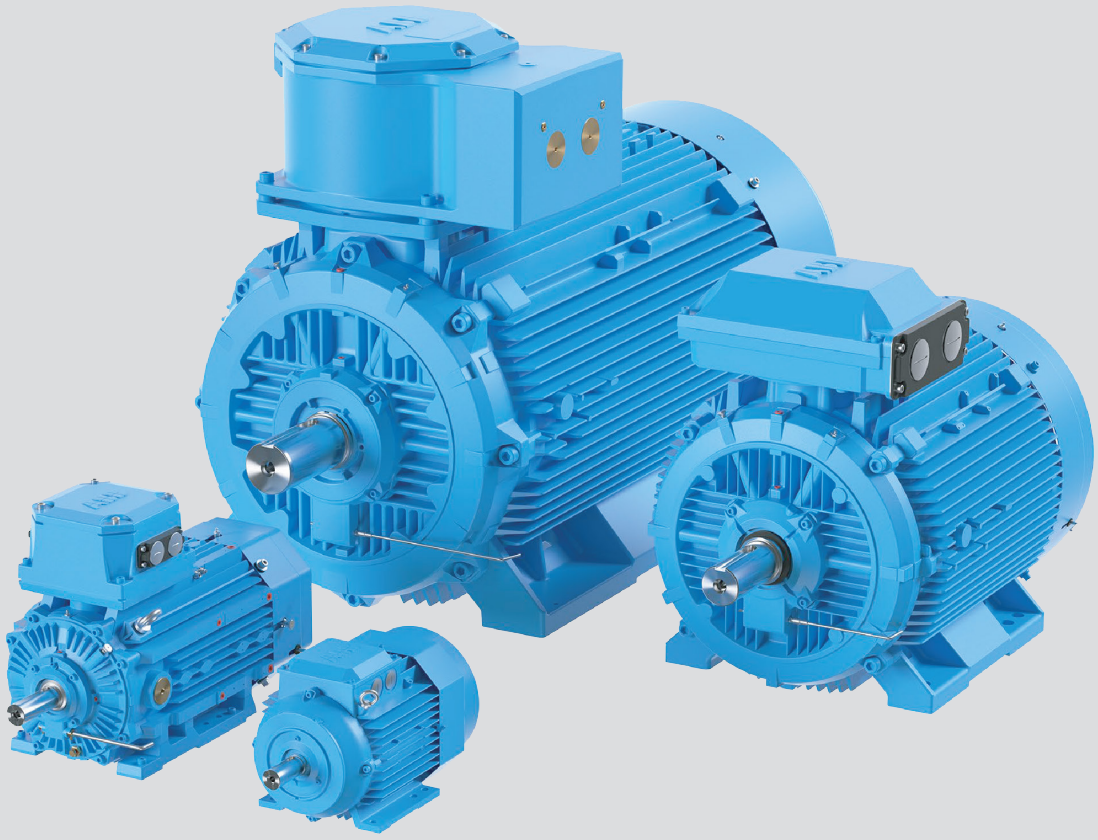
CATALOG | OCTOBER 2025

Low voltage

Motors for explosive atmospheres

400 V 50 Hz, 460V 60 Hz



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

Low voltage
Motors for explosive atmospheres

Sizes 71 to 450, 0,12 to 1000 kW

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General information

European ATEX Directives

The ATEX Directives harmonize safety rules in line with the free trading principles of the European Community.

Responsibilities are split between the manufacturers and end users. Manufacturers have to comply with the “Essential Health and Safety Requirements” of the Products Directive 2014/34/EU and end users must prepare an Explosion Protection Document based on risk assessments of their “work places” and “work equipment” to fulfi l the “minimum requirements” listed in the Worker Protection Directive 1999/92/EC.

ABB low voltage motors for explosive atmospheres comply fully with the ATEX Product Directive.

IECEx System

The IECEx System is a certification system which verifies compliance with IEC (International Electrotechnical Commission) standards and IECEx Operational Documents relating to safety in explosive atmospheres. It covers equipment, service facilities and personnel competencies and conformity mark licensing system.

Created in September 1999, the System aims “to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety…” (source: IECEx website, www.iecex.com). It is a voluntary system which provides an internationally accepted means of proving that products and services are in compliance with IEC standards.

IECEx certification involves – in addition to product tests - assessment of quality control procedures and testing plans, audits of manufacturing plants, and routine on-going surveillance and inspections.

Who is responsible for the certification work?

A manufacturer needing to have equipment certified under the IECEx System can apply to an IECEx Competent Body (ExCB) in any member country. At present there are more than 30 IECEx member countries. The ExCB performs or coordinates the activities of certification.

A quality assessment of the manufacturer is undertaken by the ExCB itself, and the auditor issues an IECEx Quality Assessment Report (QAR).

How do I know if a motor is IECEx certified?

IECEx certified motors show the certification number on their rating plate, for example: “IECEx LCI 05.0008”. In this case “LCI” indicates that the IECEx certificate was issued by LCIE, an IECEx approved Certification Body in France.

In addition, IECEx certificates are issued in electronic form and are publicly available on the IECEx website. They can therefore be viewed and printed by anyone with access to the Internet. See “Certificates & Licences” at www.iecex.com.

Compliance on basis of recently updated standards

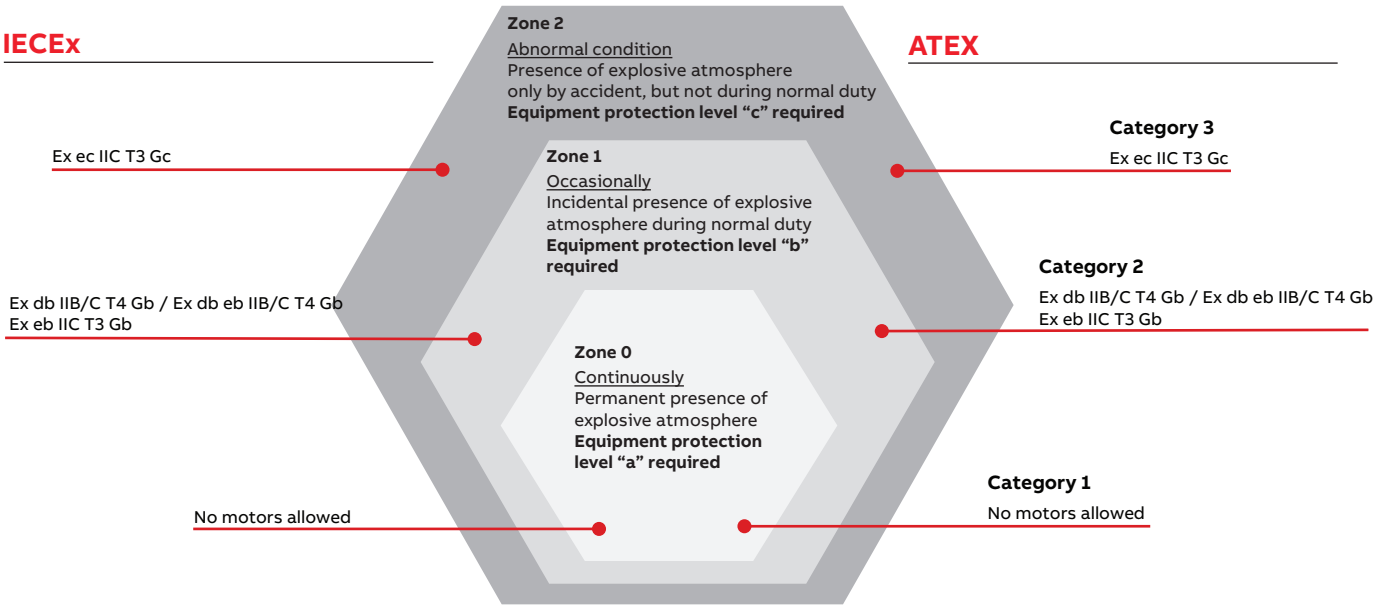
In complying with the ATEX directives, ABB follows the requirements of recently updated EN standards. Otherwise ABB follows the requirements of the IEC standards shown in the relevant certificates.

Main standards for explosive atmospheres:	
IEC/EN 60079-0	Equipment - General requirements
IEC/EN 60079-1	Equipment protection by flameproof enclosures “d”
IEC/EN 60079-7	Equipment protection by increased safety “e”
IEC/EN 60079-31	Equipment dust ignition protection by enclosure “t”
IEC/EN 60079-14	Electrical installations design, selection and erection
IEC/EN 60079-17	Electrical installations inspections and maintenance
IEC/EN 60079-19	Equipment repair, overhaul and reclamation
IEC 60050-426	Equipment for explosive atmospheres
IEC/EN 60079-10	Classification of hazardous areas (gas areas)
IEC 60079-10-1	Classification of areas - Explosive gas atmospheres
IEC 60079-10-2	Classification of areas - Combustible dust atmospheres

Equipment Protection Level (EPL)

The concept of “equipment protection levels” identifies products according to the ignition risk they might cause. A motor’s EPL therefore indicates its inherent ignition risk, regardless of its protection type. This makes the selection of equipment for different zones easier. EPLs also enable a true risk assessment approach, where the potential consequences of a possible explosion are taken into consideration. Please refer to the table on the next page for more information about EPLs and EPL markings.

Zones for explosive gas atmospheres - IECEx and ATEX



Note: Based on traditional relationship between EPL`s and zones.

There are systems in place worldwide to classify explosive atmospheres by zones, according to the risk posed by explosive gas ("G").

Classification of explosive atmospheres according to EN and IEC

The standard IEC/EN 60079-10-1 define areas according to the presence gas in the atmosphere.

Standard IEC 60079-0 EN 60079-0 Group	EPL	Protection level	Installation Zone acc. to IEC 60079-10-x EN 60079-10-x Zones	ATEX Directive 2014/34/EU Equipment group	Equipment category	Main motor protection types
I	Ma	very high	NA	I	M1	NA
(Mines)	Mb	high		(Mines)	M2	
II	Ga	very high	0	II	1G	NA
(Gas)	Gb	high	1	(Surface)	2G	Ex d/Ex de Ex p
						Ex db, Ex db eb
						Ex eb (Ex e)
	Gc	enhanced	2		3G	Ex ec (Ex nA)

Marking of temperatures, gas groups and explosive atmospheres

To ensure equipment can be safely used in potentially explosive atmospheres, the explosive atmospheres where the equipment is installed must be known. The temperature class of equipment must be compared with the spontaneous ignition the equipment of the gas mixtures concerned, and in specific cases the gas group must be known (e.g. flameproof protection).

Classification

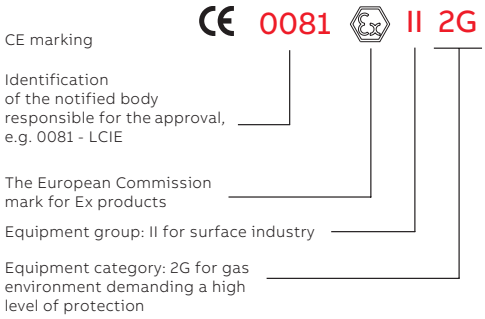
Gas classification

Temperature class	Ignition temp. of gas/ vapor °C	Max. permutiet temp. of equipment °C	Gas examples
T1	> 450	450	Hydrogen
T2	> 300 < 450	300	Ethanol
T3	> 200 < 300	200	Hydrogen sulfide
T4	> 135 < 200	135	Diethyl ether
T5	> 100 < 135	100	-
T6	> 85 < 100	85	Carbon disul- fide

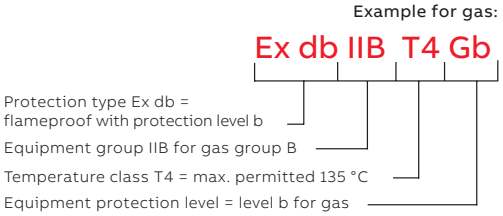
Gas subdivision

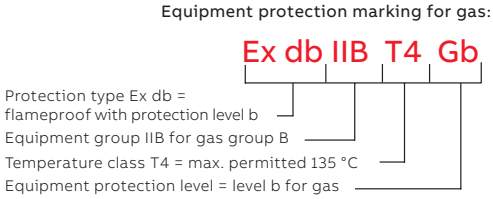
IIA	~120 gases and vapors, e.g. butane / petroleum / propane
IIB	~30 gases and vapors, e.g. ethylene / dimethyl ether
IIC	limited number of gases and vapors, e.g. hydrogen H2 / acetylene C_2H_2 carbon disulfide CS_2

Marking of equipment protection for gas according to ATEX

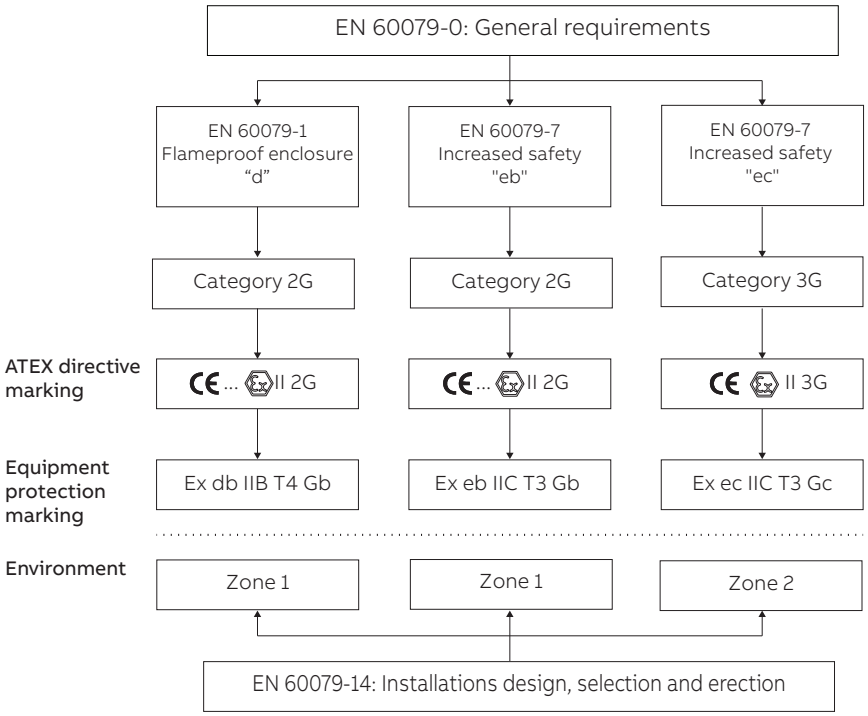


Marking of equipment protection for gas according to IEC

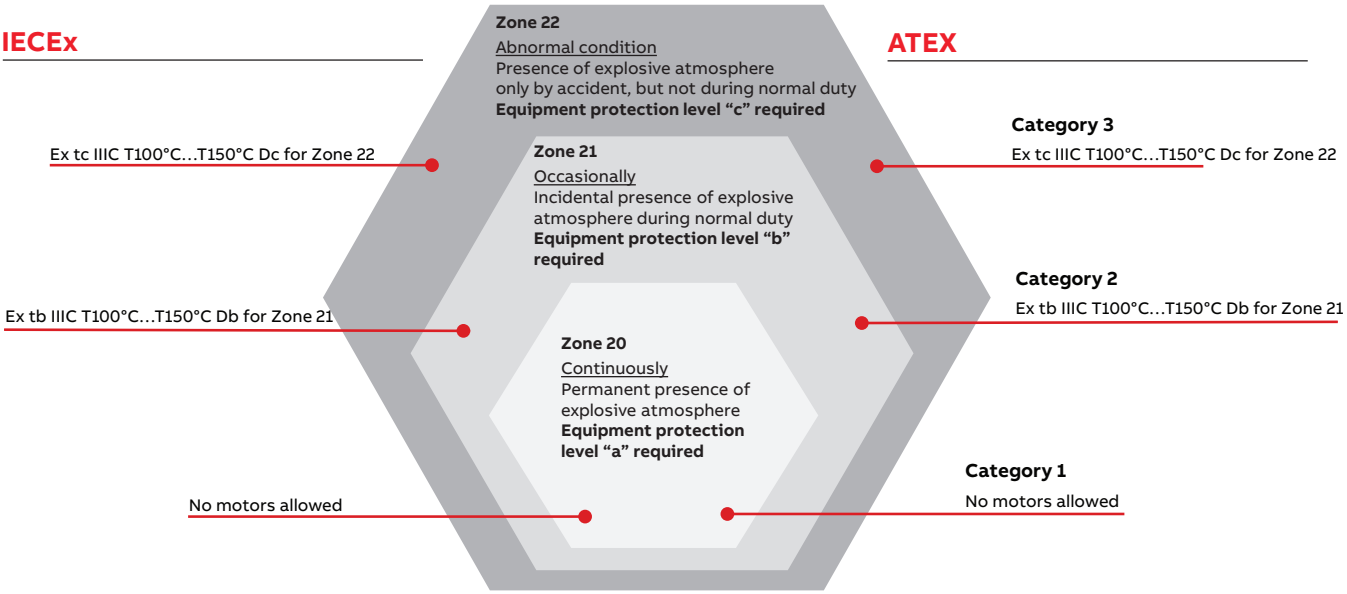




Selection of products for explosive atmospheres, EN Standard and ATEX Directive for gas environments



Zones for explosive dust atmospheres - IECEx and ATEX



Note: Based on traditional relationship between EPL`s and zones.

There are systems in place worldwide to classify explosive atmospheres by zones, according to the risk posed by explosive dust ("D").

Classification of explosive atmospheres according to EN and IEC

The standard IEC/EN 60079-10-2 define areas according to the presence dust in the atmosphere.

Standard EN and IEC 60079-0 Group	EPL	Protection level	Installation Zone acc. to EN and IEC 60079-10-2 Zones	ATEX Directive 2014/34/EU Equipment group	Equipment category	Main motor protection types
III	Da	very high	20	II	1D	NA
(Dust)	Db	high	21	(Surface)	2D	Ex tb IP 65
	Dc	enhanced	22		3D	Ex tc IP 65/IP 55

Dust ignition protection/ Protection by enclosures “t” in explosive atmospheres

Combustible dust is hazardous as it can form potentially explosive atmospheres when dispersed in air. Furthermore, layers of combustible dust may ignite and act as an ignition source for an explosive atmosphere. Explosive atmospheres with dust can be found in a variety of industries such as agriculture, chemicals, plastics, food and beverage.

Selection and installation of electrical equipment

To ensure equipment can be safely used in explosive atmospheres with dust, it is vital that the following issues are taken into account when selecting product:

Type of dust:

- Will a cloud of dust be present around the product or
- will a layer of dust build up on the product and if so, what will be the maximum thickness of the layer between two cleaning/ maintenance procedures.

Characteristics of the dust:

Is the dust electrically conductive or non-conductive?

Ignition temperature of the dust:

- T_{Cl}: Ignition temperature of dust in a “cloud” or
- $T_{5\,mm}$: Ignition temperature of a 5 mm dust layer

Selection and installation of the product according to IEC/EN60079 part 14: Electrical installations design, selection and erection. Please see the tables below.

Dust classification

		TCL (cloud)°C	T5 mm (layer)°C	Surface temperature provided that dust layer below 5 mm
Food/ Feeder industry	Wheat	350	270	195
	Barley, corn	380	280	205
	Sugar	350	430	233
Natural materials	Wood	330	280	205
	Charcoal	520	230	195
	Hard coal	460	240	165
Chemicals	PVC	450	330	255
	Synch, rubber	470	220	145
	Sulfur	240	250	160

Source BIA-report 13/97 HVBG

This protection prevents any explosion of dust because:

– The ingress of dust into the motor is prevented by the IP protection, being either IP 55 (“dust protected”) or IP 65 (“dust tight”).
– The maximum surface temperature outside the motor must not exceed the temperature class for which the motor is certified.
– No sparks must occur outside the motor enclosure.

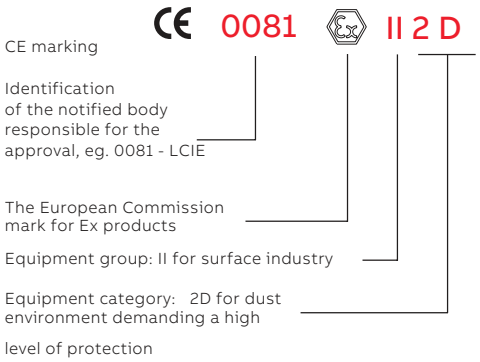
Certification: Ex tb IIIB/C T...°C Db (for zone 21) motors are certified according to ATEX with an EC type examination certificate and according to the IEC Ex System. Ex tc IIIB/C T...°C Dc (for zone 22) motors are certified according to ATEX with a “voluntary type examination certificate” and according to the IEC Ex System.

The standard surface temperature class on dust ignition protection motors from ABB is T125 °C, other temperature classes are available on request.

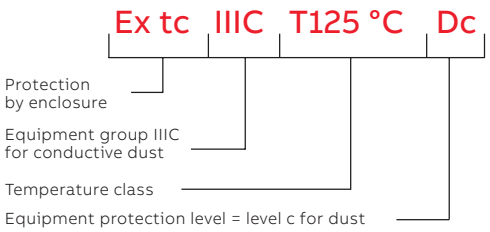
Dust subdivisions

IIIA	combustible flyings
IIIB	non-conductive dust
IIIC	conductive dust

Marking of equipment protection for dust according to ATEX

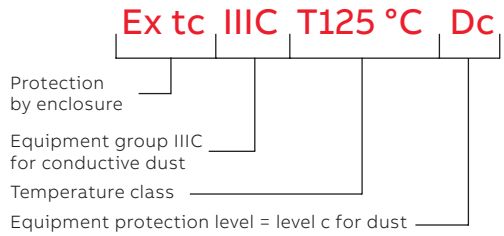


Equipment protection for dust:

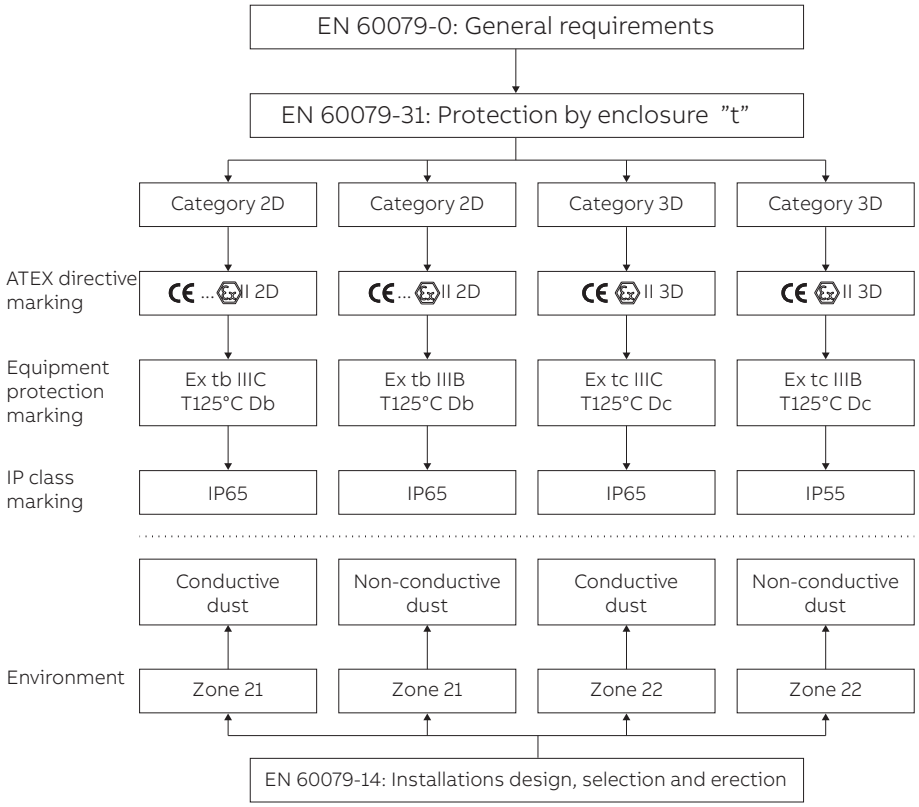


Marking of equipment protection for dust according to IEC

Example for dust:



Selection of products for explosive atmospheres, EN Standard and ATEX Directive for dust environments



Explosive atmospheres

In explosive atmospheres, it is of the utmost importance to ensure the safe use of electrical apparatus. To this end, many countries have standards concerning both the design and use of such apparatus. These standards are becoming increasingly harmonized within the framework of IEC recommendations and European Standards. The hazard may be due to an explosive atmosphere composed of a mixture of gas, vapors or dusts with air. This section is concerned only with safety in explosive gas atmospheres for which European Standards and IEC recommendations exist.

Flameproof enclosure Ex db and Ex db eb

The motor enclosure is designed in such a way that no internal explosion can be transmitted to the explosive atmosphere surrounding the motor. The enclosure must withstand, without damage, any pressure levels caused by an internal explosion. The shape, length and gap of joints of part assemblies, at shaft openings, cable entries, etc., shall be designed to allow for throttling and cooling of hot gases escaping outside. The standards emphasize the impact of an explosive atmosphere (for instance, explosion pressure) over constructional requirements of such apparatus.

Work on accessories of enclosure components is only permitted using prescribed tools. Cable entries must meet the requirements of this type of protection.

The temperature of the motor's external enclosure shall not exceed the self-ignition temperature of the explosive atmosphere of the installation area during operation. For this reason, rated output depends on this rated maximum temperature for the area in question. The standard temperature class on flameproof motors from ABB is T4 (135 °C), other temperature classes as T5 (100 °C) and T6 (85 °C) are available on request.

No motor device outside the flameproof enclosure (e.g., ventilator) shall be a potential source of sparks, arcs or dangerous overheating. Variants combining two types of protection usually combine "d" and "e" protection. The motor is designed with an Ex d flameproof enclosure, while the terminal box features Ex e increased safety protection. Such design combines the superior safety degree of the "d" type of protection with the more simple and worker friendly "e" type protection terminal box.

Increased safety design, Ex eb for Zone 1

The design of this motor type prevents the occurance in operation (including starting and lockedrotor situations), in all inner and outer parts of themachine, of sparks, arcs or hot spots that could reach the self-ignition temperature of the surrounding, potentially explosive atmosphere.

This is ensured by applying constructional or dimensional provisions that mainly concern:

- specified minimum values for creepage distances and clearances
- use of tracking-proof isolating materials
- suppression of sharp angles where static electrical loads could build-up
- ensuring electrical and mechanical assemblies are tightly secured
- minimum backlash values between stationary and rotating parts (e.g. air gap, ventilator, etc.)
- temperature-rise limits, taking into account locked rotor, normal operation, accidental mechanical stalling of machine under the most adverse thermal conditions, i.e. when thermal equilibrium of machine is reached while in service

Temperature rise limits should be considered for two operating aspects; normal operating conditions and accidental stalling conditions.

Increased safety design, Ex ec for Zone 2

The use of this type of protection is allowed in hazardous areas corresponding to zone 2. The design is known as "non-sparking" or nowdays increased safety ec, because the motor must be designed in such a way that no sparks can occur in any conditions, when used within the ratings specified by the manufacturer, and that no excessive temperatures occur under normal operating conditions, which excludes thermal requirements due to starting or accidental stalling.

Risk assessment and gas tests

Increased safety Ex eb and Ex ec motors have to meet tough requirements with regard to sparking. The latest IEC and EN standards specify criteria for risk assessment and gas environment tests for rotor and stator designs to show that the motors are spark-free in all operational conditions.

By testing and securing certification for its motors, ABB is helping to streamline the risk assessment process for its customers.

The alternative to testing and certification involves, in the majority of cases, equipping the motor with provision for pre-start ventilation. This means investing in a higher capacity air compressor, piping, and a ventilation control unit. It also requires an additional operation – pre-start ventilation – every time the motor is started.

Benefits of the ABB approach therefore include reduced initial capital expenditure, lower operating costs, and faster starting. Reliability is improved as no additional components are required. Most importantly, ABB's certified motors offer proven safety.

ABB's approach to meeting the requirements

Following a program of gas environment tests in which all rotor and stator tests were passed, ABB has secured certification for its low voltage cast iron motors for explosive atmospheres with aluminum die cast rotor.

Ex ec motors are certified according to the ATEX directive with a voluntary type examination certificate from an ATEX notified body, and according to the IECEx system with an IECEx certificate of conformity.

Dual certificates for gas or dust

Due to the high IP protection class and low surface temperature of the products, the certificates allow also in many cases dual certification for either gas or dust environments. This gives further flexibility as the same motor can either be used in a location with potentially explosive atmospheres with gas, or another with dust. For use in hybrid atmospheres (gas and dust present simultaneously) should limitations in IEC/EN 60079-14 be respected.

The following combinations are possible:

- Ex db IIB/C T4 Gb / Ex tb IIIB/C T125°C Db
- Ex db eb IIB/C T4 Gb / Ex tb IIIB/C T125°C Db
- Ex eb IIC T3 Gb / Ex tb IIIB/C T125°C Db
- Ex ec IIC T3 Gc / Ex tc IIIB/C T125°C Dc

Please refer to the variant code section of flameproof, increased safety eb and ec motors for further information about availability of dual certification.

Testing and certificates

Motors for explosive atmospheres have to be officially approved by a recognized test organization, authorized to issue test certificates, to ensure compliance with standards for this type of equipment.

ABB low voltage motors for explosive atmospheres are classified according to the categories, protection types and equipment protection type which are specified in the relevant standards.

Depending on the nature of the potentially explosive atmosphere, it is the responsibility of the user to determine which group and which maximum surface temperature should be specified for the motor installation. The motors are rated and certified for ambient temperature between –20 °C and +40 °C according to standards. For ambient temperatures below –20 °C and above +40 °C certificates are available for most of the motors.

ABB's motors conform to the stringent standards set by CENELEC (European Committee for Electrotechnical Standardization) and IEC (International Electrotechnical Commission), and are approved by testing laboratories (ExNB/Notified Body) and certification bodies (ExCB).

The motors can be certified according to the ATEX Directive by any of the Notified Bodies "ExNB" of EU member countries. These motors are therefore acceptable in all EU countries and many other countries. In addition, IECEx certificates are available for the most motor types. These certificates can be issued by any registered IECEx certification body (ExCB) worldwide.

Certification other than ATEX or IECEx

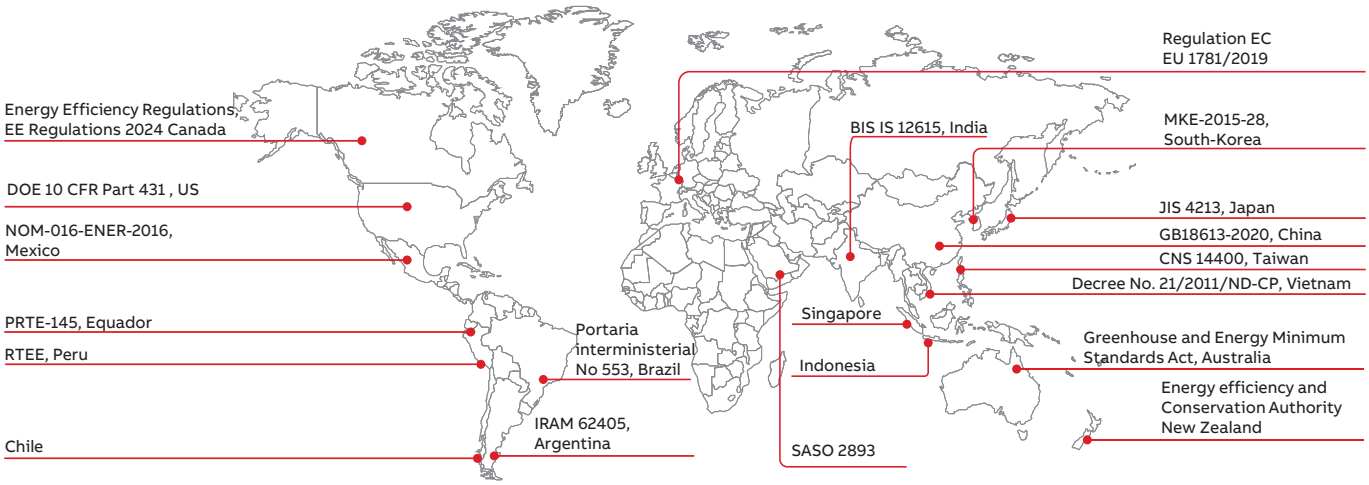
The certification provided as standard (ATEX and usually IECEx), is accepted in countries where these are mandatory or accepted as a substitute for other local certification, in addition are they also commonly accepted in countries which do not have any specific certification requirements.

There is number of countries which according to their local regulations require a specific certificate for equipment installed in explosive atmospheres, examples of such certificates are:

- INMETRO certification for Brazil
- cULus for Canada and the United States by Underwriters Laboratories
- Canadian electric code CEC certification for Canada
- China Compulsory Certificate mark, also known as CCC mark
- PESO certification for India
- Certificates issued by TIIS for Japan
- Certificates issued by KOSHA, KGS or KTL for South Korea
- IA certificates for South Africa issued by laboratories like SABS or Explolabs
- Certificates issued by ITRI for Taiwan
- NEC National electric code certification of USA

ABB is maintaining a wide selection of local certificates for the different products, please refer to the variant code section for each product for information about availability. The marking of the products certified according a specific local certification system is usually differing from the ATEX and IECEx markings, this means that the ATEX and IECEx markings will be replaced with the markings required for the local certification system if a such is ordered.

International motor efficiency standards and regulations



IEC 60034-30-1 is the worldwide energy efficiency classification standard for low voltage three-phase asynchronous motors. International IEC standards are created to enable and increase the level of harmonization in efficiency regulations, safety and many other areas around the world, and to also cover motors and other equipment for explosive atmospheres.

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

To promote transparency in the market, IEC 60034-30-1 states that both the efficiency class and efficiency value must be shown on the motor rating plate and in product documentation.

Minimum energy performance standards

While the IEC as an international standardization organization sets guidelines for motor testing and efficiency classes, IEC does not regulate efficiency levels in countries. The biggest drivers for mandatory Minimum Energy Performance Standard (MEPS) levels for electric motors are global climate change, government targets to curb CO_2 emissions and globally rising electricity demand. The whole value chain, from manufacturer up to end user, must be aware of the legislation in order to meet local requirements, to save energy and reduce the carbon footprint.

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

To get the latest information please visit www.abb.com/motors&generators/energyefficiency.

IEC 60034-30-1:2024

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

- IE5 = Ultra premium efficiency
- IE4 = Super premium efficiency
- IE3 = Premium efficiency, identical to the table in 10CFR431 (‘NEMA Premium’) in the USA and CSA C390-10:2015 for 60 Hz
- IE2 = High efficiency
- IE1 = Standard efficiency

Most of the different technical constructions of electric motors are covered as long as they are rated for direct on-line operation. The coverage of the IEC 60034-30-1 includes:

- single speed electric motors (single and three-phase), 50 and 60 Hz
- 2, 4, 6 and 8 poles
- Rated output P_N from 0.12 kW to 1000 kW

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01 IE Classes – 4-pole motors

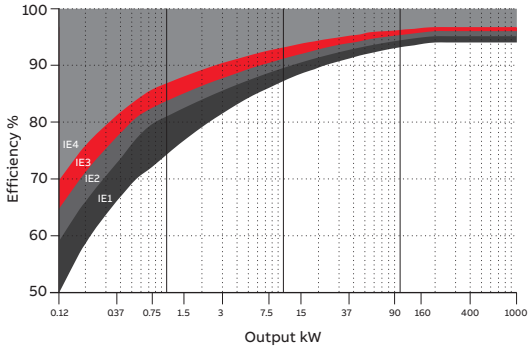
- Rated voltage U_N above 50 V up to 1 kV
- Motors capable of continuous operation at their rated power with a temperature rise within the specified insulation temperature class
- Motors, marked with any ambient temperature within the range of –20 °C to +60 °C
- Motors, marked with an altitude up to 4000 m above sea level

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

Note: CFR is Code of Federal Regulations.

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

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



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ABB and efficiency standards

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

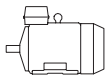
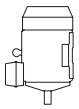
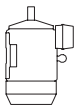
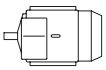
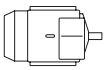
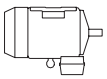
It is good to mention and emphasize that the IEC 60034-2-1 test method, which is known as an indirect method, is technically equivalent to the test methods in the standards CSA 390-10 and IEEE 112 Method B leading to the equivalent losses and thus efficiency values. All three test methods are recognized and accepted today in US and Canada and any of the three methods may be used for compliance purposes to both countries.

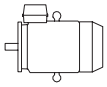
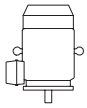
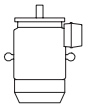
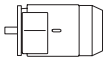
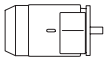
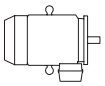
As the world market leader, ABB offers the largest range of LV motors available. It has long advocated the need for efficiency in motors, and high efficiency products have formed the core of its portfolio for many years. The core of ABB’s product portfolio is based on a full range of IE3 and IE4 motors – with many available from stock. ABB is the originator of the Energy Efficiency Movement empowering at scale adoption of energy efficiency within industry, to accelerate the world towards net-zero.

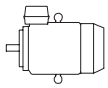
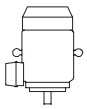
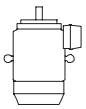
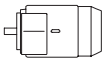
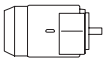
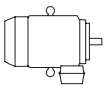
Nominal efficiency limits defined in IEC 60034-30-1:2024 (reference values at 50 Hz, based on test methods specified in IEC 60034-2-1:2014).

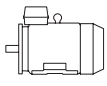
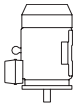
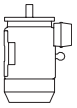
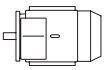
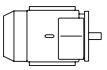
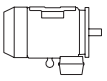
Output	IE1Standard efficiency				IE2High efficiency				IE3 Premium efficiency				IE4 Super Premium efficiency			
kW	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole
0.12	45.0	50.0	38.3	31.0	53.6	59.1	50.6	39.8	60.8	64.8	57.7	50.7	66.5	69.8	64.9	62.3
0.18	52.8	57.0	45.5	38.0	60.4	64.7	56.6	45.9	65.9	69.9	63.9	58.7	70.8	74.7	70.1	67.2
0.20	54.6	58.5	47.6	39.7	61.9	65.9	58.2	47.4	67.2	71.1	65.4	60.6	71.9	75.8	71.4	68.4
0.25	58.2	61.5	52.1	43.4	64.8	68.5	61.6	50.6	69.7	73.5	68.6	64.1	74.3	77.9	74.1	70.8
0.37	63.9	66.0	59.7	49.7	69.5	72.7	67.6	56.1	73.8	77.3	73.5	69.3	78.1	81.1	78.0	74.3
0.40	64.9	66.8	61.1	50.9	70.4	73.5	68.8	57.2	74.6	78.0	74.4	70.1	78.9	81.7	78.7	74.9
0.55	69.0	70.0	65.8	56.1	74.1	77.1	73.1	61.7	77.8	80.8	77.2	73.0	81.5	83.9	80.9	77.0
0.75	72.1	72.1	70.0	61.2	77.4	79.6	75.9	66.2	80.7	82.5	78.9	75.0	83.5	85.7	82.7	78.4
1.1	75.0	75.0	72.9	66.5	79.6	81.4	78.1	70.8	82.7	84.1	81.0	77.7	85.2	87.2	84.5	80.8
1.5	77.2	77.2	75.2	70.2	81.3	82.8	79.8	74.1	84.2	85.3	82.5	79.7	86.5	88.2	85.9	82.6
2.2	79.7	79.7	77.7	74.2	83.2	84.3	81.8	77.6	85.9	86.7	84.3	81.9	88.0	89.5	87.4	84.5
3	81.5	81.5	79.7	77.0	84.6	85.5	83.3	80.0	87.1	87.7	85.6	83.5	89.1	90.4	88.6	85.9
4	83.1	83.1	81.4	79.2	85.8	86.6	84.6	81.9	88.1	88.6	86.8	84.8	90.0	91.1	89.5	87.1
5.5	84.7	84.7	93.1	81.4	87.0	87.7	86.0	83.8	89.2	89.6	88.0	86.2	90.9	91.9	90.5	88.3
7.5	86.0	86.0	84.7	83.1	88.1	88.7	87.2	85.3	90.1	90.4	89.1	87.3	91.7	92.6	91.3	89.3
11	87.6	87.6	86.4	85.0	89.4	89.8	88.7	86.9	91.2	91.4	90.3	88.6	92.6	93.3	92.3	90.4
15	88.7	88.7	87.7	86.2	90.3	90.6	89.7	88.0	91.9	92.1	91.2	89.6	93.3	93.9	92.9	91.2
18.5	89.3	89.3	88.6	86.9	90.9	91.2	90.4	88.6	92.5	92.6	91.7	90.1	93.7	94.2	93.4	91.7
22	89.9	89.9	89.2	87.4	91.3	91.6	90.9	89.1	92.7	93.0	92.2	90.6	94.0	94.5	93.7	92.1
30	90.7	90.7	90.2	88.3	92.0	92.3	91.7	89.8	93.3	93.6	92.9	91.3	94.5	94.9	94.2	92.7
37	91.2	91.2	90.8	88.8	92.5	92.7	92.2	90.3	93.7	93.9	93.3	91.8	94.8	95.2	94.5	93.1
45	91.7	91.7	91.4	89.2	92.9	93.1	92.7	90.7	94.0	94.2	93.7	92.2	95.0	95.4	94.8	93.4
55	92.1	92.1	91.9	89.7	93.2	93.5	93.1	91.0	94.3	94.6	94.1	92.5	95.3	95.7	95.1	93.7
75	92.7	92.7	92.6	90.3	93.8	94.0	93.7	91.6	94.7	95.0	94.6	93.1	95.6	96.0	95.4	94.2
90	93.0	93.0	92.9	90.7	94.1	94.2	94.0	91.9	95.0	95.2	94.9	93.4	95.8	96.1	95.6	94.4
110	93.3	93.3	93.3	91.1	94.3	94.5	94.3	92.3	95.2	95.4	95.1	93.7	96.0	96.3	95.8	94.7
132	93.5	93.5	93.5	91.5	94.6	94.7	94.6	92.6	95.4	95.6	95.4	94.0	96.2	96.4	96.0	94.9
160	93.8	93.8	93.8	91.9	94.8	94.9	94.8	93.0	95.6	95.8	95.6	94.3	96.3	96.6	96.2	95.1
200	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
250	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.5	95.4
315	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
355	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
400	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
450	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
500–1000	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4

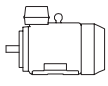
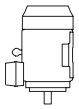
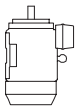
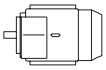
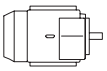
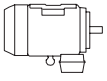
Mounting arrangements

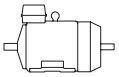
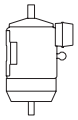
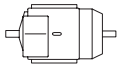
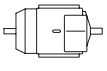
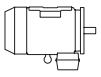
Foot-mounted motor						
Code I / code II						**Product code pos. 12**
						A: foot-mounted, term. box top
IM B3	IM V5	IM V6	IM B6	IM B7	IM B8	
IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071	

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.

