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LOW VOLTAGE

Synchronous reluctance motors up to IE6

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

LOW VOLTAGE SYNCHRONOUS RELUCTANCE MOTORS UP TO IE6

Sizes 90 to 315, 0.75 to 450 kW

01 Synchronous reluctance motors

04 synchronous reluctance motors
05 Synchronous reluctance motors
11 Technology
13 Synchronous reluctance motors with ABB variable speed drives
14 Mounting arrangements
15 Ordering information
16 Rating plates
17 Technical data
33 Variant codes
41 Mechanical design
52 Terminal box
61 Dimension drawings
64 Motors in brief

02 Motor construction

65 Motor construction

03 ABB Access

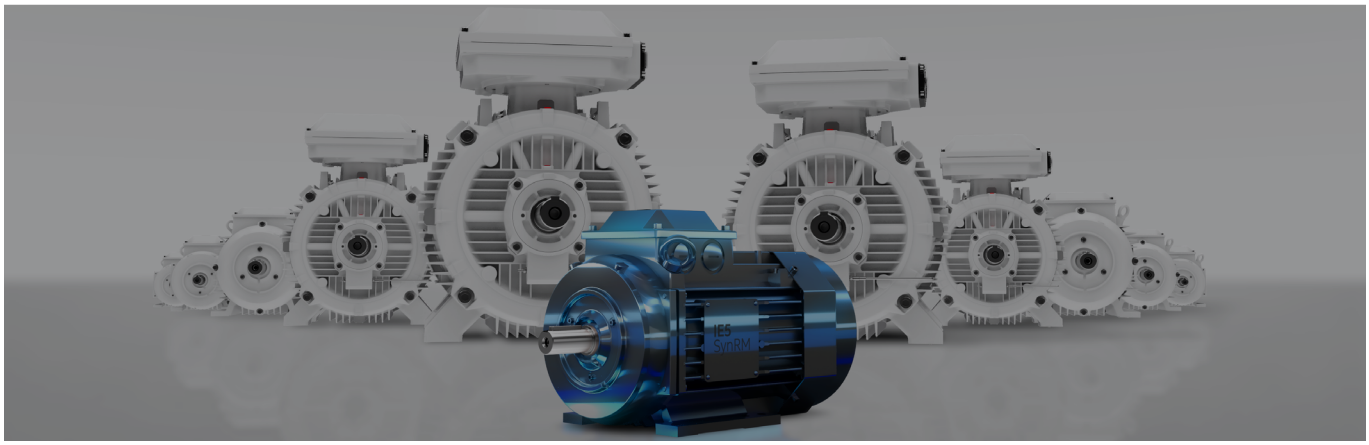
66 ABB Access

04 Total product offering

67 Total product offering

05 ABB's portfolio of drives

68 ABB's portfolio of drives



SYNCHRONOUS RELUCTANCE MOTORS

5 **Synchronous reluctance motors**
5 Ultimate efficiency and reliability to optimize your cost of ownership
6 Product features
9 Efficiency classes for VSD motors
10 High output for compactness - High performance for compact machine designs

11 **Technology**

13 **Synchronous reluctance motors with ABB variable speed drives**

14 **Mounting arrangements**

15 **Ordering information**

16 **Rating plates**

17 **Technical data**
17 High efficiency IE5 Synchronous reluctance motors, network voltage 400 V
19 High efficiency IE6 Synchronous reluctance motors, network voltage 400 V
20 High efficiency IE5 Synchronous reluctance motors, network voltage 460 V
22 High efficiency IE6 Synchronous reluctance motors, network voltage 460 V
23 High efficiency IE5 Synchronous reluctance motors, network voltage 380 V
25 High efficiency IE6 Synchronous reluctance motors, network voltage 380 V
26 High efficiency IE5 Synchronous reluctance motors, network voltage 500 V
28 High efficiency IE6 Synchronous reluctance motors, network voltage 500 V
29 High efficiency IE5 Synchronous reluctance motors, network voltage 690 V
31 High efficiency IE6 Synchronous reluctance motors, network voltage 690 V
32 High output Synchronous reluctance motors, network voltage 400 V

33 **Variant codes**

41 **Mechanical design**
41 Motor frame and drain holes
42 Lifting lugs
43 Heating elements
44 Bearings
46 Bearing life and lubrication
48 Radial forces
50 Axial forces

52 **Terminal box**
52 Standard terminal box
54 Terminal box dimensions
57 Terminal boxes and boards
58 Terminal box alternatives

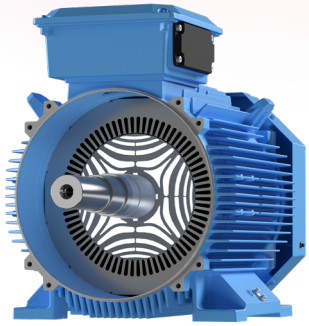
61 **Dimension drawings**
61 IE5 SynRM motors
62 IE6 SynRM motors
63 High Output SynRM Motors

64 **Motors in brief**
64 Synchronous reluctance cast iron frame motors, sizes 90-315

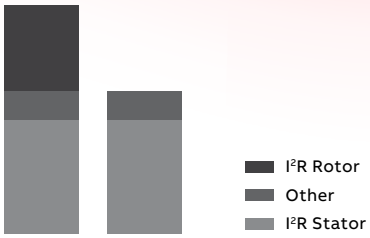
Synchronous reluctance motors

Ultimate efficiency and reliability to optimize your cost of ownership

Traditional induction motor



SynRM motor



Losses

Innovative technology

From the outside a SynRM motor looks similar to a traditional induction motor. On the inside, the stator is a conventional design but the rotor is very different from what has gone before. The innovative rotor is made from laminated iron layers which form a light but solid construction that allows magnetism to flow through.

Magnet-free design

The SynRM rotor has no magnets or windings and suffers virtually no power losses. Elimination of rotor losses means better efficiency, longer bearing lifetime, and less dissipated heat losses from the motor. Magnet-free design enchases motor reliability and minimizes service requirements.

Highest reliability

Synchronous reluctance motors have lower winding and bearing temperatures, which extends motor lifetime and reduces maintenance needs. This is very significant because bearing failures cause about 70 percent of unplanned motor outages.

Accurate torque and speed control

SynRM Motors help improve the quality of your production by accurate torque and speed control. SynRM motors require VSD for operation which controls and optimizes the operation of the motor. It varies the frequency and voltage of the electricity fed to the motor to adjust the torque and speed for an exact match with the needs of the application.

Suitable for any application and industry

SynRM motors are suitable for a wide range of applications, including pumps, fans, compressors, extruders, conveyors, and wire drawing machines, as well as many other uses across various industries.

Easy retrofits

SynRM motor is an ideal solution for motor retrofits. It has the same dimensions and output power as induction motors, eliminating the need for mechanical modifications.

SynRM technology	Benefit
Higher efficiency	Lowest energy consumption
No rare earth metals	Environmental sustainability
Magnet-free rotor	Easy maintenance
Lower winding and bearing temperatures	Longer life time, extended service intervals
Better controllability	Accurate speed and torque control
Lower noise level	Improved plant environment
Standard IEC dimensions	Drop-in replacement

Product features

1. Efficiency & MEPS

International minimum efficiency performance standards (MEPS) for measuring the efficiency of VSD-only types of motors - such as synchronous reluctance motors - are under development. No local MEPS efficiency requirements for VSD-only motors have been issued by February 2026.

2. Service

Servicing synchronous reluctance motors is as straightforward as with induction motors. The rotor does not include any magnetic materials, which means that the motor can be disassembled and serviced using the same procedure as for conventional induction motors. For test runs, SynRM capable frequency converter is needed.

3. Package selection

Refer to ABB for easy package selection for SynRM motors and drives. Use DriveSize or ABB GoSelect softwares to find the perfect match.

4. Winding insulation

The output voltage of voltage source frequency converters consists of steep voltage pulses. These pulses can be even higher and steeper when arriving at the motor terminals due to reflecting pulses in the cables. The motor's insulation must therefore be selected according to the actual pulses at the motor terminals

4.1. Maximum voltage peaks

Two different insulation systems are available for ABB motors covered in this catalogue. The Special insulation can be ordered by using variant code +405. Otherwise motors are delivered with Standard insulation. Limit values for insulation systems are listed in Table 1. These values apply at motor terminals. The pk/pk values define motor insulation capacity regardless of the origin of the voltage stress. The pk values are given as reference. Typically highest stress occurs in pk/pk situation where pk/pk can be up to 2 x pk.

LIMIT VALUES FOR ABB MOTOR INSULATION SYSTEMS

		Standard insulation	+ 405 special insulation
$U_{phase\text{-}ground}$	V pk/pk	2500	3300
$U_{phase\text{-}ground}$	Vpk	1250	1650
$U_{phase\text{-}phase}$	V pk/pk	3400	4800
$U_{phase\text{-}phase}$	Vpk	1700	2400
Rise time Tr > acc. to IEC 60034-18-41		0,24 µs	0,24 µs
Rise time Tr > acc. To NEMA MG 1-2021		0,1 µs	0,1 µs
Voltage rise, max.		5,7 kV/µs	7,8 kV/µs
Time between pulses		> 6 µs	> 6 µs

4.2. IVIC Classes

IEC 60034-18-41 specifies limit values for different IVIC classes. The most typical classes specified for variable speed duty are IVIC B and C. Limit values depend on network voltage. Table 2 includes limit values for IVIC B and C for the most typical network voltages. Limit values increase linearly according to network voltage.

LIMIT VALUES FOR DIFFERENT IVIC CLASSES AND NETWORK VOLTAGES

		400V		480V		500V		575V		690V	
		IVIC B	IVIC C	IVIC B	IVIC C	IVIC B	IVIC C	IVIC B	IVIC C	IVIC B	IVIC C
$U_{phase\text{-}ground}$	V pk/pk	1248	1664	1497	1997	1560	2080	1794	2392	2153	2870
$U_{phase\text{-}phase}$	V pk/pk	1783	2377	2139	2852	2228	2971	2563	3417	3075	4100

4.3. Guidance for ABB motor insulation system selection for use with ABB frequency converters

Choose ABB motor insulation system so that given requirements are reached. IVIC C/C is also reached with this selection.

REQUIREMENTS FOR ABB MOTOR INSULATION SYSTEM WHEN USED WITH ABB FREQUENCY CONVERTERS

Nominal AC line voltage	Requirements for motor insulation system [1]
Un ≤ 420 V	$U_{phase\text{-}phase,\ pk}$ ≥ 1250 V
	Rise time minimum 0,25 µs , IEC
420 V < Un ≤ 500 V	$U_{phase\text{-}phase,\ pk}$ ≥ 1486 V
	Rise time minimum 0,25 µs , IEC
500 V < Un ≤ 600 V	$U_{phase\text{-}phase,\ pk}$ ≥ 1783 V
	Rise time minimum 0,25 µs , IEC
600 V < Un ≤ 690 V	$U_{phase\text{-}phase,\ pk}$ ≥ 2050 V
	Rise time minimum 0,25 µs , IEC

[1] Consult ABB Drives publications for more details if needed

4.4 ABB motor insulation system selection with other frequency converters

Select ABB motor insulation system so that it meets or exceeds frequency converter manufacturers requirements for motor insulation system and that IVIC C/C limit values are met. The shortest allowed voltage rise time at motor terminals is listed in Table 1. Voltage rise time is typically depending on frequency converter type, cable length and whether the frequency converter has dU/dt filter. The dU/dt filter is the most typical way to slow down voltage rise time to acceptable level if rise time is otherwise too short.

5. Bearing currents

Bearing voltages and currents must be avoided in all motors to ensure reliable operation of the entire application.

Synchronous reluctance motors rated above 100 kW are equipped with one insulated bearing as standard, which together with the correct cabling is sufficient to secure trouble-free operation up to 350 kW. Above 350 kW the drive should be equipped with a common-mode filter as an additional measure.

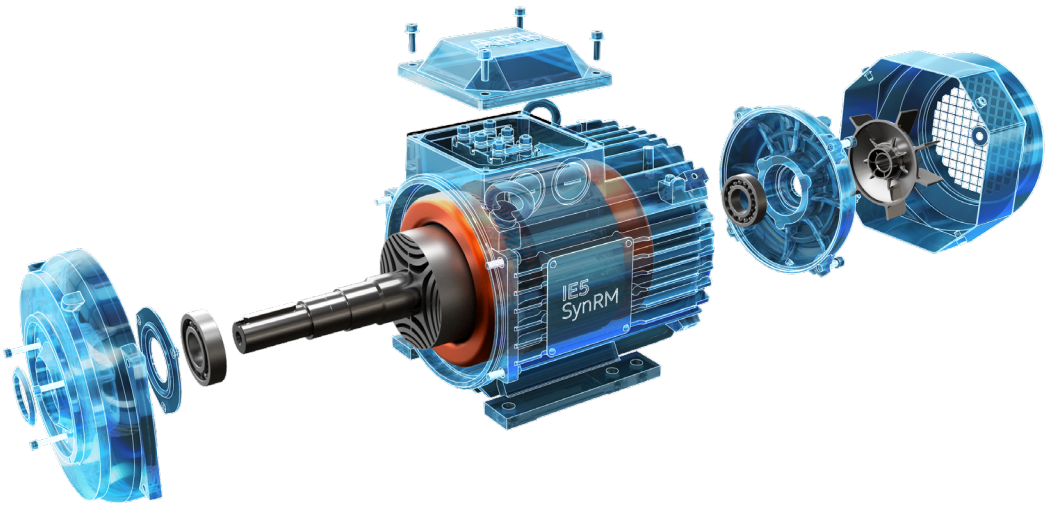
6. Cabling, grounding, and EMC

Synchronous reluctance motors are not equipped with EMC filters as standard. The variant code to order EMC cable glands is 704.

The use of a frequency converter sets higher demands on the cabling and grounding of the drive system. In other than exceptional circumstances, the motor must be cabled with shielded symmetrical cables and cable glands providing 360-degree bonding (EMC glands). For motors up to 30 kW, asymmetrical cables can be used, but shielded cables are always recommended, especially if there are sensitive components in the driven application.

For motors from frame size 280 upwards, additional potential equalization is needed between the motor frame and machinery, unless the motor and the driven machine are installed on a common steel base. When a steel base is used for potential equalization, the high frequency conductivity of the connection must be checked. For more information, see the ABB manual “Grounding and cabling of drive systems”, 3AFY61201998 Rev D.

To meet EMC requirements, special EMC cables must be used in addition to the correct cable gland mounting, with additional special earthing pieces. For more information, refer to drive manuals.



Efficiency classes for VSD motors

Technical specification IEC TS 60034-30-2 (2016) specifies the efficiency classes for variable speed drive (VSD) motors (i.e. motors which cannot be operated direct on line (DOL)). Typical standard low voltage induction motor efficiency is determined according to IEC 60034-30-1 in sinusoidal (DOL) supply.

IEC TS 60034-30-2 highlights

- The IE class limit values in IEC TS 60034-30-2 are reduced by adding the additional harmonic losses caused by the drive:
  - 15% additional losses for motors up to 90 kW
  - 25% additional losses for motors above 90 kW
- Limit values available up to IE5 level
- Limit values to be achieved with 90% speed, 100% torque

DOL or VSD motor – Same IE class, same efficiency performance in VSD duty

This allows direct comparison in IE class level of traditional induction motors in variable speed usage and advanced technology motors designed only for variable speed drive (like Synchronous reluctance motors). It does not matter if the IE classification is done with DOL supply according to IEC 60034-30-1 or with VSD supply according to IEC TS 60034-30-2. The given IE class still illustrates efficiency performance of both solutions in VSD operation very well. Same IE class, same efficiency performance.

Higher efficiency performance within the same IE class - IE6 Efficiency

ABB's IE6 Hyper Efficiency Synchronous Reluctance (SynRM) motors set a new benchmark for industrial sustainability and performance. They deliver consistently high efficiency in demanding applications, helping reduce energy use and CO_2 emissions.

IE6 Hyper-Efficiency is an anticipated efficiency class which ABB – along with many other industry bodies - defines as having 20 percent lower losses than comparable IE5 products. Currently the highest defined IE class is IE5, which means new IE6 motors are labelled IE5 even if minimum efficiency level of IE5 class is exceeded considerably.

High efficiency saves energy and reduces emissions

ABB's SynRM portfolio for safe areas currently comprises IE5 motors in powers up to 90 kW and IE6 from 110 kW upwards. Both IE5 and IE6 SynRMs are great options for energy-intensive applications, with IE6 having an even shorter payback time than IE5.

In the technical tables you can see the measured SynRM motor efficiency with VSD supply, along with anticipated IE6 and defined IE5 limit values for comparison. The tables also include typical IE3 and IE4 induction motor efficiency values with VSD supply to provide an additional reference point.

EXAMPLE COMPARISON FOR DOL AND VSD EFFICIENCY

90 kW 4-pole motor efficiency	
IEC 60034-30-1 (DOL)	IEC TS 60034-30-2 (VSD)
Losses 2,88 kW	Losses 2,88 kW x 1,15 = 3,31 kW
Eff. (90kw/92,88 kw)	Eff. (90 kW/ (90 + 3,31 kw)
= 96,9%	= 96,5%
IE5 limit 96,9%	IE5 limit 96,5%
Same motor is IE5 according to both standards	

High output for compactness - High performance for compact machine designs

High output SynRM motor is a compact and yet highly efficient motor that's up to three frame sizes smaller than a conventional motor. Rotor losses are virtually eliminated, resulting in cool running. This advantage is the basis for a high output SynRM design that delivers high power density coupled with good efficiency. High output SynRM motors enable compact and cost efficient machine designs or increased machine output without increasing motor size.

Same power - smaller motor

The High output synchronous reluctance motor is up to three frame sizes smaller than an induction motor with the same output. The size advantage increases with speed so the benefit is greater for 3000 than for 1500 rpm applications. A light, compact motor means cost-efficient installations.

Same size - higher power

The size advantage of synchronous reluctance motors can also be exploited to increase capacity without changes in the motor installation. In other words, a high output synchronous reluctance motor can deliver up to twice the output of an induction motor of the same size. Again, this power advantage is greater at higher speeds.

Customer benefits

SAME OUTPUT FROM A SMALLER SIZE OR HIGHER OUTPUT FROM THE SAME SIZE.

Application example, 22 kW, 1500 rpm		
	High output SynRM motor	**IE3 induction motor**
Frame size	160	180
Weight, kg	174	222

REDUCED SYSTEM SPACE – LOWER WEIGHT, EASIER INSTALLATION.

Application example, 37 kW, 3000 rpm		
	High output SynRM motor	**IE3 induction motor**
Frame size	160	200
Weight, kg	157	298
Free area around motor, %	 **Free area: 65%**	 **Free area: 25%**

Technology

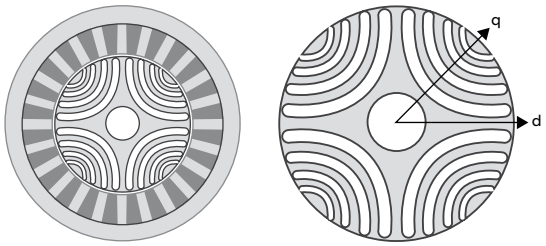
01 Cross-sectional illustration of a four-pole synchronous reluctance motor (left), and the definition of the magnetic d- and q-axes of its rotor (right).

Introduction

The synchronous reluctance motor is a three-phase electric motor with a magnetically anisotropic rotor structure. In the four-pole version, the rotor has four high- and four low-permeance axes. High permeance means high magnetic conductivity and higher inductance, while low permeance means lower inductance.

Reluctance is the inverse of permeance and is, in practical terms, magnetic resistance; high reluctance results in low inductance. The axes with high permeance can be referred to as the direct or d-axis, while the axes with high reluctance can be referred to as the quadrature or q-axis.

The figures below show cross-sectionals of a synchronous reluctance motor. The different axes in the rotor are identified in the figure on the right.



01

Functional principle

When a magnetic field is produced in the air gap by applying exciting currents to the stator windings, the rotor will strive to align its most magnetically conductive axis, the d-axis, with the applied field, in order to minimize the reluctance in the magnetic circuit. In other words, torque is produced in the air gap between the stator and rotor whenever the applied field vector and the d-axis of the rotor are not aligned.

The magnitude of the vector field and the speed of its rotation can be controlled by a frequency converter. The high saliency of the rotor means that its angular position can easily be detected by a sensorless control. Expensive absolute encoders, resolvers, and other rotational sensors are therefore not required.

The sensorless control system keeps track of the rotor's angular position in relation to the stator and creates a vector field with accurate magnitude and rotational speed in accordance with the control reference signals dictated by the load.

Since performance is dependent on the information about the rotor's position, the motor needs a frequency converter; it cannot be started with a direct-on-line supply. The rotor runs in synchronism with the applied vector field, striving to minimize reluctance in the magnetic circuit that is present. This functional principle has given its name to the technology – synchronous reluctance.

Synchronous reluctance motors run smoothly due to the sinusoidal air gap field distribution and operation with sinusoidal current.

Rotor design

The rotor design of a synchronous reluctance motor comprises electric steel plates stacked together to form a rotor package. The electric steel plates have punched holes as flux barriers, as illustrated in the figure 01.

The torque produced by the motor is proportional to the difference between the inductances on the d- and q-axes: the greater this difference, the greater the torque production. The synchronous reluctance motor is therefore designed with magnetically conductive material, iron, in the d-axis and magnetically insulating material, air, in the q-axis.

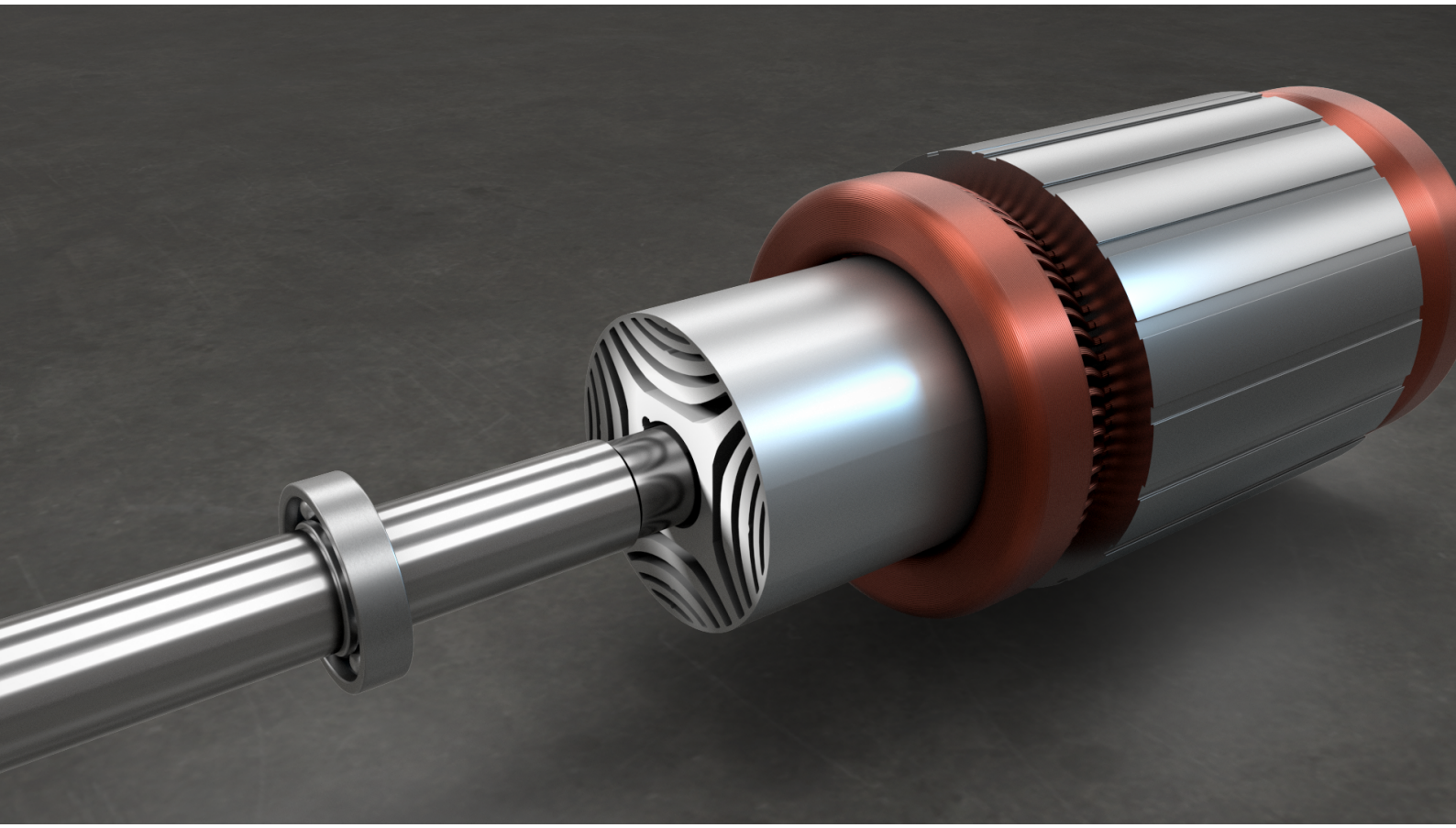
As the rotor has no windings and consequently no joule losses, it runs considerably cooler and with better efficiency than the rotor in an induction motor. The cool running of the rotor also means lower bearing temperatures, which in turn increase the reliability of the bearing system.

Further considerations

Eliminating rotor joule losses in the synchronous reluctance motor has led to compact construction, good efficiency levels and cooler bearing temperatures. The main disadvantage of this technology is that the motor's power factor is generally not as good as with induction motors.

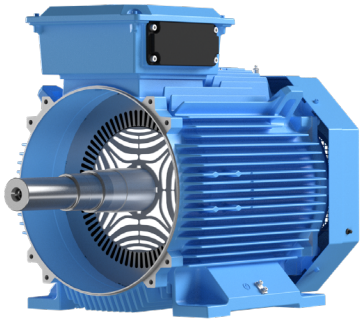
Since there is always a frequency converter between the motor and the grid, the lower power factor is not apparent on the grid side and consequently does not have an impact on the grid supply dimensioning. However, the lower power factor may sometimes mean that a frequency converter with a higher current rating is needed.

The stator and frame design are based on proven induction motor technology, and the rotor consists of only iron and air. The lack of windings and permanent magnets in the rotor eliminates potential faults associated with these components, resulting in robust motor technology optimized for industrial variable speed applications.



Synchronous reluctance motors with ABB variable speed drives

Adding a variable speed drive to motor-driven pumps, fans, or compressors can typically reduce power consumption by up to 25%, while applications requiring precise speed or position - like cranes, hoists and conveyors - benefit from improved control and operational accuracy.



ACS580 general purpose drive highlights

- A scalable offering from 0.75 kW to 500 kW.
- All compatible drive for typical light industry applications such as compressors, conveyors, mixers, pumps and fans, as well as many other variable and constant torque applications.
- The assistant control panel with multiple language choices as standard.
- An optional Bluetooth control panel for wireless commissioning and monitoring. Primary settings and application control macros ensure quick product setup.
- Enclosure classes IP21, IP42, IP55 and IP66 for various ambient conditions.
- Integrated safety, including the safe-torque off (STO) feature as standard.

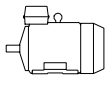
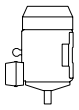
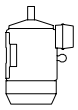
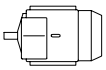
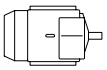
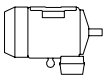
Industry specific ACH580 drives for HVAC and ACQ580 drives for water and wastewater are also available for SynRM control. Consult ABB to find the drive that matches your business needs the best or visit our web page .

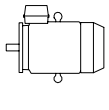
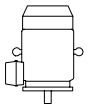
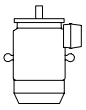
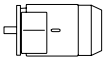
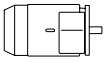
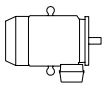
ACS880 industrial drive highlights

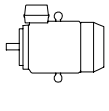
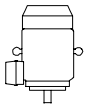
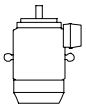
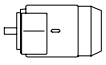
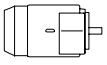
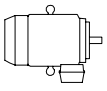
- All compatible drives range for numerous demanding industries and applications such as cranes, extruders, winches, winders, conveyors and compressors, among others.
- Compact design for easy installation, commissioning, and maintenance.
- Enclosure classes IP21, IP22, IP42, IP54 and IP55 for various ambient conditions.
- Integrated safety, including the safe-torque-off (STO) feature as standard.
- A memory module stores drive settings and can be installed in a new drive by anyone on the site.
- Supports various motor types: induction, permanent magnet, and synchronous reluctance motors.
- Direct torque control (DTC) – ABB's signature motor control technology provides precise speed and torque control also without any feedback devices like encoders or position sensors.

