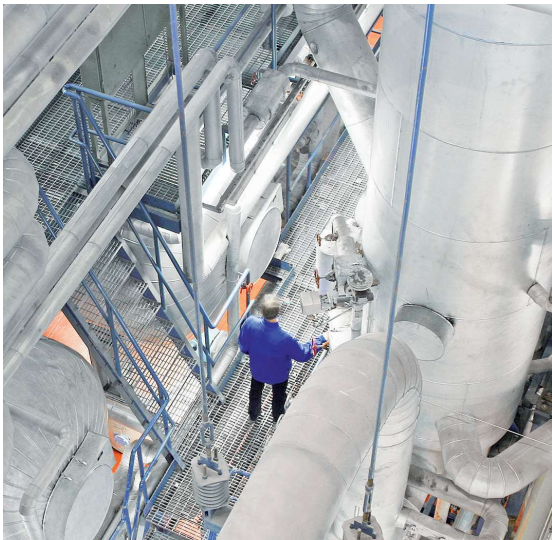


Catalog

# Low voltage General performance motors

**ABB**

With expertise, and a comprehensive portfolio of products and life-cycle services, we help value-minded industrial customers improve their energy efficiency and productivity.

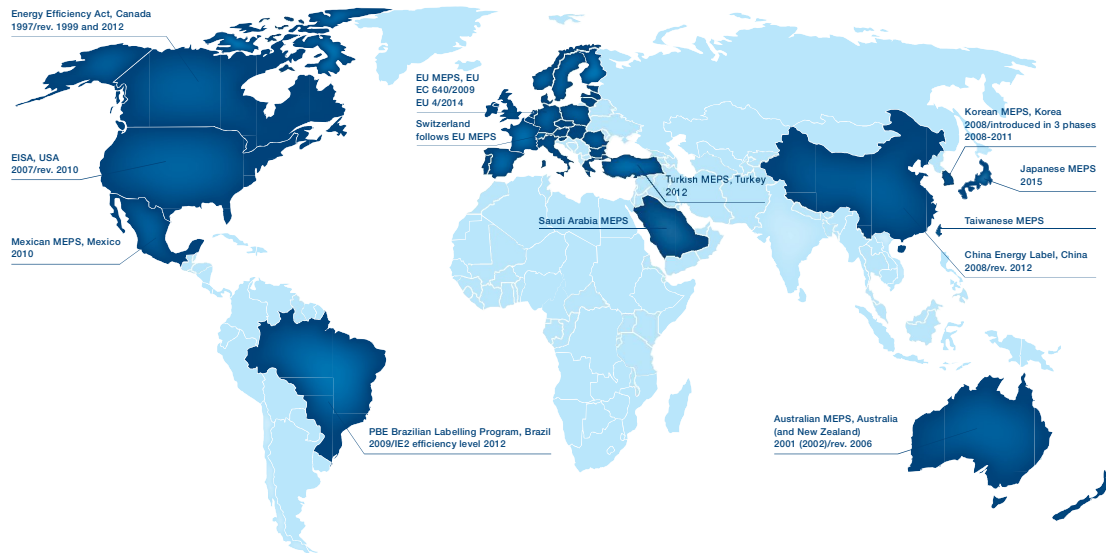


# Low voltage General performance motors

## Sizes 56 to 355, 0.06 to 355 kW

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# International motor efficiency standards



Since the validation of IEC/EN 60034-30:2008 and its refined version IEC/EN 60034-30-1: 2014, a worldwide energy efficiency classification system has existed for low voltage three-phase asynchronous motors. This system increases the level of harmonization in efficiency regulations around the world and also covers motors for explosive atmospheres. IEC/EN 60034-30-1: 2014 defines International Efficiency (IE) classes for single speed, three-phase, 50 and 60 Hz induction motors. The standard is part of an effort to unify motor testing procedures as well as efficiency and product labeling requirements to enable motor purchasers worldwide to easily recognize premium efficiency products. The efficiency levels defined in IEC/EN 60034-30-1 are based on test methods specified in IEC/EN 60034-2-1 which has been updated to edition 2.0, 2014-06.

To promote transparency in the market, IEC 60034-30 states that both the efficiency class and efficiency value must be shown on the motor rating plate and in product documentation. The documentation must clearly indicate the efficiency testing method used as the different methods can produce differing results.

## Minimum energy performance standards

While the IEC sets guidelines for motor testing and efficiency classes, the organization does not regulate efficiency. The biggest drivers for mandatory Minimum Energy Performance Standard (MEPS) levels for electric motors are global climate change, government targets to cut the CO<sub>2</sub> emissions and rising electricity demand, especially in developing countries. The whole value chain, from manufacturer up to end user, must be aware of the legislation in order to meet local requirements and additionally save energy and reduce carbon footprint.

Harmonized standards and the increasing adoption of MEPS around the world are good news. However, it is important to remember that harmonization is an ongoing process. Even though MEPS are already in effect in several regions, they are evolving and they differ in terms of scope and requirements. At the same time, new countries are planning to adopt their own MEPS. To get the latest information please visit [www.abb.com/motors&generators/energyefficiency](http://www.abb.com/motors&generators/energyefficiency).

### IEC/EN 60034-30-1: 2014

IEC/EN 60034-30-1:2014 defines four International Efficiency (IE) classes for single speed electric motors that are rated according to IEC 60034-1 or IEC 60079-0 (explosive atmospheres) and designed for operation on sinusoidal voltage.

- IE4 = Super premium efficiency
- IE3 = Premium efficiency, identical to 'NEMA Premium' in the USA for 60 Hz
- IE2 = High efficiency, identical to EPAAct in the USA for 60 Hz
- IE1 = Standard efficiency

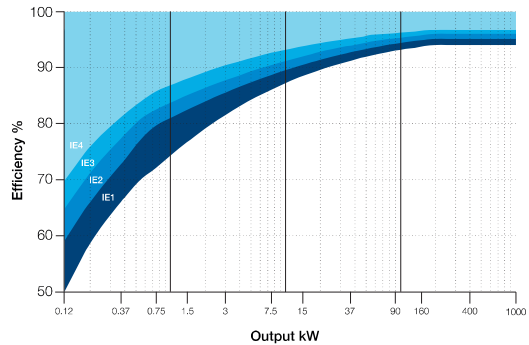
Efficiency levels defined in IEC/EN 60034-30-1 are based on test methods specified in IEC 60034-2-1.

IEC/EN 60034-30-1 covers power range 120 W to 1000 kW. All technical constructions of electric motors are covered as long as they are rated for direct on-line operation. The coverage of the standard includes:

- Single speed electric motors (single and three-phase), 50 and 60 Hz
- 2, 4, 6 and 8 poles
- Rated output  $P_N$  from 0.12 kW to 1000 kW
- Rated voltage  $U_N$  above 50 V up to 1 kV
- Motors, capable of continuous operation at their rated power with a temperature rise within the specified insulation temperature class
- Motors, marked with any ambient temperature within the range of -20 °C to +60 °C
- Motors, marked with an altitude up to 4000 m above sea level

The following motors are excluded from IEC/EN 60034-30-1:

- Single-speed motors with 10 or more poles or multi-speed motors
- Motors completely integrated into a machine (for example, pump, fan or compressor) that cannot be tested separately from machine
- Brake motors, when the brake can not be dismantled or separately fed



IE Classes - 4-pole motors

### ABB and efficiency standards

ABB determines efficiency values according to IEC 60034-2-1 using the low uncertainty method (i.e. indirect method), with additional load losses determined by measurement.

As the world market leader, ABB offers the largest range of LV motors available. It has long advocated the need for efficiency in motors, and high efficiency products have formed the core of its portfolio for many years. The core of ABB's Process performance range is based on full range in IE2 and IE3 motors - with many available from stock. We also supply IE4 motors for additional energy savings.

Minimum efficiency values defined in IEC/EN 60034-30-1: 2014 (reference values at 50 Hz, based on test methods specified in IEC 60034-2-1 which has been updated to edition 2.0, 2014-06).

Output kW	IE1 Standard efficiency				IE2 High efficiency				IE3 Premium efficiency				IE4 Super Premium efficiency			
	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole
0.12	45.0	50.0	38.3	31.0	53.6	59.1	50.6	39.8	60.8	64.8	57.7	50.7	66.5	69.8	64.9	62.3
0.18	52.8	57.0	45.5	38.0	60.4	64.7	56.6	45.9	65.9	69.9	63.9	58.7	70.8	74.7	70.1	67.2
0.20	54.6	58.5	47.6	39.7	61.9	65.9	58.2	47.4	67.2	71.1	65.4	60.6	71.9	75.8	71.4	68.4
0.25	58.2	61.5	52.1	43.4	64.8	68.5	61.6	50.6	69.7	73.5	68.6	64.1	74.3	77.9	74.1	70.8
0.37	63.9	66.0	59.7	49.7	69.5	72.7	67.6	56.1	73.8	77.3	73.5	69.3	78.1	81.1	78.0	74.3
0.40	64.9	66.8	61.1	50.9	70.4	73.5	68.8	57.2	74.6	78.0	74.4	70.1	78.9	81.7	78.7	74.9
0.55	69.0	70.0	65.8	56.1	74.1	77.1	73.1	61.7	77.8	80.8	77.2	73.0	81.5	83.9	80.9	77.0
0.75	72.1	72.1	70.0	61.2	77.4	79.6	75.9	66.2	80.7	82.5	78.9	75.0	83.5	85.7	82.7	78.4
1.1	75.0	75.0	72.9	66.5	79.6	81.4	78.1	70.8	82.7	84.1	81.0	77.7	85.2	87.2	84.5	80.8
1.5	77.2	77.2	75.2	70.2	81.3	82.8	79.8	74.1	84.2	85.3	82.5	79.7	86.5	88.2	85.9	82.6
2.2	79.7	79.7	77.7	74.2	83.2	84.3	81.8	77.6	85.9	86.7	84.3	81.9	88.0	89.5	87.4	84.5
3	81.5	81.5	79.7	77.0	84.6	85.5	83.3	80.0	87.1	87.7	85.6	83.5	89.1	90.4	88.6	85.9
4	83.1	83.1	81.4	79.2	85.8	86.6	84.6	81.9	88.1	88.6	86.8	84.8	90.0	91.1	89.5	87.1
5.5	84.7	84.7	83.1	81.4	87.0	87.7	86.0	83.8	89.2	89.6	88.0	86.2	90.9	91.9	90.5	88.3
7.5	86.0	86.0	84.7	83.1	88.1	88.7	87.2	85.3	90.1	90.4	89.1	87.3	91.7	92.6	91.3	89.3
11	87.6	87.6	86.4	85.0	89.4	89.8	88.7	86.9	91.2	91.4	90.3	88.6	92.6	93.3	92.3	90.4
15	88.7	88.7	87.7	86.2	90.3	90.6	89.7	88.0	91.9	92.1	91.2	89.6	93.3	93.9	92.9	91.2
18.5	89.3	89.3	88.6	86.9	90.9	91.2	90.4	88.6	92.4	92.6	91.7	90.1	93.7	94.2	93.4	91.7
22	89.9	89.9	89.2	87.4	91.3	91.6	90.9	89.1	92.7	93.0	92.2	90.6	94.0	94.5	93.7	92.1
30	90.7	90.7	90.2	88.3	92.0	92.3	91.7	89.8	93.3	93.6	92.9	91.3	94.5	94.9	94.2	92.7
37	91.2	91.2	90.8	88.8	92.5	92.7	92.2	90.3	93.7	93.9	93.3	91.8	94.8	95.2	94.5	93.1
45	91.7	91.7	91.4	89.2	92.9	93.1	92.7	90.7	94.0	94.2	93.7	92.2	95.0	95.4	94.8	93.4
55	92.1	92.1	91.9	89.7	93.2	93.5	93.1	91.0	94.3	94.6	94.1	92.5	95.3	95.7	95.1	93.7
75	92.7	92.7	92.6	90.3	93.8	94.0	93.7	91.6	94.7	95.0	94.6	93.1	95.6	96.0	95.4	94.2
90	93.0	93.0	92.9	90.7	94.1	94.2	94.0	91.9	95.0	95.2	94.9	93.4	95.8	96.1	95.6	94.4
110	93.3	93.3	93.3	91.1	94.3	94.5	94.3	92.3	95.2	95.4	95.1	93.7	96.0	96.3	95.8	94.7
132	93.5	93.5	93.5	91.5	94.6	94.7	94.6	92.6	95.4	95.6	95.4	94.0	96.2	96.4	96.0	94.9
160	93.8	93.8	93.8	91.9	94.8	94.9	94.8	93.0	95.6	95.8	95.6	94.3	96.3	96.6	96.2	95.1
200	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
250	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
315	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
355	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
400	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
450	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
500-1000	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4



