/f* characteristic curve** according to motor nominal voltage, not excessive voltage «boost» (about 25% ÷ 0% for 5 ÷ 30 Hz), proper **current limitation** according to motor current (stated on the name plate) and to the admissible/required overloads; **good setting** of the innumerable drive parameters that the new generation inverters allow to program in order to avoid any problems and to optimize the drive operation.

Inverter size.
It is recommended to choose an inverter with **nominal current** at least equal to **1,12 ÷ 1,25 I_N of motor and with current overload capacity** higher than 1,12 ÷ 1,25 times the torque overload required. Usually, for M_{max} / M_N = 1,5, it is necessary to have I_{max} / $I_{N\ motor}$ ≈ **1,7 ÷ 2**.

Considerations, indications, verifications

Acceleration time.

Check that the acceleration time programmed in the inverter is not less than the value that can be obtained with starting torque equal to 1,32 ÷ 1,5 M_N (also according to inverter current limitation); the setting of lower values causes a lower acceleration and an increase of current absorbed.

Frequency of starting.
Because of the smaller amount of current absorbed by the motor during starting (compared to direct supply), for a maximum starting time of 0,5 ÷ 1 s the max frequency of starting *z* is at least 180 start/h up to size 90, 90 start/h for sizes 100 ... 132, 45 start/h for larger sizes.
It is not necessary to verify frequency of starting for sufficiently long acceleration times, when accelerating torque does not exceed M_N.
Consult us for higher requirements.

Overloads.
In the case of duty featuring frequent and long lasting overloads and/or startings check the thermal suitability of inverter and motor according to the average quadratic current absorbed which should be compared to a limit value proportional to the motor nominal current I_N (the constant of proportionality depends on motor duty and cooling: consult us).
In normal conditions it is not necessary to make any kind of verification if overloads are present for less than 10 minutes per hour.

Star connection of motor (**Y**).
Whenever possible, due to the absence of internal circulation currents, the star connection of motor is to be preferred to the delta one, since the overtemperatures are lower (≈ -10 °C).

Chopper frequency.
High values (e.g.: 8 ÷ 16 kHz) cause a higher heating both for motor (≈ +10 °C) and for inverter but allow a completely noise-free running (pure tones); at the same time there is a worsening of the problems related to the electromagnetic noises, especially in case of long distances between inverter and motor (> 5 ÷ 10 m).

Brake motor and/or with independent cooling fan.
Brake and independent cooling fan must always be directly supplied from mains. When braking it is necessary to give the all-off controller to the inverter.

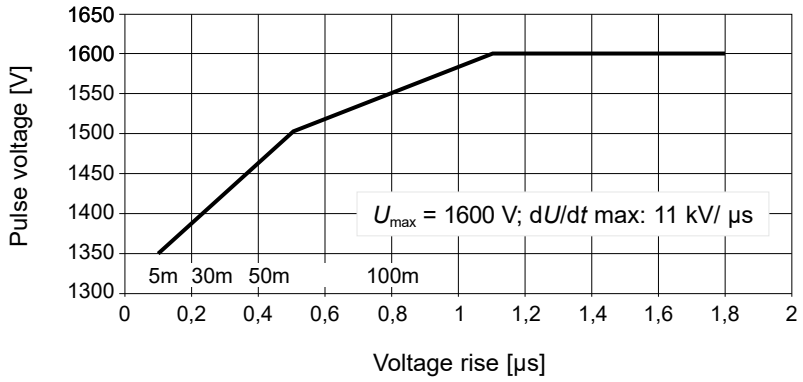
Motor coupled with gear reducer.
Prefer the low speed in the choice both of polarity and of position of variation range in order to limit noise level and heating and to increase the life of oil seal rings.

Inverter supply with voltage > 400 V 50/60 Hz.
After having verified the suitability of inverter to the supply voltage value, it is possible and convenient to use the motor with standard winding Δ230 Y400 V 50 Hz or Δ400 V 50 Hz (equivalent to Δ277 Y480 V 60 Hz or Δ480 V 60 Hz) by setting the inverter so that it provides to the motor a constant $U/f = U_{name\ plate} / f_{name\ plate}$. For additional precautions see following point.

Voltage peaks (U_{max}), voltage gradients (dU/dt), cable length

The use of inverters requires some precautions relevant to voltage peaks (U_{max}) and voltage gradients (dU/dt) generated by this power supply type; the values become higher by increasing the mains voltage U_N, the motor size, the power supply cable length between inverter and motor and by worsening the inverter quality.
The maximum allowable line voltage at the input of the inverter is 500V.
In addition, the voltage on the inverter's DC bus must not exceed 750V DC.
The peak impulse voltages generated by the combination of inverter, motor and cable length, as a function of voltage rise time, must not exceed the values shown in the chart below when hot.

Allowable pulse voltage as a function of voltage rise time



For mains voltages above 500 V, or if the values are otherwise outside the permissible range, it is necessary to adopt special solutions (contact our technical sales department for more details) or install filters.

Hoisting. In these cases it is advised to adopt inverter with U/f control mode since vector control could cause instability and oscillations. Consult Rossi S.p.A.

Multiple drives.
When several motors are connected simultaneously to the same inverter, this one has to be with U/f control mode.

Verifications relevant to: **deceleration time**, **braking** with regenerating running (with or without external braking resistance), braking with d.c. injection, are always to be done according to technical specifications and to programming of inverter applied.

Tolerances of electrical and operating specifications of the motors to standards IEC 60034-1, (CEI EN 60034-1, DIN VDE 0530-1, NF C51-111, BS 4999-101) CENELEC EN 60034-2.

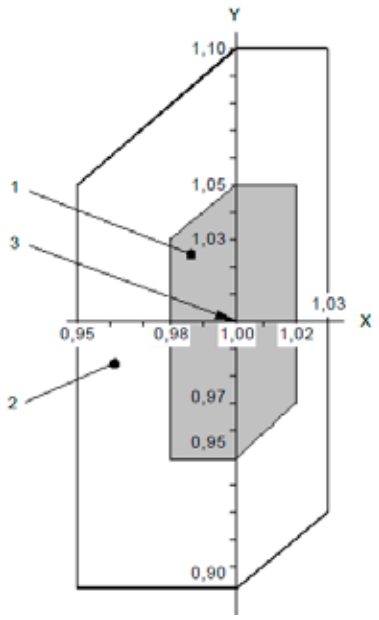
Specification	Tolerance[1]		
Efficiency	η	-0,15 (1-η)	
Power factor	cosφ	- (1-cosφ)/6	min 0,02, max 0,07
Sliding		± 20%	(± 30% for P_N < 1 kW)
Locked rotor current	I_S	+ 20%	
Locked rotor torque	M_S	- 15% + 25% [2]	
Max torque	M_{max}	- 10% [3]	
Moment of inertia	J_0	± 10%	

1) If a tolerance is specified for one direction only, the value has no limit in the other direction.
2) The value + 25% can be exceeded upon previous agreement.
3) Only if, by applying this tolerance, the torque remains equal to 1,6 times M_N, according to CEI EN 60034-2.

Mating tolerances under «accuracy» rating to IEC 60072-1 (UNEL 13501-69 DIN 42955).

Tolerance on voltage and frequency

Tolerance applicable on voltage and frequency is defined by standard IEC 60034-1 in the zones A and B as per sketch below:



1 zone A
2 zone B
3 rating point

Note:
axis X: frequency (p.u.)
Axis Y voltage (p.u.)
rating point: running rating point [1]

In zone A (combination of variations: voltage ± 5% and frequency ± 2%) motor supplies the nominal torque in continuous running duty (S1). Other specific values and heating can slightly differ from the ones of running rating point.

In zone B (combination of variations: voltage ± 10% and frequency + 3% / - 5%) motor supplies the nominal torque but not in continuous running duty. Motor may show differences and temperature increase compared with zone A. The frequent motor running on zone B is to be avoided.

1) As running rating point consider voltage/frequency values stated on motor name plate.

2.11

Specific standards

Motors comply with following standards (except for any different description of each specification).

Nominal powers and dimensions:
- for mounting position IM B3 and derivatives (CENELEC HD 231, IEC 60072-1, CNR-CEI UNEL 13113-71, DIN 42673, NF C51-110, BS 5000-10 and BS 4999-141);
- for mounting position IM B5, IM B14 and derivatives IEC 60072-1, (CENELEC HD 231, CNR-CEI UNEL 13117-71 and 13118-71, DIN 42677, NF C51-120, BS 5000-10 and BS 4999-141).

Nominal performances and running specifications:
CEI EN 60034-1, EN 60034-1, IEC 60034-2.

Protection of the housings:
CEI EN 60034-5, EN 60034-5, IEC 60034-5.

Mounting positions:
CEI EN 60034-7, EN 60034-7, IEC 60034-7.

Cylindrical shaft ends:
- ISO 775-88 (UNI-ISO 775-88, DIN 748, NF E22.051, BS 4506-70) excepted the diameters up to 28 mm which are in tolerance j6;
- tapped butt-end hole to UNI 9321, DIN 332BI.2-70, NF E22.056;
- keyway to CNR-CEI UNEL 13502-72.

Terminal markings and direction of rotation:
CEI 2-8, CENELEC HD 52.8, IEC 60034-8.

Sound levels:
CEI EN 60034-9, EN 60034-9, IEC 60034-9.

Mechanical vibrations:
CEI EN 60034-14, EN 60034-14, IEC 60034-14.

Cooling systems:
CEI EN 60034-6, EN 60034-6, IEC 60034-6.

Mating tolerances:
IEC 60072-1, (CNR-CEI UNEL 13501-69 DIN 42955).

Determining of efficiency:
CEI EN 60034-2-1, EN 60034-2-1, IEC 60034-2-2.

2.12

Regulations to standard 2012/19/EU

This symbol means that the product contains materials that can be recovered or recycled and should not be disposed of with general waste.
Disposal should be in accordance with EU Directives where applicable.
Outside the European Union contact your local authorities for information on current regulations.

This page is intentionally left blank.

3

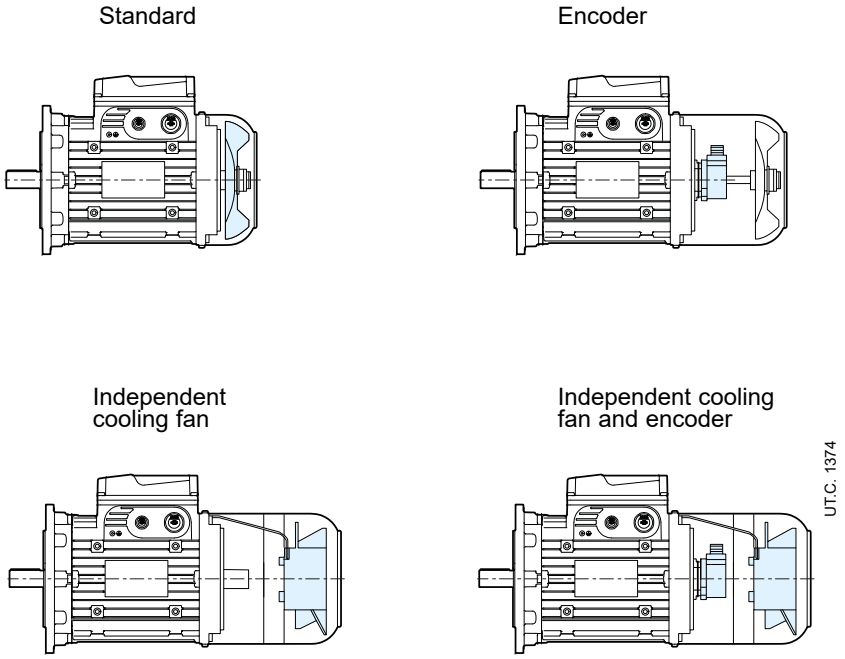
HB series Asynchronous three-phase motor

Section contents

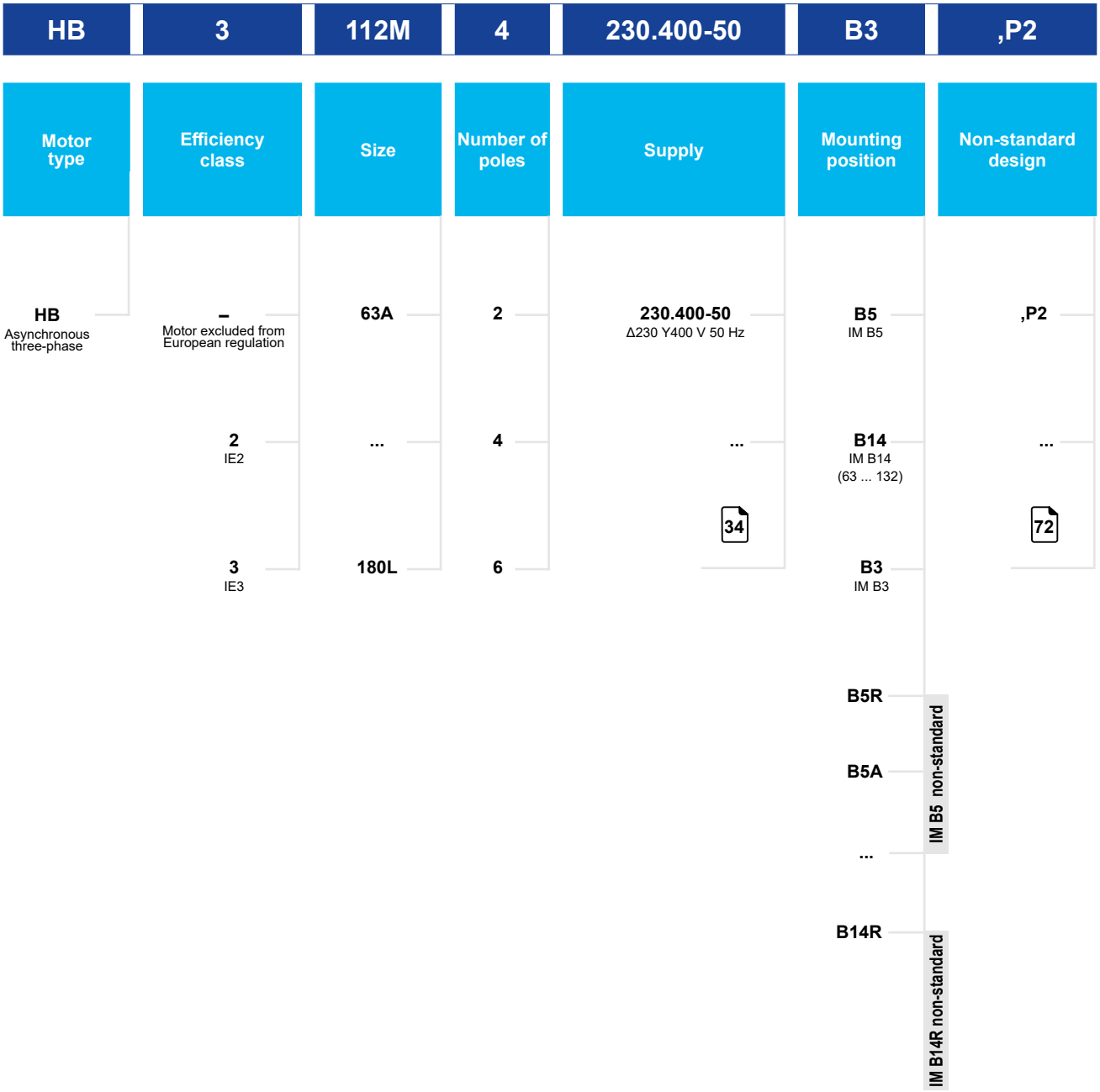
3.1

General specifications

63 ... 180



- Three-phase asynchronous motors, sizes 63 ... 180 available also with **higher powers** (marked by *) **than the ones foreseen by the standards**
- Class F insulation, temperature rise class B for all motors at standard power, B or F for remaining motors
- Mounting positions **IM B5** and derivatives, **IM B14** and derivatives and **IM B3** (sizes 63 ... 180 always pre-arranged) and corresponding vertical mounting positions; **mating tolerances under «accuracy» rating**
- **IP 55** protection
- **Particularly strong construction** (both electrical and mechanical); duly proportioned bearings
- **«Supported» tightening attachments** of endshields and flanges fitted on housing with «tight» coupling
- «Generous» electromagnetic sizing having margins of safety, good acceleration capacity (high frequency of starting) and uniform starting (slightly «sagged» characteristic curves)
- **Metallic** terminal box
- **Suitable for operation with inverter**
- **Designs available for every application need** (independent cooling fan, independent cooling fan and encoder, protections higher than IP 55, etc.).


HB
3
112M
4
230.400-50
B3
,P2
Motor type
Efficiency class
Size
Number of poles
Supply
Mounting position
Non-standard design
HB
Asynchronous three-phase
–
Motor excluded from European regulation
2
IE2
3
IE3
63A
...
180L
2
4
6
230.400-50
Δ230 Y400 V 50 Hz
...
34
B5
IM B5
B14
IM B14
(63 ... 132)
B3
IM B3
B5R
B5A
...
B14R
IM B5 non-standard
IM B14R non-standard
,P2
...
72

3.3

Specifications

Standardized asynchronous three−phase electric motor with cage rotor, totally enclosed, externally ventilated (cooling system IC 411), single-speed according to following tables:

Directive / Certification	Efficiency class	Poles	Winding	Shaft height	Standard supply	Class		Pag.
						insulation	temperature rise	
ErP	IE2, IE3	2, 4, 6	three-phase Δ Y	63 … 132	230.400-50	F	B	40
	IE3	4, 6	three-phase Δ	160 … 180	400-50			
EAC	IE3	2, 4, 6	three-phase Δ Y	63 … 132	220.380-50			46
		4, 6	three-phase Δ	160 … 180	380-50			
CCC	GR. 3 (IE3)	2, 4, 6	three-phase Δ Y	63 … 90	220.380-50			50
CEL				80 … 180				
AU MEPS	IE3	4	three-phase Δ Y	80 … 132	230.400-50			43
			three-phase Δ	160 … 180	400-50			
EISA	Nema Premium	4, 6	three-phase YY Y	90 … 132	230.460-60			55
NOM	IE3	4, 6	three-phase Δ Y	90 … 132	255.440-60			58
			three-phase Δ	160	440-60			
INMETRO	IR3 (IE3)	4, 6	three-phase Δ Y	80 … 180	220.380-60			60
				80 ... 132	255.440-60			
			three-phase Δ	160-180	440-60			

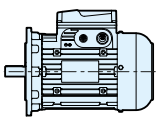
Rated power delivered on continuous duty (S1) (except cases highlighted at ch. 3.5... 3.7 for which powers are relevant to the intermittent duty S3 70%) and at standard voltage and frequency; ambient temperature -15 ÷ 40 °C, altitude 1 000m.

IP 55 protection obtained with seal rings on drive end (without spring for IM B3) and on non−drive end (without spring).

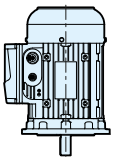
Mounting positions IM B5, IM B14, IM B3; motors can also operate in the relevant mounting positions with vertical shaft, which are respectively (see following table): IM V1 and IM V3, IM V18 and IM V19, IM V5 and IM V6; the name plate shows the designation of mounting position with horizontal shaft.
On request, other special mounting positions: contact Rossi S.p.A..

Mounting positions with flange

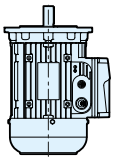
IM **B5**



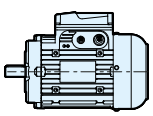
IM **V1**



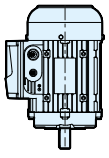
IM **V3**



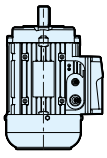
IM **B14**



IM **V18**

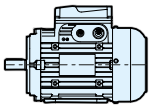


IM **V19**

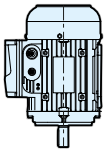


Mounting positions with feet

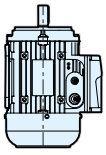
IM **B3**[1)]



IM **V5**



IM **V6**



1) Motor can also operate in the mounting positions IM B6, IM B7 and IM B8; the name plate shows the IM B3 mounting position.

Construction features

Component type	Notes	Motor size									
		63	**71**	**80**	**90**	**100**	**112**	**132**	**160S**	**160MA, M, L**	**180**
Housing	Material	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
N-DE endshield		LL	LL	LL	LL	LL	LL	LL	LL	G	G
Fan cover		LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Fan		PL	PL	PL	PL	PL	PL	PL	PL	PL	PL
DE bearing	Lubricated for life	6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6309 2Z	6309 2Z	6310 2Z
N-DE bearing		6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6308 2Z	6309 2Z	6310 2Z
DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	45×65×8	45×65×8	50×72×8
N-DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	40×60×10	45×65×8	50×72×8
Terminal block 6/ 9 pins	Pin size	M4 / M4	M4 / M4	M4 / M4	M5 / M5	M5 / M5	M5 / M5	M6 / M5	M6 / M5	M8 / M8	M8 / M8
Cable entry	Knockout cable opening for cable glands	4×M16	2×M16+ 2×M20	2×M16+ 2×M20	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M32	2×M16+ 2×M32	-	-
	Blind plugs	-	-	-	-	-	-	-	-	4×M40+ 4×M16	4×M40+ 4×M16

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

Construction features

Mounting position	Notes	Motor size									
		63	**71**	**80**	**90**	**100**	**112**	**132**	**160S**	**160MA, M, L**	**180**
B3 (with bolt-in feet)	Ø DxE shaft	11×23	14×30	19×40	24×50	28×60	28×60	38×80	42×110	42×110	48×110
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12	M16 / M10	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100	12×8×100	14×9×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	G / C45	G / C45
	n, foot position side	1	1	1	3	3	3	3	3	3	3
B5	Ø DxE shaft / Ø P flange	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	28 × 60 / 250	28 × 60 / 250	38 × 80 / 300	42 × 110 / 350	42 × 110 / 350	48 × 110 / 350
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12	M16 / M10	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100	12×8×100	14×9×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	G / C45	G / C45
B5R	Ø DxE shaft / Ø P flange	9 × 20 / 120	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	24 × 50 / 200	28 × 60 / 250	–	38 × 80 / 300	–
	DE / NDE threaded hole	M3 / NA	M4 / NA	M5 / NA	M6 / M8	M8 / M10	M8 / M10	M10 / M12		M12 / M10	
	Key type A	3×3×12	4×4×18	5×5×25	6×6×32	6×6×32	6×6×32	8×7×50		10×8×70	
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45		G / C45	
B5S[1)]	Ø DxE shaft / Ø P flange	–	–	–	14 × 30 / 160	19 × 40 / 200	19 × 40 / 200	24 × 50 / 200	–	–	–
	DE / NDE threaded hole				M5 / M8	M6 / M10	M6 / M10	M8 / M12			
	Key type A				5×5×25	6×6×32	6×6×32	6×6×32			
	Flange / Shaft material				LL / 39NiCrMo3	LL / 39NiCrMo3	LL / 39NiCrMo3	G / 39NiCrMo3			
B5A	Ø DxE shaft / Ø P flange	11 × 23 / 120	14 × 30 / 140	19 × 40 / 160	–	28 × 60 / 200	28 × 60 / 200	38 × 80 / 250	–	–	–
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA		M10 / M10	M10 / M10	M12 / M12			
	Key type A	4×4×18	5×5×25	6×6×32		8×7×50	8×7×50	10×8×70			
	Flange / Shaft material	LL / C45	LL / C45	LL / C45		LL / C45	LL / C45	G / C45			
B5B	Ø DxE shaft / Ø P flange	–	11 × 23 / 120	14 × 30 / 140	19 × 40 / 160	–	–	28 × 60 / 200	–	–	–
	DE / NDE threaded hole		M4 / NA	M5 / NA	M6 / M8			M10 / M12			
	Key type A		4×4×18	5×5×25	6×6×32			8×7×50			
	Flange / Shaft material		LL / C45	LL / C45	LL / C45			G / C45			
B5C	Ø DxE shaft / Ø P flange	–	–	–	–	19 × 40 / 160	–	–	–	–	–
	DE / NDE threaded hole					M6 / M10					
	Key type A					6×6×32					
	Flange / Shaft material					LL / C45					
B14	Ø DxE shaft / Ø P flange	11 × 23 / 90	14 × 30 / 105	19 × 40 / 120	24 × 50 / 140	28 × 60 / 160	28 × 60 / 160	38 × 80 / 200	–	–	–
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12			
	Key type A	4×4×18	5×5×25	6×6×32	6×6×32	8×7×50	8×7×50	10×8×70			
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45			
B14R	Ø DxE shaft / Ø P flange	–	11 × 23 / 90	14 × 30 / 105	–	–	–	–	–	–	–
	DE / NDE threaded hole		M4 / NA	M5 / NA							
	Key type A		4×4×18	5×5×25							
	Flange / Shaft material		LL / C45	LL / C45							

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

1) For $P_{N\ max}$ available see the following table.

Motor size	Poles					
	2		4		6	
	$P_{N\ max}$ kW [hp]					
90	1,85	[2,4]	1,1	[1,5]	0,75	[1]
112	4	[5,4]	3	[4]	1,85	[2,4]
132	9,2	[12,4]	7,5	[10]	4	[5,4]

Earth terminal located inside terminal box; prearranged for the installation of a two further external earth terminal on housing.

Rotor: pressure diecast cage.

Stator winding with class H copper conductor insulation, insulated with double coat, type of impregnation with resin of class H; other materials are of classes F and H for a **class F insulation**.
Materials and type of impregnation allow **use in tropical climates** without further treatment.

Rotor dynamic balancing: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.

Paint: Two-component waterborne paint based on polyacrylic resins corrosion class C3 (according to ISO 12944-2) with water-soluble enamel, color blue RAL 5010 DIN 1843, unaffected by normal industrial environments and suitable for further finishings with two-component synthetic paints.

For **non-standard designs** and accessories see ch. 3.13.

Compliance with European Directives

Motors of present catalog comply with following standards EN 60034−1, EN 60034−2, EN 60034-2-1, EN 60034−5, EN 60034−6, EN 60034−7, EN 60034−8, EN 60034−9, EN60034−12, EN 60034−14, IEC 60038, IEC 60072−1, and with **Low Voltage Directive 2014/35/EU**. For this reason the electric motors are CE marked.

Additional information:

The motor design, considering the motors as components, complies with:
- Machinery Directive 2006/42/EC when the installation is correctly executed by machinery manufacturer (e.g.: in compliance with our installation instructions and EN 60204 «Electric Equipments of Industrial Machines»);
- Directive 2011/65/EC RoHS relevant to the limit of use of dangerous substances in the electric and electronic equipments;
- “ErP” Directive 2009/125/EC establishing a framework for the development of specifications for energy-related products; according to the scope, motors comply with the requirements of Regulation N°2019/1781, the efficiency class is defined according to EN 60034-30-1.

Declaration of Incorporation (Directive 2006/42/EC Art 3.2 − II B):
The above mentioned motors must be commissioned as soon as the machines in which they have been incorporated have been declared to be in compliance with the Machinery Directive.
According to EN60034−1, as motors are components and not machines, supplied directly to the final user, the Electromagnetic Compatibility Directive (application of Directive 2014/30/EU) is not directly applicable.

3.4

Radial and axial loads on shaft end

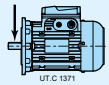
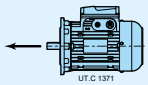
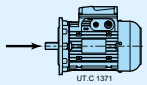
Radial loads generated on the shaft end by a drive connecting motor and driven machine must be less than or equal to those given in the relevant table.
The radial load F_r given by the following formula refers to most common drives:

$$F_r = \frac{k \cdot 19100 \cdot P}{n \cdot d} \text{ [N]}$$

where:

P [kW] is required motor power
n [min^{-1}] is the speed
d [m] is the pitch diameter
k is a coefficient assuming different values according to the drive type:
k = 1 for chain drive
k = 1,1 for gear pair drive
k = 1,5 for timing belt drive
k = 2,5 for V−belt drive

The table shows the maximum permissible values of radial and axial loads on driving shaft end (F_r overhung load on centre line of shaft end), calculated for a bearing life L_h = 18000 h. For a longer bearing life, the values stated in the table must be multiplied by:
0,9 (25000 h),
0,8 (35500 h),
0,71 (50000 h).

Motor size	F_r [1] [N]  n_N [min^{-1}]				F_a [2] [N]  n_N [min^{-1}]				 n_N [min^{-1}]			
	3000	1500	1000	750	3000	1500	1000	750	3000	1500	1000	750
63	420	530	600	670	200	290	350	400	210	290	350	400
71	510	640	740	810	210	310	380	440	210	310	380	440
80	650	830	950	1050	230	350	420	500	370	500	600	680
90S	710	900	1040	1140	250	390	490	570	250	390	490	570
90L	730	930	1050	1180	240	380	480	560	240	380	480	560
100	1000[3]	1300	1500	1650	300	490	620	730	370	570	710	820
112	1500[3]	1900	2150	2400	660	950	1150	1310	660	950	1150	1310
132	2000[3]	2500	3000	3250	1220	1650	1960	2200	1220	1650	1960	2200
160S	2500	3150	3650	4050	1720	2280	2670	2990	1220	1650	1960	2200
160M-L	2950	3700	4250	4650	2300	3100	3900	4300	2300	3100	3900	4300
180	3500	4400	5050	5550	2700	3600	4600	5000	2700	3600	4600	5000

1) An axial load of up to 0,2 times the value in the table is permissible, simultaneously with the radial load.
2) Comprehensive of a possible unfavourable effect of weight−force of rotor and bearing preload spring.
3) For radial load value near to table limit require C3 bearings.

For running at 60 Hz, table values must be reduced by 6%.

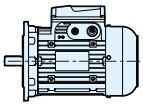
This page is intentionally left blank.

3.5

Technical data 400V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,18 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1371

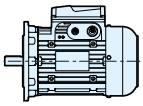
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
0,18	**HB2 63 A 2**	2800	0,61	0,56	0,71	68,7	66,6	60,7	3,1	3,3	4,1	0,0002	4750	3,7
0,25	**HB2 63 B 2**	2780	0,86	0,75	0,71	70,5	68,9	63,1	3,1	3,2	4,1	0,0002	4750	4,3
0,37 *	**HB2 63 C 2**	2790	1,26	1,02	0,72	73,3	72,4	67,3	3,5	3,3	4,5	0,0003	4000	4,9
0,37	**HB2 71 A 2**	2800	1,26	0,95	0,77	75,0	74,7	70,8	3,1	3,3	5,2	0,0003	4000	5,9
0,55	**HB2 71 B 2**	2820	1,86	1,33	0,78	77,3	76,9	72,9	3,6	3,7	5,8	0,0004	4000	6,7

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50Hz 460V 60Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,18 ... 11 kW
400V - 50Hz
460V - 60 Hz
EU (ErP)


UT.C 1371

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2	starts/h	
400 V 50 Hz	0,18	HB3 63 A 2	2800	0,61	0,56	0,71	65,9	61,8	54,4	2,9	2,9	3,9	0,0002	4750	3,7
	0,25	HB3 63 B 2	2800	0,85	0,73	0,71	69,7	68,6	62,8	3,0	2,9	4,1	0,0002	4750	4,3
	0,37 *	HB3 63 C 2	2815	1,26	0,99	0,73	73,8	69,3	62,0	3,0	3,0	4,4	0,0003	4000	4,9
	0,37	HB3 71 A 2	2810	1,26	0,93	0,78	73,8	74,6	70,0	3,1	3,0	5,1	0,0003	4000	5,9
	0,55	HB3 71 B 2	2830	1,86	1,31	0,78	77,8	75,5	71,5	3,9	3,4	6,3	0,0004	4000	6,7
	0,75	HB3 80 A 2	2875	2,49	1,70	0,79	80,7	81,5	78,8	3,5	3,8	7,3	0,0009	2500	8
	1,1	HB3 80 B 2	2870	3,7	2,29	0,84	82,7	85,0	83,6	3,7	3,9	7,6	0,0013	2500	11,6
	1,5	HB3 90 S 2	2890	5	2,92	0,88	84,2	86,7	86,7	3,0	3,6	7,5	0,0019	1800	16
	2,2	HB3 90 LA 2	2890	7,3	4,3	0,85	85,9	87,0	86,6	3,7	4,4	9,0	0,0023	1600	18
	3	HB3 100 LA 2	2930	9,8	6,2	0,80	87,1	87,5	85,8	4,9	5,1	9,8	0,0044	1500	24
	4	HB3 112 M 2	2935	13	7,5	0,87	88,1	88,3	86,7	2,7	4,2	9,4	0,0074	1400	33
	5,5	HB3 132 S 2	2955	18	10	0,85	89,2	89,1	86,5	4,2	6,1	12,7	0,0174	710	53
	7,5	HB3 132 SB 2	2960	24	14	0,85	90,1	91,3	89,2	6,5	6,5	13,4	0,0215	710	62
	9,2 *	HB3 132 SC 2	2960	30	17	0,84	90,7	91,1	89,4	6,3	6,3	13,3	0,0243	710	67
	11 *	HB3 132 MA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0243	710	67
	11	HB3 160 SA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0243	710	76
460 V 60 Hz	0,18	HB3 63 A 2	3400	0,51	0,52	0,67	65,6	62,6	55,5	3,9	3,7	4,8	0,0002	3750	3,7
	0,25	HB3 63 B 2	3430	0,70	0,67	0,67	69,5	68,3	60,8	4,1	3,8	5,6	0,0002	3750	4,3
	0,37 *	HB3 63 C 2	3435	1,03	0,90	0,70	73,4	69,2	62,2	4,1	4,0	6,1	0,0003	3150	4,9
	0,37	HB3 71 A 2	3435	1,03	0,84	0,75	73,4	74,0	68,2	3,8	3,9	6,5	0,0003	3150	5,9
	0,55	HB3 71 B 2	3455	1,52	1,18	0,76	76,8	74,8	69,6	4,6	4,0	6,4	0,0004	3150	6,7
	0,75	HB3 80 A 2	3490	2,05	1,58	0,77	77,0	80,1	75,6	4,6	4,1	8,3	0,0009	2500	8
	1,1	HB3 80 B 2	3490	3,0	2,00	0,82	84,0	85,1	84,1	3,9	4,2	8,6	0,0013	2500	11,6
	1,5	HB3 90 S 2	3500	4,1	2,54	0,87	85,5	87,2	85,2	3,5	4,4	9,0	0,0019	1800	16
	2,2	HB3 90 LA 2	3505	6,0	3,8	0,84	86,5	87,0	85,8	3,7	4,1	8,8	0,0023	1600	18
	3	HB3 100 LA 2	3535	8,1	5,3	0,80	88,5	87,6	84,3	4,3	4,8	11,5	0,0044	1500	24
	4	HB3 112 M 2	3545	11	6,6	0,86	88,5	90,5	89,1	3,1	3,9	10,8	0,0074	1400	33
	5,5	HB3 132 S 2	3560	15	9,2	0,84	89,5	88,6	85,0	7,0	5,9	13,0	0,0174	710	53
	7,5	HB3 132 SB 2	3560	20	12	0,85	90,2	89,4	87,1	6,0	6,3	13,8	0,0215	710	62
	9,2 *	HB3 132 SC 2	3560	25	15	0,84	91,0	89,7	88,6	5,6	6,2	13,6	0,0243	710	67
	11 *	HB3 132 MA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0243	710	67
	11	HB3 160 SA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0243	710	76

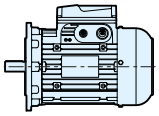
* Power or motor power-to-size correspondence not according to standard.

3.5

Technical data 400V 50Hz

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1371

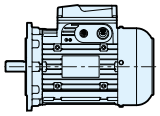
P_N	Motor			n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW				min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
0,12	**HB2**	**63 A**	**4**	1370	0,84	0,46	0,63	61,4	58,9	51,9	2,5	2,6	3,1	0,0002	12500	3,9
0,18	**HB2**	**63 B**	**4**	1350	1,28	0,64	0,66	65,0	64,1	58,4	2,6	2,5	3,3	0,0003	12500	4,5
0,25 *	**HB2**	**63 C**	**4**	1360	1,76	0,83	0,65	68,5	67,8	62,8	2,8	2,7	3,5	0,0004	10000	5,2
0,25	**HB2**	**71 A**	**4**	1400	1,71	0,8	0,71	68,5	66,6	60,7	2,3	2,6	3,8	0,0007	10000	5,7
0,37	**HB2**	**71 B**	**4**	1400	2,52	1,1	0,70	73,2	72,2	67,3	2,7	3,2	4,6	0,0009	10000	6,6
0,55 *	**HB2**	**71 C**	**4**	1400	3,75	1,5	0,70	77,1	75,7	72,0	3,3	3,5	5,1	0,00129	8000	8,3
0,55	**HB2**	**80 A**	**4**	1420	3,69	1,34	0,78	77,1	76,0	72,0	2,9	3,1	5,8	0,00234	8000	9,1

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50Hz 460V 60Hz

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
***P*N 0,12 ... 22 kW**
400V - 50Hz
EU (ErP)
AU MEPS **


UT.C 1371

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2	starts/h	
400 V 50 Hz	0,12	HB3 63 A 4	1365	0,84	0,37	0,72	64,8	64,0	58,8	2,3	2,3	3,3	0,0003	12500	4,5
	0,18	HB3 63 B 4	1380	1,25	0,56	0,66	69,9	68,8	62,9	3,0	2,8	3,8	0,0004	12500	5,3
	0,25	HB3 71 A 4	1415	1,69	0,69	0,71	73,5	71,6	66,9	3,1	2,9	5,0	0,0011	10000	7,3
	0,37	HB3 71 B 4	1415	2,50	0,98	0,71	77,3	75,1	70,8	3,4	3,2	5,6	0,0013	10000	8,3
	0,55	HB3 80 A 4	1420	3,7	1,56	0,63	80,8	79,8	76,4	3,3	3,4	5,0	0,0023	8000	10,5
	0,75	HB3 80 B 4	1420	5,0	1,87	0,70	82,5	83,6	82,1	3,2	3,1	5,4	0,0028	6800	12
	1,1	HB3 90 S 4	1430	7,3	2,50	0,76	84,1	84,5	82,8	3,4	3,6	6,4	0,0041	3150	18,5
	1,5	HB3 90 L 4	1415	10	3,3	0,78	85,3	85,2	84,2	2,6	3,5	5,6	0,0043	3000	19
	1,85 *	HB3 90 LB 4	1425	12	4,2	0,74	86,0	84,6	83,0	2,7	3,4	5,9	0,0043	3000	19
	2,2	HB3 100 LA 4	1445	15	4,7	0,78	86,7	86,9	85,9	3,4	4,0	8,1	0,0076	3000	26
	3 *	HB3 112 MA 4	1450	20	6,1	0,80	88,7	89,1	87,9	4,1	4,1	8,5	0,013	2000	33
	4	HB3 112 M 4	1445	26	8,1	0,75	88,6	90,4	89,2	4,3	4,6	8,6	0,014	1800	35
	5,5	HB3 132 S 4	1465	36	12	0,75	89,6	91,0	89,6	3,6	4,2	8,2	0,0357	900	58
	7,5	HB3 132 M 4	1460	49	15	0,80	90,4	91,0	90,1	4,2	4,4	8,8	0,0432	900	66
	9,2 *	HB3 132 MB 4	1460	60	19	0,76	91,0	91,2	90,4	4,4	4,2	8,2	0,0448	800	69
	11	HB3 160 M 4	1470	71	22	0,80	91,4	92,4	92,1	3,8	3,7	8,2	0,07	800	117
	15	HB3 160 L 4	1470	97	28	0,83	92,1	93,2	92,6	3,4	3,6	8,5	0,09	750	135
	18,5	HB3 180 M 4	1470	120	34	0,84	92,6	93,4	93,1	3,9	3,4	8,6	0,16	600	175
	22	HB3 180 L 4	1475	142	42	0,80	93,0	93,3	93,2	4,6	3,0	8,4	0,18	450	193
460 V 60 Hz	0,12	HB3 63 A 4	1685	0,68	0,34	0,67	66,0	65,9	58,0	2,9	2,9	4,1	0,0003	12500	4,5
	0,18	HB3 63 B 4	1700	1,01	0,52	0,62	69,5	68,4	62,7	3,7	3,6	4,4	0,0004	12500	5,3
	0,25	HB3 71 A 4	1725	1,38	0,64	0,67	73,4	72,4	66,1	3,7	3,7	6,2	0,0008	10000	7,3
	0,37	HB3 71 B 4	1725	2,05	0,89	0,67	78,2	74,8	70,4	4,2	3,8	6,3	0,0010	10000	8,3
	0,55	HB3 80 A 4	1735	3,0	1,44	0,59	81,1	80,7	77,3	4,0	4,0	5,8	0,0025	8000	10,5
	0,75	HB3 80 B 4	1730	4,1	1,72	0,66	83,3	85,5	83,5	3,8	3,7	6,4	0,0028	6800	12
	1,1	HB3 90 S 4	1740	6,0	2,20	0,72	86,5	85,1	82,4	4,4	4,3	7,3	0,0041	3150	18,5
	1,5	HB3 90 L 4	1730	8,3	2,95	0,74	86,5	86,8	85,3	3,9	3,5	6,8	0,0043	3000	19
	1,85 *	HB3 90 LB 4	1735	10	3,7	0,70	89,5	86,5	83,1	4,0	4,3	7,4	0,0043	3000	19
	2,2	HB3 100 LA 4	1750	12	4,1	0,76	89,5	87,9	85,6	4,1	4,7	9,4	0,0076	3000	26
	3 *	HB3 112 MA 4	1755	16	5,4	0,78	89,5	89,7	88,0	4,7	4,8	9,9	0,013	2000	33
	4	HB3 112 M 4	1755	22	7,6	0,74	89,5	90,5	88,8	6,1	5,6	10,0	0,014	1800	35
	5,5	HB3 132 S 4	1770	30	10	0,73	91,7	90,8	88,5	4,7	4,9	9,6	0,0357	900	58
	7,5	HB3 132 M 4	1765	41	13	0,78	91,7	91,0	88,8	7,0	5,1	11,9	0,0432	900	66
	9,2 *	HB3 132 MB 4	1765	50	17	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,0448	800	69
	11	HB3 160 M 4	1775	59	19	0,79	92,4	92,9	92,0	4,8	4,2	10,4	0,07	800	117
	15	HB3 160 L 4	1775	81	25	0,82	93,0	93,1	92,2	4,1	4,0	9,9	0,09	750	135
	18,5	HB3 180 M 4	1775	100	30	0,83	93,6	93,4	92,7	4,4	3,8	10,1	0,16	600	175
	22	HB3 180 L 4	1775	118	37	0,80	93,6	93,7	93,0	4,9	3,6	9,4	0,18	450	193

* Power or motor power-to-size correspondence not according to standard.

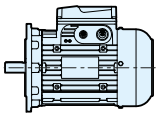
** The standard AS/NZS 1359.5:2004 (AU MEPS - Australia) covers motors rated from 0,75 kW to 185 kW (excluded). The power ratings 1,85 and 9,2 kW are also excluded.

3.5

Technical data 400V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1371

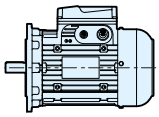
P_N	Motor		n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW			min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
0,12	**HB2**	**63 B 6**	900	1,27	0,55	0,59	52,2	48,3	40,1	2,7	2,8	2,5	0,0005	12500	4,5
0,15 *	**HB2**	**63 C 6**	875	1,64	0,62	0,64	55,6	53,2	46,0	2,5	2,5	2,6	0,0005	11800	5,1
0,18	**HB2**	**71 A 6**	900	1,91	0,66	0,67	59,5	57,1	49,8	2,4	2,4	3,0	0,0009	12500	6
0,25	**HB2**	**71 B 6**	900	2,64	0,88	0,67	61,8	59,7	52,9	2,5	2,7	3,3	0,0012	11200	6,8
0,37 *	**HB2**	**71 C 6**	895	3,95	1,2	0,69	67,6	66,1	61,0	2,6	2,3	3,5	0,0017	10000	8,2
0,37	**HB2**	**80 A 6**	910	3,9	1,2	0,67	67,6	64,0	57,8	2,7	2,6	3,6	0,0019	9500	8
0,55	**HB2**	**80 B 6**	930	5,6	1,6	0,67	73,1	72,2	67,7	3,0	3,0	4,5	0,00314	9000	11,1

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50Hz 460V 60Hz

6 poles - 1000 min^{-1} 50Hz
1200 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,09 ... 15 kW
400V - 50Hz
460V - 60Hz
EU (ErP)


UT.C 1371

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2	starts/h	
400 V 50 Hz 2)	0,09 1)	HB 63 A 6	900	0,96	0,48	0,57	47,6	43,1	34,4	2,5	2,6	2,3	0,0004	13200	4,1
	0,12	HB3 63 B 6	830	1,38	0,42	0,72	57,7	52,1	47,0	1,9	1,9	2,2	0,0005	12500	5,1
	0,18	HB3 71 A 6	910	1,89	0,57	0,71	63,9	64,3	57,4	2,5	2,4	3,4	0,0012	12500	6,8
	0,25	HB3 71 B 6	910	2,62	0,76	0,69	68,6	66,0	60,8	2,7	2,6	3,7	0,0017	11200	8,2
	0,37	HB3 80 A 6	930	3,80	1,00	0,73	73,5	70,4	65,8	2,6	2,6	4,2	0,0019	9500	11,1
	0,55	HB3 90 SA 6	945	5,6	1,45	0,71	77,2	74,2	62,1	2,5	3,1	4,9	0,0056	6000	15,5
	0,75	HB3 90 S 6	950	7,5	2,02	0,68	78,9	77,3	72,5	3,1	3,3	5,3	0,0057	6000	18,5
	1,1	HB3 90 L 6	930	11	2,72	0,72	81,0	78,6	76,1	2,6	3,0	5,0	0,0071	5600	19,5
	1,5	HB3 100 LA 6	950	15	3,5	0,75	82,5	82,6	80,8	2,6	3,2	6,3	0,013	3000	26
	2,2	HB3 112 M 6	960	22	5,2	0,72	84,3	84,9	82,8	3,1	3,4	6,1	0,0202	2800	33
	3	HB3 132 S 6	970	30	7,0	0,72	85,6	87,8	85,9	2,4	3,7	7,0	0,0435	1400	54
	4	HB3 132 M 6	970	39	9,4	0,71	86,8	88,6	86,9	2,7	4,0	7,6	0,0589	1250	66
	5,5	HB3 132 MB 6	970	54	12	0,73	88,0	89,3	88,7	3,2	3,4	7,2	0,06	1100	67
	7,5	HB3 160 M 6	970	74	15	0,78	89,1	90,0	89,1	3,2	3,8	7,9	0,11	1000	117
	11	HB3 160 L 6	965	109	22	0,80	90,3	90,4	90,0	3,3	3,7	7,6	0,14	850	137
	15	HB3 180 L 6	975	147	30	0,80	91,2	91,9	91,8	3,1	4,1	8,5	0,23	560	191
460 V 60 Hz 3)	0,09 1)	HB 63 A 6	1120	0,77	0,41	0,52	52,5	44,3	39,4	2,9	3,0	2,7	0,0004	10600	4,1
	0,12	HB3 63 B 6	1080	1,06	0,38	0,63	64,0	54,8	47,4	2,6	2,6	2,7	0,0005	12500	5,1
	0,18	HB3 71 A 6	1120	1,53	0,50	0,66	68,7	65,9	59,5	3,0	3,0	4,2	0,0012	12500	6,8
	0,25	HB3 71 B 6	1130	2,11	0,70	0,63	71,4	67,8	61,7	3,3	3,3	4,3	0,0017	11200	8,2
	0,37	HB3 80 A 6	1140	3,1	0,90	0,69	75,3	71,5	65,6	4,1	3,2	5,0	0,0019	9500	11,1
	0,55	HB3 90 SA 6	1155	4,5	1,26	0,67	81,7	78,3	74,3	3,2	3,8	6,0	0,0056	6000	15,5
	0,75 *	HB3 100 LA 6	1155	6,2	1,78	0,64	82,5	78,2	72,5	4,0	4,0	6,2	0,013	3200	26
	1,1 *	HB3 112 M 6	1160	9,1	2,16	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	2500	34
	1,5 *	HB3 112 MB 6	1160	12	3,0	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	2000	34
	2,2 *	HB3 132 S 6	1170	18	4,3	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	1400	47
	3 *	HB3 132 M 6	1170	24	5,8	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	1000	56
	4	HB3 132 MB 6	1170	33	8,0	0,70	89,5	91,0	89,5	3,1	4,1	8,0	0,06	800	67
	5,5 *	HB3 160 MA 6	1180	45	10	0,74	91,0	89,5	87,7	3,6	4,7	9,5	0,11	800	117
	7,5	HB3 160 M 6	1175	61	14	0,76	91,0	90,7	89,1	3,6	4,4	9,0	0,11	800	117
	11	HB3 160 L 6	1170	90	19	0,78	91,7	91,2	90,2	3,5	4,3	9,0	0,14	680	137
	15	HB3 180 L 6	1180	121	26	0,78	91,7	92,6	91,4	3,3	4,7	9,6	0,23	440	191

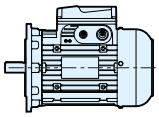
1) Power 0.09 kW not rated in efficiency according to IEC 60034-30-1.
2) Power-motor combinations from 0,75 to 5,5 kW are available and rated at 50Hz only. For other voltages see ch. 3.13 (1).
3) Motor power-size combinations from 0,75 to 4 kW are available and nameplate at 60Hz only. For other voltages see ch. 3.13 (1).
* Power or motor power-to-size correspondence not according to standard.

3.6

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,18 ... 11 kW
380V - 50Hz
Eurasian Economic Union
EAC

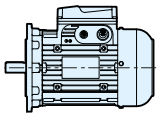

UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2	starts/h	
0,18	**HB3 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0002	4750	3,7
0,25	**HB3 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0002	4750	4,3
0,37 *	**HB3 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0003	4000	4,9
0,37	**HB3 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0003	4000	5,9
0,55	**HB3 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0004	4000	6,7
0,75	**HB3 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,0009	2500	8
1,1	**HB3 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0013	2500	11,6
1,5	**HB3 90 S 2**	2880	5,0	3,00	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,0019	1800	16
2,2	**HB3 90 LA 2**	2880	7,3	4,40	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0023	1600	18
3	**HB3 100 LA 2**	2920	9,9	6,20	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0044	1500	24
4	**HB3 112 M 2**	2930	13,0	7,80	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0074	1400	33
5,5	**HB3 132 S 2**	2950	17,8	10,60	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0174	710	53
7,5	**HB3 132 SB 2**	2950	24,3	14,20	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0215	710	62
9,2 *	**HB3 132 SC 2**	2955	29,9	17,50	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0243	710	67
11	**HB3 132 MA 2**	2940	35,9	20,50	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0243	710	67

* Power or motor power-to-size correspondence not according to standard.

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
***P*N 0,12 ... 22 kW**
380V - 50Hz
Eurasian Economic Union


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2	starts/h	
0,12	**HB3 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0003	12500	4,5
0,18	**HB3 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0004	12500	5,3
0,25	**HB3 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0011	10000	7,3
0,37	**HB3 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0013	10000	8,3
0,55	**HB3 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0023	8000	10,5
0,75	**HB3 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,0018	6800	12
1,1	**HB3 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0041	3150	18,5
1,5	**HB3 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0043	3000	19
1,85 *	**HB3 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0043	3000	19
2,2	**HB3 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,0076	3000	26
3 *	**HB3 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	2000	33
4	**HB3 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,014	1800	35
5,5	**HB3 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0357	900	58
7,5	**HB3 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0432	900	66
9,2 *	**HB3 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,0448	800	69
11	**HB3 160 M 4**	1465	72	22	0,83	91,4	92,2	91,9	3,1	3,3	8,2	0,07	800	117
15	**HB3 160 L 4**	1465	98	29	0,84	92,1	93,4	93,3	3,1	3,1	7,7	0,09	750	135
18,5	**HB3 180 M 4**	1470	120	36	0,85	92,6	93,2	92,9	3,4	3,0	7,7	0,16	600	175
22	**HB3 180 L 4**	1475	142	43	0,83	93,0	93,2	92,8	3,7	3,5	9,1	0,18	450	193

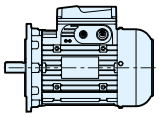
* Power or motor power-to-size correspondence not according to standard.

3.6

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,09 ... 15 kW
380V - 50Hz
Eurasian Economic Union
EAC


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2	starts/h	
0,09 [1]	**HB 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0004	13200	4,1
0,12	**HB3 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0005	12500	5,1
0,18	**HB3 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0012	12500	6,8
0,25	**HB3 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	11200	8,2
0,37	**HB3 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0019	9500	11,1
0,55	**HB3 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0056	6000	15,5
0,75	**HB3 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0056	6000	15,5
1,1	**HB3 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	5600	19,5
1,5	**HB3 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,0130	3000	26
2,2	**HB3 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,0202	2800	33
3	**HB3 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0435	1400	54
4	**HB3 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,0589	1250	66
5,5	**HB3 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,0600	1100	67
7,5	**HB3 160 M 6**	965	74	16	0,81	89,1	89,8	89,8	2,8	3,3	7,1	0,1100	1000	117
11	**HB3 160 L 6**	965	109	22	0,82	90,3	90,2	89,0	2,7	3,3	7,0	0,1400	850	137
15	**HB3 180 L 6**	970	148	30	0,82	91,2	91,8	91,8	2,8	3,6	7,9	0,2300	560	191

* Power or motor power-to-size correspondence not according to standard.

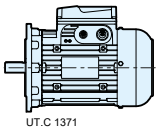
This page is intentionally left blank.

3.7

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,18 ... 11 kW
380V - 50Hz
China (CCC CEL)

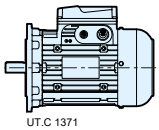

UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2	starts/h	
0,18 [1]	**HB3 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0002	4750	3,7
0,25 [1]	**HB3 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0002	4750	4,3
0,37 [1]	**HB3 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0003	4000	4,9
0,37 [1]	**HB3 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0003	4000	5,9
0,55 [1]	**HB3 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0004	4000	6,7
0,75 [1] [2]	**HB3 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,0009	2500	8,0
1,1 [1] [2]	**HB3 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0013	2500	11,6
1,5 [1] [2]	**HB3 90 S 2**	2880	5,0	3,0	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,0019	1800	16
2,2 [1] [2]	**HB3 90 LA 2**	2880	7,3	4,4	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0023	1600	18
3 [2]	**HB3 100 LA 2**	2920	9,9	6,2	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0044	1500	24
4 [2]	**HB3 112 M 2**	2930	13,0	7,8	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0074	1400	33
5,5 [2]	**HB3 132 S 2**	2950	17,8	10,6	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0174	710	53
7,5 [2]	**HB3 132 SB 2**	2950	24,3	14,2	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0215	710	62
9,2 [2]	**HB3 132 SC 2**	2955	29,9	17,5	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0243	710	67
11 [2]	**HB3 132 MA 2**	2940	35,9	20,5	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0243	710	67

1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)

4 poles - 1500 min^{-1} 50Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,12 ... 22 kW
380V - 50Hz
China (CCC CEL)


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2	starts/h	
0,12 [1]	**HB3 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0003	12500	4,5
0,18 [1]	**HB3 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0004	12500	5,3
0,25 [1]	**HB3 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0011	10000	7,3
0,37 [1]	**HB3 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0013	10000	8,3
0,55 [1]	**HB3 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0023	8000	10,5
0,75 [1] [2]	**HB3 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,0018	6800	12
1,1 [1] [2]	**HB3 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0041	3150	18,5
1,5 [2]	**HB3 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0043	3000	19
1,85 [2]	**HB3 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0043	3000	19
2,2 [2]	**HB3 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,0076	3000	26
3 [2]	**HB3 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	2000	33
4 [2]	**HB3 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,014	1800	35
5,5 [2]	**HB3 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0357	900	58
7,5 [2]	**HB3 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0432	900	66
9,2 [2]	**HB3 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,0448	800	69
11 [2]	**HB3 160M 4**	1465	72	22	0,83	91,4	92,2	91,9	3,1	3,3	8,2	0,07	800	117
15 [2]	**HB3 160L 4**	1465	98	29	0,84	92,1	93,4	93,3	3,1	3,1	7,7	0,09	750	135
18,5 [2]	**HB3 180M 4**	1470	120	36	0,85	92,6	93,2	92,9	3,4	3,0	7,7	0,16	600	175
22 [2]	**HB3 180L 4**	1470	143	44	0,82	93,0	92,7	92,9	4,0	2,7	7,6	0,18	450	193

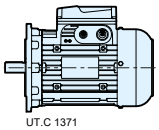
1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)

3.7

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,09 ... 15 kW
380V - 50Hz
China (CCC CEL)


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2	starts/h	
0,09 [1] *	**HB 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0004	13200	4,1
0,12 [1]	**HB3 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0005	12500	5,1
0,18 [1]	**HB3 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0012	12500	6,8
0,25 [1]	**HB3 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	11200	8,2
0,37 [1]	**HB3 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0019	9500	11,1
0,55 [1]	**HB3 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0056	6000	15,5
0,75 [1] [2]	**HB3 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0056	6000	15,5
1,1 [2]	**HB3 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	5600	19,5
1,5 [2]	**HB3 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,013	3000	26
2,2 [2]	**HB3 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,0202	2800	33
3 [2]	**HB3 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0435	1400	54
4 [2]	**HB3 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,0589	1250	66
5,5 [2]	**HB3 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,06	1100	67
7,5 [2]	**HB3 160M 6**	965	74	16	0,81	89,1	89,8	89,8	2,8	3,3	7,1	0,11	1000	117
11 [2]	**HB3 160L 6**	965	109	22	0,82	90,3	90,2	89,0	2,7	3,3	7,0	0,14	850	137
15 [2]	**HB3 180L 6**	970	148	30	0,82	91,2	91,8	91,8	2,8	3,6	7,9	0,23	560	191

1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)
* Power 0.09 kW not rated in efficiency according to IEC 60034-30-1.

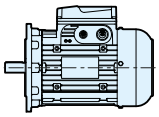
This page is intentionally left blank.

3.8

Technical data 230/460V 60Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,16 ... 0,75 hp
230/460V - 60Hz [2)]
USA
NEMA MG1-12


UT.C 1371

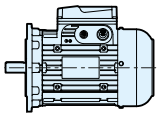
P_N 1)		Motor			n_N 1)	M_N	I_N		PF 1)	NEMA Nom, Eff, MG 1-12	NEMA Code	M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
hp	kW				RPM	N m	A 230 V	A 460 V	%	%					kg m^2	starts/h	
0,16	0,12	**HB2**	**63 A**	**4**	1690	0,68	0,84	0,42	58	64	J	3,1	3,1	3,6	0,0002	10000	3,9
0,25	0,18	**HB2**	**63 B**	**4**	1680	1,02	1,18	0,59	60	69	J	3,3	3,1	3,8	0,0003	10000	4,5
0,33	0,25 *	**HB2**	**63 C**	**4**	1690	1,42	1,5	0,75	59	72,3	J	3,5	3,5	4,2	0,0004	8000	5,2
0,33	0,25	**HB2**	**71 A**	**4**	1720	1,39	1,4	0,7	65	70,9	K	2,8	3,3	4,8	0,0007	8000	5,7
0,5	0,37	**HB2**	**71 B**	**4**	1720	2,06	1,9	0,95	65	76	K	3,1	3,8	5,3	0,0009	8000	6,6
0,75	0,55 *	**HB2**	**71 C**	**4**	1720	3,06	2,6	1,3	66	78,8	K	4	4,1	6,3	0,0013	6300	8,3
0,75	0,55	**HB2**	**80 A**	**4**	1740	3,0	2,4	1,2	74	78,4	L	3,3	3,7	7,2	0,0021	6300	9,1

1) The nameplate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States according to ANSI C84.1 there is a differentiation between the rated line voltage and the nameplate voltage of the motor
Rated line voltage: 120V, 208V, 240V, 480V, 600V.
Motor nameplate voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended that motors should not be requested by specifying nominal line voltages.
* Power or motor power-to-size correspondence not according to standard.

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

Premium Efficiency (IE3)
***P*N 0,16 ... 12,3 hp**
230/460V - 60Hz [2)]
USA (EISA)
ENERGY c UL us CC131B

In accordance with US DOE 10 CFR 431
and CSA C390 EISA ACT


UT.C 1371

P_N 1)		Motor	n_N 1)	M_N	I_N		PF 1)	NEMA Nom, Eff, MG 1-12	NEMA Code	M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
hp	kW		RPM	N m	A 230 V	A 460 V	%	%					kg m^2	starts/h	
0,16	0,12 *	**HB3 63 A 4**	1685	0,68	0,66	0,33	67	68,2	H	2,9	2,9	4,1	0,0003	12500	4,5
0,25	0,18 *	**HB3 63 B 4**	1700	1,01	1,02	0,51	62	71,8	J	3,7	3,6	4,4	0,0004	12500	5,3
0,33	0,25 *	**HB3 71 A 4**	1730	1,38	1,26	0,63	67	74,2	L	3,7	3,7	6,2	0,0011	10000	7,3
0,5	0,37 *	**HB3 71 B 4**	1725	2,05	1,77	0,89	67	78,2	K	4,2	3,8	6,3	0,0013	10000	8,3
0,75	0,55 *	**HB3 80 A 4**	1735	3,0	2,85	1,43	59	82,0	K	4,0	4,0	5,8	0,0023	8000	10,5
1	0,75 **	**HB3 90 S 4**	1735	4,1	2,86	1,43	77	85,5	K	3,4	4,3	7,2	0,0032	3150	15,5
1,5	1,1 **	**HB3 90 L 4**	1740	6,0	4,3	2,13	75	86,5	K	3,4	4,1	7,9	0,0043	2500	18,5
2	1,5	**HB3 90 LB 4**	1740	8,2	5,8	2,9	75	86,5	L	3,4	4,4	7,9	0,0043	2500	18,5
3	2,2 **	**HB3 112 MA 4**	1760	12	8,1	4,1	76	89,5	M	7,4	5,1	9,6	0,012	2000	31
4	3 **	**HB3 112 M 4**	1755	16	11	5,3	79	89,5	M	3,5	5,4	8,9	0,013	1600	33
5,4	4	**HB3 112 MB 4**	1755	22	16	7,8	72	89,5	N	4,0	5,5	10,3	0,014	1400	35
7,5	5,5 **	**HB3 132 M 4**	1765	30	19	9,5	80	91,7	L	4,1	4,4	9,7	0,0357	710	58
10	7,5	**HB3 132 MB 4**	1765	41	26	13	80	91,7	L	3,7	4,4	9,1	0,0448	710	69
12,3	9,2	**HB3 132 MC 4**	1765	50	34	17	75	91,7	M	4,3	4,4	8,7	0,0448	710	69

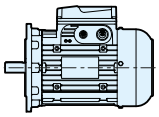
1) The nameplate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States according to ANSI C84.1 there is a differentiation between the rated line voltage and the nameplate voltage of the motor
Rated line voltage: 120V, 208V, 240V, 480V, 600V.
Motor nameplate voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended that motors should not be requested by specifying nominal line voltages.
* Power ratings of 0.16 to 0.75 hp are not covered by EISA regulations, so they carry the UL logo without “Energy” on the nameplate.
** Power or motor power-to-size correspondence not according to standard.

3.8

Technical data 230/460V 60Hz

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,16 ... 0,75 hp
230/460V - 60Hz [2)]
USA
NEMA MG1-12
c UL us


UT.C 1371

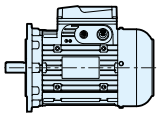
P_N 1)		Motor			n_N 1)	M_N	I_N		PF 1)	NEMA Nom, Eff, MG 1-12	NEMA Code	M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
hp	kW				RPM	N m	A 230 V	A 460 V	%	%					kg m^2	starts/h	
0,16	0,12	**HB2**	**63 B**	**6**	1120	1,02	1,04	0,52	53	55,8	J	3,1	3,2	2,9	0,0005	10000	4,5
0,20	0,15 *	**HB2**	**63 C**	**6**	1100	1,30	1,2	0,6	56	58	J	3,1	3,2	3	0,0005	9500	5,1
0,25	0,18	**HB2**	**71 A**	**6**	1120	1,53	1,22	0,61	60	62,6	H	3	3,1	3,6	0,0009	10000	6
0,33	0,25	**HB2**	**71 B**	**6**	1120	2,10	1,62	0,81	60	64,9	J	3,1	3,1	3,9	0,0012	9000	6,8
0,5	0,37 *	**HB2**	**71 C**	**6**	1120	3,16	2,2	1,1	63	70,9	J	3,2	3,3	4,5	0,0017	8000	8,2
0,5	0,37	**HB2**	**80 A**	**6**	1130	3,12	2,2	1,1	61	68,4	J	3,3	3,5	4,3	0,0019	7500	8
0,75	0,55	**HB2**	**80 B**	**6**	1140	4,60	3	1,5	62	75,7	K	3,6	3,7	5,3	0,0032	7100	11

1) The nameplate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States according to ANSI C84.1 there is a differentiation between the rated line voltage and the nameplate voltage of the motor
Rated line voltage: 120V, 208V, 240V, 480V, 600V.
Motor nameplate voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended that motors should not be requested by specifying nominal line voltages.
* Power or motor power-to-size correspondence not according to standard.

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

Premium Efficiency (IE3)
P_N 0,12 ... 5,4 hp
230/460V - 60Hz [2)]
USA (EISA)
ENERGY c UL us CC131B

In accordance with US DOE 10 CFR 431
and CSA C390 EISA ACT


UT.C 1371

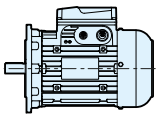
P_N 1)		Motor	n_N 1)	M_N	I_N		PF 1)	NEMA Nom, Eff, MG 1-12	NEMA Code	M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
hp	kW		RPM	N m	A 230 V	A 460 V	%	%					kg m^2	starts/h	
0,12	0,09 *	**HB 63 A 6**	1120	0,77	0,83	0,41	52	52,5	J	2,9	3,0	2,7	0,0004	10600	4,1
0,16	0,12 *	**HB3 63 B 6**	1080	1,06	0,75	0,37	63	64,0	H	2,6	2,6	2,7	0,0005	12500	5,1
0,25	0,18 *	**HB3 71 A 6**	1120	1,53	1,00	0,50	66	68,7	H	3,0	3,0	4,2	0,0012	12500	6,8
0,33	0,25 *	**HB3 71 B 6**	1130	2,11	1,40	0,70	63	71,4	J	3,3	3,4	4,3	0,0017	11200	8,2
0,5	0,37 *	**HB3 80 A 6**	1140	3,10	1,81	0,91	68	75,3	J	4,1	3,3	5,1	0,0019	9500	11,1
0,75	0,55 *	**HB3 90 SA 6**	1155	4,5	2,52	1,26	67	81,7	K	3,2	3,8	6,0	0,0056	6000	15,5
1	0,75 **	**HB3 100 LA 6**	1165	6,1	3,2	1,61	71	82,5	M	3,0	4,5	7,7	0,0130	3200	26
1,5	1,1 **	**HB3 112 M 6**	1160	9,1	4,3	2,16	73	87,5	J	2,5	3,4	6,3	0,0215	2500	34
2	1,5 **	**HB3 112 MB 6**	1160	12	6,1	3,0	70	88,5	K	3,0	3,9	6,9	0,0215	2000	34
3	2,2 **	**HB3 132 S 6**	1170	18	8,6	4,3	72	89,5	K	2,7	3,6	7,3	0,0358	1400	47
4	3 **	**HB3 132 M 6**	1775	24	12	5,8	72	89,5	K	2,8	3,8	7,6	0,0461	1000	56
5,4	4	**HB3 132 MB 6**	1775	33	16	7,9	71	89,5	L	3,4	4,3	8,2	0,06	800	67

1) The nameplate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States according to ANSI C84.1 there is a differentiation between the rated line voltage and the nameplate voltage of the motor
Rated line voltage: 120V, 208V, 240V, 480V, 600V.
Motor nameplate voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended that motors should not be requested by specifying nominal line voltages.
* Power ratings of 0,12 to 0,75 hp are suitable for the U.S. market and are not covered by the EISA regulation, so they do not carry the UL Energy logo on the nameplate.
** Power or motor power-to-size correspondence not according to standard.

3.9

Technical data 440V 60Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**


UT.C 1371

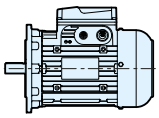
Premium Efficiency (IE3)
***P*N 0,12 ... 15 kW**
440V - 60Hz
Mexico (NOM)

NOM

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 440 V		100%	75%	50%				kg m^2	starts/h	
0,12 *	**HB3 63 A 4**	1675	0,68	0,34	0,70	66,0	66,0	59,6	2,7	2,7	3,9	0,0003	12500	4,5
0,18 *	**HB3 63 B 4**	1690	1,02	0,52	0,65	69,5	70,3	63,5	3,4	3,2	4,3	0,0004	12500	5,3
0,25 *	**HB3 71 A 4**	1720	1,39	0,64	0,70	73,4	72,9	67,9	3,4	3,3	5,9	0,0008	10000	7,3
0,37 *	**HB3 71 B 4**	1715	2,06	0,87	0,71	78,2	74,1	69,3	3,6	3,3	5,8	0,001	10000	8,3
0,55 *	**HB3 80 A 4**	1725	3,0	1,41	0,63	81,1	81,6	78,7	3,5	3,5	5,8	0,0023	8000	10,5
0,75	**HB3 90 S 4**	1735	4,1	1,54	0,77	83,5	83,5	80,4	3,4	4,3	7,2	0,0032	3150	15,5
1,1	**HB3 90 L 4**	1740	6,0	2,22	0,75	86,5	87,4	85,8	3,4	4,1	7,7	0,0043	2500	18,5
1,5	**HB3 90 LB 4**	1740	8,2	3,1	0,74	86,5	86,3	84,7	3,4	4,4	7,9	0,0043	2500	18,5
2,2	**HB3 112 MA 4**	1755	12	4,1	0,79	89,5	90,6	88,9	6,1	4,5	8,8	0,012	2000	31
3	**HB3 112 M 4**	1755	16	5,6	0,79	89,5	90,6	89,6	4,1	5,4	9,4	0,013	1600	33
4	**HB3 112 MB 4**	1755	22	8,1	0,72	89,5	91,0	89,5	4,0	5,5	10,3	0,014	1400	35
5,5	**HB3 132 M 4**	1765	30	10	0,80	91,7	92,7	91,7	4,1	4,4	9,7	0,0357	710	58
7,5	**HB3 132 MB 4**	1760	41	13	0,80	91,7	92,6	92,2	3,7	4,4	9,1	0,0448	710	69
9,2	**HB3 132 MC 4**	1765	50	18	0,75	91,7	92,0	90,9	4,3	4,4	8,7	0,0448	710	69
11	**HB3 160 M 4**	1775	59	20	0,81	92,4	92,8	91,8	4,3	3,7	9,3	0,07	640	117
15	**HB3 160 L 4**	1775	81	26	0,82	93,0	93,1	92,2	3,7	3,6	9,3	0,09	600	135

*) Power ratings from 0,12 to 0,55 kW are suitable for the Mexican market and are not covered by NOM-016 ENER 2016, so they do not carry the NOM logo on the nameplate.

6 poles - 1200 min^{-1}
S1
IP 55
IC411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**


UT.C 1371

Premium Efficiency (IE3)
P_N 0,09 ... 11 kW
440V - 60Hz
Mexico (NOM)

NOM

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 440 V		100%	75%	50%				kg m^2	starts/h	
0,09 [1] *	**HB 63 A 6**	1120	0,77	0,41	0,52	52,5	44,3	39,4	2,9	3,0	2,7	0,0004	10600	4,1
0,12 *	**HB3 63 B 6**	1065	1,08	0,37	0,66	64,0	55,4	49,2	2,3	2,3	2,7	0,0005	12500	5,1
0,18 *	**HB3 71 A 6**	1115	1,54	0,51	0,69	67,5	65,9	58,9	2,7	2,7	3,9	0,0012	12500	6,8
0,25 *	**HB3 71 B 6**	1120	2,13	0,70	0,66	71,4	65,9	59,5	2,7	2,8	4,0	0,0017	11200	8,2
0,37 *	**HB3 80 A 6**	1135	3,1	0,91	0,71	75,3	72,6	66,3	4,0	2,9	4,8	0,0019	9500	11,1
0,55 *	**HB3 90 SA 6**	1150	4,6	1,26	0,70	81,7	78,9	75,4	2,9	3,4	5,7	0,0056	6000	15,5
0,75	**HB3 100 LA 6**	1160	6,2	1,62	0,74	82,5	83,7	81,4	2,8	4,1	7,3	0,013	3200	26
1,1	**HB3 112 M 6**	1155	9,1	2,20	0,75	87,5	88,3	86,9	2,5	3,1	6,3	0,0215	2500	34
1,5	**HB3 112 MB 6**	1160	12	3,2	0,70	88,5	88,2	86,2	3,0	3,9	6,9	0,0215	2000	34
2,2	**HB3 132 S 6**	1170	18	4,5	0,72	89,5	88,6	86,6	2,7	3,6	7,3	0,0358	1400	47
3	**HB3 132 M 6**	1175	24	6,1	0,72	89,5	90,3	88,9	2,8	3,8	7,6	0,0461	1000	56
4	**HB3 132 MB 6**	1170	33	8,0	0,73	89,5	90,5	88,9	3,0	3,9	7,6	0,06	800	67
5,5	**HB3 160 MA 6**	1170	45	11	0,70	91,0	90,8	90,3	3,0	4,2	8,3	0,11	800	117
7,5	**HB3 160 M 6**	1170	61	14	0,78	91,0	90,7	89,3	3,1	4,0	8,3	0,11	800	117
11	**HB3 160 L 6**	1170	90	20	0,80	91,7	91,4	90,4	3,0	3,9	8,3	0,14	680	137

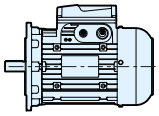
*) Power ratings from 0,12 to 0,55 kW are suitable for the Mexican market and are not covered by NOM-016 ENER 2016, so they do not carry the NOM logo on the nameplate.
1) Power 0,09 kW not rated in efficiency according to IEC 60034-30-1

3.10

Technical data
220/380V 60Hz
440V 60 Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

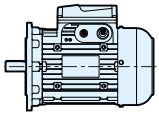
IR3 (IE3)
***P*N 0,75 ... 22 kW**
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)


UT.C 1371

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2	starts/h	
220/380 V 60 Hz	0,75	HB3 80 B 4	1740	4,1	3,8/2,20	0,62	83,5	83,1	80,1	4,1	3,9	6,5	0,0018	6800	12,0
	1,1	HB3 90 S 4	1735	6,1	4,3/2,48	0,78	86,5	85,7	83,7	3,7	3,7	7,1	0,0041	3150	18,5
	1,5	HB3 90 L 4	1740	8,2	6,4/3,7	0,71	86,5	86,4	84,1	4,1	4,4	6,9	0,0043	3000	18,5
	2,2	HB3 100 LA 4	1755	12	8,9 /5,2	0,72	89,5	86,6	83,6	4,4	5,0	9,7	0,0076	3000	26
	3 *	HB3 112 MA 4	1760	16	12/6,7	0,76	89,5	89,6	87,0	5,2	5,2	10,3	0,0130	1600	33
	4	HB3 112 M 4	1765	22	17/9,8	0,69	89,5	89,6	86,8	6,8	6,0	10,3	0,0140	1400	35
	5,5	HB3 132 S 4	1775	30	22/13	0,70	91,7	90,8	87,1	4,9	5,3	9,8	0,0357	710	58
	7,5	HB3 132 M 4	1765	41	28/16	0,77	91,7	91,0	88,8	7,0	5,1	11,9	0,0432	710	66
	9,2 *	HB3 132 MB 4	1765	50	35/20	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,0448	710	69
	11	HB3 160 M 4	1775	59	40/23	0,78	92,4	92,6	91,7	4,7	4,4	10,7	0,07	800	117
	15	HB3 160 L 4	1775	81	52/30	0,81	93,0	93,4	92,3	4,3	4,2	10,0	0,09	750	135
	18,5	HB3 180 M 4	1780	99	64/37	0,81	93,6	93,3	92,2	4,4	4,0	10,2	0,16	600	175
	22	HB3 180 L 4	1780	118	75/43	0,82	93,6	93,4	92,6	4,9	3,8	9,4	0,18	450	193
440 V 60 Hz	0,75	HB3 80 B 4	1725	4,2	1,71	0,69	83,5	83,6	81,5	3,5	3,2	6,0	0,0018	6800	12
	1,1	HB3 90 S 4	1730	6,1	2,07	0,81	86,5	82,7	80,0	3,2	3,3	6,5	0,0041	3150	18,5
	1,5	HB3 90 L 4	1725	8,3	2,92	0,78	86,5	87,0	85,9	3,5	3,3	6,6	0,0043	3000	18,5
	2,2	HB3 100 LA 4	1745	12	4,1	0,79	89,5	87,3	84,8	3,6	4,1	8,7	0,0076	3000	26
	3 *	HB3 112 MA 4	1750	16	5,4	0,81	89,5	89,9	88,3	4,2	4,3	9,1	0,0130	1600	33
	4	HB3 112 M 4	1755	22	7,6	0,77	89,5	90,6	88,4	5,6	5,0	9,7	0,0140	1400	35
	5,5	HB3 132 S 4	1770	30	10	0,77	91,7	91,4	88,3	4,1	4,6	9,1	0,0357	710	58
	7,5	HB3 132 M 4	1760	41	13	0,80	91,7	91,1	89,4	6,5	4,4	11,3	0,0432	710	66
	9,2 *	HB3 132 MB 4	1760	50	17	0,78	92,4	91,5	91,9	4,7	4,5	9,4	0,0448	710	69
	11	HB3 160 M 4	1775	59	20	0,81	92,4	92,9	92,0	4,3	3,7	9,3	0,07	800	117
	15	HB3 160 L 4	1770	81	25	0,83	93,0	93,3	92,9	3,7	3,6	9,3	0,09	750	135
	18,5	HB3 180 M 4	1775	100	31	0,83	93,6	93,4	92,7	4,4	3,8	10,1	0,16	600	175
	22	HB3 180 L 4	1775	118	38	0,82	93,6	93,6	93,1	4,3	3,3	8,6	0,18	450	193

* Power or motor power-to-size correspondence not according to standard.