Cooling

Explanation of the product code

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

Designation system concerning methods of cooling refers to standard IEC 60034-6. Standard cooling method is IC411. For further information please see the variant code section of each motor type for availability of other cooling methods.

Position 1

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

Position 2

A:	For air (omitted for simplifi ed designation)

Position 3

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

Position 4

A:	For air (omitted for simplifi ed designation)
W:	For water

Position 5

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

Degrees of protection: IP code and resistance to impact

Classification for degrees of protection (IP code) provided by enclosures of rotating machines are defined in standards IEC 60034-5 or EN 60529.

IP protection

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

Explanation of the IP code

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

Position 1

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

Position 2

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

Following IEC/EN 60079-0 non-metallic parts of enclosures in motors for explosive atmospheres must be thermal endurance tested for the temperature range the motors are designed for. Non-metallic parts are, for instance, rubber seals and gaskets. Thermal endurance tests and impact tests are carried out before the ingress protection test. This ensures that the motors meet the ingress protection level also after been put in service.

Resistance to impact

ABB's motors for explosive atmospheres have been tested for resistance to impact as described in IEC/EN 60079-0. The more demanding high risk of mechanical danger limits have been used as qualification criteria. For group II and III motors this impactmeans an impact energy strenght of 7J for both enclosure and fan cover.

Insulation

—
01 Safety margins per thermal class

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

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

Thermal class 130 (B)

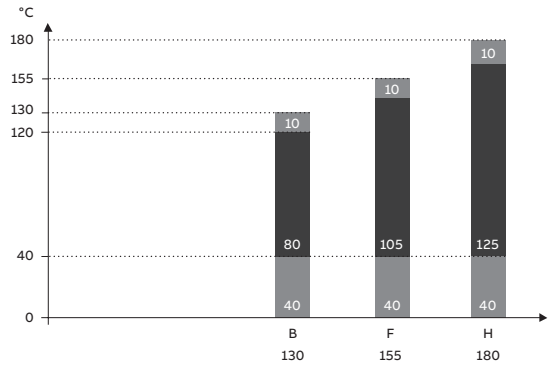
– Nominal ambient temperature 40 °C
– Max permissible temperature rise 80 K
– Hot spot temperature margin 10 K

Thermal class 155 (F)

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

Thermal class 180 (H)

– Nominal ambient temperature 40 °C
– Max permissible temperature rise 125 K
– Hot spot temperature margin 15 K



—
01

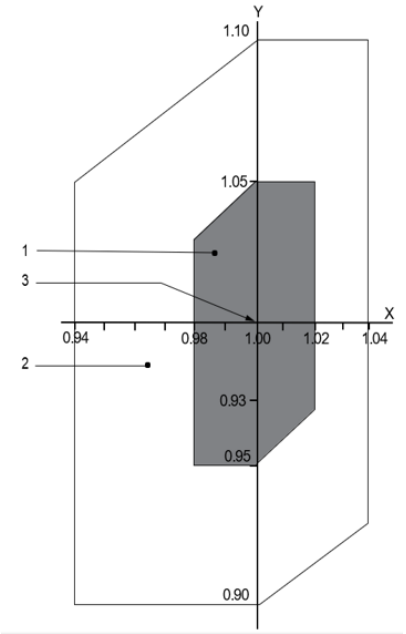
Voltage and frequency

— 01 Voltage and frequency deviation in zones A and B

The table values for output, speed, efficiency, power factor, starting torque and starting current apply at the rated voltage and frequency. These values will be affected if the supply voltage or frequency deviate from the rated values.

The motors can operate continuously at the rated output, with a long-term voltage deviation of 5 % from the specified value or range of values, and the rated frequency not deviating more than 2% (zone A), without exceeding the temperature class stamped on the rating plate. The temperature rise of the winding may increase by 10 K, but without exceeding the insulation temperature class stamped on the rating plate. Voltage deviations of up to 10 % are permissible for short periods only.

If the motor is subject to continuous voltage variations of +/- 10 % this should be taken into consideration in the design. The permitted combinations of voltage and frequency tolerances are specified in IEC60034-1. This is illustrated in the figure below.



01

Key

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

Surface treatment

The standard surface treatment of the Process performance motors is designed to meet corrosivity category C3, both outdoors and indoors. This also meets the requirements in C1 and C2.

The corrosivity categories are defined in standard ISO12944-2.

Special surface treatments for other corrosivity categories as well as offshore environments are available as options.

The standard ABB paint color for motors is Munsell blue 8B 4.5/3.25, except for special systems such as NORSOK where a specific color is requested.

Atmospheric-corrosivity categories and examples of typical environments

Corrosivity category	Examples of typical environments (informative only)	
	Exterior	**Interior**
C1	-	Heated buildings with clean atmos-pheres, e.g., offices, shops, schools, hotels
C2	Atmospheres with low levels of pollution: mostly rural areas	Unheated buildings where condensation can occur, e.g., depots, sports halls
C3	Urban and industrial atmospheres, moderate sulfur dioxide pollution; coastal areas with low salinity	Production rooms with high humidity and some air pollution, e.g., food-processing plants, laundries, breweries, dairies
C4	Industrial areas and coastal areas with moderate salinity	Chemical plants, swimming pools, coastal ship- and boatyards
C5	Industrial areas with high humidity and an aggressive atmosphere, and coastal areas with high salinity	Buildings or areas with almost permanent condensation and with high pollution
CX	Offshore areas with high salinity, and industrial areas with extreme humidity and an aggressive atmosphere, and sub-tropical and tropical atmospheres	Industrial areas with extreme humidity and an aggressive atmosphere

Low voltage motors and frequency converters for explosive atmospheres

Frequency converters provide significant benefits when used with motors for explosive atmospheres. The advantages include better process control through regulation of the motor speed, as well as energy savings, and therefore improved environmental performance.

Certain criteria must be taken into account to ensure the safety of the frequency converter and motor combination, as well as the maximum usability of the application. The requirements depend on the protection type in use and whether the motor is regarded as being one component within a wider system or a separate subsystem.

ABB offers motors for explosive atmospheres for use with variable speed drives with the following protection types: flameproof, increased safety and dust ignition proof. These motors are designed and certified for operation with frequency converters. Solutions for the different protection types, as well as for the most common types of converters, are provided below. Further information is provided in the installation, operation and maintenance and safety manual.

1. Thermal dimensioning and protection

The IEC and EN standards set the requirements for ensuring surface temperature class is not exceeded, depending on the protection type. Thermal protection is based on embedded temperature sensors such as PTC or PT100 in relevant protection types. Tripping temperature of sensor protecting the surface temperature of the motor is defined on the motor rating plate.

Thermal dimensioning and protection.

	Flameproof Ex d / Ex de or Ex db / Ex db eb T4	**Increased safety Ex ec, T3**	**Dust ignition proof – Ex t T125°C or T150°C**
Criteria for safe operation	Outer surface temperature may not exceed the temperature class.	Surface temperature of any part inside or outside the motor may not exceed temperature class in normal operation.	Outer surface temperature may not exceed temperature class (eg. 125°C)
Use with voltage source PWM type of converters	Combinations have already been type-tested, no need for further testing when specific loadability curves are followed.	Combinations have already been type-tested, no need for further testing when specific loadability curves are followed.	Combinations have already been type-tested, no need for further testing when specific loadability curves are followed.
	Mandatory direct temperature protection with temperature detector (optional VC816).	Winding protection acc. to insul.class F must be ensured by PTC in windings.	Surface temperature protection with temperature detectors (optional VC816), tempera¬ture class T150°C.
Operation with frequency converter is included in standard certificates	Yes	Yes	Yes

All motors are equipped with thermistors by default.

In countries where the ATEX directive is in force must thermistors or other temperature sensors be connected to an ATEX approved relay that does function independently and does reliably trip off the supply to the motor. Such ap¬proved temperature detector relays are available as a standard integrated option to many frequency converters from ABB but can also be separate controlling the supply to the converter.

2. Operating speed

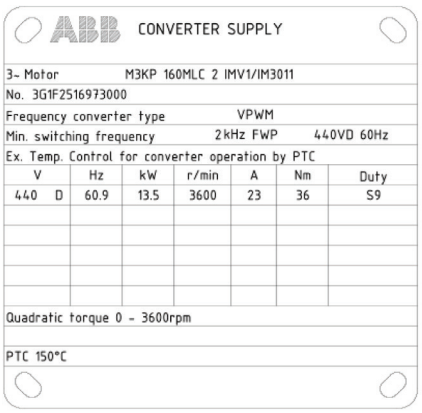
When a motor is used with a frequency converter, its actual operating speed may deviate consid¬erably from its nominal speed (i.e. the speed stamped on the main rating plate). In the VSD application the operating speed range is stamped on the separate VSD rating plate and this speed range is not allowed to be exceeded.

3. Rating plates

The EN and IEC standards require that the mo¬tors which are used in variable speed operation are provided with a rating plate that shows the parameters for which the motor is intended. There are two different types of rating plates available, one generic plate that shows loadability values in percentage of the nominal torque. This plate can be ordered using variant code 181. The other plate has order specific data, this can be ordered using variant code 163.

These parameters shall be used while checking the suitability of a specific motor for its intended application and for setting the limits of operation for the converter.





These parameters shall be used while checking the suitability of a specific motor for its intended application and for setting the limits of operation for the converter.

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 arriv¬ing 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.

Table 1. Limit values for ABB motor insulation systems

		Standard insulation	+ 405 Special insulation
$U_{phase-ground}$	$V_{pk/pk}$	2500	3300
	V_{pk}	1250	1650
$U_{phase-phase}$	$V_{pk/pk}$	3400	4800
	V_{pk}	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 are depending 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.

Table 2. Limit values for different IVIC classes and network voltages

Network voltage		400 V		480 V		500 V		575 V		690 V	
		IVIC B	IVIC C	IVIC B	IVIC C	IVIC B	IVIC C	IVIC B	IVIC C	IVIC B	IVIC C
$U_{phase-ground}$	$V_{pk/pk}$	1248	1664	1497	1997	1560	2080	1794	2392	2153	2870
$U_{phase-phase}$	$V_{pk/pk}$	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.

Table 3. 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	$U_{phase-phase, pk}$ ≥ 1250 V Rise time minimum 0,25 µs , IEC
420 V < Un ≤ 500 V	$U_{phase-phase, pk}$ ≥ 1486 V Rise time minimum 0,25 µs , IEC
500 V < Un ≤ 600 V	$U_{phase-phase, pk}$ ≥ 1783 V Rise time minimum 0,25 µs , IEC
600 V < Un ≤ 690 V	$U_{phase-phase, pk}$ ≥ 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 variable speed applications to ensure the reliability and safety of the application. For this purpose, insulated bearings or bearing constructions, common mode filters and suitable cable and grounding methods must be used.

5.1 Elimination of bearing currents with ABB ACS800, ACS880 and ACS550 converters

In the case of ABB ACS800, ACS880, ACS550 and ACS580 converters with a diode supply unit (uncontrolled DC voltage), the following methods must be used to avoid harmful bearing currents in the motors:

Frame size	Preventive measures
250 and smaller	No action needed
280-315	Insulated non-drive end bearing
355-450	Insulated non-drive end bearing AND Common mode filter at the converter

Common mode filters

Common mode filters reduce common mode currents and thus decrease the risk of bearing currents. Common mode filters do not significantly affect the phase or main voltages on the motor terminals. For more information, please see ABB Drives catalogues.

Insulated bearings

Bearings with aluminum oxide insulated and sealed inner or outer bores are used as standard with variant code 701. Hybrid bearings, i.e. bearings with non-conductive ceramic rolling elements, can also be used in special applications. More information on selection of the correct parts is available on request.

5.2 Elimination of bearing currents with all other converters

The user is responsible for protecting the mo¬tor and driven equipment from harmful bearing currents. The instructions provided in section 5.1 can be followed, but their effectiveness cannot be guaranteed in all cases.

6. Cabling, grounding and EMC

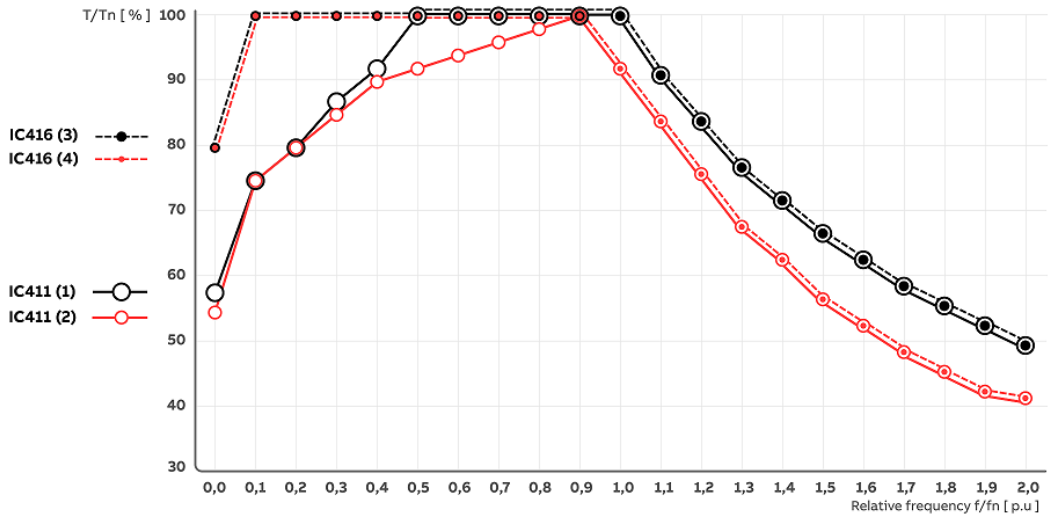
The use of a frequency converter places greater demands on the cabling and grounding of the drive system. To ensure proper grounding of the system, EMC compliance and avoid bearing currents should the instructions given in the installation, operation, and maintenance manual be followed. EMC cable glands providing 360° bonding of a concentric PE conductor are available using variant code 704, also many flameproof glands for armoured cable provide similar bounding.

7. Loadability curves

The loadability curves presented below are based on combined tests of different motors together with the converter types listed. The loadability curves assume that the nominal frequency of the motor (i.e. field weakening point) is 50 or 60Hz. The curves present the maximum allowed torque in percentage of the nominal direct online torque of the motor over the speed range.

Flameproof motors Ex db / Ex db eb and Dust ignition protection motors Ex t T150 °C IE3 and higher efficiency classes.

Loadability for frequency converter applications utilizing voltage source PWM-type converters (incl. DTC, vector or scalar control). Flameproof motors Ex db / Ex db eb T4, frame sizes 80 – 400 and Dust ignition protection motors Ex t T150°C, frame sizes 71 – 400.



IC411 (1)*	58	75	80	87	92	100	100	100	100	100	100	91	84	77	72	67	63	59	56	53	50
IC411 (2) **	55	75	80	85	90	92	94	96	98	100	92	84	76	68	63	57	53	49	46	43	42
IC416 (3) ***	80	100	100	100	100	100	100	100	100	100	100	91	84	77	72	67	63	59	56	53	50
IC416 (4) **	80	100	100	100	100	100	100	100	100	100	92	84	76	68	63	57	53	49	46	43	42

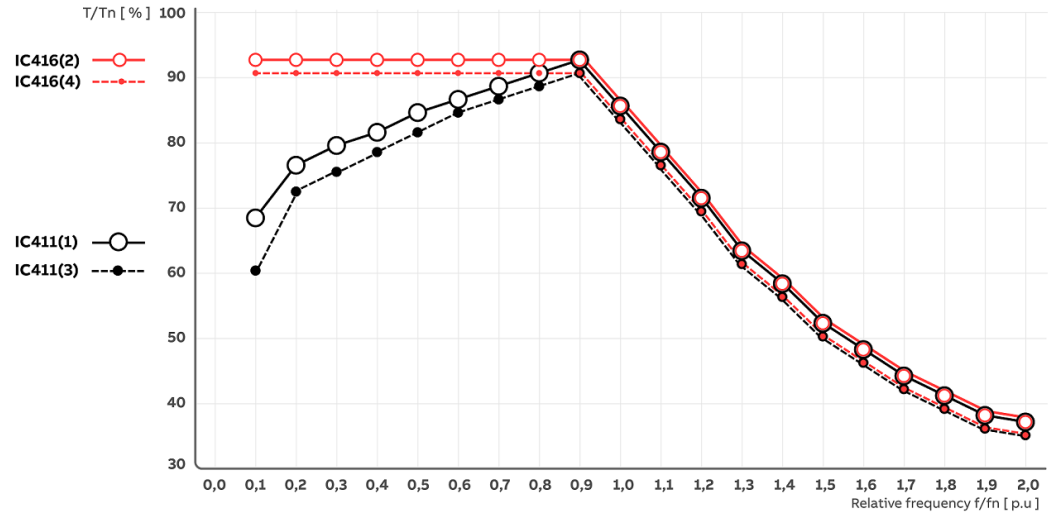
*Ex db T4 / Ex db eb T4, frame sizes 80-250 / Ex t T150°C, frame sizes 71-250

** Ex db T4 / Ex db eb T4, frame sizes 280-400 / Ex t T150°C, frame sizes 280-400

***Ex db T4 / Ex db eb T4, frame sizes 160-250 / Ex t T150°C, frame sizes 160-250

Flameproof motors Ex db / Ex db eb and Dust ignition protection motors Ex t T150 °C, frame size 450.

Loadability for frequency converter applications utilizing voltage source PWM-type converters (incl. DTC, vector or scalar control). Flameproof motors Ex db/ Ex db eb T4, frame size 450 with or without Dust ignition protection Ex t T150°C and Dust ignition protection motors Ex t T150°C, frame size 450.



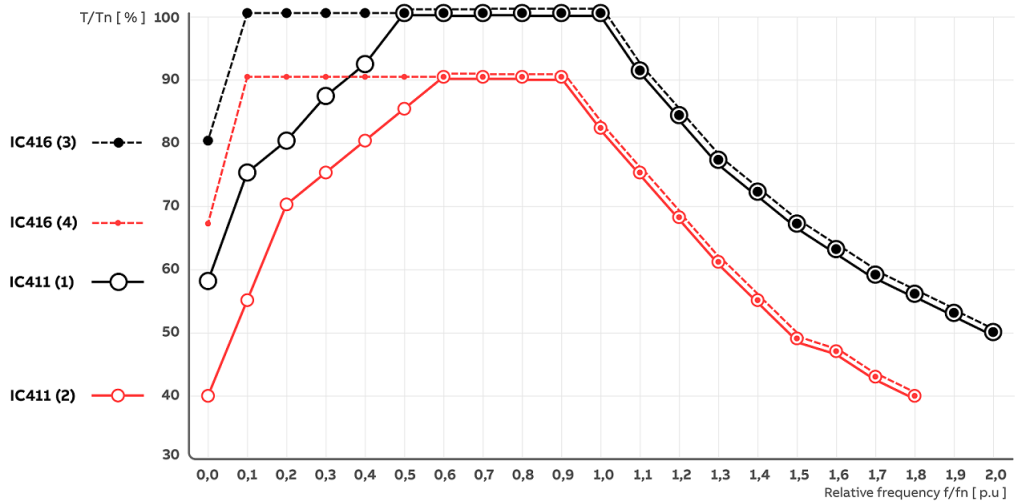
IC411 (1)*		69	77	80	82	85	87	89	91	93	86	79	72	64	59	53	49	45	42	39	38
IC416 (2)*		93	93	93	93	93	93	93	93	93	86	79	72	64	59	53	49	45	42	39	38
IC411 (3) **		61	73	76	79	82	85	87	89	91	84	77	70	62	57	51	47	43	40	37	36
IC416 (4) **		91	91	91	91	91	91	91	91	91	84	77	70	62	57	51	47	43	40	37	36

*Ex db T4 / Ex db eb T4, frame size 450 / Ex t T150°C, frame size 450 (DTC)

** Ex db T4 / Ex db eb T4, frame size 450 / Ex t T150°C, frame size 450 (vector or scalar control)

Increased safety Ex ec and Dust ignition protection motors Ex t T125 ˚C IE3 and higher efficiency classes.

Loadability for frequency converter applications utilizing voltage source PWM-type converters (incl. DTC, vector or scalar control). Increased safety motors Ex ec, frame sizes 71 – 450 and Dust ignition protection motors Ex t T125°C, frame sizes 71 – 450.



IC411 (1)*	58	75	80	87	92	100	100	100	100	100	100	91	84	77	72	67	63	59	56	53	50
IC411 (2) **	40	55	70	75	80	85	90	90	90	90	82	75	68	61	55	49	47	43	40		
IC416 (3) ***	80	100	100	100	100	100	100	100	100	100	100	91	84	77	72	67	63	59	56	53	50
IC416 (4) **	67	90	90	90	90	90	90	90	90	90	82	75	68	61	55	49	47	43	40		

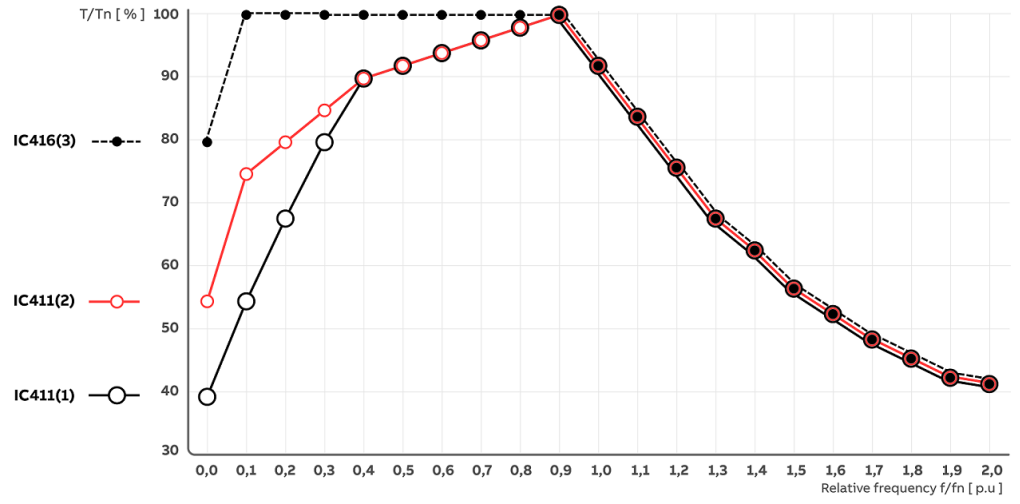
*Ex ec T3 / Ex t T125 ˚C, frame sizes 71-250

**Ex ec T3 / Ex t T125 ˚C, frame sizes 280-450

***Ex ec T3 / Ex t T125 ˚C, frame sizes 160-250

Flameproof motors Ex db / Ex db eb and Dust ignition protection motors Ex t T150 ˚C IE2 and lower efficiency classes.

Loadability for frequency converter applications utilizing voltage source PWM-type converters (incl. DTC, vector or scalar control). Flameproof motors Ex db / Ex db eb T4, frame sizes 80 – 400 and Dust ignition protection motors Ex t T150°C, frame sizes 71 – 400.



IC411 (1)*	40	55	68	80	90	92	94	96	98	100	92	84	76	68	63	57	53	49	46	43	42
IC411 (2) **	55	75	80	85	90	92	94	96	98	100	92	84	76	68	63	57	53	49	46	43	42
IC416 (3) ***	80	100	100	100	100	100	100	100	100	100	92	84	76	68	63	57	53	49	46	43	42

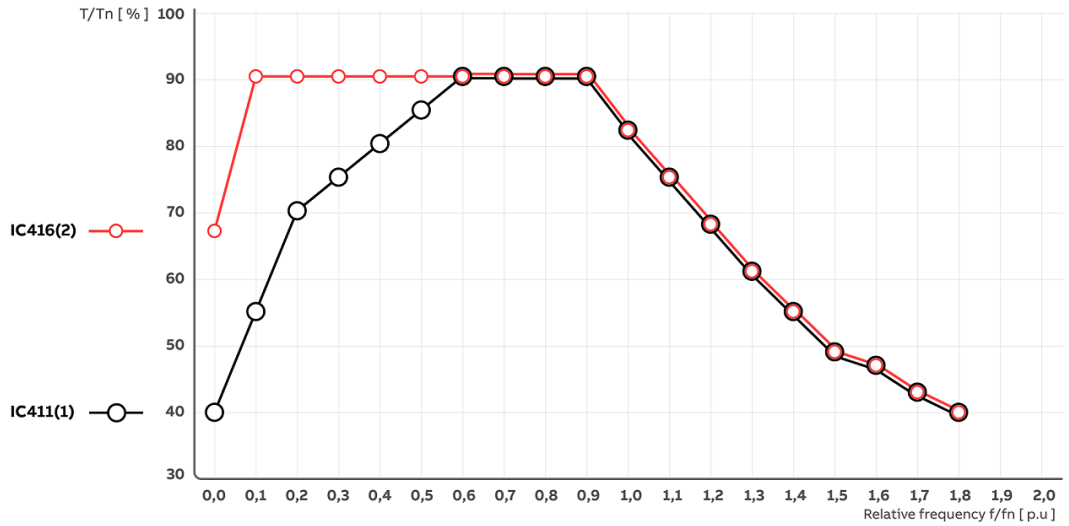
*Ex db T4 / Ex db eb T4, frame sizes 80-132 / Ex t T150°C, frame sizes 71-132

**Ex db T4 / Ex db eb T4, frame sizes 160-180 & 200-400 / Ex t T150°C, frame sizes 160-250 & 280-400

***Ex db T4 / Ex db eb T4, frame sizes 160-180 & 200-400 / Ex t T150°C, frame sizes 160-250 & 280-400

Increased safety Ex ec and Dust ignition protection motors Ex t T125 ˚C IE2 and lower efficiency classes.

Loadability for frequency converter applications utilizing voltage source PWM-type converters (incl. DTC, vector or scalar control). Increased safety motors Ex ec, frame sizes 71 – 450 and Dust ignition protection motors Ex t T125°C, frame sizes 71 – 450.



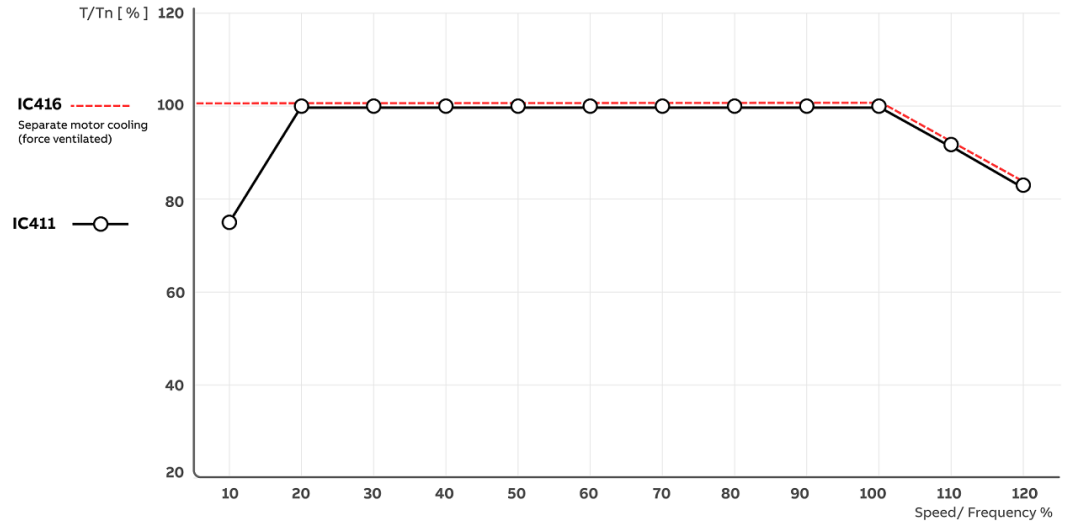
IC411 (1)*	40	55	70	75	80	85	90	90	90	90	82	75	68	61	55	49	47	43	40	
IC416 (2) **	67	90	90	90	90	90	90	90	90	90	82	75	68	61	55	49	47	43	40	

*Ex ec T3 / Ex t T125 ˚C, frame sizes 71-132 & 160-250 & 280-450

**Ex ec T3 / Ex t T125 ˚C, frame sizes 160-250 & 280-450

Synchronous reluctance Ex-motor with protection type Ex eb, Ex ec Ex t T125°C-T150°C IE5 and higher efficiency classes.

Frequency converter must include synchronous reluctance motor control software.



IC411	75	100	100	100	100	100	100	100	100	100	92	83
IC416	Separate motor cooling (force ventilated)											

Flameproof motors Ex db IIB/IIC T4 Gb

31 **Ordering information**

32 **Rating plates**

33 **Technical data**
33 IE4 Ex db cast iron motors, 3000 r/min
34 IE4 Ex db cast iron motors, 1500 r/min
35 IE4 Ex db cast iron motors, 1000 r/min
36 IE3 Ex db cast iron motors, 3000 r/min
37 IE3 Ex db cast iron motors, 1500 r/min
38 IE3 Ex db cast iron motors, 1000 r/min
39 IE3 Ex db cast iron motors, 800 r/min

40 **Variant codes**
40 Flameproof cast iron motors, Ex db IIB/IIC T4 Gb

45 **Mechanical design**
45 Motor frame and drain holes
46 Lifting lugs
47 Heating elements
48 Bearings
53 Radial forces
56 Axial forces

59 **Terminal box**
59 Standard terminal box
61 Terminal box dimensions
62 Terminal boxes and boards
64 Terminal box alternatives

66 **Dimension drawings**
66 Flameproof motors, Ex db

68 **Certificate examples**

69 **Motors in brief**
69 Flameproof motors Ex db, sizes 80 to 180
70 Flameproof motors Ex db, sizes 200 to 450

71 **Motor construction**
71 Cast iron flameproof motors, Ex db

Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3JP	160MLA	3GJP 161	410 - ADH	002, etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 to 4	
3GJP:	Totally enclosed flameproof motor Ex db with cast iron frame

Positions 5 and 6	
IEC size	
08:	80
09:	90
10:	100
11:	112
13:	132
16:	160
18:	180
20:	200
22:	225
25:	250
28:	280
31:	315
35:	355
40:	400
45:	450

Position 7	
Speed (Pole pairs)	
1:	2 poles
2:	4 poles
3:	6 poles
4:	8 poles
5:	10 poles
6:	12 poles
7:	≥ 12 poles
8:	Two-speed motors
9:	Multi-speed motors

Positions 8 to 10	
8:	Frame lenght
9:	Stator package length
10:	Speed for two-speed induction, Permanent Magnet, SynRM and High Speed motors

Position 11
- (Dash)

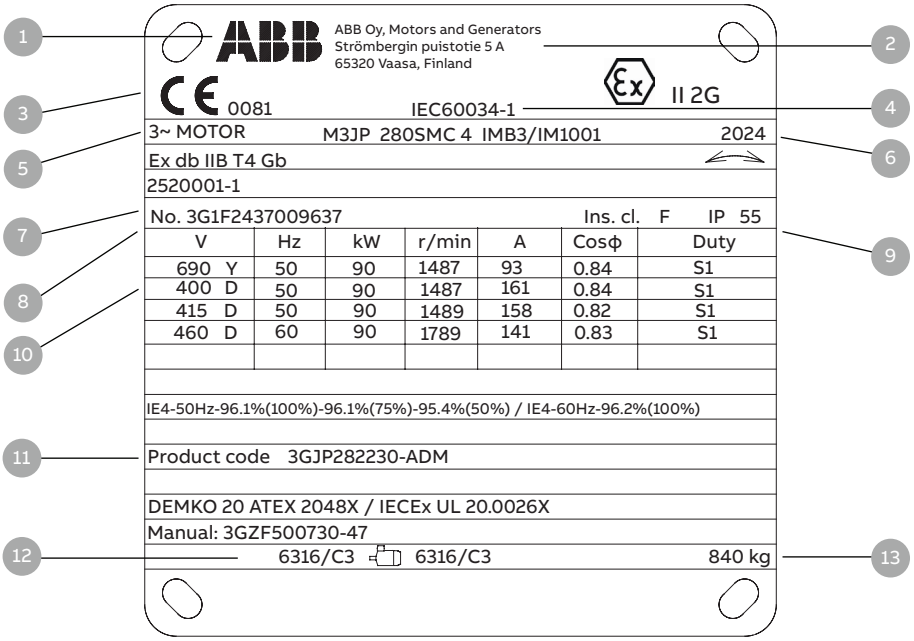
Position 12	
Mounting arrangement	
A:	Foot-mounted, top-mounted terminal box
B:	Flange-mounted, large flange with clearance holes
C:	Flange-mounted, small flange with tapped holes

Position 13	
Voltage and frequency	
Single-speed motors	
C:	400VY 50Hz, 460VY 60Hz
D:	400 VΔ, 415 VΔ, 690 VY 50 Hz
E:	500 VΔ 50 Hz
F:	500 VY 50 Hz
P:	400VD 50Hz, 460VD 60Hz
S:	230 VΔ, 400 VY, 415 VY 50 Hz

Position 14	
Generation code	
Generation code is followed by variant codes according to the hazardous area, seen below and on corresponding pages with variant codes:	
461	Ex d(e) design, Group IIC

Rating plates

01 Sample rating plate for a IE4 Flameproof Ex db motor



01

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

Technical data

IE4 Ex db cast iron motors, 3000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 $GD^2 kgm^2$	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_n A	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
75	M3JP 280SMB 2	3GJP281220-**M	2981	95,6	95,6	95	0,86	130	7,7	240	2,2	3,2	0,677	665	77
90	M3JP 280SMC 2	3GJP281230-**M	2982	95,8	95,8	95,2	0,88	153	8,7	288	2,7	3,5	0,822	725	77
110	M3JP 315SMB 2	3GJP311220-**M	2983	96	96	95,4	0,87	189	7,2	352	1,7	2,9	1,22	940	77
132	M3JP 315SMC 2	3GJP311230-**M	2985	96,2	96,2	95,8	0,87	225	8,6	422	2,3	3,3	1,44	1025	77
160	M3JP 315MLA 2	3GJP311410-**M	2983	96,3	96,4	96,2	0,89	267	8	512	2,2	2,8	1,7	1190	77
200	M3JP 355SMA 2	3GJP351210-**M	2985	96,5	96,4	95,9	0,89	335	8,2	640	1,9	3,5	2,73	1600	83
250	M3JP 355SMB 2	3GJP351220-**M	2984	96,5	96,5	96,1	0,89	415	8,1	800	2,2	3,3	3,1	1680	83
315	M3JP 355SMC 2	3GJP351230-**M	2985	96,5	96,4	95,9	0,88	533	7,3	1008	2,4	3,1	3,38	1750	83
355	M3JP 355MLA 2	3GJP351410-**M	2983	96,5	96,5	96,1	0,89	595	7,8	1137	2,4	2,8	3,74	2000	83
400	M3JP 355MLB 2	3GJP351420-**M	2982	96,5	96,4	95,8	0,87	683	7	1281	2,6	2,8	3,9	2000	83
450	M3JP 355MLC 2	3GJP351430-**M	2984	96,5	96,5	96	0,9	746	8,8	1440	2,7	3,8	3,95	2080	83
500	M3JP 355LKA 2	3GJP351810-**M	2983	96,5	96,5	96,1	0,9	823	8,7	1601	2,3	3,9	4,51	2320	83
560	M3JP 400LA 2	3GJP401510-**M	2988	96,5	96,4	95,8	0,89	939	8,4	1790	2,3	3,4	7,27	2950	82
560	M3JP 400LKA 2	3GJP401810-**M	2988	96,5	96,4	95,8	0,89	939	8,4	1790	2,3	3,4	7,27	2950	82
560	M3JP 355LKB 2	3GJP351820-**M	2983	96,5	96,4	95,9	0,9	922	8,7	1793	2,6	4,1	4,93	2460	83
630	M3JP 400LB 2	3GJP401520-**M	2988	96,5	96,4	95,9	0,89	1052	8,5	2013	2,4	3,4	7,81	2950	82
630	M3JP 400LKB 2	3GJP401820-**M	2988	96,5	96,4	95,9	0,89	1052	8,5	2013	2,4	3,4	7,81	2950	82
710	M3JP 400LC 2	3GJP401530-**M	2988	96,5	96,5	96	0,89	1185	7,3	2269	2,8	3,1	8,9	3050	82
710	M3JP 400LKC 2	3GJP401830-**M	2988	96,5	96,5	96	0,89	1185	7,3	2269	2,8	3,1	8,9	3050	82

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 $GD^2 kgm^2$	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_n A	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3JP 280SMD 2	3GJP281240-**M	2980	96	96,2	95,8	0,86	192	8,3	352	2,7	3,4	0,822	725	77
132	M3JP 280MLA 2	3GJP281410-**M	2980	96,2	96,2	95,6	0,88	224	8,5	423	2,9	3,4	0,941	840	81
160	M3JP 280MLB 2	3GJP281420-**M	2970	96,3	96,7	96,7	0,9	265	6,9	514	2,3	2,5	1,06	890	81
200	M3JP 315MLB 2	3GJP311420-**M	2982	96,5	96,7	96,6	0,89	333	6,5	640	2,1	2,8	1,78	1220	77
250	M3JP 315LKB 2	3GJP311820-**M	2981	96,5	96,7	96,7	0,9	412	7,2	801	2,8	2,9	2,33	1540	77

Technical data

IE4 Ex db cast iron motors, 1500 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
75	M3JP 280SMB 4	3GJP282220-**M	1488	96	96,2	95,8	0,85	132	8,1	481	3,3	3,2	1,41	840	72
90	M3JP 280SMC 4	3GJP282230-**M	1487	96,1	96,2	95,7	0,84	161	7,7	578	3,5	3,3	1,41	840	72
110	M3JP 315SMC 4	3GJP312230-**M	1491	96,3	96,4	96	0,84	194	7,9	705	2,9	3,4	2,33	1000	68
132	M3JP 315SMD 4	3GJP312240-**M	1491	96,4	96,5	96,2	0,84	234	7,8	846	3	3,4	2,52	1065	68
160	M3JP 315MLB 4	3GJP312420-**M	1490	96,6	96,7	96,5	0,85	278	7,7	1026	3,2	3,3	3,04	1220	68
200	M3JP 355SMA 4	3GJP352210-**M	1492	96,7	96,7	96,4	0,86	346	7,1	1280	2,6	2,9	5,11	1610	74
250	M3JP 355SMB 4	3GJP352220-**M	1492	96,7	96,7	96,4	0,85	435	7,5	1600	3	3,1	6	1780	74
315	M3JP 355SMC 4	3GJP352230-**M	1491	96,7	96,7	96,4	0,84	555	7	2017	3,2	3	6,56	1820	74
355	M3JP 355MLA 4	3GJP352410-**M	1492	96,7	96,8	96,5	0,85	617	7,7	2273	3,3	3,1	7,44	2140	78
400	M3JP 355MLB 4	3GJP352420-**M	1490	96,7	96,8	96,6	0,86	691	8,2	2563	3,2	3	7,44	2140	78
450	M3JP 355MLC 4	3GJP352430-**M	1489	96,7	96,9	96,7	0,86	782	7,9	2885	3,1	2,9	7,44	2140	78
500	M3JP 355LKA 4	3GJP352810-**M	1491	96,7	96,7	96,2	0,86	867	7	3202	3,7	3,1	9,35	2500	78
560	M3JP 400LA 4	3GJP402510-**M	1491	96,7	96,7	96,2	0,85	985	7	3586	3,1	3,1	13,6	3200	78
560	M3JP 400LKA 4	3GJP402810-**M	1491	96,7	96,7	96,2	0,85	985	7	3586	3,1	3,1	13,6	3200	78
630	M3JP 400LB 4	3GJP402520-**M	1492	96,7	96,7	96,3	0,86	1093	8,6	4033	3	3,2	13,6	3300	78
630	M3JP 400LKB 4	3GJP402820-**M	1492	96,7	96,7	96,3	0,86	1093	8,6	4033	3	3,2	13,6	3300	78
710	M3JP 400LC 4	3GJP402530-**M	1492	96,7	96,7	96,3	0,85	1245	7,7	4545	2,9	3,2	14,6	3300	78
710	M3JP 400LKC 4	3GJP402830-**M	1492	96,7	96,7	96,3	0,85	1245	7,7	4545	2,9	3,2	14,6	3300	78

