

INDUSTRIAL HAZARDOUS AREA ELECTRIC MOTORS IE1, IE2, IE3, IE4

Industrial Motors

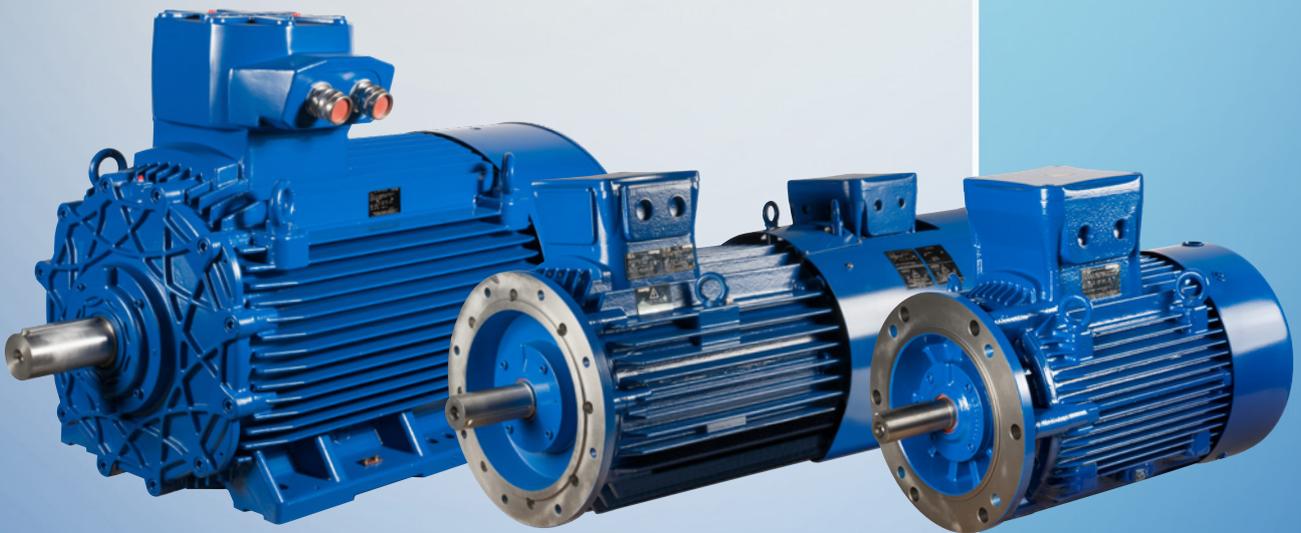
Commercial &
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S U M M A R Y

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1. Introduction

1.1. SI units and conversion equations

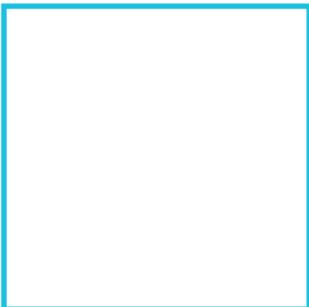
Table 1:

Description	SI			Conversion equations
	Formular symbols	Unit symbol	Unit name	
Distance	L	m	met	$1 \text{ m}^3 = 1,000 \text{ dm}^3$ $1 \text{ dm}^3 = 1 \text{ l}$
Area	A	m ²		
Volume	V	m ³		
Angle in one plane	α, β, γ	rad	radian	$1^\circ = \frac{\pi}{180} \text{ rad}$ $1' = 1^\circ/60$ $1'' = 1'/60$
Time	t	s	second	1 Hz = 1/s
Frequency	f	Hz	Hertz	
Speed	n	1/min		$1 \text{ km/h} = \frac{1}{3.6} \text{ m/s}$
Velocity	v	m/s		
Angular velocity	ω	rad/s		
Acceleration	a	m/s ²		
Angular acceleration	α	rad/s ²		
Mass	m	kg	kilogram	
Density	ρ	kg/m ³		
Force	F	N	Newton	$1 \text{ N} = 1 \text{ kg} \cdot 1 \text{ m/s}^2$ $9.81 \text{ N} = 1 \text{ kgf}$ $9.81 \cdot 10^4 \text{ N/m}^2 = 1 \text{ kgf/cm}^2$ $9.81 \text{ N/mm}^2 = 1 \text{ kgf/mm}^2$
Pressure	p	Pa = N/m ²	Pascal	
Mechanical stress	σ	N/mm ²		
Work done	W	J = Nm	Joule	9.81 Nm = 1 kgfm
Energy	W			4,187 J = 1 kcal
Thermal quantity	Q			1 kWh = 3.6 x 10 ⁶ J
Torque	M	Nm		9.81 Nm = 1 kgfm 1 Nm = 0.102 kgfm
Power	P	W = J/s = Nm/s	Watt	735.5 W = 1 HP
Moment of inertia	J	kg m ²		9.81 kg m ² = 1 kpms ² PD2 = 4 J
Dynamic viscosity	η	Pa · s		$10^{-1} \text{ Pa} \cdot \text{s} = 1 \text{ P (Poise)}$
Kinematic viscosity	ν	m ² /s		$10^{-4} \text{ m}^2/\text{s} = 1 \text{ St (Stokes)}$
Electric current	I	A	Ampere	1 A = 1 W/V = 1 V/Ω
Electric voltage	U	V	Volt	1 V = 1 W/A
Electric resistance	R	Ω	Ohm	1 Ω = 1 V/A = 1/S
Electric conductivity	G	S	Siemens	1 S = 1/Ω
Electric capacity	C	F	Faraday	1 F = 1 C/V
Charge	Q	C	Coulomb	1 C = 1 A · s
Inductance	L	H	Henry	1 H = 1 Vs/A
Magnetic flux density	B	T	Tesla	1 T = 1 Wb/m ²
Magnetic field strength	H	A/m		
Magnetic flux	Φ	Wb	Weber	1 Wb = 1 V · s
Temperature difference	T	K	Kelvin	0 K = - 273.15 °C
	θ	°C		

1. Introduction

1.2. Engineering formulae for motor drives

Power (3-phase motors)	Torque from motor power	Factor of inertia FI
<p>$P_1 = \text{power input} = U \cdot I \cdot \cos \phi \cdot \sqrt{3} \cdot 10^{-3} \text{ [kW]}$ $P_2 = \text{power output} = P_1 \cdot \eta \text{ [kW]}$</p> <p>Where: $U = \text{voltage [V]}$ $I = \text{current [A]}$ $\cos \phi = \text{power factor}$ $\eta = \text{efficiency}$</p> <p>Power requirements of some applications</p> <p>Lifting: $P = \frac{m \cdot v}{\eta} \cdot 9.81 \cdot 10^{-3} \text{ [kW]}$</p> <p>Rotation: $P = \frac{M \cdot n}{9,550 \cdot \eta} \text{ [kW]}$</p> <p>Fan and pump drives: $P = \frac{H \cdot Q}{\eta} \text{ [W]}$</p> <p>Where: $P = \text{power [kW]}$ $m = \text{mass [kg]}$ $v = \text{speed [m/s]}$ $n = \text{rotational speed [min}^{-1}\text{]}$ $\eta = \text{efficiency}$ $M = \text{torque [Nm]}$ $Q = \text{output [m}^3\text{/s]}$ $H = \text{head [N/m}^2\text{]}$</p>	<p>$M = 9,550 \cdot \frac{P_2 \text{ [Nm]}}{n}$</p> <p>Where: $P_2 = \text{motor output [kW]}$ $n = \text{motor speed}$</p> <p>Conversion of torque for step-up and step-down speed ratios: $M_2 = \frac{M_1 \cdot n_1}{n_2}$</p> <p>Where: $n_1 = \text{motor speed [min}^{-1}\text{]}$ $M_1 = \text{motor torque at } n_1 \text{ [Nm]}$ $n_2 = \text{speed of load [min}^{-1}\text{]}$ $M_2 = \text{torque of load at } n_2 \text{ [Nm]}$</p> <p>Moment of inertia J</p> <p>Moment of Inertia of a cylindrical flywheel: $J = \frac{m d^2}{8}$</p> <p>Where: $m = \text{mass [kg]}$ $d = \text{flywheel diameter [m]}$</p> <p>Effective moment of inertia on the motor of a linearly moved load: $J = 91.2 \cdot m \cdot \left(\frac{v}{n}\right)^2$</p> <p>Where: $m = \text{mass [kg]}$ $v = \text{velocity [m/s]}$ $n = \text{motor speed [min}^{-1}\text{]}$</p> <p>Conversions of moments of inertia for step-up or step-down speed ratio: $J_2 = J_1 \cdot \left(\frac{n_1}{n_2}\right)^2$</p> <p>Where: $n_1 = \text{motor speed}$ $J_1 = \text{moment of inertia at } n_1$ $n_2 = \text{speed of load}$ $J_2 = \text{moment of inertia}$</p>	<p>$FI = \frac{J_{mot} + J_{load}}{J_{mot}}$</p> <p>Where: $J_{mot} = \text{moment of inertia of motor}$ $J_{load} = \text{moment of inertia of load}$</p> <p>Starting time t_a</p> <p>$t_a = \frac{FI \cdot J_{mot} \cdot n}{9.55 \cdot (M_{mot} - M_{load})} \text{ [s]}$</p> <p>Where: $FI = \text{factor of inertia}$ $J_{mot} = \text{moment of inertia of motor [kgm}^2\text{]}$ $n = \text{motor speed [min}^{-1}\text{]}$ $M_{mot} = \text{motor torque during starting (mean) [Nm]}$ $M_{load} = \text{counter torque of load during starting (mean) [Nm]}$</p> <p>Speed</p> <p>The no-load speed is virtually the same as the synchronous speed. The synchronous speed of the motor is calculated as follow: $n_s = 120 \cdot f / p \text{ [min}^{-1}\text{]}$</p> <p>Where: $f = \text{frequency [Hz]}$ $p = \text{number of pole}$</p> <p>The synchronous speed is reduced by the slip (S) to the rated speed: $n_n = n_s \cdot (1-S) \text{ [min}^{-1}\text{]}$</p>



1. Introduction

1.3. Standards and specifications

Flameproof motors conform to the following standards and specifications:

Table 2:

Title	International IEC ^①	EU CENELEC ^②
Electrical rotating machines/rated operation and characteristic data	IEC 60034-1	EN 60034-1
Methods for determining losses and efficiency of rotating electrical machines	IEC 60034-2	EN 60034-2
Protection types rotating electrical machines	IEC 60034-5	EN 60034-5
Cooling methods of rotating electrical machines	IEC 60034-6	EN 60034-6
Construction types of rotating electrical machines	IEC 60034-7	EN 60034-7
Terminal markings and direction of rotation for electrical machines	IEC 60034-8	EN 60034-8
Noise emission, limit values	IEC 60034-9	EN 60034-9
Start-up behaviour of squirrel-cage motors at 50 Hz up to 660 V	IEC 60034-12	EN 60034-12
Vibration severity of rotating electrical machines	IEC 60034-14	EN 60034-14
Protection level provided by enclosures for electrical equipment against mechanical impact (Code IK)	IEC 60068-1	EN 60068-1
	IEC 60068-2-75	EN 60068-2-75
Fixing dimensions and outputs for IM B3	IEC 60072	EN 60072
Fixing dimensions and outputs for IM B5, IM B14	IEC 60072	EN 60072
Cylindrical shaft ends for electrical machines	IEC 60072	EN 60072
Electrical equipment for hazardous areas general provisions	IEC 60079-0	EN 60079-0
Electrical equipment for hazardous areas flame-proof enclosure "db"	IEC 60079-1	EN 60079-1
Electrical equipment for hazardous areas increased safety "e"	IEC 60079-7	EN 60079-7
Equipment with protection type "t" for use in the presence of flammable dusts	IEC 60079-31	EN 60079-31

Notes: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

2) CENELEC is a trademark of European Union and is not owned or controlled by WEG.

1. Introduction

1.4. Protection against explosions in dangerous areas

Types protection

The use of an electrical apparatus in potentially explosive atmospheres is quite usual today. This equipment has to be manufactured in such a way that there is no risk of explosion.

An explosion occurs when of the three following conditions happen:

- Presence of a potentially explosive atmosphere
- Possibility of transmission of the explosion
- Existence of an ignition source

The recognized types of protection eliminate one of these conditions and thus make an explosion impossible.

Protection methods for gas

Two types of protection prevent the presence of a potentially explosive atmosphere inside the electrical apparatus:

- Oil immersion (safety ob, oc, op)
- Pressurized apparatus (safety pv, pxb, pyb, pzc)

Two types of protection make the transmission of an internal explosion to the potentially explosive atmosphere surrounding the electrical apparatus impossible:

- Sand filling (safety q)
- Flameproof enclosure (safety db)

Lastly, three types of protection eliminate any source of ignition, such as sparks, overheating, etc.:

- Increased safety (safety eb, ec)
- Intrinsic safety (safety ia, ib, ic)
- Protection nA, nC, nR (restricted to zone 2)

Protection method for flammable dusts

For flammable dusts, only one method of protection is provided for:

- Housing which prevents the infiltration of dust and surface temperature limitation (protection type tb, tc)

Protection method for electric motors

In practice only five of these eight methods of protection are applicable to the electric motor:

- Pressurized apparatus (symbol Ex pv, Ex pxb, Ex pyb, Ex pzc)
- Flameproof enclosure (symbol Ex db)
- Increased safety (symbol Ex eb, Ex ec)
- Non sparking protection (symbol Ex nA)
- Protection by a housing (symbol Ex tb, Ex tc)

Electric motors have another method of protection for gas (symbol Ex db eb) which is a combination of:

- Flameproof enclosure db for motor frame
- Increased safety eb for terminal box



Figure 1 - Specific marking for protection against explosions - Directive 2014/34/EU

1. Introduction

1.4. Protection against explosions in dangerous areas

Dangerous areas and zones

Dangerous areas include any area in which explosive atmospheres may occur under specific conditions.

An explosive atmosphere is a mixture of air and combustible gases, vapours, fumes or dust under atmospheric conditions where combustion expands itself (explosion) after ignition.

Only local authorities can classify hazardous areas. The users shall classify the hazardous areas as indicated in the European directive 1999/92/EC under their own responsibility.

International standards IEC[®] 61241-10 provide instructions on how to classify the hazardous areas in relation to the chemical nature, to the physical characteristics and to the amount of substances used and based on the frequency and period of time in which an explosive mix may develop.



Figure 2 - Warning sign for areas subject to the risk of explosion - Directive 99/92/EC

Zones susceptible to gas

When the hazard is due to the presence of gas, vapours or mists of flammable substances, the European directive 1999/92/EC envisages a classification in three zones defined as follows:

Zone 0	Areas constantly susceptible to an explosive atmosphere, or for long periods of time. Power equipment with double insulation must be installed in this area.
Zone 1	Areas where an explosive atmosphere is likely to develop during normal conditions. Flameproof electric motors or motors with added protection means can be installed in this zone (for the latter, restrictions by the standards apply).
Zone 2	Areas rarely susceptible to an explosive atmosphere and for a short period of time. Flameproof motors or motors with added protection can be installed in this zone, as well as non-sparking motors.

Zones susceptible to combustible dust

When the hazard is due to the presence of combustible dust, the European directive 1999/92/EC envisages a classification in three zones defined as follows:

Zone 20	Areas constantly susceptible to an explosive atmosphere, or for long periods of time. Power apparatus cannot be installed in this zone.
Zone 21	Areas where an explosive atmosphere is likely to develop during normal conditions. Electric motors certified in compliance with the ATEX [®] directive with IP6x protection rating can be installed in this zone.
Zone 22	Areas rarely susceptible to an explosive atmosphere, and only for a short period of time. Depending on the type of dust also in zone 22 it may be necessary to have IP6X construction (see "Enclosure groups" on page 9).

Table 3 - Dangerous areas classified into zones:

Usage area in the presence of gas	Usage area in the presence of combustible dusts	Hazardous level of the operational zone
Zone 0	Zone 20	Explosive atmosphere ALWAYS PRESENT
Zone 1	Zone 21	PROBABLE explosive atmosphere
Zone 2	Zone 22	Explosive atmosphere UNLIKELY

Note: the following trademarks or tradenames are not owned or controlled by WEG: ATEX is a trademark of European Union; IEC is a trademark of International Electrotechnical Commission.

1. Introduction

1.4. Protection against explosions in dangerous areas

Apparatus classification

The ATEX^{®1)} 2014/34/EU European Directive classifies equipment into three categories, with differing protection levels, related to the protection guaranteed.

Note: equipment of higher categories can also be installed instead of those of a lower category.

Table 4 - Equipment categories:

Protection level guaranteed by the equipment category	Mine	Surface	
	Category	Gas category	Combustible dust category
Very high	M1	1G	1D
High	M2	2G	2D
Normal	Not provided for	3G	3D

Enclosure groups

The standards classify electrical equipment into two groups.

Group I	Electric apparatus to be installed in mines or galleries susceptible to firedamp or coal dust.
Group II	Electric apparatus to be installed in surface plants susceptible to other explosive atmospheres.

The housings for equipment to be used at the surface in the presence of gas, with protection method “db” explosion proof), are in turn subdivided into three sub-groups depending on the flammable substances for which they are suitable: Group IIA, Group IIB, Group IIC.

A motor that belongs to a certain enclosure group is also suitable for lower enclosure groups:

- A motor in group IIB is also suitable for group IIA; a motor in group IIC is also suitable for group IIA and IIB.

The housings for equipment to be used in atmospheres containing flammable dust, with protection method “t”, are separated into three sub-groups depending on the type of dust:

- IIIA: flammable particles
- IIIB: non-conducting dust
- IIIC: conducting dust

Note: for the IIIC group and also for installation in zone 22 a minimum protection level of IP6x is necessary.

Temperature classes (for gas atmospheres)

The electrical apparatus is classified into 6 classes according to the maximum surface temperatures.

The maximum surface temperature is the highest temperature which is attained in service under the conditions described in the standards, by any part of the electrical apparatus, which, could ignite the surrounding atmosphere.

For electric motors this is:

- Temperature of the outside surface of the enclosure for “db” and “p” protection modes
- Temperature of any internal or external point for type of protection “e” or “n”

Table 5:

Ignition temperature of medium relative to limit temperature [°C]	Temperature class	Maximum surface temperature of electrical equipment including 40 °C ambient temperature	
		[°C]	[°F]
Over 450	T1	450	842
From 300 to 450	T2	300	572
From 200 to 300	T3	200	392
From 135 to 200	T4	135	275
From 100 to 135	T5	100	212
From 85 to 100	T6	85	185

Note: 1) ATEX is a trademark of European Union and is not owned or controlled by WEG.

1. Introduction

1.4. Protection against explosions in dangerous areas

Combustion temperatures of gases, vapours and groups

Combustible gases and vapours are divided into classes according to their ignition temperature and into groups according to their explosive capacity.

Markings on motors and other electrical equipment with the symbols used to indicate the protection mode, the enclosure group, and the temperature class, indicate the zone in which such equipment can be installed.

The indications contained in table 6 are shown only as an example. Classification of the substances is not the responsibility of the supplier of the equipment. Responsibility for the choice of equipment lies with the user.

Table 6 - Classification of the more common combustible gases and vapours according to temperature class and group:

Group	Temperature classes					
	T1	T2	T3	T4	T5	T6
I	Methane (firedamp)					
IIA	Acetic acid Acetone Ammonia Benzole Benzene Butanone Carbon monoxide Ethane Ethyl acetate Ethyl chloride Methane Methanol Methyl acetate Methyl alcohol Methyl chloride Naphtalene Propane Xylene	Acetic anhydride I amyl acetate N butane N butyl alcohol Amylic alcohol Butyl acetate Cyclohexanon Ethyl alcohol Iso butylic alcohol Liquefied gas Natural gas Propyl acetate	Cyclohexane Cyclohexanol Decane Diesel fuels Gasoline Heating oil Heptane Hexane Jet fuels Pentane Petroleum ¹⁾	Acetaldehyde Ether		
IIB	Coke-oven gas Water gas (carburetted)	1,3- butadiene Ethylene Ethylbenzene Ethylene oxide	Hydrogen sulphide Isoprene Petroleum ¹⁾	Ethyl ether		
IIC	Hydrogen	Acetylene				Carbon disulphide Ethyl nitrate

Note: 1) Depending on composition.

1. Introduction

1.4. Protection against explosions in dangerous areas

Temperature for atmospheres with combustible dusts

The flash point of the dust must be taken into account in providing protection against flammable dust, in both the cloud form and in layers.

The surface temperature of the enclosure indicated on the motor nameplate must be less than the reference ignition temperature. The reference temperature is the lowest between the two values thus calculated:

$TS1 = 2/3 T_{cl}$ (T_{cl} = ignition temperature of the cloud of dust).
 $TS2 = T_{5mm} - 75K$ (T_{5mm} = ignition temperature of a 5 mm layer of dust).
 $T_{amm} = \text{lowest between } TS1 \text{ and } TS2.$

Table 7 - Calculation of the flash points for combustible dusts:

Dust ignition temperature	Cloud T_{cl}	Layer T_{5mm}
↓ Safety temperature	$Ts1 = 2/3 T_{cl}$	$Ts2 = T_{5mm} - 75K$
↓ Maximum surface temperature	$T_{amm} = \text{lowest between } Ts1 \text{ and } Ts2$	
↓ Surface temperature of the motor $\leq T_{amm}$		

The surface temperature class is expressed as degrees Celsius, the manufacturer determines the temperature class depending on the thermal characteristics of its own product.

The temperature classes for the Cemp® product are as follows:
 T150 °C - T135 °C - T125 °C - T100 °C - T85 °C.

The indications contained in table 8 are given only by way of example. Classification of the substances is not the responsibility of the supplier of the equipment. Responsibility for the choice of equipment lies with the user.

Table 8 - Examples of flash points for combustible dusts:

	Cloud [°C]	Layer [°C]
Aluminium	590	>450
Carbon dust	380	225
Flour	490	340
Wheat dust	510	300
Methylcellulose	420	320
Phenolic resin	530	>450
Polyethylene	420	Melting
PVC	700	>450
Soot	810	570
Starch	460	435
Sugar	490	460

Note: Source SIRA Ltd.

1. Introduction

1.4. Protection against explosions in dangerous areas

Level of protection for the equipment (EPL, Equipment Protection Level)

In accordance with standard IEC^{®1)} EN 60079-0 the marking of equipment to be used in a potentially explosive atmosphere must also have the suffix EPL.

EPL is defined as the level of protection assigned to electrical equipment based on the probability of it becoming a source of ignition. The EPL also makes it possible to distinguish between the different explosive atmospheres.

The first letter makes the following distinctions:	
M	For mining
G	For gas
D	For dust

The second letter gives information on the probability of becoming a source of ignition:		
a	Very high	Protection level (guarantees safety in normal operation, during foreseeable malfunctions and when subject to rare cases of malfunction)
b	High	Protection level (guarantees safety in normal operation and when subject to foreseeable malfunctions)
c	Increased	Protection level (it is not a source of ignition during normal operation and has some additional protection measures to ensure that it remains an inactive source of ignition in events occurring regularly)

Choice of safety-electric motor

The connection between danger zones and the categories of equipment to be used is defined in Directive 1999/92/EC. The specific construction standards for the protection modes (e.g. Ex db) also define the motor category that can be obtained by applying the standards (e.g. 2G).

Table 9 - Choosing the protection mode for zones in which gas is present:

Explosive atmosphere	Danger zone	Protection guaranteed by equipment	Motor category	Protection mode
ALWAYS PRESENT	0	Very high	1G	IEC EN 60079-26
PROBABLE	1	High	2G	Ex db Ex db eb Ex eb
IMPROBABLE	2	Normal	3G	Ex nA or Ex ec

Table 10 - Choice of protection mode for areas where combustible dust is present:

Explosive atmosphere	Danger zone	Protection guaranteed by equipment	Motor category	Protection mode
ALWAYS PRESENT	20	Very High	1D	Ex ta
PROBABLE	21	High	2D	Ex tb - IP6x
IMPROBABLE	22 conductive dusts	Normal	2D	Ex tb - IP6x
IMPROBABLE	22 conductive dusts	Normal	3D	Ex tc - IP5x

Note: equipment of a higher category can be installed in place of equipment of a lower category.

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

1. Introduction

1.5. Efficiency IE1, IE2, IE3, IE4

Cemp® product is available on IE1, IE2, IE3 and IE4 version. Efficiency level is defined by the tables 11, 12, 13 and 14 as per IEC®¹⁾ 60034-30 norm. Motor efficiency is measured following the requirements of IEC 60034-2-1 in force.

Table 11 - Nominal efficiency limits (%) for 50 and 60 Hz for IE1:

kW	2 poles		4 poles		6 poles		8 poles	
	50 Hz	60 Hz						
0.12	45.0	57.5	50.0	62.0	38.3	48.0	31.0	36.0
0.18	52.8	62.0	57.0	66.0	45.5	52.5	38.0	40.0
0.20	54.6	-	58.5	-	47.6	-	39.7	-
0.25	58.2	64.0	61.5	68.0	52.1	57.5	43.4	50.5
0.37	63.9	70.0	66.0	70.0	59.7	62.0	49.7	57.5
0.40	64.9	-	66.8	-	61.1	-	50.9	-
0.55	69.0	72.0	70.0	74.0	65.8	66.0	56.1	59.5
0.75	72.1	74.0	72.1	77.0	70.0	72.0	61.2	64.0
1.10	75.0	74.0	75.0	77.0	72.9	75.0	66.5	73.5
1.50	77.2	81.0	77.2	81.5	75.2	77.0	70.2	77.0
2.20	79.7	81.5	79.7	83.0	77.7	78.5	74.2	78.0
3.00	81.5	-	81.5	-	79.7	-	77.0	-
3.70	-	84.5	-	85.0	-	83.5	-	80.0
4.00	83.1	-	83.1	-	81.4	-	79.2	-
5.50	84.7	86.0	84.7	87.0	83.1	85.0	81.4	84.0
7.50	86.0	87.5	86.0	87.5	84.7	86.0	83.1	85.0
11.00	87.6	87.5	87.6	88.5	86.4	89.0	85.0	87.5
15.00	88.7	88.5	88.7	89.5	87.7	89.5	86.2	88.5
18.50	89.3	89.5	89.3	90.5	88.6	90.2	86.9	88.5
22.00	89.9	89.5	89.9	91.0	89.2	91.0	87.4	90.2
30.00	90.7	90.2	90.7	91.7	90.2	91.7	88.3	90.2
37.00	91.2	91.5	91.2	92.4	90.8	91.7	88.8	91.0
45.00	91.7	91.7	91.7	93.0	91.4	91.7	89.2	91.0
55.00	92.1	92.4	92.1	93.0	91.9	92.1	89.7	91.5
75.00	92.7	93.0	92.7	93.2	92.6	93.0	90.3	92.0
90.00	93.0	93.0	93.0	93.2	92.9	93.0	90.7	92.5
110.00	93.3	93.0	93.3	93.5	93.3	94.1	91.1	92.5
132.00	93.5	-	93.5	-	93.5	-	91.5	-
160.00	93.8	-	93.8	-	93.8	-	91.9	-
200.00	94.0	-	94.0	-	94.0	-	92.5	-

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

1. Introduction

1.5. Efficiency IE1, IE2, IE3, IE4

Table 12 - Nominal efficiency limits (%) for 50 and 60 Hz for IE2:

kW	2 poles		4 poles		6 poles		6 poles	
	50 Hz	60 Hz						
0.12	53.6	59.5	59.1	64.0	50.6	50.5	39.8	40.0
0.18	60.4	64.0	64.7	68.0	56.6	55.0	45.9	46.0
0.20	61.9	-	65.9	-	58.2	-	47.4	-
0.25	64.8	68.0	68.5	70.0	61.6	59.5	50.6	52.0
0.37	69.5	72.0	72.7	72.0	67.6	64.0	56.1	58.0
0.40	70.4	-	73.5	-	68.8	-	57.2	-
0.55	74.1	74.0	77.1	75.5	73.1	68.0	61.7	62.0
0.75	77.4	75.5	79.6	78.0	75.9	73.0	66.2	66.0
1.10	79.6	82.5	81.4	84.0	78.1	85.5	70.8	75.5
1.50	81.3	84.0	82.8	84.0	79.8	86.5	74.1	82.5
2.20	83.2	85.5	84.3	87.5	81.8	87.5	77.6	84
3.00	84.6	-	85.5	-	83.3	-	80.0	-
3.70	-	87.5	-	87.5	-	87.5	-	85.5
4.00	85.8	-	86.6	-	84.6	-	81.9	-
5.50	87.0	88.5	87.7	89.5	86.0	89.5	83.8	85.5
7.50	88.1	89.5	88.7	89.5	87.2	89.5	85.3	88.5
11.00	89.4	90.2	89.8	91.0	88.7	90.2	86.9	88.5
15.00	90.3	90.2	90.6	91.0	89.7	90.2	88.0	89.5
18.50	90.9	91.0	91.2	92.4	90.4	91.7	88.6	89.5
22.00	91.3	91.0	91.6	92.4	90.9	91.7	89.1	91.0
30.00	92.0	91.7	92.3	93.0	91.7	93.0	89.8	91.0
37.00	92.5	92.4	92.7	93.0	92.2	93.0	90.3	91.7
45.00	92.9	93.0	93.1	93.6	92.7	93.6	90.7	91.7
55.00	93.2	93.0	93.5	94.1	93.1	93.6	91.0	93.0
75.00	93.8	93.6	94.0	94.5	93.7	94.1	91.6	93.0
90.00	94.1	94.5	94.2	94.5	94.0	94.1	91.9	93.6
110.00	94.3	94.5	94.5	95.0	94.3	95.0	92.3	93.6
132.00	94.6	-	94.7	-	94.6	-	92.6	-
150.00	-	95.0	-	95.0	-	95.0	-	93.6
160.00	94.8	-	94.9	-	94.8	-	93.0	-
185.00	-	95.4	-	95.0	-	95.0	-	93.6
220.00 up to 335.00	-	95.4	-	95.4	-	95.0	-	93.6

1. Introduction

1.5. Efficiency IE1, IE2, IE3, IE4

Table 13 - Nominal efficiency limits (%) for 50 and 60 Hz for IE3:

kW	2 poles		4 poles		6 poles		8 poles	
	50 Hz	60 Hz						
0.12	60.8	62.0	64.8	66.0	57.7	64.0	50.7	59.5
0.18	65.9	65.6	69.9	69.5	63.9	67.5	58.7	64.0
0.20	67.2	-	71.1	-	65.4	-	60.6	-
0.25	69.7	69.5	73.5	73.4	68.6	71.4	64.1	68.0
0.37	73.8	73.4	77.3	78.2	73.5	75.3	69.3	72.0
0.40	74.6	-	78.0	-	74.4	-	70.1	-
0.55	77.8	76.8	80.8	81.1	77.2	81.7	73.0	74.0
0.75	80.7	77.0	82.5	83.5	78.9	82.5	75.0	75.5
1.10	82.7	84.0	84.1	86.5	81.0	87.5	77.7	78.5
1.50	84.2	85.5	85.3	86.5	82.5	88.5	79.7	84.0
2.20	85.9	86.5	86.7	89.5	84.3	89.5	81.9	85.5
3.00	87.1	-	87.7	-	85.6	-	83.5	-
3.70	-	88.5	-	89.5	-	89.5	-	86.5
4.00	88.1	-	88.6	-	86.8	-	84.8	-
5.50	89.2	89.5	89.6	91.7	88.0	91.0	86.2	86.5
7.50	90.1	90.2	90.4	91.7	89.1	91.0	87.3	89.5
11.00	91.2	91.0	91.4	92.4	90.3	91.7	88.6	89.5
15.00	91.9	91.0	92.1	93.0	91.2	91.7	89.6	90.2
18.50	92.4	91.7	92.6	93.6	91.7	93.0	90.1	90.2
22.00	92.7	91.7	93.0	93.6	92.2	93.0	90.6	91.7
30.00	93.3	92.4	93.6	94.1	92.9	94.1	91.3	91.7
37.00	93.7	93.0	93.9	94.5	93.3	94.1	91.8	92.4
45.00	94.0	93.6	94.2	95.0	93.7	94.5	92.2	92.4
55.00	94.3	93.6	94.6	95.4	94.1	94.5	92.5	93.6
75.00	94.7	94.1	95.0	95.4	94.6	95.0	93.1	93.6
90.00	95.0	95.0	95.2	95.4	94.9	95.0	93.4	94.1
110.00	95.2	95.0	95.4	95.8	95.1	95.8	93.7	94.1
132.00	95.4	-	95.6	-	95.4	-	94.0	-
150.00	-	95.4	-	96.2	-	95.8	-	94.5
160.00	95.6	-	95.8	-	95.6	-	94.3	-

1. Introduction

1.5. Efficiency IE1, IE2, IE3, IE4

Table 14 - Nominal efficiency limits (%) for 50 and 60 Hz for IE4:

kW	2 poles		4 poles		6 poles		8 poles	
	50 Hz	60 Hz						
0.12	66.5	66.0	69.8	70.0	64.9	68.0	62.3	64.0
0.18	70.8	70.0	74.7	74.0	70.1	72.0	67.2	68.0
0.20	71.9	-	75.8	-	71.4	-	68.4	-
0.25	74.3	74.0	77.9	77.0	74.1	75.5	70.8	72.0
0.37	78.1	77.0	81.1	81.5	78.0	78.5	74.3	75.5
0.40	78.9	-	81.7	-	78.7	-	74.9	-
0.55	81.5	80.0	83.9	84.0	80.9	82.5	77.0	77.0
0.75	83.5	82.5	85.7	85.5	82.7	84.0	78.4	78.5
1.10	85.2	85.5	87.2	87.5	84.5	88.5	80.8	81.5
1.50	86.5	86.5	88.2	88.5	85.9	89.5	82.6	85.5
2.20	88.0	88.5	89.5	91.0	87.4	90.2	84.5	87.5
3.00	89.1	-	90.4	-	88.6	-	85.9	-
3.70	-	89.5	-	91.0	-	90.2	-	88.5
4.00	90.0	-	91.1	-	89.5	-	87.1	-
5.50	90.9	90.2	91.9	92.4	90.5	91.7	88.3	88.5
7.50	91.7	91.7	92.6	92.4	91.3	92.4	89.3	91.0
11.00	92.6	92.4	93.3	93.6	92.3	93.0	90.4	91.0
15.00	93.3	92.4	93.9	94.1	92.9	93.0	91.2	91.7
18.50	93.7	93.0	94.2	94.5	93.4	94.1	91.7	91.7
22.00	94.0	93.0	94.5	94.5	93.7	94.1	92.1	93.0
30.00	94.5	93.6	94.9	95.0	94.2	95.0	92.7	93.0
37.00	94.8	94.1	95.2	95.4	94.5	95.0	93.1	93.6
45.00	95.0	94.5	95.4	95.4	94.8	95.4	93.4	93.6
55.00	95.3	94.5	95.7	95.8	95.1	95.4	93.7	94.5
75.00	95.6	95.0	96.0	96.2	95.4	95.8	94.2	94.5
90.00	95.8	95.4	96.1	96.2	95.6	95.8	94.4	95.0
110.00	96.0	95.4	96.3	96.2	95.8	96.2	94.7	95.0
132.00	96.2	-	96.4	-	96.0	-	94.9	-
150.00	-	95.8	-	96.5	-	96.2	-	95.4
160.00	96.3	-	96.6	-	96.2	-	95.1	-
185.00	-	96.2	-	96.5	-	96.2	-	95.4
200.00	96.5	-	96.7	-	96.3	-	95.4	-
220.00	-	96.2	-	96.8	-	96.5	-	95.4
250.00	96.5	96.2	96.7	96.8	96.5	96.5	95.4	95.8

CEMP[®] IE1, IE2, IE3, IE4 Motors

2. General information

2.1. Range of motors

The motors presented in this catalogue respect the standards in relation to equipment and protection systems for use on safe areas or potentially explosive atmospheres, in conformity with European directive n. 2014/34/EU dated 26/02/14, known as the ATEX^{®1)} directive.

Classification of the areas is the responsibility of the user and for the choice of motor the indications are given in table 15.

The ATEX directive states that two different certificates of conformity are to be issued. One is the “EC-Type examination certificate” for the homologation of the prototype and the other is for the “Production Quality Assurance Notification”.

The certificates are issued by Certification Bodies, defined as Notified Bodies, to which the European Community assigns the task of assessing the conformity of products to community directives.

The list of Notified Bodies can be found in the site of the European Union on the page <https://ec.europa.eu/growth/tools-databases/nando/index.cfm?fuseaction=notifiedbody.main>

The certificates of the motors can be found on internet at <https://www.cemp-international.it/en/tools-and-resources>
IECEX^{®2)} certificates can also be found at <http://www.iecex.com>

All certificates may be supplied on request.



Notes: 1) ATEX is a trademark of European Union and is not owned or controlled by WEG.

2) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

2. General information

2.1. Range of motors

Table 15 - Cemp® range of motors: Classic Series (IE1, IE2) + IE3 below 0.75 kW:

Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T4				
						EPL = Gb				
						Ex db	Ex db eb	Ex db	Ex db eb	
						IIB		IIC		
Explosion-proof gas	Standard	Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.05÷375.00	IC411	S1	AB 30r	AB 35r	AC 30r	AC 35r
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	63÷315	0.15÷300.00	IC411	S1	AB 20r	AB 25r	AC 20r	AC 25r
		Two speeds, three-phase (2/4, 4/8 poles) quadratic-torque	63÷315	0.18÷300.00	IC411	S1	AB 40r	AB 45r	AC 40r	AC 45r
		Single-phase (2, 4, 6 poles)	63÷100	0.10÷3.00	IC411	S1	AB 10r	AB 15r	AC 10r	AC 15r
		Single-phase with capacitor in extra-size terminal box (2, 4, 6 poles)	63÷100	0.10÷1.10	IC411	S1	AB 12r	-	AC 12r	-
		Motors fed by inverter (2, 4, 6, 8 poles)	63÷315	0.09÷375.00	IC411	S9	AB 70r	AB 75r	AC 70r	AC 75r
Explosion-proof gas + dust	With brake	Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.05÷160.00	IC410	S4	DB 30r	DB 35r	DC 30r	DC 35r
			71÷160	0.15÷18.50	IC411	S4	HB 30r	HB 35r	HC 30r	HC 35r
		Single speed, three-phase (4, 6, 8 poles)	180÷315	18.50÷200.00	IC416	S4	DB 30r	DB 35r	DC 30r	DC 35r
			Two speeds, three-phase (2/4, 4/8 poles) constant-torque	63÷315	0.05÷160.00	IC410	S4	DB 20r	DB 25r	DC 20r
		71÷160		0.15÷18.50	IC411	S4	HB 20r	HB 25r	HC 20r	HC 25r
		180÷315		18.50÷160.00	IC416	S4	DB 20r	DB 25r	DC 20r	DC 25r
		Single speed, three-phase (6 poles) for hoist applications		71÷315	0.18÷200.00	IC410	S4	DB 50r	DB 55r	DC 50r
			71÷160	0.18÷11.00	IC411	S4	HB 50r	HB 55r	HC 50r	HC 55r
			180÷315	15.00÷160.00	IC416	S4	DB 50r	DB 55r	DC 50r	DC 55r
			Two speeds, three-phase (2/8, 4/12, 4/16 poles) for hoist applications	71÷315	0.06÷160.00	IC410	S4	DB 50r	DB 55r	DC 50r
		71÷160		0.18÷11.00	IC411	S4	HB 50r	HB 55r	HC 50r	HC 55r
		180÷315		18.50÷160.00	IC416	S4	DB 50r	DB 55r	DC 50r	DC 55r

Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T4 - T 135 °C				
						EPL = Gb - Db				
						Ex db	Ex db eb	Ex db	Ex db eb	
						IIB		IIC		
Ex t										
Explosion-proof gas	Standard	Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.05÷375.00	IC411	S1	AB 30r	AB 35r	AC 30r	AC 35r
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	63÷315	0.15÷300.00	IC411	S1	AB 20r	AB 25r	AC 20r	AC 25r
		Two speeds, three-phase (2/4, 4/8 poles) quadratic-torque	63÷315	0.18÷300.00	IC411	S1	AB 40r	AB 45r	AC 40r	AC 45r
		Single-phase (2, 4, 6 poles)	63÷100	0.10÷3.00	IC411	S1	AB 10r	AB 15r	AC 10r	AC 15r
		Single-phase with capacitor in extra-size terminal box (2, 4, 6 poles)	63÷100	0.10÷1.10	IC411	S1	AB 12r	-	AC 12r	-
		Motors fed by inverter (2, 4, 6, 8 poles)	63÷315	0.09÷375.00	IC411	S9	AB 70r	AB 75r	AC 70r	AC 75r
Explosion-proof gas + dust	With brake	Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.05÷160.00	IC410	S4	DB 30r	DB 35r	DC 30r	DC 35r
			71÷160	0.15÷18.50	IC411	S4	HB 30r	HB 35r	HC 30r	HC 35r
		Single speed, three-phase (4, 6, 8 poles)	180÷315	18.50÷200.00	IC416	S4	DB 30r	DB 35r	DC 30r	DC 35r
			Two speeds, three-phase (2/4, 4/8 poles) constant-torque	63÷315	0.05÷160.00	IC410	S4	DB 20r	DB 25r	DC 20r
		71÷160		0.15÷18.50	IC411	S4	HB 20r	HB 25r	HC 20r	HC 25r
		180÷315		18.50÷160.00	IC416	S4	DB 20r	DB 25r	DC 20r	DC 25r
		Single speed, three-phase (6 poles) for hoist applications		71÷315	0.18÷200.00	IC410	S4	DB 50r	DB 55r	DC 50r
			71÷160	0.18÷11.00	IC411	S4	HB 50r	HB 55r	HC 50r	HC 55r
			180÷315	15.00÷160.00	IC416	S4	DB 50r	DB 55r	DC 50r	DC 55r
			Two speeds, three-phase (2/8, 4/12, 4/16 poles) for hoist applications	71÷315	0.06÷160.00	IC410	S4	DB 50r	DB 55r	DC 50r
		71÷160		0.18÷11.00	IC411	S4	HB 50r	HB 55r	HC 50r	HC 55r
		180÷315		18.50÷160.00	IC416	S4	DB 50r	DB 55r	DC 50r	DC 55r

2. General information

2.1. Range of motors

Table 15 - Cemp® range of motors: Classic Series (IE1, IE2) + IE3 below 0.75 kW:

Non-sparking gas	Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T3	
							EPL = Gc	
							Ex ec	
Standard		Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.18÷375.00	IC411	S1	AN 30	
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	63÷315	0.15÷300.00	IC411	S1	AN 30	
		Two speeds, three-phase (2/4, 4/8 poles) quadratic-torque	63÷315	0.18÷300.00	IC411	S1	AN 30	
		Motors fed by inverter (2, 4, 6, 8 poles)	63÷315	0.09÷375.00	IC411	S9	AN 70	

Dust	Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T 135 °C	
							EPL = Db	
							Ex tb	
							EPL = Dc	
Standard		Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.18÷375.00	IC411	S1	AD 30	AD 30
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	63÷315	0.15÷300.00	IC411	S1	AD 20	AD 20
		Two speeds, three-phase (2/4, 4/8 poles) quadratic-torque	63÷315	0.18÷300.00	IC411	S1	AD 40	AD 40
		Single-phase, (2, 4, 6 poles)	63÷100	0.10÷3.00	IC411	S1	AD 10	AD 10
		Single-phase with capacitor in extra-size terminal box (2, 4, 6 poles)	63÷100	0.10÷1.10	IC411	S1	AD 12	AD 12
		Motors fed by inverter (2, 4, 6, 8 poles)	63÷315	0.09÷375.00	IC411	S9	AD 70	AD 70
With brake		Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.05÷160.00	IC410	S4	DD 30	DD 30
			71÷160	0.15÷18.50	IC411	S4	HD 30	HD 30
		Single speed, three-phase (4, 6, 8 poles)	180÷315	18.50÷200.00	IC416	S4	DD 30	DD 30
			63÷315	0.05÷160.00	IC410	S4	DD 20	DD 20
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	71÷160	0.15÷18.50	IC411	S4	HD 20	HD 20
			180÷315	18.50÷160.00	IC416	S4	DD 20	DD 20
		Single speed, three-phase (6 poles) for hoist applications	71÷315	0.18÷200.00	IC410	S4	DD 50	DD 50
			71÷160	0.18÷11.00	IC411	S4	HD 50	HD 50
			180÷315	15.00÷160.00	IC416	S4	DD 50	DD 50
			71÷315	0.06÷160.00	IC410	S4	DD 50	DD 50
		Two speeds, three-phase (2/8, 4/12, 4/16 poles) for hoist applications	71÷160	0.18÷11.00	IC411	S4	HD 50	HD 50
			180÷315	18.50÷160.00	IC416	S4	DD 50	DD 50

Non-sparking dust	Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T3 - T 150 °C	
							EPL = Gc - Db	
							Ex ec - Ex tc	
Standard		Single speed, three-phase (2, 4, 6, 8 poles)	63÷315	0.18÷375.00	IC411	S1	AQ 30	AQ 30
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	63÷315	0.15÷300.00	IC411	S1	AQ 20	AQ 20
		Two speeds, three-phase (2/4, 4/8 poles) quadratic-torque	63÷315	0.18÷300.00	IC411	S1	AQ 40	AQ 40
		Motors fed by inverter (2, 4, 6, 8 poles)	63÷315	0.09÷375.00	IC411	S9	AQ 70	AQ 70

2. General information

2.1. Range of motors

Table 16 - Cemp® range of motors: Premium Series (IE3, IE4):

Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T4				
						EPL = Gb				
						Ex db	Ex db eb	Ex db	Ex db eb	
						IIB		IIC		
Explosion-proof gas	Standard	Single speed, three-phase (2, 4, 6, 8 poles)	80÷315 ¹⁾	0.55÷375.00	IC411	S1	E..AB 30	E..AB 35	E..AC 30	E..AC 35
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	80÷315	0.15÷50.00	IC411	S1	E3AB 20	E3AB 25	E3AC 20	E3AC 25
		Two speeds, three-phase (2/4, 4/8 poles) quadratic-torque	80÷315	0.18÷50.00	IC411	S1	E3AB 40	E3AB 45	E3AC 40	E3AC 45
		Motors fed by inverter (2, 4, 6, 8 poles)	80÷315 ¹⁾	0.75÷375.00	IC411	S9	E..AB 70	E..AB 75	E..AC 70	E..AC 75
Explosion-proof gas	With brake	Single speed, three-phase (2, 4, 6, 8 poles)	80÷315 ¹⁾	0.75÷375.00	IC410	S4	E..DB 30	E..DB 35	E..DC 30	E..DC 35
			80÷160	0.75÷18.50	IC411	S4	E..HB 30	E..HB 35	E..HC 30	E..HC 35
		Single speed, three-phase (4, 6, 8 poles)	180÷315	18.50÷250.00	IC416	S4	E..DB 30	E..DB 35	E..DC 30	E..DC 35
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	80÷315	0.15÷160.00	IC410	S4	E3DB 20	E3DB 25	E3DC 20	E3DC 25
			80÷160	0.12÷11.00	IC411	S4	E3HB 20	E3HB 25	E3HC 20	E3HC 25
			180÷315	18.50÷160.00	IC416	S4	E3DB 20	E3DB 25	E3DC 20	E3DC 25
		Single speed, three-phase (6 poles) for hoist applications	80÷315	0.75÷75.00	IC410	S4	E..DB 50	E..DB 55	E..DC 50	E..DC 55
			80÷160	0.75÷11.00	IC411	S4	E..HB 50	E..HB 55	E..HC 50	E..HC 55
			180÷315	15.00÷160.00	IC416	S4	E..DB 50	E..DB 55	DC 50	E..DC 55
		Two speeds, three-phase (2/8, 4/12, 4/16, 2/12 poles) for hoist applications	80÷315	0.12÷90.00	IC410	S4	E3DB 50	E3DB 55	E3DC 50	E3DC 55
			80÷160	0.12÷7.50	IC411	S4	E3HB 50	E3HB 55	E3HC 50	E3HC 55
			180÷315	2.00÷37.00	IC416	S4	E3DB 50	E3DB 55	E3DC 50	E3DC 55

Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T4 - T 135 °C				
						EPL = Gb - Db				
						Ex db	Ex db eb	Ex db	Ex db eb	
						IIB		IIC		
Ex tb/ Ex tc										
Explosion-proof gas + dust	Standard	Single speed, three-phase (2, 4, 6, 8 poles)	80÷315 ¹⁾	0.55÷375.00	IC411	S1	E..AB 30	E..AB 35	E..AC 30	E..AC 35
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	80÷315	0.15÷50.00	IC411	S1	E3AB 20	E3AB 25	E3AC 20	E3AC 25
		Two speeds, three-phase (2/4, 4/8 poles) quadratic-torque	80÷315	0.18÷50.00	IC411	S1	E3AB 40	E3AB 45	E3AC 40	E3AC 45
		Motors fed by inverter (2, 4, 6, 8 poles)	80÷315 ¹⁾	0.75÷375.00	IC411	S9	E..AB 70	E..AB 75	E..AC 70	E..AC 75
Explosion-proof gas + dust	With brake	Single speed, three-phase (2, 4, 6, 8 poles)	80÷315 ¹⁾	0.75÷375.00	IC410	S4	E..DB 30	E..DB 35	E..DC 30	E..DC 35
			80÷160	0.75÷18.50	IC411	S4	E..HB 30	E..HB 35	E..HC 30	E..HC 35
		Single speed, three-phase (4, 6, 8 poles)	180÷315	18.50÷250.00	IC416	S4	E..DB 30	E..DB 35	E..DC 30	E..DC 35
		Two speeds, three-phase (2/4, 4/8 poles) constant-torque	80÷315	0.15÷160.00	IC410	S4	E3DB 20	E3DB 25	E3DC 20	E3DC 25
			80÷160	0.12÷11.00	IC411	S4	E3HB 20	E3HB 25	E3HC 20	E3HC 25
			180÷315	18.50÷160.00	IC416	S4	E3DB 20	E3DB 25	E3DC 20	E3DC 25
		Single speed, three-phase (6 poles) for hoist applications	80÷315	0.75÷75.00	IC410	S4	E..DB 50	E..DB 55	E..DC 50	E..DC 55
			80÷160	0.75÷11.00	IC411	S4	E..HB 50	E..HB 55	E..HC 50	E..HC 55
			180÷315	15.00÷160.00	IC416	S4	E..DB 50	E..DB 55	E..DC 50	E..DC 55
		Two speeds, three-phase (2/8, 4/12, 4/16, 2/12 poles) for hoist applications	80÷315	0.12÷90.00	IC410	S4	E3DB 50	E3DB 55	E3DC 50	E3DC 55
			80÷160	0.12÷7.50	IC411	S4	E3HB 50	E3HB 55	E3HC 50	E3HC 55
			180÷315	2.00÷37.00	IC416	S4	E3DB 50	E3DB 55	E3DC 50	E3DC 55

Note: 1) For the frame size 355, the series name may be different because of certifications matters.

2. General information

2.1. Range of motors

Table 16 - Cemp® range of motors: Premium Series (IE3, IE4):

Non-sparking gas	Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T3	
							EPL = Gc	
							Ex ec	
Standard		Single speed, three-phase (2, 4, 6, 8 poles)	80÷315	0.55÷200.00	IC411	S1	E..AN 30	
		Motors fed by inverter (2, 4, 6, 8 poles)	80÷315	0.55÷200.00	IC411	S9	E..AN 70	

Dust	Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T 135 °C	
							EPL = Db	EPL = Dc
							Ex tb	Ex tc
Standard		Single speed, three-phase (2, 4, 6, 8 poles)	80÷315	0.55÷200.00	IC411	S1	E..AD 30	E..AD 30
		Motors fed by inverter (2, 4, 6, 8 poles)	80÷315	0.55÷200.00	IC411	S9	E..AD 70	E..AD 70

Non-sparking dust	Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T3 - T 150 °C	
							EPL = Gc - Db	
							Ex ec- Ex tb	Ex ec - Ex tc
Standard		Single speed, three-phase (2, 4, 6, 8 poles)	80÷315	0.55÷200.00	IC411	S1	E..AQ 30	E..AQ 30
		Motors fed by inverter (2, 4, 6, 8 poles)	80÷315	0.55÷200.00	IC411	S9	E..AQ 70	E..AQ 70

Mining	Type	Version	Frame size [mm]	Output range [kW]	Ventilation	Operation	T 150 °C	
							EPL = Mb	
							Ex db	Ex db eb
Standard		Single speed, three-phase (2, 4, 6, 8 poles)	80÷315	0.55÷200.00	IC411	S1	E..AM 30	E..AM 35

2. General information

2.2. Common main characteristics

Available in versions IE1, IE2, IE3 and IE4
Flameproof motors compliant with the Standards IEC ^{®1)} EN 60079-0, 60079-1, 60079-7 for atmospheres where gas is present and IEC EN 60079-31 for areas where combustible dust is present
Three-phase and single-phase Squirrel Cage Asynchronous Induction motors
Totally enclosed, fan cooled, frame IP55 with terminal box IP65
The motors dimensions comply with IEC 60072 standard
Power supply 400 V/50 Hz. Three-phase, 1-speed motors, 2-4-6-8 poles, T4 (for sizes between 63 and 250, multi-voltage power supply 380-400-415 V/50 Hz and 460 V/60 Hz)
Class F insulation
Terminal box: - Available both in a flameproof, or increased safety version - Standard position - top, opposite feet - Rotate by 90° in 4 positions
Motor frame and terminal box enclosure separated to avoid the transmission of explosions
Winding cables connected to the terminal board by means of terminal blocks or by a flameproof sealing device
Internal and external mechanical components painted with epoxy polyester powders: - Stainless steel nameplate - Anti-corrosion screws
Highly resistant to impact: - Cast iron made frame, terminal box and endshields - Fan cover in sheet steel
Low friction dust seals
The conformity certificates also cover alternatives, such as: - Altitude over 1,000 m - Modification of the rated voltage and rated frequency - Power supply from an inverter - Motor protection through temperature detectors - Duty S1 to S9

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

2.2.1. Special characteristics for motors for mining applications

The motors in the ATEX ^{®1)} Premium Series (IE3, IE4) for mines come under group I Category M2. They are intended for use below ground and in surface areas of mines where firedamp or combustible powder can be found. This equipment is meant to be de-energised in an explosive atmosphere
Mounting options B3, B5, B35, B14, B34
High protection against corrosion: - Inside and outside surfaces poly-ester powder painting (minimum thickness 150 µm) - Stainless steel nameplate - Anticorrosion plated fasteners
Highly resistant to impact: special fan cover in sheet steel with rear grid protection
The conformity certificates also cover alternatives, such as: - Modification of the rated voltage and rated frequency - Power supply from an inverter - Motor protection through temperature detectors - Duty S1 to S9

Note: 1) ATEX is a trademark of European Union and is not owned or controlled by WEG.

2. General information

2.3. Main options

Electrical variants
Non-standard voltages and frequencies (maximum voltage 1,000 V)
Motors for tropical climates
Motors for low temperatures up to -50 °C Classic Series (IE1, IE2), up to -60 °C Premium Series (IE3, IE4)
Temperature rise below Class B
Motors insulated to Class H
Motors with bimetallic detector, thermistor PTC or thermistor Pt-100
Motors with anti-condensation heaters
Motors with special electrical design
Single-phase motors with capacitor fitted in a large-size terminal box (Ex db)
Mechanical variants
Special flanges and shafts
Double ended shafts
Cable gland fitted to terminal box
Terminal box with special cable entries
Motors protection IP56 - IP65 - IP66
Motors with condensation drain valves
Motors with special bearings (uni-directional, with sensors, with rollers, insulated, oversized, thrust bearings)
Vibration level Grade A or B, according to IEC ¹⁾ 60034-14
Motors with a rain cap or sun shield, water-shedding disc
Side terminal box frame size 180 to 355 (from frame 160 for Premium Series IE3, IE4)
Separate terminal box for auxiliary terminals
Low noise emission version
High protection against corrosion for tropical climates or applications in marine environments: - External mechanical components finished with epoxy paint - Protection of the internal parts (winding and rotor) with protective paint - Stainless steel screws
Accessories
Motors suitable for frequency inverter drive
Motors with encoder
Motors with forced ventilation (from frame size 90)
Certificates
Motors according to ATEX, IECEx ²⁾ , CU-TR, CCOE ²⁾ , ECAS ²⁾ , CCC ²⁾ , CEL, AEx, JPN ²⁾ and many others

Notes: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

2) The following trademarks are not owned by or under the control of WEG: ATEX is a trademark of European Union; CCC is a trademark of Certification and Accreditation Administration of the People's Republic of China; CCOE is a trademark of the Government of India's Petroleum and Explosives Safety Organization; ECAS is a trademark of ESMA; IEC and IECex are trademarks or trade names of International Electrotechnical Commission; JPN is a trademark of JPN Co.,Ltd.