# EU MEPS – Efficiency requirements for low voltage motors in Europe

## Mandatory MEPS requirements

EU MEPS (European Minimum Energy Performance Standard) sets mandatory minimum efficiency levels for electric motors introduced into the European market. It is based on European Commission Regulation EC 640/2009 and an amendment passed in 2014, Regulation EU 4/2014.

## MEPS scope

The MEPS scheme covers 2-, 4- and 6-pole single speed, three-phase induction motors in a power range 0.75 to 375 kW, rated up to 1000 V on the basis of continuous duty operation. The scheme is being implemented in three stages:

- Stage 1: 16 June 2011: Motors must meet the IE2 efficiency level
- Stage 2: 1 January 2015: Motors with a rated output of 7.5 - 375 kW must meet EITHER the IE3 efficiency level if driven direct-on-line OR the IE2 level if fitted with a variable speed drive
- Stage 3: 1 January 2017: Motors with a rated output of 0.75 - 375 kW must meet EITHER the IE3 efficiency level if driven direct-on-line OR the IE2 level if fitted with a variable speed drive

The amendment (Regulation EU 4/2014) did not change the scope of EU MEPS but it did change the details concerning which motors are excluded.

## Efficiency testing methods

Motor losses and efficiency values in the EU MEPS scheme must be determined using the methods specified in standard IEC 60034-2-1:06-2014. International efficiency classes (IE4, IE3, IE2 and IE1) are defined in standard IEC 60034-30-1.

## Compulsory efficiency levels

The table of minimum efficiency values on the previous page shows values according to IEC 60034-30-1:2014. Please note that this standard covers a wider range of motors than EU MEPS, which is still based on the previous standard (IEC 60034-30). Specifically, EU MEPS does not apply to 8-pole motors, or to motors rated below 0.75 or above 375 kW. IE1 motors have been excluded from the European market since EU MEPS came into force on 16 June 2011. Regulation EC 640/2009 required the following information on the motor rating plate and in motor documentation:

- Lowest nominal efficiency at 100%, 75% and 50% rated load
- Efficiency level (IE2, IE3 or IE4)
- Year of manufacture

These requirements were relaxed by amendment EU 4/2014 for small motors where the rating plate is too small to accommodate the full set of figures. In such cases manufacturers are now allowed to show only the efficiency for 100% rated load.

## ABB and EU MEPS





































At ABB we have long spoken out in favor of efforts to boost energy efficiency and reduce emissions. We play an active role in organizations that set efficiency standards, and we are happy to see MEPS being adopted in more and more countries around the world. We hope the authorities will maintain the momentum and take MEPS forward. IEC standards move fast, and active work is needed to bring the scope of EU MEPS into line with IEC/EN 60034-30-1. EU MEPS has an important role to play in helping European industry to maintain and grow its competitiveness.

## Markings and documentation



From January 1st 2015 the stage 2 requirements for EU MEPS allow IE2 motors to be used only when they are fed by a VSD. These motors (7,5-375kW) must be marked so that the compulsory need to be used with a drive becomes evident. ABB uses the following stickers for the marking.

# Mounting arrangements

<b>Foot-mounted motor</b>						<b>Product code pos. 12</b> A: foot-mounted, term. box top R: foot-mounted, term. box RHS L: foot-mounted, term. box LHS
<b>Code I / code II</b>						
						
IM B3 IM 1001	IM V5 IM 1011	IM V6 IM 1031	IM B6 IM 1051	IM B7 IM 1061	IM B8 IM 1071	
<b>Flange-mounted motor, large flange</b>						<b>Product code pos. 12</b> B: flange mounted, large flange
<b>Code I / code II</b>						
						
IM B5 IM 3001	IM V1 IM 3011	IM V3 IM 3031	*) IM 3051	*) IM 3061	*) IM 3071	
<b>Flange-mounted motor, small flange</b>						<b>Product code pos. 12</b> C: flange mounted, small flange
<b>Code I / code II</b>						
						
IM B14 IM 3601	IM V18 IM 3611	IM V19 IM 3631	*) IM 3651	*) IM 3661	*) IM 3671	
<b>Foot- and flange-mounted motor with feet, large flange</b>						<b>Product code pos. 12</b> H: foot/flange-mounted, term. box top S: foot/flange-mounted, term. box RHS T: foot/flange-mounted, term. box LHS
<b>Code I / code II</b>						
						
IM B35 IM 2001	IM V15 IM 2011	IM V35 IM 2031	*) IM 2051	*) IM 2061	*) IM 2071	
<b>Foot- and flange-mounted motor with feet, small flange</b>						<b>Product code pos. 12</b> J: foot/flange-mounted, small flange
<b>Code I / code II</b>						
						
IM B34 IM 2101	IM V17 IM 2111	IM 2131	IM 2151	IM 2161	IM 2171	
<b>Foot-mounted motor, shaft with free extensions</b>						<b>Product code pos. 12</b>
<b>Code I / code II</b>						
						
IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072	

\*) Not stated in IEC 60034-7.

Note: If the motor is mounted shaft upwards, take measures to prevent water or any other liquid from running down the shaft into the motor.



# General information

## Cooling

Designation system concerning methods of cooling refers to standard IEC 60034-6.

### Explanation of the product code

International Cooling	Circuit arrangement	Primary coolant	Method of movement of primary coolant	Secondary coolant	Method of movement of secondary coolant
IC	4	(A)	1	(A)	6
	1	2	3	4	5

#### Position 1

0:	Free circulation (open circuit)
4:	Free circulation (open circuit)

#### Position 2

A:	For air (omitted for simplified designation)
----	--

#### Position 3

0:	Free convection
1:	Self-circulation
6:	Machine-mounted independent component

#### Position 4

A:	For air (omitted for simplified designation)
W:	For water

#### Position 5

0:	Free convection
1:	Self-circulation
6:	Machine-mounted independent component
8:	Relative displacement

# General information

## Degrees of protection: IP code/IK code

Classification of degrees of protection provided by enclosures of rotating machines are refers to:

- Standard IEC 60034-5 or EN 60529 for IP code
- Standard EN 50102 for IK code

### IP protection

Protection of persons against getting in contact with (or approaching) live parts and against contact with moving parts inside the enclosure. Also protection of the machine against ingress of solid foreign objects. Protection of machines against the harmful effects due to the ingress of water.

### Explanation of the IP code

Ingress protection	Degree of protection to persons and to parts of the motors inside the enclosure	Degree of protection provided by the enclosure with respect to harmful effects due to ingress of water
IP	5	5
	1	2

#### Position 1

2:	Motors protected against solid objects greater than 12 mm
4:	Motors protected against solid objects greater than 1 mm
5:	Dust-protected motors
6:	Dust-tight motors

#### Position 2

3:	Motors protected against spraying water
4:	Motors protected against splashing water
5:	Motors protected against water jets
6:	Motors protected against heavy seas

### IK code

Classification of degrees of protection provided by enclosure for motors against external mechanical impacts.

### Explanation of the IK code

International mechanical protection	Characteristic group
IK	08
	1

#### Position 1

#### Relation between IK code and impact energy:

IK code	Impact energy/Joule
0:	Not protected according to EN 50102
01:	0.15
02:	0.2
03:	0.35
04:	0.5
05:	0.7
06:	1
07:	2
08:	5 (ABB Standard)
09:	10
10:	20

# General information

## Insulation

ABB uses class F insulation, which, with temperature rise B, is the most common requirement among industry today.

The use of class F insulation with class B temperature rise gives ABB products a 25 °C safety margin. This can be used to increase the loading for limited periods, to operate at higher ambient temperatures or altitudes, or with greater voltage and frequency tolerances. It can also be used to extend insulation life. For instance, a 10 K temperature reduction will extend the insulation life.

### Thermal class 130 (B)

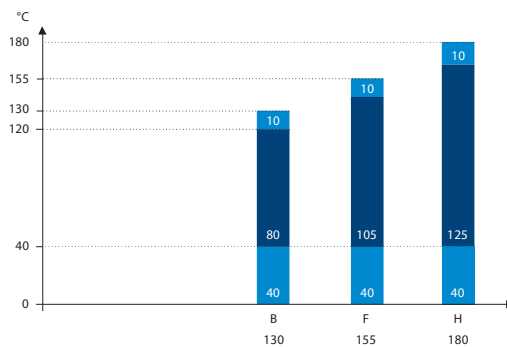
- Nominal ambient temperature 40 °C
- Max permissible temperature rise 80 K
- Hot spot temperature margin 10 K

### Thermal class 155 (F)

- Nominal ambient temperature 40 °C
- Max permissible temperature rise 105 K
- Hot spot temperature margin 10 K

### Thermal class 180 (H)

- Nominal ambient temperature 40 °C
- Max permissible temperature rise 125 K
- Hot spot temperature margin 10 K



Safety margins per thermal class

## General information

### Voltage and frequency

The impact on temperature rise caused by voltage and frequency fluctuation is defined in IEC 60034-1. The standard divides the combinations into two zones, A and B. Zone A is the combination of voltage deviation of +/-5 % and frequency deviation of +/-2 %. Zone B is the combination of voltage deviation of +/-10 % and frequency deviation of +3/-5 %. This is illustrated in figure below.

Motors are capable of supplying the rated torque in both zones A and B, but the temperature rise will be higher than at rated voltage and frequency. Motors can be run in zone B only for a short period of time.

