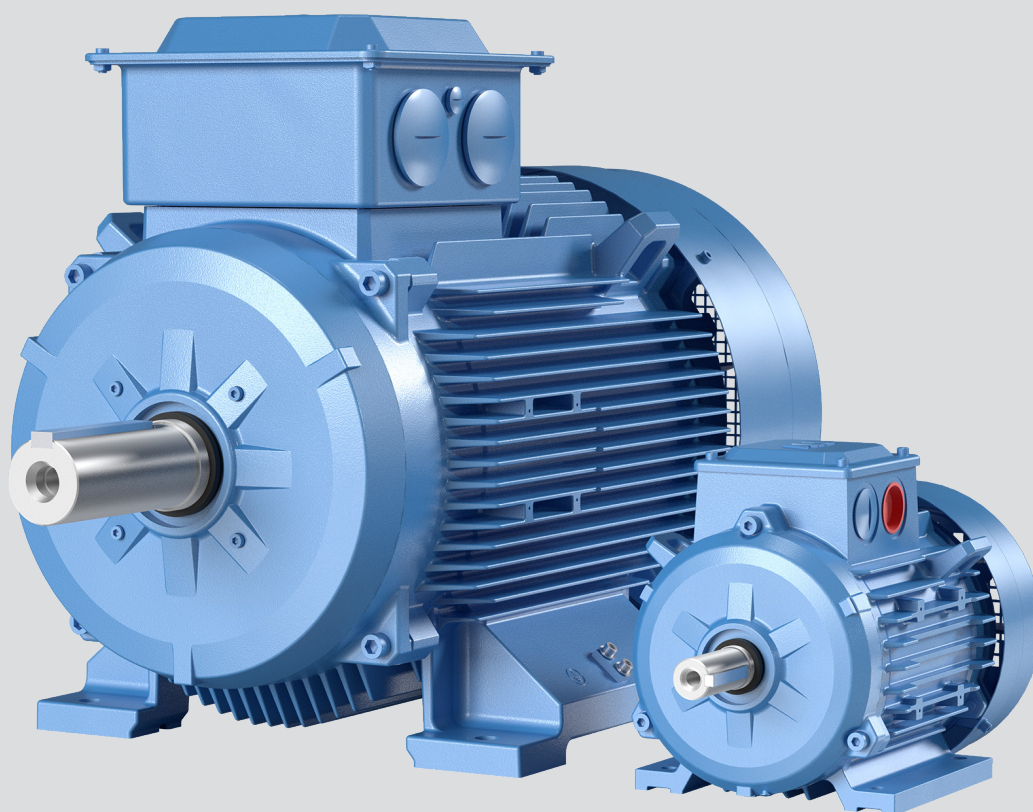


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CATALOG | AUGUST 2019

## Low voltage

General performance cast iron motors  
for Asian markets



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

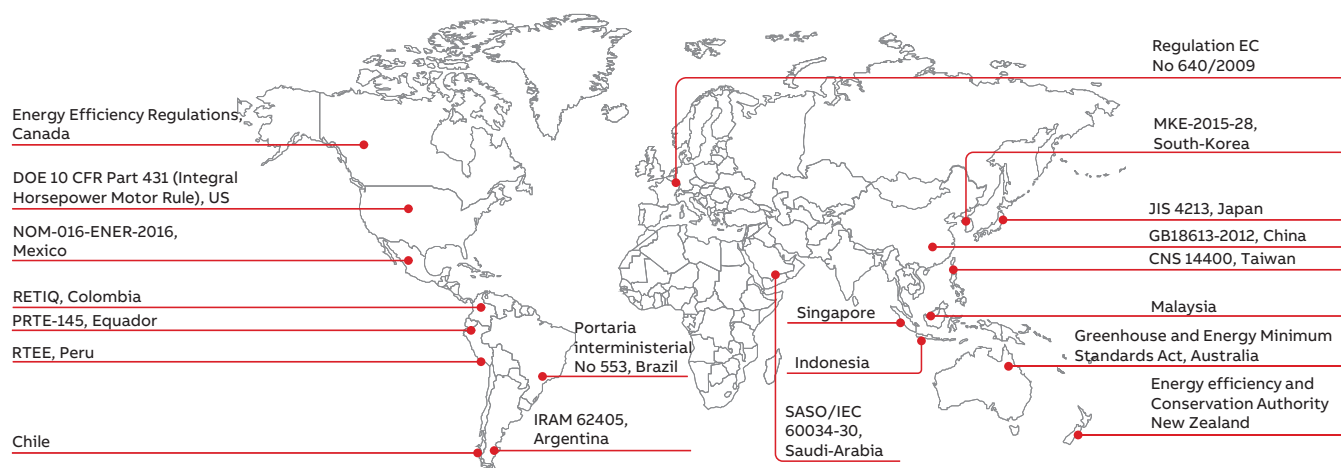
# Low voltage General performance cast iron motors

Sizes 71 to 355, 0.18 to 355 kW

|           |                                        |
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# International motor efficiency standards and regulations



Since the validation of IEC 60034-30:2008 and its refined version IEC 60034-30-1:2014, a worldwide energy efficiency classification system has existed for low voltage three-phase asynchronous motors. These international standards have been created to enable and increase the level of harmonization in efficiency regulations around the world and to also cover motors for explosive atmospheres.

IEC 60034-30-1:2014 defines International Efficiency (IE) classes for single speed, three-phase, 50 Hz and 60 Hz induction motors. The efficiency levels defined in IEC 60034-30-1 are based on the test method specified in IEC 60034-2-1:2014. Both standards are part of an effort to unify motor testing procedures with CSA390-10 and IEEE 112 standards as well as efficiency and product labeling (IE) requirements to enable motor purchasers worldwide to easily recognize premium efficiency products.

To promote transparency in the market, IEC 60034-30-1 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 different methods can produce differing results.

## Minimum energy performance standards

While the IEC as an international standardization organization sets guidelines for motor testing and efficiency classes, the organization does not regulate efficiency levels in countries. The biggest drivers for mandatory Minimum Energy Performance Standard (MEPS) levels for electric motors are global climate change, government targets to curb 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, to save energy and reduce the carbon footprint.

Harmonized global standards and the increasing adoption of MEPS around the world are good news for all of us. However, it is important to remember that harmonization is an ongoing process. Even though MEPS are already in effect in several regions and countries, they are evolving and differ in terms of scope and requirements. At the same time, more countries are planning to adopt their own MEPS regulations. A view of existing and coming MEPS regulations in the world can be seen on the World map above.

To get the latest information please visit [www.abb.com/motors&generators/energyefficiency](http://www.abb.com/motors&generators/energyefficiency).



### IEC 60034-30-1:2014

This standard 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 the table in 10CFR431 ('NEMA Premium') in the USA and CSA C390-10:2015 for 60 Hz
- IE2 = High efficiency
- IE1 = Standard efficiency

IEC 60034-30-1 covers the power range from 0.12 kW up to 1000 kW. Most of the different technical constructions of electric motors are covered as long as they are rated for direct on-line operation. The coverage of the standard includes:

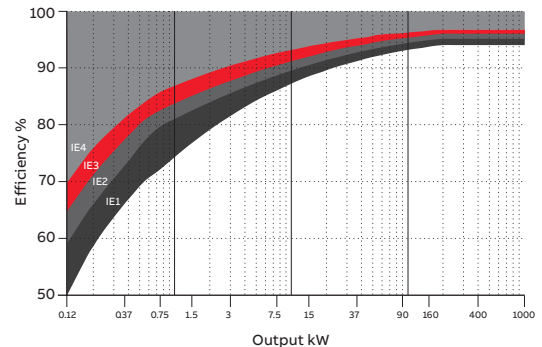
- Single speed electric motors (single and three-phase), 50 and 60 Hz
- 2, 4, 6 and 8 poles
- Rated output  $P_N$  from 0.12 kW to 1000 kW
- Rated voltage  $U_N$  above 50 V up to 1 kV
- Motors capable of continuous operation at their rated power with a temperature rise within the specified insulation 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

By comparing IEC 60034-30-1 to CSA C390-10:2015 and "10CFR431 Subpart B – Electric motors", it can be seen that the efficiency limits and tables are well aligned and their major difference is in the scope of the output power where CSA and 10CFR431 have a maximum power of 500 hp. There are also some minor differences in the scope of excluded motors.

Note: CFR is Code of Federal Regulations.

The following motors are excluded from IEC 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 the machine
- Brake motors, when the brake cannot be dismantled or separately fed



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### ABB and efficiency standards

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

It is good to mention and emphasize that the IEC 60034-2-1 test method, which is known as an indirect method, is technically equivalent to the test methods in the standards CSA 390-10 and IEEE 112 Method B leading to the equivalent losses and thus efficiency values. Both test methods can be used by ABB and shall be used for both Canada and the US where IEC 60034-2-1 is not recognized yet.

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 a full range of IE2 and IE3 motors - with many available from stock. We also supply IE4 motors for additional energy savings.

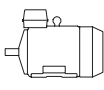
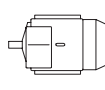
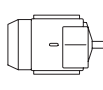
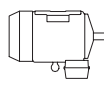
**Nominal efficiency limits defined in IEC  
60034-30-1:2014 (reference values at 50 Hz,  
based on test methods specified in IEC 60034-  
2-1:2014).**

| kW       | IE1<br>Standard efficiency |        |        |        | IE2<br>High efficiency |        |        |        | IE3<br>Premium efficiency |        |        |        | IE4<br>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   | 96.5   | 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   | 96.6   | 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   | 96.6   | 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   | 96.6   | 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   | 96.6   | 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   | 96.6   | 95.4   |

# Mounting arrangements

## Foot-mounted motor

### Code I / code II

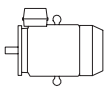
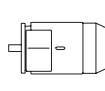
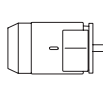
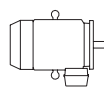
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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| IM B3                                                                             | IM V5                                                                             | IM V6                                                                             | IM B6                                                                             | IM B7                                                                             | IM B8                                                                              |
| IM 1001                                                                           | IM 1011                                                                           | IM 1031                                                                           | IM 1051                                                                           | IM 1061                                                                           | IM 1071                                                                            |

### Product code pos. 12

A: foot-mounted, term. box top  
R: foot-mounted, term. box RHS  
L: foot-mounted, term. box LHS

## Flange-mounted motor, large flange

### Code I / code II

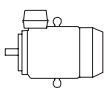
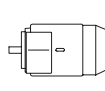
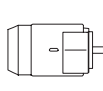
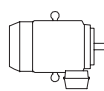
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|  |  |  |  |  |  |
| IM B5                                                                             | IM V1                                                                             | IM V3                                                                             | *)                                                                                | *)                                                                                | *)                                                                                 |
| IM 3001                                                                           | IM 3011                                                                           | IM 3031                                                                           | IM 3051                                                                           | IM 3061                                                                           | IM 3071                                                                            |

### Product code pos. 12

B: flange mounted, large flange

## Flange-mounted motor, small flange

### Code I / code II

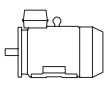
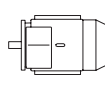
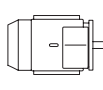
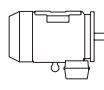
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|  |  |  |  |  |  |
| IM B14                                                                              | IM V18                                                                              | IM V19                                                                              | *)                                                                                  | *)                                                                                  | *)                                                                                   |
| IM 3601                                                                             | IM 3611                                                                             | IM 3631                                                                             | IM 3651                                                                             | IM 3661                                                                             | IM 3671                                                                              |

### Product code pos. 12

C: flange mounted, small flange

## Foot- and flange-mounted motor with feet, large flange

### Code I / code II

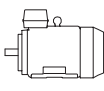
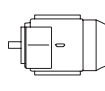
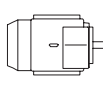
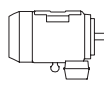
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|  |  |  |  |  |  |
| IM B35                                                                              | IM V15                                                                              | IM V35                                                                              | *)                                                                                  | *)                                                                                  | *)                                                                                   |
| IM 2001                                                                             | IM 2011                                                                             | IM 2031                                                                             | IM 2051                                                                             | IM 2061                                                                             | IM 2071                                                                              |

### Product code pos. 12

H: foot/flange-mounted, term. box top  
S: foot/flange-mounted, term. box RHS  
T: foot/flange-mounted, term. box LHS

## Foot- and flange-mounted motor with feet, small flange

### Code I / code II

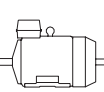
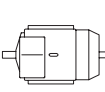
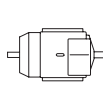
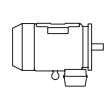
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|  |  |  |  |  |  |
| IM B34                                                                              | IM V17                                                                              | IM 2131                                                                             | IM 2151                                                                             | IM 2161                                                                             | IM 2171                                                                              |

### Product code pos. 12

J: foot/flange-mounted, small flange

## Foot-mounted motor, shaft with free extensions

### Code I / code II

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| IM 1002                                                                             | IM 1012                                                                             | IM 1032                                                                             | IM 1052                                                                             | IM 1062                                                                             | IM 1072                                                                              |

### Product code pos. 12

\*) 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 |
|-----------------------|---------------------|-----------------|---------------------------------------|-------------------|-----------------------------------------|
| <b>IC</b>             | <b>4</b>            | <b>(A)</b>      | <b>1</b>                              | <b>(A)</b>        | <b>6</b>                                |
|                       | 1                   | 2               | 3                                     | 4                 | 5                                       |

#### Position 1

|    |                                 |
|----|---------------------------------|
| 0: | Free circulation (open circuit) |
| 4: | Free circulatio (open circuit)  |

#### Position 2

|    |                                               |
|----|-----------------------------------------------|
| A: | For air (omitted for simplifi ed designation) |
|----|-----------------------------------------------|

#### Position 3

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

#### Position 4

|    |                                               |
|----|-----------------------------------------------|
| A: | For air (omitted for simplifi ed 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 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                                  |

# Insulation

—  
01 Safety margins per  
thermal class.

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. For instance, a 10 K temperature reduction will extend the insulation life.

## Thermal class 130 (B)

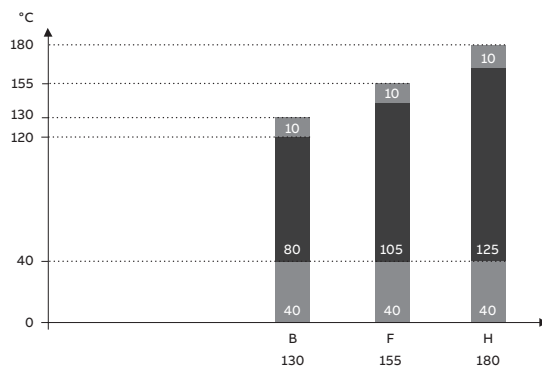
- Nominal ambient temperature 40 °C
- Max permissible temperature rise 80 K
- Hot spot temperature margin 10 K

## 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



—  
01

# General information

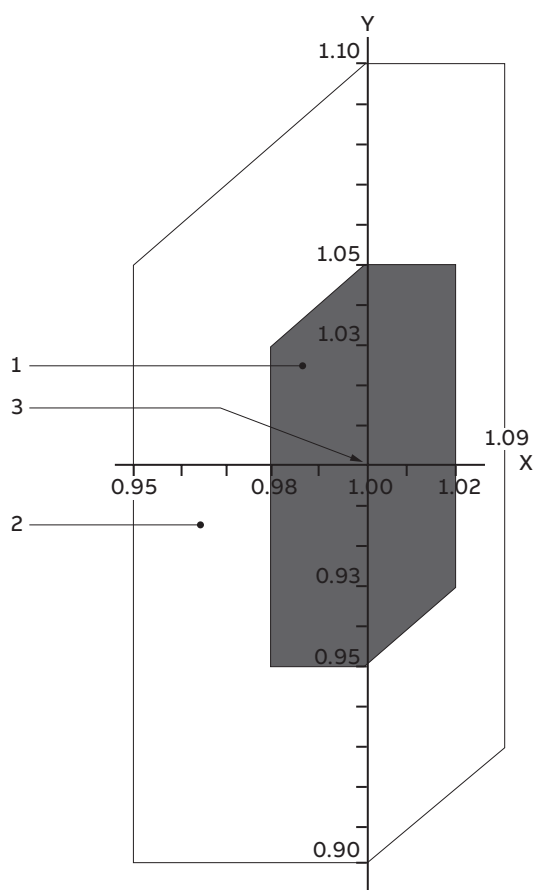
## Voltage and frequency

01 Voltage and frequency deviation in zones A and B.

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  $\pm 5\%$  and frequency deviation of  $\pm 2\%$ . Zone B is the combination of voltage deviation of  $\pm 10\%$  and frequency deviation of  $\pm 3\%$ . 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.