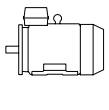
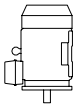
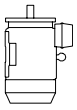
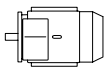
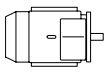
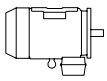
Consult ABB to find the drive that matches your business needs the best or visit our web page .

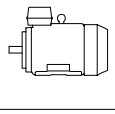
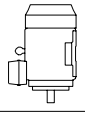
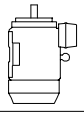
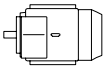
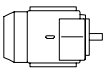
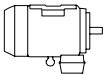
Mounting arrangements

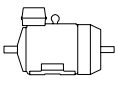
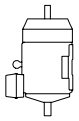
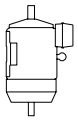
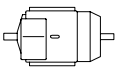
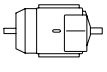
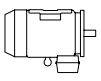
Foot-mounted motor						
Code I / code II						**Product code pos. 12**
						A: foot-mounted, term. box top
IM B3	IM V5	IM V6	IM B6	IM B7	IM B8	
IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071	

Flange-mounted motor, large flange						
Code I / code II						**Product code pos. 12**
						B: flange mounted, large flange
IM B5	IM V1	IM V3	*)	*)	*)	
IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071	

Flange-mounted motor, small flange						
Code I / code II						**Product code pos. 12**
						C: flange mounted, small flange
IM B14	IM V18	IM V19	*)	*)	*)	
IM 3601	IM 3611	IM 3631	IM 3651	IM 3661	IM 3671	

Foot- and flange-mounted motor with feet, large flange						
Code I / code II						**Product code pos. 12**
						H: foot/flange-mounted, term. box top
IM B35	IM V15	IM V35	*)	*)	*)	
IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071	

Foot- and flange-mounted motor with feet, small flange						
Code I / code II						**Product code pos. 12**
						J: foot/flange-mounted, small flange
IM B34	IM V17					
IM 2101	IM 2111	IM 2131	IM 2151	IM 2161	IM 2171	

Foot-mounted motor, shaft with free extensions						
Code I / code II						**Product code pos. 12**
						
IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072	

*) Not stated in IEC 60034-7.

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

Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3BL	160 MLA	3GBL 162 413	- ASC	445
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 to 4	
3GBL	Totally enclosed fan-cooled synchronous reluctance motor with cast iron frame, sizes 90-315

Positions 5 to 6	
IEC size	
09:	90
10:	100
11:	112
13:	132
16:	160
18:	180
20:	200
22:	225
25:	250
28:	280
31:	315

Position 7	
Pole pairs	
2:	4 poles

Positions 8 to 10	
8:	Frame length
9:	Stator package length
10:	Speed for SynRM motors

Speeds for SynRM motors:
2 = 1000-1200 r/min
3 = 1500-1800 r/min
5 = 2100 r/min
7 = 3000-3600 r/min

Position 11
-(dash)

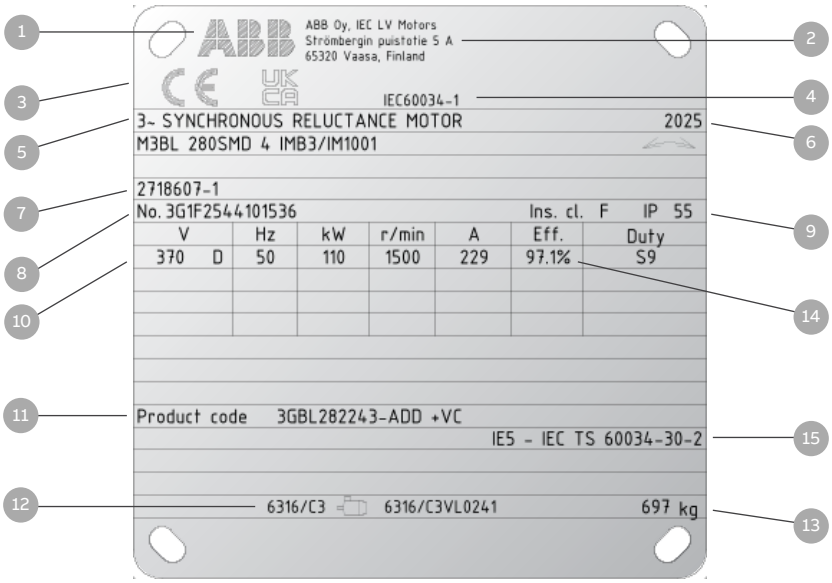
Position 12 (marked with black dot in data tables)	
Mounting arrangement	
A:	Foot-mounted
B:	Flange-mounted, large flange
Use a variant code for ordering any other mounting arrangement	

Position 13 (marked with black dot in data tables)	
Voltage and frequency	
D:	400 VΔ 50 Hz or 460 VΔ 60 Hz
E:	500 VΔ 50 Hz
F:	500 VY 50 Hz
R:	380 VY 60 Hz or 380 VD 60 Hz
S:	400 VY 50 Hz or 460 VY 60 Hz
U:	690 VY 50 Hz or 400 VD 50 Hz

Generation code	
B	High output synchronous reluctance motors
C	IE5 synchronous reluctance motors
D	Anticipated IE6 Synchronous reluctance Motors

Variant codes
The product code must be, if needed, followed by variant codes.

Rating plates



1 ABB logo

2 Manufacturing place

3 CE mark on Ecodesign approved motors UKCA mark on UK approved motors

4 Manufacturing standard

5 Product description

6 Manufacturing year

7 Factory order reference number

8 Serial number

9 Insulation class, IP protection class

10 Voltage, Frequency, output, speed, current, power factory, duty

11 Product code

12 Bearing type

13 Weight

14 Efficiency level

15 Labelled efficiency class

Technical data

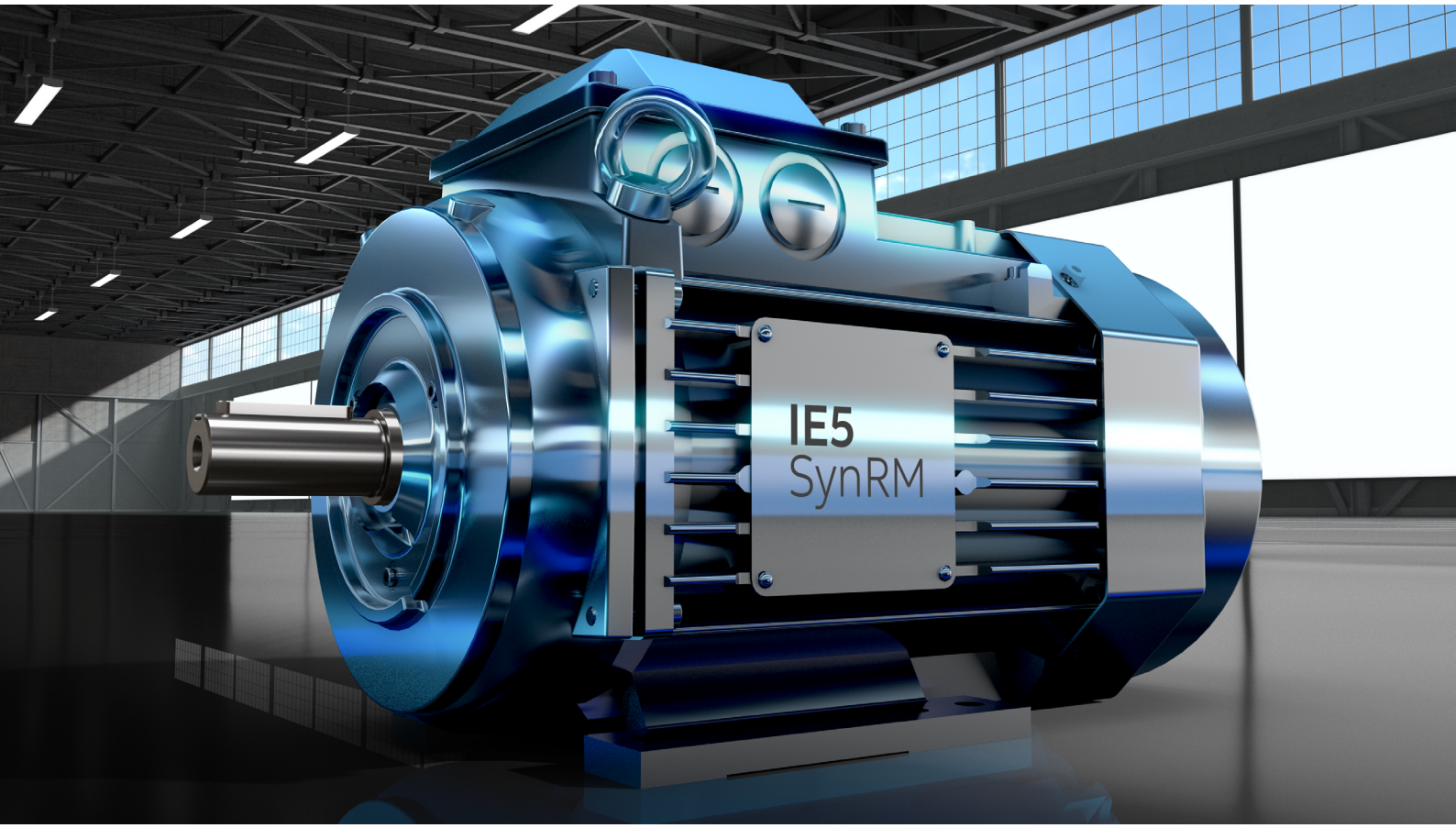
High efficiency IE5 Synchronous reluctance motors, network voltage 400 V

IE5 EFFICIENCY CLASS ACCORDING TO IEC TS 60034-30-2;2016

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque		Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply*		IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
							T_N Nm	T_{OL}/T_N Nm				IE3	IE4		
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**									
1.5	M3BL 90LA 4	3GBL092517-*SC	3000	87,4	6000	3,6	4,8	2.3	0,0026	26	B	82,3	84,8	87,4	89,7
2.2	M3BL 90LB 4	3GBL092527-*SC	3000	88,9	6000	5,1	7	2.2	0,00289	27	B	84,1	86,4	88,9	90,9
3	M3BL 100LKA 4	3GBL102817-*SC	3000	89,9	6000	6,8	9,6	2.6	0,00517	34	B	85,4	87,7	89,9	91,7
4	M3BL 112MA 4	3GBL112317-*SC	3000	90,7	6000	8,9	12,7	2.1	0,0075	43	B	86,6	88,7	90,7	92,5
5.5	M3BL 132SMA 4	3GBL132217-*SC	3000	91,6	4500	12,1	17,5	2.1	0,0145	63	B	87,8	89,7	91,6	93,2
7.5	M3BL 132SMB 4	3GBL132227-*SC	3000	92,4	4500	16,5	23,9	2	0,0145	63	B	88,8	90,6	92,4	93,7
11	M3BL 160MLA 4	3GBL162417-*SC	3000	93,2	6000	25,5	35	1.8	0,0579	133	B	90	91,6	93,2	94,5
15	M3BL 160MLB 4	3GBL162427-*SC	3000	93,7	6000	34,6	48	1.6	0,0579	133	B	90,8	92,4	93,7	95
18.5	M3BL 160MLC 4	3GBL162437-*SC	3000	94,2	6000	43	59	1.7	0,0579	133	B	91,4	92,8	94,2	95,3
22	M3BL 180MLB 4	3GBL182427-*SC	3000	94,4	6000	50	70	1.5	0,116	190	B	91,7	93,2	94,4	95,5
30	M3BL 200MLC 4	3GBL202437-*SC	3000	94,9	5000	68,9	95,6	1.5	0,207	277	B	92,4	93,7	94,9	95,9
37	M3BL 200MLD 4	3GBL202447-*SC	3000	95,2	5000	84,5	118	1.5	0,207	277	B	92,8	94,1	95,2	96,1
45	M3BL 225SMB 4	3GBL222227-*SC	3000	95,4	5000	99,8	143	1.5	0,302	330	B	93,2	94,3	95,4	96,3
55	M3BL 250SMA 4	3GBL252217-*SC	3000	95,7	5000	123	175	1.5	0,499	396	B	93,5	94,6	95,7	96,5
75	M3BL 280SMA 4	3GBL282217-*DC	3000	96	3600	168	239	1.4	0,76	600	B	94	95	96	96,8
90	M3BL 280SMB 4	3GBL282227-*DC	3000	96,1	3600	201	287	1.4	0,76	600	B	94,3	95,2	96,1	96,9
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**									
1.1	M3BL 90LC 4	3GBL092533-*SC	1500	88,1	6000	2,8	7	3	0,00332	30	B	82,1	85,6	88,1	90,2
1.5	M3BL 90LD 4	3GBL092543-*SC	1500	89,1	6000	3,7	9,6	2.7	0,00431	32	B	83,5	86,7	89,1	91
2.2	M3BL 100LKB 4	3GBL102823-*SC	1500	90,2	6000	5,4	14	3.6	0,0075	40	B	85	88,1	90,2	92
3	M3BL 100LKC 4	3GBL102833-*SC	1500	91	6000	7,2	19,1	3.5	0,00889	45	B	86,1	89,1	91	92,7
5.5	M3BL 132SMA 4	3GBL132213-*SC	1500	92,5	4500	11,7	35	2.1	0,0277	85	B	88,2	90,8	92,5	94
7.5	M3BL 132SMB 4	3GBL132223-*SC	1500	93,2	4500	15,7	47,8	2	0,0277	85	B	89,1	91,6	93,2	94,4
11	M3BL 160MLA 4	3GBL162413-*SC	1500	93,8	6000	24,2	70	1.8	0,0702	160	B	90,2	92,4	93,8	95
15	M3BL 160MLB 4	3GBL162423-*SC	1500	94,4	6000	32,1	95,5	1.8	0,0864	177	B	91	93	94,4	95,4
18.5	M3BL 180MLB 4	3GBL182423-*SC	1500	94,6	6000	42,8	118	1.5	0,156	222	B	91,6	93,4	94,6	95,7
22	M3BL 180MLC 4	3GBL182433-*SC	1500	94,9	6000	49,4	140	1.5	0,156	222	B	92	93,7	94,9	95,9
30	M3BL 200MLB 4	3GBL202423-*SC	1500	95,3	5000	65	191	1.5	0,287	304	B	92,7	94,2	95,3	96,2
37	M3BL 225SMB 4	3GBL222223-*SC	1500	95,5	4000	79,3	236	1.5	0,38	385	B	93	94,5	95,5	96,5
45	M3BL 225SMC 4	3GBL222233-*SC	1500	95,8	4000	98,5	286	1.5	0,38	350	B	93,4	94,7	95,8	96,6
55	M3BL 250SMB 4	3GBL252223-*SC	1500	96	4000	117	350	1.5	0,632	454	B	93,8	95,1	96	96,8
75	M3BL 280SMA 4	3GBL282213-*DC	1500	96,2	2600	166	478	2.2	1	639	B	94,3	95,4	96,2	97
90	M3BL 280SMB 4	3GBL282223-*DC	1500	96,5	2600	199	573	2	1	639	B	94,5	95,5	96,5	97,1
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**									
0.75	M3BL 90LC 4	3GBL092532-*SC	1000	83,9	6000	1,9	7,2	2.6	0,00332	30	B	76,5	80,6	83,9	86,7
1.1	M3BL 90LD 4	3GBL092542-*SC	1000	85,6	6000	2,7	10,5	2.2	0,00431	32	B	78,8	82,6	85,6	88,1
1.5	M3BL 100LKA 4	3GBL102812-*SC	1000	86,9	6000	3,6	14,3	2.5	0,00517	34	B	80,4	84,1	86,9	89,2
2.2	M3BL 112MA 4	3GBL112312-*SC	1000	88,3	6000	5	21	2.4	0,0075	43	B	82,4	85,8	88,3	90,5
3	M3BL 132SMA 4	3GBL132212-*SC	1000	89,3	4500	7	28,7	2.6	0,0167	69	B	83,8	87,1	89,3	91,4
4	M3BL 132SMB 4	3GBL132222-*SC	1000	90,2	4500	9,1	38,2	2.5	0,0207	78	B	85,1	88,1	90,2	92
5.5	M3BL 132SMC 4	3GBL132232-*SC	1000	91,1	4500	12,4	52,6	2.4	0,0253	85	B	86,4	89,2	91,1	92,8
7.5	M3BL 160MLA 4	3GBL162412-*SC	1000	91,9	6000	16,5	72	1.9	0,0702	160	B	87,7	90,1	91,9	93,5
11	M3BL 160MLB 4	3GBL162422-*SC	1000	92,8	6000	24,1	105	1.9	0,0864	177	B	89	91,2	92,8	94,2
15	M3BL 180MLC 4	3GBL182432-*SC	1000	93,5	5000	34,1	143	1.5	0,156	216	B	90	91,9	93,5	94,7
18.5	M3BL 200MLA 4	3GBL202412-*SC	1000	93,8	5000	39,9	177	2.3	0,287	304	B	90,6	92,5	93,8	95,1
22	M3BL 200MLB 4	3GBL202422-*SC	1000	94,2	5000	47	210	2.1	0,287	304	B	91,1	92,8	94,2	95,3
30	M3BL 225SMB 4	3GBL222222-*SC	1000	94,6	4000	64,7	287	1.5	0,38	348	B	91,9	93,4	94,6	95,7
37	M3BL 250SMA 4	3GBL252212-*SC	1000	95	4000	80,5	353	1.7	0,575	428	B	92,4	93,7	95	95,9
45	M3BL 280SMA 4	3GBL282212-*DC	1000	95,2	2600	98,6	430	2.3	1	639	B	92,8	94,1	95,2	96,1
55	M3BL 280SMB 4	3GBL282222-*DC	1000	95,4	2600	119	526	2	1	639	B	93,3	94,4	95,4	96,3
75	M3BL 315SMA 4	3GBL312212-*DC	1000	95,8	2200	164	717	2.1	1,64	873	B	93,8	94,7	95,8	96,6
90	M3BL 315SMB 4	3GBL312222-*DC	1000	96	2200	199	859	2.1	1,87	925	B	94,2	95	96	96,7

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**COMPACT-design**									
3	M3BL 90LC 4	3GBL092537-*SC	3000	89,9	6000	7	9,5	2.4	0,00332	30	B	85,4	87,7	89,9	91,7
4	M3BL 100LKB 4	3GBL102827-*SC	3000	90,7	6000	8,9	12,7	2.4	0,00517	40	B	86,6	88,7	90,7	92,5
4	M3BL 90LD 4	3GBL092547-*SC	3000	90,7	6000	9,2	12,7	2.3	0,00431	32	B	86,6	88,7	90,7	92,5
5.5	M3BL 100LKC 4	3GBL102837-*SC	3000	91,6	6000	12,3	17,5	2.5	0,0074	46	B	87,8	89,7	91,6	93,2
5.5	M3BL 112MB 4	3GBL112327-*SC	3000	91,6	6000	12,3	17,5	2.5	0,0074	43	B	87,8	89,7	91,6	93,2
7.5	M3BL 100LKD 4	3GBL102847-*SC	3000	92,4	6000	17,1	23,9	2.6	0,0074	46	B	88,8	90,6	92,4	93,7
7.5	M3BL 112MC 4	3GBL112337-*SC	3000	92,4	6000	17,1	23,9	2.6	0,0074	43	B	88,8	90,6	92,4	93,7
11	M3BL 100LKE 4	3GBL102857-*SC	3000	93,2	6000	24,7	35	2.6	0,00878	49	B	90	91,6	93,2	94,5
11	M3BL 132SMC 4	3GBL132237-*SC	3000	93,2	4500	24,5	35	2.5	0,0184	69	B	90	91,6	93,2	94,5
15	M3BL 132SMD 4	3GBL132247-*SC	3000	93,7	4500	32,9	47,8	2.1	0,0184	69	B	90,8	92,4	93,7	95
75	M3BL 250SMB 4	3GBL252227-*SC	3000	96	5000	167	239	1.5	0,499	396	B	94	95	96	96,8
90	M3BL 250SMC 4	3GBL252237-*SC	3000	96,1	5000	198	286	1.5	0,632	454	B	94,3	95,2	96,1	96,9
1500 r/min = 4 poles				**50 Hz**		**COMPACT-design**									
4	M3BL 100LKD 4	3GBL102843-*SC	1500	91,8	6000	10,2	25,5	3.3	0,00878	45	B	87,1	89,9	91,8	93,3
1000 r/min = 4 poles				**33,3 Hz**		**COMPACT-design**									
75	M3BL 280SMC 4	3GBL282232-*DC	1000	95,8	2600	160	715	1.9	1,21	697	B	93,8	94,7	95,8	96,6

*Additional Motor losses acc. to IEC TS60034-30-2



High efficiency IE6 Synchronous reluctance motors, network voltage 400 V

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**									
110	M3BL 315SMA 4	3GBL312217-*DD	3000	96,8	3600	251	350	1.3	1,38	873	B	94,1	95	96	96,8
132	M3BL 315SMB 4	3GBL312227-*DD	3000	96,9	3600	298	420	1.4	1,38	873	B	94,3	95,3	96,2	96,9
160	M3BL 315SMC 4	3GBL312237-*DD	3000	97	3600	355	509	1.2	1,59	921	B	94,6	95,4	96,3	97
200	M3BL 315MLA 4	3GBL312417-*DD	3000	97,1	3600	439	637	1.4	1,91	1074	B	94,8	95,7	96,5	97,1
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**									
110	M3BL 315SMC 4	3GBL312233-*DD	1500	97	2200	228	701	2	1,81	965	B	94,3	95,4	96,3	97
132	M3BL 315SMD 4	3GBL312243-*DD	1500	97,1	2200	275	840	1.9	1,86	1001	B	94,6	95,5	96,4	97,1
160	M3BL 315MLA 4	3GBL312413-*DD	1500	97,3	2200	329	1019	1.7	2,06	1091	B	94,8	95,8	96,5	97,3
200	M3BL 315MLB 4	3GBL312423-*DD	1500	97,4	2200	419	1274	1.9	2,27	1139	B	95	95,9	96,8	97,4
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**									
110	M3BL 315MLA 4	3GBL312412-*DD	1000	96,6	2200	233	1052	2	2,06	1091	B	93,9	94,8	95,8	96,6
132	M3BL 315LKA 4	3GBL312812-*DD	1000	96,8	2200	281	1263	2	2,57	1376	B	94,3	95	96	96,8
160	M3BL 315LKB 4	3GBL312822-*DD	1000	96,9	2200	332	1530	1.8	2,93	1460	B	94,6	95,3	96,2	96,9

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**COMPACT-design**									
110	M3BL 280SMC 4	3GBL282237-*DD	3000	96,8	3600	251	350	1.4	1,11	697	B	94,1	95	96	96,8
132	M3BL 280SMD 4	3GBL282247-*DD	3000	96,9	3600	298	420	1.5	1,11	699	B	94,3	95,3	96,2	96,9
160	M3BL 280MLA 4	3GBL282417-*DD	3000	97	3600	365	509	1.2	1,36	824	B	94,6	95,4	96,3	97
200	M3BL 280MLB 4	3GBL282427-*DD	3000	97,1	3600	449	637	1.4	1,36	824	B	94,8	95,7	96,5	97,1
250	M3BL 280MLC 4	3GBL282437-*DD	3000	97,1	3600	561	796	1.3	1,57	877	B	94,8	95,7	96,5	97,1
250	M3BL 315MLB 4	3GBL312427-*DD	3000	97,1	3600	547	796	1.5	2,12	1130	B	94,8	95,7	96,5	97,1
280	M3BL 280MLD 4	3GBL282447-*DD	3000	97,1	3600	626	892	1.8	1,58	877	F	94,8	95,7	96,5	97,1
315	M3BL 315MLC 4	3GBL312437-*DD	3000	97,1	3600	689	1003	1.6	2,33	1179	F	94,8	95,7	96,5	97,1
355	M3BL 315LKA 4	3GBL312817-*DD	3000	97,1	3600	806	1131	2.1	2,65	1350	F	94,8	95,7	96,5	97,1
400	M3BL 315LKB 4	3GBL312827-*DD	3000	97,1	3600	890	1274	1.9	2,65	1350	F	94,8	95,7	96,5	97,1
450	M3BL 315LKC 4	3GBL312837-*DD	3000	97,1	3600	987	1432	1.6	2,65	1350	F	94,8	95,7	96,5	97,1
1500 r/min = 4 poles				**50 Hz**		**COMPACT-design**									
110	M3BL 280SMD 4	3GBL282243-*DD	1500	97	2600	234	701	2	1,15	719	B	94,3	95,4	96,3	97
250	M3BL 315LKB 4	3GBL312823-*DD	1500	97,4	2200	525	1592	2	2,93	1461	B	95	95,9	96,8	97,4
315	M3BL 315LKC 4	3GBL312833-*DD	1500	97,4	2200	681	2007	2	3,22	1533	B	95	95,9	96,8	97,4
1000 r/min = 4 poles				**33,3 Hz**		**COMPACT-design**									
200	M3BL 315LKC 4	3GBL312832-*DD	999	97	2200	426	1911	2	3,24	1533	B	94,8	95,4	96,3	97