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**


UT.C 1371

IR3 (IE3)
P_N 0,75 ... 15 kW
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2	starts/h	
220/380 V 60 Hz	0,75 *	HB3 100 LA 6	1160	6,2	3,2/1,87	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,013	3200	26
	1,1 *	HB3 112 M 6	1160	9,1	4,5/2,6	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	2500	34
	1,5 *	HB3 112 MB 6	1160	12	6,4/3,7	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	2000	34
	2,2 *	HB3 132 S 6	1170	18	9,0/5,2	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	1400	47
	3 *	HB3 132 M 6	1170	24	12/7,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	1000	56
	4	HB3 132 MB 6	1175	33	17/9,6	0,71	89,5	90,3	88,4	3,4	4,3	8,2	0,06	800	67
	5,5	HB3 160 MA 6	1180	45	21/123	075	910	895	877	36	47	95	011	800	117
	7,5	HB3 160 M 6	1170	61	28/16,2	0,78	91,0	90,3	88,9	3,4	4,3	8,8	0,11	800	117
	11	HB3 160 L 6	1175	89	42/24,5	0,75	91,7	91,4	89,8	4,1	5,1	10,1	0,14	680	137
	15	HB3 180 L 6	1180	121	56/32,4	0,77	91,7	92,7	91,8	3,1	4,9	9,4	0,23	440	191
440 V 60 Hz	0,75 *	HB3 100 LA 6	1160	6,2	1,61	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,0130	3200	26
	1,1 *	HB3 112 M 6	1160	9,1	2,26	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	2500	34
	1,5 *	HB3 112 MB 6	1160	12	3,2	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	2000	34
	2,2 *	HB3 132 S 6	1170	18	4,5	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	1400	47
	3 *	HB3 132 M 6	1170	24	6,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	1000	56
	4	HB3 132 MB 6	1170	33	8,0	0,73	89,5	90,5	88,9	3,0	3,9	7,6	0,0600	800	67
	5,5	HB3 160 MA 6	1180	45	11,8	0,67	91,0	90,8	88,5	5,3	6,2	11,3	0,1100	800	117
	7,5	HB3 160 M 6	1175	61	14,2	0,76	91,0	90,7	89,1	3,6	4,4	9,0	0,11	800	117
	11	HB3 160 L 6	1170	90	19,7	0,80	91,7	91,4	90,4	3,0	3,9	8,3	0,14	680	137
	15	HB3 180 L 6	1175	122	26,9	0,80	91,7	92,7	91,4	3,0	4,2	9,0	0,23	440	191

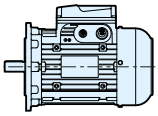
* Power or motor power-to-size correspondence not according to standard.

3.11

Technical data 400V 50Hz

2 poles - 3000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 15 kW
230/400V - 50Hz

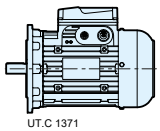

UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
0,75 *	**HB 71 C 2**	2830	2,53	1,85	0,79	73,8	72,9	68,7	3,5	3,7	5,7	0,00049	3000	7,3
0,75	**HB 80 A 2**	2850	2,51	1,85	0,75	78,3	77,7	74,3	3,6	3,8	6,1	0,00079	3000	7,8
1,1	**HB 80 B 2**	2840	3,7	2,6	0,77	79,5	80,1	78,3	3,6	3,8	6,1	0,00094	3000	8,6
1,5 *	**HB 80 C 2**	2890	4,96	3,5	0,76	81,2	81,4	78,9	4	4,4	7,4	0,00124	2500	10,6
1,85 *	**HB 80 D 2**	2820	6,3	4,2	0,8	79,8	81,2	80,1	3,7	3,8	6,2	0,00134	2500	11,1
1,5	**HB 90 S 2**	2840	5	3,4	0,81	78,5	78,9	77,0	3	3,2	5,7	0,00144	2500	13,1
1,85 *	**HB 90 SB 2**	2860	6,2	4,2	0,8	79,3	79,6	77,1	3,2	4	6,1	0,00164	2500	14,6
2,2	**HB 90 LA 2**	2880	7,3	4,9	0,8	81,0	80,7	78	3,8	4,5	7	0,00137	2500	17
3 * □	**HB 90 LB 2**	2870	10	6,6	0,8	82,0	82,2	80,1	3,7	4,1	6,8	0,00245	1800	19
3	**HB 100 LA 2**	2860	10	6,8	0,78	81,5	82,0	80,1	3,6	3,8	6	0,00315	1800	20
4 *	**HB 100 LB 2**	2860	13,4	8,8	0,79	83,1	82,5	80,0	3,8	4,4	7	0,00425	1500	24
4	**HB 112 M 2**	2880	13,3	8,8	0,79	83,3	83,6	82,0	3	3,8	6,2	0,00505	1500	27
5,5 * □	**HB 112 MB 2**	2890	18,2	11,6	0,81	84,7	84,9	83,2	3,3	3,7	7,2	0,00685	1400	31
7,5 * □	**HB 112 MC 2**	2870	25	16,5	0,79	83,0	84,4	83,7	3	3,7	6,4	0,00762	1060	33
5,5	**HB 132 S 2**	2900	18,1	11,3	0,83	84,7	84,3	82,1	2,6	3,4	6,3	0,01017	1250	43
7,5	**HB 132 SB 2**	2910	24,6	14,3	0,87	86,9	87,2	85,5	2,9	3,7	7,2	0,01357	1120	46
9,2 *	**HB 132 SC 2**	2910	30,2	18,7	0,82	87,0	87,3	85,67	3	3,8	7,7	0,01577	1060	48
11 *	**HB 132 MA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,01917	850	55
15 * □	**HB 132 MB 2**	2920	49,1	30,0	0,85	88,7	86,2	84,0	3,7	4,1	8,3	0,02477	710	66
11	**HB 160 SA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,01917	850	64
15 □	**HB 160 SB 2**	2920	49,1	30,0	0,83	88,7	86,2	84,0	3,9	4,3	8,3	0,02477	710	75

Power rating and nameplate data refer to intermittent service S3 70%, ambient temperature 65 °C.
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

4 poles - 1500 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 11 kW
230/400V - 50Hz


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
0,75 *	**HB 71 D 4**	1370	5,2	2,15	0,70	72,1	73,3	69,1	2,8	2,9	4	0,00129	7100	8,3
0,75	**HB 80 B 4**	1410	5,1	1,9	0,77	74,7	74,2	70,5	2,8	3,0	5,2	0,00234	7100	9,1
1,1 *	**HB 80 C 4**	1400	7,5	2,8	0,79	75,0	75,6	72	2,9	3,0	5,2	0,00314	5000	11,1
1,1	**HB 90 S 4**	1410	7,4	3,0	0,70	75,2	74,7	70	2,6	2,9	4,4	0,00234	5000	13,1
1,5	**HB 90 L 4**	1410	10,2	3,9	0,71	77,2	79	74,5	3,2	3,6	5,2	0,00335	4000	16
1,85 *	**HB 90 LB 4**	1400	12,6	4,5	0,76	78,6	80	77,1	2,9	3,2	5,1	0,00365	4000	17
2,2 * □	**HB 90 LC 4**	1400	15,0	5,7	0,70	79,7	80,3	77,2	2,8	3,2	4,9	0,00415	3150	18,5
2,2	**HB 100 LA 4**	1420	14,8	5,1	0,78	80,0	80,8	79,2	2,7	3,2	5,1	0,00505	3150	20
3	**HB 100 LB 4**	1425	20,1	6,9	0,76	82,8	83,7	82,0	2,8	3,2	5,5	0,00685	3150	24
4	**HB 112 M 4**	1430	26,7	9,2	0,75	83,4	84,1	82,6	3,0	3,4	6	0,01082	2500	30
5,5 * □	**HB 112 MC 4**	1420	37,0	12,3	0,76	84,7	86,1	85,7	3,0	3,4	6,1	0,01302	1800	33
5,5	**HB 132 S 4**	1450	36,2	12,2	0,76	86,3	86,9	85,7	3,2	3,4	6,3	0,02347	1800	45
7,5	**HB 132 M 4**	1450	49,4	15,8	0,79	87,1	87,7	86,5	3,4	3,6	7	0,03197	1250	54
9,2 *	**HB 132 MB 4**	1450	61,0	19,5	0,77	88,0	89,4	87,6	3,5	3,8	7,2	0,03765	1060	60
11 * □	**HB 132 MC 4**	1450	72,0	23,0	0,78	87,8	88,2	87,0	3,5	3,8	7,3	0,04325	900	66
11 □	**HB 160 SC 4**	1450	72,0	23,0	0,78	87,8	88,2	87,0	3,5	3,8	7,3	0,04325	900	75

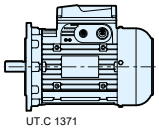
Power rating and nameplate data refer to intermittent service S3 70%, ambient temperature 65 °C.
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

3.11

Technical data 400V 50Hz

6 poles - 1000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 7.5 kW
230/400V - 50Hz


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
0,75 *	**HB 80 C 6**	920	7,8	2,3	0,67	70,1	69,7	64,5	2,5	2,7	3,8	0,00314	7100	11,1
0,75	**HB 90 S 6**	920	7,8	2,2	0,68	72,1	72	67,9	2,4	2,4	3,7	0,00404	7100	13,6
1,1	**HB 90 L 6**	915	11,5	3,2	0,68	72,9	72	69,3	2,6	2,8	3,9	0,00555	5300	17
1,5 * □	**HB 90 LC 6**	910	15,7	4,3	0,68	73,8	72,5	70,0	2,7	2,9	4,3	0,00655	5000	18,5
1,5	**HB 100 LA 6**	930	15,4	3,9	0,73	75,5	75,4	71,6	2,8	3	4,8	0,00955	3550	21
1,85 *	**HB 100 LB 6**	930	19	4,9	0,71	76,6	76,2	72,1	3	3,2	5	0,01175	3150	24
2,2	**HB 112 M 6**	940	22,3	5,4	0,75	78,7	79,7	78,1	2,1	2,5	6,5	0,01482	2800	27
3 * □	**HB 112 MC 6**	940	30,5	7,2	0,76	79,7	81,2	80,2	2,3	2,7	5,1	0,01882	2500	32
3	**HB 132 S 6**	960	29,8	7,8	0,68	82,1	82,3	80,2	2,3	3	6	0,02947	2360	42
4	**HB 132 M 6**	960	39,8	9,7	0,72	83,2	83,7	81,8	2,5	3	6,7	0,03837	1400	49
5,5	**HB 132 MB 6**	960	55,0	12,9	0,73	84,0	84,8	83,4	2,6	3	7	0,04865	1250	58
7,5 * □	**HB 132 MC 6**	950	75,0	17,6	0,73	84,7	85,0	83,8	2,4	2,8	5,7	0,05885	1000	66
7,5 □	**HB 160 SC 6**	950	75,0	17,6	0,73	84,7	85,0	83,8	2,4	2,8	5,7	0,05885	1000	75

Power rating and nameplate data refer to intermittent service S3 70%, ambient temperature 65 °C.
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

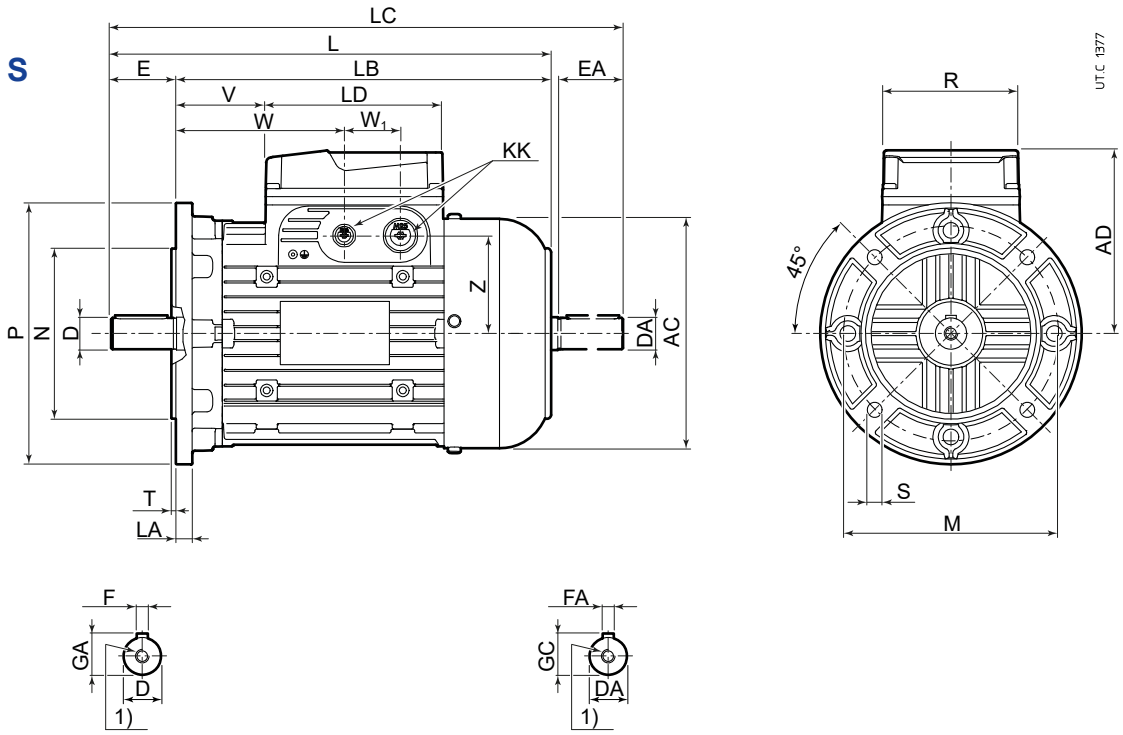
This page is intentionally left blank.

3.12

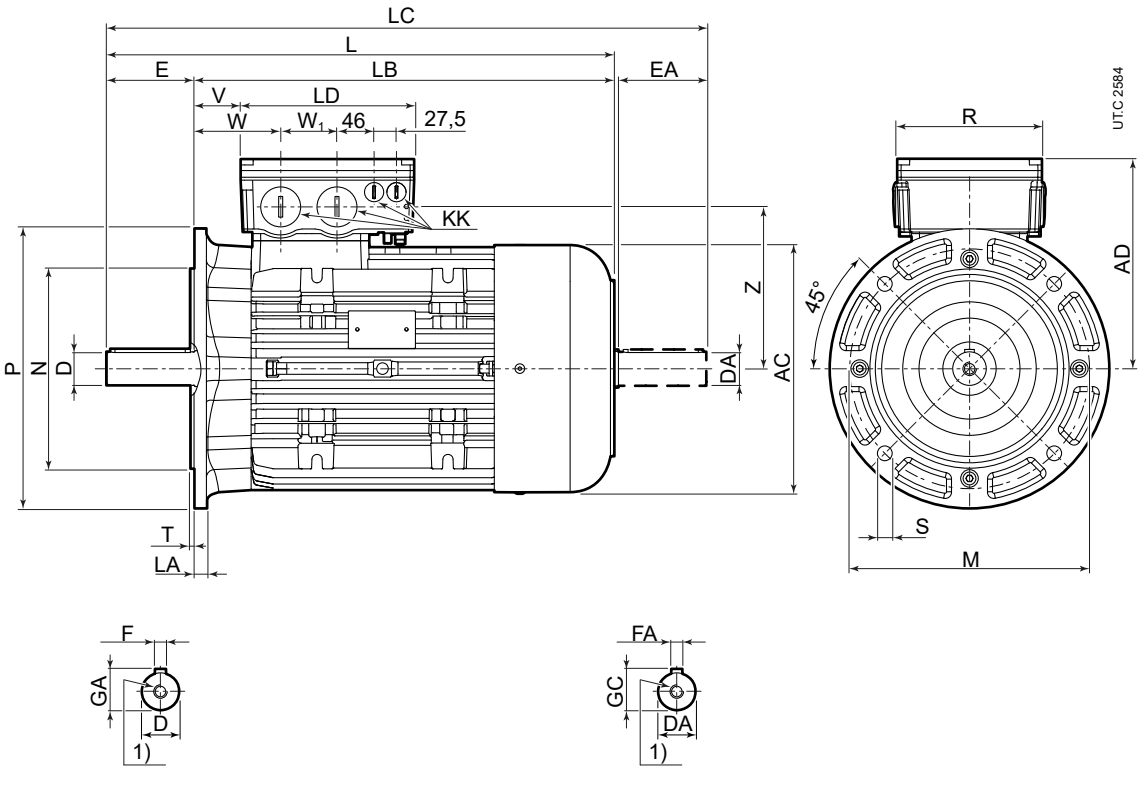
Motor dimensions

Mounting position
IM **B5**, IM **B5R**, IM **B5...**

63 ... 160 S



160 MA, M, L - 180



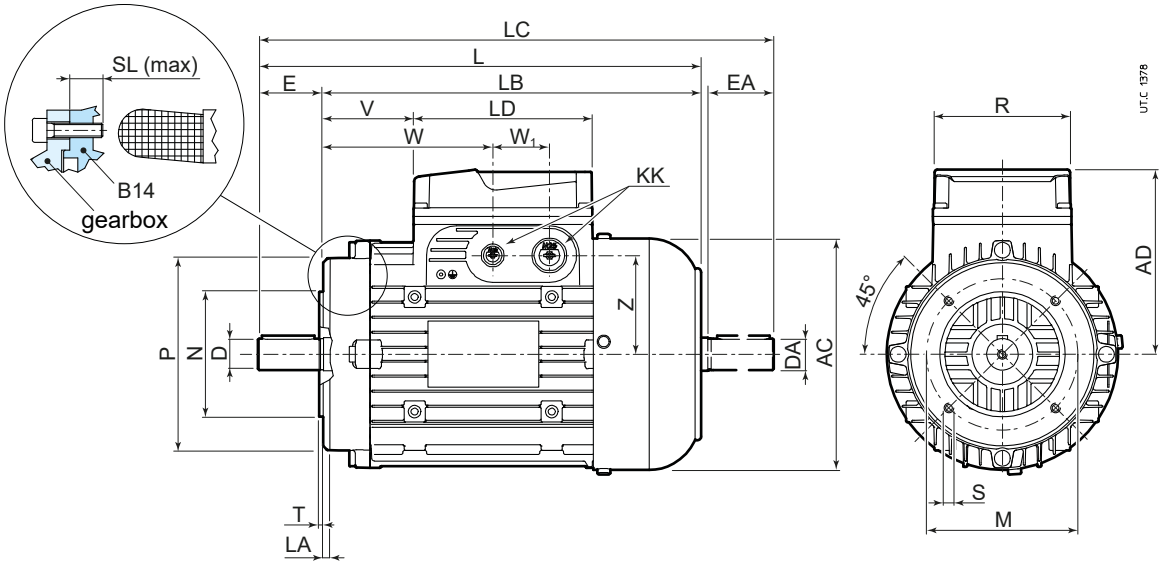
Mounting position
IM **B5**, IM **B5R**, IM **B5...**

Motor size		AC ∅	AD	L	LB	LC	LD	KK 2)	R	V	W	W_1	Z	Shaft end D DA ∅		1)	E EA	F FA h9	GA GC	Flange M ∅	N ∅	P ∅	LA	S ∅	T
63	**B5R**	123	95	226	206	251	103	4×M16	86	46	86	36	45	9	j6	M3	20	3	10,2	100	80 j6	120	8	7	3
	B5A			229		257								11	j6	M4	23	4	12,5						
	B5			212	189	240				29	69									115	95 j6	140	10	9	
	BX1													11[3]	j6	M4	23[3]		12,5	130	110 j6	160			3,5
71	**B5B**	138	112	258	235	287		2×M16 + 2×M20		66	106		62	11	j6	M4	23		12,5	100	80 j6	120	8	7	3
	B5R																			115	95 j6	140	10	9	
	B5A			265		301								14	j6	M5	30	5	16						
	B5			246	216	282				47	87									130	110 j6	160			3,5
	BX2			239		268								11[3]	j6	M4	23[3]	4	12,5						
	BX5			246		282								14[3]	j6	M5	30[3]	5	16						
	BX1																			165	130 j6	200	12	11	
80	**B5B**	156	121	284	254	321				80	120		71	14	j6	M5	30			115	95 j6	140	10	9	3
	B5R																			130	110 j6	160			3,5
	B5A			294		341								19	j6	M6	40	6	21,5						
	B5			273	233	320				59	99									165	130 j6	200	12	11	
	BX2			263		300								14[3]	j6	M5	30[3]	5	16						
90 SA, S[4]	**B5S**	176	141	308	278	345	136	2×M16 + 2×M25	106	60	120	43	75	14	j6	M5	30			130	110 j6	160	10	9	
	B5B			318		365																			
	B5R			297	257	344				39	99			19	j6	M6	40	6	21,5	165	130 j6	200	12	11	
	B5			307		364								24	j6	M8	50	8	27						
90 L	**B5S**			338	308	375				90	150			14	j6	M5	30	5	16	130	110 j6	160	10	9	
	B5B			348		395								19	j6	M6	40	6	21,5						
	B5R			327	287	374				69	129									165	130 j6	200	12	11	
	B5			337		394								24	j6	M8	50	8	27						
100	**B5C**	194	151	377	337	425				109	169		86	19	j6	M6	40	6	21,5	130	110 j6	160	10	9	
	B5S																			165	130 j6	200	12	11	
	B5R			387		445								24	j6	M8	50	8	27						
	B5A			397		465								28	j6	M10	60		31						
	B5			370	310	438				82	142									215	180 j6	250	14	14	4
112	**B5S**	218	163	402	362	451				126	186		98	19	j6	M6	40	6	21,5	165	130 j6	200	12	11	3,5
	B5R			412		471								24	j6	M8	50	8	27						
	B5A			422		491								28	j6	M10	60		31						
	B5			396	336	465				100	160									215	180 j6	250	14	14	4
132 S, M[5]	**B5S**	257	194	470	420	529	190	2×M16 + 2×M32	148	113	201	55	109	24	j6	M8	50		27	165	130 j6	200	12	11	3,5
	B5B			480		549								28	j6	M10	60								
	B5R																		31	215	180 j6	250	14	14	4
	B5A			500		589								38	k6	M12	80	10	41						
	B5			465	385	554				78	166									265	230 j6	300			
132 MA[7]**... MC**	**B5S**			530	480	589				173	261			24	j6	M8	50	8	27	165	130 j6	200	12	11	3,5
	B5B			540		609								28	j6	M10	60		31						
	B5R																			215	180 j6	250	14	14	4
	B5A			560		649								38	k6	M12	80	10	41						
	B5			525	445	614				138	226									265	230 j6	300			
160 S	**B5**			574	464	663				157	245			42	k6	M16[6]	110[6]	12[6]	45[6]	300	250 j6	350	15	18	5
160 MA, M, L	**B5**	310	262	635	525	751	218	2xM16 +	182	58	108	71	203	42	k6	M16	110	12	45	300	250 j6	350	15	18	5
	B5R			622	542	711				76	126			38	k6	M12	80	10	41	265	230 j6	300		14	4
180	**B5**	348	279	699	589	818		2xM40		60	110		219	48[8]	k6	M16[8]	110	14[8]	51,5[8]	300	250 j6	350		18	5

1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides from 63 to 160S (two openings on each side),
Prearranged for cable entry knockout openings on both sides from 160MA, M, L a 180 (with 4 plugs M40x1.5 + 4 plugs M16x1.5 mounted).
3) Shaft end not according to standard.
4) For motor **HB3 90S 2**, **HB3 90S 4**, **HB3 90S 6** dimensions are the ones as size 90L.
5) For motor **HB3 132SB 2**, **HB3 132SC 2**, **HB3 132 S 4**, **HB3 132M 4** and **HB3 132M 6** dimensions are the ones as sizes 132 MA ... MC.
6) The dimensions of second shaft end are the same as size 132.
7) For motor **HB 132MA 2** dimensions are the ones as size 132S.
8) The dimensions of second shaft end are the same as size 160 M-L.

Mounting position
IM **B14**, IM **B14R**

63 ... 132



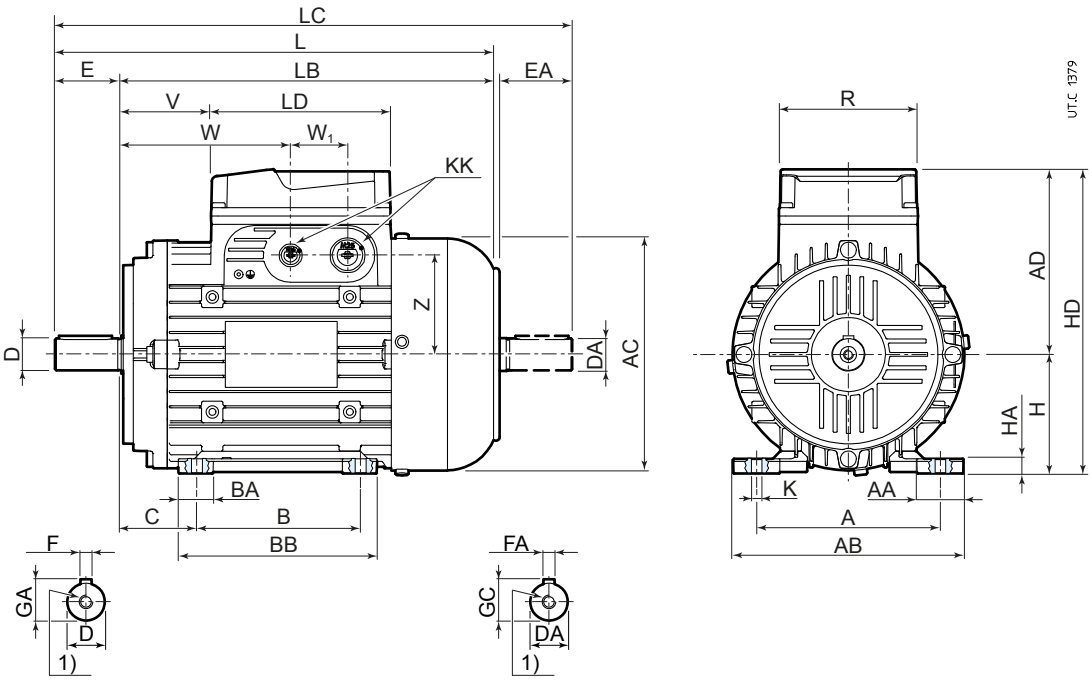
Mounting position
IM **B14**, IM **B14R**

Motor size		AC ∅	AD	L	LB	LC	LD	KK 2)	R	V	W	W_1	Z	Shaft end D DA ∅			E EA	F FA h9	GA GC	Flange M ∅	N ∅		P ∅	LA	S ∅	SL max	T
63	**B14**	123	95	212	189	240	103	4×M16	86	29	69	36	45	11	j6	M4	23	4	12,5	75	60	j6	90	8	M5	10	2,5
71	**B14R**	138	112	239	216	268		2×M16 + 2×M20		47	87		62													
	B14			246		282								14	j6	M5	30	5	16	85	70	j6	105	8	M6		2,5
80	**B14R**	156	121	263	233	300				59	99		71													
	B14			273		320								19	j6	M6	40	6	21,5	100	80	j6	120	8	M6		3
90 SA, S[8]	**B14**	176	141	307	257	364	136	2×M16 + 2×M25	106	39	99	43	75	24	j6	M8	50	8	27	115	95	j6	140	10	M8	12	3
90 L	**B14**			337	287	394				69	129																
100	**B14**	194	151	370	310	438				82	142		86	28	j6	M10	60	8	31	130	110	j6	160	10	M8	13	3,5
112	**B14**	218	163	396	336	465				100	160		98														
132 S, M[9]	**B14**	257	194	465	385	554	190	2×M16 + 2×M32	148	78	166	55	153	38	k6	M12	80	10	41	165	130	j6	200	8	M10	18	3,5
132 MA[10]**... MC**	**B14**			525	445	614				138	226																

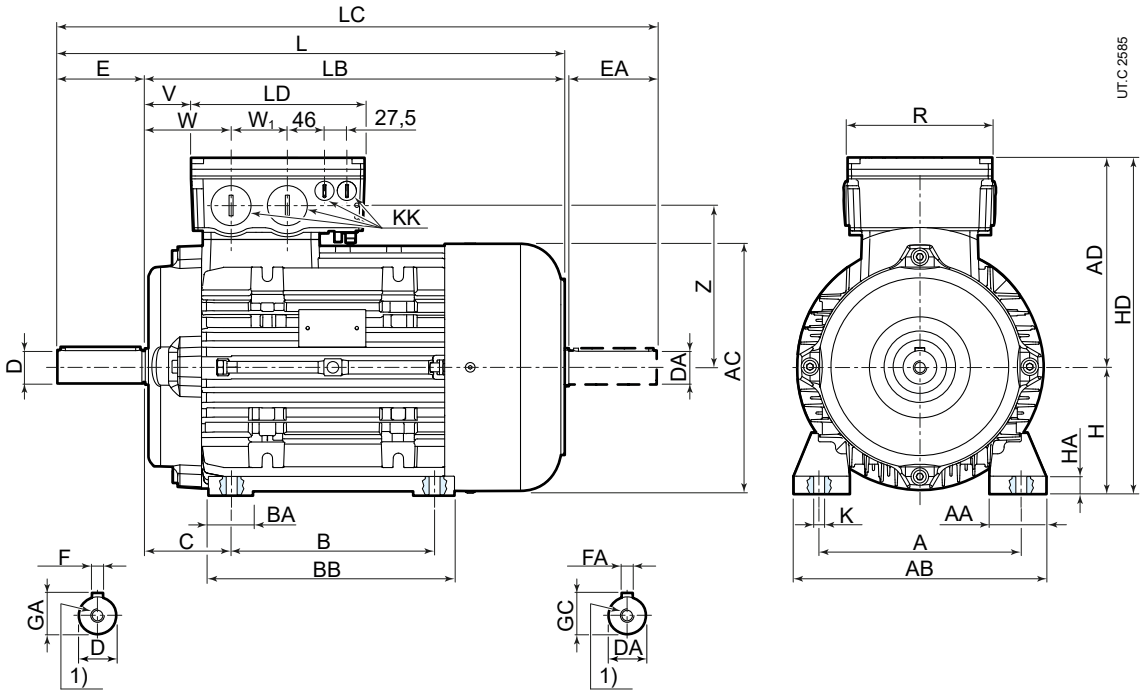
1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides (two openings on each side).
8) For motor **HB3 90S 2, HB3 90S 4** and **HB3 90S 6** dimensions are the ones as size 90L.
9) For motor **HB3 132SB 2**, **HB3 132SC 2**, **HB3 132 S 4**, **HB3 132M 4** and **HB3 132M 6** dimensions are the ones as sizes 132 MA ... MC.
10) For motor **HB 132MA 2** dimensions are the ones as size 132S.

Mounting position
IM **B3**

63 ... 160 S



160 MA, M, L - 180



Mounting position
IM **B3**

Motor size	AC ∅	AD	L	LB	LC	LD	KK 2)	R R_1	V	W	W_1	Z	Shaft end D DA ∅	1)	E EA	F FA h9	GA GC	Feet A	AB	B	C	BB	BA	AA	K	HA	H 7)	HD
63 B3	123	95	212	189	240	103	4×M16	86 –	29	69	36	45	11 j6 M4		23	4	12,5	100	120	80	40	100	21	27	7	9	63	158
71 B3	138	112	246	216	282		2×M16 + 2×M20		47	87		62	14 j6 M5		30	5	16	112	138	90	45	110	22	28		10	71	183
80 B3	156	121	273	233	320				59	99		71	19 j6 M6		40	6	21,5	125	152	100	50	125	26		9		80	201
90 SA, S 8) **B3**	176	141	307	257	364	136	2×M16 + 2×M20	106 –	39	99	43	75	24 j6 M8		50	8	27	140	174		56			35		11	90	230
90 L B3			337	287	394				69	129										125		150						
100 B3	194	151	370	310	438				82	142		86	28 j6 M10		60	8	31	160	196	140	63	185	40	37	12	12	100	251
112 B3	218	163	396	336	465				100	160		98						190	226		70			50		15	112	275
132 S, M 9) **B3**	257	194	465	385	554	190	2×M16 + 2×M32	148	78	166	55	109	38 k6 M12		80	10	41	216	257	140 3)	89	210	42	52	14	17	132	326
132 MA 10) **...MC B3**			525	445	614				138	226										178 3)							
160 S B3			574 4)	464	663 4)				157	245			42 k6 M16 4)		110 4)	12 4)	45 4)	254	294	210	108	246	45			20	160	354
160 MA, M, L B3	310	262	634	524	751	218	2×M16 + 2×M40	182	53	103	71	203	42 k6 M16		110	12	45	239	318	254	108	307	56	72	30	23	160	422
180 B3	348	279	699	589	816				56	106		219	48 k6 M16 5)			14 5)	51,5 5)	248	359	279	117	329	48	74	36	25	180	459

1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides from size 63 to 160S (two openings on each side), Prearranged for cable entry knockout openings on both sides from size 160MA, M, L to 180 (with 4 plugs M40x1.5 + 4 plugs M16x1.5 mounted).
3) The foot of 132S has a center distance of 178 mm and the one of 132MA ... MC has a center distance of 140 mm.
4) The dimensions of second shaft end are the ones of size 132.
5) The dimensions of second shaft end are the ones of size 160 M-L.
8) For motor **HB3 90S 2, HB3 90S 4** and **HB3 90S 6** dimensions as size 90L.
9) For motor **HB3 132SB 2**, **HB3 132SC 2**, **HB3 132 S 4**, **HB3 132M 4** and **HB3 132M 6** dimensions as size 132 MA ... MC.
10) For motor **HB 132MA 2** dimensions as size 132S.

3.13

Non−standard designs and accessories

Ref.	Description	Non-standard design code
(1)	Non−standard motor supply	−
(2)	Driving shaft axially fastened	,AX
(3)	Insulation class H	,H
(7)	Design for low temperatures (−30 °C)	,BT
(8)	Condensate drain holes	,CD
(9)	Additional winding impregnation	,SP
(13)	Anti−condensation heater	,S
(14)	Terminal box on one side for IM B3 and derivatives (90 ... 180)	,P...
(16)	Second shaft end	,AA
(17)	Axial independent cooling fan	,V ...
(18)	Axial independent cooling fan and encoder	,V ... ,E...
(19)	Thermistor type thermal probes (PTC)	,T15
(20)	Bi−metal type thermal probes	,B15
(21)	Drip−proof cover	,PP
(31)	Motor without fan for fans	,SV
(32)	Motor without fan by natural convection (63 ... 132)	,CN
(33)	Design for high temperatures	,AT
(35)	Light alloy fan	,VL
(36)	Encoder	,E1 ... ,E5
(42)	Motor certified to UL (63 ... 132)	,UL
(62)	Motor pre-arranged for encoder	,PE
(63)	Axial independent cooling fan and prearranged for encoder	,V...,PE
(64)	IP 66 protection	,IP 66
(99)	Paint cycles	See page 82

(1) Non-standard motor supply

The first two columns show the possible types of supply.
Supply of independent cooling fan is **co-ordinated** with motor winding voltage as stated in the table.

Directive / Certification	Motor wound and stated for		63 ... 160 S Motor type			160MA ... 180 Motor type
	V	Hz	HB	HB2	HB3	HB3
ErP EAC AU MEPS	Δ220 Y380	50	O	●	●	O
	Δ230 Y400	50	●	●	●	O
	Δ240 Y415	50	O	●	●	O
	Δ265 Y460	60	●	●	●	O
	Δ277 Y480	60	O	●	●	O
	Δ380	50	O	O	O	●
	Δ400	50	O	O	O	●
	Δ415	50	O	O	O	●
	Δ460	60	O	O	O	●
	Δ480	60	O	O	O	●
CCC, CEL	Δ220 Y380	50	-	-	●	O
	Δ380	50	-	-	O	●
EISA	YY230 Y460	60	-	-	●	-
NOM INMETRO	Δ255 Y440	60	-	-	●	O
	Δ440	60	O	O	O	●
INMETRO	Δ220 Y380	60	-	-	●	●
OTHERS	Δ290 Y500	50	O	O	O	O
	Δ330 Y575	60	O	O	O	O

● standard ○ on request — not foreseen

For different voltage values consult us.
Designation: following the instructions at ch. 3.2, state **voltage** and **frequency** (in the first table columns).

(2) Driving shaft axially fastened

Driving shaft axially fastened on rear endshield (sizes 63 ... 160S) or on flange (sizes 160-180) through circlip on endshield and on shaft.
This design is **necessary** in case of axial alternating stresses (e.g. helical pinion with **alternating load and/or run**, frequent on−load starts and/or with great inertiae) causing axial slidings on driving shaft and impacts on bearings.

Non-standard design code for the **designation**: **,AX**

(3) Insulation class H

Insulation materials in class H for running at high ambient temperature. Not available for version CCC and/or CEL.

Non-standard design code for the **designation**: **,H**

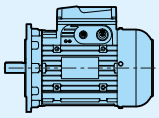
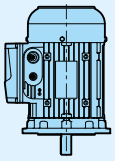
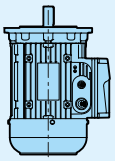
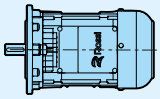
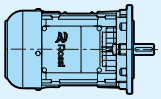
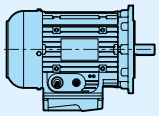
Design not available for directives CCC, CCC+CEL, CEL.

(7) Design for low temperatures (-30 °C)

Standard motors can operate at ambient temperature down to -15 °C.
For ambient temperature down to -30 °C: special bearings, light alloy fan (in addition cable glands and metal plugs if foreseen in the conditions of supply).
If there are dangers of condensate, it is advisable to require also the «Design for protection IP66» (64) and, if necessary the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13).
With designs (17), (18), (36) and (63) consult us.
Non-standard design code for the **designation: ,BT**

(8) Condensate drain holes

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature. In motor designation state in «MOUNTING POSITION» the designation of the real application mounting position, determining the hole position.
Motors are supplied with closed holes.
Non-standard design code for the **designation: ,CD**

Mounting position **IM**						
B3	IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
B5	IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071
B14	IM 3601	IM 3611	IM 3631	IM 3651	IM 3661	IM 3671
B3-B5	IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071
B3-B14	IM 2101	IM 2111	IM 2131	IM 2161	IM 2161	IM 2171
B3 ,AA	IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072
B5 ,AA	IM 3002	IM 3012	IM 3032	IM 3052	IM 3062	IM 3072
B14 ,AA	IM 3602	IM 3612	IM 3632	IM 3652	IM 3662	IM 3672

(9) Additional winding impregnation

It consists of a second impregnation cycle after stator windings assembly standard supplied with design (64).

Useful where it is necessary to have an additional protection (of the windings) against electrical stress (voltage peaks due to rapid commutations or to «low quality» inverters with high voltage gradients) or mechanical agents (mechanical or electromagnetic vibrations: e.g. from inverter). See also ch. 2.9 «Running with inverter», section «Voltage peaks (U_{max}), voltage gradients (dU/dt), cable length».

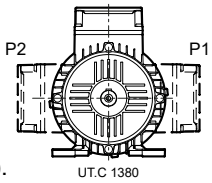
Non-standard design code for the **designation: ,SP**

(13) Anti-condensation heater

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature; single−phase supply 230 V a.c. ± 10% 50 or 60 Hz (other voltage on request); power absorbed:
15 W for sizes 63 and 71,
25 W for sizes 80 ... 100,
50 W for sizes 112 ... 160S,
80 W for sizes 160MA, M, L ... 180.
Heater must not be connected during the running.
Cables connected to fixed or loose terminal block inside terminal box.

Non-standard design code for the **designation**: **,S**

(14) Terminal box on one side for IM B3 and derivatives (sizes 90 ... 180)



Terminal box in position P1 or P2 as scheme on the left.
Non-standard design code for the **designation**: **,P...** (additional code **1** or **2** according to scheme beside).

(16) Second shaft end

For dimensions see ch. 3.12; radial loads are not permissible; not possible in case of designs (17), (18), (36), (62) and (63).

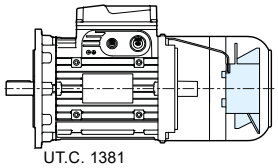
Non-standard design code for the **designation**: **,AA**

(17) Axial independent cooling fan

Cooling provided by axial independent cooling fan, **compact** type for sizes 63 ... 180, for variable speed drives (motor can absorb nominal current for all speed range, in continuous duty cycle and without overheating) with inverter and/or for heavy starting cycles (for z_0 increases consult us).

LB dimensions **increase** (see ch. 3.12) by **ΔLB** quantity as per following table.

63 ... 180



UT.C. 1381

Specifications of independent cooling fan:

- 2 poles compact motor;
- **IP 54** protection for sizes 63 ... 160S;
- **IP 66** protection for sizes 160MA, M, L ... 180;
- supply terminals on proper auxiliary terminal block in the motor terminal box for sizes 63 ... 160S;
- for sizes 160MA, M, L ... 180: supply terminals on proper auxiliary terminal block in the terminal box dedicated to the fan cover;
- other data according to following table.

Motor size wound and stated for			Independent cooling									
			Independent cooling fan name plate									
Motor size	V	Hz	V	Hz	W	A	kg	Code	Type	ΔLB		
63 … 80	Δ220 Y380	50	230	50/60	19/18	0,12/0,11	0,4	**,VA**	Single phase	78 (Size 63)	63 (Size 71)	65 (Size 80)
	Δ230 Y400	50										
	Δ240 Y415	50										
	Δ290 Y500	50										
	Δ380	50										
	Δ400	50										
	Δ415	50										
	Δ220 Y380	60										
	Δ255 Y440	60										
	Δ265 Y460	60										
	Δ277 Y480	60										
	YY230 Y460	60										
	Δ380	60										
	Δ440	60										
	Δ460	60										
	Δ480	60										
	Δ480	60										
90	Δ220 Y380	50	230	50/60	45/39	0,31/0,25	0,9	**,VA**	Single phase	82		
	Δ230 Y400	50										
	Δ240 Y415	50										
	Δ290 Y500	50										
	Δ380	50										
	Δ400	50										
	Δ415	50										
	Δ220 Y380	60										
	Δ255 Y440	60										
	Δ265 Y460	60										
	Δ277 Y480	60										
	YY230 Y460	60										
	Δ380	60										
	Δ440	60										
	Δ460	60										
	Δ480	60										
100,112	Δ220 Y380	50	Y380	50	40	0.12	1,3	**,VD**	Three phase	89 (Size 100)	81 (Size 112)	
	Δ230 Y400	50	Y400	50	45	0.13						
	Δ240 Y415	50	Y415	50	45	0.13						
	Δ290 Y500	50	Y500	50	45	0.10		**,VF**				
	Δ380	50	Y380	50	45	0.13		**,VD**				
	Δ400	50	Y400	50	45	0.13						
	Δ415	50	Y415	50	45	0.13						
	Δ220 Y380	60	Y380	60	38	0.11						
	Δ255 Y440	60	Y440	60	43	0.12						
	Δ265 Y460	60	Y460	60	45	0.13						
	Δ277 Y480	60	Y480	60	50	0.15						
	YY230 Y460	60	Y460	60	45	0.13						
	Δ480	60	Y480	60	50	0.15						
	Δ440	60	Y440	60	43	0.12						
	Δ460	60	Y460	60	45	0.13						
	Δ380	60	Y380	60	38	0.11						

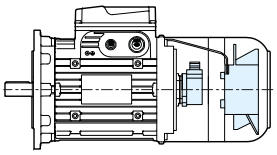
Non-standard design code for the **designation**: **,VA ,VD ,VF**.
IC 416 is stated on name plate

Motor size wound and stated for			Independent cooling fan name plate				Independent cooling			
Motor size	V	Hz	V	Hz	W	A	kg	Code	Type	ΔLB
132,160S	Δ220 Y380	50	Y380	50	50	0.13	1,7	,VD	Three phase	88
	Δ230 Y400	50	Y400	50	53	0.15				
	Δ240 Y415	50	Y415	50	51	0.16				
	Δ290 Y500	50	Y500	50	53	0.12		,VF		
	Δ380	50	Y380	50	53	0.15		,VD		
	Δ400	50	Y400	50	53	0.15				
	Δ415	50	Y415	50	51	0.16				
	Δ220 Y380	60	Y380	60	56	0.12				
	Δ255 Y440	60	Y440	60	60	0.14				
	Δ265 Y460	60	Y460	60	65	0.14				
	Δ277 Y480	60	Y480	60	70	0.15				
	YY230 Y460	60	Y460	60	65	0.14				
	Δ380	60	Y380	60	56	0.12				
	Δ440	60	Y440	60	60	0.14				
	Δ460	60	Y460	60	65	0.14				
	Δ480	60	Y480	60	70	0.15				
160 MA, M, L	Δ400	50	Y400	50	84	0.25	5	,VD		166
	Δ415	50	Y415	50	84	0.25				
	Δ290 Y500	50	Y500	50	84	0.25				
	Δ220 Y380	60	Y380	60	86	0.21				
	YY230 Y460	60	Y460	60	86	0.21				
	Δ380	60	Y380	60	86	0.21				
	Δ440	60	Y440	60	86	0.21				
	Δ460	60	Y460	60	86	0.21				
	Δ480	60	Y480	60	86	0.21				
180	Δ400	50	Y400	50	84	0.25				156
	Δ415	50	Y415	50	84	0.25				
	Δ290 Y500	50	Y500	50	84	0.25				
	Δ220 Y380	60	Y380	60	86	0.21				
	YY230 Y460	60	Y460	60	86	0.21				
	Δ380	60	Y380	60	86	0.21				
	Δ440	60	Y440	60	86	0.21				
	Δ460	60	Y460	60	86	0.21				
	Δ480	60	Y480	60	86	0.21				

Non-standard design code for the **designation**: **,VA ,VD ,VF**.
IC 416 is stated on name plate

(18) Axial independent cooling fan and encoder

Independently cooled motor equipped with hollow shaft **encoder** with elastic fastening.
For specifications and designation code relevant to the independent cooling fan and the encoder see design (17) and design (36), respectively.
Motor overall dimensions as «Axial independent cooling fan» design (17).
Non-standard design code for the **designation**: **,V ... ,E...**
IC 416 is stated on name plate



(19) Thermistor type thermal probes (PTC)

Three thermistors wired in series (to DIN 44081/44082), inserted in the windings, for connection to a suitable contact breaker device. A sharp variation in resistance occurs when (delay 10 ÷ 30 s) the temperature of the windings reaches the setting temperature of **150 °C** (T15).

With designs «Insulation class H» (3) and/or «Design for high temperature» (33) if required, thermistors with setting temperature of 170 °C (T17) are supplied.

Terminals connected to a loose or fixed terminal block inside the terminal box.

Standard on frame sizes 160MA, M, L - 180 for Brazil, Europe, China and Eurasian Economic Union markets.
Non-standard design code for the **designation**: **,T15**

(20) Bi-metal type thermal probes

Three bi-metal probes wired in series with usually closed contact inserted in the windings. Nominal corrent 1,6 A, nominal voltage 250 V a.c. The contact opens when (delay 20 ÷ 60 s) the temperature of the windings reaches the setting temperature of **150 °C** (B15).

With designs «Insulation class H» (3) and «Design for high temperature» (33) if required, bi-metal probes with setting temperature of 170 °C (B17) are supplied.

Terminals connected to a loose or fixed terminal block inside the terminal box.

Standard on frame sizes 160MA, M, L - 180 for Mexico and USA markets.
Non-standard design code for the **designation**: **,B15**

(21) Drip-proof cover

Necessary design for outdoor applications or when water sprays are present, in mounting position with downwards vertical shaft (IM V5, IM V1, IM V18).
LB dimension (see. ch. 3.12) increases by ΔLB = 25 mm.

Non-standard design code for the **designation**: **,PP**

(31) Motor without fan for fans

Motor without fan, with non-drive end completely closed endshield having the same electric specifications and power of the standard motor (as stated on ch. 3.5 ... 3.7).
Design for fans or for applications where cooling is ensured by the external environment (in nameplate IC 418). Design suitable also when duty cycle is periodic intermittent and of such short duration that they do not require any cooling (in nameplate IC 410 and S2 duty cycle, 5 min); if necessary, consult us.

LB dimension (see ch. 3.8) **decreases** by Δ**LB** quantity as per table beside.

Not possible with design «Drive shaft axially fastened» (2), and Premium Efficiency (IE3) EISA motors with design (42).

Non-standard design code for the **designation**: **,SV**

IC 418 or 410 is stated on name plate.

Design not available for directives CCC, CCC+CEL, CEL, NOM and INMETRO.

Motor size	Δ**LB** [mm]
63	33
71	41
80	43
90	46
100	53
112	58
132	69
160	58
180	71

(32) **Motor without fan** with external cooling **by natural convection** (63 ... 132)

Motor without fan, with external cooling by natural convection and non-drive end completely closed endshield. Electric winding and electric specifications differ from the standard motor and power is derated.

Motor dimensions as «Motor without fan for fans» (31) design.

Not possible with designs:
«Drive shaft axially fastened» (2),

Motors for directives EISA, CCC, CCC+CEL, CEL, NOM and INMETRO.

Non-standard design code for the **designation**: **,CN**

(33) Design for high temperatures

For ambient temperature 60°C < T° C ≤ 90° C (including non-standard design ‚AT40): insulation class H, fluoro rubber seal rings, non-standard bearings,(per AT70 e AT90), metallic fan, cable gland and metallic terminal box plugs (if foreseen).

Motor power values stated on ch. 3.5 ... 3.7 can be derated according to the following table:

Poles	Motor size	Ambient temperature designation: (HB2, HB3 *Vedi cap.* 3.5 … 3.7) P_N [kW] Nominal	Ambient temperature designation: **40 °C ‚AT40** P_N [hp] Nominal	Ambient temperature designation: **70 °C ‚AT70** **(HB)** P_N [kW] Available	Ambient temperature designation: **90 °C ‚AT90** **(HB)** P_N [kW] Available
2	**63 A**	0,18	0,25	0,18	0,12
	63 B	0,25	0,33	0,25	0,18
	63 C	0,37	0,5	0,37	0,25
	71 A	0,37	0,5	0,37	0,37
	71 B	0,55	0,75	0,55	-
	71 C	0,75	1	0,75	0,55
	80 A	0,75	1	0,75	0,55
	80 B	1,1	1,5	1,1	0,75
	80 C	1,5	2	-	1,1
	80 D	1,85	2,4	-	-
	90 S	1,5	2	1,1	0,75
	90 SB	1,85	2,4	-	1,1
	90 LA	2,2	3	1,5	1,5
	90 LB	3	4	1,85	-
	100 LA	3	4	-	-
	100 LB	4	5,4	2,2	2,2
	112 M	4	5,4	3	2,2
	112 MB	5,5	7,5	4	3
	112 MC	7,5	10	-	-
	132 S	5,5	7,5	-	4
	132 SB	7,5	10	5,5	5,5
	132 SC	9,2	12,4	-	-
	132 MA	11	15	7,5	7,5
	132 MB	15	20	9,2	9,2
	160 SA	11	15	7,5	7,5
	160 SB	15	20	9,2	9,2
4	**63 A**	0,12	0,16	0,12	0,09
	63 B	0,18	0,25	0,18	0,12
	63 C	0,25	0,33	0,25	0,18
	71 A	0,25	0,33	0,25	-
	71 B	0,37	0,5	-	0,25
	71 C	0,55	0,75	0,37	-
	71 D	0,75	1	-	0,37
	80 A	0,55	0,75	0,55	0,37
	80 B	0,75	1	0,75	0,55
	80 C	1,1	1,5	-	-
	90 S	1,1	1,5	-	0,75
	90 L	1,5	2	1,1	1,1
	90 LB	1,85	2,4	1,5	-
	90 LC	2,2	3	1,85	1,5
	100 LA	2,2	3	-	-
	100 LB	3	4	2,2	1,85
	112 MA	3	4	-	-
	112 M	4	5,4	3	2,2
	112 MC	5,5	7,5	-	3
	132 S	5,5	7,5	4	4
	132 M	7,5	10	5,5	5,5
	132 MB	9,2	12,4	7,5	-
	132 MC	11	15	9,2	7,5
	160 SC	11	15	9,2	7,5
	160 M	11	15	11	9,2
	160 L	15	20	15	11
	180 M	18,5	25	18,5	15
	180 L	22	30	22	18,5
6	**63 A**	0,09	0,12	0,09	0,06
	63 B	0,12	0,16	0,12	0,09
	63 C	0,15	0,20	0,15	0,12
	71 A	0,18	0,25	0,18	0,15
	71 B	0,25	0,33	0,25	0,18
	71 C	0,37	0,5	-	-
	80 A	0,37	0,5	0,37	0,25
	80 B	0,55	0,75	-	0,37
	80 C	0,75	1	0,55	-
	90 S	0,75	1	-	0,55
	90 L	1,1	1,5	0,75	-
	90 LC	1,5	2	-	0,75
	100 LA (ErP IE3-60 Hz)	0,75	1	-	-
	100 LA	1,5	2	-	0,75
	100 LB	1,85	2,4	1,1	1,1
	112 M (ErP IE3-60 Hz)	1,1	1,5	-	-
	112 MB (ErP IE3-60 Hz)	1,5	2	-	-
	112 M	2,2	3	1,5	1,5
	112 MC	3	4	1,85	1,85
	132 S (ErP IE3-60 Hz)	2,2	3	-	-
	132 S	3	4	2,2	2,2
	132 M (ErP IE3-60 Hz)	3	4	-	-
	132 M	4	5,4	3	3
	132 MB (ErP IE3-60 Hz)	4	5,4	-	-
	132 MB	5,5	7,5	4	4
	132 MC	7,5	10	5,5	-
	160 SC	7,5	10	5,5	-
	160 M	7,5	10	7,5	5,5
	160 L	11	15	9,2	7,5
	180 L	15	20	11	9,2

The design ,AT 40°C is available for motors HB, HB2 and HB3 with standard powers and suitable for ambient temperatures 40°C.
Designs ,AT 70° C ,AT 90° C not possible for the following motors:

- HB2 ErP;
- HB3 ErP;
- HB3 CCC-CEL;
- HB3 INMETRO;
- HB3 NOM;
- HB3 EISA;
- Designs (17), (18), (36), (63).

Following table states the designs available according to ambient temperature and motor power.
For temperatures 70° C and 90° C power can be derated and on nameplate H insulation class and required ambient temperature are stated (40° C, 70° C or 90° C).
Define the following data before selecting:
- Ambient temperature;
- Motor power;
- Motor size and pole number;
- Select motor type for 40°C see ch. 3.5 ... 3.6 for 70° C or 90° C only HB

E.g.: T_{amb} = 90°C, P_N=1,1 kW, Poles=4 **HB 90L 4**

Non-standard design code for the **designation**: **,AT...**

(35) Light alloy fan

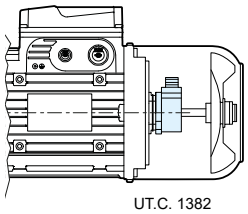
Motor with light alloy fan (aluminum) for environments where it is not advisable to use the standard plastic fan.

Non-standard design code for the **designation**: **,VL**

(36) Encoder

Motor (driving shaft **axially fastened** as standard) equipped with incremental hollow shaft encoder and elastic fastening with the following features stated in the table (free connection wirings for the use of connectors installed by the Buyer). For different and/or additional specifications consult us.

LB dimension (see ch. 3.8) **increases** by ∆**LB** quantity given in the table.



63 ... 180

Motor size	∆**LB** [mm]
63	52
71	51
80	54
90	51
100	56
112	52
132, 160S	54
160MA, M, L	62
180	57

Output signal[1]	**RS 422 LD TTL**	**RS 422 TTL**	**Push - Pull HTL LD HTL**	**sin / cos**	
Supply voltage U_B	5 V d.c. ± 5%	10 ÷ 30 V d.c.		5 V d.c. ± 5%	10 ÷ 30 V d.c.
Maximum current consumption (without load) I_N	90 mA		100 mA	110 mA	
Channels	A+, A-, B+, B-, 0+, 0-				
Output amplitude per track	$U_l \leq 0,5\ V_{dc}$; $U_h \geq 2,5\ V_{dc}$		$U_l \leq 0,5\ V_{dc}$; $U_h \geq U_B - 1\ V_{dc}$	1 V_{PP} ± 20% (channel A, B) 0,1 ÷ 1,2 V (channel 0)	
Maximum output current per track I_{out}	± 20 mA		± 30 mA	–	
Maximum pulse frequency f_{max}	100 ÷ 300 kHz[2) 3)]			–	
Frequency -3 dB	–			≥ 180 kHz	
No. pulse per revolution	1024[4)]				
Vibration resistance (DIN-IEC 68-2-6)	≤ 100 m/s², 10 ... 2000 Hz				
Shock resistance (DIN-IEC 68-2-27)	≤ 1000 ÷ 2500 m/s², 6 ms[2)]			≤ 2000 m/s², 6 ms	
Maximum speed	6000 min^{-1}				
Ambient temperature	[≤160S] -40 °C ÷ 100 °C	-30 °C ÷ 85 °C	[≤160S] -40 °C ÷ 100 °C	-25 °C ÷ 85 °C	
Protection degree (EN 60 529)	IP65				
Connections	Cables with open wire ends[8)] L = 1000 mm for use of connector installed by the user				
Encoder cable cross-sections	2×0,22+6×0,14 [mm²]	10×0,14 [mm²]	2×0,22+6×0,14 [mm²]	8×0,22 [mm²]	8×0,22 [mm²]
Code for designation	**,E1**	**,E2**	**,E3**	**,E4**	**,E5**

1) Other electronic configurations available on request; consult us.
2) Variable depending on the model.
3) Parameter to be checked depending on the combination max motor speed/pulse per revolution required.
4) Other pulse rates available on request (max 5000 ppr).
8) On request: different cable lengths, output with connector or with connector and cable; consult us.

Non-standard design code for the **designation**: **,E1** ... **,E5** (see table).

(42) c UL us Motor certified to UL

Motor sizes 63 ... 160S certified to UL1004-1 and CAN/CSA 23.2 No.100-14, for USA and Canada respectively, and electrically complying with NEMA MG 1-12 2009.

The main variations of this product are:

- approved UL class F insulation winding system;
- approved UL terminal block terminal assignment according to NEMA;
- cooling fan made of aluminium or certified thermoplastic material;
- certified and marked cables;
- verification and adjustment of air distances toward ground and between live parts;
- name plate with logo c UL us

All other non-standard designs are possible, excluding design (31). (32) and (33) (with T_{amb}. 70° C and 90° C).

Standard for 230YY 460Y V, 60 Hz motor supply and for motor with efficiency EISA Premium Efficiency class.

Non-standard design code for the **designation**: ,**UL**.

Design not available for directives CCC, CCC+CEL, CEL, NOM and INMETRO.

(62) Motor prearranged for encoder

Motor (motor shaft axially fastened as standard) prearranged for encoder with following features:

- anti-rotation center distance Ø 63 mm;
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø 10 h6 mm

Motor dimensions as design (36).

Non-standard design code for the **designation**: **,PE**

(63) Axial independent cooling fan and prearranged for encoder

Independently cooled motor (motor shaft axially fastened as standard) prearranged for encoder with following features:

- anti-rotation center distance Ø 63 mm;
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø 10 h6 mm and length 35 mm.

For specifications and independent cooling fan designation code see design (17).
Motor overall dimensions as «Axial independent cooling fan» (17).

Non-standard design code for the **designation**: **,V... ,PE**

IC 416 is stated on name plate

(64) IP 66 Protection

Advised for installation in environments as stated in the table below, including relevant limitations with designs (17) (18) (36) (63).

Environment type	Non-standard designs				
	(17)	(18)	(36)	(62)	(63)
Outdoor	○	○	○	●	○
In damp environment					
In case of condensate					
In sea or aggressive environment					
In case of direct bolts/ water splash					
In dusty environment			●		

● Possible
○ Consult us

Including design «Additional winding impregnation» (9) and anti-rust painting of rotor and shaft, adhesive on housing and endshield mating surfaces (to be re-adjusted in case of motor disassembling).
In these cases it is advised to require the following designs as well:
«Condensate drain holes» (8)
«Anti-condensation heaters» (13)

Non-standard design code for the **designation**: **,IP 66**

Design not available for directives CCC, CCC+CEL, CEL.

(99) Optional paint cycles

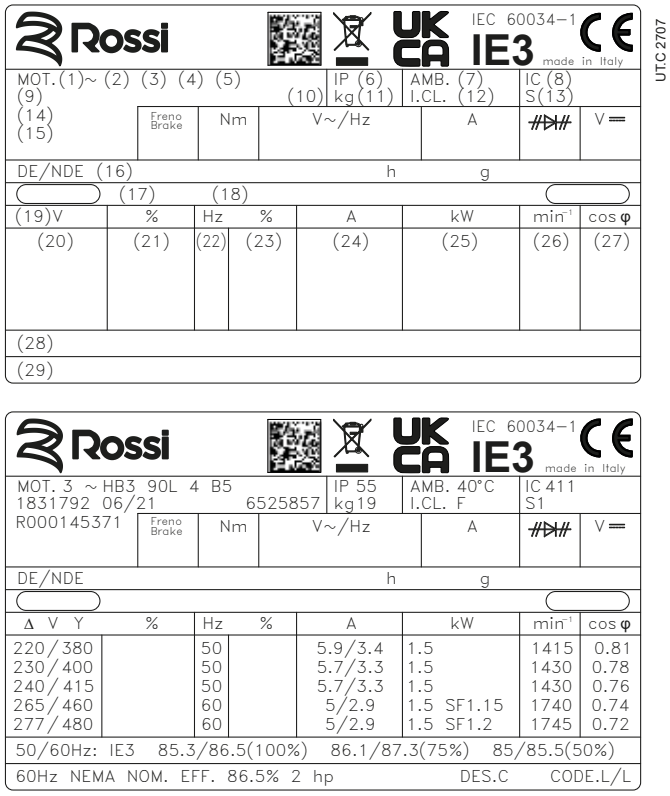
Application field	Features	Corrosivity class ISO 12944-2	Durability class ISO 12944-2	Description	Thickness cycles NDFT [µm] ISO 19840	ROSSI internal code
Applications in aggressive environments	Good resistance to atmospheric and aggressive agents	C4	L	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 160	**1H-RAL5010**
			H	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 180	**2H-RAL5010**
Outdoor applications in saline environment	Excellent resistance to atmospheric and aggressive agents Outdoor applications in saline environment	C5	M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2I-RAL5010**
Outdoor applications in chemically aggressive environment and high humidity industrial areas	Excellent resistance to atmospheric and aggressive agents Outdoor applications in chemically aggressive environment (fertilizers, etc.)		M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2L-RAL5010**

Cycles with specific features: antibacterial for FOOD environments, available on request.

Varie

- Asynchronous three-phase two-speed motors.
- Motor balancing according to reduced vibration degree (B) to CEI EN 60034-13.
- Motors with integral feet and flange (IM B35, IM B34 and relevant vertical mounting positions).
- Fan cover for textile industry (63 ... 132).
- Power connector.
- Sensorized drive end bearing (32, 48 or 64 pulses per revolution) for the measurement of angle and/or rotation speed (sizes 63 ... 100); for specifications and wiring schemes consult us.
- Pt 100 temperature probe.
- Encoder for high temperatures.
- Designs with supply cable.
- Design for oil seal (e.g. coupled with mechanical variator).

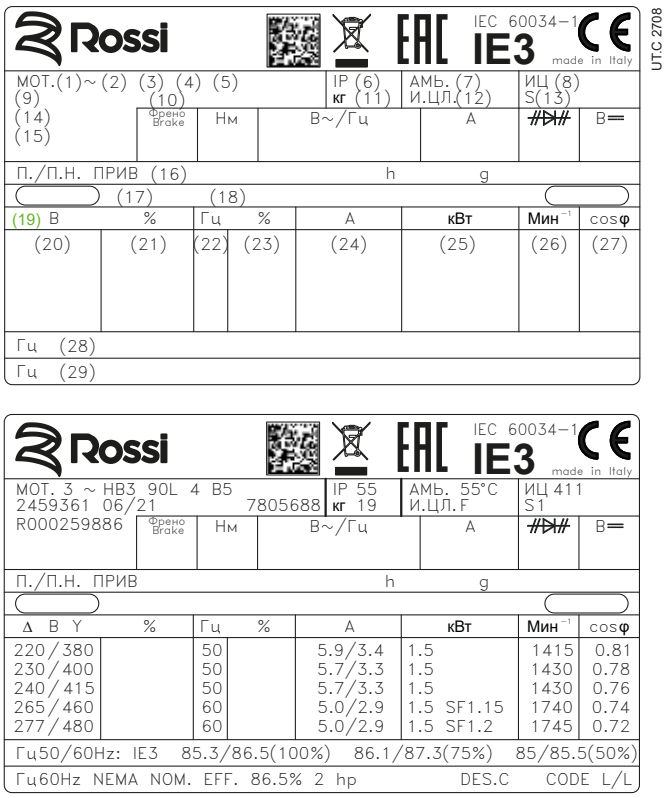
3.14.1 Name plate Europe (ErP) / Australia (AU MEPS)



(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(12) Insulation class I.CL...
(13) Duty cycle S...
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code

1) On request

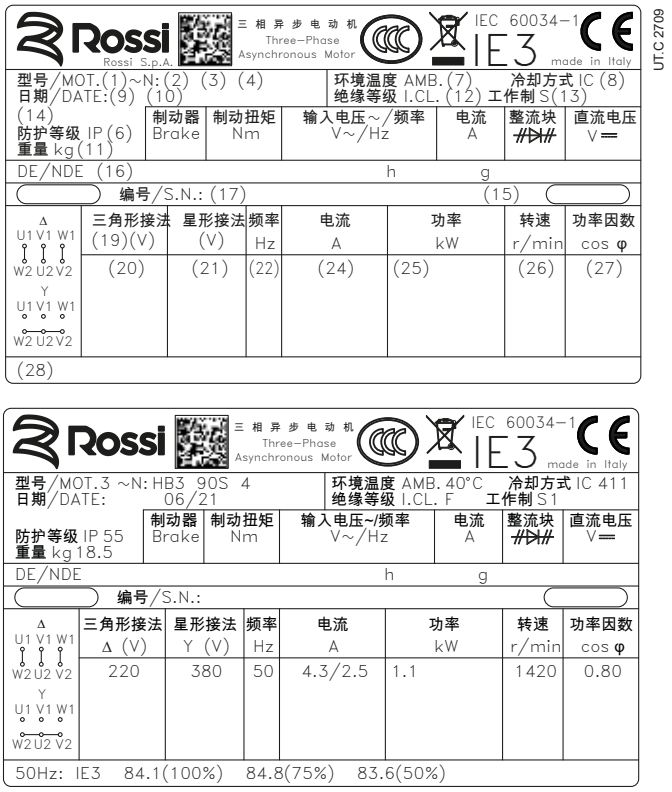
3.14.2 Name plate Eurasian Economic Union (EAC)



(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP ...
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL...
(13) Duty cycle S...
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code

1) On request

3.14.3 Name plate China (CCC)

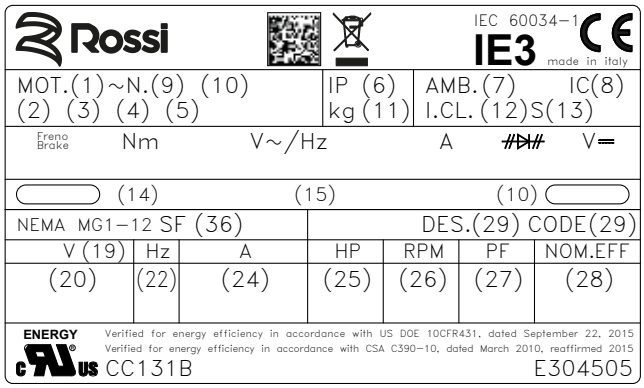


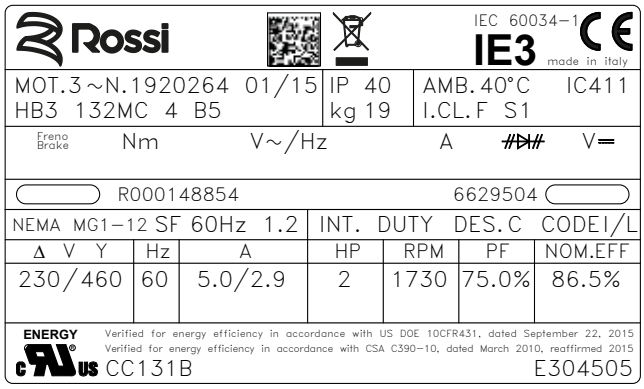
(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Serial number
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1

1) On request

3.11.4 Sticker label China (CEL)

3.14.5 Name plate USA (UL-EISA)

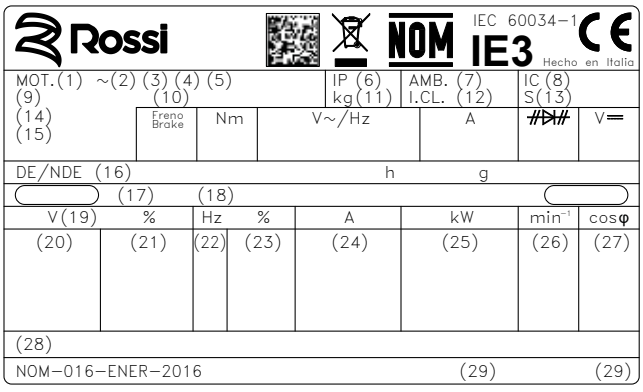


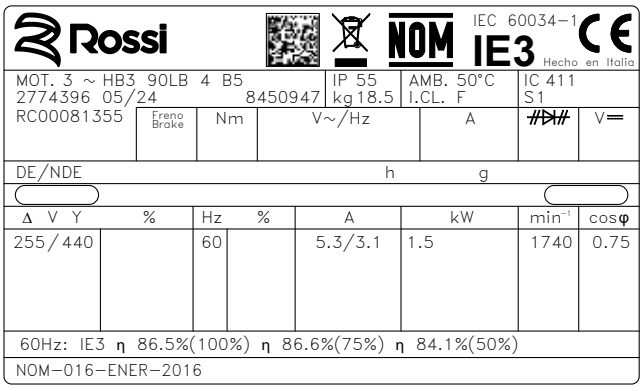


(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL...
(13) Duty cycle S...
(14) Motor code
(15) Customer code [1)]
(19) Connection of the phases
(20) Nominal voltage
(22) Nominal frequency
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design-Code
(36) Service factor

1) On request

3.14.6 Name plate Mexico (NOM)

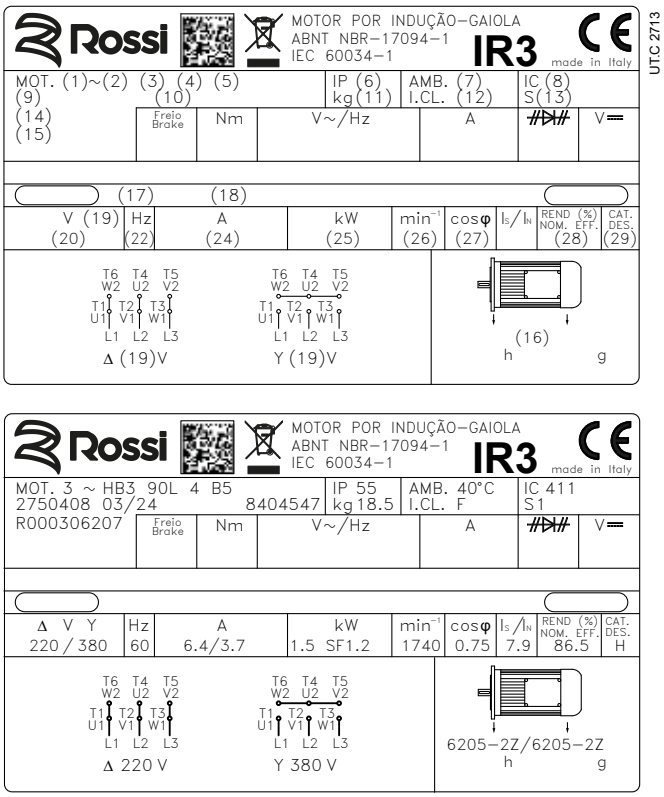




(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL...
(13) Duty cycle S...
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code

1) On request

3.14.7 Name plate Brazil (INMETRO)



(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP ...
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL...
(13) Duty cycle S...
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code

1) On request

3.14.8 Sticker label INMETRO

4 poles

6 poles

This page is intentionally left blank.

4

HBZ series Brake motor for gearmotors

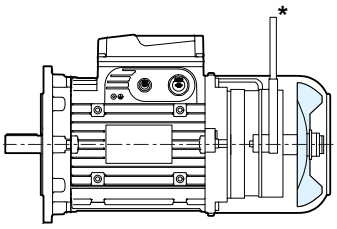
Section Contents

4.1

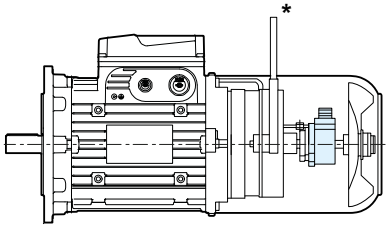
General specifications

63 ... 180

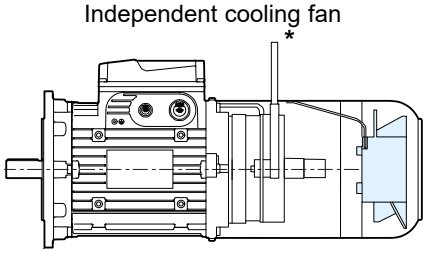
Standard



Encoder

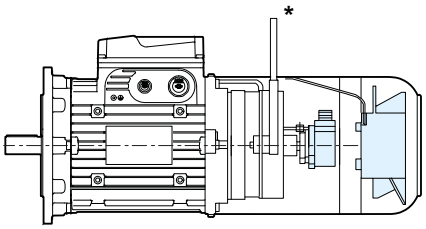


Independent cooling fan

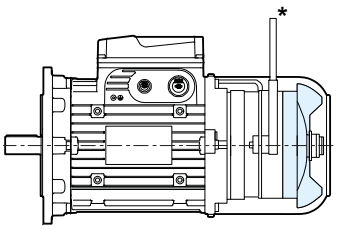


UT.C. 1374

Independent cooling fan and encoder



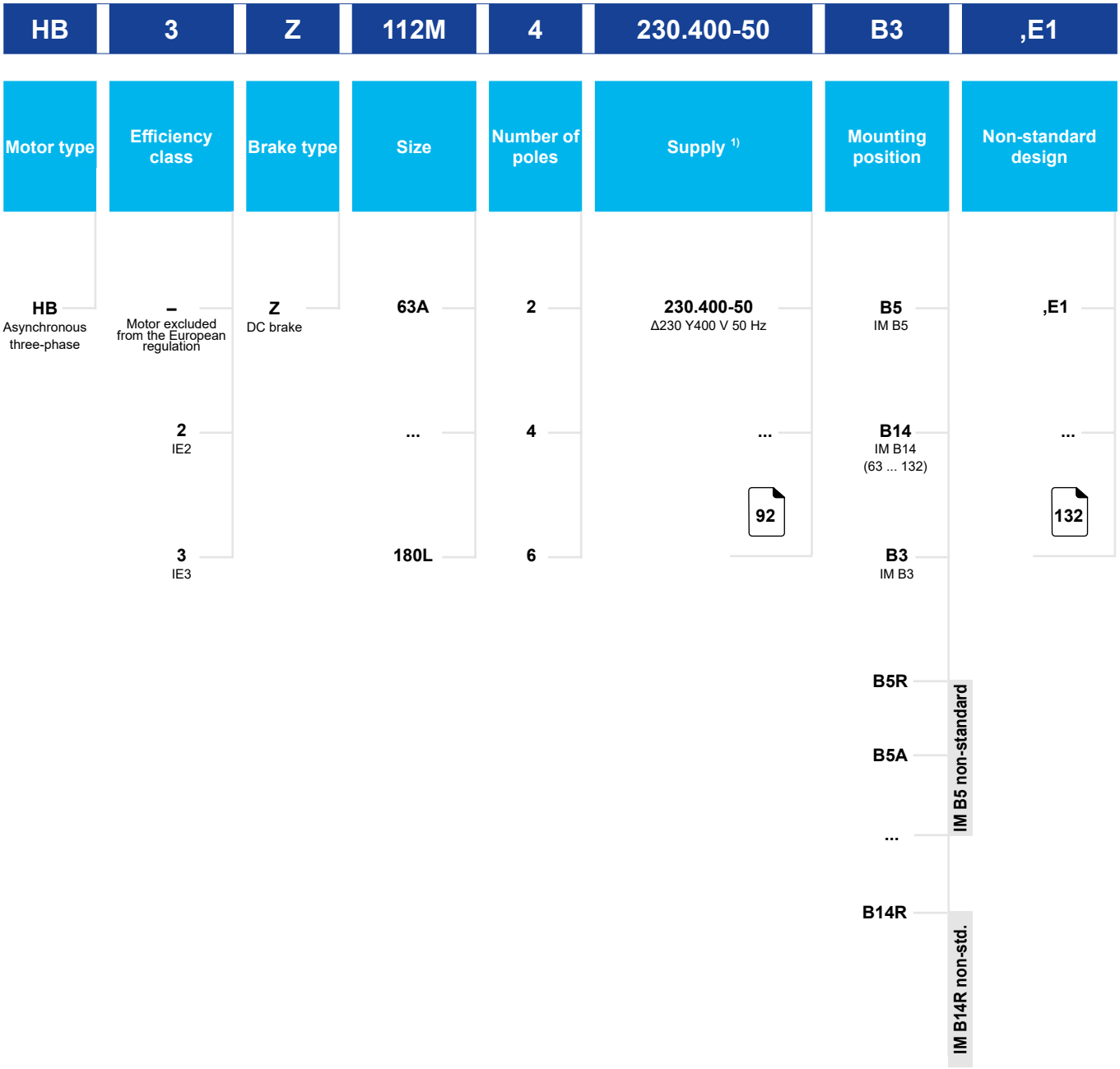
Flywheel
(only for 63 .. 160S)



* On request.

- Series of brake motors with d.c. brake suitable for universal use and especially for gearmotors applications.
- Sizes 63 ... 180 available also with **powers** (marked by*) **higher than the ones foreseen by the standards**
- Class F insulation; temperature rise class B for all motors at standard power, F for remaining motors
- Mounting position **IM B5** and derivatives, **IM B14** and derivatives and **IM B3** and corresponding vertical mounting positions; **mating tolerance under «accuracy» rating**
- **IP 55** protection
- **Particularly strong construction** (both electrical and mechanical) to withstand alternating torsional and thermic stresses of starting and braking; duly proportioned bearings
- «**Supported**» **tightening attachments** of endshields and flanges fitted on housing with «**tight**» coupling
- Electromagnetic sizing especially studied to allow high acceleration capacity (**high frequency of starting**) and uniform starting
- **Suitable for operation with inverter**
- **Asbestos-free** friction surfaces
- **Wide metallic** terminal box, **multi-voltage rectifier (for sizes 63 ... 160S), one brake coil only, for voltage always co-ordinated with motor** (both Δ and **Y**)
- Double braking surface, braking torque proportioned to motor torque (usually $M_f \approx 2M_N$)
- **Maximum reduced noise level** and operation **progressivity** (both at starting and braking) thanks to a lower rapidity (**typical of d.c. brake**) of the anchor (which is lighter and less quick in the impact): motor starts slightly braked i.e. with greater progressivity; good release and braking rapidity; possibility to increase rapidity when braking, with supply opening on d.c. side
- High braking capacity
- **Designs available for every application need** (flywheel, encoder, independent cooling fan, independent cooling fan and encoder, protections higher than IP 55: IP 56, IP 65)
- Particularly suitable for applications requiring regular and low-noise starting and braking and, at the same time, braking with good rapidity and precision and high number of starts.

Designation



1) Motor supply for USA and Canada (EISA): includes terminal block with 9 terminals and UL compliance (see ch. 4.14 (42).