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



01

# Ordering information

## Explanation of the product code

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

### Positions 1 to 4

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

### Positions 5 and 6

IEC size

|     |     |
|-----|-----|
| 07: | 71  |
| 08: | 80  |
| 09: | 90  |
| 10: | 100 |
| 11: | 112 |
| 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)

Voltage and frequency

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

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

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

01 Rating plate for IE1  
General performance cast  
iron M2BAX motor.

02 Rating plate for IE2  
General performance cast  
iron M2BAX motor.

03 Rating plate for IE3  
General performance cast  
iron M2BAX motor.

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, 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.

|                                                                                                                  |    |                |       |             |       |       |  |
|------------------------------------------------------------------------------------------------------------------|----|----------------|-------|-------------|-------|-------|--|
|                                 |    |                |       |             |       |       |  |
| IE1 IEC 60034-1                                                                                                  |    |                |       |             |       |       |  |
| 3 ~ Motor                                                                                                        |    | M2BAX 160MLA 2 |       | IMB3/IM1001 |       | 2019  |  |
|                                 |    |                |       |             |       |       |  |
| No.                                                                                                              |    |                |       | Ins.cl. F   |       | IP 55 |  |
| V                                                                                                                | Hz | kW             | r/min | A           | cos φ | Duty  |  |
| 690 Y                                                                                                            | 50 | 11             | 2931  | 12.0        | 0.86  | S1    |  |
| 400 △                                                                                                            | 50 | 11             | 2931  | 20.7        | 0.86  | S1    |  |
| 660 Y                                                                                                            | 50 | 11             | 2919  | 12.3        | 0.88  | S1    |  |
| 380 △                                                                                                            | 50 | 11             | 2919  | 21.3        | 0.88  | S1    |  |
| 440 △                                                                                                            | 60 | 11             | 3529  | 17.9        | 0.90  | S1    |  |
| 460 △                                                                                                            | 60 | 11             | 3535  | 18.2        | 0.85  | S1    |  |
| 50Hz: IE1-87.6(100%)-87.6(75%)-86.4(50%)                                                                         |    |                |       |             |       |       |  |
| 60Hz: IE1-87.5(100%)                                                                                             |    |                |       |             |       |       |  |
| Prod. code 3GBA161410-ADT                                                                                        |    |                |       |             |       |       |  |
| 6209-2Z/C3  6209-2Z/C3 103 kg |    |                |       |             |       |       |  |

01

|                                                                                     |    |                                                                                     |            |             |       |        |  |
|-------------------------------------------------------------------------------------|----|-------------------------------------------------------------------------------------|------------|-------------|-------|--------|--|
|  |    |                                                                                     |            |             |       |        |  |
| CE IE2 IEC 60034-1                                                                  |    |                                                                                     |            |             |       |        |  |
| 3 ~ Motor                                                                           |    | M2BAX 160MLA 4                                                                      |            | IMB3/IM1001 |       | 2019   |  |
|                                                                                     |    |                                                                                     |            |             |       |        |  |
| No.                                                                                 |    | Ins.cl. F                                                                           |            |             |       | IP 55  |  |
| V                                                                                   | Hz | kW                                                                                  | r/min      | A           | cos φ | Duty   |  |
| 690 Y                                                                               | 50 | 11                                                                                  | 1466       | 13.2        | 0.78  | S1     |  |
| 400 △                                                                               | 50 | 11                                                                                  | 1466       | 22.8        | 0.78  | S1     |  |
| 660 Y                                                                               | 50 | 11                                                                                  | 1461       | 13.4        | 0.81  | S1     |  |
| 380 △                                                                               | 50 | 11                                                                                  | 1461       | 23.2        | 0.81  | S1     |  |
| 440 △                                                                               | 60 | 11                                                                                  | 1765       | 20.3        | 0.79  | S1     |  |
| 460 △                                                                               | 60 | 11                                                                                  | 1768       | 20.1        | 0.77  | S1     |  |
| 50Hz: IE2-89.8(100%)-89.9(75%)-89.2(50%)                                            |    |                                                                                     |            |             |       |        |  |
| 60Hz: IE2-91(100%)                                                                  |    |                                                                                     |            |             |       |        |  |
|                                                                                     |    |                                                                                     |            |             |       |        |  |
| Prod. code                                                                          |    | 3GBA162410-ADC                                                                      |            |             |       |        |  |
|                                                                                     |    |                                                                                     |            |             |       |        |  |
| 6209-2Z/C3                                                                          |    |  | 6209-2Z/C3 |             |       | 110 kg |  |

02

|                                                                                     |    |                                                                                                  |       |      |       |        |  |
|-------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------------------------|-------|------|-------|--------|--|
|  |    |                                                                                                  |       |      |       |        |  |
| CE IE3 IEC 60034-1                                                                  |    |                                                                                                  |       |      |       |        |  |
| 3 ~ Motor IE3 M2BAX 160MLA 4 IMB3/IM1001 2019                                       |    |                                                                                                  |       |      |       |        |  |
|                                                                                     |    |                                                                                                  |       |      |       |        |  |
| No.                                                                                 |    | Ins.cl. F                                                                                        |       |      |       | IP 55  |  |
| V                                                                                   | Hz | kW                                                                                               | r/min | A    | cos φ | Duty   |  |
| 690 Y                                                                               | 50 | 11                                                                                               | 1477  | 12.3 | 0.82  | S1     |  |
| 400 Δ                                                                               | 50 | 11                                                                                               | 1477  | 21.2 | 0.82  | S1     |  |
| 660 Y                                                                               | 50 | 11                                                                                               | 1474  | 12.7 | 0.83  | S1     |  |
| 380 Δ                                                                               | 50 | 11                                                                                               | 1474  | 22.0 | 0.83  | S1     |  |
| 440 Δ                                                                               | 60 | 11                                                                                               | 1778  | 18.8 | 0.83  | S1     |  |
| 460 Δ                                                                               | 60 | 11                                                                                               | 1777  | 18.2 | 0.82  | S1     |  |
| 50Hz: IE3-91.4(100%)-91.8(75%)-91.1(50%)                                            |    |                                                                                                  |       |      |       |        |  |
| 60Hz: IE3-92.4(100%)                                                                |    |                                                                                                  |       |      |       |        |  |
|                                                                                     |    |                                                                                                  |       |      |       |        |  |
| Prod. code                                                                          |    | 3GBA162410-ADF                                                                                   |       |      |       |        |  |
|                                                                                     |    |                                                                                                  |       |      |       |        |  |
| 6209-2Z/C3                                                                          |    |  6209-2Z/C3 |       |      |       | 139 kg |  |

03

# Technical data

## IE1 General performance cast iron motors

IP 55 - IC 411 - Insulation class F, temperature rise class B  
IE1 efficiency class according to IEC 60034-30-1; 2014

| Output<br>kW         | Motor type     | Product code   | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>PA</sub><br>dB |                                |
|----------------------|----------------|----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 3000 r/min = 2 poles |                |                |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,37                 | M2BAX 71MA 2   | 3GBA071310---T | 2797           | 63,9                               | 61,4               | 55,9               | 0,78                    | 0,91                | 5,3                            | 1,24                 | 2,9                            | 3,6                                        | 0,00033      | 9                                                | 56                             |
| 0,55                 | M2BAX 71MB 2   | 3GBA071320---T | 2811           | 69,0                               | 67,5               | 63,5               | 0,79                    | 1,3                 | 5,4                            | 1,85                 | 3,0                            | 3,5                                        | 0,00041      | 10                                               | 58                             |
| 0,75                 | M2BAX 80MA 2   | 3GBA081310---T | 2843           | 72,1                               | 70,8               | 67,6               | 0,81                    | 1,71                | 6,2                            | 2,51                 | 2,9                            | 4,3                                        | 0,00067      | 14                                               | 63                             |
| 1,1                  | M2BAX 80MB 2   | 3GBA081320---T | 2840           | 75,0                               | 74,9               | 72,7               | 0,83                    | 2,44                | 6,0                            | 3,67                 | 3,1                            | 3,8                                        | 0,0009       | 15                                               | 62                             |
| 1,5                  | M2BAX 90SA 2   | 3GBA091110---T | 2887           | 77,2                               | 75,4               | 72,0               | 0,79                    | 3,37                | 7,0                            | 4,93                 | 3,0                            | 3,9                                        | 0,0021       | 21                                               | 66                             |
| 2,2                  | M2BAX 90LA 2   | 3GBA091510---T | 2894           | 79,7                               | 79,5               | 77,6               | 0,84                    | 4,48                | 7,7                            | 7,25                 | 3,1                            | 3,8                                        | 0,0027       | 24                                               | 67                             |
| 3                    | M2BAX 100LA 2  | 3GBA101510---T | 2919           | 81,5                               | 80,3               | 77,5               | 0,84                    | 6,12                | 8,7                            | 9,81                 | 4,1                            | 5,0                                        | 0,0048       | 32                                               | 74                             |
| 4                    | M2BAX 112MA 2  | 3GBA111310---T | 2916           | 83,1                               | 82,4               | 79,8               | 0,86                    | 7,89                | 9,1                            | 13,08                | 4,1                            | 4,7                                        | 0,00561      | 36                                               | 74                             |
| 5,5                  | M2BAX 132SA 2  | 3GBA131110---T | 2921           | 84,7                               | 83,4               | 80,7               | 0,85                    | 10,8                | 8,3                            | 18,02                | 2,6                            | 4,3                                        | 0,0117       | 56                                               | 74                             |
| 7,5                  | M2BAX 132SB 2  | 3GBA131120---T | 2916           | 86,0                               | 85,3               | 83,3               | 0,84                    | 14,5                | 8,7                            | 24,57                | 3,1                            | 4,5                                        | 0,0132       | 60                                               | 72                             |
| 11                   | M2BAX 160MLA 2 | 3GBA161410---T | 2931           | 87,6                               | 87,6               | 86,3               | 0,86                    | 20,7                | 6,6                            | 35,87                | 2,5                            | 3,5                                        | 0,041        | 103                                              | 72                             |
| 15                   | M2BAX 160MLB 2 | 3GBA161420---T | 2938           | 88,7                               | 89,0               | 88,1               | 0,88                    | 27                  | 7,6                            | 48,9                 | 3,1                            | 3,5                                        | 0,0538       | 116                                              | 72                             |
| 18,5                 | M2BAX 160MLC 2 | 3GBA161430---T | 2939           | 89,3                               | 89,5               | 88,6               | 0,87                    | 33,4                | 7,9                            | 60,13                | 3,1                            | 3,8                                        | 0,06         | 124                                              | 73                             |
| 22                   | M2BAX 180MLA 2 | 3GBA181410---T | 2943           | 89,9                               | 90,3               | 89,6               | 0,87                    | 39,5                | 8,6                            | 71,4                 | 3,7                            | 3,9                                        | 0,0735       | 151                                              | 72                             |
| 30                   | M2BAX 200MLA 2 | 3GBA201410---T | 2957           | 90,7                               | 90,1               | 88,5               | 0,85                    | 55,8                | 8,6                            | 97,1                 | 4,0                            | 4,2                                        | 0,11         | 198                                              | 81                             |
| 37                   | M2BAX 200MLB 2 | 3GBA201420---T | 2951           | 91,2                               | 91,2               | 90,8               | 0,90                    | 64,2                | 7,9                            | 120                  | 3,6                            | 3,7                                        | 0,141        | 229                                              | 80                             |
| 45                   | M2BAX 225SMA 2 | 3GBA221210---T | 2962           | 91,7                               | 91,6               | 90,7               | 0,86                    | 80,6                | 8,8                            | 145                  | 3,8                            | 3,8                                        | 0,226        | 275                                              | 82                             |
| 55                   | M2BAX 250SMA 2 | 3GBA251210---T | 2965           | 92,1                               | 92,0               | 91,2               | 0,87                    | 96,4                | 7,4                            | 177                  | 3,4                            | 3,0                                        | 0,344        | 335                                              | 78                             |
| 75                   | M2BAX 280SMD 2 | 3GBA281240---T | 2971           | 92,7                               | 93,0               | 92,8               | 0,89                    | 129                 | 7,7                            | 241                  | 2,7                            | 3,3                                        | 0,6          | 527                                              | 78                             |
| 90                   | M2BAX 280SME 2 | 3GBA281250---T | 2970           | 93,0                               | 93,2               | 93,1               | 0,91                    | 152                 | 8,0                            | 289                  | 3,1                            | 3,3                                        | 0,7          | 576                                              | 76                             |
| 110                  | M2BAX 315SMA 2 | 3GBA311210---T | 2981           | 93,3                               | 92,8               | 91,2               | 0,84                    | 199                 | 7,7                            | 352                  | 2,1                            | 3,2                                        | 1,2          | 750                                              | 78                             |
| 132                  | M2BAX 315SMB 2 | 3GBA311220---T | 2978           | 93,5                               | 93,1               | 91,9               | 0,86                    | 233                 | 7,8                            | 423                  | 2,4                            | 3,9                                        | 1,4          | 810                                              | 78                             |
| 160                  | M2BAX 315SMC 2 | 3GBA311230---T | 2981           | 93,8                               | 93,7               | 92,7               | 0,88                    | 274                 | 7,5                            | 513                  | 2,2                            | 3,7                                        | 1,7          | 900                                              | 78                             |
| 200                  | M2BAX 315MLA 2 | 3GBA311410---T | 2979           | 94,0                               | 93,9               | 92,8               | 0,89                    | 341                 | 7,2                            | 641                  | 2,4                            | 3,6                                        | 2,1          | 1020                                             | 83                             |
| 250                  | M2BAX 355SMA 2 | 3GBA351210---T | 2983           | 94,0                               | 93,8               | 92,6               | 0,89                    | 428                 | 6,7                            | 800                  | 1,5                            | 2,8                                        | 2,7          | 1310                                             | 83                             |
| 315                  | M2BAX 355SMB 2 | 3GBA351220---T | 2980           | 94,0                               | 94,0               | 93,1               | 0,89                    | 537                 | 7,2                            | 1009                 | 1,9                            | 2,8                                        | 3,4          | 1450                                             | 83                             |
| 355                  | M2BAX 355SMC 2 | 3GBA351230---T | 2983           | 94,0                               | 94,0               | 93,2               | 0,88                    | 609                 | 7,4                            | 1136                 | 2,1                            | 2,7                                        | 3,6          | 1520                                             | 83                             |