*Additional Motor losses acc. to IEC TS60034-30-2

High efficiency IE5 Synchronous reluctance motors, network voltage 460 V

IE5 EFFICIENCY CLASS ACCORDING TO IEC TS 60034-30-2;2016

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**BASIC-design**									
1.5	M3BL 90LA 4	3GBL092517-*SC	3600	87,4	6000	3,09	4	2,7	0,0026	26	B	82,3	84,8	87,4	89,7
2.2	M3BL 90LB 4	3GBL092527-*SC	3600	88,9	6000	4,37	5,8	2,4	0,00289	27	B	84,1	86,4	88,9	90,9
3	M3BL 100LKA 4	3GBL102817-*SC	3600	89,9	6000	5,77	8	2,9	0,00517	34	B	85,4	87,7	89,9	91,7
4	M3BL 112MA 4	3GBL112317-*SC	3600	90,7	6000	7,46	10,6	2,4	0,0075	43	B	86,6	88,7	90,7	92,5
5.5	M3BL 132SMA 4	3GBL132217-*SC	3600	91,6	5300	10,8	14,6	2.1	0,0145	63	B	87,8	89,7	91,6	93,2
7.5	M3BL 132SMB 4	3GBL132227-*SC	3600	92,4	5300	13,9	19,9	2	0,0145	63	B	88,8	90,6	92,4	93,7
11	M3BL 160MLA 4	3GBL162417-*SC	3600	93,2	6000	22,4	29,1	1.8	0,0579	133	B	90	91,6	93,2	94,5
15	M3BL 160MLB 4	3GBL162427-*SC	3600	93,7	6000	35	39,7	1.6	0,0579	133	B	90,8	92,4	93,7	95
18.5	M3BL 160MLC 4	3GBL162437-*SC	3600	94,2	6000	37	49,3	1.7	0,0579	133	B	91,4	92,8	94,2	95,3
22	M3BL 180MLB 4	3GBL182427-*SC	3600	94,4	6000	44	58,4	1.5	0,116	190	B	91,7	93,2	94,4	95,5
30	M3BL 200MLC 4	3GBL202437-*SC	3600	94,9	5000	61	79,7	1.5	0,207	277	B	92,4	93,7	94,9	95,9
37	M3BL 200MLD 4	3GBL202447-*SC	3600	95,2	5000	74,8	98,3	1.5	0,207	277	B	92,8	94,1	95,2	96,1
45	M3BL 225SMB 4	3GBL222227-*SC	3600	95,4	5000	88,3	119,4	1.5	0,302	330	B	93,2	94,3	95,4	96,3
55	M3BL 250SMA 4	3GBL252217-*SC	3600	95,7	5000	107	146	1.5	0,499	396	B	93,5	94,6	95,7	96,5
75	M3BL 280SMA 4	3GBL282217-*DC	3600	96	3600	166	238,7	1.2	0,76	600	B	94	95	96	96,8
90	M3BL 280SMB 4	3GBL282227-*DC	3600	96,1	3600	174	238,7	1.3	0,76	600	B	94,3	95,2	96,1	96,9
1800 r/min = 4 poles				**60 Hz**		**BASIC-design**									
1.1	M3BL 90LC 4	3GBL092533-*SC	1800	88,1	6000	2,41	5,8	3,5	0,00332	30	B	82,1	85,6	88,1	90,2
1.5	M3BL 90LD 4	3GBL092543-*SC	1800	89,1	6000	3,12	8	3,2	0,00431	32	B	83,5	86,7	89,1	91
2.2	M3BL 100LKB 4	3GBL102823-*SC	1800	90,2	6000	4,57	11,7	4,1	0,0075	40	B	85	88,1	90,2	92
3	M3BL 100LKC 4	3GBL102833-*SC	1800	91	6000	6,11	15,9	4	0,00889	45	B	86,1	89,1	91	92,7
5.5	M3BL 132SMA 4	3GBL132213-*SC	1800	92,5	5300	10,5	29,2	2.1	0,0277	85	B	88,2	90,8	92,5	94
7.5	M3BL 132SMB 4	3GBL132223-*SC	1800	93,2	5300	13,9	39,8	2	0,0277	85	B	89,1	91,6	93,2	94,4
11	M3BL 160MLA 4	3GBL162413-*SC	1800	93,8	6000	21,1	58,4	1.8	0,0702	160	B	90,2	92,4	93,8	95
15	M3BL 160MLB 4	3GBL162423-*SC	1800	94,4	6000	28,5	78,9	1.8	0,0864	177	B	91	93	94,4	95,4
18.5	M3BL 180MLB 4	3GBL182423-*SC	1800	94,6	6000	38,5	98	1.5	0,156	222	B	91,6	93,4	94,6	95,7
22	M3BL 180MLC 4	3GBL182433-*SC	1800	94,9	6000	43,2	116,7	1.5	0,156	222	B	92	93,7	94,9	95,9
30	M3BL 200MLB 4	3GBL202423-*SC	1800	95,3	5000	57	159	1.5	0,287	304	B	92,7	94,2	95,3	96,2
37	M3BL 225SMB 4	3GBL222223-*SC	1800	95,5	4000	69,3	196	1.5	0,38	385	B	93	94,5	95,5	96,5
45	M3BL 225SMC 4	3GBL222233-*SC	1800	95,8	4000	85,8	238,6	1.5	0,38	350	B	93,4	94,7	95,8	96,6
55	M3BL 250SMB 4	3GBL252223-*SC	1800	96	4000	102	291,5	1.5	0,632	454	B	93,8	95,1	96	96,8
75	M3BL 280SMA 4	3GBL282213-*DC	1800	96,2	2600	145	398	2.2	1	639	B	94,3	95,4	96,2	97
90	M3BL 280SMB 4	3GBL282223-*DC	1800	96,5	2600	170	477	2	1	639	B	94,5	95,5	96,5	97,1
1200 r/min = 4 poles				**40 Hz**		**BASIC-design**									
0.75	M3BL 90LC 4	3GBL092532-*SC	1200	83,9	6000	1,65	6	2,8	0,00332	30	B	76,5	80,6	83,9	86,7
1.1	M3BL 90LD 4	3GBL092542-*SC	1200	85,6	6000	2,25	8,8	2,6	0,00431	32	B	78,8	82,6	85,6	88,1
1.5	M3BL 100LKA 4	3GBL102812-*SC	1200	86,9	6000	3,05	11,9	3	0,00517	34	B	80,4	84,1	86,9	89,2
2.2	M3BL 112MA 4	3GBL112312-*SC	1200	88,3	6000	4,21	17,5	2,8	0,0075	43	B	82,4	85,8	88,3	90,5
3	M3BL 132SMA 4	3GBL132212-*SC	1200	89,3	4500	5,9	23,9	3,1	0,0167	69	B	83,8	87,1	89,3	91,4
4	M3BL 132SMB 4	3GBL132222-*SC	1200	90,2	4500	7,67	31,8	2,9	0,0207	78	B	85,1	88,1	90,2	92
5.5	M3BL 132SMC 4	3GBL132232-*SC	1200	91,1	4500	10,4	43,8	2,8	0,0253	85	B	86,4	89,2	91,1	92,8
7.5	M3BL 160MLA 4	3GBL162412-*SC	1200	91,9	6000	14,3	59,6	1.9	0,0702	160	B	87,7	90,1	91,9	93,5
11	M3BL 160MLB 4	3GBL162422-*SC	1200	92,8	6000	21,2	87,5	1.9	0,0864	177	B	89	91,2	92,8	94,2
15	M3BL 180MLC 4	3GBL182432-*SC	1200	93,5	5000	30,5	119,3	1.5	0,156	216	B	90	91,9	93,5	94,7
18.5	M3BL 200MLA 4	3GBL202412-*SC	1200	93,8	5000	35,1	147,1	2.3	0,287	304	B	90,6	92,5	93,8	95,1
22	M3BL 200MLB 4	3GBL202422-*SC	1200	94,2	5000	43	175	2.1	0,287	304	B	91,1	92,8	94,2	95,3
30	M3BL 225SMB 4	3GBL222222-*SC	1200	94,6	4000	56,1	238,7	1.5	0,38	348	B	91,9	93,4	94,6	95,7
37	M3BL 250SMA 4	3GBL252212-*SC	1200	95	4000	67	294,3	1.7	0,575	428	B	92,4	93,7	95	95,9
45	M3BL 280SMA 4	3GBL282212-*DC	1200	95,2	2600	85	358	2.3	1	639	B	92,8	94,1	95,2	96,1
55	M3BL 280SMB 4	3GBL282222-*DC	1200	95,4	2600	104	438	2	1	639	B	93,3	94,4	95,4	96,3
75	M3BL 315SMA 4	3GBL312212-*DC	1200	95,8	2200	143	597	2.1	1,64	873	B	93,8	94,7	95,8	96,6
90	M3BL 315SMB 4	3GBL312222-*DC	1200	96	2200	173	716	2.1	1,87	925	B	94,2	95	96	96,7

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**COMPACT-design**									
3	M3BL 90LC 4	3GBL092537-*SC	3600	89,9	6000	5,92	7,9	2,7	0,00332	30	B	85,4	87,7	89,9	91,7
4	M3BL 90LD 4	3GBL092547-*SC	3600	90,7	6000	7,78	10,6	2,6	0,00431	32	B	86,6	88,7	90,7	92,5
4	M3BL 100LKB 4	3GBL102827-*SC	3600	90,7	6000	7,51	10,6	2,6	0,00517	40	B	86,6	88,7	90,7	92,5
5.5	M3BL 100LKC 4	3GBL102837-*SC	3600	91,6	6000	10,3	14,6	2,9	0,0074	46	B	87,8	89,7	91,6	93,2
5.5	M3BL 112MB 4	3GBL112327-*SC	3600	91,6	6000	10,3	14,6	2,8	0,0074	43	B	87,8	89,7	91,6	93,2
7.5	M3BL 100LKD 4	3GBL102847-*SC	3600	92,4	6000	14,3	19,9	3	0,0074	46	B	88,8	90,6	92,4	93,7
7.5	M3BL 112MC 4	3GBL112337-*SC	3600	92,4	6000	14,3	19,9	2,9	0,0074	43	B	88,8	90,6	92,4	93,7
11	M3BL 100LKE 4	3GBL102857-*SC	3600	93,2	6000	21,7	29,2	3	0,00878	49	B	90	91,6	93,2	94,5
11	M3BL 132SMC 4	3GBL132237-*SC	3600	93,2	5300	21,8	29,2	2.5	0,0184	69	B	90	91,6	93,2	94,5
15	M3BL 132SMD 4	3GBL132247-*SC	3600	93,7	5300	27,8	39,8	2.1	0,0184	69	B	90,8	92,4	93,7	95
75	M3BL 250SMB 4	3GBL252227-*SC	3600	96	5000	149	198	1.5	0,499	396	B	94	95	96	96,8
90	M3BL 250SMC 4	3GBL252237-*SC	3600	96,1	5000	173	238.7	2.4	0.541	454	B	94,3	95,2	96,1	96,9
1800 r/min = 4 poles				**60 Hz**		**COMPACT-design**									
4	M3BL 100LKD 4	3GBL102843-*SC	1800	91,8	6000	8,66	21,2	3,8	0,00878	45	B	87,1	89,9	91,8	93,3
1200 r/min = 4 poles				**40 Hz**		**COMPACT-design**									
75	M3BL 280SMC 4	3GBL282232-*DC	1200	95,8	2600	138	597	1.9	1,21	697	B	93,8	94,7	95,8	96,6

*Additional Motor losses acc. to IEC TS60034-30-2

High efficiency IE6 Synchronous reluctance motors, network voltage 460 V

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**BASIC-design**									
110	M3BL 315SMA 4	3GBL312217-*DD	3600	96,8	3600	218	291,6	1.3	1,38	873	B	94,1	95	96	96,8
132	M3BL 315SMB 4	3GBL312227-*DD	3600	96,9	3600	260	350	1.3	1,38	873	B	94,3	95,3	96,2	96,9
160	M3BL 315SMC 4	3GBL312237-*DD	3600	97	3600	301	424,4	1.2	1,59	921	B	94,6	95,4	96,3	97
200	M3BL 315MLA 4	3GBL312417-*DD	3600	97,1	3600	376	530,5	1.4	1,91	1074	B	94,8	95,7	96,5	97,1
1800 r/min = 4 poles				**60 Hz**		**BASIC-design**									
110	M3BL 315SMC 4	3GBL312233-*DD	1800	97	2200	197	583,57	1.9	1,81	965	B	94,3	95,4	96,3	97
132	M3BL 315SMD 4	3GBL312243-*DD	1800	97,1	2200	238	700,5	2.2	1,86	1001	B	94,6	95,5	96,4	97,1
160	M3BL 315MLA 4	3GBL312413-*DD	1800	97,3	2200	283	848,8	1.9	2,06	1091	B	94,8	95,8	96,5	97,3
200	M3BL 315MLB 4	3GBL312423-*DD	1800	97,4	2200	361	1061	2.2	2,27	1139	B	95	95,9	96,8	97,4
1200 r/min = 4 poles				**40 Hz**		**BASIC-design**									
110	M3BL 315MLA 4	3GBL312412-*DD	1200	96,6	2200	201	875,4	2.3	2,06	1091	B	93,9	94,8	95,8	96,6
132	M3BL 315LKA 4	3GBL312812-*DD	1200	96,8	2200	244	1050,4	2.5	2,57	1376	B	94,3	95	96	96,8
160	M3BL 315LKB 4	3GBL312822-*DD	1200	96,9	2200	285	1273,2	2.1	2,93	1460	B	94,6	95,3	96,2	96,9

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**COMPACT-design**									
110	M3BL 280SMC 4	3GBL282237-*DD	3600	96,8	3600	217	291,8	1.3	1,11	697	B	94,1	95	96	96,8
132	M3BL 280SMD 4	3GBL282247-*DD	3600	96,9	3600	258	350,1	1.4	1,11	699	B	94,3	95,3	96,2	96,9
160	M3BL 280MLA 4	3GBL282417-*DD	3600	97	3600	309	424,4	1.2	1,36	824	B	94,6	95,4	96,3	97
200	M3BL 280MLB 4	3GBL282427-*DD	3600	97,1	3600	383	530,5	1.3	1,36	824	B	94,8	95,7	96,5	97,1
250	M3BL 280MLC 4	3GBL282437-*DD	3600	97,1	3600	476	663,1	1.2	1,57	877	B	94,8	95,7	96,5	97,1
250	M3BL 315MLB 4	3GBL312427-*DD	3600	97,1	3600	468	663,1	1.4	2,12	1130	B	94,8	95,7	96,5	97,1
280	M3BL 280MLD 4	3GBL282447-*DD	3600	97,1	3600	539	742,7	1.7	1,58	877	B	94,8	95,7	96,5	97,1
315	M3BL 315MLC 4	3GBL312437-*DD	3600	97,1	3600	592	835,6	1.6	2,33	1179	B	94,8	95,7	96,5	97,1
355	M3BL 315LKA 4	3GBL312817-*DD	3600	97,1	3600	702	941,7	2.1	2,65	1350	F	94,8	95,7	96,5	97,1
400	M3BL 315LKB 4	3GBL312827-*DD	3600	97,1	3600	769	1061	1.8	2,65	1350	F	94,8	95,7	96,5	97,1
1800 r/min = 4 poles				**60 Hz**		**COMPACT-design**									
110	M3BL 280SMD 4	3GBL282243-*DD	1800	97	2600	203	584,1	2.4	1,15	719	B	94,3	95,4	96,3	97
250	M3BL 315LKB 4	3GBL312823-*DD	1800	97,4	2200	453	1326,3	2.3	2,93	1461	B	95	95,9	96,8	97,4
315	M3BL 315LKC 4	3GBL312833-*DD	1800	97,4	2200	589	1671,1	2.2	3,22	1533	B	95	95,9	96,8	97,4
1200 r/min = 4 poles				**40 Hz**		**COMPACT-design**									
200	M3BL 315LKC 4	3GBL312832-*DD	1200	97	2200	368	1591,5	2.3	3,24	1533	B	94,8	95,4	96,3	97

*Additional Motor losses acc. to IEC TS60034-30-2

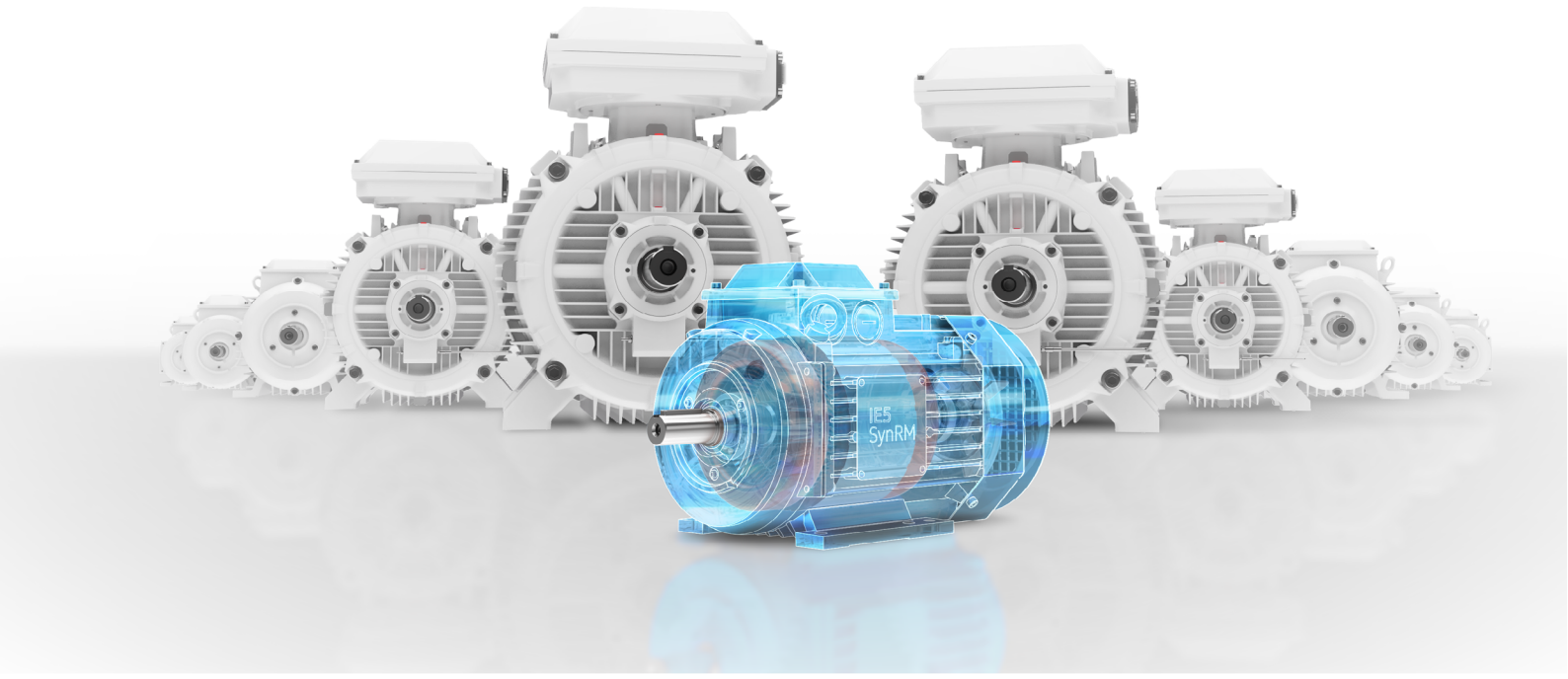
High efficiency IE5 Synchronous reluctance motors, network voltage 380 V

IE5 EFFICIENCY CLASS ACCORDING TO IEC TS 60034-30-2;2016

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**BASIC-design**									
1.5	M3BL 90LA 4	3GBL092517-*RC	3600	87,4	6000	3,9	4	2.6	0,0026	26	B	82,3	84,8	87,4	89,7
2.2	M3BL 90LB 4	3GBL092527-*RC	3600	88,9	6000	5,5	5,8	2.4	0,00289	27	B	84,1	86,4	88,9	90,9
3	M3BL 100LKA 4	3GBL102817-*RC	3600	89,9	6000	7,3	8	2.9	0,00517	34	B	85,4	87,7	89,9	91,7
4	M3BL 112MA 4	3GBL112317-*RC	3600	90,7	6000	9,6	10,6	2.8	0,0075	43	B	86,6	88,7	90,7	92,5
5.5	M3BL 132SMA 4	3GBL132217-*RC	3600	91,6	4500	13	14,6	2.3	0,0145	63	B	87,8	89,7	91,6	93,2
7.5	M3BL 132SMB 4	3GBL132227-*RC	3600	92,4	4500	17,3	19,9	2.1	0,0145	63	B	88,8	90,6	92,4	93,7
11	M3BL 160MLA 4	3GBL162417-*RC	3600	93,2	6000	27,3	29,2	2	0,0579	133	B	90	91,6	93,2	94,5
15	M3BL 160MLB 4	3GBL162427-*RC	3600	93,7	6000	36,3	39,8	1.9	0,0579	133	B	90,8	92,4	93,7	95
18.5	M3BL 160MLC 4	3GBL162437-*RC	3600	94,2	6000	44,3	49,1	1.8	0,0579	133	B	91,4	92,8	94,2	95,3
22	M3BL 180MLB 4	3GBL182427-*RC	3600	94,4	6000	54,1	58,4	1.5	0,116	190	B	91,7	93,2	94,4	95,5
30	M3BL 200MLC 4	3GBL202437-*RC	3600	94,9	5000	74,1	79,7	1.6	0,207	277	B	92,4	93,7	94,9	95,9
37	M3BL 200MLD 4	3GBL202447-*RC	3600	95,2	5000	92,2	98,2	2	0,207	277	B	92,8	94,1	95,2	96,1
45	M3BL 225SMB 4	3GBL222227-*RC	3600	95,4	5000	107	119	2	0,302	330	B	93,2	94,3	95,4	96,3
55	M3BL 250SMA 4	3GBL252217-*RC	3600	95,7	5000	131	146	1.6	0,499	396	B	93,5	94,6	95,7	96,5
75	M3BL 280SMA 4	3GBL282217-*RC	3600	96	3600	180	199	1.4	0,76	600	B	94	95	96	96,8
90	M3BL 280SMB 4	3GBL282227-*RC	3600	96,1	3600	219	239	1,1	0,76	600	B	94,3	95,2	96,1	96,9
1800 r/min = 4 poles				**60 Hz**		**BASIC-design**									
1.1	M3BL 90LC 4	3GBL092533-*RC	1800	88,1	6000	2,9	5,8	3.1	0,00332	30	B	82,1	85,6	88,1	90,2
1.5	M3BL 90LD 4	3GBL092543-*RC	1800	89,1	6000	3,9	8	2.8	0,00431	32	B	83,5	86,7	89,1	91
2.2	M3BL 100LKB 4	3GBL102823-*RC	1800	90,2	6000	5,6	11,7	4.2	0,0075	40	B	85	88,1	90,2	92
3	M3BL 100LKC 4	3GBL102833-*RC	1800	91	6000	7,8	15,9	4	0,00889	45	B	86,1	89,1	91	92,7
5.5	M3BL 132SMA 4	3GBL132213-*RC	1800	92,5	4500	12,6	29,2	2.4	0,0277	85	B	88,2	90,8	92,5	94
7.5	M3BL 132SMB 4	3GBL132223-*RC	1800	93,2	4500	16,9	39,8	2.2	0,0277	85	B	89,1	91,6	93,2	94,4
11	M3BL 160MLA 4	3GBL162413-*RC	1800	93,8	6000	25,5	58,3	2	0,0591	160	B	90,2	92,4	93,8	95
15	M3BL 160MLB 4	3GBL162423-*RC	1800	94,4	6000	34,8	79,5	2	0,0864	177	B	91	93	94,4	95,4
18.5	M3BL 180MLB 4	3GBL182423-*RC	1800	94,6	6000	46,1	98,1	2.5	0,156	222	B	91,6	93,4	94,6	95,7
22	M3BL 180MLC 4	3GBL182433-*RC	1800	94,9	6000	52,7	117	2.1	0,156	222	B	92	93,7	94,9	95,9
30	M3BL 200MLB 4	3GBL202423-*RC	1800	95,3	5000	69,5	159	2.2	0,287	304	B	92,7	94,2	95,3	96,2
37	M3BL 225SMB 4	3GBL222223-*RC	1800	95,5	4000	84,9	196	2.1	0,38	385	B	93	94,5	95,5	96,5
45	M3BL 225SMC 4	3GBL222233-*RC	1800	95,8	4000	104	239	2.1	0,38	350	B	93,4	94,7	95,8	96,6
55	M3BL 250SMB 4	3GBL252223-*RC	1800	96	4000	123	292	2.1	0,632	454	B	93,8	95,1	96	96,8
75	M3BL 280SMA 4	3GBL282213-*RC	1800	96,2	2600	170	398	2.5	1	639	B	94,3	95,4	96,2	97
90	M3BL 280SMB 4	3GBL282223-*RC	1800	96,5	2600	206	477	2.4	1	639	B	94,5	95,5	96,5	97,1
1200 r/min = 4 poles				**40 Hz**		**BASIC-design**									
0.75	M3BL 90LC 4	3GBL092532-*RC	1200	83,9	6000	2	6	2.8	0,00332	30	B	76,5	80,6	83,9	86,7
1.1	M3BL 90LD 4	3GBL092542-*RC	1200	85,6	6000	2,9	8,8	2.7	0,00431	32	B	78,8	82,6	85,6	88,1
1.5	M3BL 100LKA 4	3GBL102812-*RC	1200	86,9	6000	3,9	11,9	3.1	0,00517	34	B	80,4	84,1	86,9	89,2
2.2	M3BL 112MA 4	3GBL112312-*RC	1200	88,3	6000	5,7	17,5	3.3	0,0075	43	B	82,4	85,8	88,3	90,5
3	M3BL 132SMA 4	3GBL132212-*RC	1200	89,3	4500	7,7	23,9	3.3	0,0167	69	B	83,8	87,1	89,3	91,4
4	M3BL 132SMB 4	3GBL132222-*RC	1200	90,2	4500	10,4	31,8	3.4	0,0207	78	B	85,1	88,1	90,2	92
5.5	M3BL 132SMC 4	3GBL132232-*RC	1200	91,1	4500	14,4	43,8	3.3	0,0253	85	B	86,4	89,2	91,1	92,8
7.5	M3BL 160MLA 4	3GBL162412-*RC	1200	91,9	6000	17,5	59,6	2.2	0,0702	160	B	87,7	90,1	91,9	93,5
11	M3BL 160MLB 4	3GBL162422-*RC	1200	92,8	6000	25,7	87,4	2.3	0,0864	177	B	89	91,2	92,8	94,2
15	M3BL 180MLC 4	3GBL182432-*RC	1200	93,5	5000	36,4	119	2.1	0,156	216	B	90	91,9	93,5	94,7
18.5	M3BL 200MLA 4	3GBL202412-*RC	1200	93,8	5000	42,9	147	2.5	0,287	304	B	90,6	92,5	93,8	95,1
22	M3BL 200MLB 4	3GBL202422-*RC	1200	94,2	5000	50,9	175	2.3	0,287	304	B	91,1	92,8	94,2	95,3
30	M3BL 225SMB 4	3GBL222222-*RC	1200	94,6	4000	68,4	239	1.9	0,38	348	B	91,9	93,4	94,6	95,7
37	M3BL 250SMA 4	3GBL252212-*RC	1200	95	4000	81,7	294	2	0,575	428	B	92,4	93,7	95	95,9
45	M3BL 280SMA 4	3GBL282212-*RC	1200	95,2	2600	101	358	2.4	1	639	B	92,8	94,1	95,2	96,1
55	M3BL 280SMB 4	3GBL282222-*RC	1200	95,4	2600	122	438	2.2	1	639	B	93,3	94,4	95,4	96,3
75	M3BL 315SMA 4	3GBL312212-*RC	1200	95,8	2200	168	597	2.2	1,64	873	B	93,8	94,7	95,8	96,6
90	M3BL 315SMB 4	3GBL312222-*RC	1200	96	2200	204	716	2.4	1,87	925	B	94,2	95	96	96,7

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**COMPACT-design**									
3	M3BL 90LC 4	3GBL092537-*RC	3600	89,9	6000	7,4	8	2.3	0,00332	30	B	85,4	87,7	89,9	91,7
4	M3BL 100LKB 4	3GBL102827-*RC	3600	90,7	6000	9,4	10,6	2.4	0,00517	40	B	86,6	88,7	90,7	92,5
4	M3BL 90LD 4	3GBL092547-*RC	3600	90,7	6000	9,8	10,6	2.5	0,00431	32	B	86,6	88,7	90,7	92,5
5.5	M3BL 100LKC 4	3GBL102837-*RC	3600	91,6	6000	14,3	14,6	3.8	0,0074	46	B	87,8	89,7	91,6	93,2
5.5	M3BL 112MB 4	3GBL112327-*RC	3600	91,6	6000	14,3	14,6	3.8	0,0074	43	B	87,8	89,7	91,6	93,2
7.5	M3BL 100LKD 4	3GBL102847-*RC	3600	92,4	6000	19,4	19,9	3.5	0,0074	46	B	88,8	90,6	92,4	93,7
7.5	M3BL 112MC 4	3GBL112337-*RC	3600	92,4	6000	19,4	19,9	3.5	0,0074	43	B	88,8	90,6	92,4	93,7
11	M3BL 100LKE 4	3GBL102857-*RC	3600	93,2	6000	27,2	29,2	3.2	0,00878	49	B	90	91,6	93,2	94,5
11	M3BL 132SMC 4	3GBL132237-*RC	3600	93,2	4500	26,2	29,2	2.9	0,0184	69	B	90	91,6	93,2	94,5
15	M3BL 132SMD 4	3GBL132247-*RC	3600	93,7	4500	34,2	39,8	2.2	0,0184	69	B	90,8	92,4	93,7	95
75	M3BL 250SMB 4	3GBL252227-*RC	3600	96	5000	184	199	2.1	0,499	396	B	94	95	96	96,8
90	M3BL 250SMC 4	3GBL252237-*RC	3600	96,1	5000	208	239	2	0,632	454	B	94,3	95,2	96,1	96,9
1800 r/min = 4 poles				**60 Hz**		**COMPACT-design**									
4	M3BL 100LKD 4	3GBL102843-*RC	1800	91,8	6000	10,6	21,2	3.5	0,00878	45	B	87,1	89,9	91,8	93,3
1200 r/min = 4 poles				**40 Hz**		**COMPACT-design**									
75	M3BL 280SMC 4	3GBL282232-*RC	1200	95,8	2600	163	597	2	1,21	697	B	93,8	94,7	95,8	96,6