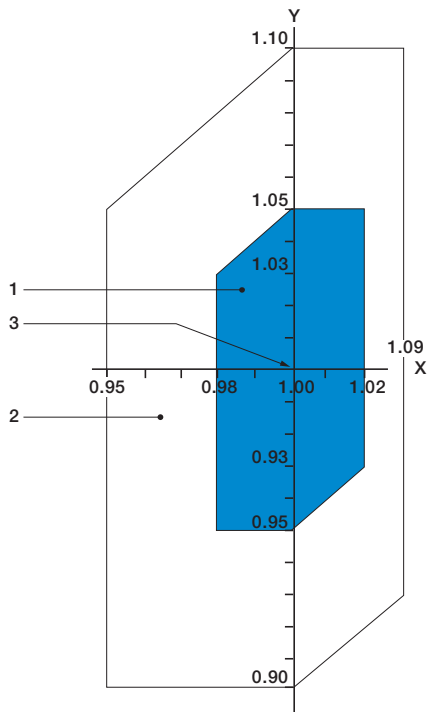


Figure Voltage and frequency deviation in zones A and B.

Key	
X axis	frequency p.u.
Y axis	voltage p.u.
1	zone A
2	zone B (outside zone A)
3	rating point

# IE3 and IE2 General performance cast iron motors

## Sizes 71 to 355, 0.18 to 355 kW

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<b>Motors in brief</b>	<b>3</b>
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# Ordering information

## Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M2BAX	112MA	3GBA 112 310	- ADD	002, etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		

When placing an order, specify motor type, size and product code according to the following example.

### Example

Motor type	M2BAX 112 MA
Pole number	4
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	4 kW
Product code	3GBA 112 310-ADD
Variant codes if needed	

### Positions 1 to 4

3GBA: Totally enclosed fan cooled squirrel cage motor with cast iron frame

### Positions 5 and 6

IEC size	
13:	132
16:	160
18:	180
20:	200
22:	225
25:	250
28:	280
31:	315
35:	355

### Position 7

Speed (Pole pairs)	
1:	2 poles
2:	4 poles
3:	6 poles

### Positions 8 to 10

Running number

### Position 11

-(dash)

### Position 12 (marked with black dot in data tables)

Mounting arrangement	
A:	Foot-mounted, top-mounted terminal box
B:	Flange-mounted, large flange

### Position 13 (marked with black dot in data tables)

<b>Voltage and frequency</b>	
Single-speed motors	
D:	400 VΔ, 690 VY, 380 VΔ, 660 VY, 50 Hz 440 VΔ, 460 VΔ, 60 Hz
S:	230 VΔ, 400 VY, 220 VΔ, 380 VY, 50 Hz 440 VY, 460 VΔ 60 Hz*

\*) M2AA 200 is not available for voltages less than 380 VD

### Position 14

A, B, C...= Generation code followed by variant codes

Efficiency values are given according to IEC 60034-2-1; 2014

For detailed dimension drawings please see our web-pages 'www.abb.com/motors&generators' or contact ABB.

## Rating plates

The motor's main rating plate shows the motor's performance values with various connections at nominal speed. The rating plate also shows the efficiency level (IE2, IE3), year of manufacture, and the lowest nominal efficiency at 100, 75, and 50 % nominal load.

The lubrication plate specifies regreasing amount, regreasing interval in hours - depending on the mounting position and ambient temperature - and types of lubricant recommended.

ABB							
CE IE2 IEC60034-1							
3- Motor M2BAX 160MLA 4 IMB3/IM1001 2015							
3030389-1							
No. 3G1P194700429				Ins. cl. F IP 55			
V	Hz	kW	r/min	A	cos φ	Duty	
690	Y	50	11	14.77	13.0	0.79	S1
400	D	50	11	14.77	22.4	0.79	S1
660	Y	50	11	14.74	13.2	0.82	S1
380	D	50	11	14.74	22.7	0.82	S1
440	D	60	11	17.78	18.7	0.81	S1
460	D	60	11	17.77	19.1	0.83	S1
IE2-50Hz-89.8%(100%)-89.9%(75%)-89.2%(50%) / IE2-60Hz-91.0%(100%)							
Product code 3GBA162410-ADC							
6209-2Z/C3				6209-2Z/C3			
				134 kg			

Rating plate for IE2 General performance cast iron M2BAX motor

ABB							
CE IE3 IEC60034-1							
3- Motor M2BAX 280SMC 4 IMB3/IM1001 2014							
3026614-1							
No. 3G1P144001206				Ins. cl. F IP 55			
V	Hz	kW	r/min	A	cos φ	Duty	
690	Y	50	90	14.85	92	0.86	S1
400	D	50	90	14.85	159	0.86	S1
660	Y	50	90	14.83	96	0.87	S1
380	D	50	90	14.83	166	0.87	S1
440	D	60	90	17.85	144	0.86	S1
460	D	60	90	17.86	139	0.85	S1
IE3-50Hz-95.2(100%)-95.6(75%)-95.5(50%) / IE3-60Hz-95.4(100%)							
Product code 3GBA282230-ADM							
6217/C3				6217/C3			
				621 kg			

Rating plate for IE3 General performance cast iron M2BAX motor



# Technical data

## IE3 General performance cast iron motors, 3000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B  
IE3 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current				Torque		Moment of inertia J = 1/4 GD <sup>2</sup> kgm <sup>2</sup>	Weight kg	Sound pressure Level L <sub>PA</sub> dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I <sub>N</sub> A	I <sub>g</sub> /I <sub>N</sub>	T <sub>N</sub> Nm	I <sub>g</sub> /I <sub>N</sub>	T <sub>g</sub> /T <sub>N</sub>				
3000 r/min = 2 poles				CENELEC-design												
0.37	M2BAX 71 MC	3GBA071330-••D	2819	76,5	76,0	73,4	0,80	0,86	6,6	1,3	2,7	3,2	0,00			
0.55	M2BAX 71 MB	3GBA071320-••D	2816	78,4	78,1	75,9	0,80	1,27	6,1	1,9	2,7	3,2	0,00040	10	49	
0.75	M2BAX 80 MC	3GBA081330-••D	2891	80,7	81,0	78,9	0,80	1,66	7,5	2,5	2,9	3,7	0,000810	15	58	
1.1	M2BAX 80 MD	3GBA081340-••D	2860	82,7	83,3	82,6	0,84	2,29	7,6	3,7	3,2	3,6	0,00102	17	60	
1.5	M2BAX 90 SB	3GBA091120-••D	2912	84,2	84,0	82,5	0,83	3,04	8,0	5,0	2,8	3,9	0,00234	22	54	
2.2	M2BAX 90 SLA	3GBA091010-••D	2908	85,9	85,6	83,9	0,81	4,54	8,2	7,3	3,2	3,9	0,00300	25	67	
3	M2BAX 100 LKA	3GBA101810-••D	2910	87,1	88,0	88,0	0,91	5,38	8,3	9,8	3,0	3,8	0,00691	47	60	
4	M2BAX 112 MB	3GBA111320-••D	2904	88,1	89,0	89,2	0,90	7,23	8,5	13,2	2,8	3,7	0,00711	46	64	
5.5	M2BAX 132SMA 2	3GBA131210-••D	2934	89,2	89,8	89	0,82	10,6	8,9	17,9	2,4	4,1	0,0136	66	65	
7.5	M2BAX 132SME 2	3GBA131250-••D	2901	90,1	91,1	91,2	0,91	13,1	7,3	24,7	2,2	3,7	0,0200	83	71	
11	M2BAX 160MLA 2	3GBA161410-••D	2943	91,2	92,0	91,6	0,91	19,1	7,2	35,6	2,6	3,6	0,0570	118	69	
15	M2BAX 160MLB 2	3GBA161420-••D	2947	91,9	92,2	91,8	0,88	26,5	8,2	48,5	3,2	4,2	0,0630	126	69	
18.5	M2BAX 160MLC 2	3GBA161430-••D	2949	92,4	93,0	92,6	0,90	32,0	9,0	59,8	3,3	3,9	0,0760	144	73	
22	M2BAX 180MLA 2	3GBA181410-••D	2956	92,7	93,1	92,7	0,90	37,7	7,8	71,0	3,4	3,8	0,110	181	73	
30	M2BAX 200MLA 2	3GBA201410-••D	2957	93,3	93,8	93,6	0,88	52,4	7,5	96,9	2,5	3,1	0,182	230	73	
37	M2BAX 200MLB 2	3GBA201420-••D	2960	93,7	94,2	94,1	0,89	64,2	8,2	119,5	3,1	3,4	0,222	257	73	
45	M2BAX 225SMA 2	3GBA221210-••D	2968	94,0	94,0	93,0	0,87	79,6	7,3	144,8	3,2	3,1	0,296	287	76	
55	M2BAX 250SMA 2	3GBA251210-••D	2968	94,3	93,7	93,6	0,89	94,8	6,8	177,0	2,4	3,0	0,426	344	76	
75	M2BAX 280SMB 2	3GBA281220-••M	2978	94,7	94,6	93,6	0,88	130	7,0	240,0	2,3	3,0	0,900	596	74	
90	M2BAX 280SMC 2	3GBA281230-••M	2975	95,0	95,0	94,2	0,88	156	6,4	289,0	2,1	2,8	0,990	618	74	
110	M2BAX 315SMB 2	3GBA311220-••M	2982	95,2	94,9	93,9	0,87	192	7,0	352,0	1,8	2,7	1,30	801	78	
132	M2BAX 315SMC 2	3GBA311230-••M	2982	95,4	95,4	94,6	0,87	229	6,8	422,0	2,0	2,8	1,50	852	78	
160	M2BAX 315SMD 2	3GBA311240-••M	2983	95,6	95,6	94,9	0,87	275	7,4	512,0	2,2	2,8	1,70	909	78	
200	1) M2BAX 315MLA 2	3GBA311410-••M	2983	95,8	96,0	95,5	0,88	342	7,5	640,0	2,3	3,1	2,10	1051	81	
250	M2BAX 355SMA 2	3GBA351210-••M	2985	95,8	95,6	94,6	0,89	423	7,7	800,0	2,1	3,3	3,00	1412	83	
315	M2BAX 355SMB 2	3GBA351220-••M	2980	95,8	95,7	95,0	0,89	529	7,0	1009,0	2,1	3,0	3,40	1495	83	
355	M2BAX 355SMC 2	3GBA351230-••M	2984	95,8	95,8	95,0	0,88	605	7,2	1136,0	2,2	3,0	3,60	1565	83	