2. General information

2.4. Nomenclature - Classic Series (IE1, IE2) + IE3 below 0.75 kW

Pos. 1 = motor series:										
A		ATEX ^{®1)}								
D		Motors with brakes without ventilation or with forced ventilation								
H		Motors with self-ventilating brakes								
Pos. 2 = type of application:										
B		Enclosure group IIB			Q		Non sparking + dust			
C		Enclosure group IIC			N		Non sparking			
D		Dust			M		Group I for mines			
Pos. 3 = type of motor (electric characteristics):										
1		Single-phase			4		Three-phase 2-speed quadratic-torque			
2		Three-phase 2-speed, constant torque			5		For lifting			
3		Three-phase 1-speed			7		For inverters			
Pos. 4 = terminal box version:										
0r		Standard version			5r		Protection method Ex eb			
3r		Without box, with plate Ex db			2r		Ex db capacitor holder in extra-size box			
Pos. 5 = frame size:										
63		90		132		200		280		
71		100		160		225		315		
80		112		180		250		355		
Pos. 6 = stator pack:										
Refer to section 5. Performance data										
Pos. 7 = polarity:										
2		2 poles		24		Double polarity: 2/4 poles		46		Double polarity: 4/6 poles
4		4 poles		28		Double polarity: 2/8 poles		48		Double polarity: 4/8 poles
6		6 poles		21		Double polarity: 2/12 poles		41		Double polarity: 4/12 poles
8		8 poles						43		Double polarity: 4/16 poles
10		10 poles						68		Double polarity: 6/8 poles
12		12 poles						61		Double polarity: 6/12 poles
Pos. 8 = mounting (IM Code I):										
B3				V5				V6		
B5				V1				V3		
B14				V18				V19		
B35				V15				V36		
Pos. 9 = version with terminal box:										
3F xxxD / xxxS / xx		Three-phase 1-speed; voltage for delta connection; voltage for star connection; frequency								
3F xxx / xx		Three-phase, 2-speed; voltage; frequency								
1F xxx / xx		Single-phase; voltage; frequency								

A B 2 5r 132 S 46 B5 3F 400/50 = example of the commercial codes

Note: 1) ATEX is a trademark of European Union and is not owned or controlled by WEG.

2. General information

2.5. Nomenclature - Premium Series (IE3, IE4)

Pos. 0 = efficiency level											
E3		Efficiency level IE3									
E4		Efficiency level IE4									
Pos. 1 = motor series:											
A		ATEX ^{®1)}									
D		Motors with brakes without ventilation or with forced ventilation									
H		Motors with self-ventilating brakes									
Pos. 2 = type of application:											
B		Enclosure group IIB		Q Non sparking + dust							
C		Enclosure group IIC		N Non sparking							
D		Dust		M Group I for mines							
Pos. 3 = type of motor (electric characteristics):											
1		Single-phase		4 Three-phase 2-speed quadratic-torque							
2		Three-phase 2-speed, constant torque		5 For lifting							
3		Three-phase 1-speed		7 For inverters							
Pos. 4 = terminal box version:											
0		Standard version		5 Protection method Ex eb							
3		Without box, with plate Ex db		2 Ex db capacitor holder in extra-size box							
Pos. 5 = frame size:											
63		90		132		200		280			
71		100		160		225		315			
80		112		180		250		355			
Pos. 6 = stator pack:											
Refer to section 5. Performance data											
Pos. 7 = polarity:											
2		2 poles		24		Double polarity: 2/4 poles		46		Double polarity: 4/6 poles	
4		4 poles		28		Double polarity: 2/8 poles		48		Double polarity: 4/8 poles	
6		6 poles		21		Double polarity: 2/12 poles		41		Double polarity: 4/12 poles	
8		8 poles						43		Double polarity: 4/16 poles	
10		10 poles						68		Double polarity: 6/8 poles	
12		12 poles						61		Double polarity: 6/12 poles	
Pos. 8 = mounting (IM Code I):											
B3				V5				V6			
B5				V1				V3			
B14				V18				V19			
B35				V15				V36			
Pos. 9 = version with terminal box:											
3F xxxD / xxxS / xx		Three-phase 1-speed; voltage for delta connection; voltage for star connection; frequency									
3F xxx / xx		Three-phase, 2-speed: voltage; frequency									
1F xxx / xx		Single-phase; voltage; frequency									

E3 A B 2 5 132 S 46 B5 3F 400/50 = example of the commercial codes

Note: 1) ATEX is a trademark of European Union and is not owned or controlled by WEG.

3. Design features

3.1. Installation and application

Standard installation

The motors can be installed outdoors and in dusty, moist and chemically aggressive environments (industrial climate) at ambient temperatures from -20 °C to 40 °C.

Mechanical protection (IP); table 17

The mechanical protection systems for electric motors are classified with the IP code followed by two numbers and, in some applications, by a letter.

IP	(International Protection)	this indicates the level of protection against accidental contacts of foreign bodies and against water.
0 - 6	(1st digit)	this indicates the level of protection against accidental contacts of foreign bodies.
0 - 8	(2nd digit)	this indicates the level of protection against water.

On-deck installation

Motors meant for installation on board ships and offshore areas are designed to comply with the specifications of the relevant classification authorities (see "2.3. Main options" on page 23).

Gear mounting, oil-protected flange

In some applications, it is necessary that the flange and the drive shaft are completely sealed against oil. This need must be specified during the order phase.

Fixed bearings

Some applications need to have a "zero axial play". This need must be specified during the order phase.

Cooling

Motors are air-cooled by means of external surface ventilation (IC411). Standard motors have radial flow fan allowing fully reversible rotation. Reference standards are: IEC^{®1)} 60034-6. From frame size 100 to 315 motors may be supplied with forced ventilation.

Table 17 - Mechanical protection to IEC 60034-5:

Protection against accidental contact and the penetration of foreign bodies	International protection	Protection against water
Complete protection against contact and approaching of voltage-carrying parts as well as against contact with rotating parts inside the housing. Protection against harmful dust deposits. The penetration of dust is not completely prevented but the dust cannot enter in such quantities as to affect operation.	IP55 standard design	A jet of water squirting out of a nozzle towards the motor from all directions has no harmful effect.
	IP56 special design	In case of temporary flood, e. g. heavy seas, water cannot enter into the motor in harmful quantities.
Complete protection against contact of voltage-carrying parts as well as against contact with rotating parts inside the housing. Protection against the penetration of dust (dust-proof).	IP65 special design	A jet of water squirting out of a nozzle towards the motor from all directions has no harmful effect.
Complete protection against contact of voltage-carrying parts as well as against contact with rotating parts inside the housing. Protection against the penetration of dust (dust-proof).	IP66 special design	In case of temporary flood, e. g. heavy seas, water cannot enter into the motor in harmful quantities.

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

3. Design features

3.2. Low temperature version and anti-condensation heating

Low temperature version

Motors intended for use at extremely low temperatures are specially designed. Flameproof certificates are valid for temperatures as low as -50 °C on Classic Series and -60 °C on Premium Series.

Anti-condensation heating

Condensate may form inside the motor due to temperature fluctuations. To prevent this from happening, motors must be heated using strip type heaters on the end windings or low voltage power can be supplied to the winding via terminals U1 and V1. The heat output is given in table 18. It is vital that during the motor operation the heaters are turned off. The supply voltage for the heaters is 230 V ± 10% (115 V ±10% on request).

Table 18 - Cemp® range of motors:

Frame size	For preventing condensation							For protection at temperature below -20 °C (down to -50 °C)						
	With heater	Via motor winding						With heater	Via motor winding					
		Heating voltage with a rated motor voltage of							Heating voltage with a rated motor voltage of					
	Output [W]	Output [VA]	230 V [V]	400 V [V]	440 V [V]	550 V [V]	690 V [V]	Output [W]	Output [VA]	230 V [V]	400 V [V]	440 V [V]	550 V [V]	690 V [V]
63	25	35	45	75	90	100	130	50	90	70	120	140	160	210
71	25	55	35	65	75	85	110	50	130	60	100	120	135	175
80	25	70	30	55	65	75	100	50	180	50	90	100	115	155
90	25	100	25	45	50	60	80	50	250	40	70	80	95	125
100	25	140	20	35	40	50	65	50	440	40	65	75	85	115
112	50	190	20	38	45	50	65	100	450	35	60	70	80	105
132	50	300	20	35	40	45	60	100	700	30	55	65	70	90
160	50	420	17	30	35	40	50	100	950	25	45	55	60	80
180	100	500	15	25	30	35	45	200	1,200	25	40	50	55	70
200	100	720	13	20	25	30	40	200	1,500	20	35	40	45	60
225	100	800	13	20	25	30	40	200	2,200	20	35	40	45	60
250	100	950	10	20	25	30	40	200	2,700	20	35	40	45	60
280	200	1,700	-	20	22	25	30	200	3,000	-	28	35	40	50
315	200	1,900	-	16	20	25	30	200	3,600	-	25	32	38	48
315 L	200	2,100	-	14	18	24	30	200	4,800	-	22	30	35	45
355	200	2,100	-	14	18	24	30	200	4,800	-	22	30	35	45

3.3. Materials, painting and nameplate

Materials

Table 19 - Materials of the main components:

Frame Endshields Terminal box	Cast iron G200 (ISO 185)
Fan cover Rain cap	Steel
Fan	Non sparking thermoplastic material or aluminum. Brass for motors for mining applications and on request
Shaft	Steel C45
Rotor	Squirrel cage in pressure cast aluminum
Winding	Insulation class F or H
Bolts and screws	Galvanised steel 8.8 or A4-80 UNI EN ISO 3506-1
Cable gland (on request)	Brass, nickel plated brass or stainless steel
Brake enclosure	Cast iron
Brake terminal box	Cast iron

3. Design features

3.3. Materials, painting and nameplate

Painting

Table 20 - Materials of the main components:

Frame size	63÷250	280÷355
Pretreatment	All components are sandblasted, cleaned and degreased	All components are sandblasted, cleaned and degreased
Painting	Polymerised epoxy polyester powder, oven-baked at 200 °C	Treatment with anti-corrosion primer Final coat of enamel paint
Thickness	Total 120 µm (different thicknesses available upon request)	Total 120 µm (different thicknesses available upon request)
Colour	RAL 5010 (special colours available upon request)	RAL 5010 (special colours available upon request)
Mechanical strength	Non-abrasive, elastic, insensitive to scratches, resistant to impact	Non-abrasive, elastic, insensitive to scratches, resistant to impact
Corrosion resistance	Highly resistant to water, water vapour, salt water	Highly resistant to water, water vapour, salt water
Chemical resistance	Good resistance in chemically aggressive environments	Good resistance in chemically aggressive environments
Temperature range	-60 °C +130 °C	-60 °C +130 °C

Nameplate

The stainless steel nameplate is fitted on the motor frame.

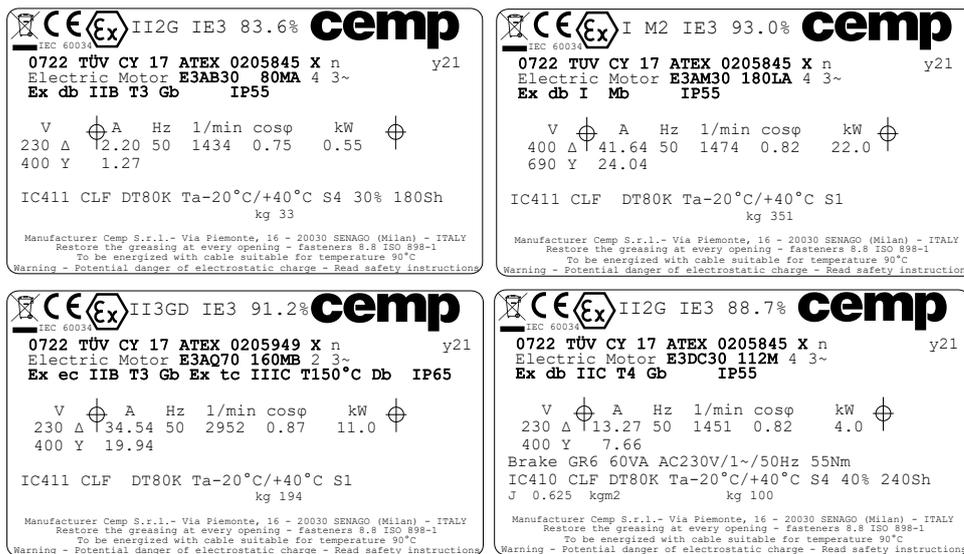


Figure 3 - Example of nameplates

3.4. Shaft ends, balancing, vibrations, noise levels, coupling and belt drives

Shaft ends

The shaft ends are cylindrical and comply with IEC⁽¹⁾ 60072 in their design and in their correspondence to frame sizes and outputs. The shaft ends of all motors are equipped with a tapped hole to assist in the fitting of pulleys and couplings. The keys are always supplied along with the motors.

On request, special shaft ends or a second free shaft end can be provided. Pole-changing motors with a 2-pole speed have the same shaft ends as single-speed 2-pole motors.

Balancing, and vibration

The motors are dynamically balanced with half keys in accordance with vibration grade "A" (N) normal balance IEC 60034-14 (and ISO 8821).

The low-vibration version "B" (R) (reduced) can be supplied where high demands are made on quiet running. Care must be taken to ensure that transmission parts (pulleys, couplings) supplied by others are dynamically balanced with half key.

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

3. Design features

3.4. Shaft ends, balancing, vibrations, noise levels, coupling and belt drives

Noise level

Noise measurements are performed to IEC^{®1)} 60034-9.

In the performance data, the sound pressure levels “Lp” are given in dB (A) for the individual frame sizes.

They apply for no load at 50 Hz. The tolerance is + 3 dB (A).

At 60 Hz the values of sound pressure increase approximately by 3 dB (A).

Coupling drive

When aligning a motor to be coupled directly to the machine, care must be taken that the rollers and balls of the bearings do not jam. Elastic couplings are permissible with all motors.

To ensure vibration-free running and to avoid any inadmissible stress on the bearings, the machine to be coupled must still be exactly aligned in the case of elastic coupling. Maximum accuracy must be applied to the coupling of 2-pole motors.

Belt drive

Slide rails are used for motors for easy tensioning and readjustment at the belts. Permissible forces have to be taken into consideration (see table 26). Pulleys and couplings must only be fitted and removed by means of specific tools.

Table 21 - Vibration limits according to IEC 60034-14:

Balancing rate	Limit values of the speed of vibration/oscillation for frame sizes:			
	63÷132 [mm/s]	160÷280 [mm/s]	315 [mm/s]	355 [mm/s]
A	1.6	2.2	2.8	2.8
B	0.7	1.1	1.8	1.8

Note: terms of measure: free standing.

3.5. Brake motors

Construction method

Motors in these two series are built with an integrated brake and are considered as an integral unit, consequently, a single ATEX^{®1)} certificate is provided for both motor and brake.

The brake is enclosed in a special enclosure built with a Ex db IIB or IIC protection type and IP65 mechanical protection. The temperature class and maximum surface temperature are those of the motor. The electro-magnet winding is encapsulated in resin which isolates it and provides mechanical protection.

Classic Series (IE1, IE2)

Motors with frame size 63 to 160 are normally fitted with a three-phase magneto with a power supply of 110 V to 690 V.

Alternatively, upon request, a magneto can be supplied with a direct current power supply using a rectifier, with a single-phase power supply of 48 V to 440 V. If you have a direct current power supply line, the magneto can be powered directly using that line (from 24 V to 230 V).

Premium Series (IE3, IE4)

Motors are fitted with a direct current power supply using a rectifier with a single-phase power supply from 48 V to 500 V_{ac} single-phase. If you have a direct current supply line, the electromagnet can be powered directly using direct voltage supply from 48 V to 500 V. Other voltage can be made on purpose.

Motors with an axle height of 180 to 315 use a “K10” type brake, which is only available with the magneto powered using direct current. This type of brake is always supplied with a direct current power supply using a rectifier, with a single-phase power supply of 48 V to 440 V.

Note: 1) The following trademarks or tradenames are not owned or controlled by WEG: ATEX is a trademark of European Union; IEC is a trademark of International Electrotechnical Commission.

3. Design features

3.5. Brake motors

Classic Series (IE1, IE2)
Frame size 63-315
Three-phase brake included as standard up to frame size 160, DC brake or DC brake with AC 1Ph rectifier from frame size 180 up to frame size 315 / DC brake or DC brake with AC 1Ph rectifier as option up to frame size 160
One terminal box for motor and brake power supply up to frame size 160 included, separate brake terminal box from frame size 180 and above
Single brake disc included as standard / double brake disc available on request
Max brake speed 3,600 rpm up to frame size 160 / max brake speed 1,800 rpm from frame size 180 and above
IC410-IC411-IC416 versions available up to frame size 160 included, IC410-IC416 versions available from frame size 180 and above
2 bearings, double shaft extension available on request only for manual rotation up to frame size 160 included
Manual release available as option on all frame sizes (single brake disc version)
Micro switch available as option from frame size 132 and above
Standard AC 1Ph rectifier available on request

Premium Series (IE3, IE4)
Frame size 80-250
DC brake or DC brake with AC 1Ph rectifier up to frame size 250
One terminal box for motor and brake power supply up to frame size 132 included, separate brake terminal box from frame size 160 and above
Single brake disc version with wide brake torque regulation
Max brake speed 3,600 rpm up to frame size 250
IC410-IC411-IC416 versions available up to frame size 250
3 bearings, double shaft extension available on request for manual release or for normal service duty
Manual release available as option on all frame sizes (single brake disc version)
Micro switch available as option from frame size 90 and above
Fast acting AC 1Ph rectifier included as standard

Operation

The brake is made up of:

- Magnet
- Counter-magnet (or mobil armature) supported by three small columns where it can slide
- Braking disk
- Toothed hub secured to the motor shaft

When the coil is powered, the magnet attracts the mobil armature which thus releases the braking disk so the motor can rotate freely. By removing voltage to the magnet, the springs push the mobil armature against the braking disk. which, by creating friction against the motor shield, locks the shaft rotation.

In rest conditions, when the brake is not powered, the motor remains locked.

Braking torque calibration

The motor is supplied with a ready-to-use calibrated brake.

Special calibration available on request. This is carried out during assembly before final testing.

Tables 22 and 23 shows the standard braking torques.

Manual release

DB, DC, HB, HC, E..DB, E..DC, E..HB, E..HC series flameproof motors with brake can be supplied on request with hand release lever for the brake. Pressure is applied on the release mechanism which moves the mobile armature, freeing the motor's shaft. When releasing pressure on the mechanism the brake automatically returns to the fail safe position.

3. Design features

3.5. Brake motors

Table 22 - Standard technical data of the integrated brake for Classic Series (IE1, IE2):

Frame size	Brake model	Static braking torque [Nm]	Air gap (+0.1 / 0) [mm]	On-off braking time requested [ms]	Number of disks [n°]	Max. speed [1/min]	Power [VA]
63 (*)	AC1	4	0.2	20	1	3,600	40
71 (*)	MEC 63	9	0.3	25	1	3,600	50
80 (*)	T80	17	0.3	30	1	3,600	60
90 (*)	MEC 80	35	0.3	40	1	3,600	14
100 (*)	MEC 90 (♦)	48	0.3	40	1	3,600	180
112 (*)	MEC 100 (♦)	70	0.3	45	1	3,600	250
132 (*)	MEC 110 (♦)	90	0.3	90	1	3,600	400
160 (*)	T140 (♦)	130	0.3	100	1	3,600	480
180-200 (•)	K10 (♦)	400	0.3	220	1	1,800	140
225-250 (•)	K10 (♦)	800	0.3	220	1	1,800	140
280-315 S-M-L (•)	K10	240 - 400 - 800	0.3	220	1	1,800	140
		1,500			2		

Notes: (*) AC 3 phase or DC Brake (with or without single phase rectifier) versions available on request.

(•) DC Brake (with or without single phase rectifier) versions available on request.

(♦) 2 brake discs (braking torque about +50%) available on request.

Table 23 - Standard technical data of the integrated brake for Premium Series (IE3, IE4):

Frame size	Brake model	Static braking torque [Nm]	Air gap (+0.1 / 0) [mm]	On-off braking time requested [ms]	Number of disks [n°]	Max. speed [1/min]	Power [W]
80 (•)	GR4	17	0.4	30	1	3,600	30
90 (•)	GR5	35	0.4	40	1	3,600	50
100 (•)	GR6	55	0.4	45	1	3,600	60
112 (•)	GR6	55	0.4	45	1	3,600	60
132 (•)	GR8	130	0.4	90	1	3,600	75
160 (•)	GR9	280	0.4	100	1	3,600	80
180 (•)	GR9	280	0.4	100	1	3,600	80
200 (•)	GR10	600	0.4	220	1	3,600	130
225 (•)	GR10	600	0.4	220	1	3,600	130
250 (•)	GR10	600	0.4	220	1	3,600	130

Note: (•) DC Brake (with or without single phase rectifier) versions available on request.



3. Design features

3.5. Brake motors

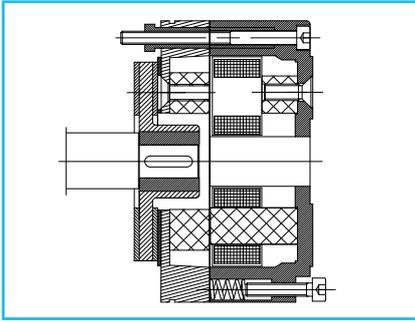


Figure 4 - Construction diagram for a 63 brake for Classic Series (IE1, IE2)

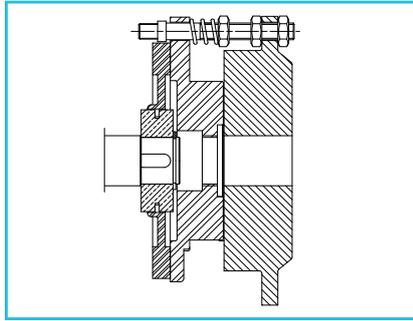


Figure 5 - Construction diagram for a 71÷160 brake for Classic Series (IE1, IE2)

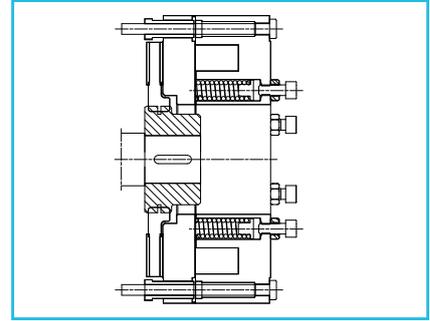
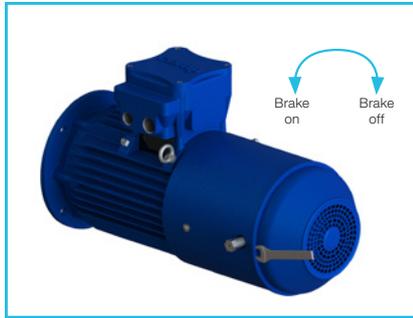


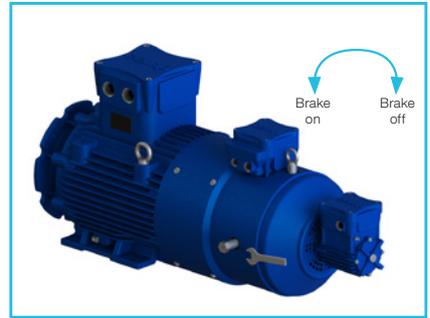
Figure 6 - Construction diagram for a 180÷315 brake for Classic Series (IE1, IE2) and for a 80-250 brake for Premium Series (IE3, IE4)



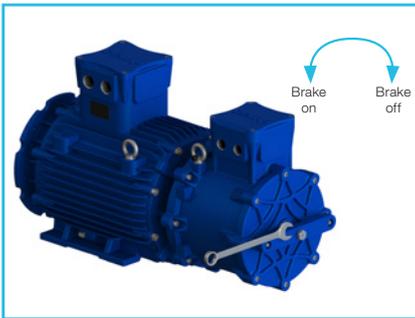
Manual release (optional on request) for motors 80-180 IE3-IE4, 71-160 IE1-IE2 - IC410



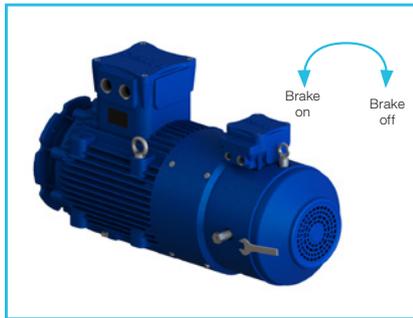
Manual release (optional on request) for motors 80-132 IE3-IE4, 71-160 IE1-IE2 - IC411



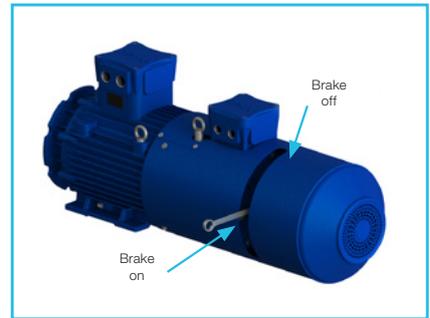
Manual release (optional on request) for motors 90-180 IE3-IE4, 90-160 IE1-IE2 - IC416



Manual release (optional on request) for motors 200-250 IE3-IE4, 180-315 IE1-IE2 - IC410



Manual release (optional on request) for motors 160-180 IE3-IE4 - IC411



Manual release (optional on request) for motors 200-250 IE3-IE4, 180-315 IE1-IE2 - IC416



3. Design features

3.6. Bearing system

Standard motors are equipped with radial deep groove ball bearings (ZZ pre-greased series) or open bearings complete with grease nipples. Where requested roller, or other special bearings can be fitted.

Lubrication

The ZZ series bearings are lubricated for life and require no further lubrication. Open bearings are supplied with grease nipples and are to be lubricated according to the indications given in the tables 24 and 25.

Bearing seal

In order to prevent dust and water penetration, a seal ring is fitted to the endshield on the driving and non-driving ends. These seal rings are highly resistant to vibrations, thermally stable, and resistant to mineral oils and diluted acids. Seals for media not listed above are available on request.

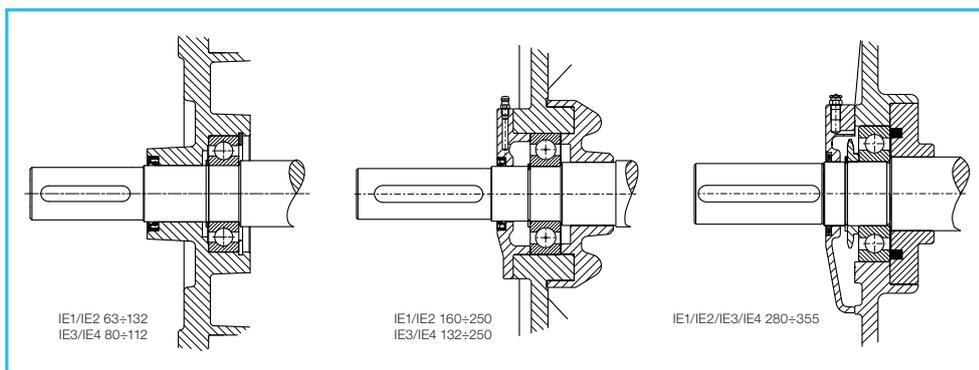


Figure 7 - Ball bearings - DE (front)

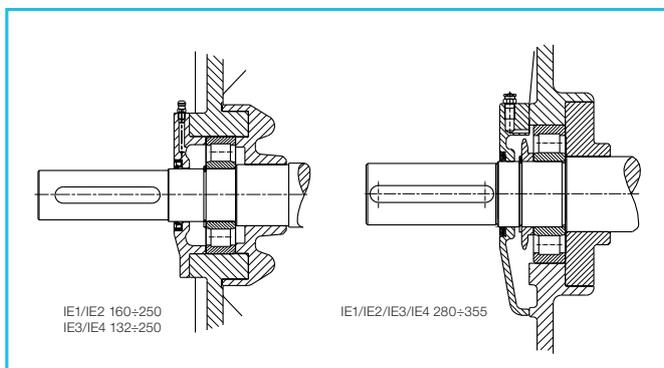


Figure 8 - Roller bearings - On request execution DE (front)

3. Design features

3.6. Bearing system

Table 24 - Standard model:

Frame size	Poles	Bearing	
		Drive end	Non-drive end
63	2 - 4 - 6 - 8	6202 ZZ	
71	2 - 4 - 6 - 8	6203 ZZ	
80	2 - 4 - 6 - 8	6204 ZZ	
90	2 - 4 - 6 - 8	6205 ZZ	
100	2 - 4 - 6 - 8	6206 ZZ	
112	2 - 4 - 6 - 8	6306 ZZ	
132	2 - 4 - 6 - 8	6308 ZZ C3	
160	2 - 4 - 6 - 8	6309 ZZ C3	
180	2 - 4 - 6 - 8	6310 ZZ C3	
200	2 - 4 - 6 - 8	6312 ZZ C3	
225	2 - 4 - 6 - 8	6313 ZZ C3	
250	2	6313 ZZ C3	
	4 - 6 - 8	6314 ZZ C3	6313 ZZ C3
280	2 - 4 - 6 - 8	6316 ZZ C3	
315	2	6316 ZZ C3	
	4 - 6 - 8	6317 ZZ C3	6316 ZZ C3
355	2	6317 C3	6316 C3
	4 - 6	6322 C3	6316 C3

Table 25 - Upon request:

Frame size	Poles	Bearing			Time interval for lubrication (hours)	Amount of grease ¹⁾
		Front ball bearings	Front rollers	Rear ball bearings		
132	2	6308 C3	NU 308	6308 C3	3,000	12 g
	4				6,000	
	6 - 8				9,000	
160	2	6309 C3	NU 309	6309 C3	5,500	12 g
	4				8,250	
	6 - 8				11,000	
180	2	6310 C3	NU 310	6310 C3	2,000	12 g
	4				6,000	15 g
	6 - 8				7,000	
200	2	6312 C3	NU 312	6312 C3	2,100	12 g
	4				5,000	15 g
	6 - 8				7,000	
225	2	6313 C3	NU 313	6313 C3	2,000	15 g
	4				4,500	20 g
	6				5,600	
	8				6,400	
250	2	6313 C3	NU 313	6313 C3	2,000	20 g
	4	6314 C3	NU 314		4,100	
	6				5,300	
	8				6,200	
280 S	2	6316 C3	NU 316	6316 C3	3,700	33 g
	4				4,300	
	6				4,600	
	8				4,800	
280 M	2	6316 C3	NU 316	6316 C3	3,700	33 g
	4				4,300	
	6				4,600	
	8				4,800	
315 S	2	6316 C3	NU 316	6316 C3	3,300	37 g
	4	6317 C3	NU 317		9,500	
	6				13,700	
	8				15,300	
315 M	2	6316 C3	NU 316	6316 C3	2,900	37 g
	4	6317 C3	NU 317		7,800	
	6				11,300	
	8				13,600	
315 LA	2	6316 C3	NU 316	6316 C3	4,100	33 g
	4 - 6	6317 C3	NU 317		11,100	37 g
	8				19,500	
315 LB	2	6316 C3	NU 316	6316 C3	3,500	37 g
	4 - 6	6317 C3	NU 317		9,500	
	8				16,550	
315 LC	2	6316 C3	NU 316	6316 C3	2,900	33 g
	4 - 6	6317 C3	NU 317		7,800	37 g
	8				13,600	
355	2	6317 C3	NU 317	6316 C3	3,400	40 g
	4	6322 C3	NU 322		6,900	60 g
	6				11,200	

3. Design features

3.7. Permissible radial loads on the shaft with standard bearings

Table 26 shows the values of radial load calculated considering:

- Frequency 50 Hz
- Temperature not exceeding 90 °C
- 20,000 hours of life for 2-pole motors
- 40,000 hours of life for 4, 6, 8-pole motors

For operation at 60 Hz the values have to be reduced by 6% in order to achieve the same useful life. For double speed motors, consider always the higher speed.

The distance of the point of action of force F_R from the shoulder of the shaft must not exceed the length of the shaft end.

F_R = maximum radial load (e. g. belt load + weight of belt pulley)

$$F = \text{belt load [N]} = \frac{2 \cdot K \cdot M}{D}$$

$$M = \text{torque [Nm]} = \frac{9,550 \cdot P}{n}$$

P = rated motor output [kW]

n = rated motor speed [1/min]

D = belt pulley diameter [m]

K = prestress factor governed by belt type: it is assumed approximately as follows

$K = 3$ for normal flat belts without tensioning pulley

$K = 2$ for normal flat belts with tensioning pulley

$K = 2.2$ for V-belts or special flat belts

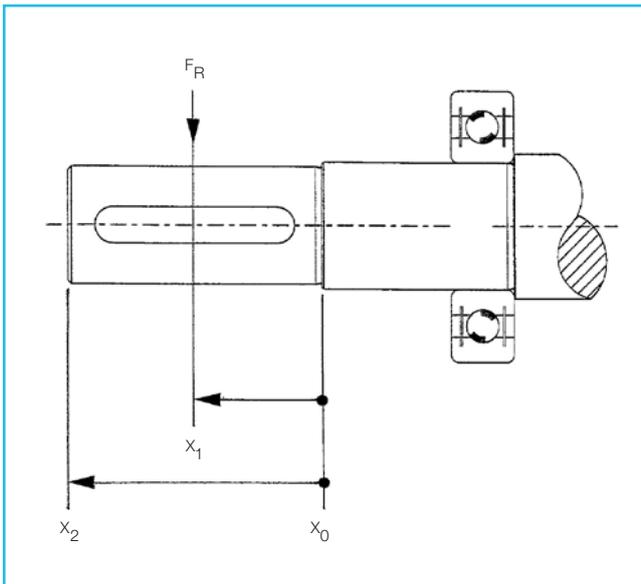


Figure 9

For special applications and for 355 motors, verification of admissible loads will be calculated during the offer phase.

Table 26

Frame size	Pole number	Permissible radial load F_R [N]					
		Ball bearings			Roller bearings		
		X_0	X_1	X_2	X_0	X_1	X_2
63	2	390	360	340	-	-	-
	4	390	360	340	-	-	-
	6	440	410	380	-	-	-
	8	490	450	420	-	-	-
71	2	490	450	420	-	-	-
	4	480	450	420	-	-	-
	6	550	510	480	-	-	-
	8	610	560	520	-	-	-
80	2	640	590	540	-	-	-
	4	640	580	540	-	-	-
	6	730	660	610	-	-	-
	8	800	730	670	-	-	-
90	2	730	660	610	-	-	-
	4	720	660	600	-	-	-
	6	820	750	680	-	-	-
	8	910	820	750	-	-	-
100	2	1,020	910	830	-	-	-
	4	1,010	910	820	-	-	-
	6	1,150	1,030	940	-	-	-
	8	1,270	1,140	1,030	-	-	-
112	2	1,480	1,350	1,240	-	-	-
	4	1,470	1,340	1,230	-	-	-
	6	1,680	1,530	1,410	-	-	-
	8	1,850	1,680	1,550	-	-	-
132	2	2,160	1,930	1,750	-	-	-
	4	2,140	1,910	1,720	-	-	-
	6	2,450	2,190	1,970	-	-	-
	8	2,700	2,410	2,180	-	-	-
160	2	2,790	2,470	2,210	5,720	5,200	4,680
	4	2,770	2,450	2,190	5,885	5,350	4,815
	6	3,150	2,790	2,490	5,995	5,450	4,905
	8	3,480	3,080	2,750	6,050	5,500	4,950
180	2	3,600	3,200	2,950	6,490	5,900	5,310
	4	3,500	3,350	2,850	7,040	6,400	5,760
	6	3,900	3,600	3,300	7,370	6,700	6,030
	8	4,300	3,950	3,700	7,480	6,800	6,120
200	2	4,500	4,300	4,000	9,680	8,800	7,920
	4	4,550	4,350	4,100	10,450	9,500	8,550
	6	5,300	5,500	5,000	10,780	9,800	8,820
	8	5,500	5,350	5,050	10,945	9,950	8,955
225	2	5,500	5,000	4,650	11,880	10,800	9,720
	4	5,350	4,900	4,500	12,760	11,600	10,440
	6	5,950	5,650	5,200	13,200	12,000	10,800
	8	6,400	6,100	5,700	13,420	12,200	10,980
250	2	5,300	5,100	4,750	13,860	12,600	11,340
	4	5,650	5,400	5,300	15,950	14,500	13,050
	6	5,820	5,600	5,370	16,500	15,000	13,500
	8	6,420	5,980	5,520	16,665	15,150	13,635
280	2	5,500	5,000	4,500	15,400	14,000	12,600
	4	5,665	5,150	4,635	15,950	14,500	13,050
	6	6,930	6,300	5,670	16,500	15,000	13,500
	8	7,920	7,200	6,480	18,150	16,500	14,850
315 S-M	2	5,500	5,000	4,500	14,300	13,000	11,700
	4	6,270	5,700	5,130	28,050	25,500	22,950
	6	7,370	6,700	6,030	29,150	26,500	23,850
	8	8,360	7,600	6,840	29,700	27,000	24,300
315 L	2	6,820	6,200	5,580	13,640	12,400	11,160
	4	7,095	6,450	5,805	24,750	22,500	20,250
	6	8,030	7,300	6,570	27,500	25,000	22,500
	8	9,020	8,200	7,380	30,800	28,000	25,200
355 S-M	2	5,500	5,000	4,800	12,500	11,500	9,800
	4						
	6	11,200	10,500	9,500	25,000	18,000	12,000
355 L	2	5,200	4,800	4,500	12,000	11,700	9,950
	4						
	6	10,500	9,500	9,000	30,000	22,000	14,000
	8						

3. Design features

3.7. Permissible radial loads on the shaft with standard bearings

If the shaft end is loaded at X² with the permissible radial load F_A, an additional axial load is allowed (table 27).

If the permissible radial load is not fully utilized, higher loads are possible in axial direction (values on request).

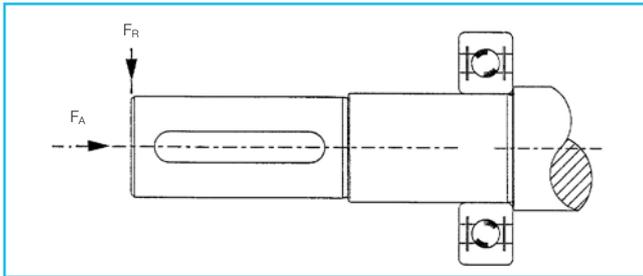


Figure 10

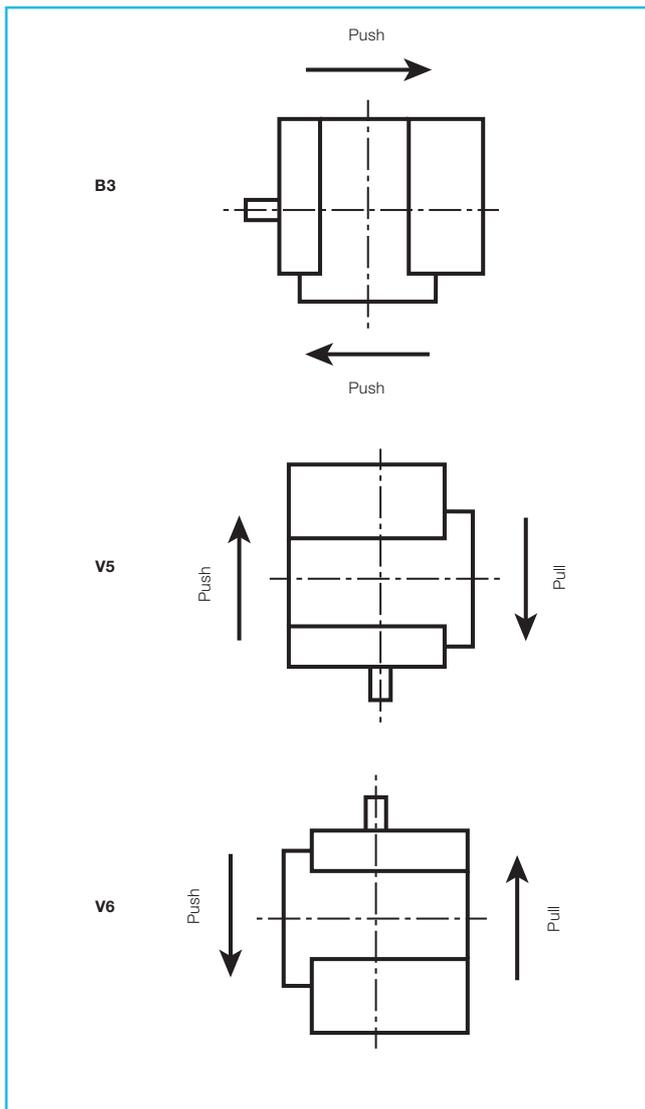


Figure 11

Table 27

Frame size	Pole number	Limit axial load with F _R at X ₂ - F _A [N]			
		Ball bearings		Roller bearings	
		B3 push/pull	V5/V6 push/pull	B3 push/pull	V5/V6 push/pull
63	2	120	110	—	—
	4	120	110	—	—
	6	140	130	—	—
	8	160	150	—	—
71	2	140	130	—	—
	4	140	120	—	—
	6	170	150	—	—
	8	190	170	—	—
80	2	190	170	—	—
	4	190	160	—	—
	6	220	190	—	—
	8	250	220	—	—
90	2	200	170	—	—
	4	200	160	—	—
	6	240	190	—	—
	8	270	220	—	—
100	2	280	230	—	—
	4	280	220	—	—
	6	330	260	—	—
	8	370	300	—	—
112	2	410	330	—	—
	4	410	320	—	—
	6	480	370	—	—
	8	540	430	—	—
132	2	590	430	—	—
	4	590	380	—	—
	6	690	470	—	—
	8	780	560	—	—
160	2	750	490	1,000	700
	4	750	450	1,200	840
	6	880	520	1,300	910
	8	1,000	640	1,400	980
180	2	880	950	1,000	700
	4	880	1,150	1,250	875
	6	1,030	1,350	1,350	945
	8	1,160	1,550	1,550	1,085
200	2	1,160	1,100	1,100	770
	4	1,160	1,200	1,200	840
	6	1,360	1,400	1,400	980
	8	1,520	1,600	1,600	1,120
225	2	1,300	1,250	1,250	875
	4	1,300	1,350	1,350	945
	6	1,520	1,600	1,600	1,120
	8	1,710	1,850	1,850	1,295
250	2	1,460	1,300	1,300	910
	4	1,460	1,400	1,400	980
	6	1,710	1,600	1,600	1,120
	8	1,920	1,920	1,900	1,330
280	2	5,500	3,850	3,700	2,590
	4	5,500	3,850	3,700	2,590
	6	6,500	4,550	4,000	2,800
	8	7,400	5,180	4,500	3,150
315 S-M	2	5,500	3,850	3,700	2,590
	4	5,800	4,060	3,500	2,450
	6	6,800	4,760	4,000	2,800
	8	7,650	5,355	4,500	3,150
315 L	2	2,200	1,540	3,850	2,695
	4	2,200	1,540	3,800	2,660
	6	2,500	1,750	4,600	3,220
	8	3,000	2,100	5,500	3,850
355 S-M	2	1,600	2,000	1,800	1,600
	4	4,200	4,100	5,000	5,000
	6	5,000	4,000	6,500	6,000
	8	5,500	3,850	8,000	7,000
355 L	2	1,400	1,200	1,600	1,500
	4	4,000	3,500	4,500	4,000
	6	4,500	4,000	6,000	5,000
	8	5,000	3,500	7,000	6,500

3. Design features

3.8. Terminal box design

The standard design has four basic versions:

- Ex db IIB
- Ex db IIC
- Ex eb IIB
- Ex eb IIC

On request we can supply:

- Additional terminal box for auxiliary terminals (figure 13)
- Motors without terminal box and with leads (figure 14)
- Bigger terminal box with capacitor for single phase motors (figure 15)

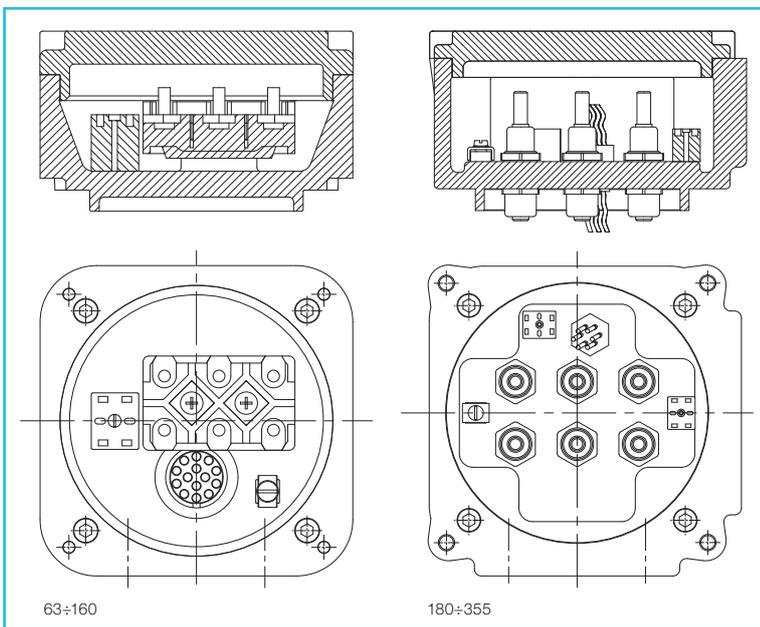


Figure 12 - Standard motor version terminal box Ex db, group IIB/ IIC(front)

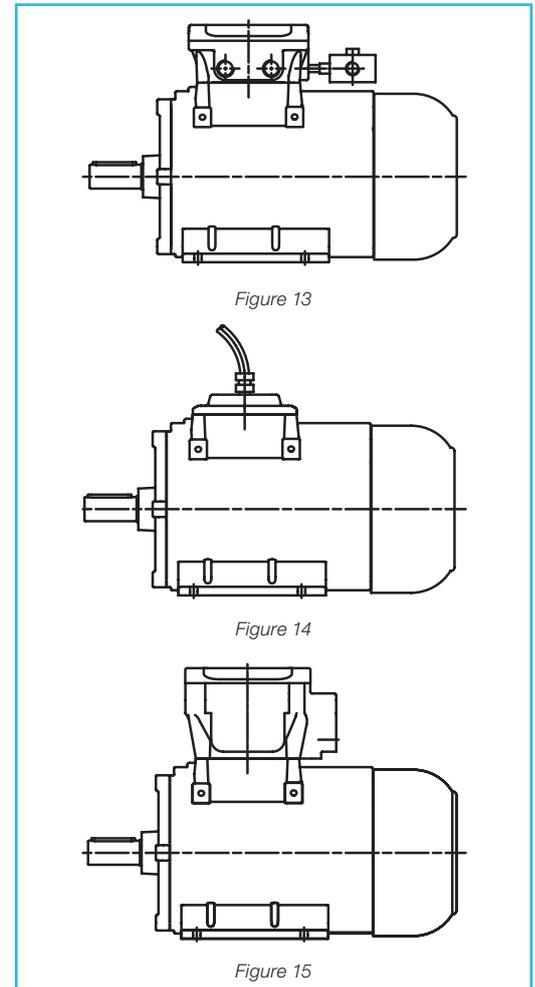


Figure 13

Figure 14

Figure 15

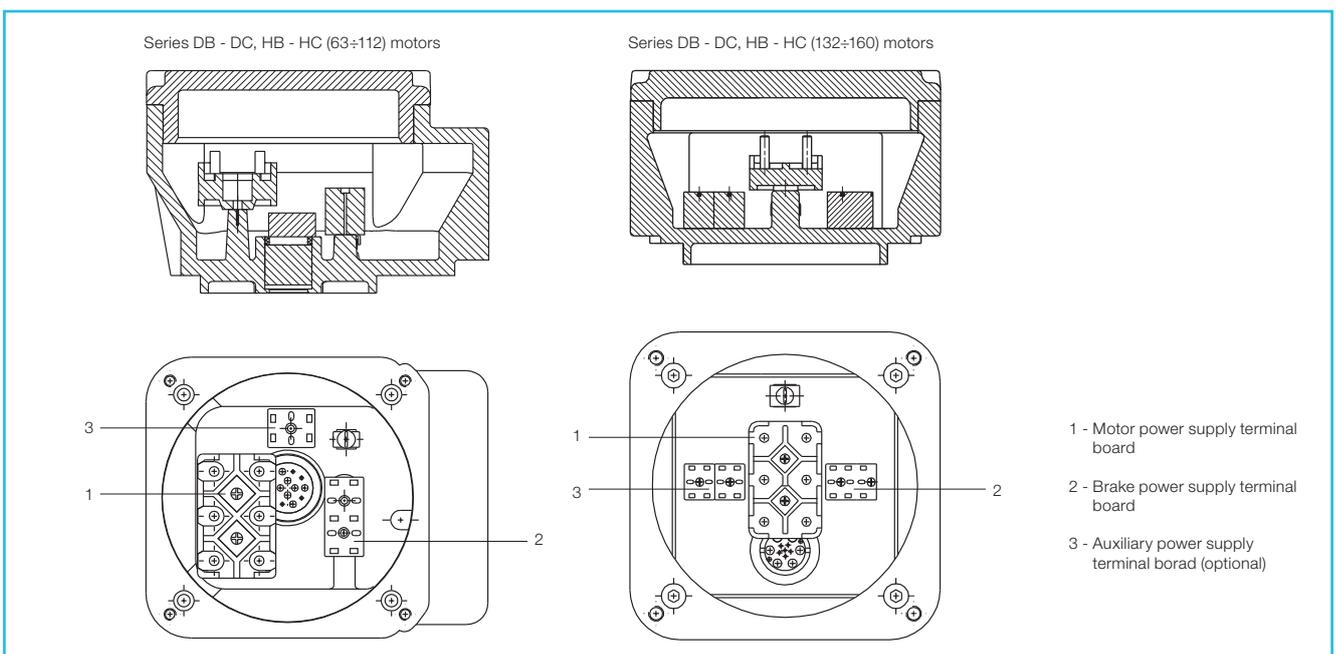


Figure 16 - Motor with brake terminal box

3. Design features

3.8. Terminal box design

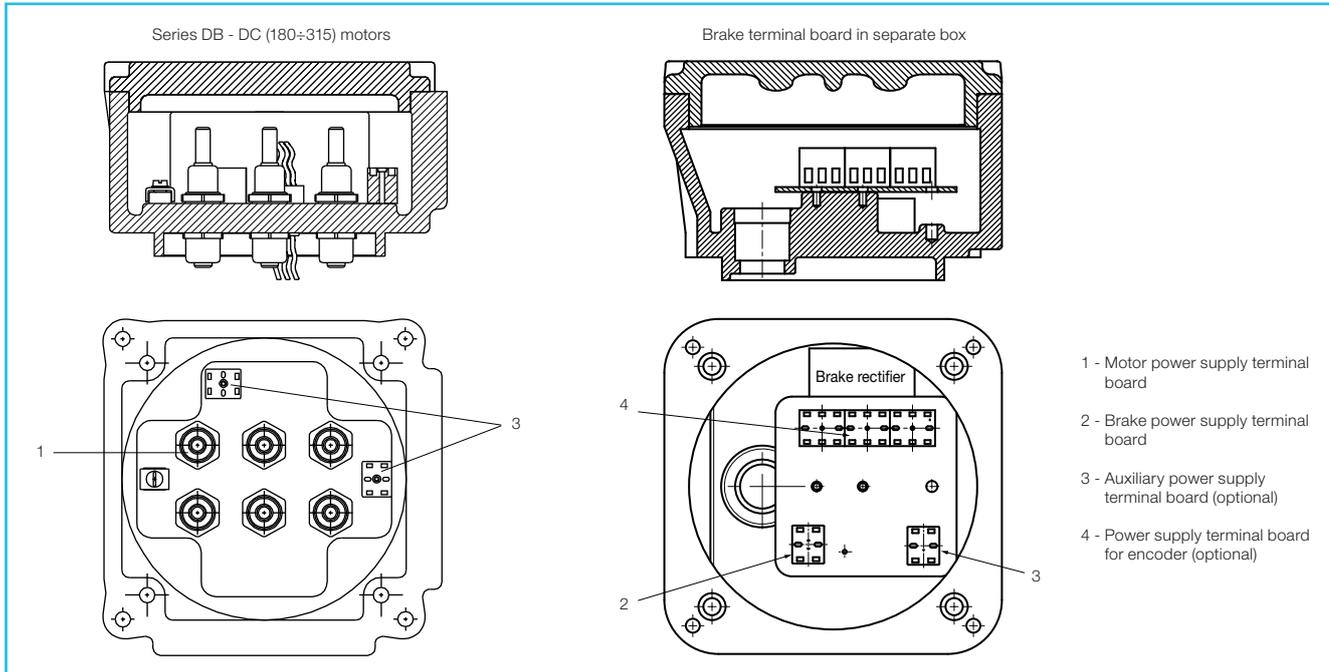


Figure 17 - Motor with brake terminal box

3.9. Position of terminal box and terminals

The terminal box is usually located on top and can be turned through $4 \times 90^\circ$ (figure 18). For a horizontal mounted motor, the cable entry is normally located on the right side (looking at the driving-end).

Cable entry:

- Standard position: 1
- Special positions upon request: 2, 3, 4

Terminals and earthing terminal

There are a maximum number of 6 power terminals in the terminal box. The type of monitoring device depends on the number of possible additional terminals in the main terminal box.

PTC thermistors can be connected to two additional terminals. Two terminals are also necessary for connecting the anticondensation heater.

For Pt-100 (RTD) thermistors, 3 or 4 terminals are necessary depending on the type chosen.

An earthing terminal is located in the terminal box and another earthing terminal is located on motor frame.

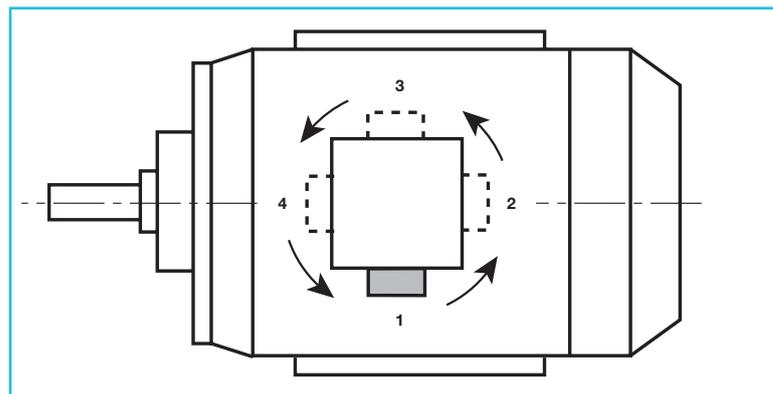


Figure 18 - Positioning of the cable entry, plan view

3.10. Cable-entries

As standard, the motors are delivered with one or two threaded cable entries for flameproof packing glands.

Ex db eb motors can be also provided with Ex eb packing glands.

Motors fitted with thermodetectors or heaters are always provided with additional cable entry.

Mains connection cable entries				
Frame size	Main power supply	Power supply from an inverter	Conical threading upon request ¹⁾	
			ANSI B 2.1	UNI 6125
63÷112	1 x M25	1x M25 + 1 x M20	NPT 3/4"	Gk 3/4"
132÷160	2 x M32	1 x M32 + 1 x M20	NPT 1"	Gk 1"
180÷250	2 x M40	1 x M40 + 1 x M20	NPT 1 1/4"	Gk 1 1/4"
280÷315	2 x M63	1 x M63 + 1 x M20	NPT 2"	Gk 2"
355	2 x M75	1 x M75 + 1 x M20	NPT 2 1/2"	Gk 2 1/2"
Auxiliaries cable entries				
63÷355	-	1 x M20	NPT 1/2"	Gk 1/2"

Note: 1) Other threads available upon request.