*Additional Motor losses acc. to IEC TS60034-30-2



High efficiency IE6 Synchronous reluctance motors, network voltage 380 V

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**BASIC-design**									
110	M3BL 315SMA 4	3GBL312217-*RD	3600	96,8	3600	269	292	1.5	1,38	873	B	94,1	95	96	96,8
132	M3BL 315SMB 4	3GBL312227-*RD	3600	96,9	3600	321	350	1.7	1,38	873	B	94,3	95,3	96,2	96,9
160	M3BL 315SMC 4	3GBL312237-*RD	3600	97	3600	377	425	1.6	1,59	921	B	94,6	95,4	96,3	97
200	M3BL 315MLA 4	3GBL312417-*RD	3600	97,1	3600	468	530	1.4	1,91	1074	B	94,8	95,7	96,5	97,1
1800 r/min = 4 poles				**60 Hz**		**BASIC-design**									
110	M3BL 315SMC 4	3GBL312233-*RD	1800	97	2200	250	584	2	1,81	965	B	94,3	95,4	96,3	97
132	M3BL 315SMD 4	3GBL312243-*RD	1800	97,1	2200	289	700	1.9	1,86	1001	B	94,6	95,5	96,4	97,1
160	M3BL 315MLA 4	3GBL312413-*RD	1800	97,3	2200	355	849	1.7	2,06	1091	B	94,8	95,8	96,5	97,3
200	M3BL 315MLB 4	3GBL312423-*RD	1800	97,4	2200	435	1062	1.9	2,27	1139	B	95	95,9	96,8	97,4
1200 r/min = 4 poles				**40 Hz**		**BASIC-design**									
110	M3BL 315MLA 4	3GBL312412-*RD	1000	96,6	2200	239	876	2	2,06	1091	B	93,9	94,8	95,8	96,6
132	M3BL 315LKA 4	3GBL312812-*RD	1000	96,8	2200	288	1051	2	2,57	1376	B	94,3	95	96	96,8
160	M3BL 315LKB 4	3GBL312822-*RD	1000	96,9	2200	343	1274	1.8	2,93	1460	B	94,6	95,3	96,2	96,9

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3600 r/min = 4 poles				**120 Hz**		**COMPACT-design**									
110	M3BL 280SMC 4	3GBL282237-*RD	3600	96,8	3600	268	292	1.6	1,11	697	B	94,1	95	96	96,8
132	M3BL 280SMD 4	3GBL282247-*RD	3600	96,9	3600	320	350	1.3	1,11	699	B	94,3	95,3	96,2	96,9
160	M3BL 280MLA 4	3GBL282417-*RD	3600	97	3600	387	425	1.7	1,36	824	B	94,6	95,4	96,3	97
200	M3BL 280MLB 4	3GBL282427-*RD	3600	97,1	3600	479	531	1.3	1,36	824	B	94,8	95,7	96,5	97,1
250	M3BL 280MLC 4	3GBL282437-*RD	3600	97,1	3600	595	664	1.4	1,57	877	B	94,8	95,7	96,5	97,1
250	M3BL 315MLB 4	3GBL312427-*RD	3600	97,1	3600	582	664	1.6	2,12	1130	B	94,8	95,7	96,5	97,1
315	M3BL 315MLC 4	3GBL312437-*RD	3600	97,1	3600	741	835	1.9	2,33	1179	F	94,8	95,7	96,5	97,1
355	M3BL 315LKA 4	3GBL312817-*RD	3600	97,1	3600	820	942	1.4	2,65	1350	B	94,8	95,7	96,5	97,1
400	M3BL 315LKB 4	3GBL312827-*RD	3600	97,1	3600	931	1062	1.2	2,65	1350	B	94,8	95,7	96,5	97,1
450	M3BL 315LKC 4	3GBL312837-*RD	3600	97,1	3600	1104	1194	2.3	2,65	1350	F	94,8	95,7	96,5	97,1
1800 r/min = 4 poles				**60 Hz**		**COMPACT-design**									
110	M3BL 280SMD 4	3GBL282243-*RD	1800	97	2600	235	584	2	1,15	719	B	94,3	95,4	96,3	97
250	M3BL 315LKB 4	3GBL312823-*RD	1800	97,4	2200	550	1327	2	2,93	1461	B	95	95,9	96,8	97,4
315	M3BL 315LKC 4	3GBL312833-*RD	1800	97,4	2200	720	1672	2	3,22	1533	B	95	95,9	96,8	97,4
1200 r/min = 4 poles				**40 Hz**		**COMPACT-design**									
200	M3BL 315LKC 4	3GBL312832-*RD	1000	97	2200	429	1591	2	3,24	1533	B	94,8	95,4	96,3	97

*Additional Motor losses acc. to IEC TS60034-30-2

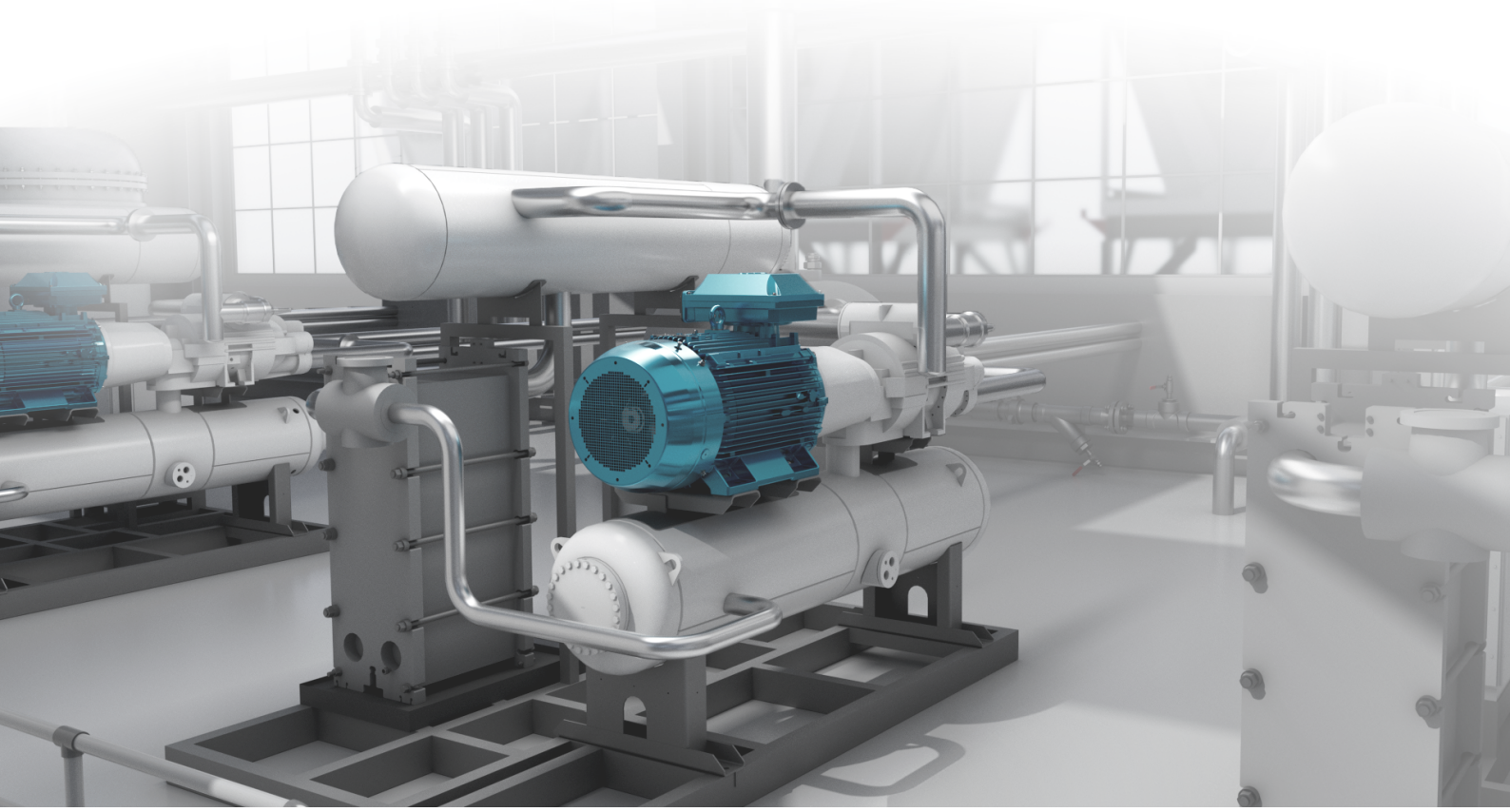
High efficiency IE5 Synchronous reluctance motors, network voltage 500 V

IE5 EFFICIENCY CLASS ACCORDING TO IEC TS 60034-30-2;2016

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**									
1.5	M3BL 90LA 4	3GBL092517-*FC	3000	87,4	6000	2,9	4,8	2.3	0,0026	26	B	82,3	84,8	87,4	89,7
2.2	M3BL 90LB 4	3GBL092527-*FC	3000	88,9	6000	4,1	7	2.2	0,00289	27	B	84,1	86,4	88,9	90,9
3	M3BL 100LKA 4	3GBL102817-*FC	3000	89,9	6000	5,5	9,6	2.7	0,00517	34	B	85,4	87,7	89,9	91,7
4	M3BL 112MA 4	3GBL112317-*FC	3000	90,7	6000	7,2	12,7	2.2	0,0075	43	B	86,6	88,7	90,7	92,5
5.5	M3BL 132SMA 4	3GBL132217-*FC	3000	91,6	4500	9,6	17,5	2.2	0,0145	63	B	87,8	89,7	91,6	93,2
7.5	M3BL 132SMB 4	3GBL132227-*FC	3000	92,4	4500	13,3	23,9	2.1	0,0145	63	B	88,8	90,6	92,4	93,7
11	M3BL 160MLA 4	3GBL162417-*FC	3000	93,2	6000	20,8	35	1.8	0,0579	133	B	90	91,6	93,2	94,5
15	M3BL 160MLB 4	3GBL162427-*FC	3000	93,7	6000	27,2	47,8	1.7	0,0579	133	B	90,8	92,4	93,7	95
18.5	M3BL 160MLC 4	3GBL162437-*FC	3000	94,2	6000	34,1	58,9	1.7	0,0579	133	B	91,4	92,8	94,2	95,3
22	M3BL 180MLB 4	3GBL182427-*FC	3000	94,4	6000	39,7	70	1.5	0,116	190	B	91,7	93,2	94,4	95,5
30	M3BL 200MLC 4	3GBL202437-*FC	3000	94,9	5000	50,9	95,5	1.5	0,207	277	B	92,4	93,7	94,9	95,9
37	M3BL 200MLD 4	3GBL202447-*FC	3000	95,2	5000	66,4	118	1.5	0,207	277	B	92,8	94,1	95,2	96,1
45	M3BL 225SMB 4	3GBL222227-*FC	3000	95,4	5000	78,4	143	1.5	0,302	330	B	93,2	94,3	95,4	96,3
55	M3BL 250SMA 4	3GBL252217-*FC	3000	95,7	5000	97	175	1.5	0,499	396	B	93,5	94,6	95,7	96,5
75	M3BL 280SMA 4	3GBL282217-*EC	3000	96	3600	132	239	1.4	0,76	600	B	94	95	96	96,8
90	M3BL 280SMB 4	3GBL282227-*EC	3000	96,1	3600	158	287	1.5	0,76	600	B	94,3	95,2	96,1	96,9
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**									
1.1	M3BL 90LC 4	3GBL092533-*FC	1500	88,1	6000	2,2	7	2.9	0,00332	30	B	82,1	85,6	88,1	90,2
1.5	M3BL 90LD 4	3GBL092543-*FC	1500	89,1	6000	2,9	9,6	2.6	0,00431	32	B	83,5	86,7	89,1	91
2.2	M3BL 100LKB 4	3GBL102823-*FC	1500	90,2	6000	4,3	14	3.5	0,0075	40	B	85	88,1	90,2	92
3	M3BL 100LKC 4	3GBL102833-*FC	1500	91	6000	5,8	19,1	3.5	0,00889	45	B	86,1	89,1	91	92,7
5.5	M3BL 132SMA 4	3GBL132213-*FC	1500	92,5	4500	9,5	35	2.1	0,0277	85	B	88,2	90,8	92,5	94
7.5	M3BL 132SMB 4	3GBL132223-*FC	1500	93,2	4500	12,8	47,8	2	0,0277	85	B	89,1	91,6	93,2	94,4
11	M3BL 160MLA 4	3GBL162413-*FC	1500	93,8	6000	19,1	70	1.9	0,0702	160	B	90,2	92,4	93,8	95
15	M3BL 160MLB 4	3GBL162423-*FC	1500	94,4	6000	25,3	95,5	2	0,0864	177	B	91	93	94,4	95,4
18.5	M3BL 180MLB 4	3GBL182423-*FC	1500	94,6	6000	33,2	118	1.5	0,156	222	B	91,6	93,4	94,6	95,7
22	M3BL 180MLC 4	3GBL182433-*FC	1500	94,9	6000	39,5	140	1.5	0,156	222	B	92	93,7	94,9	95,9
30	M3BL 200MLB 4	3GBL202423-*FC	1500	95,3	5000	51,2	191	1.5	0,287	304	B	92,7	94,2	95,3	96,2
37	M3BL 225SMB 4	3GBL222223-*FC	1500	95,5	4000	61,2	236	1.5	0,38	385	B	93	94,5	95,5	96,5
45	M3BL 225SMC 4	3GBL222233-*FC	1500	95,8	4000	78,2	286	1.5	0,389	350	B	93,4	94,7	95,8	96,6
55	M3BL 250SMB 4	3GBL252223-*FC	1500	96	4000	91,6	350	1.5	0,632	454	B	93,8	95,1	96	96,8
75	M3BL 280SMA 4	3GBL282213-*EC	1500	96,2	2600	131	477	2.1	1	639	B	94,3	95,4	96,2	97
90	M3BL 280SMB 4	3GBL282223-*EC	1500	96,5	2600	157	573	1.9	1	639	B	94,5	95,5	96,5	97,1
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**									
0.75	M3BL 90LC 4	3GBL092532-*FC	1000	83,9	6000	1,6	7,2	2.6	0,00332	30	B	76,5	80,6	83,9	86,7
1.1	M3BL 90LD 4	3GBL092542-*FC	1000	85,6	6000	2,1	10,5	2.1	0,00431	32	B	78,8	82,6	85,6	88,1
1.5	M3BL 100LKA 4	3GBL102812-*FC	1000	86,9	6000	2,9	14,3	2.5	0,00517	34	B	80,4	84,1	86,9	89,2
2.2	M3BL 112MA 4	3GBL112312-*FC	1000	88,3	6000	4,1	21	2.3	0,0075	43	B	82,4	85,8	88,3	90,5
3	M3BL 132SMA 4	3GBL132212-*FC	1000	89,3	4500	5,6	28,7	2.6	0,0167	69	B	83,8	87,1	89,3	91,4
4	M3BL 132SMB 4	3GBL132222-*FC	1000	90,2	4500	7,4	38,2	2.5	0,0207	78	B	85,1	88,1	90,2	92
5.5	M3BL 132SMC 4	3GBL132232-*FC	1000	91,1	4500	9,9	52,6	2.4	0,0253	85	B	86,4	89,2	91,1	92,8
7.5	M3BL 160MLA 4	3GBL162412-*FC	1000	91,9	6000	13,1	71,6	2	0,0702	160	B	87,7	90,1	91,9	93,5
11	M3BL 160MLB 4	3GBL162422-*FC	1000	92,8	6000	19	105	1.9	0,0864	177	B	89	91,2	92,8	94,2
15	M3BL 180MLC 4	3GBL182432-*FC	1000	93,5	5000	25,2	143	1.5	0,156	216	B	90	91,9	93,5	94,7
18.5	M3BL 200MLA 4	3GBL202412-*FC	1000	93,8	5000	31,5	177	2.4	0,287	304	B	90,6	92,5	93,8	95,1
22	M3BL 200MLB 4	3GBL202422-*FC	1000	94,2	5000	37	210	2.2	0,287	304	B	91,1	92,8	94,2	95,3
30	M3BL 225SMB 4	3GBL222222-*FC	1000	94,6	4000	51,3	287	1.5	0,38	348	B	91,9	93,4	94,6	95,7
37	M3BL 250SMA 4	3GBL252212-*FC	1000	95	4000	63,4	353	1.9	0,575	428	B	92,4	93,7	95	95,9
45	M3BL 280SMA 4	3GBL282212-*EC	1000	95,2	2600	77,6	430	2.3	1	639	B	92,8	94,1	95,2	96,1
55	M3BL 280SMB 4	3GBL282222-*EC	1000	95,4	2600	93,7	525	2	1	639	B	93,3	94,4	95,4	96,3
75	M3BL 315SMA 4	3GBL312212-*EC	1000	95,8	2200	129	716	2.1	1,64	873	B	93,8	94,7	95,8	96,6
90	M3BL 315SMB 4	3GBL312222-*EC	1000	96	2200	157	859	2.1	1,87	925	B	94,2	95	96	96,7

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**COMPACT-design**									
3	M3BL 90LC 4	3GBL092537-*FC	3000	89,9	6000	5,7	9,6	2.5	0,00332	30	B	85,4	87,7	89,9	91,7
4	M3BL 100LKB 4	3GBL102827-*FC	3000	90,7	6000	7,2	12,7	2.4	0,00517	40	B	86,6	88,7	90,7	92,5
4	M3BL 90LD 4	3GBL092547-*FC	3000	90,7	6000	7,4	12,7	2.3	0,00431	32	B	86,6	88,7	90,7	92,5
5.5	M3BL 100LKC 4	3GBL102837-*FC	3000	91,6	6000	9,8	17,5	2.4	0,0074	46	B	87,8	89,7	91,6	93,2
5.5	M3BL 112MB 4	3GBL112327-*FC	3000	91,6	6000	9,8	17,5	2.4	0,0074	43	B	87,8	89,7	91,6	93,2
7.5	M3BL 100LKD 4	3GBL102847-*FC	3000	92,4	6000	13,8	23,9	2.6	0,0074	46	B	88,8	90,6	92,4	93,7
7.5	M3BL 112MC 4	3GBL112337-*FC	3000	92,4	6000	13,8	23,9	2.6	0,0074	43	B	88,8	90,6	92,4	93,7
11	M3BL 100LKE 4	3GBL102857-*FC	3000	93,2	6000	19,2	35	2.3	0,00878	49	B	90	91,6	93,2	94,5
11	M3BL 132SMC 4	3GBL132237-*FC	3000	93,2	4500	19,8	35	2.3	0,0184	69	B	90	91,6	93,2	94,5
15	M3BL 132SMD 4	3GBL132247-*FC	3000	93,7	4500	26,6	47,8	2.3	0,0184	69	B	90,8	92,4	93,7	95
75	M3BL 250SMB 4	3GBL252227-*FC	3000	96	5000	134	239	1.5	0,499	396	B	94	95	96	96,8
90	M3BL 250SMC 4	3GBL252237-*FC	3000	96,1	5000	153	286	1.5	0,632	454	B	94,3	95,2	96,1	96,9
1500 r/min = 4 poles				**50 Hz**		**COMPACT-design**									
4	M3BL 100LKD 4	3GBL102843-*FC	1500	91,8	6000	7,8	25,5	2.9	0,00878	45	B	87,1	89,9	91,8	93,3
1000 r/min = 4 poles				**33,3 Hz**		**COMPACT-design**									
75	M3BL 280SMC 4	3GBL282232-*EC	1000	95,8	2600	126	716	1.8	1,21	697	B	93,8	94,7	95,8	96,6

*Additional Motor losses acc. to IEC TS60034-30-2



High efficiency IE6 Synchronous reluctance motors, network voltage 500 V

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**									
110	M3BL 315SMA 4	3GBL312217-*ED	3000	96,8	3600	197	350	1.3	1,38	873	B	94,1	95	96	96,8
132	M3BL 315SMB 4	3GBL312227-*ED	3000	96,9	3600	235	420	1.3	1,38	873	B	94,3	95,3	96,2	96,9
160	M3BL 315SMC 4	3GBL312237-*ED	3000	97	3600	278	510	1.4	1,59	921	B	94,6	95,4	96,3	97
200	M3BL 315MLA 4	3GBL312417-*ED	3000	97,1	3600	345	637	1.4	1,91	1074	B	94,8	95,7	96,5	97,1
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**									
110	M3BL 315SMC 4	3GBL312233-*ED	1500	97	2200	179	701	2	1,81	965	B	94,3	95,4	96,3	97
132	M3BL 315SMD 4	3GBL312243-*ED	1500	97,1	2200	218	841	1.9	1,86	1001	B	94,6	95,5	96,4	97,1
160	M3BL 315MLA 4	3GBL312413-*ED	1500	97,3	2200	259	1019	1.7	2,06	1091	B	94,8	95,8	96,5	97,3
200	M3BL 315MLB 4	3GBL312423-*ED	1500	97,4	2200	325	1274	1.9	2,27	1139	B	95	95,9	96,8	97,4
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**									
132	M3BL 315LKA 4	3GBL312812-*ED	1000	96,8	2200	223	1262	2	2,57	1376	B	94,3	95	96	96,8
160	M3BL 315LKB 4	3GBL312822-*ED	1000	96,9	2200	261	1529	1.8	2,93	1460	B	94,6	95,3	96,2	96,9

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**COMPACT-design**									
110	M3BL 280SMC 4	3GBL282237-*ED	3000	96,8	3600	197	350	1.6	1,11	697	B	94,1	95	96	96,8
132	M3BL 280SMD 4	3GBL282247-*ED	3000	96,9	3600	236	420	1.6	1,11	699	B	94,3	95,3	96,2	96,9
160	M3BL 280MLA 4	3GBL282417-*ED	3000	97	3600	286	510	1.3	1,36	824	B	94,6	95,4	96,3	97
200	M3BL 280MLB 4	3GBL282427-*ED	3000	97,1	3600	354	637	1.3	1,36	824	B	94,8	95,7	96,5	97,1
250	M3BL 280MLC 4	3GBL282437-*ED	3000	97,1	3600	442	796	1.6	1,57	877	B	94,8	95,7	96,5	97,1
250	M3BL 315MLB 4	3GBL312427-*ED	3000	97,1	3600	432	796	1.3	2,12	1130	B	94,8	95,7	96,5	97,1
280	M3BL 280MLD 4	3GBL282447-*ED	3000	97,1	3600	482	892	1.4	1,58	877	F	94,8	95,7	96,5	97,1
315	M3BL 315MLC 4	3GBL312437-*ED	3000	97,1	3600	552	1003	1.9	2,33	1179	F	94,8	95,7	96,5	97,1
355	M3BL 315LKA 4	3GBL312817-*ED	3000	97,1	3600	641	1130	2.2	2,65	1350	F	94,8	95,7	96,5	97,1
400	M3BL 315LKB 4	3GBL312827-*ED	3000	97,1	3600	706	1274	1.9	2,65	1350	F	94,8	95,7	96,5	97,1
450	M3BL 315LKC 4	3GBL312837-*ED	3000	97,1	3600	781	1431	1.7	2,65	1350	F	94,8	95,7	96,5	97,1
1500 r/min = 4 poles				**50 Hz**		**COMPACT-design**									
110	M3BL 280SMD 4	3GBL282243-*ED	1500	97	2600	182	700	2	1,15	719	B	94,3	95,4	96,3	97
250	M3BL 315LKB 4	3GBL312823-*ED	1500	97,4	2200	411	1593	2	2,93	1461	B	95	95,9	96,8	97,4
315	M3BL 315LKC 4	3GBL312833-*ED	1500	97,4	2200	524	2006	2	3,22	1533	B	95	95,9	96,8	97,4
1000 r/min = 4 poles				**33,3 Hz**		**COMPACT-design**									
200	M3BL 315LKC 4	3GBL312832-*ED	1000	97	2200	328	1913	2	3,24	1533	B	94,8	95,4	96,3	97

*Additional Motor losses acc. to IEC TS60034-30-2

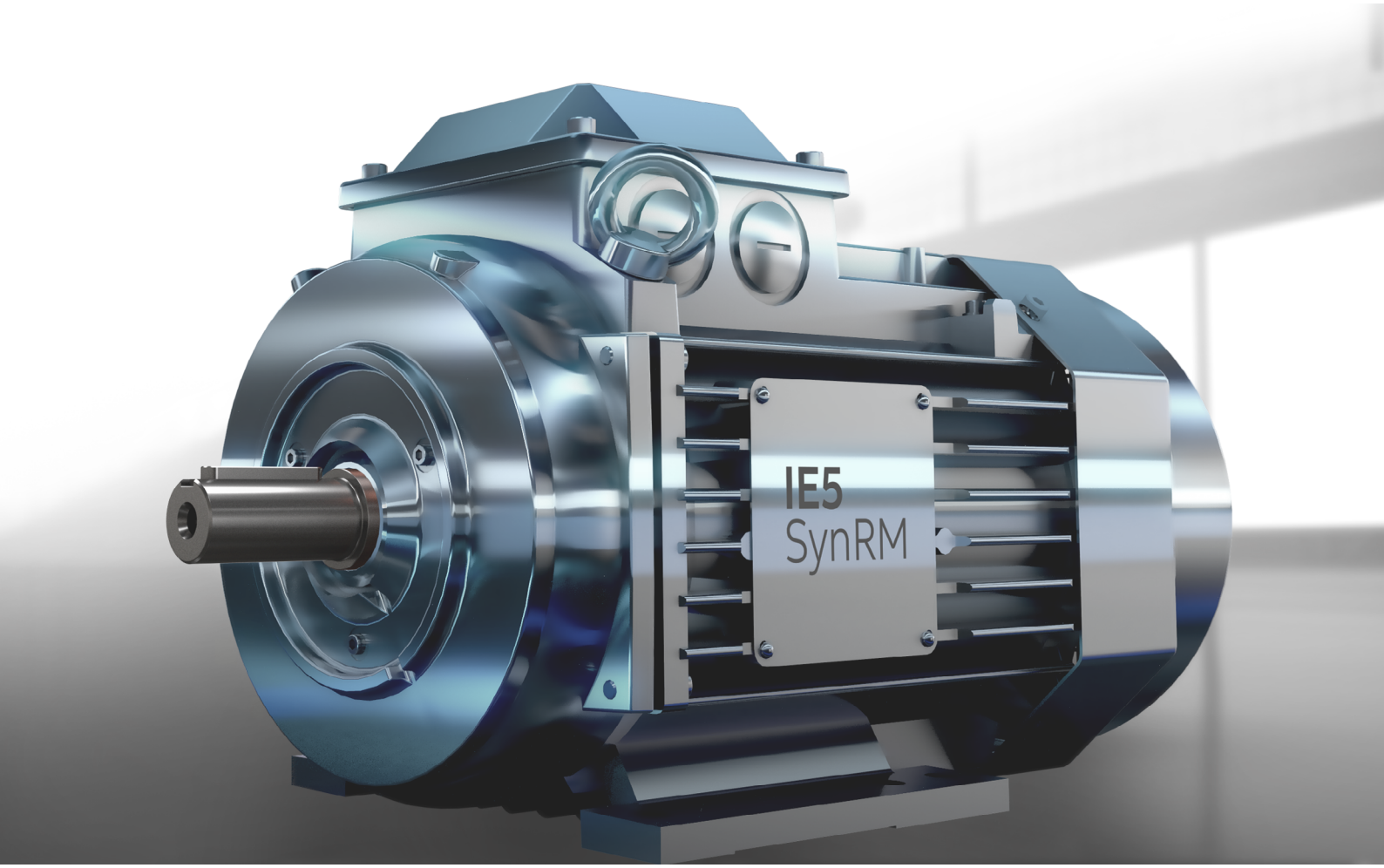
High efficiency IE5 Synchronous reluctance motors, network voltage 690 V