# Technical data

## IE1 General performance cast iron motors

IP 55 - IC 411 - Insulation class F, temperature rise class B

IE1 efficiency class according to IEC 60034-30-1; 2014

| Output<br>kW         | Motor type     | Product code   | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>PA</sub><br>dB |                                |
|----------------------|----------------|----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 1500 r/min = 4 poles |                |                |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,25                 | M2BAX 71MA 4   | 3GBA072310---T | 1425           | 61,5                               | 57,1               | 49,0               | 0,69                    | 0,75                | 4,7                            | 1,69                 | 2,1                            | 3,0                                        | 0,00059      | 9                                                | 49                             |
| 0,37                 | M2BAX 71MB 4   | 3GBA072320---T | 1418           | 66,0                               | 63,2               | 56,4               | 0,69                    | 1,08                | 5,0                            | 2,5                  | 2,5                            | 3,0                                        | 0,00076      | 10                                               | 46                             |
| 0,55                 | M2BAX 80MA 4   | 3GBA082310---T | 1441           | 70,0                               | 67,8               | 62,5               | 0,73                    | 1,41                | 6,4                            | 3,66                 | 2,8                            | 3,4                                        | 0,00205      | 15                                               | 54                             |
| 0,75                 | M2BAX 80MB 4   | 3GBA082320---T | 1446           | 72,1                               | 71,1               | 65,7               | 0,69                    | 1,99                | 6,6                            | 4,97                 | 3,7                            | 3,9                                        | 0,00247      | 18                                               | 53                             |
| 1,1                  | M2BAX 90SA 4   | 3GBA092110---T | 1447           | 75,0                               | 72,6               | 67,2               | 0,71                    | 2,74                | 6,6                            | 7,35                 | 3,9                            | 4,3                                        | 0,0037       | 22                                               | 51                             |
| 1,5                  | M2BAX 90LA 4   | 3GBA092510---T | 1444           | 77,2                               | 77,6               | 75,3               | 0,73                    | 3,6                 | 6,8                            | 10                   | 3,7                            | 4,2                                        | 0,0046       | 24                                               | 55                             |
| 2,2                  | M2BAX 100LA 4  | 3GBA102510---T | 1445           | 79,7                               | 79,0               | 76,1               | 0,77                    | 4,93                | 7,3                            | 14,54                | 3,2                            | 3,9                                        | 0,00759      | 31                                               | 55                             |
| 3                    | M2BAX 100LB 4  | 3GBA102520---T | 1443           | 81,5                               | 81,0               | 78,7               | 0,77                    | 6,61                | 7,6                            | 19,8                 | 3,8                            | 4,3                                        | 0,00939      | 35                                               | 58                             |
| 4                    | M2BAX 112MA 4  | 3GBA112310---T | 1442           | 83,1                               | 82,6               | 80,6               | 0,78                    | 8,62                | 7,5                            | 26,5                 | 4,0                            | 4,3                                        | 0,012        | 41                                               | 56                             |
| 5,5                  | M2BAX 132SA 4  | 3GBA132110---T | 1457           | 84,7                               | 84,4               | 82,8               | 0,77                    | 11,7                | 6,9                            | 36                   | 2,5                            | 3,4                                        | 0,0257       | 59                                               | 65                             |
| 7,5                  | M2BAX 132MA 4  | 3GBA132310---T | 1457           | 86,0                               | 85,9               | 84,4               | 0,77                    | 16                  | 7,2                            | 49,1                 | 2,6                            | 3,6                                        | 0,032        | 70                                               | 67                             |
| 11                   | M2BAX 160MLA 4 | 3GBA162410---T | 1466           | 87,6                               | 87,7               | 86,8               | 0,78                    | 22,8                | 7,0                            | 71,51                | 3,3                            | 3,2                                        | 0,078        | 111                                              | 66                             |
| 15                   | M2BAX 160MLB 4 | 3GBA162420---T | 1468           | 88,7                               | 89,4               | 88,6               | 0,81                    | 29,5                | 8,0                            | 97,71                | 3,2                            | 3,7                                        | 0,1          | 126                                              | 66                             |
| 18,5                 | M2BAX 180MLA 4 | 3GBA182410---T | 1470           | 89,3                               | 89,6               | 88,6               | 0,79                    | 36,9                | 8,5                            | 120                  | 3,7                            | 4,2                                        | 0,12         | 156                                              | 65                             |
| 22                   | M2BAX 180MLB 4 | 3GBA182420---T | 1472           | 89,9                               | 89,6               | 88,2               | 0,77                    | 45                  | 9,2                            | 143                  | 4,1                            | 4,6                                        | 0,139        | 169                                              | 66                             |
| 30                   | M2BAX 200MLA 4 | 3GBA202410---T | 1476           | 90,7                               | 90,9               | 90,4               | 0,81                    | 58,4                | 6,8                            | 194                  | 3,0                            | 3,2                                        | 0,236        | 222                                              | 68                             |
| 37                   | M2BAX 225SMA 4 | 3GBA222210---T | 1479           | 91,2                               | 91,2               | 90,7               | 0,82                    | 70,6                | 7,4                            | 239                  | 3,1                            | 3,3                                        | 0,35         | 265                                              | 69                             |
| 45                   | M2BAX 225SMB 4 | 3GBA222220---T | 1481           | 91,7                               | 91,5               | 90,8               | 0,80                    | 87,2                | 7,9                            | 290                  | 3,4                            | 3,4                                        | 0,416        | 292                                              | 69                             |
| 55                   | M2BAX 250SMA 4 | 3GBA252210---T | 1480           | 92,1                               | 92,0               | 91,1               | 0,82                    | 104                 | 7,6                            | 356                  | 3,3                            | 3,3                                        | 0,533        | 340                                              | 77                             |
| 75                   | M2BAX 280SMD 4 | 3GBA282240---T | 1480           | 92,7                               | 92,7               | 92,4               | 0,83                    | 138                 | 8,4                            | 484                  | 3,3                            | 3,5                                        | 0,9          | 520                                              | 70                             |
| 90                   | M2BAX 280SME 4 | 3GBA282250---T | 1480           | 93,0                               | 93,2               | 92,8               | 0,86                    | 160                 | 7,8                            | 581                  | 3,3                            | 3,4                                        | 1,1          | 583                                              | 70                             |
| 110                  | M2BAX 315SMA 4 | 3GBA312210---T | 1488           | 93,3                               | 93,2               | 92,2               | 0,85                    | 197                 | 6,9                            | 706                  | 2,3                            | 2,9                                        | 2,3          | 775                                              | 78                             |
| 132                  | M2BAX 315SMB 4 | 3GBA312220---T | 1487           | 93,5                               | 93,5               | 92,6               | 0,86                    | 236                 | 6,9                            | 847                  | 2,3                            | 2,7                                        | 2,6          | 830                                              | 78                             |
| 160                  | M2BAX 315SMC 4 | 3GBA312230---T | 1487           | 93,8                               | 94,0               | 93,1               | 0,85                    | 288                 | 7,2                            | 1027                 | 2,4                            | 2,9                                        | 2,9          | 870                                              | 78                             |
| 200                  | M2BAX 315MLA 4 | 3GBA312410---T | 1486           | 94,0                               | 94,1               | 93,5               | 0,86                    | 356                 | 7,0                            | 1285                 | 2,3                            | 2,8                                        | 3,5          | 995                                              | 78                             |
| 250                  | M2BAX 355SMA 4 | 3GBA352210---T | 1488           | 94,0                               | 94,0               | 93,0               | 0,85                    | 445                 | 6,7                            | 1604                 | 2,0                            | 2,6                                        | 5,4          | 1400                                             | 82                             |
| 315                  | M2BAX 355SMB 4 | 3GBA352220---T | 1488           | 94,0                               | 94,0               | 93,0               | 0,85                    | 560                 | 7,3                            | 2021                 | 2,2                            | 2,7                                        | 6,9          | 1570                                             | 82                             |
| 355                  | M2BAX 355SMC 4 | 3GBA352230---T | 1487           | 94,0                               | 94,3               | 93,6               | 0,86                    | 623                 | 6,8                            | 2279                 | 2,4                            | 2,7                                        | 7,2          | 1650                                             | 82                             |

# Technical data

## IE1 General performance cast iron motors

IP 55 - IC 411 - Insulation class F, temperature rise class B

IE1 efficiency class according to IEC 60034-30-1; 2014

| Output<br>kW         | Motor type     | Product code    | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>PA</sub><br>dB |                                |
|----------------------|----------------|-----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                 |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                 |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 1000 r/min = 6 poles |                |                 |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,18                 | M2BAX 71MA 6   | 3GBA073310-...T | 910            | 45,5                               | 39,9               | 30,2               | 0,71                    | 0,63                | 3,3                            | 1,87                 | 2,0                            | 2,4                                        | 0,00082      | 9                                                | 40                             |
| 0,25                 | M2BAX 71MB 6   | 3GBA073320-...T | 905            | 52,1                               | 48,7               | 40,5               | 0,70                    | 0,82                | 3,6                            | 2,64                 | 2,4                            | 2,6                                        | 0,00105      | 10                                               | 47                             |
| 0,37                 | M2BAX 80MA 6   | 3GBA083310-...T | 916            | 59,7                               | 57,4               | 50,7               | 0,71                    | 1,19                | 3,9                            | 3,85                 | 2,4                            | 2,8                                        | 0,00173      | 14                                               | 49                             |
| 0,55                 | M2BAX 80MB 6   | 3GBA083320-...T | 932            | 65,8                               | 63,3               | 57,4               | 0,65                    | 1,67                | 4,7                            | 5,61                 | 3,0                            | 3,1                                        | 0,00267      | 19                                               | 47                             |
| 0,75                 | M2BAX 90SA 6   | 3GBA093110-...T | 951            | 70,0                               | 66,8               | 60,4               | 0,60                    | 2,36                | 4,9                            | 7,6                  | 3,3                            | 3,7                                        | 0,0044       | 22                                               | 50                             |
| 1,1                  | M2BAX 90LA 6   | 3GBA093510-...T | 936            | 72,9                               | 71,0               | 66,5               | 0,65                    | 3,17                | 4,6                            | 11,06                | 3,0                            | 3,3                                        | 0,0051       | 25                                               | 48                             |
| 1,5                  | M2BAX 100LA 6  | 3GBA103510-...T | 957            | 75,2                               | 73,1               | 68,2               | 0,63                    | 4,36                | 5,7                            | 15                   | 2,6                            | 3,3                                        | 0,00795      | 31                                               | 56                             |
| 2,2                  | M2BAX 112MA 6  | 3GBA113310-...T | 956            | 77,7                               | 76,1               | 72,7               | 0,66                    | 5,92                | 5,5                            | 21,9                 | 2,8                            | 3,5                                        | 0,0116       | 40                                               | 54                             |
| 3                    | M2BAX 132SA 6  | 3GBA133110-...T | 966            | 79,7                               | 78,8               | 76,6               | 0,64                    | 8,09                | 5,5                            | 29,43                | 1,9                            | 3,0                                        | 0,0251       | 57                                               | 62                             |
| 4                    | M2BAX 132MA 6  | 3GBA133310-...T | 964            | 81,4                               | 81,1               | 79,2               | 0,69                    | 9,95                | 6,4                            | 39,76                | 2,7                            | 3,3                                        | 0,0294       | 65                                               | 59                             |
| 5,5                  | M2BAX 132MB 6  | 3GBA133320-...T | 964            | 83,1                               | 82,9               | 81,4               | 0,66                    | 14                  | 5,8                            | 54,2                 | 2,2                            | 2,9                                        | 0,0397       | 79                                               | 62                             |
| 7,5                  | M2BAX 160MLA 6 | 3GBA163410-...T | 974            | 84,7                               | 85,1               | 84,5               | 0,74                    | 16,4                | 6,6                            | 73,69                | 2,0                            | 3,2                                        | 0,0811       | 114                                              | 65                             |
| 11                   | M2BAX 160MLB 6 | 3GBA163420-...T | 971            | 86,4                               | 87,3               | 87,8               | 0,78                    | 22,9                | 6,6                            | 108                  | 1,3                            | 2,8                                        | 0,102        | 134                                              | 57                             |
| 15                   | M2BAX 180MLA 6 | 3GBA183410-...T | 971            | 87,7                               | 88,1               | 87,6               | 0,76                    | 32                  | 7,4                            | 147                  | 2,4                            | 3,9                                        | 0,136        | 169                                              | 62                             |
| 18,5                 | M2BAX 200MLA 6 | 3GBA203410-...T | 978            | 88,6                               | 88,9               | 88,1               | 0,76                    | 38,5                | 6,1                            | 181                  | 2,0                            | 2,9                                        | 0,204        | 205                                              | 61                             |
| 22                   | M2BAX 200MLB 6 | 3GBA203420-...T | 978            | 89,2                               | 89,4               | 88,7               | 0,76                    | 45,6                | 6,2                            | 215                  | 1,8                            | 2,9                                        | 0,227        | 219                                              | 62                             |
| 30                   | M2BAX 225SMA 6 | 3GBA223210-...T | 987            | 90,2                               | 90,0               | 88,8               | 0,78                    | 60,6                | 7,0                            | 290                  | 2,7                            | 3,2                                        | 0,579        | 284                                              | 64                             |
| 37                   | M2BAX 250SMA 6 | 3GBA253210-...T | 986            | 90,8                               | 91,1               | 90,5               | 0,80                    | 71,9                | 6,9                            | 359                  | 2,6                            | 2,9                                        | 0,783        | 337                                              | 66                             |
| 45                   | M2BAX 280SMD 6 | 3GBA283240-...T | 990            | 91,4                               | 91,6               | 91,0               | 0,80                    | 88,2                | 7,1                            | 434                  | 2,7                            | 3,1                                        | 1,3          | 498                                              | 62                             |
| 55                   | M2BAX 280SME 6 | 3GBA283250-...T | 989            | 91,9                               | 91,9               | 91,6               | 0,81                    | 105                 | 6,9                            | 531                  | 2,7                            | 2,9                                        | 1,5          | 523                                              | 66                             |
| 75                   | M2BAX 315SMA 6 | 3GBA313210-...T | 992            | 92,6                               | 92,6               | 91,4               | 0,81                    | 143                 | 7,0                            | 721                  | 2,1                            | 2,7                                        | 3,2          | 705                                              | 75                             |
| 90                   | M2BAX 315SMB 6 | 3GBA313220-...T | 992            | 92,9                               | 93,0               | 92,0               | 0,83                    | 165                 | 7,2                            | 866                  | 2,1                            | 2,7                                        | 4,1          | 800                                              | 75                             |
| 110                  | M2BAX 315SMC 6 | 3GBA313230-...T | 992            | 93,3                               | 93,4               | 92,7               | 0,83                    | 203                 | 7,0                            | 1058                 | 2,2                            | 2,7                                        | 4,9          | 870                                              | 75                             |
| 132                  | M2BAX 315MLA 6 | 3GBA313410-...T | 992            | 93,5                               | 93,7               | 92,9               | 0,83                    | 243                 | 7,2                            | 1270                 | 2,4                            | 2,7                                        | 5,8          | 980                                              | 75                             |
| 160                  | M2BAX 355SMA 6 | 3GBA353210-...T | 992            | 93,8                               | 93,9               | 93,2               | 0,83                    | 293                 | 6,2                            | 1540                 | 2,1                            | 2,3                                        | 7,3          | 1290                                             | 77                             |
| 200                  | M2BAX 355SMB 6 | 3GBA353220-...T | 992            | 94,0                               | 94,3               | 93,7               | 0,84                    | 360                 | 6,5                            | 1925                 | 2,1                            | 2,3                                        | 9,7          | 1440                                             | 77                             |
| 250                  | M2BAX 355SMC 6 | 3GBA353230-...T | 991            | 94,0                               | 94,3               | 93,9               | 0,84                    | 450                 | 6,7                            | 2409                 | 2,3                            | 2,3                                        | 11,3         | 1590                                             | 77                             |