4.3

Specifications

Asynchronous three-phase electric **brake motor** with **d.c. brake** (braking in case of failure of supply) with double braking surface, sizes **63 ... 180**;

Standardised motor with cage rotor, totally enclosed, externally ventilated (cooling system IC 411), single-speed according to following tables:

Directive / Certification	Efficiency class	N° poles	Winding	Shaft height	Standard supply	Class		Pag.
						Insulation	Temperature rise	
ErP	IE2, IE3	2, 4, 6	three-phase Δ Y	63 ... 132	230.400-50	F	B	40
	IE3	4, 6	three-phase Δ	160 ... 180	400-50			
EAC	IE3	2, 4, 6	three-phase Δ Y	63 ... 132	220.380-50			46
		4, 6	three-phase Δ	160 ... 180	380-50			
CCC	GR. 3 (IE3)	2, 4, 6	three-phase Δ Y	63 ... 90	220.380-50			50
CEL				80 ... 180				
AU MEPS	IE3	4	three-phase Δ Y	80 ... 132	230.400-50			43
			three-phase Δ	160 ... 180	400-50			
EISA	Nema Premium	4, 6	three-phase YY Y	90 ... 132	230.460-60			55
NOM	IE3	4, 6	three-phase Δ Y	90 ... 132	255.440-60			58
			three-phase Δ	160	440-60			
INMETRO	IR3 (IE3)	4, 6	three-phase Δ Y	80 ... 180	220.380-60			60
				80 ... 132	255.440-60			
			three-phase Δ	160-180	440-60			

«Torque-speed» **characteristic curves** duly optimized for handling (horizontal and vertical traverse movements, rotation), slightly «sagged», without peaks in the hipersynchronous area and with carefully proportioned mean value.

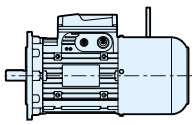
Rated power delivered on continuous duty (S1) and at standard voltage and frequency; ambient temperature -15 ÷ +40 °C, altitude 1 000 m.

IP 55 protection: drive end with seal ring (without spring for IM B3) and non-drive end with water-proof and dust-proof gaiter and V-ring.

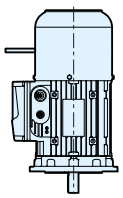
Mounting positions IM B5, IM B3 IM B14; motors can also operate in the relevant mounting positions with vertical shaft, which are respectively (see following table): IM V1 and IM V3, IM V18 and IM V19, IM V5 and IM V6; the name plate shows the designation of mounting position with horizontal shaft. On request, other special mounting positions: consult Rossi S.p.A.

Mounting positions with flange

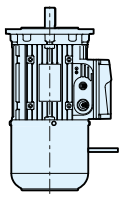
IM **B5**



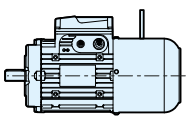
IM **V1**



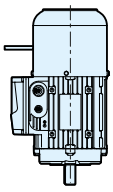
IM **V3**



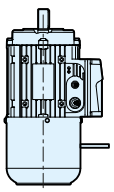
IM **B14**



IM **V18**

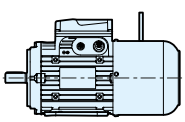


IM **V19**

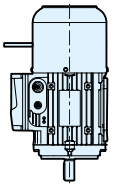


Mounting positions with feet

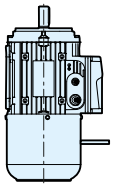
IM **B3**[1)]



IM **V5**



IM **V6**



1) Motor can also operate in the mounting positions IM B6, IM B7 and IM B8; the name plate shows the IM B3 mounting position.

Construction features

Component type	Notes	Motor size									
		63	**71**	**80**	**90**	**100**	**112**	**132**	**160S**	**160MA, M, L**	**180**
Housing	Material	LL	LL	LL	LL	LL	LL	LL	LL	LL	LL
N-DE Endshield		LL	LL	LL	LL	LL	LL	LL	LL	G	G
Fan cover		LA	LA	LA	LA	LA	LA	LA	LA	LA	LA
Fan		PL	PL	PL	PL	PL	PL	PL	PL	PL	PL
DE bearing	Lubricated for life	6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6309 2Z	6309 2Z	6310 2Z
N-DE bearing		6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6308 2Z	6309 2Z	6310 2Z
DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	45×65×8	45×65×8	50×72×8
N-DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	40×60×10	45×65×8	50×72×8
Terminal block 6/ 9 pins	Pin size	M4 / M4	M4 / M4	M4 / M4	M5 / M5	M5 / M5	M5 / M5	M6 / M5	M6 / M5	M8 / M8	M8 / M8
Cable entry	Knockout openings	4×M16	2×M16+ 2×M20	2×M16+ 2×M20	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M32	2×M16+ 2×M32	-	-
	Cable glands	-	-	-	-	-	-	-	-	2×M40+ 1×M16	2×M40+ 1×M16

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

Construction features

Mounting position	Notes	Motor size									
		63	71	80	90	100	112	132	160S	160MA, M, L	180
B3 (with bolt-in feet)	Ø DxE shaft	11×23	14×30	19×40	24×50	28×60	28×60	38×80	42×110	42×110	48×110
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12	M16 / M10	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100	12×8×100	14×9×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	G / C45	G / C45
	n, foot position sides	1	1	1	3	3	3	3	3	3	3
B5	Ø DxE shaft / Ø P flange	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	28 × 60 / 250	28 × 60 / 250	38 × 80 / 300	42 × 110 / 350	42 × 110 / 350	48 × 110 / 350
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12	M16 / M10	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100	12×8×100	14×9×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	G / C45	G / C45
B5R	Ø DxE shaft / Ø P flange	9 × 20 / 120	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	24 × 50 / 200	28 × 60 / 250	–	38 × 80 / 300	–
	DE / NDE threaded hole	M3 / NA	M4 / NA	M5 / NA	M6 / M8	M8 / M10	M8 / M10	M10 / M12		M12 / M10	
	Key type A	3×3×12	4×4×18	5×5×25	6×6×32	6×6×32	6×6×32	8×7×50		10×8×70	
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45		G / C45	
B5S[1)]	Ø DxE shaft / Ø P flange	–	–	–	14 × 30 / 160	19 × 40 / 200	19 × 40 / 200	24 × 50 / 200	–	–	–
	DE / NDE threaded hole				M5 / M8	M6 / M10	M6 / M10	M8 / M12			
	Key type A				5×5×25	6×6×32	6×6×32	6×6×32			
	Flange / Shaft material				LL / 39NiCrMo3	LL / 39NiCrMo3	LL / 39NiCrMo3	G / 39NiCrMo3			
B5A	Ø DxE shaft / Ø P flange	11 × 23 / 120	14 × 30 / 140	19 × 40 / 160	–	28 × 60 / 200	28 × 60 / 200	38 × 80 / 250	–	–	–
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA		M10 / M10	M10 / M10	M12 / M12			
	Key type A	4×4×18	5×5×25	6×6×32		8×7×50	8×7×50	10×8×70			
	Flange / Shaft material	LL / C45	LL / C45	LL / C45		LL / C45	LL / C45	G / C45			
B5B	Ø DxE shaft / Ø P flange	–	11 × 23 / 120	14 × 30 / 140	19 × 40 / 160	–	–	28 × 60 / 200	–	–	–
	DE / NDE threaded hole		M4 / NA	M5 / NA	M6 / M8			M10 / M12			
	Key type A		4×4×18	5×5×25	6×6×32			8×7×50			
	Flange / Shaft material		LL / C45	LL / C45	LL / C45			G / C45			
B5C	Ø DxE shaft / Ø P flange	–	–	–	–	19 × 40 / 160	–	–	–	–	–
	DE / NDE threaded hole					M6 / M10					
	Key type A					6×6×32					
	Flange / Shaft material					LL / C45					
B14	Ø DxE shaft / Ø P flange	11 × 23 / 90	14 × 30 / 105	19 × 40 / 120	24 × 50 / 140	28 × 60 / 160	28 × 60 / 160	38 × 80 / 200	–	–	–
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12			
	Key type A	4×4×18	5×5×25	6×6×32	6×6×32	8×7×50	8×7×50	10×8×70			
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45			
B14R	Ø DxE shaft / Ø P flange	–	11 × 23 / 90	14 × 30 / 105	–	–	–	–	–	–	–
	DE / NDE threaded hole		M4 / NA	M5 / NA							
	Key type A		4×4×18	5×5×25							
	Flange / Shaft material		LL / C45	LL / C45							

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

1) For $P_{N\ max}$ available see the following table.

Motor size	Poles					
	2		4		6	
	$P_{N\ max}$ kW [hp]					
90	1,85	[2,4]	1,1	[1,5]	0,75	[1]
112	4	[5,4]	3	[4]	1,85	[2,4]
132	9,2	[12,4]	7,5	[10]	4	[5,4]

Earth terminal located inside terminal box; prearranged for the installation of two further external earth terminals on housing.

Brake supply: with rectifier laying in terminal box having 2 terminals for cable connection for rectifier supply and 2 for external contact of fast braking; possible brake supply **directly from** motor **terminal block** or **separately** (to be used for: motors supplied by inverter, separate drive needs of motor and brake, etc.).
Brake can be supplied, also at motor standstill, with no time limitations.

Pressure diecast cage **rotor** in aluminium.

Stator winding with class H copper conductor insulation, insulated with double coat, type of impregnation with resin of class H; other materials are of classes F and H for a **class F insulation system**.

Rotor dynamic balancing: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.

Paint: Two-component water-based polyacrylic resin paint, corrosivity class C3 (according to ISO 12944-2) with water-soluble enamel, color blue RAL 5010 DIN 1843, suitable for withstanding normal industrial environments and allowing further finishing with two-component synthetic paints.

For **non-standard designs** and accessories see ch. 5.14.

Compliance with European Directives
The motors in this catalog comply with the following harmonized standards: EN 60034-1, EN 60034-2-1, EN 60034-2, EN 60034-5, EN 60034-6, EN 60034-7, EN 60034-8, EN 60034-9, EN60034-12, EN 60034-14, IEC 60038, IEC 60072-1, and therefore comply with the provisions of the L**ow Voltage Directive 2014/35/EU**.
For this reason the electric motors are CE marked.

Additional information:

The motor design, considering the motors as components, complies with:
- Machinery Directive 2006/42/EC when the installation is correctly executed by machinery manufacturer (e.g.: in compliance with our installation instructions and EN 60204 «Electric Equipments of Industrial Machines»);
- Directive 2011/65/EC RoHS relevant to the limit of use of dangerous substsances in the electric and electronic equipments.

Declaration of Incorporation (Directive 2006/42/EC Art 4.2 - II B):

The above mentioned motors must be commissioned as soon as the machines in which they have been incorporated have been declared to be in compliance with the Machinery Directive.

According to EN 60034-1, as motors are components and not machines, supplied directly to the final user, the Electromagnetic Compatibility Directive (application of Directive 2014/30/EU) is not directly applicable.

4.4

Radial and axial loads on shaft end

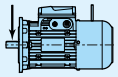
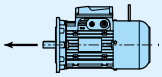
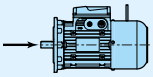
Radial loads generated on the shaft end by a drive connecting motor and driven machine must be less than or equal to those given in the relevant table.
The radial load F_r given by the following formula refers to most common drives:

$$F_r = \frac{k \cdot 19100 \cdot P}{n \cdot d} \text{ [N]}$$

where:

P [kW] is motor power required
n [min^{-1}] is the speed
d [m] is the pitch diameter
k is a coefficient assuming different values according to the drive type:
k = 1 for chain drive
k = 1,1 for gear pair drive
k = 1,5 for timing belt drive
k = 2,5 for V-belt drive

The table shows maximum permissible values of radial and axial loads on driving shaft end (F_r overhung load on centre line of shaft end), calculated for a bearing life L_h = 18000 h. For a longer bearing life, the values stated in the table must be multiplied by:
0,9 (25000 h),
0,8 (35500 h) or
0,71 (50000 h).

Motor size	F_r[1] [N]  n_N [min^{-1}]				 n_N [min^{-1}]				 n_N [min^{-1}]			
	3000	**1500**	**1000**	**750**	**3000**	**1500**	**1000**	**750**	**3000**	**1500**	**1000**	**750**
63	420	530	600	670	200	290	350	400	210	290	350	400
71	510	640	740	810	210	310	380	440	210	310	380	440
80	650	830	950	1050	230	350	420	500	370	500	600	680
90S	710	900	1040	1140	250	390	490	570	250	390	490	570
90L	730	930	1050	1180	240	380	480	560	240	380	480	560
100	1000[3]	1300	1500	1650	300	490	620	730	370	570	710	820
112	1500[3]	1900	2150	2400	660	950	1150	1310	660	950	1150	1310
132	2000[3]	2500	3000	3250	1220	1650	1960	2200	1220	1650	1960	2200
160S	2500	3150	3650	4050	1720	2280	2670	2990	1220	1650	1960	2200
160M-L	2950	3700	4250	4650	2300	3100	3900	4300	2300	3100	3900	4300
180	3500	4400	5050	5550	2700	3600	4600	5000	2700	3600	4600	5000

1) An axial load of up to 0,2 times the value in the table is permissible, simultaneously with the radial load.
2) Comprehensive of a possible unfavourable effect of weight-force of rotor and bearing preload spring.
3) For radial load value near to table limit require bearings C4.

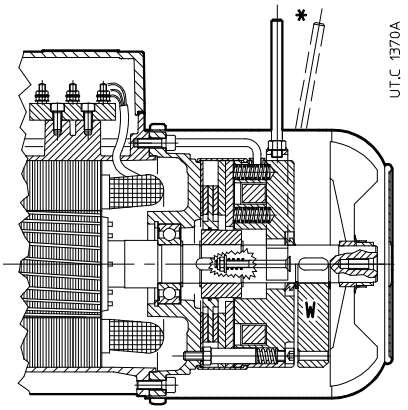
For running at 60 Hz, table values must be reduced by 6%.

Page intentionally left blank

4.5

Motor brake specifications

63 ... 180



* On request

Electromagnetic spring loaded brake (braking occurs automatically when it is not supplied), with **d.c.** toroidal coil and double braking surface, braking torque **proportioned** to motor torque (usually $M_f \approx 2\ M_N$).

Conceived for **maximum reduced noise level of running** and **progressivity** of on-off switching (both when starting and when braking thanks to lower rapidity, typical of d.c. brake, of brake anchor, lighter and less quick in the impact: motor starts slightly braked and with greater progressivity) **with increased rapidity in releasing and braking**; possibility to increase the rapidity, both in releasing (with rapid rectifier) and braking with supply opening on d.c. side, outstanding work capacity.

Wide range of non-standard designs (flywheel, encoder, independent cooling fan, independent cooling fan with encoder, second shaft end, etc.).

Particularly suitable for applications requiring regular and low-noise starting and braking and, at the same time, braking with good rapidity and precision and high number of starts.

When electromagnet is not supplied, the brake anchor pushed by springs presses the brake disk on rear endshield generating the braking torque on the same brake disk and consequentely on motor shaft it is keyed onto; by supplying the brake the electromagnet draws the brake anchor and releases the brake disk and driving shaft.

Main specifications:

- a.c. single-phase **supply voltage of rectifier** (always supplied in terminal box)
  - for sizes 63 ... 160S: **110 ÷ 440 V a.c.**, (brake 12 … 15) or **200 ÷ 440 V a.c.**, (brake 06S ... 07) **50 ÷ 60 Hz**: **multi-voltage rectifier** (as standard), properly designed to manage a **unique brake coil** with supply voltage **always co-ordinated** with **HBZ motor** standard voltage (Δ **230 Y400 V 50 Hz** and consequently also Δ **277 Y480 V 60 Hz**);
  - for sizes 160 - 180: 400 V ± 5% 50 or 60 Hz simple half-wave rectifier;
  - on request other voltages, see ch. 4.14 (1) and (26);
- rectifier supply **directly from** motor **terminal block** or indifferently from **separate** line;
- braking torque adjustable by changing number of springs;
- **insulation class F**, **temperature rise class B**;
- brake disk, sliding on moving hub: with single steel coat and double friction surface with average friction coefficient for low wear;
- **brake anchor in two pieces** for greater rapidity of starting and reduced noise;
- **water-proof and dust-proof gaiter** and **V-ring** both to prevent polluting infiltrations from surroundings towards brake, and to avoid that wear dust of friction surface will be dispersed in the surroundings;
- **lever for manual release with automatic return** and removable level rod, on request; position of release lever corresponding to terminal box as in the schemes at point 4.14; on request, other possible positions; consult us;
- for other functional specifications see following table.

For main specifications of motor see ch. 4.3.

Motor is **always equipped with** a **high reliable rectifier** fixed on terminal box providing adequate connecting terminals (2 for rectifier supply directly from motor terminal block or separate; 2 for external contact of rapid braking).

RM1[1)] rectifiers (standard for brakes 12 ÷ 14) and **RM2**[1)] (standard for brakes 05 ... 07) are a.c./d.c. supply devices with full-wave controlled bridge **able to supply a constant output voltage value independently from input voltage**; the d.c. brake is suitable to be supplied in the range of 110 - 440 V a.c. (for brake sizes 12 ÷ 15) and 200 ÷ 440 V a.c. (for brake sizes 06S ... 07) without having to change the coil. For this reason it is always co-ordinated with both motor voltages. In the range 200 ÷ 440 V a.c. it also has the speed-up function (for approximately the initial 400 ms a voltage higher than the nominal one is supplied to the brake coil, allowing to have a quicker brake release).

Moreover, compared to a conventional rectifier, the multivoltage rectifier offers the following advantages:
- higher steadiness of brake characteristics (being the output voltage set to a fixed value independent from the line fluctuations);
- lower voltage needed for feeding the brake (75 V d.c.) in release position (lower energy consumption, lower coil heating and lower braking delay).

All rectifier models can be connected-disconnected both on a.c. side (for maximum low noise running); both on a.c. and d.c. side (for a quicker braking release) as they are equipped with varistors for the protection of diodes, electromagnet and d.c. side opening contact (wiring schemes see TX Operating instructions UT.D 164).

1) Multi-Voltage rectifier **RM1** and **RM2** are **patented** devices.

Table of main functional specifications of brake

Effective values may slightly differ according to ambient temperature and humidity, brake temperature and state of wear of friction surface.

Brake size		Motor size	M_f [N m] ± 12% spring number (primed)			Absorption			Delay of [23)] release	Delay of [23)] braking		Air-gap		W_1	C_{max}	W_{max} [28)] [J] brakings/h		
	21)					V a.c.	A a.c. max	W	t_1 ms 24)	t_2 ms 25)	t_2 c.c. ms 25)	mm nom	mm max	MJ/mm 26)	mm 27)	10	100	1000
BZ 12	RM1	63, 71	1,75[2]	3,5[4]	–	110 ÷ 440	0,09	9	20	100	10	0,25	0,40	70	5	4500	1120	160
BZ 53, 13	RM1	71, 80	2,5[2]	5[4]	7,5[6]	110 ÷ 440	0,14	12	32	120	10	0,25	0,40	90	5	5600	1400	200
BZ 04, 14	RM1	80, 90	5[2]	11[4]	16[6]	110 ÷ 440	0,20	16	45	150	10	0,30	0,45	125	5	7500	1900	265
BZ 05, 15	RM2	90, 100, 112	13[2]	27[4]	40[6]	110 ÷ 440	0,26	24	63	220	15	0,30	0,45	160	5	10000	2500	355
BZ 06S	RM2	112	25[2]	50[4]	75[6]	200 ÷ 440	0,28	30	90	300	30	0,35	0,55	220	5	14000	3550	500
BZ 56	RM2	132S	37[2]	75[4]	–	200 ÷ 440	0,28	50	90	224	20	0,35	0,55	224	4,5	14000	3550	500
BZ 06	RM2	132S ... 160S	50[2]	100[4]	–	200 ÷ 440	0,28	50	90	224	20	0,35	0,55	224	4,5	14000	3550	500
BZ 07	RM2	132M ... 160S	50[2]	100[4]	150[6]	200 ÷ 440	0,34	65	125	280	25	0,40	0,60	315	4,5	20000	5000	710
BC 08	RR1[29)]	160MA, M, L	85[3]	170[6]	250[9]	400	0,56	125	150	300	30	0,40	0,60	450	6	28000	7100	1000
BC 09	RR1[29)]	180	200[6]	300[9]	400[12]	400	0,67	140	200	450	40	0,50	0,70	630	6	40000	10000	1400

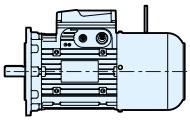
21) Standard rectifier, supplied as standard; stop time must be **2,5** s ÷ **3,5** s. If necessary, consult us.
23) Values valid with M_{fmax}, mean air-gap and nominal value of supply voltage.
24) Release time of brake obtained with standard rectifier and, for RM1, with supply voltage ≥ 200 V c.a..
25) Braking delay obtained by separate brake supply and coil disconnection on a.c. side of rectifier (t_2) or on a.c. and d.c. side (t_2 d.c.). With direct supply from motor terminal block, the values of t_2 increase of approx. 2,5 times the ones of table.
26) Friction work for brake disk wear of 1 mm (minimum value for heavy duty; real value is usually greater).
27) Maximum brake disk wear.
28) Maximum friction work for each braking.
29) In the case of a rectifier power supply ≥ 400 V a.c. with disconnection from the a.c. and d.c. sides and a high number of interventions, the RR8 rectifier is required (see section 4.14 (26)).

4.6

Technical data 400V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,18 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1373

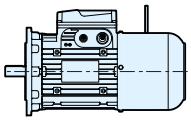
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18	**HB2Z 63 A 2**	2800	0,61	0,56	0,71	68,7	66,6	60,7	3,1	3,3	4,1	0,0002	BZ 12	1,75	4750	5,5
0,25	**HB2Z 63 B 2**	2780	0,86	0,75	0,71	70,5	68,9	63,1	3,1	3,2	4,1	0,0003	BZ 12	1,75	4750	6,1
0,37 *	**HB2Z 63 C 2**	2790	1,26	1,02	0,72	73,3	72,4	67,3	3,5	3,3	4,5	0,0003	BZ 12	3,5	4000	6,7
0,37	**HB2Z 71 A 2**	2800	1,26	0,95	0,77	75	74,7	70,8	3,1	3,3	5,2	0, 0004	BZ 12	3,5	4000	7,7
0,55	**HB2Z 71 B 2**	2820	1,86	1,33	0,78	77,3	76,9	72,9	3,6	3,7	5,8	0,0005	BZ 53	5	4000	9,4

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50 Hz 460V 60 Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
***P*N 0,18 ... 11 kW**
400V - 50Hz
460V - 60 Hz
EU (ErP)


UT.C 1373

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz	0,18	HB3Z 63 A 2	2800	0,61	0,56	0,71	65,9	61,8	54,4	2,9	2,9	3,9	0,0002	BZ 12	1,75	4750	5,5
	0,25	HB3Z 63 B 2	2800	0,85	0,73	0,71	69,7	68,6	62,8	3,0	2,9	4,1	0,0003	BZ 12	1,75	4750	6,1
	0,37 *	HB3Z 63 C 2	2815	1,26	0,99	0,73	73,8	69,3	62,0	3,0	3,0	4,4	0,0003	BZ 12	3,5	4000	6,7
	0,37	HB3Z 71 A 2	2810	1,26	0,93	0,78	73,8	74,6	70,0	3,1	3,0	5,1	0,0004	BZ 12	3,5	4000	7,7
	0,55	HB3Z 71 B 2	2830	1,86	1,31	0,78	77,8	75,5	71,5	3,9	3,4	6,3	0,0005	BZ 53	5	4000	9,4
	0,75	HB3Z 80 A 2	2875	2,49	1,70	0,79	80,7	81,5	78,8	3,5	3,8	7,3	0,0009	BZ 13	5	2500	10,7
	1,1	HB3Z 80 B 2	2870	3,7	2,29	0,84	82,7	85,0	83,6	3,7	3,9	7,6	0,0013	BZ 04	11	2500	15,5
	1,5	HB3Z 90 S 2	2890	5	2,92	0,88	84,2	86,7	86,7	3,0	3,6	7,5	0,0019	BZ 14	11	1800	20
	2,2	HB3Z 90 LA 2	2890	7,3	4,3	0,85	85,9	87,0	86,6	3,7	4,4	9,0	0,0023	BZ 05	27	1600	24
	3	HB3Z 100 LA 2	2930	9,8	6,2	0,80	87,1	87,5	85,8	4,9	5,1	9,8	0,0044	BZ 15	27	1500	30
	4	HB3Z 112 M 2	2935	13	7,5	0,87	88,1	88,3	86,7	2,7	4,2	9,4	0,0074	BZ 15	27	1400	39
	5,5	HB3Z 132 S 2	2955	18	10	0,85	89,2	89,1	86,5	4,2	6,1	12,7	0,0174	BZ 06	50	710	64
	7,5	HB3Z 132 SB 2	2960	24	14	0,85	90,1	91,3	89,2	6,5	6,5	13,4	0,0215	BZ 06	50	710	73
	9,2 *	HB3Z 132 SC 2	2960	30	17	0,84	90,7	91,1	89,4	6,3	6,3	13,3	0,0243	BZ 56	75	710	78
	11 *	HB3Z 132 MA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0243	BZ 06	100	710	78
	11	HB3Z 160 SA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0243	BZ 06	100	710	87
460 V 60 Hz	0,18	HB3Z 63 A 2	3400	0,51	0,52	0,67	65,6	62,6	55,5	3,9	3,7	4,8	0,0002	BZ 12	1,75	3750	5,5
	0,25	HB3Z 63 B 2	3430	0,70	0,67	0,67	69,5	68,3	60,8	4,1	3,8	5,6	0,0002	BZ 12	1,75	3750	6,1
	0,37 *	HB3Z 63 C 2	3435	1,03	0,90	0,70	73,4	69,2	62,2	4,1	4,0	6,1	0,0003	BZ 12	3,5	3150	6,7
	0,37	HB3Z 71 A 2	3435	1,03	0,84	0,75	73,4	74,0	68,2	3,8	3,9	6,5	0,0003	BZ 12	3,5	3150	7,7
	0,55	HB3Z 71 B 2	3455	1,52	1,18	0,76	76,8	74,8	69,6	4,6	4,0	6,4	0,0004	BZ 53	5	3150	9,4
	0,75	HB3Z 80 A 2	3490	2,05	1,58	0,77	77,0	80,1	75,6	4,6	4,1	8,3	0,0009	BZ 13	5	2500	10,7
	1,1	HB3Z 80 B 2	3490	3,0	2,00	0,82	84,0	85,1	84,1	3,9	4,2	8,6	0,0013	BZ 04	11	2500	15,5
	1,5	HB3Z 90 S 2	3500	4,1	2,54	0,87	85,5	87,2	85,2	3,5	4,4	9,0	0,0019	BZ 14	11	1800	20
	2,2	HB3Z 90 LA 2	3505	6,0	3,8	0,84	86,5	87,0	85,8	3,7	4,1	8,8	0,0023	BZ 05	27	1600	24
	3	HB3Z 100 LA 2	3535	8,1	5,3	0,80	88,5	87,6	84,3	4,3	4,8	11,5	0,0044	BZ 15	27	1500	30
	4	HB3Z 112 M 2	3545	11	6,6	0,86	88,5	90,5	89,1	3,1	3,9	10,8	0,0074	BZ 15	27	1400	39
	5,5	HB3Z 132 S 2	3560	15	9,2	0,84	89,5	88,6	85,0	7,0	5,9	13,0	0,0174	BZ 06	50	710	64
	7,5	HB3Z 132 SB 2	3560	20	12	0,85	90,2	89,4	87,1	6,0	6,3	13,8	0,0215	BZ 06	50	710	73
	9,2 *	HB3Z 132 SC 2	3560	25	15	0,84	91,0	89,7	88,6	5,6	6,2	13,6	0,0243	BZ 56	75	710	78
	11 *	HB3Z 132 MA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0243	BZ 06	100	710	78
	11	HB3Z 160 SA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0243	BZ 06	100	710	87

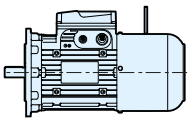
1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

4.6

Technical data 400V 50Hz

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)

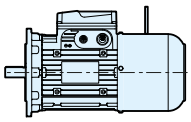

UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB2Z 63 A 4**	1 370	0,84	0,46	0,63	61,4	58,9	51,9	2,5	2,6	3,1	0,0003	BZ 12	1,75	12500	5,7
0,18	**HB2Z 63 B 4**	1350	1,28	0,64	0,66	65	64,1	58,4	2,6	2,5	3,3	0,0004	BZ 12	3,5	12500	6,3
0,25 *	**HB2Z 63 C 4**	1360	1,76	0,83	0,65	68,5	67,8	62,8	2,8	2,7	3,5	0,0004	BZ 12	3,5	10000	7,1
0,25	**HB2Z 71 A 4**	1 400	1,71	0,8	0,71	68,5	66,6	60,7	2,3	2,6	3,8	0,0008	BZ 53	5	10000	8,4
0,37	**HB2Z 71 B 4**	1 400	2,52	1,1	0,70	73,2	72,2	67,3	2,7	3,2	4,6	0,001	BZ 53	5	10000	9,3
0,55 *	**HB2Z 71 C 4**	1 400	3,75	1,5	0,70	77,1	75,7	72	3,3	3,5	5,1	0,0014	BZ 53	7,5	8000	11
0,55	**HB2Z 80 A 4**	1 420	3,69	1,34	0,78	77,1	76	72	2,9	3,1	5,8	0,0025	BZ 04	11	8000	13

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50 Hz 460V 60 Hz

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B


UT.C 1373

IE3
***P*N 0,12 ... 22 kW**
400V - 50Hz
460V - 60Hz
EU (ErP)
AU MEPS **

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz	0,12	HB3Z 63 A 4	1365	0,84	0,37	0,72	64,8	64,0	58,8	2,3	2,3	3,3	0,0003	BZ 12	1,8	12500	6,3
	0,18	HB3Z 63 B 4	1380	1,25	0,56	0,66	69,9	68,8	62,9	3,0	2,8	3,8	0,0004	BZ 12	3,5	12500	7,1
	0,25	HB3Z 71 A 4	1415	1,69	0,69	0,71	73,5	71,6	66,9	3,1	2,9	5,0	0,0008	BZ 53	5	10000	10
	0,37	HB3Z 71 B 4	1415	2,50	0,98	0,71	77,3	75,1	70,8	3,4	3,2	5,6	0,0010	BZ 53	5	10000	11
	0,55	HB3Z 80 A 4	1420	3,7	1,56	0,63	80,8	79,8	76,4	3,3	3,4	5,0	0,0025	BZ 04	11	8000	14,4
	0,75	HB3Z 80 B 4	1420	5,0	1,87	0,70	82,5	83,6	82,1	3,2	3,1	5,4	0,003	BZ 04	11	6800	16
	1,1	HB3Z 90 S 4	1430	7,3	2,50	0,76	84,1	84,5	82,8	3,4	3,6	6,4	0,0043	BZ 14	16	3150	23
	1,5	HB3Z 90 L 4	1415	10	3,3	0,78	85,3	85,2	84,2	2,6	3,5	5,6	0,0047	BZ 05	27	3000	25
	1,85 *	HB3Z 90 LB 4	1425	12	4,2	0,74	86,0	84,6	83,0	2,7	3,4	5,9	0,0047	BZ 05	27	3000	25
	2,2	HB3Z 100 LA 4	1445	15	4,7	0,78	86,7	86,9	85,9	3,4	4,0	8,1	0,008	BZ 15	40	3000	32
	3 *	HB3Z 112 MA 4	1450	20	6,1	0,80	88,7	89,1	87,9	4,1	4,1	8,5	0,013	BZ 15	40	2000	39
	4	HB3Z 112 M 4	1445	26	8,1	0,75	88,6	90,4	89,2	4,3	4,6	8,6	0,015	BZ 06S	75	1800	44
	5,5	HB3Z 132 S 4	1465	36	12	0,75	89,6	91,0	89,6	3,6	4,2	8,2	0,0367	BZ 56	75	900	69
	7,5	HB3Z 132 M 4	1460	49	15	0,80	90,4	91,0	90,1	4,2	4,4	8,8	0,0442	BZ 06	100	900	77
	9,2 *	HB3Z 132 MB 4	1460	60	19	0,76	91,0	91,2	90,4	4,4	4,2	8,2	0,047	BZ 07	150	800	81
	11	HB3Z 160 M 4	1470	71	22	0,80	91,4	92,4	92,1	3,8	3,7	8,2	0,08	BC 08	170	900	154
	15	HB3Z 160 L 4	1470	97	28	0,83	92,1	93,2	92,6	3,4	3,6	8,5	0,09	BC 08	250	800	172
	18,5	HB3Z 180 M 4	1470	120	34	0,84	92,6	93,4	93,1	3,9	3,4	8,6	0,16	BC 09	300	630	223
	22	HB3Z 180 L 4	1475	142	42	0,80	93,0	93,3	93,2	4,6	3,0	8,4	0,18	BC 09	300	500	241
460 V 60 Hz	0,12	HB3Z 63 A 4	1685	0,68	0,34	0,67	66,0	65,9	58,0	2,9	2,9	4,1	0,0003	BZ 12	1,75	10000	6,3
	0,18	HB3Z 63 B 4	1700	1,01	0,52	0,62	69,5	68,4	62,7	3,7	3,6	4,4	0,0004	BZ 12	3,5	10000	7,1
	0,25	HB3Z 71 A 4	1725	1,38	0,64	0,67	73,4	72,4	66,1	3,7	3,7	6,2	0,0011	BZ 53	5	8000	10
	0,37	HB3Z 71 B 4	1725	2,05	0,89	0,67	78,2	74,8	70,4	4,2	3,8	6,3	0,0013	BZ 53	5	8000	11
	0,55	HB3Z 80 A 4	1735	3,0	1,44	0,59	81,1	80,7	77,3	4,0	4,0	5,8	0,0023	BZ 04	11	6300	14,4
	0,75	HB3Z 80 B 4	1730	4,1	1,72	0,66	83,3	85,5	83,5	3,8	3,7	6,4	0,003	BZ 04	11	6800	16
	1,1	HB3Z 90 S 4	1740	6,0	2,20	0,72	86,5	85,1	82,4	4,4	4,3	7,3	0,0043	BZ 14	16	3150	23
	1,5	HB3Z 90 L 4	1730	8,3	2,95	0,74	86,5	86,8	85,3	3,9	3,5	6,8	0,0047	BZ 05	27	3000	25
	1,85 *	HB3Z 90 LB 4	1735	10	3,7	0,70	89,5	86,5	83,1	4,0	4,3	7,4	0,0047	BZ 05	27	3000	25
	2,2	HB3Z 100 LA 4	1750	12	4,1	0,76	89,5	87,9	85,6	4,1	4,7	9,4	0,008	BZ 15	40	3000	32
	3 *	HB3Z 112 MA 4	1755	16	5,4	0,78	89,5	89,7	88,0	4,7	4,8	9,9	0,013	BZ 15	40	2000	39
	4	HB3Z 112 M 4	1755	22	7,6	0,74	89,5	90,5	88,8	6,1	5,6	10,0	0,0150	BZ 06S	75	1800	44
	5,5	HB3Z 132 S 4	1770	30	10	0,73	91,7	90,8	88,5	4,7	4,9	9,6	0,0367	BZ 56	75	900	69
	7,5	HB3Z 132 M 4	1765	41	13	0,78	91,7	91,0	88,8	7,0	5,1	11,9	0,0442	BZ 06	100	900	77
	9,2 *	HB3Z 132 MB 4	1765	50	17	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,047	BZ 07	150	800	81
	11	HB3Z 160 M 4	1775	59	19	0,79	92,4	92,9	92,0	4,8	4,2	10,4	0,08	BC 08	170	720	154
	15	HB3Z 160 L 4	1775	81	25	0,82	93,0	93,1	92,2	4,1	4,0	9,9	0,09	BC 08	250	640	172
	18,5	HB3Z 180 M 4	1775	100	30	0,83	93,6	93,4	92,7	4,4	3,8	10,1	0,16	BC 09	300	504	223
	22	HB3Z 180 L 4	1775	118	37	0,80	93,6	93,7	93,0	4,9	3,6	9,4	0,18	BC 09	300	400	241

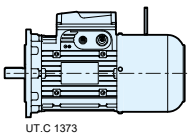
1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.
** The AS/NZS 1359.5:2004 standard (AU MEPS - Australia) applies to motors with a rated power of 0.75 kW to 185 kW (excluded). Powers of 1.85 and 9.2 kW are also excluded.

4.6

Technical data 400V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1373

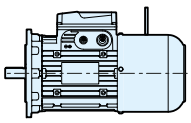
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB2Z 63 B 6**	900	1,27	0,55	0,59	52,2	48,3	40,1	2,7	2,8	2,5	0,0005	BZ 12	3,5	12500	6,3
0,15 *	**HB2Z 63 C 6**	875	1,64	0,62	0,64	55,6	53,2	46	2,5	2,5	2,6	0,0006	BZ 12	3,5	11800	6,9
0,18	**HB2Z 71 A 6**	900	1,91	0,66	0,67	59,5	57,1	49,8	2,4	2,4	3	0,001	BZ 53	5	11200	8,7
0,25	**HB2Z 71 B 6**	900	2,64	0,88	0,67	61,8	59,7	52,9	2,5	2,7	3,3	0,0013	BZ 53	5	11200	9,5
0,37 *	**HB2Z 71 C 6**	895	3,95	1,2	0,69	67,6	66,1	61	2,6	2,3	3,5	0,0018	BZ 53	7,5	10000	11,1
0,37	**HB2Z 80 A 6**	910	3,9	1,2	0,67	67,6	64	57,8	2,7	2,6	3,6	0,0021	BZ 04	11	9500	12
0,55	**HB2Z 80 B 6**	930	5,6	1,6	0,67	73,1	72,2	67,7	3	3	4,5	0,0033	BZ 04	16	9000	15

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50Hz 460V 60Hz

6 poles - 1000 min^{-1} 50Hz
1200 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,09 ... 15 kW
400V - 50Hz
460V - 60Hz
EU (ErP)


UT.C 1373

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
	kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz 3)	0,09 2)	HBZ 63 A 6	900	0,96	0,48	0,57	47,6	43,1	34,4	2,5	2,6	2,3	0,0004	BZ12	1,75	12500	5,9
	0,12	HB3Z 63 B 6	830	1,38	0,42	0,72	57,7	52,1	47,0	1,9	1,9	2,2	0,0005	BZ12	3,5	12500	6,9
	0,18	HB3Z 71 A 6	910	1,89	0,57	0,71	63,9	64,3	57,4	2,5	2,4	3,4	0,001	BZ53	5	11200	9,5
	0,25	HB3Z 71 B 6	910	2,62	0,76	0,69	68,6	66,0	60,8	2,7	2,6	3,7	0,0013	BZ53	5	11200	10,9
	0,37	HB3Z 80 A 6	930	3,80	1,00	0,73	73,5	70,4	65,8	2,6	2,6	4,2	0,0021	BZ04	11	9500	15,0
	0,55	HB3Z 90 SA 6	945	5,6	1,45	0,71	77,2	74,2	62,1	2,5	3,1	4,9	0,0033	BZ14	16	9000	19,5
	0,75	HB3Z 90 S 6	950	7,5	2,02	0,68	78,9	77,3	72,5	3,1	3,3	5,3	0,0057	BZ 14	16	7100	23
	1,1	HB3Z 90 L 6	930	11	2,72	0,72	81,0	78,6	76,1	2,6	3,0	5,0	0,0071	BZ 05	27	5300	26
	1,5	HB3Z 100 LA 6	950	15	3,5	0,75	82,5	82,6	80,8	2,6	3,2	6,3	0,013	BZ 15	40	3000	32
	2,2	HB3Z 112 M 6	960	22	5,2	0,72	84,3	84,9	82,8	3,1	3,4	6,1	0,0202	BZ 06S	50	2800	42
	3	HB3Z 132 S 6	970	30	7,0	0,72	85,6	87,8	85,9	2,4	3,7	7,0	0,0435	BZ 56	75	1400	65
	4	HB3Z 132 M 6	970	39	9,4	0,71	86,8	88,6	86,9	2,7	4,0	7,6	0,0589	BZ 06	100	1250	77
	5,5	HB3Z 132 MB 6	970	54	12	0,73	88,0	89,3	88,7	3,2	3,4	7,2	0,06	BZ 07	150	1100	79
	7,5	HB3Z 160 M 6	970	74	15	0,78	89,1	90,0	89,1	3,2	3,8	7,9	0,11	BC 08	170	1120	157
	11	HB3Z 160 L 6	965	109	22	0,80	90,3	90,4	90,0	3,3	3,7	7,6	0,14	BC 08	250	950	177
	15	HB3Z 180 L 6	975	147	30	0,80	91,2	91,9	91,8	3,1	4,1	8,5	0,23	BC 09	300	630	239
460 V 60 Hz 4)	0,09 2)	HBZ 63 A 6	1120	0,77	0,41	0,52	52,5	44,3	39,4	2,9	3,0	2,7	0,0004	BZ 12	1,75	12500	5,9
	0,12	HB3Z 63 B 6	1080	1,06	0,38	0,63	64,0	54,8	47,4	2,6	2,6	2,7	0,0005	BZ 12	3,5	10000	6,9
	0,18	HB3Z 71 A 6	1120	1,53	0,50	0,66	68,7	65,9	59,5	3,0	3,0	4,2	0,0012	BZ 53	5	9000	9,5
	0,25	HB3Z 71 B 6	1130	2,11	0,70	0,63	71,4	67,8	61,7	3,3	3,3	4,3	0,0017	BZ 53	5	9000	10,9
	0,37	HB3Z 80 A 6	1140	3,1	0,90	0,69	75,3	71,5	65,6	4,1	3,2	5,0	0,0019	BZ 04	11	7500	15
	0,55	HB3Z 90 SA 6	1155	4,5	1,26	0,67	81,7	78,3	74,3	3,2	3,8	6,0	0,0056	BZ 14	16	7100	19,5
	0,75 *	HB3Z 100 LA 6	1155	6,2	1,78	0,64	82,5	78,2	72,5	4,0	4,0	6,2	0,013	BZ 15	13	3200	32
	1,1 *	HB3Z 112 M 6	1160	9,1	2,16	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	BZ 15	27	2500	40
	1,5 *	HB3Z 112 MB 6	1160	12	3,0	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	BZ 15	40	2000	40
	2,2 *	HB3Z 132 S 6	1170	18	4,3	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	BZ 06	50	1400	58
	3 *	HB3Z 132 M 6	1170	24	5,8	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	BZ 56	75	1000	67
	4	HB3Z 132 MB 6	1170	33	8,0	0,70	89,5	91,0	89,5	3,1	4,1	8,0	0,06	BZ 06	100	800	78
	5,5 *	HB3Z 160 MA 6	1180	45	10	0,74	91,0	89,5	87,7	3,6	4,7	9,5	0,11	BC 08	170	896	157
	7,5	HB3Z 160 M 6	1175	61	14	0,76	91,0	90,7	89,1	3,6	4,4	9,0	0,11	BC 08	170	896	157
	11	HB3Z 160 L 6	1170	90	19	0,78	91,7	91,2	90,2	3,5	4,3	9,0	0,14	BC 08	250	760	177
	15	HB3Z 180 L 6	1180	121	26	0,78	91,7	92,6	91,4	3,3	4,7	9,6	0,23	BC 09	300	504	239

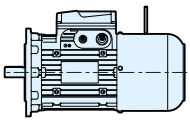
1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
2) Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.
3) Power-motor size combinations from 0.75 to 5.5 kW are available and rated at 50Hz only. For other voltages, see section 4.14 (1).
4) Power-motor size combinations from 0.75 to 4 kW are available and rated at 60Hz only. For other voltages, see section 4.14 (1).
* Power or motor power-to-size correspondence not according to standard.

4.7

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,18 ... 11 kW
380V - 50Hz
Eurasian Economic Union
EAC

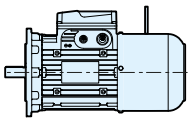

UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18	**HB3Z 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0002	BZ 12	1,75	4750	5,5
0,25	**HB3Z 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0002	BZ 12	1,75	4750	6,1
0,37 *	**HB3Z 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0003	BZ 12	3,5	4000	6,7
0,37	**HB3Z 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0003	BZ 12	3,5	4000	7,7
0,55	**HB3Z 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0004	BZ 53	5,0	4000	9,4
0,75	**HB3Z 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,0010	BZ 13	5,0	2500	10,7
1,1	**HB3Z 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0015	BZ 04	11	2500	15,5
1,5	**HB3Z 90 S 2**	2880	5,0	3,0	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,0021	BZ 14	11	1800	20
2,2	**HB3Z 90 LA 2**	2880	7,3	4,4	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0027	BZ 05	27	1600	24
3	**HB3Z100 LA 2**	2920	9,8	6,2	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0048	BZ 15	27	1500	30
4	**HB3Z112 M 2**	2930	13	7,8	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0078	BZ 15	27	1400	39
5,5	**HB3Z132 S 2**	2950	18	11	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0184	BZ 06	50	710	64
7,5	**HB3Z132 SB 2**	2950	24	14	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0225	BZ 06	50	710	73
9,2 *	**HB3Z132 SC 2**	2955	30	18	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0253	BZ 56	75	710	78
11	**HB3Z132 MA 2**	2940	36	21	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0253	BZ 06	100	710	78

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
***P*N 0,12 ... 22 kW**
380V - 50Hz
Eurasian Economic Union
EAC


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB3Z 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0003	BZ 12	1,8	12500	6,3
0,18	**HB3Z 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0004	BZ 12	3,5	12500	7,1
0,25	**HB3Z 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0011	BZ 53	5,0	10000	10
0,37	**HB3Z 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0013	BZ 53	5,0	10000	11
0,55	**HB3Z 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0023	BZ 04	11	8000	14,4
0,75	**HB3Z 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,0020	BZ 04	11	6800	16
1,1	**HB3Z 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0043	BZ 14	16	3150	23
1,5	**HB3Z 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0047	BZ 05	27	3000	25
1,85 *	**HB3Z 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0047	BZ 05	17	3000	25
2,2	**HB3Z 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,008	BZ 15	40	3000	32
3 *	**HB3Z 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	BZ 15	40	2000	39
4	**HB3Z 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,015	BZ 06S	75	1800	44
5,5	**HB3Z 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0367	BZ 56	75	900	69
7,5	**HB3Z 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0442	BZ 06	100	900	77
9,2 *	**HB3Z 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,047	BZ 07	150	800	81
11	**HB3Z 160 M 4**	1465	72	22	0,83	91,4	92,2	91,9	3,1	3,3	8,2	0,08	BC 08	170	900	154
15	**HB3Z 160 L 4**	1465	98	29	0,84	92,1	93,4	93,3	3,1	3,1	7,7	0,09	BC 08	250	800	172
18,5	**HB3Z 180 M 4**	1470	120	36	0,85	92,6	93,2	92,9	3,4	3,0	7,7	0,16	BC 09	300	630	223
22	**HB3Z 180 L 4**	1475	142	43	0,83	93,0	93,2	92,8	3,7	3,5	9,1	0,18	BC 09	300	500	241

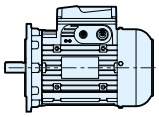
1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

4.7

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,09 ... 15 kW
380V - 50Hz
Eurasian Economic Union
EAC


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,09 *	**HBZ 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0004	BZ 12	1,75	12500	5,9
0,12	**HB3Z 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0005	BZ 12	3,5	12500	7
0,18	**HB3Z 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0012	BZ 53	5,0	12500	10
0,25	**HB3Z 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	BZ 53	5,0	11200	11
0,37	**HB3Z 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0019	BZ 04	11	9500	15
0,55	**HB3Z 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0056	BZ 14	16	6000	20
0,75	**HB3Z 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0057	BZ 14	16	7100	20
1,1	**HB3Z 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	BZ 05	27	5300	26
1,5	**HB3Z 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,0133	BZ 15	40	3000	32
2,2	**HB3Z 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,0211	BZ 06S	50	2800	42
3	**HB3Z 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0445	BZ 56	75	1400	65
4	**HB3Z 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,06	BZ 06S	100	1250	77
5,5	**HB3Z 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,0623	BZ 07	150	1100	79
7,5	**HB3Z 160 M 6**	965	74	16	0,81	89,1	89,8	89,8	2,8	3,3	7,1	0,11	BC 08	170	1120	157
11	**HB3Z 160 L 6**	965	109	22	0,82	90,3	90,2	89,0	2,7	3,3	7,0	0,14	BC 08	250	950	177
15	**HB3Z 180 L 6**	970	148	30	0,82	91,2	91,8	91,8	2,8	3,6	7,9	0,23	BC 09	300	630	239

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.

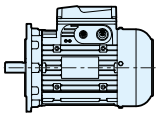
Page intentionally left blank.

4.8

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,18 ... 11 kW
380V - 50Hz
China (CCC CEL)

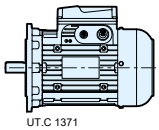

UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18 [2]	**HB3Z 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0002	BZ 12	1,75	4750	5,5
0,25 [2]	**HB3Z 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0002	BZ 12	1,75	4750	6,1
0,37 [2]	**HB3Z 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0003	BZ 12	3,5	4000	6,7
0,37 [2]	**HB3Z 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0003	BZ 12	3,5	4000	7,7
0,55 [2]	**HB3Z 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0004	BZ 53	5	4000	9,4
0,75 [2] [3]	**HB3Z 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,0010	BZ 13	5	2500	10,7
1,1 [2] [3]	**HB3Z 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0015	BZ 04	11	2500	15,5
1,5 [2] [3]	**HB3Z 90 S 2**	2880	5,0	3,00	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,0021	BZ 14	11	1800	20
2,2 [2] [3]	**HB3Z 90 LA 2**	2880	7,3	4,40	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0027	BZ 05	27	1600	24
3 [3]	**HB3Z100 LA 2**	2920	9,9	6,20	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0048	BZ 15	27	1500	30
4 [3]	**HB3Z112 M 2**	2930	13,0	7,80	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0078	BZ 15	27	1400	39
5,5 [3]	**HB3Z132 S 2**	2950	17,8	10,60	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0184	BZ 06	50	710	64
7,5 [3]	**HB3Z132 SB 2**	2950	24,3	14,20	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0225	BZ 06	50	710	73
9,2 [3]	**HB3Z132 SC 2**	2955	29,9	17,50	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0253	BZ 56	75	710	78
11 [3]	**HB3Z132 MA 2**	2940	35,9	20,50	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0253	BZ 06	100	710	78

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
2) Motors certified to CCC (China Compulsory Certificate)
3) Motors certified to CEL (China Energy Label)

4 poles - 1500 min^{-1} 50Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,12 ... 22 kW
380V - 50Hz
China (CCC CEL)


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12 [2]	**HB3Z 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0003	BZ 12	1,8	12500	6,3
0,18 [2]	**HB3Z 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0004	BZ 12	3,5	12500	7,1
0,25 [2]	**HB3Z 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0011	BZ 53	5,0	10000	10
0,37 [2]	**HB3Z 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0013	BZ 53	5,0	10000	11
0,55 [2]	**HB3Z 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0023	BZ 04	11	8000	14,4
0,75 [2] [3]	**HB3Z 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,002	BZ 04	11	6800	16
1,1 [2] [3]	**HB3Z 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0043	BZ 14	16	3150	23
1,5 [3]	**HB3Z 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0047	BZ 05	27	3000	25
1,85 [3]	**HB3Z 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0047	BZ 05	17	3000	25
2,2 [3]	**HB3Z 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,008	BZ 15	40	3000	32
3 [3]	**HB3Z 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	BZ 15	40	2000	39
4 [3]	**HB3Z 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,015	BZ 06S	75	1800	44
5,5 [3]	**HB3Z 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0367	BZ 56	75	900	69
7,5 [3]	**HB3Z 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0442	BZ 06	100	900	77
9,2 [3]	**HB3Z 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,047	BZ 07	150	800	81
11 [3]	**HB3Z 160 M 4**	1465	72	22	0,83	91,4	92,2	91,9	3,1	3,3	8,2	0,08	BC 08	170	900	154
15 [3]	**HB3Z 160 L 4**	1465	98	29	0,84	92,1	93,4	93,3	3,1	3,1	7,7	0,09	BC 08	250	800	172
18,5 [3]	**HB3Z 180 M 4**	1470	120	36	0,85	92,6	93,2	92,9	3,4	3,0	7,7	0,16	BC 09	300	630	223
22 [3]	**HB3Z 180 L 4**	1470	143	44	0,82	93,0	92,7	92,9	4,0	2,7	7,6	0,18	BC 09	300	500	241

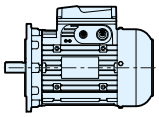
1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
2) Motors certified to CCC (China Compulsory Certificate)
3) Motors certified to CEL (China Energy Label)

4.8

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,09 ... 15 kW
380V - 50Hz
China (CCC CEL)


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts,/h	
0,09 [2] *	**HBZ 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0004	BZ 12	1,75	12500	5,9
0,12 [2]	**HB3Z 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0005	BZ 12	3,5	12500	7
0,18 [2]	**HB3Z 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0012	BZ 53	5,0	12500	10
0,25 [2]	**HB3Z 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	BZ 53	5,0	11200	11
0,37 [2]	**HB3Z 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0019	BZ 04	11	9500	15
0,55 [2]	**HB3Z 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0056	BZ 14	16	6000	20
0,75 [2] [3]	**HB3Z 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0057	BZ 14	16	7100	20
1,1 [3]	**HB3Z 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	BZ 05	27	5300	26
1,5 [3]	**HB3Z 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,0133	BZ 15	40	3000	32
2,2 [3]	**HB3Z 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,0211	BZ 06S	50	2800	42
3 [3]	**HB3Z 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0445	BZ 56	75	1400	65
4 [3]	**HB3Z 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,06	BZ 06S	100	1250	77
5,5 [3]	**HB3Z 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,0623	BZ 07	150	1100	79
7,5 [3]	**HB3Z 160M 6**	965	74	16	0,81	89,1	89,8	89,8	2,8	3,3	7,1	0,11	BC 08	170	1120	157
11 [3]	**HB3Z 160L 6**	965	109	22	0,82	90,3	90,2	89,0	2,7	3,3	7,0	0,14	BC 08	250	950	177
15 [3]	**HB3Z 180L 6**	970	148	30	0,82	91,2	91,8	91,8	2,8	3,6	7,9	0,23	BC 09	300	630	239

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
2) Motors certified to CCC (China Compulsory Certificate)
3) Motors certified to CEL (China Energy Label)
* Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.

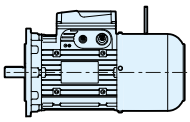
Page intentionally left blank.

4.9

Technical data 230/460V 60Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,16 ... 0,75 hp
230/460V - 60Hz 3)
USA
NEMA MG1-12
c UL us


UT.C 1373

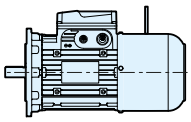
P_N 2)		Motor	n_N 2)	M_N	I_N		PF 2)	NEMA Nom. Eff. MG1-12	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake 1)	M_f	z_0	kg
hp	kW		RPM	N m	A 230V	A 460V	%	%					kg m^2		N m	starts/h	
0,16	0,12	**HB2Z 63 A 4**	1690	0,68	0,84	0,42	58	64	J	3,1	3,1	3,6	0,0003	BZ12	1,75	10000	5,7
0,25	0,18	**HB2Z 63 B 4**	1680	1,02	1,18	0,59	6	69	J	3,3	3,1	3,8	0,0004	BZ12	3,5	10000	6,3
0,33	0,25 *	**HB2Z 63 C 4**	1690	1,42	1,5	0,75	59	72,3	J	3,5	3,5	4,2	0,0004	BZ12	3,5	8000	7,1
0,33	0,25	**HB2Z 71 A 4**	1720	1,39	1,4	0,7	65	70,9	K	2,8	3,3	4,8	0,0008	BZ53	5	8000	8,4
0,5	0,37	**HB2Z 71 B 4**	1720	2,06	1,9	0,95	65	76	K	3,1	3,8	5,3	0,001	BZ53	5	8000	9,3
0,75	0,55 *	**HB2Z 71 C 4**	1720	3,06	2,6	1,3	66	78,8	K	4	4,1	6,3	0,0014	BZ53	7,5	6300	11
0,75	0,55	**HB2Z 80 A 4**	1740	3	2,4	1,2	74	78,4	L	3,3	3,7	7,2	0,0025	BZ04	11	6300	13

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
2) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
3) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power or motor power-to-size correspondence not according to standard.

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

Premium Efficiency (IE3)
P_N 0,16 ... 12,3 hp
230/460V - 60Hz 2)
USA (EISA)
ENERGY c UL us CC131B

In accordance with US DOE 10 CFR 431
and CSA C390 EISA ACT


UT.C 1373

P_N 1)		Motor	n_N 1)	M_N	I_N		PF 1)	NEMA Nom. Eff. MG1-12	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake	M_f	z_0	kg
hp	kW		RPM	N m	A 230V	A 460V	%	%					kg m^2		N m	starts/h	
0,16	0,12 *	**HB3Z 63 A 4**	1685	0,68	0,66	0,33	67	68,2	H	2,9	2,9	4,1	0,0003	BZ12	1,75	10000	6,3
0,25	0,18 *	**HB3Z 63 B 4**	1700	1,01	1,02	0,51	62	71,8	J	3,7	3,6	4,4	0,0004	BZ12	3,5	10000	7,1
0,33	0,25 *	**HB3Z 71 A 4**	1730	1,38	1,26	0,63	67	74,2	L	3,7	3,7	6,2	0,0011	BZ53	5,0	8000	10
0,5	0,37 *	**HB3Z 71 B 4**	1725	2,05	1,77	0,89	67	78,2	K	4,2	3,8	6,3	0,0013	BZ53	5,0	8000	11
0,75	0,55 *	**HB3Z 80 A 4**	1735	3,0	2,85	1,43	59	82,0	K	4,0	4,0	5,8	0,0023	BZ04	11	6300	14,4
1	0,75 **	**HB3Z 90 S 4**	1735	4,1	2,86	1,43	77	85,5	K	3,4	4,3	7,2	0,0032	BZ14	11	3150	19,4
1,5	1,1 **	**HB3Z 90 L 4**	1740	6,0	4,3	2,13	75	86,5	K	3,4	4,1	7,9	0,0043	BZ14	16	2500	22
2	1,5	**HB3Z 90 LB 4**	1740	8,2	5,8	2,9	75	86,5	L	3,4	4,4	7,9	0,0043	BZ05	27	2500	25
3	2,2 **	**HB3Z112 MA 4**	1760	12	8,1	4,1	76	89,5	M	7,4	5,1	9,6	0,012	BZ15	40	2000	37
4	3 **	**HB3Z112 M 4**	1755	16	11	5,3	79	89,5	M	3,5	5,4	8,9	0,013	BZ15	40	1600	39
5,4	4	**HB3Z112 MB 4**	1755	22	16	7,8	72	89,5	N	4,0	5,5	10,3	0,014	BZ06S	75	1400	44
7,5	5,5 **	**HB3Z132 M 4**	1765	30	19	9,5	80	91,7	L	4,1	4,4	9,7	0,0357	BZ56	75	710	69
10	7,5	**HB3Z132 MB 4**	1765	41	26	13	80	91,7	L	3,7	4,4	9,1	0,0448	BZ06	100	710	80
12,3	9,2	**HB3Z132 MC 4**	1765	50	34	17	75	91,7	M	4,3	4,4	8,7	0,0448	BZ07	150	710	80

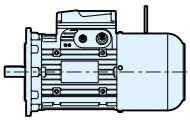
1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power ratings from 0.16 to 0.75 hp are suitable for the US market and are not covered by EISA regulations, therefore they do not bear the UL Energy logo on the nameplate.
** Power or motor power-to-size correspondence not according to standard.

4.9

Technical data 230/460V 60Hz

6 poles - 1200 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,16 ... 0,75 hp
230/460V - 60Hz 3)
USA
NEMA MG1-12


UT.C 1373

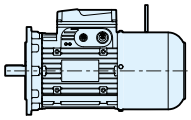
P_N 2)		Motor	n_N 2)	M_N	I_N		PF 2)	NEMA Nom. Eff. MG1-12	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake 1)	M_f	z_0	kg
hp	kW		RPM	N m	A 230V	A 460V	%	%					kg m^2		N m	starts/h	
0,16	0,12	**HB2Z 63 B 6**	1120	1,02	1,04	0,52	53	55,8	J	3,1	3,2	2,9	0,0005	BZ 12	3,5	10000	6,3
0,20	0,15 *	**HB2Z 63 C 6**	1100	1,3	1,2	0,6	56	58	J	3,1	3,2	3	0,0006	BZ 12	3,5	9500	6,9
0,25	0,18	**HB2Z 71 A 6**	1120	1,53	1,22	0,61	60	62,6	H	3	3,1	3,6	0,001	BZ 53	5	9000	8,7
0,33	0,25	**HB2Z 71 B 6**	1120	2,1	1,62	0,81	60	64,9	J	3,1	3,1	3,9	0,0013	BZ 53	5	9000	9,5
0,5	0,37 *	**HB2Z 71 C 6**	1120	3,16	2,2	1,1	63	70,9	J	3,2	3,3	4,5	0,0018	BZ53	7,5	8000	11,1
0,5	0,37	**HB2Z 80 A 6**	1130	3,12	2,2	1,1	61	68,4	J	3,3	3,5	4,3	0,0021	BZ 04	11	7500	12
0,75	0,55	**HB2Z 80 B 6**	1140	4,6	3	1,5	62	75,7	K	3,6	3,7	5,3	0,0033	BZ 04	16	7100	15

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
2) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
3) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power or motor power-to-size correspondence not according to standard.

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

Premium Efficiency (IE3)
P_N 0,12 ... 5,4 hp
230/460V - 60Hz [2)]
USA (EISA)
ENERGY c UL us CC131B

In accordance with US DOE 10 CFR 431
and CSA C390 EISA ACT


UT.C 1373

P_N 1)		Motor	n_N 1)	M_N	I_N		PF 1)	NEMA Nom. Eff. MG1-12	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake	M_f	z_0	kg
hp	kW		RPM	N m	A 230V	A 460V	%	%					kg m^2		N m	starts./h	
0,12	0,09 *	**HBZ 63 A 6**	1120	0,77	0,83	0,41	52	52,5	J	2,9	3,0	2,7	0,0004	BZ12	1,75	10000	5,9
0,16	0,12 *	**HB3Z 63 B 6**	1080	1,06	0,75	0,37	63	64,0	H	2,6	2,6	2,7	0,0005	BZ12	3,5	10000	6,9
0,25	0,18 *	**HB3Z 71 A 6**	1120	1,53	1,00	0,50	66	68,7	H	3,0	3,0	4,2	0,0012	BZ53	5,0	9000	9,5
0,33	0,25 *	**HB3Z 71B 6**	1130	2,11	1,40	0,70	63	71,4	J	3,3	3,4	4,3	0,0017	BZ53	5,0	9000	10,9
0,5	0,37 *	**HB3Z 80 A 6**	1140	3,10	1,81	0,91	68	75,3	J	4,1	3,3	5,1	0,0019	BZ04	11	7500	15
0,75	0,55 *	**HB3Z 90 SA 6**	1155	4,5	2,52	1,26	67	81,7	K	3,2	3,8	6,0	0,0056	BZ14	16	7100	19,5
1	0,75 **	**HB3Z 100 LA 6**	1165	6,1	3,2	1,61	71	82,5	M	3,0	4,5	7,7	0,0134	BZ15	13	3200	32
1,5	1,1 **	**HB3Z 112 M 6**	1160	9,1	4,3	2,16	73	87,5	J	2,5	3,4	6,3	0,0219	BZ15	27	2500	40
2	1,5 **	**HB3Z 112 MB 6**	1160	12	6,1	3,0	70	88,5	K	3,0	3,9	6,9	0,0219	BZ15	40	2000	40
3	2,2 **	**HB3Z 132 S 6**	1170	18	8,6	4,3	72	89,5	K	2,7	3,6	7,3	0,0367	BZ06	50	1400	58
4	3 **	**HB3Z 132 M 6**	1775	24	12	5,8	72	89,5	K	2,8	3,8	7,6	0,0471	BZ56	75	1000	67
5,4	4	**HB3Z 132 MB 6**	1775	33	16	7,9	71	89,5	L	3,4	4,3	8,2	0,0610	BZ06	100	800	78

1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power ratings from 0.16 to 0.75 hp are suitable for the US market and are not covered by EISA regulations, therefore they do not bear the UL Energy logo on the nameplate.
** Power or motor power-to-size correspondence not according to standard.

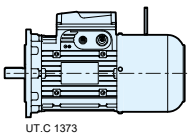
4.10

Technical data 440V 60Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

Premium Efficiency (IE3)
P_N 0,12 ... 15 kW
440V - 60Hz
Mexico (NOM)

NOM


UT.C 1373

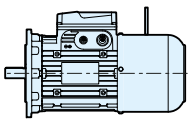
P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 440 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12 *	**HB3Z 63 A 4**	1675	0,68	0,34	0,70	66,0	66,0	59,6	2,7	2,7	3,9	0,0002	BZ 12	1,8	10000	6,3
0,18 *	**HB3Z 63 B 4**	1690	1,02	0,52	0,65	69,5	70,3	63,5	3,4	3,2	4,3	0,0004	BZ 12	3,5	10000	7,1
0,25 *	**HB3Z 71 A 4**	1720	1,39	0,64	0,70	73,4	72,9	67,9	3,4	3,3	5,9	0,0011	BZ 53	5	8000	10
0,37 *	**HB3Z 71 B 4**	1715	2,06	0,87	0,71	78,2	74,1	69,3	3,6	3,3	5,8	0,0013	BZ 53	5	8000	11
0,55 *	**HB3Z 80 A 4**	1725	3,0	1,41	0,63	81,1	81,6	78,7	3,5	3,5	5,8	0,0023	BZ 04	11	6300	14,4
0,75	**HB3Z 90 S 4**	1735	4,1	1,54	0,77	83,5	83,5	80,4	3,4	4,3	7,2	0,0034	BZ 14	11	3150	19,4
1,1	**HB3Z 90 L 4**	1740	6,0	2,22	0,75	86,5	87,4	85,8	3,4	4,1	7,7	0,0045	BZ 14	16	2500	22
1,5	**HB3Z 90 LB 4**	1740	8,2	3,1	0,74	86,5	86,3	84,7	3,4	4,4	7,9	0,0047	BZ 05	27	2500	25
2,2	**HB3Z 112 MA 4**	1755	12	4,1	0,79	89,5	90,6	88,9	6,1	4,5	8,8	0,0123	BZ 15	40	2000	37
3	**HB3Z 112 M 4**	1755	16	5,6	0,79	89,5	90,6	89,6	4,1	5,4	9,4	0,0133	BZ 15	40	1600	39
4	**HB3Z 112 MB 4**	1755	22	8,1	0,72	89,5	91,0	89,5	4,0	5,5	10,3	0,0149	BZ 06S	75	1400	44
5,5	**HB3Z 132 M 4**	1765	30	10	0,80	91,7	92,7	91,7	4,1	4,4	9,7	0,0367	BZ 56	75	710	69
7,5	**HB3Z 132 MB 4**	1760	41	13	0,80	91,7	92,6	92,2	3,7	4,4	9,1	0,0458	BZ 06	100	710	80
9,2	**HB3Z 132 MC 4**	1765	50	18	0,75	91,7	92,0	90,9	4,3	4,4	8,7	0,0458	BZ 07	150	710	80
11	**HB3Z 160 M 4**	1775	59	20	0,81	92,4	92,8	91,8	4,3	3,7	9,3	0,08	BC 08	170	720	154
15	**HB3Z 160 L 4**	1775	81	26	0,82	93,0	93,1	92,2	3,7	3,6	9,3	0,09	BC 08	250	640	172

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power ratings from 0.12 to 0.55 kW are suitable for the Mexican market and are not covered by the NOM-016 ENER 2016 standard, therefore they do not bear the NOM logo on the nameplate.

6 poles - 1200 min^{-1}
S1
IP 55
IC411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

Premium Efficiency (IE3)
P_N 0,09 ... 11 kW
440V - 60Hz
Mexico (NOM)

NOM


UT.C 1373

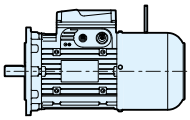
P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 440 V		100%	75%	50%				kg m^2		N m	starts/h	
0,09 *	**HBZ 63 A 6**	1120	0,77	0,41	0,52	52,5	44,3	39,4	2,9	3,0	2,7	0,0004	BZ 12	1,75	10000	5,9
0,12 *	**HB3Z 63 B 6**	1065	1,08	0,37	0,66	64,0	55,4	49,2	2,3	2,3	2,7	0,0005	BZ 12	3,5	10000	6,9
0,18 *	**HB3Z 71 A 6**	1115	1,54	0,51	0,69	67,5	65,9	58,9	2,7	2,7	3,9	0,0012	BZ 53	5,0	9000	9,5
0,25 *	**HB3Z 71 B 6**	1120	2,13	0,70	0,66	71,4	65,9	59,5	2,7	2,8	4,0	0,0017	BZ 53	5,0	9000	10,9
0,37 *	**HB3Z 80 A 6**	1135	3,1	0,91	0,71	75,3	72,6	66,3	4,0	2,9	4,8	0,0019	BZ 04	11	7500	15
0,55 *	**HB3Z 90 SA 6**	1150	4,6	1,26	0,70	81,7	78,9	75,4	2,9	3,4	5,7	0,0056	BZ 14	16	7100	19,5
0,75	**HB3Z 100 LA 6**	1160	6,2	1,62	0,74	82,5	83,7	81,4	2,8	4,1	7,3	0,0130	BZ 15	13	3200	32
1,1	**HB3Z 112 M 6**	1155	9,1	2,20	0,75	87,5	88,3	86,9	2,5	3,1	6,3	0,0215	BZ 15	27	2500	40
1,5	**HB3Z 112 MB 6**	1160	12	3,2	0,70	88,5	88,2	86,2	3,0	3,9	6,9	0,0215	BZ 15	40	2000	40
2,2	**HB3Z 132 S 6**	1170	18	4,5	0,72	89,5	88,6	86,6	2,7	3,6	7,3	0,0358	BZ 06	50	1400	58
3	**HB3Z 132 M 6**	1175	24	6,1	0,72	89,5	90,3	88,9	2,8	3,8	7,6	0,0461	BZ 56	75	1000	67
4	**HB3Z 132 MB 6**	1170	33	8,0	0,73	89,5	90,5	88,9	3,0	3,9	7,6	0,06	BZ 06	100	800	78
5,5	**HB3Z 160 MA 6**	1170	45	11	0,70	91,0	90,8	90,3	3,0	4,2	8,3	0,11	BC08	170	896	157
7,5	**HB3Z 160 M 6**	1170	61	14	0,78	91,0	90,7	89,3	3,1	4,0	8,3	0,11	BC 08	170	896	157
11	**HB3Z 160 L 6**	1170	82	18	0,80	91,7	91,4	90,4	3,0	3,9	8,3	0,14	BC 08	250	760	177

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power ratings from 0.09 to 0.55 kW are suitable for the Mexican market and are not covered by the NOM-016 ENER 2016 standard, therefore they do not bear the NOM logo on the nameplate.

4.11

Technical data
220/380V 60Hz
440V 60 Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

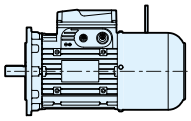

UT.C 1373

IR3 (IE3)
P_N 0,75 ... 22 kW
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake 1)	Mf	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts./h	
220/380 V 60 Hz	0,75	HB3Z 80 B 4	1740	4,1	3,8/2,20	0,62	83,5	83,1	80,1	4,1	3,9	6,5	0,002	BZ 04	11	6800	16
	1,1	HB3Z 90 S 4	1735	6,1	4,3/2,48	0,78	86,5	85,7	83,7	3,7	3,7	7,1	0,0043	BZ 14	16	3150	23
	1,5	HB3Z 90 L 4	1740	8,2	6,4/3,7	0,71	86,5	86,4	84,1	4,1	4,4	6,9	0,0047	BZ 05	27	3000	25
	2,2	HB3Z 100 LA 4	1755	12	8,9 /5,2	0,72	89,5	86,6	83,6	4,4	5,0	9,7	0,008	BZ 15	40	3000	32
	3 *	HB3Z 112 MA 4	1760	16	12/6,7	0,76	89,5	89,6	87,0	5,2	5,2	10,3	0,013	BZ 15	40	2000	39
	4	HB3Z 112 M 4	1765	22	17/9,8	0,69	89,5	89,6	86,8	6,8	6,0	10,3	0,015	BZ 06S	75	1800	44
	5,5	HB3Z 132 S 4	1775	30	22/13	0,70	91,7	90,8	87,1	4,9	5,3	9,8	0,0367	BZ 56	75	900	69
	7,5	HB3Z 132 M 4	1765	41	28/16	0,77	91,7	91,0	88,8	7,0	5,1	11,9	0,0442	BZ 06	100	900	77
	9,2 *	HB3Z 132 MB 4	1765	50	35/20	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,047	BZ 07	150	800	81
	11	HB3Z 160 M 4	1775	59	40/23	0,78	92,4	92,6	91,7	4,7	4,4	10,7	0,08	BC 08	170	720	154
	15	HB3Z 160 L 4	1775	81	52/30	0,81	93,0	93,4	92,3	4,3	4,2	10,0	0,09	BC 08	250	640	172
	18,5	HB3Z 180 M 4	1780	99	64/37	0,81	93,6	93,3	92,2	4,4	4,0	10,2	0,16	BC 09	300	504	223
	22	HB3Z 180 L 4	1780	118	75/43	0,82	93,6	93,4	92,6	4,9	3,8	9,4	0,18	BC 09	300	400	241
440 V 60 Hz	0,75	HB3Z 80 B 4	1725	4,2	1,71	0,69	83,5	83,6	81,5	3,5	3,2	6,0	0,002	BZ 04	11	6800	16
	1,1	HB3Z 90 S 4	1730	6,1	2,07	0,81	86,5	82,7	80,0	3,2	3,3	6,5	0,0043	BZ 14	16	3150	23
	1,5	HB3Z 90 L 4	1725	8,3	2,92	0,78	86,5	87,0	85,9	3,5	3,3	6,6	0,0047	BZ 05	27	3000	25
	2,2	HB3Z 100 LA 4	1745	12	4,1	0,79	89,5	87,3	84,8	3,6	4,1	8,7	0,008	BZ 15	40	3000	32
	3 *	HB3Z 112 MA 4	1750	16	5,4	0,81	89,5	89,9	88,3	4,2	4,3	9,1	0,013	BZ 15	40	2000	39
	4	HB3Z 112 M 4	1755	22	7,6	0,77	89,5	90,6	88,4	5,6	5,0	9,7	0,015	BZ 06S	75	1800	44
	5,5	HB3Z 132 S 4	1770	30	10	0,77	91,7	91,4	88,3	4,1	4,6	9,1	0,0367	BZ 56	75	900	69
	7,5	HB3Z 132 M 4	1760	41	13	0,80	91,7	91,1	89,4	6,5	4,4	11,3	0,0442	BZ 06	100	900	77
	9,2 *	HB3Z 132 MB 4	1760	50	17	0,78	92,4	91,5	91,9	4,7	4,5	9,4	0,047	BZ 07	150	800	80,5
	11	HB3Z 160 M 4	1775	59	20	0,81	92,4	92,9	92,0	4,3	3,7	9,3	0,08	BC 08	170	720	154
	15	HB3Z 160 L 4	1770	81	25	0,83	93,0	93,3	92,9	3,7	3,6	9,3	0,09	BC 08	250	640	172
	18,5	HB3Z 180 M 4	1775	100	31	0,83	93,6	93,4	92,7	4,4	3,8	10,1	0,16	BC 09	300	504	223
	22	HB3Z 180 L 4	1775	118	38	0,82	93,6	93,6	93,1	4,3	3,3	8,6	0,18	BC 09	300	400	241

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**


UT.C 1373

IR3 (IE3)
P_N 0,75 ... 15 kW
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	Mf	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
220/380 V 60 Hz	0,75 *	HB3Z 100 LA 6	1160	6,2	3,2/1,87	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,013	BZ 15	13	3200	32
	1,1 *	HB3Z 112 M 6	1160	9,1	4,5/2,6	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	BZ 15	27	2500	40
	1,5 *	HB3Z 112 MB 6	1160	12	6,4/3,7	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	BZ 15	40	2000	40
	2,2 *	HB3Z 132 S 6	1170	18	9,0/5,2	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	BZ 06	50	1400	58
	3 *	HB3Z 132 M 6	1170	24	12/7,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	BZ 56	75	1000	67
	4	HB3Z 132 MB 6	1175	33	17/9,6	0,71	89,5	90,3	88,4	3,4	4,3	8,2	0,06	BZ 06	100	800	78
	5,5	HB3Z 160 MA 6	1180	45	21/123	0,75	91,0	89,5	87,7	3,6	4,7	9,5	0,11	BC 08	170	896	157
	7,5	HB3Z 160 M 6	1170	61	28/16,2	0,78	91,0	90,3	88,9	3,4	4,3	8,8	0,11	BC 08	170	896	157
	11	HB3Z 160 L 6	1175	89	42/24,5	0,75	91,7	91,4	89,8	4,1	5,1	10,1	0,14	BC 08	250	760	177
	15	HB3Z 180 L 6	1180	121	56/32,4	0,77	91,7	92,7	91,8	3,1	4,9	9,4	0,23	BC 09	300	504	239
440 V 60 Hz	0,75 *	HB3Z 100 LA 6	1160	6,2	1,61	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,013	BZ 15	13	3200	32
	1,1 *	HB3Z 112 M 6	1160	9,1	2,26	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	BZ 15	27	2500	40
	1,5 *	HB3Z 112 MB 6	1160	12	3,2	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	BZ 15	40	2000	40
	2,2 *	HB3Z 132 S 6	1170	18	4,5	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	BZ 06	50	1400	58
	3 *	HB3Z 132 M 6	1170	24	6,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	BZ 56	75	1000	67
	4	HB3Z 132 MB 6	1170	33	8,0	0,73	89,5	90,5	88,9	3,0	3,9	7,6	0,06	BZ 06	100	800	78
	5,5	HB3Z 160 MA 6	1180	45	11,8	0,67	91,0	90,8	88,5	5,3	6,2	11,3	0,11	BC 08	170	896	157
	7,5	HB3Z 160 M 6	1175	61	14,2	0,76	91,0	90,7	89,1	3,6	4,4	9,0	0,11	BC 08	170	896	157
	11	HB3Z 160 L 6	1170	90	19,7	0,80	91,7	91,4	90,4	3,0	3,9	8,3	0,14	BC 08	250	760	177
	15	HB3Z 180 L 6	1175	122	26,9	0,80	91,7	92,7	91,4	3,0	4,2	9,0	0,23	BC 09	300	504	239

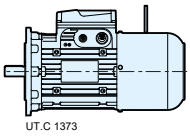
1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.