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3JP 280MLB 4	3GJP282420-**M	1489	96,3	96,3	95,7	0,81	203	8,3	705	4,3	3,8	1,7	890	75
132	M3JP 280MLC 4	3GJP282430-**M	1489	96,4	96,4	95,9	0,81	244	8,2	847	4,4	3,8	1,87	890	75
200	M3JP 315LKB 4	3GJP312820-**M	1491	96,7	96,9	96,7	0,86	345	7,6	1281	2,9	3,1	3,81	1480	74
250	M3JP 315LKC 4	3GJP312830-**M	1491	96,7	96,9	96,8	0,86	432	7,9	1602	2,7	3,2	3,91	1600	74
315	M3JP 315LKE 4	3GJP312850-**M	1489	96,7	97	96,9	0,84	560	7,8	2020	3,1	3	4,15	1640	74

Technical data

IE4 Ex db cast iron motors, 1000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
45	M3JP 280SMB 6	3GJP283220-**M	992	94,8	94,9	94,4	0,84	81,3	7,7	433	2,9	2,8	2	680	65
55	M3JP 280SMC 6	3GJP283230-**M	991	95,1	95,3	94,9	0,84	99,3	7,5	530	3	2,8	2,26	725	65
75	M3JP 315SMC 6	3GJP313230-**M	994	95,4	95,5	95,1	0,82	137	7,5	720	2,6	2,9	4,35	1000	67
90	M3JP 315SMD 6	3GJP313240-**M	994	95,6	95,7	95,3	0,8	169	7,5	864	2,8	3	4,57	1040	67
110	M3JP 315MLB 6	3GJP313420-**M	994	95,8	95,9	95,6	0,81	202	7,3	1057	2,7	2,8	5,5	1200	68
132	M3JP 315LKA 6	3GJP313810-**M	994	96	96,1	95,8	0,81	243	7,4	1268	2,9	2,9	6,54	1410	68
160	M3JP 355SMB 6	3GJP353220-**M	995	96,2	96,3	95,9	0,82	292	7,7	1535	2,6	2,8	8,65	1680	73
200	M3JP 355SMC 6	3GJP353230-**M	995	96,3	96,3	96	0,81	367	7,1	1919	2,7	2,9	10,1	1820	73
250	M3JP 355MLB 6	3GJP353420-**M	995	96,5	96,6	96,4	0,82	455	7,7	2400	2,8	2,8	12	2180	73
315	M3JP 355LKA 6	3GJP353810-**M	994	96,6	96,7	96,4	0,82	574	6,7	3025	2,8	2,7	13,8	2500	76
355	M3JP 355LKB 6	3GJP353820-**M	995	96,6	96,5	96	0,79	667	7,4	3407	3,3	3,1	14,7	2600	76
400	M3JP 400LA 6	3GJP403510-**M	995	96,6	96,7	96,3	0,81	734	7,3	3840	2,8	3,1	15,8	2900	76
400	M3JP 400LKA 6	3GJP403810-**M	995	96,6	96,7	96,3	0,81	734	7,3	3840	2,8	3,1	15,8	2900	76
450	M3JP 400LB 6	3GJP403520-**M	996	96,6	96,4	95,6	0,81	825	8,5	4316	3,4	3,5	20,7	3300	76
450	M3JP 400LKB 6	3GJP403820-**M	996	96,6	96,4	95,6	0,81	825	8,5	4316	3,4	3,5	20,7	3300	76
500	M3JP 400LC 6	3GJP403530-**M	995	96,6	96,5	95,8	0,82	912	8	4798	3,2	3,3	20,7	3300	76
500	M3JP 400LKC 6	3GJP403830-**M	995	96,6	96,5	95,8	0,82	912	8	4798	3,2	3,3	20,7	3300	76
560	M3JP 400LD 6	3GJP403540-**M	994	96,6	96,6	96,2	0,85	982	6,8	5380	2,8	2,9	22,3	3400	77
560	M3JP 400LKD 6	3GJP403840-**M	994	96,6	96,6	96,2	0,85	982	6,8	5380	2,8	2,9	22,3	3400	77
610	M3JP 450LA 6	3GJP453510-**M	996	96,6	96,5	95,8	0,81	1126	7,5	5849	1,7	3,4	32,2	4150	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
75	M3JP 280SMD 6	3GJP283240-**M	991	95,4	95,6	95,3	0,81	140	7,2	723	3,1	2,7	2,25	730	65
160	M3JP 315LKC 6	3GJP313830-**M	994	96,2	96,3	96	0,81	296	7,1	1537	3,2	3	7,71	1600	68
200	M3JP 315LKE 6	3GJP313850-**M	994	96,3	96,4	96,1	0,81	368	7,5	1921	2,9	2,9	7,71	1600	68

Technical data

IE3 Ex db cast iron motors, 3000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_i/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
0.75	M3JP 80MD 2	3GJP081340-**K	2872	80,7	81,1	79,4	0,87	1,51	6,2	2,43	2,88	3,43	0,0012	48	57
1.1	M3JP 80MG 2	3GJP081370-**K	2862	82,7	83,7	82,8	0,87	2,1	6,3	3,65	3,03	3,5	0,0014	49	60
1.5	M3JP 90SLB 2	3GJP091020-**K	2892	84,2	85,3	84,5	0,89	2,7	7,3	4,8	3,4	3,7	0,0031	60	69
2.2	M3JP 90LC 2	3GJP091530-**K	2900	85,9	86,7	85,7	0,89	4	9,1	7,27	3,35	4,09	0,0044	63	64
3	M3JP 100LKA 2	3GJP101810-**K	2907	87,1	87,6	86,5	0,89	5,4	8,8	9,9	3,25	4,32	0,0086	80	68
4	M3JP 112MG 2	3GJP111370-**K	2882	88,1	89,7	90,3	0,93	7	8,1	13,3	2,8	3,6	0,0132	85	70
5.5	M3JP 132SMF 2	3GJP131260-**K	2902	89,2	89,9	89,4	0,9	9,7	7,3	18,2	2,72	3,6	0,0218	124	67
7.5	M3JP 132SMG 2	3GJP131270-**K	2907	90,1	91	91	0,9	13,2	8,1	24,7	2,66	3,74	0,0218	124	70
11	M3JP 160MLA 2	3GJP161410-**K	2943	91,2	91,7	91,3	0,92	18,7	8,1	35,6	2,7	3,4	0,052	232	69
15	M3JP 160MLB 2	3GJP161420-**K	2943	91,9	92,4	92,1	0,91	25,4	8,4	48,6	3,1	3,4	0,062	243	69
18.5	M3JP 160MLC 2	3GJP161430-**K	2942	92,4	93	92,8	0,93	30,8	8,3	60	3,1	3,6	0,072	267	69
22	M3JP 180MLA 2	3GJP181410-**K	2957	92,7	93,3	93	0,91	37,4	8,1	71	2,6	3,2	0,116	307	69
30	M3JP 200MLA 2	3GJP201410-**K	2958	93,3	93,7	93,6	0,9	51	7,8	96,8	2,8	3,1	0,196	358	72
37	M3JP 200MLB 2	3GJP201420-**K	2960	93,7	94,1	93,9	0,91	62,2	8,8	119	3,1	3,4	0,217	370	72
45	M3JP 225SMA 2	3GJP221210-**K	2972	94	94,2	93,8	0,89	76,8	7,8	144	3,1	3	0,323	457	74
55	M3JP 250SMA 2	3GJP251210-**K	2975	94,3	94,5	94,1	0,89	93,6	8	176	2,8	3,3	0,579	509	75
75	M3JP 280SMB 2	3GJP281220-**K	2980	94,7	94,7	94	0,87	129	7,8	240	2,5	3,3	0,9	766	77
90	M3JP 280SMC 2	3GJP281230-**K	2981	95	94,8	94,1	0,88	153	8	288	2,95	3,1	1,15	836	77
110	M3JP 315SMB 2	3GJP311220-**K	2982	95,2	95,2	94,3	0,88	189	6,7	352	1,9	2,6	1,4	1041	77
132	M3JP 315SMC 2	3GJP311230-**K	2986	95,4	95,5	95,1	0,88	226	7,9	422	2,4	3	1,7	1116	77
160	M3JP 315MLA 2	3GJP311410-**K	2983	95,6	95,9	95,6	0,9	268	7,3	512	2,2	2,7	2,1	1286	77
200	M3JP 355SMA 2	3GJP351210-**K	2985	95,8	95,5	94,5	0,89	336	7,6	640	2	3,1	3	1781	83
250	M3JP 355SMB 2	3GJP351220-**K	2983	95,8	96	95,5	0,9	415	7,6	800	2,2	3	3,4	1878	83
315	M3JP 355SMC 2	3GJP351230-**K	2984	95,8	95,8	95,1	0,89	533	7,8	1008	2,3	2,8	3,6	1953	83
355	M3JP 355MLA 2	3GJP351410-**K	2981	95,8	96,1	95,7	0,9	595	7,5	1137	2,3	2,6	4,1	2188	83
400	M3JP 355MLB 2	3GJP351420-**K	2982	95,8	95,6	94,7	0,88	677	7,1	1280	2,3	2,9	4,1	2190	83
450	M3JP 355MLC 2	3GJP351430-**K	2983	95,8	95,8	95	0,9	743	7,9	1440	2,2	2,9	4,3	2270	83
500	M3JP 355LKA 2	3GJP351810-**K	2982	95,8	95,8	95,3	0,9	827	7,5	1601	2	3,9	4,8	2510	83
560	M3JP 400LA 2	3GJP401510-**K	2988	95,8	95,8	94,9	0,89	934	7,8	1789	2,46	3,67	7,9	3230	82
630	M3JP 400LB 2	3GJP401520-**K	2987	95,8	95,5	94,8	0,89	1049	7,6	2014	2,56	3,7	8,2	3330	82
710	M3JP 400LC 2	3GJP401530-**K	2987	95,8	95,7	94,9	0,89	1178	7,2	2270	2,56	3,4	9,3	3580	82

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_i/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3JP 315MLB 2	3GJP311420-**K	2983	96,4	96,7	96,6	0,9	333	6,8	640	1,9	2,6	2,2	1311	77
250	M3JP 315LKB 2	3GJP311820-**K	2982	95,8	96,2	96,2	0,91	413	7,9	800	2,5	2,7	2,9	1620	77

Technical data

IE3 Ex db cast iron motors, 1500 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
0.55	M3JP 80MLD 4	3GJP082440-**K	1439	80,8	82,2	81,4	0,81	1,18	6,3	3,6	2,3	3,29	0,0028	49	45
0.75	M3JP 80MLG 4	3GJP082470-**K	1445	82,5	83,5	82,2	0,79	1,62	6,9	4,97	2,6	3,76	0,0033	50	57
1.1	M3JP 90SLC 4	3GJP092030-**K	1444	84,1	84,6	83,2	0,79	2,3	7,2	7,28	3,77	3,68	0,0067	61	56
1.5	M3JP 90LD 4	3GJP092540-**K	1439	85,3	86,4	85,9	0,78	3,1	7,8	9,95	3,35	4,47	0,0072	62	56
2.2	M3JP 100LKA 4	3GJP102810-**K	1452	86,7	87,8	87,7	0,83	4,2	8,9	14,46	3,4	4,1	0,0146	79	56
3	M3JP 100LKB 4	3GJP102820-**K	1452	87,7	89	89	0,83	5,8	9	19,7	3,2	4	0,0146	79	58
4	M3JP 112MG 4	3GJP112370-**K	1454	88,6	89,1	88,6	0,75	8,7	7,5	26,3	3,1	3,7	0,0176	81	59
5.5	M3JP 132SMF 4	3GJP132260-**K	1462	89,6	90,6	90,6	0,81	10,8	7,3	35,87	2,41	3,39	0,0401	119	67
7.5	M3JP 132SMG 4	3GJP132270-**K	1457	90,4	91,4	91,5	0,81	14,8	7,3	49,1	2,39	3,38	0,0401	119	64
11	M3JP 160MLA 4	3GJP162410-**K	1473	91,4	91,8	91,3	0,84	20,4	7,7	71,3	2,6	2,9	0,108	246	62
15	M3JP 160MLB 4	3GJP162420-**K	1474	92,1	92,7	92,4	0,84	27,8	7,9	97,1	2,8	3,3	0,125	261	62
18.5	M3JP 180MLA 4	3GJP182410-**K	1481	92,6	92,9	92,3	0,82	34,9	7,6	119	3	3,1	0,217	300	62
22	M3JP 180MLB 4	3GJP182420-**K	1480	93	93,5	93,2	0,82	41,5	8,2	141	2,8	3,1	0,217	296	62
30	M3JP 200MLA 4	3GJP202410-**K	1484	93,6	93,8	93,2	0,84	54,6	8,3	193	3	3,3	0,366	367	63
37	M3JP 225SMA 4	3GJP222210-**K	1482	93,9	94,6	94,5	0,86	65,4	7,7	238	2,8	3,1	0,536	448	66
45	M3JP 225SMB 4	3GJP222220-**K	1482	94,2	94,7	94,6	0,85	80,2	7,9	289	3,1	3,2	0,536	451	66
55	M3JP 250SMA 4	3GJP252210-**K	1485	94,6	95,2	95	0,85	97,8	7,9	353	3	3,3	0,933	545	67
75	M3JP 280SMB 4	3GJP282220-**K	1486	95	95,4	95,3	0,85	134	7,4	482	2,5	2,8	1,5	766	72
90	M3JP 280SMC 4	3GJP282230-**K	1487	95,2	95,5	95,1	0,85	161	7,9	578	2,9	3	1,85	827	72
110	M3JP 315SMC 4	3GJP312230-**K	1491	95,4	95,7	95,2	0,85	194	7,8	704	2,4	3,1	2,9	1093	68
132	M3JP 315SMD 4	3GJP312240-**K	1490	95,6	95,8	95,4	0,85	234	7,9	846	2,6	3,2	3,2	1149	68
160	M3JP 315MLB 4	3GJP312420-**K	1490	95,8	96	95,6	0,86	278	7,9	1026	2,7	3	3,9	1308	68
200	M3JP 355SMA 4	3GJP352210-**K	1491	96	96,1	95,7	0,87	345	7,3	1282	2,1	2,7	5,9	1794	74
250	M3JP 355SMB 4	3GJP352220-**K	1491	96	96,1	95,9	0,87	433	7,8	1601	2,5	2,9	6,9	1950	74
315	M3JP 355SMC 4	3GJP352230-**K	1490	96	96,1	95,9	0,85	554	7,4	2017	2,4	2,9	7,2	1998	74
355	M3JP 355MLA 4	3GJP352410-**K	1491	96	96,3	95,9	0,87	616	7,9	2274	2,7	2,9	8,4	2333	78
400	M3JP 355MLB 4	3GJP352420-**K	1489	96	96	95,5	0,85	705	6,8	2565	2,3	2,6	8,4	2330	78
500	M3JP 355LKA 4	3GJP352810-**K	1490	96	96	95,3	0,86	865	6,8	3204	2	3	10	2690	78
560	M3JP 400LA 4	3GJP402510-**K	1491	96	96	95,4	0,85	982	7,4	3586	2,4	2,8	15	3200	78
630	M3JP 400LB 4	3GJP402520-**K	1491	96	96	95,4	0,86	1077	7,6	4034	2,2	2,9	16	3580	78
710	M3JP 400LC 4	3GJP402530-**K	1491	96	96	95,5	0,85	1227	7,6	4547	2,4	3	17	3680	78

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3JP 315LKB 4	3GJP312820-**K	1490	96,6	96,8	96,7	0,87	346	7,6	1282	2,5	2,9	5	1610	74
250	M3JP 315LKC 4	3GJP312830-**K	1490	96	96,2	96,1	0,87	432	7,8	1601	2,3	3	5,5	1690	74

Technical data

IE3 Ex db cast iron motors, 1000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
0.75	M3JP 90SLD 6	3GJP093040-**K	940	78,9	80,3	79,2	0,75	1,8	4,4	7,57	2,1	2,8	0,0056	58	44
1.1	M3JP 90LF 6	3GJP093560-**K	944	81	81,7	80,1	0,75	2,66	4,7	11,1	2,1	2,8	0,0068	61	44
1.5	M3JP 100LE 6	3GJP103550-**K	960	82,5	82,5	80,1	0,68	3,8	5,4	14,9	2,7	3,4	0,012	74	49
2.2	M3JP 112MJ 6	3GJP113390-**K	962	84,3	85,5	84,7	0,68	5,3	6	21,8	2,4	3,5	0,0196	82	66
3	M3JP 132SMD 6	3GJP133240-**K	977	85,6	85,9	84,3	0,69	6,9	5,9	29	1,9	3,3	0,0416	121	57
4	M3JP 132SMG 6	3GJP133270-**K	974	86,8	87,4	86,6	0,69	9,3	5,6	38,7	1,8	2,84	0,0416	121	57
5.5	M3JP 132SMH 6	3GJP133280-**K	966	88	88,9	88,7	0,73	12,1	5	54,1	1,83	2,7	0,0654	118	57
7.5	M3JP 160MLA 6	3GJP163410-**K	980	89,1	89,4	88,2	0,78	15,2	7,9	73	1,7	2,8	0,114	243	59
11	M3JP 160MLB 6	3GJP163420-**K	979	90,3	90,4	89,1	0,74	23,5	8,5	107	2,2	3,9	0,131	256	59
15	M3JP 180MLA 6	3GJP183410-**K	981	91,2	91,9	91,6	0,77	30,4	5,5	146	1,7	2,7	0,225	296	59
18.5	M3JP 200MLA 6	3GJP203410-**K	990	91,7	91,8	90,8	0,77	37,3	7,5	178	2,6	3,2	0,448	340	63
22	M3JP 200MLB 6	3GJP203420-**K	990	92,2	92,3	91,3	0,79	43	7,8	212	2,6	3,2	0,531	363	63
30	M3JP 225SMA 6	3GJP223210-**K	989	92,9	93,1	92,5	0,81	56,8	7,9	289	2,8	3,1	0,813	440	63
37	M3JP 250SMA 6	3GJP253210-**K	991	93,3	93,6	93,1	0,83	68	7,7	356	2,7	2,9	1,49	529	63
45	M3JP 280SMB 6	3GJP283220-**K	992	93,7	94,1	93,5	0,85	80,9	7,5	434	2,4	2,6	2,2	777	65
55	M3JP 280SMC 6	3GJP283230-**K	990	94,1	94,4	94,1	0,85	99,4	6,8	506	2,4	2,6	2,85	817	65
75	M3JP 315SMC 6	3GJP313230-**K	994	94,6	94,8	94,4	0,83	138	7	721	2,2	2,8	4,9	1089	67
90	M3JP 315SMD 6	3GJP313240-**K	994	94,9	95,1	94,7	0,81	170	7,2	864	2,4	2,9	4,9	1123	67
110	M3JP 315MLB 6	3GJP313420-**K	994	95,1	95,3	95,1	0,83	202	6,9	1058	2,3	2,7	6,3	1288	68
132	M3JP 315LKA 6	3GJP313810-**K	993	95,4	95,6	95,4	0,82	243	6,9	1269	2,4	2,7	7,3	1490	68
160	M3JP 355SMB 6	3GJP353220-**K	995	95,6	95,6	95	0,82	294	7	1536	2,1	2,7	9,7	1778	73
200	M3JP 355SMC 6	3GJP353230-**K	995	95,8	96	95,6	0,82	367	7,3	1920	2,3	2,8	11,3	1921	73
250	M3JP 355MLB 6	3GJP353420-**K	995	95,8	96	95,9	0,83	456	7,1	2399	2,3	2,7	13,5	2345	73
315	M3JP 355LKA 6	3GJP353810-**K	994	95,8	96	95,6	0,83	576	6,9	3026	2,3	2,6	15,5	2670	76
355	M3JP 355LKB 6	3GJP353820-**K	995	95,8	95,9	95,3	0,81	668	7,7	3407	2,7	2,9	16,5	2770	76
400	M3JP 400LA 6	3GJP403510-**K	993	95,8	95,8	95,1	0,82	731	7,1	3846	2,3	2,7	17	3180	76
450	M3JP 400LB 6	3GJP403520-**K	994	95,8	95,8	95,2	0,82	819	7,4	4323	2,4	2,5	20,5	3430	76
500	M3JP 400LC 6	3GJP403530-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3580	76
500	M3JP 400LKC 6	3GJP403830-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3580	76
560	M3JP 400LD 6	3GJP403540-**K	993	95,8	95,8	95,2	0,85	984	7,4	5386	2,4	2,8	24	3680	77
610	M3JP 450LA 6	3GJP453510-**K	994	95,8	95,8	95,3	0,83	1098	7,1	5860	1,4	2,9	31	4320	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
160	M3JP 315LKC 6	3GJP313830-**K	994	95,6	95,8	95,7	0,82	297	7,4	1537	2,7	2,9	9,2	1690	68

Technical data

IE3 Ex db cast iron motors, 800 r/min

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

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
800 r/min = 8 poles				**400 V 50Hz**				**BASIC-design**							
0.75	M3JP 100LKA 8	3GJP104810-**K	710	75	74,5	70,5	0,65	2,13	4,4	10	2,35	2,8	0,00855	70	53
1.1	M3JP 100LKB 8	3GJP104820-**K	703	77,7	77,7	74,7	0,65	3,08	4,4	14,9	2,7	2,9	0,0128	78	53
1.5	M3JP 112MC 8	3GJP114330-**K	717	79,7	80,1	78,8	0,62	4,12	4,3	19,9	1,8	2,6	0,0194	82	55
2.2	M3JP 132SMA 8	3GJP134210-**K	725	81,9	82,3	80,2	0,64	5,8	5,2	28,9	2	3	0,0291	105	57
3	M3JP 132SMG 8	3GJP134270-**K	723	83,5	84,1	82,8	0,66	7,5	4,8	39,6	1,8	2,8	0,0375	115	57
4	M3JP 160MLA 8	3GJP164410-**K	734	84,8	85,1	83,2	0,65	10,3	4,5	52	1,8	2,3	0,091	218	59
5.5	M3JP 160MLB 8	3GJP164420-**K	732	86,2	87,1	86,1	0,69	13	5	71,7	2	2,35	0,091	219	59
7.5	M3JP 160MLC 8	3GJP164430-**K	733	87,3	88,2	87,2	0,69	17,6	5,1	97,7	2	2,4	0,12	238	59
11	M3JP 180MLA 8	3GJP184410-**K	731	88,6	89,2	88,4	0,7	25,3	5	143,6	2,1	2,1	0,2	281	59
15	M3JP 200MLA 8	3GJP204410-**K	737	89,6	90,5	90,1	0,74	32,5	5,2	194	2,1	2,4	0,45	339	60
18.5	M3JP 225SMA 8	3GJP224210-**K	736	90,1	90,8	90,2	0,74	39,8	5,2	240	2	2,25	0,669	422	63
22	M3JP 225SMB 8	3GJP224220-**K	736	90,6	91,6	91,5	0,73	47,5	5,3	285	2,26	2,47	0,722	435	63
30	M3JP 250SMA 8	3GJP254210-**K	741	91,3	91,7	91	0,71	67	5,6	386	2,7	2,7	1,4	512	63
37	M3JP 280SMA 8	3GJP284210-**K	741	91,8	92	91,3	0,79	72,6	7,3	476	1,7	3	1,85	605	65
45	M3JP 280SMB 8	3GJP284220-**K	741	92,2	92,3	91,7	0,78	89,2	7,6	579	1,8	3,1	2,2	645	65
55	M3JP 315SMA 8	3GJP314210-**K	742	92,5	93,1	92,5	0,8	106	7,1	707	1,6	2,7	3,2	830	62
75	M3JP 315SMB 8	3GJP314220-**K	741	93,1	93,2	93,1	0,82	146	7,1	966	1,7	2,7	4,1	930	62
90	M3JP 315SMC 8	3GJP314230-**K	741	93,4	93,7	93,4	0,82	170	7,4	1159	1,8	2,7	4,9	1000	64
110	M3JP 315MLA 8	3GJP314410-**K	740	93,7	94	94,1	0,83	211	7,3	1419	1,8	2,7	5,8	1150	72
132	M3JP 355SMA 8	3GJP354210-**K	744	94	93,9	93,4	0,79	256	7,5	1694	1,5	2,6	7,9	1520	69
160	M3JP 355SMB 8	3GJP354220-**K	744	94,3	94,3	93,8	0,79	293	7,6	2053	1,6	2,6	9,7	1680	69
200	M3JP 355SMC 8	3GJP354230-**K	742	94,6	95	94,8	0,79	385	7,4	2576	1,6	2,6	11,3	1930	69
250	M3JP 355MLB 8	3GJP354420-**K	743	94,6	94,7	94,1	0,8	472	7,5	3213	1,6	2,7	13,5	2370	72
315	M3JP 400LA 8	3GJP404510-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	3180	71
315	M3JP 400LKA 8	3GJP404810-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	3180	71
355	M3JP 400LB 8	3GJP404520-**K	743	94,6	94,9	94,6	0,83	641	6,8	4562	1,2	2,5	21	3480	71
400	M3JP 400LC 8	3GJP404530-**K	744	94,6	94,9	94,3	0,81	735	6	5134	1,3	2,7	24	3680	71
430	M3JP 450LA 8	3GJP454510-**K	744	94,6	94,9	94,5	0,82	789	6,2	5519	1	2,6	26	3920	80
470	M3JP 450LB 8	3GJP454520-**K	744	94,6	94,9	94,3	0,8	861	6,6	6032	1,1	2,7	29	4160	80
530	M3JP 450LC 8	3GJP454530-**K	745	94,6	94,7	94,2	0,81	982	7,3	6793	1,3	3	35	4520	80
600	M3JP 450LD 8	3GJP454540-**K	745	94,6	94,6	94	0,8	1124	7,9	7690	1,4	3,3	41	4960	80

Variant codes

Flameproof cast iron motors, Ex db IIB/IIC T4 Gb

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

Most of the variant codes apply to IE2 and IE3 motors. However, confirm the availability of variants for IE3 motors with your ABB sales office before making an order.

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	-	-	-	●	●	●	●	●	●	●	-	-	-
040	Heat-resistant grease	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
041	Bearings regreasable via grease nipples.	-	-	-	-	●	○	○	○	○	○	○	○	○	○	○
058	Angular contact bearing at D-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.	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●
194	2Z bearings greased for life at both ends.	○	○	○	○	○	●	●	●	●	●	-	-	-	-	-
433	Outlet grease collector	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
506	Nipples for vibration measurement : SKF Marlin Quick Connect stud CMSS-2600-3	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
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	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
828	SPM compatible nipple for vibration measurement at D-end only.	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-
Branch standard designs																
178	Stainless steel / acid proof bolts.	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
204	Jacking bolts for foot mounted motors.	-	-	-	-	-	●	●	●	●	●	●	●	○	○	○
209	Non-standard voltage or frequency, (special winding).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
396	Motor designed for minimum ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
399	Motor designed for minimum ambient temperature -40 °C to -55 °C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
425	Corrosion protected stator and rotor core.	●	●	●	●	●	○	○	○	○	○	●	●	●	●	●
524	Special run-out tolerances on flange and shaft for close coupled pump applications.	-	-	-	-	●	●	●	●	●	●	●	●	●	-	-
786	Special design shaft upwards (V3, V35, V6) for outdoor mounting.	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-

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

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Cooling system																
044	Unidirectional fan for reduced noise level. Rotation clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	●	●	●	●	-
045	Unidirectional fan for reduced noise level. Rotation counter clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	●	●	●	●	-
068	Light alloy metal fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
183	Separate motor cooling (fan axial, N-end).	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
206	Steel fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
537	Advanced data sheet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
722	Rotor dimension drawing (incl. torsional stiffness).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
777	Premium documentation package	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Drain holes																
448	Draining holes with metal plugs.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
Earthing Bolt																
525	External earthing bolts on motor feet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hazardous Environments																
334	Ex t, Dust group III B T125C Db, IP6X (non-conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
336	Ex t, Dust group III C T125 Db, IP6X (conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
461	Ex d(e) design, Group II C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
464	Alleinschutz' design. Certification of flame proof motor and protection device together.	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-
516	Temperature detectors approved to be connected to an Ex i circuit	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
813	Thermistor-based surface temperature protection T4 for frequency converter duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
814	Ex t (DIP) motors, temperature class T 150C.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
816	Pt-100-based surface temperature protection T4 for frequency convertor duty. 3-wire system.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	-
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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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).	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
229	Flange FT 130.	●	●	○	○	-	-	-	-	-	-	-	-	-	-	-
235	Flange FF 165.	○	○	●	●	●	-	-	-	-	-	-	-	-	-	-
236	Flange FT 165.	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-
245	Flange FF 215.	-	-	○	○	●	-	-	-	-	-	-	-	-	-	-
246	Flange FT 215.	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-
256	Flange FT 265.	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-
257	Flange FF 100.	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	Flange FF 115.	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-
260	Flange FT 115.	●	○	-	-	-	-	-	-	-	-	-	-	-	-	-
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
Painting																
105	Paint thickness report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
114	Special paint color, standard grade	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
115	Painting system C4,durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
168	Primer paint only.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
303	Painted insulation layer on inside of the terminal boxes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
710	Norsok M-501 rev. 7 Coating system no. 2B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
711	Painting system C5, durability High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
712	Painting system C5-M according to Petrobras specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
713	Painting system according Total Egina specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
717	Painting system C4, durability High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
719	Painting system CX	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
754	Painting system C5, durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
755	Norsok M-501 revision 6, 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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
239	Opendeck saltwater execution	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240	Opendeck fresh water execution	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
249	Open deck execution for counter clockwise application, IP56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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.	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
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).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
095	Restamping output (maintained voltage, frequency), intermittent duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
126	Tag plate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
135	Mounting of additional identification plate, stainless.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
332	Baldor Catalogue #	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
333	Not for use in the USA	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
528	Rating plate sticker	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shaft & rotor																
069	Two shaft extensions according to catalog drawings.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
070	Special shaft extension at D-End, standard shaft material	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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																
331	Motor not for sale for use in EU or UK.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
381	Frame agreement betw. ABB and Shell according to Shell DEP 33.66.05.31-GEN February 2018	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
523	Neste Rotterdam design.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
540	Fulfilling energy efficiency requirements for China	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
541	Inmetro certification	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
544	Australian HE MEPS	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
551	IA certificate of conformity for South Africa	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
558	Saudi Arabian MEPS (SASO)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
586	Fulfilling UK Conformity Assessment (UKCA) requirements.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
599	EQM – Emirates Quality Mark	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
682	CCC Ex certificate for China	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
758	Saudi Aramco design.	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
803	PESO/CCoE certificate for India	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
811	JIP-33 standard design	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
827	Petrobras N-2919 Specification design	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
328	PTC - thermistors (3 in series), 120ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
435	PTC - thermistors (3 in series), 130 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
439	PTC - thermistors (2x3 in series), 150 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
441	PTC - thermistors (3 in series, 130 ºC & 3 in series, 150 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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Terminal box																
019	Larger than standard 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.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
292	Adapter C-C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
293	Adapter D-D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
294	Adapter E-D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	Adapter E-2D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
351	Terminal block turned according to cable entry	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●
380	Separate terminal box for temperature detectors, std. material	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●
413	Extended cable connection, no terminal box.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
418	Separate terminal box for auxiliaries, standard material.	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●
466	Terminal box at N-end.	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●
468	Cable entry from D-end.	●	●	●	●	●	●	●	●	●	●	●	●	-	-	-
469	Cable entry from N-end.	●	●	●	●	●	●	●	●	●	●	●	●	-	-	-
553	Terminal box degree of protection IP66.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●
624	Prepared for inch cable glands according to BSPP standard.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
727	Stainless steel flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
730	Prepared for NPT cable glands.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
731	Two standard metal cable glands.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
734	Standard cable gland, Ex d IIC, armoured cable.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
735	Standard cable gland, Ex d IIC, non-armoured cable.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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																
145	Type test report from a catalogue motor, 400V 50Hz.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
146	Type test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
148	Routine test report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
149	Test according to separate test specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
150	Customer witnessed testing. Specify test procedure with other codes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
222	Torque/speed test, type test and multi-point load test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
560	Shaft voltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
561	Overspeed test,for one motor from specific delivery batch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
562	Overvoltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
479	Mounting of other type of pulse tacho with shaft extension, tacho not included.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
701	Insulated bearing at N-end.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
704	EMC cable entry.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
747	1024 pulse tacho, Ex d, tD, L&L 841910002	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●

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

Mechanical design

Motor frame and drain holes

Motor frame

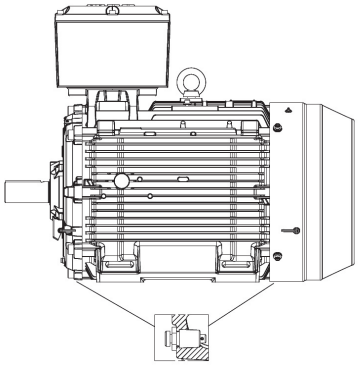
Motors can be supplied for foot mounting, flange mounting, and combinations of these.

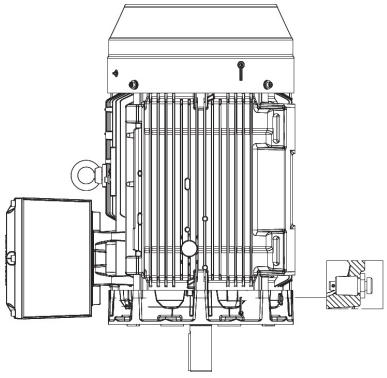
Drain holes

Flameproof Ex db motors are provided without drain holes and plugs as standard.

It's recommended that motors that will be operated in very humid or wet environments, and especially under intermittent duty, should be provided with drain holes with plugs to ensure that water possibly condensed inside the enclosure can easily be drained. Flameproof drain plugs which can be easily opened and closed are available as an option for motors in frame size 160 and larger. Please refer to the variant code section, variant 448 under heading "Drain holes".

When mounting arrangement differs from foot mounted IM B3, mention variant code 066 when ordering to ensure the drain plug is mounted in the lowest position.





Mechanical design
Lifting lugs

All motors are equipped with lifting lugs for safe lifting of the motor. The lugs are designed for lifting the motor only, they may not be used for lifting the motor and the equipment on which it is mounted.

Frame size	Type of lugs	Horisontal mounting B3, B35	Vertical mounting V1, V3
80-112	Integrated in casting	2 pcs close to ter- minal box on top	2 pcs close to terminal box
132	Integrated in casting	1 pcs at D-end, 1 pcs at N-end	1 pcs at D-end, 1 pcs at N-end
160-180	Detachable eye bolt	1 pcs close to terminal box on top	2 pcs, either at N- end or D-end depending on need
200-250	Integrated in casting	1 pcs at D-end, 1 pcs at N-end	2 pcs at N-end, 2 pcs at D-end
280-450	Detachable eye bolt	1 pcs close to terminal box on top	2 pcs, either at N- end or D-end depending on need

Mechanical design

Heating elements

Heating elements are installed on stator winding coil heads to keep the winding dry and free of corrosion in humid conditions. The power of the heating elements is shown in the table. You can order heating elements with variant code 450 or 451.

Motor size	80	90	100	112	132	160	180
Power (W)	25	25	25	25	25	25	25

Motor size	200	225	250	280	315	355	400	450
Power (W)	25	60	60	60	2x60	2x60	2x60	2x100

Motors for marine applications mounted on open deck may have heating element powers differing from the ones shown in this table.

Mechanical design
Bearings

ABB's flameproof motors are normally fitted with single-row deep-groove grease lubricated ball bearings, as shown in the table below.

If the bearing at the D-end is replaced with a roller bearing (NU- or NJ-), higher radial forces can be handled. Roller bearings are suitable for belt-drive applications and can be ordered with variant code 037. Note that the possibility to have roller bearing at D-end is limited on larger flameproof motors due to the higher radial clearance in bearing and possible bending of shaft together with narrow flame path between shaft and inner bearing cover, especially in conjunction with gas group IIC design.

Standard and alternative designs

Motor size	Number of poles	Standard design		Alternative designs		
		Deep groove ball bearings		Roller bearings (037)	Roller bearings (037)	Angular contact ball bearings (058)
		D-end	N-end	D-end, gas group IIB	D-end, gas group IIC	D-end
80	2 - 8	6205-2Z/C3	6204-2Z/C3	NA	NA	NA
90	2 - 8	6205-2Z/C3	6204-2Z/C3	NA	NA	NA
100	2 - 8	6206-2Z/C3	6205-2Z/C3	NA	NA	NA
112	2 - 8	6206-2Z/C3	6206-2Z/C3	NA	NA	NA
132	2 - 8	6208-2Z/C3	6208-2Z/C3	NA	NA	NA
160	2 - 12	6309/C3	6309/C3	NU 309 ECP/C3	NU 309 ECP/C3	NA
180	2 - 12	6310/C3	6310/C3	NU 310 ECP/C3	NU 310 ECP/C3	NA
200	2	6312M/C3	6210M/C3	NU 312 ECP/C3	NU 312 ECP/C3	NA
	4 - 12	6312/C3	6310/C3	NU 312 ECP/C3	NU 312 ECP/C3	NA
225	2	6313M/C3	6312M/C3	NU 313 ECP/C3	NU 313 ECP/C3	NA
	4 - 12	6313/C3	6312/C3	NU 313 ECP/C3	NU 313 ECP/C3	NA
250	2	6315M/C3	6313M/C3	NU 315 ECP/C3	NA	NA
	4 - 12	6315/C3	6313/C3	NU 315 ECP/C3 [1)]	NA	NA
280	2	6316/C3	6316/C3		NA	7316 B
	4 - 12	6316/C3	6316/C3	NU 316 ECP/C3 [1)]	NA	7316 B
315	2	6316/C3	6316/C3		NA	7316 B
	4 - 12	6319/C3	6316/C3	NU 319 ECP/C3	NA	7319 B
355	2	6316M/C3	6316M/C3	NA	NA	7316 B
	4 - 12	6322/C3	6316/C3	NA	NA	7322 B
400	2	6317M/C3	6317M/C3	NA	NA	7317 B
	4 - 12	6324/C3	6319/C3	NA	NA	7324 B
450	4 - 12	6326M/C3	6322/C3	NA	NA	7326 B

[1)] On request

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 label is attached to motors when transport locking is used.

When high axial forces are involved, angular-contact ball bearings should be used. 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 optimal bearing system design is chosen. The variant codes for ordering angular-contact ball bearings are 058 and 059.

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

Bearing seals

Table on next page present the standard and alternative and types of bearing seals per motor size.