1) Temperature rise class F

# Technical data

## IE3 General performance cast iron motors, 1500 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B  
IE3 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current					Moment of inertia J = 1/4 GD <sup>2</sup> kgm <sup>2</sup>	Weight kg	Sound pressure Level L <sub>PA</sub> dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I <sub>N</sub> A	Torque		I <sub>2</sub> /I <sub>N</sub>	T <sub>2</sub> /T <sub>N</sub>			
									T <sub>N</sub> Nm	I <sub>2</sub> /I <sub>N</sub>					
1500 r/min = 4 poles															
400 V 50 Hz							CENELEC-design								
0.25	M2BAX 71 MB	3GBA072320-00D	1440	73,5	70,1	63,8	0,64	0,78	6,1	1,67	2,7	3,5	0,000750	11	41
0.37	M2BAX 71 MLA	3GBA072410-00D	1441	77,3	74,9	69,8	0,66	1,06	6,8	2,47	2,7	3,8	0,000980	13	50
0.55	M2BAX 80 MC	3GBA082330-00D	1446	80,8	80,7	78,0	0,74	1,32	8,0	3,64	2,7	3,9	0,00228	15	48
0.75	M2BAX 80 MLA	3GBA082410-00D	1445	82,5	81,2	77,6	0,70	1,84	7,8	4,88	3,8	4,6	0,00295	24	49
1.1	M2BAX 90 SB	3GBA092120-00D	1438	84,1	83,4	80,9	0,73	2,59	7,9	7,28	3,6	4,2	0,00394	22	48
1.5	M2BAX 90 SLA	3GBA092010-00D	1439	85,3	84,4	82,1	0,73	3,52	7,8	9,95	3,9	4,5	0,00485	24	44
2.2	M2BAX 100 LB	3GBA102520-00D	1450	86,7	86,1	84,1	0,78	4,74	8,4	14,5	3,4	4,4	0,00863	35	50
3	M2BAX 100 LKA	3GBA102810-00D	1448	87,7	87,7	86,5	0,79	6,25	8,6	19,9	3,6	4,5	0,0115	43	57
4	M2BAX 112 MLA	3GBA112410-00D	1443	88,6	88,9	88,1	0,81	8,11	8,5	26,5	3,6	4,4	0,0152	53	57
5.5	M2BAX 132SMA 4	3GBA132210-00D	1463	89,6	90,4	90,2	0,77	11,5	7,9	35,89	2,6	3,3	0,0297	68	68
7.5	M2BAX 132SME 4	3GBA132250-00D	1465	90,4	90,7	90,3	0,78	15,5	7,4	49,0	2,5	4,0	0,0370	77	60
11	M2BAX 160MLA 4	3GBA162410-00D	1477	91,4	91,8	91,1	0,82	21,1	7,6	71,3	2,6	3,3	0,110	134	61
15	M2BAX 160MLB 4	3GBA162420-00D	1477	92,1	92,4	91,6	0,82	28,5	8,2	97,0	3,0	3,7	0,135	159	61
18.5	M2BAX 180MLA 4	3GBA182410-00D	1481	92,6	93,2	92,9	0,83	34,9	7,2	119,3	2,8	3,0	0,219	192	60
22	M2BAX 180MLB 4	3GBA182420-00D	1481	93,0	93,5	93,3	0,82	41,4	6,5	142,0	3,0	3,2	0,243	205	60
30	M2BAX 200MLA 4	3GBA202410-00D	1483	93,6	93,8	93,4	0,84	54,8	7,5	193,2	2,7	3,2	0,385	259	63
37	M2BAX 225SMA 4	3GBA222210-00D	1482	93,9	94,1	93,8	0,83	68,9	7,2	238,6	3,1	3,1	0,427	274	67
45	M2BAX 225SMB 4	3GBA222220-00D	1482	94,2	94,4	94,0	0,84	82,3	8,0	290,0	3,2	3,5	0,525	307	66
55	M2BAX 250SMA 4	3GBA252210-00D	1482	94,6	94,7	94,0	0,84	100,0	7,1	354,2	2,9	3,4	0,694	358	68
75	M2BAX 280SMB 4	3GBA282220-00M	1485	95,0	95,2	94,8	0,86	133,0	6,4	483,0	2,3	2,8	1,380	573	75
90	M2BAX 280SMC 4	3GBA282230-00M	1485	95,2	95,3	94,8	0,86	159,0	7,1	588,0	2,5	2,9	1,730	636	75
110	M2BAX 315SMB 4	3GBA312220-00M	1489	95,4	95,4	94,8	0,85	196,0	7,0	705,0	2,1	3,0	2,430	823	71
132	M2BAX 315SMC 4	3GBA312230-00M	1488	95,6	95,8	95,3	0,86	231,0	6,7	847,0	2,2	2,9	2,90	892	71
160	M2BAX 315SMD 4	3GBA312240-00M	1488	95,8	96,0	95,8	0,85	282,0	6,9	1026,0	2,2	3,0	3,20	933	71
200	M2BAX 315MLB 4	3GBA312420-00M	1487	96,0	96,4	96,4	0,86	351,0	6,8	1284,0	2,4	3,0	3,90	1091	74
250	M2BAX 355SMA 4	3GBA352210-00M	1491	96,0	96,0	95,6	0,86	435,0	6,4	1601,0	2,1	2,9	5,90	1445	78
315	M2BAX 355SMB 4	3GBA352220-00M	1491	96,0	96,0	95,6	0,86	545,0	6,7	2018,0	2,3	3,0	6,90	1595	78
355	M2BAX 355SMC 4	3GBA352230-00M	1490	96,0	96,2	95,8	0,86	616,0	6,3	2273,0	2,3	2,8	7,20	1635	78

<sup>1)</sup> Temperature rise class F

# Technical data

## IE3 General performance cast iron motors, 1000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B  
IE3 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current				Torque		Moment of inertia J = 1/4 GD <sup>2</sup> kgm <sup>2</sup>	Weight kg	Sound pressure Level L <sub>PA</sub> dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I <sub>N</sub> A	I <sub>g</sub> /I <sub>N</sub>	T <sub>N</sub> Nm	I <sub>g</sub> /I <sub>N</sub>	T <sub>g</sub> /T <sub>N</sub>				
1000 r/min = 6 poles				400 V 50 Hz												
CENELEC-design																
0.18	M2BAX 71 MB	3GBA073320-••D	931	63,9	60,0	53,2	0,69	0,60	3,8	1,87	2,1	2,6	0,00103	10	39	
0.25	M2BAX 71 MLA	3GBA073410-••D	926	68,6	66,3	60,9	0,67	0,80	4,3	2,58	2,6	2,9	0,00140	13	46	
0.37	M2BAX 80 MC	3GBA083330-••D	939	73,5	71,5	66,7	0,66	1,09	5,6	3,80	2,8	3,2	0,00240	15	42	
0.55	M2BAX 80 MLA	3GBA083410-••D	943	77,2	75,9	71,9	0,68	1,54	6,3	5,60	3,4	3,5	0,00353	20	48	
0.75	M2BAX 90 SLA	3GBA093010-••D	952	78,9	78,0	73,9	0,59	2,35	5,3	7,52	3,1	3,6	0,00440	22	50	
1.1	M2BAX 90 LB	3GBA093520-••D	954	81,0	80,3	75,5	0,62	3,20	6,1	11,1	3,3	3,9	0,00643	30	53	
1.5	M2BAX 100 LKA	3GBA103810-••D	953	82,5	83,4	82,0	0,88	3,0	5,9	15,0	2,4	3,0	0,00975	38	59	
2.2	M2BAX 112 MLA	3GBA113410-••D	957	84,3	83,8	81,5	0,64	5,94	6,5	22,0	2,9	3,7	0,0130	47	50	
3	M2BAX 132 SMA	3GBA133210-••D	968	85,6	86,1	84,9	0,68	7,40	6,7	29,6	2,1	3,2	0,0291	66	48	
4	M2BAX 132 SMB	3GBA133220-••D	972	86,8	86,8	84,9	0,65	10,1	7,0	39,3	2,7	3,6	0,0343	73	52	
5.5	M2BAX 132 MLA	3GBA133410-••D	974	88,0	87,4	86,0	0,67	13,5	7,3	54,2	2,9	3,5	0,0510	103	65	
7.5	M2BAX 160MLA 6	3GBA163410-••D	975	89,1	90,0	90,0	0,77	15,7	5,7	73,2	1,4	3,0	0,0890	119	59	
11	M2BAX 160MLB 6	3GBA163420-••D	975	90,3	91,1	91,1	0,78	22,5	6,4	107,5	1,6	3,1	0,138	160	64	
15	M2BAX 180MLA 6	3GBA183410-••D	979	91,2	91,9	91,6	0,79	30,1	5,2	146,9	1,5	2,7	0,212	190	63	
18.5	M2BAX 200MLA 6	3GBA203410-••D	989	91,7	91,9	91,2	0,82	35,2	6,5	178,8	2,2	3,2	0,496	238	59	
22	M2BAX 200MLB 6	3GBA203420-••D	989	92,2	92,4	91,4	0,81	42,4	7,3	212,4	2,6	3,5	0,585	263	59	
30	M2BAX 225SMA 6	3GBA223210-••D	988	92,9	93,0	92,2	0,77	60,4	7,7	290,6	2,9	3,6	0,724	298	63	
37	M2BAX 250SMA 6	3GBA253210-••D	990	93,3	93,7	93,5	0,80	71,1	6,5	357,0	2,4	3,1	1,30	379	58	
45	M2BAX 280SMB 6	3GBA283220-••M	991	93,7	94,0	93,5	0,84	81,9	7,4	433,0	2,7	3,0	1,870	562	72	
55	M2BAX 280SMC 6	3GBA283230-••M	993	94,1	94,3	93,8	0,86	98,2	7,5	530,0	2,8	3,0	2,570	615	71	
75	M2BAX 315SMB 6	3GBA313220-••M	994	94,6	94,9	94,6	0,84	136,0	6,8	720,0	1,8	2,6	4,10	791	75	
90	M2BAX 315SMC 6	3GBA313230-••M	994	94,9	95,1	94,7	0,84	164,0	7,2	864,0	2,0	3,0	4,60	859	76	
110	M2BAX 315SMD 6	3GBA313240-••M	994	95,1	95,3	95,0	0,83	200,0	7,3	1056,0	2,2	3,1	4,90	912	75	
132	M2BAX 315MLB 6	3GBA313420-••M	995	95,4	95,5	95,1	0,82	242,0	7,3	1266,0	2,3	3,2	6,30	1068	72	
160	M2BAX 355SMA 6	3GBA353210-••M	993	95,6	95,9	95,6	0,82	292,0	6,7	1538,0	2,5	2,6	7,90	1348	75	
200	M2BAX 355SMB 6	3GBA353220-••M	993	95,8	96,2	96,1	0,82	365,0	6,7	1923,0	2,6	2,5	9,70	1512	75	
250	M2BAX 355SMC 6	3GBA353230-••M	993	95,8	96,1	95,8	0,81	464,0	7,7	2404,0	3,0	3,1	11,30	1656	75	