4.12

Technical data 400V 50Hz

2 poles - 3000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 15 kW
230/400V - 50Hz

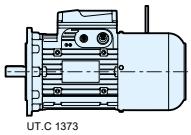

UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75 *	**HBZ 71 C 2**	2830	2,53	1,85	0,79	73,8	72,9	68,7	3,5	3,7	5,7	0,0006	BZ 53	5	3000	10
0,75	**HBZ 80 A 2**	2850	2,51	1,85	0,75	78,3	77,7	74,3	3,6	3,8	6,1	0,0009	BZ 13	5	3000	10,5
1,1	**HBZ 80 B 2**	2840	3,7	2,6	0,77	79,5	80,1	78,3	3,6	3,8	6,1	0,0011	BZ 04	11	3000	12,5
1,5 *	**HBZ 80 C 2**	2890	4,96	3,5	0,76	81,2	81,4	78,9	4	4,4	7,4	0,0014	BZ 04	11	2500	14,5
1,85 *	**HBZ 80 D 2**	2820	6,3	4,2	0,80	79,8	81,2	80,1	3,7	3,8	6,2	0,0015	BZ 04	16	2500	15
1,5	**HBZ 90 S 2**	2840	5	3,4	0,81	78,5	78,9	77	3	3,2	5,7	0,0016	BZ 14	11	2500	17
1,85 *	**HBZ 90 SB 2**	2860	6,2	4,2	0,80	79,3	79,6	77,1	3,2	4	6,1	0,0018	BZ 14	16	2500	18,5
2,2	**HBZ 90 LA 2**	2880	7,3	4,9	0,80	81	80,7	78	3,8	4,5	7	0,0024	BZ 05	27	2500	23
3 * □	**HBZ 90 LB 2**	2870	10	6,6	0,80	82	82,2	80,1	3,7	4,1	6,8	0,0028	BZ 05	27	1800	25
3	**HBZ 100 LA 2**	2860	10	6,8	0,78	81,5	82	80,1	3,6	3,8	6	0,0035	BZ 15	27	1800	26
4 *	**HBZ 100 LB 2**	2860	13,4	8,8	0,79	83,1	82,5	80	3,8	4,4	7	0,0046	BZ 15	27	1500	30
4	**HBZ 112 M 2**	2880	13,3	8,8	0,79	83,3	83,6	82	3	3,8	6,2	0,0054	BZ 15	27	1500	33
5,5 * □	**HBZ 112 MB 2**	2890	18,2	11,6	0,81	84,7	84,9	83,2	3,3	3,7	7,2	0,0072	BZ 15	40	1400	37
7,5 * □	**HBZ 112 MC 2**	2870	25	16,5	0,79	83	84,4	83,7	3	3,7	6,4	0,0085	BZ 06S	50	1060	42
5,5	**HBZ 132 S 2**	2900	18,1	11,3	0,83	84,7	84,3	82,1	2,6	3,4	6,3	0,0112	BZ 06	50	1250	54
7,5	**HBZ 132 SB 2**	2910	24,6	14,3	0,87	86,9	87,2	85,5	2,9	3,7	7,2	0,0146	BZ 06	50	1120	57
9,2 *	**HBZ 132 SC 2**	2910	30,2	18,7	0,82	87	87,3	85,67	3	3,8	7,7	0,0168	BZ 56	75	1060	59
11 *	**HBZ 132 MA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,0202	BZ 06	100	850	66
15 * □	**HBZ 132 MB 2**	2920	49,1	30	0,85	88,7	86,2	84	3,7	4,1	8,3	0,0258	BZ 06	100	710	77
11	**HBZ 160 SA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,0202	BZ 06	100	850	75
15 □	**HBZ 160 SB 2**	2920	49,1	30	0,83	88,7	86,2	84	3,9	4,3	8,3	0,0258	BZ 06	100	710	86

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

4 poles - 1500 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 11 kW
230/400V - 50Hz


UT.C 1373

P_N		Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW			min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75	*	**HBZ 71 D 4**	1 370	5,2	2,15	0,70	72,1	73,3	69,1	2,8	2,9	4	0,0014	BZ 53	7,5	7100	11
0,75		**HBZ 80 B 4**	1 410	5,1	1,9	0,77	74,7	74,2	70,5	2,8	3	5,2	0,0025	BZ 04	11	7100	13
1,1	*	**HBZ 80 C 4**	1 400	7,5	2,8	0,79	75	75,6	72	2,9	3	5,2	0,0033	BZ 04	16	5000	15
1,1		**HBZ 90 S 4**	1 410	7,4	3	0,70	75,2	74,7	70	2,6	2,9	4,4	0,0025	BZ 14	16	5000	17
1,5		**HBZ 90 L 4**	1 410	10,2	3,9	0,71	77,2	79	74,5	3,2	3,6	5,2	0,0037	BZ 05	27	4000	22
1,85	*	**HBZ 90 LB 4**	1 400	12,6	4,5	0,76	78,6	80	77,1	2,9	3,2	5,1	0,004	BZ 05	27	4000	23
2,2	* □	**HBZ 90 LC 4**	1 400	15	5,7	0,70	79,7	80,3	77,2	2,8	3,2	4,9	0,0045	BZ 05	40	3150	25
2,2		**HBZ 100 LA 4**	1 420	14,8	5,1	0,78	80	80,8	79,2	2,7	3,2	5,1	0,0054	BZ 15	40	3150	26
3		**HBZ 100 LB 4**	1 425	20,1	6,9	0,76	82,8	83,7	82	2,8	3,2	5,5	0,0072	BZ 15	40	3150	30
4		**HBZ 112 M 4**	1 430	26,7	9,2	0,75	83,4	84,1	82,6	3	3,4	6	0,0117	BZ 06S	75	2500	39
5,5	* □	**HBZ 112 MC 4**	1 420	37	12,3	0,76	84,7	86,1	85,7	3	3,4	6,1	0,0139	BZ 06S	75	1800	42
5,5		**HBZ 132 S 4**	1 450	36,2	12,2	0,76	86,3	86,9	85,7	3,2	3,4	6,3	0,0245	BZ 56	75	1800	56
7,5		**HBZ 132 M 4**	1 450	49,4	15,8	0,79	87,1	87,7	86,5	3,4	3,6	7	0,033	BZ 06	100	1250	65
9,2	*	**HBZ 132 MB 4**	1 450	61	19,5	0,77	88	89,4	87,6	3,5	3,8	7,2	0,0399	BZ 07	150	1060	72
11	* □	**HBZ 132 MC 4**	1 450	72	23	0,78	87,8	88,2	87	3,5	3,8	7,3	0,0455	BZ 07	150	900	78
11	□	**HBZ 160 SC 4**	1 450	72	23	0,78	87,8	88,2	87	3,5	3,8	7,3	0,0455	BZ 07	150	900	87

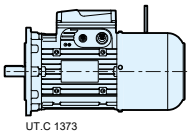
1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

4.12

Technical data 400V 50Hz

6 poles - 1000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 7.5 kW
230/400V - 50Hz


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake 1)	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75*	**HBZ 80 C 6**	920	7,8	2,3	0,67	70,1	69,7	64,5	2,5	2,7	3,8	0,0033	BZ 04	16	7100	15
0,75	**HBZ 90 S 6**	920	7,8	2,2	0,68	72,1	72	67,9	2,4	2,4	3,7	0,0042	BZ 14	16	7100	17,5
1,1	**HBZ 90 L 6**	915	11,5	3,2	0,68	72,9	72	69,3	2,6	2,8	3,9	0,0059	BZ 05	27	5300	23
1,5 * □	**HBZ 90 LC 6**	910	15,7	4,3	0,68	73,8	72,5	70	2,7	2,9	4,3	0,0069	BZ 05	40	5000	25
1,5	**HBZ 100 LA 6**	930	15,4	3,9	0,73	75,5	75,4	71,6	2,8	3	4,8	0,0099	BZ 15	40	3550	27
1,85 *	**HBZ 100 LB 6**	930	19	4,9	0,71	76,6	76,2	72,1	3	3,2	5	0,0121	BZ 15	40	3150	30
2,2	**HBZ 112 M 6**	940	22,3	5,4	0,75	78,7	79,7	78,1	2,1	2,5	6,5	0,0157	BZ 06S	50	2800	36
3 * □	**HBZ 112 MC 6**	940	30,5	7,2	0,76	79,7	81,2	80,2	2,3	2,7	5,1	0,0197	BZ 06S	75	2500	41
3	**HBZ 132 S 6**	960	29,8	7,8	0,68	82,1	82,3	80,2	2,3	3	6	0,0305	BZ 56	75	2360	53
4	**HBZ 132 M 6**	960	39,8	9,7	0,72	83,2	83,7	81,8	2,5	3	6,7	0,0394	BZ 06	100	1400	60
5,5	**HBZ 132 MB 6**	960	55	12,9	0,73	84	84,8	83,4	2,6	3	7	0,0509	BZ 07	150	1250	70
7,5 * □	**HBZ 132 MC 6**	950	75	17,6	0,73	84,7	85	83,8	2,4	2,8	5,7	0,0611	BZ 07	150	1000	78
7,5 □	**HBZ 160 SC 6**	950	75	17,6	0,73	84,7	85	83,8	2,4	2,8	5,7	0,0611	BZ 07	150	1000	87

1) For flywheel design, the motor-brake size combinations are listed in section 4.14 (23).
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

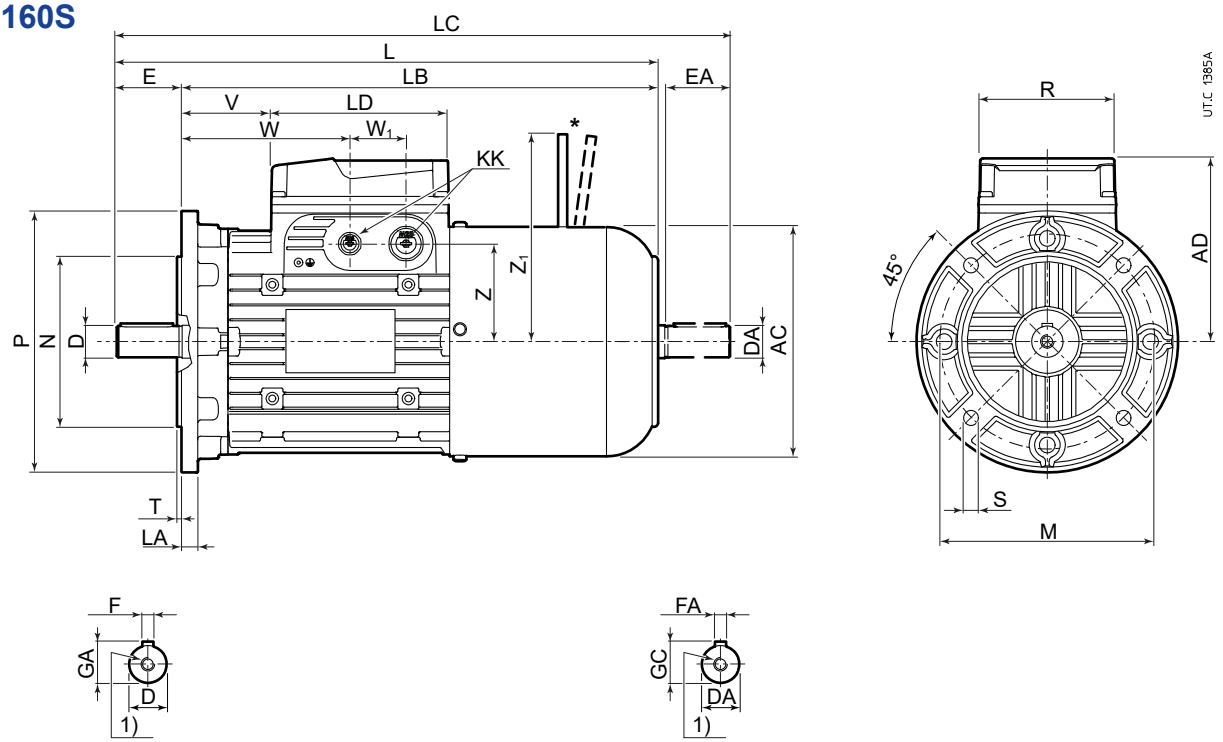
Page intentionally left blank

4.13

Motor dimensions

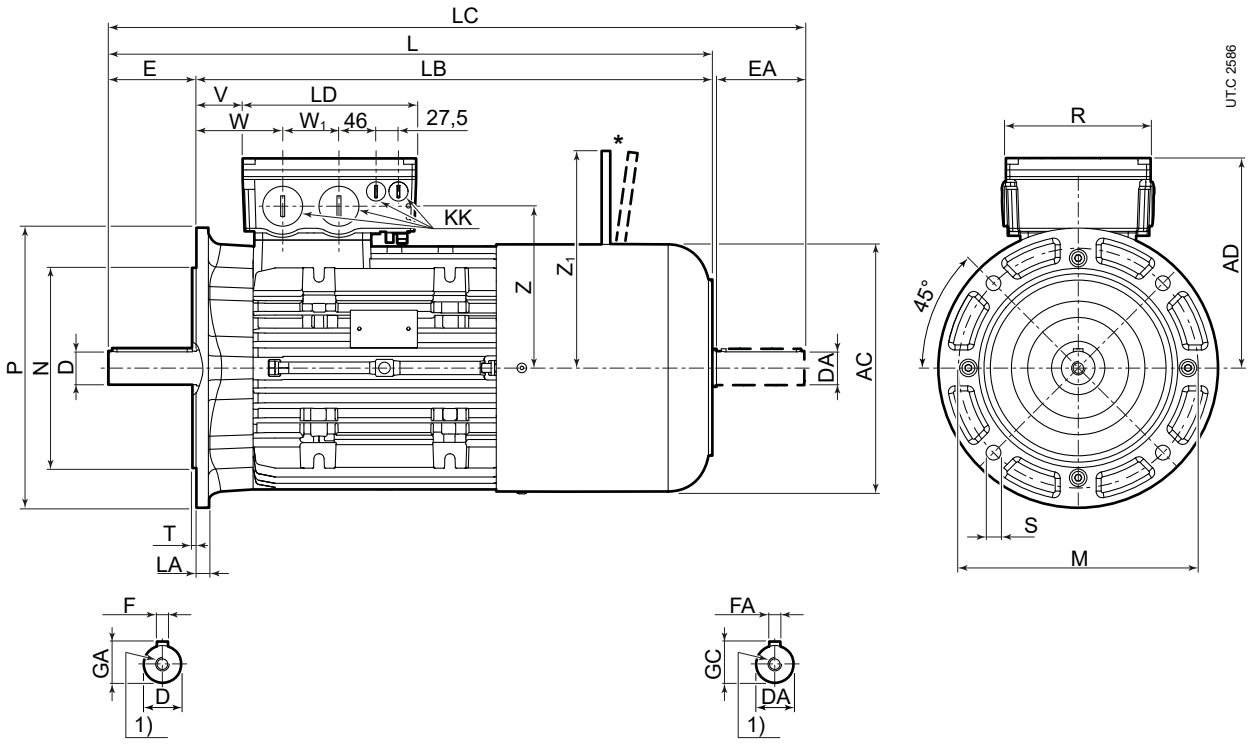
Mounting position
M **B5**, IM **B5R**, IM **B5...**

63 ... 160S



* On request

160MA, M, L -180L



* On request

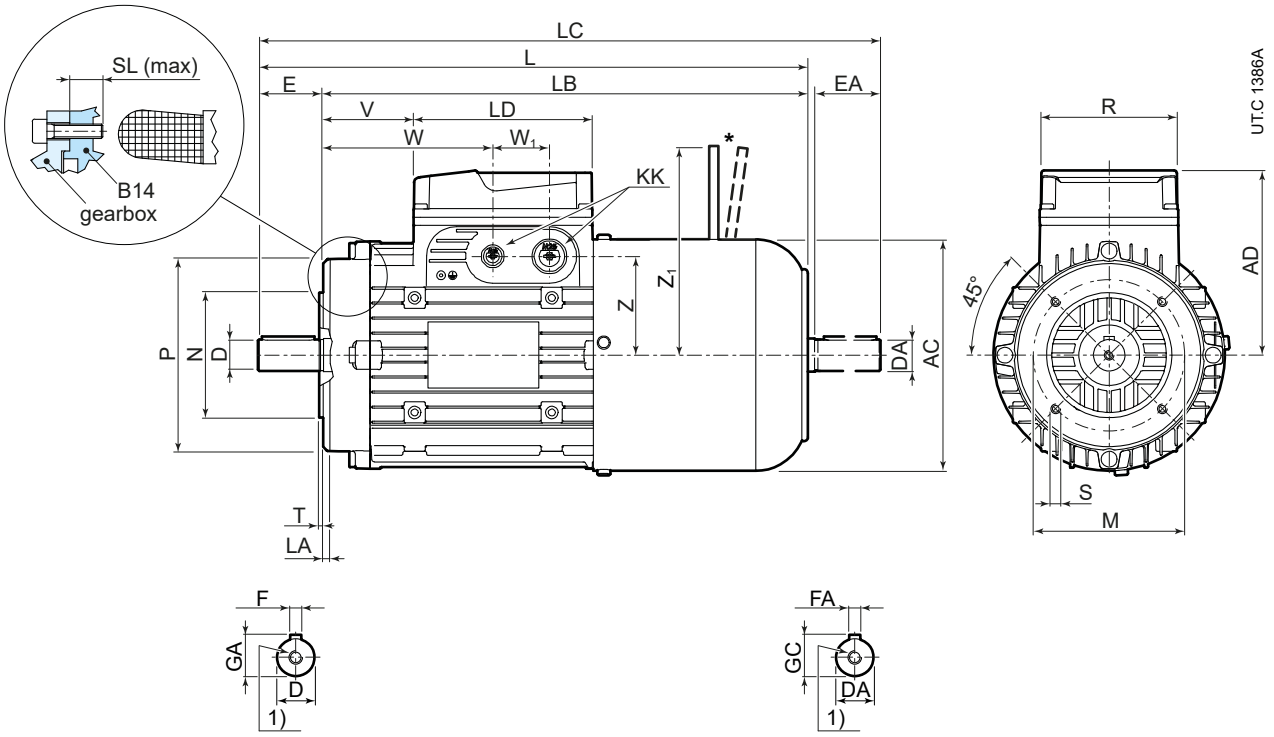
Mounting position
M **B5**, IM **B5R**, IM **B5...**

Motor size		AC	AD	L	LB	LC	LD	KK	R	V	W	W_1	Z	Z_1	Shaft end D DA	1)	E EA	F FA	GA GC	Flange M	N	P	LA	S	T
		∅						2)							∅			h9		∅	∅	∅		∅	
63	**B5R**	123	95	281	261	306	103	4×M16	86	46	86	36	45	96	9 j6	M3	20	3	10,2	100	80 j6	120	8	7	3
	B5A			284		312									11 j6	M4	23	4	12,5						
	B5			267	244	295				29	69									115	95 j6	140	10	9	
	BX1														11[3] j6	M4	23[3]		12,5	130	110 j6	160			3,5
71	**B5B**	138	112	320	297	349		2×M16 + 2×M20		66	106		62	103	11 j6	M4	23		12,5	100	80 j6	120	8	7	3
	B5R																			115	95 j6	140	10	9	
	B5A			327		363									14 j6	M5	30	5	16						
	B5			308	278	344				47	87									130	110 j6	160			3,5
	BX2			301		330									11[3] j6	M4	23[3]	4	12,5						
	BX5			308		344									14[3] j6	M5	30[3]	5	16						
	BX1																			165	130 j6	200	12	11	
80	**B5B**	156	121	353	323	390				80	120		71	129	14 j6	M5	30			115	95 j6	140	10	9	3
	B5R																			130	110 j6	160			3,5
	B5A			363		410									19 j6	M6	40	6	21,5						
	B5			342	302	389				59	99									165	130 j6	200	12	11	
	BX2			332	365	369									14[3] j6	M5	30[3]	5	16						
90 SA, S[5]	**B5S**	176	141	387	357	424	136	2×M16 + 2×M25	106	60	120	43	75		14 j6	M5	30			130	110 j6	160	10	9	
	B5B			397		444																			
	B5R			376	336	423				39	99				19 j6	M6	40	6	21,5	165	130 j6	200	12	11	
	B5			386		443									24 j6	M8	50	8	27						
90 L	**B5S**			417	387	454				90	150			160[4]	14 j6	M5	30	5	16	130	110 j6	160	10	9	
	B5B			427		474									19 j6	M6	40	6	21,5						
	B5R			406	366	453				69	129									165	130 j6	200	12	11	
	B5			416		473									24 j6	M8	50	8	27						
100	**B5C**	194	151	472	432	520				109	169		86		19 j6	M6	40	6	21,5	130	110 j6	160	10	9	
	B5S																			165	130 j6	200	12	11	
	B5R			482		540									24 j6	M8	50	8	27						
	B5A			492		560									28 j6	M10	60		31						
	B5			465	405	533				82	142									215	180 j6	250	14	14	4
112	**B5S**	218	163	501	461	550				126	186		98	198[4]	19 j6	M6	40	6	21,5	165	130 j6	200	12	11	3,5
	B5R			511		570									24 j6	M8	50	8	27						
	B5A			521		590									28 j6	M10	60		31						
	B5			495	435	564				100	160									215	180 j6	250	14	14	4
132 S, M[6]	**B5S**	257	194	578	528	637	190	2×M16 + 2×M32	148	113	201	55	109	203[4]	24 j6	M8	50		27	165	130 j6	200	12	11	3,5
	B5B			588		657									28 j6	M10	60								
	B5R																		31	215	180 j6	250	14	14	4
	B5A			608		697									38 k6	M12	80	10	41						
	B5			573	493	662				78	166									265	230 j6	300			
132 MA[8]**... MC**	**B5S**			638	588	697				173	261			226[4]	24 j6	M8	50	8	27	165	130 j6	200	12	11	3,5
	B5B			648		717									28 j6	M10	60		31						
	B5R																			215	180 j6	250	14	14	4
	B5A			668		757									38 k6	M12	80	10	41						
	B5			633	553	722				138	226									265	230 j6	300			
160 S	**B5**			682	572	771				157	245				42 k6	M16[7]	110[7]	12[7]	45[7]	300	250 j6	350	15	18	5
160 MA, M, L	**B5**	310	262	747	637	866	218	2xM16 +	182	58	108	71	203	266	42 k6	M16	110	12	45	300	250 j6	350	15	18	5
	B5R			734	654	823				76	126				38 k6	M12	80	10	41	265	230 j6	300		14	4
180	**B5**	348	279	829	719	945		2xM40		60	110		219	305	48[9] k6	M16[9]	110	14[9]	51,5[9]	300	250 j6	350		18	5

1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides from 63 to 160S (two openings on each side), prearranged for cable entry knockout openings on both sides from 160MA, M, L to 180 (with 4 plugs M40x1.5 + 4 plugs M16x1.5 assembled).
3) Shaft end not according to standard.
4) Dimension valid for motor-brake pairing: 90-BZ05, 112-BZ06S, 132-BZ56 and 160-BZ07; with brake of smaller size see Z_1 of smaller motor size
5) For motor **HB3Z 90S 2, HB3Z 90S 4** e **HB3Z 90S 6** dimensions are the ones as size 90L.
6) For motor **HB3Z 132SB 2**, **HB3Z 132SC 2**, **HB3Z 132S 4**, **HB3Z 132M 4** and **HB3Z 132M 6** dimensions are the ones as size 132 MA ... MC.
7) Second shaft end dimensions as size 132.
8) For motor **HBZ 132MA 2** dimensions as size 132S.
9) Second shaft end dimensions as size 160MA, M, L.

Mounting position
IM **B14**, IM **B14R**

63 ... 132



* On request

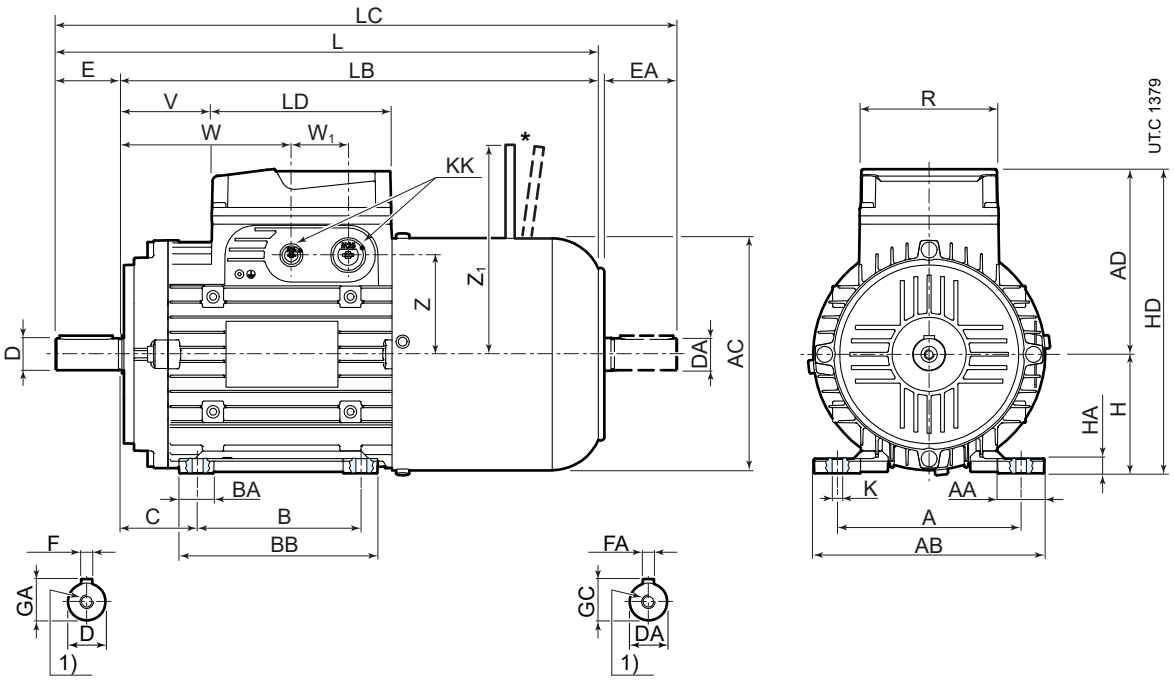
Mounting position
IM **B14**, IM **B14R**

Motor size		AC Ø	AD	L	LB	LC	LD	KK 2)	R	V	W	W_1	Z	Z_1	Shaft end D DA 1) Ø	E EA	F FA h9	GA GC	Flange M Ø	N Ø	P Ø	LA	S Ø	SL max	T
63	**B14**	123	95	267	244	295	103	4×M16	86	29	69	36	45	96	11 j6 M4	23	4	12,5	75	60 j6	90	8	M5	10	2,5
71	**B14R**	138	112	301	278	330		2×M16 + 2×M20		47	87		62	103											
	B14			308		344									14 j6 M5	30	5	16	85	70 j6	105	8	M6		
80	**B14R**	156	121	332	302	369				59	120		71	129											
	B14			342		389									19 j6 M6	40	6	21,5	100	80 j6	120	8	M6		3
90 SA, S[8]	**B14**	176	141	386	336	443	136	2×M16 + 2×M25	106	39	99	43	75		24 j6 M8	50	8	27	115	95 j6	140	10	M8	12	
90 L	**B14**			416	366	473				69	129			160[4]											
100	**B14**	194	151	465	405	533				82	142		86		28 j6 M10	60	8	31	130	110 j6	160	10	M8	13	3,5
112	**B14**	218	163	495	435	564				100	160		98	198[4]											
132 S, M[9]	**B14**	257	194	573	493	662	190	2×M16 + 2×M32	148	78	166	55	109	203[4]	38 k6 M12	80	10	41	165	130 j6	200	18	M10	18	
132 MA[10] **... MC**	**B14**			633	553	722				138	226			226											

1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides (two openings on each side).
4) Dimension valid for motor-brake pairing: 90-BZ05, 112-BZ06S,132-BZ56 and 160-BZ07; with brake of smaller size see Z_1 of smaller motor size.
8) For motor **HB3Z 90S 2, HB3Z 90S 4** and **HB3Z 90S 6** dimensions are the ones as size 90L.
9) For motor **HB3Z 132SB 2**, **HB3Z 132SC 2**, **HB3Z 132S 4**, **HB3Z 132M 4** and **HB3Z 132M 6** dimensions are the ones as size 132 MA ... MC.
10) For motor **HBZ 132MA 2** dimensions are the ones of size 132S, M.

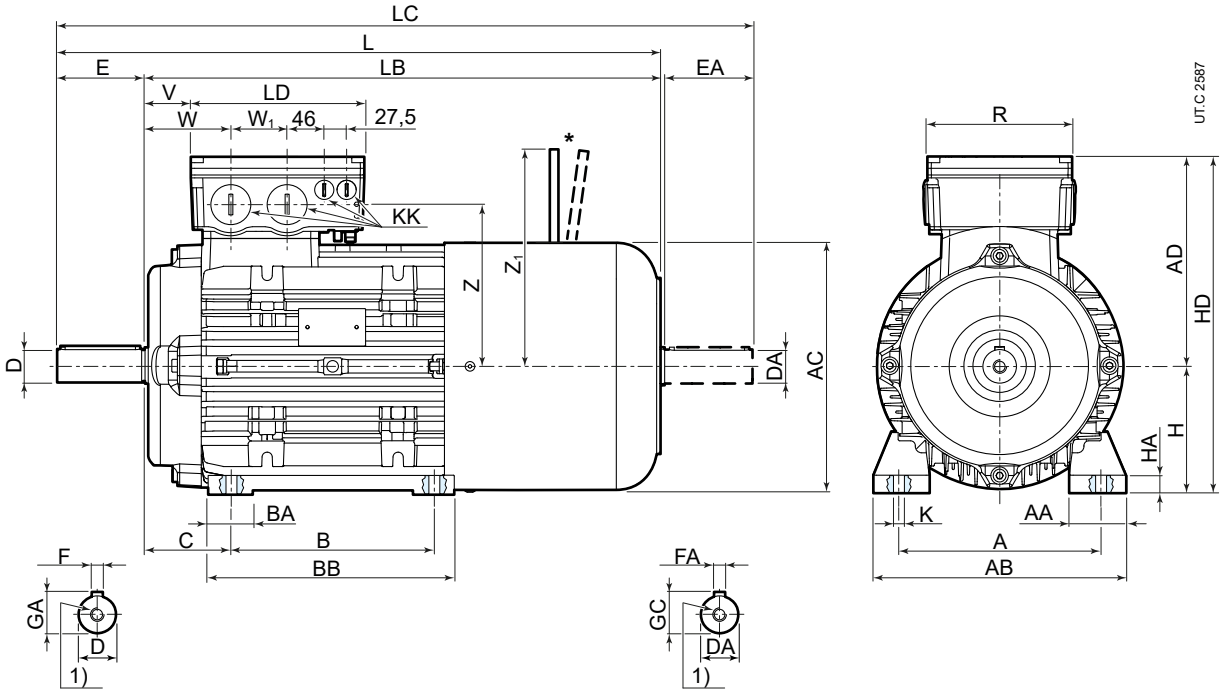
Mounting position
IM **B3**

63 ... 160S



* On request

160MA, M, L - 180L



* On request

Mounting position
IM **B3**

Motor size		AC ∅	AD	L	LB	LC	LD	KK 2)	R R1	V	W	W1	Z	Z1	Shaft end D DA ∅	1)	E EA	F FA h9	GA GC	Feet A	AB	B	C	BB	BA	AA	K	HA	H7)	HD
63	**B3**	123	95	267	244	295	103	4×M16	86 –	29	69	36	45	96	11	j6 M4	23	4	12,5	100	120	80	40	100	21	27	7	9	63	158
71	**B3**	138	112	308	278	344		2×M16 + 2×M20		47	87		62	103	14	j6 M5	30	5	16	112	138	90	45	110	22	28		10	71	183
80	**B3**	156	121	342	302	389				59	99		71	129	19	j6 M6	40	6	21,5	125	152	100	50	125	26		9		80	201
90 SA, S[8]	**B3**	176	141	386	336	443	136	2×M16 + 2×M25	106 –	39	99	43	75		24	j6 M8	50	8	27	140	174		56			35		11	90	230
90 L	**B3**			416	366	473				69	129			160[4]								125		150						
100	**B3**	194	151	465	405	533				82	142		86		28	j6 M10	60	8	31	160	196	140	63	185	40	37	12	12	100	251
112	**B3**	218	163	495	435	564				100	160		98	198[4]						190	226		70			50		15	112	275
132 S, M[9]	**B3**	257	194	573	493	662	190	2×M16 + 2×M32	148	78	166	55	109	203[4]	38	k6 M12	80	10	41	216	257	140[3]	89	210	42	52	14	17	132	326
132 MA[10]**... MC**	**B3**			633	553	722				138	226			226[4]								178[3]								
160 S	**B3**			682	572	771				157	245				42	k6 M16[5]	110[5]	12[5]	45[5]	254	294	210	108	246	45			20	160	354
160 MA, M, L	**B3**	310	262	746	636	863	218	2×M16 + 2×M40	182	53	103	71	203	266	42	k6 M16	110	12	45	239	318	254	108	307	56	72	30	23	160	422
180	**B3**	348	279	829	719	946				56	106		219	305	48[6]	k6 M16[6]		14[6]	51,5[6]	248	359	279	117	329	48	74	36	25	180	459

1) DE threaded hole.
2) Prearranged cable entry knockout openings on both sides from 63 to 160S (two openings on each side), prearranged cable entry knockout openings on both sides from 160MA, M, L to 180 (with 4 plugs M40x1.5 + 4 plugs M16x1.5 assembled).
3) Foot of 132S also has a center distance of 178 mm and the one of size 132MA ... MC has a center distance of 140 mm.
4) Dimension valid for motor-brake paring: 90-BZ05, 112-BZ06S,132-BZ56 and 160-BZ07; with brake of smaller size see Z_1 of smaller size.
5) For size 160S, the dimensions of second shaft end are the same of size 132.
6) Second shaft end dimensions as size 160 M, L
7) Tollerance $^{0}_{-0,4}$.
8) For motor **HB3Z 90S 2, HB3Z 90S 4** and **HB3Z 90S 6** dimensions are the ones as size 90L.
9) For motor **HB3Z 132SB 2**, **HB3Z 132SC 2**, **HB3Z 132S 4**, **HB3Z 132M 4** and **HB3Z 132M 6** dimensions are the ones as size 132 MA ... MC.
10) For motor **HBZ 132MA 2** dimensions are the ones as size 132S, M.

4.14

Non-standard designs and accessories

Ref.	Description	Non-standard design code
(1)	Non-standard motor supply	–
(3)	Insulation class H	,H
(7)	Design for low temperatures (-30 °C)	,BT
(8)	Condensate drain holes	,CD
(9)	Additional winding impregnation	,SP
(13)	Anti-condensation heater	,S
(14)	Terminal box on one side (IM B3 and derivatives, 90 ... 160S)	,P...
(16)	Second shaft end	,AA
(17)	Axial independent cooling fan	,V...
(18)	Axial independent cooling fan and encoder	,V... ,E
(19)	Thermistor type thermal probes (PTC)	,T15
(20)	Bi-metal type thermal probes	,B15
(21)	Drip-proof cover	,PP
(23)	Flywheel (only for sizes 63 ... 160S)	,W
(25)	Lever for manual release with automatic return	,L
(26)	Separate d.c. brake supply	see 4.14 (26)
(35)	Light alloy fan	,VL
(36)	Encoder	,E1... ,E5
(42)	Motor certified to UL	,UL
(47)	Design for damp and corrosive environment, stainless steel brake disc, bolts and screws	,UC
(48)	IP 56 protection	,IP 56
(49)	IP 65 protection	,IP 65
(53)	Brake with microswitch	,SB ,SU
(54)	Brake with ready air-gap reset	,RF
(61)	Manual rotation	,MM
(62)	Motor prearranged for encoder	,PE
(63)	Axial independent cooling fan and prearranged for encoder	,V...,PE
(99)	Paint cycles	see page 143

(1) Non-standard motor supply

The first two columns show the possible types of supply.
Supply values, brake rectifier and independent cooling fan are **co-ordinated** with motor winding voltage as stated in the table.

63 ... 160 S

Directive / Certification	Motor wound and stated for		Rectifier DIRECTLY connected to motor terminal box				Motor type		
			Brake size **12, 53, 13, 04, 14**	Brake size **05, 15, 06S, 56, 06, 07**	Rectifier voltage	Coil voltage			
	V	Hz	Rectifier		V	Vdc	HBZ	HB2Z	HB3Z
ErP EAC AU MEPS	Δ220 Y380	50	RM1	RM2	220	103	O	●	●
	Δ230 Y400	50	RM1	RM2	230	103	●	●	●
	Δ240 Y415	50	RM1	RM2	240	103	O	●	●
	Δ265 Y460	60	RM1	RM2	265	103	●	●	●
	Δ277 Y480	60	RM1	RM2	277	103	O	●	●
	Δ380	50	RM1	RM2	380	103	O	O	O
	Δ400	50	RM1	RM2	400	103	O	O	O
	Δ415	50	RM1	RM2	415	103	O	O	O
	Δ460	60	≤80 RN1 ≥90 RR8	RR8	460	206	O	O	O
	Δ480	60	≤80 RN1 ≥90 RR8	RR8	480	206	O	O	O
CCC, CEL	Δ220 Y380	50	RM1	RM2	220	103	-	-	●
	Δ380	50	RM1	RM2	380	103	-	-	O
EISA	YY230 Y460	60	RM1	RM2	230	103	-	-	●
NOM INMETRO	Δ255 Y440	60	RM1	RM2	255	103	-	-	●
	Δ440	60	RM1	RM2	440	206	-	-	O
INMETRO	Δ220 Y380	60	RM1	RM2	220	103	-	-	●
OTHERS	Δ290 Y500	50	RM1	RM2	290	103	O	O	O
	Δ330 Y575	60	RM1	RM2	330	103	O	O	O

160MA ... 180L

Directive / Certification	Motor wound and stated for		Rectifier NOT CONNECTED to motor terminal box			Motor type
			Brake size **08, 09**	Rectifier voltage	Coil voltage	
	V	Hz	Rectifier	V	Vdc	HB3Z
ErP EAC AU MEPS	Δ380	50	RR1	380	178	●
	Δ400	50	RR1	400	178	●
	Δ415	50	RR1	415	178	●
	Δ460	60	RR8	460	206	●
	Δ480	60	RR8	480	206	●
	Δ220 Y380	50	RR1	380	178	O
	Δ230 Y400	50	RR1	400	178	O
	Δ240 Y415	50	RR1	415	178	O
	Δ265 Y460	60	RR8	460	206	O
	Δ277 Y480	60	RR8	480	206	O
CCC, CEL	Δ380	50	RR1	380	178	●
	Δ220 Y380	50	RR1	380	178	O
NOM INMETRO	Δ440	60	RR8	440	206	●
	Δ255 Y440	60	RR8	440	206	O
INMETRO	Δ220 Y380	60	RR1	380	178	●
OTHERS	Δ290 Y500	50	RR8	500	206	O

○ on request ● standard — not foreseen

(3) Insulation class H

Insulation materials in class H with permissible temperature rise in class H.
Non-standard design code for the **designation: ,H**

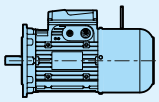
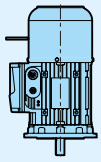
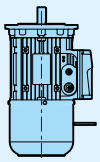
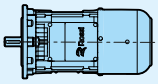
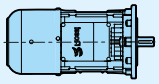
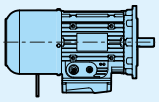
Design not available for directives CCC, CCC+CEL, CEL.

(7) Design for low temperatures (-30 °C)

Standard motors can operate for possible ambient temperature down to -15 °C.
For ambient temperature down to -30 °C: special bearings, light alloy fan (in addition, cable glands and metal plugs, if foreseen in the conditions of supply).
If there are dangers of condensate, it is advisable to require also «Design for damp and corrosive environments» (47) and, if necessary, the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13).
May there be dangers of ice on friction surface consult us.
With designs (17), (18), (36) and (63), consult us.
Non-standard design code for the **designation: ,BT**

(8) Condensate drain holes

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature. In motor designation state in «MOUNTING POSITION» the designation of the real application mounting position, determining the hole position.
Motors are supplied with closed holes.
Non-standard design code for the **designation: ,CD**

Mounting position **IM**						
B3	IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
B5	IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071
B14	IM 3601	IM 3611	IM 3631	IM 3651	IM 3661	IM 3671
B3-B5	IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071
B3-B14	IM 2101	IM 2111	IM 2131	IM 2161	IM 2161	IM 2171
B3 ,AA	IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072
B5 ,AA	IM 3002	IM 3012	IM 3032	IM 3052	IM 3062	IM 3072
B14 ,AA	IM 3602	IM 3612	IM 3632	IM 3652	IM 3662	IM 3672

(9) Additional winding impregnation

It consists of a second impregnation cycle after stator winding assembly (standard with designs (47), (48)).
Useful where it is necessary to have an additional protection (of the windings) against electrical stress (voltage peaks due to rapid commutations or to «low quality» inverters with high voltage gradients) or mechanical agents (mechanical or electromagnetic vibrations: e.g. from inverter). See also ch. 2.9 «Running with inverter», section «Voltage peaks (U_{max}), voltage gradients (dU/dt), cable length».

Non-standard design code for the **designation: ,SP**

(13) Anti-condensation heater

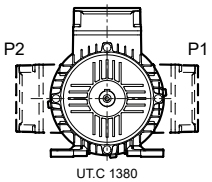
It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature; single-phase supply 230 V a.c. ± 10% 50 or 60 Hz (other voltage on request); power absorbed:
15 W for sizes 63 and 71,
25 W for sizes 80 ... 100,
50 W for sizes 112 ... 160S,
80 W for sizes 160MA, M, L ... 180.
Heater must not be connected during the running.

Terminals connected to a fixed or loose terminal block in a terminal box.
Non-standard design code for the **designation: ,S**

(14) Terminal box on one side for IM B3 and derivatives (sizes 90 ... 180)

Terminal box in position P1 r P2 as per fig. beside.

Non-standard design code for the **designation**: **,P...** (**1** or **2** see fig. beside).



(16) Second shaft end

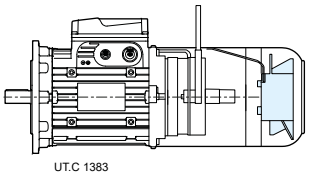
For dimensions see ch. 4.13; radial loads are not permissible; not possible with designs (17), (18), (36), (62) and (63).
Non-standard design code for the **designation**: **,AA**

(17) Axial independent cooling fan

Cooling provided with **compact** axial independent cooling fan for sizes 63 ... 180, for variable speed drives (motor may absorb nominal current for all speed range, in continuous duty and without overheating) with inverter and /or for heavy starting cycles (for z_0 increases consult us).

LB dimensions (see ch. 4.13) **increases** by the ΔLB quantity stated in the following table.

Specifications of independent cooling fan: **63 ... 180**



UT.C 1383

- 2 poles compact motor;
- **IP 54** protection for sizes 63 ... 160S;
- **IP 66** protection for sizes 160MA, M, L ... 180;
- for sizes 63 ... 160S: supply terminals on relevant auxiliary terminal block located inside the motor terminal box;
- for sizes 160MA, M, L ... 180: supply terminals on relevant auxiliary terminal block located inside the dedicated terminal box on the fan cover;
- other data according to the following table.

Motor size wound and stated for			Independent cooling									
			Independent cooling fan name plate									
Motor size	V	Hz	V	Hz	W	A	kg	Code	Type	ΔLB		
63 ... 80	Δ220 Y380	50	230	50/60	19/18	0,12/0,11	0,4	**,VA**	Single phase	81 (Size 63)	68 (Size71)	73 (Size 80)
	Δ230 Y400	50										
	Δ240 Y415	50										
	Δ290 Y500	50										
	Δ380	50										
	Δ400	50										
	Δ415	50										
	Δ220 Y380	60										
	Δ255 Y440	60										
	Δ265 Y460	60										
	Δ277 Y480	60										
	YY230 Y460	60										
	Δ380	60										
	Δ440	60										
	Δ460	60										
	Δ480	60										
90	Δ220 Y380	50	230	50/60	45/39	0,31/0,25	0,9	**,VA**	Single phase	88		
	Δ230 Y400	50										
	Δ240 Y415	50										
	Δ290 Y500	50										
	Δ380	50										
	Δ400	50										
	Δ415	50										
	Δ220 Y380	60										
	Δ255 Y440	60										
	Δ265 Y460	60										
	Δ277 Y480	60										
	YY230 Y460	60										
	Δ380	60										
	Δ440	60										
	Δ460	60										
	Δ480	60										
100,112	Δ220 Y380	50	Y380	50	40	0.12	1,3	**,VD**	Three-phase	78		
	Δ230 Y400	50	Y400	50	45	0.13						
	Δ240 Y415	50	Y415	50	45	0.13						
	Δ290 Y500	50	Y500	50	45	0.10		**,VF**				
	Δ380	50	Y380	50	45	0.13		**,VD**				
	Δ400	50	Y400	50	45	0.13						
	Δ415	50	Y415	50	45	0.13						
	Δ220 Y380	60	Y380	60	38	0.11						
	Δ255 Y440	60	Y440	60	43	0.12						
	Δ265 Y460	60	Y460	60	45	0.13						
	Δ277 Y480	60	Y480	60	50	0.15						
	YY230 Y460	60	Y460	60	45	0.13						
	Δ480	60	Y480	60	50	0.15						
	Δ440	60	Y440	60	43	0.12						
	Δ460	60	Y460	60	45	0.13						
	Δ380	60	Y380	60	38	0.11						

Non-standard design code for the **designation**: **,VA ,VD ,VF**.

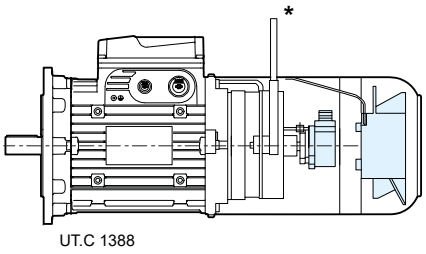
IC 416 is stated on name plate.

Motor size wound and stated for			Independent cooling fan name plate				Independent cooling			
Motor size	V	Hz	V	Hz	W	A	kg	Code	Type	ΔLB
132, 160S	Δ220 Y380	50	Y380	50	50	0.13	1,7	,VD	Three-phase	81
	Δ230 Y400	50	Y400	50	53	0.15				
	Δ240 Y415	50	Y415	50	51	0.16				
	Δ290 Y500	50	Y500	50	53	0.12		,VF		
	Δ380	50	Y380	50	53	0.15		,VD		
	Δ400	50	Y400	50	53	0.15				
	Δ415	50	Y415	50	51	0.16				
	Δ220 Y380	60	Y380	60	56	0.12				
	Δ255 Y440	60	Y440	60	60	0.14				
	Δ265 Y460	60	Y460	60	65	0.14				
	Δ277 Y480	60	Y480	60	70	0.15				
	YY230 Y460	60	Y460	60	65	0.14				
	Δ380	60	Y380	60	56	0.12				
	Δ440	60	Y440	60	60	0.14				
	Δ460	60	Y460	60	65	0.14				
	Δ480	60	Y480	60	70	0.15				
160MA, M, L	Δ400	50	Y400	50	84	0.25	5	,VD		146
	Δ415	50	Y415	50	84	0.25				
	Δ290 Y500	50	Y500	50	84	0.25				
	Δ220 Y380	60	Y380	60	86	0.21				
	YY230 Y460	60	Y460	60	86	0.21				
	Δ380	60	Y380	60	86	0.21				
	Δ440	60	Y440	60	86	0.21				
	Δ460	60	Y460	60	86	0.21				
	Δ480	60	Y480	60	86	0.21				
180	Δ400	50	Y400	50	84	0.25				134
	Δ415	50	Y415	50	84	0.25				
	Δ290 Y500	50	Y500	50	84	0.25				
	Δ220 Y380	60	Y380	60	86	0.21				
	YY230 Y460	60	Y460	60	86	0.21				
	Δ380	60	Y380	60	86	0.21				
	Δ440	60	Y440	60	86	0.21				
	Δ460	60	Y460	60	86	0.21				
	Δ480	60	Y480	60	86	0.21				

Non-standard design code for the **designation**: **,VA ,VD ,VF**.
IC 416 is stated on name plate

(18) Axial independent cooling fan and encoder

Independently cooled motor equipped with hollow shaft encoder with elastic fastening for brake air-gap adjustment.
For specifications and designation code relevant to the independent cooling fan and the encoder see designs (17) and (36), respectively.
Not possible with «Flywheel» design (23).
Non-standard design code for the **designation**: **,V ... ,E ...**
IC 416 is stated on name plate



UT.C 1388

Motor size	ΔLB [mm] Encoder ,E1 ... ,E5
63	81
71	68
80	73
90	88
100	78
112	78
132, 160S	81
160MA, M, L	146
180	136

(19) Thermistor type thermal probes (PTC)

Three thermistors wired in series (to DIN 44081/44082), inserted in the windings, for connection to a suitable contact breaker device. A sharp variation in resistance occurs when (delay 10 ÷ 30 s) the temperature of the windings reaches the setting temperature of **150 °C** (T15).
With design (3) «Insulation class H» if required **thermistor** with setting temperature of 170 °C **(T17)** are supplied.
Terminals connected to a loose or fixed terminal block inside the terminal box.
Standard on frame sizes 160MA, M, L - 180 for Brazil, Europe, China and Eurasian Economic Union markets.
Non-standard design code for the **designation**: **,T15**

(20) Bi-metal type thermal probes

Three bi-metal probes wired in series with usually closed contact inserted in the windings. Nominal corrent 1,6 A, nominal voltage 250 V a.c.. The contact opens when (delay 20 ÷ 60 s) the temperature of the windings reaches the setting temperature of **150 °C** (B15).

With design (3) «Insulation class H» if required, **bi-metal probes** with setting temperature of 170 °C **(B17)** are supplied. Terminals connected to a loose or fixed terminal block inside the terminal box.

Standard on frame sizes 160MA, M, L - 180 for Mexico and USA markets.

Non-standard design code for the **designation**: **,B15**

(21) Drip-proof cover

Necessary design for outdoor applications or when water sprays are present, in mounting position with downwards vertical shaft (IM V5, IM V1, IM V18).

LB dimension (see. ch. 4.8) increases by ΔLB stated in table:

Non-standard design code for the **designation**: **,PP**

(23) Flywheel (motor for traverse movements with progressive start and stop) (only for sizes 63 ... 160S)

63 ... 160S motors, **2** poles motors are usually envisaged in design for traverse movements which further increases the high start and stop progressivity **typical** of **HBZ** brake motor; this design allows to avoid – in an economic and reliable way – problems of jerky operations, slips, execessive stress and oscillation of overhung loads. Usually consider motor power for duty **S3** (however the motor name plate shows S1 duty).

Progressive start is obtained by the appropriate «torque-speed» characteristics and by prolonging the starting time increasing the motor moment of inertia J_0 by addition of a **flywheel** absorbing energy during starting phase and returning it during braking phase. Flywheel mass and its additional moment of intertia are stated in the table; mentioned values are to be added to mass value and J_0.

Progressive stop is obtained as a result of the greater cinetic energy motor has (due to increased moment of inertia) which prolongs the stopping time, and of the braking torque always proportioned to motor torque (with the possibility to be decreased when necessary).

Motors are designed to withstand long starting times (2 ÷ 4 s) that progressive start entails.
For the calculation of frequency of starting see point 2.6; in the formula consider (J + J_V) instead of J.
With this design, motor-brake size pairings are always:

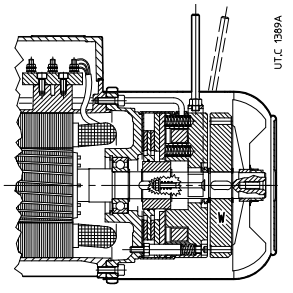
- 63, 71-BZ12 with $M_{f\,max}$ = 3,5 Nm,
- 80-BZ13 with $M_{f\,max}$ = 7,5 Nm,
- 90-BZ14 with $M_{f\,max}$ = 16 Nm,
- 100, 112-BZ15 with $M_{f\,max}$ = 40 Nm,
- 132S-BZ56 with $M_{f\,max}$ = 75 Nm,
- 132M-160S BZ06 with $M_{f\,max}$ = 100 Nm.

There are no variations in overall dimensions.

Design not possible with designs (17), (18), (36), (53), (62), (63) and HB3Z Premium Efficiency EISA motors

Non-standard design code for the **designation: ,W**.

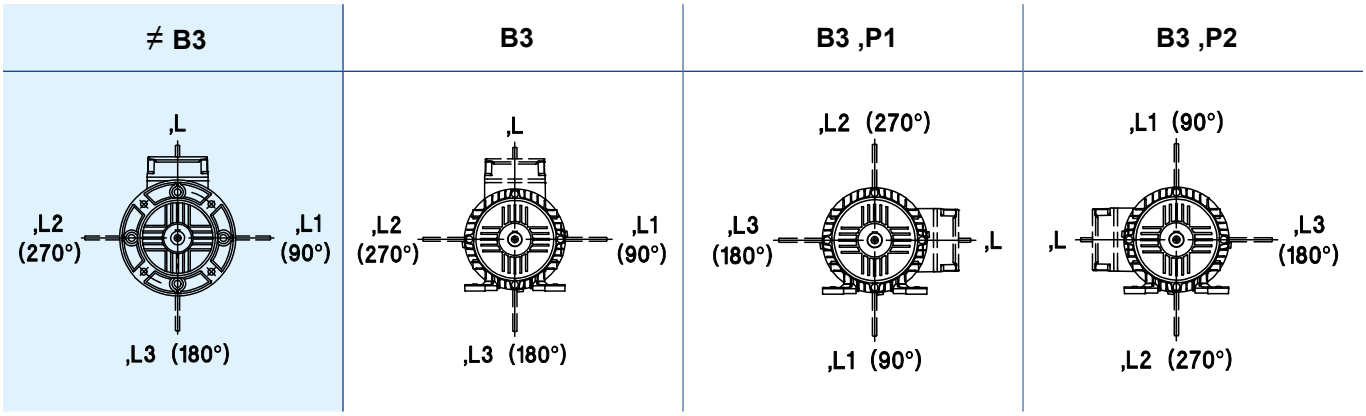
Motor size	Design **W** flywheel mass	J_V
	kg	kg m^2
63	0,63	0,0006
71	1,17	0,0013
80	1,89	0,0033
90	2,67	0,0056
100	3,6	0,0086
112	4,8	0,0134
132, 160S	6,8	0,028



(25) Lever for manual release with automatic return (standard on sizes 160 - 180)

Three-phase motors equipped with lever for manual release with automatic return and removable lever rod; position of release lever corresponding to terminal box as per schemes.

Non-standard design codes for the **designation**: **,L ,L1 (90°) L2 (270°) ,L3 (180°).**



(26) Separate d.c. brake supply

Motors are supplied as standard according to ch. 4.14 (1):
Rectifier connected directly to motor terminal block.
Brake separate supply is necessary in several applications (e.g.: motors driven by inverter, motors for lifting with on-load descent braking). Following rectifier input voltages are available on request.

For the **designation** use the non-standard design codes stated in the table.

Brake size	Rectifier supply	Name plate data		
	kg	Rectifier	Brake coil voltage V c.c. ± 5%	Code
12, 53, 13, 04, 14	24 V c.c.[1)]	-	24	,F17
	178 V c.c.[1)]	-	178	,F30
	110 ... 440 V c.a.	RM1	103	,F1A
	460 ... 480 V c.a.	≤ 80 RN1 / ≥ 90 RR8	206	,F12A
05, 15	24 V c.c.[1)]	-	24	,F17
	178 V c.c.[1)]	-	178	,F30
	110 ... 440 V c.a.	RM2	103	,F1A
	460 ... 480 V c.a.	RR8	206	,F12A
06S, 56, 06, 07	24 V c.c.[1)]		24	,F17
	178 V c.c.[1)]	-	178	,F30
	110 V c.a.	RR5	51	,F15
	200 ... 440 V c.a.	RM2	103	,F1B
	460 ... 480 V c.a.	RR8	206	,F12A
08, 09	24 V c.c.[1)]	-	24	,F17
	178 V c.c.[1)]	-	178	,F30
	110 V c.a.	RR5	51	,F15
	220 ... 240 V c.a.	RR5	103	,F1C
	255 ... 277 V c.a.	RR5	119	,F4
	290 V c.a.	RR1 [2)]	130	,F7
	330 ... 346 V c.a.	RR1 [2)]	156	,F21
	380 ... 415 V c.a.	RR1 [2)]	178	,F10
	440 ... 480 V c.a.	RR8	206	,F12B

1) Rectifier is not supplied.
2) In the event of disconnection of the AC and DC sides and a high number of interventions, the RR8 rectifier is required.

(35) Light alloy fan

Motor with light alloy fan (aluminum) for environments where it is not advisable to use the standard plastic fan.

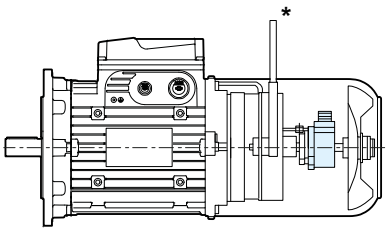
Non-standard design code for the **designation**: **,VL**

(36) Encoder

Motor equipped with incremental hollow shaft encoder and elastic fastening with the following features stated in the table (free connection wirings for the use of connectors installed by the Buyer).

Not possible with design «Flywheel» (23).
For different and/or additional technical specifications, consult us.
LB dimension (see ch. 4.8) **increases** by ΔLB quantity stated in the table.

Size	Encoder ΔLB [mm] ,E1 ... ,E5
63	54
71	55
80	60
90	56
100	44
112	50
132, 160S	42
160M-L	39
180	35



UT.C 1390

Output signal[1]	**RS 422 LD TTL**	**RS 422 TTL**	**Push - Pull HTL LD HTL**	**sin / cos**	
Supply voltage U_B	5 V d.c. ± 5%	10 ÷ 30 V d.c.		5 V d.c. ± 5%	10 ÷ 30 V d.c.
Maximum current consumption (without load) I_N	90 mA		100 mA	110 mA	
Channels	A+, A-, B+, B-, 0+, 0-				
Output amplitude per track	$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq 2{,}5\ V_{dc}$		$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq U_B - 1\ V_{dc}$	1 V_{PP} ± 20% (channel A, B) 0,1 ÷ 1,2 V (channel 0)	
Maximum output current per track I_{out}	± 20 mA		± 30 mA	–	
Maximum pulse frequency f_{max}	100 ÷ 300 kHz[2) 3)]			–	
Frequency -3 dB	–			≥ 180 kHz	
No. pulse per revolution	1024[4)]				
Vibration resistance (DIN-IEC 68-2-6)	≤ 100 m/s², 10 ... 2000 Hz				
Shock resistance (DIN-IEC 68-2-27)	≤ 1000 ÷ 2500 m/s², 6 ms[2)]			≤ 2000 m/s², 6 ms	
Maximum speed	6000 min^{-1}				
Ambient temperature	-40 °C ÷ 100 °C	-30 °C ÷ 85 °C	-40 °C ÷ 100 °C	-25 °C ÷ 85 °C	
Protection degree (EN 60 529)	IP65				
Connections	Cable with open wire ends[8)] L = 1000 mm for use of connector installed by the user				
Encoder cable cross-sections	2×0,22+6×0,14 [mm²]	10×0,14 [mm²]	2×0,22+6×0,14 [mm²]	8×0,22 [mm²]	8×0,22 [mm²]
Designation code	**,E1**	**,E2**	**,E3**	**,E4**	**,E5**

1) Other electronic configurations available on request; consult Rossi S.p.A.
2) Variable depending on the model.
3) Parameter to be checked depending on the combination max motor speed/pulse per revolution required.
4) Other pulse rates available on request (max 5000 ppr).
8) On request: different cable lengths, output with connector or with connector and cable; consult us.

Non-standard design code for the **designation**: **,E1** ... **,E5** (see table).

(42) c UL us Motor certified to UL

Motor sizes 63 … 160S certified to UL1004-1 and CAN/CSA 23.2 No.100-14, for USA and Canada markets respectively, and electrically complying with NEMA MG 1-12 2009.

The main variations of this product are:

- UL-approved winding insulation system
- UL-approved terminal block, with NEMA-compliant labeling;
- aluminum or certified thermoplastic cooling fan;
- certified and marked cables;
- verification and adjustment of air distances toward ground and between live parts;
- nameplate with logo c UL us

All other special versions are available except for (31), (32), and (33) (with T_{amb}. 70° C and 90° C).

Standard for 230YY 460Y V, 60 Hz and for EISA Premium Efficiency motors.
Non-standard design code for the **designation**: ,**UL**.

Design not available for CCC, CCC+CEL, CEL, NOM and INMETRO directives.

(47) Design for damp and corrosive environment

Advised for outdoor installation, in presence of humidity, in case of condensate dangers, especially for aggressive environment, includes design «Additional winding impregnation» (9) and anti-oxidation paint of stator, rotor and shaft.
Brake with dragging hub and brake plate (endshield end) made of stainless steel.

In these cases it is recommended to require also the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13).

For strongly aggressive environment (e.g. sea), it is possible to require also: stainless steel brake disc and anti-sticking friction surface[2)]; stainless steel bolts and screws of brake (fastening screws, bushes and nuts). In this case the motor is to be specifically purchased with «**Stainless steel brake disc, bolts and screws**»[1)].

With «Axial independent cooling fan and encoder» (18) and «Encoder» (36) consult us.

Non-standard design code for the **designation: ,UC**

1) Additional non-standard design code «Stainless steel brake disc, bolts and screws» for the **designation: , DB**
2) The braking torque is equal to 0,8 times the one stated in the point 4.5 .

(48) IP 56 protection

It is recommended for motors running in presence of direct splash or bolts of water (includes design (47) and seal between couplings surfaces of housing and endshields (to be re-adjusted when disassembling the motor).
Brake including: dragging hub and stainless steel brake plate (endshield side).

In these cases it is advisable to require also the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13) and «Stainless steel brake disc, bolts and screws».
Non-standard design code for the **designation: ,IP 56**

Design	63 ... 180
(17)	○
(18)	○
(36)	○
(62)	●
(63)	○

○ Consult Rossi S.p.A.
● Possible

(49) IP 65 protection

Advised both for motors running in dusty environments and to avoid that wear dust of friction surface is dispersed in the environment (e.g. food industry).
Seal between the coupling surfaces of housing and endshields (to be re-adjusted when disassembling the motor).

IP 65 brake protected with: rear V-ring, O-rings on fastening screws of brake and on the pullers of the release hand lever.

In damp and/or aggressive environment, in case of condensate and/or mildew dangers or of long brake standstill, it is recommended to require the «Design for damp and corrosive environment» (47),
if necessary also with «Stainless steel bolts and screws» (described always in (47)).

Non-standard design code for the **designation: ,IP 65**

Non-standard design	63 ... 180
(17)	○
(18)	○
(36)	●
(62)	●
(63)	○

○ Consult Rossi S.p.A.
● Possible

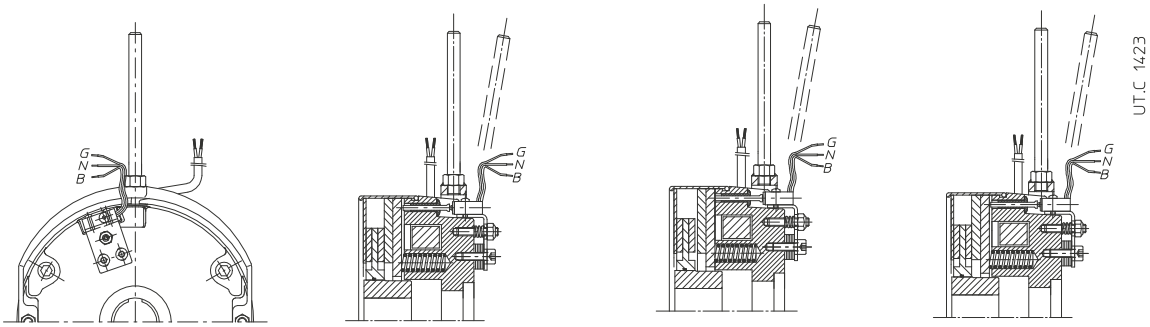
(53) Brake with microswitch

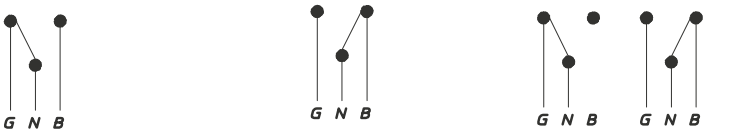
Brake equipped with a mechanical microswitch in order to indicate **brake wear or brake jam/release**:
- supply: 250 V a.c. max. 6 A;
- protection degree IP 67;
- terminals are wired to a fixed or loose terminal block inside the terminal box (for wiring schemes see fig. below).

Not possible with:
brake BZ12 (motors 63, 71A2);

Brake **jam/release** signal

Brake **wear** signal





G = grey N = black B = blue

Jam condition (brake not fed)
$M_f \neq 0$

Release condition (brake fed)
$M_f = 0$

Worn brake condition

Unworn brake condition

Non-standard design code for the **designation**:
,SB (brake **jam/release** signal)
,SU (brake **wear** signal)

(61) Manual rotation

Pre-arranged for **manual rotation** by straight setscrew (see table) that can be fitted on non-drive end motor shaft, excluded non-standard designs Axial independent cooling fan (17) and Axial independent cooling fan and encoder (18), Encoder (36), Motor prearranged for encoder (62) and Axial independent cooling fan and prearranged for encoder (63), see ch. 4.14.

Non-standard design code for the **designation: ,MM**

Motor size	Wrench
63, 71	5
80, 90	6
100, 112	8
132 ... 160S	10
160MA, M ... 180	12

(62) Motor prearranged for encoder

Motor prearranged for encoder with following features:
- anti-rotation center distance Ø 63 mm
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3
- max encoder height 48 mm
- motor shaft Ø 10 h6 mm.

Motor dimensions as per encoder design (36).

Non-standard design code for the **designation**: **,PE**

(63) Axial independent cooling fan and prearranged for encoder

Independently cooled motor prearranged for encoder with following features:
- anti-rotation center distance Ø 63 mm;
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø 10 h6 mm and length 35 mm.

For specifications and independent cooling fan designation code see design (17).
Motor overall dimensions as «Axial independent cooling fan» (17).

Non-standard design code for the **designation**: **,V... PE**

(99) Optional paint cycles

Application field	Features	Corrosivity class ISO 12944-2	Durability class ISO 12944-2	Description	Thickness cycles NDFT [µm] ISO 19840	ROSSI internal code
Applications in aggressive environments	Good resistance to atmospheric and aggressive agents	C4	L	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 160	**1H-RAL5010**
			H	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 180	**2H-RAL5010**
Outdoor applications in saline environment	Excellent resistance to atmospheric and aggressive agents Outdoor applications in saline environment	C5	M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2I-RAL5010**
Outdoor applications in chemically aggressive environment and high humidity industrial areas	Excellent resistance to atmospheric and aggressive agents Outdoor applications in chemically aggressive environment (fertilizers, etc.)		M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2L-RAL5010**

Cycles with specific features: antibacterial for FOOD environments, available on request.

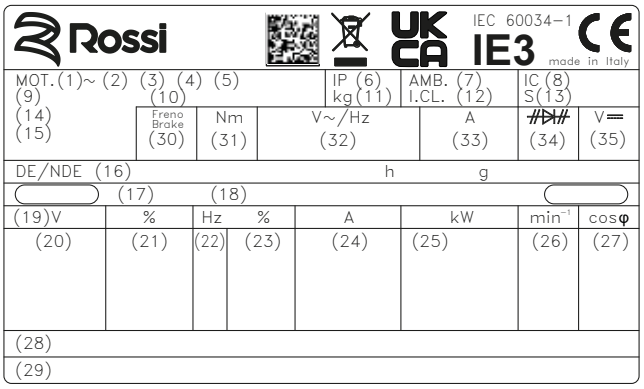
Miscellaneous

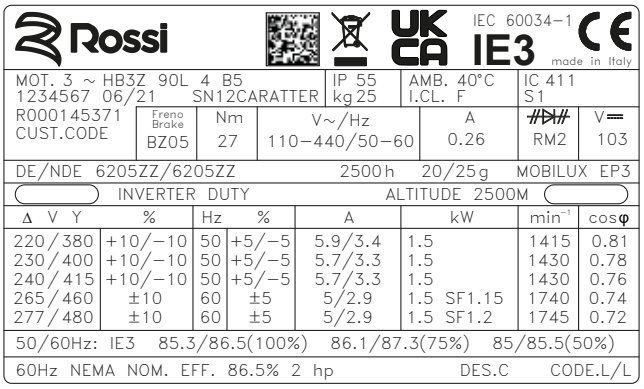
- Asynchronous three-phase two-speed motors.
- Motor balancing according to reduced vibration degree (B) to CEI EN 60034-14.
- Motors with integral feet and flange (IM B35, IM B34 and relevant vertical mounting positions).
- Power connector.
- Sensorized drive end bearing (32, 48 or 64 pulses per revolution) for the measurement of angle and/or rotation speed (sizes 63 ... 100); for specifications and wiring schemes consult us.
- Pt 100 temperature probe.
- Encoder for high temperatures.
- Designs with supply cable.
- Design for oil seal (e.g. coupled with mechanical variator).
- Special release lever rod to keep brake release condition.
- Design with double brake (theaters).

4.15

Name plate

4.15.1 Name plate Europe (ErP) / Australia (AU MEPS)



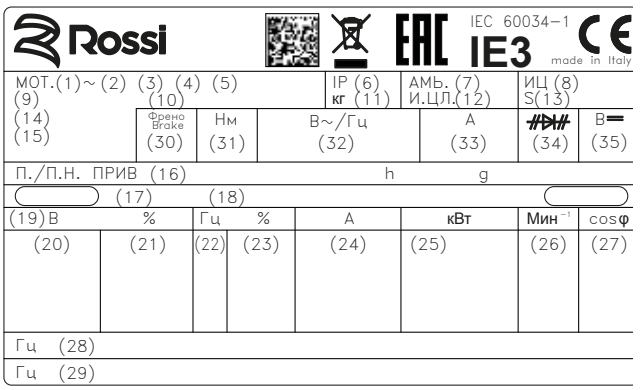


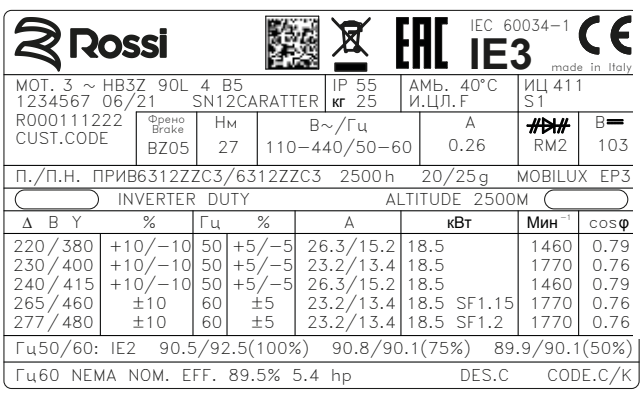
UT.C 2716

(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal frequency
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code
(30) Brake size
(31) Braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply

1) On request

4.15.2 Name plate Eurasian Economic Union (EAC)

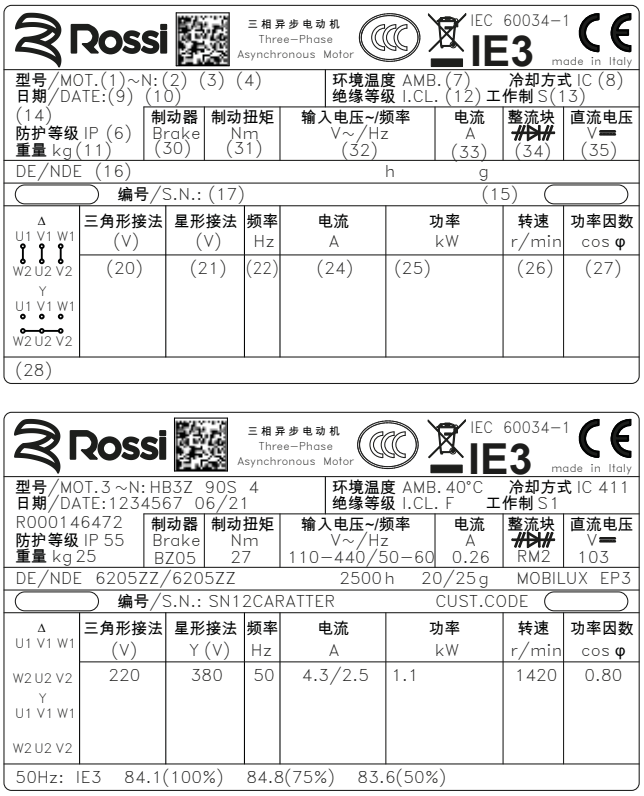




(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal frequency
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code
(30) Brake size
(31) Braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply

1) On request

4.15.3 Name plate China (CCC)



Rossi 三相异步电动机 Three-Phase Asynchronous Motor IEC 60034-1 IE3 made in Italy

型号/MOT.(1)~N:(2) (3) (4)				环境温度 AMB.(7)		冷却方式 IC (8)
日期/DATE:(9) (10)				绝缘等级 I.CL. (12)		工作制 S(13)
(14)						
防护等级 IP (6)	制动器 Brake (30)	制动扭矩 Nm (31)	输入电压~/频率 V~/Hz (32)	电流 A (33)	整流块 (34)	直流电压 V⎓ (35)
重量 kg(11)						

DE/NDE (16) h g

编号/S.N.: (17) (15)

Δ U1 V1 W1 / W2 U2 V2 — Y U1 V1 W1 / W2 U2 V2	三角形接法 (V)	星形接法 (V)	频率 Hz	电流 A	功率 kW	转速 r/min	功率因数 cos φ
	(20)	(21)	(22)	(24)	(25)	(26)	(27)

(28)

Rossi 三相异步电动机 Three-Phase Asynchronous Motor IEC 60034-1 IE3 made in Italy

型号/MOT.3~N:HB3Z 90S 4				环境温度 AMB. 40°C		冷却方式 IC 411
日期/DATE:1234567 06/21				绝缘等级 I.CL. F		工作制 S1
R000146472						
防护等级 IP 55	制动器 Brake BZ05	制动扭矩 Nm 27	输入电压~/频率 V~/Hz 110-440/50-60	电流 A 0.26	整流块 RM2	直流电压 V⎓ 103
重量 kg 25						

DE/NDE 6205ZZ/6205ZZ 2500h 20/25g MOBILUX EP3

编号/S.N.: SN12CARATTER CUST.CODE

Δ U1 V1 W1 / W2 U2 V2 — Y U1 V1 W1 / W2 U2 V2	三角形接法 (V)	星形接法 Y (V)	频率 Hz	电流 A	功率 kW	转速 r/min	功率因数 cos φ
	220	380	50	4.3/2.5	1.1	1420	0.80

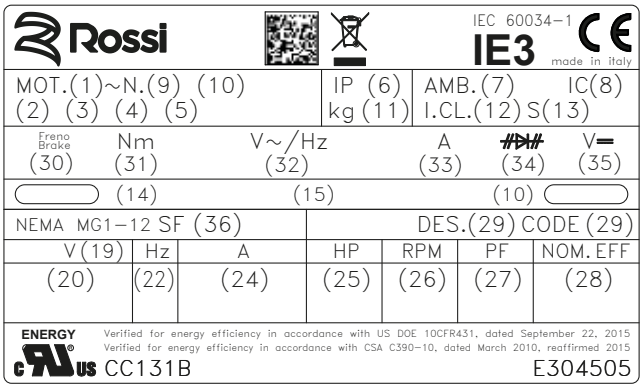
50Hz: IE3 84.1(100%) 84.8(75%) 83.6(50%)

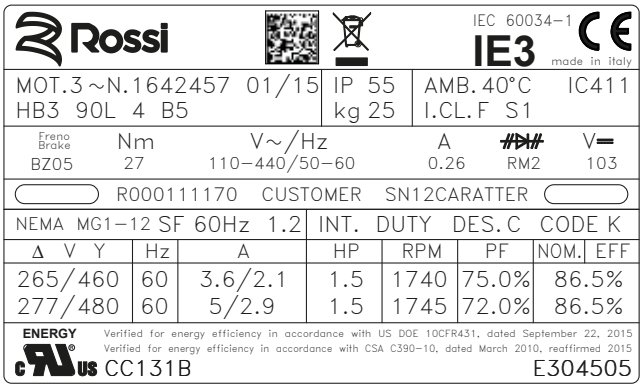
(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal frequency
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code
(30) Brake size
(31) Braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply

1) On request

4.15.4 Sticker label China (CEL)

4.15.5 Name plate USA (UL-EISA)

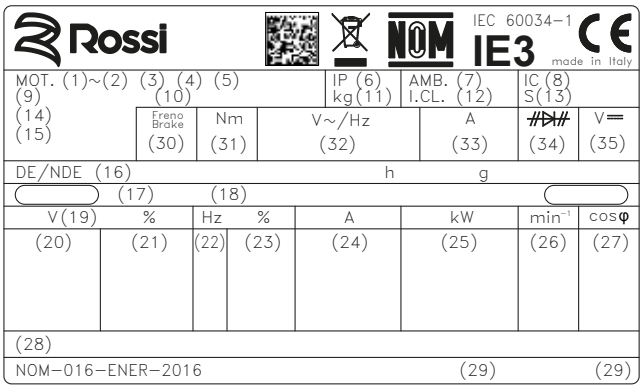


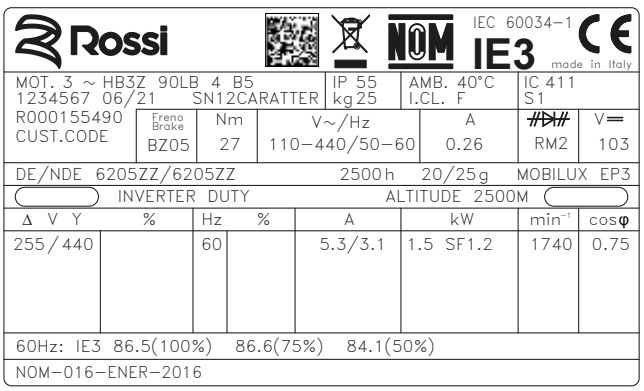


(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal frequency
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code
(30) Brake size
(31) Braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply
(36) Service factor

1) On request

4.15.6 Name plate Mexico (NOM)

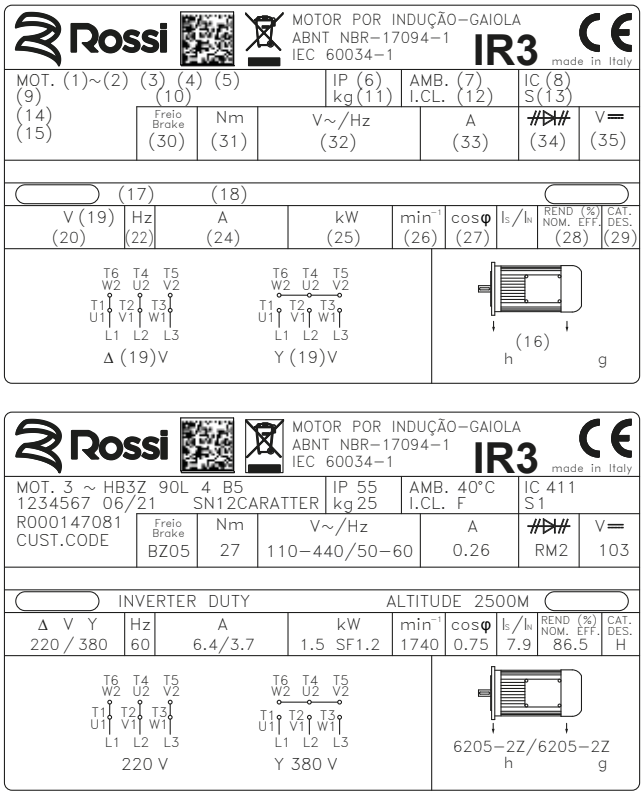




(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal frequency
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code
(30) Brake size
(31) Braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply

1) On request

4.15.7 Name plate Brazil (INMETRO)



(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal frequency
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - Code
(30) Brake size
(31) Braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply

1) On request

4.15.8 Sticker label INMETRO

4 poles

6 poles

5

HBF series
Brake motor for specific applications

Section Contents

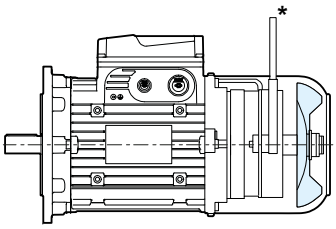
5.1

General specifications

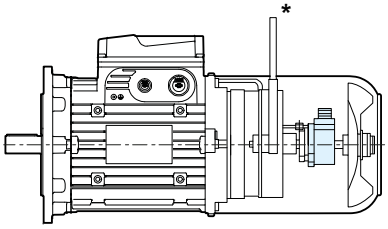
Brake motor with alternate current brake for specific applications

63 ... 160S

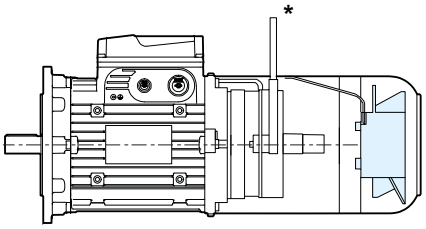
Standard



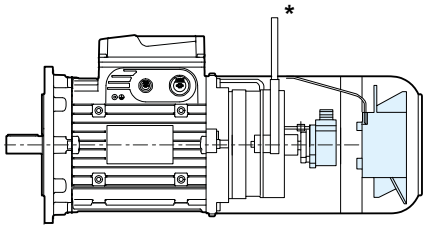
Encoder



Independent cooling fan



Independent cooling fan and encoder



UT.C 1391

* On request.