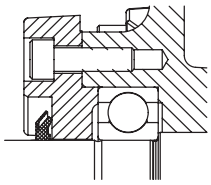
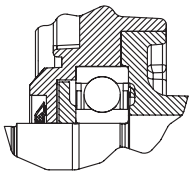
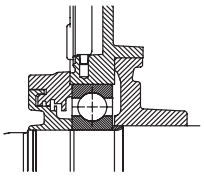
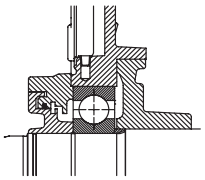
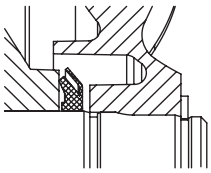
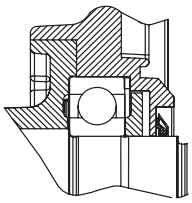
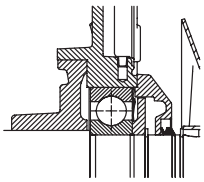
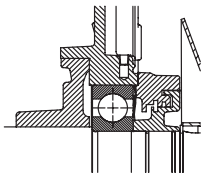
Bearing seals

Motor size	Number of poles	Standard design		Alternative design	
		D-end	N-end	Radial seal at D-end (variant code 072) [1]	Labyrinth seal at D-end (variant code 783) [1]
80	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
90	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
100	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
112	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
132	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
160	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
180	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
200	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
225	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
250	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
280	2 - 12	Labyrinth seal	V-ring [2]	NA	Standard
315	2 - 12	Labyrinth seal	V-ring [2]	NA	Standard
355	2 - 12	Labyrinth seal	V-ring [2]	NA	Standard
400	2	Labyrinth seal	Labyrinth seal	NA	Standard
400	4 - 12	Labyrinth seal	V-ring	NA	Standard
450	4 - 12	Labyrinth seal	Labyrinth seal	NA	Standard

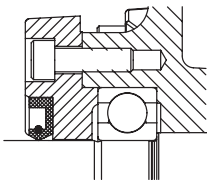
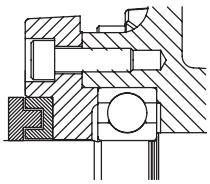
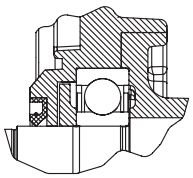
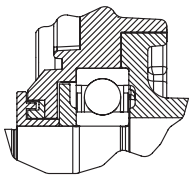
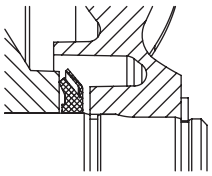
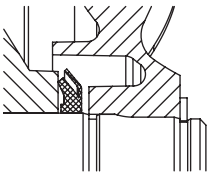
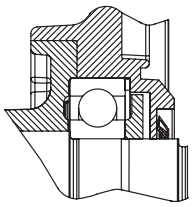
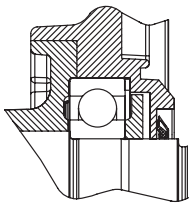
[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request

[2] V-ring on motors with efficiency class IE2, labyrinth seal on IE3 and IE4 motors

Standard design

D-end				
N-end				
Motor size, seal type D-end/N-end	80-132, gamma/gamma seal	160-250, gamma/gamma seal	280-355, 400 4-12 poles, labyrinth/V-ring seal	400 2 poles, 450 4-12 poles, labyrinth/labyrinth seal

Alternative design

D-end				
N-end				
Motor size, seal type D-end/N-end	80-132, VC072 radial/gamma seals	80-132, VC783 labyrinth/gamma seals	160-250, VC072 radial/gamma seals	160-250, VC783 labyrinth/gamma seals

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 up to 315 ≥ 100,000 hours.

Lubrication

On delivery, motors in frame size 160 and above are pre-lubricated with high-quality grease.

Before first start-up, see instructions for re-lubrication and recommended grease in the installation, operation, maintenance and safety manual delivered together with the motor, or see the lubrication plate on the motor.

Motors with bearings greased for life

Motors in frame sizes 80-132 are equipped with bearings greased for life, while this is available as an option for frame sizes 160-250. Bearings are lubricated with high-quality, high-temperature grease. Bearing types are stated on the rating plate. The approximate lifetime of bearings in four-pole motors is about 40 000 duty hours. Lifetime is subject to the load conditions of the application run by the motor.

Motors with relubrication nipples

In frame sizes 160-450, the bearing system is provided with valve discs 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 3600 r/min	Speed 3000 r/min	Speed 1800 r/min	Speed 1500 r/min	Speed 1000 r/min	Speed 500-900 r/min
Ball bearings								
Lubrication intervals in duty hours								
160	13	13	7100	8900	14300	16300	20500	21600
180	15	15	6100	7800	13100	15100	19400	20500
200	20	15	4300	5900	11000	13000	17300	18400
225	23	20	3600	5100	10100	12000	16400	17500
250	30	23	2400	3700	85000	10400	14700	15800
280	35	35	1900	3200	-	-	-	-
280	40	40	-	-	7800	9600	13900	15000
315	35	35	1900	3200	-	-	-	-
315	55	40	-	-	5900	7600	11800	12900
355	35	35	1900	3200	-	-	-	-
355	70	40	-	-	4000	5600	9600	10 700
400	40	40	1500	2700	-	-	-	-
400	85	55	-	-	3200	4700	8600	9700
450	95	70	-	-	2500	3900	7700	8700

Lubrication intervals in duty hours for roller bearings

Frame size	Amount of grease g/ bearing	Amount of grease g/N-end	Output kW	Speed 3600 r/min	Speed 3000 r/min	Output kW	Speed 1800 r/min	Speed 1500 r/ min	Output kW	Speed 1000 r/min	Output kW	Speed 500-900 r/ min
Roller bearings												
Lubrication intervals in duty hours												
160	13	13	all	3600	4500	all	7200	8100	all	10 300	all	10 800
180	15	15		3000	3900	all	6600	7500	all	9700	all	10 200
200	20	15		2100	3000	all	5500	6500	all	8600	all	9200
225	23	20		1800	1600	all	5100	6000	all	8200	all	8700
250	30	23		1200	1900	all	4200	5200	all	7300	all	7900
280	40	40		-	-	all	4000	5300	all	7000	all	8500
315	55	40		-	-	all	2900	3800	all	5900	all	6500

Mechanical design
Radial forces

Pulley diameter

When the desired bearing life has been determined, the minimum permissible pulley diameter can be calculated with FR as follows:

$$D = \frac{1.9 \cdot 10^7 \cdot K \cdot P}{n \cdot F_R}$$

Where:	
D:	pulley diameter, mm
P:	power requirement, kW
n:	motor speed, r/min.
K:	belt tension factor, dependent on belt type and type of duty. A common value for V-belts is 2.5
F_R:	permissible radial force, refer to tables below.

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 L_{10h} of 40 000 hours per motor size.

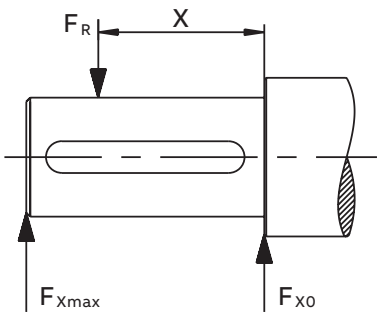
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft affects permissible forces.

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 radial forces

Motor size	No. of poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings L10h = 40,000h				Roller bearing L10h = 40,000h			
			Mounting arrangement IM B3				Mounting arrangement IM B3			
			Gas group IIB		Gas group IIC		Gas group IIB		Gas group IIC	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
80	2	40	638	557	638	557	NA		NA	
	4	40	804	702	804	702	NA		NA	
	6	40	920	804	920	804	NA		NA	
	8	40	1013	884	1013	884	NA		NA	
90	2	50	642	546	642	546	NA		NA	
	4	50	809	690	809	690	NA		NA	
	6	50	926	790	926	690	NA		NA	
	8	50	1019	870	1019	870	NA		NA	
100	2	60	886	751	886	751	NA		NA	
	4	60	1117	946	1117	751	NA		NA	
	6	60	1279	1083	1279	1083	NA		NA	
	8	60	1325	1122	1325	1122	NA		NA	
112	2	60	884	747	884	747	NA		NA	
	4	60	1114	941	1114	941	NA		NA	
	6	60	1276	1078	1276	1078	NA		NA	
	8	60	1321	1116	1321	1116	NA		NA	
132	2	80	1337	680	1337	680	NA		NA	
	4	80	1685	740	1685	740	NA		NA	
	6	80	1930	750	1930	750	NA		NA	
	8	80	1999	750	1999	750	NA		NA	
160 ML_	2	110	2530	2120	2530	2120	6400	1800	6400	1800
	4	110	3180	2670	3180	2670	7600	1800	7600	1800
	6	110	3650	3040	3650	3040	7600	1800	7600	1800
	8	110	4020	3040	4020	3040	7600	1800	7600	1800
180 ML_	2	110	2900	2440	2900	2440	6970	2700	6970	2700
	4	110	3660	3080	3660	3080	8500	2700	8500	2700
	6	110	4190	3520	4190	3520	8500	2700	8500	2700
	8	110	4620	3880	4620	3880	8500	2700	8500	2700
200 ML_	2	110	3830	3150	3830	3150	9510	7000	9510	4200
	4	110	4820	3980	4820	3980	11710	7000	11710	4200
	6	110	5520	4550	5520	4550	13230	7000	13230	4200
	8	110	6080	5000	6080	5000	14420	7000	14420	4200
225 SM_	2	110	4350	3660	4350	3660	11650	7000	9300	3000
	4	140	5490	2800	5490	2800	14340	7200	9300	2200
	6	140	6280	2800	6280	2800	16190	7200	9300	2200
	8	140	6920	2800	6920	2800	17300	7200	9300	2200
250 SM_	2	140	5390	4350	5390	4350	15420	6700	NA	
	4	140	6790	5480	6790	5480	18980	9200	NA	
	6	140	7760	6270	3000	2800	21000	9200	NA	
	8	140	8550	6900	3000	2800	21000	9200	NA	
280 SM_	2	140	5835	4900	[1]		16500	6000	NA	
	4	140	7360	6110	[1]		20100	9200	NA	
	6	140	8425	6980	[1]		22690	9200	NA	
	8	140	9165	7700	[1]		24740	9200	NA	
315 SM_	2	140	5815	4960	[1]		16540	6000	NA	
	4	170	9025	7470	[1]		26590	9600	NA	
	6	170	10310	8530	[1]		30030	10160	NA	
	8	170	11370	9410	[1]		32740	10105	NA	
315 ML_	2	140	5855	5080	[1]		16705	6205	NA	
	4	170	8980	7590	[1]		26550	13705	NA	
	6	170	10255	8665	[1]		29970	13710	NA	
	8	170	11335	9385	[1]		32730	9945	NA	
315 LK_	2	140	5860	5195	[1]		16885	6080	NA	
	4	170	9185	7945	[1]		27225	13475	NA	
	6	170	10475	9060	[1]		30735	13500	NA	
355 SM_	2	140	5790	5085	[1]		NA		NA	
	4	210	11930	9890	[1]		NA		NA	
	6	210	11930	9890	[1]		NA		NA	
	8	210	11930	9890	[1]		NA		NA	
355 ML_	2	140	5770	5120	[1]		NA		NA	
	4	210	11980	10090	[1]		NA		NA	
	6	210	11980	10090	[1]		NA		NA	
	8	210	11980	10090	[1]		NA		NA	

Motor size	No. of poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings L10h = 40,000h				Roller bearing L10h = 40,000h			
			Mounting arrangement IM B3				Mounting arrangement IM B3			
			Gas group IIB		Gas group IIC		Gas group IIB		Gas group IIC	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
355 LK_	2	140	5500	5000	[1]		NA		NA	
	4	210	12050	10450	[1]		NA		NA	
	6	210	12050	10450	[1]		NA		NA	
	8	210	12050	10450	[1]		NA		NA	
400 L_	2	170	[1]		[1]		NA		NA	
	4	210	[1]		[1]		NA		NA	
	6	210	[1]		[1]		NA		NA	
	8	210	[1]		[1]		NA		NA	
400 LK_	2	170	[1]		[1]		NA		NA	
	4	210	[1]		[1]		NA		NA	
	6	210	[1]		[1]		NA		NA	
	8	210	[1]		[1]		NA		NA	
450 L_	4	210	[1]		[1]		NA		NA	
	6	210	[1]		[1]		NA		NA	
	8	210	[1]		[1]		NA		NA	

[1] Only allowed for direct coupling duty

Mechanical design
Axial forces

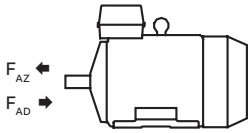
— 01 Mounting arrangement IM B3

02 Mounting arrangement IM V1

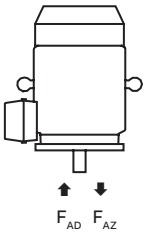
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



01



02

Permissible axial forces

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3		Mounting arrangement IM V1	
			Deep groove ball bearings		Deep groove ball bearings	
			L_{10} = 40,000 h		L_{10} = 40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
80	2	40	678	290	711	269
	4	40	835	447	888	411
	6	40	954	566	998	541
	8	40	1049	661	1093	636
90	2	50	676	286	727	252
	4	50	834	443	907	402
	6	50	950	559	1028	515
	8	50	1046	656	1114	614
100	2	60	969	339	1053	283
	4	60	1186	556	1301	489
	6	60	1346	716	1447	649
	8	60	1477	847	1576	788
112	2	60	962	330	1099	236
	4	60	1179	547	1331	445
	6	60	1337	705	1493	602
	8		1467	835	1624	731
132	2	80	1447	491	1577	405
	4	80	1763	807	1963	680
	6	80	1999	1043	2190	917
	8	80	2192	1236	2412	1110
160 ML_	2	110	2050	1435	2440	1155
	4	110	2620	2005	3160	1635
	6	110	3055	2440	3590	2060
	8	110	3410	2790	3950	2430
180 ML_	2	110	2570	1470	3075	1100
	4	110	3230	2130	3975	1630
	6	110	3730	2630	4420	2130
	8	110	4140	3040	4890	2550
200 ML_	2	110	3295	2030	3960	1545
	4	110	4170	2910	5030	2290
	6	110	4800	3535	5820	2780
	8	110	5360	4100	6370	3430
225 SM_	2	110	3710	2240	4515	1650
	4	140	4690	3225	5770	2495
	6	140	5405	3935	6660	3080
	8	140	6010	4540	7280	3700
250 SM_	2	140	5200	2100	6175	1380
	4	140	6400	3310	7645	2410
	6	140	7260	4160	8930	3035
	8	140	8000	4900	9690	3780
280 SM_	2	140	4870	2870	6330	1650
	4	140	6140	4140	7870	2760
	6	140	7040	5040	9150	3515
	8	140	7840	5840	10040	4150
315 SM_	2	140	4780	2780	6620	1270
	4	170	7155	5155	9565	3240
	6	170	8205	6205	11230	3750
	8	170	9180	7180	11935	4780
315 ML_	2	140	4730	2730	7210	940
	4	170	7055	5055	10300	2700
	6	170	8075	6075	12330	3070
	8	170	9060	7070	13310	4210
315 LK_	2	140	4620	2620	7910	320
	4	170	6980	4980	10875	2300
	6	170	7980	5980	13005	2565
	8	170	8900	6900	14100	3450
355 SM_	2	140	1660	5460	4970	2885
	4	210	5760	9390	10890	4840
	6	210	7055	10855	12370	6235
	8	210	8290	12090	14980	7530
355 ML_	2	140	1570	5370	5860	2360
	4	210	5640	9440	11810	5130
	6	210	6870	10670	14718	5215
	8	210	8100	11900	15970	6540

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3		Mounting arrangement IM V1	
			Deep groove ball bearings		Deep groove ball bearings	
			L_{10} = 40,000 h		L_{10} = 40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
355 LK_	2	140	1440	5240	6600	1630
	4	210	5460	9260	12850	4080
	6	210	6680	10480	15450	4550
	8	210	[1]	[1]	[1]	[1]
400 L,	2	170	810	5810	8010	730
LK_	4	210	4250	10250	13680	3650
	6	210	5410	11410	16610	3840
	8	210	[1]	[1]	18480	4530
450 L_	2	170	-	-	-	-
	4	210	-	-	-	-
	6	210	5630	11630	22090	150
	8	210	6920	12920	23600	1430

[1] On request

Terminal box

Standard terminal box

Degree of protection and mounting options

The degree of protection for the standard terminal box is IP 55. It complies with the requirements of the type of protection ‘d’ flame proof and prevents the transmission of an internal explosion to the surrounding, potentially explosive atmosphere.

By default, terminal boxes are mounted on top of the motor at D-end. Side mounted terminal box is possible in frame sizes 160 and 180. Mounting at N-end is also possible for the larger frame sizes. Please refer to the variant code section for more details.

Turnability

The standard terminal boxes for motor sizes 80-250 can be turned 4*90° and in sizes 280-450 2*180° after delivery. For sizes 280-450 is also mounting of terminal box with opening towards D or N-end possible using the relevant variant codes when ordering.

Cable entries

Terminal box is provided as standard with tapped holes for cable glands as specified in the table on next page. No cable glands are included as standard, the entry holes are closed with Ex d approved blanking plugs made of brass according to the table on the next page. One tapped hole for main cables is closed with a plastic plug which is to be used for transport protection only. Different types of cable glands are available as option, suitable for either armoured and non-armoured cables, please refer to the Terminal box alternatives section for more details.

Cable type and terminations

Terminations are suitable for copper and aluminum cables(Al- cables on request for motor sizes 80 to 250). Cables are connected to terminals by cable lugs, which are not included in the delivery.

Earthing bolts

The motors are as standard provided with at least one earthing bolt inside the terminal box and another on the frame. The earthing bolt on the frame is located on top close to the terminal box for easy access from either side of the motor. As an option can also earting bolts on the feet be provided, please refer to variant code section.

Ordering

To ensure the delivery of desired terminations and cable entries for the motor, state the cable type, quantity, size, outer diameter and possibly type of cable glands needed when ordering. Modifying the cable entries on a flame proof terminal box is very difficult afterwards.

See section Variant codes for all options available.

Standard delivery

Standard delivery if no other information is provided. For other network voltages than voltage code D (see Ordering information section).

Cable entries for supply cables Motor size	Pole number	Terminal box type	Amount and size of threaded holes	Cable gland	Ex d plug	Max. connectable core cross-section mm² / phase	Number and size of terminal bolts, 6 x
IE2 motors							
80 - 90	2-8	25	1 x M25x1.5	-	-	10	M5
100 - 132	2-8	25	2 x M32x1.5	-	1 x M32	10	M5
160 - 180	2-8	63	2 x M40x1.5	-	1 x M40	1x35	M6
200 - 250	2-8	160	2 x M50x1.5	-	1 x M50	1x70	M10
280 SM_	2-8	210	2 x M63x1.5	-	1 x M63	2x150	M12
315 SM_, ML_	2-8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SMA - SMC	2-4	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 SMA, SMB	6-8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SMC	6	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 SMC	8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 ML_, LK_	2-8	750	2 x M75x1.5	-	1 x M75	4x240	M12
400	2-8	750	2 x M75x1.5	-	1 x M75	4x240	M12
450	6-8	750	2 x M75x1.5	-	1 x M75	4x240	M12

IE3 motors							
80-90	2-8	25	1 x M25x1.5	-	-	10	M5
100-132	2-8	25	2 x M32x1.5	-	1 x M32	10	M5
160 - 180	2-8	63	2 x M40x1.5	-	1 x M40	1x35	M6
200 - 250	2-8	160	2 x M50x1.5	-	1 x M50	1x70	M10
280	2-8	210	2 x M63x1.5	-	1 x M63	2x150	M12
315	2-8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SM_	2-4	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 SMA, SMB	6	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SMC	6	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 ML_, LK_	2-6	750	2 x M75x1.5	-	1 x M75	4x240	M12

Auxiliary cable entries				
80 - 132	2-8	1 x M20x1.5	- 1xM20	1 x 2,5 mm² per terminal
160-450	2-8	2 x M20x1.5	- 1xM20	1 x 2,5 mm² per terminal

Motor size	Earthing on frame	Earthing in main terminal box
80 - 132	M6	M6
160 - 180	M6	M6
200 - 250	M8	M8
280 - 450	M10	2xM10

Terminal box

Terminal box dimensions

01 Motor sizes 80 to 132

02 Motor sizes 160 to 180

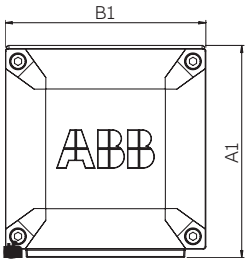
03 Motor sizes 200 to 250

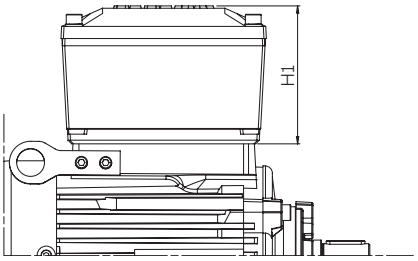
04 Motor sizes 280 to 355

05 Motor sizes 355 to 450

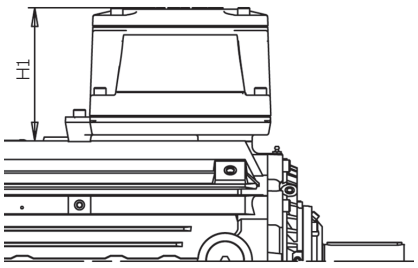
To match the correct terminal box with motor size, find the motor type and correspondent terminal box type on the previous page. The box types and their dimensions are presented on this page.

Terminal boxes, standard with 6

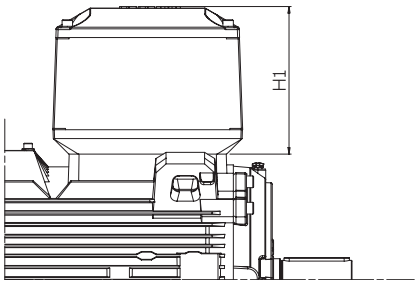




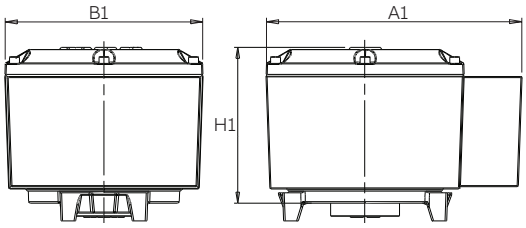
01



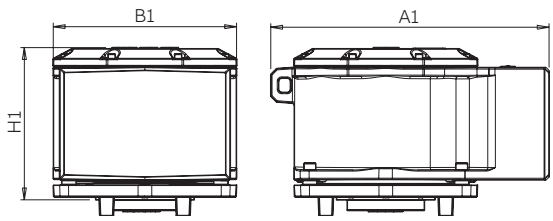
02



03



04



05

Terminal box types acc. to current capacity	A1	B1	H1
25	192	170	124
63	256	243	174
160	339	290	226
210	465	360	283
370	465	360	283
750	707	467	387

Terminal box

Terminal boxes and boards

—
01 Terminal box for motor sizes 80-132, type 25

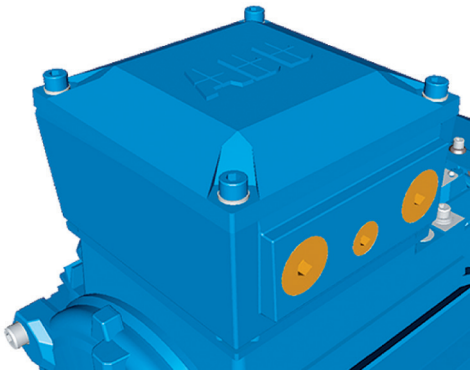
02 Terminal board for motor sizes 80-132, box type 25

03 Terminal board for motor sizes 160-180, type 63. Entries for auxiliaries are located on opposite side of terminal box

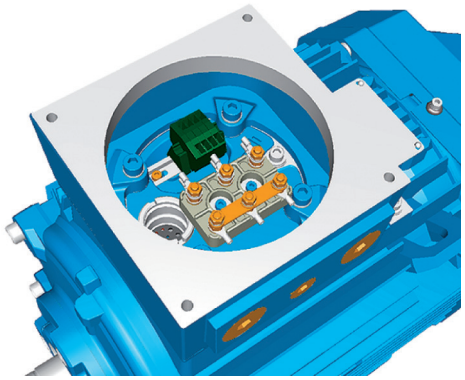
04 Terminal board for motor sizes 160-180, box type 63

The pictures below show standard terminal boxes and the corresponding terminal boards for various motor sizes and terminal box types. To match the correct terminal box with motor size, find the motor type and correspondent terminal box type in table found in section Terminal box – Standard terminal box.

Motor sizes 80-132

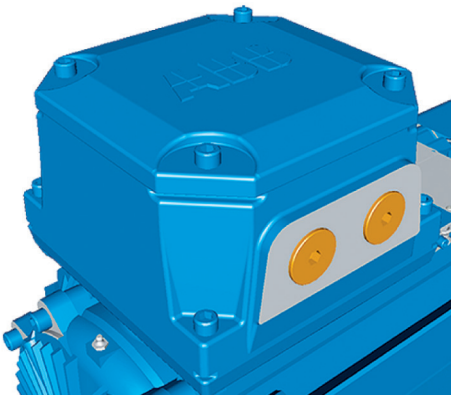


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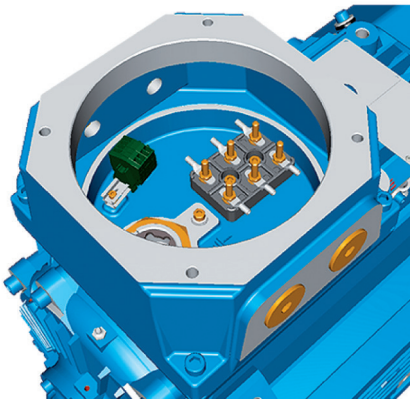


02

Motor sizes 160-180



03



04

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05 Terminal box for motor sizes 200-250, type 160

06 Terminal box for motor sizes 200-250, type 160

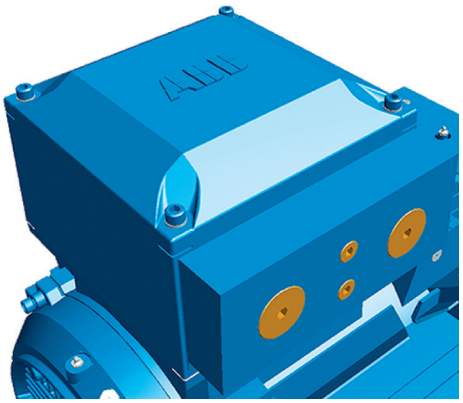
07 Terminal box for motor sizes 280-355, type 210 and 370

08 Terminal board 280-355, box type 210 and 370

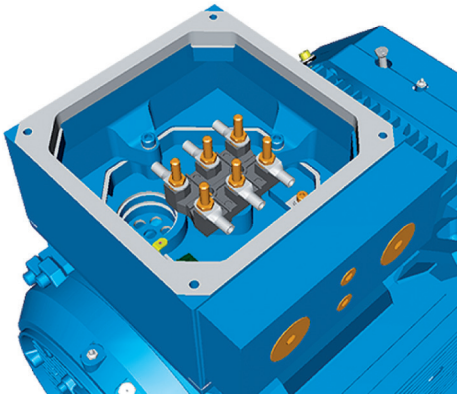
09 Terminal box for motor sizes 355-450, type 750

10 Terminal board for motor sizes 355-450, box type 750

Motor sizes 200-250

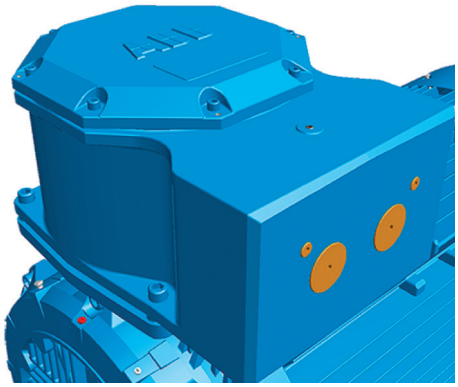


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05

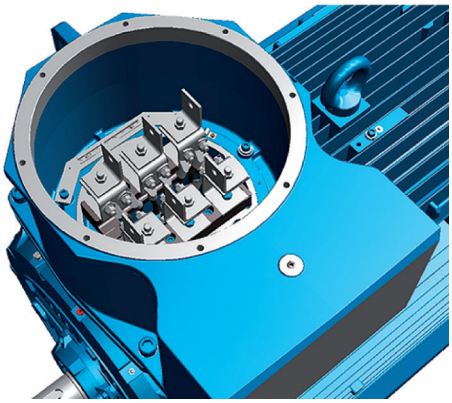


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06

Motor sizes 355-450

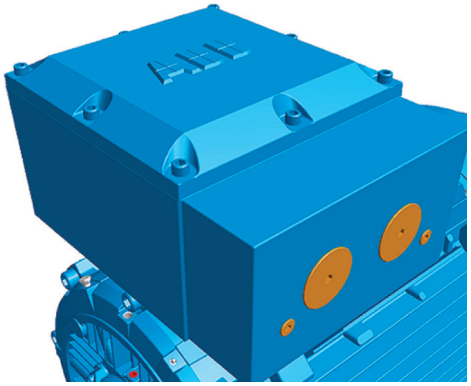


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09

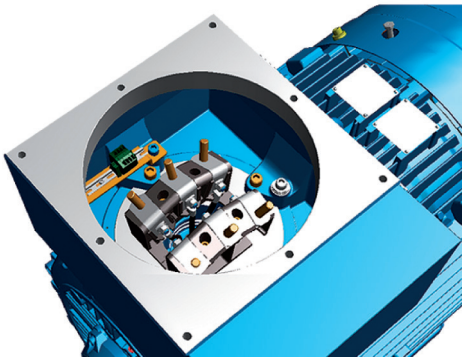


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10

Motor sizes 280-355



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07



—
08

Terminal box

Terminal box alternatives

Due to the construction of the Ex d terminal box is it not possible to mount any connection flanges, angle adapters nor cable sealing units like on motors having increased safety Ex e terminal box.

Cable glands

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

Size of threaded opening for cable gland		Cable gland Ex d IIC for armoured cable with double sealing, variant code 734		Cable gland Ex d IIC for non-armoured cable, variant code 735
Metric (std)	**NPT (Variant code 730 added)**	**Cable outer diameter, mm**	**Inner sheath diameter, mm**	**Cable outer diameter, mm**
M16 x 1.5	-	7-12	4.5-8	-
M20 x 1.5	NPT 1/2”	10-16	6-10	4-8.5
M20 x 1.5 *)	NPT 1/2” *)	-	-	5-12
M25 x 1.5	NPT 3/4”	13.5-19	10-14	9-18
M25 x 1.5 *)	NPT 3/4” *)	19-25	14-18	-
M32 x 1.5	NPT 1”	25-30	18-23	17-26
M40 x 1.5	NPT 1 1/4”	30-36	23-28	22-30
M50 x 1.5	NPT 1 1/2”	36-40	28-32	31-40
M50 x 1.5 *)	NPT 1 1/2” *)	40-46	32-37	-
M63 x 1.5	NPT 2”	46-53	37-43	39-50
M63 x 1.5 *)	NPT 2” *)	53-60	43-50	-
M75 x 1.5	NPT 2 1/2”	58-70	48-60	46-60

*) = High capacity version, delivered as standard with the variant code.

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

The motors are delivered as standard with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If glands with NPT threads will be used must variant code 730 be ordered. If nothing else is stated on the ordered will the sizes in tables below be delivered. If cable glands are also needed must either variant 734 or 735 be added.

Motor frame size	Main cable entries	NPT plug
80-112	1 x ¾”	-
132	2 x ¾”	1 x ¾”
160-180	2 x 1 ¼”	1 x 1 ¼”
200-250	2 x 1 ½”	1 x 1 ½”
280	2 x 2”	1 x 2”
315	2 x 21/2”	1 x 21/2”
355-450	2 x 3”	1 x 3”

Motor frame size	Cable entries for auxiliaries	NPT plug
80-112	1 x ¾”	-
132	1 x ¾”	1 x ¾”
160-450	2 x ¾”	2 x ¾”

Threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands does not suit the gland size and cable that will be used can openings of nonstandard size also be delivered, either by fitting a reducers to make the openings smaller or by increasing the amount or size of holes. The maximum possible size and amount for each motor frame size is listed below.

Motor frame size	Main cable entries, metric	Main cable entries, NPT
80-132	1 x M32	1 x 1”
160-180	1 or 2 x M50	1 or 2 x 1 ½”
200-250	1 or 2 x M63	1 or 2 x 2”
280-450	1 or 2 x M75	1 or 2 x 3”

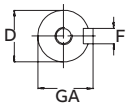
Auxiliary terminal box

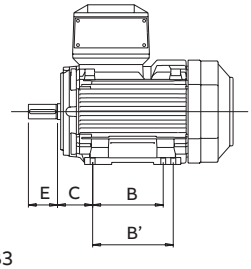
It is possible to equip motors from frame size 132 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of cast iron with Ex d type of protection. Connection terminals are of spring-loaded type for quick and easy connection. These are suitable for up to 2.5 mm^2 wires. The auxiliary terminal boxes are equipped with an earthing terminal. The first auxiliary terminal box is located on the right-hand side at D-end as standard. The standard cable entry is 2 x M20 with plugged entries. If cable glands are needed must these be ordered using the variant codes described earlier in this section.

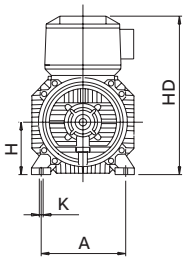
Related variant codes	
380	Separate terminal box for temperature detectors
418	Separate terminal box for auxiliaries
568	Separate terminal box for heating elements

Dimension drawings

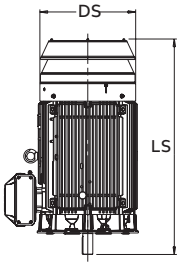
Flameproof motors, Ex db



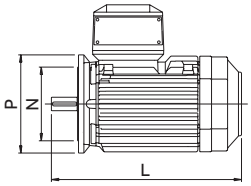




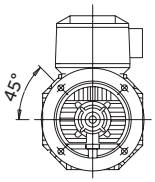
Foot-mounted motor IM 1001, IM B3



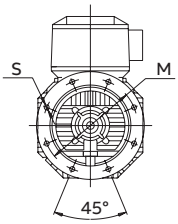
Motor with protection cover



Flange-mounted motor IM 3001, IM B5



Sizes 80 to 200



Sizes 225 to 450

Flameproof motors Ex db, foot-mounted IM 1001/ IM B3, flange-mounted IM 3001/ IM B5.

Motor size	IM 1001, IM B3 AND IM 3001, IM B5											IM 1001, IM B3							IM 3001, IM B5				Protective roof	
	D		GA		F		E		L max		O [2]	A	B	B'	C	HD	K	H	M	N	P	S	DS	LS
	poles		poles		poles		poles		poles															poles
	2	4-8	2	4-8	2	4-8	2	4-8	2	4-8														2	4-8
80	19	19	21.5	21.5	6	6	40	40	409	409	20	125	100	112	50	296	10	80	165	130	200	12	157	444	444
90	24	24	27	27	8	8	50	50	440	440	20	140	100	125	56	315	10	90	165	130	200	12	185	475	475
100	28	28	31	31	8	8	60	60	501	501	25	160	140	160	63	343	12	100	215	180	250	14.5	200	536	536
112	28	28	31	31	8	8	60	60	485	485	25	190	140	–	70	355	12	112	215	180	250	14.5	213	526	526
132 IE2	38	38	41	41	10	10	80	80	531	531	30	216	140	178	89	392	12	132	265	230	300	14.5	274	582	582
132 IE3	38	38	41	41	10	10	80	80	576	576	30	216	140	178	89	392	12	132	265	230	300	14.5	274	627	627
160	42	42	45	45	12	12	110	110	808	808	45	254	210	254	108	495	14.5	160	300	250	350	18.5	328	852	852
180	48	48	51.5	51.5	14	14	110	110	826	826	50	279	241	279	121	535	14.5	180	300	250	350	18.5	359	876	876
200	55	55	59	59	16	16	110	110	774	774	70	318	267	305	133	616	18.5	200	350	300	400	18.5	414	844	844
200 [3]	55	55	59	59	16	16	110	110	824	824	70	318	267	305	133	616	18.5	200	350	300	400	18.5	414	844	844
225	55	60	59	64	16	18	110	140	841	871	80	356	286	311	149	663	18.5	225	400	350	450	18.5	462	921	951
225 [3]	55	60	59	64	16	18	110	140	871	901	80	356	286	311	149	663	18.5	225	400	350	450	18.5	462	921	951
250	60	65	64	69	18	18	140	140	875	875	90	406	311	349	168	726	24	250	500	450	550	18.5	506	965	965
250 [3]	60	65	64	69	18	18	140	140	895	895	90	406	311	349	168	726	24	250	500	450	550	18.5	506	965	965
280	65	75	69	79.5	18	20	140	140	1090	1090	100	457	368	419	190	862	24	280	500	450	550	18	555	1190	1190
315 SM_	65	80	69	85	18	22	140	170	1176	1206	115	508	406	457	216	929	28	315	600	550	660	23	624	1290	1320
315 ML_	65	90	69	95	18	25	140	170	1287	1317	115	508	457	508	216	929	28	315	600	550	660	23	624	1401	1431
315 LK	65	90	69	95	18	25	140	170	1446	1475	115	590	508	560/ 710	216	929	28	315	600	550	660	23	624	1552	1589
355 SM_	70	100	74.5	106	20	28	140	210	1409	1479	130	610	500	560	254	1124	35	355	740	680	800	23	590	1480	1550
355 ML_	70	100	74.5	106	20	28	140	210	1514	1584	130	610	560	630	254	1124	35	355	740	680	800	23	590	1530	1600
355 LK_	70	100	74.5	106	20	28	140	210	1764	1834	130	610	630	710	254	1124	35	355	740	680	800	23	590	1635	1705
400 L_	80	110	85	126	22	28	170	210	1851	1891	150	710	900	1000	224	1211	35	400	940	880	1000	28	590	1635	1705
400 LK_	80	100	85	106	22	28	170	210	1851	1891	150	686	710	800	280	1211	35	400	740	680	800	23	700	1860	1900
450	-	120 [1]	127 [1]		-	32 [1]	-	210 [1]	2071 [1]		180	800	1000	1120	250	1328	42	450	1080	1000	1150	28	On request		

[1] Size 450 pole numbers 6-8

[2] Required distance from fan cover air inlet to obstacle behind motor 3) For IE3 version

[3] For IE3 version

Tolerances:	
A, B	± 0,8
D, DA	ISO k6 < Ø 48mm
	ISO m6 > Ø 48mm
F, FA	ISO h9
H	-0.5
N	ISO j6
C, CA	± 0.8

Available B14 and B5 flange alternatives										
Flange size	**Variant code**	**Flange dimension**				**Motor size 80-132**				
		P	**M**	**N**	**S**	**80**	**90**	**100**	**112**	**132**
FT100	258	120	100	80	M6	Std B14	NA	NA	NA	NA
FT115	260	140	115	95	M8	Opt.	Std B14	NA	NA	NA
FT130	229	160	130	110	M8	Opt.	NA	Std B14	Std B14	NA
FT165	236	200	165	130	M10	NA	NA	Opt.	Opt.	Std B14
FT215	246	250	215	180	M12	NA	NA	Opt.	Opt.	Opt.
FT265	256	300	265	230	M12	NA	NA	NA	NA	Opt.
FF100	257	120	100	80	Ø7	Opt.	NA	NA	NA	NA
FF115	259	140	115	95	Ø10	Opt.	Opt.	NA	NA	NA
FF130	228	160	130	110	Ø10	Opt.	Opt.	Opt.	Opt.	NA
FF165	235	200	165	130	Ø12	Std B5	Std B5	Opt.	Opt.	Opt.
FF215	245	250	215	180	Ø14.5	NA	NA	Std B5	Std B5	Opt.
FF265	255	300	265	230	Ø14.5	NA	NA	NA	NA	Std B5

Std. B14 = Standard small flange for given frame size

Std. B5 = Standard large flange for given frame size

Opt. = Optional flange for given frame size

NA = Not applicable

In all dimension drawings: The tables give the main dimensions in mm.

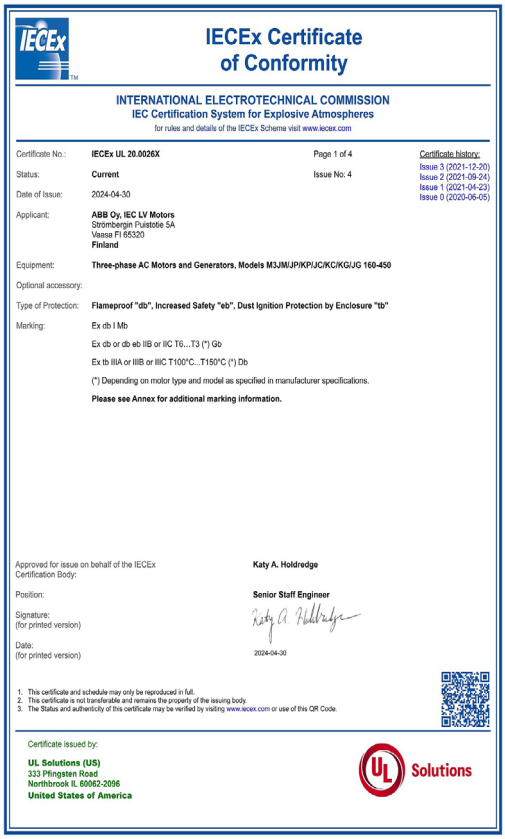
For detailed drawings please see our web-pages or contact ABB.

Certificate examples

01 IECEx Certificate of Conformity

02 EU Declaration of Conformity

03 EU Type Examination Certificate



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx UL 20.0026X** Page 1 of 4

Certificate history:
Issue 3 (2021-12-20)
Issue 2 (2021-08-24)
Issue 1 (2021-04-23)
Issue 0 (2020-06-05)

Status: **Current** Issue No: 4

Date of Issue: 2024-04-30

Applicant: **ABB Oy, IEC LV Motors**
Strömbergin Puistotie 5A
Vaasa FI 65320
Finland

Equipment: **Three-phase AC Motors and Generators, Models M3JM/JP/KP/JC/KC/KG/JG 160-450**

Optional accessory:

Type of Protection: **Flameproof "db", Increased Safety "eb", Dust Ignition Protection by Enclosure "tb"**

Marking: Ex db I Mb

Ex db or db eb IIB or IIC T6...T3 (*) Gb

Ex tb IIIA or IIIB or IIIC T100°C...T150°C (*) Db

(*) Depending on motor type and model as specified in manufacturer specifications.