# Technical data

## IE2 General performance cast iron motors, 3000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B  
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current					Torque		Moment of inertia J = 1/4 GD <sup>2</sup> kgm <sup>2</sup>	Weight kg	Sound pressure Level L <sub>PA</sub> dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I <sub>s</sub> A	I <sub>s</sub> /I <sub>N</sub>	T <sub>N</sub> Nm	T <sub>/T<sub>N</sub></sub>		T <sub>s</sub> /T <sub>N</sub>				
											T <sub>1</sub> /T <sub>N</sub>	T <sub>2</sub> /T <sub>N</sub>					
3000 r/min = 2 poles				400 V 50 Hz				CENELEC-design									
0.37	M2BAX 71MA 2	3GBA071310-●●C	2807	73,5	72,8	68,7	0,80	0,9	5,1	1,3	2,6	3,5	0,000330	9			
0.55	M2BAX 71MB 2	3GBA071320-●●C	2820	75,5	75,5	72,2	0,79	1,3	5,2	1,9	2,7	3,5	0,000410	10	58		
0.75	M2BAX 80MA 2	3GBA081310-●●C	2830	77,4	77,8	75,3	0,83	1,7	5,4	2,5	2,9	4,3	0,000670	13	63		
1.1	M2BAX 80MB 2	3GBA081320-●●C	2849	79,6	80,4	78,7	0,84	2,4	5,4	3,7	2,9	4,1	0,000880	14	62		
1.5	M2BAX 90SA 2	3GBA091110-●●C	2890	81,3	81,0	78,2	0,80	3,3	6,5	4,9	2,5	3,8	0,00208	20	66		
2.2	M2BAX 90LA 2	3GBA091510-●●C	2897	83,2	83,6	81,7	0,85	4,5	7,5	7,3	2,5	3,8	0,00274	23	67		
3	M2BAX 100LA 2	3GBA101510-●●C	2919	84,6	84,0	81,3	0,85	6,0	8,5	9,8	3,4	5,0	0,00475	32	74		
4	M2BAX 112MA 2	3GBA111310-●●C	2916	85,8	85,3	83,1	0,87	7,7	9,1	13,1	4,1	4,7	0,00561	36	75		
5.5	M2BAX 132SA 2	3GBA131110-●●C	2921	87,0	85,9	83,6	0,86	10,6	8,3	18,0	2,6	4,3	0,0117	54	74		
7.5	M2BAX 132SB 2	3GBA131120-●●C	2916	88,1	87,5	85,8	0,85	14,5	8,7	24,6	3,1	4,5	0,0132	58	73		
11	M2BAX 160MLA 2	3GBA161410-●●C	2931	89,4	89,4	88,4	0,86	20,7	6,6	35,9	2,5	3,5	0,0413	102	72		
15	M2BAX 160MLB 2	3GBA161420-●●C	2938	90,3	90,6	89,8	0,89	26,9	7,6	48,9	3,0	3,5	0,0538	115	72		
18.5	M2BAX 160MLC 2	3GBA161430-●●C	2939	90,9	91,0	90,3	0,88	33,4	7,9	60,1	3,1	3,8	0,060	123	73		
22	M2BAX 180MLA 2	3GBA181410-●●C	2943	91,3	91,4	90,7	0,88	39,5	8,4	71,4	3,8	3,9	0,0735	150	72		
30	M2BAX 200MLA 2	3GBA201410-●●C	2957	92,0	91,5	90,1	0,85	55,4	8,6	97,1	4,0	4,2	0,110	198	81		
37	M2BAX 200MLB 2	3GBA201420-●●C	2951	92,5	92,5	92,1	0,90	64,2	8,4	120	3,6	3,7	0,141	229	80		
45	M2BAX 225SMA 2	3GBA221210-●●C	2962	92,9	92,8	92,1	0,87	80,4	8,8	145	3,8	3,8	0,226	273	82		
55	M2BAX 250SMA 2	3GBA251210-●●C	2965	93,2	93,2	92,6	0,88	96,8	7,4	177	3,4	3,0	0,344	334	78		
75	M2BAX 280SA 2	3GBA281110-●●C	2977	94,0	93,7	92,3	0,88	130	7,6	240	2,1	3,0	0,80	530	78		
90	M2BAX 280SMB 2	3GBA281220-●●C	2976	94,3	94,2	93,1	0,90	153	7,4	288	2,1	2,9	0,90	570	78		
110	M2BAX 315SMA 2	3GBA311210-●●C	2982	94,6	94,1	92,7	0,86	195	7,6	352	2,0	3,0	1,20	750	78		
132	M2BAX 315SMB 2	3GBA311220-●●C	2982	94,9	94,6	93,4	0,88	228	7,4	422	2,2	3,0	1,40	810	78		
160	M2BAX 315SMC 2	3GBA311230-●●C	2981	95,2	95,0	94,1	0,89	272	7,5	512	2,3	3,0	1,70	900	78		
200	M2BAX 315MLA 2	3GBA311410-●●C	2980	95,3	95,2	94,4	0,90	336	7,7	640	2,6	3,0	2,10	1020	83		
250	M2BAX 355SMA 2	3GBA351210-●●C	2983	95,4	95,2	94,3	0,89	424	6,8	800	1,5	2,8	2,70	1310	83		
315	M2BAX 355SMB 2	3GBA351220-●●C	2980	95,4	95,4	94,7	0,89	535	7,2	1009	1,9	2,8	3,40	1450	83		
355	M2BAX 355SMC 2	3GBA351230-●●C	2983	95,5	95,5	94,9	0,88	609	7,4	1136	2,1	2,7	3,60	1520	83		

Note! Please check the availability for sizes 280-355 with ABB

# Technical data

## IE2 General performance cast iron motors, 1500 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B  
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current				Torque		Moment of inertia J = 1/4 GD <sup>2</sup> kgm <sup>2</sup>	Weight kg	Sound pressure Level L <sub>PA</sub> dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I <sub>N</sub> A	I <sub>g</sub> /I <sub>N</sub>	T <sub>N</sub> Nm	T <sub>r</sub> /T <sub>N</sub>	T <sub>g</sub> /T <sub>N</sub>				
1500 r/min = 4 poles																
CENELEC-design																
0.25	M2BAX 71MA 4	3GBA072310-••C	1415	67,0	63,1	56,6	0,73	0,74	4,4	1,68	2,1	2,8	0,000590	9	49	
0.37	M2BAX 71MB 4	3GBA072320-••C	1407	69,5	69,0	64,4	0,77	1,0	4,2	2,5	1,9	2,7	0,000590	10	49	
0.55	M2BAX 80MA 4	3GBA082310-••C	1413	73,5	73,2	69,2	0,76	1,4	4,7	3,7	2,0	2,9	0,00156	13	54	
0.75	M2BAX 80MB 4	3GBA082320-••C	1462	79,6	78,5	74,4	0,71	1,9	6,2	5,0	3,1	3,9	0,00247	17	53	
1.1	M2BAX 90SA 4	3GBA092110-••C	1447	81,4	80,7	77,2	0,73	2,7	6,3	7,4	3,2	4,3	0,00372	21	51	
1.5	M2BAX 90LA 4	3GBA092510-••C	1441	82,8	82,6	79,8	0,74	3,5	6,6	10,0	3,1	4,2	0,00462	23	55	
2.2	M2BAX 100LA 4	3GBA102510-••C	1445	84,3	84,2	81,9	0,78	4,8	6,7	14,5	2,6	3,8	0,00759	31	55	
3	M2BAX 100LB 4	3GBA102520-••C	1443	85,5	85,4	83,3	0,79	6,4	7,4	19,8	2,8	4,2	0,00939	35	58	
4	M2BAX 112MA 4	3GBA112310-••C	1442	86,6	86,2	84,6	0,79	8,4	7,5	26,5	4,0	4,3	0,0120	41	57	
5.5	M2BAX 132SA 4	3GBA132110-••C	1457	87,7	87,5	86,2	0,78	11,6	6,9	36,0	2,5	3,4	0,0257	57	66	
7.5	M2BAX 132MA 4	3GBA132310-••C	1457	88,7	88,6	87,5	0,78	15,6	7,2	49,1	2,6	3,6	0,0320	68	67	
11	M2BAX 160MLA 4	3GBA162410-••C	1466	89,8	89,9	89,2	0,79	22,4	7,0	71,5	3,2	3,2	0,0784	110	67	
15	M2BAX 160MLB 4	3GBA162420-••C	1468	90,6	91,1	90,5	0,82	29,1	8,0	97,7	3,2	3,7	0,10	125	66	
18.5	M2BAX 180MLA 4	3GBA182410-••C	1470	91,2	91,5	90,6	0,80	36,6	8,5	120	3,7	4,2	0,120	155	65	
22	M2BAX 180MLB 4	3GBA182420-••C	1472	91,6	91,3	90,2	0,78	44,4	9,2	143	4,1	4,6	0,139	168	66	
30	M2BAX 200MLA 4	3GBA202410-••C	1476	92,3	92,4	92,0	0,81	57,9	6,8	194	3,0	3,2	0,236	222	68	
37	M2BAX 225SMA 4	3GBA222210-••C	1479	92,7	92,7	92,2	0,82	70,3	7,4	239	3,1	3,3	0,350	263	69	
45	M2BAX 225SMB 4	3GBA222220-••C	1481	93,1	93,0	92,3	0,81	86,1	7,9	290	3,5	3,5	0,416	290	69	
55	M2BAX 250SMA 4	3GBA252210-••C	1480	93,5	93,4	92,7	0,83	102	7,6	355	3,3	3,3	0,533	339	77	
75	M2BAX 280SA 4	3GBA282110-••C	1484	94,2	94,2	93,5	0,85	135	6,9	482	2,5	2,8	1,250	515	71	
90	M2BAX 280SMB 4	3GBA282220-••C	1483	94,4	94,6	94,1	0,86	160	7,2	579	2,5	2,7	1,50	575	71	
110	M2BAX 315SMA 4	3GBA312210-••C	1487	94,7	94,6	93,8	0,86	194	7,2	706	2,0	2,5	2,30	775	78	
132	M2BAX 315SMB 4	3GBA312220-••C	1487	95,0	95,0	94,3	0,86	233	7,1	847	2,3	2,7	2,60	830	78	
160	M2BAX 315SMC 4	3GBA312230-••C	1487	95,2	95,3	94,6	0,85	285	7,2	1027	2,4	2,9	2,90	870	78	
200	M2BAX 315MLA 4	3GBA312410-••C	1486	95,3	95,4	94,9	0,86	352	7,0	1285	2,3	2,8	3,50	995	78	
250	M2BAX 355SMA 4	3GBA352210-••C	1488	95,2	95,2	94,4	0,85	445	6,7	1604	2,0	2,6	5,40	1400	82	
315	M2BAX 355SMB 4	3GBA352220-••C	1488	95,5	95,5	94,8	0,85	560	7,3	2021	2,2	2,7	6,90	1570	82	
355	M2BAX 355SMC 4	3GBA352230-••C	1487	95,5	95,7	95,2	0,86	623	6,8	2279	2,4	2,7	7,20	1650	82	