IE5 EFFICIENCY CLASS ACCORDING TO IEC TS 60034-30-2;2016

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**									
1.5	M3BL 90LA 4	3GBL092517-*UC	3000	87,4	6000	1,97	4,8	2.3	0,0026	26	B	82,3	84,8	87,4	89,7
2.2	M3BL 90LB 4	3GBL092527-*UC	3000	88,9	6000	2,8	7	2.2	0,00289	27	B	84,1	86,4	88,9	90,9
3	M3BL 100LKA 4	3GBL102817-*UC	3000	89,9	6000	3,7	9,6	2.6	0,00517	34	B	85,4	87,7	89,9	91,7
4	M3BL 112MA 4	3GBL112317-*UC	3000	90,7	6000	4,9	12,7	2.1	0,0075	43	B	86,6	88,7	90,7	92,5
5.5	M3BL 132SMA 4	3GBL132217-*UC	3000	91,6	4500	7	17,5	2.4	0,0145	63	B	87,8	89,7	91,6	93,2
7.5	M3BL 132SMB 4	3GBL132227-*UC	3000	92,4	4500	9,5	23,9	2.1	0,0145	63	B	88,8	90,6	92,4	93,7
11	M3BL 160MLA 4	3GBL162417-*UC	3000	93,2	6000	14,8	35	1.9	0,0579	133	B	90	91,6	93,2	94,5
15	M3BL 160MLB 4	3GBL162427-*UC	3000	93,7	6000	20	47,8	1.6	0,0579	133	B	90,8	92,4	93,7	95
18.5	M3BL 160MLC 4	3GBL162437-*UC	3000	94,2	6000	25,1	58,9	1.8	0,0579	133	B	91,4	92,8	94,2	95,3
22	M3BL 180MLB 4	3GBL182427-*UC	3000	94,4	6000	28,9	70	1.5	0,116	190	B	91,7	93,2	94,4	95,5
30	M3BL 200MLC 4	3GBL202437-*UC	3000	94,9	5000	39,3	95,5	1.5	0,207	277	B	92,4	93,7	94,9	95,9
37	M3BL 200MLD 4	3GBL202447-*UC	3000	95,2	5000	47,8	118	1.5	0,207	277	B	92,8	94,1	95,2	96,1
45	M3BL 225SMB 4	3GBL222227-*UC	3000	95,4	5000	57,2	143	1.5	0,302	330	B	93,2	94,3	95,4	96,3
55	M3BL 250SMA 4	3GBL252217-*UC	3000	95,7	5000	70	175	1.5	0,499	396	B	93,5	94,6	95,7	96,5
75	M3BL 280SMA 4	3GBL282217-*UC	3000	96	3600	96	239	1.5	0,76	600	B	94	95	96	96,8
90	M3BL 280SMB 4	3GBL282227-*UC	3000	96,1	3600	114	287	1.5	0,76	600	B	94,3	95,2	96,1	96,9
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**									
1.1	M3BL 90LC 4	3GBL092533-*UC	1500	88,1	6000	1,5	7	3	0,00332	30	B	82,1	85,6	88,1	90,2
1.5	M3BL 90LD 4	3GBL092543-*UC	1500	89,1	6000	2	9,5	2.7	0,00431	32	B	83,5	86,7	89,1	91
2.2	M3BL 100LKB 4	3GBL102823-*UC	1500	90,2	6000	2,8	14	3.6	0,0075	40	B	85	88,1	90,2	92
3	M3BL 100LKC 4	3GBL102833-*UC	1500	91	6000	3,8	19,1	3.5	0,00889	45	B	86,1	89,1	91	92,7
5.5	M3BL 132SMA 4	3GBL132213-*UC	1500	92,5	4500	6,8	35	2.1	0,0277	85	B	88,2	90,8	92,5	94
7.5	M3BL 132SMB 4	3GBL132223-*UC	1500	93,2	4500	9,2	47,8	2.1	0,0277	85	B	89,1	91,6	93,2	94,4
11	M3BL 160MLA 4	3GBL162413-*UC	1500	93,8	6000	14,1	70	1.8	0,0702	160	B	90,2	92,4	93,8	95
15	M3BL 160MLB 4	3GBL162423-*UC	1500	94,4	6000	18,4	95,5	1.9	0,0864	177	B	91	93	94,4	95,4
18.5	M3BL 180MLB 4	3GBL182423-*UC	1500	94,6	6000	24,3	118	1.5	0,156	222	B	91,6	93,4	94,6	95,7
22	M3BL 180MLC 4	3GBL182433-*UC	1500	94,9	6000	28	140	1.5	0,156	222	B	92	93,7	94,9	95,9
30	M3BL 200MLB 4	3GBL202423-*UC	1500	95,3	5000	37,3	191	1.5	0,287	304	B	92,7	94,2	95,3	96,2
37	M3BL 225SMB 4	3GBL222223-*UC	1500	95,5	4000	45,2	236	1.5	0,38	385	B	93	94,5	95,5	96,5
45	M3BL 225SMC 4	3GBL222233-*UC	1500	95,8	4000	54,8	286	1.5	0,38	350	B	93,4	94,7	95,8	96,6
55	M3BL 250SMB 4	3GBL252223-*UC	1500	96	4000	67	350	1.5	0,632	454	B	93,8	95,1	96	96,8
75	M3BL 280SMA 4	3GBL282213-*UC	1500	96,2	2600	92,6	477	2	1	639	B	94,3	95,4	96,2	97
90	M3BL 280SMB 4	3GBL282223-*UC	1500	96,5	2600	110	573	1.8	1	639	B	94,5	95,5	96,5	97,1
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**									
0.75	M3BL 90LC 4	3GBL092532-*UC	1000	83,9	6000	1,07	7,2	2.6	0,00332	30	B	76,5	80,6	83,9	86,7
1.1	M3BL 90LD 4	3GBL092542-*UC	1000	85,6	6000	1,49	10,5	2.2	0,00431	32	B	78,8	82,6	85,6	88,1
1.5	M3BL 100LKA 4	3GBL102812-*UC	1000	86,9	6000	2	14,3	2.5	0,00517	34	B	80,4	84,1	86,9	89,2
2.2	M3BL 112MA 4	3GBL112312-*UC	1000	88,3	6000	2,8	21	2.4	0,0075	43	B	82,4	85,8	88,3	90,5
3	M3BL 132SMA 4	3GBL132212-*UC	1000	89,3	4500	3,8	28,7	2.6	0,0167	69	B	83,8	87,1	89,3	91,4
4	M3BL 132SMB 4	3GBL132222-*UC	1000	90,2	4500	5,1	38,3	2.5	0,0207	78	B	85,1	88,1	90,2	92
5.5	M3BL 132SMC 4	3GBL132232-*UC	1000	91,1	4500	6,9	52,6	2.4	0,0253	85	B	86,4	89,2	91,1	92,8
7.5	M3BL 160MLA 4	3GBL162412-*UC	1000	91,9	6000	9,5	71,6	2.1	0,0702	160	B	87,7	90,1	91,9	93,5
11	M3BL 160MLB 4	3GBL162422-*UC	1000	92,8	6000	13,8	105	2	0,0864	177	B	89	91,2	92,8	94,2
15	M3BL 180MLC 4	3GBL182432-*UC	1000	93,5	5000	19,3	143	1.5	0,156	216	B	90	91,9	93,5	94,7
18.5	M3BL 200MLA 4	3GBL202412-*UC	1000	93,8	5000	22,6	177	2.1	0,287	304	B	90,6	92,5	93,8	95,1
22	M3BL 200MLB 4	3GBL202422-*UC	1000	94,2	5000	26,5	210	2	0,287	304	B	91,1	92,8	94,2	95,3
30	M3BL 225SMB 4	3GBL222222-*UC	1000	94,6	4000	36,7	287	1.5	0,38	348	B	91,9	93,4	94,6	95,7
37	M3BL 250SMA 4	3GBL252212-*UC	1000	95	4000	46	353	1.8	0,575	428	B	92,4	93,7	95	95,9
45	M3BL 280SMA 4	3GBL282212-*UC	1000	95,2	2600	54,6	430	2	1	639	B	92,8	94,1	95,2	96,1
55	M3BL 280SMB 4	3GBL282222-*UC	1000	95,4	2600	66,8	525	1.9	1	639	B	93,3	94,4	95,4	96,3
75	M3BL 315SMA 4	3GBL312212-*UC	1000	95,8	2200	91,6	716	1.9	1,64	873	B	93,8	94,7	95,8	96,6
90	M3BL 315SMB 4	3GBL312222-*UC	1000	96	2200	111	860	1.9	1,87	925	B	94,2	95	96	96,7

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**COMPACT-design**									
3	M3BL 90LC 4	3GBL092537-*UC	3000	89,9	6000	3,8	9,5	2.4	0,00332	30	B	85,4	87,7	89,9	91,7
4	M3BL 100LKB 4	3GBL102827-*UC	3000	90,7	6000	4,9	12,7	2.4	0,00517	40	B	86,6	88,7	90,7	92,5
4	M3BL 90LD 4	3GBL092547-*UC	3000	90,7	6000	5	12,7	2.3	0,00431	32	B	86,6	88,7	90,7	92,5
5.5	M3BL 100LKC 4	3GBL102837-*UC	3000	91,6	6000	6,9	17,5	2.5	0,0074	46	B	87,8	89,7	91,6	93,2
5.5	M3BL 112MB 4	3GBL112327-*UC	3000	91,6	6000	6,9	17,5	2.5	0,0074	43	B	87,8	89,7	91,6	93,2
7.5	M3BL 100LKD 4	3GBL102847-*UC	3000	92,4	6000	9,5	23,9	2.6	0,0074	46	B	88,8	90,6	92,4	93,7
7.5	M3BL 112MC 4	3GBL112337-*UC	3000	92,4	6000	9,5	23,9	2.6	0,0074	43	B	88,8	90,6	92,4	93,7
11	M3BL 100LKE 4	3GBL102857-*UC	3000	93,2	6000	14,3	35	2.6	0,00878	49	B	90	91,6	93,2	94,5
11	M3BL 132SMC 4	3GBL132237-*UC	3000	93,2	4500	14,1	35	2.2	0,0184	69	B	90	91,6	93,2	94,5
15	M3BL 132SMD 4	3GBL132247-*UC	3000	93,7	4500	18,9	47,8	2.1	0,0184	69	B	90,8	92,4	93,7	95
75	M3BL 250SMB 4	3GBL252227-*UC	3000	96	5000	96	239	1.5	0,499	396	B	94	95	96	96,8
90	M3BL 250SMC 4	3GBL252237-*UC	3000	96,1	5000	111	286	1.5	0,632	454	B	94,3	95,2	96,1	96,9
1500 r/min = 4 poles				**50 Hz**		**COMPACT-design**									
4	M3BL 100LKD 4	3GBL102843-*UC	1500	91,8	6000	5,2	25,5	3.3	0,00878	45	B	87,1	89,9	91,8	93,3
1000 r/min = 4 poles				**33,3 Hz**		**COMPACT-design**									
75	M3BL 280SMC 4	3GBL282232-*UC	1000	95,8	2600	89,8	716	1.7	1,21	697	B	93,8	94,7	95,8	96,6

*Additional Motor losses acc. to IEC TS60034-30-2



High efficiency IE6 Synchronous reluctance motors, network voltage 690 V

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**									
110	M3BL 315SMA 4	3GBL312217-*UD	3000	96,8	3600	142	350	1.4	1,38	873	B	94,1	95	96	96,8
132	M3BL 315SMB 4	3GBL312227-*UD	3000	96,9	3600	170	420	1.5	1,38	873	B	94,3	95,3	96,2	96,9
160	M3BL 315SMC 4	3GBL312237-*UD	3000	97	3600	202	510	1.3	1,59	921	B	94,6	95,4	96,3	97
200	M3BL 315MLA 4	3GBL312417-*UD	3000	97,1	3600	250	637	1.5	1,91	1074	B	94,8	95,7	96,5	97,1
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**									
110	M3BL 315SMC 4	3GBL312233-*UD	1500	97	2200	130	700	2	1,81	965	B	94,3	95,4	96,3	97
132	M3BL 315SMD 4	3GBL312243-*UD	1500	97,1	2200	157	841	1.9	1,86	1001	B	94,6	95,5	96,4	97,1
160	M3BL 315MLA 4	3GBL312413-*UD	1500	97,3	2200	188	1018	1.7	2,06	1091	B	94,8	95,8	96,5	97,3
200	M3BL 315MLB 4	3GBL312423-*UD	1500	97,4	2200	240	1274	1.9	2,27	1139	B	95	95,9	96,8	97,4
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**									
110	M3BL 315MLA 4	3GBL312412-*UD	1000	96,6	2200	133	1051	2	2,06	1091	B	93,9	94,8	95,8	96,6
132	M3BL 315LKA 4	3GBL312812-*UD	1000	96,8	2200	161	1262	2	2,57	1376	B	94,3	95	96	96,8
160	M3BL 315LKB 4	3GBL312822-*UD	1000	96,9	2200	189	1528	1.8	2,93	1460	B	94,6	95,3	96,2	96,9

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque T_N Nm	Torque T_{OL}/T_N Nm	Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Typical induction motor efficiency with VSD supply* IE3	Typical induction motor efficiency with VSD supply* IE4	IE5 limit values acc. to IEC TS60034-30-2	Anticipated IE6 limit values
3000 r/min = 4 poles				**100 Hz**		**COMPACT-design**									
110	M3BL 280SMC 4	3GBL282237-*UD	3000	96,8	3600	142	350	1.4	1,11	697	B	94,1	95	96	96,8
132	M3BL 280SMD 4	3GBL282247-*UD	3000	96,9	3600	170	421	1.5	1,11	699	B	94,3	95,3	96,2	96,9
160	M3BL 280MLA 4	3GBL282417-*UD	3000	97	3600	207	510	1.3	1,36	824	B	94,6	95,4	96,3	97
200	M3BL 280MLB 4	3GBL282427-*UD	3000	97,1	3600	255	636	1.4	1,36	824	B	94,8	95,7	96,5	97,1
250	M3BL 280MLC 4	3GBL282437-*UD	3000	97,1	3600	318	796	1.3	1,57	877	B	94,8	95,7	96,5	97,1
250	M3BL 315MLB 4	3GBL312427-*UD	3000	97,1	3600	311	796	1.5	2,12	1130	B	94,8	95,7	96,5	97,1
280	M3BL 280MLD 4	3GBL282447-*UD	3000	97,1	3600	358	892	1.9	1,58	877	F	94,8	95,7	96,5	97,1
315	M3BL 315MLC 4	3GBL312437-*UD	3000	97,1	3600	393	1003	1.7	2,33	1179	F	94,8	95,7	96,5	97,1
355	M3BL 315LKA 4	3GBL312817-*UD	3000	97,1	3600	463	1131	2.2	2,65	1350	F	94,8	95,7	96,5	97,1
400	M3BL 315LKB 4	3GBL312827-*UD	3000	97,1	3600	510	1274	1.9	2,65	1350	F	94,8	95,7	96,5	97,1
450	M3BL 315LKC 4	3GBL312837-*UD	3000	97,1	3600	564	1431	1.7	2,65	1350	F	94,8	95,7	96,5	97,1
1500 r/min = 4 poles				**50 Hz**		**COMPACT-design**									
110	M3BL 280SMD 4	3GBL282243-*UD	1500	97	2600	134	701	2	1,15	719	B	94,3	95,4	96,3	97
250	M3BL 315LKB 4	3GBL312823-*UD	1500	97,4	2200	301	1593	2	2,93	1461	B	95	95,9	96,8	97,4
315	M3BL 315LKC 4	3GBL312833-*UD	1500	97,4	2200	390	2004	2	3,22	1533	B	95	95,9	96,8	97,4
1000 r/min = 4 poles				**33,3 Hz**		**COMPACT-design**									
200	M3BL 315LKC 4	3GBL312832-*UD	1000	97	2200	245	1913	2	3,24	1533	B	94,8	95,4	96,3	97

*Additional Motor losses acc. to IEC TS60034-30-2

High output Synchronous reluctance motors, network voltage 400 V

Output kW	Type designation	Product code	Speed (r/min)	Motor efficiency with VSD supply TN = 100%. nN = 100%	Max speed. n_{max} r/m	Current. IN A	Torque		Rotor inertia (J = 1/4GD2) (M) (kgm2)	Weight kg	Temperature rise class	Efficiency class
							T_N Nm	T_{OL}/T_N Nm				
3000 r/min = 4 poles				**100 Hz**		**COMPACT-design**						
33	M3BL 160MLB 4	3GBL162427-*SB	3000	93,5	5300	76,7	105	1.6	0,0579	130	F	IE3
40	M3BL 160MLC 4	3GBL162437-*SB	3000	93,9	5300	92,5	127	1.8	0,0702	157	F	IE3
45	M3BL 160MLE 4	3GBL162457-*SB	3000	94,6	5300	103	143	1.9	0,0864	174	F	IE4
62	M3BL 200MLA 4	3GBL202417-*SB	3000	95,1	4500	144	197	1.9	0,242	279	F	IE4
72	M3BL 200MLC 4	3GBL202437-*SB	3000	95,4	4500	166	229	2	0,287	304	F	IE4
97	M3BL 250SMA 4	3GBL252217-*SB	3000	95,2	3600	224	309	1.7	0,499	396	F	IE4
112	M3BL 250SMB 4	3GBL252227-*SB	3000	95,3	3600	259	357	1.8	0,575	428	F	IE4
125	M3BL 250SMC 4	3GBL252237-*SB	3000	95,5	3600	288	398	2.2	0,632	454	F	IE4
2100 r/min = 4 poles				**70 Hz**		**COMPACT-design**						
25	M3BL 160MLB 4	3GBL162425-*SB	2100	92,3	5300	58,8	114	1.8	0,0579	130	F	IE3
31	M3BL 160MLC 4	3GBL162435-*SB	2100	93	5300	72,4	141	1.7	0,0702	157	F	IE3
39	M3BL 160MLE 4	3GBL162455-*SB	2100	93,7	5300	90,4	177	1.7	0,0864	174	F	IE3
44	M3BL 200MLA 4	3GBL202415-*SB	2100	93,8	4500	102	200	2.2	0,242	279	F	IE3
62	M3BL 200MLC 4	3GBL202435-*SB	2100	94	4500	143	282	1.9	0,287	304	F	IE3
88	M3BL 250SMA 4	3GBL252215-*SB	2100	95	4000	201	400	1.7	0,499	396	F	IE3
98	M3BL 250SMB 4	3GBL252225-*SB	2100	95,2	4000	224	446	1.6	0,575	428	F	IE4
115	M3BL 250SMC 4	3GBL252235-*SB	2100	95,5	4000	258	523	1.6	0,632	454	F	IE4
124	M3BL 280SMA 4	3GBL282215-*DB	2100	95,2	2500	259	564	1.5	0,857	604	F	IE4
134	M3BL 280SMB 4	3GBL282225-*DB	2100	95,5	2500	279	609	1.7	1	639	F	IE4
160	M3BL 280SMC 4	3GBL282235-*DB	2100	95,8	2500	329	728	1.7	1,21	697	F	IE4
1500 r/min = 4 poles				**50 Hz**		**COMPACT-design**						
97	M3BL 250SMC 4	3GBL252233-*SB	1500	95	4000	225	618	1.7	0,632	454	F	IE3
103	M3BL 280SMA 4	3GBL282213-*DB	1500	94,8	2500	221	656	1.6	0,857	604	F	IE3
118	M3BL 280SMB 4	3GBL282223-*DB	1500	95,3	2500	246	751	1.5	1	639	F	IE3
134	M3BL 280SMC 4	3GBL282233-*DB	1500	95,6	2500	279	853	1.7	1,21	697	F	IE4
155	M3BL 315SMA 4	3GBL312213-*DB	1500	95,7	2000	321	987	1.5	1,64	873	F	IE4
180	M3BL 315SMB 4	3GBL312223-*DB	1500	96	2000	374	1146	1.6	1,87	925	F	IE4
205	M3BL 315SMC 4	3GBL312233-*DB	1500	96,1	2000	423	1305	1.5	2,04	965	F	IE4
250	M3BL 315MLA 4	3GBL312413-*DB	1500	96,4	2000	516	1592	1.6	2,45	1116	F	IE4
275	M3BL 315MLB 4	3GBL312423-*DB	1500	96,5	2000	573	1751	1.7	2,68	1169	F	IE4
315	M3BL 315LKA 4	3GBL312813-*DB	1500	96,4	2000	659	2005	1.7	3,04	1357	F	IE4
350	M3BL 315LKC 4	3GBL312833-*DB	1500	96,5	2000	712	2228	1.7	3,77	1533	F	IE4

Variant codes

Synchronous reluctance 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. Contact ABB for detailed information.

Code	Variant	High output SynRM					IE5 SynRM											IE6 SynRM	
		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
Administration																			
529	Customer witnessed visual inspection of complete order line.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
530	Two-year extension on standard warranty	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
531	Sea freight packing	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
533	Wooden sea freight packing	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
590	Mounting of customer supplied part other than coupling.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
648	Rating plate in special language	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
684	ABB Ability Smart sensor mounted	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
999	Case specific design requiring a quotation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Balancing																			
417	Vibration acc. to Grade B (IEC 60034-14).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
423	Balanced without key.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
424	Full-key balancing	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bearings and Lubrication																			
036	Transport lock for bearings.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
037	Roller bearing at D-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
039	Cold-resistant grease	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
040	Heat-resistant grease	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
041	Bearings regreasable via grease nipples.	○	○	○	○	○	●	●	●	●	○	○	○	○	○	○	○	○	○
043	SPM compatible nipples for vibration measurement	●	●	○	○	○	●	●	●	●	○	○	○	○	○	○	○	○	○
057	2RS bearings at both ends.	●	●	●	-	-	●	●	●	●	●	●	●	●	●	-	-	-	-
058	Angular contact bearing at D-end, shaft force away from bearing.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
059	Angular contact bearing at N-end, shaft force towards bearing.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
060	Angular contact bearing at D-end, shaft force towards bearing.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
061	Angular contact bearing at N-end, shaft force away from bearing.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
107	Pt100 2-wire in bearings.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
128	Double PT100, 2-wire in bearings	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
129	Double PT100, 3-wire in bearings	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
130	Pt100 3-wire in bearings.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
188	63-series bearing in D-end	○	○	○	○	○	●	●	●	●	○	○	○	○	-	○	○	○	○
194	2Z bearings greased for life at both ends.	●	●	●	-	-	○	○	○	○	●	●	●	●	●	-	-	-	-
420	Bearing mounted PTC thermistors.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
433	Outlet grease collector	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
506	Nipples for vibration measurement : SKF Marlin Quick Connect stud CMSS-2600-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●

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Code	Variant	High output SynRM				IE5 SynRM												IE6 SynRM	
		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
593	Bearings grease suitable for food and beverage industry.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
654	Provision for vibration sensors (M8x1)	●	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
795	Lubrication information plate	●	●	●	○	○	-	-	-	-	●	●	●	●	●	○	○	○	○
796	Grease nipples JIS B 1575 PT 1/8 Type A	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
797	Stainless steel SPM nipples	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
798	Stainless steel grease nipples	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
799	Grease nipples flat type DIN 3404, thread M10x1	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
800	Grease nipples JIS B 1575 PT 1/8" pin type	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
Branch standard designs																			
177	Design for high ambient applications	●	●	●	-	-	-	-	-	-	●	●	●	●	●	-	-	-	-
178	Stainless steel / acid proof bolts.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
204	Jacking bolts for foot mounted motors.	-	-	-	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
209	Non-standard voltage or frequency, (special winding).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
217	Cast iron D-end shield (on aluminum motor).	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
396	Motor designed for minimum ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
397	Motor designed for minimum ambient temperature -40 °C to -55 °C, with space heaters (code 450/451 must be added)	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
398	Motor designed for minimum ambient temperature -20 °C to -40 °C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
425	Corrosion protected stator and rotor core.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
786	Special design shaft upwards (V3, V35, V6) for outdoor mounting.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
877	Design for high ambient applications, motor without fan and fan cover	-	-	-	-	-	-	-	-	-	●	●	●	●	●	-	-	-	-
Cooling system																			
053	Metal fan cover.	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
068	Light alloy metal fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
075	Cooling method IC418 (without fan).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
183	Separate motor cooling (fan axial, N-end).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
206	Steel fan	●	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
422	Separate motor cooling (on top) with integrated fan motor	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
514	Separate motor cooling (fan on top)	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
791	Stainless steel fan cover	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
Coupling																			
035	Assembly of customer supplied coupling-half.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
Documentation																			
141	Binding 2D main dimension drawing.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
370	Motor model drawing in 3D	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
374	Binding 2D motor detailed drawing	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
536	Photos of manufactured motors	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
722	Rotor dimension drawing (incl. torsional stiffness).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Drain holes																			
065	Plugged existing drain holes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
448	Draining holes with metal plugs.	-	-	-	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
Earthing Bolt																			
067	External earthing bolt.	○	○	○	○	○	●	●	●	●	○	○	○	○	○	○	○	○	○
525	External earthing bolts on motor feet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heating elements																			
450	Heating element, 100-120 V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
451	Heating element, 200 - 240 V	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Insulation system																			
014	Winding insulation class H.	●	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
405	Special winding insulation for frequency converter supply.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Marine																			
024	Fulfilling Bureau Veritas (BV) requirements, with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
025	Fulfilling DNV requirements, with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
026	Fulfilling Lloyds Register of Shipping (LR) requirements, with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
027	Fulfilling American Bureau of Shipping (ABS) requirements, with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
050	Fulfilling Registro Italiano Navale (RINA) requirements, with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
096	Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
186	Fulfilling DNV requirements, without certificate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
481	Fulfilling Nippon Kaiji Kyokai (NK) requirements, with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
483	Fulfilling China Classification Societies (CCS) requirements (Beijing), with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
484	Fulfilling Korea Register of Shipping (KR) requirements, 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)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mounting arrangements																			
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).	-	-	-	-	-	●	●	●	●	-	-	-	-	-	-	-	-	-