# Technical data

## IE2 General performance cast iron motors

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

| Output<br>kW         | Motor type     | Product code   | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>pA</sub><br>dB |                                |
|----------------------|----------------|----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 3000 r/min = 2 poles |                |                |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,37                 | M2BAX 71MA 2   | 3GBA071310---C | 2797           | 69,5                               | 67,4               | 62,7               | 0,78                    | 0,91                | 5,3                            | 1,24                 | 2,9                            | 3,6                                        | 0,00033      | 9                                                | 56                             |
| 0,55                 | M2BAX 71MB 2   | 3GBA071320---C | 2811           | 74,1                               | 72,8               | 69,5               | 0,79                    | 1,3                 | 5,4                            | 1,85                 | 3,0                            | 3,5                                        | 0,00041      | 10                                               | 58                             |
| 0,75                 | M2BAX 80MA 2   | 3GBA081310---C | 2843           | 77,4                               | 76,3               | 73,7               | 0,81                    | 1,71                | 6,2                            | 2,51                 | 2,9                            | 4,3                                        | 0,00067      | 14                                               | 63                             |
| 1,1                  | M2BAX 80MB 2   | 3GBA081320---C | 2840           | 79,6                               | 79,5               | 77,6               | 0,83                    | 2,44                | 6,0                            | 3,67                 | 3,1                            | 3,8                                        | 0,0009       | 15                                               | 62                             |
| 1,5                  | M2BAX 90SA 2   | 3GBA091110---C | 2887           | 81,3                               | 79,9               | 77,1               | 0,79                    | 3,37                | 6,5                            | 4,93                 | 3,0                            | 3,9                                        | 0,0021       | 21                                               | 66                             |
| 2,2                  | M2BAX 90LA 2   | 3GBA091510---C | 2894           | 83,2                               | 83,0               | 81,4               | 0,84                    | 4,48                | 7,7                            | 7,25                 | 3,1                            | 3,8                                        | 0,0027       | 24                                               | 67                             |
| 3                    | M2BAX 100LA 2  | 3GBA101510---C | 2919           | 84,6                               | 83,6               | 81,3               | 0,84                    | 6,12                | 8,7                            | 9,81                 | 4,1                            | 5,0                                        | 0,0048       | 32                                               | 74                             |
| 4                    | M2BAX 112MA 2  | 3GBA111310---C | 2916           | 85,8                               | 85,3               | 83,1               | 0,86                    | 7,89                | 9,1                            | 13,08                | 4,1                            | 4,7                                        | 0,00561      | 36                                               | 74                             |
| 5,5                  | M2BAX 132SA 2  | 3GBA131110---C | 2921           | 87,0                               | 86,0               | 83,7               | 0,85                    | 10,8                | 8,3                            | 18,02                | 2,6                            | 4,3                                        | 0,0117       | 56                                               | 74                             |
| 7,5                  | M2BAX 132SB 2  | 3GBA131120---C | 2916           | 88,1                               | 87,5               | 85,7               | 0,84                    | 14,5                | 8,7                            | 24,57                | 3,1                            | 4,5                                        | 0,0132       | 60                                               | 72                             |
| 11                   | M2BAX 160MLA 2 | 3GBA161410---C | 2931           | 89,4                               | 89,4               | 88,3               | 0,86                    | 20,7                | 6,6                            | 35,87                | 2,5                            | 3,5                                        | 0,041        | 103                                              | 72                             |
| 15                   | M2BAX 160MLB 2 | 3GBA161420---C | 2938           | 90,3                               | 90,5               | 89,8               | 0,88                    | 27                  | 7,6                            | 48,89                | 3,1                            | 3,5                                        | 0,0538       | 116                                              | 72                             |
| 18,5                 | M2BAX 160MLC 2 | 3GBA161430---C | 2939           | 90,9                               | 91,0               | 90,3               | 0,87                    | 33,4                | 7,9                            | 60,13                | 3,1                            | 3,8                                        | 0,06         | 124                                              | 73                             |
| 22                   | M2BAX 180MLA 2 | 3GBA181410---C | 2943           | 91,3                               | 91,6               | 90,9               | 0,87                    | 39,5                | 8,6                            | 71,4                 | 3,7                            | 3,9                                        | 0,0735       | 151                                              | 72                             |
| 30                   | M2BAX 200MLA 2 | 3GBA201410---C | 2957           | 92,0                               | 91,5               | 90,1               | 0,85                    | 55,8                | 8,6                            | 97,1                 | 4,0                            | 4,2                                        | 0,11         | 198                                              | 81                             |
| 37                   | M2BAX 200MLB 2 | 3GBA201420---C | 2951           | 92,5                               | 92,5               | 92,2               | 0,9                     | 64,2                | 7,9                            | 120                  | 3,6                            | 3,7                                        | 0,141        | 229                                              | 80                             |
| 45                   | M2BAX 225SMA 2 | 3GBA221210---C | 2962           | 92,9                               | 92,8               | 92,1               | 0,86                    | 80,6                | 8,8                            | 145                  | 3,8                            | 3,8                                        | 0,226        | 275                                              | 82                             |
| 55                   | M2BAX 250SMA 2 | 3GBA251210---C | 2965           | 93,2                               | 93,1               | 92,4               | 0,87                    | 96,4                | 7,4                            | 177                  | 3,4                            | 3,0                                        | 0,344        | 335                                              | 78                             |
| 75                   | M2BAX 280SMD 2 | 3GBA281240---H | 2971           | 93,8                               | 94,0               | 93,9               | 0,89                    | 129                 | 7,7                            | 241                  | 2,7                            | 3,3                                        | 0,6          | 527                                              | 78                             |
| 90                   | M2BAX 280SME 2 | 3GBA281250---H | 2970           | 94,1                               | 94,3               | 94,2               | 0,91                    | 152                 | 8,0                            | 289                  | 3,1                            | 3,3                                        | 0,7          | 576                                              | 76                             |
| 132                  | M2BAX 315SMB 2 | 3GBA311220---C | 2978           | 94,6                               | 94,2               | 93,2               | 0,86                    | 233                 | 7,8                            | 423                  | 2,4                            | 3,9                                        | 1,4          | 810                                              | 78                             |
| 160                  | M2BAX 315SMC 2 | 3GBA311230---C | 2981           | 94,8                               | 94,6               | 93,8               | 0,88                    | 274                 | 7,5                            | 513                  | 2,2                            | 3,7                                        | 1,7          | 900                                              | 78                             |
| 200                  | M2BAX 315MLA 2 | 3GBA311410---C | 2979           | 95,0                               | 94,8               | 93,9               | 0,89                    | 341                 | 7,2                            | 641                  | 2,4                            | 3,6                                        | 2,1          | 1020                                             | 83                             |
| 250                  | M2BAX 355SMA 2 | 3GBA351210---C | 2983           | 95,0                               | 94,7               | 93,7               | 0,89                    | 428                 | 6,7                            | 800                  | 1,5                            | 2,8                                        | 2,7          | 1310                                             | 83                             |
| 315                  | M2BAX 355SMB 2 | 3GBA351220---C | 2980           | 95,0                               | 95,0               | 94,2               | 0,89                    | 537                 | 7,2                            | 1009                 | 1,9                            | 2,8                                        | 3,4          | 1450                                             | 83                             |
| 355                  | M2BAX 355SMC 2 | 3GBA351230---C | 2983           | 95,0                               | 95,0               | 94,3               | 0,88                    | 609                 | 7,4                            | 1136                 | 2,1                            | 2,7                                        | 3,6          | 1520                                             | 83                             |

# Technical data

## IE2 General performance cast iron motors

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

| Output<br>kW         | Motor type     | Product code   | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>pA</sub><br>dB |                                |
|----------------------|----------------|----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 1500 r/min = 4 poles |                |                |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,25                 | M2BAX 71MA 4   | 3GBA072310---C | 1424           | 68,5                               | 65,1               | 58,6               | 0,7                     | 0,74                | 4,6                            | 1,68                 | 2,0                            | 2,9                                        | 9            | 49                                               |                                |
| 0,37                 | M2BAX 71MB 4   | 3GBA072320---C | 1418           | 72,7                               | 70,4               | 65,0               | 0,69                    | 1,08                | 5,0                            | 2,5                  | 2,5                            | 3,0                                        | 10           | 46                                               |                                |
| 0,55                 | M2BAX 80MA 4   | 3GBA082310---C | 1441           | 77,1                               | 75,4               | 71,3               | 0,73                    | 1,41                | 6,4                            | 3,66                 | 2,8                            | 3,4                                        | 15           | 54                                               |                                |
| 0,75                 | M2BAX 80MB 4   | 3GBA082320---C | 1446           | 79,6                               | 78,8               | 74,9               | 0,69                    | 1,99                | 6,6                            | 4,97                 | 3,7                            | 3,9                                        | 0,00247      | 18                                               | 53                             |
| 1,1                  | M2BAX 90SA 4   | 3GBA092110---C | 1447           | 81,4                               | 79,6               | 75,6               | 0,71                    | 2,74                | 6,6                            | 7,35                 | 3,9                            | 4,3                                        | 0,0037       | 22                                               | 51                             |
| 1,5                  | M2BAX 90LA 4   | 3GBA092510---C | 1444           | 82,8                               | 83,1               | 81,3               | 0,73                    | 3,6                 | 6,8                            | 10                   | 3,7                            | 4,2                                        | 0,0046       | 24                                               | 55                             |
| 2,2                  | M2BAX 100LA 4  | 3GBA102510---C | 1445           | 84,3                               | 83,8               | 81,5               | 0,77                    | 4,93                | 7,3                            | 14,54                | 3,2                            | 3,9                                        | 0,00759      | 31                                               | 55                             |
| 3                    | M2BAX 100LB 4  | 3GBA102520---C | 1443           | 85,5                               | 85,2               | 83,4               | 0,77                    | 6,61                | 7,6                            | 19,8                 | 3,8                            | 4,3                                        | 0,00939      | 35                                               | 58                             |
| 4                    | M2BAX 112MA 4  | 3GBA112310---C | 1442           | 86,6                               | 86,2               | 84,6               | 0,78                    | 8,62                | 7,5                            | 26,5                 | 4,0                            | 4,3                                        | 0,012        | 41                                               | 56                             |
| 5,5                  | M2BAX 132SA 4  | 3GBA132110---C | 1457           | 87,7                               | 87,5               | 86,2               | 0,77                    | 11,7                | 6,9                            | 36                   | 2,5                            | 3,4                                        | 0,0257       | 59                                               | 65                             |
| 7,5                  | M2BAX 132MA 4  | 3GBA132310---C | 1457           | 88,7                               | 88,6               | 87,4               | 0,77                    | 16                  | 7,2                            | 49,1                 | 2,6                            | 3,6                                        | 0,032        | 70                                               | 67                             |
| 11                   | M2BAX 160MLA 4 | 3GBA162410---C | 1466           | 89,8                               | 89,9               | 89,2               | 0,78                    | 22,8                | 7,0                            | 71,51                | 3,3                            | 3,2                                        | 0,078        | 111                                              | 66                             |
| 15                   | M2BAX 160MLB 4 | 3GBA162420---C | 1468           | 90,6                               | 91,1               | 90,5               | 0,81                    | 29,5                | 8,0                            | 97,71                | 3,2                            | 3,7                                        | 0,1          | 126                                              | 66                             |
| 18,5                 | M2BAX 180MLA 4 | 3GBA182410---C | 1470           | 91,2                               | 91,4               | 90,5               | 0,79                    | 36,9                | 8,5                            | 120                  | 3,7                            | 4,2                                        | 0,12         | 156                                              | 65                             |
| 22                   | M2BAX 180MLB 4 | 3GBA182420---C | 1472           | 91,6                               | 91,3               | 90,2               | 0,77                    | 45                  | 9,2                            | 143                  | 4,1                            | 4,6                                        | 0,139        | 169                                              | 66                             |
| 30                   | M2BAX 200MLA 4 | 3GBA202410---C | 1476           | 92,3                               | 92,4               | 92,0               | 0,81                    | 58,4                | 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                    | 70,6                | 7,4                            | 239                  | 3,1                            | 3,3                                        | 0,35         | 265                                              | 69                             |
| 45                   | M2BAX 225SMB 4 | 3GBA222220---C | 1481           | 93,1                               | 92,9               | 92,3               | 0,8                     | 87,2                | 7,9                            | 290                  | 3,4                            | 3,4                                        | 0,416        | 292                                              | 69                             |
| 55                   | M2BAX 250SMA 4 | 3GBA252210---C | 1480           | 93,5                               | 93,4               | 92,7               | 0,82                    | 104                 | 7,6                            | 355                  | 3,3                            | 3,3                                        | 0,533        | 340                                              | 77                             |
| 75                   | M2BAX 280SMD 4 | 3GBA282240---H | 1480           | 94,0                               | 94,1               | 93,8               | 0,83                    | 138                 | 8,4                            | 484                  | 3,3                            | 3,5                                        | 0,9          | 520                                              | 70                             |
| 90                   | M2BAX 280SME 4 | 3GBA282250---H | 1480           | 94,2                               | 94,3               | 94,0               | 0,86                    | 160                 | 7,8                            | 581                  | 3,3                            | 3,4                                        | 1,1          | 583                                              | 70                             |
| 110                  | M2BAX 315SMA 4 | 3GBA312210---C | 1488           | 94,5                               | 94,3               | 93,5               | 0,85                    | 197                 | 6,9                            | 706                  | 2,3                            | 2,9                                        | 2,3          | 775                                              | 78                             |
| 132                  | M2BAX 315SMB 4 | 3GBA312220---C | 1487           | 94,7                               | 94,7               | 93,9               | 0,86                    | 236                 | 6,9                            | 847                  | 2,3                            | 2,7                                        | 2,6          | 830                                              | 78                             |
| 160                  | M2BAX 315SMC 4 | 3GBA312230---C | 1487           | 94,9                               | 95,0               | 94,2               | 0,85                    | 288                 | 7,2                            | 1027                 | 2,4                            | 2,9                                        | 2,9          | 870                                              | 78                             |
| 200                  | M2BAX 315MLA 4 | 3GBA312410---C | 1486           | 95,1                               | 95,2               | 94,6               | 0,86                    | 356                 | 7,0                            | 1285                 | 2,3                            | 2,8                                        | 3,5          | 995                                              | 78                             |
| 250                  | M2BAX 355SMA 4 | 3GBA352210---C | 1488           | 95,1                               | 95,1               | 94,2               | 0,85                    | 445                 | 6,7                            | 1604                 | 2,0                            | 2,6                                        | 5,4          | 1400                                             | 82                             |
| 315                  | M2BAX 355SMB 4 | 3GBA352220---C | 1488           | 95,1                               | 95,1               | 94,3               | 0,85                    | 560                 | 7,3                            | 2021                 | 2,2                            | 2,7                                        | 6,9          | 1570                                             | 82                             |
| 355                  | M2BAX 355SMC 4 | 3GBA352230---C | 1487           | 95,1                               | 95,3               | 94,7               | 0,86                    | 623                 | 6,8                            | 2279                 | 2,4                            | 2,7                                        | 7,2          | 1650                                             | 82                             |

# Technical data

## IE2 General performance cast iron motors

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

| Output<br>kW         | Motor type     | Product code    | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    |                         | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>PA</sub><br>dB |                                |
|----------------------|----------------|-----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                 |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% | Power<br>factor<br>Cosφ | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                 |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 1000 r/min = 6 poles |                |                 |                | 400 V 50 Hz                        |                    |                    |                         | CENELEC-design      |                                |                      |                                |                                            |              |                                                  |                                |
| 0,18                 | M2BAX 71MA 6   | 3GBA073310-...C | 905            | 59,0                               | 54,9               | 48,1               | 0,72                    | 0,65                | 3,5                            | 1,84                 | 2,2                            | 2,6                                        | 0,00082      | 9                                                | 40                             |
| 0,25                 | M2BAX 71MB 6   | 3GBA073320-...C | 920            | 63,0                               | 58,6               | 51,8               | 0,71                    | 0,83                | 3,8                            | 2,56                 | 2,6                            | 3,1                                        | 0,00105      | 10                                               | 47                             |
| 0,37                 | M2BAX 80MA 6   | 3GBA083310-...C | 916            | 67,6                               | 65,8               | 60,4               | 0,71                    | 1,19                | 3,9                            | 3,85                 | 2,4                            | 2,8                                        | 0,00173      | 14                                               | 49                             |
| 0,55                 | M2BAX 80MB 6   | 3GBA083320-...C | 932            | 73,1                               | 71,1               | 66,5               | 0,65                    | 1,67                | 4,7                            | 5,61                 | 3,0                            | 3,1                                        | 0,00267      | 19                                               | 47                             |
| 0,75                 | M2BAX 90SA 6   | 3GBA093110-...C | 951            | 75,9                               | 73,3               | 68,2               | 0,6                     | 2,36                | 4,9                            | 7,6                  | 3,3                            | 3,7                                        | 0,0044       | 22                                               | 50                             |
| 1,1                  | M2BAX 90LA 6   | 3GBA093510-...C | 936            | 78,1                               | 76,5               | 73,0               | 0,65                    | 3,17                | 4,6                            | 11,06                | 3,0                            | 3,3                                        | 0,0051       | 25                                               | 48                             |
| 1,5                  | M2BAX 100LA 6  | 3GBA103510-...C | 957            | 79,8                               | 78,1               | 74,0               | 0,63                    | 4,36                | 5,7                            | 15                   | 2,6                            | 3,3                                        | 0,00795      | 31                                               | 56                             |
| 2,2                  | M2BAX 112MA 6  | 3GBA113310-...C | 956            | 81,8                               | 80,4               | 77,6               | 0,66                    | 5,92                | 5,5                            | 21,9                 | 2,8                            | 3,5                                        | 0,0116       | 40                                               | 54                             |
| 3                    | M2BAX 132SA 6  | 3GBA133110-...C | 966            | 83,3                               | 82,6               | 80,8               | 0,64                    | 8,09                | 5,6                            | 29,43                | 1,9                            | 3,0                                        | 0,0251       | 57                                               | 62                             |
| 4                    | M2BAX 132MA 6  | 3GBA133310-...C | 964            | 84,6                               | 84,3               | 82,7               | 0,69                    | 9,95                | 6,4                            | 39,76                | 2,7                            | 3,3                                        | 0,0294       | 65                                               | 59                             |
| 5,5                  | M2BAX 132MB 6  | 3GBA133320-...C | 964            | 86,0                               | 85,9               | 84,6               | 0,66                    | 14                  | 5,8                            | 54,2                 | 2,2                            | 2,9                                        | 0,0397       | 79                                               | 62                             |
| 7,5                  | M2BAX 160MLA 6 | 3GBA163410-...C | 974            | 87,2                               | 87,5               | 86,9               | 0,74                    | 16,4                | 6,6                            | 73,69                | 2,0                            | 3,2                                        | 0,0811       | 114                                              | 65                             |
| 11                   | M2BAX 160MLB 6 | 3GBA163420-...C | 971            | 88,7                               | 89,3               | 89,7               | 0,78                    | 22,9                | 6,6                            | 108                  | 1,3                            | 2,8                                        | 0,102        | 134                                              | 57                             |
| 15                   | M2BAX 180MLA 6 | 3GBA183410-...C | 971            | 89,7                               | 90,0               | 89,6               | 0,76                    | 32                  | 7,4                            | 147                  | 2,4                            | 3,9                                        | 0,136        | 169                                              | 62                             |
| 18,5                 | M2BAX 200MLA 6 | 3GBA203410-...C | 978            | 90,4                               | 90,7               | 90,0               | 0,76                    | 38,5                | 6,1                            | 181                  | 2,0                            | 2,9                                        | 0,204        | 205                                              | 61                             |
| 22                   | M2BAX 200MLB 6 | 3GBA203420-...C | 978            | 90,9                               | 91,1               | 90,5               | 0,76                    | 45,6                | 6,2                            | 215                  | 1,8                            | 2,9                                        | 0,227        | 219                                              | 62                             |
| 30                   | M2BAX 225SMA 6 | 3GBA223210-...C | 987            | 91,7                               | 91,5               | 90,5               | 0,78                    | 60,6                | 7,0                            | 290                  | 2,7                            | 3,2                                        | 0,579        | 284                                              | 64                             |
| 37                   | M2BAX 250SMA 6 | 3GBA253210-...C | 986            | 92,2                               | 92,5               | 91,9               | 0,8                     | 71,9                | 6,9                            | 359                  | 2,6                            | 2,9                                        | 0,783        | 337                                              | 66                             |
| 45                   | M2BAX 280SMD 6 | 3GBA283240-...H | 990            | 92,7                               | 92,8               | 92,4               | 0,80                    | 88,2                | 7,1                            | 434                  | 2,7                            | 3,1                                        | 1,3          | 498                                              | 62                             |
| 55                   | M2BAX 280SME 6 | 3GBA283250-...H | 989            | 93,1                               | 93,2               | 92,8               | 0,81                    | 105                 | 6,9                            | 531                  | 2,7                            | 2,9                                        | 1,5          | 523                                              | 66                             |
| 75                   | M2BAX 315SMA 6 | 3GBA313210-...C | 992            | 93,7                               | 93,7               | 92,6               | 0,81                    | 143                 | 7,0                            | 721                  | 2,1                            | 2,7                                        | 3,2          | 705                                              | 75                             |
| 90                   | M2BAX 315SMB 6 | 3GBA313220-...C | 992            | 94,0                               | 94,1               | 93,2               | 0,83                    | 165                 | 7,2                            | 866                  | 2,1                            | 2,7                                        | 4,1          | 800                                              | 75                             |
| 110                  | M2BAX 315SMC 6 | 3GBA313230-...C | 992            | 94,3                               | 94,4               | 93,7               | 0,83                    | 203                 | 7,0                            | 1058                 | 2,2                            | 2,7                                        | 4,9          | 870                                              | 75                             |
| 132                  | M2BAX 315MLA 6 | 3GBA313410-...C | 992            | 94,6                               | 94,7               | 94,0               | 0,83                    | 243                 | 7,2                            | 1270                 | 2,4                            | 2,7                                        | 5,8          | 980                                              | 75                             |
| 160                  | M2BAX 355SMA 6 | 3GBA353210-...C | 992            | 94,8                               | 94,9               | 94,2               | 0,83                    | 293                 | 6,2                            | 1540                 | 2,1                            | 2,3                                        | 7,3          | 1290                                             | 77                             |
| 200                  | M2BAX 355SMB 6 | 3GBA353220-...C | 992            | 95,0                               | 95,2               | 94,6               | 0,84                    | 360                 | 6,5                            | 1925                 | 2,1                            | 2,3                                        | 9,7          | 1440                                             | 77                             |
| 250                  | M2BAX 355SMC 6 | 3GBA353230-...C | 991            | 95,0                               | 95,2               | 94,8               | 0,84                    | 450                 | 6,7                            | 2409                 | 2,3                            | 2,3                                        | 11,3         | 1590                                             | 77                             |