Please see Annex for additional marking information.

Approved for issue on behalf of the IECEx Certification Body: **Katy A. Holdredge**

Position: **Senior Staff Engineer**

Signature: (for printed version)

Date: (for printed version) 2024-04-30

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:
UL Solutions (US)
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America

01



ABB

EU Declaration of Conformity

The products: 3-phase induction motors for potentially explosive atmospheres as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The Manufacturer:

ABB Oy
Motors and Generators
P.O. Box 633
Strömbergin Puistotie 5A
FIN - 65101 Vaasa, Finland

ABB Sp.z.o.o
27 Placydowska Str.
PL-95-070 Aleksandrow Lodzki
Poland

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The products of the declaration described above are in conformity with the relevant Union harmonization legislation:

Directive 2014/34/EU
The following harmonized standards are applied in relation to which conformity is declared: EN 60079-0/A11:2013[1], EN 60079-1:2014[2], EN 60079-7:2015, EN 60079-31:2014[3] and relevant parts of the EN 60034 -series of standards.

Directive 2009/125/EC
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EC) No. 640/2009 and the amending Regulation (EU) No. 4/2014.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU and the amending Annex II to this Directive of the Delegated Directive (EU) 2015/863 of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Notes:

Motors shall be installed and maintained according to the relevant standards and instructions of ABB Oy, Motors and Generators. When installed in converter supplied applications, additional requirements must be respected regarding the motor as well as the installation as described in the appropriate dedicated addendum

The conformity of the incorporation into a finished product according to the Directive 2006/42/EC shall be established by the commissioning party when a motor is fitted to the machinery.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc. 33, 92266 Fontenay-aux-Roses, France,
VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland
UL International Demko A/S (0539), Borupvang 5A, 2750 Ballerup, Denmark

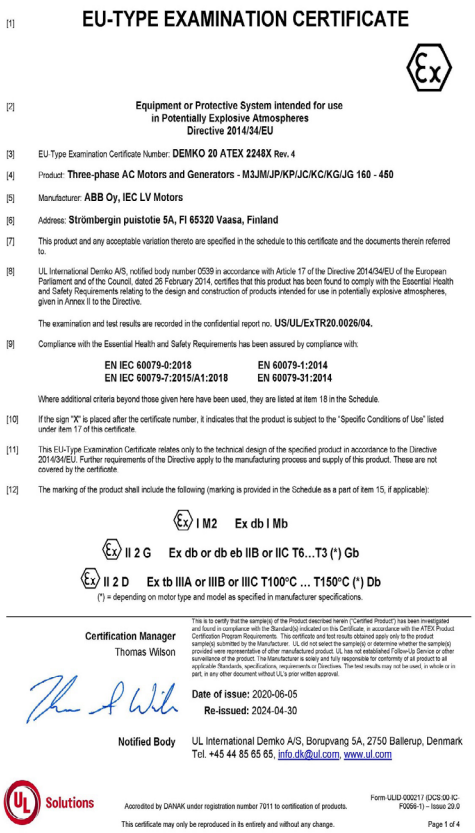
Signed for and on behalf of: ABB Oy, Motors and Generators

Place and dateof Issue: Vaasa, Finland, 2019-09-04

Harri Mykkänen
Vice President

3GZF500930-309L

02



[1] EU-TYPE EXAMINATION CERTIFICATE

[2] **Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU**

[3] EU-Type Examination Certificate Number: **DEMKO 20 ATEX 2248X Rev. 4**

[4] Product: **Three-phase AC Motors and Generators - M3JM/JP/KP/JC/KC/KG/JG 160 - 450**

[5] Manufacturer: **ABB Oy, IEC LV Motors**

[6] Address: **Strömbergin puistotie 5A, FI 65320 Vaasa, Finland**

[7] This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report no. **US/UL/ExTR20.0026/04.**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 **EN 60079-1:2014**
EN IEC 60079-7:2015/A1:2018 **EN 60079-31:2014**

Where additional criteria beyond those given here have been used, they are listed at item 18 in the Schedule.

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the "Specific Conditions of Use" listed under item 17 of this certificate.

[11] This EU-Type Examination Certificate relates only to the technical design of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by the certificate.

[12] The marking of the product shall include the following (marking is provided in the Schedule as a part of item 15, if applicable):

Ex I M2 Ex db I Mb

Ex II 2 G Ex db or db eb IIB or IIC T6...T3 (*) Gb

Ex II 2 D Ex tb IIIA or IIIB or IIIC T100°C ... T150°C (*) Db

(*) = depending on motor type and model as specified in manufacturer specifications.

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Certification Manager
Thomas Wilson

Date of issue: 2020-06-05
Re-issued: 2024-04-30

Notified Body UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark
Tel. +45 44 85 65 65, info.dk@ul.com, www.ul.com

UL Solutions

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Form ULID 000217 (IDCS 00 IC-F0098-1) – Issue 20.0

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Page 1 of 4

03

Motors in brief

Flameproof motors Ex db, sizes 80 to 180

Motor size			80	90	100	112	132	160	180
Stator	Material		Cast iron, EN-GJL-200 or better						
	Paint color shade		Blue, Munsell 8B 4.5/3.25						
	Corrosion class		C3						
Feet			Cast iron, EN-GJL-200 or better, integrated with stator						
Bearing end shields	Material		Cast iron, EN-GJL-200 or better						
	Paint colour shade		Blue, Munsell 8B 4.5/3.25						
	Corrosion class		C3						
Bearings	D-end	2-12 poles	6205-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C	6208-2Z/C3	6309/C3	6310/C3
	N-end	2-12 poles	6204-2Z/C3	6204-2Z/C3	6205-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3
Axially locked bearings	Inner bearing cover		As standard, locked at D-end						
Bearing seals			Gamma ring						
Lubrication			Permanent grease lubrication					Regreasable bearings	
SPM nipples			-					As standard	
Rating plate	Material		Stainless steel						
Terminal box	Frame material		Cast iron, EN-GJL-200 or better						
	Cover material		Cast iron, EN-GJL-200 or better						
	Cover screws material		Acidproof steel A4-80					Steel 8.8, zinc electroplated and chromated.	
Connections	Cable entries		1 x M25 + 1 x M20 plugged		2 x M32 + 1 x M20 plugged			2 x M40 + 2 x M20 plugged	
	Terminals		6 terminals for connection with cable lugs (not included)						
Fan	Material		Polyamide. Reinforced with glass fibre.					Polypropylene. Reinforced with glass fibre.	
Fan cover	Material		Steel				Hot dip galvanized steel		
	Paint color shade		Munsell blue 8B 4.5/3.25						
	Corrosion class		C3						
Stator winding	Material		Copper						
	Insulation		Insulation class F						
	Winding protection		3 pcs thermistors as standard						
Rotor winding	Material		Pressure die-cast aluminum						
Balancing			Half-key balancing						
Keyway			Closed						
Heating elements	On request		25 W						
Drain holes			-					Optional	
External earthing bolt			As standard						
Enclosure			IP 55						
Cooling method			IC 411						

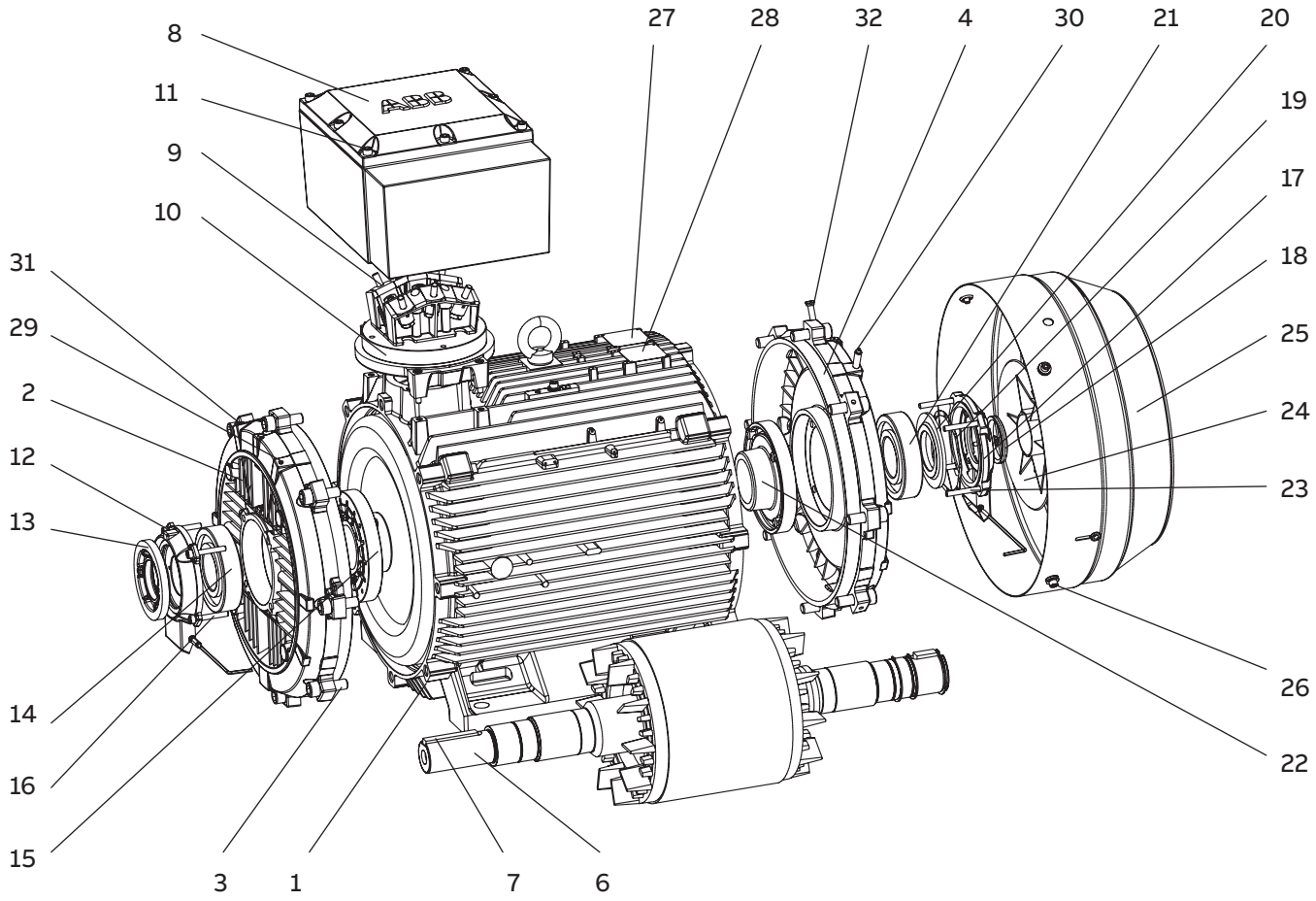
Motors in brief

Flameproof motors Ex db, sizes 200 to 450

Motor size			200	225	250	280	315	355	400	450
Stator	Material		Cast iron, EN-GJL-200 or better							
	Paint color shade		Munsell blue 8B 4.5/3.25							
	Corrosion class		C3							
Feet	Material		Cast iron, EN-GJL-200 or better, integrated with stator							
Bearing end shields	Material		Cast iron, EN-GJL-200 or better							
	Paint color shade		Blue, Munsell 8B 4.5/3.25							
	Corrosion class		C3							
Bearings	D-end	2-pole	6312M/C3	6313M/C3	6315M/C3	6316/C3	6316/C3	6316M/C3	6317M/C3	-
		4-12-pole	6312/C3	6313/C3	6315/C3	6316/C3	6319/C3	6322/C3	6324/C3	6326M/C3
	N-end	2-pole	6310M/C3	6312M/C3	6313M/C3	6316/C3	6316/C3	6316M/C3	6317M/C3	-
		4-12-pole	6310/C3	6312/C3	6313/C3	6316/C3	6316/C3	6316/C3	6319/C3	6322/C3
Axially locked bearings	Inner bearing cover		As standard, locked at D-end							
Bearing seals			Gamma ring			V-ring or labyrinth seal				
Lubrication			Regreasable bearings							
SPM nipples			As standard							
Rating plate	Material		Stainless steel							
Terminal box	Frame material		Cast iron, EN-GJL-200 or better							
	Cover material		Cast iron, EN-GJL-200 or better							
	Cover screws material		Steel 8.8, zinc electroplated and chromated							
Connections	Cable-entries		2 x M50 + 2 x M20 plugged			2 x M63 + 2 x M20 plugged	2 x M75 + 2 x M20 plugged			
	Terminals		6 terminals for connection with cable lugs (not included)							
Fan	Material		Polypropylene. Reinforced with glass fibre.					Polypropylene reinforced with glass fibre or aluminum.		
Fan cover	Material		Hot dip galvanized steel							
	Paint color shade		Munsell blue 8B 4.5/3.25							
	Corrosion class		C3							
Stator winding	Material		Copper							
	Insulation		Insulation class F							
	Winding protection		3 pcs thermistors as standard							
Rotor winding	Material		Pressure die-cast aluminum							
Balancing			Half key balancing							
Keyway			Closed Open			Open				
Heating elements	On request		25 W	60 W			120 W			200 W
Drain holes			Optional							
External earthing bolt			As standard							
Enclosure			IP 55							
Cooling method			IC 411							

Motor construction

Cast iron flameproof motors, Ex db



1 Stator frame
2 End shield, D-end
3 Screws for end shield, D-end
4 End shield, N-end
5 Screws for end shield, N-end
6 Rotor with shaft
7 Key, D-end
8 Terminal box
9 Terminal board
10 Intermediate flange
11 Screws for terminal box cover
12 Outer bearing cover, D-end
13 Valve disc with labyrinth seal, D-end
14 Bearing, D-end
15 Inner bearing cover, D-end
16 Screws for bearing cover
17 Outer bearing cover, N-end
18 Seal, N-end
19 Wave spring (280-315)
Coil spring (355-450)
20 Valve disc, N-end
21 Bearing, N-end
22 Inner bearing cover, N-end
23 Screws for bearing cover
24 Fan
25 Fan cover
26 Screws for fan cover
27 Rating plate
28 Lubrication plate
29 Grease nipple, D-end
30 Grease nipple, N-end
31 SPM nipple, D-end
32 SPM nipple, N-end

Flameproof motors Ex db eb IIB/IIC T4 Gb

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Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3KP	160MLA	3GKP 161	410 - ADH	002, etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 to 4	
3GKP:	Totally enclosed flameproof Ex de motor with cast iron frame

Positions 5 and 6	
IEC size	
08:	80
09:	90
10:	100
11:	112
13:	132
16:	160
18:	180
20:	200
22:	225
25:	250
28:	280
31:	315
35:	355
40:	400
45:	450

Position 7	
Speed (Pole pairs)	
1:00	2 poles
2:	4 poles
3:	6 poles
4:	8 poles
5:	10 poles
6:	12 poles
7:	≥ 12 poles
8:	Two-speed motors
9:	Multi-speed motors

Positions 8 to 10	
8:	Frame lenght
9:	Stator package length
10:	Speed for two-speed induction, Permanent Magnet, SynRM and High Speed motors

Position 11
- (Dash)

Position 12	
Mounting arrangement	
A:	Foot-mounted, top-mounted terminal box
B:	Flange-mounted, large flange with clearance holes
C:	Flange-mounted, small flange with tapped holes

Position 13	
Voltage and frequency	
Single-speed motors	
C:	400VY 50Hz, 460VY 60Hz
D:	400 VΔ, 415 VΔ, 690 VY 50 Hz
E:	500 VΔ 50 Hz
F:	500 VY 50 Hz
P:	400VD 50Hz, 460VD 60Hz
S:	230 VΔ, 400 VY, 415 VY 50 Hz

Position 14	
Generation code	
Generation code is followed by variant codes according to the hazardous area, seen below and on corresponding pages with variant codes:	
461	Ex d(e) design, Group IIC

Rating plates

01 Sample rating plate for IE4 Flameproof Ex eb db motors



01

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

Technical data

IE4 Ex db eb cast iron motors, 3000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 $GD^2 kgm^2$	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_n A	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
75	M3KP 280SMB 2	3GKP281220-**M	2981	95,6	95,6	95	0,86	130	7,7	240	2,2	3,2	0,677	665	77
90	M3KP 280SMC 2	3GKP281230-**M	2982	95,8	95,8	95,2	0,88	153	8,7	288	2,7	3,5	0,822	725	77
110	M3KP 315SMB 2	3GKP311220-**M	2983	96	96	95,4	0,87	189	7,2	352	1,7	2,9	1,22	940	77
132	M3KP 315SMC 2	3GKP311230-**M	2985	96,2	96,2	95,8	0,87	225	8,6	422	2,3	3,3	1,44	1025	77
160	M3KP 315MLA 2	3GKP311410-**M	2983	96,3	96,4	96,2	0,89	267	8	512	2,2	2,8	1,7	1190	77
200	M3KP 355SMA 2	3GKP351210-**M	2985	96,5	96,4	95,9	0,89	335	8,2	640	1,9	3,5	2,73	1600	83
250	M3KP 355SMB 2	3GKP351220-**M	2984	96,5	96,5	96,1	0,89	415	8,1	800	2,2	3,3	3,1	1680	83
315	M3KP 355SMC 2	3GKP351230-**M	2985	96,5	96,4	95,9	0,88	533	7,3	1008	2,4	3,1	3,38	1750	83
355	M3KP 355MLA 2	3GKP351410-**M	2983	96,5	96,5	96,1	0,89	595	7,8	1137	2,4	2,8	3,74	2000	83
400	M3KP 355MLB 2	3GKP351420-**M	2982	96,5	96,4	95,8	0,87	683	7	1281	2,6	2,8	3,9	2000	83
450	M3KP 355MLC 2	3GKP351430-**M	2984	96,5	96,5	96	0,9	746	8,8	1440	2,7	3,8	3,95	2080	83
500	M3KP 355LKA 2	3GKP351810-**M	2983	96,5	96,5	96,1	0,9	823	8,7	1601	2,3	3,9	4,51	2320	83
560	M3KP 400LA 2	3GKP401510-**M	2988	96,5	96,4	95,8	0,89	939	8,4	1790	2,3	3,4	7,27	2950	82
560	M3KP 400LKA 2	3GKP401810-**M	2988	96,5	96,4	95,8	0,89	939	8,4	1790	2,3	3,4	7,27	2950	82
560	M3KP 355LKB 2	3GKP351820-**M	2983	96,5	96,4	95,9	0,9	922	8,7	1793	2,6	4,1	4,93	2460	83
630	M3KP 400LB 2	3GKP401520-**M	2988	96,5	96,4	95,9	0,89	1052	8,5	2013	2,4	3,4	7,81	2950	82
630	M3KP 400LKB 2	3GKP401820-**M	2988	96,5	96,4	95,9	0,89	1052	8,5	2013	2,4	3,4	7,81	2950	82
710	M3KP 400LC 2	3GKP401530-**M	2988	96,5	96,5	96	0,89	1185	7,3	2269	2,8	3,1	8,9	3050	82
710	M3KP 400LKC 2	3GKP401830-**M	2988	96,5	96,5	96	0,89	1185	7,3	2269	2,8	3,1	8,9	3050	82

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 $GD^2 kgm^2$	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_n A	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3KP 280SMD 2	3GKP281240-**M	2980	96	96,2	95,8	0,86	192	8,3	352	2,7	3,4	0,822	725	77
132	M3KP 280MLA 2	3GKP281410-**M	2980	96,2	96,2	95,6	0,88	224	8,5	423	2,9	3,4	0,941	840	81
160	M3KP 280MLB 2	3GKP281420-**M	2970	96,3	96,7	96,7	0,9	265	6,9	514	2,3	2,5	1,06	890	81
200	M3KP 315MLB 2	3GKP311420-**M	2982	96,5	96,7	96,6	0,89	333	6,5	640	2,1	2,8	1,78	1220	77
250	M3KP 315LKB 2	3GKP311820-**M	2981	96,5	96,7	96,7	0,9	412	7,2	801	2,8	2,9	2,33	1540	77

Technical data

IE4 Ex db eb cast iron motors, 1500 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
75	M3KP 280SMB 4	3GKP282220-**M	1488	96	96,2	95,8	0,85	132	8,1	481	3,3	3,2	1,41	840	72
90	M3KP 280SMC 4	3GKP282230-**M	1487	96,1	96,2	95,7	0,84	161	7,7	578	3,5	3,3	1,41	840	72
110	M3KP 315SMC 4	3GKP312230-**M	1491	96,3	96,4	96	0,84	194	7,9	705	2,9	3,4	2,33	1000	68
132	M3KP 315SMD 4	3GKP312240-**M	1491	96,4	96,5	96,2	0,84	234	7,8	846	3	3,4	2,52	1065	68
160	M3KP 315MLB 4	3GKP312420-**M	1490	96,6	96,7	96,5	0,85	278	7,7	1026	3,2	3,3	3,04	1220	68
200	M3KP 355SMA 4	3GKP352210-**M	1492	96,7	96,7	96,4	0,86	346	7,1	1280	2,6	2,9	5,11	1610	74
250	M3KP 355SMB 4	3GKP352220-**M	1492	96,7	96,7	96,4	0,85	435	7,5	1600	3	3,1	6	1780	74
315	M3KP 355SMC 4	3GKP352230-**M	1491	96,7	96,7	96,4	0,84	555	7	2017	3,2	3	6,56	1820	74
355	M3KP 355MLA 4	3GKP352410-**M	1492	96,7	96,8	96,5	0,85	617	7,7	2273	3,3	3,1	7,44	2140	78
400	M3KP 355MLB 4	3GKP352420-**M	1490	96,7	96,8	96,6	0,86	691	8,2	2563	3,2	3	7,44	2140	78
450	M3KP 355MLC 4	3GKP352430-**M	1489	96,7	96,9	96,7	0,86	782	7,9	2885	3,1	2,9	7,44	2140	78
500	M3KP 355LKA 4	3GKP352810-**M	1491	96,7	96,7	96,2	0,86	867	7	3202	3,7	3,1	9,35	2500	78
560	M3KP 400LA 4	3GKP402510-**M	1491	96,7	96,7	96,2	0,85	985	7	3586	3,1	3,1	13,6	3200	78
560	M3KP 400LKA 4	3GKP402810-**M	1491	96,7	96,7	96,2	0,85	985	7	3586	3,1	3,1	13,6	3200	78
630	M3KP 400LB 4	3GKP402520-**M	1492	96,7	96,7	96,3	0,86	1093	8,6	4033	3	3,2	13,6	3300	78
630	M3KP 400LKB 4	3GKP402820-**M	1492	96,7	96,7	96,3	0,86	1093	8,6	4033	3	3,2	13,6	3300	78
710	M3KP 400LC 4	3GKP402530-**M	1492	96,7	96,7	96,3	0,85	1245	7,7	4545	2,9	3,2	14,6	3300	78
710	M3KP 400LKC 4	3GKP402830-**M	1492	96,7	96,7	96,3	0,85	1245	7,7	4545	2,9	3,2	14,6	3300	78
780	M3KP 450LA 4	3GKP452510-**M	1492	96,7	96,6	96	0,85	1360	6,5	4991	1,4	3,1	21,3	4050	85
850	M3KP 450LB 4	3GKP452520-**M	1493	96,7	96,6	96	0,85	1490	6,7	5437	1,5	3,3	24,5	4050	85
950	M3KP 450LC 4	3GKP452530-**M	1492	96,7	96,6	96,2	0,86	1652	6,5	6079	1,4	3,1	28,4	4350	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3KP 280MLB 4	3GKP282420-**M	1489	96,3	96,3	95,7	0,81	203	8,3	705	4,3	3,8	1,7	890	75
132	M3KP 280MLC 4	3GKP282430-**M	1489	96,4	96,4	95,9	0,81	244	8,2	847	4,4	3,8	1,87	890	75
200	M3KP 315LKB 4	3GKP312820-**M	1491	96,7	96,9	96,7	0,86	345	7,6	1281	2,9	3,1	3,81	1480	74
250	M3KP 315LKC 4	3GKP312830-**M	1491	96,7	96,9	96,8	0,86	432	7,9	1602	2,7	3,2	3,91	1600	74
315	M3KP 315LKE 4	3GKP312850-**M	1489	96,7	97	96,9	0,84	560	7,8	2020	3,1	3	4,15	1640	74

Technical data

IE4 Ex db eb cast iron motors, 1000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
45	M3KP 280SMB 6	3GKP283220-**M	992	94,8	94,9	94,4	0,84	81,3	7,7	433	2,9	2,8	2	680	65
55	M3KP 280SMC 6	3GKP283230-**M	991	95,1	95,3	94,9	0,84	99,3	7,5	530	3	2,8	2,26	725	65
75	M3KP 315SMC 6	3GKP313230-**M	994	95,4	95,5	95,1	0,82	137	7,5	720	2,6	2,9	4,35	1000	67
90	M3KP 315SMD 6	3GKP313240-**M	994	95,6	95,7	95,3	0,8	169	7,5	864	2,8	3	4,57	1040	67
110	M3KP 315MLB 6	3GKP313420-**M	994	95,8	95,9	95,6	0,81	202	7,3	1057	2,7	2,8	5,5	1200	68
132	M3KP 315LKA 6	3GKP313810-**M	994	96	96,1	95,8	0,81	243	7,4	1268	2,9	2,9	6,54	1410	68
160	M3KP 355SMB 6	3GKP353220-**M	995	96,2	96,3	95,9	0,82	292	7,7	1535	2,6	2,8	8,65	1680	73
200	M3KP 355SMC 6	3GKP353230-**M	995	96,3	96,3	96	0,81	367	7,1	1919	2,7	2,9	10,1	1820	73
250	M3KP 355MLB 6	3GKP353420-**M	995	96,5	96,6	96,4	0,82	455	7,7	2400	2,8	2,8	12	2180	73
315	M3KP 355LKA 6	3GKP353810-**M	994	96,6	96,7	96,4	0,82	574	6,7	3025	2,8	2,7	13,8	2500	76
355	M3KP 355LKB 6	3GKP353820-**M	995	96,6	96,5	96	0,79	667	7,4	3407	3,3	3,1	14,7	2600	76
400	M3KP 400LA 6	3GKP403510-**M	995	96,6	96,7	96,3	0,81	734	7,3	3840	2,8	3,1	15,8	2900	76
400	M3KP 400LKA 6	3GKP403810-**M	995	96,6	96,7	96,3	0,81	734	7,3	3840	2,8	3,1	15,8	2900	76
450	M3KP 400LB 6	3GKP403520-**M	996	96,6	96,4	95,6	0,81	825	8,5	4316	3,4	3,5	20,7	3300	76
450	M3KP 400LKB 6	3GKP403820-**M	996	96,6	96,4	95,6	0,81	825	8,5	4316	3,4	3,5	20,7	3300	76
500	M3KP 400LC 6	3GKP403530-**M	995	96,6	96,5	95,8	0,82	912	8	4798	3,2	3,3	20,7	3300	76
500	M3KP 400LKC 6	3GKP403830-**M	995	96,6	96,5	95,8	0,82	912	8	4798	3,2	3,3	20,7	3300	76
560	M3KP 400LD 6	3GKP403540-**M	994	96,6	96,6	96,2	0,85	982	6,8	5380	2,8	2,9	22,3	3400	77
560	M3KP 400LKD 6	3GKP403840-**M	994	96,6	96,6	96,2	0,85	982	6,8	5380	2,8	2,9	22,3	3400	77
610	M3KP 450LA 6	3GKP453510-**M	996	96,6	96,5	95,8	0,81	1126	7,5	5849	1,7	3,4	32,2	4150	81
680	M3KP 450LB 6	3GKP453520-**M	995	96,6	96,6	96,1	0,84	1200	6,9	6524	1,5	3	38,2	4500	81
760	M3KP 450LC 6	3GKP453530-**M	995	96,6	96,6	96,1	0,83	1358	7	7293	1,5	3,2	42,9	4800	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
75	M3KP 280SMD 6	3GKP283240-**M	991	95,4	95,6	95,3	0,81	140	7,2	723	3,1	2,7	2,25	730	65
160	M3KP 315LKC 6	3GKP313830-**M	994	96,2	96,3	96	0,81	296	7,1	1537	3,2	3	7,71	1600	68
200	M3KP 315LKE 6	3GKP313850-**M	994	96,3	96,4	96,1	0,81	368	7,5	1921	2,9	2,9	7,71	1600	68

Technical data

IE3 Ex db eb cast iron motors, 3000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD^2kgm^2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
0.75	M3KP 80MD 2	3GKP081340-**K	2872	80,7	81,1	79,4	0,87	1,51	6,2	2,43	2,88	3,43	0,0012	39	57
1.1	M3KP 80MG 2	3GKP081370-**K	2862	82,7	83,7	82,8	0,87	2,1	6,3	3,65	3,03	3,5	0,0014	40	60
1.5	M3KP 90SLB 2	3GKP091020-**K	2892	84,2	85,3	84,5	0,89	2,7	7,3	4,8	3,4	3,7	0,0031	50	69
2.2	M3KP 90LC 2	3GKP091530-**K	2900	85,9	86,7	85,7	0,89	4	9,1	7,27	3,35	4,09	0,0044	54	64
3	M3KP 100LKA 2	3GKP101810-**K	2907	87,1	87,6	86,5	0,89	5,4	8,8	9,9	3,25	4,32	0,0086	70	68
4	M3KP 112MG 2	3GKP111370-**K	2882	88,1	89,7	90,3	0,93	7	8,1	13,3	2,8	3,6	0,0132	75	70
5.5	M3KP 132SMF 2	3GKP131260-**K	2902	89,2	89,9	89,4	0,9	9,7	7,3	18,2	2,72	3,6	0,0218	115	67
7.5	M3KP 132SMG 2	3GKP131270-**K	2907	90,1	91	91	0,9	13,2	8,1	24,7	2,66	3,74	0,0218	115	70
11	M3KP 160MLA 2	3GKP161410-**K	2943	91,2	91,7	91,3	0,92	18,7	8,1	35,6	2,7	3,4	0,052	219	69
15	M3KP 160MLB 2	3GKP161420-**K	2943	91,9	92,4	92,1	0,91	25,4	8,4	48,6	3,1	3,4	0,062	226	69
18.5	M3KP 160MLC 2	3GKP161430-**K	2942	92,4	93	92,8	0,93	30,8	8,3	60	3,1	3,6	0,072	250	69
22	M3KP 180MLA 2	3GKP181410-**K	2957	92,7	93,3	93	0,91	37,4	8,1	71	2,6	3,2	0,116	301	69
30	M3KP 200MLA 2	3GKP201410-**K	2958	93,3	93,7	93,6	0,9	51	7,8	96,8	2,8	3,1	0,196	338	72
37	M3KP 200MLB 2	3GKP201420-**K	2960	93,7	94,1	93,9	0,91	62,2	8,8	119	3,1	3,4	0,217	350	72
45	M3KP 225SMA 2	3GKP221210-**K	2972	94	94,2	93,8	0,89	76,8	7,8	144	3,1	3	0,323	457	74
55	M3KP 250SMA 2	3GKP251210-**K	2975	94,3	94,5	94,1	0,89	93,6	8	176	2,8	3,3	0,579	509	75
75	M3KP 280SMB 2	3GKP281220-**K	2980	94,7	94,7	94	0,87	129	7,8	240	2,5	3,3	0,9	686	77
90	M3KP 280SMC 2	3GKP281230-**K	2981	95	94,8	94,1	0,88	153	8	288	2,95	3,1	1,15	756	77
110	M3KP 315SMB 2	3GKP311220-**K	2982	95,2	95,2	94,3	0,88	189	6,7	352	1,9	2,6	1,4	961	77
132	M3KP 315SMC 2	3GKP311230-**K	2986	95,4	95,5	95,1	0,88	226	7,9	422	2,4	3	1,7	1036	77
160	M3KP 315MLA 2	3GKP311410-**K	2983	95,6	95,9	95,6	0,9	268	7,3	512	2,2	2,7	2,1	1206	77
200	M3KP 355SMA 2	3GKP351210-**K	2985	95,8	95,5	94,5	0,89	336	7,6	640	2	3,1	3	1621	83
250	M3KP 355SMB 2	3GKP351220-**K	2983	95,8	96	95,5	0,9	415	7,6	800	2,2	3	3,4	1718	83
315	M3KP 355SMC 2	3GKP351230-**K	2984	95,8	95,8	95,1	0,89	533	7,8	1008	2,3	2,8	3,6	1793	83
355	M3KP 355MLA 2	3GKP351410-**K	2981	95,8	96,1	95,7	0,9	595	7,5	1137	2,3	2,6	4,1	2028	83
400	M3KP 355MLB 2	3GKP351420-**K	2982	95,8	95,6	94,7	0,88	677	7,1	1280	2,3	2,9	4,1	2030	83
450	M3KP 355MLC 2	3GKP351430-**K	2983	95,8	95,8	95	0,9	743	7,9	1440	2,2	2,9	4,3	2110	83
500	M3KP 355LKA 2	3GKP351810-**K	2982	95,8	95,8	95,3	0,9	827	7,5	1601	2	3,9	4,8	2350	83
560	M3KP 400LA 2	3GKP401510-**K	2988	95,8	95,8	94,9	0,89	934	7,8	1789	2,46	3,67	7,9	3070	82
630	M3KP 400LB 2	3GKP401520-**K	2987	95,8	95,5	94,8	0,89	1049	7,6	2014	2,56	3,7	8,2	3170	82
710	M3KP 400LC 2	3GKP401530-**K	2987	95,8	95,7	94,9	0,89	1178	7,2	2270	2,56	3,4	9,3	3420	82

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD^2kgm^2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3KP 315MLB 2	3GKP311420-**K	2983	96,4	96,7	96,6	0,9	333	6,8	640	1,9	2,6	2,2	1231	77
250	M3KP 315LKB 2	3GKP311820-**K	2982	95,8	96,2	96,2	0,91	413	7,9	800	2,5	2,7	2,9	1550	77

Technical data

IE3 Ex db eb cast iron motors, 1500 r/min

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

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
0.55	M3KP 80MLD 4	3GKP082440-**K	1439	80,8	82,2	81,4	0,81	1,18	6,3	3,6	2,3	3,29	0,0028	40	45
0.75	M3KP 80MLG 4	3GKP082470-**K	1445	82,5	83,5	82,2	0,79	1,62	6,9	4,97	2,6	3,76	0,0033	41	57
1.1	M3KP 90SLC 4	3GKP092030-**K	1444	84,1	84,6	83,2	0,79	2,3	7,2	7,28	3,77	3,68	0,0067	52	56
1.5	M3KP 90LD 4	3GKP092540-**K	1439	85,3	86,4	85,9	0,78	3,1	7,8	9,95	3,35	4,47	0,0072	53	56
2.2	M3KP 100LKA 4	3GKP102810-**K	1452	86,7	87,8	87,7	0,83	4,2	8,9	14,46	3,4	4,1	0,0146	70	56
3	M3KP 100LKB 4	3GKP102820-**K	1452	87,7	89	89	0,83	5,8	9	19,7	3,2	4	0,0146	70	58
4	M3KP 112MG 4	3GKP112370-**K	1454	88,6	89,1	88,6	0,75	8,7	7,5	26,3	3,1	3,7	0,0176	71	59
5.5	M3KP 132SMF 4	3GKP132260-**K	1462	89,6	90,6	90,6	0,81	10,8	7,3	35,87	2,41	3,39	0,0401	110	67
7.5	M3KP 132SMG 4	3GKP132270-**K	1457	90,4	91,4	91,5	0,81	14,8	7,3	49,1	2,39	3,38	0,0401	110	64
11	M3KP 160MLA 4	3GKP162410-**K	1473	91,4	91,8	91,3	0,84	20,4	7,7	71,3	2,6	2,9	0,108	234	62
15	M3KP 160MLB 4	3GKP162420-**K	1474	92,1	92,7	92,4	0,84	27,8	7,9	97,1	2,8	3,3	0,125	253	62
18.5	M3KP 180MLA 4	3GKP182410-**K	1481	92,6	92,9	92,3	0,82	34,9	7,6	119	3	3,1	0,217	294	62
22	M3KP 180MLB 4	3GKP182420-**K	1480	93	93,5	93,2	0,82	41,5	8,2	141	2,8	3,1	0,217	290	62
30	M3KP 200MLA 4	3GKP202410-**K	1484	93,6	93,8	93,2	0,84	54,6	8,3	193	3	3,3	0,366	347	63
37	M3KP 225SMA 4	3GKP222210-**K	1482	93,9	94,6	94,5	0,86	65,4	7,7	238	2,8	3,1	0,536	448	66
45	M3KP 225SMB 4	3GKP222220-**K	1482	94,2	94,7	94,6	0,85	80,2	7,9	289	3,1	3,2	0,536	451	66
55	M3KP 250SMA 4	3GKP252210-**K	1485	94,6	95,2	95	0,85	97,8	7,9	353	3	3,3	0,933	494	67
75	M3KP 280SMB 4	3GKP282220-**K	1486	95	95,4	95,3	0,85	134	7,4	482	2,5	2,8	1,5	686	72
90	M3KP 280SMC 4	3GKP282230-**K	1487	95,2	95,5	95,1	0,85	161	7,9	578	2,9	3	1,85	747	72
110	M3KP 315SMC 4	3GKP312230-**K	1491	95,4	95,7	95,2	0,85	194	7,8	704	2,4	3,1	2,9	1013	68
132	M3KP 315SMD 4	3GKP312240-**K	1490	95,6	95,8	95,4	0,85	234	7,9	846	2,6	3,2	3,2	1075	68
160	M3KP 315MLB 4	3GKP312420-**K	1490	95,8	96	95,6	0,86	278	7,9	1026	2,7	3	3,9	1228	68
200	M3KP 355SMA 4	3GKP352210-**K	1491	96	96,1	95,7	0,87	345	7,3	1282	2,1	2,7	5,9	1634	74
250	M3KP 355SMB 4	3GKP352220-**K	1491	96	96,1	95,9	0,87	433	7,8	1601	2,5	2,9	6,9	1790	74
315	M3KP 355SMC 4	3GKP352230-**K	1490	96	96,1	95,9	0,85	554	7,4	2017	2,4	2,9	7,2	1838	74
355	M3KP 355MLA 4	3GKP352410-**K	1491	96	96,3	95,9	0,87	616	7,9	2274	2,7	2,9	8,4	2173	78
400	M3KP 355MLB 4	3GKP352420-**K	1489	96	96	95,5	0,85	705	6,8	2565	2,3	2,6	8,4	2170	78
450	M3KP 355MLC 4	3GKP352430-**K	1490	96	96,1	95,6	0,86	780	6,9	2884	2,3	2,9	8,4	2170	78
500	M3KP 355LKA 4	3GKP352810-**K	1490	96	96	95,3	0,86	865	6,8	3204	2	3	10	2530	78
560	M3KP 400LA 4	3GKP402510-**K	1491	96	96	95,4	0,85	982	7,4	3586	2,4	2,8	15	3040	78
630	M3KP 400LB 4	3GKP402520-**K	1491	96	96	95,4	0,86	1077	7,6	4034	2,2	2,9	16	3420	78
710	M3KP 400LC 4	3GKP402530-**K	1491	96	96	95,5	0,85	1227	7,6	4547	2,4	3	17	3520	78

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3KP 315LKB 4	3GKP312820-**K	1490	96,6	96,8	96,7	0,87	346	7,6	1282	2,5	2,9	5	1530	74
250	M3KP 315LKC 4	3GKP312830-**K	1490	96	96,2	96,1	0,87	432	7,8	1601	2,3	3	5,5	1610	74