- Brake motors with a.c. brake – Sizes 63 ... 160S available also with **powers** (marked by*) **higher than the ones foreseen by the standards**
- Class F insulation; temperature rise class B for motors at standard power, F for remaining motors
- **Mounting positions IMB5 and derivatives, IM B14 and derivatives (on request) and IM B3** (always pre-arranged) and corresponding vertical mounting position; **mating tolerances under «accuracy» rating**
- **IP 55** protection
- **Particularly strong construction** (both electrical and mechanical) to withstand alternating torsional and thermic stresses of starting and braking; duly proportioned bearings
- «**Supported**» **tightening attachments** of endshields and flanges fitted on housing with «**tight**» coupling
- Electromagnetic sizing especially studied to allow high acceleration capacity (high frequency of starting) and uniform starting (slightly «sagged» characteristic curves)
- **Suitable for operation with inverter**
- **Asbestos-free** friction surfaces
- **Wide metallic** terminal box, possibility of **direct** or **separate** brake supply
- **Designs available for every application need.**
- High braking capacity
- Double braking surface, high braking torque (usually $M_f >> 2M_N$) and step adjustable.
- **Maximum quickness** and **precision** in releasing and braking (typical of a.c. brake) and maximum frequency of braking
- Maximum frequency of starting for the motor (rapidity in brake releasing allows a completely free start also at high frequency of starting)
- Particularly suitable for applications requiring strong and very rapid brakings together with a high number of starts
- **HBF** includes a **comprehensive range of accessories and non-standard designs** in order to satisfy the wide gearmotor application needs (e.g.: IP 56, IP 65, encoder, independent cooling fan, independent cooling fan and encoder, second shaft end, etc.).

Designation

HB	3	F	71B	4	230.400-50	B3	,E1
Motor type	Efficiency class	Brake type	Size	Number of poles	Supply	Mounting position	Non-standard design
HB Asynchronous three-phase	**–** Motor excluded from European Regulation	**F** a.c. brake	**63A**	**2**	**230.400-50** Δ230 Y400 V 50 Hz	**B5** IM B5	**,E1**
	2 IE2		**...**	**4**	**...**	**B14** IM B14 (63 ... 132)	**...**
	3 IE3		**160S**	**6**	**152**	**B3** IM B3	**190**
						B5R	IM B5 non-standard
						B5A	
						...	
						B14R	IM B14R non-std.

5.3

Specifications

Asynchronous three-phase electric **brake motor** with **a.c. brake** (braking in case of failure of supply) with double braking surface, sizes **63 ... 160S**.

Standardised motor with cage rotor, totally enclosed, externally ventilated (cooling system IC 411), single-speed according to following tables:

Directive / Certification	Efficiency class	Poles	Winding	Shaft height	Standard supply	Class		Pag.
						Insulation	Temperature rise	
ErP	IE2, IE3	2, 4, 6	three-phase Δ Y	63 … 132	230.400-50	F	B	160
EAC	IE3	2, 4, 6	three-phase Δ Y	63 … 132	220.380-50			166
CCC	GR. 3 (IE3)	2, 4, 6	three-phase Δ Y	63 … 90	220.380-50			170
CEL				80 … 132				
AU MEPS	IE3	4	three-phase Δ Y	80 … 132	230.400-50			163
EISA	Nema Premium	4, 6	three-phase YY Y	90 … 132	230.460-60			174
NOM	IE3	4, 6	three-phase Δ Y	90 … 132	255.440-60			178
INMETRO	IR3 (IE3)	4, 6	three-phase Δ Y	80 … 132	220.380-60			180
				80 … 132	255.440-60			

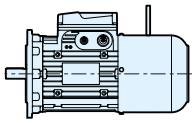
IP 55 protection: drive end motor with seal ring (without spring for IM B3) and non-drive end with water-proof and dust-proof gaiter and V-ring.

Rated power delivered in continuous duty (S1) and at standard voltage and frequency; ambient temperature -15÷40 °C, altitude 1 000 m.

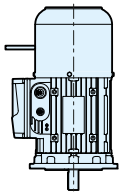
Mounting positions IM B5, IM B3 IM B14; motors can also operate in the relevant mounting positions with vertical shaft, which are respectively (see following table): IM V1 and IM V3, IM V18 and IM V19, IM V5 and IM V6; the name plate shows the designation of mounting position with horizontal shaft.
On request, other special mounting positions: consult Rossi S.p.A.

Mounting positions with flange

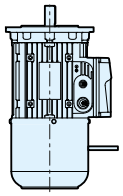
IM **B5**



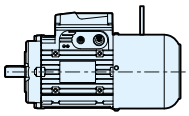
IM **V1**



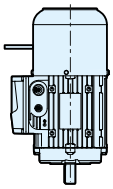
IM **V3**



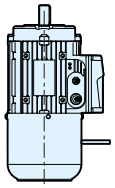
IM **B14**



IM **V18**

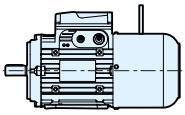


IM **V19**

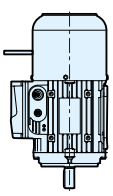


Mounting positions with feet

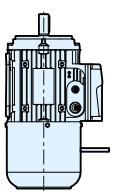
IM **B3**[1)]



IM **V5**



IM **V6**



1) Motor can also operate in the mounting positions IM B6, IM B7 and IM B8; the name plate shows the IM B3 mounting position.

Construction features

Component type	Notes	Motor size							
		63	**71**	**80**	**90**	**100**	**112**	**132**	**160S**
Housing	Material	LL	LL	LL	LL	LL	LL	LL	LL
Endshield N-DE		LL	LL	LL	LL	LL	LL	LL	LL
Fan cover		LA	LA	LA	LA	LA	LA	LA	LA
Fan		PL	PL	PL	PL	PL	PL	PL	PL
DE bearing	Lubricated for life	6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6309 2Z
N-DE bearing		6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6308 2Z
DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	45×65×8
N-DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	40×60×10
Terminal block 6/ 9 pins	Pin size	M4 / M4	M4 / M4	M4 / M4	M5 / M5	M5 / M5	M5 / M5	M6 / M5	M6 / M5
Cable entry	Knockout opening	4×M16	2×M16+ 2×M20	2×M16+ 2×M20	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M32	2×M16+ 2×M32
	Cable gland	-	-	-	-	-	-	-	-

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

Construction features

Mounting position	Notes	Motor size							
		63	**71**	**80**	**90**	**100**	**112**	**132**	**160S**
B3 (with bolt-in feet)	Ø DxE shaft	11×23	14×30	19×40	24×50	28×60	28×60	38×80	42×110
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45
	n, foot position sides	1	1	1	3	3	3	3	3
B5	Ø DxE shaft / Ø P flange	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	28 × 60 / 250	28 × 60 / 250	38 × 80 / 300	42 × 110 / 350
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45
B5R	Ø DxE shaft / Ø P flange	9 × 20 / 120	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	24 × 50 / 200	28 × 60 / 250	
	DE / NDE threaded hole	M3 / NA	M4 / NA	M5 / NA	M6 / M8	M8 / M10	M8 / M10	M10 / M12	
	Key type A	3×3×12	4×4×18	5×5×25	6×6×32	6×6×32	6×6×32	8×7×50	–
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	
B5S[1)]	Ø DxE shaft / Ø P flange				14 × 30 / 160	19 × 40 / 200	19 × 40 / 200	24 × 50 / 200	
	DE / NDE threaded hole				M5 / M8	M6 / M10	M6 / M10	M8 / M12	
	Key type A	–	–	–	5×5×25	6×6×32	6×6×32	6×6×32	–
	Flange / Shaft material				LL / 39NiCrMo3	LL / 39NiCrMo3	LL / 39NiCrMo3	G / 39NiCrMo3	
B5A	Ø DxE shaft / Ø P flange	11 × 23 / 120	14 × 30 / 140	19 × 40 / 160		28 × 60 / 200	28 × 60 / 200	38 × 80 / 250	
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA		M10 / M10	M10 / M10	M12 / M12	
	Key type A	4×4×18	5×5×25	6×6×32	–	8×7×50	8×7×50	10×8×70	–
	Flange / Shaft material	LL / C45	LL / C45	LL / C45		LL / C45	LL / C45	G / C45	
B5B	Ø DxE shaft / Ø P flange		11 × 23 / 120	14 × 30 / 140	19 × 40 / 160			28 × 60 / 200	
	DE / NDE threaded hole		M4 / NA	M5 / NA	M6 / M8			M10 / M12	
	Key type A	–	4×4×18	5×5×25	6×6×32	–	–	8×7×50	–
	Flange / Shaft material		LL / C45	LL / C45	LL / C45			G / C45	
B5C	Ø DxE shaft / Ø P flange					19 × 40 / 160			
	DE / NDE threaded hole					M6 / M10			
	Key type A	–	–	–	–	6×6×32	–	–	–
	Flange / Shaft material					LL / C45			
B14	Ø DxE shaft / Ø P flange	11 × 23 / 90	14 × 30 / 105	19 × 40 / 120	24 × 50 / 140	28 × 60 / 160	28 × 60 / 160	38 × 80 / 200	
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	
	Key type A	4×4×18	5×5×25	6×6×32	6×6×32	8×7×50	8×7×50	10×8×70	–
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	
B14R	Ø DxE shaft / Ø P flange		11 × 23 / 90	14 × 30 / 105					
	DE / NDE threaded hole		M4 / NA	M5 / NA					
	Key type A	–	4×4×18	5×5×25	–	–	–	–	–
	Flange / Shaft material		LL / C45	LL / C45					

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

1) For $P_{N\ max}$ available see the following table.

Motor size	Poles					
	2		4		6	
	$P_{N\ max}$ kW [hp]					
90	1,85	[2,4]	1,1	[1,5]	0,75	[1]
112	4	[5,4]	3	[4]	1,85	[2,4]
132	9,2	[12,4]	7,5	[10]	4	[5,4]

Earth terminal located inside terminal box; prearranged for the installation of two further external earth terminals on housing.

Brake supply: with rectifier laying in terminal box having 2 terminals for cable connection for rectifier supply and 2 for external contact of fast braking; possible brake supply **directly from** motor **terminal block** or **separately** (to be used for: motors supplied by inverter, separate drive needs of motor and brake, etc.).
Brake can be supplied, also at motor standstill, with no time limitations.

Pressure diecast cage **rotor** in aluminium.

Stator winding with class H copper conductor insulation, insulated with double coat, type of impregnation with resin of class H; other materials are of classes F and H for a **class F insulation system**.

Rotor dynamic balancing: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.

Paint: Two-component water-based polyacrylic resin paint, corrosivity class C3 (according to ISO 12944-2) with water-soluble enamel, color blue RAL 5010 DIN 1843, suitable for withstanding normal industrial environments and allowing further finishing with two-component synthetic paints.

For **non-standard designs** and accessories see ch. 5.14.

Compliance with European Directives
The motors in this catalog comply with the following harmonized standards: EN 60034-1, EN 60034-2-1, EN 60034-2, EN 60034-5, EN 60034-6, EN 60034-7, EN 60034-8, EN 60034-9, EN60034-12, EN 60034-14, IEC 60038, IEC 60072-1, and therefore comply with the provisions of the L**ow Voltage Directive 2014/35/EU**.
For this reason the electric motors are CE marked.

Additional information:

The motor design, considering the motors as components, complies with:
- Machinery Directive 2006/42/EC when the installation is correctly executed by machinery manufacturer (e.g.: in compliance with our installation instructions and EN 60204 «Electric Equipments of Industrial Machines»);
- Directive 2011/65/EC RoHS relevant to the limit of use of dangerous substsances in the electric and electronic equipments.

Declaration of Incorporation (Directive 2006/42/EC Art 4.2 - II B):

The above mentioned motors must be commissioned as soon as the machines in which they have been incorporated have been declared to be in compliance with the Machinery Directive.

According to EN 60034-1, as motors are components and not machines, supplied directly to the final user, the Electromagnetic Compatibility Directive (application of Directive 2014/30/EU) is not directly applicable.

5.4

Radial and axial loads on shaft end

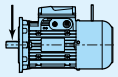
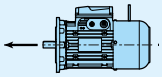
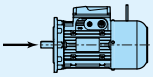
Radial loads generated on the shaft end by a drive connecting motor and driven machine must be less than or equal to those given in the relevant table.
The radial load F_r given by the following formula refers to most common drives:

$$F_r = \frac{k \cdot 19100 \cdot P}{n \cdot d} \text{ [N]}$$

where:

P [kW] is motor power required
n [min^{-1}] is the speed
d [m] is the pitch diameter
k is a coefficient assuming different values according to the drive type:
k = 1 for chain drive
k = 1,1 for gear pair drive
k = 1,5 for timing belt drive
k = 2,5 for V-belt drive

The table shows maximum permissible values of radial and axial loads on driving shaft end (F_r overhung load on centre line of shaft end), calculated for a bearing life L_h = 18000 h. For a longer bearing life, the values stated in the table must be multiplied by:
0,9 (25000 h),
0,8 (35500 h) or
0,71 (50000 h).

Motor size	F_r[1] [N]  n_N [min^{-1}]				 n_N [min^{-1}]				 n_N [min^{-1}]			
	3000	**1500**	**1000**	**750**	**3000**	**1500**	**1000**	**750**	**3000**	**1500**	**1000**	**750**
63	420	530	600	670	200	290	350	400	210	290	350	400
71	510	640	740	810	210	310	380	440	210	310	380	440
80	650	830	950	1050	230	350	420	500	370	500	600	680
90S	710	900	1040	1140	250	390	490	570	250	390	490	570
90L	730	930	1050	1180	240	380	480	560	240	380	480	560
100	1000[3]	1300	1500	1650	300	490	620	730	370	570	710	820
112	1500[3]	1900	2150	2400	660	950	1150	1310	660	950	1150	1310
132	2000[3]	2500	3000	3250	1220	1650	1960	2200	1220	1650	1960	2200
160S	2500	3150	3650	4050	1720	2280	2670	2990	1220	1650	1960	2200

1) An axial load of up to 0,2 times the value in the table is permissible, simultaneously with the radial load.
2) Comprehensive of a possible unfavourable effect of weight-force of rotor and bearing preload spring.
3) For radial load value near to table limit require bearings C4.

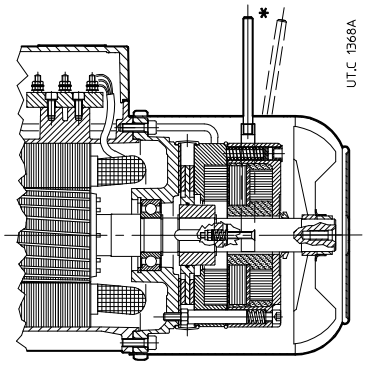
For running at 60 Hz, table values must be reduced by 6%.

Page intentionally left blank

5.5

Motor brake specifications

63 ... 160S



* On request.

Electromagnetic spring loaded brake (braking occurs automatically when it is not supplied), running at **alternate current**, with double braking surface and **high braking torque** (usually $M_f >> 2\ M_N$).

Conceived for **maximum quickness and precision** in releasing and braking (typical of a.c. brake) and **maximum frequency of braking**, **high braking capacity**, **high number of brakings** between two airgap adjustments (more than the double compared to the other brake motors), maximum frequency of starting for the motor (rapidity in brake releasing allows a completely free start also at high frequencies of starting).

This brake motor is particularly suitable for heavy duties requiring **powerful and very quick brakings** and a high number of operations (e.g.: hoists with high frequency of starting, normally for sizes > 132, and/or with jog operations).

Vice versa, its very **high dynamic characteristics** (maximum braking capacity, rapidity and frequency of starting) **are not advisable for the use** in **gearmotor** coupling, especially when these features are not strictly necessary for the application (avoiding useless overloads on the whole transmission).

Comprehensive range of non-standard designs: encoder, independent cooling fan, independent cooling fan and encoder, second shaft end, etc..

When electromagnet is not supplied, the brake anchor pushed by springs, presses the brake disk on rear endshield generating the braking torque on the same brake disk and consequentely on motor shaft it is keyed onto; by supplying the brake the electromagnet draws the brake anchor and releases brake disk and driving shaft.

Main specifications:

- three-phase alternate supply voltage (in the connection the a.c. electromagnet is similar to an asynchronous three-phase motor) mathing the motor supply (see 5.14 (1));
- **brake terminal block** for brake supply **directly from terminal block** of motor or indifferently from **separate** line;
- **insulation class F**, **temperature rise class B**;
- Windings and electromagnet core **laying into insulating resin** in order to grant a good life and withstanding in terms of shocks, vibrations and thermal shocks deriving from heavy duties of brake and in order to have a noiseless duty;
- **brake anchor made of cast iron**;
- brake disk sliding on the steel splined moving hub, always with steel core for the maximum reliability of keying and double friction surface with average friction coefficient for low wear;
- **water-proof and dust-proof gaiter** and **V-ring** both to prevent polluting infiltrations from surroundings towards brake, and to avoid that wear dust of friction surface will be dispersed in the surroundings;
- on request, prearranged for **manual rotation** by straight setscrew (wrench 5 for sizes 63 and 71, 6 for 80 and 90, 8 for 100 and 112, 8 for 132) that can be fitted on non-drive end motor shaft;
- on request, only, **lever for manual release with automatic return** and removable lever rod; position of release lever corresponding to terminal box; on request, other possible positions;
- for other operational features see the following table.

For general motor specifications see ch. 5.3.

Table of main functional specifications of brake

Effective values may slightly differ according to ambient temperature and humidity, brake temperature and state of wear of friction surface

Brake size	Motor size	M_f [N m] 21) Spacer number (primed)			Absorption		Delay of 22)		Air-gap		W_1	C_{max}	W_{max} 26) [J]		
							release t_1	braking t_2 23)					brakings/h		
					A D230 / Y400 ± 5% 50 Hz	W	ms	ms	mm nom	mm max	MJ/mm 24)	mm 25)	10	100	1000
BF 12	63, 71	1,75[0]	3,5[2]	–	0,15 / 0,09	19	4	20	0,25	0,40	70	5	4500	1120	160
BF 53, 13	71, 80	2,5[0]	5[1]	7,5[3]	0,20 / 0,12	25	4	40	0,25	0,40	90	5	5600	1400	200
BF 04, 14	80, 90	5[0]	11[1]	16[2]	0,28 / 0,16	37	6	60	0,30	0,45	125	5	7500	1900	265
BF 05, 15	90, 100, 112	13[0]	27[2]	40[4]	0,63 / 0,36	48	8	90	0,30	0,45	160	5	10000	2500	355
BF 06S	112	–	40[2]	60[3]	1,18 / 0,68	58	16	120	0,35	0,55	220	5	14000	3550	500
BF 06	132	50[0]	75[2]	–	1,38 / 0,79	63	16	140	0,35	0,55	200	4,5	14000	3550	500
BF 07	132,160S	50[0]	100[3]	150[5]	1,51 / 0,86	78	16	180	0,40	0,60	315	4,5	20000	5000	710
			min ÷ max												

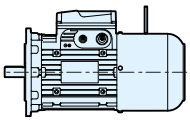
21) Braking torque values (±12%) corresponding to number of installed spacers under the spring (primed).
22) Values valid for $M_f = M_{fmax}$, mean air-gap, nominal value of supply voltage.
23) Braking delay obtained by separate brake supply; with direct supply from motor terminal block, the values of t_2 increase of approx. 2,5 times the ones to table.
24) Friction work for brake disc wear of 1 mm (minimum value for heavy use; real value is usually greater).
25) Maximum brake disk wear.
26) Maximum friction work for each braking.

5.6

Technical data 400V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,18 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1373

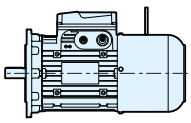
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18	**HB2F 63 A 2**	2800	0,61	0,56	0,71	68,7	66,6	60,7	3,1	3,3	4,1	0,0002	BF 12	1,75	4750	5,3
0,25	**HB2F 63 B 2**	2780	0,86	0,75	0,71	70,5	68,9	63,1	3,1	3,2	4,1	0,0003	BF 12	1,75	4750	5,9
0,37 *	**HB2F 63 C 2**	2790	1,26	1,02	0,72	73,3	72,4	67,3	3,5	3,3	4,5	0,0003	BF 12	3,5	4000	6,5
0,37	**HB2F 71 A 2**	2800	1,26	0,95	0,77	75	74,7	70,8	3,1	3,3	5,2	0,0004	BF 12	3,5	4000	7,5
0,55	**HB2F 71 B 2**	2820	1,86	1,33	0,78	77,3	76,9	72,9	3,6	3,7	5,8	0,0005	BF 53	5	4000	9,1

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50Hz 460V 60 Hz

2 poles - 3000 min^{-1} 50Hz
3600 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,18 ... 11 kW
400V - 50Hz
460V - 60 Hz
EU (ErP)


UT.C 1373

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz	0,18	HB3F 63 A 2	2800	0,61	0,56	0,71	65,9	61,8	54,4	2,9	2,9	3,9	0,0002	BF 12	1,75	4750	5,3
	0,25	HB3F 63 B 2	2800	0,85	0,73	0,71	69,7	68,6	62,8	3,0	2,9	4,1	0,0003	BF 12	1,75	4750	5,9
	0,37 *	HB3F 63 C 2	2815	1,26	0,99	0,73	73,8	69,3	62,0	3,0	3,0	4,4	0,0003	BF 12	3,5	4000	6,5
	0,37	HB3F 71 A 2	2810	1,26	0,93	0,78	73,8	74,6	70,0	3,1	3,0	5,1	0,0004	BF 12	3,5	4000	7,5
	0,55	HB3F 71 B 2	2830	1,86	1,31	0,78	77,8	75,5	71,5	3,9	3,4	6,3	0,0005	BF 53	5	4000	9,1
	0,75	HB3F 80 A 2	2875	2,49	1,70	0,79	80,7	81,5	78,8	3,5	3,8	7,3	0,001	BF 13	5	2500	10,4
	1,1	HB3F 80 B 2	2870	3,7	2,29	0,84	82,7	85,0	83,6	3,7	3,9	7,6	0,0015	BF 04	11	2500	15,4
	1,5	HB3F 90 S 2	2890	5	2,92	0,88	84,2	86,7	86,7	3,0	3,6	7,5	0,0021	BF 14	11	1800	20
	2,2	HB3F 90 LA 2	2890	7,3	4,3	0,85	85,9	87,0	86,6	3,7	4,4	9,0	0,0027	BF 05	27	1600	25
	3	HB3F 100 LA 2	2930	9,8	6,2	0,80	87,1	87,5	85,8	4,9	5,1	9,8	0,0048	BF 15	27	1500	31
	4	HB3F 112 M 2	2935	13	7,5	0,87	88,1	88,3	86,7	2,7	4,2	9,4	0,0078	BF 15	27	1400	40
	5,5	HB3F 132 S 2	2955	18	10	0,85	89,2	89,1	86,5	4,2	6,1	12,7	0,0184	BF 06	50	710	65
	7,5	HB3F 132 SB 2	2960	24	14	0,85	90,1	91,3	89,2	6,5	6,5	13,4	0,0225	BF 06	50	710	74
	9,2 *	HB3F 132 SC 2	2960	30	17	0,84	90,7	91,1	89,4	6,3	6,3	13,3	0,0253	BF 06	75	710	79
	11 *	HB3F 132 MA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0265	BF 07	100	710	82
	11	HB3F 160 SA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0265	BF 07	100	710	91
460 V 60 Hz	0,18	HB3F 63 A 2	3400	0,51	0,52	0,67	65,6	62,6	55,5	3,9	3,7	4,8	0,0002	BF 12	1,75	4750	5,5
	0,25	HB3F 63 B 2	3430	0,70	0,67	0,67	69,5	68,3	60,8	4,1	3,8	5,6	0,0003	BF 12	1,75	4750	6,1
	0,37 *	HB3F 63 C 2	3435	1,03	0,90	0,70	73,4	69,2	62,2	4,1	4,0	6,1	0,0003	BF 12	3,5	4000	6,7
	0,37	HB3F 71 A 2	3435	1,03	0,84	0,75	73,4	74,0	68,2	3,8	3,9	6,5	0,0004	BF 12	3,5	4000	7,7
	0,55	HB3F 71 B 2	3455	1,52	1,18	0,76	76,8	74,8	69,6	4,6	4,0	6,4	0,0005	BF 53	5	4000	9,4
	0,75	HB3F 80 A 2	3490	2,05	1,58	0,77	77,0	80,1	75,6	4,6	4,1	8,3	0,0009	BF 13	5	2500	10,4
	1,1	HB3F 80 B 2	3490	3,0	2,00	0,82	84,0	85,1	84,1	3,9	4,2	8,6	0,0013	BF 04	11	2500	15,4
	1,5	HB3F 90 S 2	3500	4,1	2,54	0,87	85,5	87,2	85,2	3,5	4,4	9,0	0,0019	BF 14	11	1800	20
	2,2	HB3F 90 LA 2	3505	6,0	3,8	0,84	86,5	87,0	85,8	3,7	4,1	8,8	0,0023	BF 05	27	1600	25
	3	HB3F 100 LA 2	3535	8,1	5,3	0,80	88,5	87,6	84,3	4,3	4,8	11,5	0,0044	BF 15	27	1500	31
	4	HB3F 112 M 2	3545	11	6,6	0,86	88,5	90,5	89,1	3,1	3,9	10,8	0,0074	BF 15	27	1400	40
	5,5	HB3F 132 S 2	3560	15	9,2	0,84	89,5	88,6	85,0	7,0	5,9	13,0	0,0174	BF 06	50	710	65
	7,5	HB3F 132 SB 2	3560	20	12	0,85	90,2	89,4	87,1	6,0	6,3	13,8	0,0215	BF 06	50	710	74
	9,2 *	HB3F 132 SC 2	3560	25	15	0,84	91,0	89,7	88,6	5,6	6,2	13,6	0,0243	BF 06	75	710	79
	11 *	HB3F 132 MA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0243	BF 07	100	710	82
	11	HB3F 160 SA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0243	BF 07	100	710	91

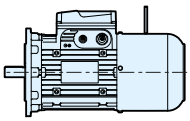
* Power or motor power-to-size correspondence not according to standard.

5.6

Technical data 400V 50Hz

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)

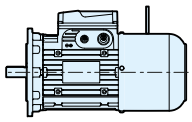

UT.C 1373

P_N	Motor		n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW			min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB2F 63 A**	**4**	1370	0,84	0,46	0,63	61,4	58,9	51,9	2,5	2,6	3,1	0,0003	BF 12	1,75	12500	5,5
0,18	**HB2F 63 B**	**4**	1350	1,28	0,64	0,66	65	64,1	58,4	2,6	2,5	3,3	0,0004	BF 12	3,5	12500	6,1
0,25 *	**HB2F 63 C**	**4**	1360	1,76	0,83	0,65	68,5	67,8	62,8	2,8	2,7	3,5	0,0004	BF 12	3,5	10000	6,9
0,25	**HB2F 71 A**	**4**	1400	1,71	0,8	0,71	68,5	66,6	60,7	2,3	2,6	3,8	0,0008	BF 53	5	10000	8,1
0,37	**HB2F 71 B**	**4**	1400	2,52	1,1	0,70	73,2	72,2	67,3	2,7	3,2	4,6	0,001	BF 53	5	10000	9
0,55 *	**HB2F 71 C**	**4**	1400	3,75	1,5	0,70	77,1	75,7	72	3,3	3,5	5,1	0,0014	BF 53	7,5	8000	10,5
0,55	**HB2F 80 A**	**4**	1420	3,69	1,34	0,78	77,1	76	72	2,9	3,1	5,8	0,0025	BF 04	11	8000	13

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50 Hz 460V 60 Hz

4 poles - 1500 min^{-1} 50Hz
1800 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B


UT.C 1373

IE3
P_N 0,12 ... 9,2 kW
400V - 50Hz
EU (ErP)
AU MEPS **

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz	0,12	HB3F 63 A 4	1365	0,84	0,37	0,72	64,8	64,0	58,8	2,3	2,3	3,3	0,0003	BF 12	1,8	12500	6,1
	0,18	HB3F 63 B 4	1380	1,25	0,56	0,66	69,9	68,8	62,9	3,0	2,8	3,8	0,0004	BF 12	3,5	12500	6,9
	0,25	HB3F 71 A 4	1415	1,69	0,69	0,71	73,5	71,6	66,9	3,1	2,9	5,0	0,0008	BF 53	5	10000	9,7
	0,37	HB3F 71 B 4	1415	2,50	0,98	0,71	77,3	75,1	70,8	3,4	3,2	5,6	0,0010	BF 53	5	10000	10,7
	0,55	HB3F 80 A 4	1420	3,7	1,56	0,63	80,8	79,8	76,4	3,3	3,4	5,0	0,0025	BF 04	11	8000	14,4
	0,75	HB3F 80 B 4	1420	5,0	1,87	0,70	82,5	83,6	82,1	3,2	3,1	5,4	0,003	BF 04	11	6800	16
	1,1	HB3F 90 S 4	1430	7,3	2,50	0,76	84,1	84,5	82,8	3,4	3,6	6,4	0,0043	BF 14	16	3150	22,5
	1,5	HB3F 90 L 4	1415	10	3,3	0,78	85,3	85,2	84,2	2,6	3,5	5,6	0,0047	BF 05	27	3000	26
	1,85 *	HB3F 90 LB 4	1425	12	4,2	0,74	86,0	84,6	83,0	2,7	3,4	5,9	0,0047	BF 05	27	3000	26
	2,2	HB3F 100 LA 4	1445	15	4,7	0,78	86,7	86,9	85,9	3,4	4,0	8,1	0,008	BF 15	40	3000	33
	3 *	HB3F 112 MA 4	1450	20	6,1	0,80	88,7	89,1	87,9	4,1	4,1	8,5	0,013	BF 15	40	2000	40
	4	HB3F 112 M 4	1445	26	8,1	0,75	88,6	90,4	89,2	4,3	4,6	8,6	0,015	BF 06S	60	1800	46
	5,5	HB3F 132 S 4	1465	36	12	0,75	89,6	91,0	89,6	3,6	4,2	8,2	0,0367	BF 06	75	900	70
	7,5	HB3F 132 M 4	1460	49	15	0,80	90,4	91,0	90,1	4,2	4,4	8,8	0,0442	BF 07	100	900	81
	9,2 *	HB3F 132 MB 4	1460	60	19	0,76	91,0	91,2	90,4	4,4	4,2	8,2	0,047	BF 07	150	800	83
460 V 60 Hz	0,12	HB3F 63 A 4	1685	0,68	0,34	0,67	66,0	65,9	58,0	2,9	2,9	4,1	0,0003	BF 12	1,75	12500	6,3
	0,18	HB3F 63 B 4	1700	1,01	0,52	0,62	69,5	68,4	62,7	3,7	3,6	4,4	0,0004	BF 12	3,5	12500	7,1
	0,25	HB3F 71 A 4	1725	1,38	0,64	0,67	73,4	72,4	66,1	3,7	3,7	6,2	0,0008	BF 53	5	10000	10
	0,37	HB3F 71 B 4	1725	2,05	0,89	0,67	78,2	74,8	70,4	4,2	3,8	6,3	0,0010	BF 53	5	10000	11
	0,55	HB3F 80 A 4	1735	3,0	1,44	0,59	81,1	80,7	77,3	4,0	4,0	5,8	0,0025	BF 04	11	8000	14,4
	0,75	HB3F 80 B 4	1730	4,1	1,72	0,66	83,3	85,5	83,5	3,8	3,7	6,4	0,003	BF 04	11	6800	16
	1,1	HB3F 90 S 4	1740	6,0	2,20	0,72	86,5	85,1	82,4	4,4	4,3	7,3	0,0043	BF 14	16	3150	23
	1,5	HB3F 90 L 4	1730	8,3	2,95	0,74	86,5	86,8	85,3	3,9	3,5	6,8	0,0047	BF 05	27	3000	26
	1,85 *	HB3F 90 LB 4	1735	10	3,7	0,70	89,5	86,5	83,1	4,0	4,3	7,4	0,0047	BF 05	27	3000	26
	2,2	HB3F 100 LA 4	1750	12	4,1	0,76	89,5	87,9	85,6	4,1	4,7	9,4	0,008	BF 15	40	3000	33
	3 *	HB3F 112 MA 4	1755	16	5,4	0,78	89,5	89,7	88,0	4,7	4,8	9,9	0,013	BF 15	40	2000	40
	4	HB3F 112 M 4	1755	22	7,6	0,74	89,5	90,5	88,8	6,1	5,6	10,0	0,015	BF 06S	60	1800	46
	5,5	HB3F 132 S 4	1770	30	10	0,73	91,7	90,8	88,5	4,7	4,9	9,6	0,0367	BF 06	75	900	70
	7,5	HB3F 132 M 4	1765	41	13	0,78	91,7	91,0	88,8	7,0	5,1	11,9	0,0454	BF 07	100	900	81
	9,2 *	HB3F 132 MB 4	1765	50	17	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,047	BF 07	150	800	83

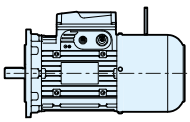
* Power or motor power-to-size correspondence not according to standard.
** The AS/NZS 1359.5:2004 standard (AU MEPS - Australia) covers motors with a rated power from 0.75 kW to 185 kW (excluded). Powers 1,85 and 9,2 kW are excluded.

5.6

Technical data 400V 50 Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1373

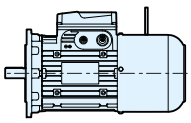
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB2F 63 B 6**	900	1,27	0,55	0,59	52,2	48,3	40,1	2,7	2,8	2,5	0,0005	BF 12	3,5	12500	6,1
0,15 *	**HB2F 63 C 6**	875	1,64	0,62	0,64	55,6	53,2	46	2,5	2,5	2,6	0,0006	BF 12	3,5	11800	6,7
0,18	**HB2F 71 A 6**	900	1,91	0,66	0,67	59,5	57,1	49,8	2,4	2,4	3	0,001	BF 53	5	11200	8,4
0,25	**HB2F 71 B 6**	900	2,64	0,88	0,67	61,8	59,7	52,9	2,5	2,7	3,3	0,0013	BF 53	5	11200	9,2
0,37 *	**HB2F 71 C 6**	895	3,95	1,2	0,69	67,6	66,1	61	2,6	2,3	3,5	0,0018	BF 53	4,5	10000	-
0,37	**HB2F 80 A 6**	910	3,9	1,2	0,67	67,6	64	57,8	2,7	2,6	3,6	0,0021	BF 04	11	9500	12
0,55	**HB2F 80 B 6**	930	5,6	1,6	0,67	73,1	72,2	67,7	3	3	4,5	0,0033	BF 04	16	9000	15

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50 Hz 460V 60 Hz

6 poles - 1000 min^{-1} 50Hz
1200 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,09 ... 5,5 kW
400V - 50Hz
460V - 60Hz
EU (ErP)


UT.C 1373

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz 2)	0,09 1)	HBF 63 A 6	900	0,96	0,48	0,57	47,6	43,1	34,4	2,5	2,6	2,3	0,0004	BF 12	1,8	12500	5,7
	0,12	HB3F 63 B 6	830	1,38	0,42	0,72	57,7	52,1	47,0	1,9	1,9	2,2	0,0005	BF 12	3,5	12500	6,7
	0,18	HB3F 71 A 6	910	1,89	0,57	0,71	63,9	64,3	57,4	2,5	2,4	3,4	0,0010	BF 53	5	11200	9,2
	0,25	HB3F 71 B 6	910	2,62	0,76	0,69	68,6	66,0	60,8	2,7	2,6	3,7	0,0013	BF 53	5	11200	10,6
	0,37	HB3F 80 A 6	930	3,80	1,00	0,73	73,5	70,4	65,8	2,6	2,6	4,2	0,0021	BF 04	11	9500	15,1
	0,55	HB3F 90 SA 6	945	5,6	1,45	0,71	77,2	74,2	62,1	2,5	3,1	4,9	0,0033	BF 14	16	9000	19,5
	0,75	HB3F 90 S 6	950	7,5	2,02	0,68	78,9	77,3	72,5	3,1	3,3	5,3	0,0057	BF 14	16	7100	23
	1,1	HB3F 90 L 6	930	11	2,72	0,72	81,0	78,6	76,1	2,6	3,0	5,0	0,0071	BF 05	27	5300	26
	1,5	HB3F 100 LA 6	950	15	3,5	0,75	82,5	82,6	80,8	2,6	3,2	6,3	0,0133	BF 15	40	3000	33
	2,2	HB3F 112 M 6	960	22	5,2	0,72	84,3	84,9	82,8	3,1	3,4	6,1	0,0211	BF 06S	60	2800	44
	3	HB3F 132 S 6	970	30	7,0	0,72	85,6	87,8	85,9	2,4	3,7	7,0	0,0455	BF 06	75	1400	66
	4	HB3F 132 M 6	970	39	9,4	0,71	86,8	88,6	86,9	2,7	4,0	7,6	0,0611	BF 07	100	1250	81
	5,5	HB3F 132 MB 6	970	54	12	0,73	88,0	89,3	88,7	3,2	3,4	7,2	0,0623	BF 07	150	1100	82
460 V 60 Hz 3)	0,09 2)	HBF 63 A 6	1120	0,77	0,41	0,52	52,5	44,3	39,4	2,9	3,0	2,7	0,0004	BF 12	1,75	12500	5,7
	0,12	HB3F 63 B 6	1080	1,06	0,38	0,63	64,0	54,8	47,4	2,6	2,6	2,7	0,0005	BF 12	3,5	10000	6,9
	0,18	HB3F 71 A 6	1120	1,53	0,50	0,66	68,7	65,9	59,5	3,0	3,0	4,2	0,0012	BF 53	5	9000	9,5
	0,25	HB3F 71 B 6	1130	2,11	0,70	0,63	71,4	67,8	61,7	3,3	3,3	4,3	0,0017	BF 53	5	9000	10,9
	0,37	HB3F 80 A 6	1140	3,1	0,90	0,69	75,3	71,5	65,6	4,1	3,2	5,0	0,0019	BF 04	11	7500	15,1
	0,55	HB3F 90 SA 6	1155	4,5	1,26	0,67	81,7	78,3	74,3	3,2	3,8	6,0	0,0056	BF 14	16	7100	19,5
	0,75 *	HB3F 100 LA 6	1155	6,2	1,78	0,64	82,5	78,2	72,5	4,0	4,0	6,2	0,013	BF 15	13	3200	33
	1,1 *	HB3F 112 M 6	1160	9,1	2,16	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	BF 15	27	2500	41
	1,5 *	HB3F 112 MB 6	1160	12	3,0	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	BF 15	40	2000	41
	2,2 *	HB3F 132 S 6	1170	18	4,3	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	BF 06	50	1400	59
	3 *	HB3F 132 M 6	1170	24	5,8	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	BF 06	75	1000	68
	4	HB3F 132 MB 6	1170	33	8,0	0,70	89,5	91,0	89,5	3,1	4,1	8,0	0,06	BF 07	100	800	82

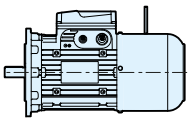
1) Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.
2) Power-motor size combinations from 0.75 to 5.5 kW are available and rated at 50Hz only. For other voltages, see section 5.14 (1).
3) Power-motor size combinations from 0.75 to 4 kW are available and rated at 60Hz only. For other voltages, see section 5.14 (1).
* Power or motor power-to-size correspondence not according to standard.

5.7

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,18 ... 11 kW
380V - 50Hz
Eurasian Economic Union
EAC

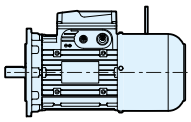

UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18	**HB3F 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0002	BZ 12	1,75	4750	5,5
0,25	**HB3F 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0002	BZ 12	1,75	4750	6,1
0,37 *	**HB3F 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0003	BZ 12	3,5	4000	6,7
0,37	**HB3F 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0003	BZ 12	3,5	4000	7,7
0,55	**HB3F 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0004	BZ 53	5,0	4000	9,4
0,75	**HB3F 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,001	BZ 13	5,0	2500	10,7
1,1	**HB3F 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0015	BZ 04	11	2500	15,5
1,5	**HB3F 90 S 2**	2880	5,0	3,0	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,0021	BZ 14	11	1800	20
2,2	**HB3F 90 LA 2**	2880	7,3	4,4	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0027	BZ 05	27	1600	24
3	**HB3F 100 LA 2**	2920	9,8	6,2	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0048	BZ 15	27	1500	30
4	**HB3F 112 M 2**	2930	13	7,8	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0078	BZ 15	27	1400	39
5,5	**HB3F 132 S 2**	2950	18	11	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0184	BZ 06	50	710	64
7,5	**HB3F 132 SB 2**	2950	24	14	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0225	BZ 06	50	710	73
9,2 *	**HB3F 132 SC 2**	2955	30	18	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0253	BZ 56	75	710	78
11	**HB3F 132 MA 2**	2940	36	21	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0253	BZ 06	100	710	78

* Power or motor power-to-size correspondence not according to standard.

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
***P*N 0,12 ... 9,2 kW**
380V - 50Hz
Eurasian Economic Union
EAC


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB3F 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0003	BF 12	1,75	12500	6,1
0,18	**HB3F 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0004	BF 12	3,5	12500	6,9
0,25	**HB3F 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0011	BF 53	5,0	10000	9,7
0,37	**HB3F 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0013	BF 53	5,0	10000	10,7
0,55	**HB3F 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0023	BF 04	11	8000	14,4
0,75	**HB3F 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,002	BF 04	11	6800	16
1,1	**HB3F 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0043	BF 14	16	3150	23
1,5	**HB3F 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0047	BF 05	27	3000	26
1,85 *	**HB3F 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0047	BF 05	27	3000	26
2,2	**HB3F 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,008	BF 15	40	3000	33
3 *	**HB3F 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	BF 15	40	2000	40
4	**HB3F 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,015	BF 06S	60	1800	46
5,5	**HB3F 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0367	BF 06	75	900	70
7,5	**HB3F 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0454	BF 07	100	900	81
9,2 *	**HB3F 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,047	BF 07	150	800	83

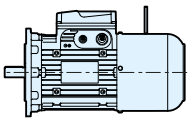
* Power or motor power-to-size correspondence not according to standard.

5.7

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,09 ... 5,5 kW
380V - 50Hz
Eurasian Economic Union


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,09 [1]	**HBF 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0004	BF 12	1,75	12500	5,7
0,12	**HB3F 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0005	BF 12	3,5	12500	6,7
0,18	**HB3F 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0012	BF 53	5,0	11200	9,2
0,25	**HB3F 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	BF 53	5,0	11200	10,6
0,37	**HB3F 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0019	BF 04	11	9500	15,1
0,55	**HB3F 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0056	BF 14	16	9000	19,5
0,75	**HB3F 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0057	BF 14	16	7100	19,5
1,1	**HB3F 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	BF 05	27	5300	26
1,5	**HB3F 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,0133	BF 15	40	3000	33
2,2	**HB3F 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,0211	BF 06S	60	2800	44
3	**HB3F 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0445	BF 06	75	1400	66
4	**HB3F 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,0611	BF 07	100	1250	81
5,5	**HB3F 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,0623	BF 07	150	1100	82

1) Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.

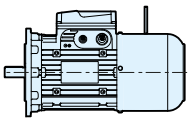
Page intentionally left blank.

5.8

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,18 ... 11 kW
380V - 50Hz
China (CCC CEL)

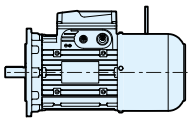

UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18 [1]	**HB3F 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0002	BF 12	1,75	4750	5,5
0,25 [1]	**HB3F 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0002	BF 12	1,75	4750	6,1
0,37 [1]	**HB3F 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0003	BF 12	3,5	4000	6,7
0,37 [1]	**HB3F 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0003	BF 12	3,5	4000	7,7
0,55 [1]	**HB3F 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0004	BF 53	5,0	4000	9,4
0,75 [1] [2]	**HB3F 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,0010	BF 13	5,0	2500	10,7
1,1 [1] [2]	**HB3F 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0015	BF 04	11	2500	15,5
1,5 [1] [2]	**HB3F 90 S 2**	2880	5,0	3,0	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,0021	BF 14	11	1800	20
2,2 [1] [2]	**HB3F 90 LA 2**	2880	7,3	4,4	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0027	BF 05	27	1600	24
3 [2]	**HB3F 100 LA 2**	2920	9,8	6,2	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0048	BF 15	27	1500	30
4 [2]	**HB3F 112 M 2**	2930	13	7,8	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0078	BF 15	27	1400	39
5,5 [2]	**HB3F 132 S 2**	2950	18	11	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0184	BF 06	50	710	64
7,5 [2]	**HB3F 132 SB 2**	2950	24	14	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0225	BF 06	50	710	73
9,2 [2]	**HB3F 132 SC 2**	2955	30	18	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0253	BF 06	75	710	78
11 [2]	**HB3F 132 MA 2**	2940	36	21	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0253	BF 07	100	710	78

1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)

4 poles - 1500 min^{-1} 50Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,12 ... 9,2 kW
380V - 50Hz
China (CCC CEL)


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12 [1]	**HB3F 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0003	BF 12	1,75	12500	6,1
0,18 [1]	**HB3F 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0004	BF 12	3,5	12500	6,9
0,25 [1]	**HB3F 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0011	BF 53	5,0	10000	9,7
0,37 [1]	**HB3F 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0013	BF 53	5,0	10000	10,7
0,55 [1]	**HB3F 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0023	BF 04	11	8000	14,4
0,75 [1] [2]	**HB3F 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,002	BF 04	11	6800	16
1,1 [1] [2]	**HB3F 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0043	BF 14	16	3150	23
1,5 [2]	**HB3F 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0047	BF 05	27	3000	26
1,85 [2]	**HB3F 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0047	BF 05	27	3000	26
2,2 [2]	**HB3F 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,008	BF 15	40	3000	33
3 [2]	**HB3F 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	BF 15	40	2000	40
4 [2]	**HB3F 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,015	BF 06S	60	1800	46
5,5 [2]	**HB3F 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0367	BF 06	75	900	70
7,5 [2]	**HB3F 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0454	BF 07	100	900	81
9,2 [2]	**HB3F 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,0470	BF 07	150	800	83

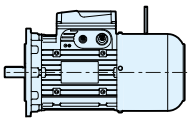
1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)

5.8

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,09 ... 5,5 kW
380V - 50Hz
China (CCC CEL)


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts./h	
0,09 [1)*]	**HBF 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0004	BF 12	1,75	12500	5,7
0,12 [1)]	**HB3F 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0005	BF 12	3,5	12500	6,7
0,18 [1)]	**HB3F 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0012	BF 53	5,0	11200	9,2
0,25 [1)]	**HB3F 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	BF 53	5,0	11200	10,6
0,37 [1)]	**HB3F 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0019	BF 04	11	9500	15,1
0,55 [1)]	**HB3F 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0056	BF 14	16	9000	19,5
0,75 [1) 2)]	**HB3F 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0057	BF 14	16	7100	19,5
1,1 [2)]	**HB3F 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	BF 05	27	5300	26
1,5 [2)]	**HB3F 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,0133	BF 15	40	3000	33
2,2 [2)]	**HB3F 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,0211	BF 06S	60	2800	44
3 [2)]	**HB3F 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0445	BF 06	75	1400	66
4 [2)]	**HB3F 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,0611	BF 07	100	1250	81
5,5 [2)]	**HB3F 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,0623	BF 07	150	1100	82

1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)
* Power 0.09 kW not classified in efficiency according to IEC 60034-30-1

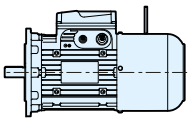
Page intentionally left blank.

5.9

Technical data 230/460V 60Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,16 ... 0,75 hp
230/460V - 60Hz [2)]
USA
NEMA MG1-12
c UL us


UT.C 1373

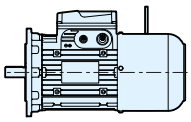
P_N 1)		Motor	n_N 1)	M_N	I_N		PF 1)	NEMA Nom. Eff. MG1-12	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake	M_f	z_0	kg
hp	kW		RPM	N m	A 230V	A 460V	%	%					kg m^2		N m	starts/h	
0,16	0,12	**HB2F 63 A 4**	1690	0,68	0,84	0,42	58	64	J	3,1	3,1	3,6	0,0003	BF 12	1,75	10000	5,5
0,25	0,18	**HB2F 63 B 4**	1680	1,02	1,18	0,59	60	69	J	3,3	3,1	3,8	0,0004	BF12	3,5	10000	6,1
0,33	0,25 *	**HB2F 63 C 4**	1690	1,42	1,5	0,75	59	72,3	J	3,5	3,5	4,2	0,0004	BF12	3,5	8000	6,9
0,33	0,25	**HB2F 71 A 4**	1720	1,39	1,4	0,7	65	70,9	K	2,8	3,3	4,8	0,0008	BF 53	5	8000	8,1
0,5	0,37	**HB2F 71 B 4**	1720	2,06	1,9	0,95	65	76	K	3,1	3,8	5,3	0,001	BF 53	5	8000	9
0,75	0,55*	**HB2F 71 C 4**	1720	3,06	2,6	1,3	66	78,8	K	4	4,1	6,3	0,0014	BF 53	7,5	6300	10,5
0,75	0,55	**HB2F 80 A 4**	1740	3	2,4	1,2	74	78,4	L	3,3	3,7	7,2	0,0025	BF 04	11	6300	13

1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages.
* Power or motor power-to-size correspondence not according to standard

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

Premium Efficiency (IE3)
P_N 0,16 ... 12,3 hp
230/460V - 60Hz 2)
USA (EISA)
ENERGY c UL us CC131B

In accordance with US DOE 10 CFR 431
and CSA C390 EISA ACT


UT.C 1373

P_N 1)		Motor	n_N 1)	M_N	I_N		PF 1)	NEMA Nom. Eff. MG1-12	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake	M_f	z_0	kg
hp	kW		RPM	N m	A 230V	A 460V	%	%					kg m^2		N m	starts/h	
0,16	0,12 *	**HB3F 63 A 4**	1685	0,68	0,66	0,33	67	68,2	H	2,9	2,9	4,1	0,0003	BF12	1,75	12500	6,3
0,25	0,18 *	**HB3F 63 B 4**	1700	1,01	1,02	0,51	62	71,8	J	3,7	3,6	4,4	0,0004	BF12	3,5	12500	7,1
0,33	0,25 *	**HB3F 71 A 4**	1730	1,38	1,26	0,63	67	74,2	L	3,7	3,7	6,2	0,0008	BF53	5,0	10000	10
0,5	0,37 *	**HB3F 71 B 4**	1725	2,05	1,77	0,89	67	78,2	K	4,2	3,8	6,3	0,0010	BF53	5,0	10000	11
0,75	0,55 *	**HB3F 80 A 4**	1735	3,0	2,85	1,43	59	82,0	K	4,0	4,0	5,8	0,0025	BF04	11	8000	14,4
1	0,75 **	**HB3F 90 S 4**	1735	4,1	2,86	1,43	77	85,5	K	3,4	4,3	7,2	0,0034	BF14	11	3150	19,3
1,5	1,1 **	**HB3F 90 L 4**	1740	6,0	4,3	2,13	75	86,5	K	3,4	4,1	7,9	0,0045	BF14	16	2500	23
2	1,5	**HB3F 90 LB 4**	1740	8,2	5,8	2,9	75	86,5	L	3,4	4,4	7,9	0,0047	BF05	27	2500	25
3	2,2 **	**HB3F 112 MA 4**	1760	12	8,1	4,1	76	89,5	M	7,4	5,1	9,6	0,0123	BF15	40	2000	38
4	3 **	**HB3F 112 M 4**	1755	16	11	5,3	79	89,5	M	3,5	5,4	8,9	0,0133	BF15	40	1600	40
5,4	4	**HB3F 112 MB 4**	1755	22	16	7,8	72	89,5	N	4,0	5,5	10,3	0,0149	BF06S	75	1400	46
7,5	5,5 **	**HB3F 132 M 4**	1765	30	19	9,5	80	91,7	L	4,1	4,4	9,7	0,0367	BF56	75	710	70
10	7,5	**HB3F 132 MB 4**	1765	41	26	13	80	91,7	L	3,7	4,4	9,1	0,0471	BF06	100	710	83
12,3	9,2	**HB3F 132 MC 4**	1765	50	34	17	75	91,7	M	4,3	4,4	8,7	0,0471	BF07	150	710	83

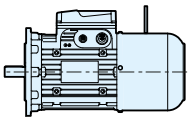
1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power ratings from 0.16 to 0.75 hp are suitable for the US market and are not covered by EISA regulations, therefore they do not bear the UL Energy logo on the nameplate.
** Power or motor power-to-size correspondence not according to standard.

5.9

Technical data 230/460V 60Hz

6 poles - 1200 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,16 ... 0,75 hp
230/460V - 60Hz [2)]
USA
NEMA MG1-12


UT.C 1373

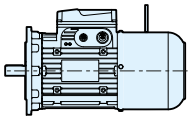
P_N 1) hp	P_N 1) kW	Motor	n_N 1) RPM	M_N N m	I_N A 230V	I_N A 460V	PF 1) %	NEMA Nom. Eff. MG1-12 %	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0 kg m^2	Brake	M_f N m	z_0 starts/h	kg
0,16	0,12	**HB2F 63 B 6**	1120	1,02	1,04	0,52	53	55,8	J	3,1	3,2	2,9	0,0005	BF 12	3,5	10000	6,1
0,20	0,15 *	**HB2F 63 C 6**	1100	1,3	1,2	0,6	56	58	J	3,1	3,2	3	0,0006	BF 12	3,5	9500	6,7
0,25	0,18	**HB2F 71 A 6**	1120	1,53	1,22	0,61	60	62,6	H	3	3,1	3,6	0,001	BF 53	5	9000	8,4
0,33	0,25	**HB2F 71 B 6**	1120	2,1	1,62	0,81	60	64,9	J	3,1	3,1	3,9	0,0013	BF 53	5	9000	9,2
0,5	0,37 *	**HB2F 71 C 6**	1120	3,16	2,2	1,1	63	70,9	J	3,2	3,3	4,5	0,0018	BF 53	7,5	8000	10,6
0,5	0,37	**HB2F 80 A 6**	1130	3,12	2,2	1,1	61	68,4	J	3,3	3,5	4,3	0,0021	BF 04	11	7500	12
0,75	0,55	**HB2F 80 B 6**	1140	4,6	3	1,5	62	75,7	K	3,6	3,7	5,3	0,0033	BF 04	16	7100	15

1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power or motor power-to-size correspondence not according to standard.

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

Premium Efficiency (IE3)
P_N 0,12 ... 5,4 hp
230/460V - 60Hz [2)]
USA (EISA)
ENERGY c UL us CC131B

In accordance with US DOE 10 CFR 431
and CSA C390 EISA ACT


UT.C 1373

P_N 1)		Motor	n_N 1)	M_N	I_N		PF 1)	NEMA Nom. Eff. MG1-12	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0	Brake	M_f	z_0	kg
hp	kW		RPM	N m	A 230V	A 460V	%	%					kg m^2		N m	starts./h	
0,12	0,09 *	**HBF 63 A 6**	1120	0,77	0,83	0,41	52	52,5	J	2,9	3,0	2,7	0,0004	BF12	1,75	10000	5,7
0,16	0,12 *	**HB3F 63 B 6**	1080	1,06	0,75	0,37	63	64,0	H	2,6	2,6	2,7	0,0005	BF12	3,5	12500	6,9
0,25	0,18 *	**HB3F 71 A 6**	1120	1,53	1,00	0,50	66	68,7	H	3,0	3,0	4,2	0,0010	BF53	5,0	11200	9,5
0,33	0,25 *	**HB3F 71 B 6**	1130	2,11	1,40	0,70	63	71,4	J	3,3	3,4	4,3	0,0013	BF53	5,0	11200	10,9
0,5	0,37 *	**HB3F 80 A 6**	1140	3,10	1,81	0,91	68	75,3	J	4,1	3,3	5,1	0,0210	BF04	11	9500	15,1
0,75	0,55 *	**HB3F 90 SA 6**	1155	4,5	2,52	1,26	67	81,7	K	3,2	3,8	6,0	0,0330	BF14	16	9000	19,5
1	0,75 **	**HB3F 100 LA 6**	1165	6,1	3,2	1,61	71	82,5	M	3,0	4,5	7,7	0,0134	BF15	13	3200	33
1,5	1,1 **	**HB3F 112 M 6**	1160	9,1	4,3	2,16	73	87,5	J	2,5	3,4	6,3	0,0219	BF15	27	2500	41
2	1,5 **	**HB3F 112 MB 6**	1160	12	6,1	3,0	70	88,5	K	3,0	3,9	6,9	0,0219	BF15	40	2000	41
3	2,2 **	**HB3F 132 S 6**	1170	18	8,6	4,3	72	89,5	K	2,7	3,6	7,3	0,0368	BF06	50	1400	59
4	3 **	**HB3F 132 M 6**	1775	24	12	5,8	72	89,5	K	2,8	3,8	7,6	0,0471	BF06	75	1000	68
5,4	4	**HB3F 132 MB 6**	1775	33	16	7,9	71	89,5	L	3,4	4,3	8,2	0,0623	BF07	100	800	82

1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power ratings from 0.16 to 0.75 hp are suitable for the US market and are not covered by EISA regulations, therefore they do not bear the UL Energy logo on the nameplate.
** Power or motor power-to-size correspondence not according to standard.

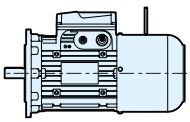
5.10

Technical data 440V 60Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

Premium Efficiency (IE3)
P_N 0,12 ... 9,2 kW
440V - 60Hz
Mexico (NOM)

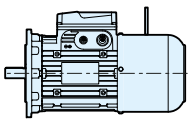
NOM


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 440 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12 *	**HB3F 63 A 4**	1675	0,68	0,34	0,70	66,0	66,0	59,6	2,7	2,7	3,9	0,0002	BF 12	1,8	12500	6,3
0,18 *	**HB3F 63 B 4**	1690	1,02	0,52	0,65	69,5	70,3	63,5	3,4	3,2	4,3	0,0004	BF 12	3,5	12500	7,1
0,25 *	**HB3F 71 A 4**	1720	1,39	0,64	0,70	73,4	72,9	67,9	3,4	3,3	5,9	0,0011	BF 53	5	10000	10
0,37 *	**HB3F 71 B 4**	1715	2,06	0,87	0,71	78,2	74,1	69,3	3,6	3,3	5,8	0,0013	BF 53	5	10000	11
0,55 *	**HB3F 80 A 4**	1725	3,0	1,41	0,63	81,1	81,6	78,7	3,5	3,5	5,8	0,0023	BF 04	11	8000	14,4
0,75	**HB3F 90 S 4**	1735	4,1	1,54	0,77	83,5	83,5	80,4	3,4	4,3	7,2	0,0034	BF 14	11	3150	19,3
1,1	**HB3F 90 L 4**	1740	6,0	2,22	0,75	86,5	87,4	85,8	3,4	4,1	7,7	0,0045	BF 14	16	2500	22
1,5	**HB3F 90 LB 4**	1740	8,2	3,1	0,74	86,5	86,3	84,7	3,4	4,4	7,9	0,0047	BF 05	27	2500	25
2,2	**HB3F 112 MA 4**	1755	12	4,1	0,79	89,5	90,6	88,9	6,1	4,5	8,8	0,0123	BF 15	40	2000	38
3	**HB3F 112 M 4**	1755	16	5,6	0,79	89,5	90,6	89,6	4,1	5,4	9,4	0,0133	BF 15	40	1600	40
4	**HB3F 112 MB 4**	1755	22	8,1	0,72	89,5	91,0	89,5	4,0	5,5	10,3	0,0149	BF 06S	75	1400	46
5,5	**HB3F 132 M 4**	1765	30	10	0,80	91,7	92,7	91,7	4,1	4,4	9,7	0,0367	BF 56	75	710	70
7,5	**HB3F 132 MB 4**	1760	41	13	0,80	91,7	92,6	92,2	3,7	4,4	9,1	0,0471	BF 06	100	710	83
9,2	**HB3F 132 MC 4**	1765	50	18	0,75	91,7	92,0	90,9	4,3	4,4	8,7	0,0471	BF 07	150	710	83

* Power ratings from 0.12 to 0.55 kW are suitable for the Mexican market and are not covered by the NOM-016 ENER 2016 standard, therefore they do not bear the NOM logo on the nameplate.

6 poles - 1200 min^{-1}
S1
IP 55
IC411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**


UT.C 1373

Premium Efficiency (IE3)
P_N 0,09 ... 4 kW
440V - 60Hz
Mexico (NOM)

NOM

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 440 V		100%	75%	50%				kg m^2		N m	starts/h	
0,09 *	**HBF 63 A 6**	1120	0,77	0,41	0,52	52,5	44,3	39,4	2,9	3,0	2,7	0,0004	BF 12	1,75	10000	5,7
0,12 *	**HB3F 63 B 6**	1065	1,08	0,37	0,66	64,0	55,4	49,2	2,3	2,3	2,7	0,0005	BF 12	3,5	10000	6,9
0,18 *	**HB3F 71 A 6**	1115	1,54	0,51	0,69	67,5	65,9	58,9	2,7	2,7	3,9	0,0012	BF 53	5,0	9000	9,5
0,25 *	**HB3F 71 B 6**	1120	2,13	0,70	0,66	71,4	65,9	59,5	2,7	2,8	4,0	0,0017	BF 53	5,0	9000	10,9
0,37 *	**HB3F 80 A 6**	1135	3,1	0,91	0,71	75,3	72,6	66,3	4,0	2,9	4,8	0,0019	BF 04	11	7500	15,1
0,55 *	**HB3F 90 SA 6**	1150	4,6	1,26	0,70	81,7	78,9	75,4	2,9	3,4	5,7	0,0056	BF 14	16	7100	19,5
0,75	**HB3F 100 LA 6**	1160	6,2	1,62	0,74	82,5	83,7	81,4	2,8	4,1	7,3	0,0130	BF 15	13	3200	33
1,1	**HB3F 112 M 6**	1155	9,1	2,20	0,75	87,5	88,3	86,9	2,5	3,1	6,3	0,0215	BF 15	27	2500	41
1,5	**HB3F 112 MB 6**	1160	12	3,2	0,70	88,5	88,2	86,2	3,0	3,9	6,9	0,0215	BF 15	40	2000	41
2,2	**HB3F 132 S 6**	1170	18	4,5	0,72	89,5	88,6	86,6	2,7	3,6	7,3	0,0358	BF 06	50	1400	59
3	**HB3F 132 M 6**	1175	24	6,1	0,72	89,5	90,3	88,9	2,8	3,8	7,6	0,0461	BF 06	75	1000	68
4	**HB3F 132 MB 6**	1170	33	8,0	0,73	89,5	90,5	88,9	3,0	3,9	7,6	0,0600	BF 07	100	800	82

* Power ratings from 0.09 to 0.55 kW are suitable for the Mexican market and are not covered by the NOM-016 ENER 2016 standard, therefore they do not bear the NOM logo on the nameplate.
1) Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.

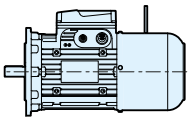
5.11

Technical data
220/380V 60Hz
440V 60 Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

IR3 (IE3)
P_N 0,75 ... 9,2 kW
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)

INMETRO



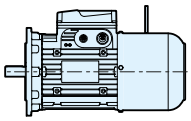
UT.C 1373

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S/I_N	J_0	Brake	Mf	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts./h	
220/380 V 60 Hz	0,75	HB3F 80 B 4	1740	4,1	3,8/2,20	0,62	83,5	83,1	80,1	4,1	3,9	6,5	0,002	BF 04	11	6800	16
	1,1	HB3F 90 S 4	1735	6,1	4,3/2,48	0,78	86,5	85,7	83,7	3,7	3,7	7,1	0,0043	BF 14	16	3150	23
	1,5	HB3F 90 L 4	1740	8,2	6,4/3,7	0,71	86,5	86,4	84,1	4,1	4,4	6,9	0,0047	BF 05	27	3000	26
	2,2	HB3F 100 LA 4	1755	12	8,9/5,2	0,72	89,5	86,6	83,6	4,4	5,0	9,7	0,008	BF 15	40	3000	33
	3 *	HB3F 112 MA 4	1760	16	12/6,7	0,76	89,5	89,6	87,0	5,2	5,2	10,3	0,013	BF 15	40	2000	40
	4	HB3F 112 M 4	1765	22	17/9,8	0,69	89,5	89,6	86,8	6,8	6,0	10,3	0,015	BF 06S	60	1800	46
	5,5	HB3F 132 S 4	1775	30	22/13	0,70	91,7	90,8	87,1	4,9	5,3	9,8	0,0367	BF 06	75	900	70
	7,5	HB3F 132 M 4	1765	41	28/16	0,77	91,7	91,0	88,8	7,0	5,1	11,9	0,0454	BF 07	100	900	81
	9,2 *	HB3F 132 MB 4	1765	50	35/20	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,047	BF 07	150	800	83
440 V 60 Hz	0,75	HB3F 80 B 4	1725	4,2	1,71	0,69	83,5	83,6	81,5	3,5	3,2	6,0	0,002	BF 04	11	6800	16
	1,1	HB3F 90 S 4	1730	6,1	2,07	0,81	86,5	82,7	80,0	3,2	3,3	6,5	0,0043	BF 14	16	3150	23
	1,5	HB3F 90 L 4	1725	8,3	2,92	0,78	86,5	87,0	85,9	3,5	3,3	6,6	0,0047	BF 05	27	3000	26
	2,2	HB3F 100 LA 4	1745	12	4,1	0,79	89,5	87,3	84,8	3,6	4,1	8,7	0,008	BF 15	40	3000	33
	3 *	HB3F 112 MA 4	1750	16	5,4	0,81	89,5	89,9	88,3	4,2	4,3	9,1	0,013	BF 15	40	2000	40
	4	HB3F 112 M 4	1755	22	7,6	0,77	89,5	90,6	88,4	5,6	5,0	9,7	0,015	BF 06S	60	1800	46
	5,5	HB3F 132 S 4	1770	30	10	0,77	91,7	91,4	88,3	4,1	4,6	9,1	0,0367	BF 06	75	900	70
	7,5	HB3F 132 M 4	1760	41	13	0,80	91,7	91,1	89,4	6,5	4,4	11,3	0,0454	BF 07	100	900	81
	9,2 *	HB3F 132 MB 4	1760	50	17	0,78	92,4	91,5	91,9	4,7	4,5	9,4	0,047	BF 07	150	800	83

* Power or motor power-to-size correspondence not according to standard.

Technical data
220/380V 60Hz
440V 60Hz

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**


UT.C 1373

IR3 (IE3)
P_N 0,75 ... 4 kW
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)

INMETRO

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S/I_N	J_0	Brake	Mf	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
220/380 V 60 Hz	0,75 *	HB3F 100 LA 6	1160	6,2	3,2/1,87	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,013	BF 15	13	3200	33
	1,1 *	HB3F 112 M 6	1160	9,1	4,5/2,6	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	BF 15	27	2500	41
	1,5 *	HB3F 112 MB 6	1160	12	6,4/3,7	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	BF 15	40	2000	41
	2,2 *	HB3F 132 S 6	1170	18	9,0/5,2	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	BF 06	50	1400	59
	3 *	HB3F 132 M 6	1170	24	12/7,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	BF 06	75	1000	68
	4	HB3F 132 MB 6	1175	33	17/9,6	0,71	89,5	90,3	88,4	3,4	4,3	8,2	0,06	BF 07	100	800	82
440 V 60 Hz	0,75 *	HB3F 100 LA 6	1160	6,2	1,61	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,013	BF 15	13	3200	33
	1,1 *	HB3F 112 M 6	1160	9,1	2,26	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	BF 15	27	2500	41
	1,5 *	HB3F 112 MB 6	1160	12	3,2	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	BF 15	40	2000	41
	2,2 *	HB3F 132 S 6	1170	18	4,5	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	BF 06	50	1400	59
	3 *	HB3F 132 M 6	1170	24	6,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	BF 06	75	1000	68
	4	HB3F 132 MB 6	1170	33	8,0	0,73	89,5	90,5	88,9	3,0	3,9	7,6	0,06	BF 07	100	800	82

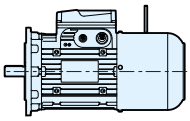
* Power or motor power-to-size correspondence not according to standard.

5.12

Technical data 400V 50Hz

2 poles - 3000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 15 kW
230/400V - 50Hz

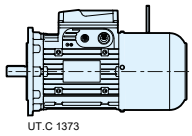

UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75 *	**HBF 71 C 2**	2830	2,53	1,85	0,79	73,8	72,9	68,7	3,5	3,7	5,7	0,0006	BF 53	5	3000	9,9
0,75	**HBF 80 A 2**	2850	2,51	1,85	0,75	78,3	77,7	74,3	3,6	3,8	6,1	0,0009	BF 13	5	3000	10
1,1	**HBF 80 B 2**	2840	3,7	2,6	0,77	79,5	80,1	78,3	3,6	3,8	6,1	0,0011	BF 04	11	3000	12,5
1,5 *	**HBF 80 C 2**	2890	4,96	3,5	0,76	81,2	81,4	78,9	4	4,4	7,4	0,0014	BF 04	11	2500	14,5
1,85 *	**HBF 80 D 2**	2820	6,3	4,2	0,8	79,8	81,2	80,1	3,7	3,8	6,2	0,0015	BF 04	16	2500	15
1,5	**HBF 90 S 2**	2840	5	3,4	0,81	78,5	78,9	77	3	3,2	5,7	0,0016	BF 14	11	2500	17
1,85 *	**HBF 90 SB 2**	2860	6,2	4,2	0,8	79,3	79,6	77,1	3,2	4	6,1	0,0018	BF 14	16	2500	18,5
2,2	**HBF 90 LA 2**	2880	7,3	4,9	0,8	81	80,7	78	3,8	4,5	7	0,0024	BF 05	27	2500	23
3 * □	**HBF 90 LB 2**	2870	10	6,6	0,8	82	82,2	80,1	3,7	4,1	6,8	0,0028	BF 05	27	1800	25
3	**HBF 100 LA 2**	2860	10	6,8	0,78	81,5	82	80,1	3,6	3,8	6	0,0035	BF 15	27	1800	27
4 *	**HBF 100 LB 2**	2860	13,4	8,8	0,79	83,1	82,5	80	3,8	4,4	7	0,0046	BF 15	27	1500	31
4	**HBF 112 M 2**	2880	13,3	8,8	0,79	83,3	83,6	82	3	3,8	6,2	0,0054	BF 15	27	1500	34
5,5 * □	**HBF 112 MB 2**	2890	18,2	11,6	0,81	84,7	84,9	83,2	3,3	3,7	7,2	0,0072	BF 15	40	1400	38
7,5 * □	**HBF 112 MC 2**	2870	25	16,5	0,79	83	84,4	83,7	3	3,7	6,4	0,0085	BF 06S	60	1060	43
5,5	**HBF 132 S 2**	2900	18,1	11,3	0,83	84,7	84,3	82,1	2,6	3,4	6,3	0,0112	BF 06	50	1250	55
7,5	**HBF 132 SB 2**	2910	24,6	14,3	0,87	86,9	87,2	85,5	2,9	3,7	7,2	0,0146	BF 06	50	1120	58
9,2 *	**HBF 132 SC 2**	2910	30,2	18,7	0,82	87	87,3	85,67	3	3,8	7,7	0,0168	BF 06	75	1060	60
11 *	**HBF 132 MA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,0214	BF 07	100	850	69
15 * □	**HBF 132 MB 2**	2920	49,1	30	0,85	88,7	86,2	84	3,7	4,1	8,3	0,0271	BF 07	100	710	80
11	**HBF 160 SA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,0214	BF 07	100	850	78
15 □	**HBF 160 SB 2**	2920	49,1	30	0,83	88,7	86,2	84	3,9	4,3	8,3	0,0271	BF 07	100	710	89

* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

4 poles - 1500 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 11 kW
230/400V - 50Hz


UT.C 1373

P_N		Motor		n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW				min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75*		**HBF 71 D**	**4**	1370	5,2	2,15	0,7	72,1	73,3	69,1	2,8	2,9	4	0,0014	BF 53	7,5	7100	10,5
0,75		**HBF 80 B**	**4**	1410	5,1	1,9	0,77	74,7	74,2	70,5	2,8	3	5,2	0,0025	BF 04	11	7100	13
1,1 *		**HBF 80 C**	**4**	1400	7,5	2,8	0,79	75	75,6	72	2,9	3	5,2	0,0033	BF 04	16	5000	15
1,1		**HBF 90 S**	**4**	1410	7,4	3	0,7	75,2	74,7	70	2,6	2,9	4,4	0,0025	BF 14	16	5000	17
1,5		**HBF 90 L**	**4**	1410	10,2	3,9	0,71	77,2	79	74,5	3,2	3,6	5,2	0,0037	BF 05	27	4000	23
1,85 *		**HBF 90 LB**	**4**	1400	12,6	4,5	0,76	78,6	80	77,1	2,9	3,2	5,1	0,004	BF 05	27	4000	24
2,2 *	□	**HBF 90 LC**	**4**	1400	15	5,7	0,7	79,7	80,3	77,2	2,8	3,2	4,9	0,0045	BF 05	40	3150	25
2,2		**HBF 100 LA**	**4**	1420	14,8	5,1	0,78	80	80,8	79,2	2,7	3,2	5,1	0,0054	BF 15	40	3150	27
3		**HBF 100 LB**	**4**	1425	20,1	6,9	0,76	82,8	83,7	82	2,8	3,2	5,5	0,0072	BF 15	40	3150	31
4		**HBF 112 M**	**4**	1430	26,7	9,2	0,75	83,4	84,1	82,6	3	3,4	6	0,0117	BF 06S	60	2500	40
5,5 *	□	**HBF 112 MC**	**4**	1420	37	12,3	0,76	84,7	86,1	85,7	3	3,4	6,1	0,0139	BF 06S	60	1800	43
5,5		**HBF 132 S**	**4**	1450	36,2	12,2	0,76	86,3	86,9	85,7	3,2	3,4	6,3	0,0245	BF 06	75	1800	57
7,5		**HBF 132 M**	**4**	1450	49,4	15,8	0,79	87,1	87,7	86,5	3,4	3,6	7	0,0342	BF 07	100	1250	68
9,2 *		**HBF 132 MB**	**4**	1450	61	19,5	0,77	88	89,4	87,6	3,5	3,8	7,2	0,0399	BF 07	150	1060	74
11 *	□	**HBF 132 MC**	**4**	1450	72	23	0,78	87,8	88,2	87	3,5	3,8	7,3	0,0455	BF 07	150	900	80
11	□	**HBF 160 SC**	**4**	1450	72	23	0,78	87,8	88,2	87	3,5	3,8	7,3	0,0455	BF 07	150	900	89

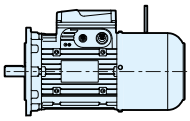
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

5.12

Technical data 400V 50Hz

6 poles - 1000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 7.5 kW
230/400V - 50Hz


UT.C 1373

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75*	**HBF 80 C 6**	920	7,8	2,3	0,67	70,1	69,7	64,5	2,5	2,7	3,8	0,0033	BF 04	16	7100	15
0,75	**HBF 90 S 6**	920	7,8	2,2	0,68	72,1	72	67,9	2,4	2,4	3,7	0,0042	BF 14	16	7100	17,5
1,1	**HBF 90 L 6**	915	11,5	3,2	0,68	72,9	72	69,3	2,6	2,8	3,9	0,0059	BF 05	27	5300	23
1,5 * □	**HBF 90 LC 6**	910	15,7	4,3	0,68	73,8	72,5	70	2,7	2,9	4,3	0,0069	BF 05	40	5000	25
1,5	**HBF 100 LA 6**	930	15,4	3,9	0,73	75,5	75,4	71,6	2,8	3	4,8	0,0099	BF 15	40	3550	28
1,85 *	**HBF 100 LB 6**	930	19	4,9	0,71	76,6	76,2	72,1	3	3,2	5	0,0121	BF 15	40	3150	31
2,2	**HBF 112 M 6**	940	22,3	5,4	0,75	78,7	79,7	78,1	2,1	2,5	5,0	0,0157	BF 06S	60	2800	37
3 * □	**HBF 112 MC 6**	940	30,5	7,2	0,76	79,7	81,2	80,2	2,3	2,7	5,1	0,0197	BF 06S	60	2500	42
3	**HBF 132 S 6**	960	29,8	7,8	0,68	82,1	82,3	80,2	2,3	3	5,1	0,0305	BF 06	75	2360	54
4	**HBF 132 M 6**	960	39,8	9,7	0,72	83,2	83,7	81,8	2,5	3	5,7	0,0406	BF 07	100	1400	63
5,5	**HBF 132 MB 6**	960	55	12,9	0,73	84	84,8	83,4	2,6	3	6,3	0,0509	BF 07	150	1250	72
7,5 * □	**HBF 132 MC 6**	950	75	17,6	0,73	84,7	85	83,8	2,4	2,8	5,7	0,0611	BF 07	150	1000	80
7,5 □	**HBF 160 SC 6**	950	75	17,6	0,73	84,7	85	83,8	2,4	2,8	5,7	0,0611	BF 07	150	1000	89

* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

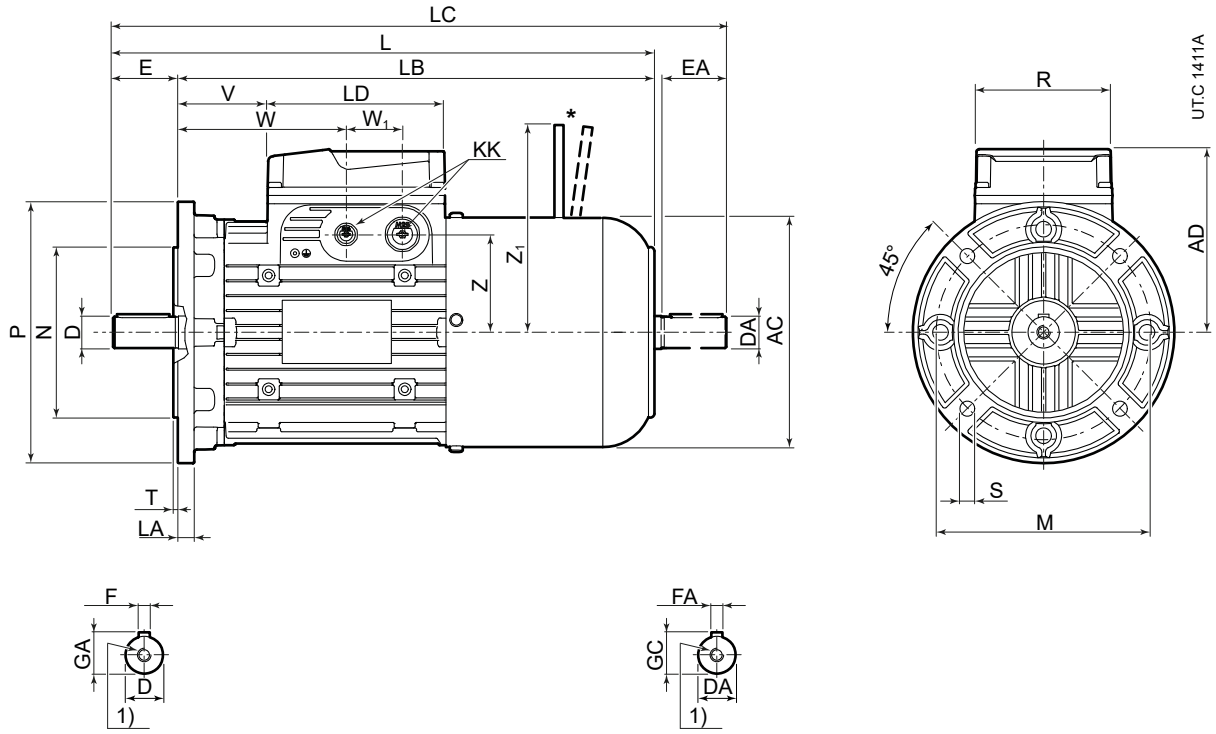
Page intentionally left blank

5.13

Motor dimensions

Mounting position
IM **B5**, IM **B5R**, IM **B5...**

63 ... 160S



* On request

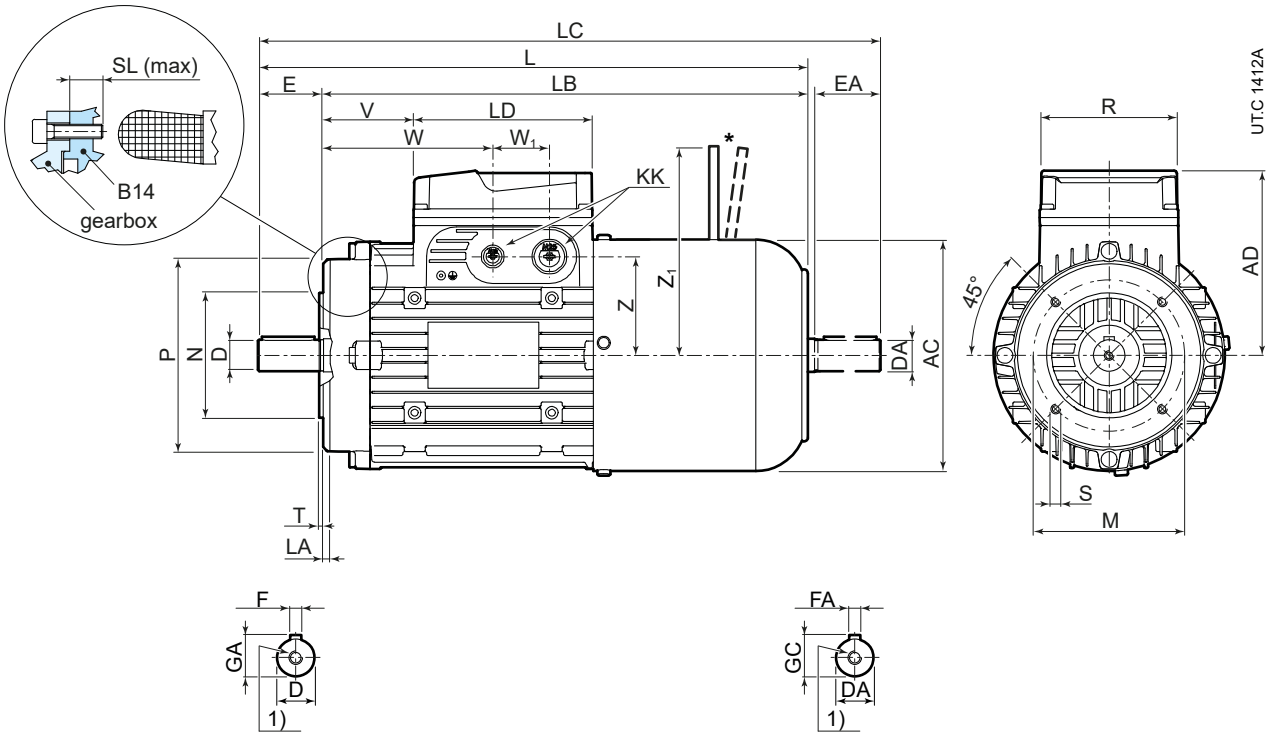
Mounting position
M **B5**, IM **B5R**, IM **B5...**

Motor size		AC ∅	AD	L	LB	LC	LD	KK 2)	R	V	W	W_1	Z	Z_1	Shaft end D DA ∅		1)	E EA	F FA h9	GA GC	Flange M ∅	N ∅		P ∅	LA	S ∅	T
63	**B5R**	123	95	281	261	306	103	4×M16	86	46	86	36	45	116	9	j6	M3	20	3	10,2	100	80	j6	120	8	7	3
	B5A			284		312									11	j6	M4	23	4	12,5							
	B5			267	244	295				29	69										115	95	j6	140	10	9	3
	BX1														11[3]	j6	M4	23[3]			130	110	j6	160			3,5
71	**B5B**	138	112	320	297	349		2×M16 + 2×M20		66	106		62	125	11	j6	M4	23			100	80	j6	120	8	7	3
	B5R																				115	95	j6	140	10	9	
	B5A			327		363									14	j6	M5	30	5	16							
	B5			308	278	344				47	87										130	110	j6	160			3,5
	BX2			301		330									11[3]	j6	M4	23[3]	4	12,5							
	BX5			308		344									14[3]	j6	M5	30[3]	5	16							
	BX1																				165	130	j6	200	12	11	
80	**B5B**	156	121	353	323	390				80	120		71	134	14	j6	M5	30			115	95	j6	140	10	9	3
	B5R																				130	110	j6	160			3,5
	B5A			363		410									19	j6	M6	40	6	21,5							
	B5			342	302	389				59	99										165	130	j6	200	12	11	
	BX2			332	365	369									14[3]	j6	M5	30[3]	5	16							
90 SA, S[5]	**B5S**	176	141	387	357	424	136	2×M16 + 2×M25	106	60	120	43	75		14	j6	M5	30			130	110	j6	160	10	9	
	B5B			397		444									19	j6	M6	40	6	21,5							
	B5R			376	336	423				39	99										165	130	j6	200	12	11	
	B5			386		443									24	j6	M8	50	8	27							
90 L	**B5S**			417	387	454				90	150			160[4]	14	j6	M5	30	5	16	130	110	j6	160	10	9	
	B5B			427		474									19	j6	M6	40	6	21,5							
	B5R			406	366	453				69	129										165	130	j6	200	12	11	
	B5			416		473									24	j6	M8	50	8	27							
100	**B5C**	194	151	472	432	520				109	169		86		19	j6	M6	40	6	21,5	130	110	j6	160	10	9	
	B5S																				165	130	j6	200	12	11	
	B5R			482		540									24	j6	M8	50	8	27							
	B5A			492		560									28	j6	M10	60		31							
	B5			465	405	533				82	142										215	180	j6	250	14	14	4
112	**B5S**	218	163	501	461	550				126	186		98	198[4]	19	j6	M6	40	6	21,5	165	130	j6	200	12	11	3,5
	B5R			511		570									24	j6	M8	50	8	27							
	B5A			521		590									28	j6	M10	60		31							
	B5			495	435	564				100	160										215	180	j6	250	14	14	4
132 S, M[6]	**B5S**	257	194	578	528	637	190	2×M16 + 2×M32	148	113	201	55	109	203[4]	24	j6	M8	50		27	165	130	j6	200	12	11	3,5
	B5B			588		657									28	j6	M10	60		31							
	B5R																				215	180	j6	250	14	14	4
	B5A			608		697									38	k6	M12	80	10	41							
	B5			573	493	662				78	166										265	230	j6	300			
132 MA[8]**... MC**	**B5S**			638	588	697				173	261			226[4]	24	j6	M8	50	8	27	165	130	j6	200	12	11	3,5
	B5B			648		717									28	j6	M10	60		31							
	B5R																				215	180	j6	250	14	14	4
	B5A			668		757									38	k6	M12	80	10	41							
	B5			633	553	722				138	226										265	230	j6	300			
160 S	**B5**			682	572	771				157	245				42	k6	M16[7]	110[7]	12[7]	45[7]	300	250	j6	350	15	18	5

1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides (two openings on each side).
3) Shaft end not according to standard.
4) Dimension valid for motor-brake pairing 90-BF05 and 112-BF06S, 132-BF06 and 160-BF07 with brake of smaller size see Z_1 of smaller motor size.
5) For motor **HB3F 90S2, HB3F 90S 4** e **HB3F 90S 6** dimensions are the ones as size 90L.
6) For motor **HB3F 132SB 2**, **HB3F 132SC 2**, **HB3F 132S 4**, **HB3F 132M 4** and **HB3F 132M 6** dimensions are the ones as size 132 MA ... MC.
7) Second shaft end dimensions as size 132.
8) For motor **HBF 132MA 2** dimensions as size 132S, M.