4. Electrical design

4.1. Standard operating conditions

Output

The rated outputs and operating characteristics given in the performance data according to IEC^{®1)} 60034-1 refer to:

- Continuous duty (S1)
- Frequency of 50 Hz
- Voltage 400 V (230 V for single-phase)
- Standard ambient temperature of -20/ +40 °C
- Maximum height of installation of 1,000 m above sea level

Premium Series (IE3, IE4) motors can operate at rated output up to 60 °C without derating.

Motors can also be operated in ambient temperatures up to 80 °C and at altitudes up to 4,000 m above sea level. In these cases, the rated output given in the tables must be reduced in accordance with figure 19 or a larger motor has to be chosen.

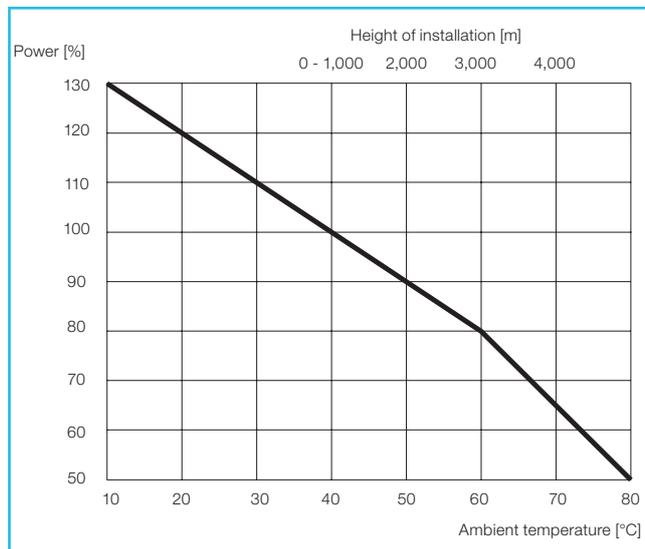


Figure 19 - Power variation of standard motors in case of coolant temperature different from 40 °C or height of installation over 1,000 m above sea-level

The rated data does not need to be changed, if at altitudes in excess of 1,000 m above sea level, the ambient temperature is reduced according to the following table:

Altitude of installation [m]	Maximum ambient temperature [°C]
0 to 1,000	40
1,000 to 2,000	30
2,000 to 3,000	19
3,000 to 4,000	9

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

Voltage and frequency

The motors as standard are built to run at the voltage and frequency with the tolerances indicated in figure 20.

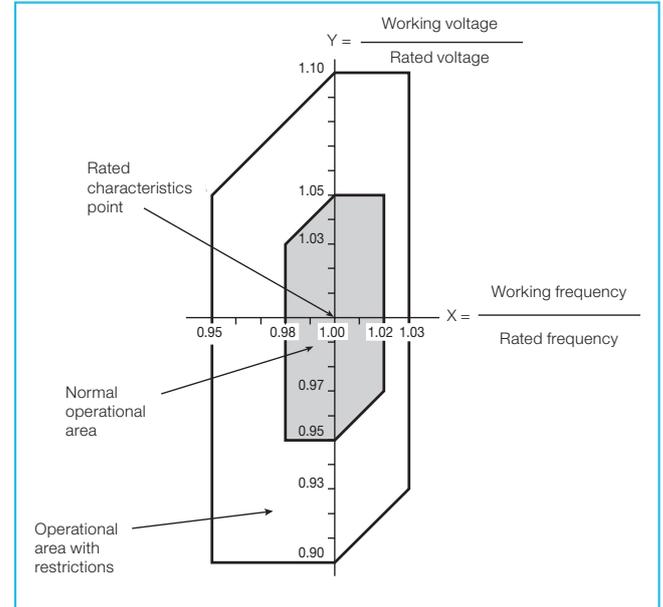


Figure 20

The motors can run with the variations envisaged in normal operational areas at a voltage of ±5% and frequency of ±2%. Furthermore, the motors can be used in the operational area with restrictions (variations in voltage of ±10% and frequency of ±3%) as long as the indications given by norm 60034-1 are complied with.

Torque

The motors are fitted with squirrel-cage rotors suitable for direct-on-line starting. The resulting starting and maximum torques, expressed as a multiple of the rated torques are given in the performance data.

A deviation in the voltage from the rated value changes the torques as an approximate function of the square of the voltages. Normally two-speed motors have a nominal torque that is roughly the same for both speeds.

A version is also available with quadratic-torque, for centrifugal machines (fans, pumps). In this case, the torque at the lower speed is roughly half that available at the higher speed.

Rated current

In the performance data the rated currents are only indicated for a rated voltage of 400 V.

For other voltages the rated currents are inversely proportional to the voltages:

$$\frac{U}{U'} = \frac{I'}{I}$$

This results in:

$$I' = \frac{U \cdot I}{U'}$$

4. Electrical design

4.1. Standard operating conditions

Speed

The rated speeds shown in the performance data are valid for 50 Hz and the rated speed equals synchronous speed less slip. The following speeds result from the number of poles and the mains frequencies of 50 and 60 Hz:

Pole number	No-load speed at	
	50 Hz [1/min]	60 Hz [1/min]
2	3,000	3,600
4	1,500	1,800
6	1,000	1,200
8	750	900
10	600	720
12	500	600
16	375	450

Direction of rotation

The motors can be operated in both directions of rotation. If the phases are connected in the sequence L1, L2, L3 to the terminals U1, V1, W1, the motor turns clockwise. The direction of rotation can be reversed by interchanging any two phases.

Note: regarding electro-magnetic compatibility, low voltage induction motors, if installed correctly and connected to the power supply, respect all immunity and emission limits as set out in the regulations relating to electro-magnetic compatibility (EMC "Generic Standard" for industrial environments).

In the case of supply by means of electronic impulse devices (inverters, soft starters etc.), all verifications and any modifications, necessary to ensure that emission and immunity limits, as stated within the regulations, are respected, are the responsibility of the installer.

Tolerances

According to IEC^{®1)} 60034-1 the electrical data stated in the tables are subject to the following tolerances:

Efficiency	
Pn ≤ 50 kW	- 0.15 (1-η)
Pn > 50 kW	- 0.10 (1η)
Power factor	$-\frac{1 - \cos \phi}{6}$
(minimum 0.02 - maximum 0.07)	
Slip at rated load operating temperature	±20% of rated slip
Locked rotor torque (starting torque)	-15% +25%
Maximum torque	-10%
Current with locked rotor	20% (no lower limit)

4.2. Efficiency and power factor at partial load

The efficiency and power factor values shown in the performance data refer to rated output at 50 Hz.

4.3. Insulation and temperature rise

Insulation

The components of the insulation system were selected so as to ensure good protection against chemically aggressive gases, vapours, dust, oil and air humidity. All materials used for insulating the winding and winding ends correspond to insulating classes F or H according to IEC 60085:

- Enamel-insulated copper wires with temperature index 200 (class H)
- Insulating sheet on polyester base (class F)
- Impregnation with fenolic resins modified with polyesther resins (class H)

Temperature rise

Standard single-speed motors in continuous service (excluding 315M) have temperature rises that are within the limits for class B. Motors with higher output and pole-changing motors normally have temperature rise within class F limit.

Table 28 - Limit temperature for insulating material according IEC 60085:

Insulation class	Limit temperature [°C]
B	130
F	155
H	180

Table 29 - Temperature rise limit for rotating machines according IEC 60034-1:

Insulation class	Max. temperature rise [K]
B	80
F	105
H	125

According to Normative IEC 60034-1, the values shown in the table above may be up to 10 °C higher, with a feeding current variance of ±5%.

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

4. Electrical design

4.4. Duty types

In compliance with IEC^{®1)} 60034-1 the following duty-types are distinguished:

Duty-type S1	Continuous running duty. Constant load operation.
Duty-type S2	Short-time duty.
	Operating times of 10, 30, 60, and 90 minutes are recommended.
	After each operating period the motor remains de-energized until the winding has cooled down to the ambient temperature.

Duty-type where start-ups DO NOT INFLUENCE winding over-heating:

Duty-type S3	Intermittent periodic duty.
	Where starting does not influence the temperature. Duty cycle 10 minutes unless otherwise agreed upon.
	For the cyclic duration factor the values 15, 25, 40, and 60% are recommended.
Duty-type S6	Continuous operation periodic duty.
	Duty cycle 10 minutes unless otherwise agreed upon.
	For the cyclic duration factor the value 15, 25, 40, and 60% are recommended.

Duty-types where starting and braking have a corresponding INFLUENCE on the temperature rise of the winding:

Duty-type S4	Intermittent periodic duty with starting. Intermittent periodical operation with identical cycles.
---------------------	---

For S4 duty-type the following details must be given after this code:

- Intermittence ratio
- The number of starts per hour
- Moment of inertia of the motor
- Moment of inertia of the load

Duty-type S9	Duty with non-periodical load and speed variations. Typical operation for motors powered by frequency converters. Constant load operation. CEMP [®] certification cover also duty-types S5, S7, S8.
---------------------	--

Most of the real duty-type conditions represent a combination of duty-types as mentioned under 1 and 2. In order to exactly determine a suitable motor, details of all the operating conditions are required.

Note: the output ratings stated in the "5. Performance data" apply to duty-type S1.

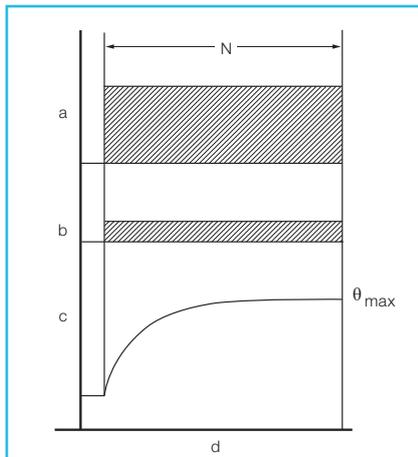


Figure 21 - Duty type S1

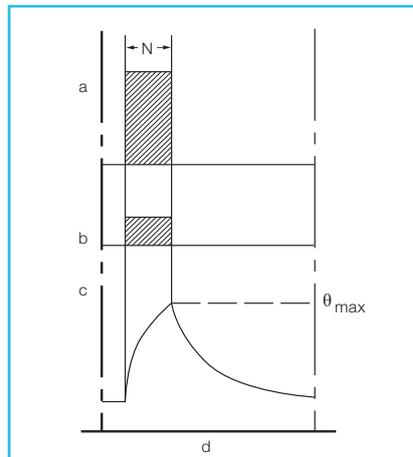


Figure 22 - Duty type S2

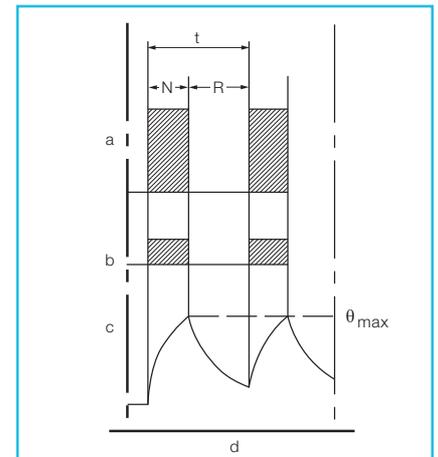


Figure 23 - Duty type S3

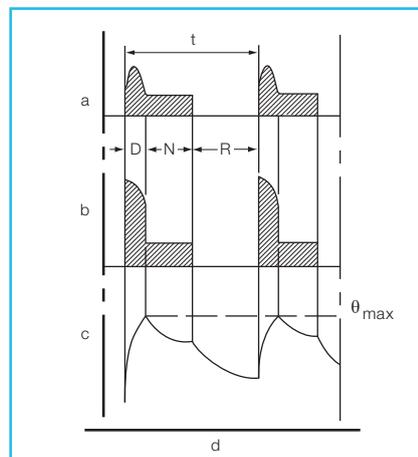


Figure 24 - Duty type S4

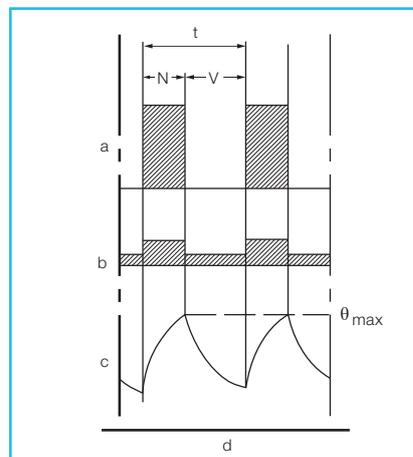


Figure 25 - Duty type S6

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

4. Electrical design

4.4. Duty types

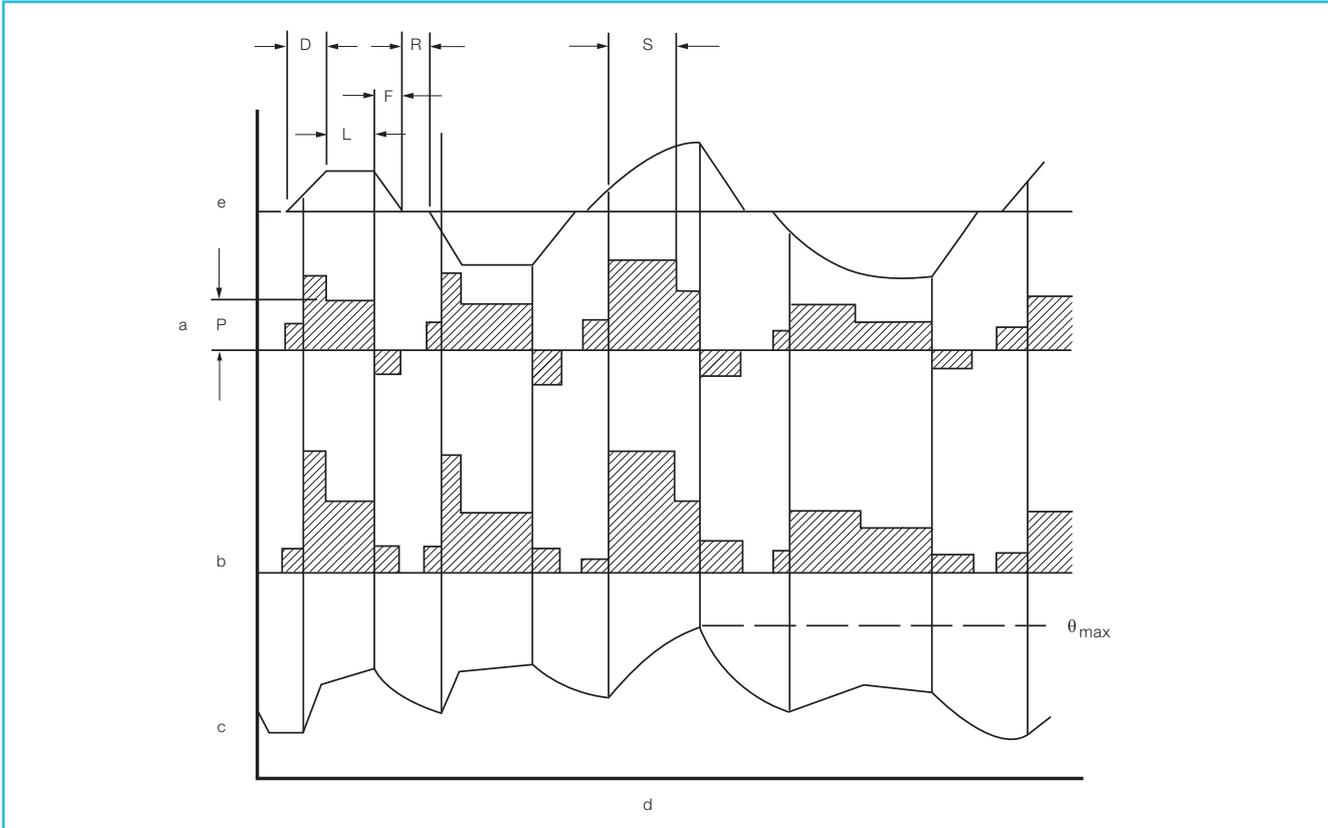


Figure 26 - Duty type S9

Table 30 - Simbology:

a	Load
b	Electrical losses
c	Temperature
d	Time
e	Speed
t	Cycle length
D	Start-up or acceleration time
F, F ₁ , F ₂	Electrical braking time
N, N ₁ , N ₂ , N ₃	Constant load operating time
L	Variable load operating time
V	No-load operating time
R	Rest time
S	Overload operating time
P	Full load
θ_{max}	Maximum temperature reached during cycle

4. Electrical design

4.5. Connecting diagrams

Three-phase motors

Single-speed motors are normally pre-arranged to be connected in star or delta method.

Star connection

Connecting together the W2, U2, V2 terminals (star point) and connecting to the mains the U1, V1, W1 terminals a star connection is obtained. The phase current I_{ph} and the phase voltage U_{ph} are the following:

$$I_{ph} = I_n$$

$$U_{ph} = U_n / \sqrt{3}$$

where I_n the line current and U_n is the line voltage.

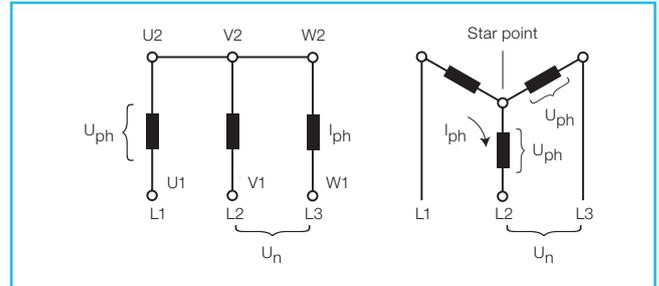


Figure 27

Delta connection

Connecting the end of each winding to the beginning of the next winding a delta connection is obtained. The phase current I_{ph} and the phase voltage U_{ph} are the following:

$$I_{ph} = I_n \sqrt{3}$$

$$U_{ph} = U_n$$

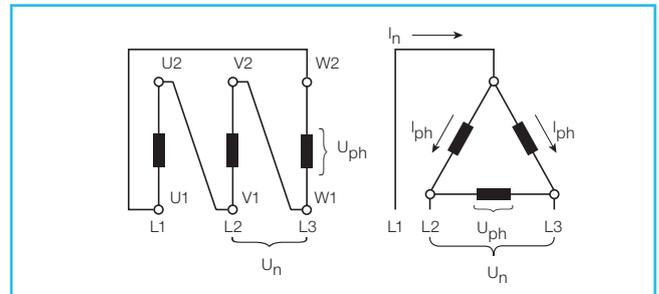


Figure 28

4. Electrical design

4.5. Connecting diagrams

Three-phase motors

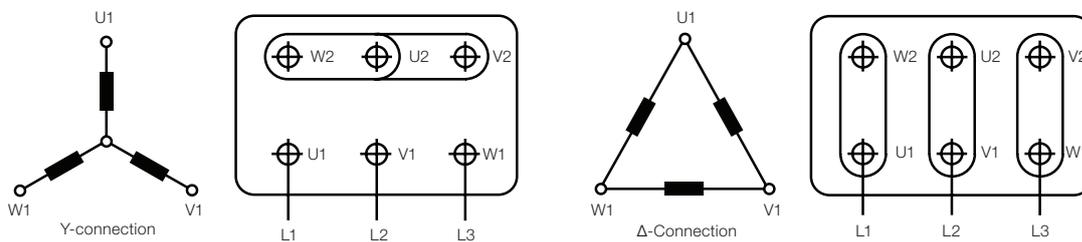
Star - Delta starting

The star-delta starting is an easy way to reduce the starting current and starting torque. Motors can be started with the star-delta starting method whenever the supply voltage correspond to the rated voltage of the motors in delta connections.

Two speed motors

Standard two speed motors are designed for only one rated voltage and for direct starting. When the speed ratio is 1/2 the standard motors have one winding (Dahlander connection). For other speed ratios the motors have two different windings.

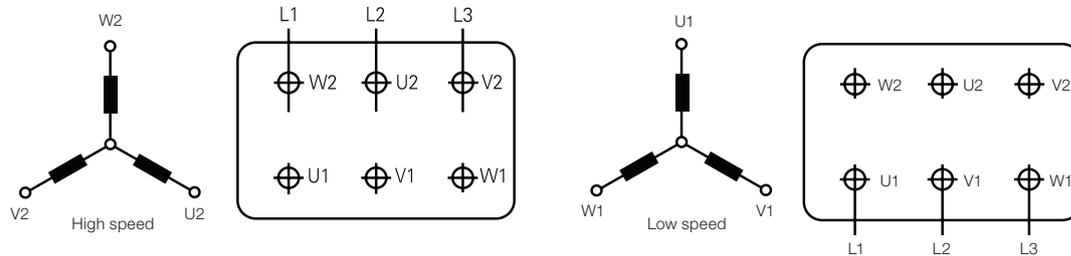
Connection for single speed motors:



Number of pole: 2, 4, 6, 8...

Synchronous speed at 50 Hz: 3,000, 1,500, 1,000, 750...

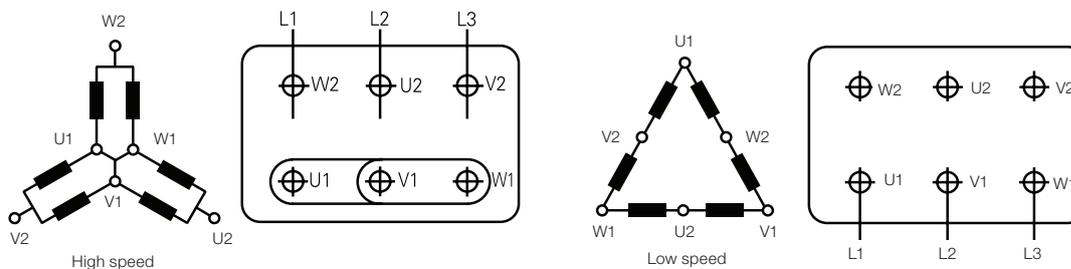
Two separate windings for two speed motors:



Number of pole: 2/6, 2/8, 4/6, 6/8.

Synchronous speed at 50 Hz: 3,000/1,000, 1,500/1,000, 1,000/750.

Dahlander system for two speed motors:



Number of pole: 2/4, 4/8...

Synchronous speed at 50 Hz: 3,000/1,500, 1,500/750.

Figure 29 - Three-phase motors connecting diagrams

4. Electrical design

4.5. Connecting diagrams

Single-phase motors

Single phase motors are designed for only one rated voltage.

They have two windings (starting and main winding) which have to be connected to the capacitor supplied with the motor. The sense of rotation can be reversed according to the connecting diagram.

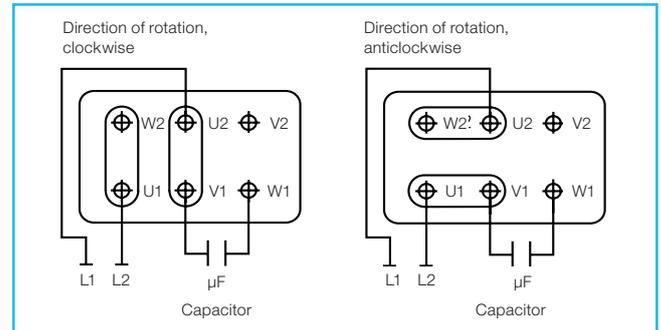


Figure 30 - Single-phase motors connecting diagram

4.6. Brake connection diagrams

Other connection diagrams between motor and brake are available, including a single power supply for motor and brake, or power supply on the same terminal board.

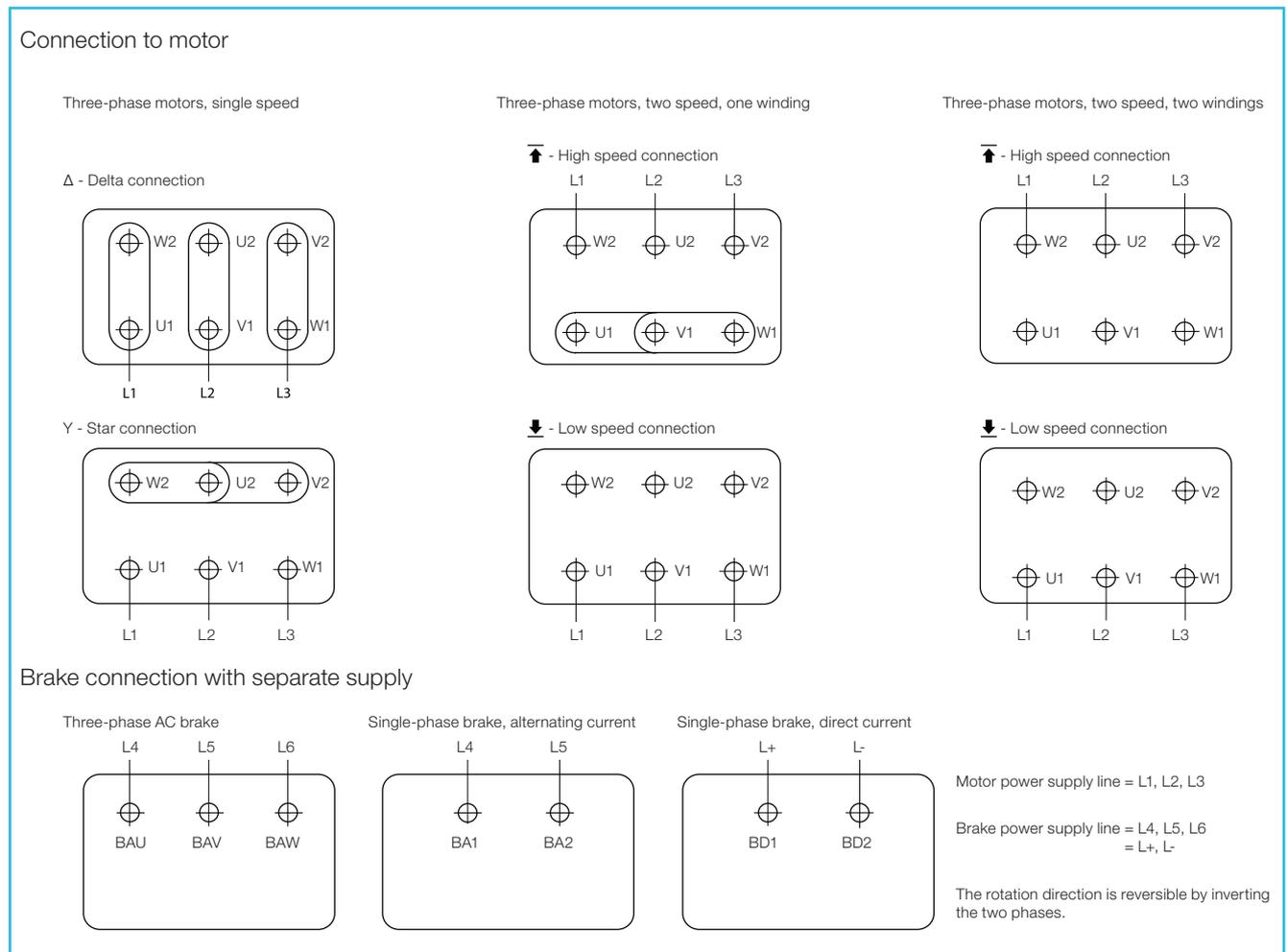


Figure 30 - Motor and brake connection diagrams

4.7. Hourly start-ups allowed (braking: n° per hour)

For motors with intermittent service, (S4) the start-ups per hour allowed depend on the service time and load characteristics, of which inertia is particularly influential. In general, as inertia increases the number of start-ups reduces.

The data given in the column for the “braking: n° per hour” in section 5. Performance data in this catalogue relate to operation with loads that have an inertia 1.5 times that of the motor.

4. Electrical design

4.8. Additional terminals marking (IEC^{®1}) 60034-8)

Motors having accessories are supplied with auxiliary terminal boards which bear the marking shown in table 31.

Table 31

Marking	N° terminals	Additional terminal for:
TP1 - TP2 (warning)	2	Thermistor PTC ¹⁾
TP3 - TP4 (switch off)		
R1 - R2 - R3 (I sensor)	3	Thermistor Pt-100 with 3 wires
R4 - R5 - R6 (II sensor)		
R7 - R8 - R9 (III sensor)		
R11 - R12 - R13 (DE)	3	Thermistor Pt-100 on bearing
R21 - R22 - R23 (NDE)		
TB1 - TB2 (warning)	2	Normally closed bi-metallic switch ²⁾
TB3 - TB4 (switch off)		
TB8 - TB9 (switch off)	2	Normally closed brake bi-metallic switch ²⁾
TM1 - TM2 (warning)	2	Normally open bi-metallic switch ²⁾
TM3 - TM4 (switch off)		
HE1 - HE2	2	Space heaters
U1 - U2	2	Single-phase forced ventilation
U - V - W	2	Three-phase forced ventilation
Colours according manufacturer diagram	9	Encoder
CA1 - CA2	2	Capacitor
PE	1	Earth cable

Notes: 1) $U_{rated} = 6V - max\ 30\ V$.

2) $U_{rated} = 250\ V$.

4.9. Protection devices

In order to protect the winding of a three-phase induction motor against thermal overloads, resulting in example from overloading and operation with only two phases, one of the following devices can be provided:

Bimetallic type device

It consists of 2 motor protectors connected in series. The contact is normally closed; the disc opens when the windings temperature reaches limits dangerous for the insulation system. On request, normally open device are available.

PTC temperature sensor (thermistors)

It consists of 3 sensors connected in series embedded in stator windings. Once it reaches the operating temperature, this device quickly changes the resistance; it must be connected to a suitable releasing device (supplied only on request).

Pt-100 (RTD) thermometric resistors (from size 132 and above)

The resistance value of this device varies according to the windings temperature. They are particularly suitable for a continuous survey of the windings temperature. For a good survey, at least two sets of Pt-100 are requested; they must be connected to their proper monitoring equipment (supplied only on request).

PTC and Pt-100 also offer reliable protection for operating modes other than continuous operation, e. g. short-time operation, switching operation, longtime start-up as well as for reduced cooling air flow rates and high ambient temperatures.

Motors for operation with frequency converter are always supplied with PTC thermistor temperature detectors. Above devices have their proper terminal block located inside main box. Upon request also available with separate terminal box.

Note: 1) IEC is a trademark of International Electrotechnical Commission and is not owned or controlled by WEG.

4. Electrical design

4.10. Frequency converter driven motors

Cemp® VFD motors are certified for use with all types of variable speed drives, following inverter nameplate and Safety Instructions.

Chapter 5.8. lists the electrical data in different working conditions.

When using a squirrel cage motor with a frequency converter, the following points must be taken into account in addition to the general selection criteria:

The voltage (or current) fed by the frequency converter is not purely sinusoidal. As a result it may increase the losses, vibration, and noise of the motor. Furthermore, a change in the distribution of the losses may affect the motor temperature balance.
In every case, the motor must be correctly sized according to the instructions supplied with the selected frequency converter and with our technical data.
In a frequency converter drive the actual operating speed of the motor may deviate considerably from its rated speed.
For higher speeds it must be ensured that the highest permissible speed of rotation of the motor, or the critical speed of the entire equipment, is not exceeded. In addition, bearing lubrication and any ventilation noise suppression arrangements will require special attention.
The torque values shown in this catalogue for motors with constant torque at frequencies over 60 Hz can be stably supplied only if the motor has a delta connection.
For example, to stably achieve these values from a 230/400 V 50 Hz winding motor with a 400 V 50 Hz mains voltage supply, the motor must have a delta connection and, consequently, the inverter must be configured so that at 50 Hz it supplies a voltage of 230 V.
Vice-versa, with a star connection, the values listed can be supplied only for very short periods.
Operating periods at a speed above 3,600 1/min must never exceed 10% of the entire work cycle of the motor to ensure the bearings last accordingly.
If the rated voltage is 500 V or if there is a long feeding cable between the motor and the frequency converter, the insulation of the motor must be reinforced because of the occurring voltage peaks.

A correct earthing of the motor and the driven equipment is also important to avoid bearing currents and voltages.



*Notes: The features of motors for use in constant torque and those for use in quadratic-torque are indicated in section 5.8.
The reference torque value (Mn) is the value indicated in the tables in section 5.1.*

5. Performance data

5.1. Three-phase motors, 1 speed, rated data at 400 V 50 Hz DOL start

Three-phase motors			1	Speed	3,000	rpm						Brake							
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Max. torque	Noise level		Moment of inertia	Mass	Mass	Torque		Power	Braking: n° per hour	Total inertia
	P _n [kW]	n [1/min]	I _n [A]	η [%]	cos φ	M _n [Nm]	I _s /I _n	M _s /M _n	M _m /M _n	[dB(A)]		J ▼ [kgm ²]	m [kg]	m [kg]	[Nm]		[VA/W]	[max. n.]	[kgm ²]
										Lw	Lp				S1	S4			
63 A 2	0.18	2,900	0.80	67.0	0.49	0.59	5.0	6.00	6.30	60	52	0.0001	16	22	3	4	40	240	0.00015
63 B 2	0.25	2,858	0.85	70.1	0.60	0.84	4.7	4.30	3.70	60	52	0.0001	16	22	3	4	40	240	0.00015
71 A 2	0.37	2,770	0.95	69.0	0.83	1.27	4.2	2.60	2.70	66	58	0.0004	19	29	6	9	50	240	0.00082
71 B 2	0.55	2,830	1.35	74.9	0.79	1.86	5.3	2.40	2.70	66	58	0.0004	19	29	6	9	50	240	0.00082
80 A 2	0.75	2,800	1.84	74.5	0.79	2.56	4.9	2.58	2.90	70	62	0.0006	26	36	12	17	60	240	0.00140
80 B 2	1.10	2,845	2.68	77.0	0.77	3.69	5.3	3.00	2.90	70	62	0.0008	26	36	12	17	60	240	0.00160
90 S 2	1.50	2,845	3.26	79.0	0.84	5.04	5.4	2.60	2.50	77	69	0.0012	33	52	25	35	140	240	0.00230
90 L 2	2.20	2,820	4.53	80.5	0.87	7.44	6.0	2.37	2.95	77	69	0.0015	33	52	25	35	140	240	0.00260
100 LA 2	3.00	2,910	6.64	82.5	0.79	9.85	7.5	3.20	3.40	80	72	0.0029	46	62	34	48	180	240	0.00422
112 M 2	4.00	2,900	8.00	84.2	0.86	13.17	6.8	2.00	2.50	80	72	0.0074	65	100	50	70	250	240	0.00959
132 SA 2	5.50	2,905	10.90	85.0	0.86	18.07	6.5	2.80	2.90	81	73	0.0124	95	124	60	90	400	236	0.01648
132 SB 2	7.50	2,925	14.80	86.0	0.85	24.48	6.4	2.51	3.00	83	75	0.0150	95	124	60	90	400	236	0.01908
132 MB 2	9.20	2,934	17.30	88.1	0.87	29.95	7.5	2.80	3.00	83	75	0.0178	105	134	60	90	400	236	0.02188
132 ML 2	11.00	2,930	21.20	89.3	0.84	35.85	6.6	2.80	3.09	83	75	0.0216	105	134	60	90	400	236	0.02568
160 MA 2	11.00	2,930	20.00	89.0	0.89	35.85	6.6	2.50	2.80	84	76	0.0360	180	217	90	130	480	136	0.04101
160 MB 2	15.00	2,950	26.80	89.7	0.90	48.56	7.0	2.90	3.00	84	76	0.0463	180	217	90	130	480	136	0.05131
160 L 2	18.50	2,930	33.00	89.8	0.90	60.30	7.0	2.80	3.00	84	76	0.0534	195	230	90	130	480	136	0.05841
180 M 2	22.00	2,945	39.00	90.6	0.90	71.35	7.5	2.80	2.70	83	74	0.0818	230	-	-	-	-	-	-
200 LA 2	30.00	2,975	54.00	91.6	0.88	96.29	8.5	3.50	2.70	87	77	0.1625	285	-	-	-	-	-	-
200 LB 2	37.00	2,975	65.00	91.8	0.90	118.72	7.9	2.80	2.50	87	77	0.1947	305	-	-	-	-	-	-
225 M 2	45.00	2,975	79.00	92.3	0.89	144.42	9.0	2.60	3.00	89	79	0.2902	385	-	-	-	-	-	-
250 M 2	55.00	2,980	95.00	92.5	0.90	176.24	7.5	2.50	2.80	90	79	0.4197	505	-	-	-	-	-	-
280 S 2	75.00	2,982	134.00	93.2	0.87	240.11	7.5	2.70	3.30	88	76	0.5200	842	-	-	-	-	-	-
280 M 2	90.00	2,985	160.00	93.0	0.88	287.93	9.0	3.10	3.80	88	76	0.6300	881	-	-	-	-	-	-
315 S 2	110.00	2,980	191.40	93.3	0.89	352.40	8.3	3.00	3.30	90	76	0.7000	932	-	-	-	-	-	-
315 M 2	132.00	2,970	228.00	93.0	0.90	424.00	7.9	2.50	3.30	90	76	0.7500	948	-	-	-	-	-	-
315 LA 2	132.00	2,984	222.00	94.0	0.92	422.47	7.0	2.00	2.30	99	85	1.8800	1,340	-	-	-	-	-	-
315 LB 2	160.00	2,984	268.50	94.5	0.91	512.21	7.0	1.65	2.00	99	85	2.2500	1,430	-	-	-	-	-	-
315 LC 2	200.00	2,980	336.00	94.5	0.91	640.72	7.3	1.70	2.00	99	85	2.7900	1,550	-	-	-	-	-	-

► I'n = I_n · 400 / U' (I'n = current at U' Volt); ▼ J = PD² / 4

5. Performance data

5.1. Three-phase motors, 1 speed, rated data at 400 V 50 Hz DOL start

Three-phase motors			1	Speed	1,500	rpm						Brake							
Motor type	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M _{ov} /M _n	Noise level [dB(A)]		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque [Nm]		Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
										Lw	Lp				S1	S4			
63 A 4	0.12	1,400	0.62	57.60	0.50	0.82	4.5	3.6	3.80	52	44	0.0002	16	22	3	4	40	240	0.00025
63 B 4	0.18	1,340	0.67	61.50	0.62	1.28	4.2	2.3	2.53	52	44	0.0002	16	22	3	4	40	240	0.00025
71 A 4	0.25	1,372	0.80	60.00	0.74	1.72	3.0	2.2	2.60	56	48	0.0006	19	29	6	9	50	240	0.00102
71 B 4	0.37	1,390	1.10	69.00	0.72	2.53	3.5	2.2	2.76	56	48	0.0009	19	29	6	9	50	240	0.00132
80 A 4	0.55	1,380	1.60	69.00	0.71	3.86	4.0	2.3	2.50	59	51	0.0009	26	36	12	17	60	240	0.00170
80 B 4	0.75	1,390	2.06	73.00	0.72	5.15	4.0	2.3	2.60	59	51	0.0013	26	36	12	17	60	240	0.00210
90 S 4	1.10	1,420	2.80	76.30	0.74	7.38	5.0	2.5	3.00	62	54	0.0020	33	52	25	35	140	240	0.00310
90 L 4	1.50	1,400	3.54	77.50	0.79	10.22	5.0	2.3	2.50	62	54	0.0026	33	52	25	35	140	240	0.00370
100 LA 4	2.20	1,427	5.15	80.50	0.77	14.72	5.0	2.5	2.60	63	55	0.0043	46	62	34	48	180	240	0.00562
100 LB 4	3.00	1,436	7.07	81.70	0.75	19.95	4.8	2.4	3.10	63	55	0.0053	46	62	34	48	180	240	0.00662
112 M 4	4.00	1,440	9.01	83.60	0.76	26.49	7.0	2.9	3.20	68	60	0.0103	65	100	50	70	250	240	0.01249
132 SB 4	5.50	1,455	11.90	87.00	0.77	36.11	6.3	2.4	2.80	72	64	0.0250	95	134	60	90	400	240	0.02908
132 MB 4	7.50	1,460	17.20	86.30	0.73	49.05	5.8	2.7	3.40	75	67	0.0324	95	134	60	90	400	240	0.03648
132 ML 4	8.80	1,455	18.50	87.00	0.79	57.77	6.8	2.5	3.51	75	67	0.0405	105	134	60	90	400	240	0.04458
160 MB 4	11.00	1,465	22.90	89.00	0.78	71.66	6.2	2.5	3.00	77	69	0.0627	180	217	90	130	480	240	0.06771
160 L 4	15.00	1,470	31.40	89.50	0.77	97.42	5.9	2.5	2.99	77	69	0.0801	195	217	90	130	480	240	0.08511
180 M 4	18.50	1,470	39.00	89.80	0.76	120.23	6.0	3.2	3.00	79	70	0.1236	230	420	300	400	140	150	0.13560
180 L 4	22.00	1,470	44.00	91.00	0.79	142.90	7.0	2.3	2.50	79	70	0.1493	245	435	300	400	140	150	0.16130
200 LB 4	30.00	1,470	54.00	91.20	0.88	194.91	6.5	2.5	2.90	82	72	0.2456	305	495	300	400	140	150	0.25760
225 S 4	37.00	1,480	69.00	91.70	0.84	238.68	7.1	2.7	3.00	84	73	0.3737	360	710	600	800	140	150	0.38570
225 M 4	45.00	1,480	85.00	92.50	0.83	290.30	6.2	2.4	2.80	84	73	0.4479	385	750	600	800	140	150	0.45990
250 M 4	55.00	1,485	97.00	92.90	0.88	353.77	7.2	2.9	2.90	86	75	0.7673	540	835	600	800	140	100	0.77930
280 S 4	75.00	1,480	136.00	93.00	0.86	483.95	6.3	2.2	2.40	82	70	0.9500	875	1,170	600	800	140	100	0.96200
280 M 4	90.00	1,485	163.00	93.00	0.86	578.00	7.3	3.0	3.10	82	70	1.1200	901	1,196	600	800	140	100	1.13200
315 S 4	110.00	1,488	198.50	94.00	0.85	706.40	8.3	3.2	3.49	85	71	1.2700	971	1,266	600	800	140	100	1.34200
315 LA 4	132.00	1,488	240.50	94.10	0.84	847.01	7.2	1.9	1.90	90	76	3.7200	1,190	1,485	600	800	140	100	3.79200
315 LB 4	160.00	1,488	286.50	94.00	0.86	1,026.88	7.1	2.0	2.10	90	76	4.1100	1,455	1,750	600	800	140	100	4.18200
315 LC 4	200.00	1,494	364.00	95.00	0.84	1,278.43	8.8	2.0	2.10	90	76	5.2100	1,640	1,935	600	800	140	100	5.28200

► $I'_n = I_n \cdot \frac{400}{U}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.1. Three-phase motors, 1 speed, rated data at 400 V 50 Hz DOL start

Three-phase motors			1	Speed	1,000	rpm						Brake										
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Max. torque	Noise level		Moment of inertia	Mass	Mass	Torque		Power	Braking: n° per hour	Total inertia			
										Lw	Lp				J▼	m				m	[Nm]	
																					S1	S4
63 B 6	0.09	850	0.65	38.00	0.52	0.99	2.0	2.3	2.20	48	40	0.0002	16	22	3	4	40	240	0.00025			
71 A 6	0.18	945	0.92	55.00	0.51	1.82	3.7	3.7	3.70	50	42	0.0007	19	29	6	9	50	240	0.00112			
71 B 6	0.26	918	1.00	60.00	0.63	2.71	3.4	2.6	2.60	50	42	0.0010	19	29	6	9	50	240	0.00142			
80 A 6	0.37	930	1.60	58.00	0.58	3.80	3.1	2.9	3.20	53	45	0.0022	26	36	12	17	60	240	0.00300			
80 B 6	0.55	930	1.80	70.00	0.65	5.79	2.8	2.0	2.10	53	45	0.0027	26	36	12	17	60	240	0.00350			
90 S 6	0.75	910	2.20	70.00	0.71	7.85	3.0	1.8	2.10	54	46	0.0034	33	52	25	35	140	240	0.00450			
90 L 6	1.10	935	3.35	73.00	0.65	11.21	3.4	2.0	2.15	54	46	0.0049	33	52	25	35	140	240	0.00600			
100 LB 6	1.50	950	3.80	76.00	0.75	15.11	4.2	2.0	2.30	63	55	0.0088	46	62	34	48	180	240	0.01012			
112 M 6	2.20	960	6.11	80.00	0.65	21.84	5.2	2.3	2.09	65	57	0.0172	65	100	50	70	250	240	0.01939			
132 SB 6	3.00	950	7.50	80.00	0.72	30.16	5.8	1.5	1.68	68	60	0.0323	95	134	60	90	400	240	0.03638			
132 MB 6	4.00	970	9.50	81.40	0.75	39.38	6.1	1.7	1.90	68	60	0.0395	95	134	60	90	400	240	0.04358			
132 ML 6	5.50	960	12.30	84.00	0.77	54.69	4.7	1.8	2.00	68	60	0.0506	105	134	60	90	400	240	0.05468			
160 MB 6	7.50	950	15.70	85.00	0.81	75.33	4.8	2.1	2.14	72	64	0.0919	180	217	90	130	480	240	0.09691			
160 L 6	11.00	950	21.50	87.00	0.85	110.57	6.2	1.7	2.00	72	64	0.1218	195	217	90	130	480	240	0.12681			
180 L 6	15.00	960	29.00	88.00	0.86	149.20	5.3	2.1	2.73	76	67	0.2263	245	435	300	400	140	150	0.23830			
200 LA 6	18.50	975	38.25	90.30	0.77	181.21	5.9	1.6	2.10	79	69	0.2986	295	490	300	400	140	150	0.31060			
200 LB 6	22.00	980	45.00	90.50	0.78	214.35	6.0	1.6	1.60	79	69	0.3064	305	515	300	400	140	150	0.31840			
225 M 6	30.00	985	61.20	91.00	0.78	290.86	5.8	2.0	2.50	81	70	0.7617	385	750	600	800	140	150	0.77370			
250 M 6	37.00	990	73.35	91.80	0.79	356.91	6.7	2.0	2.41	81	70	1.0475	520	813	600	800	140	150	1.05950			
250 ML 6	45.00	988	93.60	93.00	0.75	434.60	8.6	3.0	1.90	81	70	1.2300	590	905	600	800	140	150	1.24200			
280 S 6	45.00	982	90.50	89.00	0.80	436.29	4.9	2.5	2.80	77	65	1.1400	858	1,153	600	800	140	150	1.15200			
280 M 6	55.00	980	109.00	91.00	0.81	535.00	4.7	2.3	2.40	77	65	1.3600	894	1,189	600	800	140	150	1.37200			
315 S 6	75.00	990	151.80	93.20	0.77	722.51	6.1	2.2	2.40	79	65	1.6300	974	1,269	600	800	140	150	1.84200			
315 LA 6	90.00	992	171.80	93.00	0.82	865.31	6.8	1.7	1.85	84	70	5.7300	1,370	1,665	600	800	140	150	5.94200			
315 LB 6	110.00	992	184.50	94.00	0.91	1,058.91	8.6	1.2	1.70	84	70	6.9400	1,450	1,745	600	800	140	150	7.15200			
315 LC 6	132.00	995	243.00	94.00	0.83	1,264.00	5.3	2.1	2.10	84	70	8.4500	1,520	1,815	600	800	140	150	8.66200			

► $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.1. Three-phase motors, 1 speed, rated data at 400 V 50 Hz DOL start

Three-phase motors			1	Speed		750	rpm					Brake							
Motor type	Rated output P_n [kW]	Speed n [1/min]	Current I_n [A]	Efficiency η [%]	Power factor $\cos\phi$	Torque M_n [Nm]	Starting current I_s/I_n	Starting torque M_s/M_n	Max. torque M_m/M_n	Noise level		Moment of inertia $J \blacktriangledown$ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque		Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
										[dB(A)]					[Nm]				
										Lw	Lp				S1	S4			
63 B 8	0.05	590	0.45	27.00	0.60	0.79	1.60	1.6	1.8	47	39	0.0002	16	22	3	4	40	240	0.00025
71 B 8	0.12	600	0.76	38.00	0.75	2.54	2.10	1.3	1.5	48	40	0.0010	19	29	6	9	50	240	0.00142
80 A 8	0.18	707	1.34	38.00	0.51	2.43	3.10	1.9	2.0	49	41	0.0022	26	36	12	17	60	240	0.00300
80 B 8	0.25	690	1.39	43.40	0.60	3.53	3.30	1.4	1.7	49	41	0.0027	26	36	12	17	60	240	0.00350
90 S 8	0.37	680	1.95	49.70	0.55	5.20	2.20	1.5	1.8	53	45	0.0034	33	52	25	35	140	240	0.00450
90 L 8	0.55	680	2.72	56.10	0.52	7.73	2.10	1.5	1.8	53	45	490.000	33	52	25	35	140	240	0.00600
100 LA 8	0.75	700	3.10	61.20	0.57	10.20	2.60	2.0	2.2	60	52	0.0088	46	62	34	48	180	240	0.01012
100 LB 8	1.10	675	3.51	66.50	0.68	15.50	2.70	1.8	2.2	60	52	0.0088	46	62	34	48	180	240	0.01012
112 M 8	1.50	720	4.74	70.20	0.65	20.00	4.10	1.9	2.2	62	54	0.0172	65	100	50	70	250	240	0.01939
132 SB 8	2.20	720	6.48	74.20	0.66	29.20	4.00	1.8	2.3	66	58	0.0323	95	134	60	90	400	240	0.03638
132 MB 8	3.00	720	8.93	77.00	0.63	40.25	3.90	1.7	2.3	66	58	0.0506	105	134	60	90	400	240	0.05468
160 MA 8	4.00	718	10.41	79.20	0.70	53.20	4.50	2.3	2.6	70	62	0.0919	180	217	90	130	480	240	0.09691
160 MB 8	5.50	725	12.67	81.40	0.77	73.00	3.90	2.2	2.5	70	62	0.0919	180	217	90	130	480	240	0.12681
160 L 8	7.50	720	16.92	83.10	0.77	99.50	4.20	2.4	2.8	70	62	0.1218	195	217	90	130	480	240	0.15671
180 L 8	11.00	720	23.64	85.00	0.79	146.40	5.70	2.2	2.4	73	64	0.2791	245	435	300	400	140	150	0.29110
200 LB 8	15.00	735	35.88	86.20	0.70	196.00	5.30	1.6	2.1	75	65	0.4595	305	495	300	400	140	150	0.47150
225 S 8	18.50	735	42.68	86.90	0.72	240.33	5.80	2.4	2.7	79	68	0.6337	360	710	600	800	140	150	0.64570
225 M 8	22.00	730	45.99	87.40	0.79	288.00	5.00	2.1	2.3	79	68	0.7617	385	750	600	800	140	150	0.77370
250 M 8	30.00	740	64.52	88.30	0.76	386.90	6.20	1.8	2.2	79	68	1.2961	550	840	600	800	140	150	130.810
280 S 8	37.00	730	69.93	88.80	0.86	492.30	5.50	1.9	2.5	72	60	1.5100	875	1,170	600	800	140	150	152.200
280 M 8	45.00	739	87.73	89.20	0.83	581.53	5.30	1.4	1.9	72	60	1.7900	901	1,196	600	800	140	150	180.200
315 S 8	55.00	742	119.60	89.70	0.74	707.88	8.70	2.7	2.9	75	61	1.9900	965	1,260	600	800	140	150	219.200
315 LA 8	75.00	740	155.69	90.30	0.77	709.53	6.60	1.7	2.0	77	63	5.7300	1,330	1,625	600	800	140	150	594.200
315 LB 8	90.00	744	170.50	90.70	0.84	1,164.00	6.40	1.7	2.5	77	63	6.9400	1,470	1,765	600	800	140	150	715.200
315 LC 8	110.00	743	207.48	91.10	0.84	1,414.00	6.40	1.7	2.7	77	63	8.4500	1,590	1,885	600	800	140	150	866.200

► $I'_n = I_n \cdot \frac{400}{U}$ (I'_n = current at U' Volt); $\blacktriangledown J = \frac{PD^2}{4}$

5. Performance data

5.2. Three-phase motors, 1 speed IE2 rated data at 400 V 50 Hz DOL start

Three-phase motors IE2				1	Speed	3,000	rpm						Brake						
Motor type	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ _v	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M _m /M _n	Noise level		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque		Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
										[dB(A)]					[Nm]				
										Lw	Lp				S1	S4			
63 A 2	0.18	2,900	0.78	67.4	0.49	0.59	5.1	4.8	4.8	60	52	0.0001	16	22	3	4	40	240	0.00015
63 B 2	0.25	2,858	0.93	64.8	0.60	0.84	4.3	4.3	4.5	60	52	0.0001	16	22	3	4	40	240	0.00015
71 A 2	0.37	2,872	1.04	69.5	0.74	1.23	4.7	2.5	2.7	66	58	0.0004	19	29	6	9	50	240	0.00082
71 B 2	0.55	2,856	1.39	74.1	0.77	1.84	5.9	3.6	3.7	66	58	0.0004	19	29	6	9	50	240	0.00082
80 A 2	0.75	2,847	1.80	77.4	0.78	2.52	5.7	2.4	2.6	70	62	0.0006	26	36	12	17	60	240	0.00140
80 B 2	1.10	2,830	2.50	79.6	0.80	3.71	5.8	3.7	2.5	70	62	0.0008	26	36	12	17	60	240	0.00160
90 S 2	1.50	2,880	3.30	81.3	0.81	4.97	6.4	2.7	2.6	77	69	0.0012	33	52	25	35	140	240	0.00230
90 L 2	2.20	2,880	4.80	83.2	0.80	7.29	7.1	3.2	4.0	77	69	0.0015	33	52	25	35	140	240	0.00260
100 LA 2	3.00	2,905	6.45	84.6	0.79	9.85	7.8	3.2	3.4	80	72	0.0029	46	62	34	48	180	240	0.00422
112 M 2	4.00	2,900	7.75	85.8	0.87	13.16	7.6	2.7	3.4	80	72	0.0074	65	100	50	70	250	240	0.00959
132 SA 2	5.50	2,920	10.55	87.0	0.87	17.98	7.2	2.8	2.9	81	73	0.0124	95	124	60	90	400	236	0.01648
132 MB 2	7.50	2,920	14.45	88.1	0.85	24.51	7.3	3.0	3.6	83	75	0.0150	95	124	60	90	400	236	0.01908
160 MA 2	11.00	2,935	19.90	89.4	0.89	35.79	6.9	3.4	3.8	84	76	0.0360	180	217	90	130	480	136	0.04101
160 MB 2	15.00	2,945	26.65	90.3	0.90	48.62	7.6	3.4	3.5	84	76	0.0463	180	217	90	130	480	136	0.05131
160 L 2	18.50	2,930	32.30	90.9	0.91	60.24	5.5	3.0	3.2	84	76	0.0534	195	230	90	130	480	136	0.05841
180 M 2	22.00	2,952	38.30	91.3	0.90	71.15	9.2	3.0	2.9	83	74	0.0818	230	-	-	-	-	-	-
200 LA 2	30.00	2,970	51.25	92.0	0.92	96.42	9.3	3.7	3.0	87	77	0.1625	285	-	-	-	-	-	-
200 LB 2	37.00	2,960	62.50	92.5	0.93	119.30	9.4	2.2	2.0	87	77	0.1947	305	-	-	-	-	-	-
225 M 2	45.00	2,973	76.95	92.9	0.91	144.57	8.1	2.1	2.3	89	79	0.2902	385	-	-	-	-	-	-
250 M 2	55.00	2,975	95.20	93.2	0.90	176.64	8.6	2.5	2.8	90	79	0.4197	505	-	-	-	-	-	-
280 S 2	75.00	2,978	128.90	93.8	0.90	240.49	8.0	2.3	2.5	88	76	0.5200	842	-	-	-	-	-	-
280 M 2	90.00	2,984	157.70	94.1	0.88	287.93	8.1	3.1	3.3	88	76	0.6300	881	-	-	-	-	-	-
315 S 2	110.00	2,980	189.10	94.3	0.89	352.50	6.7	1.8	2.0	90	76	0.7000	932	-	-	-	-	-	-
315 LA 2	132.00	2,983	218.90	94.6	0.92	422.44	7.2	2.0	2.2	99	85	1.8800	1,340	-	-	-	-	-	-
315 LB 2	160.00	2,984	267.70	94.8	0.91	516.06	7.0	1.7	2.1	99	85	2.2500	1,430	-	-	-	-	-	-
315 LC 2	200.00	2,980	333.70	95.0	0.91	640.70	7.5	1.7	1.9	99	85	2.7900	1,550	-	-	-	-	-	-