# Technical data

## IE3 General performance cast iron motors

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

| Output<br>kW         | Motor type                   | Product code   | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>PA</sub><br>dB |                                |
|----------------------|------------------------------|----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                              |                |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                              |                |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 3000 r/min = 2 poles |                              |                |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,37                 | M2BAX 71MC 2                 | 3GBA071330---D | 2819           | 76,5                               | 76,0               | 73,4               | 0,8                     | 0,86                | 6,6                            | 1,26                 | 2,7                            | 3,2                                        | 0,00035      | 10                                               | 50                             |
| 0,55                 | M2BAX 71MB 2                 | 3GBA071320---D | 2816           | 78,4                               | 78,1               | 75,9               | 0,8                     | 1,27                | 6,1                            | 1,88                 | 2,7                            | 3,2                                        | 0,0004       | 10                                               | 49                             |
| 0,75                 | M2BAX 80MC 2                 | 3GBA081330---D | 2891           | 80,7                               | 81,0               | 78,9               | 0,8                     | 1,66                | 7,5                            | 2,49                 | 2,9                            | 3,7                                        | 0,00081      | 16                                               | 58                             |
| 1,1                  | M2BAX 80MD 2                 | 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 90SB 2                 | 3GBA091120---D | 2912           | 84,2                               | 84,0               | 82,5               | 0,83                    | 3,04                | 8,6                            | 4,96                 | 2,8                            | 3,9                                        | 0,00234      | 23                                               | 54                             |
| 2,2                  | M2BAX90SLA 2                 | 3GBA091010---D | 2908           | 85,9                               | 85,6               | 83,9               | 0,81                    | 4,54                | 8,8                            | 7,26                 | 3,2                            | 3,9                                        | 0,003        | 26                                               | 67                             |
| 3                    | M2BAX 100LKA 2               | 3GBA101810---D | 2910           | 87,1                               | 88,0               | 88,0               | 0,91                    | 5,38                | 8,9                            | 9,84                 | 3,0                            | 3,8                                        | 0,00691      | 42                                               | 60                             |
| 4                    | M2BAX 112MB 2                | 3GBA111320---D | 2908           | 88,1                               | 89,0               | 89,1               | 0,91                    | 7,2                 | 9,7                            | 13,14                | 3,0                            | 3,8                                        | 0,00711      | 42                                               | 64                             |
| 5,5                  | M2BAX 132SMA 2               | 3GBA131210---D | 2931           | 89,2                               | 89,8               | 89,2               | 0,83                    | 10,5                | 8,6                            | 17,92                | 2,4                            | 4,0                                        | 0,0136       | 64                                               | 65                             |
| 7,5                  | M2BAX 132SMB 2               | 3GBA131220---D | 2921           | 90,1                               | 91,0               | 90,9               | 0,84                    | 14                  | 9,0                            | 24,5                 | 2,6                            | 4,0                                        | 0,0166       | 72                                               | 65                             |
| 11                   | M2BAX 160MLA 2               | 3GBA161410---F | 2943           | 91,2                               | 92,0               | 91,6               | 0,91                    | 19,1                | 7,2                            | 35,57                | 2,6                            | 3,6                                        | 0,057        | 121                                              | 69                             |
| 15                   | M2BAX 160MLB 2               | 3GBA161420---F | 2947           | 91,9                               | 92,2               | 91,8               | 0,88                    | 26,5                | 8,2                            | 48,49                | 3,2                            | 4,2                                        | 0,063        | 128                                              | 69                             |
| 18,5                 | M2BAX 160MLC 2               | 3GBA161430---F | 2949           | 92,4                               | 93,0               | 92,6               | 0,9                     | 32                  | 9,0                            | 59,81                | 3,3                            | 3,9                                        | 0,076        | 145                                              | 73                             |
| 22                   | M2BAX 180MLA 2               | 3GBA181410---F | 2941           | 92,7                               | 93,0               | 92,7               | 0,84                    | 41,1                | 8,7                            | 71,42                | 3,4                            | 4,1                                        | 0,073        | 152                                              | 70                             |
| 30                   | M2BAX 200MLA 2               | 3GBA201410---F | 2961           | 93,3                               | 93,3               | 92,6               | 0,89                    | 52                  | 10,0                           | 96,89                | 3,7                            | 4,1                                        | 0,144        | 250                                              | 80                             |
| 37                   | M2BAX 200MLB 2               | 3GBA201420---F | 2951           | 93,7                               | 93,9               | 93,3               | 0,89                    | 63,9                | 10,5                           | 119                  | 4,2                            | 4,1                                        | 0,16         | 268                                              | 78                             |
| 45                   | M2BAX 225SMA 2               | 3GBA221210---F | 2962           | 94,0                               | 94,0               | 93,3               | 0,85                    | 81,3                | 9,3                            | 145                  | 3,8                            | 4,1                                        | 0,223        | 278                                              | 80                             |
| 55                   | M2BAX 250SMA 2               | 3GBA251210---F | 2965           | 94,3                               | 94,3               | 93,7               | 0,87                    | 96,4                | 7,4                            | 177                  | 3,4                            | 3,0                                        | 0,344        | 335                                              | 78                             |
| 75                   | M2BAX 280SMF 2               | 3GBA281260---F | 2971           | 94,7                               | 94,7               | 94,0               | 0,89                    | 129                 | 7,7                            | 241                  | 2,7                            | 3,3                                        | 0,6          | 527                                              | 78                             |
| 90                   | M2BAX 280SMG 2               | 3GBA281270---F | 2970           | 95,0                               | 95,3               | 95,2               | 0,91                    | 152                 | 8,0                            | 289                  | 3,1                            | 3,3                                        | 0,7          | 576                                              | 76                             |
| 110                  | M2BAX 315SMB 2               | 3GBA311220---M | 2982           | 95,2                               | 94,9               | 93,9               | 0,87                    | 192                 | 7,0                            | 352                  | 1,8                            | 2,7                                        | 1,3          | 801                                              | 78                             |
| 132                  | M2BAX 315SMC 2               | 3GBA311230---M | 2982           | 95,4                               | 95,4               | 94,6               | 0,87                    | 229                 | 6,8                            | 422                  | 2,0                            | 2,8                                        | 1,5          | 852                                              | 78                             |
| 160                  | M2BAX 315SMD 2               | 3GBA311240---M | 2983           | 95,6                               | 95,6               | 94,9               | 0,87                    | 275                 | 7,4                            | 512                  | 2,2                            | 2,8                                        | 1,7          | 909                                              | 78                             |
| 200                  | <sup>1)</sup> M2BAX 315MLA 2 | 3GBA311410---M | 2983           | 95,8                               | 96,0               | 95,5               | 0,88                    | 342                 | 7,5                            | 640                  | 2,3                            | 3,1                                        | 2,1          | 1051                                             | 81                             |
| 250                  | M2BAX 355SMA 2               | 3GBA351210---M | 2985           | 95,8                               | 95,6               | 94,6               | 0,89                    | 423                 | 7,7                            | 800                  | 2,1                            | 3,3                                        | 3            | 1412                                             | 83                             |
| 315                  | M2BAX 355SMB 2               | 3GBA351220---M | 2980           | 95,8                               | 95,7               | 95,0               | 0,89                    | 529                 | 7,0                            | 1009                 | 2,1                            | 3,0                                        | 3,4          | 1495                                             | 83                             |
| 355                  | M2BAX 355SMC 2               | 3GBA351230---M | 2984           | 95,8                               | 95,8               | 95,0               | 0,88                    | 605                 | 7,2                            | 1136                 | 2,2                            | 3                                          | 3,6          | 1565                                             | 83                             |

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

# Technical data

## IE3 General performance cast iron motors

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

| Output<br>kW         | Motor type     | Product code   | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>PA</sub><br>dB |                                |
|----------------------|----------------|----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 1500 r/min = 4 poles |                |                |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,25                 | M2BAX 71MB 4   | 3GBA072320---D | 1440           | 73,5                               | 70,1               | 63,8               | 0,64                    | 0,78                | 6,1                            | 1,67                 | 2,7                            | 3,5                                        | 0,00075      | 10                                               | 41                             |
| 0,37                 | M2BAX 71MLA 4  | 3GBA072410---D | 1441           | 77,3                               | 74,9               | 69,8               | 0,66                    | 1,06                | 6,8                            | 2,47                 | 2,7                            | 3,8                                        | 0,00098      | 12                                               | 50                             |
| 0,55                 | M2BAX 80MC 4   | 3GBA082330---D | 1446           | 80,8                               | 80,7               | 78,0               | 0,74                    | 1,32                | 8,4                            | 3,64                 | 2,7                            | 3,9                                        | 0,00228      | 17                                               | 48                             |
| 0,75                 | M2BAX 80MLA 4  | 3GBA082410---D | 1445           | 82,5                               | 81,2               | 77,6               | 0,7                     | 1,84                | 8,2                            | 4,88                 | 3,8                            | 4,6                                        | 0,00295      | 21                                               | 49                             |
| 1,1                  | M2BAX 90SB 4   | 3GBA092120---D | 1438           | 84,1                               | 83,4               | 80,9               | 0,73                    | 2,59                | 7,9                            | 7,28                 | 3,6                            | 4,2                                        | 0,00394      | 23                                               | 48                             |
| 1,5                  | M2BAX 90SLA 4  | 3GBA092010---D | 1434           | 85,3                               | 84,4               | 82,1               | 0,73                    | 3,52                | 7,9                            | 9,95                 | 3,9                            | 4,0                                        | 0,00485      | 25                                               | 44                             |
| 2,2                  | M2BAX 100LB 4  | 3GBA102520---D | 1450           | 86,7                               | 86,1               | 84,1               | 0,78                    | 4,74                | 9,3                            | 14,53                | 3,4                            | 4,4                                        | 0,00863      | 34                                               | 50                             |
| 3                    | M2BAX 100LKA 4 | 3GBA102810---D | 1448           | 87,7                               | 87,7               | 86,5               | 0,79                    | 6,25                | 9,6                            | 19,86                | 3,6                            | 4,5                                        | 0,0115       | 41                                               | 57                             |
| 4                    | M2BAX 112MLA 4 | 3GBA112410---D | 1443           | 88,6                               | 89,6               | 89,4               | 0,82                    | 7,91                | 9,5                            | 26,59                | 3,6                            | 4,3                                        | 0,0152       | 50                                               | 56                             |
| 5,5                  | M2BAX 132SMA 4 | 3GBA132210---D | 1463           | 89,6                               | 90,5               | 90,3               | 0,77                    | 11,4                | 7,9                            | 35,9                 | 2,6                            | 3,3                                        | 0,0297       | 67                                               | 68                             |
| 7,5                  | M2BAX 132MLA 4 | 3GBA132410---D | 1456           | 90,4                               | 91,1               | 90,8               | 0,78                    | 15,2                | 8,8                            | 49,1                 | 2,5                            | 3,0                                        | 0,039        | 84                                               | 65                             |
| 11                   | M2BAX 160MLA 4 | 3GBA162410---F | 1477           | 91,4                               | 91,8               | 91,1               | 0,82                    | 21,1                | 7,6                            | 71,27                | 2,6                            | 3,3                                        | 0,11         | 136                                              | 61                             |
| 15                   | M2BAX 160MLB 4 | 3GBA162420---F | 1477           | 92,1                               | 92,4               | 91,6               | 0,82                    | 28,5                | 8,2                            | 96,99                | 3,0                            | 3,7                                        | 0,135        | 161                                              | 61                             |
| 18,5                 | M2BAX 180MLA 4 | 3GBA182410---F | 1472           | 92,6                               | 92,6               | 92,0               | 0,82                    | 35                  | 10,3                           | 120                  | 3,6                            | 4,0                                        | 0,135        | 169                                              | 64                             |
| 22                   | M2BAX 180MLB 4 | 3GBA182420---F | 1473           | 93,0                               | 93,2               | 92,5               | 0,8                     | 42,8                | 10,1                           | 143                  | 3,3                            | 4,2                                        | 0,167        | 198                                              | 65                             |
| 30                   | M2BAX 200MLA 4 | 3GBA202410---F | 1481           | 93,6                               | 94,0               | 93,5               | 0,82                    | 56,3                | 10,0                           | 193                  | 3,9                            | 3,0                                        | 0,32         | 282                                              | 69                             |
| 37                   | M2BAX 225SMA 4 | 3GBA222210---F | 1479           | 93,9                               | 94,2               | 93,7               | 0,81                    | 70,3                | 9,3                            | 238                  | 2,5                            | 3,0                                        | 0,376        | 278                                              | 67                             |
| 45                   | M2BAX 225SMB 4 | 3GBA222220---F | 1481           | 94,2                               | 94,4               | 93,8               | 0,79                    | 87,8                | 9,1                            | 288                  | 4,2                            | 3,6                                        | 0,415        | 293                                              | 68                             |
| 55                   | M2BAX 250SMA 4 | 3GBA252210---F | 1479           | 94,6                               | 94,7               | 94,0               | 0,83                    | 102                 | 10,1                           | 352                  | 4,4                            | 3,4                                        | 0,62         | 386                                              | 74                             |
| 75                   | M2BAX 280SMF 4 | 3GBA282260---F | 1481           | 95,0                               | 95,1               | 95,0               | 0,83                    | 137                 | 8,6                            | 484                  | 3,6                            | 3,8                                        | 0,959        | 530                                              | 68                             |
| 90                   | M2BAX 280SMG 4 | 3GBA282270---F | 1482           | 95,2                               | 95,3               | 95,2               | 0,85                    | 161                 | 8,4                            | 580                  | 3,8                            | 3,9                                        | 1,17         | 593                                              | 68                             |
| 110                  | M2BAX 315SMB 4 | 3GBA312220---M | 1489           | 95,4                               | 95,4               | 94,8               | 0,85                    | 196                 | 7,0                            | 705                  | 2,1                            | 3,0                                        | 2,43         | 823                                              | 71                             |
| 132                  | M2BAX 315SMC 4 | 3GBA312230---M | 1488           | 95,6                               | 95,8               | 95,3               | 0,86                    | 231                 | 6,7                            | 847                  | 2,2                            | 2,9                                        | 2,9          | 892                                              | 71                             |
| 160                  | M2BAX 315SMD 4 | 3GBA312240---M | 1488           | 95,8                               | 96,0               | 95,8               | 0,85                    | 282                 | 6,9                            | 1026                 | 2,2                            | 3,0                                        | 3,2          | 933                                              | 71                             |
| 200                  | M2BAX 315MLB 4 | 3GBA312420---M | 1487           | 96,0                               | 96,4               | 96,4               | 0,86                    | 351                 | 6,8                            | 1284                 | 2,4                            | 3,0                                        | 3,9          | 1091                                             | 74                             |
| 250                  | M2BAX 355SMA 4 | 3GBA352210---M | 1491           | 96,0                               | 96,0               | 95,6               | 0,86                    | 435                 | 6,4                            | 1601                 | 2,1                            | 2,9                                        | 5,9          | 1445                                             | 78                             |
| 315                  | M2BAX 355SMB 4 | 3GBA352220---M | 1491           | 96,0                               | 96,0               | 95,6               | 0,86                    | 545                 | 6,7                            | 2018                 | 2,3                            | 3,0                                        | 6,9          | 1595                                             | 78                             |
| 355                  | M2BAX 355SMC 4 | 3GBA352230---M | 1490           | 96,0                               | 96,2               | 95,8               | 0,86                    | 616                 | 6,3                            | 2273                 | 2,3                            | 2,8                                        | 7,2          | 1635                                             | 78                             |