Technical data

IE3 Ex db eb cast iron motors, 1000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
0.75	M3KP 90SLD 6	3GKP093040-**K	940	78,9	80,3	79,2	0,75	1,8	4,4	7,57	2,1	2,8	0,0056	49	44
1.1	M3KP 90LF 6	3GKP093560-**K	944	81	81,7	80,1	0,75	2,66	4,7	11,1	2,1	2,8	0,0068	52	44
1.5	M3KP 100LE 6	3GKP103550-**K	960	82,5	82,5	80,1	0,68	3,8	5,4	14,9	2,7	3,4	0,012	64	49
2.2	M3KP 112MJ 6	3GKP113390-**K	962	84,3	85,5	84,7	0,68	5,3	6	21,8	2,4	3,5	0,0196	72	66
3	M3KP 132SMD 6	3GKP133240-**K	977	85,6	85,9	84,3	0,69	6,9	5,9	29	1,9	3,3	0,0416	111	57
4	M3KP 132SMG 6	3GKP133270-**K	974	86,8	87,4	86,6	0,69	9,3	5,6	38,7	1,8	2,84	0,0416	112	57
5.5	M3KP 132SMH 6	3GKP133280-**K	966	88	88,9	88,7	0,73	12,1	5	54,1	1,83	2,7	0,0654	109	57
7.5	M3KP 160MLA 6	3GKP163410-**K	980	89,1	89,4	88,2	0,78	15,2	7,9	73	1,7	2,8	0,114	219	59
11	M3KP 160MLB 6	3GKP163420-**K	979	90,3	90,4	89,1	0,74	23,5	8,5	107	2,2	3,9	0,131	253	59
15	M3KP 180MLA 6	3GKP183410-**K	981	91,2	91,9	91,6	0,77	30,4	5,5	146	1,7	2,7	0,225	290	59
18.5	M3KP 200MLA 6	3GKP203410-**K	990	91,7	91,8	90,8	0,77	37,3	7,5	178	2,6	3,2	0,448	320	63
22	M3KP 200MLB 6	3GKP203420-**K	990	92,2	92,3	91,3	0,79	43	7,8	212	2,6	3,2	0,531	343	63
30	M3KP 225SMA 6	3GKP223210-**K	989	92,9	93,1	92,5	0,81	56,8	7,9	289	2,8	3,1	0,813	440	63
37	M3KP 250SMA 6	3GKP253210-**K	991	93,3	93,6	93,1	0,83	68	7,7	356	2,7	2,9	1,49	529	63
45	M3KP 280SMB 6	3GKP283220-**K	992	93,7	94,1	93,5	0,85	80,9	7,5	434	2,4	2,6	2,2	697	65
55	M3KP 280SMC 6	3GKP283230-**K	990	94,1	94,4	94,1	0,85	99,4	6,8	506	2,4	2,6	2,85	737	65
75	M3KP 315SMC 6	3GKP313230-**K	994	94,6	94,8	94,4	0,83	138	7	721	2,2	2,8	4,9	1009	67
90	M3KP 315SMD 6	3GKP313240-**K	994	94,9	95,1	94,7	0,81	170	7,2	864	2,4	2,9	4,9	1043	67
110	M3KP 315MLB 6	3GKP313420-**K	994	95,1	95,3	95,1	0,83	202	6,9	1058	2,3	2,7	6,3	1208	68
132	M3KP 315LKA 6	3GKP313810-**K	993	95,4	95,6	95,4	0,82	243	6,9	1269	2,4	2,7	7,3	1420	68
160	M3KP 355SMB 6	3GKP353220-**K	995	95,6	95,6	95	0,82	294	7	1536	2,1	2,7	9,7	1698	73
200	M3KP 355SMC 6	3GKP353230-**K	995	95,8	96	95,6	0,82	367	7,3	1920	2,3	2,8	11,3	1841	73
250	M3KP 355MLB 6	3GKP353420-**K	995	95,8	96	95,9	0,83	456	7,1	2399	2,3	2,7	13,5	2185	73
315	M3KP 355LKA 6	3GKP353810-**K	994	95,8	96	95,6	0,83	576	6,9	3026	2,3	2,6	15,5	2510	76
355	M3KP 355LKB 6	3GKP353820-**K	995	95,8	95,9	95,3	0,81	668	7,7	3407	2,7	2,9	16,5	2610	76
400	M3KP 400LA 6	3GKP403510-**K	993	95,8	95,8	95,1	0,82	731	7,1	3846	2,3	2,7	17	3020	76
450	M3KP 400LB 6	3GKP403520-**K	994	95,8	95,8	95,2	0,82	819	7,4	4323	2,4	2,5	20,5	3270	76
500	M3KP 400LC 6	3GKP403530-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3420	76
500	M3KP 400LKC 6	3GKP403830-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3420	76
560	M3KP 400LD 6	3GKP403540-**K	993	95,8	95,8	95,2	0,85	984	7,4	5386	2,4	2,8	24	3520	77
610	M3KP 450LA 6	3GKP453510-**K	994	95,8	95,8	95,3	0,83	1098	7,1	5860	1,4	2,9	31	4150	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
160	M3KP 315LKC 6	3GKP313830-**K	994	95,6	95,8	95,7	0,82	297	7,4	1537	2,7	2,9	9,2	1610	68

Technical data

IE3 Ex db eb cast iron motors, 800 r/min

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

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
800 r/min = 8 poles				**400 V 50Hz**				**BASIC-design**							
0.75	M3KP 100LKA 8	3GKP104810-**K	710	75	74,5	70,5	0,65	2,13	4,4	10	2,35	2,8	0,00855	60	53
1.1	M3KP 100LKB 8	3GKP104820-**K	703	77,7	77,7	74,7	0,65	3,08	4,4	14,9	2,7	2,9	0,0128	68	53
1.5	M3KP 112MC 8	3GKP114330-**K	717	79,7	80,1	78,8	0,62	4,12	4,3	19,9	1,8	2,6	0,0194	72	55
2.2	M3KP 132SMA 8	3GKP134210-**K	725	81,9	82,3	80,2	0,64	5,8	5,2	28,9	2	3	0,0291	96	57
3	M3KP 132SMG 8	3GKP134270-**K	723	83,5	84,1	82,8	0,66	7,5	4,8	39,6	1,8	2,8	0,0375	106	57
4	M3KP 160MLA 8	3GKP164410-**K	734	84,8	85,1	83,2	0,65	10,3	4,5	52	1,8	2,3	0,091	212	59
5.5	M3KP 160MLB 8	3GKP164420-**K	732	86,2	87,1	86,1	0,69	13	5	71,7	2	2,35	0,091	213	59
7.5	M3KP 160MLC 8	3GKP164430-**K	733	87,3	88,2	87,2	0,69	17,6	5,1	97,7	2	2,4	0,12	232	59
11	M3KP 180MLA 8	3GKP184410-**K	731	88,6	89,2	88,4	0,7	25,3	5	143,6	2,1	2,1	0,2	275	59
15	M3KP 200MLA 8	3GKP204410-**K	737	89,6	90,5	90,1	0,74	32,5	5,2	194	2,1	2,4	0,45	319	60
18.5	M3KP 225SMA 8	3GKP224210-**K	736	90,1	90,8	90,2	0,74	39,8	5,2	240	2	2,25	0,669	422	63
22	M3KP 225SMB 8	3GKP224220-**K	736	90,6	91,6	91,5	0,73	47,5	5,3	285	2,26	2,47	0,722	435	63
30	M3KP 250SMA 8	3GKP254210-**K	741	91,3	91,7	91	0,71	67	5,6	386	2,7	2,7	1,4	512	63
37	M3KP 280SMA 8	3GKP284210-**K	741	91,8	92	91,3	0,79	72,6	7,3	476	1,7	3	1,85	625	65
45	M3KP 280SMB 8	3GKP284220-**K	741	92,2	92,3	91,7	0,78	89,2	7,6	579	1,8	3,1	2,2	665	65
55	M3KP 315SMA 8	3GKP314210-**K	742	92,5	93,1	92,5	0,8	106	7,1	707	1,6	2,7	3,2	850	62
75	M3KP 315SMB 8	3GKP314220-**K	741	93,1	93,2	93,1	0,82	146	7,1	966	1,7	2,7	4,1	950	62
90	M3KP 315SMC 8	3GKP314230-**K	741	93,4	93,7	93,4	0,82	170	7,4	1159	1,8	2,7	4,9	1020	64
110	M3KP 315MLA 8	3GKP314410-**K	740	93,7	94	94,1	0,83	211	7,3	1419	1,8	2,7	5,8	1170	72
132	M3KP 355SMA 8	3GKP354210-**K	744	94	93,9	93,4	0,79	256	7,5	1694	1,5	2,6	7,9	1550	69
160	M3KP 355SMB 8	3GKP354220-**K	744	94,3	94,3	93,8	0,79	293	7,6	2053	1,6	2,6	9,7	1710	69
200	M3KP 355SMC 8	3GKP354230-**K	742	94,6	95	94,8	0,79	385	7,4	2576	1,6	2,6	11,3	1850	69
250	M3KP 355MLB 8	3GKP354420-**K	743	94,6	94,7	94,1	0,8	472	7,5	3213	1,6	2,7	13,5	2210	72
315	M3KP 400LA 8	3GKP404510-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	3020	71
315	M3KP 400LKA 8	3GKP404810-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	3020	71
355	M3KP 400LB 8	3GKP404520-**K	743	94,6	94,9	94,6	0,83	641	6,8	4562	1,2	2,5	21	3320	71
400	M3KP 400LC 8	3GKP404530-**K	744	94,6	94,9	94,3	0,81	735	6	5134	1,3	2,7	24	3520	71
430	M3KP 450LA 8	3GKP454510-**K	744	94,6	94,9	94,5	0,82	789	6,2	5519	1	2,6	26	3750	80
470	M3KP 450LB 8	3GKP454520-**K	744	94,6	94,9	94,3	0,8	861	6,6	6032	1,1	2,7	29	4000	80
530	M3KP 450LC 8	3GKP454530-**K	745	94,6	94,7	94,2	0,81	982	7,3	6793	1,3	3	35	4350	80
600	M3KP 450LD 8	3GKP454540-**K	745	94,6	94,6	94	0,8	1124	7,9	7690	1,4	3,3	41	4800	80

Variant codes

Flameproof cast iron motors, Ex db eb IIB/IIC T4 Gb

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

Most of the variant codes apply to IE2 and IE3 motors. However, confirm the availability of variants for IE3 motors with your ABB sales office before making an order.

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	-	-	-	●	●	●	●	●	●	●	-	-	-
040	Heat-resistant grease	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
041	Bearings regreasable via grease nipples.	-	-	-	-	●	○	○	○	○	○	○	○	○	○	○
058	Angular contact bearing at D-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.	-	-	-	-	●	●	●	●	●	●	●	●	●	●	●
194	2Z bearings greased for life at both ends.	○	○	○	○	○	●	●	●	●	●	-	-	-	-	-
433	Outlet grease collector	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
506	Nipples for vibration measurement : SKF Marlin Quick Connect stud CMSS-2600-3	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
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	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
828	SPM compatible nipple for vibration measurement at D-end only.	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-
Branch standard designs																
178	Stainless steel / acid proof bolts.	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
204	Jacking bolts for foot mounted motors.	-	-	-	-	-	●	●	●	●	●	●	●	○	○	○
209	Non-standard voltage or frequency, (special winding).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
396	Motor designed for minimum ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
399	Motor designed for minimum ambient temperature -40 °C to -55 °C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
425	Corrosion protected stator and rotor core.	●	●	●	●	●	○	○	○	○	○	●	●	●	●	●
524	Special run-out tolerances on flange and shaft for close coupled pump applications.	-	-	-	-	●	●	●	●	●	●	●	●	●	-	-

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

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
786	Special design shaft upwards (V3, V35, V6) for outdoor mounting.	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
Cooling system																
044	Unidirectional fan for reduced noise level. Rotation clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	●	●	●	●	-
045	Unidirectional fan for reduced noise level. Rotation counter clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	●	●	●	●	-
068	Light alloy metal fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
183	Separate motor cooling (fan axial, N-end).	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
206	Steel fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
537	Advanced data sheet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
722	Rotor dimension drawing (incl. torsional stiffness).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
777	Premium documentation package	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Drain holes																
448	Draining holes with metal plugs.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
Earthing Bolt																
525	External earthing bolts on motor feet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hazardous Environments																
334	Ex t, Dust group III B T125C Db, IP6X (non-conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
336	Ex t, Dust group III C T125 Db, IP6X (conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
461	Ex d(e) design, Group II C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
464	Alleinschutz' design. Certification of flame proof motor and protection device together.	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-
516	Temperature detectors approved to be connected to an Ex i circuit	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
813	Thermistor-based surface temperature protection T4 for frequency converter duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
814	Ex t (DIP) motors, temperature class T 150C.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
816	Pt-100-based surface temperature protection T4 for frequency convertor duty. 3-wire system.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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).	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
229	Flange FT 130.	●	●	○	○	-	-	-	-	-	-	-	-	-	-	-
235	Flange FF 165.	○	○	●	●	●	-	-	-	-	-	-	-	-	-	-
236	Flange FT 165.	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-
245	Flange FF 215.	-	-	○	○	●	-	-	-	-	-	-	-	-	-	-
246	Flange FT 215.	-	-	●	●	●	-	-	-	-	-	-	-	-	-	-
256	Flange FT 265.	-	-	-	-	●	-	-	-	-	-	-	-	-	-	-
257	Flange FF 100.	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	Flange FF 115.	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-
260	Flange FT 115.	●	○	-	-	-	-	-	-	-	-	-	-	-	-	-
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
Painting																
105	Paint thickness report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
114	Special paint color, standard grade	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
115	Painting system C4,durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
168	Primer paint only.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
303	Painted insulation layer on inside of the terminal boxes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
710	Norsok M-501 rev. 7 Coating system no. 2B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
711	Painting system C5, durability High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
712	Painting system C5-M according to Petrobras specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
713	Painting system according Total Egina specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
717	Painting system C4, durability High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
719	Painting system CX	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
754	Painting system C5, durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
755	Norsok M-501 revision 6, 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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
239	Opendeck saltwater execution	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
240	Opendeck fresh water execution	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
249	Open deck execution for counter clockwise application, IP56	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
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).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
095	Restamping output (maintained voltage, frequency), intermittent duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
126	Tag plate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
135	Mounting of additional identification plate, stainless.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
139	Additional identification plate delivered loose.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
159	Additional plate with text "Made in ...."	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
160	Additional rating plate affixed.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
161	Additional rating plate delivered loose.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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Code/Variants		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
163	Frequency converter rating plate. Rating data according to quotation.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
332	Baldor Catalogue #	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
333	Not for use in the USA	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
528	Rating plate sticker	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shaft & rotor																
069	Two shaft extensions according to catalog drawings.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
070	Special shaft extension at D-End, standard shaft material	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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																
331	Motor not for sale for use in EU or UK.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
381	Frame agreement betw. ABB and Shell according to Shell DEP 33.66.05.31-GEN February 2018	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
523	Neste Rotterdam design.	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
540	Fulfilling energy efficiency requirements for China	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
541	Inmetro certification	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
544	Australian HE MEPS	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
551	IA certificate of conformity for South Africa	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
558	Saudi Arabian MEPS (SASO)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
586	Fulfilling UK Conformity Assessment (UKCA) requirements.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
599	EQM – Emirates Quality Mark	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
682	CCC Ex certificate for China	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
758	Saudi Aramco design.	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
803	PESO/CCoE certificate for India	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
811	JIP-33 standard design	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
827	Petrobras N-2919 Specification design	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
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	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
328	PTC - thermistors (3 in series), 120ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
435	PTC - thermistors (3 in series), 130 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
439	PTC - thermistors (2x3 in series), 150 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
441	PTC - thermistors (3 in series, 130 ºC & 3 in series, 150 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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Terminal box																
019	Larger than standard 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.	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
292	Adapter C-C	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-
293	Adapter D-D	-	-	-	-	-	-	-	-	-	-	-	●	●	●	-
294	Adapter E-D	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●

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

Code/Variants		Frame size															
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
295	Adapter E-2D	-	-	-	-	-	-	-	-	-	-	-	●	●	-	-
351	Terminal block turned according to cable entry	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
380	Separate terminal box for temperature detectors, std. material	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
413	Extended cable connection, no terminal box.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
418	Separate terminal box for auxiliaries, standard material.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
466	Terminal box at N-end.	-	-	-	-	-	-	-	●	●	●	●	●	●	●	●
468	Cable entry from D-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
469	Cable entry from N-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
553	Terminal box degree of protection IP66.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
624	Prepared for inch cable glands according to BSPP standard.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
727	Stainless steel flange for cable glands drilled and tapped according to order.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
730	Prepared for NPT cable glands.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
731	Two standard metal cable glands.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
734	Standard cable gland, Ex d IIC, armoured cable.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
735	Standard cable gland, Ex d IIC, non-armoured cable.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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																
145	Type test report from a catalogue motor, 400V 50Hz.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
146	Type test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
148	Routine test report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
149	Test according to separate test specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
150	Customer witnessed testing. Specify test procedure with other codes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
222	Torque/speed test, type test and multi-point load test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
560	Shaft voltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
561	Overspeed test,for one motor from specific delivery batch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
562	Overvoltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
479	Mounting of other type of pulse tacho with shaft extension, tacho not included.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
701	Insulated bearing at N-end.	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
704	EMC cable entry.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
747	1024 pulse tacho, Ex d, tD, L&L 841910002	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●

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

Mechanical design

Motor frame and drain holes

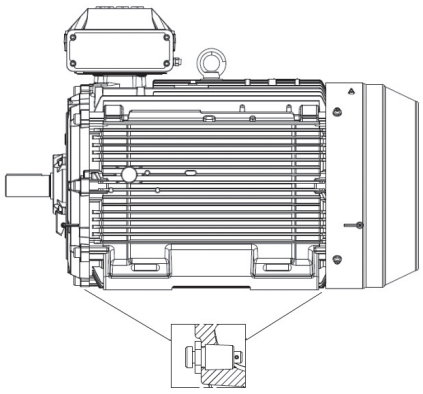
Motors can be supplied for foot mounting, flange mounting, and combinations of these.

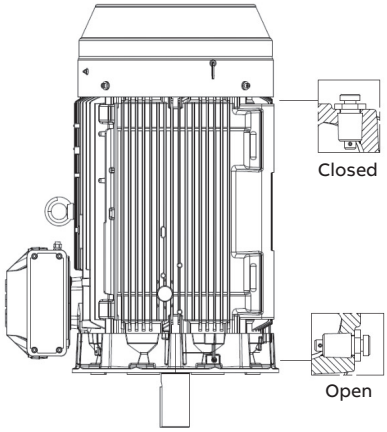
Drain holes

Flameproof Ex db eb motors are provided without drain holes and plugs as standard.

It's recommended that motors that will be operated in very humid or wet environments, and especially under intermittent duty, should be provided with drain holes with plugs to ensure that water possibly condensed inside the enclosure can easily be drained. Flameproof drain plugs which can be easily opened and closed are available as an option for motors in frame size 160 and larger. Please refer to the variant code section, variant 448 under heading "Drain holes".

When mounting arrangement differs from foot mounted IM B3, mention variant code 066 when ordering to ensure the drain plug is mounted in the lowest position.





Mechanical design
Lifting lugs

All motors are equipped with lifting lugs for safe lifting of the motor. The lugs are designed for lifting the motor only, they may not be used for lifting the motor and the equipment on which it is mounted.

Frame size	Type of lugs	Horisontal mounting B3, B35	Vertical mounting V1, V3
80-112	Integrated in casting	2 pcs close to ter- minal box on top	2 pcs close to terminal box
132	Integrated in casting	1 pcs at D-end, 1 pcs at N-end	1 pcs at D-end, 1 pcs at N-end
160-180	Detachable eye bolt	1 pcs close to terminal box on top	2 pcs, either at N- end or D-end depending on need
200-250	Integrated in casting	1 pcs at D-end, 1 pcs at N-end	2 pcs at N-end, 2 pcs at D-end
280-450	Detachable eye bolt	1 pcs close to terminal box on top	2 pcs, either at N- end or D-end depending on need

Mechanical design

Heating elements

Heating elements are installed on stator winding coil heads to keep the winding dry and free of corrosion in humid conditions. The power of the heating elements is shown in the table. You can order heating elements with variant code 450 or 451.

Motor size	80	90	100	112	132	160	180
Power (W)	25	25	25	25	25	25	25

Motor size	200	225	250	280	315	355	400	450
Power (W)	25	60	60	60	2x60	2x60	2x60	2x100

Motors for marine applications mounted on open deck may have heating element powers differing from the ones shown in this table.

Mechanical design
Bearings

ABB's flameproof motors are normally fitted with single-row deep-groove grease lubricated ball bearings, as shown in the table below.

If the bearing at the D-end is replaced with a roller bearing (NU- or NJ-), higher radial forces can be handled. Roller bearings are suitable for belt-drive applications and can be ordered with variant code 037. Note that the possibility to have roller bearing at D-end is limited on larger flameproof motors due to the higher radial clearance in bearing and possible bending of shaft together with narrow flame path between shaft and inner bearing cover, especially in conjunction with gas group IIC design.

Standard and alternative designs

Motor size	Number of poles	Standard design		Alternative designs		
		Deep groove ball bearings		Roller bearings (037)	Roller bearings (037)	Angular contact ball bearings (058)
		D-end	N-end	D-end, gas group IIB	D-end, gas group IIC	D-end
80	2 - 8	6205-2Z/C3	6204-2Z/C3	NA	NA	NA
90	2 - 8	6205-2Z/C3	6204-2Z/C3	NA	NA	NA
100	2 - 8	6206-2Z/C3	6205-2Z/C3	NA	NA	NA
112	2 - 8	6206-2Z/C3	6206-2Z/C3	NA	NA	NA
132	2 - 8	6208-2Z/C3	6208-2Z/C3	NA	NA	NA
160	2 - 12	6309/C3	6309/C3	NU 309 ECP/C3	NU 309 ECP/C3	NA
180	2 - 12	6310/C3	6310/C3	NU 310 ECP/C3	NU 310 ECP/C3	NA
200	2	6312M/C3	6210M/C3	NU 312 ECP/C3	NU 312 ECP/C3	NA
	4 - 12	6312/C3	6310/C3	NU 312 ECP/C3	NU 312 ECP/C3	NA
225	2	6313M/C3	6312M/C3	NU 313 ECP/C3	NU 313 ECP/C3	NA
	4 - 12	6313/C3	6312/C3	NU 313 ECP/C3	NU 313 ECP/C3	NA
250	2	6315M/C3	6313M/C3	NU 315 ECP/C3	NA	NA
	4 - 12	6315/C3	6313/C3	NU 315 ECP/C3 [1)]	NA	NA
280	2	6316/C3	6316/C3		NA	7316 B
	4 - 12	6316/C3	6316/C3	NU 316 ECP/C3 [1)]	NA	7316 B
315	2	6316/C3	6316/C3		NA	7316 B
	4 - 12	6319/C3	6316/C3	NU 319 ECP/C3	NA	7319 B
355	2	6316M/C3	6316M/C3	NA	NA	7316 B
	4 - 12	6322/C3	6316/C3	NA	NA	7322 B
400	2	6317M/C3	6317M/C3	NA	NA	7317 B
	4 - 12	6324/C3	6319/C3	NA	NA	7324 B
450	4 - 12	6326M/C3	6322/C3	NA	NA	7326 B

[1)] On request

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 label is attached to motors when transport locking is used.

When high axial forces are involved, angular-contact ball bearings should be used. 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 optimal bearing system design is chosen. The variant codes for ordering angular-contact ball bearings are 058 and 059.

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

Bearing seals

Table on next page present the standard and alternative and types of bearing seals per motor size.

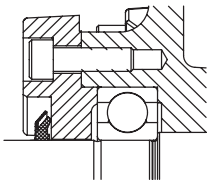
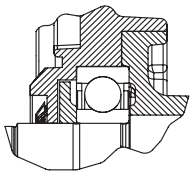
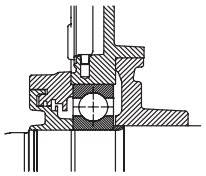
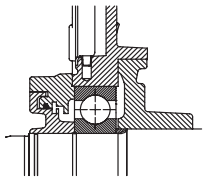
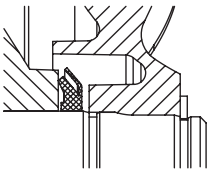
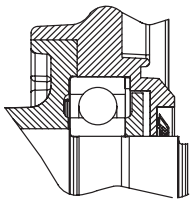
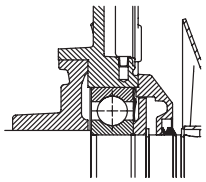
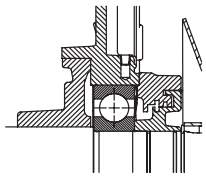
Bearing seals

Motor size	Number of poles	Standard design		Alternative design	
		D-end	N-end	Radial seal at D-end (variant code 072) [1]	Labyrinth seal at D-end (variant code 783) [1]
80	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
90	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
100	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
112	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
132	2 - 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
160	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
180	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
200	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
225	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
250	2 - 12	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
280	2 - 12	Labyrinth seal	V-ring [2]	NA	Standard
315	2 - 12	Labyrinth seal	V-ring [2]	NA	Standard
355	2 - 12	Labyrinth seal	V-ring [2]	NA	Standard
400	2	Labyrinth seal	Labyrinth seal	NA	Standard
400	4 - 12	Labyrinth seal	V-ring	NA	Standard
450	4 - 12	Labyrinth seal	Labyrinth seal	NA	Standard

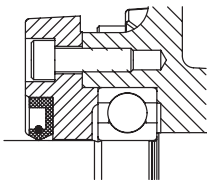
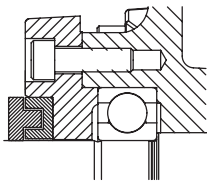
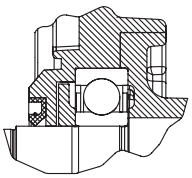
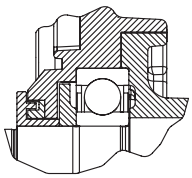
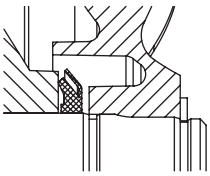
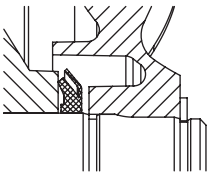
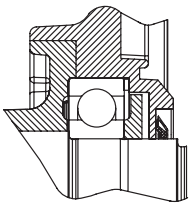
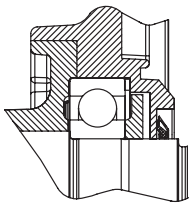
[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request

[2] V-ring on motors with efficiency class IE2, labyrinth seal on IE3 and IE4 motors

Standard design

D-end				
N-end				
Motor size, seal type D-end/N-end	80-132, gamma/gamma seal	160-250, gamma/gamma seal	280-355, 400 4-12 poles, labyrinth/V-ring seal	400 2 poles, 450 4-12 poles, labyrinth/labyrinth seal

Alternative design

D-end				
N-end				
Motor size, seal type D-end/N-end	80-132, VC072 radial/ gamma seals	80-132, VC783 labyrinth/ gamma seals	160-250, VC072 radial/ gamma seals	160-250, VC783 labyrinth/gamma seals

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 up to 315 ≥ 100,000 hours.

Lubrication

On delivery, motors in frame size 160 and above are pre-lubricated with high-quality grease.

Before first start-up, see instructions for re-lubrication and recommended grease in the installation, operation, maintenance and safety manual delivered together with the motor, or see the lubrication plate on the motor.

Motors with bearings greased for life

Motors in frame sizes 80-132 are equipped with bearings greased for life, while this is available as an option for frame sizes 160-250. Bearings are lubricated with high-quality, high-temperature grease. Bearing types are stated on the rating plate. The approximate lifetime of bearings in four-pole motors is about 40 000 duty hours. Lifetime is subject to the load conditions of the application run by the motor.

Motors with relubrication nipples

In frame sizes 160-450, the bearing system is provided with valve discs 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 3600 r/min	Speed 3000 r/min	Speed 1800 r/min	Speed 1500 r/min	Speed 1000 r/min	Speed 500-900 r/min
Ball bearings								
Lubrication intervals in duty hours								
160	13	13	7100	8900	14300	16300	20500	21600
180	15	15	6100	7800	13100	15100	19400	20500
200	20	15	4300	5900	11000	13000	17300	18400
225	23	20	3600	5100	10100	12000	16400	17500
250	30	23	2400	3700	85000	10400	14700	15800
280	35	35	1900	3200	-	-	-	-
280	40	40	-	-	7800	9600	13900	15000
315	35	35	1900	3200	-	-	-	-
315	55	40	-	-	5900	7600	11800	12900
355	35	35	1900	3200	-	-	-	-
355	70	40	-	-	4000	5600	9600	10 700
400	40	40	1500	2700	-	-	-	-
400	85	55	-	-	3200	4700	8600	9700
450	95	70	-	-	2500	3900	7700	8700

Lubrication intervals in duty hours for roller bearings

Frame size	Amount of grease g/ bearing	Amount of grease g/N-end	Output kW	Speed 3600 r/min	Speed 3000 r/min	Output kW	Speed 1800 r/min	Speed 1500 r/ min	Output kW	Speed 1000 r/min	Output kW	Speed 500-900 r/ min
Roller bearings												
Lubrication intervals in duty hours												
160	13	13	all	3600	4500	all	7200	8100	all	10 300	all	10 800
180	15	15		3000	3900	all	6600	7500	all	9700	all	10 200
200	20	15		2100	3000	all	5500	6500	all	8600	all	9200
225	23	20		1800	1600	all	5100	6000	all	8200	all	8700
250	30	23		1200	1900	all	4200	5200	all	7300	all	7900
280	40	40		-	-	all	4000	5300	all	7000	all	8500
315	55	40		-	-	all	2900	3800	all	5900	all	6500

Mechanical design
Radial forces

Pulley diameter

When the desired bearing life has been determined, the minimum permissible pulley diameter can be calculated with FR as follows:

$$D = \frac{1.9 \cdot 10^7 \cdot K \cdot P}{n \cdot F_R}$$

Where:	
D:	pulley diameter, mm
P:	power requirement, kW
n:	motor speed, r/min.
K:	belt tension factor, dependent on belt type and type of duty. A common value for V-belts is 2.5
F_R:	permissible radial force, refer to tables below.

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 L_{10h} of 40 000 hours per motor size.

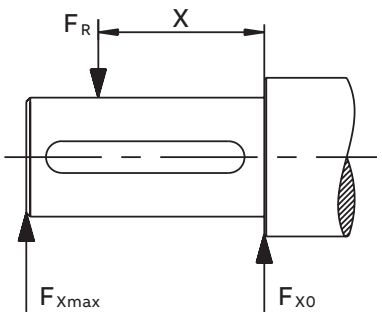
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft affects permissible forces.

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 radial forces

Motor size	No. of poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings L10h = 40,000h				Roller bearing L10h = 40,000h			
			Mounting arrangement IM B3				Mounting arrangement IM B3			
			Gas group IIB		Gas group IIC		Gas group IIB		Gas group IIC	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
80	2	40	638	557	638	557	NA		NA	
	4	40	804	702	804	702	NA		NA	
	6	40	920	804	920	804	NA		NA	
	8	40	1013	884	1013	884	NA		NA	
90	2	50	642	546	642	546	NA		NA	
	4	50	809	690	809	690	NA		NA	
	6	50	926	790	926	690	NA		NA	
	8	50	1019	870	1019	870	NA		NA	
100	2	60	886	751	886	751	NA		NA	
	4	60	1117	946	1117	751	NA		NA	
	6	60	1279	1083	1279	1083	NA		NA	
	8	60	1325	1122	1325	1122	NA		NA	
112	2	60	884	747	884	747	NA		NA	
	4	60	1114	941	1114	941	NA		NA	
	6	60	1276	1078	1276	1078	NA		NA	
	8	60	1321	1116	1321	1116	NA		NA	
132	2	80	1337	680	1337	680	NA		NA	
	4	80	1685	740	1685	740	NA		NA	
	6	80	1930	750	1930	750	NA		NA	
	8	80	1999	750	1999	750	NA		NA	
160 ML_	2	110	2530	2120	2530	2120	6400	1800	6400	1800
	4	110	3180	2670	3180	2670	7600	1800	7600	1800
	6	110	3650	3040	3650	3040	7600	1800	7600	1800
	8	110	4020	3040	4020	3040	7600	1800	7600	1800
180 ML_	2	110	2900	2440	2900	2440	6970	2700	6970	2700
	4	110	3660	3080	3660	3080	8500	2700	8500	2700
	6	110	4190	3520	4190	3520	8500	2700	8500	2700
	8	110	4620	3880	4620	3880	8500	2700	8500	2700
200 ML_	2	110	3830	3150	3830	3150	9510	7000	9510	4200
	4	110	4820	3980	4820	3980	11710	7000	11710	4200
	6	110	5520	4550	5520	4550	13230	7000	13230	4200
	8	110	6080	5000	6080	5000	14420	7000	14420	4200
225 SM_	2	110	4350	3660	4350	3660	11650	7000	9300	3000
	4	140	5490	2800	5490	2800	14340	7200	9300	2200
	6	140	6280	2800	6280	2800	16190	7200	9300	2200
	8	140	6920	2800	6920	2800	17300	7200	9300	2200
250 SM_	2	140	5390	4350	5390	4350	15420	6700	NA	
	4	140	6790	5480	6790	5480	18980	9200	NA	
	6	140	7760	6270	3000	2800	21000	9200	NA	
	8	140	8550	6900	3000	2800	21000	9200	NA	
280 SM_	2	140	5835	4900	[1]		16500	6000	NA	
	4	140	7360	6110	[1]		20100	9200	NA	
	6	140	8425	6980	[1]		22690	9200	NA	
	8	140	9165	7700	[1]		24740	9200	NA	
315 SM_	2	140	5815	4960	[1]		16540	6000	NA	
	4	170	9025	7470	[1]		26590	9600	NA	
	6	170	10310	8530	[1]		30030	10160	NA	
	8	170	11370	9410	[1]		32740	10105	NA	
315 ML_	2	140	5855	5080	[1]		16705	6205	NA	
	4	170	8980	7590	[1]		26550	13705	NA	
	6	170	10255	8665	[1]		29970	13710	NA	
	8	170	11335	9385	[1]		32730	9945	NA	
315 LK_	2	140	5860	5195	[1]		16885	6080	NA	
	4	170	9185	7945	[1]		27225	13475	NA	
	6	170	10475	9060	[1]		30735	13500	NA	
355 SM_	2	140	5790	5085	[1]		NA		NA	
	4	210	11930	9890	[1]		NA		NA	
	6	210	11930	9890	[1]		NA		NA	
	8	210	11930	9890	[1]		NA		NA	
355 ML_	2	140	5770	5120	[1]		NA		NA	
	4	210	11980	10090	[1]		NA		NA	
	6	210	11980	10090	[1]		NA		NA	
	8	210	11980	10090	[1]		NA		NA	

Motor size	No. of poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings L10h = 40,000h				Roller bearing L10h = 40,000h			
			Mounting arrangement IM B3				Mounting arrangement IM B3			
			Gas group IIB		Gas group IIC		Gas group IIB		Gas group IIC	
			F_{x0}(N)	F_{xmax}(N)	F_{x0}(N)	F_{xmax}(N)	F_{x0}(N)	F_{xmax}(N)	F_{x0}(N)	F_{xmax}(N)
355 LK_	2	140	5500	5000	[1]		NA		NA	
	4	210	12050	10450	[1]		NA		NA	
	6	210	12050	10450	[1]		NA		NA	
	8	210	12050	10450	[1]		NA		NA	
400 L_	2	170	[1]		[1]		NA		NA	
	4	210	[1]		[1]		NA		NA	
	6	210	[1]		[1]		NA		NA	
	8	210	[1]		[1]		NA		NA	
400 LK_	2	170	[1]		[1]		NA		NA	
	4	210	[1]		[1]		NA		NA	
	6	210	[1]		[1]		NA		NA	
	8	210	[1]		[1]		NA		NA	
450 L_	4	210	[1]		[1]		NA		NA	
	6	210	[1]		[1]		NA		NA	
	8	210	[1]		[1]		NA		NA	

[1] Only allowed for direct coupling duty

Mechanical design
Axial forces

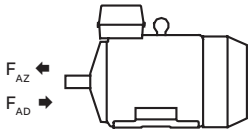
— 01 Mounting arrangement IM B3

02 Mounting arrangement IM V1

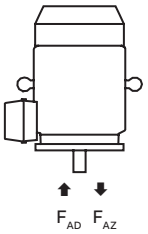
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



01



02

Permissible axial forces

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3		Mounting arrangement IM V1	
			Deep groove ball bearings		Deep groove ball bearings	
			L_{10} = 40,000 h		L_{10} = 40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
80	2	40	678	290	711	269
	4	40	835	447	888	411
	6	40	954	566	998	541
	8	40	1049	661	1093	636
90	2	50	676	286	727	252
	4	50	834	443	907	402
	6	50	950	559	1028	515
	8	50	1046	656	1114	614
100	2	60	969	339	1053	283
	4	60	1186	556	1301	489
	6	60	1346	716	1447	649
	8	60	1477	847	1576	788
112	2	60	962	330	1099	236
	4	60	1179	547	1331	445
	6	60	1337	705	1493	602
	8		1467	835	1624	731
132	2	80	1447	491	1577	405
	4	80	1763	807	1963	680
	6	80	1999	1043	2190	917
	8	80	2192	1236	2412	1110
160 ML_	2	110	2050	1435	2440	1155
	4	110	2620	2005	3160	1635
	6	110	3055	2440	3590	2060
	8	110	3410	2790	3950	2430
180 ML_	2	110	2570	1470	3075	1100
	4	110	3230	2130	3975	1630
	6	110	3730	2630	4420	2130
	8	110	4140	3040	4890	2550
200 ML_	2	110	3295	2030	3960	1545
	4	110	4170	2910	5030	2290
	6	110	4800	3535	5820	2780
	8	110	5360	4100	6370	3430
225 SM_	2	110	3710	2240	4515	1650
	4	140	4690	3225	5770	2495
	6	140	5405	3935	6660	3080
	8	140	6010	4540	7280	3700
250 SM_	2	140	5200	2100	6175	1380
	4	140	6400	3310	7645	2410
	6	140	7260	4160	8930	3035
	8	140	8000	4900	9690	3780
280 SM_	2	140	4870	2870	6330	1650
	4	140	6140	4140	7870	2760
	6	140	7040	5040	9150	3515
	8	140	7840	5840	10040	4150
315 SM_	2	140	4780	2780	6620	1270
	4	170	7155	5155	9565	3240
	6	170	8205	6205	11230	3750
	8	170	9180	7180	11935	4780
315 ML_	2	140	4730	2730	7210	940
	4	170	7055	5055	10300	2700
	6	170	8075	6075	12330	3070
	8	170	9060	7070	13310	4210
315 LK_	2	140	4620	2620	7910	320
	4	170	6980	4980	10875	2300
	6	170	7980	5980	13005	2565
	8	170	8900	6900	14100	3450
355 SM_	2	140	1660	5460	4970	2885
	4	210	5760	9390	10890	4840
	6	210	7055	10855	12370	6235
	8	210	8290	12090	14980	7530
355 ML_	2	140	1570	5370	5860	2360
	4	210	5640	9440	11810	5130
	6	210	6870	10670	14718	5215
	8	210	8100	11900	15970	6540

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3		Mounting arrangement IM V1	
			Deep groove ball bearings		Deep groove ball bearings	
			L_{10} = 40,000 h		L_{10} = 40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
355 LK_	2	140	1440	5240	6600	1630
	4	210	5460	9260	12850	4080
	6	210	6680	10480	15450	4550
	8	210	[1]	[1]	[1]	[1]
400 L,	2	170	810	5810	8010	730
LK_	4	210	4250	10250	13680	3650
	6	210	5410	11410	16610	3840
	8	210	[1]	[1]	18480	4530
450 L_	2	170	-	-	-	-
	4	210	-	-	-	-
	6	210	5630	11630	22090	150
	8	210	6920	12920	23600	1430

[1] On request

Terminal box

Standard terminal box

Protection and mounting options

The degree of protection for the standard terminal box is IP 55.It complies with the requirements of the protection method ‘e’ protection level ‘c’ increased safety and prevents all ignition sources such as sparks, excessive over heating etc. The features of the terminal box are: No self loosening terminals, compliance with creepage and clearance distances as defined in standard for increased safety ‘ec’ protection.

By default, terminal boxes are mounted on top of the motor at D-end. Side mounted terminal box is possible in frame sizes 160 and 400. Mounting at N-end is also possible for the larger frame sizes. Please refer to the variant code section for more details.

Turnability

The standard terminal boxes for motor sizes 80-250 can be turned 4*90° and in sizes 280-450 2*180° after delivery. For sizes 280-450 is also mounting of terminal box with opening towards D or N-end possible using the relevant variant codes when ordering.

Cable entries

Terminal box is provided as standard with tapped holes for cable glands, no cable glands are included as standard. The entry holes are closed with Ex eb approved blanking plugs made of nickel-plated brass, one of the main entries is closed with a plastic plug as transport and storage protection. Very large motors have an angle adapter between the terminal box and gland plate. Please refer to the table on next page for further information about amount and size of threaded holes, plugs provided as standard.

Different types of cable glands are available as option, suitable for either armoured and non-armoured cables, please refer to the Terminal box alternatives section for more details.

Cable type and terminations

Terminations are suitable for copper and aluminum cables(Al- cables on request for motor sizes 80 to 250). Cables are connected to terminals by cable lugs, which are not included in the delivery.

Earthing bolts

The motors are as standard provided with at least one earthing bolt inside the terminal box and another on the frame. The earthing bolt on the frame is located on top close to the terminal box for easy access from either side of the motor. As an option can also earting bolts on the feet be provided, please refer to variant code section.

Ordering

To ensure the delivery of desired terminations and cable entries for the motor, state the cable type, quantity, size, outer diameter and possibly type of cable glands needed when ordering.

See section Variant codes for all options available.

Standard delivery

Standard delivery if no other information is provided. For other network voltages than voltage code D (see Ordering information section).