Note! Please check the availability for sizes 280-355 with ABB

# Technical data

## IE2 General performance cast iron motors, 1000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B  
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034-30-1; 2014			Power factor Cosφ	Current			Torque			Moment of inertia J = 1/4 GD <sup>2</sup> kgm <sup>2</sup>	Weight kg	Sound pressure Level L <sub>PA</sub> dB
				Full load 100%	3/4 load 75%	1/2 load 50%		I <sub>N</sub> A	I <sub>2</sub> /I <sub>N</sub>	T <sub>N</sub> Nm	T <sub>1</sub> /T <sub>N</sub>	T <sub>2</sub> /T <sub>N</sub>				
				CENELEC-design												
1000 r/min = 6 poles				400 V 50 Hz			CENELEC-design									
0.18	M2BAX 71MA 6	3GBA073310-••C	910	59,0	54,7	47,5	0,72	0,61	3,3	1,87	2,0	2,4	0,000820	9	40	
0.25	M2BAX 71MB 6	3GBA073320-••C	913	63,0	59,9	53,8	0,71	0,81	3,6	2,64	2,4	2,8	0,00105	10	46	
0.37	M2BAX 80MA 6	3GBA083310-••C	919	68,0	66,6	60,8	0,74	1,1	3,9	3,8	2,4	2,9	0,00173	13	49	
0.55	M2BAX 80MB 6	3GBA083320-••C	921	71,0	69,8	64,7	0,73	1,5	4,2	5,7	2,6	3,0	0,00234	14	47	
0.75	M2BAX 90SA 6	3GBA093110-••C	949	75,9	74,3	69,2	0,62	2,3	4,5	7,6	3,2	3,7	0,00438	21	50	
1.1	M2BAX 90LA 6	3GBA093510-••C	936	78,1	78,0	74,7	0,67	3,0	4,5	11,1	2,5	3,3	0,00507	24	48	
1.5	M2BAX 100LA 6	3GBA103510-••C	953	79,8	79,4	76,0	0,67	4,1	4,9	15,0	2,1	3,1	0,00795	31	56	
2.2	M2BAX 112MA 6	3GBA113310-••C	956	81,8	81,4	78,4	0,68	5,7	5,3	21,9	2,3	3,5	0,0116	40	54	
3	M2BAX 132SA 6	3GBA133110-••C	967	83,3	82,8	79,8	0,65	8,0	5,0	29,5	1,7	3,0	0,0251	55	60	
4	M2BAX 132MA 6	3GBA133310-••C	965	84,6	84,2	82,4	0,70	9,8	5,7	40,0	2,6	3,3	0,0294	63	58	
5.5	M2BAX 132MB 6	3GBA133320-••C	964	86,0	85,9	84,7	0,68	13,6	5,8	54,2	2,2	2,9	0,0397	77	62	
7.5	M2BAX 160MLA 6	3GBA163410-••C	974	87,2	87,5	86,9	0,76	16,3	6,6	73,7	2,0	3,2	0,0811	113	65	
11	M2BAX 160MLB 6	3GBA163420-••C	971	88,7	89,4	89,8	0,79	22,7	6,6	108	1,6	2,8	0,102	133	57	
15	M2BAX 180MLA 6	3GBA183410-••C	971	89,7	90,0	89,6	0,77	31,3	7,4	147	2,4	3,9	0,136	168	62	
18.5	M2BAX 200MLA 6	3GBA203410-••C	978	90,4	90,7	90,0	0,77	38,4	6,1	181	2,0	2,9	0,204	205	61	
22	M2BAX 200MLB 6	3GBA203420-••C	978	90,9	91,1	90,5	0,78	44,8	6,2	215	1,8	2,9	0,227	219	62	
30	M2BAX 225SMA 6	3GBA223210-••C	987	91,7	91,5	90,5	0,79	59,8	7,0	290	2,7	3,2	0,579	282	64	
37	M2BAX 250SMA 6	3GBA253210-••C	986	92,2	92,5	91,9	0,81	71,5	6,9	359	2,6	2,9	0,783	336	66	
45	M2BAX 280SA 6	3GBA283110-••C	990	92,8	93,0	92,1	0,84	83,3	7,0	434	2,5	2,5	1,850	500	71	
55	M2BAX 280SB 6	3GBA283120-••C	990	93,3	93,5	92,9	0,84	101	7,0	530	2,7	2,6	2,20	540	71	
75	M2BAX 315SMA 6	3GBA313210-••C	992	94,0	94,0	93,0	0,81	142	7,0	721	2,1	2,7	3,20	705	75	
90	M2BAX 315SMB 6	3GBA313220-••C	992	94,3	94,4	93,6	0,83	165	7,2	866	2,1	2,7	4,10	800	75	
110	M2BAX 315SMC 6	3GBA313230-••C	992	94,7	94,8	94,2	0,83	201	7,0	1058	2,2	2,7	4,90	870	75	
132	M2BAX 315MLA 6	3GBA313410-••C	992	94,9	95,0	94,4	0,83	241	7,2	1270	2,4	2,7	5,80	980	75	
160	M2BAX 355SMA 6	3GBA353210-••C	992	94,9	95,0	94,4	0,83	293	6,2	1540	2,1	2,3	7,30	1290	77	
200	M2BAX 355SMB 6	3GBA353220-••C	992	95,2	95,4	94,9	0,84	360	6,5	1925	2,1	2,3	9,70	1440	77	
250	M2BAX 355SMC 6	3GBA353230-••C	991	95,3	95,5	95,2	0,84	450	6,7	2409	2,3	2,3	11,30	1590	77	

Note! Please check the availability for sizes 280-355 with ABB

# Variant codes

## IE3 and IE2 General performance cast iron motors

Variant codes specify additional options and features to the standard motor. The desired features are listed as three-digit variant codes in the motor order. Note also that there are variants that cannot be used together.

Code/Variants M2BAX	Frame size													
	71	80	90	100	112	132	160	180	200	225	250	280	315	355
<b>Bearings and Lubrication</b>														
037	Roller bearing at D-end.	-	-	-	-	-	•	•	•	•	•	•	•	•
041	Bearings regreasable via grease nipples.	-	-	-	-	-	•	•	•	•	•	•	○	○
043	SPM compatible nipples for vibration measurement	-	-	-	-	-	•	•	•	•	•	•	•	•
<b>Branch standard designs</b>														
178	Stainless steel / acid proof bolts.	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Cooling system</b>														
068	Light alloy metal fan	•	•	•	•	•	•	•	•	•	•	•	•	•
183	Separate motor cooling (fan axial, N-end).	•	•	•	•	•	•	•	•	•	•	•	•	-
<b>Drain holes</b>														
065	Plugged existing drain holes.	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Earthing bolt</b>														
067	External earthing bolt	○	○	○	○	○	○	○	○	○	○	○	○	○
<b>Heating elements</b>														
450	Heating element, 100-120 V	•	•	•	•	•	•	•	•	•	•	•	•	•
451	Heating element, 200 - 240 V	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Marine</b>														
096	Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•
186	Fulfilling Det Norske Veritas (DNV) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•
496	Fulfilling Bureau Veritas (BV) requirements, without certificate(non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•
675	Fulfilling American Bureau of Shipping (ABS) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•
676	Fulfilling Germanischer Lloyd (GL) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Mounting arrangements</b>														
008	IM 2101 foot/flange mounted, IEC flange, from IM 1001 (B34 from B3).	•	•	•	•	•	•	-	-	-	-	-	-	-
009	IM 2001 foot/flange mounted, IEC flange, from IM 1001 (B35 from B3).	•	•	•	•	•	•	•	•	•	•	•	•	•
047	IM 3601 flange mounted, IEC flange, from IM 3001 (B14 from B5).	•	•	•	•	•	•	-	-	-	-	-	-	-
048	IM 3001 flange mounted, IEC flange, from IM 3601 (B5 from B14).	•	•	•	•	•	•	-	-	-	-	-	-	-
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Painting</b>														
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Protection</b>														
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•	•	•	•
072	Radial seal at D-end. Not possible for 2-pole, 280 and 315 frames	•	•	•	•	•	•	•	•	•	•	•	•	•
158	Degree of protection IP65.	•	•	•	•	•	•	•	•	•	•	•	•	•
403	Degree of protection IP56.	•	•	•	•	•	•	•	•	•	•	•	•	•
784	Gamma-seal at D-end.	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Rating &amp; instruction plates</b>														
002	Restamping voltage, frequency and output, continuous duty.	•	•	•	•	•	•	•	•	•	•	•	•	•
095	Restamping output (maintained voltage, frequency), intermittent duty.	•	•	•	•	•	•	•	•	•	•	•	•	•
098	Stainless steel rating plate	○	○	○	○	○	○	○	○	○	○	○	○	○
135	Mounting of additional identification plate, stainless.	•	•	•	•	•	•	•	•	•	•	•	•	•
159	Additional plate with text "Made in..."	•	•	•	•	•	•	•	•	•	•	•	•	•
161	Additional rating plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•
163	Frequency converter rating plate. Rating data according to quotation.	•	•	•	•	•	•	•	•	•	•	•	•	•
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	-	-	-	-	-	•	•	•	•	•	•	•	•
<b>Standards and Regulations</b>														
331	IE1 motor not for sale for use in EU	•	•	•	•	•	•	•	•	•	•	•	•	•
540	China energy label	•	•	•	•	•	•	•	•	•	•	•	•	•
543	Australian MEPS	-	-	-	-	-	•	•	•	•	•	•	•	•

○ = Included as standard | • = Available as option | - = Not applicable



Code/Variants M2BAX	Frame size													
	71	80	90	100	112	132	160	180	200	225	250	280	315	355
822 WIMES 3.03i6 Compliant Design for DOL operation	-	-	-	-	-	•	•	•	•	•	•	•	•	•
<b>Stator winding temperature sensors</b>														
122 Bimetal detectors, break type (NOC), (3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•
435 PTC - thermistors (3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•
436 PTC - thermistors (3 in series), 150 °C, in stator winding	○	○	○	○	○	○	○	○	○	○	○	○	○	○
439 PTC - thermistors (2x3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•
445 Pt100 2-wire in stator winding, 1 per phase	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Terminal box</b>														
022 Cable entry LHS (seen from D-end).	•	•	•	•	•	•	•	•	•	•	•	•	•	•
230 Standard metal cable gland.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
375 Standard plastic cable gland	•	•	•	•	•	•	•	•	•	•	•	-	-	-
376 Two standard plastic cable glands	•	•	•	•	•	•	•	•	•	•	•	-	-	-
400 4 x 90 degr turnable terminal box.	•	•	•	•	•	○	○	○	○	○	○	○	○	○
418 Separate terminal box for auxiliaries, standard material.	•	•	•	•	•	•	•	•	•	•	•	-	-	-
447 Top mounted separate terminal box for monitoring equipment.	-	-	-	-	-	-	-	-	-	-	-	•	•	•
731 Two standard metal cable glands.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Testing</b>														
145 Type test report from a catalogue motor, 400V 50Hz.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
148 Routine test report.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>Variable speed drives</b>														
470 Prepared for hollow shaft pulse tacho (L&L equivalent).	-	-	-	-	-	-	•	•	•	•	•	•	•	•
472 1024 pulse tacho (L&L 861007455-1024).	-	-	-	-	-	-	•	•	•	•	•	•	•	•
473 2048 pulse tacho (L&L 861007455-2048).	-	-	-	-	-	-	•	•	•	•	•	•	•	•
701 Insulated bearing at N-end.	-	-	-	-	-	-	-	-	-	-	-	•	•	•
704 EMC cable entry.	•	•	•	•	•	•	•	•	•	•	•	•	•	•

○ = Included as standard | • = Available as option | - = Not applicable

# Mechanical design

## Bearings

General performance motors are normally fitted with single-row deep-groove ball bearings, as shown in the table below.