# Technical data

## IE3 General performance cast iron motors

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

| Output<br>kW         | Motor type     | Product code   | Speed<br>r/min | Efficiency<br>IEC 60034-30-1; 2014 |                    |                    | Power<br>factor<br>Cosφ | Current             |                                | Torque               |                                | Moment<br>of inertia<br>J = 1/4<br>GD²kgm² | Weight<br>kg | Sound<br>pressure<br>Level L <sub>PA</sub><br>dB |                                |
|----------------------|----------------|----------------|----------------|------------------------------------|--------------------|--------------------|-------------------------|---------------------|--------------------------------|----------------------|--------------------------------|--------------------------------------------|--------------|--------------------------------------------------|--------------------------------|
|                      |                |                |                | Full<br>load<br>100%               | 3/4<br>load<br>75% | 1/2<br>load<br>50% |                         | I <sub>N</sub><br>A | I <sub>s</sub> /I <sub>N</sub> | T <sub>N</sub><br>Nm | T <sub>i</sub> /T <sub>N</sub> |                                            |              |                                                  | T <sub>b</sub> /T <sub>N</sub> |
|                      |                |                |                |                                    |                    |                    |                         |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 1000 r/min = 6 poles |                |                |                | 400 V 50 Hz                        |                    |                    | CENELEC-design          |                     |                                |                      |                                |                                            |              |                                                  |                                |
| 0,18                 | M2BAX 71MB 6   | 3GBA073320---D | 931            | 63,9                               | 60,0               | 53,2               | 0,69                    | 0,6                 | 3,8                            | 1,87                 | 2,1                            | 2,6                                        | 0,00103      | 10                                               | 39                             |
| 0,25                 | M2BAX 71MLA 6  | 3GBA073410---D | 926            | 68,6                               | 66,3               | 60,9               | 0,67                    | 0,8                 | 4,3                            | 2,58                 | 2,6                            | 2,9                                        | 0,0014       | 13                                               | 46                             |
| 0,37                 | M2BAX 80MC 6   | 3GBA083330---D | 939            | 73,5                               | 71,5               | 66,7               | 0,66                    | 1,09                | 5,6                            | 3,8                  | 2,8                            | 3,2                                        | 0,0024       | 17                                               | 42                             |
| 0,55                 | M2BAX 80MLA 6  | 3GBA083410---D | 943            | 77,2                               | 75,9               | 71,9               | 0,68                    | 1,54                | 6,3                            | 5,6                  | 3,4                            | 3,5                                        | 0,00353      | 23                                               | 48                             |
| 0,75                 | M2BAX 90SLA 6  | 3GBA093010---D | 952            | 78,9                               | 78,0               | 73,9               | 0,59                    | 2,35                | 5,3                            | 7,52                 | 3,1                            | 3,6                                        | 0,0044       | 23                                               | 50                             |
| 1,1                  | M2BAX 90LB 6   | 3GBA093520---D | 954            | 81,0                               | 80,3               | 75,5               | 0,62                    | 3,2                 | 6,1                            | 11,12                | 3,3                            | 3,9                                        | 0,00643      | 30                                               | 53                             |
| 1,5                  | M2BAX 100LKA 6 | 3GBA103810---D | 953            | 82,5                               | 82,1               | 80,0               | 0,66                    | 4,0                 | 5,3                            | 15,11                | 2,7                            | 3,0                                        | 0,00975      | 37                                               | 48                             |
| 2,2                  | M2BAX 112MLA 6 | 3GBA113410---D | 957            | 84,3                               | 83,8               | 81,5               | 0,64                    | 5,94                | 6,5                            | 21,95                | 2,9                            | 3,7                                        | 0,013        | 46                                               | 50                             |
| 3                    | M2BAX 132SMA 6 | 3GBA133210---D | 968            | 85,6                               | 86,1               | 84,9               | 0,68                    | 7,4                 | 6,7                            | 29,59                | 2,1                            | 3,2                                        | 0,0291       | 65                                               | 48                             |
| 4                    | M2BAX 132SMB 6 | 3GBA133220---D | 972            | 86,8                               | 86,8               | 84,9               | 0,65                    | 10,1                | 7,0                            | 39,3                 | 2,7                            | 3,6                                        | 0,0343       | 71                                               | 52                             |
| 5,5                  | M2BAX 132MLA 6 | 3GBA133410---D | 974            | 88,0                               | 87,4               | 86,0               | 0,67                    | 13,5                | 7,3                            | 54,2                 | 2,9                            | 3,5                                        | 0,0511       | 97                                               | 65                             |
| 7,5                  | M2BAX 160MLA 6 | 3GBA163410---F | 979            | 89,1                               | 89,5               | 88,9               | 0,75                    | 15,9                | 7,6                            | 73,39                | 1,8                            | 3,1                                        | 0,099        | 131                                              | 59                             |
| 11                   | M2BAX 160MLB 6 | 3GBA163420---F | 976            | 90,3                               | 91,3               | 91,3               | 0,78                    | 22,5                | 7,8                            | 108                  | 1,9                            | 3,0                                        | 0,134        | 161                                              | 57                             |
| 15                   | M2BAX 180MLA 6 | 3GBA183410---F | 971            | 91,2                               | 91,8               | 91,2               | 0,75                    | 31,8                | 9,4                            | 146                  | 2,3                            | 3,6                                        | 0,162        | 197                                              | 63                             |
| 18,5                 | M2BAX 200MLA 6 | 3GBA203410---F | 978            | 91,7                               | 92,1               | 91,5               | 0,75                    | 38,8                | 6,7                            | 180                  | 2,1                            | 2,8                                        | 0,207        | 208                                              | 64                             |
| 22                   | M2BAX 200MLB 6 | 3GBA203420---F | 978            | 92,2                               | 92,5               | 91,8               | 0,75                    | 45,9                | 7,3                            | 214                  | 2,3                            | 3,0                                        | 0,255        | 251                                              | 62                             |
| 30                   | M2BAX 225SMA 6 | 3GBA223210---F | 988            | 92,9                               | 93,3               | 92,7               | 0,79                    | 59                  | 8,2                            | 290                  | 2,9                            | 3,3                                        | 0,592        | 286                                              | 63                             |
| 37                   | M2BAX 250SMA 6 | 3GBA253210---F | 986            | 93,3                               | 93,6               | 93,1               | 0,79                    | 72,4                | 8,5                            | 353                  | 3,3                            | 3,0                                        | 0,83         | 360                                              | 64                             |
| 45                   | M2BAX 280SMF 6 | 3GBA283260---F | 990            | 93,7                               | 93,9               | 93,5               | 0,82                    | 84,5                | 8,0                            | 434                  | 3,2                            | 2,9                                        | 1,6          | 524                                              | 62                             |
| 55                   | M2BAX 280SMG 6 | 3GBA283270---F | 989            | 94,1                               | 94,5               | 94,2               | 0,82                    | 103                 | 8,6                            | 531                  | 3,4                            | 2,9                                        | 1,8          | 563                                              | 64                             |
| 75                   | M2BAX 315SMB 6 | 3GBA313220---M | 994            | 94,6                               | 94,9               | 94,6               | 0,84                    | 136                 | 6,8                            | 720                  | 1,8                            | 2,6                                        | 4,1          | 791                                              | 75                             |
| 90                   | M2BAX 315SMC 6 | 3GBA313230---M | 994            | 94,9                               | 95,1               | 94,7               | 0,84                    | 164                 | 7,2                            | 864                  | 2,0                            | 3,0                                        | 4,6          | 859                                              | 76                             |
| 110                  | M2BAX 315SMD 6 | 3GBA313240---M | 994            | 95,1                               | 95,3               | 95,0               | 0,83                    | 200                 | 7,3                            | 1056                 | 2,2                            | 3,1                                        | 4,9          | 912                                              | 75                             |
| 132                  | M2BAX 315MLB 6 | 3GBA313420---M | 995            | 95,4                               | 95,5               | 95,1               | 0,82                    | 242                 | 7,3                            | 1266                 | 2,3                            | 3,2                                        | 6,3          | 1068                                             | 72                             |
| 160                  | M2BAX 355SMA 6 | 3GBA353210---M | 993            | 95,6                               | 95,9               | 95,6               | 0,82                    | 292                 | 6,7                            | 1538                 | 2,5                            | 2,6                                        | 7,9          | 1348                                             | 75                             |
| 200                  | M2BAX 355SMB 6 | 3GBA353220---M | 993            | 95,8                               | 96,2               | 96,1               | 0,82                    | 365                 | 6,7                            | 1923                 | 2,6                            | 2,5                                        | 9,7          | 1512                                             | 75                             |
| 250                  | M2BAX 355SMC 6 | 3GBA353230---M | 993            | 95,8                               | 96,1               | 95,8               | 0,81                    | 464                 | 7,7                            | 2404                 | 3,0                            | 3,1                                        | 11,3         | 1656                                             | 75                             |

# Variant codes

## 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.

Most of the variant codes apply to IE1, IE2 and IE3 motors. For details please contact you ABB sales office before making an order.

|                                 |                                                                                                                  | Frame size |    |    |     |     |     |     |     |     |     |     |     |     |     |
|---------------------------------|------------------------------------------------------------------------------------------------------------------|------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code/Variants M2BAX             |                                                                                                                  | 71         | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 | 355 |
| <b>Administration</b>           |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 530                             | Two-year extension on standard warranty                                                                          | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 531                             | Sea freight packing                                                                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 533                             | Wooden sea freight packing                                                                                       | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 865                             | One-year extension on standard warranty                                                                          | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Balancing</b>                |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 417                             | Vibration acc. to Grade B (IEC 60034-14).                                                                        | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Bearings and Lubrication</b> |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 037                             | Roller bearing at D-end.                                                                                         | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | •   | •   | •   |
| 040                             | Heat-resistant grease                                                                                            | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 041                             | Bearings regreasable via grease nipples.                                                                         | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | ○   | ○   | ○   |
| 043                             | SPM compatible nipples for vibration measurement                                                                 | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 130                             | Pt100 3-wire in bearings.                                                                                        | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | •   | •   | •   |
| 188                             | 63-series bearing in D-end                                                                                       | -          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 798                             | Stainless steel grease nipples                                                                                   | -          | -  | -  | -   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 866                             | Stainless steel grease nipples, PT1/4"                                                                           | -          | -  | -  | -   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Branch standard designs</b>  |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 142                             | Manilla connection.                                                                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | -   |
| 178                             | Stainless steel / acid proof bolts.                                                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 209                             | Non-standard voltage or frequency, (special winding).                                                            | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 396                             | Motor designed for minimum ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added) | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 425                             | Corrosion protected stator and rotor core.                                                                       | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Cooling system</b>           |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 068                             | Light alloy metal fan                                                                                            | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 075                             | Cooling method IC418 (without fan).                                                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 183                             | Separate motor cooling (fan axial, N-end).                                                                       | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Heating elements</b>         |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 450                             | Heating element, 100-120 V                                                                                       | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 451                             | Heating element, 200 - 240 V                                                                                     | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Insulation system</b>        |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 014                             | Winding insulation class H.                                                                                      | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 405                             | Special winding insulation for frequency converter supply.                                                       | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Marine</b>                   |                                                                                                                  |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 024                             | Fulfilling Bureau Veritas (BV) requirements, with certificate.                                                   | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 025                             | Fulfilling Det Norske Veritas (DNV) requirements, with certificate.                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 027                             | Fulfilling American Bureau of Shipping (ABS) requirements, with certificate.                                     | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 049                             | Fulfilling Germanischer Lloyd (GL) requirements, with certificate.                                               | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 096                             | Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)          | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 186                             | Fulfilling Det Norske Veritas (DNV) requirements, without certificate                                            | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 481                             | Fulfilling Nippon Kaiji Kyokai (NK) requirements, with certificate.                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |

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

|                                           |                                                                                                                              | Frame size |    |    |     |     |     |     |     |     |     |     |     |     |     |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code/Variants M2BAX                       |                                                                                                                              | 71         | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 | 355 |
| 483                                       | Fulfilling China Classification Societies (CCS) requirements (Beijing), with certificate.                                    | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 491                                       | Fulfilling Nippon Kaiji Kyokai (NK) requirements, without certificate.                                                       | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 492                                       | Fulfilling Registro Italiano Navale (RINA) requirements, without certificate.                                                | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 493                                       | Fulfilling China Classification Societies (CCS) requirements (Beijing), without certificate.                                 | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 494                                       | Fulfilling Korea Register of Shipping (KR) requirements, without certificate.                                                | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 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).                                                              | •          | •  | •  | •   | •   | •   | -   | -   | -   | -   | -   | -   | -   | -   |
| 066                                       | Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101) | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 320                                       | IM2001 foot/flat bottom flange mounted, from IM1001 (B35 flat bottom flange from B3)                                         | •          | •  | •  | •   | •   | •   | -   | -   | -   | -   | -   | -   | -   | -   |
| <b>Painting</b>                           |                                                                                                                              |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 114                                       | Special paint color, standard grade                                                                                          | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 115                                       | Painting system C4M acc. to ISO 12944-2: 1998.                                                                               | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 754                                       | Painting system C5M acc. to ISO 12944-2:1998                                                                                 | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Protection</b>                         |                                                                                                                              |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 005                                       | Protective roof                                                                                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 072                                       | Radial seal at D-end. Not possible for 2-pole , 280 and 315 frames                                                           | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 158                                       | Degree of protection IP65.                                                                                                   | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 250                                       | Degree of protection IP66                                                                                                    | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 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.                                                        | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 135                                       | Mounting of additional identification plate, stainless.                                                                      | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 159                                       | Additional plate with text "Made in ...."                                                                                    | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 163                                       | Frequency converter rating plate. Rating data according to quotation.                                                        | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Shaft &amp; rotor</b>                  |                                                                                                                              |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 069                                       | Two shaft extensions according to catalog drawings.                                                                          | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 070                                       | Special shaft extension at D-End, standard shaft material                                                                    | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 410                                       | Shaft material stainless steel                                                                                               | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 600                                       | Special shaft extension at N-end, standard shaft material.                                                                   | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Standards and Regulations</b>          |                                                                                                                              |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 538                                       | CE mark                                                                                                                      | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 540                                       | China energy label                                                                                                           | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Stator winding temperature sensors</b> |                                                                                                                              |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 121                                       | Bimetal detectors, break type (NCC), (3 in series), 130 °C, in stator winding                                                | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | -   | -   | -   |
| 122                                       | Bimetal detectors, break type (NCC), (3 in series), 150 °C, in stator winding                                                | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 435                                       | PTC - thermistors (3 in series), 130 °C, in stator winding                                                                   | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 439                                       | PTC - thermistors (2x3 in series), 150 °C, in stator winding                                                                 | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | •   | •   | •   |
| 441                                       | PTC - thermistors (3 in series, 130 °C & 3 in series, 150 °C), in stator winding                                             | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 445                                       | Pt100 2-wire in stator winding, 1 per phase                                                                                  | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 446                                       | Pt100 2-wire in stator winding, 2 per phase                                                                                  | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | •   | •   | •   |
| 502                                       | Pt100 3-wire in stator winding, 1 per phase                                                                                  | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | •   | •   | •   |
| 503                                       | Pt100 3-wire in stator winding, 2 per phase                                                                                  | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | •   | •   | •   |