Cable entries for supply cables Motor size	Pole number	Terminal box type	Amount and size of threaded holes	Cable gland	Ex d plug	Max. connectable core cross-section mm² /phase	Number and size of terminal bolts, 6 x
IE2 motors							
80 - 90	2-8	25	1 x M25x1.5	-	-	10	M5
100 - 132	2-8	25	2 x M32x1.5	-	1 x M32	10	M5
160 - 180	2-8	63	2 x M40x1.5	-	1 x M40	1x35	M6
200 - 250	2-8	160	2 x M50x1.5	-	1 x M50	1x70	M10
280 SM_	2-8	210	2 x M63x1.5	-	1 x M63	2x150	M12
315 SM_, ML_	2-8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SMA - SMC	2-4	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 SMA, SMB	6-8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SMC	6	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 SMC	8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 ML_, LK_	2-8	750	2 x M75x1.5	-	1 x M75	4x240	M12
400	2-8	750	2 x M75x1.5	-	1 x M75	4x240	M12
450	6-8	750	2 x M75x1.5	-	1 x M75	4x240	M12

IE3 motors							
80-90	2-8	25	1 x M25x1.5	-	-	10	M5
100-132	2-8	25	2 x M32x1.5	-	1 x M32	10	M5
160 - 180	2-8	63	2 x M40x1.5	-	1 x M40	1x35	M6
200 - 250	2-8	160	2 x M50x1.5	-	1 x M50	1x70	M10
280	2-8	210	2 x M63x1.5	-	1 x M63	2x150	M12
315	2-8	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SM_	2-4	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 SMA, SMB	6	370	2 x M75x1.5	-	1 x M75	2x240	M12
355 SMC	6	750	2 x M75x1.5	-	1 x M75	4x240	M12
355 ML_, LK_	2-6	750	2 x M75x1.5	-	1 x M75	4x240	M12

Auxiliary cable entries				
80 - 132	2-8	1 x M20x1.5	- 1xM20	1 x 2,5 mm² per terminal
160-450	2-8	2 x M20x1.5	- 1xM20	1 x 2,5 mm² per terminal

Motor size	Earthing on frame	Earthing in main terminal box
80 - 132	M6	M6
160 - 180	M6	M6
200 - 250	M8	M8
280 - 450	M10	2xM10

Terminal box

Terminal box dimensions

01 Motor sizes 80 to 132

02 Motor sizes 80 to 132

03 Motor sizes 160 to 180

04 Motor sizes 200 to 250

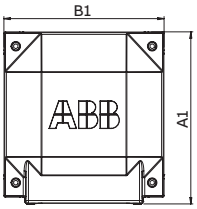
05 Motor sizes 280 to 315

06 Motor sizes 355 to 400

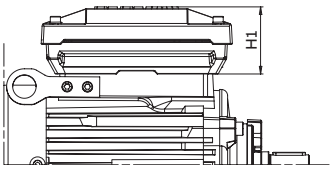
07 Motor sizes 450

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

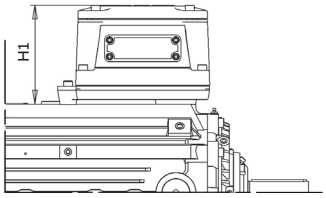
Terminal boxes, standard with 6 terminals



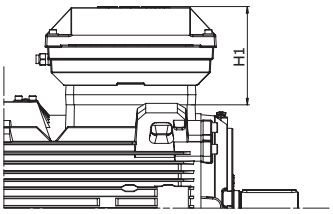
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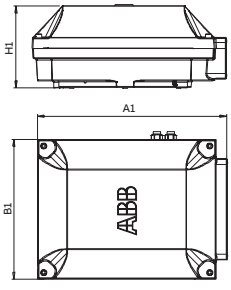
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03

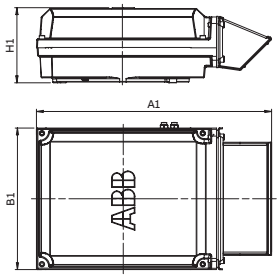


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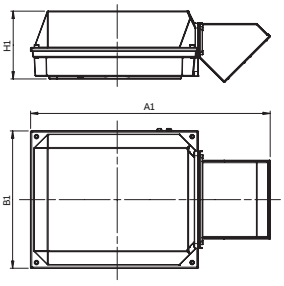


05

Terminal box types acc. to current capacity	A1 mm	B1 mm	H1 mm	Gland plate opening
25	208	180	74	B
63	243	243	178	2x B
160	352	319	186	B
210	416	306	186	C
370	451	347	200	D
750 with E-D adapter	686	413	219	D
750 without E-D adapter	523	413	219	E
1200 with E-2D adapter	1000	578	285	2x D
1200 without E-2D adapter	697	578	285	E

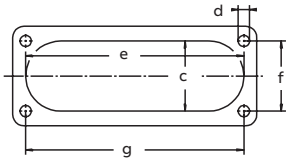


06



07

Dimensions of opening for gland plate



Gland plate opening	c mm	e mm	f mm	g mm	d thread
B	32	115	30	120	M6
C	65	193	62	193	M8
D	100	300	80	292	M10
E	115	370	100	360	M12

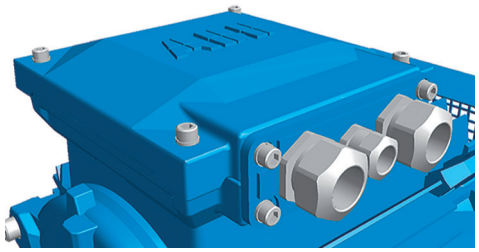
Terminal box

Terminal boxes and boards

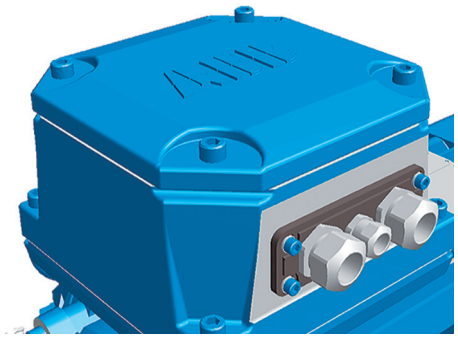
The pictures below show standard terminal boxes and the corresponding terminal boards for various motor sizes.

Cable glands are not delivered as standard.

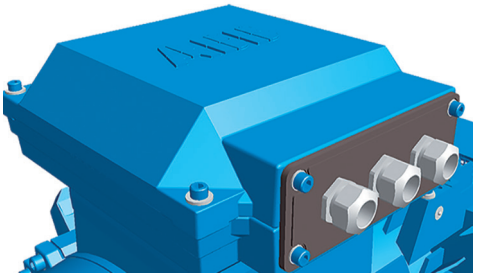
Terminal boxes



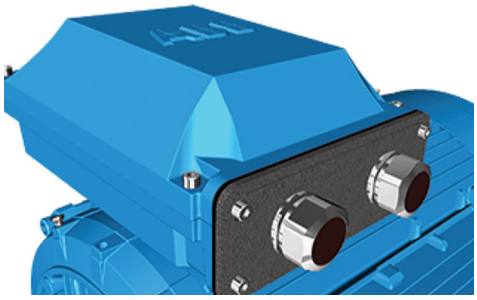
01



02



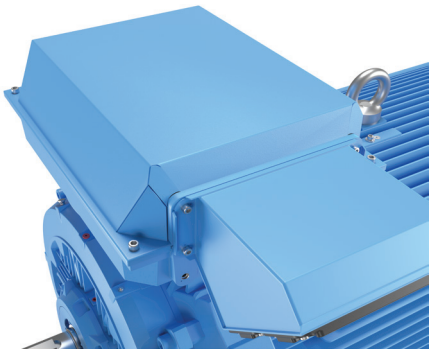
03



04



05



06

01 Terminal box for motor sizes 80 to 132

02 Terminal box for motor sizes 160 to 180

03 Terminal box for motor sizes 200 to 250

04 Terminal box for motor sizes 280 to 315

05 Terminal box for motor sizes 355 and 400. Size 400 and 355ML 2-4 pole does have 45° adapter as shown in picture 06

06 Terminal box for motor size 450 with 45° adapter

Terminal boards

07 Terminal board for motor sizes 80 to 132

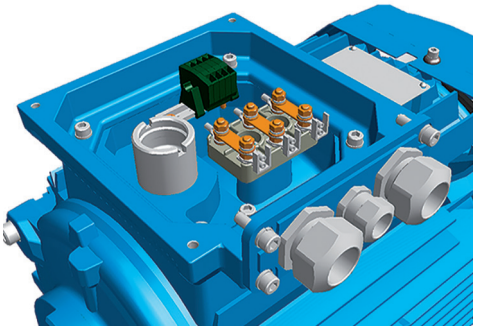
08 Terminal board for motor sizes 160 to 180

09 Terminal board for motor sizes 200 to 250

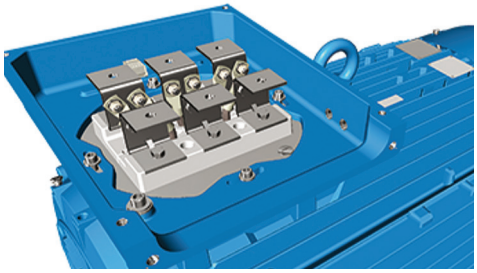
10 Terminal board for motor sizes 280 to 315

11 Terminal board for motor sizes 355 to 400

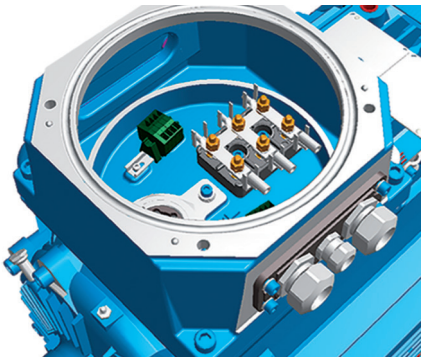
12 Terminal board for motor size 450



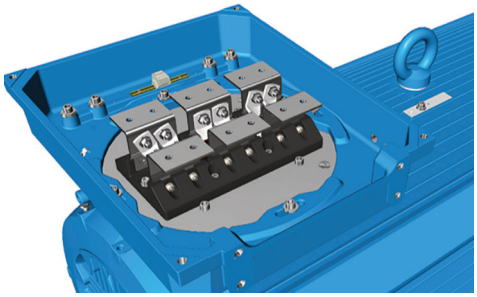
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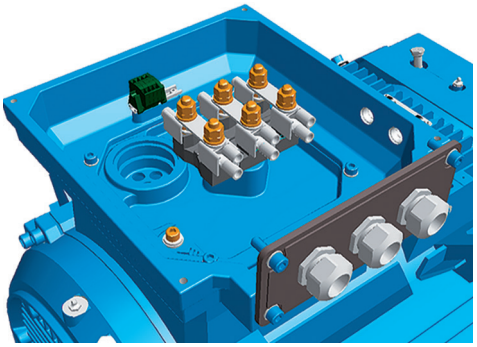
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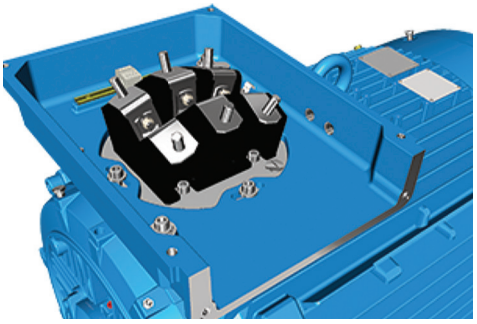
08



12



09



10

Terminal box

Terminal box alternatives

Optional cable termination parts

There is a broad selection of cable termination accessories available to allow a safe and reliable termination of one or several supply cables. The most common options are explained in this chapter.

How to order

- Check first that the terminal box itself allows mounting of the desired cable and cores (refer to table showing standard delivery for each motor size). If very large cable are used might it be necessary to use a larger terminal box and larger terminal board than standard.
- Select the right cable gland(s) or cable sealing end unit based on the diameter of the cables(s) and suitability for cable type.
- Select appropriate adapter or flange to allow mounting on opening in terminal box.
- Note that turning the terminal box might be prevented by use of some adapters

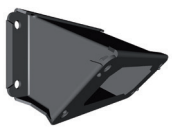
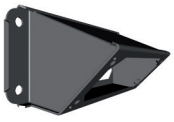
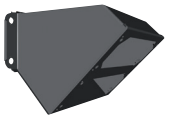
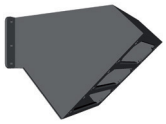
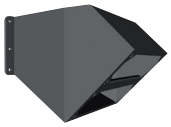
Ordering example

Ordering example for M3KP motors

Motor and supply cables	110kW, 4-pole, 400V 50Hz, IE3. Cables needed: 1 pcs outer diameter 42mm steel wire armoured cable, single cross section 120 mm2. Cables coming from below.
Motor	M3KP 315SMC 4, B3
Adapter (to allow entry of cables coming from below)	Variant code 293 (adaptor D-D)
Cable glands Ex d/ Ex e suitable for armoured cables (an M50 gland will suit this cable)	Variant code 734 (specify cable dimensions)
Gland plate made of steel drilled and tapped with 1 pcs M50 hole (non-std size)	Variant code 554 (1 pcs M50 x 1.5 threaded hole to be specified)

Optional adapters

To allow easy termination of cables entering the terminal box from above or below, an angle adapter is recommended. These can be used to allow the mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the ‘terminal box opening’ column in section Standard terminal box.

Adapater						
Variant code	292	293	294	295	296	444
Opening to terminal box	C	D	E	E	E	E
Flange or opening for end unit	C	D	D	2 x D	3 x D	2 x E
Material	Cast iron	Cast iron	Cast iron	Steel	Steel	Steel
Notes				Included as standard delivery for some types.	Only possible on type 1200 terminal box.	Only possible on type 1200 terminal box.

Cable glands

The motors are delivered as standard with plugged cable entries as described in the previous section. There is a broad selection of different type of cable glands available which are suitable for different types of cable and outer diameter ranges. As it is very difficult to change the amount and size of cable glands afterwards, is it extremely important that these are selected carefully.

Size of threaded opening for cable gland	**NPT (Variant code 730 added)**	**Cable gland Ex d IIC for armoured cable with double sealing (Variant code 734)**		**Cable gland Ex d IIC for non-armoured cable (Variant code 735)**
Metric (std)		**Cable outer diameter, mm**	**Inner sheath diameter, mm**	**Cable outer diameter, mm**
M16 x 1.5	4-12	4-8	7-12	4.5-8
M20 x 1.5	4-12	4-12	10-16	6-10
M25 x 1.5	-	-	13.5-19	10-14
M25 x 1.5 *	10-18	10-18	19-25	14-18
M32 x 1.5	14-24	14-24	25-30	18-23
M40 x 1.5	22-32	22-32	30-36	23-28
M50 x 1.5	-	-	36-40	28-32
M50 x 1.5 *	26-35	26-35	40-46	32-37
M63 x 1.5	-	-	46-53	37-43
M63 x 1.5 *	35-45	35-45	53-60	43-50
M75 x 1.5	46-62	46-62	58-70	48-60
M90 x 1.5	-		78-90	68-80
M100 x 1.5	-		88-100	78-90

* = High capacity version, delivered as standard with the variant code.

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

The motors are delivered as standard with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If glands with NPT threads will be used must variant code 730 be ordered. If nothing else is stated on the ordered will the sizes in tables below be delivered. If cable glands are also needed must either variant 734 or 735 be added.

Motor frame size	Main cable entries	NPT plug
80-112	1 x ¾”	-
132	2 x ¾”	1 x ¾”
160-180	2 x 1 ¼”	1 x 1 ¼”
200-250	2 x 1 ½”	1 x 1 ½”
280	2 x 2”	1 x 2”
315	2 x 21/2”	1 x 21/2”
355-450	2 x 3”	1 x 3”

Motor frame size	Cable entries for auxiliaries	NPT plug
80-112	1 x ¾”	-
132	1 x ¾”	1 x ¾”
160-450	2 x ¾”	2 x ¾”

Threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands does not suit the gland size and cable that will be used can openings of nonstandard size also be delivered, either by fitting a 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 using variant codes 554 and 555.

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

Gland plates of non-standard material

The standard material used in gland plates is steel. Gland plates made of stainless steel are optional, either with cable glands or blind without threaded holes. Please refer to the variant code section for more information.

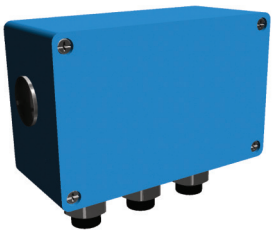
Auxiliary terminal box

It is possible to equip motors from frame size 132 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of aluminum, except frame sizes 160-250 where cast iron boxes are used.

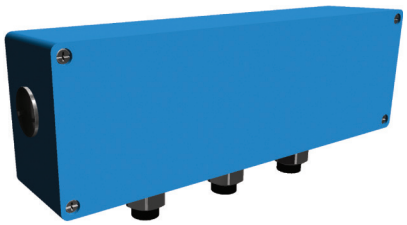
Connection terminals are of spring-loaded type for quick and easy connection. These are suitable for up to 2.5 mm^2 wires. The auxiliary terminal boxes are equipped with an earthing terminal. The first auxiliary terminal box is located on the right-hand side at D-end as standard.

The standard cable entry is 2 x M20 with plugged entries. If cable glands are needed must these be ordered using the variant codes described earlier in this section.

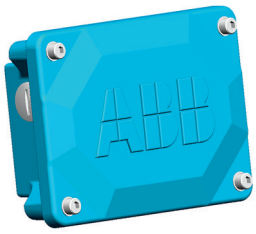
Related variant codes	
380	Separate terminal box for temperature detectors
418	Separate terminal box for auxiliaries
567	Separate terminal box material: cast Iron
568	Separate terminal box for heating elements



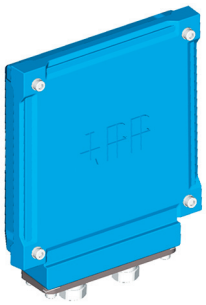
Small auxiliary aluminum terminal box for motor sizes 280-450 (variant codes 418, 568, 380, 569). The size of terminal box ordered with these codes depends on the number of accessories ordered. 80 x 125 mm, max 12 strips. Earthing size M4.



Large auxiliary aluminum terminal box for motor sizes 280-450. 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.



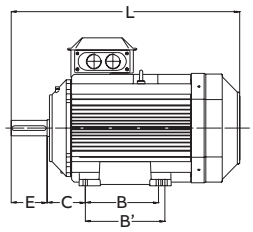
Auxiliary cast iron terminal box for motor size 160-250 (variant code 418). 111 x 162 mm.

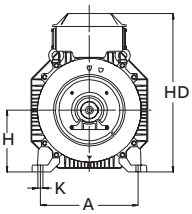


Auxiliary cast iron terminal box for motor sizes 280-450 (variant code 567). 208 x 180 mm.

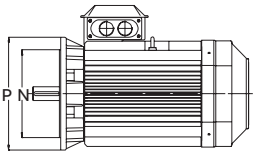
Dimension drawings

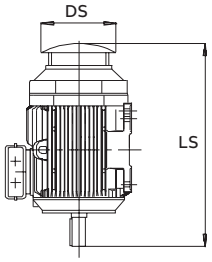
Flameproof motors, Ex db eb



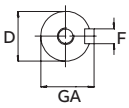


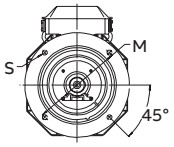
Foot-mounted motor IM 1001, IM B3



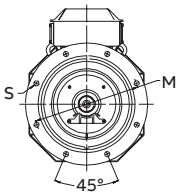


Flange-mounted motor IM 3001, IM B5

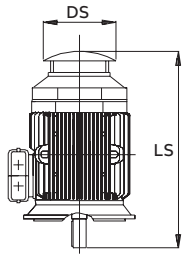




Sizes 80 to 200



Sizes 225 to 450



Protective roof, variant code 005

Motor size	IM 1001, IM B3 AND IM 3001, IM B5										IM 1001, IM B3								IM 3001, IM B5					Protective roof		
	D		GA		F		E		L max		O [1]	A	B	B'	C	HD	K	H	M	N	P	S	DS	LS	
	poles		poles		poles		poles		poles															poles		
	2	4-8	2	4-8	2	4-8	2	4-8	2	4-8														2	4-8	
80	19	19	21.5	21.5	6	6	40	40	409	409	20	125	100	112	50	250	10	80	165	130	200	12	157	444	444	
90	24	24	27	27	8	8	50	50	440	440	20	140	100	125	56	269	10	90	165	130	200	12	185	475	475	
100	28	28	31	31	8	8	60	60	501	501	25	160	140	160	63	297	12	100	215	180	250	14.5	200	536	536	
112	28	28	31	31	8	8	60	60	485	485	25	190	140	–	70	309	12	112	215	180	250	14.5	213	526	526	
132 IE2	38	38	41	41	10	10	80	80	531	531	30	216	140	178	89	346	12	132	265	230	300	14.5	274	582	582	
132 IE3	38	38	41	41	10	10	80	80	576	576		216	140	178	89	346	12	132	265	230	300	14.5	274	627	627	
160	42	42	45	45	12	12	110	110	808	808	45	254	210	254	108	499	14.5	160	300	250	350	18.5	328	852	852	
180	48	48	51.5	51.5	14	14	110	110	826	826	50	279	241	279	121	539	14.6	180	300	250	350	18.5	359	876	876	
200	55	55	59	59	16	16	110	110	774	774	70	318	267	305	133	573	18.5	200	350	300	400	18.5	414	844	844	
200 [2]	55	55	59	59	16	16	110	110	824	824	70	318	267	305	133	573	18.5	200	350	300	400	18.5	414	844	844	
225	55	60	59	64	16	18	110	140	841	871	80	356	286	311	149	620	18.6	225	400	350	450	18.5	462	921	951	
225 [2]	55	60	59	64	16	18	110	140	871	901	80	356	286	311	149	620	18.6	225	400	350	450	18.5	462	921	951	
250	60	65	64	69	18	18	140	140	875	875	90	406	311	349	168	683	24	250	500	450	550	18.5	506	965	965	
250 [2]	60	65	64	69	18	18	140	140	895	895	90	406	311	349	168	683	24	250	500	450	550	18.5	506	965	965	
280	65	75	69	79.5	18	20	140	140	1090	1090	100	457	368	419	190	768	24	280	500	450	550	18	555	1192	1192	
315 SM_	65	80	69	85	18	22	140	170	1176	1206	115	508	406	457	216	858	30	315	600	550	660	23	624	1293	1323	
315 ML_	65	90	69	95	18	25	140	170	1285	1315	115	508	457	508	216	858	30	315	600	550	660	23	624	1404	1434	
315 LK	65	89	69	95	18	25	140	170	1446	1475	115	590	508	560/	216	858	28	315	600	550	660	23	624	1552	1589	
														710												
355 SM_	70	100	62.5	90	20	28	140	210	1409	1479	130	610	500	560	254	984	35	355	740	680	800	23	720	1526	1596	
355 ML_	70	100	62.5	90	20	28	140	210	1514	1584	130	610	560	630	254	984	35	355	740	680	800	23	720	1633	1703	
355 LK_	70	100	62.5	90	20	28	140	210	1764	1834	130	610	710	900	254	984	35	355	740	680	800	23	720	1881	1951	
400 L_	80	110	85	126	22	28	170	210	1851	1891	150	710	900	1000	224	1071	35	400	940	880	1000	28	810	1860	1900	
400 LK_	80	100	85	106	22	28	170	210	1851	1891	150	686	710	800	280	1071	35	400	740	680	800	24	810	1860	1900	
450	80	120	-	127	-	32	-	210	-	2071	180	800	1000	1120	250	1255	42	450	1080	1000	1150	28	On request			

[1] Required distance from fan cover air inlet to obstacle behind motor

[2] For IE3 motors

Tolerances:	
A, B	± 0.8
D, DA	ISO k6 < Ø 48mm
	ISO m6 > Ø 48mm
F, FA	ISO h9
H	-0.5
N	ISO j6
C, CA	± 0.8

Available B14 and B5 flange alternatives

Flange size	Variant code	Flange dimension				Motor size 80-132				
		P	M	N	S	80	90	100	112	132
FT100	258	120	100	80	M6	Std B14	NA	NA	NA	NA
FT115	260	140	115	95	M8	Opt.	Std B14	NA	NA	NA
FT130	229	160	130	110	M8	Opt.	Opt.	Std B14	Std B14	NA
FT165	236	200	165	130	M10	NA	NA	Opt.	Opt.	Std B14
FT215	246	250	215	180	M12	NA	NA	Opt.	Opt.	Opt.
FT265	256	300	265	230	M12	NA	NA	NA	NA	Opt.
FF100	257	120	100	80	7	Opt.	M	NA	NA	NA
FF115	259	140	115	95	10	Opt.	Opt.	NA	NA	NA
FF130	228	160	130	110	10	Opt.	Opt.	Opt.	Opt.	NA
FF165	235	200	165	130	12	Std B5	Std B5	Opt.	Opt.	Opt.
FF215	245	250	215	180	14.5	NA	NA	Std B5	Std B5	Opt.
FF265	255	300	265	230	14.5	NA	NA	NA	NA	Std B5

Std. B14 = Standard small flange for given frame size

Std. B5 = Standard large flange for given frame size

Opt. = optional flange for given frame size

NA = Not applicable

In all dimension drawings: The tables give the main dimensions in mm.

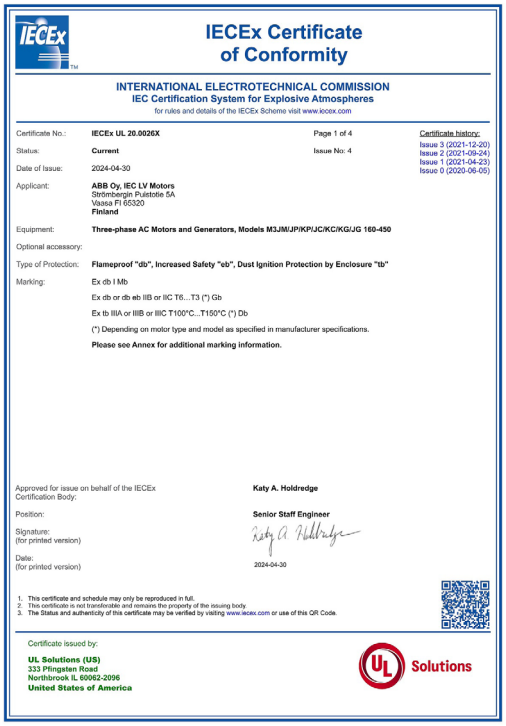
For detailed drawings please see our web-pages or contact ABB.

Certificate examples

01 IECEx Certificate of Conformity

02 EU Declaration of Conformity

03 EU Type Examination Certificate



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx UL 20.0026X — Page 1 of 4 — Certificate history: Issue 3 (2021-12-20), Issue 2 (2021-09-24), Issue 1 (2021-04-23), Issue 0 (2020-06-05)

Status: Current — Issue No: 4

Date of Issue: 2024-04-30

Applicant: ABB Oy, IEC LV Motors, Strömbergin Puistotie 5A, Vaasa FI 65320, Finland

Equipment: Three-phase AC Motors and Generators, Models M3JM/JP/KP/JC/KC/KG/JG 160-450

Optional accessory:

Type of Protection: Flameproof "db", Increased Safety "eb", Dust Ignition Protection by Enclosure "tb"

Marking: Ex db I Mb

Ex db or db eb IIB or IIC T6...T3 (*) Gb

Ex tb IIIA or IIIB or IIIC T100°C...T150°C (*) Db

(*) Depending on motor type and model as specified in manufacturer specifications.

Please see Annex for additional marking information.

Approved for issue on behalf of the IECEx Certification Body: Katy A. Holdredge

Position: Senior Staff Engineer

Signature: (for printed version)

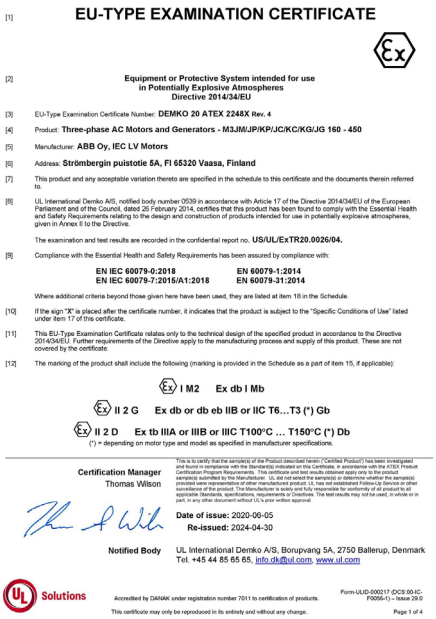
Date: (for printed version) 2024-04-30

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:
UL Solutions (US)
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America

UL Solutions

01



[1] EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

[3] EU-Type Examination Certificate Number: DEMKO 20 ATEX 2248X Rev. 4

[4] Product: Three-phase AC Motors and Generators - M3JM/JP/KP/JC/KC/KG/JG 160 - 450

[5] Manufacturer: ABB Oy, IEC LV Motors

[6] Address: Strömbergin puistotie 5A, FI 65320 Vaasa, Finland

[7] This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report no. US/UL/ExTR20.0026/04.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 — EN 60079-1:2014
EN IEC 60079-7:2015/A1:2018 — EN 60079-31:2014

Where additional criteria beyond those given here have been used, they are listed at item 18 in the Schedule.

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the "Specific Conditions of Use" listed under item 17 of this certificate.

[11] This EU-Type Examination Certificate relates only to the technical design of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by the certificate.

[12] The marking of the product shall include the following (marking is provided in the Schedule as a part of item 15, if applicable):

Ex I M2 Ex db I Mb

Ex II 2 G Ex db or db eb IIB or IIC T6…T3 (*) Gb

Ex II 2 D Ex tb IIIA or IIIB or IIIC T100°C … T150°C (*) Db

(*) = depending on motor type and model as specified in manufacturer specifications.

Certification Manager: Thomas Wilson

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Scheme operated by UL. Unless otherwise indicated, testing was limited to the sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) tested were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Date of issue: 2020-06-05
Re-issued: 2024-04-30

Notified Body: UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark
Tel. +45 44 85 65 65, info.dk@ul.com, www.ul.com

UL Solutions

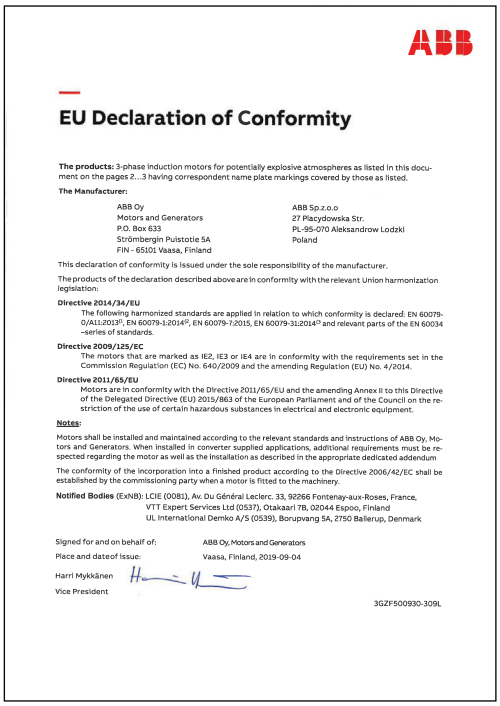
Accredited by DANAK under registration number 7011 to certification of products.

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Form-ULID-000217-(DCS.00-IC-F0056+1) – Issue 29.0

Page 1 of 4

03



ABB

EU Declaration of Conformity

The products: 3-phase induction motors for potentially explosive atmospheres as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The Manufacturer:

ABB Oy
Motors and Generators
P.O. Box 633
Strömbergin Puistotie 5A
FIN - 65101 Vaasa, Finland

ABB Sp.z.o.o
27 Placydowska Str.
PL-95-070 Aleksandrow Lodzki
Poland

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The products of the declaration described above are in conformity with the relevant Union harmonization legislation:

Directive 2014/34/EU
The following harmonized standards are applied in relation to which conformity is declared: EN 60079-0/A11:2013[1], EN 60079-1:2014[2], EN 60079-7:2015, EN 60079-31:2014[3] and relevant parts of the EN 60034 –series of standards.

Directive 2009/125/EC
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EC) No. 640/2009 and the amending Regulation (EU) No. 4/2014.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU and the amending Annex II to this Directive of the Delegated Directive (EU) 2015/863 of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Notes:

Motors shall be installed and maintained according to the relevant standards and instructions of ABB Oy, Motors and Generators. When installed in converter supplied applications, additional requirements must be respected regarding the motor as well as the installation as described in the appropriate dedicated addendum

The conformity of the incorporation into a finished product according to the Directive 2006/42/EC shall be established by the commissioning party when a motor is fitted to the machinery.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc. 33, 92266 Fontenay-aux-Roses, France,
VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland
UL International Demko A/S (0539), Borupvang 5A, 2750 Ballerup, Denmark

Signed for and on behalf of: ABB Oy, Motors and Generators

Place and date of issue: Vaasa, Finland, 2019-09-04

Harri Mykkänen
Vice President

3GZF500930-309L

02

Motors in brief

Flameproof motors Ex db eb, sizes 80 to 180

Motor size		80	90	100	112	132	160	180
Stator	Material	Cast iron, EN-GJL-200 or better						
	Paint color shade	Blue, Munsell 8B 4.5/3.25						
	Corrosion class	C3						
Feet		Cast iron, EN-GJL-200 or better, integrated with stator						
Bearing end shields	Material	Cast iron, EN-GJL-200 or better						
	Paint colour shade	Blue, Munsell 8B 4.5/3.25						
	Paint colour shade	C3						
Bearings	D-end 2-12 poles	6205-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C	6208-2Z/C3	6309/C3	6310/C3
	N-end 2-12 poles	6204-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3
Axially locked bearings	Inner bearing cover	As standard, locked at D-end						
Bearing seals		Gamma ring						
Lubrication		Permanent grease lubrication					Regreasable bearings	
SPM nippleas		-					As standard	
Rating plate	Material	Stainless steel						
Terminal box	Frame material	Cast iron, EN-GJL-200 or better						
	Cover material	Cast iron, EN-GJL-200 or better						
	Cover screws material	Acidproof steel A4-80					Steel 8.8, zinc electroplated and chromated.	
Connections	Cable entries	1 x M25 + 1 x M20 plugged		2 x M32 + 1 x M20 plugged			2 x M40 + 2 x M20 plugged	
	Terminals	6 terminals for connection with cable lugs (not included)						
Fan	Material	Polyamide. Reinforced with glass fibre.					Polypropylene. Reinforced with glass fibre.	
Fan cover	Material	Steel				Hot dip galvanized steel		
	Paint color shade	Munsell blue 8B 4.5/3.25						
	Corrosion class	C3						
Stator winding	Material	Copper						
	Insulation	Insulation class F						
	Winding protec- tion	3 pcs thermistors as standard						
Rotor winding	Material	Pressure die-cast aluminum						
Balancing		Half-key balancing as standard						
Keyway		Closed keyway						
Drain holes		-					Optional	
External earthing bolt		As standard						
Enclosure		IP 55						
Cooling method		IC 411						

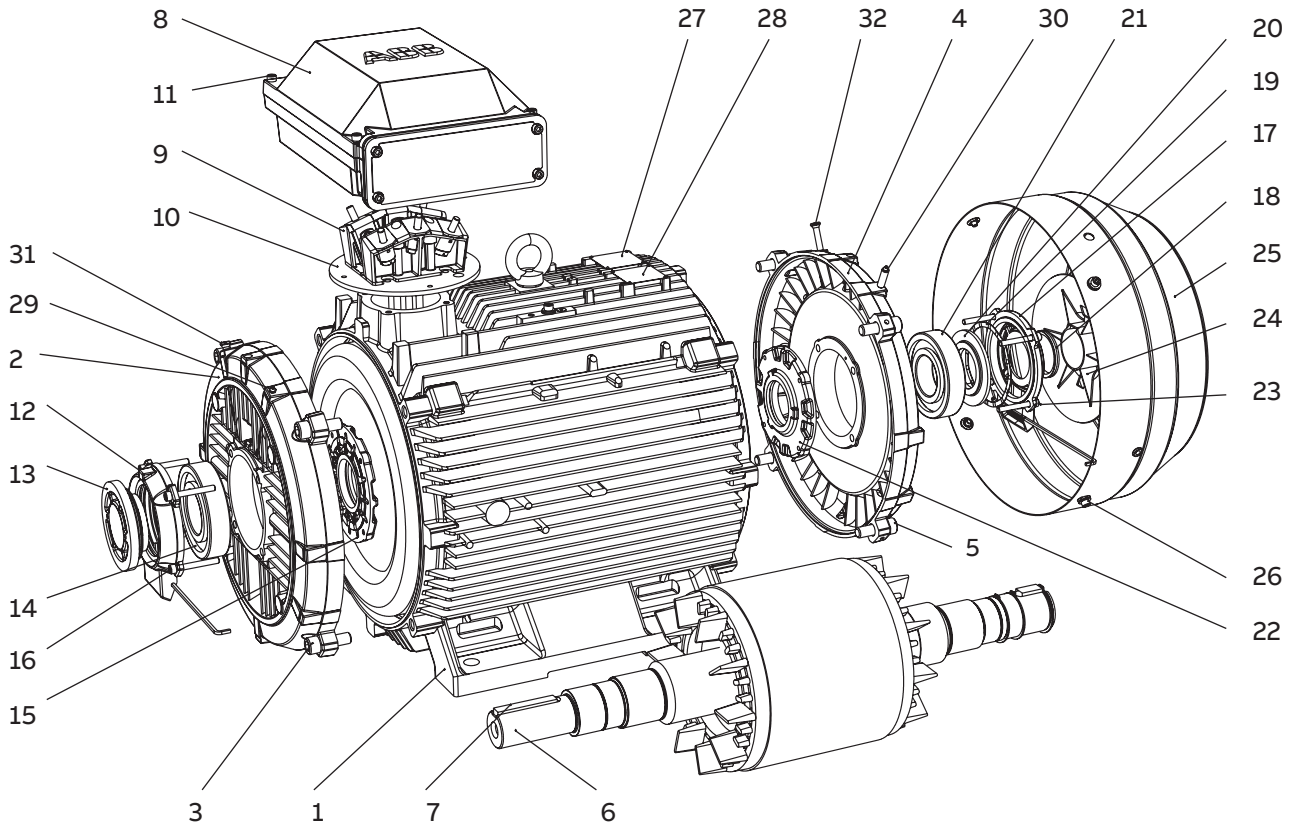
Motors in brief

Flameproof motors Ex db eb, sizes 200 to 450

Motor size			200	225	250	280	315	355	400	450
Stator	Material		Cast iron, EN-GJL-200 or better							
	Paint color shade		Munsell blue 8B 4.5/3.25							
	Corrosion class		C3							
Feet	Material		Cast iron, EN-GJL-200 or better, integrated with stator							
Bearing end shields	Material		Cast iron, EN-GJL-200 or better							
	Paint colour shade		Blue, Munsell 8B 4.5/3.25							
	Corrosion class		C3 medium according to ISO/EN 12944-5							
Bearings	D-end	2-pole	6312M/C3	6313M/C3	6315M/C3	6316/C3	6316/C3	6316M/C3	6317M/C3	-
		4-12-pole	6312/C3	6313/C3	6315/C3	6316/C3	6319/C3	6322/C3	6324/C3	6326M/C3
	N-end	2-pole	6310M/C3	6312M/C3	6313M/C3	6316/C3	6316/C3	6316M/C3	6317M/C3	-
		4-12-pole	6310/C3	6312/C3	6313/C3	6316/C3	6316/C3	6313/C3	6319/C3	6322/C3
Axially locked bearings	Inner bearing cover		As standard, locked at D-end							
Bearing seals			Gamma ring			Labyrinth seal				
Lubrication			Regreasable bearings							
SPM nipples			As standard							
Rating plate	Material		Stainless steel							
Terminal box	Frame material		Cast iron, EN-GJL-200 or better							
	Cover material		Cast iron, EN-GJL-200 or better							
	Cover screws material		Steel 8.8, zinc electroplated and chromated							
Connections	Cable-entries		2 x M50 + 2 x M20 plugged			2 x M63 + 2 x M20 plugged		Refer to table on page 91		
	Terminals		6 terminals for connection with cable lugs (not included)							
Fan	Material		Polypropylene. Reinforced with glass fibre.					Polypropylene reinforced with glass fibre or aluminum.		
Fan cover	Material		Hot dip galvanized steel							
	Paint color shade		Munsell blue 8B 4.5/3.25							
	Corrosion class		C3							
Stator winding	Material		Copper							
	Insulation		Insulation class F.							
	Winding protection		3 pcs thermistors as standard							
Rotor winding12.6600	Material		Pressure die-cast aluminum							
Balancing			Half key balancing							
Keyway			Closed			Open				
Heating elements	On request		25 W	60 W			120 W			200 W
Drain holes			Optional							
External earthing bolt			As standard							
Enclosure			IP 55							
Cooling method			IC 41							

Motor construction

Flameproof motors, Ex db eb



1 Stator frame
2 Endshield, D-end
3 Screws for endshield, D-end
4 Endshield, N-end
5 Screws for endshield, N-end
6 Rotor with shaft
7 Key, D-end
8 Terminal box
9 Terminal board
10 Intermediate flange
11 Screws for terminal box cover
12 Outer bearing cover, D-end
13 Valve disc with labyrinth seal, D-end;
14 standard in 2-pole motors (V-ring in 4-8 pole)
15 Bearing, D-end
16 Inner bearing cover, D-end
17 Screws for bearing cover, D-end
18 Outer bearing cover, N-end
19 Seal, N-end
20 Wave spring (280-315)
21 Coil spring (355-450)
22 Valve disc, N-end
23 Bearing, N-end
24 Inner bearing cover, N-end
23 Screws for bearing cover, N-end
24 Fan
25 Fan cover
26 Screws for fan cover
27 Rating plate
28 Regreasing plate
29 Grease nipple, D-end
30 Grease nipple, N-end
31 SPM nipple, D-end
32 SPM nipple, N-end

Increased safety cast iron motors Ex ec IIC T3 Gc

117 **Ordering information**

118 **Rating plates**

119 **Technical data**
119 IE4 Ex ec cast iron motors, 3000 r/min
120 IE4 Ex ec cast iron motors, 1500 r/min
121 IE4 Ex ec cast iron motors, 1000 r/min
122 IE3 Ex ec cast iron motors, 3000 r/min
123 IE3 Ex ec cast iron motors, 1500 r/min
124 IE3 Ex ec cast iron motors, 1000 r/min
125 IE3 Ex ec cast iron motors, 800 r/min

126 **Variant codes**
126 Increased safety cast iron motors, Ex ec IIC T3 Gc

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135 Bearings
140 Radial forces
143 Axial forces

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146 Standard terminal box
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149 Terminal boxes and boards
151 Terminal box alternatives

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155 Increased safety cast iron motors, Ex ec

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158 Cast iron Ex ec and Ex t motors, sizes 71 to 180
159 Cast iron Ex ec and Ex t motors, sizes 200 to 450

160 **Motor construction**
160 Increased safety motors, Ex ec

Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3GP	160MLA	3GGP 161	410 - ADD	002, etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 to 4	
3GGP:	Totally enclosed fan cooled squirrel cage motor with cast iron frame, increased safety Ex ec

Positions 5 and 6	
IEC size	
07:	71
08:	80
09:	90
10:	100
11:	112
13:	132
16:	160
18:	180
20:	200
22:	225
25:	250
28:	280
31:	315
35:	355
40:	400

Position 7	
Speed (Pole pairs)	
1:	2 poles
2:	4 poles
3:	6 poles
4:	8 poles

Positions 8 to 10	
8:	Frame lenght
9:	Stator package length
10:	Speed for two-speed induction, Permanent Magnet, SynRM and High Speed motors

Position 11
- (Dash)

Position 12	
Mounting arrangement	
A:	Foot-mounted, top-mounted terminal box
B:	Flange-mounted, large flange
C:	Flange-mounted, small flange (size 90 to 132)

Position 13	
Voltage and frequency code	
Single-speed motors	
C:	400VY 50Hz, 460VY 60Hz
D:	400 VΔ, 415 VΔ, 690 VY 50 Hz
E:	500 VΔ 50 Hz
F:	500 VY 50 Hz
P:	400VD 50Hz, 460VD 60Hz
S:	230 VΔ, 400 VY, 415 VY 50 Hz

Position 14	
Generation code	
G, H...	The product code must be, if needed, followed by variant codes.