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		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
200	Flange ring holder.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
236	Flange FT 165.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
243	Flange ring FF 215.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
244	Flange ring FT 215.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
253	Flange ring FF 265.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
254	Flange ring FT 265.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
255	Flange FF 265.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
305	Additional lifting lugs.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
Noise reduction																			
055	Noise reduction cover for foot mounted motor	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
Painting																			
105	Paint thickness report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
114	Special paint color, standard grade	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
115	Painting system C4,durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
168	Primer paint only.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
710	Norsok M-501 rev. 7 Coating system no. 2B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
711	Painting system C5, durability High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
717	Painting system C4, durability High	●	●	●	●	●	●	●	●	-	-	●	●	●	●	●	●	●	●
719	Painting system CX	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
754	Painting system C5, durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
755	Norsok M-501 revision 7, Coating system no. 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●
Protection																			
005	Protective roof	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
072	Radial seal at D-end. Not possible for 2-pole , 280 and 315 frames	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
073	Sealed against oil at D-end.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
158	Degree of protection IP65.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
250	Degree of protection IP66	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
401	Protective roof, horizontal motor.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
403	Degree of protection IP56.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
434	Degree of protection IP56, open deck.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
783	Labyrinth sealing at D-end.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	○	○
784	Gamma-seal at D-end.	○	○	○	-	-	●	●	●	●	○	○	○	○	○	-	-	-	-
Rating & instruction plates																			
002	Restamping voltage, frequency and output, continuous duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
004	Additional text on std rating plate (max 12 digits on free text line).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
126	Tag plate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
135	Mounting of additional identification plate, stainless.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
138	Mounting of additional identification plate, aluminium.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
139	Additional identification plate delivered loose.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
159	Additional plate with text "Made in ...."	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
160	Additional rating plate affixed.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
161	Additional rating plate delivered loose.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
163	Frequency converter rating plate. Rating data according to quotation.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
528	Rating plate sticker	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shaft & rotor																			
069	Two shaft extensions according to catalog drawings.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
070	Special shaft extension at D-End, standard shaft material	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
131	Motor delivered with half key (key not exceeding shaft diameter)	●	●	●	-	-	●	●	●	●	●	●	●	●	●	-	-	-	-
155	Cylindrical shaft extension, D-end, without key-way.	●	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
164	Shaft extension with closed keyway	○	○	○	●	●	●	●	●	○	○	○	○	○	○	●	●	●	●
165	Shaft extension with open keyway	●	●	●	○	○	-	-	-	-	●	●	●	●	●	○	○	○	○
410	Shaft material stainless steel	-	-	-	●	●	●	●	●	-	-	-	-	-	-	●	●	●	●
591	Special shaft extension according to customer specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
600	Special shaft extension at N-end, standard shaft material.	●	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
630	Shaft material certificate 3.1/3.2 according to EN10204:2004	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
Standards and Regulations																			
208	Fulfilling Underwriters Laboratories (UL), listed requirements	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
549	Product data info for Turkey	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
586	Fulfilling UK Conformity Assessment (UKCA) requirements.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
811	JIP-33 standard design	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	-	-
823	WIMES 3.03i6 Compliant Design for VSD operation	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
841	Shell DEP 33.66.05.31-GEN February 2022	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
Stator winding temperature sensors																			
121	Bimetal detectors, break type (NCC), (3 in series), 130 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
122	Bimetal detectors, break type (NCC), (3 in series), 150 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
123	Bimetal detectors, break type (NCC), (3 in series), 170 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
124	Bimetal detectors, break type (NCC), (3 in series), 140 ºC, in stator winding	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
125	Bimetal detectors, break type (NCC), (2x3 in series), 150 ºC, in stator winding	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
127	Bimetal detectors, break type (NCC), (3 in series, 130 ºC & 3 in series, 150 ºC), in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
321	Bimetal detectors, closing type (NO), (3 in parallel), 130ºC, in stator winding.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	Bimetal detectors, closing type (NO), (2x3 in parallel), 150ºC, in stator winding.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Code	Variant	High output SynRM				IE5 SynRM												IE6 SynRM	
		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
327	Bimetal detectors, closing type (NO), (3 in parallel, 130ºC & 3 in parallel, 150ºC), in stator winding.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
435	PTC - thermistors (3 in series), 130 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
437	PTC - thermistors (3 in series), 170 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
439	PTC - thermistors (2x3 in series), 150 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
440	PTC - thermistors (3 in series, 110ºC & 3 in series, 130ºC), in stator winding.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
441	PTC - thermistors (3 in series, 130 ºC & 3 in series, 150 ºC), in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
442	PTC - thermistors (3 in series, 150 ºC & 3 in series, 170 ºC), 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	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
511	PTC thermistors (2 x 3 in series), 130 ºC, in stator winding	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
592	Pt1000 2-wire in stator winding, 1 per phase	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
595	Pt1000 2-wire in stator winding, 2 per phase	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
596	Pt1000 3-wire in stator winding, 1 per phase	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
597	Pt1000 3-wire in stator winding, 2 per phase	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
Terminal box																			
019	Larger than standard terminal box.	-	-	-	●	●	●	●	●	-	-	-	-	-	-	●	●	●	●
020	Detached terminal box.	-	-	-	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
021	Terminal box LHS (seen from D-end).	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
022	Cable entry LHS (seen from D-end).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
157	Terminal box degree of protection IP65.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
180	Terminal box RHS (seen from D-end).	●	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
230	Standard metal cable gland.	●	●	●	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●
277	Cable sealing end unit, size small for C-opening	-	-	-	●	-	-	-	-	-	-	-	-	-	-	●	-	●	-
278	Cable sealing end unit, size medium for D-opening	-	-	-	-	●	-	-	-	-	-	-	-	-	-	●	●	-	●
279	Cable sealing end unit, size large for D-opening	-	-	-	-	●	-	-	-	-	-	-	-	-	-	●	●	●	●
292	Adapter C-C	-	-	-	●	-	-	-	-	-	-	-	-	-	-	●	-	●	-
293	Adapter D-D	-	-	-	-	●	-	-	-	-	-	-	-	-	-	●	●	●	●
294	Adapter E-D	-	-	-	-	●	-	-	-	-	-	-	-	-	-	●	●	●	●
295	Adapter E-2D	-	-	-	-	●	-	-	-	-	-	-	-	-	-	●	●	●	●
375	Standard plastic cable gland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
376	Two standard plastic cable glands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
380	Separate terminal box for temperature detectors, std. material	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
400	4 x 90 degr turnable terminal box.	○	○	○	○	○	●	●	●	●	○	○	○	○	○	○	○	○	○
413	Extended cable connection, no terminal box.	-	-	-	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
418	Separate terminal box for auxiliaries, standard material.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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Code	Variant	High output SynRM				IE5 SynRM												IE6 SynRM	
		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
447	Top mounted separate terminal box for monitoring equipment.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
466	Terminal box at N-end.	-	-	-	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
468	Cable entry from D-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
469	Cable entry from N-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
554	Cast iron flange for cable glands drilled and tapped according to order.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
557	Nickel plated cable glands mounted according to order.	●	●	●	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
567	Separate terminal box material: cast Iron	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
568	Separate terminal box for heating elements, std. material	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
569	Separate terminal box for brakes	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
730	Prepared for NPT cable glands.	-	-	-	●	●	●	●	●	-	●	●	●	●	●	●	●	●	●
731	Two standard metal cable glands.	●	●	●	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●
740	Prepared for PG cable glands.	●	●	●	-	-	-	-	-	-	●	●	●	●	●	-	-	-	-
742	Protective cover for accessory terminal block in main terminal box.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
743	Non-drilled cast iron flange for cable glands	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
744	Stainless steel non-drilled flange for cable glands.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
745	Painted cast iron flange equipped with nickel plated brass cable glands	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
746	Stainless steel cable flange equipped with standard nickel plated brass cable glands	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
Testing																			
148	Routine test report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
150	Customer witnessed testing. Specify test procedure with other codes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
560	Shaft voltage test, for one motor from specific delivery batch.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●
718	Routine test with rated values for all motors	-	-	-	●	●	●	●	●	-	-	-	-	-	-	●	●	●	●
760	Vibration level test	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
761	Vibration spectrum test for one motor from specific delivery batch.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
762	Noise level test for one motor from specific delivery batch.	-	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
763	Noise spectrum test for one motor from specific delivery batch.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
764	Test for one motor from specific delivery batch with ABB frequency converter available at ABB test field. ABB standard test procedure.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Variable speed drives																			
182	Mounting of non-listed pulse tacho.	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
429	Separate motor cooling (fan top, N-end) and 1024 pulse tacho (Leine & Linde 861) mounted.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
470	Prepared for hollow shaft pulse tacho (L&L equivalent).	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
472	1024 pulse tacho (L&L 861007455-1024).	●	●	●	●	●	-	-	●	●	●	●	●	●	●	●	●	●	●
473	2048 pulse tacho (L&L 861007455-2048).	●	●	●	●	●	-	-	●	●	●	●	●	●	●	●	●	●	●

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Code	Variant	High output SynRM				IE5 SynRM												IE6 SynRM	
		M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL	M3BL
		160	200	250	280	315	90	100	112	132	160	180	200	225	250	280	315	280	315
474	Separate motor cooling (axial fan, N-end) and prepared for hollow shaft tacho (L&L equivalent)	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
476	Separate motor cooling (axial fan, N-end) and 1024 pulse tacho (L&L 861007455-1024)	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
477	Separate motor cooling (axial fan, N-end) and 2048 pulse tacho (L&L 861007455-2048)	●	●	●	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
478	Separate motor cooling (fan on top, N-end) and prepared for hollow shaft tacho (L&L equivalent)	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
479	Mounting of other type of pulse tacho with shaft extension, tacho not included.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
510	Separate motor cooling (fan top, N-end) and 2048 pulse tacho (Leine & Linde 861) mounted.	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
570	Prepared for hollow shaft pulse tacho (L&L 503).	●	●	●	-	-	-	-	-	-	●	●	●	●	●	-	-	-	-
577	Separate motor cooling (fan axial, N-end) and 2048 pulse tacho (L&L 503).	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
578	Separate motor cooling, IP44, 400V, 50Hz (fan axial, N-end) and prepared for hollow shaft tacho (L&L 503).	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
588	Shaft grounding device	●	●	●	●	●	-	-	-	●	●	●	●	●	●	●	●	●	●
658	Special tacho mounted, price category 1	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
659	Special tacho mounted, price category 2	-	-	-	●	●	-	-	-	-	●	●	●	●	●	●	●	●	●
660	Special tacho mounted, price category 3	-	-	-	●	●	-	-	-	-	-	-	-	-	-	●	●	●	●
661	1024 Pulse tacho mounted, Hohner series 59, 11-30V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
662	2048 Pulse tacho mounted, Hohner series 59, 11-30V	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
701	Insulated bearing at N-end.	●	●	●	○	○	-	-	-	-	●	●	●	●	●	○	○	○	○
702	Insulated bearings at both ends	●	●	●	-	-	●	●	●	●	●	●	●	●	●	-	-	-	-
704	EMC cable entry.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Mechanical design

Motor frame and drain holes

01 As standard, the motor is delivered with drain holes and closable plugs.

Motor frame

Motor sizes 90-132 have frame, end shields and main terminal box made of cast iron. Motor sizes 160 and above have cast iron frame and feet and a removable terminal box. Integrated feet provide rigid mounting and minimize vibration.

Motors can be supplied for foot mounting, flange mounting, and combinations of these.

Drain holes

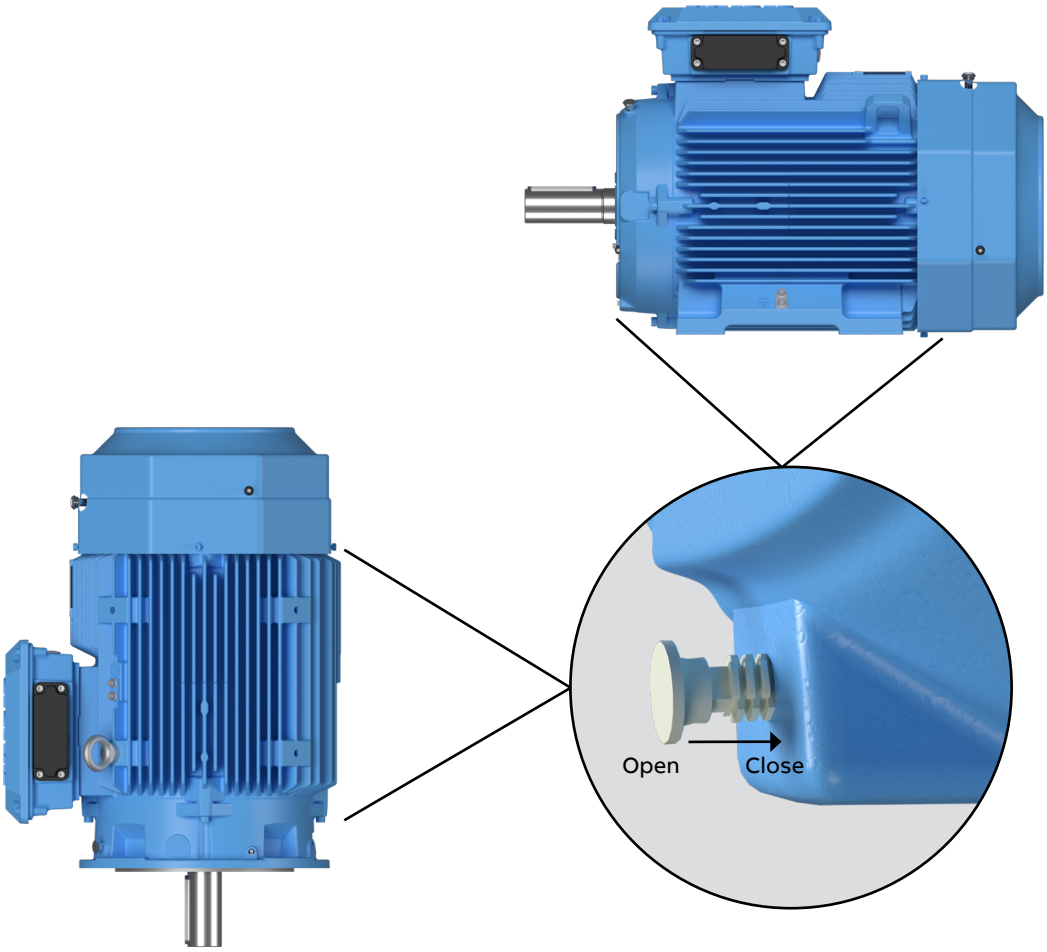
Motors that will be operated in very humid or wet environments, and especially under intermittent duty, should be provided with drain holes. The IM designation, such as IM 3031, determines the intended mounting arrangement for the motor.

Motors are fitted with drain holes and closable plugs. The plugs are open on delivery. When mounting the motors, ensure that the drain holes face downwards.

In case of vertical mounting, the upper plug must be closed completely. In very dusty environments, both plugs should be closed.

When mounting differs from foot-mounted IM B3 arrangement, use variant code 066 when ordering. (See variant code 065 under Drain holes and variant code 066 under Mounting arrangements in the Variant codes section.)

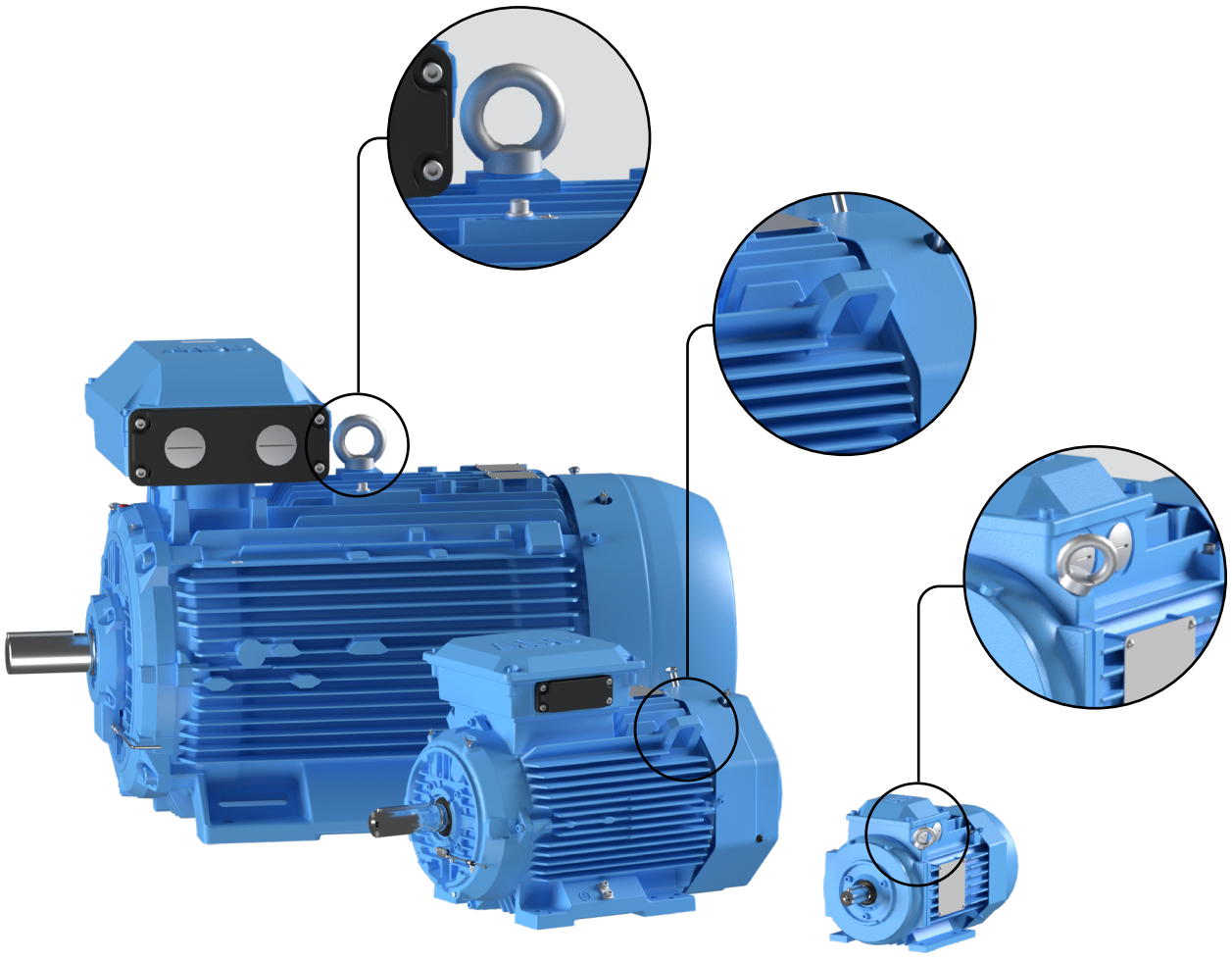
01



Lifting lugs

The motors are provided as standard with lifting lugs according to the table below. For improved lifting possibilities can variant code 305 be added, please refer to the variant code section for information about availability.

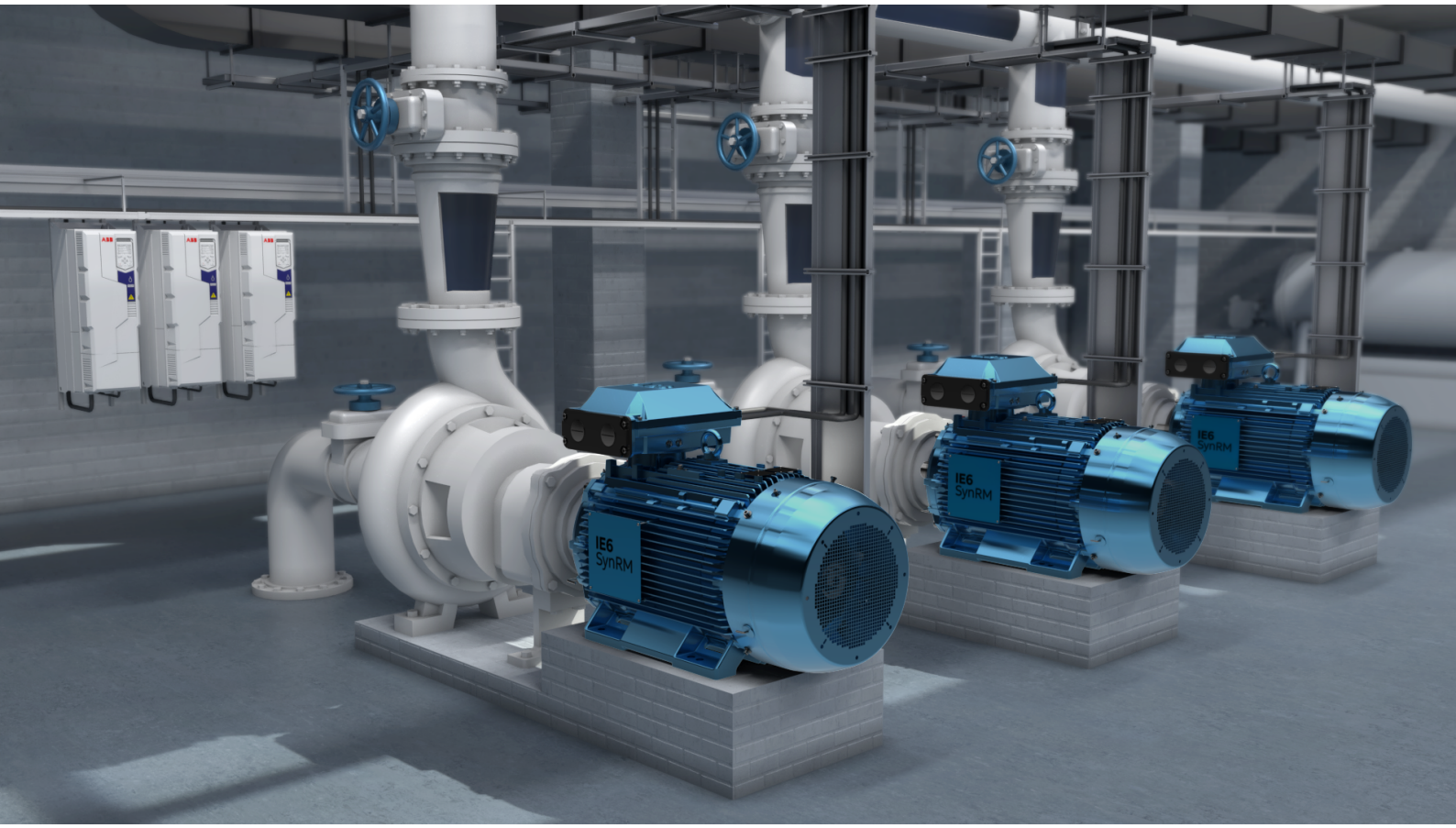
Frame size	Type of lugs	Foot mounted motors	Flange mounted motors
90-132	Detachable eye bolt	2 pcs on top of motor diagonally placed, size M8	2 pcs on top of motor diagonally placed, size M8
160-200	Integrated in casting / detachable eye bolt	2 pcs on top of motor diagonally placed, integrated in frame casting	Locations for eye bolts: 4 pcs at N-end and 4 pcs at D-end. 2 pcs eye bolts size M12 delivered with each motor
225-250	Integrated in casting / detachable eye bolt	2 pcs on top of motor diagonally placed, integrated in frame casting	Locations for eye bolts: 4 pcs at N-end and 4 pcs at D-end. 2 pcs eye bolts size M16 delivered with each motor
280, 315	Detachable eye bolt	1 pcs close to terminal box on top, size M24	Locations for eye bolts: 4 pcs at N-end and 4 pcs at D-end, one location on top close to terminal box. 2 pcs eye bolts size M24 delivered with each motor



Heating elements

Heating elements are installed into windings to keep them free of corrosion in humid conditions. The required power of heating elements is shown in the table. You can order heating elements with variant code 450 or 451.

Motor size	90	100	112	132	160	180	200	225	250	280	315
Power (W)	25	25	25	25	25	25	25	60	60	60	2x60



Bearings

Standard and alternative bearing designs

Synchronous reluctance 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.

When there are high axial forces, angular-contact ball bearings should be used. This option is available on request. When ordering a motor with an angular-contact ball bearing, specify also the method of mounting and the direction and magnitude of axial force to ensure that the optimal bearing system design is selected. The variant codes for ordering angular-contact ball bearings at D-end are 058 and 060.

STANDARD AND ALTERNATIVE DESIGNS

Shaft height	Product design code	Speed r/min	Standard design		Alternative designs	
			Deep groove ball bearings		Roller bearings (037)	Ang. contact ball bearings (058)
			D-end	N-end	D-end	D-end
90	C	1000-3000	6205-2Z/C3	6204-2Z/C3	NU 205 ECP/C3	7205 B
100	C	1000-3000	6206-2Z/C3	6205-2Z/C3	NU 206 ECP/C3	7206 B
112	C	1000-3000	6206-2Z/C3	6205-2Z/C3	NU 206 ECP/C3	7206 B
132	C	1000-3000	6208-2Z/C3	6208-2Z/C3	NU 208 ECP/C3	7208 B
160	B, C	1000-3000	6309-C3	6209-C3	NU 309 ECP/C3	7309 B
180	C	1000-3000	6310-C3	6209-C3	NU 310 ECP/C3	7310 B
200	B, C	1000-3000	6312-C3	6210/C3	NU 312 ECP/C3	7312 B
225	C	1000-3000	6313/C3	6212/C3	NU 313 ECP/C3	7313 B
250	B, C	1000-3000	6315/C3	6213/C3	NU 315 ECP/C3	7315 B
280	B, C, D	1000-1500	6316/C3	6316/C3VL0241*	NU 316 ECP/C3	7316 B
280	C, D	3000	6316/C3	6316/C3VL0241*	On request	7316 B
315	B, C, D	1000-1500	6319/C3	6316/C3VL0241*	NU 319 ECP/C3	7319 B
315	C, D	3000	6316/C3	6316/C3VL0241*	On request	7316 B

* Insulated bearing at N-end as standard.

Axially-locked bearings

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

Transport locking

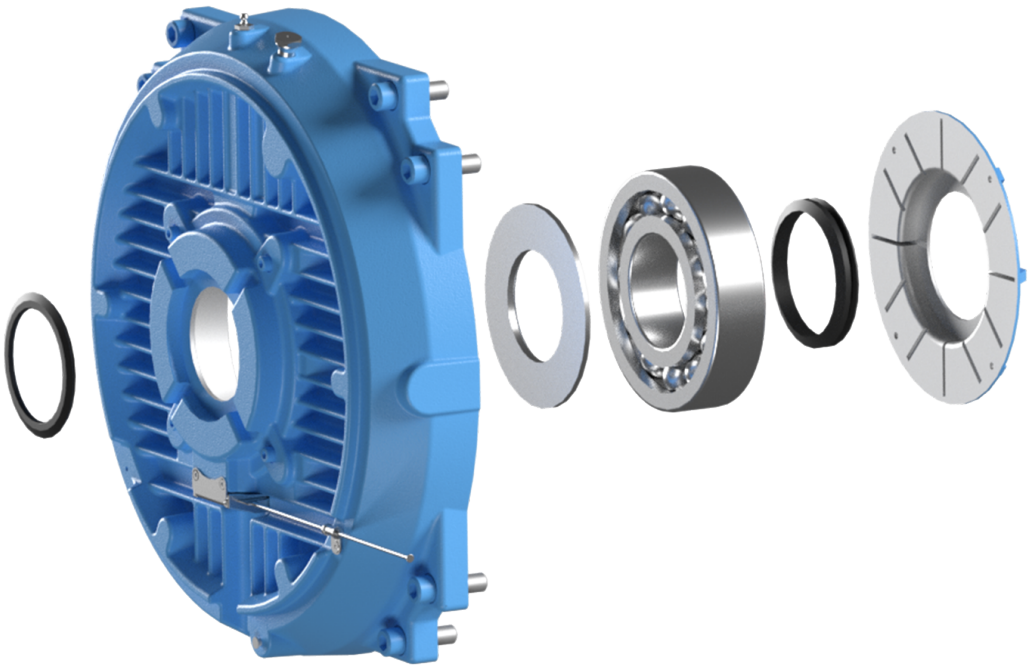
Motors with roller bearings or an angular-contact ball bearing are fitted with a transport lock before dispatch to prevent damage to bearings during transport. A warning sign is attached to motors larger than 250 when transport locking is used.

Locking may also be fitted in other cases if severe transport conditions are expected.

Bearing seals

These tables present the standard and alternative sizes and types of seals per motor size.

Shaft height	Product design code	Speed r/min	Standard design		Alternative designs	
			Axial seal		Labyrint seal at D-end (variant code 783)	Radial seal at D-end (variant code 072)
			D-end	N-end		
90	B, C	1000-3000	Gamma seal	Gamma seal	NA	Radial seal
100	C	1000-3000	Gamma seal	Gamma seal	NA	Radial seal
112	C	1000-3000	Gamma seal	Gamma seal	NA	Radial seal
132	C	1000-3000	Gamma seal	Gamma seal	NA	Radial seal
160	B, C	1000-3000	Gamma seal	Gamma seal	Labyrint seal	Radial seal
180	C	1000-3000	Gamma seal	Gamma seal	Labyrint seal	Radial seal
200	B, C	1000-3000	Gamma seal	Gamma seal	Labyrint seal	Radial seal
225	C	1000-3000	Gamma seal	Gamma seal	Labyrint seal	Radial seal
250	B, C	1000-3000	Gamma seal	Gamma seal	Labyrint seal	Radial seal
280	C, D	3000	Labyrinth seal	Labyrinth seal	Standard	NA
280	B, C, D	1000-1500	Labyrinth seal	Labyrinth seal	Standard	NA
315	C, D	3000	Labyrinth seal	Labyrinth seal	Standard	NA
315	B, C, D	1000-1500	Labyrinth seal	Labyrinth seal	Standard	NA



Bearing life and lubrication

Bearing life

The nominal life L_{10h} of a bearing is defined according to ISO 281 as the number of operating hours achieved or exceeded by 90 % of identical bearings in a large test series under specified conditions. 50 % of bearings achieve at least five times this lifetime.

The calculated bearing life L_{10h} for power transmission by means of coupling is for horizontally mounted motors in sizes 280 to 315 ≥ 200,000 hours.

Lubrication

On delivery, motors in frame sizes 160 and above are prelubricated with high-quality grease. Before first start-up, see instructions for relubrication and recommended grease in the Manual for low voltage motors delivered together with the motor.

For frame sizes 160-250 the lubrication plate can be ordered separately with variant code 795.

Lubrication intervals

ABB follows the L_1 principle in defining lubrication intervals. According to this principle, 99 % of motors will make the interval time. The synchronous reluctance motor sizes 160 to 315 have regreasable bearings as the standard solution. The lubrication intervals can also be calculated according to the L_{10} principle, which usually gives twice as long interval times. L_{10} values are available from ABB at request.

Motors with relubrication nipples

In frame sizes 280 – 315, the bearing system allows the use of a valve disc to ease lubrication. Motors are lubricated while running.

The grease outlet opening has closing valves at both ends. These should be opened before greasing and closed 1 – 2 hours after regreasing. This ensures that the construction is tight and bearings remain dust- and dirt-free. A grease-collection method can be used optionally.

The following tables show lubrication intervals according to the L_1 principle for various nominal speeds in 25 °C ambient temperature. These values apply to horizontally mounted motors (B3) with 80 °C bearing temperature and high-quality grease containing lithium-complex soap and mineral or PAO-oil.