Mounting position
IM **B14**, IM **B14R**

63 ... 132



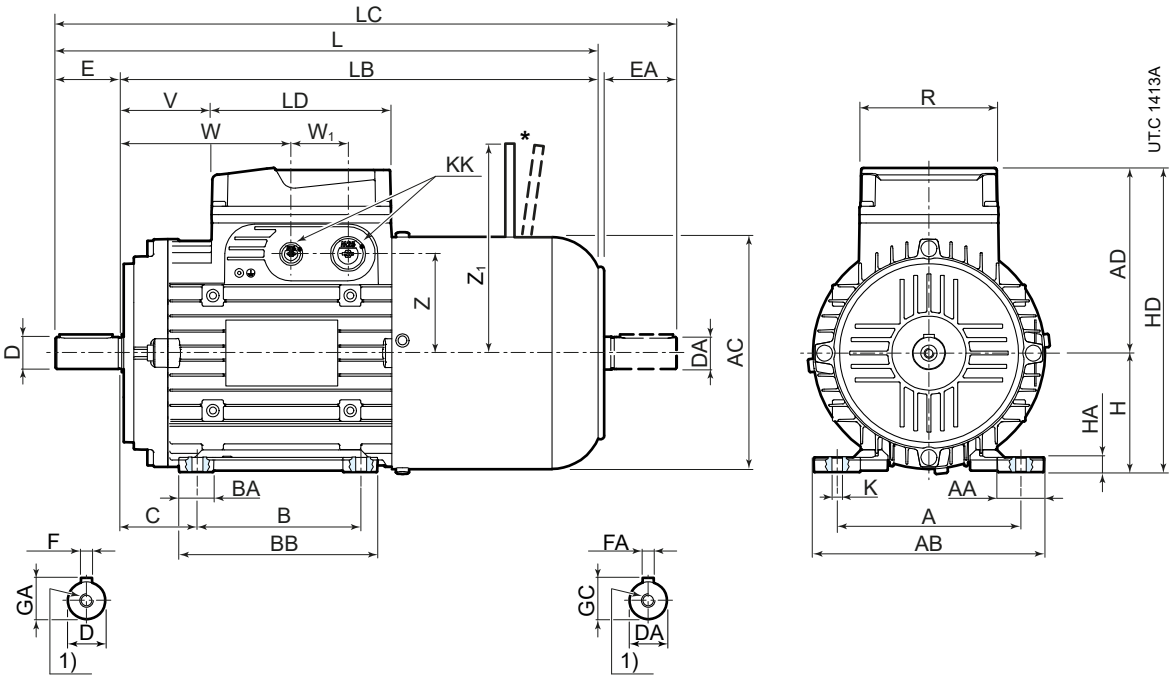
* On request

Motor size		AC ∅	AD	L	LB	LC	LD	KK 2)	R	V	W	W_1	Z	Z_1	Shaft end D DA 1) ∅	E EA	F FA h9	GA GC	Flange M ∅	N ∅	P ∅	LA	S ∅	SL max	T
63	**B14**	123	95	267	244	295	103	4×M16	86	29	69	36	45	116	11 j6 M4	23	4	12,5	75	60 j6	90	8	M5	10	2,5
71	**B14R**	138	112	301	278	330		2×M16 + 2×M20		47	87		62	125											
	B14			308		344									14 j6 M5	30	5	16	85	70 j6	105	8	M6		2,5
80	**B14R**	156	121	332	302	369				59	99		71	134											
	B14			342		389									19 j6 M6	40	6	21,5	100	80 j6	120	8	M6		3
90 SA, S 6)	**B14**	176	141	386	336	443	136	2×M16 + 2×M25	106	39	99	43	75		24 j6 M8	50	8	27	115	95 j6	140	10	M8	12	
90 L	**B14**			416	366	473				69	129			160 3)											
100	**B14**	194	151	465	405	533				82	142		86		28 j6 M10	60	8	31	130	110 j6	160	10	M8	13	3,5
112	**B14**	218	163	495	435	564				100	160		98	198 3)											
132 S, M 7)	**B14**	257	194	573	493	662	190	2×M16 + 2×M32	148	78	166	55	109	203 3)	38 k6 M12	80	10	41	165	130 j6	200	8	M10	18	
132 MA 8) **... MC**	**B14**			633	553	722				138	226			226 3)											

1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides (two openings on each side).
3) Dimension valid for motor-brake pairing 90-BF05 and 112-BF06S, 132-BF06 and 160-BF07; with brake of smaller size see Z_1 of smaller motor size.
6) For motor **HB3F 90S2, HB3F 90S 4** e **HB3F 90S 6** dimensions are the ones as size 90L.
7) For motor **HB3F 132SB 2**, **HB3F 132SC 2**, **HB3F 132S 4**, **HB3F 132M 4** e **HB3F 132M 6** dimensions are the ones as size 132 MA ... MC.
8) For motor **HBF 132MA 2** dimensions are the ones as size 132S, M.

Mounting position
IM **B3**

63 ... 160S



* On request

Motor size		AC ∅	AD	L	LB	LC	LD	KK 2)	R R1	V	W	W1	Z	Z1	Shaft end D DA ∅	1)	E EA	F FG h9	GA GC	Feet A	AB	B	C	BB	BA	AA	K	HA	H4)	HD
63	**B3**	123	95	267	244	295	103	4×M16	86 –	29	69	36	45	116	11 j6	M4	23	4	12,5	100	120	80	40	100	21	27	7	9	63	158
71	**B3**	138	112	308	278	344		2×M16 + 2×M20		47	87		62	125	14 j6	M5	30	5	16	112	138	90	45	110	22	28		10	71	183
80	**B3**	156	121	342	302	389				59	99		71	134	19 j6	M6	40	6	21,5	125	152	100	50	125	26		9		80	201
90 SA, S6)	**B3**	176	141	386	336	443	136	2×M16 + 2×M25	106 –	39	99	43	75		24 j6	M8	50	8	27	140	174		56			35		11	90	230
90 L	**B3**			416	366	473				69	129			160 3)								125		150						
100	**B3**	194	151	465	405	533				82	142		86		28 j6	M10	60	8	31	160	196	140	63	185	40	37	12	12	100	251
112	**B3**	218	163	495	435	564				100	160		98	198 3)						190	226		70			50		15	112	275
132 S, M7)	**B3**	257	194	573	493	662	190	2×M16 + 2×M32	148	78	166	55	203 3)		38 k6	M12	80	10	41	216	257	140 9)	89	210	42	52	14	17	132	326
132 MA8)**... MC**	**B3**			633	553	722				138	226		226 3)									178 9)								
160 S	**B3**			682	572	771				157	245				42 k6	M16 5)	110 5)	12 5)	45 5)	254	294	210	108	246	45			20	160	354

1) DE threaded hole.
2) Prearranged for cable entry knockout openings on both sides (two openings on each side).
3) Dimension valid for motor-brake paring 90-BF05 and 112-BF06S, 132-BF06 and160-BF07; with brake of smaller size see Z_1 of smaller motor size.
4) Tollerance $^{0}_{-0,5}$.
6) For motor **HB3F 90S2, HB3F 90S 4** e **HB3F 90S 6** dimensions are the ones as size 90L.
7) For motor **HB3F 132SB 2**, **HB3F 132SC 2**, **HB3F 132S 4**, **HB3F 132M 4** e **HB3F 132M 6** dimensions are the ones as size132 MA ... MC.
8) For motor **HBF 132MA 2** dimensions are the ones as size 132S.
9) Foot of 132S has also a center distance of 178 mm and the one of 132M has a center distance of 140 mm.

5.14

Non-standard designs and accessories

Ref.	Description	Non-standard design code
(1)	Non-standard motor supply	–
(3)	Insulation class H	,H
(7)	Design for low temperatures (-30 °C)	,BT
(8)	Condensate drain holes	,CD
(9)	Additional winding impregnation	,SP
(13)	Anti-condensation heater	,S
(14)	Terminal box on one side (IM B3 and derivatives, 90 ... 160S)	,P...
(16)	Second shaft end	,AA
(17)	Axial independent cooling fan	,V...
(18)	Axial independent cooling fan and encoder	,V... ,E...
(19)	Thermistor type thermal probes (PTC)	,T15
(20)	Bi-metal type thermal probes	,B15
(21)	Drip-proof cover	,PP
(25)	Lever for manual release with automatic return	,L
(35)	Light alloy fan	,VL
(36)	Encoder	,E1 ... ,E5
(42)	Motor certified to UL	,UL
(47)	Design for damp and corrosive environment, stainless steel brake disc, bolts and screws	,UC, DB
(48)	IP 56 protection	,IP56
(49)	IP 65 protection	,IP65
(61)	Manual rotation	,MM
(62)	Motor prearranged for encoder	,PE
(63)	Axial independent cooling fan and prearranged for encoder	,V... ,PE...
(99)	Paint cycles	see page 198

(1) Non-standard motor supply

The first two columns show the possible types of supply.
Supply values, brake rectifier and independent cooling fan are **co-ordinated** with motor winding voltage as stated in the table.

Directive / Certification	Motor wound and stated for		Brake supply		Motor type		
	V ± 5%	**Hz**	**V ~ ± 5%**	**Hz**	**HBF**	**HB2F**	**HB3F**
ErP EAC AU MEPS	Δ220 Y380	50	Δ220 Y380	50	O	O	O
	Δ230 Y400	50	Δ230 Y400	50	●	●	●
	Δ240 Y415	50	Δ240 Y415	50	O	O	O
	Δ265 Y460	60	Δ265 Y460	60	●	●	●
	Δ277 Y480	60	Δ277 Y480	60	O	●	●
	Δ380	50	Δ380	50	O	O	O
	Δ400	50	Δ400	50	O	O	O
	Δ415	50	Δ415	50	O	O	O
	Δ460	60	Δ460	60	O	O	O
	Δ480	60	Δ480	60	O	O	O
CCC, CEL	Δ220 Y380	50	Δ220 Y380	50	-	-	●
EISA	YY230 Y460	60	YY230 Y460	60	-	-	●
NOM INMETRO	Δ255 Y440	60	Δ255 Y440	60	-	-	●
	Δ440	60	Δ440	60	-	-	O
INMETRO	Δ220 Y380	60	Δ220 Y380	60	-	-	●
OTHERS	Δ290 Y500	50	Δ290 Y500	50	O	O	O
	Δ330 Y575	60	Δ330 Y575	60	O	O	O

○ on request ● standard — not foreseen

(3) Insulation class H

Insulation materials in class H with permissible temperature rise in class H.
Non-standard design code for the **designation: ,H**

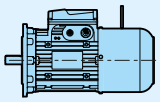
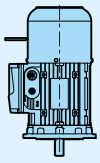
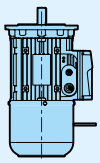
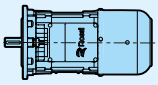
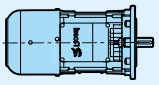
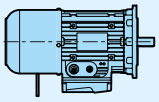
Design not available for directives CCC, CCC+CEL, CEL.

(7) Design for low temperatures (-30 °C)

Standard motors can operate for possible ambient temperature down to -15 °C.
For ambient temperature down to -30 °C: special bearings, light alloy fan (in addition, cable glands and metal plugs, if foreseen in the conditions of supply).
If there are dangers of condensate, it is advisable to require also «Design for damp and corrosive environments» (47) and, if necessary, the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13).
May there be dangers of ice on friction surface consult us.
With designs (17), (18), (36) and (63), consult us.
Non-standard design code for the **designation: ,BT**

(8) Condensate drain holes

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature. In motor designation state in «MOUNTING POSITION» the designation of the real application mounting position, determining the hole position.
Motors are supplied with closed holes.
Non-standard design code for the **designation: ,CD**

Mounting position IM						
B3	IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
B5	IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071
B14	IM 3601	IM 3611	IM 3631	IM 3651	IM 3661	IM 3671
B3-B5	IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071
B3-B14	IM 2101	IM 2111	IM 2131	IM 2161	IM 2161	IM 2171
B3 ,AA	IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072
B5 ,AA	IM 3002	IM 3012	IM 3032	IM 3052	IM 3062	IM 3072
B14 ,AA	IM 3602	IM 3612	IM 3632	IM 3652	IM 3662	IM 3672

(9) Additional winding impregnation

It consists of a second impregnation cycle after stator winding assembly (standard with designs (47), (48)).
Useful where it is necessary to have an additional protection (of the windings) against electrical stress (voltage peaks due to rapid commutations or to «low quality» inverters with high voltage gradients) or mechanical agents (mechanical or electromagnetic vibrations: e.g. from inverter). See also ch. 2.9 «Running with inverter», section «Voltage peaks (U_{max}), voltage gradients (dU/dt), cable length».

Non-standard design code for the **designation: ,SP**

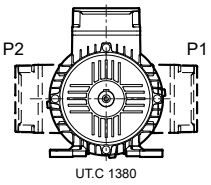
(13) Anti-condensation heater

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature; single-phase supply 230 V a.c. ± 10% 50 or 60 Hz (other voltage on request); power absorbed: 15 W for sizes 63 and 71, 25 W for sizes 80 ... 100, 50 W for sizes 112 ... 160. Heater must not be connected during the running.

Non-standard design code for the **designation**: **,S**

(14) Terminal box on one side for IM B3 and derivatives (sizes 90 ... 160S)

Terminal box in position P1 or P2.
Non-standard design code for the **designation**: **,P...** (additional code **1** or **2** according to scheme beside).



UT.C 1380

(16) Second shaft end

For dimensions s. ch. 5.8; radial loads are not permissible.
Not possible with designs (17), (18), (36), (62) and (63).
Non-standard design code for the **designation**: **,AA**

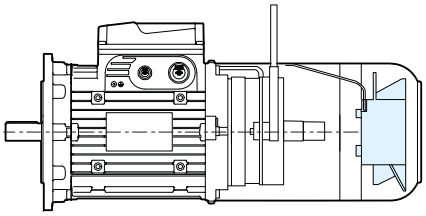
(17) Axial independent cooling fan

Cooling provided with **compact** axial independent cooling fan, for variable speed drives (motor can absorb nominal current for all speed range, in continuous duty cycle and without overheating) with inverter and/or for heavy starting cycles (for z_0 increases consult us).
LB dimension (see ch. 5.13) increases by ΔLB quantity stated in the following table.
Specifications of independent cooling fan:

- 2 poles motor;
- **IP 54** protection (it is the protection stated on name plate);
- supply terminals on relevant: auxiliary inside the motor terminal box;
- other data according to the following table.

Non-standard design code for the **designation**:**,VA ,VD ,VF**.

IC 416 is stated on name plate.


UT.C 1392

Motor size wound and stated for			Independent cooling									
			Independent cooling fan name plate							ΔLB		
Motor size	V	Hz	V	Hz	W	A	kg	Code	Type			
63 … 80	Δ220 Y380	50	230	50/60	19/18	0,12/0,11	0,4	**,VA**	Single-phase	81 (Size 63)	68 (Size 71)	73 (Size 80)
	Δ230 Y400	50										
	Δ240 Y415	50										
	Δ290 Y500	50										
	Δ380	50										
	Δ400	50										
	Δ415	50										
	Δ220 Y380	60										
	Δ255 Y440	60										
	Δ265 Y460	60										
	Δ277 Y480	60										
	YY230 Y460	60										
	Δ380	60										
	Δ440	60										
	Δ460	60										
	Δ480	60										
90	Δ220 Y380	50	230	50/60	45/39	0,31/0,25	0,9	**,VA**	Single-phase	88		
	Δ230 Y400	50										
	Δ240 Y415	50										
	Δ290 Y500	50										
	Δ380	50										
	Δ400	50										
	Δ415	50										
	Δ220 Y380	60										
	Δ255 Y440	60										
	Δ265 Y460	60										
	Δ277 Y480	60										
	YY230 Y460	60										
	Δ380	60										
	Δ440	60										
	Δ460	60										
	Δ480	60										
100,112	Δ220 Y380	50	Y380	50	40	0.12	1,3	**,VD**	Three-phase	78		
	Δ230 Y400	50	Y400	50	45	0.13						
	Δ240 Y415	50	Y415	50	45	0.13						
	Δ290 Y500	50	Y500	50	45	0.10		**,VF**				
	Δ380	50	Y380	50	45	0.13		**,VD**				
	Δ400	50	Y400	50	45	0.13						
	Δ415	50	Y415	50	45	0.13						
	Δ220 Y380	60	Y380	60	38	0.11						
	Δ255 Y440	60	Y440	60	43	0.12						
	Δ265 Y460	60	Y460	60	45	0.13						
	Δ277 Y480	60	Y480	60	50	0.15						
	YY230 Y460	60	Y460	60	45	0.13						
	Δ480	60	Y480	60	50	0.15						
	Δ440	60	Y440	60	43	0.12						
	Δ460	60	Y460	60	45	0.13						
	Δ380	60	Y380	60	38	0.11						
132,160S	Δ220 Y380	50	Y380	50	50	0.13	1,7	**,VD**	Three-phase	81		
	Δ230 Y400	50	Y400	50	53	0.15						
	Δ240 Y415	50	Y415	50	51	0.16						
	Δ290 Y500	50	Y500	50	53	0.12		**,VF**				
	Δ380	50	Y380	50	53	0.15		**,VD**				
	Δ400	50	Y400	50	53	0.15						
	Δ415	50	Y415	50	51	0.16						
	Δ220 Y380	60	Y380	60	56	0.12						
	Δ255 Y440	60	Y440	60	60	0.14						
	Δ265 Y460	60	Y460	60	65	0.14						
	Δ277 Y480	60	Y480	60	70	0.15						
	YY230 Y460	60	Y460	60	65	0.14						
	Δ380	60	Y380	60	56	0.12						
	Δ440	60	Y440	60	60	0.14						
	Δ460	60	Y460	60	65	0.14						
	Δ480	60	Y480	60	70	0.15						

(18) Axial independent cooling fan and encoder

Independently cooled motor equipped with hollow shaft encoder with elastic fastening for brake air-gap adjustment.

For specifications and designation code relevant to the independent cooling fan and the encoder see designs (17) and (36), respectively.

Motor overall dimensions as «Axial independent coling fan» (17).

Non-standard design code for the **designation**: **,V ... ,E...**

IC 416 is stated on name plate.

(19) Thermistor type thermal probes (PTC)

Three thermistors wired in series (to DIN 44081/44082), inserted in the windings, for connection to a suitable contact breaker device. A sharp variation in resistance occurs when (delay 10 ÷ 30 s) the temperature of the windings reaches the setting temperature of **150 °C** (T15).

With design (3) «Insulation class H» if required, **thermistors** with setting temperature of 170 °C **(T17)** are supplied.

Terminals connected to a loose or fixed terminal block inside the terminal box.
Non-standard design code for the **designation**: **,T15**

(20) Bi-metal type thermal probes

Three bi-metal probes wired in series with usually closed contact inserted in the windings. Nominal corrent 1,6 A, nominal voltage 250 V a.c.. The contact opens when (delay 20 ÷ 60 s) the temperature of the windings reaches the setting temperature of **150 °C** (B15).

With design (3) «Insulation class H» if required, **bi-metal probes** with setting temperature of 170 °C **(B17)** are supplied.

Terminals connected to fixed or loose terminal block inside the terminal box.

Non-standard design code for the **designation**: **,B15**

(21) Drip-proof cover

Necessary design for outdoor applications or when water sprays are present, in mounting position with downwards vertical shaft (IM V5, IM V1, IM V18).

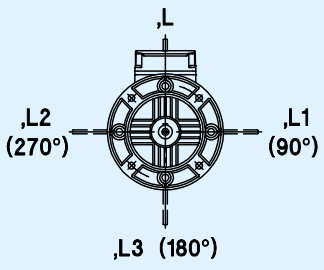
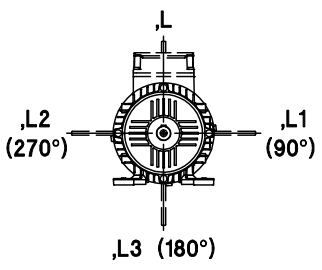
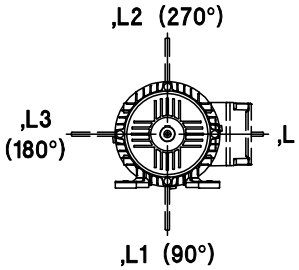
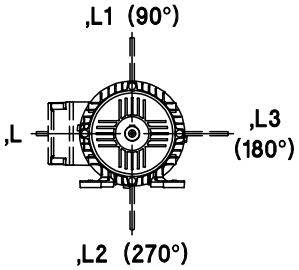
LB dimension (see. ch. 5.8) increases by ΔLB = 25 mm.

Non-standard design code for the **designation**: **,PP**

(25) Lever for manual release with automatic return

Three-phase motors sizes 63 ... 160S equipped with lever for manual release with automatic return and removable lever rod; position of release lever corresponding to terminal box as per schemes.

Non-standard design codes for the **designation**: **,L ,L1 (90°) ,L2 (270°) ,L3 (180°).**

≠ B3	B3	B3 ,P1	B3 ,P2
			

(35) Light alloy fan

Motor with light alloy fan (aluminum) for environments where it is not advisable to use the standard plastic fan.

Non-standard design code for the **designation**: **,VL**

(36) Encoder

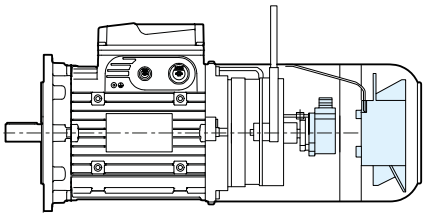
Motor equipped with incremental hollow shaft encoder and elastic fastening with the following features stated in the table (free connection wirings for the use of connectors installed by the Buyer).

For different and/or additional technical specifications, consult us.

LB dimensions (see ch. 5.8) **increases** by ΔLB quantity stated in the table.

Non-standard design code for the **designation**: **,E1** ... **,E5** (see table).

Size	Encoder **ΔLB** [mm] **,E1 ... ,E5**
63	54
71	55
80	60
90	56
100	44
112	50
132, 160S	42



UT.C 1393

Output signal[1]	**RS 422 LD TTL**	**RS 422 TTL**	**Push - Pull HTL LD HTL**	**sin / cos**	
Supply voltage U_B	5 V d.c. ± 5%	10 ÷ 30 V d.c.		5 V d.c. ± 5%	10 ÷ 30 V d.c.
Maximum current consumption (without load) I_N	90 mA		100 mA	110 mA	
Channels	A+, A-, B+, B-, 0+, 0-				
Output amplitude per track	$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq 2{,}5\ V_{dc}$		$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq U_B - 1\ V_{dc}$	1 V_{PP} ± 20% (channel A, B) 0,1 ÷ 1,2 V (channel 0)	
Maximum output current per track I_{out}	± 20 mA		± 30 mA	–	
Maximum pulse frequency f_{max}	100 ÷ 300 kHz[2) 3)]			–	
Frequency -3 dB	–			≥ 180 kHz	
No. pulse per revolution	1024[4)]				
Vibration resistance (DIN-IEC 68-2-6)	≤ 100 m/s², 10 ... 2000 Hz				
Shock resistance (DIN-IEC 68-2-27)	≤ 1000 ÷ 2500 m/s², 6 ms[2)]			≤ 2000 m/s², 6 ms	
Maximum speed	6000 min^{-1}				
Ambient temperature	-40 °C ÷ 100 °C	-30 °C ÷ 85 °C	-40 °C ÷ 100 °C	-25 °C ÷ 85 °C	
Protection degree (EN 60 529)	IP65				
Connections	Cable with open wire ends[8)] L = 1000 mm for use of connector installed by the user				
Encoder cable cross-sections	2×0,22+6×0,14 [mm²]	10×0,14 [mm²]	2×0,22+6×0,14 [mm²]	8×0,22 [mm²]	8×0,22 [mm²]
Code for designation	**,E1**	**,E2**	**,E3**	**,E4**	**,E5**

1) Other electronic configurations available on request; consult us.
2) Variable depending on the model.
3) Parameter to be checked depending on the combination max motor speed/pulse per revolution required.
4) Other pulse rates available on request (max 5 000 ppr).
8) On request: different cable lengths, output with connector or with connector and cable; consult us.

(42) c UL us Motor certified to UL

Motor sizes 63 … 160S certified to UL1004-1 and CAN/CSA 23.2 No.100-14, for USA and Canada markets respectively, and electrically complying with NEMA MG 1-12 2009.

The main variations of this product are:

- UL-approved winding insulation system
- UL-approved terminal block, with NEMA-compliant labeling;
- aluminum or certified thermoplastic cooling fan;
- certified and marked cables;
- verification and adjustment of air distances toward ground and between live parts;
- nameplate with logo c UL us

All other special versions are available except for (31), (32), and (33) (with T_{amb}. 70° C and 90° C).

Standard for 230YY 460Y V, 60 Hz and for EISA Premium Efficiency motors.
Non-standard design code for the **designation**: ,**UL**.

Design not available for CCC, CCC+CEL, CEL, NOM and INMETRO directives.

(47) Design for damp and corrosive environment

Advised for outdoor installation, in presence of humidity, in case of condensate dangers, especially for aggressive environment, including design «Additional winding impregnation» (9) and anti-oxidation paint of stator, rotor and shaft.

Brake with dragging hub and brake plate (end-shield end) made of stainless steel.

In these cases it is recommended to require also the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13).

For strongly aggressive environment (e.g. sea), it is possible to require: stainless steel brake disc and anti-sticking friction surface (the braking torque reduces to 0,8 times the one stated at point 5.5); stainless steel bolts and screws of brake (fastening screws, bushes and nuts). In this case the motor is to be specifically purchased with «**Stainless steel brake disc, bolts and screws**» (Further non-standard design code for the **designation: ,DB**).

With design «Axial independent cooling fan and encoder» (18) and «Encoder» (36) consult us.

Non-standard design code for the **designation: ,UC**

(48) IP 56 protection

It is recommended for motors running in presence of direct splash or bolts of water (including design (47)).

Seal between couplings surfaces of housing and endshields (to be re-adjusted when disassembling the motor).

Brake including: stainless steel dragging hub.

In these cases it is advisable to require also the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13) and «Stainless steel brake disc, bolts and screws».

Non-standard design code for the **designation: ,IP 56**

Non-standard design	63 ... 160S
(17)	○
(18)	○
(36)	○
(62)	●
(63)	○

○ Consult Rossi S.p.A.
● Possible

(49) IP 65 protection

Advised both for motors running in dusty environments and to avoid that wear dust of friction surface is dispersed in the environment (e.g. food industry).
Seal between the coupling surfaces of housing and endshields (to be re-adjusted when disassembling the motor).
IP 65 brake protected with: V-ring, O-rings on fastening screws of brake and on the pullers of the release hand lever.

In damp and/or aggressive environment, in case of condensate and/or mildew dangers or of long brake standstill, it is recommended to require the «Design for damp and corrosive environment» (47), if necessary also with «Stainless steel bolts and screws» (described ways in (47)).

Non-standard design code for the **designation: ,IP 65**.

Non-standard design	63 ... 160S
(17)	○
(18)	○
(36)	●
(62)	●
(63)	○

○ Consult Rossi S.p.A.
● Possible

(61) Manual rotation

On request, prearranged for **manual rotation** by straight setscrew (see table) that can be fitted on non-drive end motor shaft (excluding the non-standard designs «Axial independent cooling fan» and «Axial independent cooling fan and encoder» ch. 5.14(17), (18), (63));
To be always combined with special execution 25 (level for manual realase with automatic return).

Non-standard design code for the **designation: ,MM.**

Motor size	Wrench
63, 71	5
80, 90	6
100, 112	8
132 ... 160S	10

(62) Motor prearranged for encoder

Motor prearranged for encoder with following features:

- anti-rotation center distance Ø 63 mm
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø 10 h6 mm

Motor dimensions as per encoder design (36).

Non-standard design code for the **designation**: **,PE**

(63) Axial independent cooling fan and prearranged for encoder

Independently cooled motorprearranged for encoder with following features:

- anti-rotation center distance Ø 63 mm;
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø 10 h6 mm and length 35 mm.

For specifications and independent cooling fan designation code see design (17)
Motor overall dimensions as «Axial independent cooling fan» (17).

Non-standard design code for the **designation**: **,V... PE**

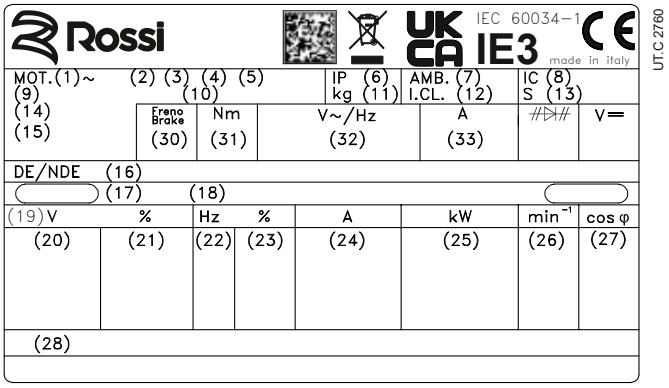
(99) Optional paint cycles

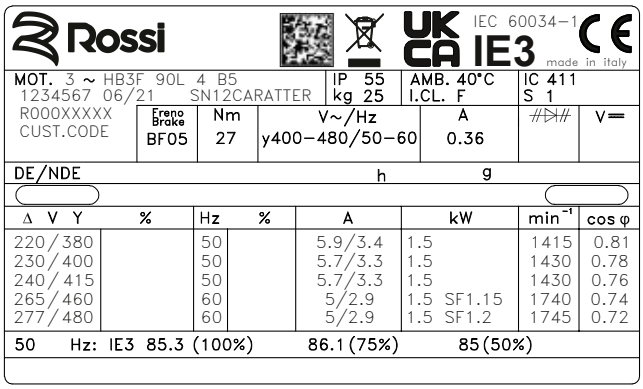
Application field	Features	Corrosivity class ISO 12944-2	Durability class ISO 12944-2	Description	Thickness cycles NDFT [µm] ISO 19840	ROSSI internal code
Applications in aggressive environments	Good resistance to atmospheric and aggressive agents	C4	L	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 160	**1H-RAL5010**
			H	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 180	**2H-RAL5010**
Outdoor applications in saline environment	Excellent resistance to atmospheric and aggressive agents Outdoor applications in saline environment	C5	M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2I-RAL5010**
Outdoor applications in chemically aggressive environment and high humidity industrial areas	Excellent resistance to atmospheric and aggressive agents Outdoor applications in chemically aggressive environment (fertilizers, etc.)		M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2L-RAL5010**

Cycles with specific features: antibacterial for FOOD environments, available on request.

Varie

- Asynchronous three-phase two-speed motors.
- Motor balancing according to reduced vibration degree (B) to CEI EN 60034-14.
- Motors with integral feet and flange (IM B35, IM B34 and relevant vertical mounting positions).
- Power connector.
- Sensorized drive end bearing (32, 48 or 64 pulses per revolution) for the measurement of angle and/or rotation speed (sizes 63 ... 100); for specifications and wiring schemes consult us.
- Pt 100 temperature probe.
- Encoder for high temperatures.
- Designs with supply cable.
- Design for oil seal (e.g. coupled with mechanical variator).
- Design for high temperatures.
- Special release lever rod to keep brake release condition.





(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months, year of manufacturing and serial number
(11) Motor mass
(12) Insulation class I.CL…
(13) Duty cycle S…
(14) Motor code
(15) Customer code [1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal frequency
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(30) Brake size
(31) Braking torque
(32) Rectifier supply
(33) Current absorbed by brake

1) On request

Other certifications are also available, so please refer to the previous chapters.

6

HBV series
Brake motor for specific applications

Section Contents

HBV Brake motor for specific applications 6

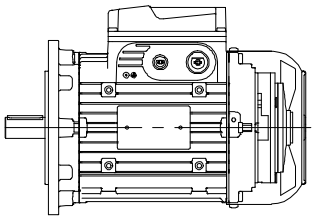
6.1

General specifications

Brake motor with direct current safety brake for specific applications

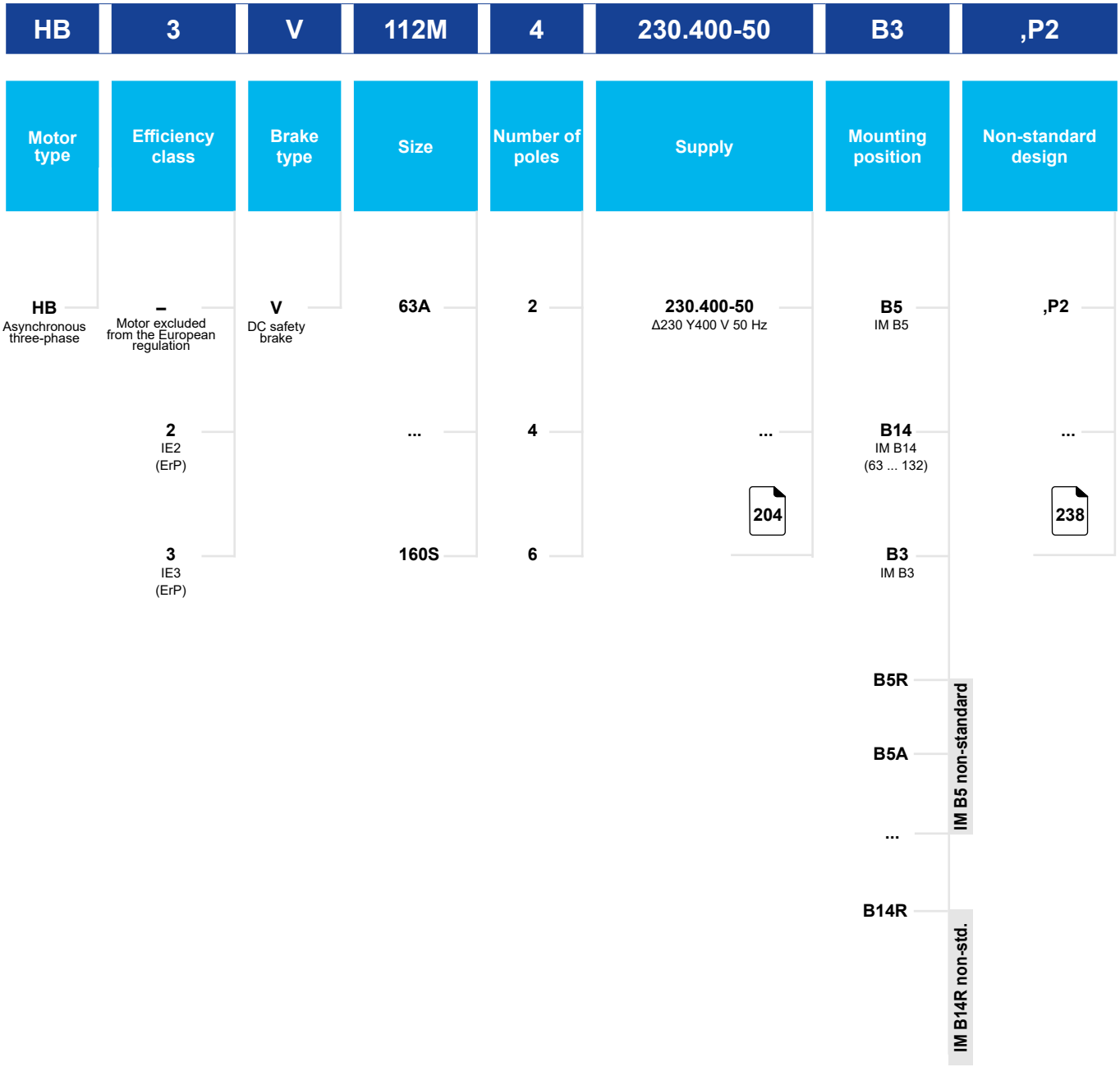
Standard

63 ... 160S



- **Brake motors with d.c. safety brake suitable for specific applications demanding maximum economy and compactness**
- Sizes 63 … 160S also with **powers** (marked by *) **higher than the ones foreseen by the standards**
- Class F insulation; temperature rise class B for all motors at standard power, F for remaining motors
- **Mounting positions IM B5 and derivatives, IM B14 and derivatives and IM B3** (always pre-arranged) and corresponding vertical mounting positions; **mating tolerances under accuracy rating**
- **IP 55** protection
- **Particularly strong construction** (both electrical and mechanical) to withstand alternating torsional and thermic stresses of starting and braking; duty proportioned bearings
- «**Supported**» **tightening attachments** of endshields and flanges fitted on housing with «**tight**» coupling
- Electromagnetic sizing especially studied to allow high acceleration capacity (high frequency of starting) and uniform starting (slightly «sagged» characteristic curves)
- **Suitable for operation with inverter**
- **Asbestos-free** friction surfaces
- **Wide metallic** terminal box
- **Designs available for every application need**
- **Very reduced motor overall dimensions**, which are nearly the same of a non-braking motor; maximum economy
- Single braking surface, fixed braking torque (usually $M_f \approx M_N$)
- High braking capacity for each braking thanks to cast iron fan (or made of light alloy together with steel disc; which also acts as brake disk) especially sized in order to achieve the dissipation of high braking energies
- Particularly suitable for cutting machines, safety stops, as parking brake, etc.

Designation



6.3

Specifications

Electric brake motors (braking in case of failure of supply):

Asynchronous three-phase electric **brake motor** with **d.c. safety brake**, with single braking surface, with **reduced overall dimensions**, sizes **63 ... 160S**.

Standardized motor with cage rotor, totally enclosed, externally ventilated (cooling system IC 411), single-speed according to following tables:

Directive / Certification	Efficiency class	N° poles	Winding	Shaft height	Standard supply	Class		Pag.
						Insulation	Temperature rise	
ErP	IE2, IE3	2, 4, 6	three-phase Δ Y	63 … 132	230.400-50	F	B	212
EAC	IE3	2, 4, 6	three-phase Δ Y	63 … 132	220.380-50			218
CCC	GR. 3 (IE3)	2, 4, 6	three-phase Δ Y	63 … 90	220.380-50			222
CEL				80 … 132				
AU MEPS	IE3	4	three-phase Δ Y	80 … 132	230.400-50			215
INMETRO	IR3 (IE3)	4, 6	three-phase Δ Y	80 … 132	220.380-60			228
				80 … 132	255.440-60			

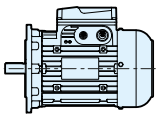
IP 55 protection: drive end with seal ring (without spring for IM B3) and non-drive end with water-proof and dust-proof O-ring

Rated power delivered on **continuous duty** (S1) and at standard voltage and frequency; ambient temperature -15 ÷ 40 °C, altitude 1000 m.

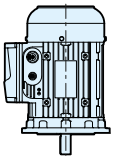
Mounting positions IM B5, IM B3 IM B14; motors can also operate in the relevant mounting positions with vertical shaft, which are respectively (see following table): IM V1 and IM V3, IM V18 and IM V19, IM V5 and IM V6; the name plate shows the designation of mounting position with horizontal shaft.
On request, other special mounting positions: consult Rossi S.p.A.

Mounting positions with flange

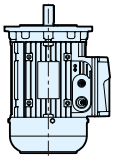
IM **B5**



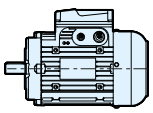
IM **V1**



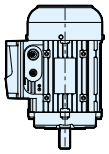
IM **V3**



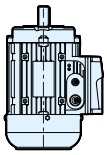
IM **B14**



IM **V18**

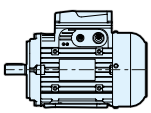


IM **V19**

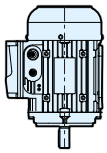


Mounting positions with feet

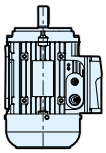
IM **B3**[1)]



IM **V5**



IM **V6**



1) Motor can also operate in the mounting positions IM B6, IM B7 and IM B8; the name plate shows the IM B3 mounting position.

Construction features

Component type	Notes	Motor size							
		63	**71**	**80**	**90**	**100**	**112**	**132**	**160S**
Housing	Material	LL	LL	LL	LL	LL	LL	LL	LL
N-DE Endshield		LL	LL	LL	LL	LL	LL	LL	LL
Fan cover		LA	LA	LA	LA	LA	LA	LA	LA
Fan		PL	PL	PL	PL	PL	PL	PL	PL
DE bearing	Lubricated for life	6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6309 2Z
N-DE bearing		6202 2Z	6203 2Z	6204 2Z	6205 2Z	6206 2Z	6306 2Z	6308 2Z	6308 2Z
DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	45×65×8
N-DE seal ring	Material NBR Type A	15×30×4,5	17×32×5	20×35×7	25×46×7	30×50×7	30×50×7	40×60×10	40×60×10
Terminal block 6/ 9 pins	Pin size	M4 / M4	M4 / M4	M4 / M4	M5 / M5	M5 / M5	M5 / M5	M6 / M5	M6 / M5
Cable entry	Knockout openings	4×M16	2×M16+ 2×M20	2×M16+ 2×M20	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M25	2×M16+ 2×M32	2×M16+ 2×M32
	Cable glands	-	-	-	-	-	-	-	-

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

Construction features

Mounting position	Notes	Motor size							
		63	**71**	**80**	**90**	**100**	**112**	**132**	**160S**
B3 (with bolt-in feet)	Ø DxE shaft	11×23	14×30	19×40	24×50	28×60	28×60	38×80	42×110
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45
	n, foot position sides	1	1	1	3	3	3	3	3
B5	Ø DxE shaft / Ø P flange	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	28 × 60 / 250	28 × 60 / 250	38 × 80 / 300	42 × 110 / 350
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	M16 / M12
	Key type A	4×4×18	5×5×25	6×6×32	8×7×40	8×7×50	8×7×50	10×8×70	12×8×100
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45
B5R	Ø DxE shaft / Ø P flange	9 × 20 / 120	11 × 23 / 140	14 × 30 / 160	19 × 40 / 200	24 × 50 / 200	24 × 50 / 200	28 × 60 / 250	
	DE / NDE threaded hole	M3 / NA	M4 / NA	M5 / NA	M6 / M8	M8 / M10	M8 / M10	M10 / M12	
	Key type A	3×3×12	4×4×18	5×5×25	6×6×32	6×6×32	6×6×32	8×7×50	–
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	
B5S[1)]	Ø DxE shaft / Ø P flange				14 × 30 / 160	19 × 40 / 200	19 × 40 / 200	24 × 50 / 200	
	DE / NDE threaded hole				M5 / M8	M6 / M10	M6 / M10	M8 / M12	
	Key type A	–	–	–	5×5×25	6×6×32	6×6×32	6×6×32	–
	Flange / Shaft material				LL / 39NiCrMo3	LL / 39NiCrMo3	LL / 39NiCrMo3	G / 39NiCrMo3	
B5A	Ø DxE shaft / Ø P flange	11 × 23 / 120	14 × 30 / 140	19 × 40 / 160		28 × 60 / 200	28 × 60 / 200	38 × 80 / 250	
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA		M10 / M10	M10 / M10	M12 / M12	
	Key type A	4×4×18	5×5×25	6×6×32	–	8×7×50	8×7×50	10×8×70	–
	Flange / Shaft material	LL / C45	LL / C45	LL / C45		LL / C45	LL / C45	G / C45	
B5B	Ø DxE shaft / Ø P flange		11 × 23 / 120	14 × 30 / 140	19 × 40 / 160			28 × 60 / 200	
	DE / NDE threaded hole		M4 / NA	M5 / NA	M6 / M8			M10 / M12	
	Key type A	–	4×4×18	5×5×25	6×6×32	–	–	8×7×50	–
	Flange / Shaft material		LL / C45	LL / C45	LL / C45			G / C45	
B5C	Ø DxE shaft / Ø P flange					19 × 40 / 160			
	DE / NDE threaded hole					M6 / M10			
	Key type A	–	–	–	–	6×6×32	–	–	–
	Flange / Shaft material					LL / C45			
B14	Ø DxE shaft / Ø P flange	11 × 23 / 90	14 × 30 / 105	19 × 40 / 120	24 × 50 / 140	28 × 60 / 160	28 × 60 / 160	38 × 80 / 200	
	DE / NDE threaded hole	M4 / NA	M5 / NA	M6 / NA	M8 / M8	M10 / M10	M10 / M10	M12 / M12	
	Key type A	4×4×18	5×5×25	6×6×32	6×6×32	8×7×50	8×7×50	10×8×70	–
	Flange / Shaft material	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	LL / C45	G / C45	
B14R	Ø DxE shaft / Ø P flange		11 × 23 / 90	14 × 30 / 105					
	DE / NDE threaded hole		M4 / NA	M5 / NA					
	Key type A	–	4×4×18	5×5×25	–	–	–	–	–
	Flange / Shaft material		LL / C45	LL / C45					

LL = light alloy; G = cast iron; LA = metal sheet; PL = plastic

1) For $P_{N\ max}$ available see the following table.

Motor size	Poles					
	2		4		6	
	$P_{N\ max}$ kW [hp]					
90	1,85	[2,4]	1,1	[1,5]	0,75	[1]
112	4	[5,4]	3	[4]	1,85	[2,4]
132	9,2	[12,4]	7,5	[10]	4	[5,4]

Earth terminal located inside terminal box; prearranged for the installation of two further external earth terminals on housing.

Brake supply: with rectifier laying in terminal box having 2 terminals for cable connection for rectifier supply and 2 for external contact of fast braking; possible brake supply **directly from** motor **terminal block** or **separately** (to be used for: motors supplied by inverter, separate drive needs of motor and brake, etc.).
Brake can be supplied, also at motor standstill, with no time limitations.

Pressure diecast cage **rotor** in aluminium.

Stator winding with class H copper conductor insulation, insulated with double coat, type of impregnation with resin of class H; other materials are of classes F and H for a **class F insulation system**.

Rotor dynamic balancing: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.

Paint: Two-component water-based polyacrylic resin paint, corrosivity class C3 (according to ISO 12944-2) with water-soluble enamel, color blue RAL 5010 DIN 1843, suitable for withstanding normal industrial environments and allowing further finishing with two-component synthetic paints.

For **non-standard designs** and accessories see ch. 6.13.

Compliance with European Directives
The motors in this catalog comply with the following harmonized standards: EN 60034-1, EN 60034-2-1, EN 60034-2, EN 60034-5, EN 60034-6, EN 60034-7, EN 60034-8, EN 60034-9, EN60034-12, EN 60034-14, IEC 60038, IEC 60072-1, and therefore comply with the provisions of the L**ow Voltage Directive 2014/35/EU**.
For this reason the electric motors are CE marked.

Additional information:

The motor design, considering the motors as components, complies with:
- Machinery Directive 2006/42/EC when the installation is correctly executed by machinery manufacturer (e.g.: in compliance with our installation instructions and EN 60204 «Electric Equipments of Industrial Machines»);
- Directive 2011/65/EC RoHS relevant to the limit of use of dangerous substsances in the electric and electronic equipments.

Declaration of Incorporation (Directive 2006/42/EC Art 4.2 - II B):

The above mentioned motors must be commissioned as soon as the machines in which they have been incorporated have been declared to be in compliance with the Machinery Directive.

According to EN 60034-1, as motors are components and not machines, supplied directly to the final user, the Electromagnetic Compatibility Directive (application of Directive 2014/30/EU) is not directly applicable.

6.4

Radial and axial loads on shaft end

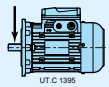
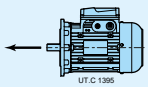
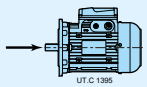
Radial loads generated on the shaft end by a drive connecting motor and driven machine must be less than or equal to those given in the relevant table.
The radial load F_r given by the following formula refers to most common drives:

$$F_r = \frac{k \cdot 19100 \cdot P}{n \cdot d} \text{ [N]}$$

where:

P [kW] is motor power required
n [min^{-1}] is the speed
d [m] is the pitch diameter
k is a coefficient assuming different values according to the drive type:
k = 1 for chain drive
k = 1,1 for gear pair drive
k = 1,5 for timing belt drive
k = 2,5 for V-belt drive

The table shows maximum permissible values of radial and axial loads on driving shaft end (F_r overhung load on centre line of shaft end), calculated for a bearing life L_h = 18000 h. For a longer bearing life, the values stated in the table must be multiplied by:
0,9 (25000 h),
0,8 (35500 h) or
0,71 (50000 h).

Motor size	F_r [1] [N]  n_N [min^{-1}]				F_a [2] [N]  n_N [min^{-1}]				 n_N [min^{-1}]			
	3000	1500	1000	750	3000	1500	1000	750	3000	1500	1000	750
63	420	530	600	670	200	290	350	400	210	290	350	400
71	510	640	740	810	210	310	380	440	210	310	380	440
80	650	830	950	1050	230	350	420	500	370	500	600	680
90S	710	900	1040	1140	250	390	490	570	250	390	490	570
90L	730	930	1050	1180	240	380	480	560	240	380	480	560
100	1000[3]	1300	1500	1650	300	490	620	730	370	570	710	820
112	1500[3]	1900	2150	2400	660	950	1150	1310	660	950	1150	1310
132	2000[3]	2500	3000	3150	1220	1650	1960	2200	1220	1650	1960	2200
160S	2500	3150	3650	4050	1720	2280	2670	2990	1220	1650	1960	2200

1) An axial load of up to 0,2 times the value in the table is permissible, simultaneously with the radial load.
2) Comprehensive of a possible unfavourable effect of weight-force of rotor and bearing preload spring.
3) For radial load value near to table limit require bearings C3.

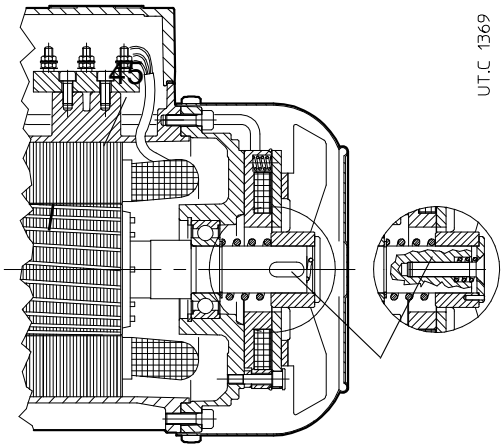
For running at 60 Hz, table values must be reduced by 6%.

Page intentionally left blank

6.5

HBV motor brake specifications (d.c. safety brake)

63 ... 160S



Electromagnetic spring loaded brake (braking automatically occurs when it is not supplied), with **d.c.** toroidal coil and single braking surface, **fixed braking torque** ($M_f \approx M_N$).

Conceived for **very reduced overall dimensions of motor** (nearly the same of a non-braking motor), **smooth braking** (thanks to lower rapidity, typical of d.c. brake, of brake anchor, lighter and less rapid in the impact: motor starts slightly braked and with greater progressivity), **high braking capacity for each braking** thanks to a cast iron fan (or made of thermoplastic material together with steel disc which acts as brake disk) especially sized (in order to achieve dissipation of high braking energies), **highest economy**.

Particularly suitable for cutting machines, for «**light**» **traverse movements**[1)], in general and for **running with inverter** at the end of deceleration ramp, for safety stops, as parking brake, etc.

1) Mechanism group M 4 (max 180 start/h) and on-load running L 1 (light) or L 2 (moderate) to ISO 4301/1, F.E.M./II 1997).

When electromagnet is not supplied, the brake anchor, pushed by springs, presses on the braking-cooling fan by generating a braking torque on the driving shaft; by supplying the brake, the electromagnet draws the brake anchor, releases the fan and the driving shaft.

Main specifications:

- **supply** voltage **of rectifier** (always supplied from terminal block) alternate single-phase **230 V ± 5% 50 or 60 Hz** (for Δ 230 Y 400 V 50 Hz wound); on request other voltages, see ch. 6.9 (1);
- rectifier supply **directly from** motor **terminal block** or indifferently from a **separate** line;
- **insulation class F**, **temperature rise class B**;
- **friction surface** with average friction coefficient for low wear, integral with brake anchor;
- **cast iron fan** or made of light alloy together with steel disc whose surface towards brake anchor also acts as brake disk;
- **air-gap adjustment also with mounted fan cover** through a hole with safety protection;
- possibility of **manual release of brake** through the release of the screw **45** so that fan draws away from brake anchor;
- for other functional specifications see following table;

For general motor specifications see ch. 6.3.

Motor is **always equipped with rectifier** fixed at terminal box providing adequate connecting terminals.

Simple half-wave diodes rectifier **RN1** for **V0** brake type (output d.c. voltage ≈ 0,45 a.c. supply voltage, maximum continuative current 1A) can be connected-disconnected both from a.c. side (for maximum reduced noise level of running) and from a.c. and d.c. side (for a quicker braking) because it is **provided with varistors to protect diodes**, electromagnet and opening contact of d.c. side (wiring schemes see TX Operating instructions UT.D 164).

Simple halfwave diodes rectifier **RR1** for **VG** brake type (output d.c. voltage ≈ 0,45 a.c. supply voltage, maximum current in connecting 2A, 1A continuative) runs with double half-wave for approx. initial 600 ms supplying to brake coil a double voltage; this allows to achieve a more rapid brake release (wiring schemes see TX Operating instructions UT.D 164).

Table of main functional specifications of brake

Effective values may slightly differ according to ambient temperature and humidity, brake temperature and state of wear of friction surface.

Brake size		Motor size	M_f ± 12%	Absorption			Delay of [2]		Air-gap		W_1	C_{max}	W_{fmax} [7] [J]		
							release	braking							
			N m	Ac.c. 230 V~	A.c.c. 400 V~	W	t_1 ms	t_2 ms	mm		MJ/mm	mm	brakings/h		
	1)						3)	4)	nom[9]	max	5)	6)	10	100	1000
V 02	RN1	63	2,5	0,17	0,10	18	40	100	0,25	0,50	56	2,5	3550	900	125
V 03	RN1	71	4	0,17	0,10	18	40	100	0,25	0,60	80	2,5	5000	1250	180
V 04, 05	RN1	80, 90	7	0,24	0,14	25	60	150	0,25	0,60	132	2,5	7500	1900	265
V G5	RR1[8]	90	11	0,24	0,14	25	75	118	0,25	0,60	132	2,5	7500	1900	265
V 06	RN1	100, 112	15	0,34	0,20	35	100	250	0,30	0,65	236	2,5	12500	3150	450
V G6	RR1[8]	112	25	0,34	0,20	35	125	200	0,30	0,65	280	2,5	15000	3750	530
V 07	RN1	132	30	0,58	0,34	60	150	400	0,35	0,70	375	2,5	20000	5000	710
V G7	RR1[8]	132,160S	50	0,58	0,34	60	190	315	0,35	0,70	375	2,5	20000	5000	710

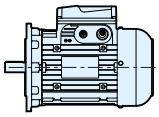
1) Standard rectifier.
2) Values valid with medium air-gap and nominal value of supply voltage.
3) Release time for anchor, obtained with standard rectifier.
4) Braking delay obtained by separate brake supply. With direct supply from motor terminal block the values of t_2 increase of approx. 2,5 times the ones of table.
5) Friction work for brake disk wear of 1 mm (minimum value for heavy use, real value is usually greater).
6) Maximum wear of friction surface.
7) Maximum friction work for each braking.
8) For **RR1** the **stop time** must be between **2,3 s ÷ 2,8 s**. If necessary, consult us.
9) Nominal value means aproximate average value.

6.6

Technical data 400V 50 Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,18 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1372

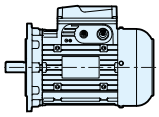
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18	**HB2V 63 A 2**	2800	0,61	0,56	0,71	68,7	66,6	60,7	3,1	3,3	4,1	0,0005	V 02	2,5	2120	4,7
0,25	**HB2V 63 B 2**	2780	0,86	0,75	0,71	70,5	68,9	63,1	3,1	3,2	4,1	0,0005	V 02	2,5	2360	5,3
0,37 *	**HB2V 63 C 2**	2790	1,26	1,02	0,72	73,3	72,4	67,3	3,5	3,3	4,5	0,0006	V 02	2,5	2120	5,9
0,37	**HB2V 71 A 2**	2800	1,26	0,95	0,77	75	74,7	70,8	3,1	3,3	5,2	0,0008	V 03	4	2240	7,2
0,55	**HB2V 71 B 2**	2820	1,86	1,33	0,78	77,3	76,9	72,9	3,6	3,7	5,8	0,0009	V 03	4	2360	8

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50 Hz 460V 60 Hz

2 poles - 3000 min^{-1} 50Hz
3600 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,18 ... 11 kW
400V - 50Hz
460V - 60 Hz
EU (ErP)


UT.C 1372

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz	0,18	HB3V 63A 2	2800	0,61	0,56	0,71	65,9	61,8	54,4	2,9	2,9	3,9	0,0005	V 02	2,5	2120	4,7
	0,25	HB3V 63B 2	2800	0,85	0,73	0,71	69,7	68,6	62,8	3,0	2,9	4,1	0,0005	V 02	2,5	2360	5,3
	0,37 *	HB3V 63C 2	2815	1,26	0,99	0,73	73,8	69,3	62,0	3,0	3,0	4,4	0,0006	V 02	2,5	2120	5,9
	0,37	HB3V 71A 2	2810	1,26	0,93	0,78	73,8	74,6	70,0	3,1	3,0	5,1	0,0008	V 03	4	2240	6,9
	0,55	HB3V 71B 2	2830	1,86	1,31	0,78	77,8	75,5	71,5	3,9	3,4	6,3	0,0009	V 03	4	2360	8
	0,75	HB3V 80 A 2	2875	2,49	1,70	0,79	80,7	81,5	78,8	3,5	3,8	7,3	0,0019	V 04	7	1500	10
	1,1	HB3V 80 B 2	2870	3,7	2,29	0,84	82,7	85,0	83,6	3,7	3,9	7,6	0,0023	V 04	7	1500	13,5
	1,5	HB3V 90 S 2	2890	5	2,92	0,88	84,2	86,7	86,7	3,0	3,6	7,5	0,003	V 05	7	1400	18
	2,2	HB3V 90 LA 2	2890	7,3	4,3	0,85	85,9	87,0	86,6	3,7	4,4	9,0	0,0034	V G5	11	1800	20
	3	HB3V 100 LA 2	2930	9,8	6,2	0,80	87,1	87,5	85,8	4,9	5,1	9,8	0,0074	V 06	15	950	27
	4	HB3V 112 M 2	2935	13	7,5	0,87	88,1	88,3	86,7	2,7	4,2	9,4	0,0104	V 06	15	950	36
	5,5	HB3V 132 S 2	2955	18	10	0,85	89,2	89,1	86,5	4,2	6,1	12,7	0,0224	V 07	30	700	61
	7,5	HB3V 132 SB 2	2960	24	14	0,85	90,1	91,3	89,2	6,5	6,5	13,4	0,0265	V 07	30	700	70
	9,2 *	HB3V 132 SC 2	2960	30	17	0,84	90,7	91,1	89,4	6,3	6,3	13,3	0,0293	V 07	30	700	75
	11 *	HB3V 132 MA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0293	V G7	50	700	75
	11	HB3V 160 SA 2	2945	36	20	0,87	91,2	91,6	90,6	5,2	4,9	11,6	0,0293	V G7	50	700	84
460 V 60 Hz	0,18	HB3V 63 A 2	3400	0,51	0,52	0,67	65,6	62,6	55,5	3,9	3,7	4,8	0,0005	V 02	2,5	2120	4,7
	0,25	HB3V 63 B 2	3430	0,70	0,67	0,67	69,5	68,3	60,8	4,1	3,8	5,6	0,0005	V 02	2,5	2360	5,3
	0,37 *	HB3V 63 C 2	3435	1,03	0,90	0,70	73,4	69,2	62,2	4,1	4,0	6,1	0,0006	V 02	2,5	2120	5,9
	0,37	HB3V 71 A 2	3435	1,03	0,84	0,75	73,4	74,0	68,2	3,8	3,9	6,5	0,0008	V 03	4	2240	6,9
	0,55	HB3V 71 B 2	3455	1,52	1,18	0,76	76,8	74,8	69,6	4,6	4,0	6,4	0,0009	V 03	4	2360	8
	0,75	HB3V 80 A 2	3490	2,05	1,58	0,77	77,0	80,1	75,6	4,6	4,1	8,3	0,0019	V 04	7	1500	10
	1,1	HB3V 80 B 2	3490	3,0	2,00	0,82	84,0	85,1	84,1	3,9	4,2	8,6	0,0023	V 04	7	1500	13,5
	1,5	HB3V 90 S 2	3500	4,1	2,54	0,87	85,5	87,2	85,2	3,5	4,4	9,0	0,003	V 05	7	1400	18
	2,2	HB3V 90 LA 2	3505	6,0	3,8	0,84	86,5	87,0	85,8	3,7	4,1	8,8	0,0034	V G5	11	1800	20
	3	HB3V 100 LA 2	3535	8,1	5,3	0,80	88,5	87,6	84,3	4,3	4,8	11,5	0,0074	V 06	15	950	27
	4	HB3V 112 M 2	3545	11	6,6	0,86	88,5	90,5	89,1	3,1	3,9	10,8	0,0104	V 06	15	950	36
	5,5	HB3V 132 S 2	3560	15	9,2	0,84	89,5	88,6	85,0	7,0	5,9	13,0	0,0224	V 07	30	700	61
	7,5	HB3V 132 SB 2	3560	20	12	0,85	90,2	89,4	87,1	6,0	6,3	13,8	0,0265	V 07	30	700	70
	9,2 *	HB3V 132 SC 2	3560	25	15	0,84	91,0	89,7	88,6	5,6	6,2	13,6	0,0293	V 07	30	700	75
	11 *	HB3V 132 MA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0293	V G7	50	700	75
	11	HB3V 160 SA 2	3550	30	17	0,87	91,0	91,7	88,8	5,4	4,8	11,8	0,0293	V G7	50	700	84

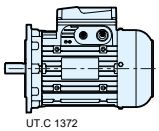
*) Power or motor power-to-size correspondence not according to standard.

6.6

Technical data 400V 50 Hz

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1372

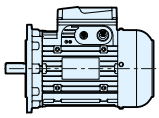
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	avv./h	
0,12	**HB2V 63 A 4**	1370	0,84	0,46	0,63	61,4	58,9	51,9	2,5	2,6	3,1	0,0005	V 02	2,5	5600	4,9
0,18	**HB2V 63 B 4**	1350	1,28	0,64	0,66	65	64,1	58,4	2,6	2,5	3,3	0,0006	V 02	2,5	6000	5,5
0,25 *	**HB2V 63 C 4**	1360	1,76	0,83	0,65	68,5	67,8	62,8	2,8	2,7	3,5	0,0007	V 02	2,5	5300	6,3
0,25	**HB2V 71 A 4**	1400	1,71	0,8	0,71	68,5	66,6	60,7	2,3	2,6	3,8	0,0012	V 03	4	6000	7
0,37	**HB2V 71 B 4**	1400	2,52	1,1	0,70	73,2	72,2	67,3	2,7	3,2	4,6	0,0014	V 03	4	6700	7,9
0,55 *	**HB2V 71 C 4**	1400	3,75	1,5	0,70	77,1	75,7	72	3,3	3,5	5,1	0,0018	V 03	4	5600	9,4

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50 Hz 460V 60 Hz

4 poles - 1500 min^{-1} 50Hz
1800 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,12 ... 9,2 kW
400V - 50Hz
EU (ErP)
AU MEPS **


UT.C 1372

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
400 V 50 Hz	0,12	HB3V 63 A 4	1365	0,84	0,37	0,72	64,8	64,0	58,8	2,3	2,3	3,3	0,0003	V 02	2,5	5600	5,5
	0,18	HB3V 63 B 4	1380	1,25	0,56	0,66	69,9	68,8	62,9	3,0	2,8	3,8	0,0004	V 02	2,5	6000	6,3
	0,25	HB3V 71 A 4	1415	1,69	0,69	0,71	73,5	71,6	66,9	3,1	2,9	5,0	0,0008	V 03	4	6000	8,6
	0,37	HB3V 71 B 4	1415	2,50	0,98	0,71	77,3	75,1	70,8	3,4	3,2	5,6	0,0010	V 03	4	6700	9,6
	0,55	HB3V 80 A 4	1420	3,7	1,56	0,63	80,8	79,8	76,4	3,3	3,4	5,0	0,0025	V 04	7	5300	12,4
	0,75	HB3V 80 B 4	1420	5,0	1,87	0,70	82,5	83,6	82,1	3,2	3,1	5,4	0,003	V 04	7	4800	14
	1,1	HB3V 90 S 4	1430	7,3	2,50	0,76	84,1	84,5	82,8	3,4	3,6	6,4	0,0043	V 05	7	3150	21
	1,5	HB3V 90 L 4	1415	10	3,3	0,78	85,3	85,2	84,2	2,6	3,5	5,6	0,0047	V 05	7	3000	21
	1,85 *	HB3V 90 LB 4	1425	12	4,2	0,74	86,0	84,6	83,0	2,7	3,4	5,9	0,0047	V G5	11	2800	21
	2,2	HB3V 100 LA 4	1445	15	4,7	0,78	86,7	86,9	85,9	3,4	4,0	8,1	0,008	V 06	15	2200	29
	3 *	HB3V 112 MA 4	1450	20	6,1	0,80	88,7	89,1	87,9	4,1	4,1	8,5	0,013	V 06	15	2000	36
	4	HB3V 112 M 4	1445	26	8,1	0,75	88,6	90,4	89,2	4,3	4,6	8,6	0,015	V G6	25	1800	39
	5,5	HB3V 132 S 4	1465	36	12	0,75	89,6	91,0	89,6	3,6	4,2	8,2	0,0367	V 07	30	900	66
	7,5	HB3V 132 M 4	1460	49	15	0,80	90,4	91,0	90,1	4,2	4,4	8,8	0,0442	V G7	50	900	74
	9,2 *	HB3V 132 MB 4	1460	60	19	0,76	91,0	91,2	90,4	4,4	4,2	8,2	0,047	V G7	50	800	77
460 V 60 Hz	0,12	HB3V 63 A 4	1685	0,68	0,34	0,67	66,0	65,9	58,0	2,9	2,9	4,1	0,0005	V 02	2,5	5600	5,5
	0,18	HB3V 63 B 4	1700	1,01	0,52	0,62	69,5	68,4	62,7	3,7	3,6	4,4	0,0006	V 02	2,5	6000	6,3
	0,25	HB3V 71 A 4	1725	1,38	0,64	0,67	73,4	72,4	66,1	3,7	3,7	6,2	0,0012	V 03	4	6000	8,6
	0,37	HB3V 71 B 4	1725	2,05	0,89	0,67	78,2	74,8	70,4	4,2	3,8	6,3	0,0014	V 03	4	6700	9,6
	0,55	HB3V 80 A 4	1735	3,0	1,44	0,59	81,1	80,7	77,3	4,0	4,0	5,8	0,0034	V 04	7	5300	12,4
	0,75	HB3V 80 B 4	1730	4,1	1,72	0,66	83,3	85,5	83,5	3,8	3,7	6,4	0,0040	V 04	7	4800	14
	1,1	HB3V 90 S 4	1740	6,0	2,20	0,72	86,5	85,1	82,4	4,4	4,3	7,3	0,0052	V 05	7	3150	21
	1,5	HB3V 90 L 4	1730	8,3	2,95	0,74	86,5	86,8	85,3	3,9	3,5	6,8	0,0054	V 05	7	3000	21
	1,85 *	HB3V 90 LB 4	1735	10	3,7	0,70	89,5	86,5	83,1	4,0	4,3	7,4	0,0054	V G5	11	2800	21
	2,2	HB3V 100 LA 4	1750	12	4,1	0,76	89,5	87,9	85,6	4,1	4,7	9,4	0,011	V 06	15	2200	29
	3 *	HB3V 112 MA 4	1755	16	5,4	0,78	89,5	89,7	88,0	4,7	4,8	9,9	0,013	V 06	15	2000	36
	4	HB3V 112 M 4	1755	22	7,6	0,74	89,5	90,5	88,8	6,1	5,6	10,0	0,018	V G6	25	1800	39
	5,5	HB3V 132 S 4	1770	30	10	0,73	91,7	90,8	88,5	4,7	4,9	9,6	0,041	V 07	30	900	66
	7,5	HB3V 132 M 4	1765	41	13	0,78	91,7	91,0	88,8	7,0	5,1	11,9	0,048	V G7	50	900	74
	9,2 *	HB3V 132 MB 4	1765	50	17	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,05	V G7	50	800	77

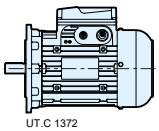
*) Power or motor power-to-size correspondence not according to standard.
** The AS/NZS 1359.5:2004 standard (AU MEPS - Australia) applies to motors with a rated power of 0.75 kW to 185 kW (excluded). Powers of 1.85 and 9.2 kW are also excluded.

6.6

Technical data 400V 50Hz

6 poles - 1000 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE2
P_N 0,12 ... 0,55 kW
400V - 50Hz
EU (ErP)


UT.C 1372

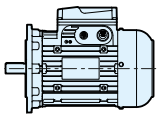
P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB2V 63 B 6**	900	1,27	0,55	0,59	52,2	48,3	40,1	2,7	2,8	2,5	0,0008	V 02	2,5	7500	5,5
0,15 *	**HB2V 63 C 6**	875	1,64	0,62	0,64	55,6	53,2	46	2,5	2,5	2,6	0,0008	V 02	2,5	7500	6,1
0,18	**HB2V 71 A 6**	900	1,91	0,66	0,67	59,5	57,1	49,8	2,4	2,4	3	0,0014	V 03	4	9500	7,3
0,25	**HB2V 71 B 6**	900	2,64	0,88	0,67	61,8	59,7	52,9	2,5	2,7	3,3	0,0017	V 03	4	8500	8,1
0,37 *	**HB2V 71 C 6**	895	3,95	1,2	0,69	67,6	66,1	61	2,6	2,3	3,5	0,0022	V 03	4	8000	9,5
0,37	**HB2V 80 A 6**	910	3,9	1,2	0,67	67,6	64	57,8	2,7	2,6	3,6	0,0029	V 04	7	6700	9,9
0,55	**HB2V 80 B 6**	930	5,6	1,6	0,67	73,1	72,2	67,7	3	3	4,5	0,0042	V 04	7	6700	11,5

* Power or motor power-to-size correspondence not according to standard.