► I_n = I_n · $\frac{400}{U'}$ (I_n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.2. Three-phase motors, 1 speed IE2 rated data at 400 V 50 Hz DOL start

Three-phase motors IE2			1	Speed	1,500	rpm						Brake							
Motor type	Rated output P_n [kW]	Speed n [1/min]	Current I_n [A]	Efficiency η [%]	Power factor $\cos\phi$	Torque M_n [Nm]	Starting current I_s/I_n	Starting torque M_s/M_n	Max. torque M_{tr}/M_n	Noise level		Moment of inertia $J \blacktriangledown$ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque		Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
										[dB(A)]					[Nm]				
										Lw	Lp				S1	S4			
63 A 4	0.12	1,360	0.67	59.1	0.44	0.84	1.8	3.7	3.8	52	44	0.0002	16	22	3	4	40	240	0.00025
63 B 4	0.18	1,331	0.64	64.7	0.63	1.29	1.5	2.1	2.3	52	44	0.0002	16	22	3	4	40	240	0.00025
71 A 4	0.25	1,413	0.74	70.1	0.71	1.69	2.7	2.3	2.4	56	48	0.0006	19	29	6	9	50	240	0.00102
71 B 4	0.37	1,385	1.01	72.7	0.73	2.55	3.9	2.4	2.4	56	48	0.0009	19	29	6	9	50	240	0.00132
80 A 4	0.55	1,448	1.78	77.1	0.58	3.63	10.3	3.8	4.1	59	51	0.0009	26	36	12	17	60	240	0.00170
80 B 4	0.75	1,430	2.05	79.6	0.67	5.01	5.4	3.0	3.2	59	51	0.0013	26	36	12	17	60	240	0.00210
90 S 4	1.10	1,430	2.70	81.4	0.73	7.34	5.8	3.3	3.6	62	54	0.0020	33	52	25	35	140	240	0.00310
90 L 4	1.50	1,430	3.75	82.8	0.72	10.02	6.4	3.7	4.4	62	54	0.0026	33	52	25	35	140	240	0.00370
100 LA 4	2.20	1,450	5.20	84.3	0.72	14.47	7.1	2.5	3.1	63	55	0.0043	46	62	34	48	180	240	0.00562
100 LB 4	3.00	1,450	6.70	85.5	0.76	19.98	6.6	3.0	3.3	63	55	0.0053	46	-	-	-	-	-	-
112 M 4	4.00	1,435	8.80	86.6	0.76	26.35	7.4	3.5	4.0	68	60	0.0103	65	100	50	70	250	240	0.01249
132 SB 4	5.50	1,450	11.70	87.7	0.78	36.37	5.1	2.2	2.7	72	64	0.0250	95	134	60	90	400	240	0.02908
132 MB 4	7.50	1,444	14.65	88.7	0.83	49.59	5.9	3.1	3.4	75	67	0.0324	95	134	60	90	400	240	0.03648
160 MB 4	11.00	1,444	23.10	89.8	0.77	71.57	6.0	2.3	3.0	77	69	0.0627	180	217	90	130	480	240	0.06771
160 L 4	15.00	1,468	30.50	90.6	0.79	97.63	6.6	2.7	3.0	77	69	0.0801	195	217	90	130	480	240	0.08511
180 M 4	18.50	1,465	36.65	91.2	0.80	120.17	7.3	3.1	3.6	79	70	0.1236	230	420	300	400	140	150	0.13560
180 L 4	22.00	1,470	42.20	91.6	0.82	142.89	8.4	3.5	4.4	79	70	0.1493	245	435	300	400	140	150	0.16130
200 LB 4	30.00	1,470	53.30	92.3	0.88	194.44	7.7	1.8	2.5	82	72	0.2456	305	495	300	400	140	150	0.25760
225 S 4	37.00	1,472	66.40	92.7	0.87	239.79	6.0	2.0	2.4	84	73	0.3737	360	710	600	800	140	150	0.38570
225 M 4	45.00	1,474	80.60	93.1	0.87	290.87	6.8	2.1	2.5	84	73	0.4479	385	750	600	800	140	150	0.45990
250 M 4	55.00	1,475	96.50	93.5	0.88	353.69	7.3	2.9	2.7	86	75	0.7673	540	835	600	800	140	100	0.77930
280 S 4	75.00	1,485	134.90	94.0	0.85	483.80	6.5	2.7	2.9	82	70	0.9500	875	1,170	600	800	140	100	0.96200
280 M 4	90.00	1,480	160.40	94.2	0.86	577.60	7.5	3.0	3.5	82	70	1.1200	901	1,196	600	800	140	100	1.13200
315 S 4	110.00	1,487	198.00	94.5	0.85	706.40	8.3	3.2	3.6	85	71	1.2700	971	1,266	600	800	140	100	1.34200
315 LA 4	132.00	1,488	239.00	94.7	0.84	847.01	7.2	1.9	2.2	90	76	3.7200	1,190	1,485	600	800	140	100	3.79200
315 LB 4	160.00	1,488	283.00	94.9	0.86	1,026.88	7.1	2.0	2.0	90	76	4.1100	1,455	1,750	600	800	140	100	4.18200
315 LC 4	200.00	1,494	361.00	95.1	0.84	1,278.43	8.8	2.0	2.2	90	76	5.2100	1,640	1,935	600	800	140	100	5.28200

$\blacktriangleright I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); $\blacktriangledown J = \frac{PD^2}{4}$

5. Performance data

5.2. Three-phase motors, 1 speed IE2 rated data at 400 V 50 Hz DOL start

Three-phase motors IE2			1	Speed	1,000	rpm						Brake							
Motor type	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M _m /M _n	Noise level		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque		Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
										[dB(A)]					[Nm]				
										Lw	Lp				S1	S4			
71 A 6	0.18	933	0.81	56.6	0.56	1.84	2.4	2.7	2.8	50	42	0.0007	19	29	6	9	50	240	0.00112
71 B 6	0.26	926	0.85	61.6	0.72	2.68	2.7	2.3	2.5	50	42	0.0010	19	29	6	9	50	240	0.00142
80 A 6	0.37	930	1.36	67.6	0.58	3.80	5.0	2.9	3.2	53	45	0.0022	26	36	12	17	60	240	0.00300
80 B 6	0.55	955	1.47	73.1	0.74	5.50	6.2	2.2	2.5	53	45	0.0027	26	36	12	17	60	240	0.00350
90 S 6	0.75	955	2.38	75.9	0.60	7.50	5.0	2.5	2.8	54	46	0.0034	33	52	25	35	140	240	0.00450
90 L 6	1.10	920	2.95	78.1	0.69	11.41	3.4	2.0	2.3	54	46	0.0049	33	52	25	35	140	240	0.00600
100 LB 6	1.50	948	3.85	79.8	0.71	15.11	4.2	2.0	2.2	63	55	0.0088	46	62	34	48	180	240	0.01012
112 M 6	2.20	964	5.60	81.8	0.69	21.79	6.1	2.4	2.8	65	67	0.0172	65	100	50	70	250	240	0.01939
132 SB 6	3.00	960	7.32	83.3	0.71	29.84	5.8	2.0	2.2	68	60	0.0323	95	134	60	90	400	240	0.03638
132 MB 6	4.00	960	9.10	84.6	0.72	39.67	5.7	2.0	2.2	68	60	0.0395	95	134	60	90	400	240	0.04358
132 ML 6	5.50	968	13.25	86.0	0.70	54.27	6.0	2.9	3.2	68	60	0.0506	105	134	60	90	400	240	0.05468
160 MB 6	7.50	970	16.20	87.2	0.77	73.94	6.5	3.0	3.3	72	64	0.0919	180	217	90	130	480	240	0.09691
160 L 6	11.00	965	22.95	88.7	0.78	108.86	6.5	2.3	2.5	72	64	0.1218	195	217	90	130	480	240	0.12681
180 L 6	15.00	975	31.45	89.7	0.77	146.85	7.2	2.5	3.0	76	67	0.2263	245	435	300	400	140	150	0.23830
200 LA 6	18.50	980	39.38	90.4	0.75	180.28	6.5	1.8	1.9	79	69	0.2986	295	490	300	400	140	150	0.31060
200 LB 6	22.00	985	47.85	90.9	0.73	213.30	7.5	2.3	2.6	79	69	0.3064	305	515	300	400	140	150	0.31840
225 M 6	30.00	985	62.96	91.7	0.75	290.86	7.0	2.8	3.2	81	70	0.7617	385	750	600	800	140	150	0.77370
250 M 6	37.00	985	71.10	92.2	0.82	358.43	7.0	2.0	2.4	81	70	1.0475	520	813	600	800	140	150	1.05950
280 S 6	45.00	982	87.58	92.7	0.80	437.63	4.9	2.5	2.8	77	65	1.1400	858	1,153	600	800	140	150	1.15200
280 M 6	55.00	985	109.32	93.1	0.78	533.25	5.2	2.3	2.4	77	65	1.3600	894	1,189	600	800	140	150	1.37200
315 S 6	75.00	990	150.04	93.7	0.77	723.48	6.1	2.2	2.4	79	65	1.6300	865	1,160	600	800	140	150	1.84200
315 LA 6	90.00	992	172.74	94.0	0.80	866.43	6.8	1.7	1.9	84	70	5.7300	1,370	1,665	600	800	140	150	5.94200
315 LB 6	110.00	992	185.02	94.3	0.91	1,058.97	8.6	1.2	1.7	84	70	6.9400	1,450	1,745	600	800	140	150	7.15200
315 LC 6	132.00	995	236.94	94.6	0.85	1,266.93	6.3	1.9	2.0	84	70	8.4500	1,520	1,815	600	800	140	150	8.66200

► I_n = I_n · 400 (I_n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.2. Three-phase motors, 1 speed IE2 rated data at 400 V 50 Hz DOL start

Three-phase motors IE2			1	Speed	750	rpm						Brake							
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Max. torque	Noise level		Moment of inertia	Mass	Mass	Torque		Power	Braking: n° per hour	Total inertia
										[dB(A)]					[Nm]				
										Lw	Lp				S1	S4			
71 B 8	0.12	600	0.63	45.90	0.75	2.54	2.1	1.3	1.5	48	40	0.0010	19	29	6	9	50	240	0.00142
80 A 8	0.18	705	1.11	45.90	0.52	2.63	3.0	1.9	2.1	49	41	0.0022	26	36	12	17	60	240	0.00300
80 B 8	0.25	694	1.19	50.60	0.59	3.44	2.7	1.4	1.5	49	41	0.0027	26	36	12	17	60	240	0.00350
90 S 8	0.37	662	1.73	56.10	0.63	5.34	2.0	1.3	1.4	53	45	0.0034	33	52	25	35	140	240	0.00450
90 L 8	0.55	670	2.47	61.70	0.69	7.84	2.1	1.5	1.6	53	45	0.0049	33	52	25	35	140	240	0.00600
100 LA 8	0.75	720	2.87	66.20	0.56	9.90	3.4	2.0	2.0	60	52	0.0088	46	62	34	48	180	240	0.01012
100 LB 8	1.10	675	3.30	70.80	0.68	15.50	2.5	1.8	1.8	60	52	0.0088	46	62	34	48	180	240	0.01012
112 M 8	1.50	717	4.50	74.10	0.61	19.98	3.9	1.8	1.8	62	54	0.0172	65	100	50	70	250	240	0.01939
132 SB 8	2.20	720	6.20	77.60	0.66	29.20	4.2	1.8	2.1	66	58	0.0323	95	134	60	90	400	240	0.03638
132 MB 8	3.00	720	8.59	80.00	0.62	39.82	3.8	1.7	1.8	66	58	0.0506	105	134	60	90	400	240	0.05468
160 MA 8	4.00	718	10.07	81.90	0.70	53.20	4.4	2.3	2.4	70	62	0.0919	180	217	90	130	480	240	0.09691
160 MB 8	5.50	710	12.30	83.80	0.71	73.94	5.0	1.9	2.0	70	62	0.0919	180	217	90	130	480	240	0.12681
160 L 8	7.50	720	16.48	85.30	0.77	99.50	4.6	2.4	2.8	70	62	0.1218	195	217	90	130	480	240	0.15671
180 L 8	11.00	718	23.13	86.90	0.79	146.32	4.8	2.2	2.3	73	64	0.2791	245	435	300	400	140	150	0.29110
200 LB 8	15.00	738	35.15	88.00	0.66	194.23	7.1	2.4	2.4	75	65	0.4595	305	495	300	400	140	150	0.47150
225 S 8	18.50	730	41.86	88.60	0.79	288.00	6.0	2.1	2.1	79	68	0.6337	360	710	600	800	140	150	0.64570
225 M 8	22.00	736	45.11	89.10	0.70	285.56	7.2	2.1	2.1	79	68	0.7617	385	750	600	800	140	150	0.77370
250 M 8	30.00	740	63.45	89.80	0.76	386.90	6.0	1.8	1.9	79	68	1.2961	550	840	600	800	140	150	1.30810
280 S 8	37.00	730	68.77	90.30	0.86	492.30	5.7	1.9	1.9	72	60	1.5100	875	1,170	600	800	140	150	1.52200
280 M 8	45.00	735	86.28	90.70	0.81	584.56	5.3	1.4	1.5	72	60	1.7900	901	1,196	600	800	140	150	1.80200
315 S 8	55.00	742	117.89	91.00	0.76	712.00	8.7	2.7	2.8	75	61	1.9900	965	1,260	600	800	140	150	2.19200
315 LA 8	75.00	743	153.48	91.60	0.81	964.00	7.5	1.9	2.0	77	63	5.7300	1,330	1,625	600	800	140	150	5.94200
315 LB 8	90.00	744	168.28	91.90	0.84	1,164.00	6.2	1.7	1.7	77	63	6.9400	1,470	1,765	600	800	140	150	7.15200
315 LC 8	110.00	742	204.78	92.30	0.85	1,415.67	8.6	1.7	1.8	77	63	8.4500	1,590	1,885	600	800	140	150	8.66200

► $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.3. Three-phase motors, 1 speed IE3 rated data at 400 V 50 Hz DOL start

Three-phase motors IE3																	1	Speed			3,000	rpm				Brake				
Motor type	Frame	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M _m /M _n	Noise level [dB(A)]		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque [Nm] S1-S4	Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]											
											Lw	Lp																		
63 A 2	-	0.18	2,880	0.72	65.9	0.55	0.60	3.9	4.2	4.5	60	52	0.0001	16	22	3	40	240	0.00015											
63 B 2	-	0.25	2,858	0.86	70.1	0.60	0.84	4.7	4.3	3.7	60	52	0.0001	16	22	3	40	240	0.00015											
71 A 2	-	0.37	2,849	0.92	73.8	0.79	1.24	4.8	3.2	3.3	66	58	0.0004	19	29	6	50	240	0.00082											
71 B 2	-	0.55	2,808	1.22	77.8	0.83	1.87	5.3	3.1	3.5	66	58	0.0004	19	29	6	50	240	0.00082											
80 MA 2	Short	0.75	2,865	1.59	81.4	0.83	2.50	7.0	2.7	3.4	73	65	0.0010	26	41	17	30	180	0.00114											
80 MB 2	Short	1.10	2,861	2.31	83.0	0.83	3.67	7.6	3.5	3.5	73	65	0.0012	28	43	17	30	180	0.00134											
90 S 2	Short	1.50	2,870	3.04	84.8	0.84	4.99	7.8	2.0	3.6	76	68	0.0017	36	54	35	50	180	0.00205											
90 SL 2	Short	2.20	2,866	4.33	86.2	0.85	7.33	8.4	2.9	3.6	76	68	0.0021	40	58	35	50	180	0.00245											
100 LA 2	Short	3.00	2,879	5.73	87.2	0.87	9.96	8.4	3.6	3.9	78	70	0.0031	51	74	55	60	180	0.00366											
112 M 2	Short	4.00	2,903	7.27	88.1	0.90	13.20	8.4	2.1	3.5	81	73	0.0081	61	83	55	60	180	0.00866											
132 SA 2	Short	5.50	2,924	10.20	89.2	0.87	18.00	8.1	2.4	3.5	84	75	0.0142	112	156	130	75	180	0.02012											
132 SB 2	Short	7.50	2,920	13.50	90.1	0.89	24.50	8.2	2.5	3.5	84	75	0.0169	121	165	130	75	180	0.02282											
160 MB 2	Short	11.00	2,951	19.90	91.2	0.87	35.60	7.9	2.3	3.6	84	76	0.0553	194	293	280	80	180	0.06268											
160 MC 2	Short	15.00	2,944	26.40	91.9	0.89	48.70	8.2	2.2	3.5	84	76	0.0689	210	309	280	80	180	0.07628											
160 LA 2	Long	18.50	2,944	32.00	92.4	0.90	60.00	8.2	2.4	3.5	84	76	0.0808	245	344	280	80	180	0.08818											
160 LB 2	Long	22.00	2,963	38.7	92.7	0.88	70.90	7.8	2.1	3.4	84	76	0.0808	245	344	280	80	180	0.08818											
180 M 2	Short	22.00	2,963	38.7	92.7	0.88	70.90	7.8	2.1	3.4	81	72	0.1265	306	402	280	80	180	0.13388											
180 L 2	Long	30.00	2,973	54.3	93.3	0.85	96.40	7.5	2.1	3.3	81	72	0.1265	306	402	280	80	180	0.13388											
200 LA 2	Short	30.00	2,973	54.30	93.3	0.85	96.40	7.5	2.1	3.3	89	79	0.2245	403	563	600	130	180	0.24504											
200 LB 2	Short	37.00	2,973	65.50	93.7	0.87	119.00	7.4	2.1	3.1	89	79	0.2541	434	594	600	130	180	0.27464											
200 LC 2	Long	45.00	2,976	77.9	94.0	0.89	144.00	7.2	1.7	3.1	89	79	0.2541	434	594	600	130	180	0.27464											
225 SM 2	Short	45.00	2,976	77.9	94.0	0.89	144.00	7.2	1.7	3.1	89	79	0.3641	491	653	600	130	180	0.38464											
225 MB 2	Long	55.00	2,981	93.3	94.3	0.90	176.00	7.5	1.8	3.2	89	79	0.3641	491	653	600	130	180	0.38464											
250 MA 2	Long	55.00	2,981	93.30	94.3	0.90	176.00	7.5	1.8	3.2	87	77	0.6229	644	799	600	130	180	0.80360											
250 MB 2	Long	75.00	2,982	126.0	94.8	0.90	240.00	7.5	1.8	3.2	87	77	0.6229	644	799	600	130	180	0.80360											
280 S 2	Short	75.00	2,982	126.0	94.8	0.90	240.00	7.5	1.8	3.2	90	79	1.0493	1,049	-	-	-	-	-											
280 SM 2	Short	90.00	2,981	151.0	95.0	0.91	288.00	7.3	1.8	3.0	90	79	1.1238	1,072	-	-	-	-	-											
280 MB 2	Long	110.00	2,983	186.0	95.3	0.89	352.00	6.9	1.7	3.0	90	79	1.1238	1,072	-	-	-	-	-											
315 S 2	Short	110.00	2,983	186.00	95.3	0.89	352.00	6.9	1.7	3.0	95	84	1.9059	1,433	-	-	-	-	-											
315 MB 2	Short	132.00	2,983	224.00	95.5	0.89	423.00	7.1	1.8	3.1	95	84	2.0265	1,496	-	-	-	-	-											
315 ML 2	Short	160.00	2,983	270.00	95.7	0.89	513.00	7.1	1.8	3.1	95	84	2.2091	1,716	-	-	-	-	-											
315 LC 2	Long	200.00	2,980	339.00	95.8	0.89	641.00	7.1	1.9	3.1	95	84	2.4519	1,816	-	-	-	-	-											
355 M 2	Short	250.00	2,983	420.00	95.8	0.90	801.00	6.8	1.7	2.8	96	85	3.8130	1,980	-	-	-	-	-											
355 ML 2	Short	315.00	2,984	526.00	95.8	0.90	1,009.00	6.9	1.8	2.8	96	85	4.4076	2,230	-	-	-	-	-											
355 LC 2	Long	355.00	2,981	595.00	95.8	0.90	1,138.00	7.9	2.2	3.2	96	85	4.4075	2,440	-	-	-	-	-											
355 LD 2	Long	375.00	2,980	626.00	95.8	0.90	1,202.00	7.8	2.2	3.1	96	85	4.4075	2,440	-	-	-	-	-											

Note: motors marked in bold are higher output motors.

► I_n = I_n · 400 (I_n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.3. Three-phase motors, 1 speed IE3 rated data at 400 V 50 Hz DOL start

Three-phase motors IE3				1	Speed		1,500	rpm					Brake							
Motor type	Frame	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M ₂ /M _n	Noise level		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque [Nm]	Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]	
											[dB(A)]									S1-S4
											Lw	Lp								
63 B 4	-	0.18	1,334	0.59	69.9	0.63	1.29	2.6	2.1	2.3	52	44	0.0002	16	22	3	40	240	0.00025	
71 A 4	-	0.25	1,405	0.73	73.5	0.69	1.70	4.7	3.0	3.6	56	48	0.0006	19	29	6	50	240	0.00102	
71 B 4	-	0.37	1,408	1.15	77.3	0.60	2.51	4.6	1.1	1.4	56	48	0.0009	19	29	6	50	240	0.00132	
80 MA 4	-	0.55	1,434	1.27	83.6	0.75	3.66	5.4	2.4	2.7	62	56	0.0009	26	41	17	30	240	0.00104	
80 MB 4	Long	0.75	1,428	1.70	82.9	0.77	5.02	6.3	2.8	2.8	62	56	0.0018	33	48	17	30	240	0.00194	
90 S 4	Short	1.10	1,444	2.42	84.5	0.78	7.28	7.2	3.0	3.4	67	61	0.0031	39	57	35	50	240	0.00345	
90 L 4	Long	1.50	1,441	3.23	85.6	0.78	9.95	7.4	3.2	3.5	67	61	0.0037	45	63	35	50	240	0.00405	
100 LA 4	Short	2.20	1,457	4.51	86.9	0.81	14.40	8.0	2.7	3.2	69	62	0.0096	54	77	55	60	240	0.01016	
100 LB 4	Long	3.00	1,455	5.97	87.8	0.83	19.70	8.1	2.9	3.3	69	62	0.0109	61	84	55	60	240	0.01146	
112 MB 4	Long	4.00	1,451	7.94	88.7	0.82	26.30	8.0	2.7	3.1	70	62	0.0174	76	99	55	60	240	0.01796	
132 S 4	Long	5.50	1,463	10.80	89.6	0.82	35.90	6.9	2.0	2.8	73	65	0.0363	136	180	130	75	240	0.04222	
132 M 4	Long	7.50	1,462	14.40	90.4	0.83	49.00	6.8	2.1	2.7	73	65	0.0428	145	189	130	75	240	0.04872	
132 ML 4	Long	11.00	1,476	20.70	91.4	0.84	71.20	7.3	2.4	3.2	73	65	0.0428	145	189	130	75	240	0.04872	
160 MB 4	Short	11.00	1,476	20.70	91.4	0.84	71.20	7.3	2.4	3.2	74	66	0.1080	216	315	280	80	240	0.11538	
160 LA 4	Long	15.00	1,472	27.80	92.1	0.85	97.40	7.5	2.5	3.2	74	66	0.1368	258	357	280	80	240	0.14418	
160 LB 4	Long	18.50	1,477	35.00	92.6	0.83	120.00	7.1	2.2	3.1	74	66	0.1487	258	357	280	80	240	0.15608	
180 M 4	Short	18.50	1,477	35.0	92.6	0.83	120.00	7.1	2.2	3.1	76	67	0.1794	307	403	280	80	240	0.18678	
180 LA 4	Long	22.00	1,474	41.6	93.0	0.82	143.00	7.5	2.4	3.3	76	67	0.2041	351	541	280	80	240	0.21148	
180 LB 4	Long	30.00	1,482	54.20	93.6	0.85	193.00	8.0	2.2	3.1	76	67	0.2041	351	541	280	80	240	0.21148	
200 LA 4	Short	30.00	1,482	54.2	93.6	0.85	193.00	8.0	2.2	3.1	76	67	0.4379	430	590	600	130	240	0.45844	
200 LBX 4	Long	37.00	1,483	67.20	93.9	0.85	238.00	7.1	2.2	2.8	76	67	0.4379	430	590	600	130	240	0.45844	
225 S 4	Short	37.00	1,483	67.2	93.9	0.85	238.00	7.1	2.2	2.8	79	68	0.5911	468	630	600	130	240	0.61164	
225 SM 4	Short	45.00	1,484	80.7	94.2	0.85	290.00	7.5	2.4	2.9	79	68	0.6745	514	676	600	130	240	0.69504	
225 M 4	Long	55.00	1,488	97.70	94.6	0.86	353.00	7.1	2.0	3.1	79	68	0.6745	514	676	600	130	240	0.69504	
250 MA 4	Long	55.00	1,488	97.7	94.6	0.86	353.00	7.1	2.0	3.1	83	72	1.4025	686	841	600	130	240	1.58320	
250 MB 4	Long	75.00	1,489	130.00	95.0	0.87	481.00	6.3	2.1	2.5	83	72	1.4025	686	841	600	130	240	1.58320	
280 S 4	Long	75.00	1,489	130.0	95.0	0.87	481.00	6.3	2.1	2.5	87	75	2.1833	1,166	-	-	-	-	-	
280 MA 4	Long	90.00	1,489	155.0	95.2	0.88	578.00	6.1	2.0	2.4	87	75	2.3954	1,250	-	-	-	-	-	
280 MB 4	Long	110.00	1,489	194.00	95.5	0.86	706.00	7.1	2.0	3.1	87	75	2.3954	1,250	-	-	-	-	-	
315 S 4	Short	110.00	1,489	194.0	95.5	0.86	706.00	7.1	2.0	3.1	86	72	2.9187	1,382	-	-	-	-	-	
315 MB 4	Short	132.00	1,489	231.0	95.6	0.86	847.00	7.3	2.1	3.1	86	72	3.3145	1,484	-	-	-	-	-	
315 LA 4	Long	160.00	1,489	275.0	95.9	0.88	1,027.00	7.3	2.2	3.1	86	72	3.9566	1,807	-	-	-	-	-	
315 LC 4	Long	200.00	1,489	345.0	96.0	0.87	1,283.00	7.2	2.2	3.0	86	72	4.4667	1,877	-	-	-	-	-	
355 M 4	Short	250.00	1,491	424.0	96.0	0.89	1,602.00	7.1	1.9	2.5	94	79	7.7973	2,120	-	-	-	-	-	
355 LB 4	Long	315.00	1,491	529.0	96.0	0.90	2,019.00	7.1	1.9	2.4	94	79	9.6454	2,410	-	-	-	-	-	
355 LC 4	Long	355.00	1,491	598.0	96.0	0.89	2,275.00	7.2	2.0	2.3	94	79	10.3940	2,490	-	-	-	-	-	
355 LD 4	Long	375.00	1,489	630.0	96.0	0.90	2,406.00	6.8	1.9	2.2	94	79	10.0240	2,490	-	-	-	-	-	

Note: motors marked in bold are higher output motors.

► I_n = I_n · $\frac{400}{U'}$ (I_n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.3. Three-phase motors, 1 speed IE3 rated data at 400 V 50 Hz DOL start

Three-phase motors IE3																	1	Speed			1,000	rpm				Brake				
Motor type	Frame	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M _m /M _n	Noise level [dB(A)]		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque [Nm] S1-S4	Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]											
											Lw	Lp																		
71 A 6	-	0.18	947	0.80	63.9	0.53	1.82	3.5	3.6	3.6	50	42	0.0007	19	29	6	50	240	0.00112											
71 B 6	-	0.25	920	0.84	68.6	0.62	2.60	3.9	2.6	2.6	50	42	0.0010	19	29	6	50	240	0.00142											
80 A 6	-	0.37	965	1.13	73.5	0.64	3.66	3.7	2.2	2.4	53	45	0.0022	26	36	12	60	240	0.00300											
80 B 6	-	0.55	955	1.39	77.2	0.74	5.50	4.4	2.2	2.3	53	45	0.0027	26	36	12	60	240	0.00350											
90 LA 6	Long	0.75	946	2.00	78.9	0.69	7.58	5.6	2.7	3.4	68	60	0.0032	41	59	35	50	240	0.00355											
90 LB 6	Long	1.10	941	2.84	81.0	0.69	11.20	5.4	3.2	3.2	68	60	0.0040	43	61	35	50	240	0.00435											
100 L 6	Short	1.50	966	3.62	82.5	0.72	14.80	6.6	2.6	3.1	70	62	0.0127	51	74	55	60	240	0.01305											
112 M 6	Short	2.20	958	5.04	84.3	0.75	21.90	6.5	2.7	3.0	70	62	0.0148	66	88	55	60	240	0.01536											
132 SA 6	Short	3.00	970	6.60	85.6	0.77	29.60	5.6	1.9	2.4	73	65	0.0358	106	150	130	75	240	0.04172											
132 MA 6	Long	4.00	973	8.68	86.8	0.77	39.30	6.0	2.1	2.6	73	65	0.0450	129	173	130	75	240	0.05092											
132 MB 6	Long	5.50	973	11.80	88.0	0.77	54.00	6.2	2.2	2.7	73	65	0.0536	142	186	130	75	240	0.05952											
160 M 6	Short	7.50	976	14.90	89.1	0.82	73.40	5.6	1.8	2.4	75	67	0.1374	203	302	280	80	240	0.14478											
160 LB 6	Long	11.00	977	21.90	90.3	0.80	108.00	6.1	2.1	2.7	75	67	0.1907	251	350	280	80	240	0.19808											
180 LA 6	Long	15.00	982	30.30	91.2	0.78	146.00	6.9	2.4	2.9	80	71	0.2874	353	543	280	80	240	0.29478											
200 LA 6	Short	18.50	984	36.60	91.7	0.80	180.00	6.3	2.1	2.6	80	71	0.5182	410	570	600	130	240	0.53874											
200 LB 6	Short	22.00	985	43.00	92.2	0.80	213.00	6.1	2.1	2.5	80	71	0.6079	429	589	600	130	240	0.62844											
225 SM 6	Short	30.00	987	55.90	92.9	0.83	290.00	6.8	2.1	2.8	79	70	0.8966	505	667	600	130	240	0.91714											
250 MA 6	Long	37.00	987	68.40	93.3	0.84	358.00	6.6	2.2	2.7	81	71	1.5698	642	797	600	130	240	1.75050											
250 MB 6	Long	45.00	989	84.10	93.7	0.82	435.00	6.0	1.7	2.5	81	71	1.5698	642	797	600	130	240	1.75050											
280 S 6	Short	45.00	989	84.10	93.7	0.82	435.00	6.0	1.7	2.5	83	72	2.1714	925	-	-	-	-	-											
280 SM 6	Short	55.00	989	101.00	94.1	0.84	531.00	6.0	1.8	2.4	83	72	2.3543	990	-	-	-	-	-											
280 MB 6	Long	75.00	989	139.00	94.6	0.82	725.00	6.0	1.8	2.4	83	72	2.3543	990	-	-	-	-	-											
315 S 6	Short	75.00	989	139.00	94.6	0.82	725.00	6.0	1.8	2.4	83	70	3.2215	1,282	-	-	-	-	-											
315 MA 6	Short	90.00	990	168.00	95.0	0.82	869.00	6.1	1.9	2.4	83	70	3.7478	1,374	-	-	-	-	-											
315 ML 6	Short	110.00	990	203.00	95.3	0.82	1,062.00	6.4	2.0	2.5	83	70	4.5367	1,525	-	-	-	-	-											
315 LC 6	Long	132.00	990	244.00	95.5	0.82	1,274.00	6.5	2.1	2.5	83	70	5.1945	1,788	-	-	-	-	-											
355 MA 6	Short	160.00	992	287.00	95.8	0.84	1,541.00	6.6	2.0	2.7	90	75	8.2873	2,015	-	-	-	-	-											
355 MB 6	Short	200.00	992	359.00	95.8	0.84	1,926.00	6.8	2.1	2.7	90	75	9.3705	2,155	-	-	-	-	-											
355 LB 6	Long	250.00	992	446.00	95.8	0.84	2,408.00	6.9	2.0	2.7	90	75	11.1050	2,440	-	-	-	-	-											
355 LC 6	Long	280.00	992	500.00	95.8	0.84	2,695.00	6.8	2.1	2.7	90	75	14.6350	2,570	-	-	-	-	-											
355 LD 6	Long	315.00	992	562.00	95.8	0.84	3,032.00	6.8	2.1	2.7	90	75	16.0071	2,690	-	-	-	-	-											

Note: motors marked in bold are higher output motors.

► $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.3. Three-phase motors, 1 speed IE3 rated data at 400 V 50 Hz DOL start

Three-phase motors IE3				1	Speed	750	rpm					Brake							
Motor type	Frame	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M _{ov} /M _n	Noise level [dB(A)]		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque [Nm]	Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
											Lw	Lp							
100 LA 8	Long	0.75	721	2.06	75.0	0.70	9.90	5.1	1.9	2.7	70	62	0.0149	51	74	55	60	240	0.01525
100 LB 8	Long	1.10	719	2.88	77.7	0.71	14.90	5.0	1.9	2.6	70	62	0.0172	53	76	55	60	240	0.01755
112 M 8	Long	1.50	710	3.74	79.7	0.73	20.10	5.0	1.8	2.3	70	62	0.0200	66	89	55	60	240	0.02056
132 S 8	Short	2.20	725	5.38	81.9	0.72	29.50	5.0	1.8	2.3	73	65	0.0453	106	150	130	75	240	0.05122
132 M 8	Long	3.00	725	7.19	83.6	0.72	39.40	5.0	1.8	2.3	73	65	0.0577	129	173	130	75	240	0.06362
160 MB 8	Short	4.00	730	9.45	85.0	0.72	53.80	5.3	1.7	2.3	75	67	0.1312	203	302	280	80	240	0.13858
160 MC 8	Long	5.50	730	12.60	86.5	0.73	73.40	5.3	1.7	2.3	75	67	0.1674	223	322	280	80	240	0.17478
160 L 8	Long	7.50	728	16.70	87.8	0.74	98.00	5.4	1.8	2.2	75	67	0.2040	251	350	280	80	240	0.21138
180 LA 8	Long	11.00	730	23.70	89.3	0.75	147.00	6.4	1.7	2.6	80	71	0.3337	353	543	280	80	240	0.34108
200 LA 8	Long	15.00	739	32.90	90.4	0.73	193.00	5.5	1.9	2.5	80	71	0.7327	429	589	600	130	240	0.75324
225 S 8	Short	18.50	738	37.10	91.1	0.79	241.00	5.2	1.7	2.2	81	71	0.8781	468	630	600	130	240	0.89864
225 MA 8	Long	22.00	738	43.40	91.5	0.80	290.00	5.2	1.7	2.2	81	71	1.0453	514	676	600	130	240	1.06584
250 MA 8	Long	30.00	739	58.00	92.4	0.81	386.00	5.3	1.8	2.2	81	71	2.1617	642	797	600	130	240	2.34240
280 S 8	Short	37.00	742	71.90	92.9	0.80	480.00	5.8	1.8	2.2	83	72	3.2584	925	-	-	-	-	-
280 M 8	Long	45.00	742	87.40	93.5	0.80	576.00	5.6	1.8	2.2	83	72	3.5326	990	-	-	-	-	-
315 SA 8	Short	55.00	742	115.00	92.5	0.75	720.00	5.2	1.7	2.2	83	70	3.7895	1,282	-	-	-	-	-
315 SB 8	Short	75.00	743	154.00	93.1	0.75	960.00	5.3	1.8	2.2	83	70	4.8296	1,374	-	-	-	-	-
315 SC 8	Long	90.00	743	184.00	93.4	0.76	1,151.00	5.4	1.9	2.2	83	70	5.6618	1,525	-	-	-	-	-
355 MA 8	Short	110.00	743	205.64	93.7	0.82	1,439.37	6.1	1.4	2.4	90	75	8.0510	1,788	-	-	-	-	-
355 MB 8	Short	132.00	742	241.58	94.0	0.84	1,679.41	5.9	1.4	2.3	90	75	8.4710	2,015	-	-	-	-	-
355 MC 8	Short	150.00	742	273.62	94.2	0.84	1,919.75	5.9	1.4	2.3	90	75	10.1630	2,155	-	-	-	-	-
355 MD 8	Short	160.00	742	292.24	94.3	0.84	2,444.37	6.2	1.5	2.3	90	75	10.8260	2,184	-	-	-	-	-
355 LA 8	Long	185.00	742	334.79	94.5	0.84	2,399.34	6.1	1.5	2.3	90	75	12.3810	2,440	-	-	-	-	-
355 LB 8	Long	200.00	742	361.13	94.6	0.85	2,590.61	6.3	1.6	2.4	90	75	13.4910	2,490	-	-	-	-	-
355 LC 8	Long	220.00	743	396.77	94.6	0.85	2,877.96	6.5	1.6	2.4	90	75	15.0450	2,490	-	-	-	-	-

▶ $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.4. Three-phase motors, 1 speed IE4 rated data at 400 V 50 Hz DOL start

Three-phase motors IE4			1	Speed	3,000	rpm						Brake										
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Max. torque	Noise level		Moment of inertia	Mass	Mass	Torque		Power	Braking: n° per hour	Total inertia			
										Lw	Lp				[Nm]					[VA/W]	[max. n.]	[kgm²]
															S1	S4						
P _n [kW]	n [1/min]	I _n [A]	η [%]	cos φ	M _n [Nm]	I _s /I _n	M _s /M _n	M _m /M _n	[dB(A)]		J ▼ [kgm²]	m [kg]	m [kg]	S1	S4	[VA/W]	[max. n.]	[kgm²]				
80 MC 2	0.75	2,885	1.60	83.5	0.84	2.47	7.2	3.5	3.9	73	65	0.0017	36	51	17	30	180	0.00184				
80 MCX 2	1.10	2,891	2.20	85.2	0.84	3.70	7.8	4.1	4.0	73	65	0.0019	38	53	17	30	180	0.00204				
90 SL 2	1.50	2,907	3.00	86.5	0.83	4.89	8.7	4.3	4.4	76	68	0.0031	51	70	35	50	180	0.00345				
90 LX 2	2.20	2,902	4.20	88.0	0.86	7.36	9.1	4.6	4.4	76	68	0.0035	55	74	35	50	180	0.00385				
100 LBX 2	3.00	2,917	5.60	89.1	0.88	9.76	10.2	4.6	5.0	78	70	0.0084	63	86	55	60	180	0.00896				
112 ML 2	4.00	2,932	7.10	90.0	0.91	13.35	9.9	3.3	4.6	81	73	0.0150	117	23	55	60	180	0.01556				
132 MAX 2	5.50	2,945	10.00	90.9	0.88	18.14	8.6	2.9	4.3	84	75	0.0553	194	238	130	75	180	0.06122				
132 M 2	7.50	2,943	13.30	91.7	0.89	24.20	8.8	3.1	4.3	84	75	0.0560	205	249	130	75	180	0.06192				
160 LAX 2	11.00	2,960	19.40	92.6	0.89	36.08	8.8	2.8	4.3	84	76	0.0689	210	309	280	80	180	0.07628				
160 LBX 2	15.00	2,961	26.10	93.3	0.89	48.10	9.2	3.0	3.4	84	76	0.0808	245	344	280	80	180	0.08818				
160 LCX 2	18.50	2,958	31.80	93.7	0.90	60.18	8.8	3.0	4.2	84	76	0.0854	268	367	280	80	180	0.09278				
180 LX 2	22.00	2,963	38.10	94.0	0.89	72.10	7.4	2.2	3.6	81	72	0.1340	315	411	280	80	180	0.14138				
200 LBX 2	30.00	2,974	52.70	94.5	0.87	95.79	7.2	2.1	3.6	89	79	0.2541	434	594	600	130	180	0.02054				
200 LCX 2	37.00	2,973	64.50	94.8	0.88	119.75	7.4	2.2	3.6	89	79	0.2670	464	624	600	130	180	0.02054				
225 M 2	45.00	2,981	80.90	95.0	0.85	143.35	8.7	2.6	4.4	89	79	0.3800	504	666	600	130	180	0.02054				
250 MBX 2	55.00	2,981	94.00	95.3	0.89	179.17	7.9	2.3	3.9	87	77	0.6450	672	827	600	130	180	0.82570				
280 SMX 2	75.00	2,984	127.10	95.6	0.90	238.68	8.0	2.3	3.9	90	79	1.1238	1,072	-	-	-	-	-				
280 MA 2	90.00	2,982	150.30	95.8	0.91	286.53	7.5	2.2	3.6	90	79	1.1580	1,164	-	-	-	-	-				
315 MAX 2	110.00	2,983	188.20	96.0	0.88	358.07	6.9	2.0	3.5	95	84	2.2091	1,716	-	-	-	-	-				
315 LAX 2	132.00	2,984	225.60	96.2	0.88	416.66	7.1	2.1	3.6	95	84	2.4519	1,816	-	-	-	-	-				
315 LAY 2	160.00	2,984	272.50	96.3	0.89	513.11	7.1	2.1	3.5	95	84	3.8130	1,980	-	-	-	-	-				
315 LDX 2	200.00	2,984	338.20	96.5	0.89	644.38	7.0	2.2	3.5	95	84	3.9400	2,042	-	-	-	-	-				

► I'n = I_n · 400 / U' (I'n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.4. Three-phase motors, 1 speed IE4 rated data at 400 V 50 Hz DOL start

Three-phase motors IE4			1	Speed	1,500	rpm						Brake							
Motor type	Rated output P _n [kW]	Speed n [1/min]	Current I _n [A]	Efficiency η [%]	Power factor cos φ	Torque M _n [Nm]	Starting current I _s /I _n	Starting torque M _s /M _n	Max. torque M ₂ /M _n	Noise level		Moment of inertia J ▼ [kgm ²]	Mass m [kg]	Mass m [kg]	Torque		Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
										[dB(A)]					[Nm]				
										Lw	Lp				S1	S4			
80 MCY 4	0.75	1,447	1.70	85.7	0.74	4.94	6.3	2.9	3.2	62	56	0.0019	35	50	17	30	240	0.00203	
90 LAX 4	1.10	1,451	2.40	87.2	0.77	7.36	7.1	3.0	3.6	67	61	0.0037	45	63	35	50	240	0.00405	
90 LB 4	1.50	1,457	3.40	88.2	0.73	9.78	8.1	3.8	4.2	67	61	0.0039	47	66	35	50	240	0.00424	
100 LBX 4	2.20	1,462	4.60	89.5	0.77	14.60	8.0	3.0	3.7	69	62	0.0109	61	84	55	60	240	0.01146	
100 LC 4	3.00	1,466	6.20	90.4	0.77	19.44	9.2	3.7	4.3	69	62	0.0114	64	87	55	60	240	0.01201	
112 MLX 4	4.00	1,462	7.80	91.1	0.81	26.79	9.3	3.7	4.2	70	62	0.0183	80	102	55	60	240	0.01883	
132 MX 4	5.50	1,470	11.00	91.9	0.79	36.36	6.9	2.5	3.1	73	65	0.0428	145	189	130	75	240	0.04872	
132 MBX 4	7.50	1,472	15.20	92.6	0.77	48.42	7.5	3.0	3.4	73	65	0.0449	153	197	130	75	240	0.05086	
160 LAX 4	11.00	1,479	21.30	93.3	0.80	72.22	8.2	3.1	4.0	74	66	0.1368	258	357	280	80	240	0.14418	
160 LBX 4	15.00	1,479	28.10	93.9	0.82	96.28	8.5	3.2	4.1	74	66	0.1436	271	369	280	80	240	0.15102	
180 LX 4	18.50	1,479	34.20	94.2	0.83	120.41	7.6	2.6	3.6	76	67	0.1530	284	380	280	80	240	0.16038	
180 LBX 4	22.00	1,481	42.00	94.5	0.80	144.27	8.2	3.0	4.0	76	67	0.2143	369	559	280	80	240	0.22169	
200 LB 4	30.00	1,485	55.00	94.9	0.83	191.79	9.2	3.3	4.1	76	67	0.2143	369	529	600	130	240	0.23485	
225 SMX 4	37.00	1,486	67.60	95.2	0.83	239.59	8.4	2.9	3.7	79	68	0.6745	514	676	600	130	240	0.69504	
225 MB 4	45.00	1,486	82.00	95.4	0.83	287.64	8.4	3.0	3.6	79	68	0.7082	540	702	600	130	240	0.72877	
250 MBX 4	55.00	1,489	98.80	95.7	0.84	358.82	8.0	2.5	3.9	83	72	0.7082	540	695	600	130	240	0.88893	
280 SM 4	75.00	1,491	131.10	96.0	0.86	477.76	6.8	2.5	3.0	87	75	2.3954	1,250	-	-	-	-	-	
280 MBX 4	90.00	1,490	155.40	96.1	0.87	573.48	6.6	2.5	2.8	87	75	2.5152	1,313	-	-	-	-	-	
315 MAX 4	110.00	1,491	196.30	96.3	0.84	716.54	8.1	2.6	3.9	86	72	2.5152	1,313	-	-	-	-	-	
315 LAX 4	132.00	1,490	229.80	96.4	0.86	836.24	7.8	2.5	3.6	86	72	3.4802	1,558	-	-	-	-	-	
315 LB 4	160.00	1,490	274.80	96.6	0.87	1,027.33	7.9	2.5	3.6	86	72	4.1544	1,897	-	-	-	-	-	
315 LDX 4	200.00	1,489	339.20	96.7	0.88	1,291.17	7.2	2.3	3.3	86	72	4.6900	1,971	-	-	-	-	-	

► $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.4. Three-phase motors, 1 speed IE4 rated data at 400 V 50 Hz DOL start

Three-phase motors IE4			1	Speed	1,000	rpm						Brake										
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Max. torque	Noise level		Moment of inertia	Mass	Mass	Torque		Power	Braking: n° per hour	Total inertia			
										Lw	Lp				[Nm]					[VA/W]	[max. n.]	[kgm²]
															S1	S4						
90 LAX 6	0.75	949	1.90	82.7	0.69	7.53	5.3	3.0	3.2	68	60	0.0040	43	61	35	50	240	0.00435				
90 LX 6	1.10	948	2.70	84.5	0.69	11.27	5.5	3.2	3.3	68	60	0.0042	45	64	35	50	240	0.00455				
100 LBX 6	1.50	972	3.40	85.9	0.75	14.64	6.9	2.4	3.3	70	62	0.0133	54	77	55	60	240	0.01369				
112 ML 6	2.20	969	5.10	87.4	0.71	22.07	7.6	3.3	3.7	70	62	0.0155	69	91	55	60	240	0.01610				
132 SB 6	3.00	976	6.50	88.6	0.75	29.22	6.1	2.1	2.7	73	65	0.0376	112	156	130	75	240	0.04351				
132 M 6	4.00	978	8.70	89.5	0.74	40.12	6.6	2.4	3.0	73	65	0.0473	136	180	130	75	240	0.05317				
132 ML 6	5.50	979	12.00	90.5	0.73	54.64	7.1	2.7	3.3	73	65	0.0563	149	193	130	75	240	0.06220				
160 LBY 6	7.50	981	15.20	91.3	0.78	72.60	6.4	2.2	3.0	75	67	0.1443	213	312	280	80	240	0.15165				
160 LCX 6	11.00	984	22.60	92.3	0.76	108.63	7.7	3.1	3.5	75	67	0.2002	264	362	280	80	240	0.20762				
180 LBX 6	15.00	987	30.70	92.9	0.76	144.41	7.8	2.9	3.5	80	71	0.3018	371	561	280	80	240	0.30915				
200 LBX 6	18.50	986	36.20	93.4	0.79	180.57	6.5	2.3	2.8	80	71	0.5441	431	591	600	130	240	0.56465				
200 LCX 6	22.00	986	42.40	93.7	0.80	216.70	6.5	2.2	2.7	80	71	0.6383	450	610	600	130	240	0.65884				
225 MB 6	30.00	989	56.70	94.2	0.81	287.95	8.0	2.7	3.5	79	70	0.9414	530	692	600	130	240	0.96197				
250 MBX 6	37.00	988	69.80	94.5	0.81	360.30	7.3	2.7	3.2	81	71	1.6483	674	829	600	130	240	1.82899				
280 SM 6	45.00	981	83.60	94.8	0.82	431.31	7.1	2.3	3.0	83	72	1.6483	674	-	-	-	-	-				
280 MBX 6	55.00	991	100.60	95.1	0.83	539.18	7.2	2.3	3.0	83	72	2.3543	990	-	-	-	-	-				
315 MAX 6	75.00	991	140.10	95.4	0.81	718.58	5.9	1.9	2.5	83	70	2.4720	1,040	-	-	-	-	-				
315 MB 6	90.00	992	169.90	95.6	0.80	861.91	6.1	2.1	2.6	83	70	3.9352	1,443	-	-	-	-	-				
315 LB 6	110.00	992	202.10	95.8	0.82	1,077.21	6.2	2.2	2.6	83	70	4.7635	1,601	-	-	-	-	-				
315 LDX 6	132.00	992	248.10	96.0	0.80	1,256.03	6.6	2.4	2.8	83	70	5.4542	1,877	-	-	-	-	-				

$I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); $J = \frac{PD^2}{4}$

5. Performance data

5.5. Three-phase motors, 2 speeds, rated data at 400 V 50 Hz DOL start, for general purpose (constant torque)

Three-phase motors			2	Speed		3,000	rpm		For general purpose - 1 winding Dahlander			Brake						
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Noise level		Moment of inertia	Mass	Mass	Torque		Power	Braking: n° per hour	Total inertia
									[dB(A)]	[dB(A)]				[Nm]	[Nm]			
	P _n [kW]	n [1/min]	I _n [A]	η [%]	cos φ	M _n [Nm]	I _s /I _n	M _s /M _n	Lw	Lp	J ▼ [kgm ²]	m [kg]	m [kg]	S1	S4	[VA/W]	[max. n.]	[kgm ²]
63 B 24	0.20	2,740	0.52	68	0.83	0.7	3.5	1.9	60	52	0.0002	16	22	3	4	40	240	0.00015
	0.15	1,310	0.59	49	0.74	1.1	2.2	1.6										
71 A 24	0.30	2,820	0.86	71	0.71	1.0	3.7	1.7	66	58	0.0006	19	29	6	9	50	240	0.00082
	0.20	1,360	0.76	54	0.70	1.4	3.8	1.5										
71 B 24	0.45	2,805	1.26	62	0.83	1.5	4.6	2.5	66	58	0.0009	19	29	6	9	50	240	0.00082
	0.30	1,420	1.20	59	0.63	2.0	3.4	2.3										
80 A 24	0.60	2,800	1.60	68	0.87	2.1	4.9	2.8	70	62	0.0009	26	36	12	17	60	240	0.00140
	0.45	1,400	1.20	69	0.84	3.1	4.7	2.3										
80 B 24	0.80	2,800	2.10	64	0.85	2.7	4.4	1.8	70	62	0.0013	26	36	12	17	60	240	0.00160
	0.60	1,400	1.70	72	0.71	4.1	4.1	1.7										
90 S 24	1.25	2,780	2.90	65	0.96	4.3	5.5	2.0	77	69	0.0020	33	52	25	35	140	240	0.00230
	0.90	1,380	2.40	64	0.85	6.2	4.6	1.8										
90 L 24	1.60	2,850	3.70	71	0.90	5.4	5.1	2.4	77	69	0.0026	33	52	25	35	140	240	0.00260
	1.20	1,410	3.10	73	0.77	8.1	4.5	2.3										
100 M 24	2.35	2,780	5.40	70	0.90	8.1	6.5	2.4	80	72	0.0043	46	62	34	48	180	240	0.00562
	1.85	1,400	4.50	72	0.82	12.6	5.4	2.1										
100 L 24	3.00	2,880	7.30	73	0.77	10.0	6.6	2.6	80	72	0.0053	46	62	34	48	180	240	0.00662
	2.40	1,420	5.70	79	0.77	16.1	5.2	2.4										
112 M 24	4.00	2,860	8.60	84	0.80	13.4	7.0	2.3	80	72	0.0103	65	100	50	70	250	240	0.00959
	3.30	1,450	6.80	65	0.80	21.7	6.2	2.2										
132 S 24	5.90	2,880	11.50	80	0.93	19.6	7.2	2.2	83	75	0.0150	95	124	60	90	400	236	0.01648
	4.80	1,430	10.00	81	0.85	32.1	6.4	2.1										
132 MB 24	7.50	2,880	14.50	88	0.85	24.9	8.9	2.2	83	75	0.0178	95	134	60	90	400	236	0.02188
	5.50	1,430	13.50	73	0.80	36.8	7.2	2.1										
132 L 24	8.00	2,890	19.00	72	0.85	26.5	7.5	2.3	83	75	0.0216	105	134	60	90	400	236	0.02578
	6.00	1,440	17.00	63	0.80	39.3	6.3	2.2										
160 M 24	11.00	2,940	22.00	80	0.90	35.7	7.3	2.3	84	76	0.0627	180	217	90	130	480	136	0.04101
	8.80	1,440	22.00	78	0.74	58.4	6.5	2.1										
160 L 24	15.00	2,945	29.50	77	0.95	48.6	7.5	2.4	84	76	0.0801	195	230	90	130	480	136	0.05841
	12.00	1,450	28.50	81	0.75	79.0	6.6	2.3										
180 M 24	18.50	2,930	36.00	82	0.90	60.3	6.4	2.1	83	74	0.1270	230						
	15.00	1,460	29.50	83	0.88	98.1	5.6	2.0										
180 L 24	22.00	2,960	42.60	89	0.84	71.2	6.6	2.2	83	74	0.1488	245						
	18.50	1,465	38.00	90	0.78	121.1	5.8	2.1										
200 LB 24	30.00	2,970	54.60	90	0.88	97.3	7.7	2.2	87	77	0.2436	315						
	24.00	1,480	44.60	93	0.84	156.5	3.9	2.5										
225 S 24	33.00	2,955	66.00	80	0.90	106.6	6.8	2.2	89	79	0.3762	355						
	30.00	1,475	55.00	91	0.87	194.2	6.2	2.1										
225 M 24	40.00	2,965	77.00	82	0.92	128.8	6.8	2.2	89	79	0.4451	380						
	37.00	1,480	69.00	88	0.88	238.7	6.2	2.2										
250 M 24	50.00	2,970	92.00	88	0.89	160.8	6.9	2.1	90		0.4611	450						
	45.00	1,475	84.00	89	0.87	291.3	6.4	2.3										
280 S 24	66.00	2,950	123.30	91	0.85	200.7	9.4	2.8	88	76	0.5200	875						
	52.00	1,480	102.80	85	0.86	238.8	8.2	2.7										
280 M 24	79.00	2,950	145.90	91	0.86	242.8	9.2	2.8	88	76	0.6300	901						
	60.00	1,480	122.90	84	0.84	290.4	8.0	2.6										
315 S 24	90.00	2,955	166.10	89	0.88	323.2	9.4	2.9	90	76	0.7000	971						
	70.00	1,485	133.80	90	0.84	334.4	8.0	2.9										
315 M 24	95.00	2,965	173.30	89	0.89	347.9	9.5	2.9	90	76	0.7500	984						
	75.00	1,485	140.10	91	0.85	353.7	8.1	2.8										
315 LA 24	○	○	○	○	○	○	○	○	○	○	○	○						
315 LB 24	○	○	○	○	○	○	○	○	○	○	○	○						
315 LC 24	○	○	○	○	○	○	○	○	○	○	○	○						
355 24	○	○	○	○	○	○	○	○	○	○	○	○						

○ Data not indicated is supplied on request.