LUBRICATION INTERVALS IN DUTY HOURS FOR BALL BEARINGS

Frame size	Amount of grease g/ bearing	Amount of grease g/N-end	Speed 3000 r/min	Speed 1500 r/min	Speed 1000 r/ min
Ball bearings					
Lubrication intervals in duty hours					
90-132	Greased for life				
160	13	8	14900	27100	34 200
180	15	8	13000	25100	32 300
200	20	9	9900	21600	28 800
225	23	9	8500	20100	27 300
250	30	15	6200	17300	24 400
280	40	40	3200	16000	23 100
315	55	40	3200	12700	19 600

LUBRICATION INTERVALS IN DUTY HOURS FOR ROLLER BEARINGS

Frame size	Amount of grease g/ bearing	Amount of grease g/N-end	Speed 3000 r/min	Speed 1500 r/min	Speed 1000 r/min
Roller bearings					
Lubrication intervals in duty hours					
90-132	Greased for life				
160	13	8	7500	13 500	17 100
180	15	8	6500	12600	16 100
200	20	9	4900	10800	14 400
225	23	9	5300	10000	13600
250	30	15	3100	8600	12 200
280	40	40	1600	8000	11600
315	55	40	1600	6300	9 800

Grease lifetime

Grease lifetime information is relevant for motors equipped with bearings greased for life. Synchronous reluctance motors in frame sizes 90-132 is equipped with them.

The standard bearing grease is high-quality grease intended for normal temperatures in dry or humid environments. The normal ambient temperature is 40 °C, in some cases even higher. Refer to the table below to see how temperature affects grease lifetime.

As an optional solution, grease nipples for regreasing can also be provided. See variant code 041.

The grease lifetime L_{10}, applicable to permanently lubricated bearings, is defined as the number of operating hours after which 90 % of bearings are still adequately lubricated. 50 % of the bearings achieve twice the lifetime L_{10}.

40 000 hours should be regarded as the definitive maximum lifetime after which bearings should be replaced. Lifetime is subject to the load conditions of the application run by the motor.

AMBIENT TEMPERATURE AND GREASE LIFETIME

Motor size	Speed	Ambient temperature and grease lifetime					
	r/min	25 °C	40 °C	50 °C	60 °C	70 °C	80 °C
90	3000	40 000	40 000	33 000	20 000	11 000	6000
90	1500	40 000	40 000	40 000	33 000	18 000	9000
90	1000	40 000	40 000	40 000	33 000	18 000	9000
100	3000	40 000	39 000	25 000	15 000	8000	4000
100	1500	40 000	40 000	40 000	30 000	17 000	9000
100	1000	40 000	40 000	40 000	33 000	18 000	9000
112	3000	40 000	39 000	25 000	15 000	8000	4000
112	1500	40 000	40 000	40 000	30 000	17 000	9000
112	1000	40 000	40 000	40 000	33 000	18 000	9000
132	3000	40 000	33 000	21 000	13 000	7 000	4 000
132	1500	40 000	40 000	40 000	26 000	14 000	7 000
132	1000	40 000	40 000	40 000	33000	18000	9000

Grease lifetime L10 in deep groove ball bearings of type 2Z in horizontally mounted motors in continuous running duty

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:

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

Where:	
E:	length of the shaft extension in the standard version

Permissible loading on the shaft

PERMISSIBLE RADIAL FORCES, MOTOR SIZES 90 – 315

Motor size	Speed, r/min	Length of shaft extension	Ball bearings				Roller bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
		E (mm)	FX0(N)	FXmax(N)	FX0(N)	FXmax(N)	FX0(N)	FXmax(N)	FX0(N)	FXmax(N)
90	3000	50	821	691	653	549	-	-	-	-
	1500	50	1035	870	822	691	-	-	-	-
	1000	50	1185	997	941	792	-	-	-	-
100	3000	60	1137	948	903	753	-	-	-	-
	1500	60	1433	1195	1138	949	-	-	-	-
	1000	60	1641	1369	1303	1087	-	-	-	-
112	3000	60	1123	918	892	730	-	-	-	-
	1000	60	1621	1325	1287	1053	-	-	-	-
132	3000	80	2120	1610	2120	1610	-	-	-	-
	1500	80	2120	1610	2120	1610	-	-	-	-
	1000	80	2513	2200	1994	1745	-	-	-	-
160	3000	110	3540	2740	2955	2285	7100	4300	6140	4300
	1500	110	4000	3100	3325	2570	8000	4300	6870	4300
	1000	110	4170	3200	3440	2655	8600	4300	7270	4300
180	3000	110	4100	3385	3455	2825	8125	5500	7025	5500
	1500	110	4270	3485	3525	2885	8600	5500	7300	5500
	1000	110	4700	3800	3855	3155	9400	5500	7900	5500
200	3000	110	5600	4685	4700	3925	10900	9100	9470	7900
	1500	110	6285	5200	5240	4370	12500	9550	10700	8900
	1000	110	6800	5700	5700	4770	13600	9550	11670	9550
225	3000	110	6400	5400	5355	4500	13300	10700	11500	9700
	1500	140	7300	5900	6155	4970	15400	10250	13200	10250
	1000	140	7600	6200	6370	5140	16400	10250	14000	12500
250	3000	140	7700	6285	6500	5285	17100	10900	14900	10900
	1500	140	8700	7000	7300	5900	19800	13800	17000	13800
	1000	140	8900	7200	7355	5955	21200	13800	18000	13800
280 SM_	3000	140	7254	6091	5744	4824	20380	6887	16549	6887
	1500	140	9200	7800	7300	6200	25100	9200	20300	9200
	1000	140	10600	8900	8400	7000	28300	9200	23000	9200
280 ML_	3000	140	7312	6263	5779	4950	20603	6528	16727	6528
315 SM_	3000	140	7229	6172	5717	4881	20349	6779	16522	6779
	1500	170	11400	9400	9000	7450	32500	9600	26600	9600
	1000	170	13000	9600	10300	8500	37000	9600	30000	9600
315 ML_	3000	140	7281	6326	5744	4991	20568	6411	16696	6411
	1500	170	11500	9700	9100	7650	32700	13600	26500	13600
	1000	170	13200	11100	10400	8800	36900	13600	29900	13600
315 LK_	3000	140	7342	5795	5779	5121	20808	5795	16887	5795
	1500	170	11500	10000	9100	7850	33100	13350	26800	13350
	1000	170	13200	11400	10450	9050	37300	13350	30300	13350

Axial forces

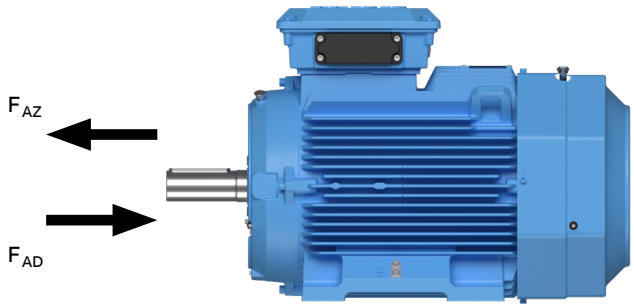
01 Mounting arrangement IM B3

02 Mounting arrangement IM V1

Axial forces

The following tables present permissible axial forces on the shaft in Newton‘s, 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.

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.



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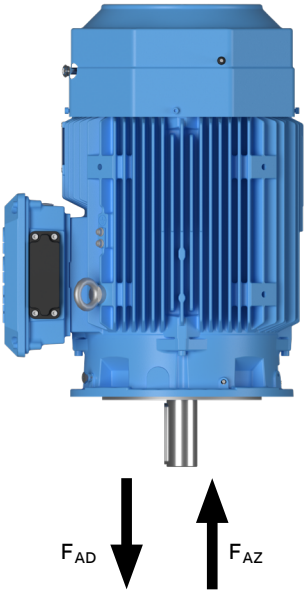


02

PERMISSIBLE AXIAL FORCES, MOTOR SIZES 90 – 315

Motor size	Speed, r/min	Length of shaft extension	Mounting arrangement IM B3				Mounting arrangement IM V1			
			20,000 h		40,000 h		20,000 h		40,000 h	
			FAD(N)	FAZ(N)	FAD(N)	FAZ(N)	FAD(N)	FAZ(N)	FAD(N)	FAZ(N)
90	3000	50	782	502	620	342	829	471	669	311
	1500	50	943	759	732	548	1007	716	796	506
	1000	50	1096	912	849	665	1161	871	913	623
100	3000	60	1092	654	873	435	1183	593	964	374
	1500	60	1379	941	1091	653	1481	874	1193	585
	1000	60	1003	1003	755	755	1077	955	829	707
112	3000	60	1092	654	874	436	1180	596	961	377
	1000	60	1592	1154	1253	815	1680	1096	1341	757
132	3000	80	2245	1645	1760	1160	2460	1505	1970	1015
	1500	80	2595	1980	2025	1425	2815	1850	2245	1280
	1000	80	2476	1676	1928	1128	2657	1557	2107	1007
160	3000	110	4650	4650	3850	3850	4950	4350	4200	3600
	1500	110	5000	5000	4200	4200	5450	4650	4600	3800
	1000	110	4840	4840	4000	4000	5400	4420	4540	3560
180	3000	110	5480	5480	4600	4600	5920	5515	5060	4255
	1500	110	4360	4360	3540	3540	5080	3860	4240	3020
	1000	110	3990	3990	2820	2820	5240	3780	4060	2610
200	3000	110	5000	7350	5000	6150	5000	7050	5000	5800
	1500	110	5000	8050	5000	6700	5000	7550	5000	6200
	1000	110	5000	8300	5000	6880	5000	7505	5000	6025
225	3000	110	4860	4860	3960	3960	5000	4245	4780	3345
	1500	140	4820	4820	3470	3470	6770	4320	5420	2960
	1000	140	5960	5960	4210	4210	7910	5450	6160	3700
250	3000	140	6000	6050	4900	4900	6000	5300	5800	4200
	1500	140	6000	7100	5800	5800	6000	6300	6000	4900
	1000	140	6000	7480	6000	6040	6000	6370	6000	4830
280 SM_	3000	140	6503	3817	5183	2497	8160	2688	6829	1357
	1500	140	8000	6000	6250	4250	9600	4550	7800	2750
	1000	140	7250	9250	7150	5150	11150	5500	9000	3350
280 ML_	3000	140	6067	4067	4752	2752	8309	2538	6979	1208
315 SM_	3000	140	6348	3842	5031	2525	8433	2415	7102	1084
	1500	170	9400	7400	7250	5250	11750	5500	9500	3300
	1000	170	10 900	8900	8350	6350	13600	6300	11 050	3750
315 ML_	3000	140	6 251	3745	4939	2433	8992	1855	7 661	525
	1500	170	9250	7250	7100	5100	12 500	5500	10 300	2900
	1000	170	10650	8650	8100	6100	14 900	5800	12 350	3250
315 LK_	3000	140	6073	3783	4765	2475	9 255	1593	7 924	262
	1500	170	9100	7150	7000	5000	13 100	3850	10900	1700
	1000	170	10 500	8500	7950	5950	15700	4100	13100	1550

Terminal box

Standard terminal box

Degree of protection and mounting options

The degree of protection for the standard terminal box is IP 55. By default, terminal boxes are mounted on top of the motor at the D-end. In motor sizes 90-132, the terminal box is integrated in the motor frame. On request, the terminal box can also be mounted on the left or right side regardless of the motor size (see Mounting options).

Turnability

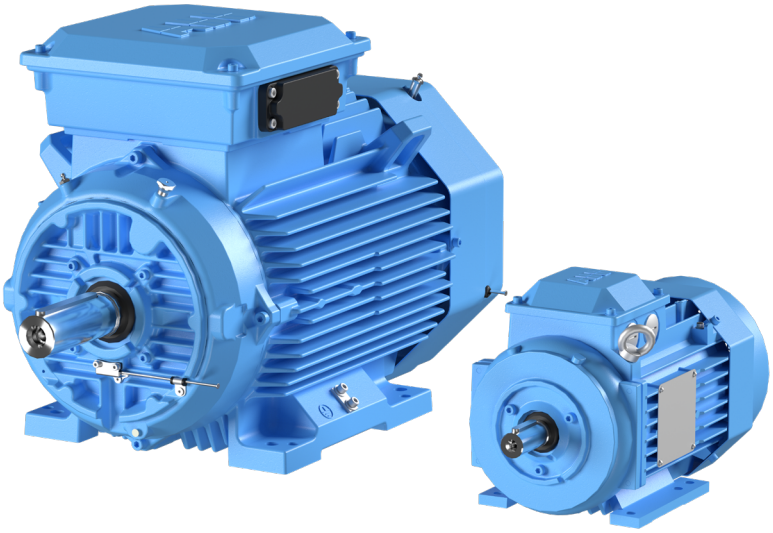
The standard terminal boxes for motor sizes 160–315 can be turned 4*90° after delivery. For motors in sizes 90-132, a 4*90° turnable terminal box is optional - this can be ordered with variant code 400.

Cable entries

The terminal box is provided with tapped holes for cable glands. No cable glands are included as standard, the entry holes are closed with blanking plugs made of plastic. Please refer to the table on the next page for further information about the amount and size of threaded holes, plugs and cable sealing units provided as standard.

Different types of cable glands are available as an option. Please refer to the terminal box alternatives section for more details.

Terminations are suitable for copper and aluminum cables. Cables are connected to terminals by cable lugs, which are not included in the delivery.



Cable entries

STANDARD TERMINAL BOX CONNECTIONS

Motor size	Product design code	Speed, r/min	Terminal box type	Size of flange opening	Amount and size of threaded plugged holes, or cable sealing end unit	Plugged holes	Max. connectable core cross-section mm² /phase	Number and size of terminal bolts	Earthing in the main terminal box
90	C	1000-3000	integr.	-	2x M25x1.5	2x M25	1x6	6 x M5	1xM4
100	C	1000-3000	integr.	-	2x M32x1.5	2x M32	1x10	6 x M5	1xM4
112	C	1000-3000	integr.	-	2x M32x1.5	2x M32	1x10	6 x M5	1xM4
132	C	1000-3000	integr.	-	2x M32x1.5	2x M32	1x10	6 x M5	1xM5
160	B, C	1000-3000	63	B	2xM40x1.5	2xM40	1x35	6 x M6	1xM6
180	C	1000-3000	63	B	2xM40x1.5	2xM40	1x35	6 x M6	1xM6
200	B, C	1000-3000	160	C	2xM63x1.5	2xM63	1x70	6 x M10	1xM6
225	C	1000-3000	160	C	2xM63x1.5	2xM63	1x70	6 x M10	1xM6
250	B, C	1000-3000	160	C	2xM63x1.5	2xM63	1x70	6 x M10	1xM6
280 SM	B, C, D	1000-3000	210	C	2xM63x1.5	2xM63	2x150	6 x M12	2xM10
280 SMD	D	3000	370	D	2xM63x1.5	2xM63	2x240	6 x M12	2xM10
280 ML	D	3000	370	D	2xM63x1.5	2xM63	2x240	6 x M12	2xM10
315 SM, ML	B	1500	370	D	2xM63x1.5	2xM63	2x240	6 x M12	2xM10
315 SM_	C,D	1000-3000	370	D	2xM63x1.5	2xM63	2x240	6 x M12	2xM10
315 ML_	D	1000-1500	370	D	2xM63x1.5	2xM63	2x240	6 x M12	2xM10
315 MLA	D	3000	370	D	2xM63x1.5	2xM63	2x240	6 x M12	2xM10
315 MLB, MLC	D	3000	750	E	2xM75x1,5	1xM75	4x240	6 x M12	2xM10
315 LK_	B	1500	750	E	2xM75x1,5	1xM75	4x240	6 x M12	2xM10
315 LK_	D	1000	370	D	2xM63x1.5	2xM63	2x240	6 x M12	2xM10
315 LK_	D	1500-3000	750	E	2xM75x1,5	1xM75	4x240	6 x M12	2xM10

AUXILIARY CABLE ENTRIES

Motor size	Speed, r/min	Amount and size of threaded plugged holes	Max, connectable core cross section mm² / phase
90-132	all	-	-
160-315	all	2x M20x1,5	1x2,5

Standard delivery if no other information is provided.

Note: For other network voltages and/or side-mounted motors, contact your ABB sales office.

Ordering

To ensure the delivery of desired terminations for the motor, state the cable type, quantity, size and outer diameter when ordering. Non-standard designs of terminal boxes, such as non-standard size, or higher degree of protection, are available as options.

See section Variant codes for all options available.

Terminal box dimensions

01 Terminal box type 63 and 160

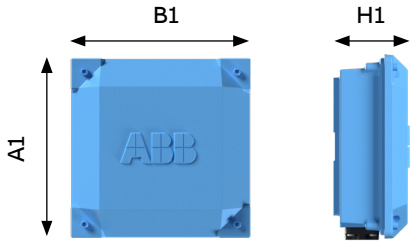
02 Terminal box types 210 and 370

03 Terminal box type 750 + adapter

For dimensions of integrated terminal boxes in motors, sizes 90-132, see the following Dimension drawings pages.

To match the correct terminal box with motor sizes 160 - 315, find the motor type and correspondent terminal box type on the previous page. The box types and their dimensions are presented on this page.

Frame dimensions



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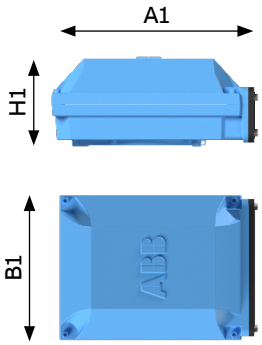

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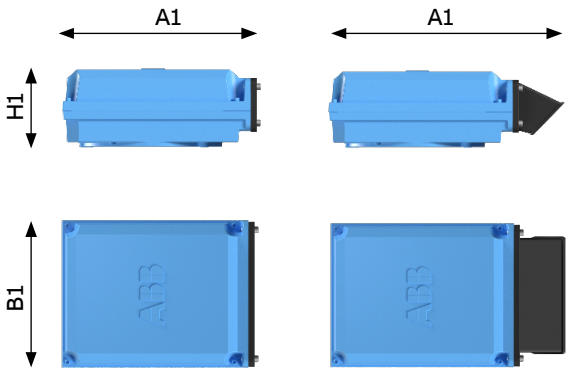
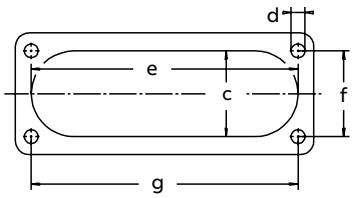


03

Terminal box types	A1 mm	B1 mm	H1 mm	Gland plate opening
63	248	248	109	B
160	291	302	154	C
210	416	306	177	C
370	451	347	200	D
750 with E-D adapter	686	413	219	D
750 without E-D adapter	523	413	219	E
750 with E-2D adapter	826	413	219	2xD

Dimensions for terminal box inlets



Flange opening	c mm	e mm	f mm	g mm	d thread type
B	31	120	30	120	M6
C	62	193	62	193	M8
D	100	300	80	292	M10
E	115	370	100	360	M12

Cable glands

The motors are delivered as standard with plugged cable entries. There is available a broad selection of different type of cable glands, which are suitable for different types of cable and outer diameter ranges.

Size of threaded opening for cable gland	Cable gland(s) nickel plated brass, variant code 230 or 731	EMC Cable gland(s) nickel-plated brass, variant code 704	Cable gland(s) plastic, variant code 375 or 376
Metric (std)	**Cable outer diameter, mm**	**Cable outer diameter, mm**	**Cable outer diameter, mm**
M16 x 1.5	4-12	4-8	4-12
M20 x 1.5	4-12	4-12	4-12
M25 x 1.5	10-18	10-18	10-18
M32 x 1.5	14-24	14-24	14-24
M40 x 1.5	22-32	22-32	22-32
M50 x 1.5	26-35	26-35	26-35
M63 x 1.5	35-45	35-45	35-45
M75 x 1.5	46-62	46-62	na

EMC cable entry solution (variant code 704)

The standard delivery for the motors are provided with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If EMC cable glands are needed the variant code 704 is to be ordered. In the table below you can see the solution for variant code 704. For other solutions please refer to variant code list.

Motor frame size	Product design code	Nominal Speed, r/min	Main cable entry amount and size of threaded holes	Auxiliary cable entry amount and size of threaded holes	EMC cable gland amount and size	Plug amount and size [PC]
90	C	1000-3000	2x M25x1.5	-	2x M25x1.5	2x M25x1.5
100-132	C	1000-3000	2x M32x1.5	-	2x M32x1.5	2x M32x1.5
160	B, C	1000-3000	2xM40x1.5	2x M20x1,5	2xM40x1.5 + 1xM20x1,5	1x M20x1,5
180	C	1000-3000	2xM40x1.5	2x M20x1,5	2xM40x1.5 + 1xM20x1,5	1x M20x1,5
200	B, C	1000-3000	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
225	C	1000-3000	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
250	B, C	1000-3000	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
280	B, C, D	1000-3000	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
315 SM, ML	B	1500	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
315 SM_	C,D	1000-3000	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
315 ML_	D	1000-1500	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
315 MLA	D	3000	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
315 MLB, MLC	D	3000	2xM75x1,5	2x M20x1,5	2xM75x1.5 + 1xM20x1,5	1x M20x1,5
315 LK_	B	1500	2xM75x1,5	2x M20x1,5	2xM75x1.5 + 1xM20x1,5	1x M20x1,5
315 LK_	D	1000	2xM63x1.5	2x M20x1,5	2xM63x1.5 + 1xM20x1,5	1x M20x1,5
315 LK_	D	1500-3000	2xM75x1,5	2x M20x1,5	2xM75x1.5 + 1xM20x1,5	1x M20x1,5

Threaded openings for cable glands with NPT thread (variant code 730)

The standard delivery for the motors are provided with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If NPT threads will be needed, the variant code 730 is to be ordered. For other solutions please refer to variant code list.

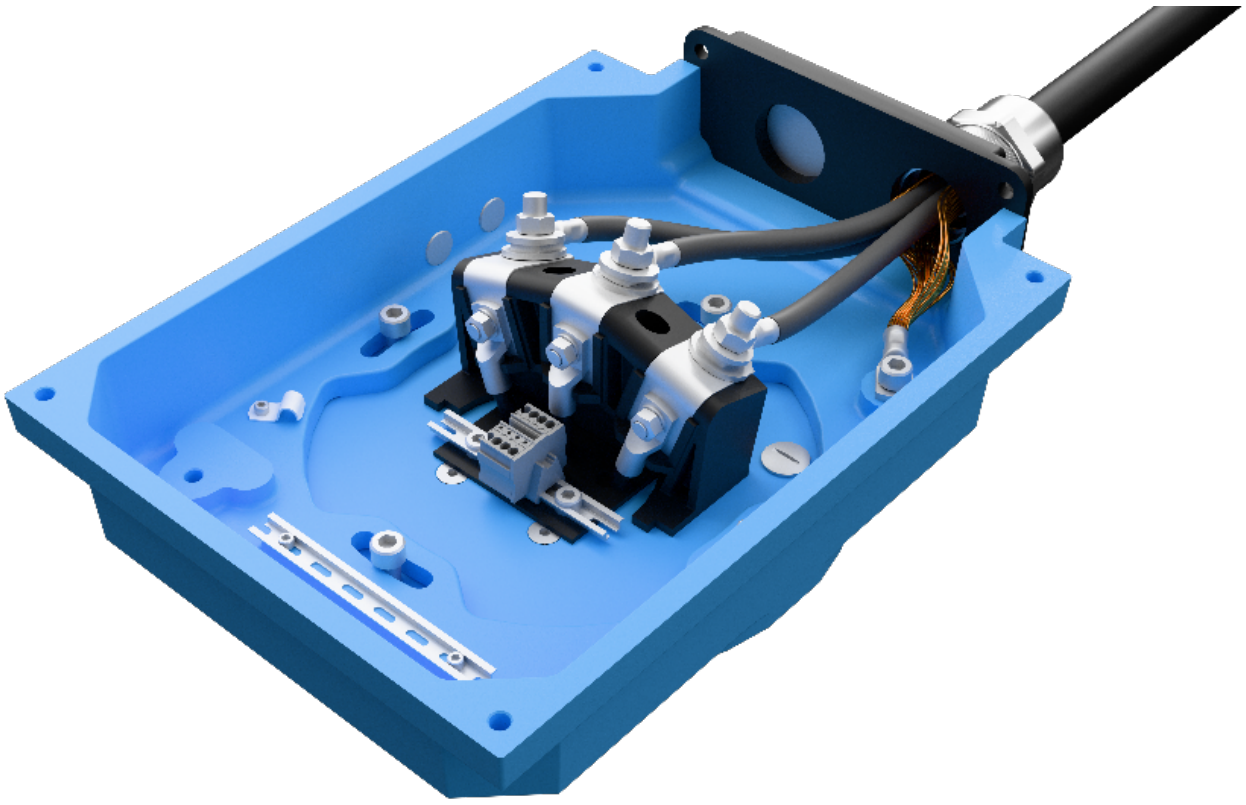
Motor frame size	Main cable entries	NPT plug [pc]	DBI plug [pc]
90	2 x ¾”	2 x ¾”	-
100-132	2 x 1”	2 x 1”	-
160-180	2 x 1 ¼”	1 x 1 ¼”	1
200-250	2 x 1 ½”	1 x 1 ½”	1
280	2 x 2”	1 x 2”	1
315	2 x 2 ½”	1 x 2 ½”	1

Motor frame size	Speed, r/min	Cable entries for auxiliaries	NPT plug [pc]
90-132	all	-	-
160-315	all	2 x ¾”	2 x ¾”

Gland plates with threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands is not suitable then nonstandard size openings are also available, either by fitting the reducers to make the openings smaller or by increasing the amount or size of holes. The maximum possible size and amount for each gland plate size is listed below. Threaded openings of non-standard size can be ordered by using variant codes 554 and 727.

Gland plate size	Maximum amount and size of threaded holes
B	2 x M40
C	2 x M63
D	2 x M90 or 3 x M75
E	2 x M90 or 4 x M75



Terminal boxes and boards

01 Integrated terminal box for motor size 132. Knock-out openings for cable entries

02 Terminal board for motor size 132

03 Terminal box for motor sizes 160 – 250. Connection flanges with tapped cable entries

04 Terminal board for 160 – 250

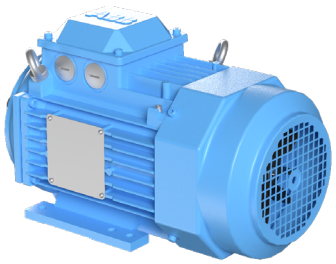
05 Terminal box for motor sizes 280 - 315. Connection flange with tapped cable entries

06 Terminal board for motor sizes 280 - 315

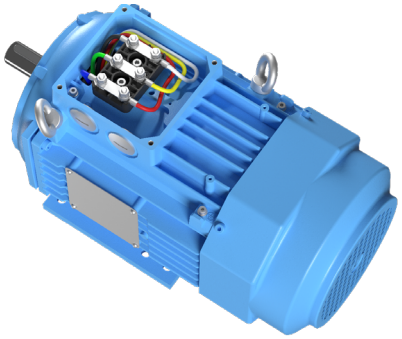
The pictures below show standard terminal boxes and the corresponding terminal boards for various motor sizes.

Motor sizes 132-315

Motor size 90-132

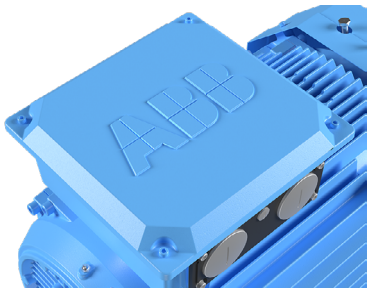


01



02

Motor sizes 160 – 250



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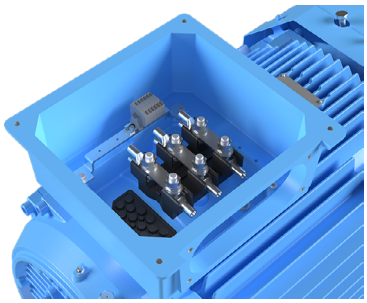
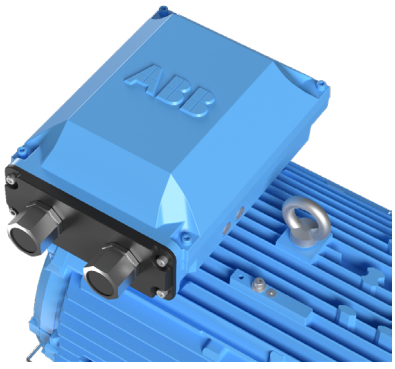


04

Motor sizes 280 – 315



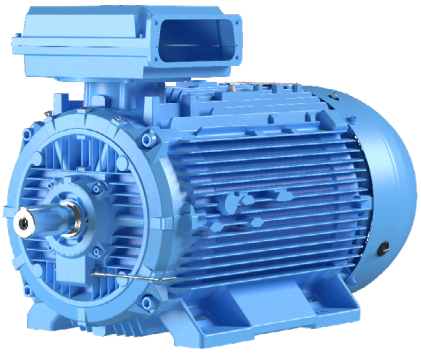
05

06

Terminal box alternatives

01 Main terminal box

02 Adapters, Flange with glands; cable sealing end units.



01

02

Optional adapters

There is a broad selection of cable termination accessories available to allow termination of one or several cables. The most common ones are explained below.