If the bearing at the D-end is replaced with a roller bearing (NU- or NJ-), higher radial forces can be handled. Roller bearings are suitable for belt-drive applications and can be ordered with variant code 037.

### Standard and alternative designs

Motor size	Poles	Standard design		Alternative design
		Deep groove ball bearings		Deep groove ball bearings
		D-end	N-end	Roller bearings (VC037) D-end
71	2 - 6	6203-2Z/C3	6202-2Z/C3	
80	2 - 6	6204-2Z/C3	6203-2Z/C3	
90	2 - 6	6205-2Z/C3	6204-2Z/C3	
100	2 - 6	6206-2Z/C3	6205-2Z/C3	
112	2 - 6	6206-2Z/C3	6205-2Z/C3	
132	2 - 4	6208-2Z/C3	6208-2Z/C3	NU 208 ECP/C3
160	2 - 6	6209-2Z/C3	6209-2Z/C3	NU 209 ECP/C3
180	2 - 6	6210-2Z/C3	6209-2Z/C3	NU 210 ECP/C3
200	2 - 6	6212-2Z/C3	6209-2Z/C3	NU 212 ECP/C3
225	2 - 6	6213-2Z/C3	6210-2Z/C3	NU 213 ECP/C3
250	2 - 6	6215-2Z/C3	6212-2Z/C3	NU 215 ECP/C3
280	2 - 6	6217/C3	6217/C3	NU 217 ECP/C3
315	2	6217/C3	6217/C3	NU 217 ECP/C3
315	4 - 6	6219/C3	6217/C3	NU 219 ECP/C3
355	2	6219/C3	6219/C	NU 219 ECP/C3
355	4 - 6	6222/C3	6219/C3	NU 222 ECP/C3

### Axially-locked bearings

All motors are equipped as standard with an axially locked bearing at the D-end.

# Mechanical design

## Radial forces

### Permissible loading on the shaft

The following table shows permissible radial forces on the shaft in Newtons, assuming zero axial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20 000 and 40 000 hours per motor size.

These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft affects permissible forces.

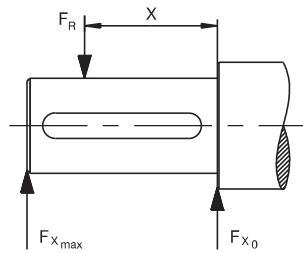
Permissible loads of simultaneous radial and axial forces can be supplied on request.

If the radial force is applied between points  $X_0$  and  $X_{max}$ , the permissible force  $F_R$  can be calculated with the following formula:

$$F_R = F_{X_0} - \frac{X}{E} (F_{X_0} - F_{X_{max}})$$

Where:

E: length of the shaft extension in the standard version



Permissible radial forces, M2BAX motor sizes 71-355, IE3 and IE2

Motor size	Poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings				Basic design with deep groove roller bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			$F_{x0}$ (N)	$F_{xmax}$ (N)	$F_{x0}$ (N)	$F_{xmax}$ (N)	$F_{x0}$ (N)	$F_{xmax}$ (N)	$F_{x0}$ (N)	$F_{xmax}$ (N)
71	2	30	545	465	430	3				
	4	30	685	585	545	465				
	6	30	785	660	620	530				
80	2	40	740	620	585	490				
	4	40	925	775	730	615				
	6	40	1065	890	840	705				
90S	2	50	795	645	625	5				
	4	50	1000	815	790	645				
	6	50	1145	935	905	740				
90L	2	50	795	660	630	520				
	4	50	1005	830	790	65				
	6	50	1150	950	910	750				
100	2	60	1110	895	875	705				
	4	60	1395	1120	1100	885				
	6	60	1605	1290	1265	1020				
112	2	60	1120	925	885	7				
	4	60	1405	1160	1105	91				
	6	60	1615	1335	12					
132S	2	80	1630	1270	1285	100				
	4	80	2055	1600	1620	1260				
	6	80	2360	1840	1860	1450				
132M	4	80	2075	1665	1630	1310				
	6	80	2375	1905	1865	149				
	2	110	1945	1510	1545	1195				
160	4	110	2455	1905	1945	151				
	6	110	2835	2250	2245	1780				
	2	110	2095	1705	1660	1350				
180	4	110	2640	2145	2090	1700				
	6	110	3025	2460	2395	1950				
	2	110	2800	2350	2200	1830				
200	4	110	3550	2910	2810	230				
	6	110	4065	3335	3220	2640				
	2	110	3335	2795	2640	22				
225	4	140	4200	3370	3325	2670				
	6	140	4810	3860	2805	305				
	2	140	3965	3220	3140	255				
250	4	140	4995	4060	3995	3215				
	6	140	5715	4645	4525	3675				
	2	140	4900	4050	3850	3200	14750	6850	12000	68
280	4	140	6150	5100	4850	4050	18200	11200	14750	11200
	6	140	7050	5850	5550	4600	20550	11200	16650	11200
	2	140	4900	4150	3850	3250	14900	6650	1	
315	4	170	8000	6650	6350	5250	21200	10350	17200	10350
	6	170	9150	7550	7200	5950	23900	10250	19400	10250
	2	140	6250	5500	4900	4300	17200	7850	13950	7850
355	4	210	10500	8700	8250	6800	28050	16250	22750	16250
	6	210	12000	9900	9400	7750	31650	16200	25700	16200

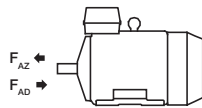
# Mechanical design

## Axial forces

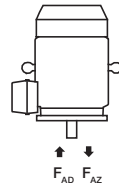
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

At 60 Hz, the values must be reduced by 10 percent, and for two-speed motors, the higher speed determines permissible axial force. Permissible loads of simultaneous radial and axial forces can be supplied on request.

For axial force  $F_{AD}$ , it is assumed that the D-bearing is locked with a locking ring.



Mounting arrangement IM B3



Mounting arrangement IM V1

### Permissible axial forces, motor sizes 71-112, IE3 and IE2

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			$F_{AD}(N)$	$F_{AZ}(N)$	$F_{AD}(N)$	$F_{AZ}(N)$	$F_{AD}(N)$	$F_{AZ}(N)$	$F_{AD}(N)$	$F_{AZ}(N)$
71	2	30	580	300	465	185				
	4	30	725	445	58					
	6	30	810	530	670	390				
80	2	40	750	430	595	275				
	4	40	940	620	750	4				
	6	40	1055	735	870	550				
90	2	50	845	445	675	27				
	4	50	1050	650	840					
	6	50	1175	775	935					
100	2	60	1175	615	940	380				
	4	60	1465	905	1175	615				
	6	60	1640	1080	1305	745				
112	2	60	1175	61						
	4	60	1460	900	1					
	6	60	1635	1075	1300	740				

Permissible axial forces, motor sizes 132-355, IE3 and IE2

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			$F_{A0}(N)$	$F_{AZ}(N)$	$F_{A0}(N)$	$F_{AZ}(N)$	$F_{A0}(N)$	$F_{AZ}(N)$	$F_{A0}(N)$	$F_{AZ}(N)$
132	2	80	1750	950	1400	600	1900	850	1550	5
	4	80	2200	1400	1750	950	2400	1250	1950	800
160	2	110	1750	1050	1400	700	2050	800	170	
	4	110	2200	1500	1700	1050	2650	1150	2200	65
	6	110	2550	1850	2000	1300	2950	1500	2400	95
180	2	110	1800	1100	1450	750	2300	800	190	
	4	110	2300	1600	1750	1100	2950	1100	2450	600
	6	110	2650	2000	2050	1400	3300	1550	2700	
200	2	110	2300	1600	1800	1100	2950	1150	2400	650
	4	110	2950	2300	2300	1600	3850	1650	3200	100
	6	110	3450	2750	2600	1950	4450	2000	36	
225	2	110	2500	2100	1900	1500	3250	1600	2650	100
	4	140	3250	2850	2450	2050	4150	2150	3350	135
	6	140	3800	3400	2850	2500	5000	2650	4050	1700
250	2	140	2950	2450	2250	1750	3950	1800	3200	110
	4	140	3850	3350	2950	2400	5100	2550	4150	160
	6	140	4500	3950	3400	2850	6100	2900	5000	1750
280	2	140	4350	2350	3450	1450	5750	1350	48	
	4	140	5400	3400	4250	2250	7400	2100	6200	900
	6	140	6200	4200	4850	2850	8300	2650	6900	12
315	2	140	4150	2150	3300	1300	6100	450	-	-
	4	170	6600	4600	5100	3100	9250	2300	7700	750
	6	170	7550	5550	5800	3800	10850	2600	9050	750
355	2	140	4900	3200	3800	2100	8300	60		
	4	210	8050	6300	6100	4350	12750	2700	1075	
	6	210	9250	7500	6950	5200	14650	2950	12300	600

# Terminal box

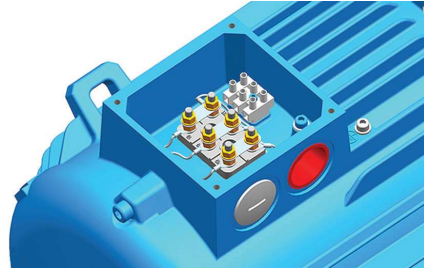
## Standard terminal box

### Terminal boxes

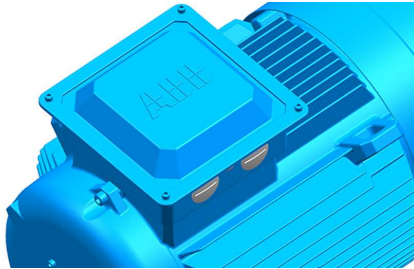
The pictures below show standard terminal boxes.



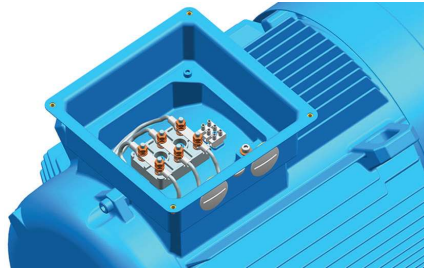
Terminal box for Motor sizes 71 to 132.



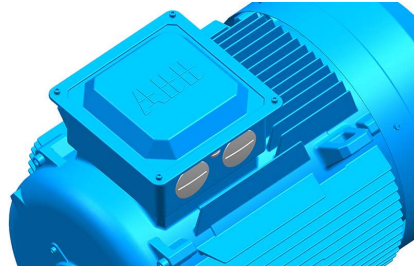
Terminal board for Motor sizes 71 to 132.