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

|                              |                                                                   | Frame size |    |    |     |     |     |     |     |     |     |     |     |     |     |
|------------------------------|-------------------------------------------------------------------|------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code/Variants M2BAX          |                                                                   | 71         | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 | 355 |
| <b>Terminal box</b>          |                                                                   |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 020                          | Detached terminal box.                                            | -          | -  | -  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 021                          | Terminal box LHS (seen from D-end).                               | -          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | -   | -   | -   |
| 022                          | Cable entry LHS (seen from D-end).                                | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 180                          | Terminal box RHS (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.                                | •          | •  | •  | •   | •   | •   | ○   | ○   | ○   | ○   | ○   | ○   | ○   | ○   |
| 413                          | Extended cable connection, no terminal box.                       | -          | -  | -  | -   | -   | -   | •   | •   | •   | •   | •   | •   | •   | •   |
| 418                          | Separate terminal box for auxiliaries, standard material.         | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | -   | -   |
| 447                          | Top mounted separate terminal box for monitoring equipment.       | -          | -  | -  | -   | -   | -   | -   | -   | -   | -   | -   | -   | •   | •   |
| 468                          | Cable entry from D-end.                                           | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 469                          | Cable entry from N-end.                                           | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 730                          | Prepared for NPT cable glands.                                    | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 731                          | Two standard metal cable glands.                                  | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 738                          | Prepared for metric cable glands.                                 | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 740                          | Prepared for PG cable glands.                                     | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Testing</b>               |                                                                   |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 145                          | Type test report from a catalogue motor, 400V 50Hz.               | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 146                          | Type test with report for one motor from specific delivery batch. | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 148                          | Routine test report.                                              | •          | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| <b>Variable speed drives</b> |                                                                   |            |    |    |     |     |     |     |     |     |     |     |     |     |     |
| 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)   |
| 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 | 6316/C3                   | 6316/C3    | NU 316 ECP/C3             |
| 315 IE1      | 2     | 6316/C3                   | 6316/C3    | NU 315 ECP/C3             |
| 315 IE2, IE3 | 2     | 6217/C3                   | 6217/C3    | NU 217 ECP/C3             |
| 315 IE1      | 4 - 6 | 6319/C3                   | 6316/C3    | NU 319 ECP/C3             |
| 315 IE2, IE3 | 4 - 6 | 6219/C3                   | 6217/C3    | NU 219 ECP/C3             |
| 355 IE1      | 2     | 6316/C3                   | 6316/C3    | NU 316 ECP/C3             |
| 355 IE2, IE3 | 2     | 6219/C3                   | 6219/C3    | NU 219 ECP/C3             |
| 355 IE1      | 2     | 6322/C3                   | 6316/C3    | NU 322 ECP/C3             |
| 355 IE2, IE3 | 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 X0 and Xmax, the permissible force  $F_R$  can be calculated with the following formula:

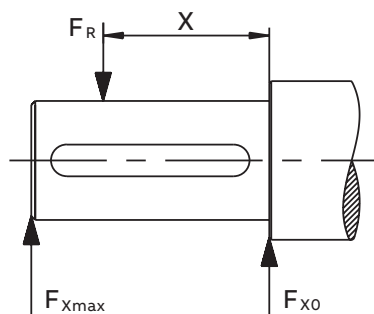
$$F_R = F_{X0} - \frac{X}{E} (F_{X0} - F_{Xmax})$$

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**Where:**

E: length of the shaft extension in the standard version

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# Permissible radial forces

| Motor size      |   | Poles | Lenght<br>of shaft<br>extension<br>E (mm) | Ball bearings       |                       | Roller bearings     |                       |                     |                       |                     |                       |
|-----------------|---|-------|-------------------------------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|
|                 |   |       |                                           | 20,000 h            |                       | 40,000 h            |                       | 20,000 h            |                       | 40,000 h            |                       |
|                 |   |       |                                           | F <sub>x0</sub> (N) | F <sub>xmax</sub> (N) | F <sub>x0</sub> (N) | F <sub>xmax</sub> (N) | F <sub>x0</sub> (N) | F <sub>xmax</sub> (N) | F <sub>x0</sub> (N) | F <sub>xmax</sub> (N) |
| 71              | 2 | 30    | 545                                       | 465                 | 430                   | 370                 |                       |                     |                       |                     |                       |
|                 | 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                   | 510                 |                       |                     |                       |                     |                       |
|                 | 4 | 50    | 1000                                      | 815                 | 790                   | 645                 |                       |                     |                       |                     |                       |
|                 | 6 | 50    | 1145                                      | 935                 | 905                   | 740                 |                       |                     |                       |                     |                       |
| 90L             | 2 | 50    | 795                                       | 660                 | 630                   | 520                 |                       |                     |                       |                     |                       |
|                 | 4 | 50    | 1005                                      | 830                 | 790                   | 655                 |                       |                     |                       |                     |                       |
|                 | 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                   | 730                 |                       |                     |                       |                     |                       |
|                 | 4 | 60    | 1405                                      | 1160                | 1105                  | 915                 |                       |                     |                       |                     |                       |
|                 | 6 | 60    | 1615                                      | 1335                | 1275                  | 1050                |                       |                     |                       |                     |                       |
| 132S            | 2 | 80    | 1630                                      | 1270                | 1285                  | 1000                |                       |                     |                       |                     |                       |
|                 | 4 | 80    | 2055                                      | 1600                | 1620                  | 1260                |                       |                     |                       |                     |                       |
|                 | 6 | 80    | 2360                                      | 1840                | 1860                  | 1450                |                       |                     |                       |                     |                       |
| 132M            | 4 | 80    | 2075                                      | 1665                | 1630                  | 1310                |                       |                     |                       |                     |                       |
|                 | 6 | 80    | 2375                                      | 1905                | 1865                  | 1495                |                       |                     |                       |                     |                       |
| 160             | 2 | 110   | 1945                                      | 1510                | 1545                  | 1195                |                       |                     |                       |                     |                       |
|                 | 4 | 110   | 2455                                      | 1905                | 1945                  | 1510                |                       |                     |                       |                     |                       |
|                 | 6 | 110   | 2835                                      | 2250                | 2245                  | 1780                |                       |                     |                       |                     |                       |
| 180             | 2 | 110   | 2095                                      | 1705                | 1660                  | 1350                |                       |                     |                       |                     |                       |
|                 | 4 | 110   | 2640                                      | 2145                | 2090                  | 1700                |                       |                     |                       |                     |                       |
|                 | 6 | 110   | 3025                                      | 2460                | 2395                  | 1950                |                       |                     |                       |                     |                       |
| 200             | 2 | 110   | 2800                                      | 2350                | 2200                  | 1830                |                       |                     |                       |                     |                       |
|                 | 4 | 110   | 3550                                      | 2910                | 2810                  | 2305                |                       |                     |                       |                     |                       |
|                 | 6 | 110   | 4065                                      | 3335                | 3220                  | 2640                |                       |                     |                       |                     |                       |
| 225             | 2 | 110   | 3335                                      | 2795                | 2640                  | 2215                |                       |                     |                       |                     |                       |
|                 | 4 | 140   | 4200                                      | 3370                | 3325                  | 2670                |                       |                     |                       |                     |                       |
|                 | 6 | 140   | 4810                                      | 3860                | 2805                  | 3055                |                       |                     |                       |                     |                       |
| 250             | 2 | 140   | 3965                                      | 3220                | 3140                  | 2550                |                       |                     |                       |                     |                       |
|                 | 4 | 140   | 4995                                      | 4060                | 3995                  | 3215                |                       |                     |                       |                     |                       |
|                 | 6 | 140   | 5715                                      | 4645                | 4525                  | 3675                |                       |                     |                       |                     |                       |
| 280             | 2 | 140   | 6590                                      | 5500                | 5100                  | 4250                | 22700                 | 7200                | 18350                 | 7200                |                       |
|                 | 4 | 140   | 8310                                      | 6930                | 6430                  | 5360                | 27900                 | 9500                | 22550                 | 9500                |                       |
|                 | 6 | 140   | 9460                                      | 7890                | 7310                  | 6090                | 31550                 | 9500                | 25450                 | 9500                |                       |
| 315<br>IE 1     | 2 | 140   | 6540                                      | 5670                | 4970                  | 4310                | 22700                 | 6400                | 18250                 | 6400                |                       |
|                 | 4 | 170   | 10300                                     | 8690                | 7860                  | 6630                | 36400                 | 13800               | 29300                 | 13800               |                       |
|                 | 6 | 170   | 11610                                     | 9790                | 8810                  | 7430                | 40900                 | 13800               | 23900                 | 13800               |                       |
| 315<br>IE2, IE3 | 2 | 140   | 4900                                      | 4150                | 3850                  | 3250                | 14900                 | 6650                | 12100                 | 6650                |                       |
|                 | 4 | 170   | 8000                                      | 6650                | 6350                  | 5250                | 21200                 | 10350               | 17200                 | 10350               |                       |
|                 | 6 | 170   | 9150                                      | 7550                | 7200                  | 5950                | 23900                 | 10250               | 19400                 | 10250               |                       |
| 355<br>IE1      | 2 | 140   | 6030                                      | 5280                | 4460                  | 3910                | 22050                 | 800                 | 17650                 | 8000                |                       |
|                 | 4 | 210   | 13240                                     | 10930               | 10030                 | 8280                | 48700                 | 16000               | 39200                 | 16000               |                       |
|                 | 6 | 210   | 14900                                     | 12310               | 11240                 | 9280                | 54750                 | 16000               | 43950                 | 16000               |                       |
| 355<br>IE2, IE3 | 2 | 140   | 6250                                      | 5500                | 4900                  | 4300                | 17200                 | 7850                | 13950                 | 7850                |                       |
|                 | 4 | 210   | 10500                                     | 8700                | 8250                  | 6800                | 28050                 | 16250               | 22750                 | 16250               |                       |
|                 | 6 | 210   | 12000                                     | 9900                | 9400                  | 7750                | 31650                 | 16200               | 25700                 | 16200               |                       |

# Mechanical design

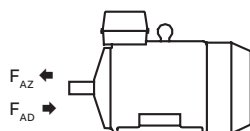
## Axial forces

01 Mounting arrangement IM B3.

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.



01

### Permissible axial forces

| Motor size | Poles | Length of shaft extension E (mm) | Mounting arrangement IM B3 |             |             |             |
|------------|-------|----------------------------------|----------------------------|-------------|-------------|-------------|
|            |       |                                  | Deep groove ball bearings  |             |             |             |
|            |       |                                  | 20,000 h                   |             | 40,000 h    |             |
|            |       |                                  | $F_{AD}(N)$                | $F_{AZ}(N)$ | $F_{AD}(N)$ | $F_{AZ}(N)$ |
| 71         | 2     | 30                               | 580                        | 300         | 465         | 185         |
|            | 4     | 30                               | 725                        | 445         | 580         | 300         |
|            | 6     | 30                               | 810                        | 530         | 670         | 390         |
| 80         | 2     | 40                               | 750                        | 430         | 595         | 275         |
|            | 4     | 40                               | 940                        | 620         | 750         | 430         |
|            | 6     | 40                               | 1055                       | 735         | 870         | 550         |
| 90         | 2     | 50                               | 845                        | 445         | 675         | 275         |
|            | 4     | 50                               | 1050                       | 650         | 840         | 440         |
|            | 6     | 50                               | 1175                       | 775         | 935         | 535         |
| 100        | 2     | 60                               | 1175                       | 615         | 940         | 380         |
|            | 4     | 60                               | 1465                       | 905         | 1175        | 615         |
|            | 6     | 60                               | 1640                       | 1080        | 1305        | 745         |
| 112        | 2     | 60                               | 1175                       | 615         | 935         | 375         |
|            | 4     | 60                               | 1460                       | 900         | 1170        | 610         |
|            | 6     | 60                               | 1635                       | 1075        | 1300        | 740         |

## Permissible axial forces

| Motor size   | Poles | Length of shaft extension E (mm) | Mounting arrangement IM B3 |             |             |             |
|--------------|-------|----------------------------------|----------------------------|-------------|-------------|-------------|
|              |       |                                  | Deep groove ball bearings  |             |             |             |
|              |       |                                  | 20,000 h                   |             | 40,000 h    |             |
|              |       |                                  | $F_{AD}(N)$                | $F_{AZ}(N)$ | $F_{AD}(N)$ | $F_{AZ}(N)$ |
| 132          | 2     | 80                               | 1675                       | 795         | 1415        | 535         |
|              | 4     | 80                               | 2110                       | 1230        | 1665        | 785         |
|              | 6     | 80                               | 2450                       | 1570        | 1950        | 1070        |
| 160          | 2     | 110                              | 1665                       | 1205        | 1300        | 840         |
|              | 4     | 110                              | 2135                       | 1675        | 1650        | 1190        |
|              | 6     | 110                              | 2465                       | 2005        | 1895        | 1435        |
| 180          | 2     | 110                              | 1730                       | 1275        | 1345        | 890         |
|              | 4     | 110                              | 2215                       | 1755        | 1705        | 1245        |
|              | 6     | 110                              | 2590                       | 2130        | 1990        | 1530        |
| 200          | 2     | 110                              | 2240                       | 1780        | 1725        | 1265        |
|              | 4     | 110                              | 2900                       | 2445        | 2215        | 1755        |
|              | 6     | 110                              | 3400                       | 2945        | 2595        | 2135        |
| 225          | 2     | 110                              | 2440                       | 2210        | 1845        | 1615        |
|              | 4     | 140                              | 3195                       | 2965        | 2395        | 2170        |
|              | 6     | 140                              | 3745                       | 3520        | 2810        | 2580        |
| 250          | 2     | 140                              | 2860                       | 2620        | 2155        | 1920        |
|              | 4     | 140                              | 3765                       | 3525        | 2825        | 2585        |
|              | 6     | 140                              | 4420                       | 4180        | 3310        | 3070        |
| 280          | 2     | 140                              | 6060                       | 4060        | 4530        | 2530        |
|              | 4     | 140                              | 7380                       | 5380        | 6010        | 4010        |
|              | 6     | 140                              | 8850                       | 6850        | 6710        | 4710        |
| 315 IE1      | 2     | 140                              | 6120                       | 4120        | 4760        | 2760        |
|              | 4     | 170                              | 9280                       | 7280        | 7080        | 5080        |
|              | 6     | 170                              | 10700                      | 8700        | 8110        | 6110        |
| 315 IE2, IE3 | 2     | 140                              | 4150                       | 2150        | 3300        | 1300        |
|              | 4     | 170                              | 6600                       | 4600        | 5100        | 3100        |
|              | 6     | 170                              | 7550                       | 5550        | 5800        | 3800        |
| 355 IE1      | 2     | 140                              | 5782                       | 4070        | 4432        | 2720        |
|              | 4     | 210                              | 11372                      | 9660        | 8572        | 6860        |
|              | 6     | 210                              | 13172                      | 11460       | 9852        | 8140        |
| 355 IE2, IE3 | 2     | 140                              | 4900                       | 3200        | 3800        | 2100        |
|              | 4     | 210                              | 8050                       | 6300        | 6100        | 4350        |
|              | 6     | 210                              | 9250                       | 7500        | 6950        | 5200        |

# Terminal box

## Standard terminal box

01 Terminal box for sizes 71 to 132.

02 Terminal box for sizes 160 to 180.

03 Terminal box for sizes 200 to 250.

04 Terminal box for sizes 280 to 355.

05 Terminal board for sizes 71 to 132.

06 Terminal board for sizes 160 to 180.

07 Terminal board for sizes 200 to 250.

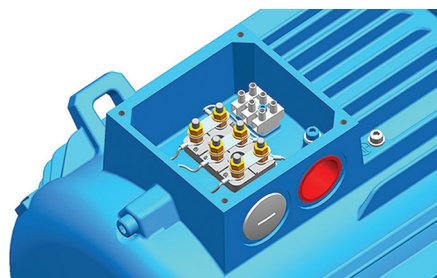
08 Terminal board for sizes 280 to 355.