How to order

- Check first that the teminal box itself allows mounting of the desired cable and cores (refer to motor type and terminal box type cross reference on previous page)
- If very large cables are used it might be necessary to use a larger terminal box than standard. Select the right cable gland(s) or cable sealing end unit(s) that match outer diamater of the cable(s)
- Select appropriate adapter or flange
- Note that turning the terminal box to a non-standard position might limit the use of some adapters.

Main terminal box and maximum single core cross-section

The terminal boxes are named according to their current-carrying capacity, from 120 to 1200. You can select one size larger than standard terminal box if a larger single cross-section is needed. The standard sizes of the main terminal box are listed in the following table. Check also the capacity of the cable entry to make sure that the cables fit. A larger terminal box can be ordered with variant code 019.

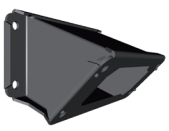
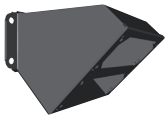
Standard terminal box	Large terminal box	Size of opening	Max single cross-section mm²/ phase
120	210	B	1 x 70
210	370	C	2 x 240
370	750	D	2 x 300
750	1200	E	4 x 500
1200	-	-	-

ORDERING EXAMPLE FOR SPECIAL CABLE ENTRY AND AUXILIARY TERMINAL BOX

Motor Cables	250 kW, 1500 rpm, 400 V 50 Hz 2 pieces, outer diameter 58 mm, single core cross section 185 mm2 clamping device needed, cables coming from below
Needed one terminal box for anticondensation heaters and another for temperature detectors, material must be cast iron.	
Motor	M3BL 315 LKB, 1500 rpm, B3
Adapter	D-D - variant code 293
Cable sealing end unit	Variant code 278
Clamping	Variant code 231
Auxiliaries	Variant codes 380, 567, 568

Optional adapters

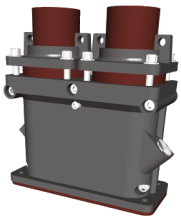
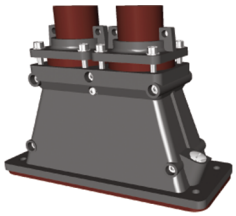
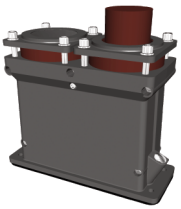
To allow easy termination of cables entering the terminal box from above or below, an angle adapter is recommended. These are available for motor sizes 280 - 315 and can also be used to allow the mounting of several cable sealing end units or gland plates.

Adapter				
Variant code	292	293	294	295
Suited for motor sizes	280 with gland plate opening C in the terminal box.	280-315 with gland plate opening D in the terminal box.	280-315 with gland plate opening E in the terminal box.	280-315 with gland plate opening E in the terminal box.
Opening to terminal box	C	D	E	E
Flange or opening for end unit	C	D	D	2 X D
Material	Cast iron	Cast iron	Cast iron	Steel

Cable sealing end units

As an alternative to flanges and cable glands, cable sealing end units can be used. These allow more space for spreading the cores for easy termination. Cable sealing end units have rubber-sealed entries for one of the two main cables. In addition, there are two plugged M20 holes for auxiliary cables.

Please note that the table below is only for guidance. Due to the large amount of combinations possible between terminal box sizes , end units and adapters, not all possible combinations can be described. Please contact your ABB sales office for more detailed information.

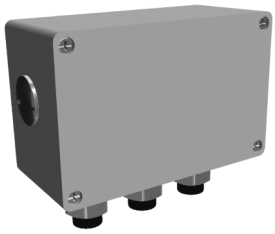
	Small	Medium	Large
End unit			
Variant code	277	278	279
Suited for motor sizes	280	280-315	280-315
Opening to terminal box	C	D	D
Cable outer diameter	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 60 - 80 mm
Cable entry for auxiliary cable	2×M20 plugged holes	2×M20 plugged holes	2×M20 plugged holes
Additional optional variants	EMC cable gland (704)	EMC cable gland (704)	EMC cable gland (704)

Auxiliary terminal box

The following tables present permissible axial forces on the shaft in Newton's, 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.

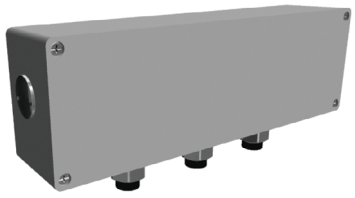
Permissible loads of simultaneous radial and axial forces can be supplied on request. For axial force F_{AD}, it is assumed that the D-bearing is locked with a locking ring.

Related variant codes	
380	Separate terminal box for temperature detectors, standard material
418	Separate terminal box for auxiliaries, standard material
567	Separate terminal box material: cast iron
568	Separate terminal box for heating elements, standard material
569	Separate terminal box for brake



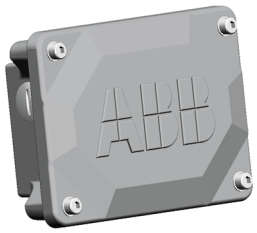
Small auxiliary aluminum terminal box for motor sizes 280 - 315 (variant codes 418, 568, 380, 569).

The size of terminal box ordered with these codes depends on the number of accessories ordered. 80 x 125 mm, max 12 strips. Earthing size M4.



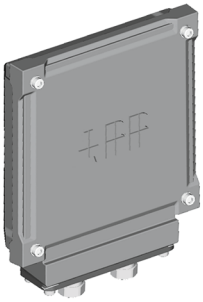
Large auxiliary aluminum terminal box for motor sizes 280 - 315.

The size of terminal box ordered with these codes depends on the number of accessories ordered. 80 x 250 mm, max 30 strips. Earthing size M4.

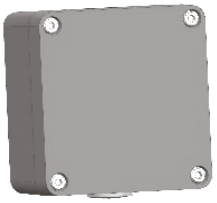


Auxiliary cast iron terminal box

Frame size for motor sizes 160 - 250 (variant code 418): 111 x 162 mm, max. 18 strips. No earthing.



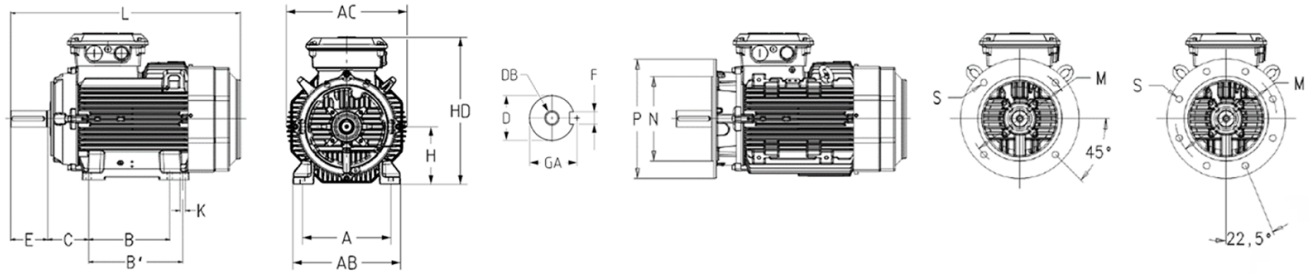
Frame size for motor sizes 280 - 315 (variant code 567): 208 x 180 mm, max 30 strips. Earthing size M6.



Small auxiliary aluminum terminal box for motor size 132 (variant code: 418): 80 x 75 mm, max 8 strips. Earthing size M4.

Dimension drawings

IE5 SynRM motors



MAIN DIMENSIONS FOR IE5 SYNRM MOTORS (C-GENERATION)

Motor size	Speed r/ min	IM1001, IM B3 and IM3001, IM B5						IM1001, IMB3											IM3001, IM B5				
		D	DB	GA	F	E	L max	A	AB	AC	B	B'	C	HD						K	M	N	P	S
														1)	1)	3)	4)	5)	6)					
90 L_	1000-3000	24	M8	27	8	50	390	140	170	177	100	125	56	218	-	-	-	-	-	10	165	130	200	12
100 LK_	1000-3000	28	M10	31	8	60	435	160	200	197	140	160	63	247	-	-	-	-	-	12	215	180	250	15
112 M_	1000-3000	28	M10	31	8	60	403	190	230	197	140	172	70	259	-	-	-	-	-	12	215	180	250	15
132 SM_	1500 - 3000	38	M12	41	10	80	533	216	262	271	140	178	89	300	-	-	-	-	-	12	265	230	300	15
160 ML_	3000	42	M16	45	12	110	584	254	310	338	210	254	108	-	421	-	-	-	-	14,5	300	250	350	19
160 ML_	1 000 - 1 500	42	M16	45	12	110	681	254	310	338	210	254	108	-	421	-	-	-	-	14,5	300	250	350	19
180 ML_	3000	48	M16	51,5	14	110	726	279	340	381	241	279	121	-	461	-	-	-	-	14,5	300	250	350	19
180 ML_	1 000 - 1 500	48	M16	51,5	14	110	766	279	340	381	241	279	121	-	461	-	-	-	-	14,5	300	250	350	19
200 ML_	1 000 - 3 000	55	M20	59	16	110	821	318	378	413	267	305	133	-	-	528	-	-	-	18,5	350	300	400	19
225 SM_	3000	55	M20	59	16	110	849	356	435	460	286	311	149	-	-	573	-	-	-	18,5	400	350	450	19
225 SM_	1 000 - 1500	60	M20	64	18	140	879	356	435	460	286	311	149	-	-	573	-	-	-	18,5	400	350	450	19
250SM_	3000	60	M20	64	18	140	884	406	480	508	311	349	168	-	-	626	-	-	-	24	500	450	550	19
250 SM_	1 000 - 1 500	65	M20	69	18	140	884	406	480	508	311	349	168	-	-	626	-	-	-	24	500	450	550	19
280 SM_	1000 - 1500	75	M20	79,5	20	140	1088	457	530	577	368	419	190	-	-	-	762	-	-	24	500	450	550	18
280 SM_	3000	65	M20	69	18	140	1088	457	530	577	368	419	190	-	-	-	762	-	-	24	500	450	550	18
315 SM_	1000	80	M24	85	22	170	1204	508	590	654	406	457	216	-	-	-	-	852	-	28	600	550	660	23

[1] Integrated

[2] Terminal box 63

[3] Terminal box 160

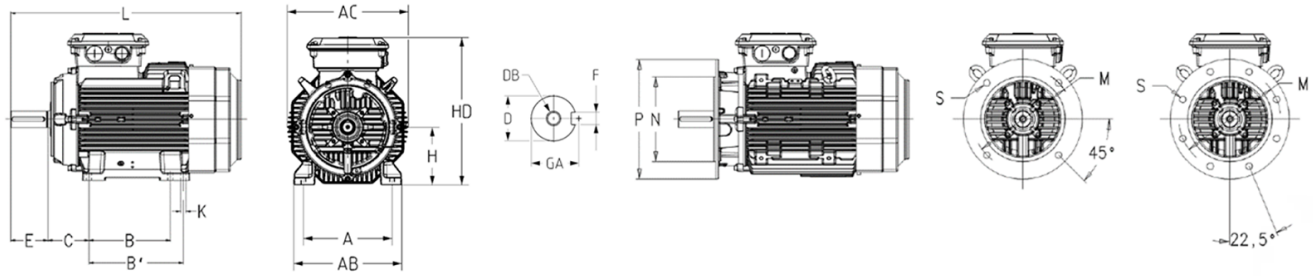
[4] Terminal box 210

[5] Terminal box 370

[6] Terminal box 750

The table gives the main dimension in mm. For detailed drawings please see our web pagesnew.abb.com/motors-generators.

IE6 SynRM motors



MAIN DIMENSIONS FOR IE6 SYNRM MOTORS (D-GENERATION)

Motor size	Speed r/min	IM1001, IM B3 and IM3001, IM B5						IM1001, IMB3									IM3001, IM B5				
		D	DB	GA	F	E	L max	A	AB	AC	B	B'	C	HD			K	M	N	P	S
														1)	2)	3)					
280 SMD	1500	75	M20	79,5	20	140	1088	457	530	577	368	419	190	762	-	-	24	500	450	550	18
280 SMC	3000	65	M20	69	18	140	1088	457	530	577	368	419	190	762	-	-	24	500	450	550	18
280 SMD	3000	65	M20	69	18	140	1088	457	530	577	368	419	190	-	785	-	24	500	450	550	18
280 ML_	3000	65	M20	69	18	140	1190	457	530	577	419	457	190	-	785	-	24	500	450	550	18
315 SM_	1500	80	M20	85	22	170	1202	508	590	654	406	457	216	-	852	-	28	600	550	660	23
315 SM_	3000	65	M20	69	18	140	1172	508	590	654	406	457	216	-	852	-	28	600	550	660	23
315 ML_	1000 - 1500	90	M24	95	25	170	1313	508	590	654	457	508	216	-	852	-	28	600	550	660	23
315 MLA	3000	65	M20	69	18	140	1283	508	590	654	457	508	216	-	852	-	28	600	550	660	23
315 MLB, MLC	3000	65	M20	69	18	140	1283	508	590	654	457	508	216	-	-	880	28	600	550	660	23
315 LK_	1000	90	M24	95	25	170	1519	508	590	660	508	560	216	-	852	-	28	600	550	660	23
315 LK_	1500	90	M24	95	25	170	1519	508	590	660	508	560	216	-	-	880	28	600	550	660	23
315 LK_	3000	65	M20	69	18	140	1489	508	590	660	508	560	216	-	-	880	28	600	550	660	23

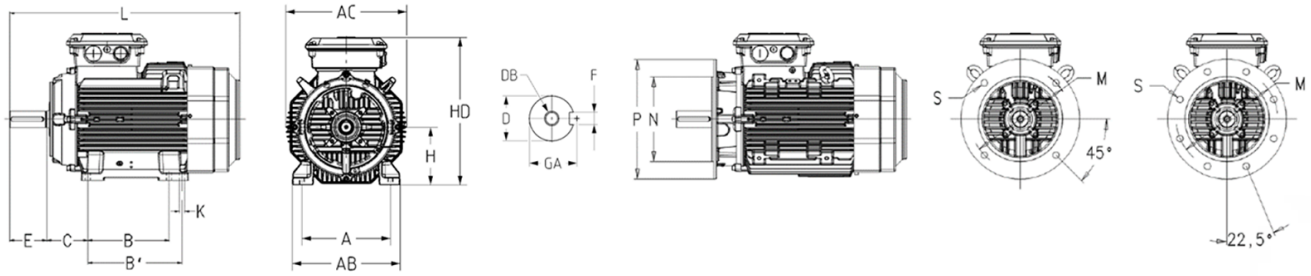
[1] Terminal box 210

[2] Terminal box 370

[3] Terminal box 750

The table gives the main dimension in mm. For detailed drawings please see our web pagesnew.abb.com/motors-generators.

High Output SynRM Motors



MAIN DIMENSIONS FOR HIGH OUTPUT SYNRM MOTORS (B-GENERATION)

Motor size	Speed r/min	IM1001, IM B3 and IM3001, IM B5						IM1001, IMB3											IM3001, IM B5				
		D	DB	GA	F	E	L max	A	AB	AC	B	B'	C	HD					K	M	N	P	S
														6)	2)	3)	4)	4)					
160 MLB	1500-3000	42	M16	45	12	110	584	254	310	338	210	254	108	421	-	-	-	-	14,5	300	250	350	19
160 MLC, MLE	1500-3000	42	M16	45	12	110	681	254	310	338	210	254	108	421	-	-	-	-	14,5	300	250	350	19
200 ML_	1 500 - 3 000	55	M20	59	16	110	821	318	378	413	267	305	133	-	528	-	-	-	18,5	350	300	400	19
250	3000	60	M20	64	18	140	884	406	480	508	311	349	168	-	626	-	-	-	24	500	450	550	19
250	1500-2100	65	M20	69	18	140	884	406	480	508	311	349	168	-	626	-	-	-	24	500	450	550	19
280 SM	1500-2100	75	M20	79,5	20	140	1088	457	530	577	368	419	190	-	-	762	-	-	24	500	450	550	18
315 SM_	1500	80	M24	85	22	170	1204	508	590	654	406	457	216	-	-	-	852	880	28	600	550	660	23
315 ML_	1500	90	M24	95	25	170	1315	508	590	654	457	508	216	-	-	-	852	880	28	600	550	660	23
315 LK_	1500	90	M24	95	25	170	1521	508	590	654	508	560	216	-	-	-	852	880	28	600	550	660	23

[1] Terminal box 63

[2] Terminal box 160

[3] Terminal box 210

[4] Terminal box 370

[5] Terminal box 750

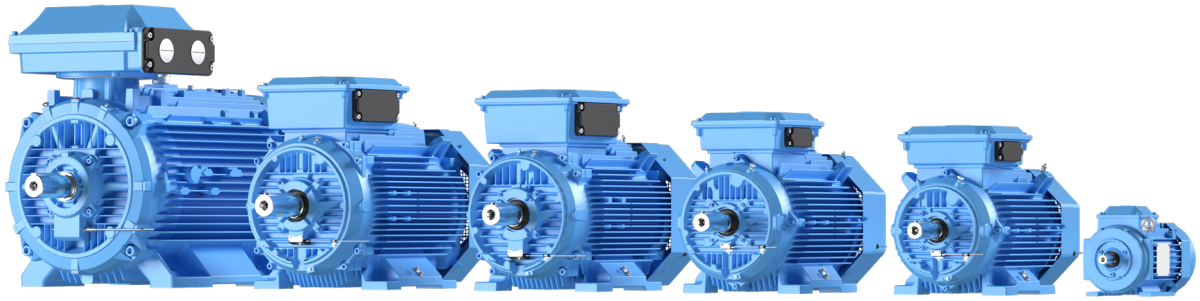
The tables gives the main dimension in mm. For detailed drawings please see our web pagesnew.abb.com/motors-generators.

Motors in brief

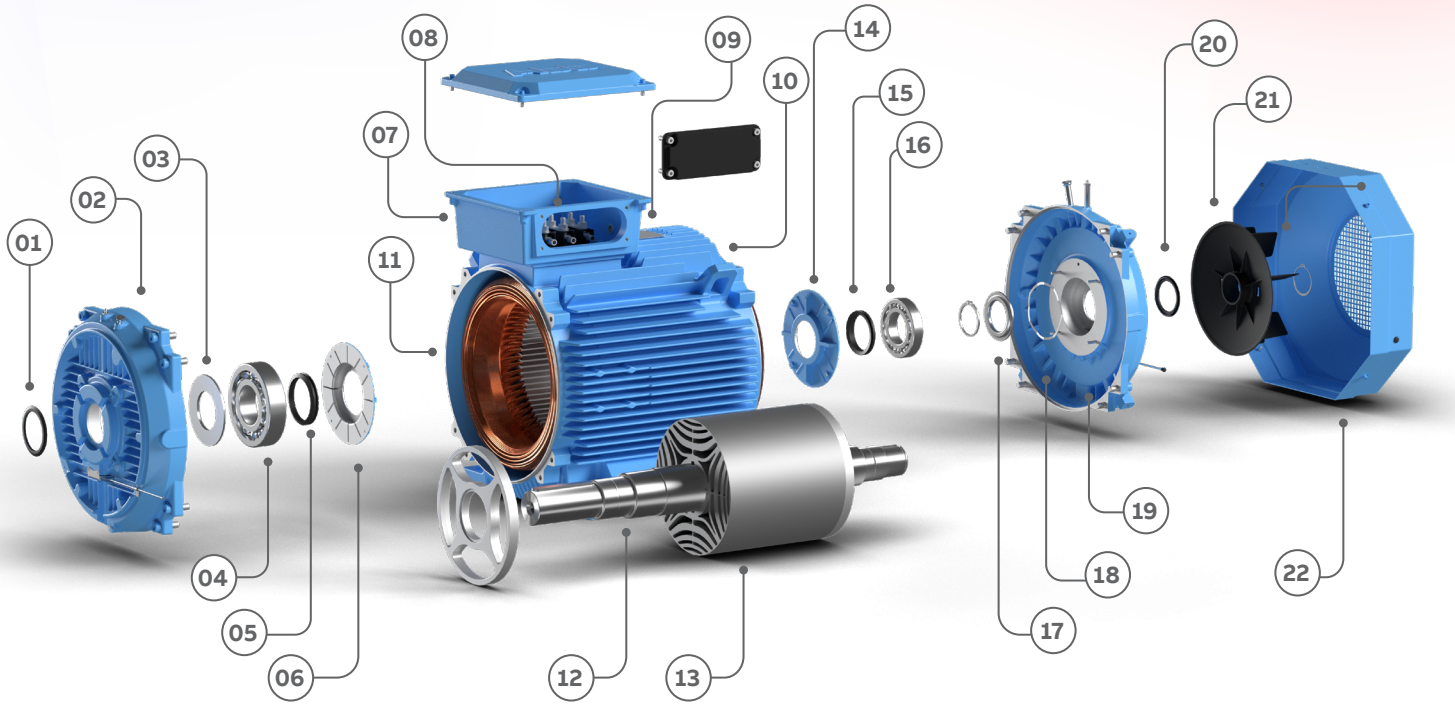
Synchronous reluctance cast iron frame motors, sizes 90-315

Motor size		90	100	112	132	160	180	200	225	250	280	315
Stator and end shields	Material	Cast iron										
	Paint colour shade	Munsell blue 8B 4.5/3.25										
	Corrosion class	C3										
Bearings	D-end	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3	6312/C3	6313/C3	6315/C3	6316/C3	6319/C3
	N-end	6204-2Z/C3	6205-2Z/C3	6205-2Z/C3	6208-2Z/C3	6209/C3	6209/C3	6210/C3	6212/C3	6213/C3	6316/C3*	6316/C3*
Axially-locked bearings	Inner bearing cover	Locked at D-end										
Bearing seals	D-end	Gamma seal									Labyrinth	
	N-end	Gamma seal									Labyrinth	
Lubrication		Permanently lubricated shielded bearings				Regreasable bearings, regreasing nipples M6x1					Regreasable bearings, regreasing nipples M10x1	
Measuring nipples		Not included				Included						
Rating plate	Material	Stainless steel										
Terminal box	Frame and cover	Cast iron										
	Corrosion class	C3										
	Cover screws	Zinc-electroplated steel										
Connections	Cable entries	2xM25	2xM32			2xM40 + 2xM20		2xM63 + 2xM20				2xM63 + 2xM20
												2xM75 + 2xM20
	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 colour shade	Munsell blue 8B 4.5/3.25										
	Corrosion class	C3										
Stator winding	Material	Copper										
	Insulation	Insulation class F or H. Temperature rise class B unless otherwise stated.										
	Winding protection	3 PTC thermistors, 150 °C									3 PTC thermistors, 155 °C	
Balancing method		Half-key balancing										
Keyway		Closed keyway									Open keyway	
Drain holes		Drain holes with closable plastic plugs, open on delivery										
Enclosure		IP 55										
Cooling method		IC 411										

* Insulated bearing at N-end as standard.



Motor construction



01	Shaft sealing
02	Endshield, D-end
03	Valve disc, D-end
04	Bearing, D-end
05	Shaft sealing
06	Inner bearing cover, D-end

07	Terminal box
08	Terminal board
09	Rating plate
10	Stator frame
11	Stator
12	Shaft
13	Rotor
14	Inner bearing cover, N-end
15	Shaft sealing
16	Bearing

17	Valve disc, N-end
18	Spring
19	Endshield, N-end
20	Shaft sealing
21	Cooling fan
22	Fan cover

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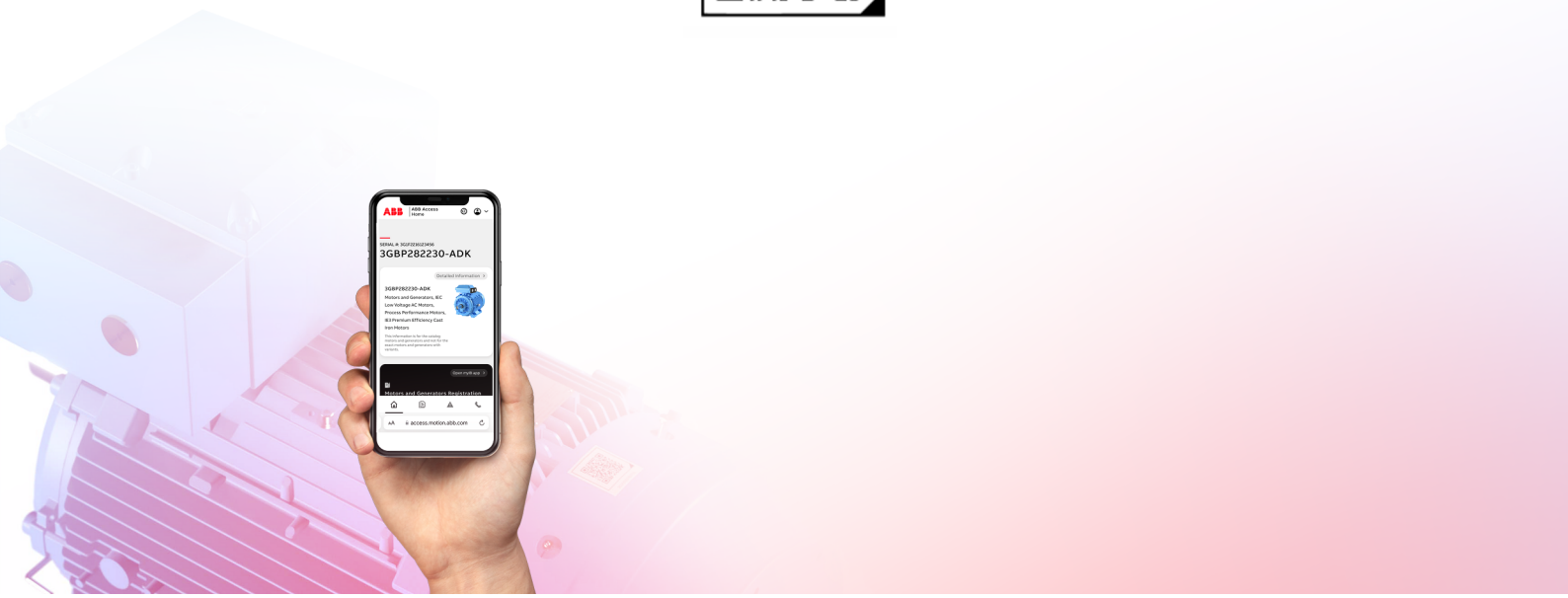
- Contact - Access ABB contacts and search Channel partners



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Synchronous reluctance 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

Life cycle services

ABB'S PORTFOLIO OF DRIVES

Optimal solution for efficient motor control

Being able to rely on the continuous high performance and efficiency of your operations is something you want to take for granted. ABB variable-frequency drives are made with all this in mind, established upon more than 40 years of experience and backed by a broad range of life cycle services.

ABB drives help you to optimize your processes and systems with state-of-the-art motor control technology, resulting in increased energy efficiency, better product quality, and reduced operating costs with higher output, less downtime, and reduced need for maintenance. All ABB drives are designed for easy selection, ordering, installation and use, and they offer integrated safety features, giving you more time to focus on what matters for you and your business.

Our portfolio offers low-voltage AC and DC drives, medium-voltage AC drives, and motion control drives spanning the fractional-kilowatt to multi-megawatt power level. There is a drive available for essentially every industry and application and for all types of motors, in environments ranging from water utility facilities to clean electrical rooms, and to harsh coal mines and windy offshore platforms to food and beverage production. This wide product range allows you to select the best-fitting drive solution, providing maximum reliability and efficiency for every need.

For more information and contact details:

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