► I_n = I_n · 400 (I_n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.5. Three-phase motors, 2 speeds, rated data at 400 V 50 Hz DOL start, for general purpose (constant torque)

Three-phase motors			2	Speed	1,500	rpm	For general purpose - 1 winding Dahlander				Brake							
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Noise level		Moment of inertia	Mass	Mass	Torque		Power	Braking: n° per hour	Total inertia
									Lw	Lp				S1	S4			
	P _n [kW]	n [1/min]	I _n [A]	η [%]	cos φ	M _n [Nm]	I _s /I _n	M _s /M _n	[dB(A)]		J ▼ [kgm ²]	m [kg]	m [kg]	[Nm]		[VA/W]	[max. n.]	[kgm ²]
71 A 48	0.17	1,330	0.57	74	0.58	1.2	3.2	1.5	56	48	0.0007	19	29	3	9	50	240	0.00102
	0.09	670	0.48	48	0.57	1.3	2.4	1.4										
71 B 48	0.20	1,400	0.71	68	0.80	1.4	5.6	2.1	56	48	0.0010	19	29	3	9	50	240	0.00132
	0.10	700	0.67	35	0.52	1.4	3.0	3.0										
80 A 48	0.30	1,400	0.90	67	0.72	2.1	4.3	2.0	59	51	0.0022	26	36	6	17	60	240	0.00170
	0.15	710	1.05	42	0.48	2.0	2.7	1.7										
80 B 48	0.40	1,400	0.95	71	0.86	2.7	4.2	1.8	59	51	0.0027	26	36	6	17	60	240	0.00210
	0.20	710	1.12	48	0.54	2.7	1.3	2.6										
90 S 48	0.60	1,380	1.60	64	0.84	4.1	3.0	2.4	62	54	0.0034	33	52	12	35	140	240	0.00310
	0.30	700	1.70	47	0.54	4.1	2.1	2.1										
90 L 48	0.90	1,370	2.00	74	0.90	6.4	4.0	1.8	62	54	0.0049	33	52	12	35	140	240	0.00370
	0.45	710	1.80	65	0.60	6.1	2.9	1.6										
100 LA 48	1.25	1,400	3.20	81	0.70	8.5	3.8	2.0	63	55	0.0088	46	62	25	48	180	240	0.00562
	0.60	700	3.00	61	0.47	8.2	3.0	1.8										
100 LB 48	1.60	1,445	3.60	73	0.88	10.6	4.8	1.9	63	55	0.0088	46	62	25	48	180	240	0.00662
	0.80	700	4.00	59	0.49	10.9	3.7	1.6										
112 M 48	2.55	1,420	5.40	78	0.90	17.2	5.1	1.8	68	60	0.0172	65	100	34	70	250	240	0.01249
	1.25	710	4.90	66	0.61	16.8	4.1	2.5										
132 S 48	3.30	1,430	7.20	77	0.86	22.5	5.0	1.7	72	64	0.0323	95	134	50	90	400	240	0.02908
	1.85	720	8.30	58	0.56	24.5	3.6	1.6										
132 MB 48	4.80	1,410	10.50	77	0.86	32.5	5.3	1.8	75	67	0.0506	95	134	50	90	400	240	0.03648
	2.40	700	8.10	68	0.63	32.0	4.9	1.7										
132 L 48	5.50	1,450	11.00	87	0.83	36.2	5.6	1.8	75	67	0.0506	105	134	50	90	400	240	0.04458
	3.00	720	13.50	72	0.45	40.0	4.6	1.8										
160 M 48	7.50	1,450	16.00	82	0.82	49.4	5.8	1.9	77	69	0.0919	180	217	60	130	480	240	0.06771
	4.80	730	15.00	83	0.56	62.8	4.8	1.7										
160 L 48	10.00	1,440	21.00	76	0.91	66.3	6.9	1.8	77	69	0.1218	195	217	60	130	480	240	0.08511
	6.60	710	22.00	73	0.59	88.8	2.8	1.8										
180 M 48	13.00	1,474	26.50	81	0.87	84.1	6.6	2.0	79	70	0.2067	230	435	90	400	140	150	0.13560
	8.10	735	22.50	85	0.61	105.2	5.3	2.0										
180 L 48	16.00	1,472	33.00	82	0.86	103.8	8.3	2.5	79	70	0.2067	245	435	90	400	140	150	0.16130
	9.90	735	27.00	88	0.60	128.6	6.2	2.5										
200 LB 48	20.00	1,480	37.30	91	0.85	129.0	7.3	2.8	82	72	0.2436	315	495	300	400	140	150	0.25760
	13.00	730	39.00	86	0.56	170.2	4.6	2.9										
225 S 48	25.00	1,460	47.50	82	0.93	163.5	6.5	2.1	84	73	0.3762	355	710	600	800	140	150	0.38570
	17.00	720	44.50	79	0.70	225.5	5.2	1.9										
225 M 48	30.00	1,485	57.30	90	0.84	193.6	7.7	2.0	84	73	0.4451	380	750	600	800	140	150	0.45990
	20.00	735	61.00	88	0.54	261.0	4.5	1.5										
250 M 48	40.00	1,480	73.00	91	0.88	258.4	6.4	2.2	86	75	0.4611	450	835	600	800	140	100	0.77930
	26.00	735	67.50	91	0.62	336.8	5.5	2.0										
280 S 48	59.00	1,485	110.00	91	0.86	380.1	9.0	2.4	82	70	0.9500	875	○	○	○	○	○	○
	34.00	740	101.00	90	0.55	448.5	4.5	1.9										
280 M 48	71.00	1,480	132.00	92	0.85	456.3	5.5	1.8	82	70	1.1200	901	○	○	○	○	○	○
	41.00	740	105.00	90	0.62	524.8	3.7	1.4										
315 S 48	80.00	1,485	152.90	90	0.84	514.5	5.4	1.9	85	71	1.2700	971	○	○	○	○	○	○
	47.00	735	116.90	88	0.66	610.7	3.8	1.5										
315 M 48	85.00	1,480	158.80	91	0.85	548.5	4.9	1.8	85	71	1.3300	984	○	○	○	○	○	○
	50.00	735	123.00	89	0.66	649.7	3.8	1.4										
315 LA 48	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
315 LB 48	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
315 LC 48	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
355 48	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

▶ I'n = I_n · 400 / U' (I'n = current at U' Volt); ▼ J = $\frac{P D^2}{4}$

5. Performance data

5.5. Three-phase motors, 2 speeds, rated data at 400 V 50 Hz DOL start, for general purpose (constant torque)

Three-phase motors			2	Speed		1,500 1,000	rpm		For general purpose - 1 winding Dahlander			
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Noise level		Moment of inertia	Mass
									[dB(A)]			
	P _n [kW]	n [1/min]	I _n ▽ [A]	η [%]	cos φ	M _n [Nm]	I _s /I _n	M _s /M _n	Lw	Lp	J ▽ [kgm ²]	m [kg]
71 B 46	0.20	1,420	0.76	60	0.63	1.3	4.5	1.4	56	48	0.0010	19
	0.10	900	0.57	50	0.51	1.1	4.2	1.4				
80 A 46	0.40	1,360	1.00	80	0.72	2.8	3.5	1.5	59	51	0.0027	26
	0.20	900	0.86	56	0.60	2.1	2.9	1.4				
80 B 46	0.50	1,380	1.40	70	0.73	3.4	3.7	1.5	59	51	0.0027	26
	0.30	910	0.95	68	0.67	3.2	3.1	1.5				
90 S 46	0.65	1,400	2.00	63	0.75	4.4	2.0	1.6	62	54	0.0034	33
	0.45	910	1.70	55	0.70	4.7	1.9	1.4				
90 L 46	0.95	1,455	2.70	80	0.65	6.4	5.6	1.6	62	54	0.0049	33
	0.60	920	1.60	71	0.78	6.3	3.7	1.5				
100 LA 46	1.40	1,400	3.80	70	0.76	9.5	5.8	1.8	63	55	0.0088	46
	0.90	930	2.90	64	0.70	9.2	4.2	1.6				
100 L 46	1.85	1,415	4.20	77	0.84	12.7	4.5	1.8	63	55	0.0088	46
	1.10	900	3.05	71	0.73	11.5	3.0	1.6				
112 M 46	2.40	1,420	5.20	79	0.84	16.1	6.6	1.8	68	60	0.0172	65
	1.60	920	4.20	71	0.78	16.6	4.4	1.6				
132 S 46	3.00	1,475	8.30	83	0.65	20.0	6.0	2.0	72	64	0.0323	95
	2.00	960	5.50	75	0.71	19.7	4.0	1.5				
132 MA 46	4.00	1,460	9.40	79	0.78	26.2	6.2	2.0	75	67	0.0395	95
	2.60	960	8.40	72	0.62	25.9	4.6	1.8				
132 MB 46	4.40	1,450	10.50	76	0.80	29.0	6.4	2.0	75	67	0.0506	105
	3.00	950	8.90	79	0.62	30.2	4.5	1.8				
132 L 46	5.15	1,470	12.00	83	0.75	33.5	6.9	1.9	75	67	0.0506	105
	3.30	965	9.50	79	0.64	32.7	4.8	1.7				
160 M 46	6.60	1,460	14.50	79	0.84	43.2	6.8	2.0	77	69	0.0919	180
	4.40	960	10.50	87	0.70	43.8	4.6	1.9				
160 L 46	8.80	1,460	18.50	78	0.88	57.6	7.0	2.0	77	69	0.1218	195
	5.90	970	13.50	88	0.72	58.1	5.0	1.9				
180 M 46	11.00	1,470	21.50	88	0.84	71.5	6.6	2.0	79	70	0.2067	230
	7.50	980	18.50	84	0.70	73.1	5.2	1.9				
180 L 46	13.00	1,475	25.00	88	0.85	84.2	8.9	2.3	79	70	0.2067	245
	8.80	980	20.50	86	0.72	85.7	8.5	3.8				
200 LA 46	16.00	1,480	33.50	82	0.84	103.2	6.7	2.1	82	72	0.2986	295
	11.00	985	24.50	80	0.81	106.6	5.4	1.9				
200 LB 46	18.50	1,485	40.10	88	0.76	119.0	9.8	2.2	82	72	0.3503	315
	13.00	985	28.70	90	0.73	126.0	8.9	3.2				
225 S 46	22.00	1,485	42.50	89	0.84	141.8	8.1	2.6	84	73	0.6965	355
	15.00	995	33.50	88	0.74	144.4	5.5	3.6				
225 M 46	26.00	1480	48.40	91	0.85	167.7	7.1	2.6	84	73	0.6965	380
	16.50	990	33.90	90	0.74	159.2	5.4	3.6				
250 M 46	30.00	1,480	55.90	90	0.87	195.2	5.0	1.2	86	75	0.7216	450
	20.00	990	41.30	90	0.78	193.5	4.9	1.4				
280 S 46	56.00	1,480	109.80	91	0.81	361.4	8.1	2.9	82	70	0.9500	875
	34.00	985	78.30	86	0.73	329.6	6.4	2.8				
280 M 46	65.00	1,480	124.50	92	0.82	419.4	8.2	2.8	82	70	1.1200	901
	40.00	985	89.60	86	0.75	387.8	6.2	2.9				
315 S 46	75.00	1,485	147.00	91	0.81	482.3	8.3	2.9	85	71	1.2700	971
	46.00	990	103.30	87	0.74	443.7	6.4	3.0				
315 M 46	80.00	1,488	145.00	96	0.84	518.0	6.9	2.0	85	71	1.3300	984
	50.00	990	104.40	93	0.74	482.6	5.0	2.2				
315 LA 46	○	○	○	○	○	○	○	○	○	○	○	○
315 LB 46	○	○	○	○	○	○	○	○	○	○	○	○
315 LC 46	○	○	○	○	○	○	○	○	○	○	○	○
355 46	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

▸ $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▽ $J = \frac{PD^2}{4}$

5. Performance data

5.5. Three-phase motors, 2 speeds, rated data at 400 V 50 Hz DOL start, for general purpose (constant torque)

Three-phase motors			2	Speed			1,000 750	rpm	For general purpose - 1 winding Dahlander			
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Noise level		Moment of inertia	Mass
									[dB(A)]			
	P _n [kW]	n [1/min]	I _n ▶ [A]	η [%]	cos φ _v	M _n [Nm]	I _s /I _n	M _s /M _n	Lw	Lp		
71 B 68	0.12	960	0.73	45	0.55	1.2	3.0	2.4	50	42	0.0010	19
	0.08	670	0.48	32	0.77	1.2	1.4	1.0				
80 A 68	0.15	930	0.67	46	0.70	1.5	4.0	1.5	53	45	0.0027	26
	0.13	690	0.62	51	0.59	1.8	3.2	1.4				
80 B 68	0.25	920	1.00	51	0.71	2.6	2.8	1.6	53	45	0.0027	26
	0.15	680	0.81	46	0.58	2.1	2.6	1.3				
90 S 68	0.35	910	1.30	53	0.74	3.7	3.2	1.4	54	46	0.0034	33
	0.25	640	1.00	59	0.61	3.7	2.2	1.4				
90 L 68	0.60	920	2.12	53	0.72	6.2	3.2	1.5	54	46	0.0049	33
	0.30	690	1.55	41	0.58	4.1	2.6	1.7				
100 LA 68	0.80	920	2.30	66	0.76	8.3	1.7	1.5	63	55	0.0088	46
	0.55	700	1.90	67	0.62	7.5	1.8	1.5				
100 LB 68	1.00	920	3.30	54	0.82	10.4	3.0	1.1	63	55	0.0088	46
	0.65	680	2.55	50	0.74	9.1	2.6	1.4				
112 M 68	1.50	960	4.10	74	0.71	14.9	1.0	1.7	65	57	0.0172	65
	1.00	710	3.20	65	0.69	13.4	1.2	1.6				
132 S 68	1.85	960	5.20	73	0.70	18.4	4.1	1.6	68	60	0.0323	95
	1.30	715	4.20	68	0.66	17.4	4.0	1.7				
132 MA 68	2.55	965	6.80	75	0.72	25.2	4.2	1.8	68	60	0.0395	95
	1.85	720	5.80	68	0.68	24.5	4.1	1.8				
132 MB 68	3.00	970	7.40	79	0.74	29.5	5.4	1.9	68	60	0.0506	105
	2.00	730	6.00	73	0.66	26.2	3.9	1.8				
160 M 68	4.00	980	10.80	84	0.65	39.6	6.0	2.3	72	64	0.0919	180
	2.80	730	9.50	77	0.56	36.7	4.8	2.7				
160 L 68	5.50	985	14.60	86	0.64	53.5	7.7	2.5	72	64	0.1218	195
	4.00	732	11.60	81	0.63	52.9	5.6	2.3				
180 M 68	6.50	970	15.00	83	0.75	64.0	4.1	1.7	76	67	0.2067	230
	5.00	720	12.50	77	0.75	66.3	4.3	1.8				
180 L 68	8.00	965	17.50	85	0.78	79.2	4.4	1.8	76	67	0.2067	245
	6.00	715	15.00	78	0.74	80.1	4.2	1.9				
200 LA 68	9.90	970	21.00	85	0.80	97.5	4.6	1.7	79	69	0.2986	295
	7.50	710	18.00	80	0.75	100.9	4.3	1.7				
200 LB 68	12.00	990	33.40	88	0.59	115.8	7.0	2.4	79	69	0.3503	315
	8.80	736	22.20	87	0.66	114.3	4.9	1.7				
225 S 68	15.00	970	32.50	82	0.81	147.7	4.8	1.8	81	70	0.6965	355
	11.00	720	24.50	83	0.78	145.9	4.7	1.8				
225 M 68	17.00	975	37.00	81	0.82	166.5	4.9	1.8	81	70	0.6965	380
	13.00	725	30.50	80	0.77	171.2	4.6	1.9				
250 M 68	22.00	980	48.50	82	0.80	214.4	4.7	1.9	81	70	0.7216	450
	16.00	730	37.00	82	0.76	209.3	4.5	1.8				
280 S 68	37.00	990	80.30	90	0.74	356.9	7.3	3.1	77	65	1.1400	858
	25.00	740	57.00	88	0.72	322.6	5.3	2.7				
280 M 68	44.00	995	97.00	91	0.72	422.3	7.5	3.0	77	65	1.3600	894
	30.00	740	70.40	88	0.70	387.2	5.2	2.7				
315 S 68	52.00	990	112.80	90	0.74	501.6	7.9	3.4	79	65	1.6300	965
	36.00	745	81.20	89	0.72	461.5	5.4	2.9				
315 M 68	60.00	995	132.30	91	0.72	575.9	7.8	3.3	79	65	1.8300	997
	40.00	743	91.80	90	0.70	514.1	5.3	2.9				
315 LA 68	○	○	○	○	○	○	○	○	○	○	○	○
315 LB 68	○	○	○	○	○	○	○	○	○	○	○	○
315 LC 68	○	○	○	○	○	○	○	○	○	○	○	○
355 68	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

▶ I'n = I_n · $\frac{400}{U'}$ (I'n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.6. Three-phase motors, 2 speeds rated data at 400 V 50 Hz DOL start, for centrifugal machines (quadratic torque)

Three-phase motors			2	Speed		3,000 1,500	rpm		For centrifugal machines - 1 winding Dahlander			
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Noise level		Moment of inertia	Mass
									[dB(A)]			
	P_n [kW]	n [1/min]	I_n [A]	η [%]	$\cos\phi_p$	M_n [Nm]	I_s/I_n	M_s/M_n	Lw	Lp	$J \blacktriangledown$ [kgm ²]	m [kg]
63 B 24	0.24	2,800	0.86	55	0.75	0.8	4.1	3.0	60	52	0.0001	16
	0.07	1,340	0.34	43	0.71	0.5	2.1	1.9				
71 A 24	0.37	2,750	1.00	74	0.72	1.3	3.6	2.0	66	58	0.0004	19
	0.09	1,380	0.27	69	0.70	0.6	2.9	2.0				
71 B 24	0.50	2,810	1.50	67	0.72	1.7	2.5	1.8	66	58	0.0004	19
	0.14	1,380	0.42	72	0.70	1.0	4.5	2.0				
80 A 24	0.75	2,820	1.90	70	0.80	2.5	4.0	1.7	70	62	0.0006	26
	0.18	1,400	0.48	70	0.76	1.2	3.6	2.1				
80 B 24	0.11	2,800	2.60	75	0.82	3.8	4.2	1.8	70	62	0.0008	26
	0.25	1,380	0.71	66	0.76	1.7	3.7	2.0				
90 S 24	1.50	2,780	3.20	81	0.84	5.2	5.8	1.9	77	69	0.0012	33
	0.37	1,400	1.00	68	0.78	2.5	4.1	2.1				
90 L 24	2.00	2,760	4.30	77	0.88	7.0	4.3	1.9	77	69	0.0015	33
	0.51	1,380	1.30	68	0.82	3.5	3.2	2.1				
100 M 24	2.60	2,810	5.60	75	0.89	8.8	7.7	2.2	80	72	0.0029	46
	0.62	1,410	1.60	69	0.81	4.2	7.0	2.0				
100 L 24	3.30	2,870	7.70	78	0.80	11.0	5.6	2.2	80	72	0.0029	46
	0.75	1,480	2.20	57	0.85	4.8	5.1	2.0				
112 M 24	4.41	2,930	8.90	81	0.88	14.4	7.9	2.5	80	72	0.0074	65
	1.10	1,450	2.30	82	0.83	7.2	6.9	2.7				
132 S 24	6.50	2,910	12.50	83	0.90	21.3	6.2	2.1	83	75	0.0150	95
	2.00	1,450	4.80	75	0.80	13.2	6.0	1.9				
132 M 24	8.50	2,945	16.70	89	0.82	27.6	8.8	3.4	83	75	0.0178	95
	2.50	1,460	5.50	88	0.74	16.4	5.9	2.8				
132 L 24	9.20	2,910	17.50	90	0.84	30.2	6.9	2.3	83	75	0.0216	105
	2.80	1,440	5.70	87	0.82	18.6	6.6	2.2				
160 M 24	12.00	2,955	21.50	89	0.90	38.7	8.1	2.1	84	76	0.0360	180
	3.00	1,470	6.45	84	0.81	19.6	4.9	2.5				
160 L 24	16.00	2,945	29.60	87	0.90	51.6	7.0	2.5	84	76	0.0534	195
	4.40	1,455	8.90	87	0.82	29.0	5.3	2.6				
180 M 24	18.00	2,965	37.00	79	0.89	58.0	8.4	2.6	83	74	0.0750	230
	5.00	1,465	11.40	75	0.85	32.6	7.1	2.3				
180 L 24	24.00	2,960	44.50	90	0.87	77.4	9.7	3.3	83	74	0.0750	245
	6.00	1,480	11.80	89	0.83	39.0	9.6	3.1				
200 LB 24	30.00	2,970	51.20	92	0.92	96.5	7.2	2.0	87	77	0.1449	315
	8.00	1,480	15.60	88	0.86	52.2	7.2	1.9				
225 S 24	37.00	2,960	68.00	86	0.91	119.4	7.3	2.1	89	79	0.1714	355
	9.20	1,460	21.00	74	0.86	60.2	7.0	2.0				
225 M 24	44.00	2,970	78.00	91	0.90	141.5	9.0	2.6	89	79	0.2656	380
	11.50	1,480	21.80	91	0.84	74.3	8.4	2.4				
250 M 24	51.00	2,970	93.00	89	0.89	164.0	6.5	2.2	90	79	0.2809	450
	13.50	1,475	26.50	87	0.85	87.4	6.2	1.8				
280 S 24	70.00	2,960	130.80	91	0.85	225.8	9.4	2.8	88	76	0.5200	875
	25.00	1,480	49.40	85	0.86	161.3	8.2	2.7				
280 M 24	86.00	2,960	158.80	91	0.86	277.5	9.2	2.8	88	76	0.6300	901
	31.00	1,480	63.50	84	0.84	200.0	8.0	2.6				
315 S 24	100.00	2,965	181.50	91	0.87	322.1	9.4	2.9	90	76	0.7000	971
	36.00	1,485	75.50	83	0.83	231.5	8.0	2.9				
315 M 24	110.00	2,970	196.30	92	0.88	353.7	9.5	2.9	90	76	0.7500	948
	40.00	1,485	83.90	84	0.82	257.2	8.1	2.8				
315 LA 24	○	○	○	○	○	○	○	○	○	○	○	○
315 LB 24	○	○	○	○	○	○	○	○	○	○	○	○
315 LC 24	○	○	○	○	○	○	○	○	○	○	○	○
355 24	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

► $I'_n = I_n \cdot \frac{400}{U}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.6. Three-phase motors, 2 speeds rated data at 400 V 50 Hz DOL start, for centrifugal machines (quadratic torque)

Three-phase motors			2	Speed		1,500 750	rpm		For centrifugal machines - 1 winding Dahlander			
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Noise level		Moment of inertia	Mass
									[dB(A)]			
	P _n [kW]	n [1/min]	I _n ▶ [A]	η [%]	cosφ _p	M _n [Nm]	I _s /I _n	M _s /M _n	Lw	Lp		
71 A 48	0.20	1,420	0.82	50	0.71	1.4	3.5	1.7	56	48	0.0009	19
	0.05	700	0.39	32	0.59	0.7	1.8	1.4				
71 B 48	0.30	1,390	0.95	58	0.78	2.1	3.7	1.8	56	48	0.0009	19
	0.07	680	0.44	34	0.70	1.0	1.8	1.6				
80 A 48	0.45	1,410	1.40	66	0.70	3.0	2.9	2.0	59	51	0.0013	26
	0.10	700	0.48	44	0.69	1.4	4.4	1.8				
80 B 48	0.65	1,420	1.67	70	0.80	4.4	4.3	1.8	59	51	0.0013	26
	0.14	695	0.69	47	0.63	1.9	2.5	2.0				
90 S 48	0.90	1,420	2.15	76	0.80	6.1	4.3	1.8	62	54	0.0020	33
	0.22	700	0.85	61	0.61	3.0	2.4	1.5				
90 L 48	1.20	1,440	3.25	77	0.70	8.0	4.3	2.0	62	54	0.0026	33
	0.30	700	1.50	56	0.52	4.1	3.7	1.8				
100 M 48	1.90	1,410	4.70	74	0.79	13.0	4.3	1.8	63	55	0.0053	46
	0.44	700	1.90	58	0.58	6.2	2.4	1.6				
100 L 48	2.20	1,405	5.30	73	0.82	15.0	4.8	2.3	63	55	0.0053	46
	0.55	695	2.00	63	0.64	7.6	2.8	1.9				
112 M 48	3.00	1,440	6.50	80	0.85	20.2	5.1	1.7	68	60	0.0103	65
	0.75	710	2.50	67	0.66	10.1	2.9	1.5				
132 S 48	4.41	1,445	9.30	86	0.80	29.3	5.5	2.2	72	64	0.0250	95
	1.10	710	3.90	74	0.56	15.0	2.9	1.7				
132 M 48	5.90	1,455	12.00	86	0.83	38.7	5.3	2.0	75	67	0.0324	95
	1.50	715	4.80	76	0.59	20.0	2.7	1.6				
132 L 48	7.50	1,440	16.00	83	0.82	49.8	6.9	2.0	75	67	0.0405	105
	1.85	710	6.20	72	0.60	25.0	4.5	1.8				
160 M 48	8.80	1,470	18.00	89	0.80	57.7	7.0	2.1	77	69	0.0627	180
	2.50	730	7.75	82	0.58	33.1	4.0	1.8				
160 L 48	12.00	1,470	25.10	89	0.77	77.7	5.9	2.1	77	69	0.0801	195
	3.20	715	10.50	79	0.56	42.5	3.1	2.0				
180 M 48	16.00	1,480	36.00	89	0.72	103.3	7.8	3.3	79	70	0.1270	230
	4.00	735	13.80	83	0.51	52.0	4.0	2.3				
180 L 48	22.00	1,470	45.00	89	0.80	143.0	6.7	2.6	79	70	0.1488	245
	5.50	732	17.20	82	0.56	71.8	3.2	1.9				
200 LB 48	26.00	1,480	49.40	92	0.83	168.2	9.1	3.4	82	72	0.2436	315
	6.00	735	15.60	91	0.61	78.2	4.5	2.6				
225 S 48	32.00	1,470	65.00	92	0.77	207.9	6.5	3.6	84	73	0.3762	355
	8.10	725	21.00	91	0.62	106.8	5.5	2.8				
225 M 48	37.00	1,475	67.00	92	0.87	236.6	6.9	2.8	84	73	0.4451	380
	9.20	730	22.00	90	0.67	120.0	4.6	2.4				
250 M 48	45.00	1,475	87.00	94	0.80	291.3	5.8	2.4	86	75	0.4611	450
	11.00	730	27.90	91	0.63	143.3	5.0	2.2				
280 S 48	69.00	1,480	128.90	91	0.85	445.2	5.4	1.9	82	70	0.9500	875
	20.00	720	49.80	88	0.66	265.3	3.8	1.5				
280 M 48	83.00	1,480	155.10	91	0.85	535.6	5.5	1.8	82	70	1.1200	901
	25.00	720	63.90	87	0.65	331.6	3.7	1.4				
315 S 48	94.00	1,485	173.70	92	0.85	604.5	5.4	1.9	85	71	1.2700	971
	28.00	725	70.50	87	0.66	368.8	3.8	1.5				
315 M 48	100.00	1,485	182.60	92	0.86	643.1	4.9	1.8	85	71	1.3300	984
	30.00	725	75.80	88	0.65	395.2	3.8	1.4				
315 LA 48	○	○	○	○	○	○	○	○	○	○	○	○
315 LB 48	○	○	○	○	○	○	○	○	○	○	○	○
315 LC 48	○	○	○	○	○	○	○	○	○	○	○	○
355 48	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

▶ I'n = I_n · 400 (I'n = current at U' Volt); ▼ J = $\frac{PD^2}{4}$

5. Performance data

5.6. Three-phase motors, 2 speeds rated data at 400 V 50 Hz DOL start, for centrifugal machines (quadratic torque)

Three-phase motors			2	Speed		1,500	rpm		For centrifugal machines - 2 windings			
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Noise level		Moment of inertia	Mass
									[dB(A)]			
	P_n [kW]	n [1/min]	I_n [A]	η [%]	$\cos\phi$	M_n [Nm]	I_s/I_n	M_s/M_n	Lw	Lp	$J \blacktriangledown$ [kgm ²]	m [kg]
71 B 46	0.30	1,390	0.95	56	0.82	2.1	2.9	1.2	56	48	0.0009	19
	0.10	905	0.45	46	0.76	1.1	2.0	1.1				
80 A 46	0.44	1,430	1.40	65	0.70	2.9	3.0	1.6	59	51	0.0013	26
	0.13	930	0.49	55	0.70	1.3	7.8	1.2				
80 B 46	0.59	1,430	1.60	74	0.72	4.0	4.0	1.7	59	51	0.0013	26
	0.18	950	0.67	56	0.69	1.8	3.6	1.9				
90 S 46	0.90	1,440	2.95	68	0.66	5.9	4.1	2.5	62	54	0.0020	33
	0.30	970	2.20	41	0.49	2.9	2.4	2.7				
90 L 46	1.15	1,395	3.20	70	0.77	8.3	3.9	2.2	62	54	0.0026	33
	0.40	920	1.65	51	0.69	4.2	2.5	2.0				
100 LA 46	1.80	1,430	4.10	79	0.80	12.0	5.2	2.0	63	55	0.0053	46
	0.60	955	1.90	70	0.65	6.0	4.0	1.7				
100 LB 46	2.20	1,425	4.70	80	0.85	14.7	5.0	1.9	63	55	0.0053	46
	0.70	950	2.10	73	0.66	7.0	3.8	1.6				
112 M 46	3.00	1,455	6.90	76	0.83	19.7	5.0	1.9	68	60	0.0103	65
	0.90	960	2.30	75	0.75	9.0	4.3	1.8				
132 S 46	4.00	1,460	9.50	79	0.77	26.2	6.5	2.0	72	64	0.0250	95
	1.20	980	4.60	68	0.55	11.7	5.2	1.7				
132 MA 46	4.80	1,455	11.50	75	0.80	31.5	6.9	1.9	75	67	0.0324	95
	1.40	965	5.10	68	0.58	13.9	5.4	1.8				
132 MB 46	5.50	1,460	13.00	76	0.80	36.0	5.7	1.9	75	67	0.0324	105
	1.70	960	6.50	63	0.60	16.9	4.9	2.0				
132 L 46	6.60	1,470	15.50	88	0.70	42.9	6.9	1.8	75	67	0.0405	105
	2.00	980	8.00	76	0.49	20.0	5.4	1.8				
160 M 46	7.50	1,470	15.35	86	0.82	48.9	7.1	2.1	77	69	0.0627	180
	2.50	985	6.67	83	0.66	24.4	6.2	2.2				
160 L 46	11.00	1,460	23.00	82	0.84	71.9	7.1	2.2	77	69	0.0801	195
	3.30	980	9.50	71	0.71	32.2	6.2	2.3				
180 M 46	15.00	1,450	31.50	81	0.85	98.8	6.9	1.8	79	70	0.1270	230
	5.20	960	21.00	85	0.57	51.7	6.0	1.6				
180 L 46	18.50	1,450	36.00	84	0.88	121.8	7.0	7.0	79	70	0.1488	245
	6.25	965	22.00	66	0.62	61.8	6.2	6.2				
200 LA 46	21.00	1,460	41.00	85	0.87	137.4	6.9	2.0	82	72	0.2436	295
	7.50	970	16.50	82	0.80	73.8	6.5	1.9				
200 LB 46	26.00	1,465	48.50	89	0.87	169.5	6.4	1.8	82	72	0.2436	315
	8.80	970	24.50	83	0.63	86.6	6.8	2.1				
225 S 46	31.00	1,470	58.00	88	0.88	201.4	6.5	2.2	84	73	0.3762	355
	11.00	975	23.00	82	0.84	107.7	6.0	2.1				
225 M 46	36.00	1,475	70.00	88	0.84	233.0	4.9	2.2	84	73	0.4451	380
	12.00	990	30.00	86	0.68	117.0	6.1	2.0				
250 M 46	38.00	1,485	72.66	89	0.85	244.5	5.6	1.9	86	75	0.4611	450
	14.00	985	28.89	85	0.83	136.0	5.4	1.9				
280 S 46	65.00	1,480	123.00	92	0.83	419.4	8.1	2.9	82	70	0.9500	875
	25.00	980	63.60	86	0.66	243.6	6.4	2.8				
280 M 46	80.00	1,485	145.20	96	0.84	518.0	8.2	2.8	82	70	1.1200	901
	30.00	995	76.30	91	0.63	291.6	6.2	2.9				
315 S 46	90.00	1,485	170.30	92	0.83	578.8	8.3	2.9	85	71	1.2700	971
	35.00	985	89.40	87	0.65	339.3	6.4	3.0				
315 M 46	95.00	1,485	179.80	92	0.83	610.9	8.2	2.8	85	71	1.3300	984
	37.00	990	92.10	88	0.66	356.9	6.4	3.0				
315 LA 46	○	○	○	○	○	○	○	○	○	○	○	○
315 LB 46	○	○	○	○	○	○	○	○	○	○	○	○
315 LC 46	○	○	○	○	○	○	○	○	○	○	○	○
355 46	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

▷ $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); $\blacktriangledown J = \frac{PD^2}{4}$

5. Performance data

5.6. Three-phase motors, 2 speeds rated data at 400 V 50 Hz DOL start, for centrifugal machines (quadratic torque)

Three-phase motors			2	Speed			1,000 750	rpm	For centrifugal machines - 2 windings			
Motor type	Rated output P_n [kW]	Speed n [1/min]	Current I_n \blacktriangleright [A]	Efficiency η [%]	Power factor $\cos\phi_p$	Torque M_n [Nm]	Starting current I_s/I_n	Starting torque M_s/M_n	Noise level [dB(A)]		Moment of inertia J \blacktriangledown [kgm ²]	Mass m [kg]
									Lw	Lp		
80 A 68	0.33	930	1.15	59	0.68	3.4	3.2	1.8	53	45	0.0027	26
	0.09	700	0.64	33	0.51	1.2	2.0	1.4				
80 B 68	0.40	930	1.20	61	0.76	4.1	2.9	1.7	53	45	0.0027	26
	0.12	680	0.65	44	0.63	1.7	2.0	1.8				
90 S 68	0.48	895	1.54	52	0.89	5.3	2.2	1.6	54	46	0.0034	33
	0.19	705	0.82	52	0.65	2.6	2.7	3.3				
90 L 68	0.66	925	2.10	63	0.72	6.9	2.6	2.0	54	46	0.0049	33
	0.25	700	1.25	46	0.65	3.4	2.0	3.0				
100 LA 68	0.88	960	2.90	66	0.66	8.8	4.1	1.8	63	55	0.0088	46
	0.37	715	1.80	47	0.63	4.9	3.6	1.7				
100 L 68	1.10	930	3.25	68	0.75	11.6	3.2	2.2	63	55	0.0088	46
	0.44	720	2.20	55	0.55	5.9	2.9	2.9				
112 M 68	1.50	970	4.60	74	0.64	14.8	4.2	2.0	65	57	0.0172	65
	0.75	725	3.30	60	0.54	9.9	3.4	2.6				
132 S 68	2.20	975	6.00	79	0.67	21.6	4.5	2.2	68	60	0.0323	95
	0.88	730	3.50	67	0.54	11.6	3.8	1.7				
132 MA 68	3.00	960	7.00	76	0.81	29.8	4.9	2.0	68	60	0.0395	95
	1.20	730	4.80	59	0.61	15.7	3.9	2.0				
132 MB 68	3.70	965	8.90	79	0.76	36.6	5.1	2.2	68	60	0.0506	105
	1.50	715	5.00	64	0.68	20.0	3.9	2.1				
160 M 68	5.50	980	12.50	87	0.73	53.6	5.6	2.2	72	64	0.0919	180
	2.50	730	6.80	83	0.64	32.7	4.3	2.3				
160 L 68	7.50	970	17.40	83	0.75	73.9	5.8	1.8	72	64	0.1218	195
	4.00	728	11.60	78	0.64	52.8	4.0	2.3				
180 M 68	9.00	965	20.00	83	0.78	89.1	5.8	2.3	76	67	0.2067	230
	4.50	725	11.00	80	0.74	59.3	4.3	2.2				
180 L 68	10.00	960	23.50	79	0.78	99.5	5.6	2.1	76	67	0.2067	245
	5.20	720	13.00	80	0.72	69.0	4.1	2.0				
200 LA 68	13.00	970	29.50	81	0.79	128.0	5.3	2.0	79	69	0.2986	295
	6.50	720	15.50	82	0.74	86.2	4.7	2.1				
200 LB 68	16.00	970	36.00	80	0.80	157.5	5.2	1.9	79	69	0.3503	315
	8.10	725	21.00	72	0.77	106.7	4.6	2.0				
225 S 68	20.00	980	41.00	88	0.80	194.9	5.0	2.3	81	70	0.6965	355
	10.00	730	24.50	76	0.78	130.8	4.9	2.2				
225 M 68	23.00	988	46.40	91	0.79	223.9	5.0	1.9	81	70	0.6965	380
	11.00	737	25.20	89	0.72	144.8	4.2	1.7				
250 M 68	26.00	980	53.00	89	0.80	253.3	4.8	1.8	81	70	0.7216	450
	13.00	730	31.50	75	0.80	170.1	4.5	1.7				
280 S 68	40.00	985	81.40	91	0.78	387.8	7.3	3.1	77	65	1.1400	875
	16.00	740	38.20	84	0.72	206.5	5.3	2.7				
280 M 68	48.00	990	99.50	90	0.68	464.5	7.5	3.0	77	65	1.3600	901
	20.00	740	53.40	86	0.63	258.0	5.2	2.7				
315 S 68	58.00	990	119.60	91	0.77	559.5	7.9	3.4	79	65	1.6300	971
	24.00	742	56.90	87	0.70	308.9	5.4	2.9				
315 M 68	65.00	995	130.90	92	0.78	623.9	7.8	3.3	79	65	1.8300	884
	27.00	740	62.30	87	0.72	348.4	5.3	2.9				
315 LA 68	○	○	○	○	○	○	○	○	○	○	○	○
315 LB 68	○	○	○	○	○	○	○	○	○	○	○	○
315 LC 68	○	○	○	○	○	○	○	○	○	○	○	○
355 68	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

▷ $I_n = I_n \cdot \frac{400}{U'}$ (I_n = current at U' Volt); $\blacktriangledown J = \frac{PD^2}{4}$

5. Performance data

5.7. Single-phase motors, 1 speed, rated data at 230 V 50 Hz DOL start

Single-phase motors										1		Speed		1,500		rpm	
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Capacitor	Noise level		Moment of inertia	Mass				
										C	[dB(A)]			J ▼	m		
P _n [kW]	n [1/min]	I _n ▶ [A]	η [%]	cos φ	M _n [Nm]	I _s /I _n	M _s /M _n	[μF]	Lw		Lp	J ▼ [kgm ²]	m [kg]				
63 A 2	0.10	2,750	1.30	35	0.95	0.3	3.3	0.6	6.3	60	52	0.0001	16				
63 B 2	0.15	2,750	1.30	53	0.95	0.5	3.8	0.6	8.0	60	52	0.0001	16				
71 A 2	0.20	2,800	2.60	48	0.92	0.7	3.6	0.7	10.0	66	58	0.0004	19				
71 B 2	0.40	2,730	2.90	63	0.95	1.4	2.7	0.7	12.5	66	58	0.0004	19				
80 A 2	0.55	2,720	5.40	53	0.82	1.9	2.5	0.6	16.0	70	62	0.0006	26				
80 B 2	0.75	2,790	5.30	63	0.97	2.6	4.5	0.8	20.0	70	62	0.0008	26				
90 S 2	1.10	2,750	7.80	63	0.97	3.8	4.4	0.7	45.0	77	69	0.0012	33				
90 L 2	1.50	2,800	8.90	74	0.98	5.1	4.9	0.7	60.0	77	69	0.0015	33				
100 LA 2	2.20	2,800	15.50	65	0.95	7.5	5.0	0.6	60.0	80	72	0.0029	46				
100 LB 2	3.00	2,800	18.00	74	0.98	10.2	5.0	0.6	80.0	80	72	0.0036	46				
63 A 4	0.09	1,360	1.10	39	0.90	0.6	3.2	0.6	6.3	52	44	0.0002	16				
63 B 4	0.13	1,350	1.30	55	0.90	1.1	3.0	0.6	8.0	52	44	0.0002	16				
71 A 4	0.15	1,380	1.70	42	0.90	1.0	3.2	0.7	10.0	56	48	0.0006	19				
71 B 4	0.25	1,380	2.30	48	0.97	1.7	3.4	0.7	12.5	56	48	0.0009	19				
80 A 4	0.35	1,410	3.30	49	0.96	2.4	3.8	0.7	20.0	59	51	0.0009	26				
80 B 4	0.45	1,420	4.30	53	0.85	3.0	3.8	0.8	25.0	59	51	0.0013	26				
80 L 4	0.55	1,420	4.90	56	0.87	3.7	3.9	0.7	20.0	59	51	0.0014	26				
90 S 4	0.75	1,420	5.90	56	0.97	5.2	2.1	1.0	30.0	62	54	0.0020	33				
90 L 4	1.10	1,430	7.20	73	0.91	7.3	4.0	0.6	35.0	62	54	0.0026	33				
100 LA 4	1.30	1,370	8.10	72	0.98	9.0	3.2	0.5	35.0	63	55	0.0043	46				
100 LB 4	1.60	1,400	10.00	71	0.98	11.1	2.6	0.5	40.0	63	55	0.0053	46				
71 A 6	0.10	900	1.50	36	0.80	1.1	2.6	0.5	8.0	50	42	0.0007	19				
71 B 6	0.15	850	1.40	50	0.93	1.7	2.8	0.5	10.0	50	42	0.0010	19				
80 A 6	0.20	910	2.70	40	0.81	2.1	2.9	0.6	16.0	53	45	0.0022	26				
80 B 6	0.30	930	3.00	53	0.82	3.1	3.0	0.6	25.0	53	45	0.0027	26				
90 S 6	0.55	920	4.30	63	0.88	5.7	3.0	0.6	30.0	54	46	0.0034	33				
90 L 6	0.75	910	6.10	60	0.88	7.9	3.1	0.7	35.0	54	46	0.0049	33				
100 LB 6	1.10	920	8.00	65	0.92	11.4	3.2	0.7	75.0	63	55	0.0088	46				

▶ $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.8. Three-phase motors with brake, 1 or 2 speeds, for hoist applications, rated data at 400 V 50 Hz DOL start

Three-phase motors with brake			1	Speed	1,000	rpm	Duty type	IC410 S4 40%	For hoist applications	Brake						
Motor type	Rated output	Speed	Current	Efficiency	Power factor	Torque	Starting current	Starting torque	Max. torque	Noise level	Mass	Torque		Power	Braking: n° per hour	Total inertia
												[Nm]	[VA/W]			
	P _n [kW]	n [1/min]	I _n [A]	η [%]	cos φ	M _n [Nm]	I _s /I _n	M _s /M _n	M _m /M _n	L _p	m [kg]	S1	S4	[VA/W]	[max. n.] ●	[kgm²]
71 A 6	0.18	945	0.92	55.0	0.51	1.82	3.7	3.7	3.7	42	29	3	9	50	240	0.00112
71 B 6	0.26	918	1.00	60.0	0.63	2.71	3.4	2.6	2.6	42	29	3	9	50	240	0.00142
80 A 6	0.37	930	1.60	58.0	0.58	3.80	3.1	2.9	3.2	45	36	6	17	60	240	0.00300
80 B 6	0.55	930	1.80	70.0	0.65	5.79	2.8	2.0	2.1	45	36	6	17	60	240	0.00350
90 S 6	0.75	950	2.39	73.0	0.62	7.52	4.0	3.0	3.3	46	52	12	35	140	240	0.00450
90 L 6	1.10	935	3.35	73.0	0.65	11.21	3.4	2.0	2.2	46	52	12	35	140	240	0.00600
100 LB 6	1.50	950	3.80	76.0	0.75	15.11	4.2	2.0	2.3	55	62	25	48	180	240	0.01012
112 M 6	2.20	960	6.11	80.0	0.65	21.84	5.2	2.3	2.1	57	100	34	70	250	240	0.01939
132 SB 6	3.00	975	9.34	82.0	0.56	29.40	6.4	3.3	3.5	60	134	50	90	400	240	0.03638
132 MB 6	4.00	970	9.84	86.0	0.69	39.38	6.0	2.0	2.5	60	134	50	90	400	240	0.04358
132 ML 6	5.50	960	15.56	74.0	0.69	54.90	5.5	2.7	3.0	60	134	50	90	400	240	0.05468
160 MB 6	7.50	950	15.70	85.0	0.81	75.33	4.8	2.1	2.1	64	217	60	130	480	240	0.09661
160 L 6	11.00	965	25.60	89.0	0.70	109.20	5.0	2.5	2.9	64	217	60	130	480	240	0.12681
180 L 6	15.00	984	33.41	93.0	0.70	145.70	7.7	3.0	3.5	67	435	90	400	140	150	0.23830
200 LA 6	18.50	980	41.70	90.2	0.71	180.28	7.2	2.5	3.7	69	490	300	400	140	150	0.31060
200 LB 6	22.00	985	49.90	90.4	0.70	212.97	7.3	2.8	4.4	69	515	300	400	140	150	0.31840
225 M 6	30.00	985	61.00	91.7	0.78	290.86	5.8	2.0	2.5	70	750	600	800	140	150	0.77370
250 M 6	37.00	990	72.00	94.0	0.70	358.00	5.2	2.0	2.4	70	815	600	800	140	150	1.05950
250 ML 6	45.00	988	93.60	93.0	0.75	434.60	8.6	3.0	1.9	70	905	600	800	140	150	1.24200
280 S 6	45.00	982	90.50	89.0	0.80	436.29	4.9	2.5	2.8	65	1,153	600	800	140	150	1.15200
280 M 6	55.00	980	109.00	91.0	0.81	535.00	4.7	2.3	2.4	65	1,189	600	800	140	150	1.37200
315 S 6	75.00	990	151.80	93.2	0.77	722.51	6.1	2.2	2.4	65	1,269	600	800	140	150	1.84200

• Higher number of start-ups by request.

▷ $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$



5. Performance data

5.8. Three-phase motors with brake, 1 or 2 speeds, for hoist applications, rated data at 400 V 50 Hz DOL start

Three-phase motors with brake			2	Speed	3,000 750	rpm	Duty type	IC410 S4 40%	For hoist applications	Brake					
Motor type	Rated output P_n [kW]	Speed n [1/min]	Current I_n [A]	Efficiency η [%]	Power factor $\cos\phi$	Torque M_n [Nm]	Starting current I_s/I_n	Starting torque M_s/M_n	Noise level L_p	Mass m [kg]	Torque [Nm]		Power [VA/W]	Braking: n° per hour ● [max. n.]	Total inertia [kgm ²]
											S1	S4			
71 B 28	0.36	2,860	1.10	60.6	0.82	1.20	3.5	2.0	58	29	6	9	50	240	0.00082
	0.06	670	0.60	21.0	0.68	0.86	1.5	1.4							
80 A 28	0.55	2,935	1.32	77.0	0.78	1.79	6.4	2.4	62	36	12	17	60	240	0.00140
	0.12	688	0.85	45.0	0.45	1.77	1.6	1.3							
80 B 28	0.66	2,840	1.48	78.0	0.82	2.22	6.1	2.1	62	36	12	17	60	240	0.00160
	0.17	660	1.02	47.0	0.51	2.46	1.5	1.2							
90 S 28	0.90	2,845	2.45	58.0	0.91	3.02	4.8	2.9	69	52	25	35	140	240	0.00230
	0.22	680	1.35	36.0	0.65	3.09	2.1	2.8							
90 L 28	1.10	2,968	4.10	60.3	0.64	3.54	6.2	3.2	69	52	25	35	140	240	0.00260
	0.30	722	1.40	57.6	0.54	3.97	2.2	2.1							
100 LA 28	1.30	2,960	3.40	71.1	0.78	4.19	8.6	3.7	72	62	34	48	180	240	0.00422
	0.33	735	2.58	48.0	0.39	4.29	2.9	3.6							
100 L 28	1.50	2,930	4.00	70.0	0.78	4.89	6.1	2.5	72	62	34	48	180	240	0.00662
	0.37	725	3.00	47.0	0.38	4.87	2.4	3.7							
112 M 28	2.60	2,950	5.50	86.0	0.81	8.42	8.3	2.6	72	100	50	70	250	240	0.00959
	0.70	720	2.70	69.0	0.55	9.28	3.1	2.5							
132 S 28	4.00	2,950	6.80	83.0	0.91	12.95	8.5	2.7	75	134	60	90	400	236	0.01648
	1.00	720	4.20	63.0	0.60	13.26	3.3	2.3							
132 M 28	5.00	2,960	10.77	77.0	0.87	16.13	8.1	2.8	75	134	60	90	400	236	0.02188
	1.25	720	4.73	72.0	0.53	16.58	3.1	1.6							
132 L 28	6.00	2,950	14.42	78.0	0.77	19.42	7.2	3.0	75	134	60	90	400	236	0.02568
	1.50	710	7.34	59.0	0.50	20.18	2.4	1.7							

- Higher number of start-ups by request.
- ▶ $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.8. Three-phase motors with brake, 1 or 2 speeds, for hoist applications, rated data at 400 V 50 Hz DOL start

Three-phase motors with brake			2	Speed	1,500 500	rpm	Duty type	IC410 S4 40%	For hoist applications	Brake					
Motor type	Rated output P_n [kW]	Speed n [1/min]	Current I_n [A]	Efficiency η [%]	Power factor $\cos\phi$	Torque M_n [Nm]	Starting current I_s/I_n	Starting torque M_s/M_n	Noise level L_p	Mass m [kg]	Torque [Nm]		Power [VA/W]	Braking: n° per hour [max. n.]	Total inertia [kgm ²]
											S1	S4			
90 S 412	0.55	1,450	1.50	69.6	0.76	3.62	4.0	1.6	○	52	25	35	140	240	0.00310
	0.18	432	1.10	34.7	0.70	3.98	2.0	1.6							
90 L 412	0.75	1,455	2.25	69.0	0.70	4.92	4.5	2.0	○	52	25	35	140	240	0.00370
	0.25	440	1.35	45.0	0.60	5.43	2.0	1.8							
100 LA 412	1.10	1,473	4.80	56.3	0.59	7.13	4.8	3.4	○	62	34	48	180	240	0.00562
	0.37	478	3.65	31.3	0.47	7.39	1.6	2.5							
100 LB 412	1.50	1,455	4.83	64.0	0.70	9.85	4.6	2.3	○	62	34	48	180	240	0.00662
	0.50	455	3.00	40.9	0.59	10.49	1.8	1.8							
112 M 412	1.80	1,475	7.05	61.3	0.60	11.65	6.3	2.9	○	100	50	70	250	240	0.01249
	0.60	470	3.85	44.0	0.51	12.19	2.2	1.7							
132 S 412	2.20	1,484	7.25	77.0	0.57	14.16	6.5	3.7	○	134	60	90	400	240	0.02908
	0.73	470	4.60	50.0	0.46	14.83	1.7	1.8							
132 M 412	3.50	1,480	10.20	84.0	0.59	22.58	9.4	2.9	○	134	60	90	400	240	0.03648
	1.17	485	10.56	41.0	0.39	23.04	1.3	2.4							
132 L 412	4.00	1,484	10.60	84.0	0.65	25.74	6.8	2.8	○	134	60	90	400	240	0.04458
	1.33	479	9.87	54.0	0.36	26.52	1.9	2.5							
160 M 412	5.50	1,470	12.60	77.0	0.82	35.73	5.8	2.1	○	217	90	130	480	240	0.06771
	1.83	485	10.91	55.0	0.44	36.03	2.3	2.1							
160 L 412	7.50	1,480	16.98	85.0	0.75	48.40	5.7	2.5	○	217	90	130	480	240	0.08511
	2.50	483	14.34	68.0	0.37	49.43	2.0	2.1							
180 M 412	9.00	1,485	20.98	86.0	0.72	57.9	8.1	3.7	70	435	300	400	140	150	0.13560
	3.00	485	17.62	63.0	0.39	59.1	2.0	2.1							
180 L 412	11.60	1,480	24.80	92.5	0.73	74.8	8.3	3.5	70	435	300	400	140	150	0.16130
	3.87	480	23.98	61.3	0.38	77.0	1.9	2.5							
200 LA 412	13.00	1,490	27.00	89.1	0.78	83.3	11.4	2.5	72	515	300	400	140	150	0.25760
	4.33	493	20.57	74.1	0.41	83.9	3.6	2.4							
200 LB 412	16.00	1,490	36.34	89.5	0.71	102.5	10.0	2.8	72	515	300	400	140	150	0.25760
	5.33	491	27.78	71.0	0.39	103.7	3.8	2.7							
225 S 412	18.00	1,475	38.90	90.0	0.64	116.4	11.6	3.8	73	750	600	800	140	150	0.38570
	6.00	485	22.30	78.0	0.50	119.6	1.9	2.7							
225 M 412	20.00	1,470	42.53	91.0	0.75	129.9	10.6	3.4	73	750	600	800	140	150	0.45990
	6.67	480	22.99	79.0	0.53	132.7	1.7	2.7							
250 M 412	29.00	1,490	51.01	92.2	0.89	185.9	10.5	2.8	75	905	600	800	140	100	0.77930
	9.50	495	33.77	84.6	0.48	183.3	4.8	2.3							
250 ML 412	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
280 S 412	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
280 M 412	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
315 S 412	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ Data not indicated is supplied on request.

• Higher number of start-ups by request.