### Terminal boxes

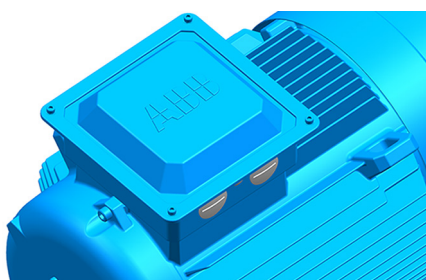
The pictures below show standard terminal boxes.



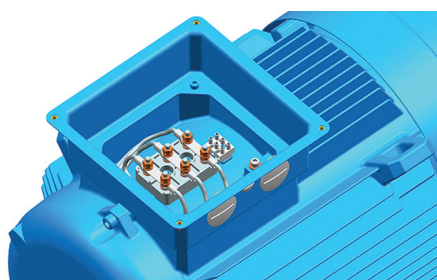
01



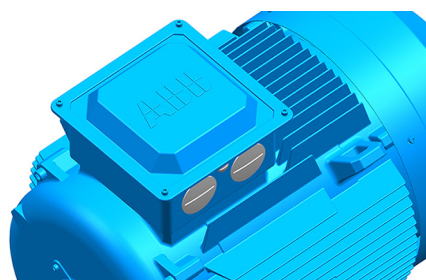
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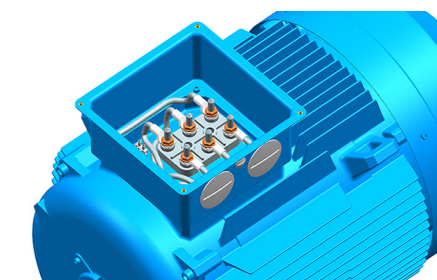
02



06



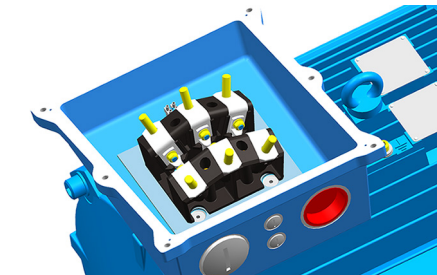
03



07



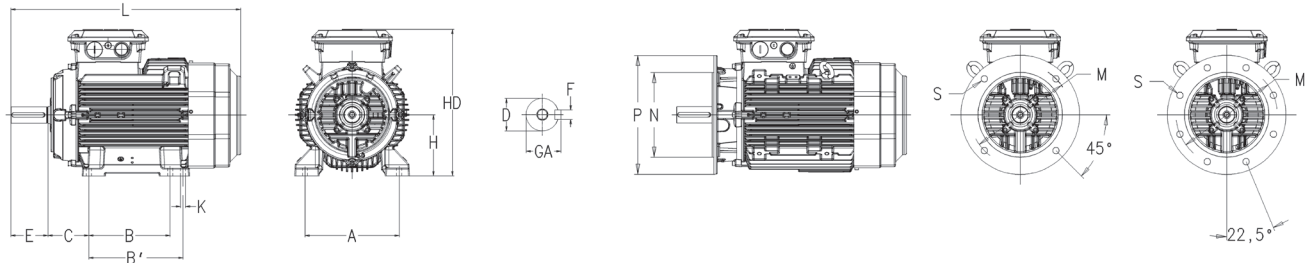
04



08

# Dimension drawings

## General performance IE1 and IE2 cast iron motors



Foot-mounted motor IM1001, B3 and flange-mounted motor IM3001, B5

| Motor size        | D poles |     | GA poles |      | F poles |     | E poles |     | L max poles |       | A   | B   | B'  | C   | HD max | K    | M   | N   | P   | S    |
|-------------------|---------|-----|----------|------|---------|-----|---------|-----|-------------|-------|-----|-----|-----|-----|--------|------|-----|-----|-----|------|
|                   | 2       | 4-8 | 2        | 4-8  | 2       | 4-8 | 2       | 4-8 | 2           | 4-8   |     |     |     |     |        |      |     |     |     |      |
| 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 | 12   |
| 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               | 24      | 24  | 27       | 27   | 8       | 8   | 50      | 50  | 351         | 351   | 140 | 125 | -   | 56  | 217    | 10   | 165 | 130 | 200 | 12   |
| 100L              | 28      | 28  | 31       | 31   | 8       | 8   | 60      | 60  | 376         | 376   | 160 | 140 | -   | 63  | 240    | 12   | 215 | 180 | 250 | 14,5 |
| 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 | 14,5 |
| 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 | 14,5 |
| 132ML             | 38      | 38  | 41       | 41   | 10      | 10  | 80      | 80  | 586         | 586   | 216 | 178 | 203 | 89  | 302    | 12   | 265 | 230 | 300 | 14,5 |
| 160 <sup>1)</sup> | 42      | 42  | 45       | 45   | 12      | 12  | 110     | 110 | 586,5       | 586,5 | 254 | 210 | 254 | 108 | 414    | 14,5 | 300 | 250 | 350 | 18,5 |
| 160 <sup>2)</sup> | 42      | 42  | 45       | 45   | 12      | 12  | 110     | 110 | 626,5       | 626,5 | 254 | 210 | 254 | 108 | 414    | 14,5 | 300 | 250 | 350 | 18,5 |
| 180               | 48      | 48  | 51,5     | 51,5 | 14      | 14  | 110     | 110 | 683,5       | 683,5 | 279 | 241 | 279 | 121 | 454    | 14,5 | 300 | 250 | 350 | 18,5 |
| 200               | 55      | 55  | 59       | 59   | 16      | 16  | 110     | 110 | 728         | 728   | 318 | 267 | 305 | 133 | 515    | 18,5 | 350 | 300 | 400 | 18,5 |
| 225               | 55      | 60  | 59       | 64   | 16      | 18  | 110     | 140 | 824         | 854   | 356 | 286 | 311 | 149 | 560    | 18,5 | 400 | 350 | 450 | 18,5 |
| 250               | 60      | 65  | 64       | 69   | 18      | 18  | 140     | 140 | 882         | 882   | 406 | 311 | 349 | 168 | 613    | 24   | 500 | 450 | 550 | 18,5 |
| 280               | 65      | 75  | 69       | 79,5 | 18      | 20  | 140     | 140 | 1012        | 1012  | 457 | 368 | 419 | 190 | 710    | 24   | 500 | 450 | 550 | 18,5 |
| 315 SM_           | 65      | 80  | 69       | 85   | 18      | 22  | 140     | 170 | 1216        | 1246  | 508 | 406 | 457 | 216 | 849    | 28   | 600 | 550 | 660 | 24   |
| 315 ML_           | 65      | 90  | 69       | 95   | 18      | 25  | 140     | 170 | 1326        | 1356  | 508 | 457 | 508 | 216 | 849    | 28   | 600 | 550 | 660 | 24   |
| 355 SM_           | 70      | 100 | 74,5     | 106  | 20      | 28  | 140     | 210 | 1399        | 1469  | 610 | 500 | 560 | 254 | 933    | 35   | 740 | 680 | 800 | 24   |

<sup>1)</sup> All types except MLB6

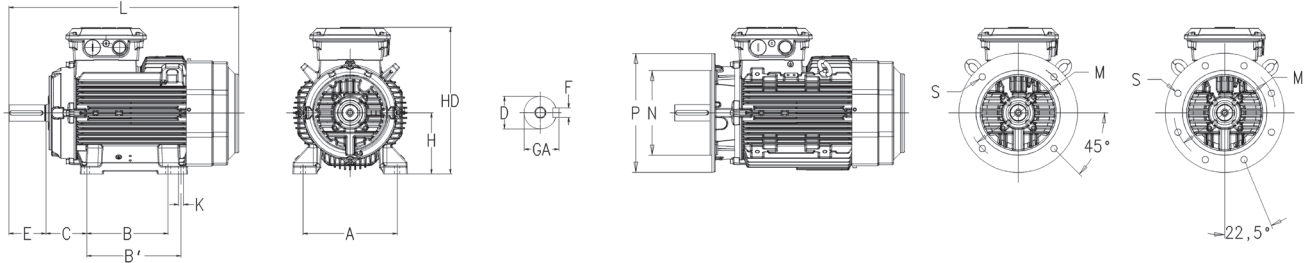
<sup>2)</sup> MLB 6

### IMB14 (IM3601)

| Motor size | M   | N   | P   | S  | T   |
|------------|-----|-----|-----|----|-----|
| 71         | 85  | 70  | 105 | 6  | 2,5 |
| 80         | 100 | 80  | 120 | 6  | 3   |
| 90         | 115 | 95  | 140 | 8  | 3   |
| 100        | 130 | 110 | 160 | 8  | 3,5 |
| 112        | 130 | 110 | 160 | 8  | 3,5 |
| 132        | 165 | 130 | 200 | 10 | 3,5 |

# Dimension drawings

## General performance IE3 cast iron motors



Foot-mounted motor IM1001, B3 and flange-mounted motor IM3001, B5

| Motor size        | D poles |     | GA poles |      | F poles |     | E poles |     | L max poles |       | A   | B   | B'  | C   | HD max | K    | M   | N   | P   | S    |
|-------------------|---------|-----|----------|------|---------|-----|---------|-----|-------------|-------|-----|-----|-----|-----|--------|------|-----|-----|-----|------|
|                   | 2       | 4-8 | 2        | 4-8  | 2       | 4-8 | 2       | 4-8 | 2           | 4-8   |     |     |     |     |        |      |     |     |     |      |
| 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 | 12   |
| 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_              | 24      | 24  | 27       | 27   | 8       | 8   | 50      | 50  | 386         | 386   | 140 | 125 | -   | 56  | 217    | 10   | 165 | 130 | 200 | 12   |
| 100L_             | 28      | 28  | 31       | 31   | 8       | 8   | 60      | 60  | 376         | 376   | 160 | 140 | -   | 63  | 240    | 12   | 215 | 180 | 250 | 14,5 |
| 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  | 521         | 521   | 216 | 140 | 178 | 89  | 302    | 12   | 265 | 230 | 300 | 14,5 |
| 132M_             | 38      | 38  | 41       | 41   | 10      | 10  | 80      | 80  | 586         | 586   | 216 | 178 | 203 | 89  | 302    | 12   | 265 | 230 | 300 | 14,5 |
| 160 <sup>1)</sup> | 42      | 42  | 45       | 45   | 12      | 12  | 110     | 110 | 586,5       | 586,5 | 254 | 210 | 254 | 108 | 413    | 14,5 | 300 | 250 | 350 | 18,5 |
| 160 <sup>2)</sup> | 42      | 42  | 45       | 45   | 12      | 12  | 110     | 110 | 626,5       | 626,5 | 254 | 210 | 254 | 108 | 413    | 14,5 | 300 | 250 | 350 | 18,5 |
| 160 <sup>3)</sup> | 42      | 42  | 45       | 45   | 12      | 12  | 110     | 110 | 683,5       | 683,5 | 254 | 210 | 254 | 108 | 413    | 14,5 | 300 | 250 | 350 | 18,5 |
| 180 <sup>4)</sup> | 48      | 48  | 51,5     | 51,5 | 14      | 14  | 110     | 110 | 683,5       | 683,5 | 279 | 241 | 279 | 121 | 434    | 14,5 | 300 | 250 | 350 | 18,5 |
| 180 <sup>5)</sup> | 48      | 48  | 51,5     | 51,5 | 14      | 14  | 110     | 110 | 743,5       | 743,5 | 279 | 241 | 279 | 121 | 434    | 14,5 | 300 | 250 | 350 | 18,5 |
| 200 MLA6          | 55      | 55  | 59       | 59   | 16      | 16  | 110     | 110 | 728         | 728   | 318 | 267 | 305 | 133 | 473    | 18,5 | 350 | 300 | 400 | 18,5 |
| 200 <sup>6)</sup> | 55      | 55  | 59       | 59   | 16      | 16  | 110     | 110 | 828         | 828   | 318 | 267 | 305 | 133 | 473    | 18,5 | 350 | 300 | 400 | 18,5 |
| 225 SM_           | 55      | 60  | 59       | 64   | 16      | 18  | 110     | 140 | 824         | 854   | 356 | 286 | 311 | 149 | 539    | 18,5 | 400 | 350 | 450 | 18,5 |
| 250 SMA           | 60      | 65  | 64       | 69   | 18      | 18  | 140     | 140 | 882         | 927   | 406 | 311 | 349 | 168 | 585    | 24   | 500 | 450 | 550 | 18,5 |
| 280               | 65      | 75  | 69       | 79,5 | 18      | 20  | 140     | 140 | 1012        | 1012  | 457 | 368 | 419 | 190 | 775    | 24   | 500 | 450 | 550 | 18,5 |
| 315 SM_           | 65      | 80  | 69       | 85   | 18      | 22  | 140     | 170 | 1216        | 1246  | 508 | 406 | 457 | 216 | 849    | 28   | 600 | 550 | 660 | 24   |
| 315 ML_           | 65      | 90  | 69       | 95   | 18      | 25  | 140     | 170 | 1326        | 1356  | 508 | 457 | 508 | 216 | 849    | 28   | 600 | 550 | 660 | 24   |
| 355 SM_           | 70      | 100 | 74,5     | 106  | 20      | 28  | 140     | 210 | 1399        | 1469  | 610 | 500 | 560 | 254 | 933    | 35   | 740 | 680 | 800 | 24   |

<sup>1)</sup> MLA 2, MLB 2

<sup>2)</sup> MLA 4, MLA 6

<sup>3)</sup> MLC 2, MLB 4, MLB 6

<sup>4)</sup> MLA 2, MLA 4

<sup>5)</sup> MLB 4, MLA 6

<sup>6)</sup> All types except MLA6

### IMB14 (IM3601)

| Motor size | M   | N   | P   | S  | T   |
|------------|-----|-----|-----|----|-----|
| 71         | 85  | 70  | 105 | 6  | 2,5 |
| 80         | 100 | 80  | 120 | 6  | 3   |
| 90         | 115 | 95  | 140 | 8  | 3   |
| 100        | 130 | 110 | 160 | 8  | 3,5 |
| 112        | 130 | 110 | 160 | 8  | 3,5 |
| 132        | 165 | 130 | 200 | 10 | 3,5 |

# Motors in brief

## 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                                               | Cover, 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                                                      |              |            |              |            |
| 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 lugs                                     |              |            |              |            |



# Motors in brief

## 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 | 6212-2Z/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                                               | Cover, 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

## 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       | 6316/C3                                                               | 6217/C3 or 6316/C3 | 6219/C3 or 6319/C3 |
|                                                            | D-end 4-6 -pole    | 6316/C3                                                               | 6219/C3 or 6316/C3 | 6222/C3 or 6322/C3 |
|                                                            | N-end 2-pole       | 6316/C3                                                               | 6217/C3 or 6316/C3 | 6219/C3 or 6316/C3 |
|                                                            | N-end 4-6 -pole    | 6316/C3                                                               | 6217/C3 or 6316/C3 | 6219/C3 or 6316/C3 |
| Axially locked bearings                                    |                    | Locked at D-end with inner bearing cover                              |                    |                    |
| Bearing seals                                              | D-end              | V-ring                                                                |                    |                    |
|                                                            | N-end              | V-ring                                                                |                    |                    |
| Lubrication                                                |                    | Regreasable 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 polypypropylene                                |                    |                    |
| 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                                                   |                    |                    |



# Total product offering

Motors, generators and mechanical power transmission products with a complete portfolio of services



## IEC motors

- Low voltage motors
- High voltage induction and synchronous motors
- Marine motors
- Motors for explosive atmospheres
- Motors for food and beverage
- Motors for variable speed drives
- Permanent magnet motors
- Synchronous reluctance motors
- Traction motors

## NEMA motors

- Low voltage motors
- High voltage induction and synchronous motors
- Marine motors
- Motors for explosive atmospheres
- Motors for variable speed drives
- Permanent magnet motors
- Servomotors
- Washdown motors

## Generators

- Generators for wind turbines
- Generators for diesel and gas engine power plants
- Generators for steam and gas turbine power plants
- Generators for marine applications
- Generators for industrial applications
- Generators for traction applications
- Synchronous condensers for reactive power compensation

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