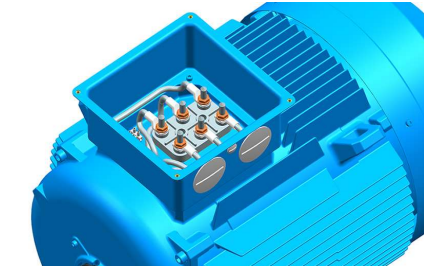
Terminal box for Motor sizes 160 to 180.



Terminal board for Motor size 160 to 180.



Terminal box for motor size 200 to 250.



Terminal board for motor size 200 to 250.



Terminal box for motors size 280 to 355.

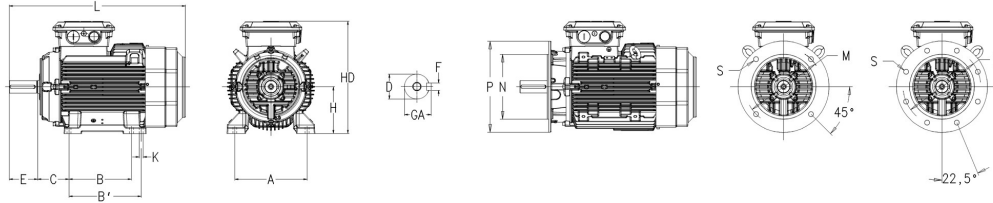


Terminal board for motor size 280 to 355.



# Dimension drawings

## IE3 and IE2 General performance cast iron motors



Foot-mounted motor IM1001, B3 and Flange-mounted motor IM 3001, B5

### General performance cast iron motors M2BAX

Motor size	D poles 2		GA poles 2		F poles 2		E poles 2		L max poles 2		A	B	B'	C	HD	K	M	N	P	S	
71M	14	14	16	16	5	5	30	30	257	257	112	90	-	45	175	7	130	110	160	10	
71ML	14	14	16	16	5	5	30	30	282	282	112	90	-	45	175	7	130	110	160	10	
80M	19	19	21.5	21.5	6	6	40	40	309	309	125	100	-	50	192	10	165	130	200	12	
80ML	19	19	21.5	21.5	6	6	40	40	334	334	125	100	112	50	192	10	165	130	200	1	
90S	24	24	27	27	8	8	50	50	335	335	140	100	-	56	217	10	165	130	200	12	
90SL	24	24	27	27	8	8	50	50	351	351	140	100	125	56	217	10	165	130	200	12	
90L <sup>1)</sup>	24	24	27	27	8	8	50	50	351	351	140	125	-	56	217	10	165	130	200	1	
90L <sup>2)</sup>	24	24	27	27	8	8	50	50	386	386	140	125	-	56	217	10	165	130	200		
100L	28	28	31	31	8	8	60	60	376	376	160	140	-	63	240	12	215	180	250	14	
100LK	28	28	31	31	8	8	60	60	411	411	160	140	160	63	240	12	215	180	250	14.5	
112M	28	28	31	31	8	8	60	60	411	411	190	140	-	70	252	12	215	180	250	14.5	
112ML	28	28	31	31	8	8	60	60	456	456	190	140	159	70	252	12	215	180	250	14.5	
132S	38	38	41	41	10	10	80	80	479	479	216	140	-	89	302	12	265	230	300	14	
132SM	38	38	41	41	10	10	80	80	521	521	216	140	178	89	302	12	265	230	300	14.5	
132M	38	38	41	41	10	10	80	80	521	521	216	178	-	89	302	12	265	230	300	14	
132ML	38	38	41	41	10	10	80	80	586	586	216	178	203	89	302	12	265	230	300	14.5	
160 MLA 2	42	42	45	45	12	12	110	110	639	639	254	210	254	108	414	14.5	300	250	350	19	
160 MLB 2																					
160 MLA 4																					
160 MLA 6																					
160 MLC 2	42	42	45	45	12	12	110	110	696	696	254	210	254	108	414	14.5	300	250	350	19	
160 MLB 4																					
160 MLB 6																					
180	48	48	51.5	51.5	14	14	110	110	728	728	279	241	279	121	454	14.5	300	250	350	19	
200	55	55	59	59	16	16	110	110	809	809	318	267	305	133	515	18.5	350	300	400	19	
225	55	60	59	64	16	18	110	140	812	842	356	286	311	149	560	18.5	400	350	450	19	
250	60	65	64	69	18	18	140	140	853	853	406	311	349	168	613	24	500	450	550	19	
280	65	75	69	79.5	18	20	140	140	1052	1056	457	368	419	190	771	24	500	450	550	18.5	
315 SM <sub>-</sub>	65	80	69	85	18	22	140	170	1220	1250	508	406	457	216	845	28	600	550	660	24	
315 ML <sub>-</sub>	65	90	69	95	18	25	140	170	1326	1356	508	457	508	216	845	28	600	550	660	24	
355	70	100	74.5	106	20	28	140	210	1403	1473	610	500	560	254	929	35	740	680	800	24	

Tolerances	Footnotes
A, B	±0,4 <sup>1)</sup> M2BAX IE2
D	ISO k6 < Ø 50 mm <sup>2)</sup> M2BAX IE3
	ISO m6 > Ø 50 mm
F	ISO h9
H	-0,5
N	ISO j6
C	±0,

## Motors in brief

### IE3/IE2 General performance cast iron motors, sizes 71 - 112

Motor size	M2BAX	71	80	90	100	112
Stator and end shields	Material	Cast iron				
	Paint color shade	Munsell blue 8B 4.5/3.25				
	Corrosion class	C3 medium				
Feet	Material	Integrated cast iron				
Bearings	D-end	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3
	N-end	6202-2Z/C3	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6205-2Z/C3
Axially locked bearings		Locked at D-end with retaining ring				
Bearing seals	D-end	V-ring				
	N-end	V-ring				
Lubrication		Permanently lubricated shielded bearings				
Measuring nipples for condition monitoring of the bearings		Not Included				
Rating plate	Material	Stainless steel				
Terminal box	Material	Steel				
	Corrosion class	C3 medium				
	Cover screws	Zinc-electroplated steel				
Connections	Threaded openings	2xM16, 1xM16	2xM25, 1xM16		2xM32, 1xM16	
	Max Cu-area mm	4	6		10	
	Terminals	6 terminals for connection with cable lugs (not included)				
	Cable glands	Glands as option				
	Material	Glass-fiber reinforced polypropylene				
Fan cover	Material	Steel				
Stator winding	Material	Copper				
	Insulation	Insulation class F. Temperature rise class B unless otherwise stated.				
	Winding protection	3 PTC thermistors, 150°C				
Rotor winding	Material	Pressure die-cast aluminum				
Balancing method		Half key balancing as standard				
Key ways		Open key way				
Drain holes		Drain holes with closable plastic plugs, open on delivery				
Enclosure		IP 55 Higher protection on request				
Cooling method		IC 411				
Lifting lugs		Integrated cast iron lifting lugs				

## Motors in brief

### IE3/IE2 General performance cast iron motors, sizes 132 - 250

Motor size	M2BAX	132	160	180	200	225	250
Stator and end shields	Material	Cast iron					
	Paint color shade	Munsell blue 8B 4.5/3.25					
	Corrosion class	C3 (medium)					
Feet	Material	Integrated cast iron feet					
Bearings	D-end	6208-2Z/C3	6209-2Z/C3	6210-2Z/C3	6212/C3	6213-2Z/C3	6215-2Z/C3
	N-end	6208-2Z/C3	6209-2Z/C3	6209-2Z/C3	6209-2Z/C3	6210-2Z/C3	6212-2Z/C3
Axially locked bearings		Locked at D-end with retaining ring	Locked at D-end with inner bearing cover				
Bearing seals	D-end	V-ring					
	N-end	V-ring					
Lubrication		Permanently lubricated shielded bearings					
Measuring nipples for condition monitoring of the bearings		Not included					
Rating plate	Material	Stainless steel					
Terminal box	Material	Steel					
	Corrosion class	C3 (medium)					
	Cover screws	Zinc-electroplated steel					
Connections	Threaded openings	2xM32	2xM40, 1xM16		2xM63, 1xM16		
	Terminals	6 terminals for connection with cable lugs (not included)					
	Cable glands	Glands as option		Cable flange included, glands as option			
Fan	Material	Glass-fiber reinforced polypropylene					
Fan cover	Material	Steel					
	Paint color shade	Munsell blue 8B 4.5/3.25					
	Corrosion class	C3 (medium)					
Stator winding	Material	Copper					
	Insulation	Insulation class F. Temperature rise class B unless otherwise stated.					
	Winding protection	3 PTC thermistors, 150 °C					
Rotor winding	Material	Pressure die-cast aluminum					
Balancing method		Half-key balancing as standard					
Key ways		Open key way					
Drain holes		Drain holes with closable plastic plugs, open on delivery					
Enclosure		IP 55 Higher protection on request					
Cooling method		IC 411					
Lifting lugs		Integrated cast iron lifting lug					

## Motors in brief

### IE3/IE2 General performance cast iron motors, sizes 280 - 355

Motor size	M2BAX	280	315	355
Stator and end shields	Material	Cast iron		
	Paint color shade	Munsell blue 8B 4.5/3.25		
	Corrosion class	C3 medium		
Feet		Integrated cast iron		
Bearings	D-end 2-pole	6217/C3	6217/C3	6219/C3
	D-end 4-6 -pole	6217/C3	6219/C3	6222/C3
	N-end 2-pole	6217/C3	6217/C3	6219/C3
	N-end 4-6 -pole	6217/C3	6217/C3	6219/C3
Axially locked bearings		Locked at D-end with inner bearing cover		
Bearing seals	D-end	V-ring		
	N-end	V-ring		
Lubrication		Regreaseable bearings, regreasing nipples M6x1		
Measuring nipples for condition monitoring of the bearings		Not included		
Rating plate	Material	Stainless steel		
Terminal box	Material frame	Cast iron		
	Cover	Cast iron terminal box cover		
	Corrosion class	C3 medium		
	Screws	Zinc-electroplated steel		
Connections	Threaded openings	2xM63, 2 x M20	2xM63, 2 x M20	2xM75, 2 x M20
	Terminals	6 terminals for connection with cable lugs (not included)		
	Cable glands	Cable glands as option		
Fan	Material	Glass-fiber reinforced polypropylene / 2-pole metal.		
Fan cover	Material	Steel fan cover		
	Paint color shade	Black / Munsell blue 8B 4.5/3.25		
	Corrosion class	C3 medium		
Stator winding	Material	Copper		
	Insulation	Insulation class F. Temperature rise class B unless otherwise stated.		
	Winding protection	3 PTC thermistors, 150 °C		
Rotor winding	Material	Pressure diecast aluminum		
Balancing method		Half key balancing as standard		
Keyway		Open key way		
Heating elements	On request	60 W	2x60 W	2x60 W
Enclosure		IP 55 Higher protection on request		
Cooling method		IC 411		
Drain holes		Drain holes with closable plastic plugs, open on delivery		
Lifting lugs		Bolted lifting lugs		



# IE2 General performance cast iron motors

## Sizes 71 to 355, 0.18 to 355 kW

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