▷ $I'_n = I_n \cdot \frac{400}{U'}$ (I'_n = current at U' Volt); ▼ $J = \frac{PD^2}{4}$

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411								
	400 V, 50 Hz [1/min] 3,000		[Hz] 5÷50 range 1÷10 [1/min] 300÷3,000			[Hz] 10÷50 range 1÷5 [1/min] 600÷3,000			[Hz] 25÷50 range 1÷2 [1/min] 1,500÷3,000		
Motor type	Mains connection		Constant torque			Constant torque			Constant torque		
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]
63 B 2	0.25	0.85	0.02-0.16	0.54	0.53	0.04-0.18	0.61	0.60	0.11-0.22	0.76	0.74
71 A 2	0.37	1.10	0.02-0.24	0.81	0.71	0.05-0.27	0.91	0.80	0.16-0.33	1.12	0.99
71 B 2	0.55	1.40	0.04-0.35	1.19	0.91	0.08-0.40	1.34	1.02	0.24-0.49	1.65	1.26
80 A 2	0.75	1.90	0.05-0.48	1.6	1.29	0.11-0.54	1.84	1.45	0.33-0.67	2.2	1.80
80 B 2	1.10	2.60	0.07-0.70	2.38	1.67	0.16-0.79	2.67	1.88	0.49-0.98	3.31	2.32
90 S 2	1.50	3.10	0.10-0.96	3.19	1.99	0.22-1.08	3.59	2.24	0.67-1.34	4.45	2.78
90 L 2	2.20	4.80	0.14-1.41	4.77	3.08	0.32-1.58	5.36	3.47	0.98-1.96	6.64	4.29
100 LA 2	3.00	7.30	0.19-1.92	6.41	4.67	0.43-2.16	7.21	5.26	1.34-2.67	8.93	6.51
112 M 2	4.00	8.70	0.30-2.60	8.40	5.60	0.60-2.90	9.50	6.30	1.80-3.60	11.70	7.80
132 SA 2	5.50	12.00	0.40-3.50	11.60	7.40	0.80-4.00	13.10	8.30	2.50-4.90	16.20	10.30
132 SB 2	7.50	15.00	0.50-4.80	15.80	9.60	1.10-5.40	17.70	10.80	3.30-6.70	21.90	13.40
132 MB 2	9.20	18.00	0.60-5.90	19.40	11.50	1.30-6.60	21.80	13.00	4.10-8.20	27.00	16.10
160 MA 2	11.00	20.60	0.70-7.00	23.00	13.10	1.60-7.90	25.80	14.80	4.90-9.80	32.00	18.30
160 MB 2	15.00	26.80	1.00-9.60	31.10	16.90	2.20-10.80	35.00	19.00	6.70-13.40	43.30	23.60
160 L 2	18.50	32.80	1.20-11.80	38.40	20.90	2.70-13.30	43.20	23.50	8.20-16.50	53.50	29.00
180 M 2	22.00	40.00	1.40-14.10	46.00	25.40	3.20-15.80	51.00	28.50	9.80-19.60	63.00	35.30
200 LA 2	30.00	55.00	1.90-19.20	62.00	35.20	4.30-21.60	69.00	39.60	13.40-26.70	86.00	49.00
200 LB 2	37.00	67.00	2.40-23.70	76.00	42.40	5.30-26.60	86.00	47.70	16.50-33.00	106.00	59.00
225 M 2	45.00	82.00	2.90-28.80	92.00	52.00	6.50-32.40	104.00	58.50	20.00-40.10	129.00	72.30
250 M 2	55.00	98.00	3.50-35.20	113.00	62.80	7.90-39.60	127.00	70.60	24.50-49.00	157.00	87.40
280 S 2	75.00	132.00	4.60-46.40	149.00	81.00	10.10-50.70	163.00	88.50	31.70-63.40	203.00	110.70
280 M 2	90.00	165.00	5.60-55.60	178.00	101.40	12.20-60.80	195.00	110.90	38.00-76.10	244.00	138.70
315 S 2	110.00	139.00	6.80-68.00	218.00	118.50	14.90-74.40	238.00	129.60	46.50-91.00	298.00	162.10
315 LA 2	132.00	222.00	8.20-81.60	262.00	140.70	17.90-89.20	287.00	153.90	55.80-111.60	359.00	192.40
315 LB 2	160.00	269.00	9.90-98.90	317.00	166.00	21.60-108.20	346.00	181.50	67.60-135.30	433.00	227.00
315 LC 2	200.00	332.00	12.40-123.60	396.00	206.00	27.00-135.20	433.00	225.30	84.50-169.10	541.00	281.70

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411/ IC 416♦						IC 416			IC 411
	400 V, 50 Hz [1/min] 3,000		[Hz] 50÷87 range 10÷17 [1/min] 3,000÷5,200			[Hz] 50÷87 range 10÷17 [1/min] 3,000÷5,200			[Hz] 5÷50 range 1÷10 [1/min] 300÷3,000			[Hz] 5÷50 range 1÷10 [1/min] 300÷3,000
Motor type	Mains connection		Constant torque - Weakened flux			Constant torque - Constant flux Δ connection			Constant torque - Forced ventilation			Quadratic torque*
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]
63 B 2	0.25	0.85	0.13-0.23	0.46	0.44	0.21-0.36	0.70	1.18	-	-	-	0.25
71 A 2	0.37	1.10	0.20-0.35	0.68	0.60	0.30-0.53	1.04	1.60	-	-	-	0.37
71 B 2	0.55	1.40	0.30-0.51	1.00	0.76	0.45-0.79	1.53	2.02	-	-	-	0.55
80 A 2	0.75	1.90	0.40-0.70	1.37	1.08	0.62-1.07	2.10	2.89	-	-	-	0.75
80 B 2	1.10	2.60	0.59-1.03	1.99	1.40	0.90-1.57	3.05	3.73	-	-	-	1.10
90 S 2	1.50	3.10	0.81-1.40	2.68	1.67	1.23-2.14	4.10	4.45	-	-	-	1.50
90 L 2	2.20	4.80	1.18-2.06	4.00	2.59	1.81-3.15	6.12	6.88	-	-	-	2.20
100 LA 2	3.00	7.30	1.61-2.80	5.38	3.92	2.47-4.29	8.23	10.44	0.27-2.70	9.02	6.57	3.00
			[Hz] 50÷70★ range 10÷14 [1/min] 3,000÷4,200			[Hz] 50÷70★ range 10÷14 [1/min] 3,000÷4,200						
112 M 2	4.00	8.70	3.00-4.10	9.80	6.50	3.90-5.40	12.80	14.90	0.40-3.60	11.90	7.90	4.00
132 SA 2	5.50	12.00	4.10-5.70	13.50	8.60	5.30-7.50	17.60	19.50	0.50-5.00	16.40	10.40	5.50
132 SB 2	7.50	15.00	5.60-7.80	18.20	11.10	7.30-10.20	23.90	25.30	0.70-6.8	22.20	13.50	7.50
132 MB 2	9.20	18.00	6.80-9.50	22.40	13.40	8.90-12.50	29.40	30.40	0.80-8.30	27.30	16.20	9.20
160 MA 2	11.00	20.60	8.10-11.40	26.50	15.20	10.70-14.90	34.80	34.60	1.00-9.90	32.3	18.50	11.00
160 MB 2	15.00	26.80	11.10-15.50	36.00	19.60	14.60-20.40	47.20	44.60	1.40-13.50	3.80	23.80	15.00
160 L 2	18.50	32.80	13.70-19.20	44.40	24.10	17.90-25.10	58.20	55.00	1.70-16.70	54.00	29.30	18.50
			[Hz] 50÷60★ range 10÷12 [1/min] 3,000÷3,600			[Hz] 50÷60★ range 10÷12 [1/min] 3,000÷3,600						
180 M 2	22.00	40.00	19.80-23.80	64.00	35.70	22.00-26.40	71.00	68.90	2.00-19.80	64.00	35.70	22.00
200 LA 2	30.00	55.00	27.00-32.40	87.00	49.50	30.00-36.00	96.00	95.70	2.70-27.00	87.00	49.50	30.00
200 LB 2	37.00	67.00	33.30-40.00	107.00	59.60	37.00-44.40	119.00	115.20	3.30-33.30	107.00	59.60	37.00
225 M 2	45.00	82.00	40.50-48.60	130.00	73.10	42.70-51.30	137.00	134.20	4.10-40.50	130.00	73.10	45.00
250 M 2	55.00	98.00	49.50-59.40	159.00	88.30	52.20-62.70	168.00	162.10	5.00-49.50	159.00	88.30	55.00
280 S 2	75.00	132.00	63.70-76.50	204.00	111.30	67.50-81.00	216.00	205.00	6.40-63.70	204.00	111.30	73.50
280 M 2	90.00	165.00	76.50-91.80	245.00	139.40	81.00-97.20	259.00	256.70	7.70-76.50	245.00	139.40	87.30
315 S 2	110.00	139.00	93.50-112.20	300.00	163.00	99.00-118.80	317.00	300.10	9.40-93.50	300.00	163.00	105.60
315 LA 2	132.00	222.00	112.20-134.60	361.00	193.40	118.80-142.50	382.00	356.20	11.20-112.20	361.00	193.40	124.10
315 LB 2	160.00	269.00	136.00-163.20	435.00	228.20	144.00-172.80	461.00	420.30	13.60-136.00	435.00	228.20	147.20
315 LC 2	200.00	332.00	170.00-204.00	544.00	283.20	180.00-216.00	576.00	521.50	17.00-170.00	544.00	283.00	180.00

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

Rounded values:

- Values refer to 50 Hz.
- ★ Higher frequency upon request.
- ♦ To reduce noise level, IC 416 is advisable (available from frame size 100).

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411								
	400 V, 50 Hz [1/min] 1,500		[Hz] 5÷50 range 1÷10 [1/min] 150÷1,500			[Hz] 10÷50 range 1÷5 [1/min] 300÷1,500			[Hz] 25÷50 range 1÷2 [1/min] 750÷1,500		
Motor type	Mains connection		Constant torque			Constant torque			Constant torque		
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]
63 A 4	0.12	0.62	0.01-0.08	0.53	0.34	0.02-0.09	0.60	0.38	0.05-0.11	0.74	0.48
63 B 4	0.18	0.67	0.01-0.12	0.82	0.44	0.03-0.13	0.92	0.49	0.08-0.16	1.14	0.61
71 A 4	0.25	0.80	0.02-0.16	1.11	0.49	0.04-0.18	1.25	0.56	0.11-0.22	1.55	0.69
71 B 4	0.37"	1.10	0.02-0.24	1.63	0.69	0.05-0.27	1.83	0.77	0.16-0.33	2.26	0.96
80 A 4	0.55	1.60	0.04-0.35	2.44	1.04	0.08-0.40	2.74	1.17	0.24-0.49	3.39	1.44
80 B 4	0.75	2.00	0.05-0.48	3.27	1.29	0.11-0.54	3.68	1.45	0.33-0.67	4.56	1.79
90 S 4	1.10	2.80	0.07-0.70	4.80	1.75	0.16-0.79	5.40	1.97	0.49-0.98	6.69	2.43
90 L 4	1.50	3.60	0.10-0.96	6.46	2.31	0.22-1.08	7.26	2.60	0.67-1.34	8.99	3.21
100 LA 4	2.20	5.25	0.14-1.41	9.42	3.34	0.32-1.58	10.60	3.76	0.98-1.96	13.12	4.65
100 LB 4	3.00	6.83	0.19-1.92	12.77	4.34	0.43-2.16	14.36	4.88	1.34-2.67	17.78	6.04
112 M 4	4.00	8.20	0.30-2.60	17.00	5.10	0.60-2.90	19.10	5.80	1.80-3.60	23.60	7.20
132 SB 4	5.50	11.60	0.40-3.50	23.10	7.40	0.80-4.00	26.00	8.30	2.50-4.90	32.20	10.30
132 MB 4	7.50	16.50	0.50-4.80	31.60	10.50	1.10-5.40	35.60	11.80	3.30-6.70	44.00	14.60
132 ML 4	8.80	18.50	0.60-5.60	37.00	11.80	1.30-6.30	41.60	13.30	3.90-7.80	51.50	16.50
160 MB 4	11.00	23.00	0.70-7.00	45.70	14.60	1.60-7.90	51.50	16.50	4.90-9.80	63.70	20.40
160 L 4	15.00	30.00	1.00-9.60	62.40	19.10	2.20-10.80	70.20	21.50	6.70-13.40	86.80	26.70
180 M 4	18.50	39.00	1.20-11.80	77.00	25.00	2.70-13.30	87.00	28.20	8.20-16.50	107.00	34.90
180 L 4	22.00	44.00	1.40-14.10	92.00	28.30	3.20-15.80	103.00	31.90	9.80-19.60	127.00	39.40
200 LB 4	30.00	54.00	1.90-19.20	124.00	34.30	4.30-21.60	140.00	38.60	13.40-26.70	173.00	47.80
225 S 4	37.00	70.00	2.40-23.70	153.00	44.60	5.30-26.60	172.00	50.20	16.50-33.00	213.00	62.20
225 M 4	45.00	82.00	2.90-28.80	186.00	52.70	6.50-32.40	209.00	59.30	20.00-40.10	259.00	73.40
250 M 4	55.00	96.00	3.50-35.20	226.00	61.40	7.90-39.60	255.00	69.10	24.50-49.00	315.00	85.50
280 S 4	75.00	136.00	4.80-48.00	310.00	86.60	10.50-52.50	339.00	94.70	32.20-64.50	416.00	116.40
280 M 4	90.00	163.00	5.80-57.60	370.00	103.90	12.60-63.00	405.00	113.70	38.70-77.40	498.00	139.70
315 A 4	110.00	199.00	7.00-70.40	453.00	127.20	15.40-77.00	495.00	139.10	47.30-94.60	608.00	170.90
315 LA 4	132.00	239.00	8.50-84.50	543.00	154.20	18.50-92.40	594.00	168.70	56.80-113.50	730.00	207.20
315 LB 4	160.00	282.00	10.20-102.40	657.00	179.90	22.40-112.00	719.00	196.80	68.80-137.60	883.00	241.80
315 LC 4	200.00	354.00	12.80-128.00	822.00	225.60	28.00-140.00	899.00	246.80	86.00-172.00	1,104.00	303.20

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411/ IC 416♦						IC 416			IC 411
		400 V, 50 Hz [1/min] 1,500	[Hz] 50÷87 range 10÷17 [1/min] 1,500÷2,610			[Hz] 50÷87 range 10÷17 [1/min] 1,500÷2,610			[Hz] 5÷50 range 1÷10 [1/min] 150÷1,500			[Hz] 5÷50 range 1÷10 [1/min] 150÷1,500
Motor type		Mains connection	Constant torque - Weakened flux			Constant torque - Constant flux Δ connection			Constant torque - Forced ventilation			Quadratic torque•
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]
63 A 4	0.12	0.62	0.06-0.11	0.45	0.29	0.10-0.17	0.68	0.76	—	—	—	0.12
63 B 4	0.18	0.67	0.10-0.17	0.69	0.37	0.15-0.26	1.05	0.97	—	—	—	0.18
71 A 4	0.25	0.80	0.13-0.23	0.93	0.41	0.21-0.36	1.43	1.10	—	—	—	0.25
71 B 4	0.37*	1.10	0.20-0.35	1.37	0.58	0.30-0.53	2.09	1.54	—	—	—	0.37
80 A 4	0.55	1.60	0.30-0.51	2.04	0.87	0.45-0.79	3.13	2.32	—	—	—	0.55
80 B 4	0.75	2.00	0.40-0.70	2.75	1.08	0.62-1.07	4.21	2.87	—	—	—	0.75
90 S 4	1.10	2.80	0.59-1.03	4.03	1.47	0.90-1.57	6.17	3.91	—	—	—	1.10
90 L 4	1.50	3.60	0.81-1.40	5.42	1.94	1.23-2.14	8.29	5.15	—	—	—	1.50
100 LA 4	2.20	5.25	1.18-2.06	7.91	2.80	1.81-3.15	12.10	7.46	0.20-1.98	13.25	4.70	2.20
100 LB 4	3.00	6.83	1.61-2.80	10.71	3.64	2.47-4.29	16.40	9.68	0.27-2.70	17.96	6.10	3.00
112 M 4	4.00	8.20	2.20-3.70	14.30	4.30	3.30-5.70	21.80	11.50	0.40-3.60	23.90	7.20	4.00
132 SB 4	5.50	11.60	3.00-5.10	19.40	6.20	4.50-7.90	29.70	16.50	0.50-5.00	32.50	10.40	5.50
132 MB 4	7.50	16.50	4.00-7.00	26.50	8.80	6.20-10.70	40.60	23.30	0.70-6.80	44.50	14.70	7.50
132 ML 4	8.80	18.50	4.70-8.20	31.00	9.90	7.20-12.60	47.50	26.40	0.80-7.90	52.00	16.60	8.80
160 MB 4	11.00	23.00	5.90-10.30	38.40	12.30	9.00-15.70	58.70	32.70	1.00-9.90	64.30	20.60	11.00
160 L 4	15.00	30.00	8.10-14.00	52.30	16.10	12.30-21.50	80.10	42.80	1.40-13.50	87.70	26.90	15.00
180 M 4	18.50	39.00	9.90-17.30	65.00	21.00	15.20-26.50	99.00	55.90	1.70-16.70	108.00	35.20	18.50
180 L 4	22.00	44.00	11.80-20.60	77.00	23.80	18.10-31.50	118.00	63.30	2.00-19.80	129.00	39.80	22.00
200 LB 4	30.00	54.00	16.10-28.00	104.00	28.80	24.70-42.90	160.00	76.60	2.70-27.00	175.00	48.30	30.00
225 S 4	37.00	70.00	19.90-34.60	128.00	37.50	28.90-50.30	186.00	94.70	3.30-33.30	215.00	62.80	37.00
225 M 4	45.00	82.00	24.20-42.00	156.00	44.20	35.10-61.10	227.00	111.90	4.10-40.50	261.00	74.10	45.00
250 M 4	55.00	96.00	29.50-51.40	190.00	51.50	42.90-74.70	276.00	130.30	5.00-49.50	318.00	86.40	55.00
280 S 4	75.00	136.00	33.70-58.70	218.00	60.90	58.60-101.90	378.00	183.80	6.60-66.00	426.00	119.10	75.00
280 M 4	90.00	163.00	40.50-70.50	261.00	73.10	70.30-122.30	452.00	220.50	7.90-79.20	509.00	142.90	90.00
315 A 4	110.00	199.00	49.50-86.10	318.00	89.40	85.90-149.40	552.00	269.80	9.70-96.80	623.00	174.80	110.00
315 LA 4	132.00	239.00	59.40-103.30	382.00	108.40	103.10-179.30	663.00	327.30	11.60-116.10	747.00	212.10	132.00
315 LB 4	160.00	282.00	72.00-125.30	462.00	126.50	124.90-217.40	802.00	381.80	14.10-140.80	904.00	247.40	160.00
315 LC 4	200.00	354.00	90.00-156.60	578.00	158.60	156.20-271.70	1002.00	478.80	17.60-176.00	1,130.00	310.20	200.00

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

Rounded values:

- Values refer to 50 Hz.
- ♦ To reduce noise level, IC 416 is advisable (available from frame size 100).

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411								
400 V, 50 Hz [1/min] 1,000			[Hz] 5÷50 range 1÷10 [1/min] 100÷1,000			[Hz] 10÷50 range 1÷5 [1/min] 200÷1,000			[Hz] 25÷50 range 1÷2 [1/min] 500÷1,000		
Motor type	Mains connection		Constant torque			Constant torque			Constant torque		
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]
63 B 6	0.09	0.65	0.01-0.06	0.65	0.42	0.01-0.06	0.73	0.47	0.04-0.08	0.90	0.59
71 A 6	0.18	0.92	0.01-0.12	1.18	0.70	0.03-0.13	1.33	0.79	0.08-0.16	1.65	0.97
71 B 6	0.26	1.00	0.02-0.17	1.73	0.64	0.04-0.19	1.95	0.71	0.12-0.23	2.41	0.88
80 A 6	0.37	1.60	0.02-0.24	2.43	1.02	0.05-0.27	2.74	1.14	0.16-0.33	3.39	1.41
80 B 6	0.55	1.80	0.04-0.35	3.61	1.12	0.08-0.40	4.07	1.26	0.24-0.49	5.03	1.55
90 S 6	0.75	2.20	0.05-0.48	5.04	1.39	0.11-0.54	5.67	1.57	0.33-0.67	7.01	1.94
90 L 6	1.10	3.20	0.07-0.70	7.19	2.00	0.16-0.79	8.09	2.25	0.49-0.98	10.01	2.79
100 LB 6	1.50	3.80	0.10-0.96	9.65	2.43	0.22-1.07	10.86	2.73	0.67-1.34	13.44	3.38
112 M 6	2.20	6.20	0.10-1.40	14.00	3.90	0.30-1.60	15.80	4.40	1.00-2.00	19.50	5.40
132 S 6	3.00	8.50	0.20-1.90	19.30	5.40	0.40-2.20	21.70	6.10	1.30-2.70	26.90	7.60
132 M 6	4.00	9.50	0.30-2.60	25.20	6.10	0.60-2.90	28.40	6.80	1.80-3.60	35.10	8.50
132 ML 6	5.50	12.00	0.40-3.50	35.00	7.70	0.80-4.00	39.40	8.60	2.50-4.90	48.80	10.70
160 MB 6	7.50	16.00	0.50-4.80	48.30	10.20	1.10-5.40	54.30	11.50	3.30-6.70	67.20	14.20
160 L 6	11.00	23.00	0.70-7.00	70.80	14.80	1.60-7.90	79.60	16.60	4.90-9.80	98.50	20.50
180 L 6	15.00	29.00	1.00-9.60	96.00	18.30	2.20-10.80	107.00	20.60	6.70-13.40	133.00	25.50
200 LA 6	18.50	38.00	1.20-11.80	116.00	24.40	2.70-13.30	130.00	27.40	8.20-16.50	161.00	34.00
200 LB 6	22.00	44.00	1.40-14.10	137.00	28.30	3.20-15.80	154.00	31.90	9.80-19.60	191.00	39.40
225 M 6	30.00	61.00	1.90-19.20	186.00	38.60	4.30-21.60	209.00	43.40	13.40-26.70	259.00	53.80
250 M 6	37.00	72.00	2.40-23.70	228.00	46.00	5.30-26.60	257.00	51.80	16.50-33.00	318.00	64.10
280 S 6	45.00	90.50	2.90-28.80	280.00	58.40	6.30-31.50	306.00	63.80	19.40-38.70	376.00	78.40
280 M 6	55.00	109.00	3.50-35.20	343.00	68.90	7.70-38.50	375.00	75.40	23.70-47.30	461.00	92.60
315 S 6	75.00	147.20	4.80-48.00	463.00	93.30	10.50-52.50	506.00	102.00	32.20-64.50	622.00	125.30
315 LA 6	90.00	167.60	5.80-57.60	558.00	111.90	12.60-63.00	611.00	122.40	38.70-77.40	750.00	150.40
315 LB 6	110.00	205.00	7.00-70.40	676.00	130.20	15.40-77.00	740.00	142.40	47.30-94.60	909.00	175.00
315 LC 6	132.00	243.00	8.50-84.50	811.00	156.30	18.50-92.40	887.00	170.90	56.80-113.50	1,090.00	210.00

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411/ IC 416♦						IC 416			IC 411
	400 V, 50 Hz [1/min] 1,000		[Hz] 50±87 range 10÷17 [1/min] 1,000±1,740			[Hz] 50±87 range 10÷17 [1/min] 1,000±1,740			[Hz] 5±50 range 1÷10 [1/min] 100±1,000			[Hz] 5±50 range 1÷10 [1/min] 100±1,000
Motor type	Mains connection		Constant torque - Weakened flux			Constant torque - Constant flux Δ connection			Constant torque - Forced ventilation			Quadratic torque•
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]
63 B 6	0.09	0.65	0.05-0.08	0.54	0.35	0.07-0.13	0.83	0.94	—	—	—	0.09
71 A 6	0.18	0.92	0.10-0.17	0.99	0.59	0.15-0.26	1.52	1.56	—	—	—	0.18
-	0.26	1.00	0.14-0.24	1.45	0.53	0.21-0.37	2.22	1.42	—	—	—	0.26
80 A 6	0.37	1.60	0.20-0.35	2.04	0.85	0.30-0.53	3.12	2.27	—	—	—	0.37
80 B 6	0.55	1.80	0.30-0.51	3.03	0.94	0.45-0.79	4.64	2.49	—	—	—	0.55
90 S 6	0.75	2.20	0.40-0.70	4.23	1.17	0.62-1.07	6.47	3.11	—	—	—	0.75
90 L 6	1.10	3.20	0.59-1.03	6.03	1.68	0.90-1.57	9.24	4.47	—	—	—	1.10
100 LB 6	1.50	3.80	0.81-1.40	8.10	2.04	1.23-2.14	12.39	5.43	0.13-1.35	13.57	3.42	1.50
112 M 6	2.20	6.20	1.20-2.10	11.80	3.30	1.80-3.20	18.00	8.70	0.20-2.00	19.70	5.50	2.20
132 S 6	3.00	8.50	1.60-2.80	16.20	4.60	2.50-4.30	24.80	12.10	0.30-2.70	27.20	7.60	3.00
132 M 6	4.00	9.50	2.20-3.70	21.20	5.10	3.30-5.70	32.40	13.60	0.40-3.60	35.40	8.60	4.00
132 ML 6	5.50	12.00	3.00-5.10	29.40	6.40	4.50-7.90	45.00	17.10	0.50-5.00	49.20	10.80	5.50
160 MB 6	7.50	16.00	4.00-7.00	40.50	8.50	6.20-10.70	62.00	22.70	0.70-6.80	67.90	14.30	7.50
160 L 6	11.00	23.00	5.90-10.30	59.40	12.40	9.00-15.70	91.00	33.00	1.00-9.90	99.50	20.80	11.00
180 L 6	15.00	29.00	8.10-14.00	80.00	15.40	12.30-21.50	123.00	40.90	1.40-13.50	134.00	25.70	15.00
200 LA 6	18.50	38.00	9.90-17.30	97.00	20.50	15.20-26.50	149.00	54.50	1.70-16.70	163.00	34.30	18.50
200 LB 6	22.00	44.00	11.80-20.60	115.00	23.80	18.10-31.50	176.00	63.30	2.00-18.80	193.00	39.80	22.00
225 M 6	30.00	61.00	16.10-28.00	156.00	32.40	23.40-40.80	227.00	81.90	2.70-27.00	262.00	54.30	30.00
250 M 6	37.00	72.00	19.90-34.60	192.00	38.60	28.90-50.30	279.00	97.70	3.30-33.30	321.00	64.70	37.00
280 S 6	45.00	90.50	20.30-35.20	197.00	41.00	35.10-61.10	342.00	123.90	4.00-39.60	385.00	80.30	45.00
280 M 6	55.00	109.00	24.70-43.10	241.00	48.50	43.00-74.70	419.00	146.20	4.80-48.40	472.00	94.80	55.00
315 S 6	75.00	147.20	33.70-58.70	326.00	65.60	58.60-101.90	565.00	197.90	6.60-66.00	637.00	128.30	75.00
315 LA 6	90.00	167.60	40.50-70.50	393	78.70	70.30-122.30	681.00	237.50	7.90-79.20	768.00	153.90	90.00
315 LB 6	110.00	205.00	49.50-86.10	476.00	91.60	85.90-149.40	825.00	276.30	9.70-96.80	930.00	179.00	110.00
315 LC 6	132.00	243.00	59.40-103.30	570.00"	109.90	103.10-179.30	989.00	331.60	11.60-116.10	1,115.00	214.90	132.00

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

Rounded values:

- Values refer to 50 Hz.
- ♦ To reduce noise level, IC 416 is advisable (available from frame size 100).

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411								
400 V, 50 Hz [1/min] 750			[Hz] 5÷50 range 1÷10 [1/min] 75÷750			[Hz] 10÷50 range 1÷5 [1/min] 150÷750			[Hz] 25÷50 range 1÷2 [1/min] 375÷750		
Motor type	Mains connection		Constant torque			Constant torque			Constant torque		
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]
63 B 8	0.05	0.44	0.003-0.03	0.52	0.29	0.01-0.04	0.58	0.32	0.02-0.04	0.72	0.40
71 B 8	0.15	0.57	0.01-0.10	1.53	0.34	0.02-0.11	1.72	0.38	0.07-0.13	2.13	0.48
80 A 8	0.18	0.97	0.01-0.12	1.56	0.58	0.03-0.13	1.76	0.65	0.08-0.16	2.17	0.81
80 B 8	0.25	1.00	0.02-0.16	2.21	0.63	0.04-0.18	2.49	0.71	0.11-0.22	3.08	0.88
90 S 8	0.37	1.30	0.02-0.24	3.33	0.83	0.05-0.27	3.74	0.93	0.16-0.33	4.63	1.15
90 L 8	0.55	1.90	0.04-0.35	4.94	1.22	0.08-0.40	5.56	1.37	0.24-0.49	6.88	1.70
100 LA 8	0.75	2.90	0.05-0.48	6.37	1.85	0.11-0.54	7.16	2.08	0.33-0.67	8.86	2.57
100 LB 8	1.10	3.10	0.07-0.70	9.96	1.99	0.16-0.79	11.21	2.24	0.49-0.98	13.87	2.77
112 M 8	1.50	4.40	0.10-1.00	12.70	2.80	0.20-1.10	14.30	3.20	0.70-1.30	17.70	3.90
132 SB 8	2.20	6.50	0.10-1.40	18.70	4.10	0.30-1.60	21.00	4.60	1.00-2.00	26.00	5.70
132 ML 8	3.00	8.50	0.20-1.90	25.50	5.40	0.40-2.20	28.70	6.00	1.30-2.70	35.50	7.50
160 MA 8	4.00	9.70	0.30-2.60	34.10	6.20	0.60-2.90	38.30	7.00	1.80-3.60	47.40	8.60
160 MB 8	5.50	14.00	0.40-3.50	46.40	8.70	0.80-4.00	52.20	9.80	2.50-4.90	64.60	12.10
160 L 8	7.50	18.00	0.50-4.80	63.70"	11.20	1.10-5.40	71.60	12.70	3.30-6.70	88.60	15.70
180 L 8	11.00	23.00	0.70-7.00	93.00	14.80	1.60-7.90	105.00	16.60	4.90-9.80	130.00	20.60
200 LB 8	15.00	35.00	0.70-7.00	125.00	22.20	2.20-10.80	140.00	25.00	6.70-13.40	174.00	31.00
225 S 8	18.50	42.25	1.20-11.80	155.00	24.60	2.70-13.30	174.00	27.70	8.20-16.50	213.00	34.20
225 M 8	22.00	46.00	1.40-14.10	184.00	29.20	3.20-15.80	207.00	32.90	9.80-19.60	256.00	40.70
250 M 8	30.00	61.00	1.90-19.20	248.00	38.80	4.30-21.60	279.00	43.60	13.40-26.70	345.00	54.00
280 S 8	37.00	71.00	2.40-23.70	310.00	44.20	5.20-25.90	339.00	48.30	15.90-31.80	416.00	59.30
280 M 8	45.00	83.00	2.90-28.80	372.00	53.30	6.30-31.50	407.00	58.30	19.40-38.70	500.00	71.60
315 S 8	55.00	113.50	3.50-35.20	453.00	71.90	7.70-38.50	496.00	78.60	23.70-47.30	609.00	96.60
315 LA 8	75.00	136.60	4.80-48.00	624.00	90.80	10.50-52.50	682.00	99.40	32.20-64.50	838.00	122.10
315 LB 8	90.00	164.50	5.80-57.60	739.00	104.20	12.60-63.00	809.00	113.90	38.70-77.40	994.00	140.00
315 LC 8	110.00	102.00	7.00-70.40	905.00	128.70	15.40-77.00	990.00	140.70	47.30-94.60	1,216.00	172.90

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

5. Performance data

5.9. Motors energized by inverter

Ventilation			IC 411/ IC 416♦						IC 416			IC 411
	400 V, 50 Hz [1/min] 750		[Hz] 50÷87 range 10÷17 [1/min] 750÷1,305			[Hz] 50÷87 range 10÷17 [1/min] 750÷1,305			[Hz] 5÷50 range 1÷10 [1/min] 75÷750			[Hz] 5÷50 range 1÷10 [1/min] 75÷750
Motor type	Mains connection		Constant torque - Weakened flux			Constant torque - Constant flux Δ connection			Constant torque - Forced ventilation			Quadratic torque•
Ex db - Ex db eb	P _n [kW]	I _n [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]	M [Nm]	I [A]	P [kW]
63 B 8	0.05	0.44	0.03-0.05	0.43	0.24	0.04-0.07	0.67	0.64	—	—	—	0.05
71 B 8	0.15	0.57	0.08-0.14	1.28	0.29	0.12-0.21	1.96	0.76	—	—	—	0.15
80 A 8	0.18	0.97	0.10-0.17	1.31	0.49	0.15-0.26	2.00	1.30	—	—	—	0.18
80 B 8	0.25	1.00	0.13-0.23	1.86	0.53	0.21-0.36	2.84	1.41	—	—	—	0.25
90 S 8	0.37	1.30	0.20-0.35	2.79	0.70	0.30-0.53	4.27	1.85	—	—	—	0.37
90 L 8	0.55	1.90	0.30-0.51	4.15	1.02	0.45-0.79	6.35	2.73	—	—	—	0.55
100 LA 8	0.75	2.90	0.40-0.70	5.34	1.55	0.62-1.07	8.18	4.12	0.07-0.67	8.95	2.60	0.75
100 LB 8	1.10	3.10	0.59-1.03	8.36	1.67	0.90-1.57	12.79	4.45	0.10-0.99	14.01	2.80	1.10
112 M 8	1.50	4.40	0.80-1.40	10.70	2.40	1.20-2.10	16.40	6.30	0.10-1.40	17.90	3.90	1.50
132 SB 8	2.20	6.50	1.20-2.10	15.70	3.40	1.80-3.20	24.00	9.20	0.20-2.00	26.30	5.80	2.20
132 ML 8	3.00	8.50	1.60-2.80	21.40	4.50	2.50-4.30"	32.70	12.00	0.30-2.70	35.80	7.50	3.00
160 MA 8	4.00	9.70	2.20-3.70	28.60	5.20	3.30-5.70	43.70	3.90	0.40-3.60	47.90	8.70	4.00
160 MB 8	5.50	14.00	3.00-5.10	38.90	7.30	4.50-7.90	59.60	19.40	0.50-5.00	65.20	12.20	5.50
160 L 8	7.50	18.00	4.00-7.00	53.40	9.40	6.20-10.70	81.80	25.10	0.70-6.80	89.50	15.80	7.50
180 L 8	11.00	23.00	5.90-10.30	78.00	12.40	9.00-15.70	120.00	33.00	1.00-9.90	131.00	20.80	11.00
200 LB 8	15.00	35.00	8.10-14.00	105.00	18.70	12.30-21.50	160.00	49.7	1.40-13.50	175.00	31.30	15.00
225 S 8	18.50	42.25	9.90-17.30	130.00	20.60	14.40-25.10	189.00	52.20	1.70-16.70	218.00	34.60	18.50
225 M 8	22.00	46.00	11.80-20.60	155.00	24.50	17.20-29.90	225.00	62.00	2.00-19.80	259.00	41.10	22.00
250 M 8	30.00	61.00	16.10-28.00	208.00	32.50	23.40-40.80	302.00	82.30	2.70-27.00	348.00	54.50	30.00
280 S 8	37.00	71.00	16.70-29.00	218.00	31.00	28.90-50.30	378.00	93.70	3.30-32.60	426.00	60.70	37.00
280 M 8	45.00	83.00	20.30-35.20	262.00	37.50	35.10-61.10	454.00	113.00	4.00-39.60	512.00	73.20	45.00
315 S 8	55.00	113.50	24.70-43.10	319.00	50.50	42.90-74.70	553.00	152.50	4.80-48.40	623.00	98.80	55.00
315 LA 8	75.00	136.60	33.70-58.70	439.00	63.90	58.60-101.90	761.00	192.70	6.60-66.00	858.00	124.90	75.00
315 LB 8	90.00	164.50	40.50-70.50	520.00	73.20	70.30-122.30	902.00	221.00	7.90-79.20	1,017.00	143.20	90.00
315 LC 8	110.00	102.00	49.50-86.10	636.00	90.50	85.90-149.40	1,104.00	273.00	9.70-96.80	1,244.00	176.90	110.00

Note: for 355 motors and for IE3 motors, data is supplied during the offer phase.

Rounded values:

- Values refer to 50 Hz.
- ♦ To reduce noise level, IC 416 is advisable (available from frame size 100).

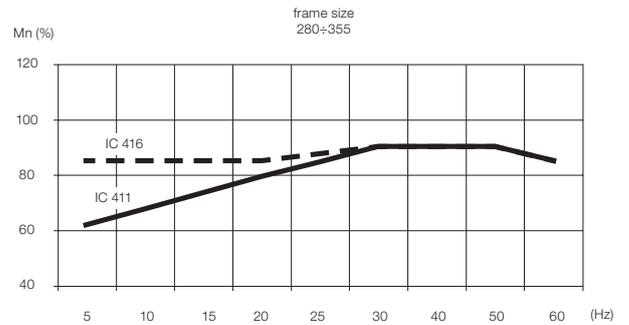
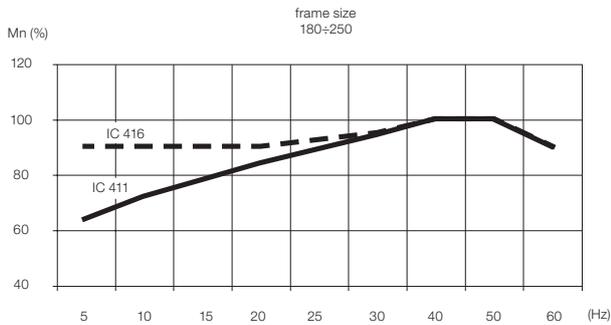
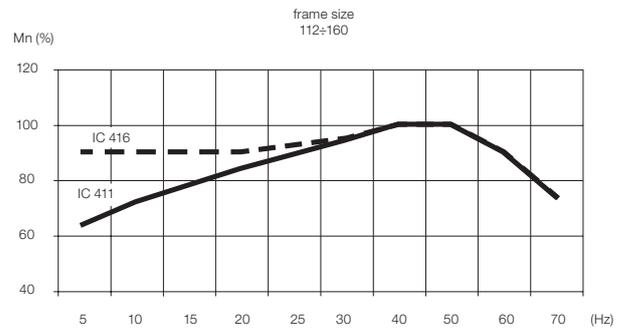
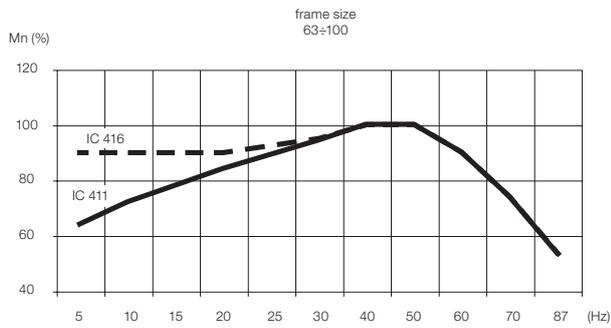
5. Performance data

5.9. Motors energized by inverter

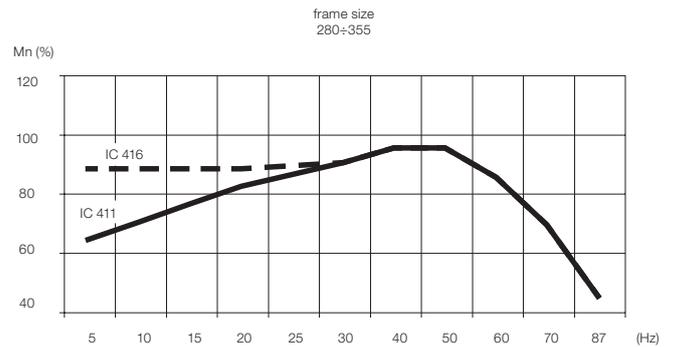
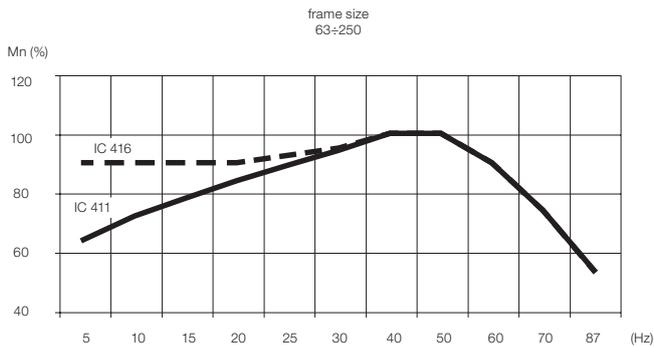
Motors energized by inverter - load capacity curves

Variable torque - weakened flux

2 poles:



4 - 6 - 8 poles:



Mn (%)	(Hz)	IC 411	IC 416
Torque	Frequency	Self-ventilated	Forced ventilation (available from frame size 100)

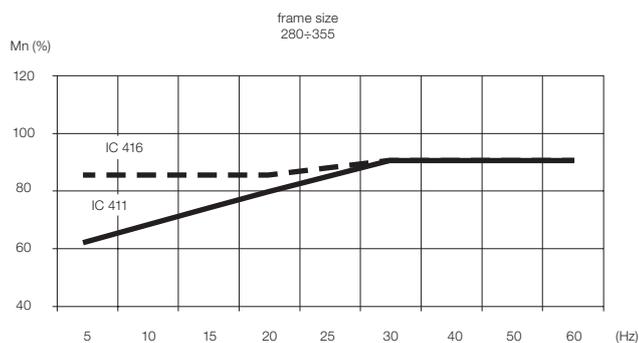
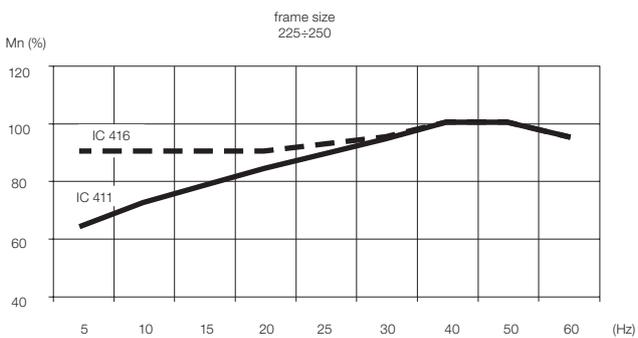
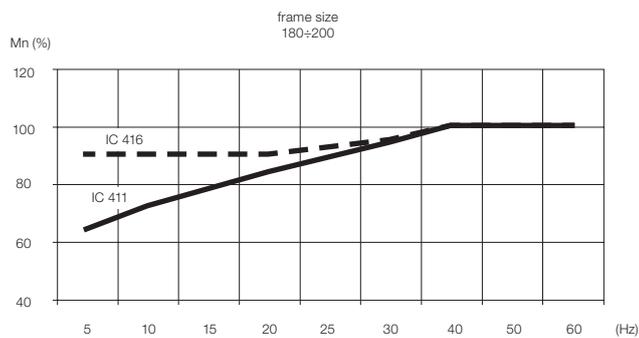
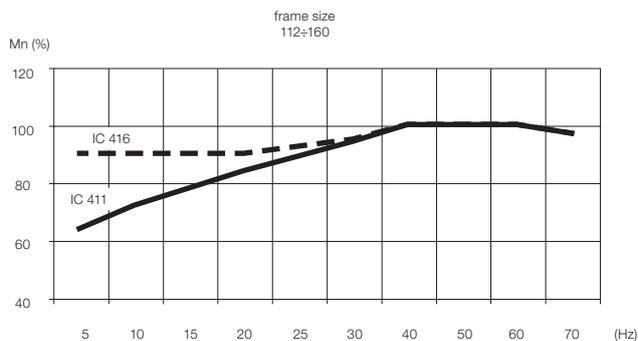
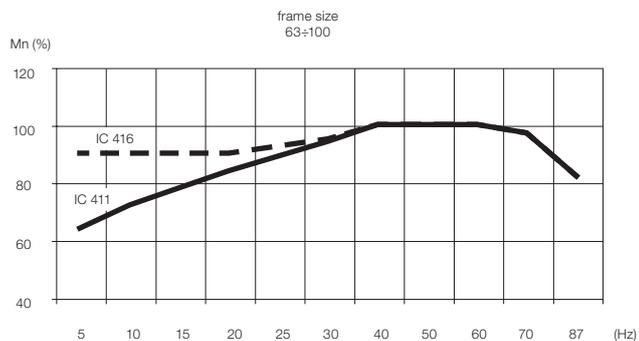
5. Performance data

5.9. Motors energized by inverter

Load capacity curves

Variable torque - constant flux

2 poles:



Notes: In the constant torque operating mode, the usable torque value is the lowest value of the chosen range of operation.
The reference torque value (Mn) is the value indicated in the tables in section 5.1. Three-phase motors, 1 speed, rated data at 400 V 50 Hz DOL start.

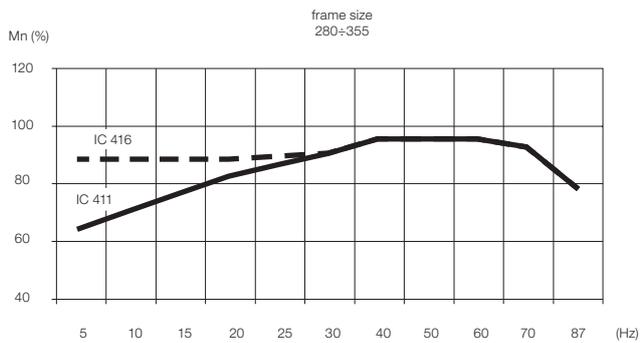
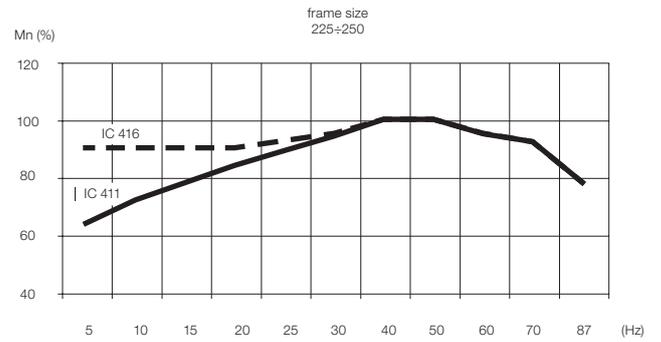
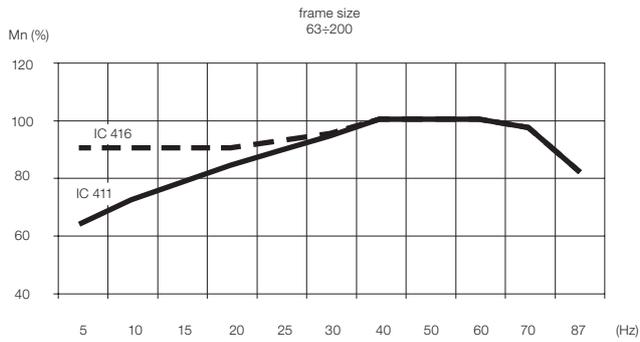
5. Performance data

5.9. Motors energized by inverter

Load capacity curves

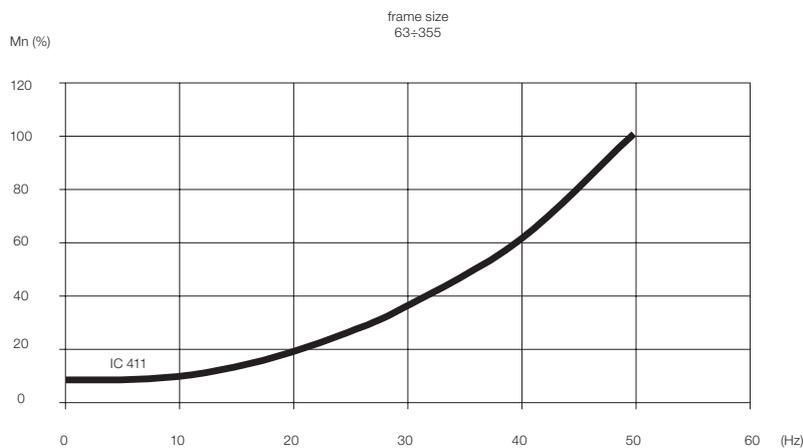
Variable torque - constant flux

4 - 6 - 8 poles:



Quadratic torque

4 - 6 - 8 poles:



Note: see pages 83-84.

6. Overall dimensions and mounting arrangements

6.1. Mounting arrangements

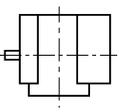
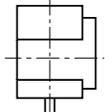
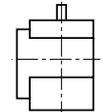
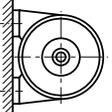
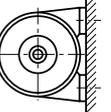
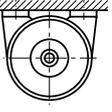
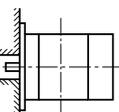
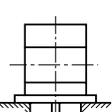
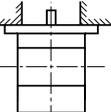
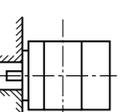
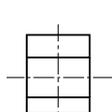
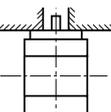
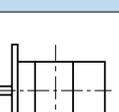
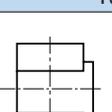
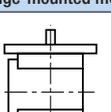
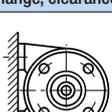
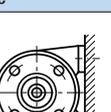
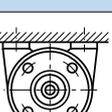
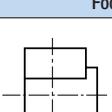
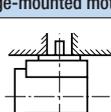
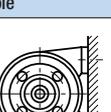
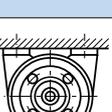
The most commonly used mounting arrangements are shown in the table 32. Other mounting arrangements are available on request.

Standard motors ordered in basic mounting arrangements (universal mounting arrangements) IM B3, IM B5 or IM B14 can also be operated in the following different mounting positions:

- IM B3 in IM B6, IM B7, IM B8, IM V5 or IM V6
- IM B5 in IM V1 or IM V3
- IM B14 in IM V18 or IM V19

According to the safety standard for electrical machines, foreign objects must be prevented from falling into the fan cover. Motors for vertical arrangement with shaft end down are fitted with a protective hood over the fan cowl.

Table 32

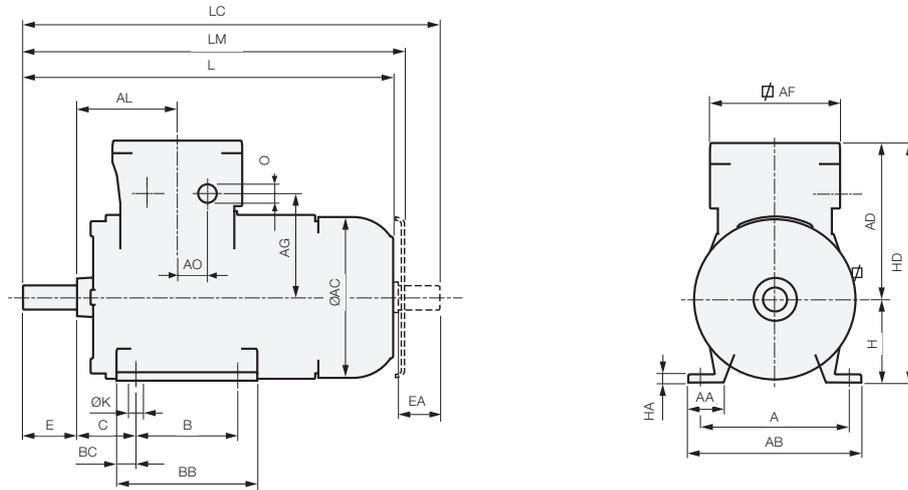
63÷355	Foot-mounted motor					
						
CEI 2-14	B3	V5	V6	B6	B7	B8
IEC EN 60034-7 code I	IM B3	IM V3	IM V6	IM B6	IM B7	IM B8
IEC EN 60034-7 code II	IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071
63÷355	Flange-mounted motor: large flange, clearance fixing holes					
						
CEI 2-14	B5	V1	V3			
IEC EN 60034-7 code I	IM B5	IM V1	IM V3			
IEC EN 60034-7 code II	IM 3001	IM 3011	IM 3031			
63÷132	Flange-mounted motor: small flange, tapped fixing holes					
						
CEI 2-14	B14	V18	V19			
IEC EN 60034-7 code I	IM B14	1M V18	1M V19			
IEC EN 60034-7 code II	IM 3601	IM 3611	IM 3631			
63÷355	Foot and flange-mounted motor: large flange, clearance fixing hole					
						
CEI 2-14	B3/B5	V5/V1	V6/V3	B6/B5	B7/B5	B8/B5
IEC EN 60034-7 code I	IM B35	IM V15	IM V36			
IEC EN 60034-7 code II	IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071
63÷132	Foot and flange-mounted motor: with small flange, tapped fixing hole					
						
CEI 2-14	B3/B14	V5/V18	V6/V19	B6/B14	B7/B14	B8/B14
IEC EN 60034-7 code I	IM B34					
IEC EN 60034-7 code II	IM 2101	IM 2111	IM 2131	IM 2151	IM 2161	IM 2171

6. Overall dimensions and mounting arrangements

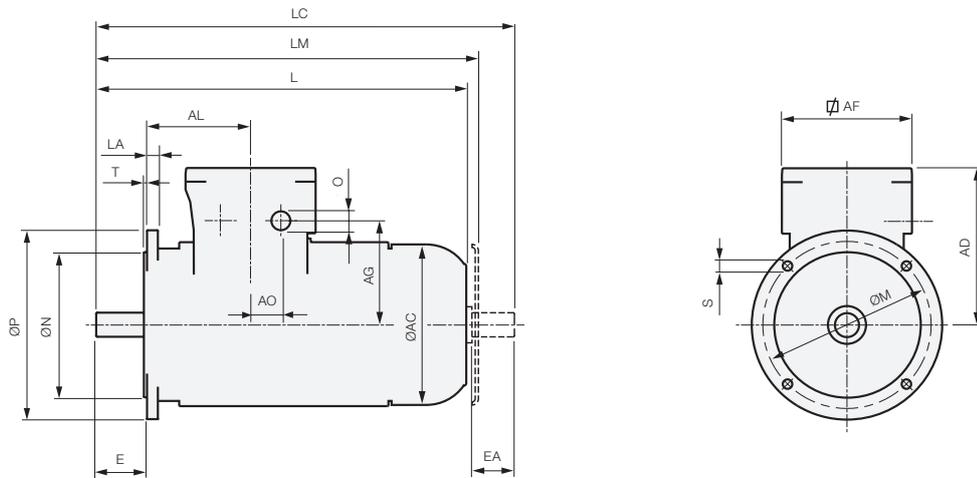
6.2. Overall dimensions of standard and mining version motors

63÷315 / IM B3 / IM B5 / IM B35

IM B3



IM B5

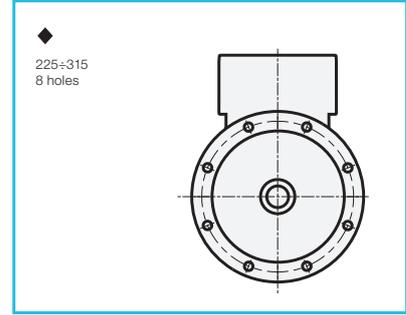
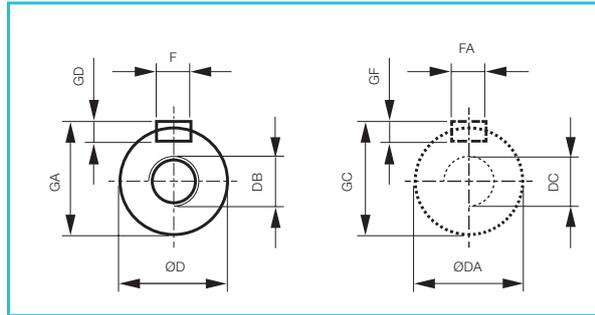
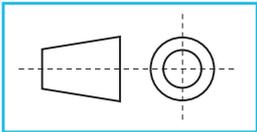
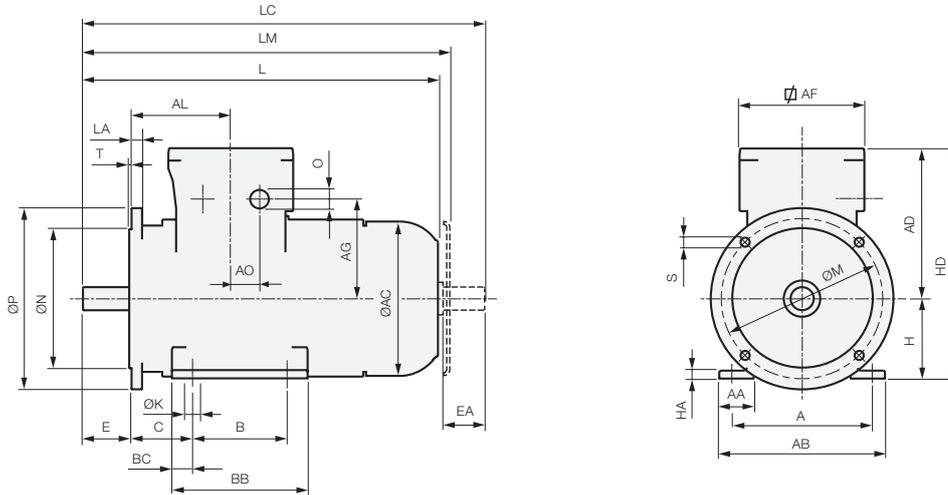