Technical data 400V 50Hz 460V 60 Hz

6 poles - 1000 min^{-1} 50Hz
1200 min^{-1} 60Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,09 ... 5,5 kW
400V - 50Hz
460V - 60Hz
EU (ErP)


UT.C 1372

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake M_f	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2	N m	starts/h	
400 V 50 Hz 2)	0,09 1)	HBV 63 A 6	900	0,96	0,48	0,57	47,6	43,1	34,4	2,5	2,6	2,3	0,0007	V 02 2,5	7500	5,1
	0,12	HB3V 63 B 6	830	1,38	0,42	0,72	57,7	52,1	47,0	1,9	1,9	2,2	0,0008	V 02 2,5	7500	6,1
	0,18	HB3V 71 A 6	910	1,89	0,57	0,71	63,9	64,3	57,4	2,5	2,4	3,4	0,0014	V 03 4	9500	8,1
	0,25	HB3V 71 B 6	910	2,62	0,76	0,69	68,6	66,0	60,8	2,7	2,6	3,7	0,0017	V 03 4	8500	9,5
	0,37	HB3V 80 A 6	930	3,80	1,00	0,73	73,5	70,4	65,8	2,6	2,6	4,2	0,0029	V 04 7	6700	13
	0,55	HB3V 90 SA 6	945	5,6	1,45	0,71	77,2	74,2	62,1	2,5	3,1	4,9	0,0051	V 05 7	5600	17,4
	0,75	HB3V 90 S 6	950	7,5	2,02	0,68	78,9	77,3	72,5	3,1	3,3	5,3	0,0067	V 05 7	5600	21
	1,1	HB3V 90 L 6	930	11	2,72	0,72	81,0	78,6	76,1	2,6	3,0	5,0	0,0071	V G5 11	4750	22
	1,5	HB3V 100 LA 6	950	15	3,5	0,75	82,5	82,6	80,8	2,6	3,2	6,3	0,016	V 06 15	3000	29
	2,2	HB3V 112 M 6	960	22	5,2	0,72	84,3	84,9	82,8	3,1	3,4	6,1	0,024	V G6 25	2800	37
	3	HB3V 132 S 6	970	30	7,0	0,72	85,6	87,8	85,9	2,4	3,7	7,0	0,0485	V 07 30	1400	62
	4	HB3V 132 M 6	970	39	9,4	0,71	86,8	88,6	86,9	2,7	4,0	7,6	0,064	V 07 30	1250	74
	5,5	HB3V 132 MB 6	970	54	12	0,73	88,0	89,3	88,7	3,2	3,4	7,2	0,065	V G7 50	1100	75
460 V 60 Hz 3)	0,09 2)	HBV 63 A 6	1120	0,77	0,41	0,52	52,5	44,3	39,4	2,9	3,0	2,7	0,0004	V 02 2,5	7500	5,1
	0,12	HB3V 63 B 6	1080	1,06	0,38	0,63	64,0	54,8	47,4	2,6	2,6	2,7	0,0008	V 02 2,5	7500	6,1
	0,18	HB3V 71 A 6	1120	1,53	0,50	0,66	68,7	65,9	59,5	3,0	3,0	4,2	0,0014	V 03 4	9500	8,1
	0,25	HB3V 71 B 6	1130	2,11	0,70	0,63	71,4	67,8	61,7	3,3	3,3	4,3	0,0017	V 03 4	8500	9,5
	0,37	HB3V 80 A 6	1140	3,1	0,90	0,69	75,3	71,5	65,6	4,1	3,2	5,0	0,0029	V 04 7	6700	13
	0,55	HB3V 90 SA 6	1155	4,5	1,26	0,67	81,7	78,3	74,3	3,2	3,8	6,0	0,0051	V 05 7	5600	17,4
	0,75 *	HB3V 100 LA 6	1155	6,2	1,78	0,64	82,5	78,2	72,5	4,0	4,0	6,2	0,013	V 06 15	3200	29
	1,1 *	HB3V 112 M 6	1160	9,1	2,16	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	V 06 15	2500	37
	1,5 *	HB3V 112 MB 6	1160	12	3,0	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	V 06 15	2000	37
	2,2 *	HB3V 132 S 6	1170	18	4,3	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	V 07 30	1400	55
	3 *	HB3V 132 M 6	1170	24	5,8	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	V 07 30	1000	64
	4	HB3V 132 MB 6	1170	33	8,0	0,70	89,5	91,0	89,5	3,1	4,1	8,0	0,06	V 07 30	800	75

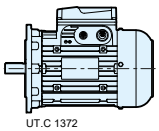
1) Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.
2) Power-motor size combinations from 0.75 to 5.5 kW are available and rated at 50Hz only. For other voltages, see section 6.13 (1).
3) Power-motor size combinations from 0.75 to 4 kW are available and rated at 60Hz only. For other voltages, see section 6.13 (1).
* Power or motor power-to-size correspondence not according to standard.

6.7

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
P_N 0,18 ... 11 kW
380V - 50Hz
Eurasian Economic Union

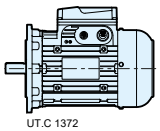

UT.C 1372

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18	**HB3V 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0005	V 02	2,50	2120	4,7
0,25	**HB3V 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0005	V 02	2,50	2360	5,3
0,37 *	**HB3V 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0006	V 02	2,50	2120	5,9
0,37	**HB3V 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0008	V 03	4,0	2240	6,9
0,55	**HB3V 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0009	V 03	4,0	2360	8
0,75	**HB3V 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,0019	V 04	7,0	1500	10
1,1	**HB3V 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0023	V 04	7,0	1500	13,5
1,5	**HB3V 90 S 2**	2880	5,0	3,0	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,003	V 05	7,0	1400	18
2,2	**HB3V 90 LA 2**	2880	7,3	4,4	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0034	V G5	11	1800	20
3	**HB3V 100 LA 2**	2920	9,8	6,2	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0074	V 06	15	950	27
4	**HB3V 112 M 2**	2930	13	7,8	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0104	V 06	15	950	36
5,5	**HB3V 132 S 2**	2950	18	11	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0224	V 07	30	700	61
7,5	**HB3V 132 SB 2**	2950	24	14	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0265	V 07	30	700	70
9,2 *	**HB3V 132 SC 2**	2955	30	18	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0293	V 07	30	700	75
11	**HB3V 132 MA 2**	2940	36	21	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0293	V G7	50	700	75

* Power or motor power-to-size correspondence not according to standard.

4 poles - 1500 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
***P*N 0,12 ... 9,2 kW**
380V - 50Hz
Eurasian Economic Union


UT.C 1372

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12	**HB3V 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0005	V 02	2,50	5600	5,5
0,18	**HB3V 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0006	V 02	2,50	6000	6,3
0,25	**HB3V 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0012	V 03	4,0	6000	8,6
0,37	**HB3V 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0014	V 03	4,0	6700	9,6
0,55	**HB3V 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0034	V 04	7,0	5300	12,4
0,75	**HB3V 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,002	V 04	7,0	4800	14
1,1	**HB3V 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0043	V 05	7,0	3150	21
1,5	**HB3V 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0047	V 05	7,0	3000	21
1,85 *	**HB3V 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0047	V G5	11	2800	21
2,2	**HB3V 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,008	V 06	15	2200	29
3 *	**HB3V 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	V 06	15	2000	36
4	**HB3V 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,015	V G6	25	1800	39
5,5	**HB3V 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0367	V 07	30	900	66
7,5	**HB3V 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0454	V G7	50	900	74
9,2 *	**HB3V 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,047	V G7	50	800	77

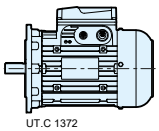
* Power or motor power-to-size correspondence not according to standard.

6.7

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
***P*N 0,09 ... 5,5 kW**
380V - 50Hz
Eurasian Economic Union
EAC


UT.C 1372

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,09 [1]	**HBV 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0007	V 02	1,75	7500	5,1
0,12	**HB3V 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0008	V 02	2,50	7500	6,1
0,18	**HB3V 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0014	V 03	4,0	9500	8,1
0,25	**HB3V 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	V 03	4,0	8500	9,5
0,37	**HB3V 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0029	V 04	7,0	6700	13
0,55	**HB3V 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0051	V 05	7,0	5600	17,4
0,75	**HB3V 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0067	V 05	7,0	5600	17,5
1,1	**HB3V 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	V G5	11	4750	22
1,5	**HB3V 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,016	V 06	15	3000	29
2,2	**HB3V 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,024	V G6	25	2800	37
3	**HB3V 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0485	V 07	30	1400	62
4	**HB3V 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,064	V 07	30	1250	74
5,5	**HB3V 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,065	V G7	50	1100	75

1) Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.

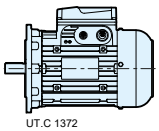
Page intentionally left blank.

6.8

Technical data 380V 50Hz

2 poles - 3000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,18 ... 11 kW
380V - 50Hz
China (CCC CEL)

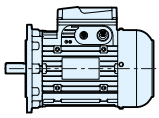

UT.C 1372

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,18 [1]	**HB3V 63 A 2**	2770	0,62	0,55	0,76	65,9	64,7	57,5	2,6	2,6	3,8	0,0005	V 02	2,5	2120	4,7
0,25 [1]	**HB3V 63 B 2**	2780	0,86	0,77	0,71	69,7	66,1	59,1	3,1	3,2	4,1	0,0005	V 02	2,5	2360	5,3
0,37 [1]	**HB3V 63 C 2**	2785	1,27	0,97	0,79	73,8	70,8	64,8	2,7	2,6	4,4	0,0006	V 02	2,5	2120	5,9
0,37 [1]	**HB3V 71 A 2**	2805	1,26	0,98	0,78	73,8	72,8	68,0	3,1	3,3	5,2	0,0008	V 03	4,0	2240	6,9
0,55 [1]	**HB3V 71 B 2**	2820	1,86	1,38	0,78	77,8	75,7	71,2	3,6	3,7	5,8	0,0009	V 03	4,0	2360	8
0,75 [1] [2]	**HB3V 80 A 2**	2860	2,5	1,81	0,78	80,7	81,4	78,7	3,6	3,8	7,3	0,0019	V 04	7,0	1500	10
1,1 [1] [2]	**HB3V 80 B 2**	2860	3,7	2,34	0,87	82,7	83,2	81,0	3,9	3,6	7,7	0,0023	V 04	7,0	1500	13,5
1,5 [1] [2]	**HB3V 90 S 2**	2880	5,0	3,0	0,89	84,2	84,5	83,3	3,9	3,6	7,9	0,003	V 05	7,0	1400	18
2,2 [1] [2]	**HB3V 90 LA 2**	2880	7,3	4,4	0,88	85,9	86,2	85,1	3,6	4,4	8,7	0,0034	V G5	11	1800	20
3 [2]	**HB3V 100 LA 2**	2920	9,8	6,2	0,84	87,1	87,2	85,2	4,2	5,1	10,1	0,0074	V 06	15	950	27
4 [2]	**HB3V 112 M 2**	2930	13	7,8	0,88	88,1	88,2	86,7	2,8	4,2	9,8	0,0104	V 06	15	950	36
5,5 [2]	**HB3V 132 S 2**	2950	18	11	0,87	89,2	88,6	85,6	5,2	6,1	12,7	0,0224	V 07	30	700	61
7,5 [2]	**HB3V 132 SB 2**	2950	24	14	0,88	90,1	89,9	87,3	5,7	6,5	13,6	0,0265	V 07	30	700	70
9,2 [2]	**HB3V 132 SC 2**	2955	30	18	0,87	90,7	89,9	87,4	5,7	6,3	13,4	0,0293	V 07	30	700	75
11 [2]	**HB3V 132 MA 2**	2940	36	21	0,89	91,2	90,1	88,4	5,2	4,9	11,6	0,0293	V G7	50	700	75

1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)

4 poles - 1500 min^{-1} 50Hz
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,12 ... 9,2 kW
380V - 50Hz
China (CCC CEL)


UT.C 1372

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts/h	
0,12 [1]	**HB3V 63 A 4**	1335	0,86	0,37	0,76	65,0	64,4	60,9	2,0	2,0	3,1	0,0005	V 02	2,5	5600	5,5
0,18 [1]	**HB3V 63 B 4**	1365	1,26	0,56	0,70	69,9	69,7	64,8	2,7	2,5	3,6	0,0006	V 02	2,5	6000	6,3
0,25 [1]	**HB3V 71 A 4**	1405	1,70	0,69	0,74	73,8	71,1	67,3	2,7	2,6	4,7	0,0012	V 03	4,0	6000	8,6
0,37 [1]	**HB3V 71 B 4**	1405	2,51	0,97	0,75	77,3	74,0	71,1	3,0	2,8	5,1	0,0014	V 03	4,0	6700	9,6
0,55 [1]	**HB3V 80 A 4**	1410	3,7	1,54	0,67	80,8	80,0	78,2	3,0	2,9	4,7	0,0034	V 04	7,0	5300	12,4
0,75 [1] [2]	**HB3V 80 B 4**	1405	5,1	1,89	0,73	82,5	81,8	81,9	2,8	2,7	4,9	0,002	V 04	7,0	4800	14
1,1 [1] [2]	**HB3V 90 S 4**	1425	7,4	2,53	0,79	84,1	84,7	83,5	3,0	3,1	5,8	0,0043	V 05	7,0	3150	21
1,5 [2]	**HB3V 90 L 4**	1405	10	3,3	0,81	85,3	85,2	84,9	2,4	2,5	5,3	0,0047	V 05	7,0	3000	21
1,85 [2]	**HB3V 90 LB 4**	1415	12	4,2	0,78	86,0	85,1	84,4	2,5	3,1	5,6	0,0047	V G5	11	2800	21
2,2 [2]	**HB3V 100 LA 4**	1440	15	4,8	0,81	86,7	85,9	84,5	3,0	3,4	7,3	0,008	V 06	15	2200	29
3 [2]	**HB3V 112 MA 4**	1445	20	6,2	0,83	88,7	89,2	88,1	3,5	3,5	7,6	0,013	V 06	15	2000	36
4 [2]	**HB3V 112 M 4**	1445	26	8,6	0,80	88,6	90,4	89,2	3,9	4,1	8,9	0,015	V G6	25	1800	39
5,5 [2]	**HB3V 132 S 4**	1465	36	12	0,79	89,6	91,5	90,6	3,2	3,8	7,7	0,0367	V 07	30	900	66
7,5 [2]	**HB3V 132 M 4**	1455	49	15	0,82	90,4	90,9	90,5	3,8	3,9	8,1	0,0454	V G7	50	900	74
9,2 [2]	**HB3V 132 MB 4**	1455	60	19	0,80	91,0	90,0	90,6	3,8	3,7	7,8	0,0470	V G7	50	800	77

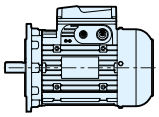
1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)

6.8

Technical data 380V 50Hz

6 poles - 1000 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B

Grade 3 (IE3)
P_N 0,09 ... 5,5 kW
380V - 50Hz
China (CCC CEL)


UT.C 1371

P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 380 V		100%	75%	50%				kg m^2		N m	starts./h	
0,09 [1)*]	**HBV 63 A 6**	900	0,96	0,47	0,58	47,6	39,1	33,9	2,5	2,6	2,3	0,0007	V 02	1,75	7500	5,1
0,12 [1)]	**HB3V 63 B 6**	865	1,32	0,48	0,66	57,7	53,7	46,9	2,3	2,3	2,5	0,0008	V 02	2,5	7500	6,1
0,18 [1)]	**HB3V 71 A 6**	895	1,92	0,56	0,75	64,8	64,9	59,6	2,2	2,1	3,2	0,0014	V 03	4,0	9500	8,1
0,25 [1)]	**HB3V 71 B 6**	895	2,67	0,76	0,73	68,6	67,4	63,5	2,4	2,3	3,5	0,0017	V 03	4,0	8500	9,5
0,37 [1)]	**HB3V 80 A 6**	915	3,9	0,99	0,77	73,5	70,8	65,8	2,3	2,3	3,9	0,0029	V 04	7,0	6700	13
0,55 [1)]	**HB3V 90 SA 6**	935	5,6	1,44	0,75	77,2	78,1	75,4	2,3	2,7	4,6	0,0051	V 05	7,0	5600	17,4
0,75 [1) 2)]	**HB3V 90 S 6**	940	7,6	1,99	0,73	78,9	77,0	74,1	2,8	2,8	4,9	0,0067	V 05	7,0	5600	17,5
1,1 [2)]	**HB3V 90 L 6**	930	11	2,87	0,72	81,0	79,0	77,0	2,6	3,0	5,1	0,0071	V G5	11	4750	22
1,5 [2)]	**HB3V 100 LA 6**	940	15	3,5	0,79	82,5	82,8	80,6	2,3	2,8	5,9	0,016	V 06	15	3000	29
2,2 [2)]	**HB3V 112 M 6**	955	22	5,2	0,76	84,3	85,0	83,4	2,7	3,0	5,5	0,024	V G6	25	2800	37
3 [2)]	**HB3V 132 S 6**	970	30	7,1	0,75	85,6	88,0	86,1	2,1	3,3	6,4	0,0485	V 07	30	1400	62
4 [2)]	**HB3V 132 M 6**	970	39	9,5	0,74	86,8	88,8	87,5	2,5	3,6	7,0	0,064	V 07	30	1250	74
5,5 [2)]	**HB3V 132 MB 6**	960	55	12	0,76	88,0	89,3	88,7	3,2	3,4	7,2	0,065	V G7	50	1100	75

1) Motors certified to CCC (China Compulsory Certificate)
2) Motors certified to CEL (China Energy Label)
* Power 0.09 kW not classified in efficiency according to IEC 60034-30-1.

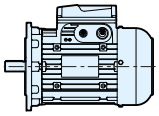
Page intentionally left blank.

6.9

Technical data 230/460V 60Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,16 ... 0,75 hp
230/460V - 60Hz [2)]
USA
NEMA MG1-12

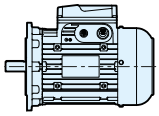

UT.C 1372

P_N 1) hp	kW	Motor	n_N 1) RPM	M_N N m	I_N A 230V	A 460V	PF 1) %	NEMA Nom. Eff. MG1-12 %	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0 kg m^2	Brake M_f N m	z_0 starts/h	kg
0,16	0,12	**HB2V 63 A 4**	1690	0,68	0,84	0,42	58	65	J	3,1	3,1	3,6	0,0002	V 02 2,5	10000	4,9
0,25	0,18	**HB2V 63 B 4**	1680	1,02	1,18	0,59	60	69	J	3,3	3,1	3,8	0,0003	V 02 2,5	10000	5,5
0,33	0,25 *	**HB2V 63 C 4**	1690	1,42	1,5	0,75	59	72,3	J	3,5	3,5	4,2	0,0004	V 02 2,5	8000	6,3
0,33	0,25	**HB2V 71 A 4**	1720	1,39	1,4	0,7	65	70,9	K	2,8	3,3	4,8	0,0007	V 03 4	8000	7
0,5	0,37	**HB2V 71 B 4**	1720	2,06	1,9	0,95	65	76	K	3,1	3,8	5,3	0,0009	V 03 4	8000	7,9
0,75	0,55 *	**HB2V 71 C 4**	1720	3,06	2,6	1,3	66	78,8	K	4	4,1	6,3	0,0013	V 03 4	6300	9,4
0,75	0,55	**HB2V 80 A 4**	1740	3	2,4	1,2	74	78,4	L	3,3	3,7	7,2	0,0021	V 04 7	6300	11

1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages..
* Power or motor power-to-size correspondence not according to standard.

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,15**
9 terminals

High Efficiency (IE2)
P_N 0,12 ... 0,75 hp
230/460V - 60Hz [2)]
USA
NEMA MG1-12


UT.C 1372

P_N 1) hp	P_N 1) kW	Motor	n_N 1) RPM	M_N N m	I_N A230V	I_N A460V	PF 1) %	NEMA Nom. Eff. MG1-12 %	NEMA Code	M_S/M_N	M_{max}/M_N	I_S/I_N	J_0 kg m^2	Brake	M_f N m	z_0 starts/h	kg
0,12	0,09	**HBV 63 A 6**	1120	0,76	0,88	0,44	52	52,5	J	2,9	3	2,7	0,0004	V 02	2,5	10600	4,1
0,16	0,12	**HB2V 63 B 6**	1120	1,02	1,04	0,52	53	55,8	J	3,1	3,2	2,9	0,0005	V 02	2,5	10000	5,5
0,2	0,15 *	**HB2V 63 C 6**	1100	1,3	1,2	0,6	56	58	J	3,1	3,2	3	0,0005	V 02	2,5	9500	6,1
0,25	0,18	**HB2V 71 A 6**	1120	1,53	1,22	0,61	60	62,6	H	3	3,1	3,6	0,0009	V 03	4	10000	7,3
0,33	0,25	**HB2V 71 B 6**	1120	2,1	1,62	0,81	60	64,9	J	3,1	3,1	3,9	0,0012	V 03	4	9000	8,1
0,5	0,37 *	**HB2V 71 C 6**	1120	3,16	2,2	1,1	63	70,9	J	3,2	3,3	4,5	0,0017	V 03	4	8000	9,5
0,75	0,55	**HB2V 80 B 6**	1140	4,6	3	1,5	62	75,7	K	3,6	3,7	5,3	0,0032	V 04	7	7100	13

1) The name plate contains data expressed in: hp, rpm, PF (power factor) in %.
2) In the United States, according to ANSI C84.1, there is a distinction between the nominal mains voltage and the motor's rated voltage.
Nominal mains voltage: 120V, 208V, 240V, 480V, 600V.
Motor's rated voltage: 115V, 200V, 230V, 460V, 575V.
It is recommended not to request motors specifying nominal mains voltages.
* Power or motor power-to-size correspondence not according to standard.

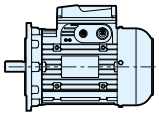
6.10

Technical data
220/380V 60Hz
440V 60 Hz

4 poles - 1800 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

IR3 (IE3)
P_N 0,75 ... 9,2 kW
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)

INMETRO



UT.C 1372

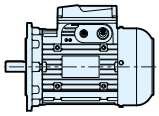
Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S/I_N	J_0	Brake	Mf	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts./h	
220/380 V 60 Hz	0,75	HB3V 80 B 4	1740	4,1	3,8/2,20	0,62	83,5	83,1	80,1	4,1	3,9	6,5	0,0028	V04	7	4800	14
	1,1	HB3V 90 S 4	1735	6,1	4,3/2,48	0,78	86,5	85,7	83,7	3,7	3,7	7,1	0,0052	V05	7	3150	21
	1,5	HB3V 90 L 4	1740	8,2	6,4/3,7	0,71	86,5	86,4	84,1	4,1	4,4	6,9	0,0054	V05	7	3000	21
	2,2	HB3V 100 LA 4	1755	12	8,9/5,2	0,72	89,5	86,6	83,6	4,4	5,0	9,7	0,011	V06	15	2200	29
	3 *	HB3V 112 MA 4	1760	16	12/6,7	0,76	89,5	89,6	87,0	5,2	5,2	10,3	0,013	V06	15	2000	36
	4	HB3V 112 M 4	1765	22	17/9,8	0,69	89,5	89,6	86,8	6,8	6,0	10,3	0,018	VG6	25	1800	39
	5,5	HB3V 132 S 4	1775	30	22/13	0,70	91,7	90,8	87,1	4,9	5,3	9,8	0,041	V07	30	900	66
	7,5	HB3V 132 M 4	1765	41	28/16	0,77	91,7	91,0	88,8	7,0	5,1	11,9	0,048	VG7	50	900	74
	9,2 *	HB3V 132 MB 4	1765	50	35/20	0,74	92,4	91,9	90,9	5,1	4,9	10,0	0,05	VG7	50	800	77
440 V 60 Hz	0,75	HB3V 80 B 4	1725	4,2	1,71	0,69	83,5	83,6	81,5	3,5	3,2	6,0	0,0028	V04	7	4800	14
	1,1	HB3V 90 S 4	1730	6,1	2,07	0,81	86,5	82,7	80,0	3,2	3,3	6,5	0,0052	V05	7	3150	21
	1,5	HB3V 90 L 4	1725	8,3	2,92	0,78	86,5	87,0	85,9	3,5	3,3	6,6	0,0054	V05	7	3000	21
	2,2	HB3V 100 LA 4	1745	12	4,1	0,79	89,5	87,3	84,8	3,6	4,1	8,7	0,011	V06	15	2200	29
	3 *	HB3V 112 MA 4	1750	16	5,4	0,81	89,5	89,9	88,3	4,2	4,3	9,1	0,013	V06	15	2000	36
	4	HB3V 112 M 4	1755	22	7,6	0,77	89,5	90,6	88,4	5,6	5,0	9,7	0,018	VG6	25	1800	39
	5,5	HB3V 132 S 4	1770	30	10	0,77	91,7	91,4	88,3	4,1	4,6	9,1	0,041	V07	30	900	66
	7,5	HB3V 132 M 4	1760	41	13	0,80	91,7	91,1	89,4	6,5	4,4	11,3	0,048	VG7	50	900	74
	9,2 *	HB3V 132 MB 4	1760	50	17	0,78	92,4	91,5	91,9	4,7	4,5	9,4	0,05	VG7	50	800	77

* Power or motor power-to-size correspondence not according to standard.

6 poles - 1200 min^{-1}
S1
IP 55
IC 411
Insulation class F
Temperature rise class B
Service factor **SF 1,2**

IR3 (IE3)
P_N 0,75 ... 4 kW
220/380V - 60Hz
440V - 60Hz
Brazil (INMETRO)

INMETRO



UT.C 1372

Supply	P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S/I_N	J_0	Brake	Mf	z_0	kg
	kW		min^{-1}	N m	A		100%	75%	50%				kg m^2		N m	starts/h	
220/380 V 60 Hz	**0,75 ***	**HB3V 100 LA 6**	1160	6,2	3,2/1,87	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,0130	V06	15	3200	29
	1,1 *	**HB3V 112 M 6**	1160	9,1	4,5/2,6	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	V06	15	2500	37
	1,5 *	**HB3V 112 MB 6**	1160	12	6,4/3,7	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	V06	15	2000	37
	2,2 *	**HB3V 132 S 6**	1170	18	9,0/5,2	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	V07	30	1400	55
	3 *	**HB3V 132 M 6**	1170	24	12/7,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	V07	30	1000	64
	4	**HB3V 132 MB 6**	1175	33	17/9,6	0,71	89,5	90,3	88,4	3,4	4,3	8,2	0,06	V07	30	800	75
440 V 60 Hz	**0,75 ***	**HB3F 100 LA 6**	1160	6,2	1,61	0,74	82,5	83,7	81,4	2,9	4,4	7,9	0,0130	V06	15	3200	29
	1,1 *	**HB3F 112 M 6**	1160	9,1	2,26	0,73	87,5	88,2	86,8	2,5	3,4	6,3	0,0215	V06	15	2500	37
	1,5 *	**HB3F 112 MB 6**	1160	12	3,2	0,70	88,5	88,2	86,5	3,0	3,9	6,9	0,0215	V06	15	2000	37
	2,2 *	**HB3F 132 S 6**	1170	18	4,5	0,72	89,5	89,9	88,4	2,7	3,6	7,3	0,0358	V07	30	1400	55
	3 *	**HB3F 132 M 6**	1170	24	6,1	0,72	89,5	90,2	88,7	2,8	3,8	7,6	0,0461	V07	30	1000	64
	4	**HB3F 132 MB 6**	1170	33	8,0	0,73	89,5	90,5	88,9	3,0	3,9	7,6	0,06	V07	30	800	75

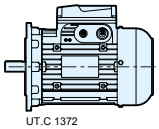
* Power or motor power-to-size correspondence not according to standard.

6.11

Technical data 400V 50Hz

2 poles - 3000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 15 kW
230/400V - 50Hz

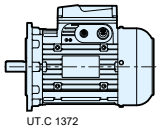

UT.C 1372

P_N		Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW			min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75 *		**HBV 71 C 2**	2830	2,53	1,85	0,79	73,8	72,9	68,7	3,5	3,7	5,7	0,001	V 03	4	1900	8,8
0,75		**HBV 80 A 2**	2850	2,51	1,85	0,75	78,3	77,7	74,3	3,6	3,8	6,1	0,0018	V 04	7	1600	9,5
1,1		**HBV 80 B 2**	2840	3,7	2,6	0,77	79,5	80,1	78,3	3,6	3,8	6,1	0,002	V 04	7	1800	10,5
1,5 *		**HBV 80 C 2**	2890	4,96	3,5	0,76	81,2	81,4	78,9	4	4,4	7,4	0,0022	V 04	7	1600	12,5
1,85 *		**HBV 80 D 2**	2820	6,3	4,2	0,8	79,8	81,2	80,1	3,7	3,8	6,2	0,0024	V 04	7	1600	13
1,5		**HBV 90 S 2**	2840	5	3,4	0,81	78,5	78,9	77	3	3,2	5,7	0,0025	V 05	7	1600	15
1,85 *		**HBV 90 SB 2**	2860	6,2	4,2	0,8	79,3	79,6	77,1	3,2	4	6,1	0,0028	V 05	7	1600	16,5
2,2		**HBV 90 LA 2**	2880	7,3	4,9	0,8	81	80,7	78	3,8	4,5	7	0,0031	V G5	11	2000	18,5
3 *	□	**HBV 90 LB 2**	2870	10	6,6	0,8	82	82,2	80,1	3,7	4,1	6,8	0,0035	V G5	11	1400	21
3		**HBV 100 LA 2**	2860	10	6,8	0,78	81,5	82	80,1	3,6	3,8	6	0,0062	V 06	15	1060	23
4 *		**HBV 100 LB 2**	2860	13,4	8,8	0,79	83,1	82,5	80	3,8	4,4	7	0,0073	V 06	15	1000	27
4		**HBV 112 M 2**	2880	13,3	8,8	0,79	83,3	83,6	82	3	3,8	6,2	0,0081	V 06	15	1000	30
5,5 *	□	**HBV 112 MB 2**	2890	18,2	11,6	0,81	84,7	84,9	83,2	3,3	3,7	7,2	0,0104	V G6	25	900	35
7,5 *	□	**HBV 112 MC 2**	2870	25	16,5	0,79	83	84,4	83,7	3	3,7	6,4	0,0112	V G6	25	800	37
5,5		**HBV 132 S 2**	2900	18,1	11,3	0,83	84,7	84,3	82,1	2,6	3,4	6,3	0,0151	V 07	30	900	51
7,5		**HBV 132 SB 2**	2910	24,6	14,3	0,87	86,9	87,2	85,5	2,9	3,7	7,2	0,0185	V 07	30	850	54
9,2 *		**HBV 132 SC 2**	2910	30,2	18,7	0,82	87	87,3	85,7	3	3,8	7,7	0,0208	V 07	30	850	56
11 *		**HBV 132 MA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,0242	V G7	50	800	63
15 *	□	**HBV 132 MB 2**	2920	49,1	30	0,85	88,7	86,2	84	3,7	4,1	8,3	0,0298	V G7	50	670	74
11		**HBV 160 SA 2**	2920	36	20,5	0,88	87,6	87,5	85,9	3,2	3,9	8,3	0,0242	V G7	50	800	72
15	□	**HBV 160 SB 2**	2920	49,1	30	0,83	88,7	86,2	84	3,9	4,3	8,3	0,0298	V G7	50	670	83

* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

4 poles - 1500 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 11 kW
230/400V - 50Hz


UT.C 1372

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75*	**HBV 71 D 4**	1370	5,2	2,15	0,7	72,1	73,3	69,1	2,8	2,9	4	0,0018	V 03	4	5300	9,4
0,75	**HBV 80 B 4**	1410	5,1	1,9	0,77	74,7	74,2	70,5	2,8	3	5,2	0,0034	V 04	7	5000	11
1,1 *	**HBV 80 C 4**	1400	7,5	2,8	0,79	75	75,6	72	2,9	3	5,2	0,0042	V 04	7	3750	13
1,1	**HBV 90 S 4**	1410	7,4	3	0,7	75,2	74,7	70	2,6	2,9	4,4	0,0035	V 05	7	3750	15
1,5	**HBV 90 L 4**	1410	10,2	3,9	0,71	77,2	79	74,5	3,2	3,6	5,2	0,0044	V 05	7	3550	18
1,85 *	**HBV 90 LB 4**	1400	12,6	4,5	0,76	78,6	80	77,1	2,9	3,2	5,1	0,0047	V G5	11	3550	19
2,2 * □	**HBV 90 LC 4**	1400	15	5,7	0,7	79,7	80,3	77,2	2,8	3,2	4,9	0,0052	V G5	11	2800	21
2,2	**HBV 100 LA 4**	1420	14,8	5,1	0,78	80	80,8	79,2	2,7	3,2	5,1	0,0081	V 06	15	2120	23
3	**HBV 100 LB 4**	1425	20,1	6,9	0,76	82,8	83,7	82	2,8	3,2	5,5	0,0098	V 06	15	2360	27
4	**HBV 112 M 4**	1430	26,7	9,2	0,75	83,4	84,1	82,6	3	3,4	6	0,0144	V G6	25	2000	34
5,5 * □	**HBV 112 MC 4**	1420	37	12,3	0,76	84,7	86,1	85,7	3	3,4	6,1	0,0166	V G6	25	1500	37
5,5	**HBV 132 S 4**	1450	36,2	12,2	0,76	86,3	86,9	85,7	3,2	3,4	6,3	0,0285	V 07	30	1500	53
7,5	**HBV 132 M 4**	1450	49,4	15,8	0,79	87,1	87,7	86,5	3,4	3,6	7	0,037	V G7	50	1120	62
9,2 *	**HBV 132 MB 4**	1450	61	19,5	0,77	88	89,4	87,6	3,5	3,8	7,2	0,0426	V G7	50	1030	68
11 * □	**HBV 132 MC 4**	1450	72	23	0,78	87,8	88,2	87	3,5	3,8	7,3	0,0482	V G7	50	850	74
11 □	**HBV 160 SC 4**	1450	72	23	0,78	87,8	88,2	87	3,5	3,8	7,3	0,0482	V G7	50	850	83

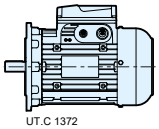
* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

6.11

Technical data 400V 50Hz

6 poles - 1000 min^{-1}
S3-70%
IP 55
IC 411
Insulation class F
Temperature rise class B

P_N 0,75 ... 7.5 kW
230/400V - 50Hz


UT.C 1372

P_N	Motor	n_N	M_N	I_N	cos φ	η IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
0,75*	**HBV 80 C 6**	920	7,8	2,3	0,67	70,1	69,7	64,5	2,5	2,7	3,8	0,0042	V 04	7	5600	13
0,75	**HBV 90 S 6**	920	7,8	2,2	0,68	72,1	72	67,9	2,4	2,4	3,7	0,0051	V 05	7	5600	15,5
1,1	**HBV 90 L 6**	915	11,5	3,2	0,68	72,9	72	69,3	2,6	2,8	3,9	0,0067	V G5	11	4750	18,5
1,5 * □	**HBV 90 LC 6**	910	15,7	4,3	0,68	73,8	72,5	70	2,7	2,9	4,3	0,0077	V G5	11	4500	21
1,5	**HBV 100 LA 6**	930	15,4	3,9	0,73	75,5	75,4	71,6	2,8	3	4,8	0,0125	V 06	15	2800	24
1,85 *	**HBV 100 LB 6**	930	19	4,9	0,71	76,6	76,2	72,1	3	3,2	5	0,0147	V 06	15	2650	27
2,2	**HBV 112 M 6**	940	22,3	5,4	0,75	78,7	79,7	78,1	2,1	2,5	5,0	0,0184	V G6	25	2360	31
3 * □	**HBV 112 MC 6**	940	30,5	7,2	0,76	79,7	81,2	80,2	2,3	2,7	5,1	0,0225	V G6	25	2240	36
3	**HBV 132 S 6**	960	29,8	7,8	0,68	82,1	82,3	80,2	2,3	3	5,1	0,0344	V 07	30	2000	50
4	**HBV 132 M 6**	960	39,8	9,7	0,72	83,2	83,7	81,8	2,5	3	5,7	0,0434	V 07	30	1320	57
5,5	**HBV 132 MB 6**	960	55	12,9	0,73	84	84,8	83,4	2,6	3	6,3	0,0536	V G7	50	1220	66
7,5 * □	**HBV 132 MC 6**	950	75	17,6	0,73	84,7	85	83,8	2,4	2,8	5,7	0,0639	V G7	50	950	74
7,5 □	**HBV 160 SC 6**	950	75	17,6	0,73	84,7	85	83,8	2,4	2,8	5,7	0,0639	V G7	50	950	83

* Power or motor power-to-size correspondence not according to standard.
□ Temperature rise class F.

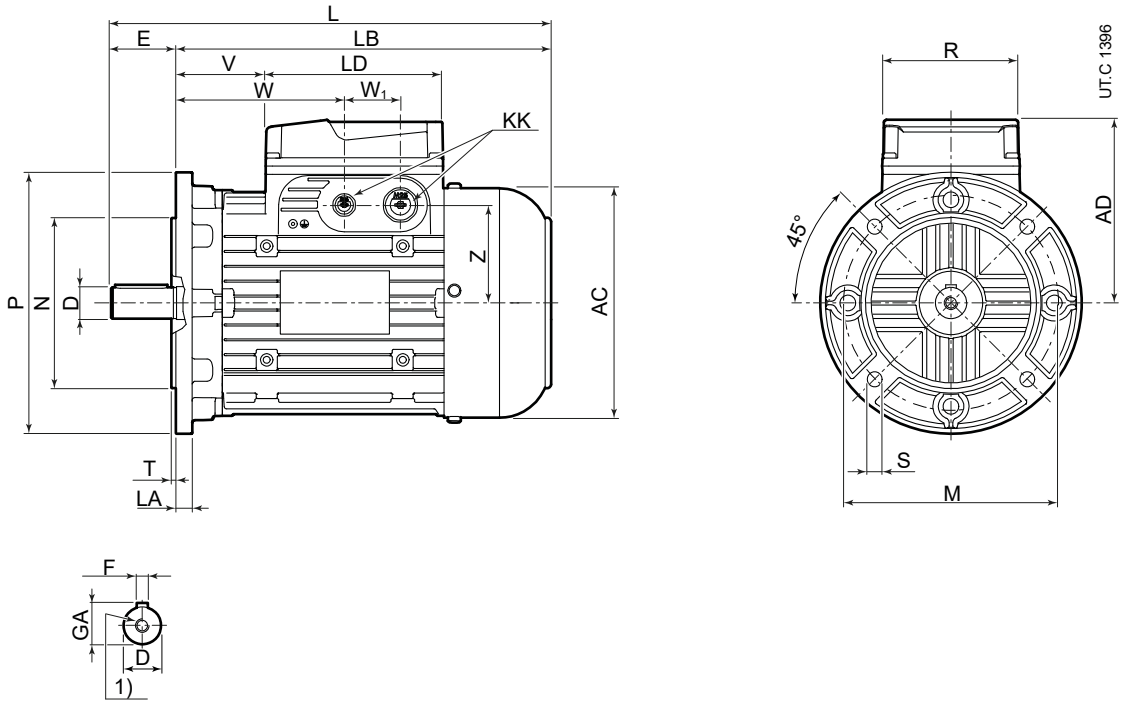
Page intentionally left blank

6.12

Motor dimensions

Mounting position
IM **B5**, IM **B5R**, IM **B5...**

63 ... 160S



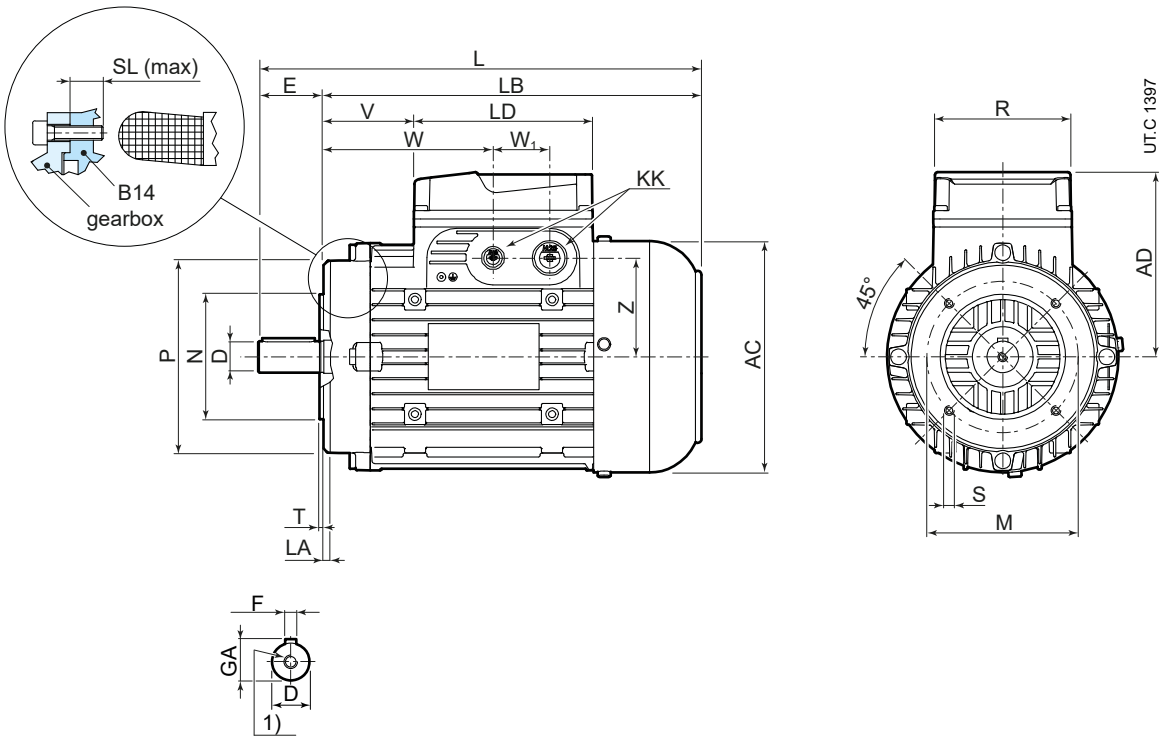
Mounting position
IM **B5**, IM **B5R**, IM **B5...**

Motor size		AC	AD	L	LB	LD	KK	R	V	W	W_1	Z	Shaft end D 1)	E	F	GA	Flange M	N	P	LA	S	T
		∅					2)						∅		h9		∅	∅	∅		∅	
63	**B5R**	123	95	242	222	103	4×M16	86	46	86	36	45	9 j6 M3	20	3	10,2	100	80 j6	120	8	7	3
	B5A			245									11 j6 M4	23	4	12,5						
	B5			228	205				29	69							115	95 j6	140	10	9	3
	BX1												11[3] j6 M4	23[3]	4	12,5	130	110 j6	160			3,5
71	**B5B**	138	112	266	243		2×M16 + 2×M20		66	106		62	11 j6 M4	23	4	12,5	100	80 j6	120	8	7	3
	B5R																115	95 j6	140	10	9	
	B5A			273									14 j6 M5	30	5	16						
	B5			254	224				47	87							130	110 j6	160			3,5
	BX2			247									11[3] j6 M4	23[3]	4	12,5						
	BX5			254									14[3] j6 M5	30[3]	5	16						
	BX1																165	130 j6	200	12	11	
80	**B5B**	156	121	293	263				80	120		71	14 j6 M5	30	5	16	115	95 j6	140	10	9	3
	B5R																130	110 j6	160			3,5
	B5A			303									19 j6 M6	40	6	21,5						
	B5			282	242				59	99							165	130 j6	200	12	11	
	BX2			272									14[3] j6 M5	30[3]	5	16						
90 SA, S[4]	**B5S**	176	141	317	287	136	2×M16 + 2×M25	106	60	120	43	75	14 j6 M5	30	5	16	130	110 j6	160	10	9	
	B5B			327									19 j6 M6	40	6	21,5						
	B5R			306	266				39	99							165	130 j6	200	12	11	
	B5			316									24 j6 M8	50	8	27						
90 L	**B5S**			347					90	150			14 j6 M5	30	5	16	130	110 j6	160	10	9	
	B5B			357									19 j6 M6	40	6	21,5						
	B5R			336	296				69	129							165	130 j6	200	12	11	
	B5			346									24 j6 M8	50	8	27						
100	**B5C**	194	151	387	347				109	169		86	19 j6 M6	40	6	21,5	130	110 j6	160	10	9	
	B5S																165	130 j6	200	12	11	
	B5R			397									24 j6 M8	50	8	27						
	B5A			407									28 j6 M10	60	8	31						
	B5			380	320				82	142							215	180 j6	250	14	14	4
112	**B5S**	218	163	409	369				126	186		98	19 j6 M6	40	6	21,5	165	130 j6	200	12	11	3,5
	B5R			419									24 j6 M8	50	8	27						
	B5A			429									28 j6 M10	60	8	31						
	B5			403	343				100	160							215	180 j6	250	14	14	4
132 S, M[5]	**B5S**	257	194	484	434	190	2×M16 + 2×M32	148	113	201	55	109	24 j6 M8	50	8	27	165	130 j6	200	12	11	3,5
	B5B			494									28 j6 M10	60	8	31						
	B5R																215	180 j6	250	14	14	4
	B5A			514									38 k6 M12	80	10	41						
	B5			479	399				78	166							265	230 j6	300			
132 MA[6]... MC	**B5S**			544	494				173	261			24 j6 M8	50	8	27	165	130 j6	200	12	11	3,5
	B5B			554									28 j6 M10	60	8	31						
	B5R																215	180 j6	250	14	14	4
	B5A			574									38 k6 M12	80	10	41						
	B5			539	459				138	226							265	230 j6	300			
160 S	**B5**			588	478				157	245			42 K6 M16	110	12	45	300	250 j6	350	15	18	5

1) DE threaded hole.
2) Prearranged cable entry knockout openings on both sides (two openings on each side, cable gland and threaded plug not supplied).
3) Shaft end not according to standard.
4) For motor **HB3V 90S 2**, **HB3V 90 S 4** and **HB3V 90 S 6** the dimensions are the ones of size 90L.
5) For motor **HB3V 132SB 2**, **HB3V 132 SC2**, **HB3V 132S 4**, **HB3V 132M 4** and **HB3V 132M 6** the dimensions are the ones of size 132 MA ... MC.
6) For motor **HBV 132MA 2** dimensions are the ones of size 132S, M.

Mounting position
IM **B14**, IM **B14R**

63 ... 132

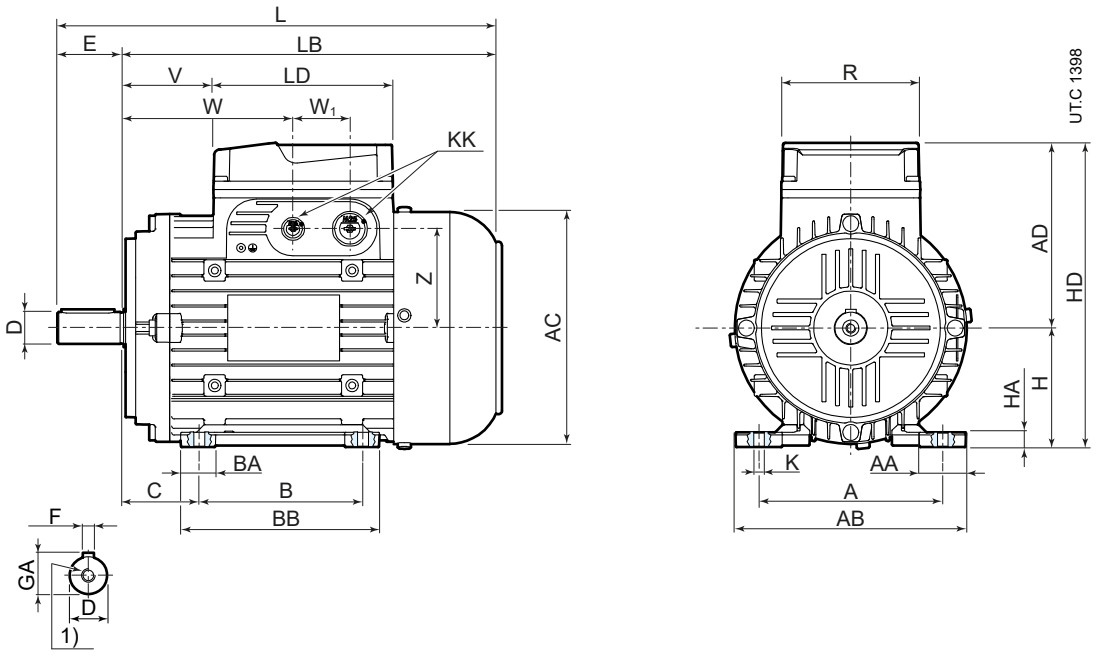


Motor size		AC	AD	L	LB	LD	KK	R	V	W	W1	Z	Shaft end D	1)	E	F	GA	Flange M	N	P	LA	S	SL	T
		Ø					2)						Ø			h9		Ø	Ø	Ø		Ø	max	
63	**B14**	123	95	228	205	103	4×M16	86	29	69	36	45	11	j6 M4	23	4	12,5	75	60 j6	90	8	M5	10	2,5
71	**B14R**	138	112	247	224		2×M16 + 2×M20		47	87		62												
	B14			254									14	j6 M5	30	5	16	85	70 j6	105	8	M6		
80	**B14R**	156	121	272	242				59	99		71												
	B14			282									19	j6 M6	40	6	21,5	100	80 j6	120	8	M6		3
90 SA, S[4]	**B14**	176	141	316	266	136	2×M16 + 2×M25	106	39	99	43	75	24	j6 M8	50	8	27	115	95 j6	140	10	M8	12	
90 L	**B14**			346	296				69	129														
100	**B14**	194	151	380	320				82	142		86	28	j6 M10	60	8	31	130	110 j6	160	10	M8	13	3,5
112	**B14**	218	163	403	343				100	160		98												
132 S, M[5]	**B14**	257	194	479	399	190	2×M16 + 2×M32	148	78	166	55	109	38	k6 M12	80	10	41	165	130 j6	200	8	M10	18	
132 MA[6] **... MC**	**B14**			539	459				138	226														

1) DE threaded hole.
2) Prearranged cable entry knockout openings on both sides (two openings on each side, cable gland and plugs not supplied).
4) For motor **HB3V 90S 2**, **HB3V 90 S 4** and **HB3V 90 S 6** dimensions are the ones as size 90L.
5) For motor **HB3V 132SB 2**, **HB3V 132 SC2**, **HB3V 132S 4**, **HB3V 132M 4** and **HB3V 132M 6** dimensions are the ones as sizes 132 MA ... MC.
6) For motor **HBV 132MA 2** dimensions are the ones as size 132S, M.

Mounting position
IM **B3**

63 ... 160S



Motor size		AC	AD	L	LB	LD	KK	R	V	W	W1	Z	Shaft end D			E	F	GA	Feet A	AB	B	C	BB	BA	AA	K	HA	H4)	HD
		∅					2)						∅		1)		h9												
63	**B3**	123	95	228	205	103	4×M16	86 –	29	69	36	45	11	j6	M4	23	4	12,5	100	120	80	40	100	21	27	7	9	63	158
71	**B3**	138	112	254	224		2×M16 + 2×M20		47	87		62	14	j6	M5	30	5	16	112	138	90	45	110	22	28		10	71	183
80	**B3**	156	121	282	242				59	99		71	19	j6	M6	40	6	21,5	125	152	100	50	125	26		9		80	201
90 SA, S5)	**B3**	176	141	316	266	136	2×M16 + 2×M25	106 –	39		43	75	24	j6	M8	50	8	27	140	174		56			35		11	90	230
90 L	**B3**			346	296				69	129											125		150						251
100	**B3**	194	151	380	320				82	142		86	28	j6	M10	60	8	31	160	196	140	63	185	40	37	12	12	100	275
112	**B3**	218	163	403	343				100	160		98							190	226		70			50		15	112	264
132 S, M6)	**B3**	257	194	479	399	190	2×M16 + 2×M32	148	78	166	55	109	38	k6	M12	80	10	41	216	257	140[3]	89	210	42	52	14	17	132	326
132 MA7)**... MC**	**B3**			539	459				138	226											178[3]								
160 S	**B3**			588	478				157	245			42	k6	M16	110	12	45	254	294	210	108	246	45			20	160	354

1) DE threaded hole.
2) Prearranged cable entry knockout openings on both sides (two openings on each side, cable gland and plugs not supplied).
3) Foot of 132S also has a centre distance of 178 mm and the one of size 132MA ... MC has also a centre distance of 140mm.
4) Tolerance $^{0}_{-0.5}$ mm.
5) For motor **HB3V 90S 2**, **HB3V 90 S 4** and **HB3V 90 S 6** dimensions are the ones as size 90L.
6) For motor **HB3V 132SB 2**, **HB3V 132 SC2**, **HB3V 132S 4**, **HB3V 132M 4** and **HB3V 132M 6** dimensions are the ones as sizes 132 MA ... MC.
7) For motor **HBV 132MA 2** dimensions are the ones as size 132S.

6.13

Non−standard designs and accessories

Ref.	Descripition	Non-standard design code
(1)	Non-standard motor supply	–
(3)	Insulation class H	,H
(7)	Design for low temperatures (-30 °C)	,BT
(8)	Condensate drain holes	,CD
(9)	Additional winding impregnation	,SP
(13)	Anti-condensation heater	,S
(14)	Terminal box on one side (IM B3 and derivatives 90 ... 160S)	,P...
(19)	Thermistor type thermal probes (PTC)	,T15
(20)	Bi-metal type thermal probes	,B15
(21)	Drip-proof cover	,PP
(26)	Separate d.c. brake supply	see 6.13 (26)
(28)	Noise-reducing capacitor (EMC directive)	,EC
(42)	Motor certified to UL	,UL
(99)	Paint cycles	see page 242

HBV Brake motor for specific applications 6

(1) Non-standard motor supply

The first two columns show the possible types of supply.

Supply values, brake rectifier and independent cooling fan are **co-ordinated** with motor winding voltage as stated in the table.

Directive / Certification	Motor wound and stated for		Rectifier DIRECTLY connected to motor terminal box				Motor type		
			Brake size	Brake size	Rectifier voltage	Coil voltage			
			02 ... 07	**G5 ... G7**	V ~ ± 5%	V dc ± 5%			
	V	**Hz**	**Rectifier**		**V**	**Vdc**	**HBV**	**HB2V**	**HB3V**
ErP EAC AU MEPS	Δ220 Y380	50	RN1	RR1	220	103	O	●	●
	Δ230 Y400	50	RN1	RR1	230	103	●	●	●
	Δ240 Y415	50	RN1	RR1	240	103	O	●	●
	Δ265 Y460	60	RN1	RR1	265	119	O	O	O
	Δ277 Y480	60	RN1	RR1	277	119	O	O	O
	Δ380	60	RN1	RR1	380	178	O	O	O
	Δ400	50	RN1	RR1	400	178	O	O	O
	Δ415	50	RN1	RR1	415	178	O	O	O
	Δ460	60	RN1	RR8	460	206	O	O	O
	Δ480	60	RN1	RR8	480	206	O	O	O
CCC, CEL	Δ220 Y380	50	RN1	RR1	220	103	-	-	●
INMETRO	Δ220 Y380	60	RN1	RR1	220	103	-	-	●
	Δ255 Y440	60	RN1	RR1	255	119	-	-	●
	Δ440	60	RN1	RR8	440	206	-	-	O
OTHERS	YY230 Y460 [3]	60	RN1	RR8	460 [4]	206	O	O	-
	Δ290 Y500	50	RN1	RR1	290	130	O	O	O
	Δ346 Y600	60	RN1	RR1	346	156	O	O	O

○ on request ● standard — not foreseen

3) For motor supply 230/60 YY consult us.
4) Rectifier connected directly to motor terminal block between 2 phases.

(3) Insulation class H

Insulation materials in class H with permissible temperature rise in class H.

Non-standard design code for the **designation: ,H**

Design not available for directives CCC, CCC+CEL, CEL.

(7) Design for low temperatures (-30 °C)

Standard motors can operate for possible ambient temperature down to -15 °C.

For ambient temperature down to -30 °C: special bearings, (in addition of cable glands and metal plugs, if available).

If there are dangers of condensate, it is advisable to require also the design «Design for damp and corrosive environment» (47), and optionally «Condensate drain holes» (8) and/or «Anti-condensation heater» (13).

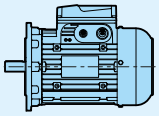
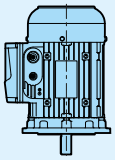
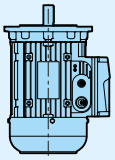
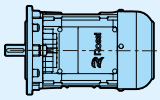
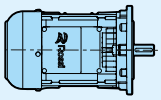
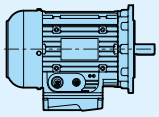
May there be dangers of ice on friction surface consult us.

Non-standard design code for the **designation: ,BT**

(8) Condensate drain holes

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature. In motor designation state in «MOUNTING POSITION» the designation of the real application mounting position, determining the hole position.
Motors are supplied with closed holes.

Non-standard design code for the **designation: ,CD.**

Mounting position IM						
B3	IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
B5	IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071
B14	IM 3601	IM 3611	IM 3631	IM 3651	IM 3661	IM 3671
B3-B5	IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071
B3-B14	IM 2101	IM 2111	IM 2131	IM 2161	IM 2161	IM 2171

(9) Additional winding impregnation

If consists of a second impregnation cycle after stator winding assembly.
Useful where it is necessary to have an additional protection (of the windings) against electrical stress (voltage peaks due to rapid commutations or to «low quality» inverters with high voltage gradients) or mechanical agents (mechanical or electromagnetic vibrations: e.g. from inverter). See also ch. 2.9 «Running with inverter», section «Voltage peaks (U_{max}), voltage gradients (dU/dt), cable length».

Non-standard design code for the **designation: ,SP**

(13) Anti-condensation heater

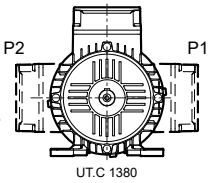
It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature; single-phase supply 230 V a.c. ± 10% 50 or 60 Hz (other voltage on request); power absorbed: 15 W for sizes 63 and 71, 25 W for sizes 80 ... 100, 50 W for sizes 112 ... 160S. Heater must not be connected during the running.

Non-standard design code for the **designation**: **,S**

(14) Terminal box on one side for IM B3 and derivatives (sizes 90 ... 160S)

Terminal box in position P1 or P2.

Non-standard design code for the **designation**: **,P...** (additional code **1** or **2** according to scheme beside).



(19) Thermistor type thermal probes (PTC)

Three thermistors wired in series (to DIN 44081/44082), inserted in the windings, for connection to a suitable contact breaker device. A sharp variation in resistance occurs when (delay 10 ÷ 30 s) the temperature of the windings reaches the setting temperature of **150 °C** (T15).

With design (3) «Insulation class H» if required, **thermistors** with setting temperature of 170 °C **(T17)** are supplied.

Terminals connected to a loose or fixed terminal block inside the terminal box.

Non-standard design code for the **designation**: **,T15**

(20) Bi-metal type thermal probes

Three bi-metal probes wired in series with usually closed contact inserted in the windings. Nominal corrent 1,6 A, nominal voltage 250 V a.c.. The contact opens when (delay 20 ÷ 60 s) the temperature of the windings reaches the setting temperature of **150 °C** (B15).

With design (3) «Insulation class H» if required, **bi-metal probes** with setting temperature of 170 °C **(B17)** are supplied.

Terminals connected to a loose or fixed terminal block inside the terminal box.

Non-standard design code for the **designation**: **,B15**

(21) Drip-proof cover

Necessary design for outdoor applications or when water sprays are present, in mounting position with downwards vertical shaft (IM V5, IM V1, IM V18).

LB dimension (see. ch. 6.12) increases by ΔLB = 26.

Non-standard design code for the **designation**: **,PP**

(26) Separate d.c. brake supply

Separate brake supply is necessary in various applications (e.g.: motors supplied by inverter). On request, the following rectifier input supply voltages are available.

For the **designation** use the non-standard design codes stated in the table.

Brake size	Rectifier supply	Name plate data		
		Rectifier	Nominal brake coil voltage	Code
	V~		V dc ± 5%	
02 ... 07	24 V c.c.[1) 7)]	-	24	**,F17**
	110	RD1[4)]	103	**,F15**
	220 ... 240	RN1	103	**,F1C**
	255 ... 277	RN1	119	**,F4**
	290	RN1	130	**,F7**
	330 ... 346	RN1	156	**,F21**
	380 ... 415	RN1	178	**,F10**
	440 ... 480	RN1	206	**,F12B**
	500	RN1	224	**,F14**
G5 ... G7	110	RR5[3)]	51	**,F15**
	220 ... 240	RR1	103	**,F1C**
	255 ... 277	RR1	119	**,F4**
	290	RR1	130	**,F7**
	330 ... 346	RR1	156	**,F21**
	380 ... 415	RR1[6)]	178	**,F10**
	440 ... 480	RR8[3)]	206	**,F12B**
	500	RR8[3)]	224	**,F14**

1) Rectifier is not supplied.
3) Single half-wave rectifiers (for wiring schemes see point 6.5).
4) Double half-waves rectifier RD1: output d.c. voltage ≈ 0,9 input a.c. supply voltage (connections equal to RN1, see point 6.5).
6) In case of disconnection on a.c. and d.c. side and high number of starts use a RR8 rectifier.
7) For higher sizes and G5 ... G7 consult us. It may be necessary to reduce M_f value.

(28) Noise-reducing capacitor (EMC dir.)

Rectifier-brake coil group can comply with standard EN 50081-1 (emission levels for civil einvironments) and EN 50082-2 (immunity for industrial environments) through a parallel connection of rectifier a.c. supply with a noise-reducing capacitor or filter (consult us for relevant features).

Non-standard design code for the **designation: ,EC**

(42) c UL us Motor certified to UL

Motor sizes 63 … 160S certified (≤ 750 V, 50/60 Hz) both to UL1004-1 and CAN/CSA 22.2 No.100-14, for USA and Canada markets respectively, and electrically complying with NEMA Standard Publication MG 1-12 2009.

The main variations of this product are:

- approved UL class F insulation winding system;
- approved UL terminal block terminal assignment according to NEMA;
- certified and marked cables;
- verification and adjustment of air distances toward ground and between live parts;
- name plate with logo c UL us, showing only the data relating to the supply required in the order.
- motor with P_N ≥ 1 hp are available with intermittent duty cycle S3 70%.

As standard, in case of motor supply 230 YY 460 Y V, 60 Hz.

Non-standard design code for the **designation: ,UL**.

Design not available for directives CCC, CCC+CEL, CEL and INMETRO.

(99) Optional paint cycles

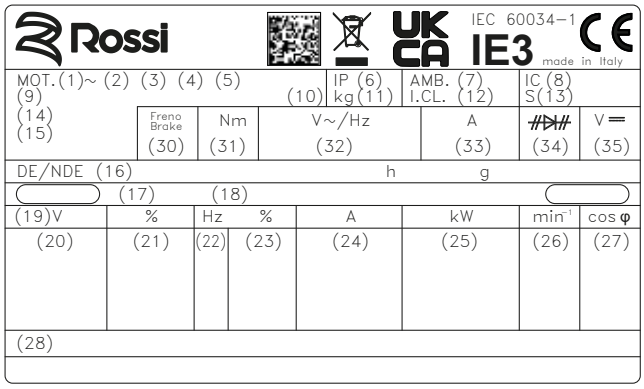
Application field	Features	Corrosivity class ISO 12944-2	Durability class ISO 12944-2	Description	Thickness cycles NDFT [µm] ISO 19840	ROSSI internal code
Applications in aggressive environments	Good resistance to atmospheric and aggressive agents	C4	L	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 160	**1H-RAL5010**
			H	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 180	**2H-RAL5010**
Outdoor applications in saline environment	Excellent resistance to atmospheric and aggressive agents Outdoor applications in saline environment	C5	M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2I-RAL5010**
Outdoor applications in chemically aggressive environment and high humidity industrial areas	Excellent resistance to atmospheric and aggressive agents Outdoor applications in chemically aggressive environment (fertilizers, etc.)		M	1) Dual compound epoxy primer 2) Water-based dual compound polyacrylic enamel	≥ 240	**M2L-RAL5010**

Cycles with specific features: antibacterial for FOOD environments, available on request.

Miscellaneous

- Asynchronous three-phase two-speed motors.
- Special paints or completely unpainted motor.
- Motor balancing according to reduced vibration degree (R) to CEI EN 60034-16.
- Motors with integral feet and flange (IM B35, IM B34 and relevant vertical mounting positions).
- Power connector.
- Sensorized drive end bearing (32, 48 or 64 pulses per rotation) for the measurement of angle and/or rotation speed (sizes 63 ... 100); for specifications and wiring schemes consult us.
- Pt 100 temperature probe.
- Designs with supply cable.
- Design for oil seal (e.g. coupled with mechanical variator).

6.14 Name plate


Rossi

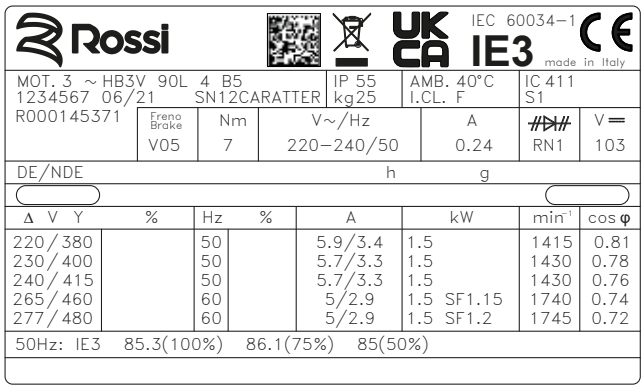
IEC 60034-1 IE3 made in Italy

MOT.(1)~ (2) (3) (4) (5) (9) (14) (15)			IP (6) kg(11) (10)	AMB. (7) I.CL. (12)	IC (8) S(13)	
	Freno Brake (30)	Nm (31)	V~/Hz (32)	A (33)	#▷|# (34)	V⎓ (35)
DE/NDE (16)			h	g		
(17)		(18)				

(19)V	%	Hz	%	A	kW	min⁻¹	cos φ
(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)

(28)

UT.C.2761


Rossi

IEC 60034-1 IE3 made in Italy

MOT. 3 ~ HB3V 90L 4 B5 1234567 06/21 SN12CARATTER			IP 55 kg25	AMB. 40°C I.CL. F	IC 411 S1	
R000145371	Freno Brake V05	Nm 7	V~/Hz 220–240/50	A 0.24	#▷|# RN1	V⎓ 103
DE/NDE			h	g		

Δ V Y	%	Hz	%	A	kW	min⁻¹	cos φ
220/380		50		5.9/3.4	1.5	1415	0.81
230/400		50		5.7/3.3	1.5	1430	0.78
240/415		50		5.7/3.3	1.5	1430	0.76
265/460		60		5/2.9	1.5 SF1.15	1740	0.74
277/480		60		5/2.9	1.5 SF1.2	1745	0.72

50Hz: IE3 85.3(100%) 86.1(75%) 85(50%)

(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP ...
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months and year of manufacturing end serial number
(11) Motor mass
(12) Insulation class I.CL....
(13) Duty cycle S...
(14) Motor code
(15) Customer code[1)]
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - code
(30) Brake size
(31) Brake braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply

1) On request.

Other certifications are also available, so please refer to the previous chapters.

7

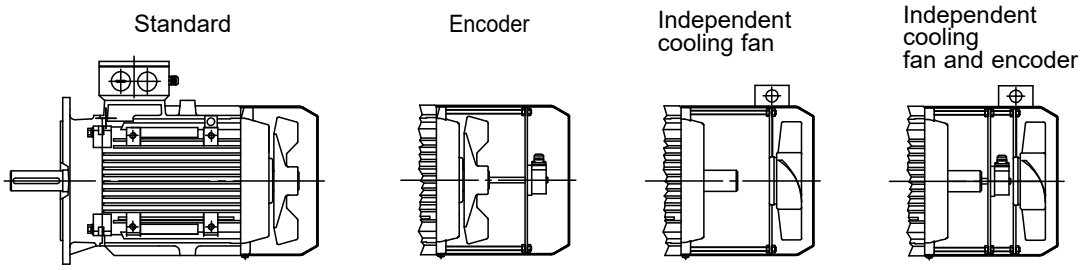
HE series Asynchronous three-phase motor

Section Contents

7.1

General specifications

160 ... 315

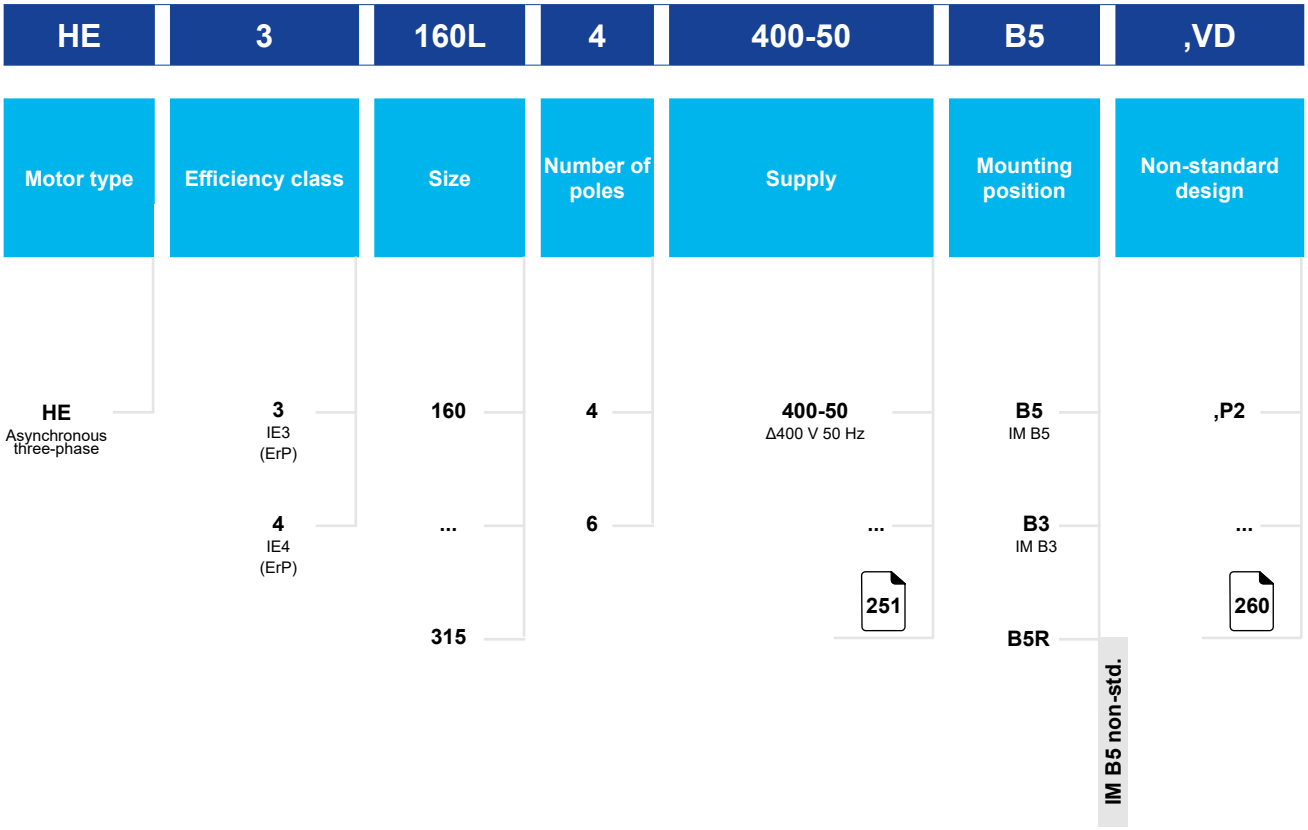


Range of asynchronous three-phase motors sizes 160... 315.
Class F insulation, temperature rise class B for all motors at standard power, B or F for remaining motors
Mounting positions **IM B3, B5** and derivatives.
IP 55 protection
«**Supported**» **tightening attachments** of endshields and flanges
Metallic terminal box

The following designs are **standard** for the whole range:
- **Cable glands already assembled** oriented on nameplate side
- **Axial fastening on drive end**
- **Thermistor type thermal probes (PTC) 150 °C**
- **Suitable for inverter operation**
- **5 voltage values stated on nameplate**
- **Standard condensate drain hole from sizes 180 ... 315**
  (For B5 motor n. 1 hole on flange and n. 2 holes on housing respectively on drive end and non drive end.
  For B3 and B5R motor n. 2 holes on housing respectively on drive end and non drive end)
  suitable for mounting position B3, **B5**

- **Terminal box connection already Δ-prearranged connection**

7.2 Designation



7.3 Specifications

Standardized asynchronous three−phase electric motor with cage rotor, totally enclosed, externally ventilated (cooling system IC 411), single-speed according to following table:

Number of poles	Winding	Motor size	Standard supply		Class insulation	Class temperature rise
4, 6	three-phase Δ	160 ... 315	50 Hz	**Δ 380 V**	F	B[1)]
				Δ 400 V		
				Δ 415 V		
			60 Hz	**Δ 460 V**		
				Δ 480 V		

1) Excluded specific motors (identified by □ at ch. 7.5) whose temperature rise class is F.

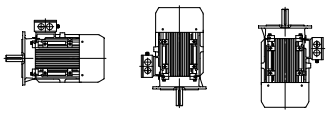
Rated power delivered on continuous duty (S1) at standard voltage and frequency; ambient temperature -15 ÷ 40 °C, altitudes lower than 1000 m.

IP 55 protection

Mounting positions IM B5, IM B3 motors can also operate in the relevant mounting positions with vertical shaft, which are respectively (see following table): IM V1 and IM V3 the name plate shows the designation of mounting position with horizontal shaft.

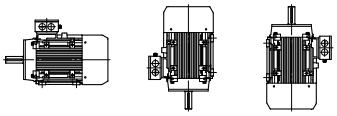
Mounting positions with flange

IM **B5** IM **V1** IM **V3**



Mounting positions with feet

IM **B3** IM **V5** IM **V6**



Main mating dimensions of the mounting positions with flange

Mounting position	Shaft end - Ø D x E Flange - Ø P Motor size						
IM	**160**	**180**	**200**	**225**	**250**	**280**	**315**
B3	42 x 110	48 x 110	55 x 110	60 x 140	65 x 140	75 x 140	80 x 170
B5	42 x 110 350	48 x 110 350	55 x 110 400	60 x 140 450	65 x 140 550	75 x 140 550	80 x 170 660
B5R	38 x 80 300	-	48 x 110 350	-	60 x 140 450	-	-

Construction features

Motor size	Bearing D-E 1)	Bearing N-D-E 1)	Housing	Flange D-E		Endshield D-E N-D-E	Terminal box cover 3)	Seal 5)	Terminal block 4)	Cable gland	Fan cover	Cooling fan
				B5	B5R							
160	6309-2RZ-C3	6309-2RZ-C3	LL	G	G	G	LL	45×60×8	M6	2×M40+1×M16	Painted	Plastic
180	6311-2RZ-C3	6311-2RZ-C3	G	G	-	G	G	VA55	M6	2×M50+1×M16		
200	6312-2RZ-C3	6312-2RZ-C3	G	G	G	G	G	VA60	M6	2×M50+1×M16		
225	6313-2RZ-C3	6313-2RZ-C3	G	G	-	G	G	VA65	M8	2×M50+1×M16		
250	6314-C3 2)	6314-C3 2)	G	G	-	G	G	VA70	M8	2×M50+1×M16		
280	6317-C3 2)	6317-C3 2)	G	G	-	G	G	VA85	M10	2×M63+1×M16		
315S	6319-C3 2)	6319-C3 2)	G	A	-	G	G	VA95	M12	2×M63+1×M16		

LL = light alloy.
G = cast iron. grey
A = steel

1) Lubricated for life assuming pollution free surroundings.
2) Greaser foreseen as standard D-E and N-D-E, hydraulic type Form A UNI 7663
3) Terminal box cover on housing with cable glands mounted on one side only, where:
one power cable gland and one for auxiliary devices with position 90° apart.
4) Terminal block with 6 terminals for cable terminal connection.
5) Sizes 160 seal ring; sizes 180 ... 315S V-ring.

Motor shaft specifications

Motor shaft made of steel C45 or equivalent; cylindrical shaft ends with A-shape (rounded) keyway and tapped butt-end hole, axially fastened on D-E side.

	Shaft end - Ø × E							
	Ø 38x80	**Ø 42x110**	**Ø 48x110**	**Ø 55x110**	**Ø 60x140**	**Ø 65x140**	**Ø 75x140**	**Ø 80x170**
d	M12	M16	M16	M20	M20	M20	M20	M20
b×h×l	10x8x70	12x8x100	14x9x100	16x10x100	18x11x130	18x11x130	20x12x130	22x14x160

d = DE threaded hole
bxhxl = key dimensions

Preload spring on non-drive end side, as standard.

Thermoplastic **cooling fan** with radial blades.

Earth terminal located inside terminal box; prearranged for the installation of a two further external earth terminals.

Rotor: pressure diecast cage in alluminium.

Stator winding with class F copper conductor insulation, insulated with double coat, type of impregnation with **VI** process, **class F insulation system**.

Materials and type of impregnation allow **use in tropical climates** without further treatment.

Rotor dynamic balancing: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.

Paint: water−soluble enamel, colour blue RAL 5010 DIN 1843, unaffected by normal industrial environments and suitable for further finishings with single−compound synthetic paints.

For **non−standard designs** and accessories see ch. 7.7.

Compliance with European Directives
Motors of present catalog comply with following standards EN 60034−1, EN 60034−2, EN 60034-2-1, EN 60034−5, EN 60034−6, EN 60034−7, EN 60034−8, EN 60034−9, EN60034−12, EN 60034−14, IEC 60038, IEC 60072−1, and with **Low Voltage Directive 2014/35/EU** (repealing the old 73/23/EC). For this reason the electric motors are CE marked.

Additional information:
The motor design, considering the motors as components, complies with
- Machinery Directive 2006/42/EC when the installation is correctly executed by machinery manufacturer (e.g.: in compliance with our installation instructions and EN 60204 «Electric Equipments of Industrial Machines»);
- Directive 2011/65/EC RoHS relevant to the limit of use of dangerous substsances in the electric and electronic equipments;
- Directive «ErP» 2009/125/EC estabilishing a framework for the setting of ecodesign requirements for energy-related products; on the base of the field of application, the motor are in conformity with requirements set in Regulation N° 640/2009 and subsequent modification No. 2019/1781 and the efficiency class is defined according to the Standard EN 60034-30.

Declaration of Incorporation (Directive 2006/42/EC Art. 7.2 − II B):
The above mentioned motors must be commissioned as soon as the machines in which they have been incorporated have been declared to be in compliance with the Machinery Directive.
According to EN 60034−1, as motors are components and not machines, supplied directly to the final user, the Electromagnetic Compatibility Directive (application of Directive 2014/30/EU) is not directly applicable.