6. Overall dimensions and mounting arrangements

6.2. Overall dimensions of standard and mining version motors

63÷315 / IM B3 / IM B5 / IM B35

IM B35



6. Overall dimensions and mounting arrangements

6.2. Overall dimensions of standard and mining version motors

Metric dimensions

IE1 / IE2

Type	A	AA	AB	ØAC	AD	AF	AL	B	BC	BB	C	H _{0.5}	HA	HD	ØK	D L	LC
63	100	25	125	123	145	139	95	80	9.5	105	40	63	6	208	7	247	275.5
71	112	32	140	140	155	139	106	90	11.0	112	45	71	7	226	7	276	311.0
80	125	40	160	158	165	139	142	100	15.0	130	50	80	8	245	9	327	372.5
90 S	140	45	175	178	175	139	125	100	14.0	157	56	90	9	265	9	390	441.0
90 L	140	45	175	178	175	139	125	125	14.0	157	56	90	9	265	9	390	441.0
100	160	45	200	196	185	139	125	140	15.0	170	63	100	10	285	12	430	490.5
112	190	45	235	223	206	139	138	140	17.0	175	70	112	12	318	12	475	543.5
132 S	216	56	272	258	260	205	163	140	22.0	222	89	132	13	392	12	505	590.0
132 M-L	216	56	272	258	260	205	163	178	22.0	222	89	132	13	392	12	580	665.0
160 M	254	64	318	310	290	205	166	210	25.0	305	108	160	15	450	14	693	811.0
160 L	254	64	318	310	290	205	166	254	25.0	305	108	160	15	450	14	693	811.0
180 M	279	71	350	359	326	242	223	241	25.0	340	121	180	17	506	14	814	923.5
180 L	279	71	350	359	326	242	223	279	25.0	340	121	180	17	506	14	814	923.5
200	318	75	393	395	346	242	230	305	27.0	360	133	200	18	546	18	867	985.0
225 S	356	78	431	445	371	242	240	286	38.0	380	149	225	20	596	18	945	1,090.0
225 M 2	356	78	431	445	371	242	240	311	38.0	380	149	225	20	596	18	915	1,030.0
225 M 4-8	356	78	431	445	371	242	240	311	38.0	380	149	225	20	596	24	945	1,090.0
250 M 2	406	95	500	467	396	242	221	349	33.0	415	168	250	22	646	24	963	1,110.0
250 M 4-8	406	95	500	467	396	242	221	349	33.0	415	168	250	22	646	25	963	1,110.0
280 S 2	457	90	540	558	548	320	316	368	80.0	550	190	280	41	828	25	1,119	1,272.0
280 S 4-8	457	90	540	558	548	320	316	368	80.0	550	190	280	41	828	25	1,119	1,272.0
280 M 2	457	90	540	558	548	320	316	419	80.0	550	190	280	41	828	25	1,119	1,272.0
280 M 4-8	457	90	540	558	548	320	316	419	80.0	550	216	280	41	828	25	1,119	1,272.0
315 S 2	508	110	590	558	548	320	316	406	68.5	560	216	315	41	863	27	1,269	1,420.0
315 S 4-8	508	110	590	558	548	320	316	406	68.5	560	216	315	41	863	27	1,299	1,480.0
315 M 2	508	110	590	558	548	320	316	457	68.5	560	216	315	41	863	27	1,269	1,420.0
315 M 4-8	508	110	590	558	548	320	316	457	68.5	560	216	315	41	863	27	1,299	1,480.0
315 L 2	508	100	590	626	612	320	330	457	68.5	560	216	315	41	927	28	1,407	1,560.0
315 L 4-8	508	100	590	626	612	320	330	457	68.5	610	216	315	41	927	28	1,437	1,620.0

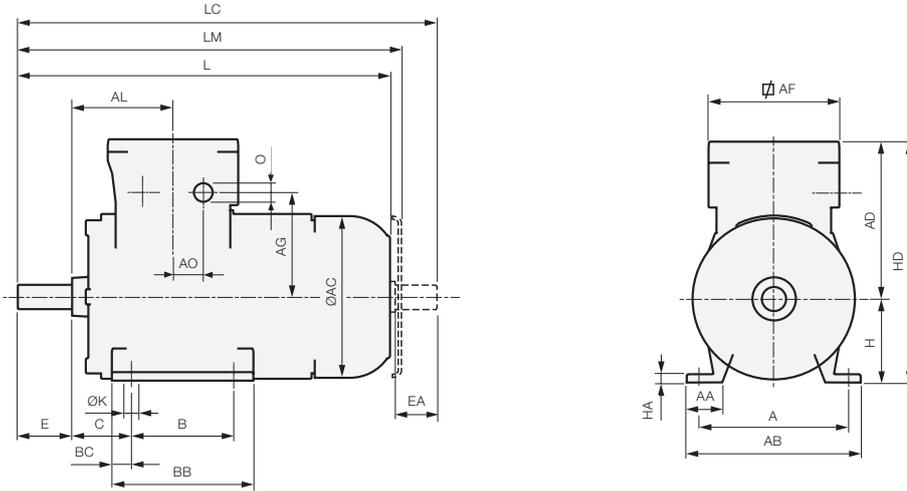
Type	* LM	AO	IEC 60423 n. x O	AG	ØD ØDA	E EA	F FA	GA GC	GD GF	DB DC	LA	ØM	ØN	ØP	◆ S	T
63	275	24	1 x M25	100	11j6	23	4	12.5	4	M4	6.5	115	95j6	140	10	3.0
71	305	24	1 x M25	110	14j6	30	5	16.0	5	M5	6.5	130	110j6	160	10	3.5
80	356	24	1 x M25	120	19j6	40	6	21.5	6	M6	11.0	165	130j6	200	12	3.5
90 S	418	24	1 x M25	130	24j6	50	8	27.0	7	M8	12.0	165	130j6	200	12	3.5
90 L	418	24	1 x M25	130	24j6	50	8	27.0	7	M8	12.0	165	130j6	200	12	3.5
100	458	24	1 x M25	140	28j6	60	8	31.0	7	M10	14.0	215	180j6	250	15	4.0
112	503	24	1 x M25	161	28j6	60	8	31.0	7	M10	16.0	215	180j6	250	15	4.0
132 S	550	35	2 x M32	185	38k6	80	10	41.0	8	M12	17.0	265	230j6	300	15	4.0
132 M-L	625	35	2 x M32	185	38k6	80	10	41.0	8	M12	17.0	265	230j6	300	15	4.0
160 M	738	35	2 x M32	215	42k6	110	12	45.0	8	M16	18.0	300	250h6	350	18	5.0
160 L	738	35	2 x M32	215	42k6	110	12	45.0	8	M16	18.0	300	250h6	350	18	5.0
180 M	860	38	2 x M40	266	48k6	110	14	52.0	9	M16	20.0	300	250h6	350	18	5.0
180 L	860	38	2 x M40	266	48k6	110	14	52.0	9	M16	20.0	300	250h6	350	18	5.0
200	913	38	2 x M40	286	55m6	110	16	59.0	10	M20	20.0	350	300h6	400	18	5.0
225 S	991	38	2 x M40	311	60m6	140	18	64.0	11	M20	22.0	400	350h6	450	18	5.0
225 M 2	991	38	2 x M40	311	55m6	110	16	59.0	10	M20	22.0	400	350h6	450	18	5.0
225 M 4-8	991	38	2 x M40	311	60m6	140	18	64.0	11	M20	22.0	400	350h6	450	18	5.0
250 M 2	1,006	38	2 x M40	336	60m6	140	18	64.0	11	M20	22.0	500	450h6	550	18	5.0
250 M 4-8	1,006	38	2 x M40	336	65m6	140	18	69.0	11	M20	22.0	500	450h6	550	18	5.0
280 S 2	1,215	56	2 x M63	410	65m6	140	18	69.0	11	M20	18.0	500	450h6	550	18	5.0
280 S 4-8	1,215	56	2 x M63	410	75m6	140	20	79.5	12	M20	18.0	500	450h6	550	18	5.0
280 M 2	1,215	56	2 x M63	410	65m6	140	18	69.0	11	M20	18.0	500	450h6	550	18	5.0
280 M 4-8	1,215	56	2 x M63	410	75m6	140	20	79.5	12	M20	18.0	500	450h6	550	18	5.0
315 S 2	1,365	56	2 x M63	410	65m6	140	18	69.0	11	M20	22.0	600	550h6	660	22	6.0
315 S 4-8	1,395	56	2 x M63	410	80m6	170	22	85.0	14	M20	22.0	600	550h6	660	22	6.0
315 M 2	1,365	56	2 x M63	410	65m6	140	18	69.0	11	M20	22.0	600	550h6	660	22	6.0
315 M 4-8	1,395	56	2 x M63	410	80m6	170	22	85.0	14	M20	22.0	600	550h6	660	22	6.0
315 L 2	1,503	56	2 x M63	474	65m6	140	18	69.0	11	M20	22.0	600	550h6	660	24	6.0
315 L 4-8	1,533	56	2 x M63	474	80m6	170	22	85.0	14	M20	22.0	600	550h6	660	24	6.0

6. Overall dimensions and mounting arrangements

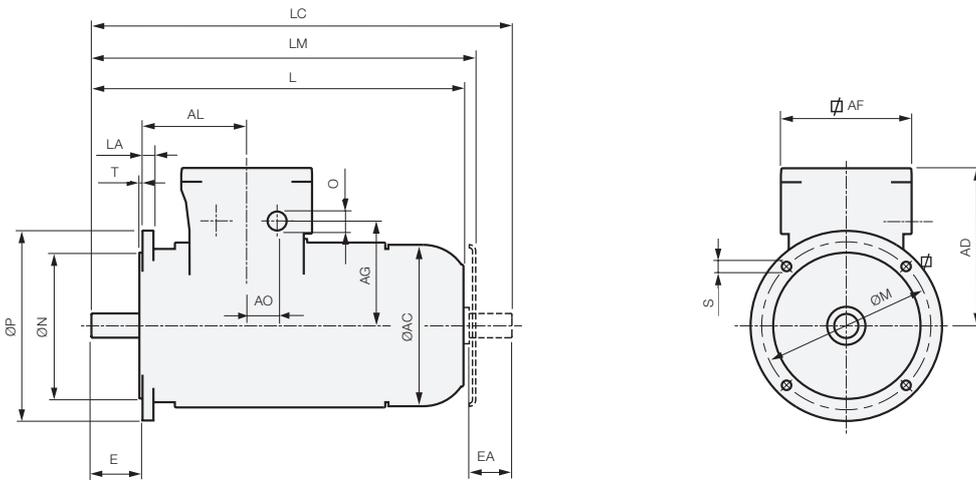
6.2. Overall dimensions of standard and mining version motors

80÷355 / IM B3 / IM B5 / IM B35

IM B3



IM B5

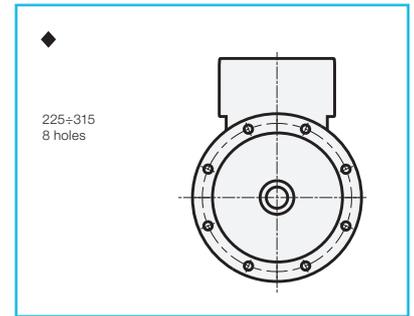
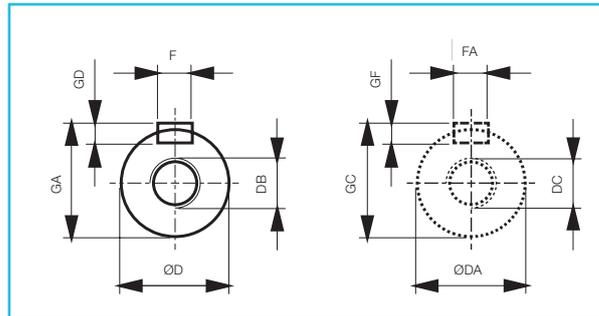
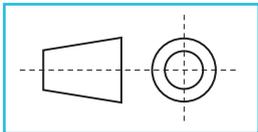
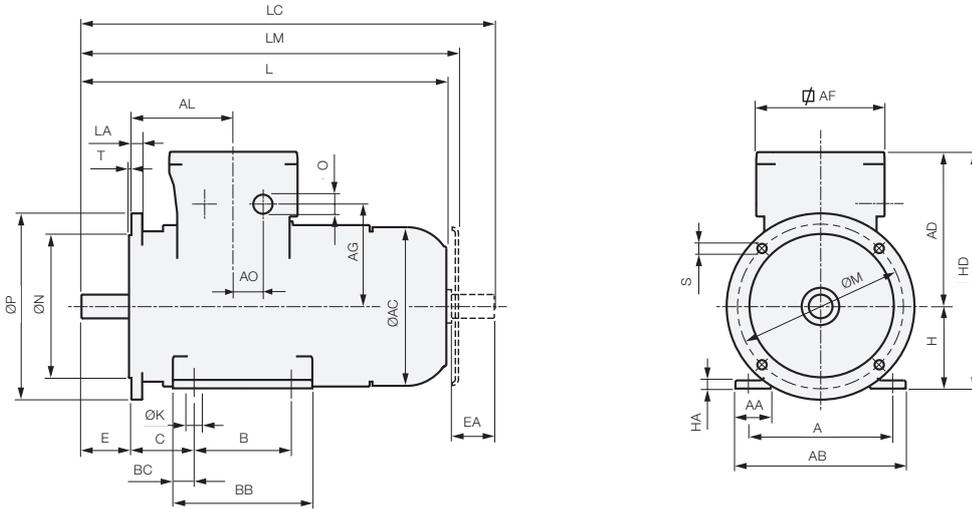


6. Overall dimensions and mounting arrangements

6.2. Overall dimensions of standard and mining version motors

80÷355 / IM B3 / IM B5 / IM B35

IM B35



6. Overall dimensions and mounting arrangements

6.2. Overall dimensions of standard and mining version motors

Metric dimensions

IE3 / IE4

Type	A	AA	AB	ØAC	AD	∠AF	AL	B	BC	BB	C	H _{0.5}	HA	HD	ØK	∅	LC
80 S	125	40	160	182	180	139	116	100	12.0	125	50	80	9	261	9	320	365.5
80 L	125	40	160	182	180	139	116	100	12.0	125	50	80	9	261	9	350	400.5
90 S	140	45	175	199	185	139	121	100	12.0	150	56	90	10	275	9	372	422.5
90 L	140	45	175	199	185	139	121	125	12.0	180	56	90	10	275	9	432	482.5
100 S	160	45	200	229	200	139	125	140	15.0	170	63	100	12	300	12	431	491.5
100 L	160	45	200	229	200	139	125	140	15.0	170	63	100	12	300	12	472	532.5
112 S	190	45	235	256	215	139	137	140	13.0	170	70	112	12	327	12	461	526.5
112 L	190	45	235	256	215	139	137	140	13.0	170	70	112	12	327	12	521	606.5
132 S	216	56	272	295	287	205	192	140	15.0	184	89	132	13	419	12	558	643.5
132 L	216	56	272	295	287	205	192	178	15.0	222	89	132	13	419	12	643	728.0
160 S	254	64	318	353	318	205	210	210	20.0	250	108	160	17	478	14	735	853.0
160 L	254	64	318	353	318	205	210	254	20.0	294	108	160	17	478	14	785	933.0
180 S	279	71	350	399	366	242	277	241	17.0	302	121	180	18	546	14	824	933.5
180 L	279	71	350	399	366	242	277	279	17.0	340	121	180	18	546	14	898	1,007.5
200 S	318	75	393	446	386	242	280	305	27.0	360	133	200	20	586	18	882	985.0
200 L	318	75	393	446	386	242	280	305	27.0	360	133	200	20	586	18	947	1,060.0
225 S 2	356	78	431	491	404	242	284	286	34.5	360	149	225	22	629	18	896	1,011.0
225 S 4-8	356	78	431	491	404	242	284	286	34.5	360	149	225	22	629	18	926	1,071.0
225 M 2	356	78	431	491	404	242	284	311	34.5	380	149	225	22	629	18	950	1,065.0
225 M 4-8	356	78	431	491	404	242	284	311	34.5	380	149	225	22	629	18	980	1,125.0
250 M 2	406	95	500	542	431	242	300	349	33.0	415	168	250	30	681	24	1,044	1,197.0
250 M 4-8	406	95	500	542	431	242	300	349	33.0	415	168	250	30	681	24	1,044	1,197.0
280 S 2	457	90	540	595	619	320	384	368	52.0	550	190	280	41	899	25	1,213	1,389.0
280 S 4-8	457	90	540	595	619	320	384	368	52.0	550	190	280	41	899	25	1,213	1,389.0
280 M 2	457	90	540	595	619	320	384	419	52.0	550	190	280	41	899	25	1,313	1,489.0
280 M 4-8	457	90	540	595	619	320	384	419	52.0	550	190	280	41	899	25	1,313	1,489.0
315 S 2	508	110	590	654	653	320	429	406	68.5	594	216	315	45	968	27	1,324	1,475.0
315 S 4-8	508	110	590	654	653	320	429	406	68.5	594	216	315	45	968	27	1,354	1,535.0
315 M 2	508	110	590	654	653	320	429	457	68.5	594	216	315	45	968	27	1,324	1,475.0
315 M 4-8	508	110	590	654	653	320	429	457	68.5	594	216	315	45	968	27	1,354	1,535.0
315 L 2	508	100	590	654	653	410	429	508	68.5	645	216	315	45	968	28	1,494	1,647.0
315 L 4-8	508	100	590	654	653	410	429	508	68.5	645	216	315	45	968	28	1,524	1,707.0
355 M 2	610	150	760	735	693	410	429	560	80.0	739	254	355	50	1,048	28	1,554	1,704.0
355 M 4-8	610	150	760	735	693	410	429	560	80.0	739	254	355	50	1,048	28	1,624	1,844.0
355 L 2	610	150	760	735	693	410	429	630	80.0	889	254	355	50	1,048	28	1,704	1,854.0
355 L 4-8	610	150	760	735	693	410	429	630	80.0	889	254	355	50	1,048	28	1,774	1,994.0

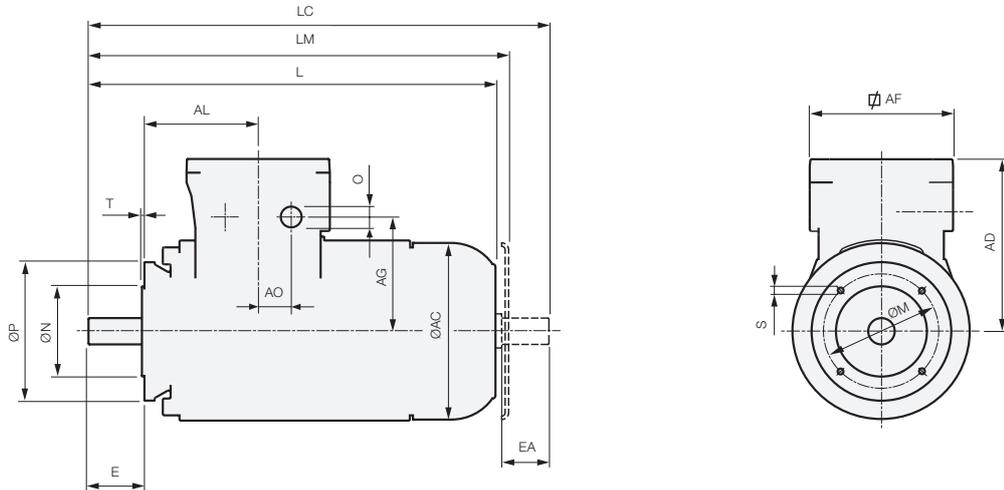
Type	* LM	A0	IEC 60423 n. x O	AG	ØD ØDA	E EA	F FA	GA GC	GD GF	DB DC	LA	ØM	ØN	ØP	◆ S	T
80 S	349	24	1 x M25	136	196	40	6	21.5	6	M6	8	165	130j6	200	12	3.5
80 L	383	24	1 x M25	136	196	40	6	21.5	6	M6	8	165	130j6	200	12	3.5
90 S	399	24	1 x M25	185	246	50	8	27.0	7	M8	8	165	130j6	200	12	3.5
90 L	459	24	1 x M25	185	246	50	8	27.0	7	M10	8	165	130j6	200	12	3.5
100 S	459	24	1 x M25	155	28j6	60	8	31.0	7	M10	14	215	180j6	250	15	4.0
100 L	500	24	1 x M25	155	28j6	60	8	31.0	7	M10	14	215	180j6	250	15	4.0
112 S	486	24	1 x M25	170	28j6	60	8	31.0	7	M10	12	215	180j6	250	15	4.0
112 L	583	24	1 x M25	170	28j6	60	8	31.0	7	M12	12	215	180j6	250	15	4.0
132 S	603	35	2 x M32	212	38k6	80	10	41.0	8	M12	14	265	230j6	300	15	4.0
132 L	688	35	2 x M32	212	38k6	80	10	41.0	8	M16	14	265	230j6	300	15	4.0
160 S	780	35	2 x M32	243	42k6	110	12	45.0	8	M16	18	300	250h6	350	18	5.0
160 L	861	35	2 x M32	243	42k6	110	12	45.0	8	M16	18	300	250h6	350	18	5.0
180 S	870	38	2 x M40	306	48k6	110	14	52.0	9	M16	16	300	250h6	350	18	5.0
180 L	944	38	2 x M40	306	48k6	110	14	52.0	9	M20	16	300	250h6	350	18	5.0
200 S	913	38	2 x M40	326	55m6	110	16	59.0	10	M20	16	350	300h6	400	18	5.0
200 L	1,018	38	2 x M40	326	55m6	110	16	59.0	10	M20	16	350	300h6	400	18	5.0
225 S	942	38	2 x M40	344	60m6	140	18	64.0	11	M20	18	400	350h6	450	18	5.0
225 S 4-8	1,002	38	2 x M40	344	60m6	140	18	64.0	11	M20	18	400	350h6	450	18	5.0
225 M 2	996	38	2 x M40	344	55m6	110	16	59.0	10	M20	18	400	350h6	450	18	5.0
225 M 4-8	1,023	38	2 x M40	344	60m6	140	18	64.0	11	M20	18	400	350h6	450	18	5.0
250 M 2	1,093	38	2 x M40	371	60m6	140	18	64.0	11	M20	18	500	450h6	550	18	5.0
250 M 4-8	1,146	38	2 x M40	371	65m6	140	18	69.0	11	M20	18	500	450h6	550	18	5.0
280 S 2	1,332	56	2 x M63	481	65m6	140	18	69.0	11	M20	18	500	450h6	550	18	5.0
280 S 4-8	1,332	56	2 x M63	481	75m6	140	20	79.5	12	M20	18	500	450h6	550	18	5.0
280 M 2	1,432	56	2 x M63	481	65m6	140	18	69.0	11	M20	18	500	450h6	550	18	5.0
280 M 4-8	1,432	56	2 x M63	481	75m6	140	20	79.5	12	M20	18	500	450h6	550	18	5.0
315 S 2	1,420	56	2 x M63	498	65m6	140	18	69.0	11	M20	22	600	550h6	660	22	6.0
315 S 4-8	1,450	56	2 x M63	498	80m6	170	22	85.0	14	M20	22	600	550h6	660	22	6.0
315 M 2	1,420	56	2 x M63	498	65m6	140	18	69.0	11	M20	22	600	550h6	660	22	6.0
315 M 4-8	1,450	56	2 x M63	498	80m6	170	22	85.0	14	M20	22	600	550h6	660	22	6.0
315 L 2	1,590	56	2 x M63	498	65m6	140	18	69.0	11	M20	22	600	550h6	660	24	6.0
315 L 4-8	1,634	56	2 x M63	498	80m6	170	22	85.0	14	M20	22	600	550h6	660	24	6.0
355 M 2	1,654	65	2 x M75	538	70m6	140	20	74.5	12	M20	25	740	680h6	800	24	6.0
355 M 4-8	1,724	65	2 x M75	538	100m6	210	28	106.0	16	M24	25	740	680h6	800	24	6.0
355 L 2	1,804	65	2 x M75	538	70m6	140	20	74.5	12	M20	25	740	680h6	800	24	6.0
355 L 4-8	1,874	65	2 x M75	538	100m6	210	28	106.0	16	M24	25	740	680h6	800	24	6.0

6. Overall dimensions and mounting arrangements

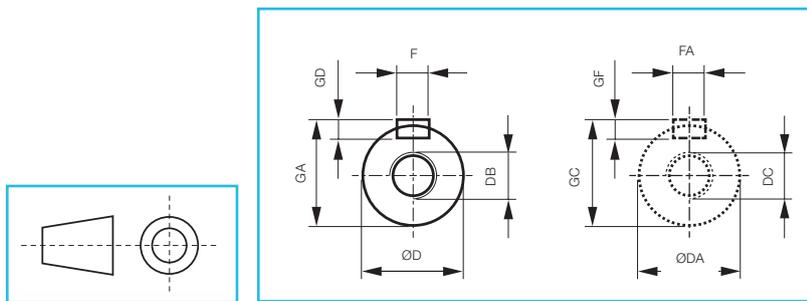
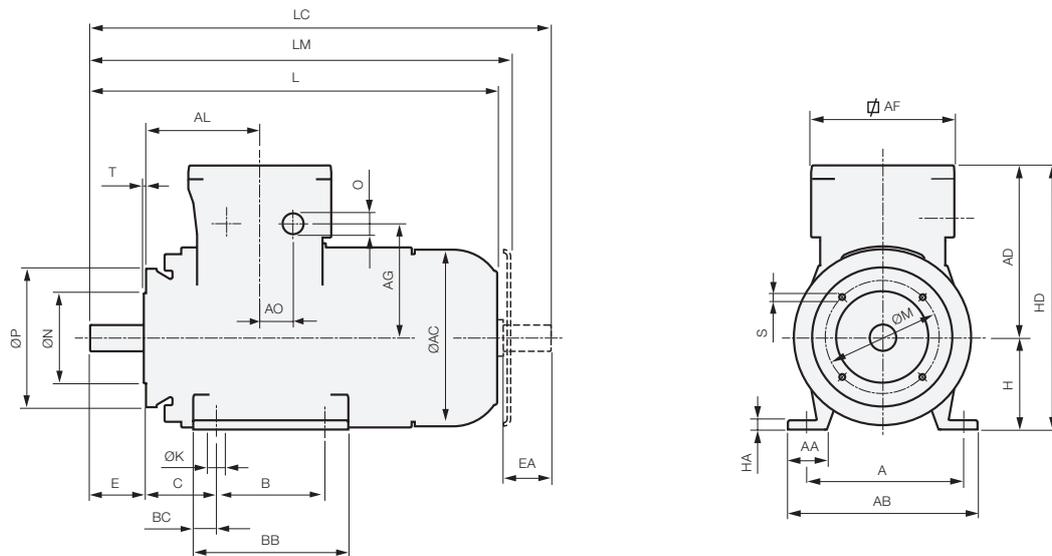
6.2. Overall dimensions of standard and mining version motors

63÷160 / IM B14 / IM B34

IM B14



IM B34



6. Overall dimensions and mounting arrangements

6.2. Overall dimensions of standard and mining version motors

Metric dimensions

IE1 / IE2

Type	A	AA	AB	ØAC	AD	∅AF	AL	B	BC	BB	C	H _{0.5}	HA	HD	ØK	$\frac{D}{L}$	LC
63	100	25	125	123	145	139	95	80	9.5	105	40	63	6	208	7	247	275.5
71	112	32	140	140	155	139	106	90	11.0	112	45	71	7	226	7	276	311.0
80	125	40	160	158	165	139	142	100	15.0	130	50	80	8	245	9	327	372.5
90 S	140	45	175	178	175	139	125	100	14.0	157	56	90	9	265	9	390	441.0
90 L	140	45	175	178	175	139	125	125	14.0	157	56	90	9	265	9	390	441.0
100	160	45	200	196	185	139	125	140	15.0	170	63	100	10	285	12	430	490.5
112	190	45	235	223	206	139	138	140	17.0	175	70	112	12	318	12	475	543.5
132 S	216	56	272	258	260	205	163	140	22.0	222	89	132	13	392	12	505	590.0
132 M-L	216	56	272	258	260	205	163	178	22.0	222	89	132	13	392	12	580	665.0
160 M	254	64	318	310	290	205	166	210	25.0	305	108	160	15	450	14	693	811.0
160 L	254	64	318	310	290	205	166	254	25.0	305	108	160	15	450	14	693	811.0

Type	* LM	A0	IEC 60423 n. x 0	AG	ØD ØDA	E EA	F FA	GA GC	GD GF	DB DC		ØM	ØN	ØP	◆ S	T
63	275	24	1 x M25	100	11j6	23	4	12.5	4	M4		75	60j6	90	M5	2.5
71	305	24	1 x M25	110	14j6	30	5	16.0	5	M5		85	70j6	105	M6	2.5
80	356	24	1 x M25	120	19j6	40	6	21.5	6	M6		100	80j6	120	M6	3.0
90 S	418	24	1 x M25	130	24j6	50	8	27.0	7	M8		115	95j6	140	M8	3.0
90 L	418	24	1 x M25	130	24j6	50	8	27.0	7	M8		115	95j6	140	M8	3.0
100	458	24	1 x M25	140	28j6	60	8	31.0	7	M10		130	110j6	160	M8	3.5
112	503	24	1 x M25	161	28j6	60	8	31.0	7	M10		130	110j6	160	M8	3.5
132 S	550	35	2 x M32	185	38k6	80	10	41.0	8	M12		165	130j6	200	M10	3.5
132 M-L	625	35	2 x M32	185	42k6	80	10	41.0	8	M12		165	130j6	200	M10	3.5
160 M	738	35	2 x M32	215	42k6	110	12	45.0	8	M16		215	180h6	250	M12	4.0
160 L	738	35	2 x M32	215	42k6	110	12	45.0	8	M16		215	180h6	250	M12	4.0

Tolerances allowed:

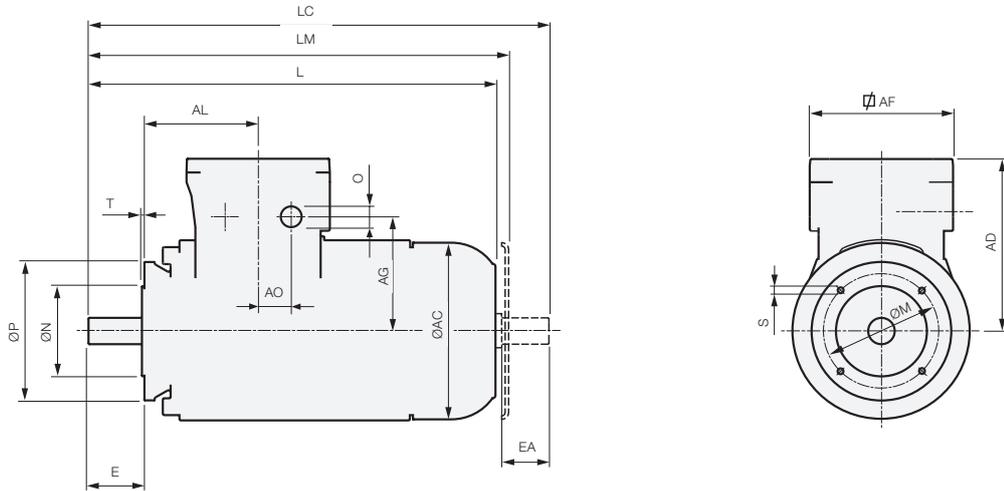
- ▶ The distance L of the motors for mining applications corresponds to the distance LM of explosion-proof motors for surfaces.
- * Rain canopy: only when vertical shaft-down mounting.
- ⊥ 1 in the terminal box, 1 on the frame.
- ▶ 280 and 315 L fixed feet. Removable feet available on request with different dimensions.

6. Overall dimensions and mounting arrangements

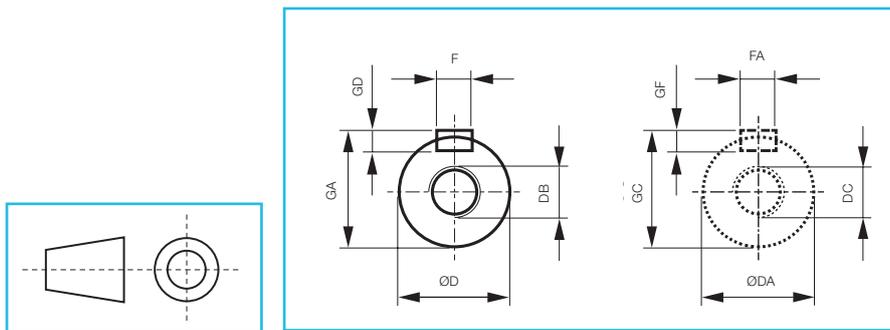
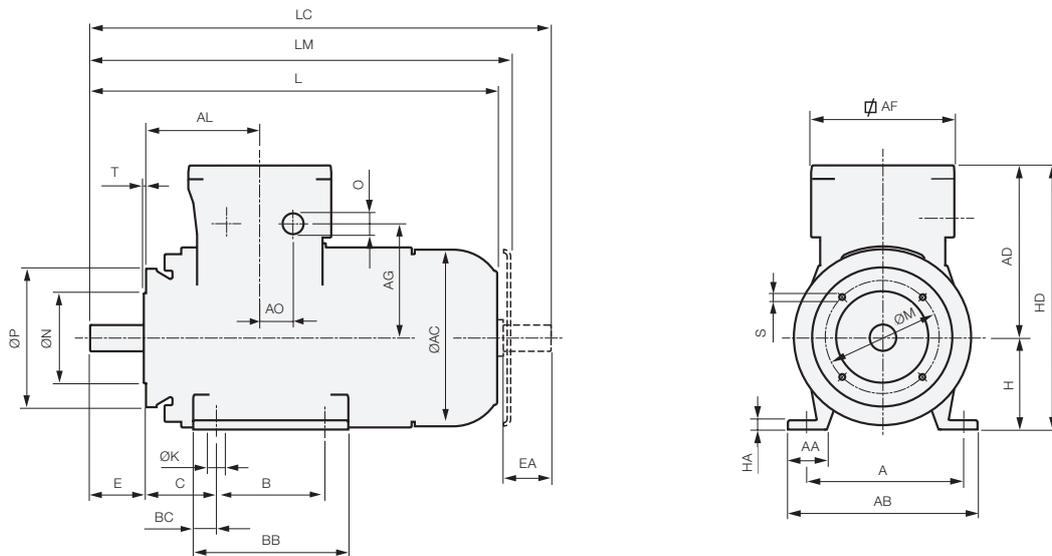
6.2. Overall dimensions of standard and mining version motors

80÷160 / IM B14 / IM B34

IM B14



IM B34



6. Overall dimensions and mounting arrangements

6.2. Overall dimensions of standard and mining version motors

Metric dimensions

IE3 / IE4

Type	A	AA	AB	ØAC	AD	∠AF	AL	B	BC	BB	C	H _{0.5}	HA	HD	ØK	∅L	LC
80 S	125	40	160	182	180	139	116	100	12	125	50	80	9	261	9	320	365.5
80 L	125	40	160	182	180	139	116	100	12	150	50	80	9	261	9	355	400.5
90 S	140	45	175	199	185	139	121	100	12	180	56	90	10	275	9	371	422.5
90 L	140	45	175	199	185	139	121	125	12	170	56	90	10	275	9	431	482.5
100 S	160	45	200	229	200	139	125	140	15	170	63	100	12	300	12	431	491.5
100 L	160	45	200	229	200	139	125	140	15	170	63	100	12	300	12	472	532.5
112 S	190	45	235	256	215	139	137	140	13	170	70	112	12	327	12	458	526.5
112 L	190	45	235	256	215	139	137	140	13	184	70	112	12	327	12	538	606.5
132 S	216	56	272	295	287	205	192	140	15	222	89	132	13	419	12	558	643.5
132 L	216	56	272	295	287	205	192	178	15	250	89	132	13	419	12	643	728.0
160 S	254	64	318	352	318	205	210	210	20	294	108	160	17	478	14	735	853.0
160 L	254	64	318	352	318	205	210	254	20	305	108	160	17	478	14	815	933.0

Type	* LM	A0	IEC 60423 n. x 0	AG	ØD ØDA	E EA	F FA	GA GC	GD GF	DB DC		ØM	ØN	ØP	◆ S	T
80 S	349	24	1 x M25	136	136	40	6	21.5	6	M6		100	80j6	120	M6	3.0
80 L	383	24	1 x M25	136	136	40	6	21.5	6	M6		100	80j6	120	M6	3.0
90 S	399	24	1 x M25	185	185	50	8	27.0	7	M8		115	95j6	140	M8	3.0
90 L	459	24	1 x M25	185	185	50	8	27.0	7	M8		115	95j6	140	M8	3.0
100 S	459	24	1 x M25	155	155	60	8	31.0	7	M10		130	110j6	160	M8	3.5
100 L	500	24	1 x M25	155	155	60	8	31.0	7	M10		130	110j6	160	M8	3.5
112 S	486	24	1 x M25	170	170	60	8	31.0	7	M10		130	110j6	160	M8	3.5
112 L	583	24	1 x M25	170	170	60	8	31.0	7	M10		130	110j6	160	M8	3.5
132 S	603	35	2 x M32	212	212	80	10	41.0	8	M12		165	130j6	200	M10	3.5
132 L	688	35	2 x M32	212	212	80	10	41.0	8	M12		165	130j6	200	M10	3.5
160 S	780	35	2 x M32	243	243	110	12	45.0	8	M16		215	180j6	250	M12	4.0
160 L	861	35	2 x M32	243	243	110	12	45.0	8	M16		215	180j6	250	M12	4.0

Tolerances allowed:

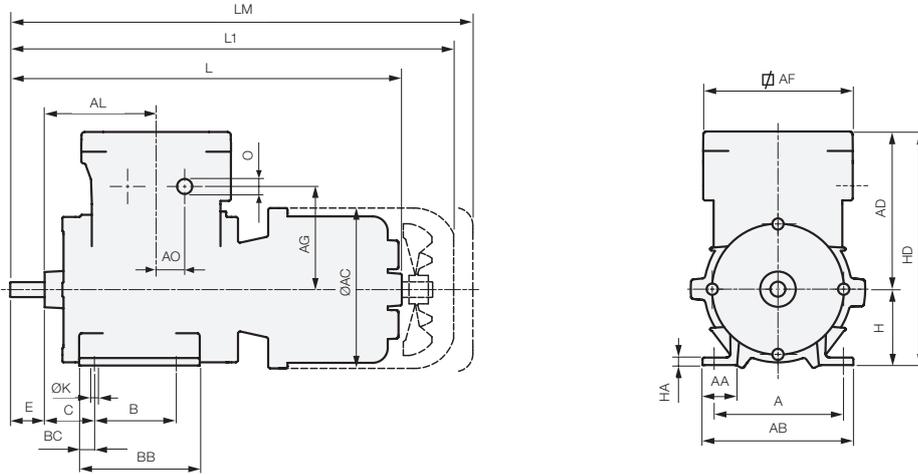
- ▶ The distance L of the motors for mining applications corresponds to the distance LM of explosion-proof motors for surfaces.
- * Rain canopy: only when vertical shaft-down mounting.
- ⊥ 1 in the terminal box, 1 on the frame.
- ▶ 280 and 315 L fixed feet. Removable feet available on request with different dimensions.

6. Overall dimensions and mounting arrangements

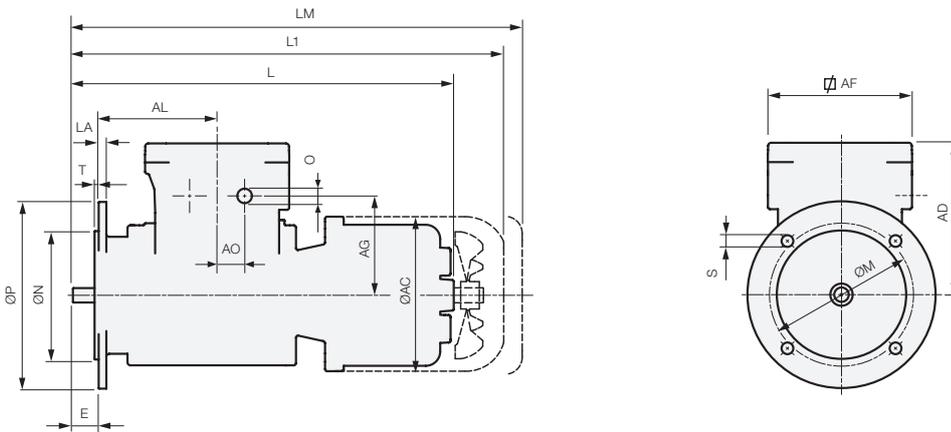
6.3. Overall dimensions of motors with brakes

DB/DC 63÷160 / HB/HC 71÷160 / IM B3 / IM B5 / IM B35

IM B3



IM B5

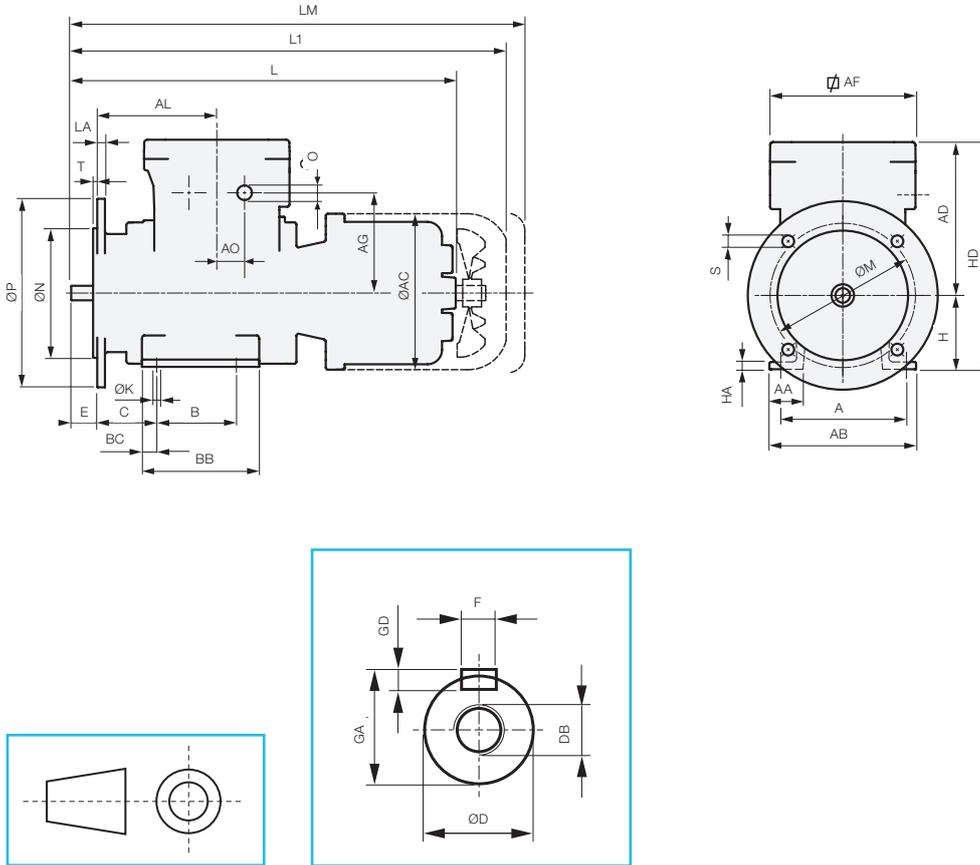


6. Overall dimensions and mounting arrangements

6.3. Overall dimensions of motors with brakes

DB/DC 63÷160 / HB/HC 71÷160 / IM B3 / IM B5 / IM B35

IM B35



6. Overall dimensions and mounting arrangements

6.3. Overall dimensions of motors with brakes

Metric dimensions

Type	A	AA	AB	ØAC	AD	∠AF	IM B5 AL	IM B3-B35 AL	B	BC	BB	C	H _{0.5} ⁰	HA	HD	ØK	● L	▼ L1
63	100	25	125	134	176	145	95	95	80	9.5	105	40	63	6	239	7	310	
71	112	32	140	165	186	145	106	106	90	11.0	112	45	71	7	257	7	365	410
80	125	40	160	183	196	145	142	142	100	15.0	130	50	80	8	276	9	423	478
90 S	140	45	175	208	206	145	125	125	100	14.0	157	56	90	9	296	9	502	557
90 L	140	45	175	208	206	145	125	125	125	14.0	157	56	90	9	296	9	502	557
100	160	45	200	234	216	145	125	125	140	15.0	170	63	100	10	316	12	537	595
112	190	45	235	259	237	145	228	138	140	17.0	175	70	112	12	349	12	609	668
132 S	216	56	272	311	260	205	193	163	140	22.0	222	89	132	13	392	12	650	722
132 M-L	216	56	272	311	260	205	268	163	178	22.0	222	89	132	13	392	12	725	797
160 M	254	64	318	348	290	205	311	166	210	25.0	305	108	160	15	450	14	823	901
160 L	254	64	318	348	290	205	311	166	254	25.0	305	108	160	15	450	14	823	901

Type	*▼ LM	A0	IEC 60423 n. x 0	AG	ØD	E	F	GA	GD	DBC		ØM	ØN	ØP	S	T	
63		26	1xM25 1xM20	96	11j6	23	4	12.5	4	M4		75	60j6	90	M5	2.5	
71	438	26	1xM25 1xM20	106	14j6	30	5	16.0	5	M5		85	70j6	105	M6	2.5	
80	507	26	1xM25 1xM20	116	19j6	40	6	21.5	6	M6		100	80j6	120	M6	3.0	
90 S	585	26	1xM25 1xM20	126	24j6	50	8	27.0	7	M8		115	95j6	140	M8	3.0	
90 L	585	26	1xM25 1xM20	126	24j6	50	8	27.0	7	M8		115	95j6	140	M8	3.0	
100	624	26	1xM25 1xM20	136	28j6	60	8	31.0	7	M10		130	110j6	160	M8	3.5	
112	697	26	1xM25 1xM20	157	28j6	60	8	31.0	7	M10		130	110j6	160	M8	3.5	
132 S	767	35	2xM32 1xM20	185	38k6	80	10	41.0	8	M12		165	130j6	200	M10	3.5	
132 M-L	842	35	2xM32 1xM20	185	38k6	80	10	41.0	8	M12		165	130j6	200	M10	3.5	
160 M	946	35	2xM32 1xM20	215	42k6	110	12	45.0	8	M16		215	180h6	250	M12	4.0	
160 L	946	35	2xM32 1xM20	215	42k6	110	12	45.0	8	M16		215	180h6	250	M12	4.0	

Tolerances allowed:

● Version DB, DC.

▼ Version HB, HC.

± 1 in the terminal box, 1 on the frame.

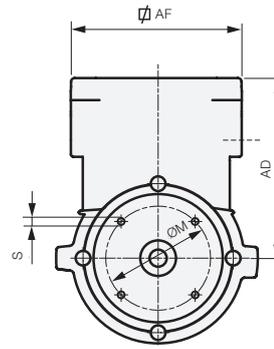
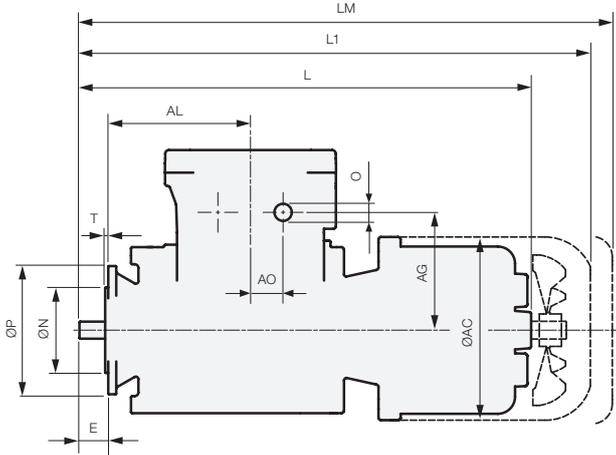
* Rain cover: normally found only on self-ventilating motors (IC 411) for vertical assembly, shaft at the bottom.

6. Overall dimensions and mounting arrangements

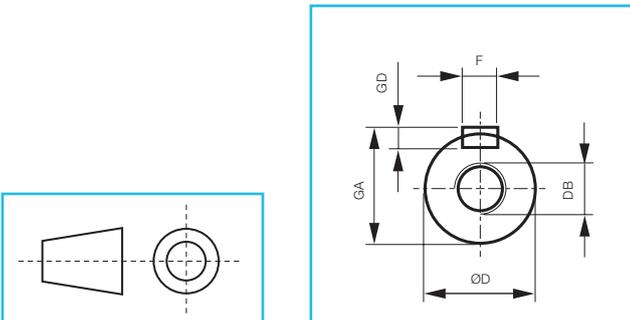
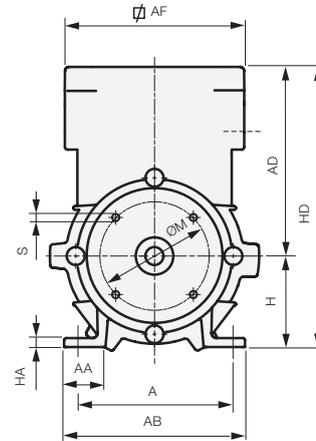
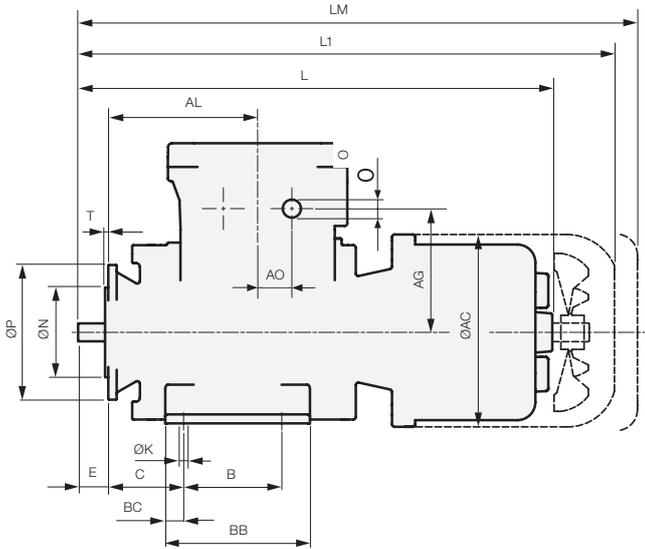
6.3. Overall dimensions of motors with brakes

DB/DC 63÷160 / HB/HC 71÷160 / IM B14 / IM B34

IM B14



IM B34



6. Overall dimensions and mounting arrangements

6.3. Overall dimensions of motors with brakes

Metric dimensions

Type	A	AA	AB	ØAC	AD	AF	IM B14 AL	IM B3-B34 AL	B	BC	BB	C	H _{0.5} ⁰	HA	HD	ØK	● L	▼ L1
63	100	25	125	134	176	145	95	95	80	9.5	105	40	63	6	239	7	310	
71	112	32	140	165	186	145	106	106	90	11.0	112	45	71	7	257	7	365	410
80	125	40	160	183	196	145	142	142	100	15.0	130	50	80	8	276	9	423	478
90 S	140	45	175	208	206	145	125	125	100	14.0	157	56	90	9	296	9	502	557
90 L	140	45	175	208	206	145	125	125	125	14.0	157	56	90	9	296	9	502	557
100	160	45	200	234	216	145	125	125	140	15.0	170	63	100	10	316	12	537	595
112	190	45	235	259	237	145	228	138	140	17.0	175	70	112	12	349	12	609	668
132 S	216	56	272	311	260	205	193	163	140	22.0	222	89	132	13	392	12	650	722
132 M-L	216	56	272	311	260	205	268	163	178	22.0	222	89	132	13	392	12	725	797
160 M	254	64	318	348	290	205	311	166	210	25.0	305	108	160	15	450	14	823	901
160 L	254	64	318	348	290	205	311	166	254	25.0	305	108	160	15	450	14	823	901

Type	*▼ LM	A0	IEC 60423 n. x 0	AG	ØD	E	F	GA	GD	DBC		ØM	ØN	ØP	S	T
63		26	1xM25 1xM20	96	11j6	23	4	12.5	4	M4		75	60j6	90	M5	2.5
71	438	26	1xM25 1xM20	106	14j6	30	5	16.0	5	M5		85	70j6	105	M6	2.5
80	507	26	1xM25 1xM20	116	19j6	40	6	21.5	6	M6		100	80j6	120	M6	3.0
90 S	585	26	1xM25 1xM20	126	24j6	50	8	27.0	7	M8		115	95j6	140	M8	3.0
90 L	585	26	1xM25 1xM20	126	24j6	50	8	27.0	7	M8		115	95j6	140	M8	3.0
100	624	26	1xM25 1xM20	136	28j6	60	8	31.0	7	M10		130	110j6	160	M8	3.5
112	697	26	1xM25 1xM20	157	28j6	60	8	31.0	7	M10		130	110j6	160	M8	3.5
132 S	767	35	2xM32 1xM20	185	38k6	80	10	41.0	8	M12		165	130j6	200	M10	3.5
132 M-L	842	35	2xM32 1xM20	185	38k6	80	10	41.0	8	M12		165	130j6	200	M10	3.5
160 M	946	35	2xM32 1xM20	215	42k6	110	12	45.0	8	M16		215	180h6	250	M12	4.0
160 L	946	35	2xM32 1xM20	215	42k6	110	12	45.0	8	M16		215	180h6	250	M12	4.0

Tolerances allowed:

● Version DB, DC.

▼ Version HB, HC.

± 1 in the terminal box, 1 on the frame.

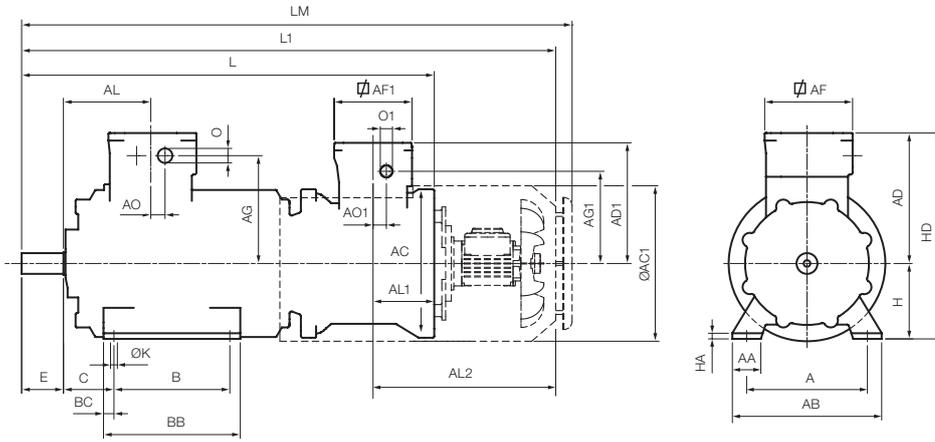
* Rain cover: normally found only on self-ventilating motors (IC 411) for vertical assembly, shaft at the bottom.

6. Overall dimensions and mounting arrangements

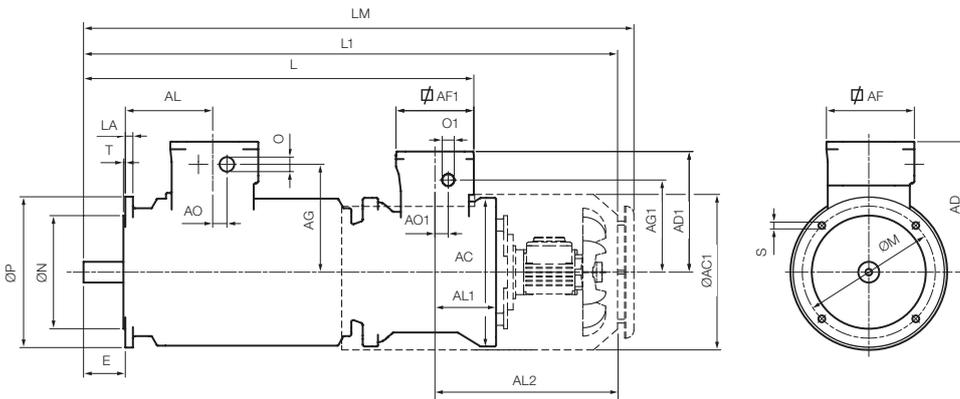
6.3. Overall dimensions of motors with brakes

DB/DC 180÷315 / IM B3 / IM B5 / IM B35

IM B3



IM B5

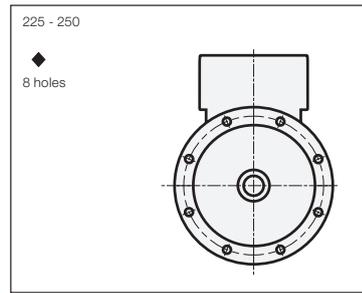
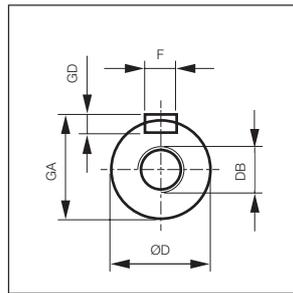
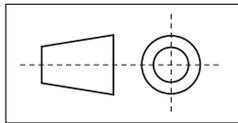
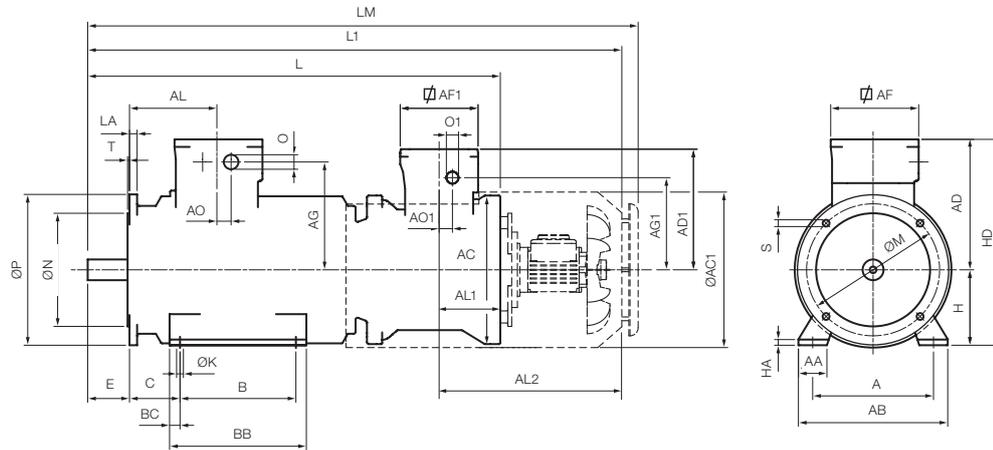


6. Overall dimensions and mounting arrangements

6.3. Overall dimensions of motors with brakes

DB/DC 180÷315 / IM B3 / IM B5 / IM B35

IM B35



6. Overall dimensions and mounting arrangements

6.3. Overall dimensions of motors with brakes

Metric dimensions

Type	A	AA	AB	ØAC	AC1	AD	AD1	∅AF	∅AF1	AL	AL1	AL2	B	BC	BB	C	H _{0.5}	HA	HD	ØK	L
180 M	279	71	350	394	412	326	320	242	205	223	162	482	241	25.0	340	121	180	17	506	14	1,055
180 L	279	71	350	394	412	326	320	242	205	223	162	482	279	25.0	340	121	180	17	506	14	1,055
200	318	75	393	394	412	346	320	242	205	230	162	481	305	27.0	360	133	200	18	546	18	1,086
225 S	356	78	431	394	467	371	320	242	205	240	162	506	286	38.0	380	149	225	20	596	18	1,156
225 M 4-8	356	78	431	394	467	371	320	242	205	240	162	506	311	38.0	380	149	225	20	596	18	1,156
250 M 4-8	406	95	500	394	467	396	320	242	205	221	162	507	349	33.0	415	168	250	22	646	24	1,157
280 S 4-8	457	90	540	394	558	548	320	320	205	316	162	618	368	80.0	550	190	280	41	828	25	1,265
280 M 4-8	457	90	540	394	558	548	320	320	205	316	162	618	419	80.0	550	190	280	41	828	25	1,265
315 S 4-8	508	110	590	394	558	548	320	320	205	316	162	618	406	68.5	560	216	315	41	863	27	1,445
315 M 4-8	508	110	590	394	558	548	320	320	205	316	162	618	457	68.5	560	216	315	41	863	27	1,445

Type	L1	LM	AO	A01	IEC 60423 n. x 0	IEC 60423 n. x 01	AG	AG1	ØD	E	F	GA	GD	DB	LA	ØM	ØN	ØP	S	T
180 M	1,376	1,419	38	35	2xM40	1xM25	266	245	48k6	110	14	52.0	9	M16	20	300	250h6	350	18	5
180 L	1,376	1,419	38	35	2xM40	1xM25	266	245	48k6	110	14	52.0	9	M16	20	300	250h6	350	18	5
200	1,412	1,455	38	35	2xM40	1xM25	286	245	55m6	110	16	59.0	10	M20	20	350	300h6	400	18	5
225 S	1,501	1,544	38	35	2xM40	1xM25	311	245	60m6	140	18	64.0	11	M20	22	400	350h6	450	18	5
225 M 4-8	1,501	1,544	38	35	2xM40	1xM25	311	245	60m6	140	18	64.0	11	M20	22	400	350h6	450	18	5
250 M 4-8	1,503	1,546	38	35	2xM40	1xM25	336	245	65m6	140	18	69.0	11	M20	22	500	450h6	550	18	5
280 S 4-8	1,721	1,817	56	35	2xM63	1xM25	410	245	75m6	140	20	79.5	12	M20	18	500	450h6	550	18	5
280 M 4-8	1,721	1,817	56	35	2xM63	1xM25	410	245	75m6	140	20	79.5	12	M20	18	500	450h6	550	18	5
315 S 4-8	1,901	1,997	56	35	2xM63	1xM25	410	245	80m6	170	22	85.0	14	M20	22	600	550h6	660	22	6
315 M 4-8	1,901	1,997	56	35	2xM63	1xM25	410	245	80m6	170	22	85.0	14	M20	22	600	550h6	660	22	6

Tolerances allowed:

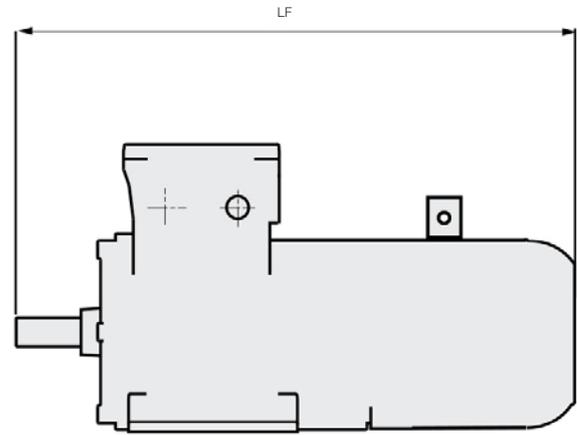
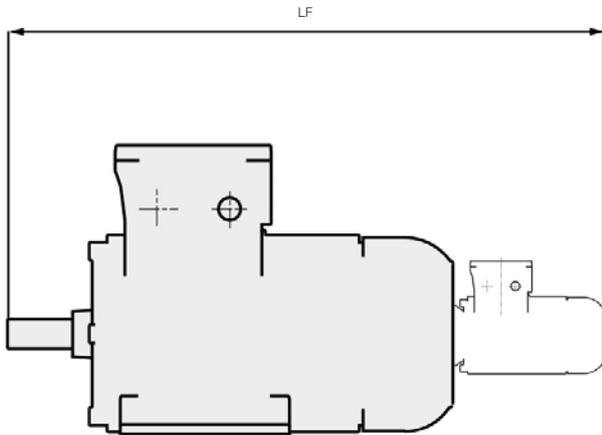
± 0.1 1 in the motor terminal box, 1 on the motor frame and 1 in the brake terminal box.

6. Overall dimensions and mounting arrangements

6.4. Overall dimensions of IC 416 motors

90÷250 IE1/IE2 - 90÷315 IE3/IE4

280÷315 L IE1/IE2 - 355 IE3/IE4



Note: for the other dimensions please refer to chapters 6.2. Overall dimensions of standard and mining version motors and 6.3. Overall dimensions of motors with brakes.

IE1 - IE2	
Type	LF
63	NA
71	NA
80	NA
90 S	583
90 L	583
100	622
112	671
132 S	697
132 M-L	772
160 M	878
160 L	878
180 M	1,037
180 L	1,037
200	1,052
225 S	1,129
225 M 2	1,090
225 M 4-8	1,129
250 M 2	1,146
250 M 4-8	1,146
280 S 2	1,359
280 S 4-8	1,359
280 M 2	1,359
280 M 4-8	1,359
315 S 2	1,509
315 S 4-8	1,539
315 M 2	1,509
315 M 4-8	1,539
315 L 2	1,715
315 L 4-8	1,745

IE3 - IE4	
Type	LF
80 S	NA
80 L	NA
90 S	565
90 L	625
100 S	617
100 L	658
112 S	645
112 L	705
132 S	742
132 L	827
160 S	918
160 L	968
180 S	1,007
180 L	1,081
200 S	1,065
200 L	1,130
225 S 2	1,083
225 S 4-8	1,113
225 M 2	1,138
225 M 4-8	1,168
250 M 2	1,233
250 M 4-8	1,233
280 S 2	1,456
280 S 4-8	1,456
280 M 2	1,556
280 M 4-8	1,556
315 S 2	1,567
315S4-8	1,597
315 M 2	1,567
315 M 4-8	1,597
315 L 2	1,737
315 L 4-8	1,767
355 M 2	1,863
355 M 4-8	1,933
355 L 2	2,013
355 L 4-8	2,083

7. Spare parts

7.1. Standard and mining application motors

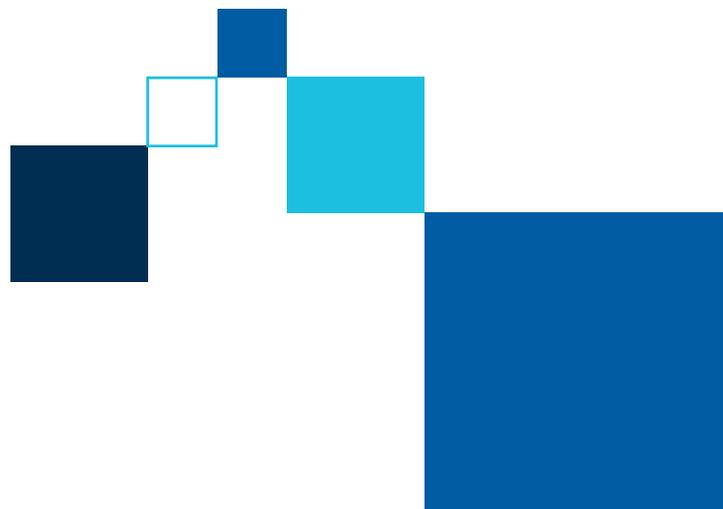
1	End cap - front
(2)	Grease nipple - front
3	Front bearing
4	Terminal box
(5)	Auxiliary connections
6	Terminal box lid
7	Terminal board
8	Cable nipple
9	Rotor
10	Wound stator
11	Frame
12	Endshield - rear
(13)	Grease sealing ring - rear
(14)	Grease nipple - rear
15	End cap - rear
16	Fan cover (cowl)
17	Shaft
18	Sealing ring - front
(19)	Grease sealing ring - front
20	Endshield - front
21	Pre loading springs

22	Inner bearing cap - front
(23)	Feet
24	Inner bearing cap - rear
25	Rear bearing
26	Sealing ring - rear
27	Cooling fan
(28)	Rain cap
29	NDE shield brake holder
30	Brake enclosure
38	Brake shield
39	Brake cover enclosure
40	Brake terminal box cover
41	Brake terminal box
42	Brake terminal board
43	Cable nipple brake
44	Forced ventilation motor support
45	Forced ventilation motor
52	Plate
53	Electrical earth screw
54	Separation base
55	Brake

Notes: (...) = when provided.

N.B.: the fan cap (16) in the motors for mining applications is welded to the rain cover (28).

On Premium Series (IE3, IE4) frame size 132 the standard version is without grease nipples and without end caps. The version with grease nipples and with end caps is available on request.

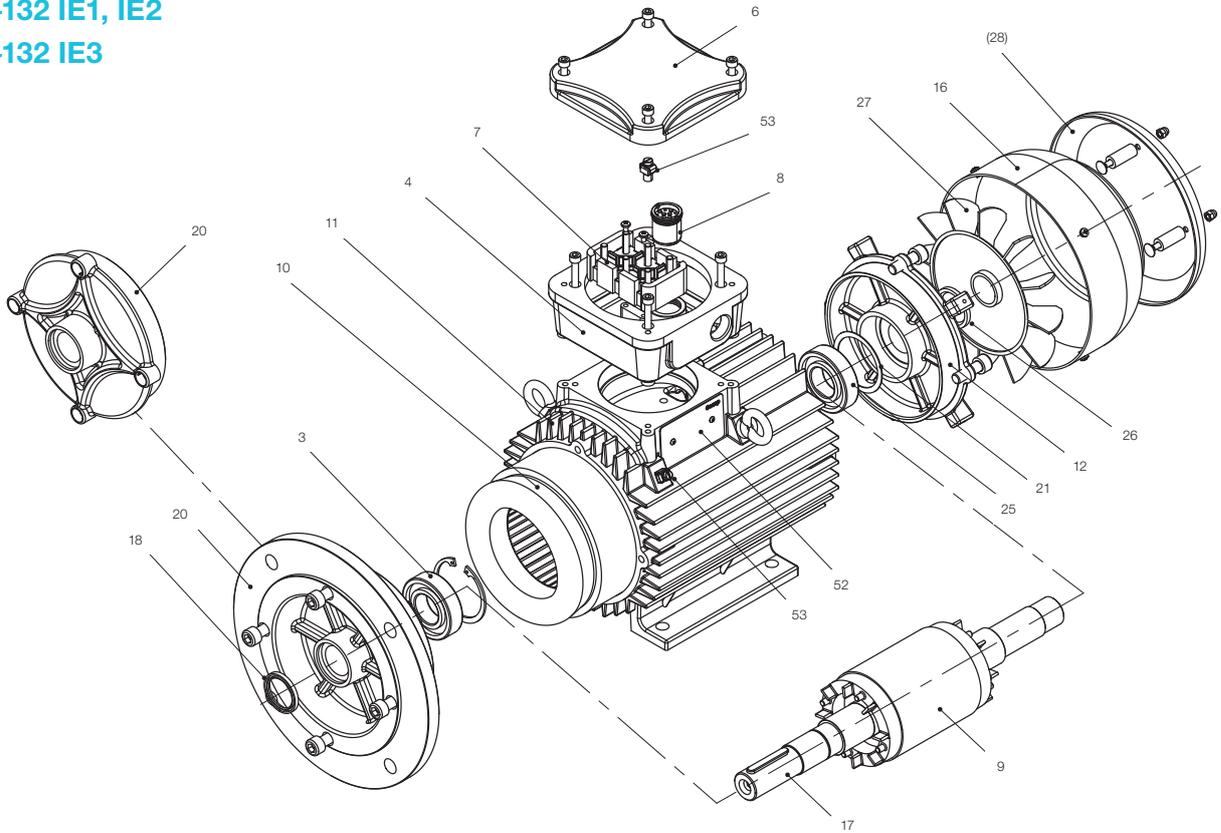


7. Spare parts

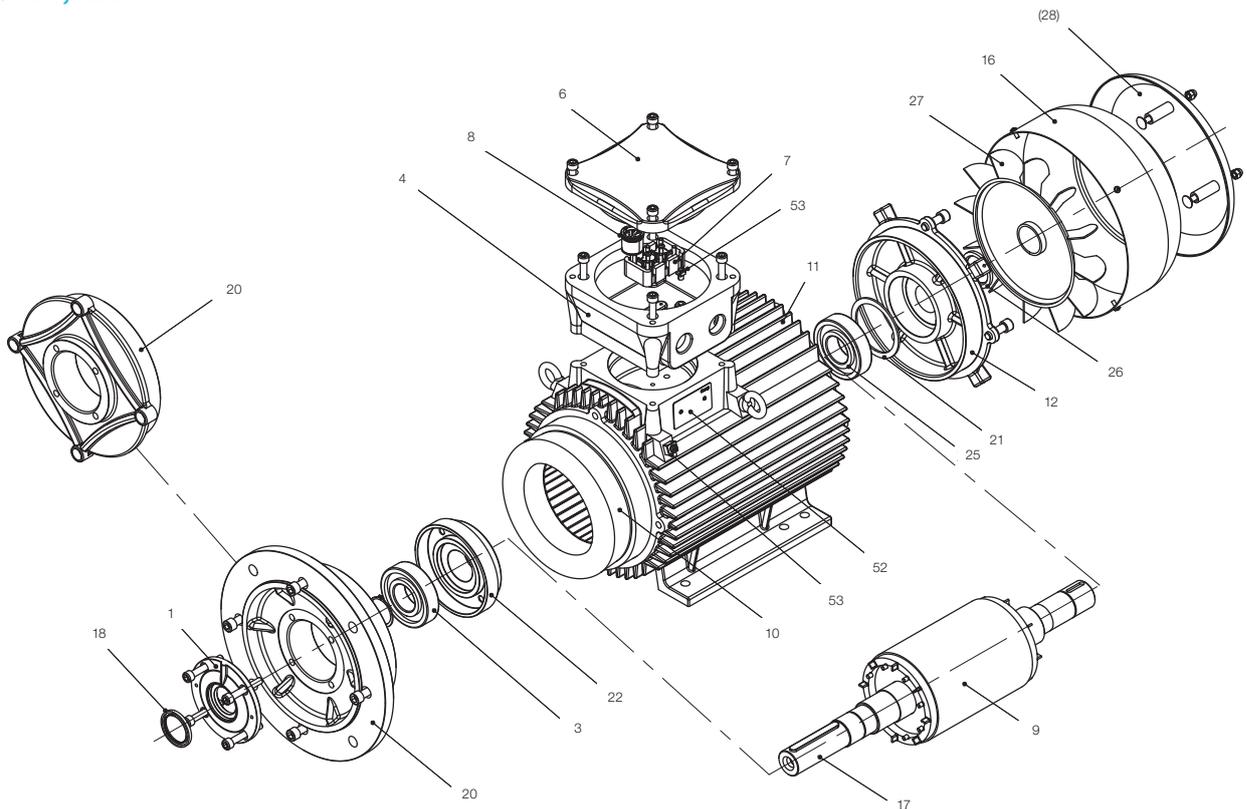
7.1. Standard and mining application motors

63÷132 IE1, IE2

80÷132 IE3



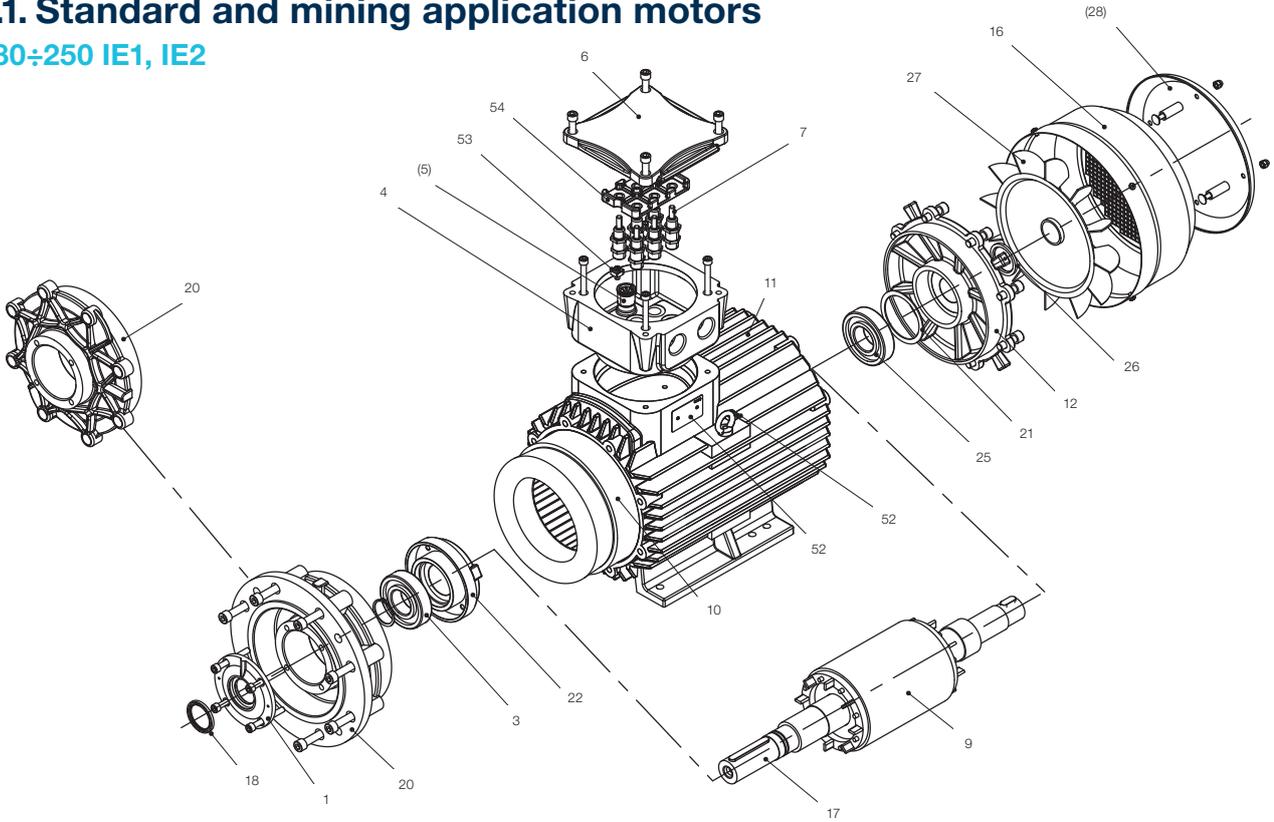
160 IE1, IE2



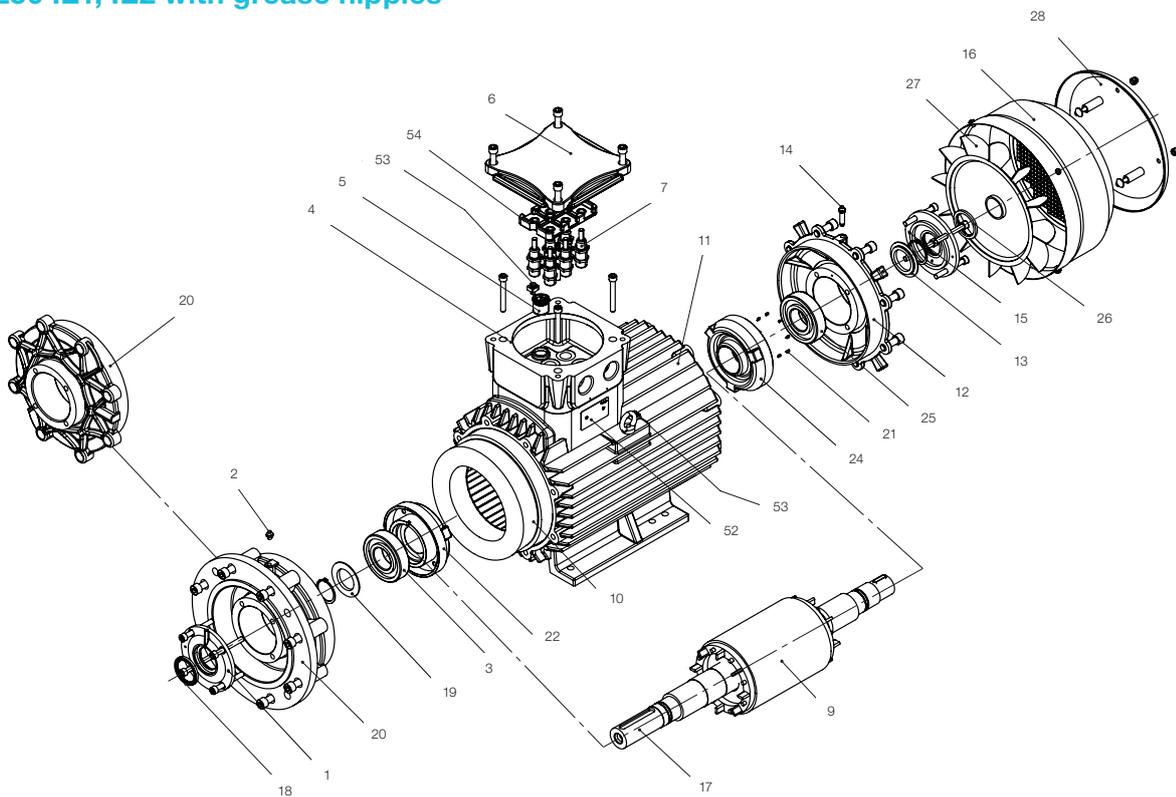
7. Spare parts

7.1. Standard and mining application motors

180÷250 IE1, IE2



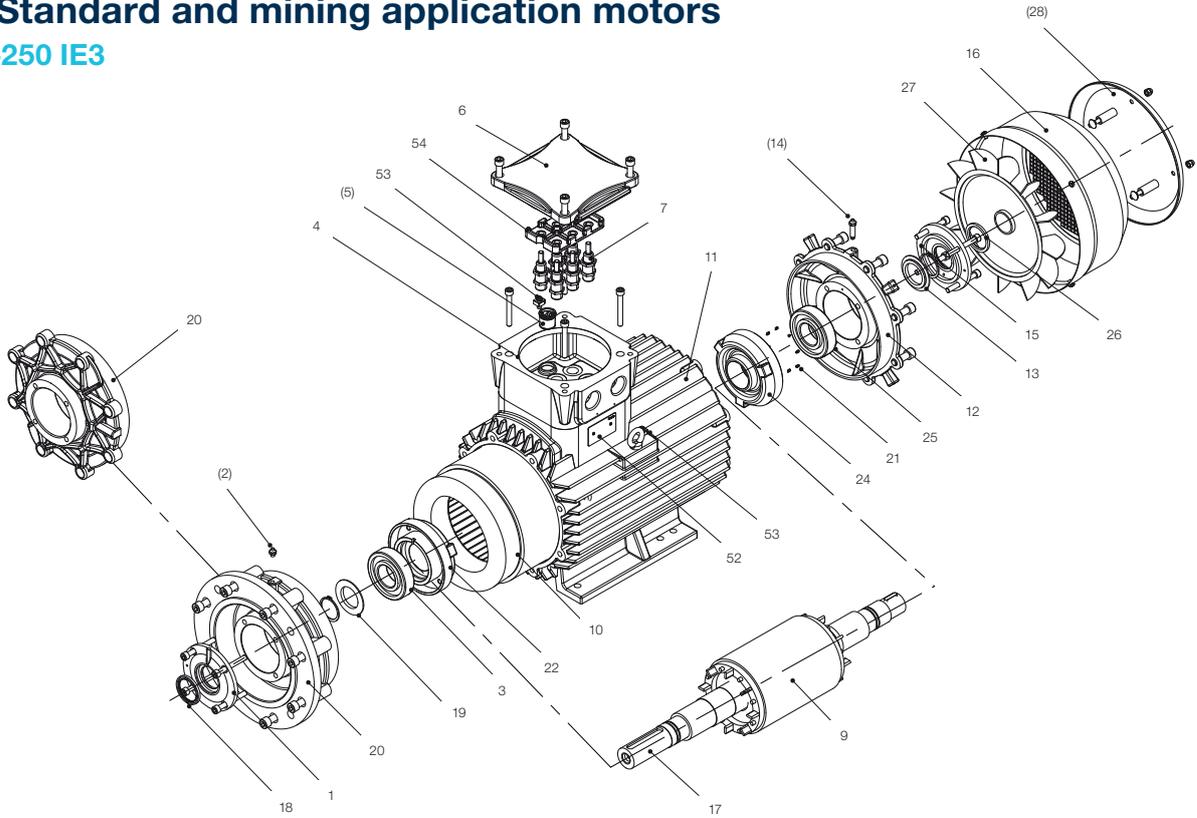
180÷250 IE1, IE2 with grease nipples



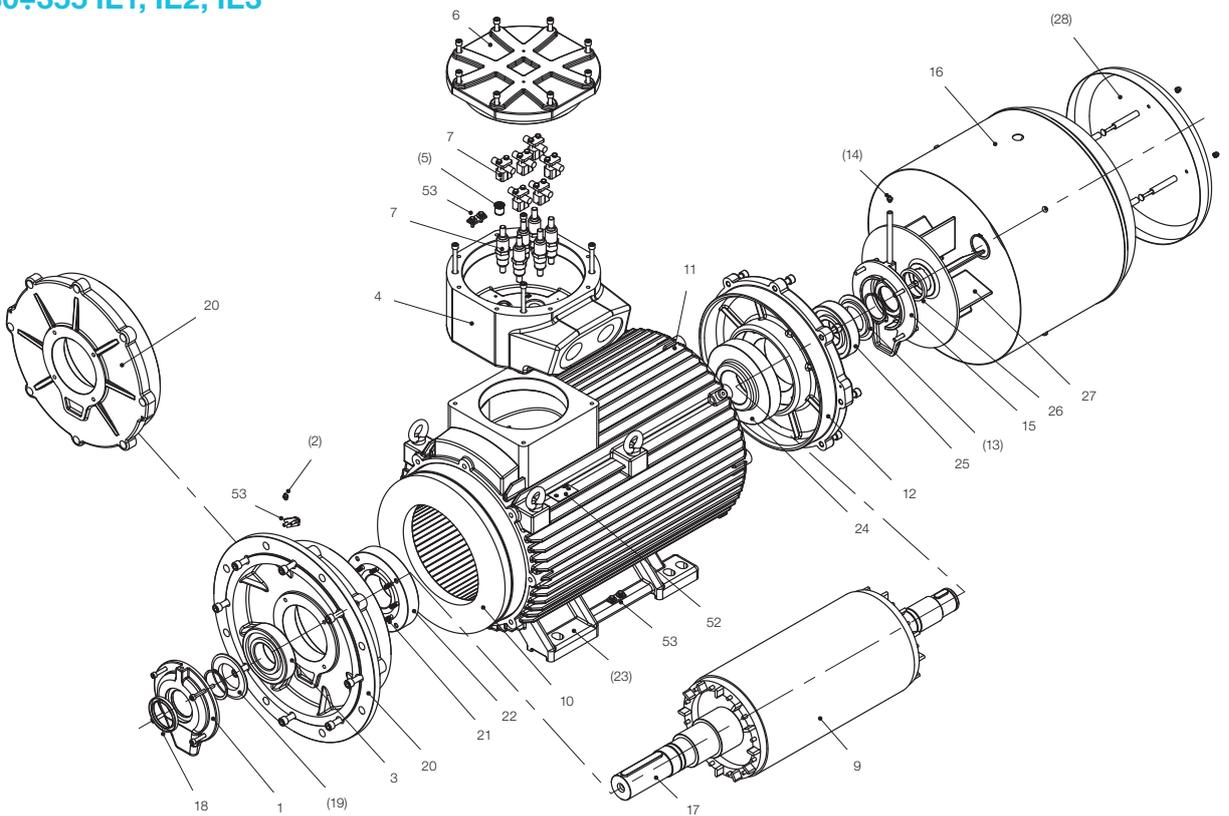
7. Spare parts

7.1. Standard and mining application motors

132÷250 IE3



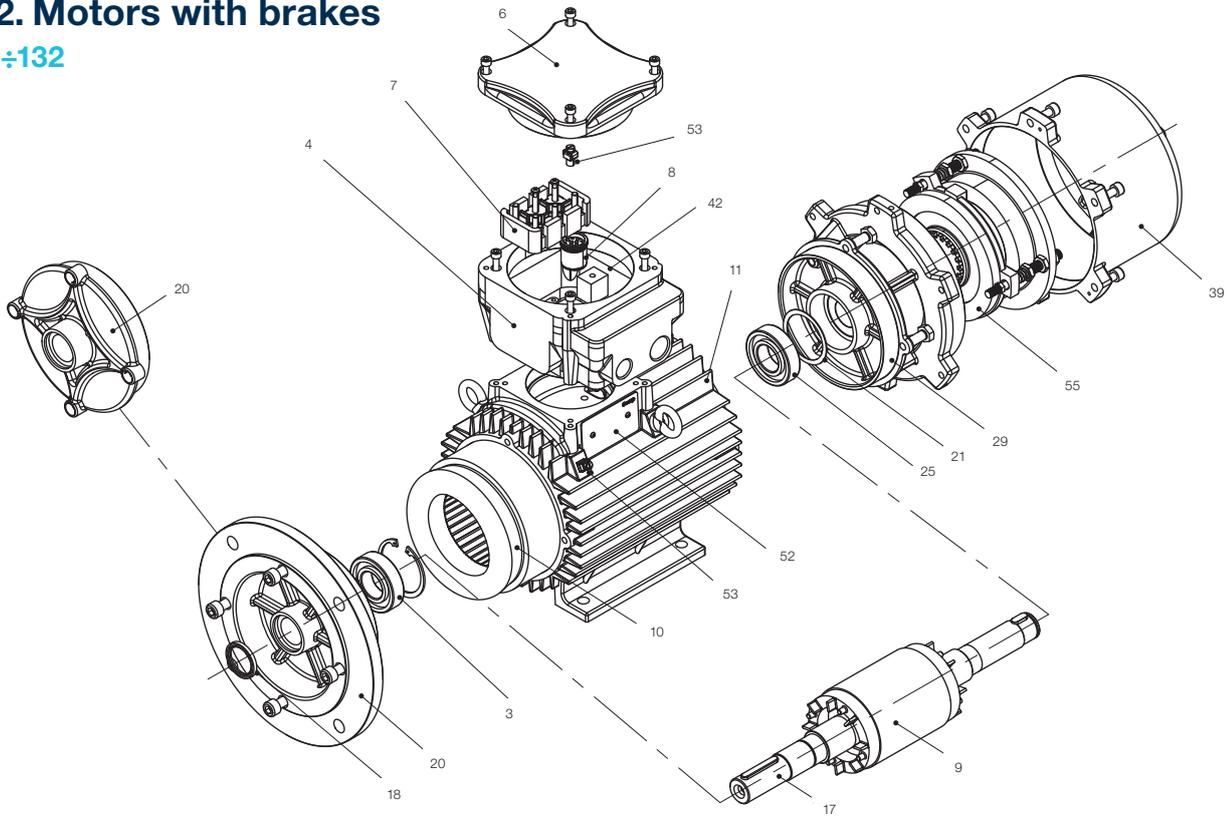
280÷355 IE1, IE2, IE3



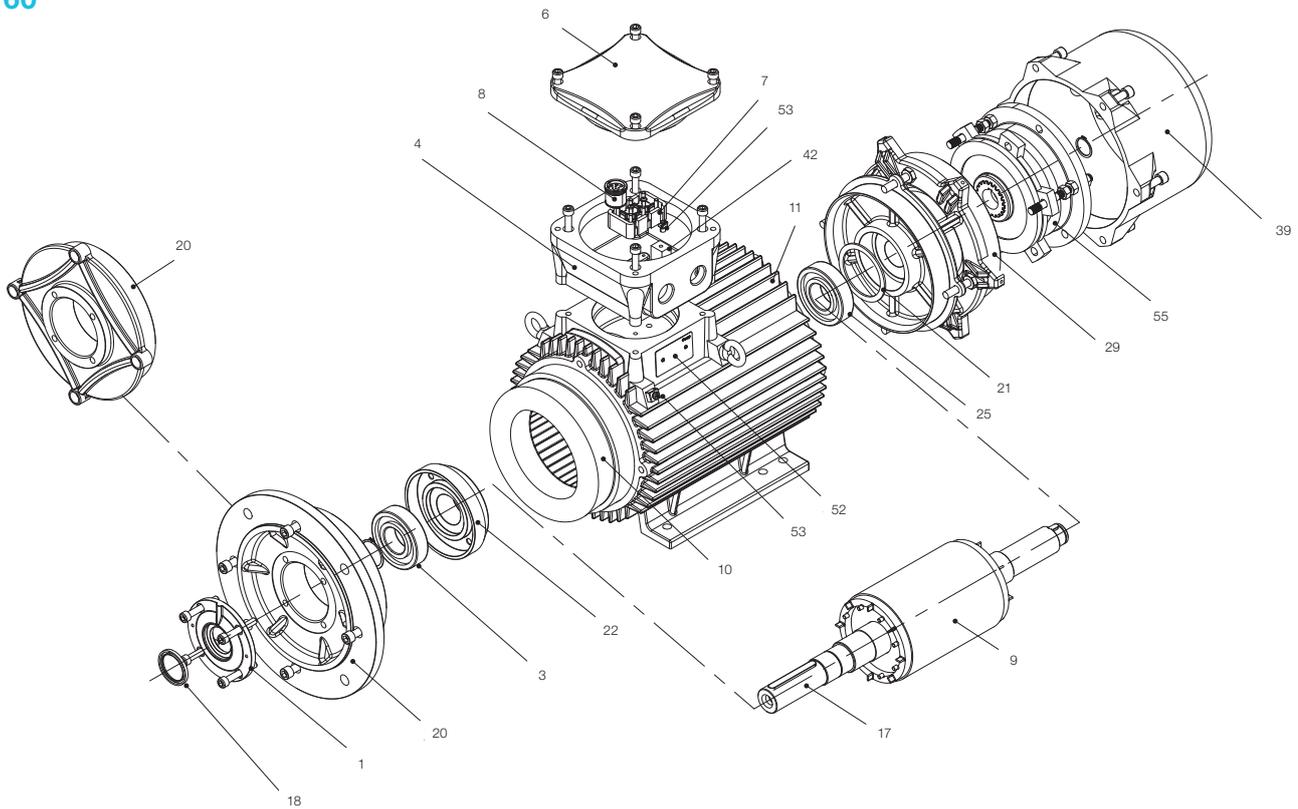
7. Spare parts

7.2. Motors with brakes

63÷132



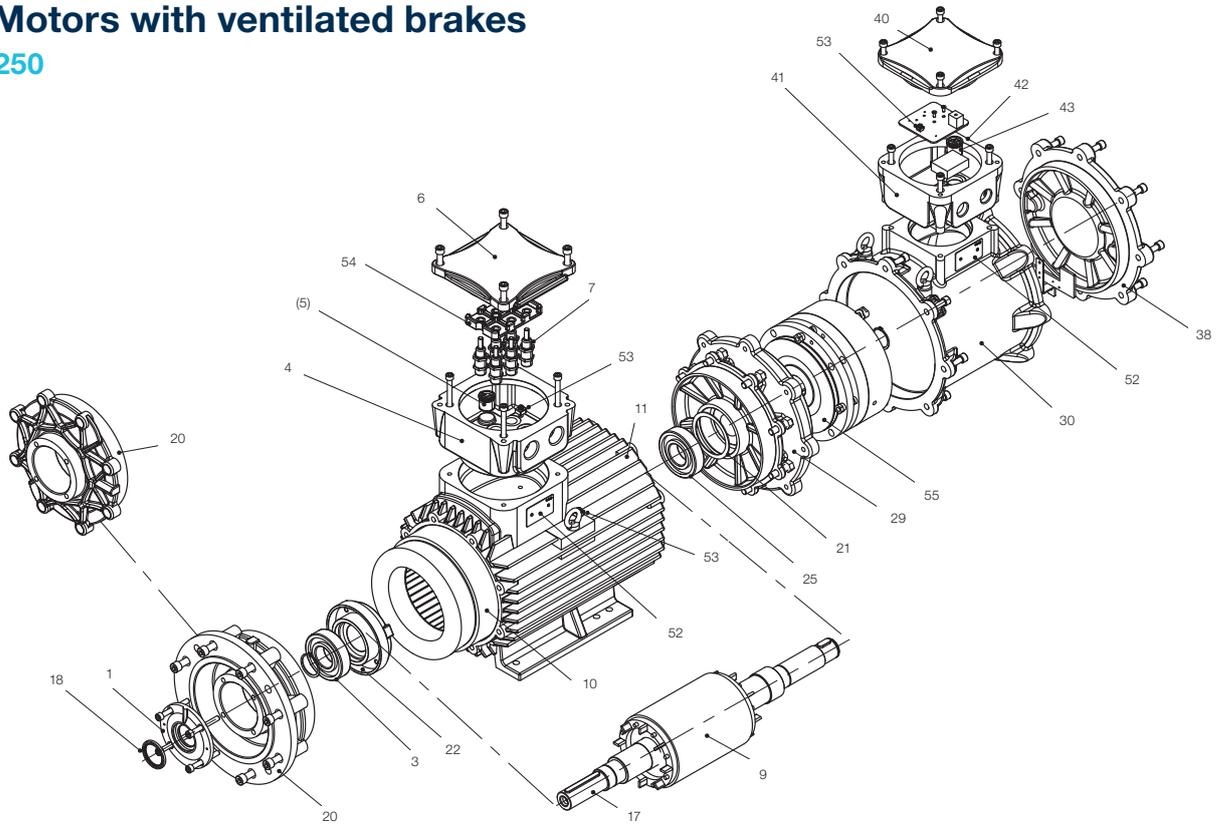
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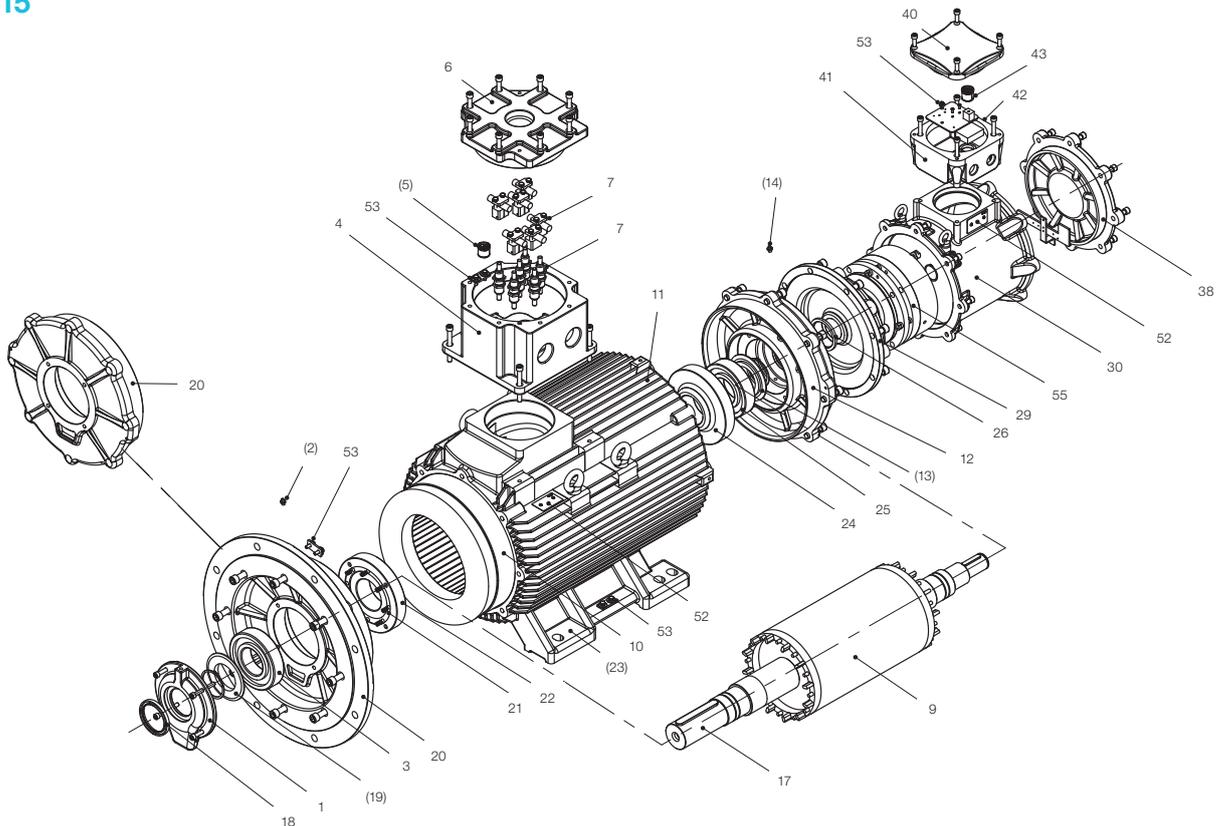
7. Spare parts

7.3. Motors with ventilated brakes

180÷250



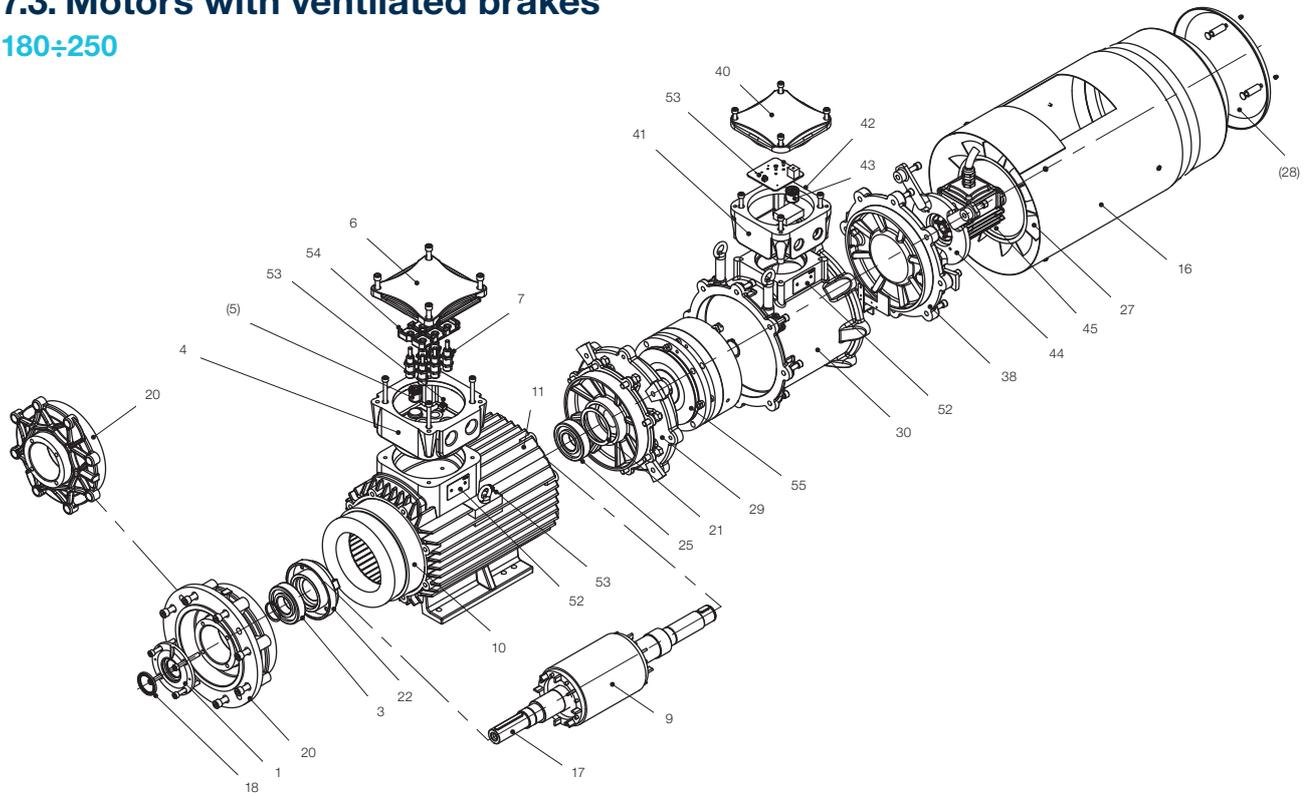
280÷315



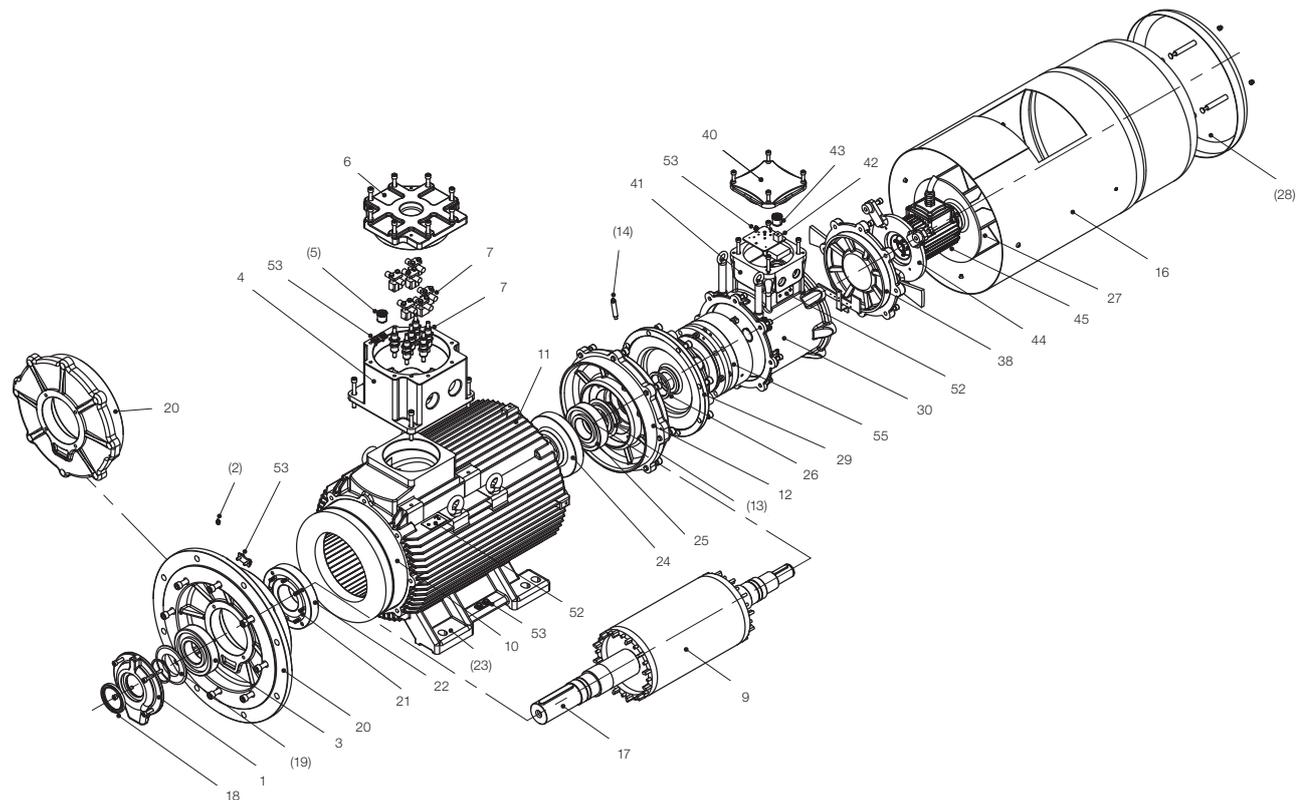
7. Spare parts

7.3. Motors with ventilated brakes

180÷250



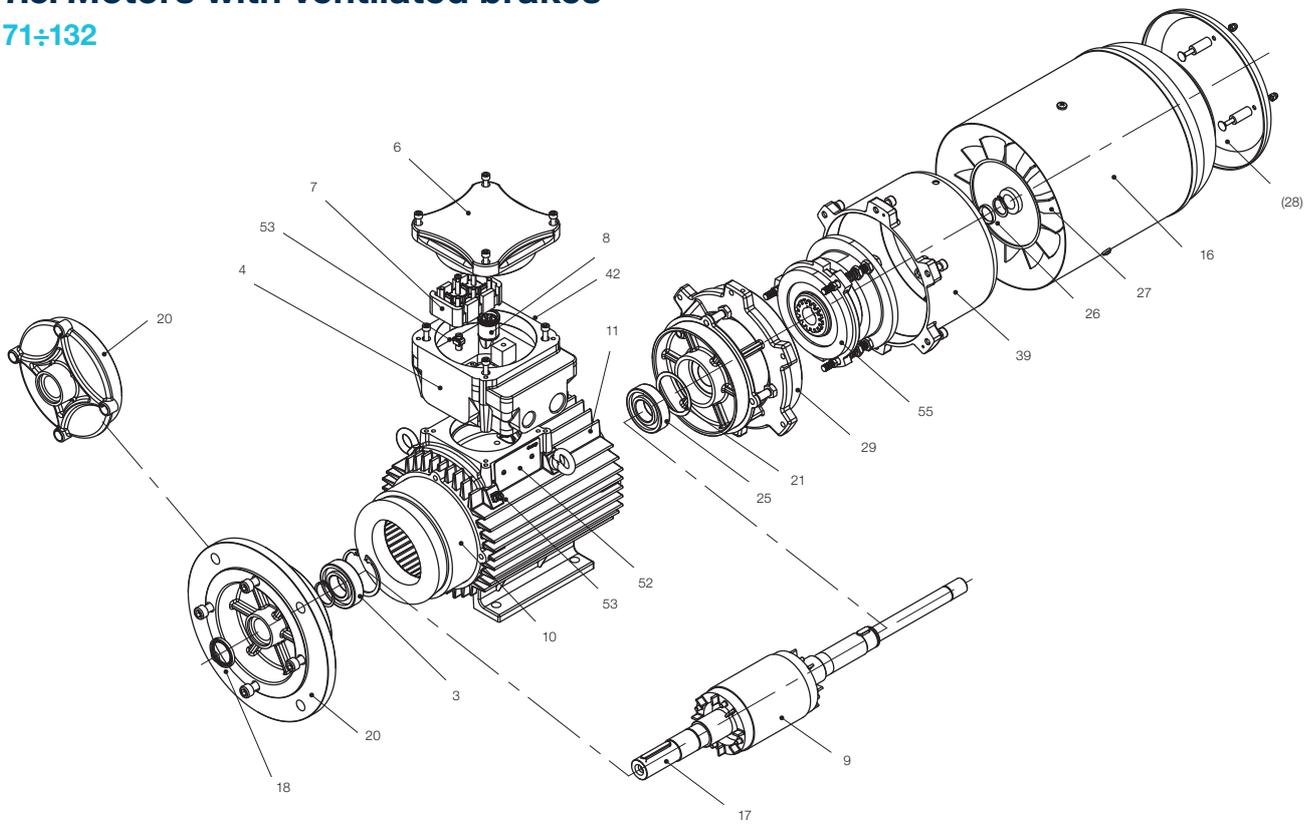
280÷315



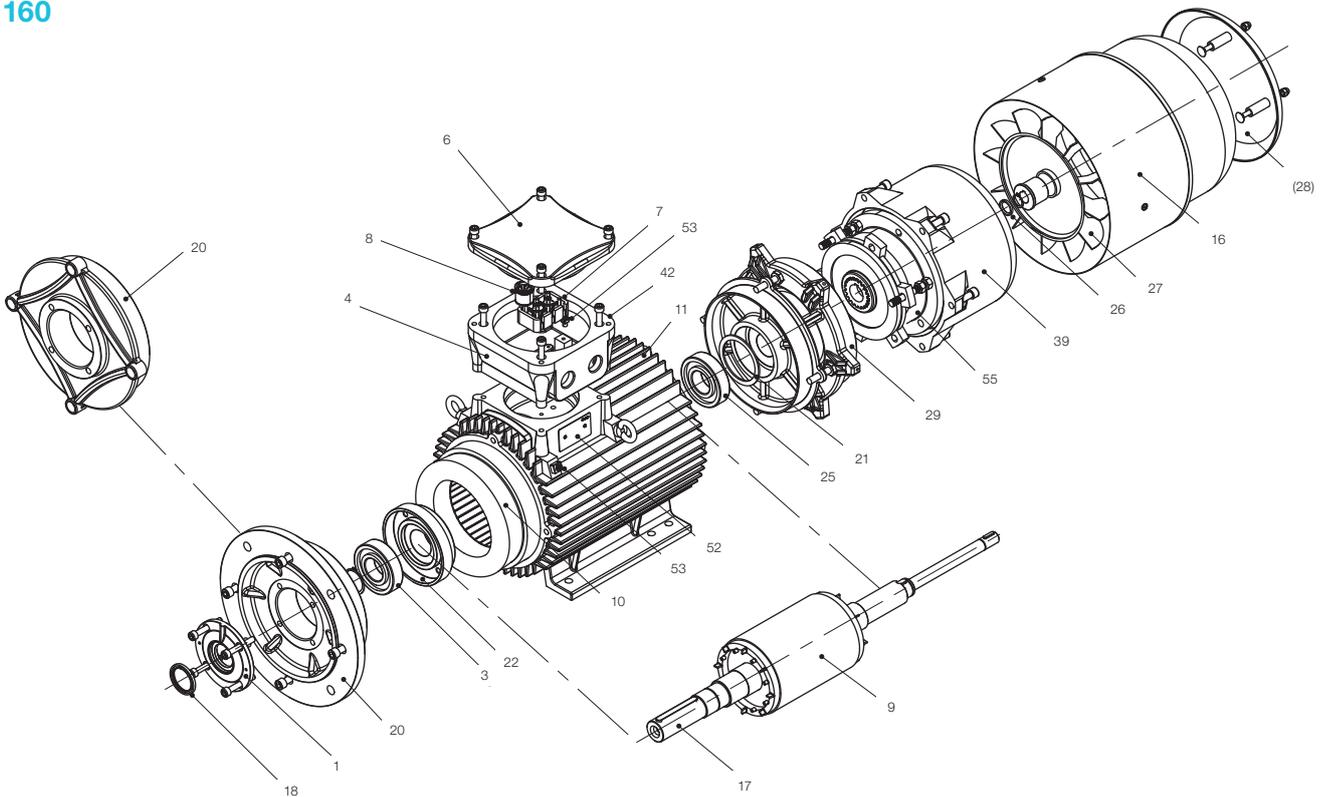
7. Spare parts

7.3. Motors with ventilated brakes

71÷132



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is not limited to products and solutions
presented in this catalogue.

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The values shown are subject to change without prior notice.
The information contained is reference values.