7.4

Radial and axial loads on shaft end

Radial loads generated on the shaft end by a drive connecting motor and driven machine must be less than or equal to the maximum values given in the relevant table.
The radial load F_r given by the following formula refers to most common drives:

$$F_r = \frac{k \cdot 19100 \cdot P}{n \cdot d} \text{ [N]}$$

where:
P [kW] is motor power required
n [min^{-1}] is the speed
d [m] is the pitch diameter
k is a coefficient assuming different values according to the drive type:
k = 1 for chain drive
k = 1,1 for gear pair drive
k = 1,5 for timing belt drive
k = 2,5 for V−belt drive
The table shows the maximum permissible values of radial and axial loads on driving shaft end (F_r overhung load on centre line of shaft end), calculated for a bearing life L_h = 18 000 h. For a longer bearing life, the values stated in the table must be multiplied by:
0,9 (25000 h),
0,8 (35500 h) or
0,71 (50000 h).

Motor size	F_r [1] [N] n_N [min^{-1}]			F_a [2] [N] n_N [min^{-1}]			F_a [2] [N] n_N [min^{-1}]		
	3000	1500	1000	3000	1500	1000	3000	1500	1000
160M	-	3150	3650	-	2280	2670	-	1650	1960
160L	-	3750	4500	-	2000	2360	-	1000	1250
180M	-	-	-	-	-	-	-	-	-
180L	-	4000	4500	-	2000	2360	-	1120	1400
200	-	5300	6000	-	2500	3150	-	1120	1400
225	-	6000	6700	-	2800	3550	-	1700	2120
250	-	6700	7500	-	3350	4000	-	1700	2120
280	-	-	-	-	-	-	-	-	-
315S	-	-	-	-	-	-	-	-	-

1) An axial load of up to 0,2 times the value in the table is permissible, simultaneously with the radial load.
2) Comprehensive of a possible unfavourable effect of weight−force of rotor and bearing preload spring.

For running at 60Hz, table values must be reduced by 6%.

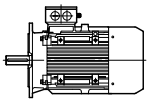
This page is intentionally left blank.

7.5

Technical data 400V 50 Hz

4 poles - 1500 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
400V - 50Hz
ErP



P_N		Motor			n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW					min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
11		**HE3**	**160 M**	**4**	1470	71,5	21,5	0,81	91,4	92,7	92,4	2,4	3,35	7,8	0,09409	550	110
15	□	**HE3**	**160 L**	**4**	1475	97,1	29,9	0,79	92,1	92,4	91,5	2,2	3,45	8,5	0,11927	600	123
18,5		**HE3**	**180 M**	**4**	1470	120,2	34,9	0,83	92,6	92,8	92,2	1,9	3,5	6,1	0,166	390	211
22		**HE3**	**180 L**	**4**	1470	142,9	41,3	0,83	93	93,2	92,8	2	2,9	6,2	0,198	500	240
30	□	**HE3**	**200 L**	**4**	1470	194,9	54,6	0,85	93,6	94	93,4	1,9	2,75	6,6	0,32	250	235
37		**HE3**	**225 S**	**4**	1480	238,7	67,2	0,85	93,9	95	94,2	1,9	2,75	6,3	0,59	–	290
45		**HE3**	**225 M**	**4**	1480	290,3	81,5	0,85	94,2	93,8	89,7	2	2,9	6,8	0,69	–	330
55		**HE3**	**250 M**	**4**	1480	354,9	99,4	0,85	94,3	95,7	95,2	1,8	2,35	5,6	1,02	–	473

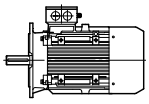
□ Temperature rise class F.

IE4
400V - 50Hz
ErP

P_N	Motor			n_N	M_N	I_N	cos φ	η IE4 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW				min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
75	**HE4**	**280S**	**4**	1490	480,7	129,6	0,87	96,0	96,2	93,1	2,0	2,3	8,5	1,472	-	619
90	**HE4**	**280M**	**4**	1490	576,8	153,6	0,88	96,1	96,3	93,2	2,0	2,3	8,5	1,677	-	682
110	**HE4**	**315 S**	**4**	1480	710,1	185,3	0,89	96,3	96,5	93,5	1,8	2,2	8,5	3,432	-	975

6 poles - 1000 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
400V - 50Hz
ErP



P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
7,5	**HE3 160 M 6**	970	73,8	16,2	0,75	89,1	89,3	88,3	2,1	3,3	6,9	0,09965	1790	83
11	**HE3 160 L 6**	970	108,2	22,8	0,77	90,3	90,2	89,6	2,5	3,5	7,5	0,14308	1130	120
15	**HE3 180 L 6**	980	146,2	30,8	0,77	91,2	91,5	90,7	1,9	2,7	5,6	0,32608	690	232
18,5	**HE3 200 LR 6**	985	179,4	38,3	0,76	91,7	92,4	90,2	2	3,1	6,4	0,44133	360	220
22	**HE3 200 L 6**	980	214,4	43,6	0,79	92,2	92,3	89,4	1,9	2,5	7	0,51	-	230
30	**HE3 225 M 6**	985	290,9	57,5	0,81	92,9	93	90,1	2	2,3	7,2	0,81	–	300
37	**HE3 250 M 6**	985	358,7	69	0,83	93,3	93,4	90,5	2,3	3	7,3	1,2	–	410
45	**HE3 280 S 6**	990	434,1	84,5	0,82	93,7	93,8	90,9	2,3	2,7	7,4	2,34	–	586
55	**HE3 280 M 6**	990	530,6	101,6	0,83	94,1	94,2	91,3	2,3	2,8	7,5	2,8	–	665

IE4
400V - 50Hz
ErP

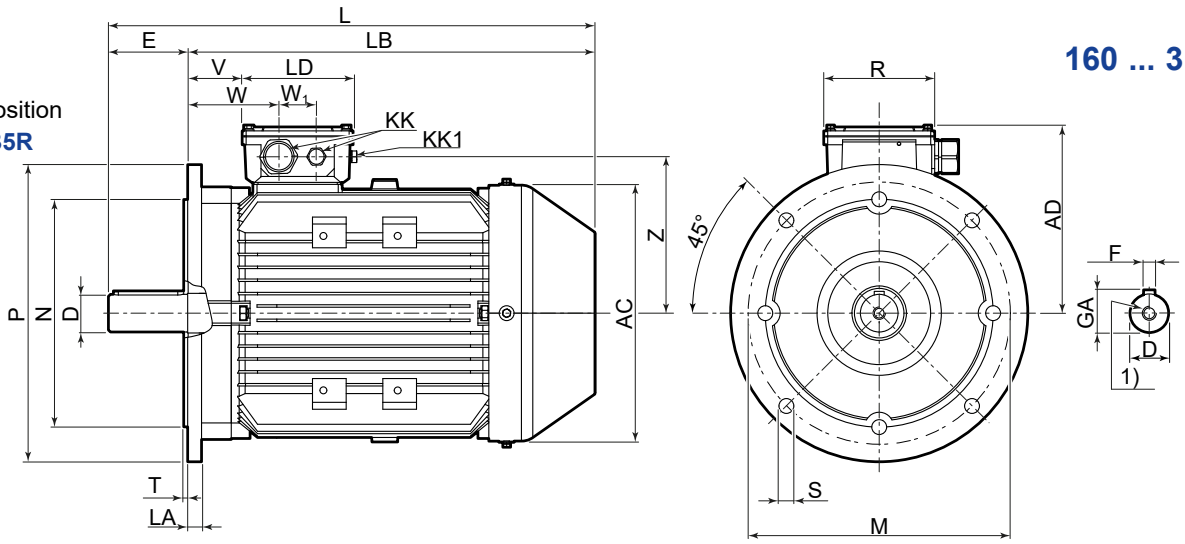
P_N	Motor	n_N	M_N	I_N	cos φ	η IE4 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	starts/h	
75	**HE4 315S 6**	985	727,5	135,1	0,84	95,4	95,6	92,5	1,6	2,0	8,0	3,417	-	861

7.6

Motor dimensions

Mounting position
IM **B5**, IM **B5R**

160 ... 315

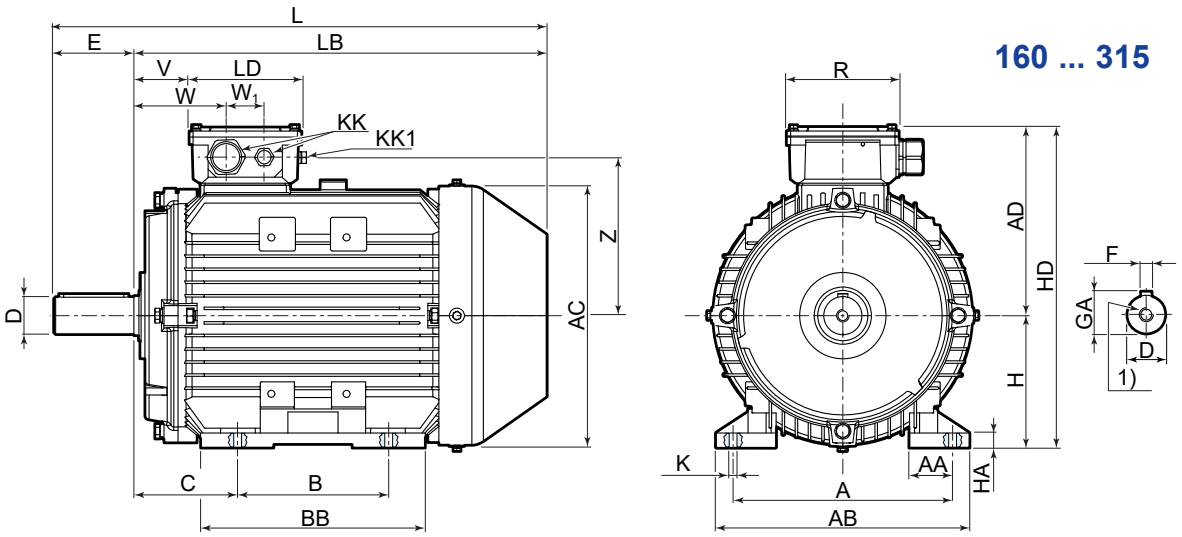


Motor size		AC	AD	L	LB	LD	KK	KK1	R	V	W	W_1	Z	Shaft end D	1)		E	F	GA	Flange M	N		P	LA	S	T
		∅												∅				h9		∅	∅		∅		∅	
160	**B5R**	315	240	620	540	150	2×M40	1×M16	160	92	140	56	210	38	k6	M12	80	10	41	265	230	j6	300	14	14	4
	B5			650						82	130			42	k6	M16	110	12	45	300	250	h6	350	15	19	5
180 M	**B5**	360	278	660	550	158	2×M50		169	81	130	60	225	48	k6	M16		14	51,5							
180 L	**B5**			700	590																					
200	**B5R**	400	310	795	685	198			218	123	185	72	250													
	B5			760	650					88	150			55	m6	M20		16	59	350	300	h6	400	17		
225 S	**B5**	450	330	795	655					91	153		272	60	m6	M20	140	18	64	400	350	h6	450	20	19[4]	
225 M	**B5**			820	680																					
250	**B5R**	485	375	876	736	228			228	93	162	90	295											16		
	B5													65	m6	M20			69	500	450	h6	550	22		
280S	**B5**	550	405	1013	873		2×M63			101	170		324	75	m6	M20		20	79,5							
280M	**B5**			1064	928																					
315S	**B5**	620	530	1185	1015	303			303	106	197	120	433	80	m6	M20	170	22	85	600	550	h6	660		24[4]	6

1) DE threaded hole.
4) 22° 30' rotation of 8 holes compared to scheme.

Mounting position
IM **B3**

160 ... 315



Motor size	AC	AD	L	LB	LD	KK	KK1	R	V	W	W_1	Z	Shaft end D 1)	E	F	GA	Feet A	AB	B	C	BB	AA	K	HA	H 2)	HD
	∅												∅		h9											
160 M B3	315	240	650	540	150	4×M40	1×M16	160	82	140	56	210	42 k6 M16	110	12	45	254	296	254	108	296	55	14	20	160	418
160L B3																										
180 M B3	360	278	660	550	158	2×M50		169	81		60	225	48 k6 M16		14	51,5	279	350	241	121	315	70	15	22	180	458
180 L B3			700	590															279							
200 B3	400	310	760	650	198			218	88	150	72	250	55 m6 M20		16	59	318	390	305	133	370	70	19	25	200	510
225 S B3	450	330	795	655					91	153		272	60 m6 M20	140	18	64	356	435	286	149		75		28	225	555
225 M B3			820	680															311		395					
250 B3	485	375	876	736	228			228	93	162	90	295	65 m6 M20			69	406	485	349	168	445	80	24	30	250	625
280 S B3	550	405	1013	873		2×M63			101	170		324	75 m6 M20		20	79,5	457	545	368	190	490	85		35	280	685
280 M B3			1064	928															419		540					
315 S B3	620	530	1185	1015	303			303	106	197	120	433	80 m6 M20	170	22	85	508	630	406	216	570	120	28	45	315	845

1) DE threaded hole.
2) Tolerance: up to size 250 $^{0}_{-0.5}$ mm, for sizes 280 and 315 $^{0}_{-1}$ mm.

7.7

Non−standard designs and accessories

Ref.	Description	Non-standard design code
(1)	Non−standard motor and brake supply	–
(3)	Insulation class H	,H
(8)	Condensate drain holes	,CD
(13)	Anti-condensation heater	,S
(14)	Terminal box on one side (IM B3 and derivatives)	,P...
(17)	Axial independent cooling fan	,V...
(18)	Axial independent cooling fan and encoder	,V... ,E...
(20)	Bi-metal type thermal probes	,B15
(21)	Drip-proof cover	,PP
(35)	Light alloy fan	,VL
(36)	Encoder	,E1 ... ,E5
(51)	Strengthened design for supply from inverter	,IR
(62)	Motor pre-arranged for encoder	,PE
(63)	Axial independent cooling fan and prearranged for encoder	,V... ,PE...
(64)	IP 66 protection	,IP 66

(1) Non-standard motor supply

The first two columns show the possible types of supply.

Supply of independent cooling fan is **co-ordinated** with motor winding voltage as stated in the table.

Motor wound and stated for	Hz	160M ... 315
Δ **380**	50	●
Δ **400**	50	●
Δ **415**	50	●
Δ **440**	60	○
Δ **460**	60	●
Δ **480**	60	●

● standard ○ on request

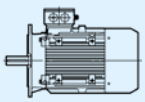
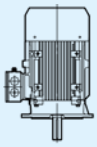
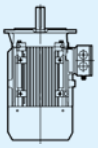
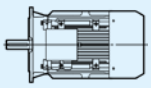
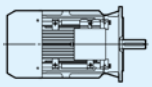
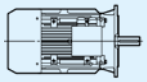
Designation: following the instructions at ch. 7.2, state **voltage** and **frequency** (in the first table columns).

(3) Insulation class H

Insulation materials in class H with permissible temperature rise in class H.
Thermistor thermal probes are supplied as standard with an intervention temperature of 170 °C (, T17).
Non-standard design code for the **designation**: **,H**

(8) Condensate drain holes

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature. In motor designation state in «MOUNTING POSITION» the designation of the real application mounting position, determining the hole position.
Motors are supplied with closed holes.
Non-standard design code for the **designation: ,CD**

Mounting position IM						
B3	IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
B5	IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071

Design supplied as standard 180 ... 315.

(13) Anti-condensation heater

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature; supply and power absorbed, see table below.

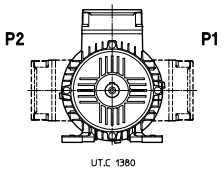
Motor size	Heater [W]	V a.c. ~ supply
160	50	230 V 50 / 60 Hz ± 10%
180, 225	80	
250 ... 280	100	
315	130	

Heater must not be connected during the running.
Cables connected to fixed or loose terminal block inside terminal box.
Non-standard design code for the **designation**: **,S**

(14) Terminal box on one side (for IM B3 and derivatives)

Terminal box in position P1 or P2.

Non-standard design code for the **designation**:
,P... (additional code **1** or **2** according to scheme beside).

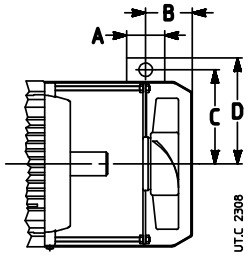


(17) Axial independent cooling fan

Cooling provided by axial independent cooling fan, **compact** for variable speed drives (motor can absorb nominal current for all speed range, in continuous duty cycle and without overheating) with inverter and/or for heavy starting cycles (for z_0 increases consult us).
The supply of the independent cooling fan is according to the table below.
LB dimensions **increase** (see ch. 7.6) by ∆**LB** quantity as per following table.
Specifications of independent cooling fan:

- Three phase Y only supply
- **IP 55** protection
- supply terminals on proper auxiliary terminal block in the motor terminal box

Non-standard design code for the **designation**: **,VD ,VM**



Motor size wound and stated for			Independent cooling											
			Independent cooling fan name plate											
Motor size	V	Hz	V	Hz	W	A	cos φ	kg	ΔLB	A	B	C	D	Code
160	Y380	50	Y380	50	50	0,13	0,59	7	135	74	113	189	207	
	Y400		Y400		55	0,14	0,56							
	Y415		Y415		55	0,15	0,54							
	Y440	60	Y440	60	75	0,15	0,69							
	Y460		Y460		75	0,15	0,66							
	Y480		Y480		80	0,16	0,63							
180	Y380	50	Y380	50	65	0,15	0,7	8	110	74	107	210	228	,VD
	Y400		Y400		70	0,16	0,67							
	Y415		Y415		75	0,16	0,65							
	Y440	60	Y440	60	95	0,16	0,79							
	Y460		Y460		100	0,17	0,76							
	Y480		Y480		105	0,17	0,75							
200	Y380	50	Y380	50	80	0,15	0,78	9	120	74	120	231	249	
	Y400		Y400		80	0,16	0,76							
	Y415		Y415		85	0,16	0,75							
	Y440	60	Y440	60	115	0,18	0,84							
	Y460		Y460		120	0,18	0,83							
	Y480		Y480		125	0,19	0,81							
225	Y380	50	Y380	50	160	0,38	0,68	13	150	74	152	256	274	
	Y400		Y400		165	0,39	0,65							
	Y415		Y415		170	0,4	0,63							
	Y440	60	Y440	60	240	0,43	0,78							
	Y460		Y460		245	0,44	0,75							
	Y480		Y480		255	0,45	0,74							
250	Y380	50	Y380	50	200	0,6	0,52	15	160	74	154	276	294	
	Y400		Y400		205	0,63	0,49							
	Y415		Y415		210	0,67	0,46							
	Y440	60	Y440	60	285	0,63	0,61							
	Y460		Y460		290	0,67	0,59							
	Y480		Y480		300	0,69	0,56							
280	Y380	50	Y380	50	165	0,56	0,48	20	170	125	152	315	355	,VM
	Y400		Y400		175	0,59	0,45							
	Y415		Y415		180	0,6	0,43							
	Y440	60	Y440	60	250	0,58	0,6							
	Y460		Y460		255	0,6	0,57							
	Y480		Y480		260	0,62	0,54							
315	Y380	50	Y380	50	375	0,8	0,73	32	185	125	184	251	391	
	Y400		Y400		375	0,8	0,7							
	Y415		Y415		375	0,8	0,68							
	Y440	60	Y440	60	600	1,09	0,8							
	Y460		Y460		600	1,09	0,79							
	Y480		Y480		600	1,09	0,77							

Non-standard design code for the **designation**: **,VD** **,VM**.

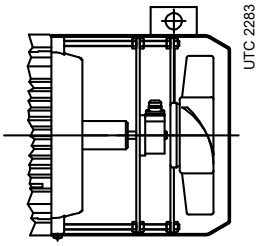
(18) Axial independent cooling fan and encoder

Independently cooled motor equipped with hollow shaft **encoder** with elastic fastening.
For specifications and designation code relevant to the independent cooling fan and the encoder see design (17) and design (36), respectively.

Motor overall dimensions as «Axial independent cooling fan» design (17).

Non-standard design code for the **designation**: **,V ... ,E...**

IC 416 is stated on name plate



(20) Bi-metal type thermal probes

Three bi-metal probes wired in series with usually closed contact inserted in the windings. Nominal corrent 1,6 A, nominal voltage 250 V a.c.. The contact opens when (delay 20 ÷ 60 s) the temperature of the windings reaches the setting temperature of **150 °C** (B15).

With design (3) «Insulation class H» if required, **bi-metal probes** with setting temperature of 170 °C **(B17)** are supplied.

Terminals connected to a loose or fixed terminal block inside the terminal box.

Non-standard design code for the **designation**: **,B15**

(21) Drip-proof cover

Necessary design for outdoor applications or when water sprays are present, in mounting position with downwards vertical shaft (IM V1, IM V18).

LB dimension (see. ch. 7.6) increases by ΔLB stated in table:

Non-standard design code for the **designation**: **,PP**

Motor size	**ΔLB** [mm]
160 ... 225	60
250 ... 280	80
315	100

(35) Light alloy fan

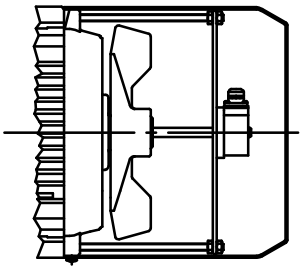
Motor with light alloy fan (aluminum) for environments where it is not advisable to use the standard plastic fan.

Non-standard design code for the **designation**: **,VL**

(36) Encoder

Motor equipped with incremental hollow shaft encoder and elastic fastening with the following features stated in the table (free connection wirings for the use of connectors installed by the Buyer). For different and/or additional specifications consult us.
LB dimension (see ch. 7.6) **increases** by ΔLB quantity given in the table.

Motor size	**Encoder ΔLB** [mm]
160	55
180	62
200	70
225	70
250	60
280	54
315	60



Output signal[1]	**RS 422 LD TTL**	**RS 422 TTL**	**Push - Pull HTL LD HTL**	**sin / cos**	
Supply voltage U_B	5 V d.c. ± 5%	10 ÷ 30 V d.c.		5 V d.c. ± 5%	10 ÷ 30 V d.c.
Maximum current consumption (without load) I_N	90 mA		100 mA	110 mA	
Channels	A+, A-, B+, B-, 0+, 0-				
Output amplitude per track	$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq 2{,}5\ V_{dc}$		$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq U_B - 1\ V_{dc}$	1 V_{PP} ± 20% (channel A, B) 0,1 ÷ 1,2 V (channel 0)	
Maximum output current per track I_{out}	± 20 mA		± 30 mA	–	
Maximum pulse frequency f_{max}	100 ÷ 300 kHz[2) 3)]			–	
Frequency -3 dB	–			≥ 180 kHz	
No. pulse per revolution	1024[4)]				
Vibration resistance (DIN-IEC 68-2-6)	≤ 100 m/s², 10 ... 2000 Hz				
Shock resistance (DIN-IEC 68-2-27)	≤ 1000 ÷ 2500 m/s², 6 ms[2)]			≤ 2000 m/s², 6 ms	
Maximum speed	6000 min^{-1}				
Ambient temperature	-40 °C ÷ 100 °C	-30 °C ÷ 85 °C	-40 °C ÷ 100 °C	-25 °C ÷ 85 °C	
Protection degree (EN 60 529)	IP65				
Connections	Cable with open wire ends[8)] L = 1000 mm for use of connector installed by the user				
Encoder cable cross-sections	2×0,22+6×0,14 [mm²]	10×0,14 [mm²]	2×0,22+6×0,14 [mm²]	8×0,22 [mm²]	8×0,22 [mm²]
Code for designation	**,E1**	**,E2**	**,E3**	**,E4**	**,E5**

1) Other electronic configurations available on request; consult us.
2) Variable depending on the model.
3) Parameter to be checked depending on the combination max motor speed/pulse per revolution required.
4) Other pulse rates available on request (max 5000 ppr).
8) On request: different cable lengths, output with connector or with connector and cable; consult us.

Non-standard design code for the **designation**: **,E1** ... **,E5** (see table).

(51) Strengthened design for supply from inverter

Advised or necessary (see ch. 2.9 «Voltage peaks (U_{max}), voltage gradients (dU/dt), cable length») for inverter supply voltages U_N > 400 V, voltage peaks U_{max} > 1000 V, voltage gradients dU/dt > 1 kV/µs, supply cable length between inverter and motor > 30 m. For sizes 280, 315 this design becomes necessary also for U_N ≤ 400 V.

It consists of special winding and impregnation cycle; for sizes 280, 315 also strengthened insulation, insulated bearing on non-drive end (to avoid shaft currents generated by supply from inverter).

«Inverter duty ,IR» stated on name plate

Non-standard design code for the **designation: ,IR**

(62) Motor prearranged for encoder

Motor prearranged for encoder with following features:
- anti-rotation center distance Ø 63 mm;
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180°suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø10 h6 mm.

Motor dimensions as design (36).

Non-standard design code for the **designation**: **,PE**

(63) Axial independent cooling fan and prearranged for encoder

Independently cooled motor prearranged for encoder with following features:
- anti-rotation center distance Ø 63 mm;
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø 10 h6 mm and length 35 mm.

For specifications and independent cooling fan designation code see design (17).
Motor overall dimensions as «Axial independent cooling fan» (17).

Non-standard design code for the **designation**: **,V... ,PE**

IC 416 is stated on name plate

(64) IP 66 protection

Advised for installation in environments as stated in the table below, including relevant limitations.

Environment type	Non-standard designs		
	(17)	(18)	(36)
Outdoor	○	○	○
In damp environment			
In case of condensate			
In sea or aggressive environment			
In case of direct bolts/ water splash			
In dusty environment			●

● Possible ○ Consult us

Apply adhesive between housing and endshield mating surfaces (to be re-adjusted when disassembling the motor).
In these cases it is advised to require the following designs as well:
«Condensate drain holes» (8)
«Anti-condensation heaters» (13)

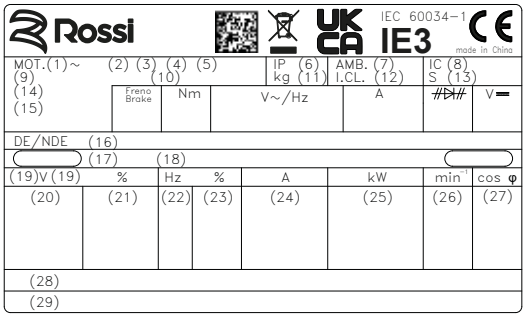
Non-standard design code for **designation**: **,IP 66**

7.8 Name plate

Supply of independent cooling fan is **co-ordinated** with motor winding voltage as stated in the table.

(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP ...
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months and year of manufacturing end serial number
(11) Motor mass
(12) Insulation class I.CL....
(13) Duty cycle S...
(14) Motor code
(15) Customer code *
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - code

* On request

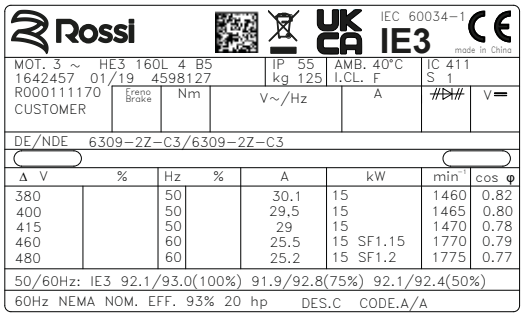


UT.C 2288

Motor wound and stated for		Motor size
V	Hz	160 ... 315
Δ 380	50	●
Δ 400	50	●
Δ 415	50	●
Δ 460	60	●
Δ 480	60	●

● Standard name plate

160 ... 315



UT.C 2290

8

HEZ series Brake motor for gearmotors

Section Contents

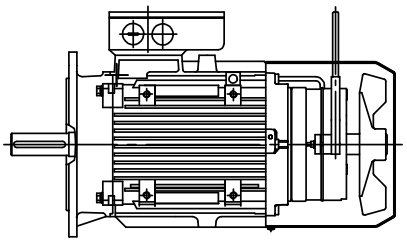
HEZ Brake motor for gearmotors 8

8.1

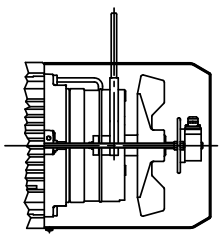
General specifications

Brake motor with direct current brake for gearmotors

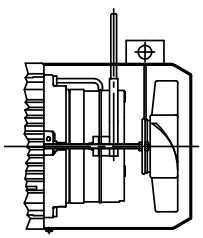
Standard



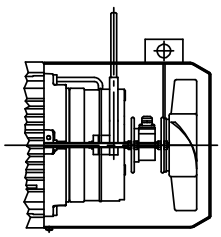
Encoder



Independent cooling fan



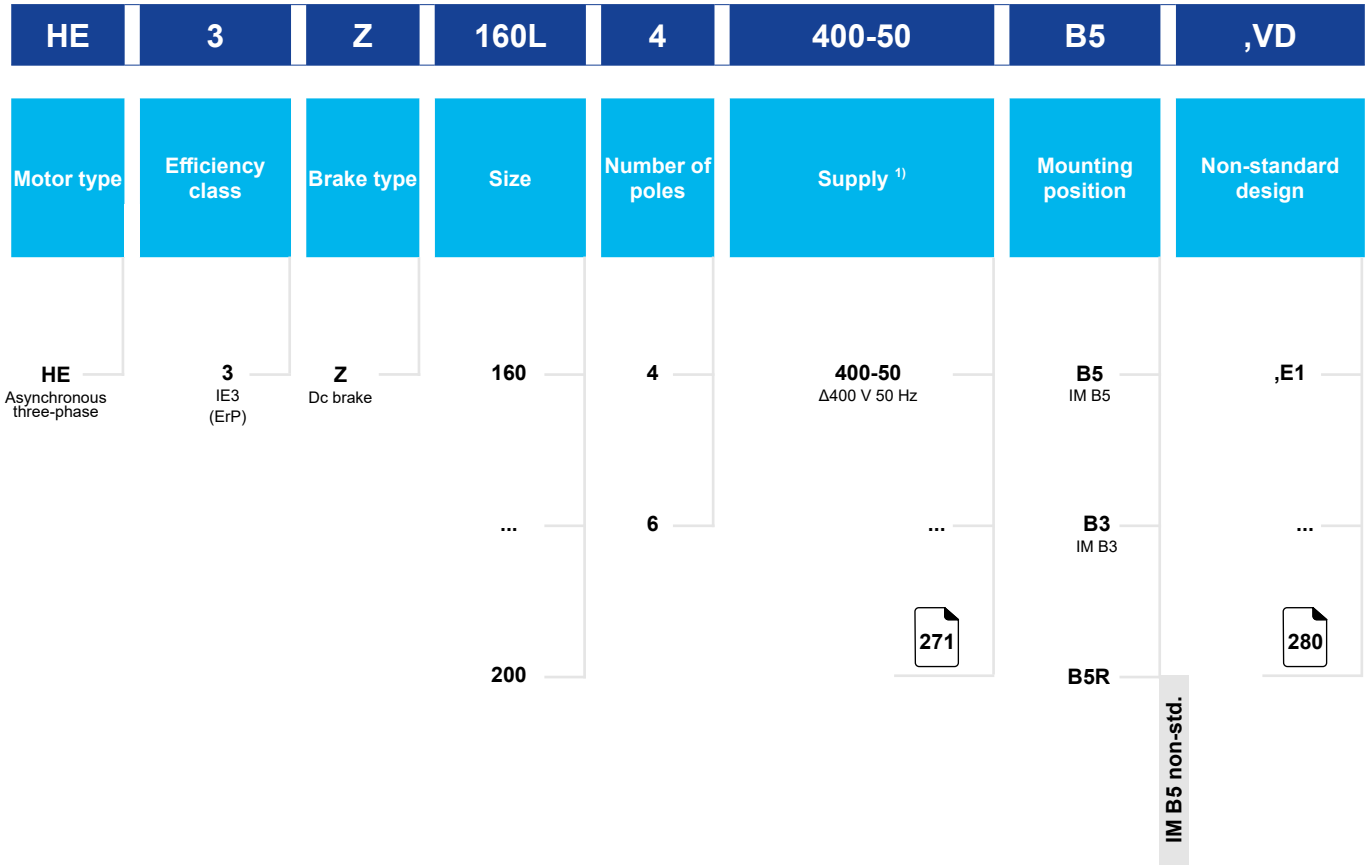
Independent cooling fan and encoder



- Series of brake motors with d.c. suitable for universal use and especially for gearmotors' applications.
- Sizes 160 ... 200
- Class F insulation; temperature rise class B or F
- Mounting position **IM B3**, **IM B5** and derivatives.
- **IP 55** protection
- **Particularly strong construction** (both electrical and mechanical) suitable for to withstand alternating torsional and thermic stresses of starting and braking;
- **Suitable for operation with inverter**
- **Asbestos-free** friction surfaces
- Double braking surface, braking torque proportioned to motor torque (usually $M_f \approx 2M_N$)
- **Maximum** operation **progressivity** (both at starting and braking) thanks to a lower rapidity (**typical of d.c. brake**) of the anchor (which is lighter and less quick in the impact): motor starts slightly braked i.e. with greater progressivity; good release and braking rapidity; possibility to increase rapidity when braking, with supply opening on d.c. side
- High braking capacity.
- Particularly suitable for applications requiring regular and low-noise starting and braking and, at the same time, braking with good rapidity and precision and high number of starts

The following designs are **standard** for the whole range:
- **Cable glands already assembled** oriented to nameplate
- **Axial fastening on opposite drive end**
- **Thermistor type thermal probes (PTC) 150 °C**
- **Suitable for operation with inverter**
- **Three types of voltages stated on nameplate**
- **Standard condensate drain holes for sizes 180, 200**
- **Suitable for mounting position B3 ,B8.**
- (For B5 motor n. 1 hole on flange and n. 2 holes on housing respectively on drive end and non drive end.
- For B3 and B5R motor n. 2 holes on housing respectively on drive end and non drive end)
- **Terminal box connection already Δ-prearranged connection**
- **NEMA MG 1-12 references stated on nameplate**
- **Manual release lever with automatic return**

8.2 Designation



8.3 Specifications

Asynchronous three-phase electric **brake motor** with **d.c. brake** (braking in case of failure of supply) with double braking surface

Standardised motor with cage rotor, totally enclosed, externally ventilated (cooling system IC 411), single-speed according to following tables:

Number of poles	Winding	Motor size	**Standard supply**		Class	
					insulation	temperature rise
4, 6	three-phase Δ	160 ... 200	50 Hz	**Δ 380 V**	F	B[1)]
				Δ 400 V		
				Δ 415 V		

1) Excluding some motors (identified by □ at ch. 8.6) whose temperature rise class is F.

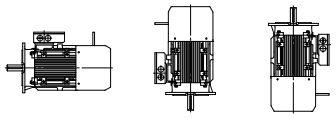
Rated power delivered on continuous duty (S1) and at standard voltage and frequency; ambient temperature -15 ÷ +40 °C, altitude < 1000 m.

IP 55 protection

Mounting positions IM B5; motors can also operate in the relevant mounting positions with vertical shaft, which are respectively (see following table): IM V1 and IM V3; the name plate shows the designation of mounting position with horizontal.

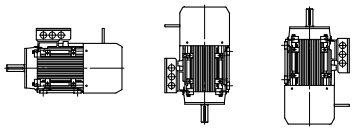
Mounting positions with flange

IM **B5** IM **V1** IM **V3**



Mounting positions with feet

IM **B3** IM **V5** IM **V6**



Main mating dimensions of the mounting positions with flange

Mounting position	Shaft end - Ø D x E Flange - Ø P Motor size		
IM	**160**	**180**	**200**
B3	42 x 110	48 x 110	55 x 110
B5	42 x 110 350	48 x 110 350	55 x 110 400
B5R	38 x 80 300	-	48 x 110 350

Construction features

Motor size	Bearing D-E 1)	Bearing N-D-E 1)	Housing	Flange D-E		Endshield D-E N-D-E	Terminal box cover 3)	Seal 5)		Terminal block 4)	Cable gland in plastic	Fan cover	Cooling fan
				B5	B5R			D-E	N-D-E				
160	6309-2RZ	6309-2RZ-C3	LL	G	G	G	LL	45×60×8	VA45	M6	2×M40+1×M16		
180	6311-2RZ-C3	6311-2RZ-C3	G	G	-	G	LL	VA55	VA55	M6	2×M50+1×M16	6)	7)
200	6312-2RZ	6310-2RZ-C3	G	G	G	G	LL	VA60	VA60	M6	2×M50+1×M16		

LL = light alloy.
G = cast iron.
1) Lubricated for life assuming pollution free surroundings.
3) Terminal box cover pre-arranged for cable glands mounting on both sides.
Cable glands assembled on one side only, one power type and one for auxiliary devices.
4) Terminal block with 6 terminals for cable terminal connection.
5) D-E sizes 160: seal ring;
D-E sizes 180 ... 200: V-ring.
N-D-E sizes 160 ... 200: V-ring
6) Painted
7) Plastic

Motor shaft specifications

Motor shaft made of steel C45 or equivalent; cylindrical shaft ends with A-shape (rounded) keyway and tapped butt-end hole, axially fastened on N-D-E side.

	Shaft end - Ø × E			
	Ø 38x80	**Ø 42x110**	**Ø 48x110**	**Ø 55x110**
d	M12	M16	M16	M20
b×h×l	10x8x70	12x8x100	14x9x100	16x10x100

d = tapped butt-end hole
bxhxl = key dimensions

Preload spring drive end as standard.

Thermoplastic **cooling fan** with radial blades.

Earth terminal located inside terminal box; prearranged for the installation of a further external earth terminal on housing.

Brake supply: with rectifier laying in terminal box having 2 terminals for cable connection for rectifier supply and 2 for external contact of fast braking; possible brake supply **directly from** motor **terminal block** or **separately** (to be used for: motors supplied by inverter, separate drive needs of motor and brake, etc.).
Brake can be supplied, also at motor standstill, with no time limitations.

Pressure diecast cage **rotor** in aluminium.

Stator winding with class F copper conductor insulation, insulated with double coat, type of impregnation with VI process, **class F insulation system**.

Rotor dynamic balancing: vibration velocity under standard rating A. Motors are balanced with half key inserted into shaft extension.

Paint: water-soluble, colour blue RAL 5010 DIN 1843, unaffected by normal industrial environments and suitable for further finishings with single-compound synthetic paints.

For **non-standard designs** and accessories see ch. 8.8.

Compliance with European Directives

Motors of present catalog comply with following standards: EN 60034-1, EN 60034-2-1, EN 60034-2, EN 60034-5, EN 60034-6, EN 60034-7, EN 60034-8, EN 60034-9, EN60034-12, EN 60034-14, IEC 60038, IEC 60072-1, and with **Low Voltage Directive 2014/35/EU**.

For this reason the electric motors are CE marked.

Additional information:

The motor design, considering the motors as components, complies with

- Machinery Directive 2006/42/EC when the installation is correctly executed by machinery manufacturer (e.g.: in compliance with our installation instructions and EN 60204 «Electric Equipments of Industrial Machines»);
- Directive 2011/65/EC RoHS relevant to the limit of use of dangerous substsances in the electric and electronic equipments.
- Directive «ErP» 2009/125/EC estabilishing a framework for the setting of ecodesign requirements for energy-related products; on the base of the field of application, the motor are in conformity with requirements set in Regulation N° 640/2009 and subsequent modification No. 2019/1781 and the efficiency class is defined according to the Standard EN 60034-30.

Declaration of Incorporation (Directive 2006/42/EC Art 8.2 - II B):

The above mentioned motors must be commissioned as soon as the machines in which they have been incorporated have been declared to be in compliance with the Machinery Directive.

According to EN 60034-1, as motors are components and not machines, supplied directly to the final user, the Electromagnetic Compatibility Directive (application of Directive 2014/30/EU) is not directly applicable.

8.4

Radial and axial loads on shaft end

Radial loads generated on the shaft end by a drive connecting motor and driven machine must be less than or equal to those given in the relevant table.
The radial load F_r given by the following formula refers to most common drives:

$$F_r = \frac{k \cdot 19100 \cdot P}{n \cdot d} \text{ [N]}$$

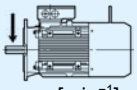
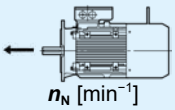
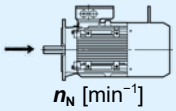
where:

P [kW] is motor power required
n [min^{-1}] is the speed
d [m] is the pitch diameter

k is a coefficient assuming different values according to the drive type:

k = 1 for chain drive
k = 1,1 for gear pair drive
k = 1,5 for timing belt drive
k = 2,5 for V-belt drive

The table shows maximum permissible values of radial and axial loads on driving shaft end (F_r overhung load on centre line of shaft end), calculated for a bearing life L_h = 18 000 h. For a longer bearing life, the values stated in the table must be multiplied by:
0,9 (25000 h),
0,8 (35500 h) or
0,71 (50000 h).

Motor size	F_r [1] [N]			F_a [2] [N]					
	 n_N [min^{-1}]			 n_N [min^{-1}]			 n_N [min^{-1}]		
	3000	1500	1000	3000	1500	1000	3000	1500	1000
160	-	3750	4500	-	2000	2360	-	1000	1250
180	-	4000	4500	-	2000	2360	-	1120	1400
200	-	5300	6000	-	2500	3150	-	1120	1400

1) An axial load of up to 0,2 times the value in the table is permissible, simultaneously with the radial load.
2) Comprehensive of a possible unfavourable effect of weight-force of rotor and bearing preload spring.

For running at 60 Hz, table values must be reduced by 6%.

Electromagnetic spring loaded brake (braking occurs automatically when it is not supplied), with **d.c.** toroidal coil and double braking surface, braking torque **proportioned** to motor torque (usually $M_f \approx 2\ M_N$).

Conceived for **maximum reduced noise level of running** and **progressivity** of on-off switching (both when starting and when braking thanks to lower rapidity, typical of d.c. brake, of brake anchor, lighter and less quick in the impact: motor starts slightly braked and with greater progressivity) **with increased rapidity in releasing and braking**; possibility to increase the rapidity, both in releasing (with rapid rectifier) and braking with supply opening on d.c. side, outstanding work capacity.

Particularly suitable for applications requiring regular and low-noise starting and braking and, at the same time, braking with good rapidity and precision and high number of starts.

When electromagnet is not supplied, the brake anchor pushed by springs presses the brake disk on rear endshield generating the braking torque on the same brake disk and consequentely on motor shaft it is keyed onto; by supplying the brake the electromagnet draws the brake anchor and releases the brake disk and driving shaft.

Main specifications:

- alternate single-phase **supply voltage** of rectifier (always supplied in terminal box)
- **400 V ± 5% 50** or **60 Hz simple half-wave rectifier**;
- rectifier supply **separatly from** motor **terminal block**;
- braking torque adjustable by changing number of springs;
- **insulation class F**, **temperature rise class B**;
- brake disk, sliding on moving hub: with single steel coat and double friction surface with average friction coefficient for low wear;
- **brake anchor in two pieces** for greater rapidity of starting and reduced noise;
- **water-proof and dust-proof gaiter** and **V-ring** both to prevent polluting infiltrations from surroundings towards brake, and to avoid that wear dust of friction surface will be dispersed in the surroundings;
- **lever for manual release with automatic return** and removable level rod;
- for other functional specifications see following table.

For main specifications of motor see ch. 8.6.

For non-standard designs see ch. 8.8.

Motor is **always equipped with** a **high reliable rectifier** fixed on terminal box providing adequate connecting terminals (2 for rectifier supply separatly from motor terminal block or directly; 2 for external contact of rapid braking).

RR1 rectifier (standard for) is a single half-wave diode bridge (output d.c. voltage ≈ 0,45 a.c. supply voltage) running at double half-wave for the approximately initial 600 ms supplying a double voltage to the brake coil, and allowing to have a quick brake release.

All rectifier models can be connected-disconnected both on a.c. side (for maximum low noise running); both on a.c. and d.c. side (for a quicker braking release) as they are equipped with varistors for the protection of diodes, electromagnet and d.c. side opening contact (wiring schemes see TX Operating instructions UT.D 164).

Table of main functional specifications of brake

Effective values may slightly differ according to ambient temperature and humidity, brake temperature and state of wear of friction surface.

Brake size		Motor size	M_f ±12%			Absorption			Delay of [23]			Air-gap		W_1	C_{max}	W_{max} [28] [J]		
			Spacer number (primed)						release	braking								
									t_1	t_2	t_2 c.c.							
			N m			V c.a	A c.a. max	W	ms	ms	ms	mm		MJ/mm	mm	brakings/h		
	21)								24)		25)	nom	max	26)	27)	10	100	1000
BC 08	RR1[29]	160M	85[3]	170[6]	250[9]	400	0,56	125	150	300	30	0,40	0,60	450	6	28000	7100	1000
BC 09	RR1[29]	180M ... 200	200[6]	300[9]	400[12]	400	0,67	140	200	450	40	0,50	0,70	630	6	40000	10000	1400

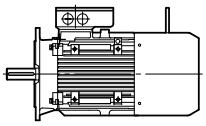
21) Standard rectifier, supplied as standard; stop time must be **2,5** s ÷ **3,5** s. If necessary, consult us.
23) Values valid with M_{fmax}, mean air-gap and nominal value of supply voltage.
24) Release time of brake obtained with standard rectifier.
25) Braking delay obtained by separate brake supply and coil disconnection on a.c. side of rectifier (t_2) or on a.c. and d.c. side (t_2 d.c.). With direct supply from motor terminal block, the values of t_2 increase of approx. 2,5 times the ones of table.
26) Friction work for brake disk wear of 1 mm (minimum value for heavy duty; real value is usually greater).
27) Maximum brake disk wear.
28) Maximum friction work for each braking.
29) In case of rectifier supply ≥ 400 V a.c. with disconnection on a.c. and d.c. side at high number of start use RR8 rectifier (see ch. 8.9 (26)).

8.6

Technical data 400V 50 Hz

4 poli - 1500 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
400V - 50Hz
ErP

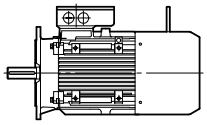


P_N		Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake	M_f	z_0	kg
kW			min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2		N m	starts/h	
11		**HE3Z 160 M 4**	1470	71,5	21,5	0,81	91,4	92,7	92,4	2,4	3,35	7,8	0,10309	BC 08	170	550	147
15	□	**HE3Z 160 L 4**	1475	97,1	29,9	0,79	92,1	92,4	91,5	2,2	3,45	8,5	0,12827	BC 08	250	600	160
18,5		**HE3Z 180 M 4**	1470	120,2	34,9	0,83	92,6	92,8	92,2	1,9	3,5	6,1	0,186	BC 09	300	390	259
22		**HE3Z 180 L 4**	1470	142,9	41,3	0,83	93	93,2	92,8	2	2,9	6,2	0,218	BC 09	300	500	288
30	□	**HE3Z 200 L 4**	1470	194,9	54,6	0,85	93,6	94	93,4	1,9	2,75	6,6	0,34	BC 09	400	250	283

□ Temperature rise class F.

6 poli - 1000 min^{-1}
IP 55
IC 411
Insulation class F
Temperature rise class B

IE3
400V - 50Hz
ErP

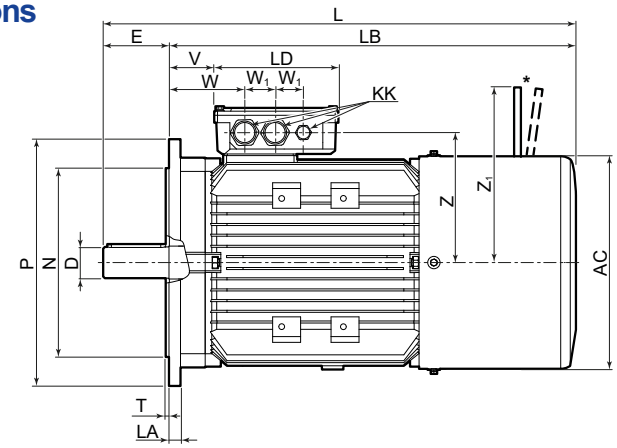


P_N	Motor	n_N	M_N	I_N	cos φ	η IE3 IEC 60034-2-1			M_S / M_N	M_{max} / M_N	I_S / I_N	J_0	Brake M_f	z_0	kg
kW		min^{-1}	N m	A 400 V		100%	75%	50%				kg m^2	N m	starts/h	
7,5	**HE3Z 160 M 6**	970	73,8	16,2	0,75	89,1	89,3	88,3	2,1	3,3	6,9	0,10865	BC 08 170	1650	123
11	**HE3Z 160 L 6**	970	108,2	22,8	0,77	90,3	90,2	89,6	2,5	3,5	7,5	0,15208	BC 08 250	1050	160
15	**HE3Z 180 L 6**	980	146,2	30,8	0,77	91,2	91,5	90,7	1,9	2,7	5,6	0,34608	BC 09 300	650	280
18,5	**HE3Z 200 LR 6**	985	179,4	38,3	0,76	91,7	92,4	90,2	2	3,1	6,4	0,46133	BC 09 400	340	268
22	**HE3Z 200 L 6**	980	214,4	43,6	0,79	92,2	92,3	89,4	1,9	2,5	7	0,53	BC 09 400	200	278

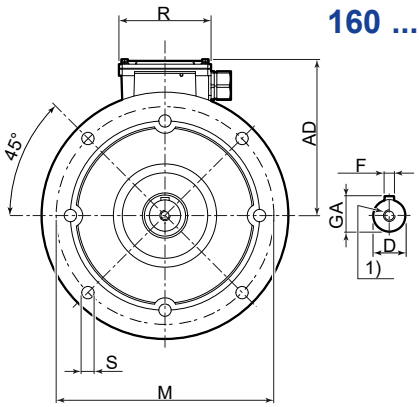
8.7

Motor dimensions

Mounting position
IM **B5**, IM **B5R**



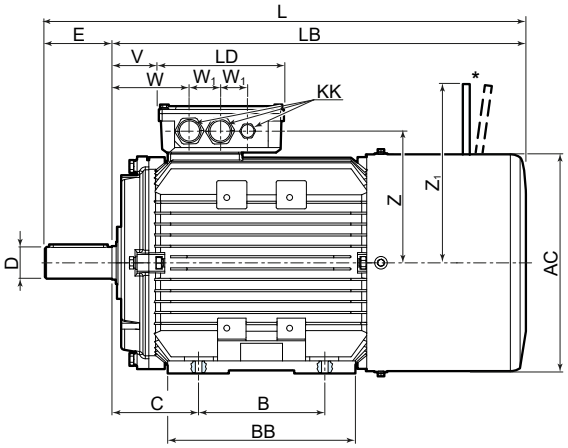
160 ... 200



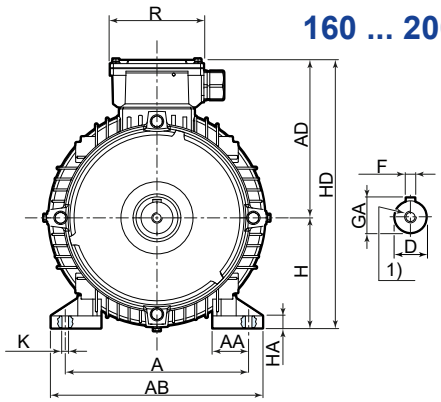
Motor size		AC	AD	L	LB	LD	KK	R	V	W	W_1	Z	Z_1	Shaft end D 1)	E	F	GA	Flange M	N	P	LA	S	T
		∅												∅		h9		∅	∅	∅		∅	
160	**B5R**	315	268	710	630	240	2×M40+	160	80	130	55	210	266	38 k6 M12	80	10	41	265	230 j6	300	14	14	4
	B5			740			1xM16							42 k6 M16	110	12	45	300	250 h6	350	15	19	5
180 M	**B5**	360	289	800	690		2×M50		87	137		225	305	48 k6 M16		14	51,5						
180 L	**B5**			835	725		+																
200	**B5R**	400	304	905	795		1×M16	190	126	186	65	250											
	B5			870	760				91	151				55 m6 M20		16	59	350	300 h6	400	17		

1) DE threaded hole.

Mounting position
IM **B3**



160 ... 200



Motor size	AC	AD	L	LB	LD	KK	R	V	W	W_1	Z	Z_1	Shaft end D	1)	E	F	GA	Feet A	AB	B	C	BB	AA	K	HA	H[2]	HD
	∅												∅			h9											
160 M B3	315	268	740	630	240	2×M40+	160	80	130	55	223	266	42 k6	M16	110	12	45	254	296	254	108	296	55	14	20	160	418
160L B3						1xM16																					
180 M B3	360	289	800	690		2×M50		87	137		224	305	48 k6	M16		14	51,5	279	350	241	121	315	70	15	22	180	458
180 L B3			835	725		+														279							
200 B3	400	304	870	760		1xM16	190	91	15	65	254		55 m6	M20		16	59	318	390	305	133	370	70	19	25	200	510

1) DE threaded hole.
2) Tolerance $^{0}_{-0.5}$

8.8

Non−standard designs and accessories

Ref.	Description	Non-standard design code
(1)	Non−standard motor and brake supply	–
(3)	Insulation class H	,H
(8)	Condensate drain holes	,CD
(13)	Anti-condensation heater	,S
(14)	Terminal box on one side (IM B3 and derivatives)	,P...
(17)	Axial independent cooling fan	,V...
(18)	Axial independent cooling fan and encoder	,V... ,E...
(20)	Bi-metal type thermal probes	,B15
(21)	Drip-proof cover	,PP
(25)	Lever for manual release with automatic return ,L1 ,L2 ,L3	,L...
(26)	Separate d.c. brake supply	ved. 8,8 (26)
(35)	Light alloy fan	,VL
(36)	Encoder	,E1 ... ,E5
(47)	Design for damp and corrosive environment, stainless steel brake disc, bolts and screws	,UC, DB
(48)	IP 56 protection	,IP56
(49)	IP 65 protection	,IP65
(51)	Strengthened design for supply from inverter	,IR
(53)	Brake with microswitch	,SB, SU
(61)	Manual rotation	,MM
(62)	Motor prearranged for encoder	,PE
(63)	Axial independent cooling fan and prearranged for encoder	,V... ,PE...

(1) Non-standard motor supply

The first two columns show the possible types of supply.

Supply values, brake rectifier and independent cooling fan are **co-ordinated** with motor winding voltage as stated in the table.

Motor wound and stated for		Non standard design available	160 ... 200 Rectifier NOT CONNECTED to motor terminal block		
			Brake size	Rectifier supply	Coil voltage
V	Hz		08 ... 09	[V]	[Vdc]
			Rectifier		
Δ220 Y380	**50**	-	-	-	-
Δ230 Y400	**50**	-	-	-	-
Δ240 Y415	**50**	-	-	-	-
Δ255 Y440	**60**	-	-	-	-
Δ265 Y460	**60**	-	-	-	-
Δ277 Y480	**60**	-	-	-	-
Δ380	**50**	●	RR1	380	178
Δ400	**50**	●	RR1	400	178
Δ415	**50**	●	RR1	415	178
Δ440	**60**	○	RR8	440	206
Δ460	**60**	○	RR8	460	206
Δ480	**60**	○	RR8	480	206

● standard ○ on request — not foreseen

Designation: by following instructions at ch. 8.2, state **voltage** and **frequency** (in the first table columns).

(3) Insulation class H

Insulation materials in class H with permissible temperature rise in class H.

Thermistor thermal probes are supplied as standard with an intervention temperature of 170 °C (, T17).

Non-standard design code for the **designation**: **,H**

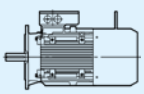
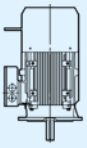
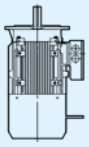
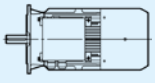
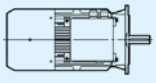
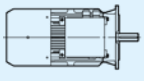
(8) Condensate drain holes

It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature.

In motor designation state in «MOUNTING POSITION» the designation of the real application mounting position, determining the hole position.

Motors are supplied with closed holes.

Non-standard design code for the **designation: ,CD**

Mounting position IM						
B3	IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
B5	IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071

Design supplied as standard for sizes 180 ... 200.

(13) Anti-condensation heater

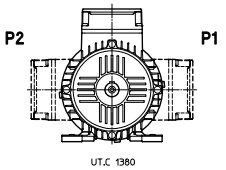
It is advisable for motors operating in particularly damp environments and/or with wide variation in the temperature and/or at low temperature; supply and power absorbed, see table below.

Motor size	Heater [W]	V a.c. ~ supply
160	50	230 V 50 / 60 Hz ± 10%
180, 200	80	

Heater must not be connected during the running.
Cables connected to fixed or loose terminal block inside terminal box.

Non-standard design code for the **designation**: **,S**

(14) Terminal box on one side (for IM B3 and derivatives)



Terminal box in position P1 or P2.

Non-standard design code for the **designation**:
,P... (additional code **1** or **2** according to scheme beside).

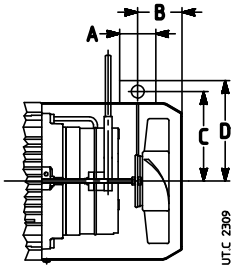
(17) Axial independent cooling

Cooling provided with **compact** axial independent cooling fan, for variable speed drives (motor may absorb nominal current for all speed range, in continuous duty cycle and without overheating) with inverter and/or for heavy starting cycles (for z_0 increases consult us).

LB dimension (see ch. 8.7) **increases** by the **ΔLB** quantity stated in the following table.
Specifications of independent cooling fan:

- three-phase Y only supply
- **IP 55** protection (it is the protection stated on name plate);
- supply terminals on relevant auxiliary terminal block located inside the motor terminal box

Non-standard design code for the **designation**: **,VD.**
IC 416 is stated on name plate.



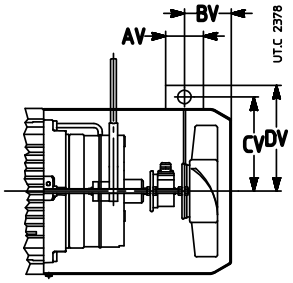
Motor size wound and stated for			Independent cooling fan											
			Independent cooling fan name plate											
Motor size	**V**	**Hz**	**V**	**Hz**	**W**	**A**	**cos φ**	**kg**	**ΔLB**	**A**	**B**	**C**	**D**	**Code**
160	Y380	50	Y380	50	50	0,13	0,59	7	125	74	113	189	207	**,VD**
	Y400		Y400		55	0,14	0,56							
	Y415		Y415		55	0,15	0,54							
	Y440	60	Y440	60	75	0,15	0,69							
	Y460		Y460		75	0,15	0,66							
	Y480		Y480		80	0,16	0,63							
180	Y380	50	Y380	50	65	0,15	0,7	8	85	74	107	210	228	
	Y400		Y400		70	0,16	0,67							
	Y415		Y415		75	0,16	0,65							
	Y440	60	Y440	60	95	0,16	0,79							
	Y460		Y460		100	0,17	0,76							
	Y480		Y480		105	0,17	0,75							
200	Y380	50	Y380	50	80	0,15	0,78	9	125	74	120	231	249	
	Y400		Y400		80	0,16	0,76							
	Y415		Y415		85	0,16	0,75							
	Y440	60	Y440	60	115	0,18	0,84							
	Y460		Y460		120	0,18	0,83							
	Y480		Y480		125	0,19	0,81							

Non-standard design code for the **designation**: **,VD**.

Independently cooled motor equipped with hollow shaft encoder with elastic fastening.

For specifications and designation code relevant to the independent cooling fan and the encoder see designs (17) and (36), respectively.

Non-standard design code for the **designation**: **,V ... ,E ...**
IC 416 is stated on name plate.



Motor size	ΔLB mm	A	B	C	D
160	140	74	113	189	207
180	158	74	107	210	228
200	180	74	120	231	249

(20) Bi-metal type thermal probes

Three bi-metal probes wired in series with usually closed contact inserted in the windings. Nominal corrent 1,6 A, nominal voltage 250 V a.c.. The contact opens when (delay 20 ÷ 60 s) the temperature of the windings reaches the setting temperature of **150 °C** (B15).

With design (3) «Insulation class H» if required, **bi-metal probes** with setting temperature of 170 °C **(B17)** are supplied. Terminals connected to a loose or fixed terminal block inside the terminal box.

Non-standard design code for the **designation**: **,B15**

(21) Drip-proof cover

Necessary design for outdoor applications or when water sprays are present, in mounting position with downwards vertical shaft (IM V1, IM V18).

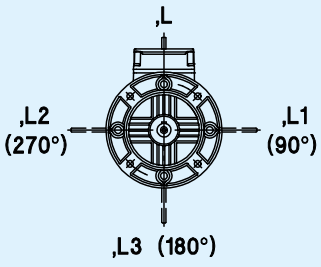
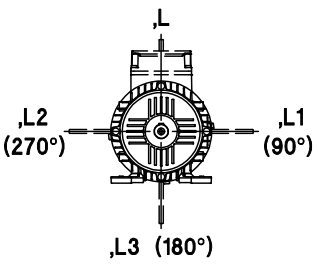
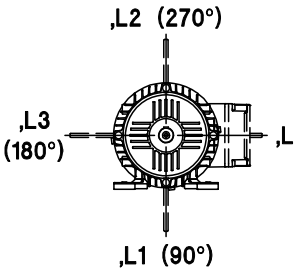
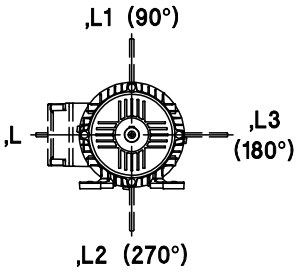
LB dimension (see. ch. 8.8) increases by ΔLB = 60mm.

Non-standard design code for the **designation**: **,PP**

(25) Lever for manual release with automatic return

Three-phase motors equipped with lever for manual release with automatic return and removable lever rod; position of release lever corresponding to terminal box as per schemes.

Non-standard design codes for the **designation**: **,L1 (90°) L2 (270°) ,L3 (180°).**

≠ B3	B3	B3 ,P1	B3 ,P2
			

(26) Separate d.c. brake supply

Motors are supplied as standard according to ch. 8.8 (1):

Rectifier not connected to motor terminal block.
Brake separate supply is necessary in several applications (e.g.: motors driven by inverter, motors for lifting with on-load descent braking). Following rectifier input voltages are available on request.

For the **designation** use the non-standard design codes stated in the table.

Motor size	Brake size	Rectifier supply	Name plate data		
			Rectifier	Nominal brake coil voltage	Code
		V~		V cc ± 5%	
160 ... 200	**08, 09**	24 V c.c.[1)]	-	24	**,F17**
		110	RR5	51	**,F15**
		220 ... 240	RR5	103	**,F1C**
		255 ... 277	RR5	119	**,F4**
		290	RR1[2)]	130	**,F7**
		330 ... 346	RR1[2)]	156	**,F21**
		380 ... 415	RR1[2)]	178	**,F10**
		440 ... 480	RR8	206	**,F12B**

1) Rectifier is not supplied.
2) In case of disconnection on a.c. and d.c. side and high number of starts use a RR8 rectifier.

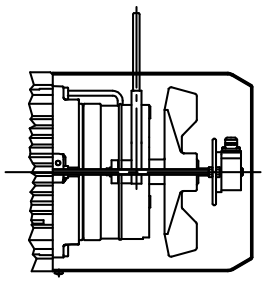
(35) Light alloy fan

Motor with light alloy fan (aluminum) for environments where it is not advisable to use the standard plastic fan.
Non-standard design code for the **designation**: **,VL**

(36) Encoder

Motor equipped with incremental hollow shaft encoder and elastic fastening with the following features stated in the table (free connection wirings for the use of connectors installed by the Buyer).
For different and/or additional technical specifications, consult us.
LB dimension (see ch. 8.7) **increases** by ΔLB quantity stated in the table.

Motor size	Encoder ΔLB [mm]
160	58
180	42
200	65



Output signal[1]	RS 422 LD TTL	RS 422 TTL	Push - Pull HTL LD HTL	sin / cos	
Supply voltage U_B	5 V d.c. ± 5%	10 ÷ 30 V d.c.		5 V d.c. ± 5%	10 ÷ 30 V d.c.
Maximum current consumption (without load) I_N	90 mA		100 mA	110 mA	
Channels	A+, A-, B+, B-, 0+, 0-				
Output amplitude per track	$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq 2{,}5\ V_{dc}$		$U_l \leq 0{,}5\ V_{dc}$; $U_h \geq U_B - 1\ V_{dc}$	1 V_{PP} ± 20% (channel A, B) 0,1 ÷ 1,2 V (channel 0)	
Maximum output current per track I_{out}	± 20 mA		± 30 mA	–	
Maximum pulse frequency f_{max}	100 ÷ 300 kHz[2) 3)]			–	
Frequency -3 dB	–			≥ 180 kHz	
No. pulse per revolution	1024[4)]				
Vibration resistance (DIN-IEC 68-2-6)	≤ 100 m/s², 10 ... 2000 Hz				
Shock resistance (DIN-IEC 68-2-27)	≤ 1000 ÷ 2500 m/s², 6 ms[2)]			≤ 2000 m/s², 6 ms	
Maximum speed	6000 min^{-1}				
Ambient temperature	-40 °C ÷ 100 °C	-30 °C ÷ 85 °C	-40 °C ÷ 100 °C	-25 °C ÷ 85 °C	
Protection degree (EN 60 529)	IP65				
Connections	Cable with open wire ends[8)] L = 1000 mm for use of connector installed by the user				
Encoder cable cross-sections	2×0,22+6×0,14 [mm²]	10×0,14 [mm²]	2×0,22+6×0,14 [mm²]	8×0,22 [mm²]	8×0,22 [mm²]
Code for designation	**,E1**	**,E2**	**,E3**	**,E4**	**,E5**

1) Other electronic configurations available on request; consult us.
2) Variable depending on the model.
3) Parameter to be checked depending on the combination max motor speed/pulse per revolution required.
4) Other pulse rates available on request (max 5000 ppr).
8) On request: different cable lengths, output with connector or with connector and cable; consult us.

Non-standard design code for the **designation**: **,E1** ... **,E5** (see table).

(47) Design for damp and corrosive environment

Advised for outdoor installation, in presence of humidity, in case of condensate dangers, especially for aggressive environment, includes type of impregnation with VI process, anti-oxidation paint of rotor, brake with dragging hub and brake plate (endshield end) made of stainless steel.
In these cases it is recommended to require also the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13).
For strongly aggressive environment (e.g. sea), it is possible to require also: stainless steel brake disc and anti-sticking friction surface[2)]; stainless steel bolts and screws of brake (fastening screws, bushes and nuts). In this case the motor is to be specifically purchased with «**Stainless steel brake disc, bolts and screws**»[1)].

With «Axial independent cooling fan and encoder» (18) and «Encoder» (36) consult us.

Non-standard design code for the **designation: ,UC**

1) Additional non-standard design code «Stainless steel brake disc, bolts and screws» for the **designation: , DB**
2) The braking torque is equal to 0,8 times the one stated in the point 8.5.

(48) IP 56 protection

It is recommended for motors running in presence of direct splash or bolts of water (includes design (9) and seal between couplings surfaces of housing and endshields (to be re-adjusted when disassembling the motor).
Brake including: dragging hub and stainless steel brake plate (endshield side).
In these cases it is advisable to require also the design «Condensate drain holes» (8) and/or «Anti-condensation heater» (13) and «Stainless steel brake disc, bolts and screws».
Non-standard design code for the **designation: ,IP 56**

Non-standard design	160 ... 200
(17)	○
(18)	○
(36)	○
(62)	●
(63)	○

○ Consult Rossi S.p.A.
● Possible

(49) IP 65 protection

Advised both for motors running in dusty environments and to avoid that wear dust of friction surface is dispersed in the environment (e.g. food industry).
Seal between the coupling surfaces of housing and endshields (to be re-adjusted when disassembling the motor).
IP 65 brake protected with: rear V-ring, O-rings on fastening screws of brake and on the pullers of the release hand lever.
In damp and/or aggressive environment, in case of condensate and/or mildew dangers or of long brake standstill, it is recommended to require the «Design for damp and corrosive environment» (47),

if necessary also with «Stainless steel bolts and screws» (described always in (47)).

Non-standard design code for the **designation: ,IP 65**

Non-standard design	160 ... 200
(17)	○
(18)	○
(36)	●
(62)	●
(63)	○

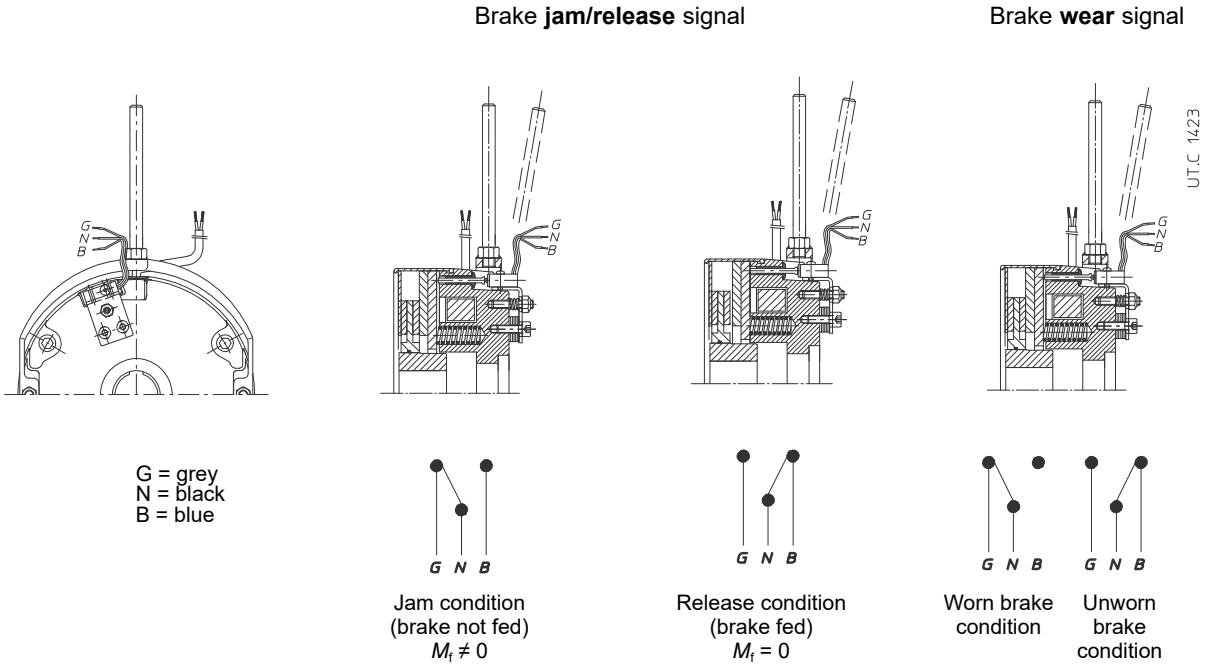
○ Consult Rossi S.p.A.
● Possible

(51) Strengthened design for supply from inverter

Advised or necessary (see ch. 2.9 «Voltage peaks (U_{max}), voltage gradients (dU/dt), cable length») for inverter supply voltages U_N > 400 V, voltage peaks U_{max} > 1000 V, voltage gradients dU/dt > 1 kV/µs, supply cable length between inverter and motor > 30 m.
It consists of special winding and impregnation cycle.
Non-standard design code for the **designation: ,IR**

(53) Brake with microswitch

Brake equipped with a mechanical microswitch in order to indicate **brake wear or brake jam/release**:
- supply: 250 V a.c. max. 6 A;
- protection degree IP 67;
- terminals are wired to a fixed or loose terminal block inside the terminal box (for wiring schemes see fig. below).



Non-standard design code for the **designation**:
,SB (brake **jam/release** signal)
,SU (brake **wear** signal)

(61) Manual rotation

Pre-arranged for **manual rotation** by straight setscrew (see table) that can be fitted on non-drive end motor shaft (excluded non-standard designs «Axial independent cooling fan» and «Axial independent cooling fan and encoder» ch. 4.8 (17), (18) and (63).
Non-standard design code for the **designation: ,MM**

Motor size	Wrench
160 ... 200	12

(62) Motor prearranged for encoder

Motor prearranged for encoder with following features:
- anti-rotation center distance Ø 63 mm
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3
- max encoder height 48 mm
- motor shaft Ø 10 h6 mm.

Motor dimensions as per encoder design (36).

Non-standard design code for the **designation**: **,PE**

(63) Axial independent cooling fan and prearranged for encoder

Independently cooled motor prearranged for encoder with following features:
- anti-rotation center distance Ø 63 mm;
- flexible anti-rotation bracket with 1 or 2 holes/slots at 180° suitable for screw passage M3;
- max encoder height 48 mm;
- motor shaft Ø 10 h6 mm and length 35 mm.

For specifications and independent cooling fan designation code see design (17).

Motor overall dimensions as «Axial independent cooling fan» (17).

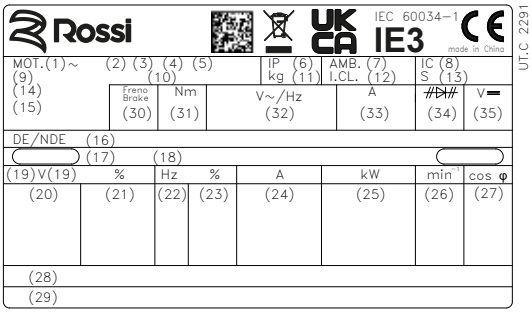
Non-standard design code for the **designation**: **,V... PE**

8.9

Name plate

Supply of independent cooling fan is **co-ordinated** with motor winding voltage as stated in the table.

(1) Number of phases
(2) Motor type
(3) Size
(4) Number of poles
(5) Designation of mounting position
(6) Protection IP ...
(7) Maximum ambient temperature
(8) Code IC
(9) Production number
(10) Two months and year of manufacturing end serial number
(11) Motor mass
(12) Insulation class I.CL....
(13) Duty cycle S...
(14) Motor code
(15) Customer code *
(16) Bearings
(17) Note 1
(18) Note 2
(19) Connection of the phases
(20) Nominal voltage
(21) Voltage tollerance
(22) Nominal frequency
(23) Frequency tollerance
(24) Nominal current
(25) Nominal power
(26) Nominal speed
(27) Nominal power factor
(28) Nominal efficiency IEC 60034-2-1
(29) Design - code
(30) Brake size
(31) Brake braking torque
(32) Rectifier supply
(33) Current absorbed by brake
(34) Rectifier designation
(35) D.c. nominal voltage of brake supply

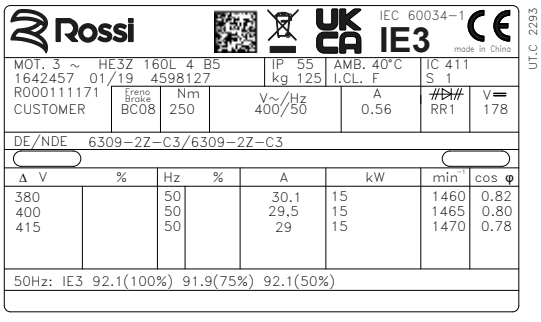


* on request

Motor wound and stated for		Motor size
V	Hz	160 ... 200
Δ 220 Y380	50	-
Δ 230 Y400	50	-
Δ 240 Y415	50	-
Δ 265 Y460	60	-
Δ 277 Y480	60	-
Δ 380	50	●
Δ 400	50	●
Δ 415	50	●

● Standard nameplate – Not foreseen

160 ... 200



Frame size	With Technical System units	With SI units
starting or stopping **time** as a function of an acceleration or deceleration, of a starting or braking torque	$t = \frac{v}{a}$ [s] $t = \frac{Gd^2 \cdot n}{375 \cdot M}$ [s]	$t = \frac{J \cdot \omega}{M}$ [s]
velocity in rotary motion	$v = \frac{\pi \cdot d \cdot n}{60} = \frac{d \cdot n}{19{,}1}$ [m/s]	$v = \omega \cdot r$ [m/s]
angular velocity	$n = \frac{60 \cdot v}{\pi \cdot d} = \frac{19{,}1 \cdot v}{d}$ [min^{-1}]	$\omega = \frac{v}{r}$ [rad/s]
acceleration or deceleration as a function of starting or stopping time	$a = \frac{v}{t}$ [m/s^2]	
angular **acceleration** or **deceleration** as a function of a starting or stopping time, of a starting or braking torque	$\alpha = \frac{n}{9{,}55 \cdot t}$ [rad/s^2] $\alpha = \frac{39{,}2 \cdot M}{Gd^2}$ [rad/s^2]	$\alpha = \frac{\omega}{t}$ [rad/s^2] $\alpha = \frac{M}{J}$ [rad/s^2]
starting or stopping distance as a function of an **acceleration** or deceleration, of a final or initial velocity	$s = \frac{a \cdot t^2}{2}$ [m] $s = \frac{v \cdot t}{2}$ [m] $w = \frac{\alpha \cdot t^2}{2}$ [rad]	
starting or stopping **angle** as a function of an angular acceleration or deceleration, of a final or initial angular velocity	$\varphi = \frac{n \cdot t}{19{,}1}$ [rad]	$\varphi = \frac{\omega \cdot t}{2}$ [rad]
mass	$m = \frac{G}{g}$ $[\frac{\text{kgf s}^2}{\text{m}}]$	m è l'unità di massa [kg]
weight (weight force)	G è l'unità di peso (forza peso) [kgf]	$G = m \cdot g$ [N]
force in vertical (lifting), horizontal, inclined motion of translation (μ = coefficient of friction; φ = angle of inclination)	$F = G$ [kgf] $F = \mu \cdot G$ [kgf] $F = G\ (\mu \cdot \cos\varphi + \text{sen}\ \varphi)$ [kgf]	$F = m \cdot g$ [N] $F = \mu \cdot m \cdot g$ [N] $F = m \cdot g\ (\mu \cdot \cos\varphi + \text{sen}\ \varphi)$ [N]
dynamic moment Gd², moment of inertia J due to a motion of translation (numerically $J = \frac{Gd^2}{4}$)	$Gd^2 = \frac{365 \cdot G \cdot v^2}{n^2}$ [kgf m^2]	$J = \frac{m \cdot v^2}{\omega^2}$ [kg m^2]
torque as a function of a force, of a dynamic moment or of a moment of inertia, of a power	$M = \frac{F \cdot d}{2}$ [kgf m] $M = \frac{Gd^2 \cdot n}{375 \cdot t}$ [kgf m] $M = \frac{716 \cdot P}{n}$ [kgf m]	$M = F \cdot r$ [N m] $M = \frac{J \cdot \omega}{t}$ [N m] $M = \frac{P}{\omega}$ [N m]
work, energy in motion of translation, in rotary motion	$W = \frac{G \cdot v^2}{19{,}6}$ [kgf m] $W = \frac{Gd^2 \cdot n^2}{7160}$ [kgf m]	$W = \frac{m \cdot v^2}{2}$ [J] $W = \frac{J \cdot \omega^2}{2}$ [J]
power in motion of translation, in rotary motion	$P = \frac{F \cdot v}{75}$ [CV] $P = \frac{M \cdot n}{716}$ [CV]	$P = F \cdot v$ [W] $P = M \cdot \omega$ [W]
power available at the shaft of a single-phase motor ($\cos\varphi$ = power factor)	$P = \frac{U \cdot I \cdot \eta \cdot \cos\varphi}{736}$ [CV]	$P = U \cdot I \cdot \eta \cdot \cos\varphi$ [W]
power available at the shaft of a three-phase motor	$P = \frac{U \cdot I \cdot \eta \cdot \cos\varphi}{425}$ [CV]	$P = 1{,}73 \cdot U \cdot I \cdot \eta \cdot \cos\varphi$ [W]

Solutions for an evolving industry

Rossi S.p.A.
Via Emilia Ovest 915/A
41123 Modena - Italy

info@rossi.com
www.rossi.com

2630.CAT.TX-25.10-4-EN