Rating plates

01 Sample rating plate for IE4 Increased safety Ex ec motors



01

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

Technical data

IE4 Ex ec cast iron motors, 3000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
30	M3GP 200MLA 2	3GGP201410-**M	2967	94,5	94,6	93,9	0,88	51,7	9,2	96,6	3,27	3,74	0,217	309	72
37	M3GP 200MLB 2	3GGP201420-**M	2955	94,8	95,4	95,5	0,89	63,4	7,5	121	2,7	3,4	0,217	309	72
45	M3GP 225SMA 2	3GGP221210-**M	2971	95	95,2	94,5	0,88	77,3	8	144,62	3,44	3,59	0,323	395	74
55	M3GP 250SMA 2	3GGP251210-**M	2976	95,3	95,5	95,2	0,88	94,4	8,4	178	3,3	3,6	0,634	483	75
75	M3GP 280SMB 2	3GGP281220-**M	2980	95,6	95,6	95	0,87	129	7,8	240	2,5	3,3	0,9	665	77
90	M3GP 280SMC 2	3GGP281230-**M	2981	95,8	95,6	95	0,88	153	8	288	3	3,1	1,15	725	77
110	M3GP 315SMB 2	3GGP311220-**M	2982	96	96	95,3	0,88	189	6,7	352	1,9	2,6	1,4	940	77
132	M3GP 315SMC 2	3GGP311230-**M	2986	96,2	96,3	95,9	0,88	226	7,9	422	2,4	3	1,7	1025	77
160	M3GP 315MLA 2	3GGP311410-**M	2983	96,3	96,5	96,3	0,9	268	7,3	512	2,2	2,7	2,1	1190	77
200	M3GP 355SMA 2	3GGP351210-**M	2985	96,5	96,2	95,4	0,9	336	7,6	640	2	3,1	3	1600	83
250	M3GP 355SMB 2	3GGP351220-**M	2983	96,5	96,6	96,2	0,9	415	7,6	800	2,2	3	3,4	1680	83
315	M3GP 355SMC 2	3GGP351230-**M	2984	96,5	96,5	95,9	0,89	533	7,8	1008	2,3	2,8	3,6	1750	83
355	M3GP 355MLA 2	3GGP351410-**M	2981	96,5	96,7	96,3	0,9	595	7,5	1137	2,3	2,6	4,1	2000	83
400	M3GP 355MLB 2	3GGP351420-**M	2982	96,5	96,2	95,5	0,88	677	7,1	1280	2,3	2,9	4,1	2000	83
450	M3GP 355MLC 2	3GGP351430-**M	2983	96,5	96,5	95,7	0,9	743	7,9	1440	2,2	2,9	4,3	2080	83
500	M3GP 355LKA 2	3GGP351810-**M	2982	96,5	96,5	96	0,9	827	7,5	1601	2	3,9	4,8	2320	83
560	M3GP 400LA 2	3GGP401510-**M	2988	96,5	96,5	95,7	0,89	934	7,8	1789	2,46	3,67	7,9	2950	82
560	M3GP 355LKB 2	3GGP351820-**M	2983	96,5	96,4	95,9	0,92	903	10	1793	2,2	4,1	5,2	2460	83
630	M3GP 400LB 2	3GGP401520-**M	2987	96,5	96,2	95,6	0,89	1049	7,6	2014	2,56	3,7	8,2	2950	82
710	M3GP 400LC 2	3GGP401530-**M	2987	96,5	96,3	95,7	0,89	1178	7,2	2270	2,6	3,4	9,3	3050	82
800	M3GP 450LA 2	3GGP451510-**M	2990	96,5	96,2	95,4	0,87	1362	7,8	2555	1,26	3,4	12,2	4000	85
900	M3GP 450LB 2	3GGP451520-**M	2990	96,5	96,3	95,6	0,87	1534	7,6	2874	1,5	3,1	13,5	4000	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3GP 280SMD 2	3GGP281240-**M	2979	96	96	95,3	0,85	192	8,4	352	2,9	3,7	1,15	725	77
132	M3GP 280MLA 2	3GGP281410-**M	2979	96,2	96,2	95,6	0,87	225	8,2	423	3	3,5	1,4	840	81
160	M3GP 280MLB 2	3GGP281420-**M	2968	96,3	96,6	96,6	0,9	266	6,7	515	2,4	2,6	1,55	890	81
200	M3GP 315MLB 2	3GGP311420-**M	2983	96,5	96,8	96,7	0,9	333	6,8	640	1,9	2,6	2,2	1220	77
250	M3GP 315LKB 2	3GGP311820-**M	2982	96,5	96,8	96,8	0,91	413	7,9	800	2,5	2,7	2,9	1540	77
315	M3GP 315LKC 2	3GGP311830-**M	2981	96,5	96,6	96,2	0,89	528	8,8	1009	3,2	3,2	3,3	1630	78

Technical data

IE4 Ex ec cast iron motors, 1500 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 $GD^2 kgm^2$	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_n A	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
30	M3GP 200MLA 4	3GGP202410-**M	1486	94,9	94,9	94,3	0,76	59,8	8,7	194	4,1	4,2	0,369	304	63
37	M3GP 225SMA 4	3GGP222210-**M	1480	95,2	95,7	95,6	0,84	66,8	7,5	239	3,1	3,2	0,536	383	66
45	M3GP 225SMC 4	3GGP222230-**M	1484	95,4	95,7	95,5	0,82	83,4	8,5	289,6	3,63	3,78	0,607	433	66
55	M3GP 250SMA 4	3GGP252210-**M	1483	95,7	95,8	95,4	0,83	100	7,8	354	3,3	3,6	0,933	467	67
75	M3GP 280SMC 4	3GGP282230-**M	1487	96	96,4	96,1	0,86	130	7,8	481	2,8	2,9	1,85	725	72
90	M3GP 280MLA 4	3GGP282410-**M	1489	96,1	96,5	96,4	0,85	160	8,8	577	3,4	3,2	2,3	840	72
110	M3GP 315SMC 4	3GGP312230-**M	1491	96,3	96,5	96,1	0,85	194	7,8	704	2,4	3,1	2,9	1000	68
132	M3GP 315SMD 4	3GGP312240-**M	1490	96,4	96,6	96,2	0,85	234	7,9	846	2,6	3,2	3,2	1065	68
160	M3GP 315MLB 4	3GGP312420-**M	1490	96,6	96,8	96,4	0,86	278	7,9	1026	2,7	3	3,9	1220	68
200	M3GP 355SMA 4	3GGP352210-**M	1491	96,7	96,8	96,4	0,87	345	7,3	1282	2,1	2,7	5,9	1610	74
250	M3GP 355SMB 4	3GGP352220-**M	1491	96,7	96,8	96,5	0,87	433	7,8	1601	2,5	2,9	6,9	1780	74
315	M3GP 355SMC 4	3GGP352230-**M	1490	96,7	96,8	96,5	0,86	554	7,4	2017	2,4	2,9	7,2	1820	74
355	M3GP 355MLA 4	3GGP352410-**M	1491	96,7	96,9	96,5	0,87	616	7,9	2274	2,7	2,9	8,4	2140	78
400	M3GP 355MLB 4	3GGP352420-**M	1490	96,7	96,7	96,4	0,85	700	6,8	2563	2,1	2,8	8,4	2140	78
450	M3GP 355MLC 4	3GGP352430-**M	1489	96,7	96,8	96,5	0,86	779	6,8	2886	2,4	2,8	8,4	2140	78
500	M3GP 355LKA 4	3GGP352810-**M	1490	96,7	96,7	96,1	0,86	865	6,8	3204	2	3	10	2500	78
560	M3GP 400LA 4	3GGP402510-**M	1491	96,7	96,7	96,3	0,85	982	7,4	3586	2,4	2,8	15	3200	78
630	M3GP 400LB 4	3GGP402520-**M	1491	96,7	96,7	96,2	0,86	1091	7,6	4034	2,2	2,9	16	3300	78
800	M3GP 450LA 4	3GGP452510-**M	1491	96,7	96,7	96,2	0,86	1388	7	5121	1,3	2,8	23	4050	85
900	M3GP 450LB 4	3GGP452520-**M	1491	96,7	96,5	96	0,85	1575	7	5761	1,3	2,8	25	4050	85
1000	M3GP 450LC 4	3GGP452530-**M	1491	96,7	96,7	96,1	0,86	1724	6,8	6404	1,3	2,7	30	4350	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 $GD^2 kgm^2$	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_n A	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3GP 280MLB 4	3GGP282420-**M	1489	96,3	96,3	95,7	0,8	205	8,8	706	4	4	2,5	890	75
132	M3GP 280MLC 4	3GGP282430-**M	1489	96,4	96,4	95,8	0,8	247	8,3	846	3,5	4,1	2,5	890	75
200	M3GP 315LKB 4	3GGP312820-**M	1490	96,7	96,9	96,8	0,87	346	7,6	1282	2,5	2,9	5	1480	74
250	M3GP 315LKC 4	3GGP312830-**M	1490	96,7	96,9	96,8	0,87	432	7,8	1601	2,3	3	5,5	1600	74
315	M3GP 315LKE 4	3GGP312850-**M	1488	96,7	97	97	0,84	558	7,3	2029	2,5	3,1	4,6	1540	72

Technical data

IE4 Ex ec cast iron motors, 1000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class
BIE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
18.5	M3GP 200MLA 6	3GGP203410-**M	991	93,4	93,7	93,2	0,8	35,7	8,1	178	3	3,6	0,531	306	63
22	M3GP 200MLC 6	3GGP203430-**M	990	93,7	93,7	93,2	0,77	44,3	8,6	212	3	3,83	0,545	311	63
30	M3GP 225SMA 6	3GGP223210-**M	988	94,2	94,5	94,1	0,78	59,2	7,3	290	3	3,4	0,813	369	63
37	M3GP 250SMA 6	3GGP253210-**M	992	94,5	94,9	94,8	0,76	74	8,6	357	3,7	3,7	1,49	457	63
45	M3GP 280SMB 6	3GGP283220-**M	992	94,8	95,1	94,6	0,85	80,9	7,5	434	2,4	2,6	2,2	680	65
55	M3GP 280SMC 6	3GGP283230-**M	990	95,1	95,4	95,1	0,85	99,4	6,8	506	2,4	2,6	2,85	725	65
75	M3GP 315SMC 6	3GGP313230-**M	994	95,4	95,6	95,2	0,83	138	7	721	2,2	2,8	4,9	1000	67
90	M3GP 315SMD 6	3GGP313240-**M	994	95,6	95,8	95,4	0,81	170	7,2	864	2,4	2,9	4,9	1040	67
110	M3GP 315MLB 6	3GGP313420-**M	994	95,8	96	95,8	0,83	202	6,9	1057	2,3	2,7	6,3	1200	68
132	M3GP 315LKA 6	3GGP313810-**M	993	96	96,2	96	0,82	243	6,9	1269	2,4	2,7	7,3	1410	68
160	M3GP 355SMB 6	3GGP353220-**M	995	96,2	96,2	95,7	0,82	294	7	1536	2,1	2,7	9,7	1680	73
200	M3GP 355SMC 6	3GGP353230-**M	995	96,3	96,5	96,1	0,82	367	7,3	1920	2,3	2,8	11,3	1820	73
250	M3GP 355MLB 6	3GGP353420-**M	995	96,5	96,7	96,6	0,83	456	7,1	2399	2,3	2,7	13,5	2180	73
315	M3GP 355LKA 6	3GGP353810-**M	994	96,6	96,7	96,5	0,83	576	6,9	3026	2,3	2,6	15,5	2500	76
355	M3GP 355LKB 6	3GGP353820-**M	995	96,6	96,6	96	0,81	668	7,7	3407	2,7	2,9	16,5	2600	76
400	M3GP 400LA 6	3GGP403510-**M	994	96,6	96,7	96,3	0,8	747	7,5	3843	2,8	3,1	17	2900	76
400	M3GP 400LKA 6	3GGP403810-**M	994	96,6	96,7	96,3	0,8	747	7,5	3843	2,8	3,1	17	2900	76
450	M3GP 400LB 6	3GGP403520-**M	995	96,6	96,5	95,7	0,81	830	8,3	4319	3,4	3,6	22	3300	76
450	M3GP 400LKB 6	3GGP403820-**M	995	96,6	96,5	95,7	0,81	830	8,3	4319	3,4	3,6	22	3300	76
500	M3GP 400LC 6	3GGP403530-**M	995	96,6	96,5	95,9	0,82	911	7,8	4799	3,2	3,4	22	3300	76
560	M3GP 400LD 6	3GGP403540-**M	993	96,6	96,6	96,1	0,85	984	7,4	5386	2,4	2,8	24	3400	77
630	M3GP 450LA 6	3GGP453510-**M	995	96,6	96,6	95,9	0,82	1146	7,5	6046	1,4	3,2	31	4150	81
710	M3GP 450LB 6	3GGP453520-**M	995	96,6	96,7	96,2	0,85	1244	7	6814	1,3	2,5	37	4500	81
800	M3GP 450LC 6	3GGP453530-**M	995	96,6	96,6	96,1	0,84	1415	7,2	7677	1,3	2,7	41	4800	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
75	M3GP 280SMD 6	3GGP283240-**M	990	95,4	95,7	95,5	0,81	141	7	726	2,8	2,8	2,5	730	65
160	M3GP 315LKC 6	3GGP313830-**M	994	96,2	96,4	96,3	0,82	297	7,4	1537	2,7	2,9	9,2	1600	68
200	M3GP 315LKE 6	3GGP313850-**M	993	96,3	96,5	96,2	0,81	372	7	1923	2,2	2,8	9,2	1600	76

Technical data

IE3 Ex ec cast iron motors, 3000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
0.37	M3GP 71MC 2	3GGP071330-**K	2743	73,8	74,4	71,7	0,76	0,94	4,9	1,26	2,33	2,81	0,00088	10	58
0.55	M3GP 71ME 2	3GGP071350-**K	2755	77,8	79,6	78,8	0,83	1,25	6,8	1,9	2,8	3,1	0,00045	11	56
0.75	M3GP 80MD 2	3GGP081340-**K	2872	80,7	81,1	79,4	0,87	1,51	6,2	2,43	2,88	3,43	0,0012	18	57
1.1	M3GP 80MG 2	3GGP081370-**K	2862	82,7	83,7	82,8	0,87	2,1	6,3	3,65	3,03	3,5	0,0014	19	60
1.5	M3GP 90LB 2	3GGP091520-**K	2892	84,2	85,3	84,5	0,89	2,7	7,3	4,8	1,97	3,24	0,0031	31	69
2.2	M3GP 90LC 2	3GGP091530-**K	2900	85,9	86,7	85,7	0,89	4	9,1	7,27	3,35	4,09	0,0044	35	64
3	M3GP 100LKA 2	3GGP101810-**K	2907	87,1	87,6	86,5	0,89	5,4	8,8	9,9	3,25	4,32	0,0086	50	68
4	M3GP 112MG 2	3GGP111370-**K	2882	88,1	89,7	90,3	0,93	7	8,1	13,3	2,8	3,6	0,0132	56	70
5.5	M3GP 132SMF 2	3GGP131260-**K	2902	89,2	89,9	89,4	0,9	9,7	7,3	18,2	2,72	3,6	0,0218	77	67
7.5	M3GP 132SMG 2	3GGP131270-**K	2907	90,1	91	91	0,9	13,2	8,1	24,7	2,66	3,74	0,0218	77	70
11	M3GP 160MLA 2	3GGP161410-**K	2943	91,2	91,7	91,3	0,92	18,7	8,1	35,6	2,7	3,4	0,052	141	69
15	M3GP 160MLB 2	3GGP161420-**K	2943	91,9	92,8	92,6	0,92	25,4	8,4	48,6	3,1	3,4	0,062	170	69
18.5	M3GP 160MLC 2	3GGP161430-**K	2942	92,4	93	92,8	0,93	30,8	8,3	60	3,1	3,6	0,072	183	69
22	M3GP 180MLA 2	3GGP181410-**K	2957	92,7	93,2	93	0,91	37,4	8,1	71	2,6	3,2	0,116	234	69
30	M3GP 200MLA 2	3GGP201410-**K	2958	93,3	93,7	93,6	0,9	51	7,8	96,8	2,8	3,1	0,196	289	77
37	M3GP 200MLB 2	3GGP201420-**K	2960	93,7	94,1	93,9	0,86	65,5	8,8	119	3,1	3,4	0,217	314	72
45	M3GP 225SMA 2	3GGP221210-**K	2972	94	94,2	93,8	0,89	76,8	7,8	144	3,1	3	0,323	409	74
55	M3GP 250SMA 2	3GGP251210-**K	2975	94,3	94,5	94,1	0,89	93,6	8	176	2,8	3,3	0,579	452	75
75	M3GP 280SMB 2	3GGP281220-**K	2980	94,7	94,7	94	0,87	129	7,8	240	2,5	3,3	0,9	665	77
90	M3GP 280SMC 2	3GGP281230-**K	2981	95	94,8	94,1	0,88	153	8	288	2,95	3,1	1,15	725	77
110	M3GP 315SMB 2	3GGP311220-**K	2982	95,2	95,2	94,3	0,88	189	6,7	352	1,9	2,6	1,4	940	77
132	M3GP 315SMC 2	3GGP311230-**K	2986	95,4	95,5	95,1	0,88	226	7,9	422	2,4	3	1,7	1025	77
160	M3GP 315MLA 2	3GGP311410-**K	2983	95,6	95,9	95,6	0,9	268	7,3	512	2,2	2,7	2,1	1190	77
200	M3GP 355SMA 2	3GGP351210-**K	2985	95,8	95,5	94,5	0,89	336	7,6	640	2	3,1	3	1600	83
250	M3GP 355SMB 2	3GGP351220-**K	2983	95,8	96	95,5	0,9	415	7,6	800	2,2	3	3,4	1680	83
315	M3GP 355SMC 2	3GGP351230-**K	2984	95,8	95,8	95,1	0,89	533	7,8	1008	2,3	2,8	3,6	1750	83
355	M3GP 355MLA 2	3GGP351410-**K	2981	95,8	96,1	95,7	0,9	595	7,5	1137	2,3	2,6	4,1	2000	83
400	M3GP 355MLB 2	3GGP351420-**K	2982	95,8	95,6	94,7	0,88	677	7,1	1280	2,3	2,9	4,1	2000	83
450	M3GP 355MLC 2	3GGP351430-**K	2983	95,8	95,8	95	0,9	743	7,9	1440	2,2	2,9	4,3	2080	83
500	M3GP 355LKA 2	3GGP351810-**K	2982	95,8	95,8	95,3	0,9	827	7,5	1601	2	3,9	4,8	2320	83
560	M3GP 400LA 2	3GGP401510-**K	2988	95,8	95,8	94,9	0,89	934	7,8	1789	2,46	3,67	7,9	2950	82
560	M3GP 355LKB 2	3GGP351820-**K	2983	95,8	95,8	95,1	0,9	925	8	1792	2,2	4,1	5,2	2460	83
630	M3GP 400LB 2	3GGP401520-**K	2987	95,8	95,5	94,8	0,89	1049	7,6	2014	2,56	3,7	8,2	3050	82
710	M3GP 400LC 2	3GGP401530-**K	2987	95,8	95,7	94,9	0,89	1178	7,2	2270	2,56	3,4	9,3	3300	82
800	M3GP 450LA 2	3GGP451510-**K	2990	95,8	95,5	94,5	0,87	1362	7,8	2555	1,26	3,39	12,2	4000	85
900	M3GP 450LB 2	3GGP451520-**K	2990	95,8	95,5	94,7	0,87	1534	7,6	2874	1,49	3,09	13,5	4200	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3GP 315MLB 2	3GGP311420-**K	2983	96,4	96,7	96,6	0,9	333	6,8	640	1,9	2,6	2,2	1220	77
250	M3GP 315LKB 2	3GGP311820-**K	2982	95,8	96,2	96,2	0,91	413	7,9	800	2,5	2,7	2,9	1540	77

Technical data

IE3 Ex ec cast iron motors, 1500 r/min

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

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD^2kgm^2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
0.25	M3GP 71MD 4	3GGP072340-**K	1416	73,5	75,1	73,8	0,8	0,6	4,8	1,68	2	2,6	0,0009	11	45
0.37	M3GP 71MLE 4	3GGP072450-**K	1432	77,3	77,4	74,5	0,76	0,9	5,8	2,46	2,7	3,3	0,00122	15	45
0.55	M3GP 80MLD 4	3GGP082440-**K	1439	80,8	82,2	81,4	0,81	1,18	6,3	3,6	2,3	3,29	0,0028	20	45
0.75	M3GP 80MLG 4	3GGP082470-**K	1445	82,5	83,5	82,2	0,79	1,62	6,9	4,97	2,6	3,76	0,0033	22	57
1.1	M3GP 90LC 4	3GGP092530-**K	1444	84,1	84,6	83,2	0,79	2,3	7,2	7,28	3,64	4,2	0,0067	33	56
1.5	M3GP 90LD 4	3GGP092540-**K	1439	85,3	86,4	85,9	0,78	3,1	7,8	9,95	3,35	4,47	0,0072	34	56
2.2	M3GP 100LKA 4	3GGP102810-**K	1452	86,7	87,8	87,7	0,83	4,2	8,9	14,46	3,4	4,1	0,0146	49	56
3	M3GP 100LKB 4	3GGP102820-**K	1452	87,7	89	89	0,83	5,8	9	19,7	3,2	4	0,0146	49	58
4	M3GP 112MG 4	3GGP112370-**K	1454	88,6	89,2	88,3	0,75	8,7	6,9	26,3	3,1	3,3	0,0176	52	59
5.5	M3GP 132SMF 4	3GGP132260-**K	1462	89,6	90,6	90,6	0,81	10,8	7,3	35,87	2,41	3,39	0,0401	81	67
7.5	M3GP 132SMG 4	3GGP132270-**K	1457	90,4	91,4	91,5	0,81	14,8	7,3	49,1	2,39	3,38	0,0401	81	64
11	M3GP 160MLA 4	3GGP162410-**K	1473	91,4	91,8	91,3	0,84	20,4	7,7	71,3	2,6	2,9	0,108	188	62
15	M3GP 160MLB 4	3GGP162420-**K	1474	92,1	92,7	92,4	0,84	27,8	7,9	97,1	2,8	3,3	0,125	187	62
18.5	M3GP 180MLA 4	3GGP182410-**K	1481	92,6	92,9	92,3	0,82	34,9	7,6	119	3	3,1	0,217	235	62
22	M3GP 180MLB 4	3GGP182420-**K	1480	93	93,5	93,2	0,82	41,5	8,2	141	2,8	3,1	0,217	235	62
30	M3GP 200MLA 4	3GGP202410-**K	1484	93,6	93,8	93,2	0,84	54,6	8,3	193	3	3,3	0,366	319	63
37	M3GP 225SMA 4	3GGP222210-**K	1482	93,9	94,6	94,5	0,86	65,4	7,7	238	2,8	3,1	0,536	398	66
45	M3GP 225SMB 4	3GGP222220-**K	1482	94,2	94,7	94,6	0,85	80,2	7,9	289	2,8	3,2	0,536	398	66
55	M3GP 250SMA 4	3GGP252210-**K	1485	94,6	95,2	94,9	0,85	97,8	7,9	353	3	3,3	0,933	476	67
75	M3GP 280SMB 4	3GGP282220-**K	1486	95	95,4	95,3	0,85	134	7,4	482	2,5	2,8	1,5	665	72
90	M3GP 280SMC 4	3GGP282230-**K	1487	95,2	95,5	95,1	0,85	161	7,9	578	2,9	3	1,85	725	72
110	M3GP 315SMC 4	3GGP312230-**K	1491	95,4	95,7	95,2	0,85	194	7,8	704	2,4	3,1	2,9	1000	68
132	M3GP 315SMD 4	3GGP312240-**K	1490	95,6	95,8	95,4	0,85	234	7,9	846	2,6	3,2	3,2	1065	68
160	M3GP 315MLB 4	3GGP312420-**K	1490	95,8	96	95,6	0,86	278	7,9	1026	2,7	3	3,9	1220	68
200	M3GP 355SMA 4	3GGP352210-**K	1491	96	96,1	95,7	0,87	345	7,3	1282	2,1	2,7	5,9	1610	74
250	M3GP 355SMB 4	3GGP352220-**K	1491	96	96,1	95,9	0,87	433	7,8	1601	2,5	2,9	6,9	1780	74
315	M3GP 355SMC 4	3GGP352230-**K	1490	96	96,1	95,9	0,85	554	7,4	2017	2,4	2,9	7,2	1820	74
355	M3GP 355MLA 4	3GGP352410-**K	1491	96	96,3	95,9	0,87	616	7,9	2274	2,7	2,9	8,4	2140	78
400	M3GP 355MLB 4	3GGP352420-**K	1489	96	96	95,5	0,85	705	6,8	2565	2,3	2,6	8,4	2140	78
450	M3GP 355MLC 4	3GGP352430-**K	1490	96	96,1	95,6	0,86	780	6,9	2884	2,3	2,9	8,4	2140	78
500	M3GP 355LKA 4	3GGP352810-**K	1490	96	96	95,3	0,86	865	6,8	3204	2	3	10	2500	78
560	M3GP 400LA 4	3GGP402510-**K	1491	96	96	95,4	0,85	982	7,4	3586	2,4	2,8	15	3200	78
630	M3GP 400LB 4	3GGP402520-**K	1491	96	96	95,4	0,86	1077	7,6	4034	2,2	2,9	16	3300	78
680	M3GP 400LC 4	3GGP402530-**K	1491	96	96	95,4	0,85	1206	7,7	4354	2,5	3,1	17	3400	78
800	M3GP 450LA 4	3GGP452510-**K	1491	96	96	95,4	0,86	1396	7	5121	1,3	2,8	23	4050	85
900	M3GP 450LB 4	3GGP452520-**K	1492	96	95,9	95,2	0,86	1573	7	5761	1,3	2,8	25	4350	85
1000	M3GP 450LC 4	3GGP452530-**K	1491	96	96	95,3	0,86	1724	6,8	6404	1,3	2,7	30	4700	85

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD^2kgm^2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3GP 315LKB 4	3GGP312820-**K	1490	96,6	96,8	96,7	0,87	346	7,6	1282	2,5	2,9	5	1480	74
250	M3GP 315LKC 4	3GGP312830-**K	1490	96	96,2	96,1	0,87	432	7,8	1601	2,3	3	5,5	1600	74

Technical data

IE3 Ex ec cast iron motors, 1000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
0.18	M3GP 71ME 6	3GGP073350-**K	887	63,9	63,3	57,6	0,74	0,57	3,2	1,9	1,9	2,2	0,0009	10	45
0.25	M3GP 80MA 6	3GGP083310-**K	937	68,6	67,3	61,9	0,64	0,76	2,6	2,52	2,8	3,4	0,0019	14	47
0.37	M3GP 80MD 6	3GGP083340-**K	930	73,5	74,3	72	0,68	1	4,6	3,75	2,8	3,2	0,0028	16	47
0.55	M3GP 80MLG 6	3GGP083470-**K	937	77,2	77,9	76,1	0,63	1,56	4,4	5,6	2,8	3,2	0,0044	21	60
0.75	M3GP 90LG 6	3GGP093570-**K	938	78,9	80,4	79,7	0,74	1,8	4,8	7,7	2,42	2,73	0,0072	34	44
1.1	M3GP 100LKG 6	3GGP103870-**K	969	81	81,1	79	0,68	2,6	5,9	10,9	1,99	2,18	0,0025	47	49
1.5	M3GP 112MH 6	3GGP113380-**K	972	82,5	82,2	79,6	0,64	3,8	7	14,7	2,66	4,45	0,0196	53	66
2.2	M3GP 132SMC 6	3GGP133230-**K	978	84,3	84,4	82,7	0,69	5,1	5,4	21,5	1,96	2,6	0,0416	81	57
3	M3GP 132SMD 6	3GGP133240-**K	977	85,6	85,9	84,3	0,69	6,9	5,9	29	1,9	3,3	0,0416	82	57
4	M3GP 132SMG 6	3GGP133270-**K	974	86,8	87,4	86,6	0,69	9,3	5,6	38,7	1,8	2,84	0,0416	82	57
5.5	M3GP 132SMH 6	3GGP133280-**K	966	88	88,9	88,7	0,73	12,1	5	54,1	1,83	2,7	0,0654	79	57
7.5	M3GP 160MLA 6	3GGP163410-**K	980	89,1	89,9	89,3	0,78	15,2	7,9	73	1,7	2,8	0,114	172	59
11	M3GP 160MLB 6	3GGP163420-**K	979	90,3	90,9	90,2	0,74	23,5	8,5	107	2,2	3,9	0,131	198,7	59
15	M3GP 180MLA 6	3GGP183410-**K	981	91,2	91,5	90,4	0,77	30,4	5,5	146	1,7	2,7	0,225	234	59
18.5	M3GP 200MLA 6	3GGP203410-**K	990	91,7	92,1	91,4	0,77	37,3	7,5	178	2,6	3,2	0,448	291	63
22	M3GP 200MLB 6	3GGP203420-**K	990	92,2	92,6	91,9	0,79	43	7,8	212	2,6	3,2	0,531	318	63
30	M3GP 225SMA 6	3GGP223210-**K	989	92,9	93,5	93,3	0,81	56,8	7,9	289	2,8	3,1	0,813	392	63
37	M3GP 250SMA 6	3GGP253210-**K	991	93,3	93,8	93,6	0,83	68	7,7	356	2,7	2,9	1,49	467	63
45	M3GP 280SMB 6	3GGP283220-**K	992	93,7	94,1	93,5	0,85	80,9	7,5	434	2,4	2,6	2,2	680	65
55	M3GP 280SMC 6	3GGP283230-**K	990	94,1	94,4	94,1	0,85	99,4	6,8	506	2,4	2,6	2,85	725	65
75	M3GP 315SMC 6	3GGP313230-**K	994	94,6	94,8	94,4	0,83	138	7	721	2,2	2,8	4,9	1000	67
90	M3GP 315SMD 6	3GGP313240-**K	994	94,9	95,1	94,7	0,81	170	7,2	864	2,4	2,9	4,9	1040	67
110	M3GP 315MLB 6	3GGP313420-**K	994	95,1	95,3	95,1	0,83	202	6,9	1058	2,3	2,7	6,3	1200	68
132	M3GP 315LKA 6	3GGP313810-**K	993	95,4	95,6	95,4	0,82	243	6,9	1269	2,4	2,7	7,3	1410	68
160	M3GP 355SMB 6	3GGP353220-**K	995	95,6	95,6	95	0,82	294	7	1536	2,1	2,7	9,7	1680	73
200	M3GP 355SMC 6	3GGP353230-**K	995	95,8	96	95,6	0,82	367	7,3	1920	2,3	2,8	11,3	1820	73
250	M3GP 355MLB 6	3GGP353420-**K	995	95,8	96	95,9	0,83	456	7,1	2399	2,3	2,7	13,5	2180	73
315	M3GP 355LKA 6	3GGP353810-**K	994	95,8	96	95,6	0,83	576	6,9	3026	2,3	2,6	15,5	2500	76
355	M3GP 355LKB 6	3GGP353820-**K	995	95,8	95,9	95,3	0,81	668	7,7	3407	2,7	2,9	16,5	2600	76
400	M3GP 400LA 6	3GGP403510-**K	993	95,8	95,8	95,1	0,82	731	7,1	3846	2,3	2,7	17	2900	76
450	M3GP 400LB 6	3GGP403520-**K	994	95,8	95,8	95,2	0,82	819	7,4	4323	2,4	2,5	20,5	3150	76
500	M3GP 400LC 6	3GGP403530-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3300	76
500	M3GP 400LKC 6	3GGP403830-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3300	76
560	M3GP 400LD 6	3GGP403540-**K	993	95,8	95,8	95,2	0,85	984	7,4	5386	2,4	2,8	24	3400	77
630	M3GP 450LA 6	3GGP453510-**K	994	95,8	95,9	95,3	0,84	1127	6,5	6053	1,1	2,5	31	4150	81
710	M3GP 450LB 6	3GGP453520-**K	995	95,8	95,9	95,3	0,85	1244	7	6814	1,3	2,5	37	4500	81
800	M3GP 450LC 6	3GGP453530-**K	995	95,8	95,8	95,1	0,84	1415	7,2	7677	1,3	2,7	41	4800	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
160	M3GP 315LKC 6	3GGP313830-**K	994	95,6	95,8	95,7	0,82	297	7,4	1537	2,7	2,9	9,2	1600	68

Technical data

IE3 Ex ec cast iron motors, 800 r/min

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

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
800 r/min = 8 poles				**400 V 50Hz**				**BASIC-design**							
0.12	M3GP 71ME 8	3GGP074350-**K	659	50,7	48,9	41,9	0,68	0,49	2,5	1,7	1,9	2,1	0,00107	11	43
0.75	M3GP 100LKA 8	3GGP104810-**K	710	75	74,5	70,5	0,65	2,13	4,4	10	2,35	2,8	0,00855	37	53
1.1	M3GP 100LKB 8	3GGP104820-**K	703	77,7	77,7	74,7	0,65	3,08	4,4	14,9	2,7	2,9	0,0128	45	53
1.5	M3GP 112MC 8	3GGP114330-**K	717	79,7	80,1	78,8	0,62	4,12	4,3	19,9	1,8	2,6	0,0194	53	55
2.2	M3GP 132SMA 8	3GGP134210-**K	725	81,9	82,3	80,2	0,64	5,8	5,2	28,9	2	3	0,0291	66	57
3	M3GP 132SMG 8	3GGP134270-**K	723	83,5	84,1	82,8	0,66	7,5	4,8	39,6	1,8	2,8	0,0375	76	57
4	M3GP 160MLA 8	3GGP164410-**K	734	84,8	85,1	83,2	0,65	10,3	4,5	52	1,8	2,3	0,091	148	59
5.5	M3GP 160MLB 8	3GGP164420-**K	732	86,2	87,1	86,1	0,69	13	5	71,7	2	2,35	0,091	150	59
7.5	M3GP 160MLC 8	3GGP164430-**K	733	87,3	88,2	87,2	0,69	17,6	5,1	97,7	2	2,4	0,12	167	59
11	M3GP 180MLA 8	3GGP184410-**K	731	88,6	89,2	88,4	0,7	25,3	5	143,6	2,1	2,1	0,2	219	59
15	M3GP 200MLA 8	3GGP204410-**K	737	89,6	90,5	90,1	0,74	32,5	5,2	194	2,1	2,4	0,45	290	60
18.5	M3GP 225SMA 8	3GGP224210-**K	736	90,1	90,8	90,1	0,74	39,8	5,2	240	2	2,25	0,669	350	63
22	M3GP 225SMB 8	3GGP224220-**K	736	90,6	91,6	91,5	0,73	47,5	5,3	285	2,26	2,47	0,722	363	63
30	M3GP 250SMA 8	3GGP254210-**K	741	91,3	91,7	91	0,71	67	5,6	386	2,7	2,7	1,4	440	63
37	M3GP 280SMA 8	3GGP284210-**K	741	91,8	92	91,3	0,79	72,6	7,3	476	1,7	3	1,85	605	65
45	M3GP 280SMB 8	3GGP284220-**K	741	92,2	92,3	91,7	0,78	89,2	7,6	579	1,8	3,1	2,2	645	65
55	M3GP 315SMA 8	3GGP314210-**K	742	92,5	93,1	92,5	0,8	106	7,1	707	1,6	2,7	3,2	830	62
75	M3GP 315SMB 8	3GGP314220-**K	741	93,1	93,2	93,1	0,82	146	7,1	966	1,7	2,7	4,1	930	62
90	M3GP 315SMC 8	3GGP314230-**K	741	93,4	93,7	93,4	0,82	170	7,4	1159	1,8	2,7	4,9	1000	64
110	M3GP 315MLA 8	3GGP314410-**K	740	93,7	94	94,1	0,83	211	7,3	1419	1,8	2,7	5,8	1150	72
132	M3GP 355SMA 8	3GGP354210-**K	744	94	93,9	93,4	0,79	256	7,5	1694	1,5	2,6	7,9	1520	69
160	M3GP 355SMB 8	3GGP354220-**K	744	94,3	94,3	93,8	0,79	293	7,6	2053	1,6	2,6	9,7	1680	69
200	M3GP 355SMC 8	3GGP354230-**K	742	94,6	95	94,8	0,79	385	7,4	2576	1,6	2,6	11,3	1820	69
250	M3GP 355MLB 8	3GGP354420-**K	743	94,6	94,7	94,1	0,8	472	7,5	3213	1,6	2,7	13,5	2180	72
315	M3GP 400LA 8	3GGP404510-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	2900	71
315	M3GP 400LKA 8	3GGP404810-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	2900	71
355	M3GP 400LB 8	3GGP404520-**K	743	94,6	94,9	94,6	0,83	641	6,8	4562	1,2	2,5	21	3200	71
400	M3GP 400LC 8	3GGP404530-**K	744	94,6	94,9	94,3	0,81	735	6	5134	1,3	2,7	24	3400	71
450	M3GP 450LA 8	3GGP454510-**K	744	94,6	95	94,6	0,83	813	6	5775	1	2,5	26	3750	80
500	M3GP 450LB 8	3GGP454520-**K	744	94,6	94,7	94,5	0,83	902	6,4	6417	1	2,6	29	4000	80
560	M3GP 450LC 8	3GGP454530-**K	744	94,6	94,9	94,2	0,81	1038	7	7188	1,2	2,9	35	4350	80
630	M3GP 450LD 8	3GGP454540-**K	745	94,6	94,8	94	0,82	1162	7,6	8075	1,3	3,2	41	4800	80

Variant codes

Increased safety cast iron motors, Ex ec IIC T3 Gc

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

Most of the variant codes apply to IE2 and IE3 motors. However, confirm the availability of variants for IE motors with your ABB sales office before making an order.

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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																	
194	2Z bearings greased for life at both ends.	○	○	○	○	○	○	●	●	●	●	●	-	-	-	-	-
433	Outlet grease collector	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
506	Nipples for vibration measurement : SKF Marlin Quick Connect stud CMSS-2600-3	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
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	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
036	Transport lock for bearings.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
037	Roller bearing at D-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
040	Heat-resistant grease	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
043	SPM compatible nipples for vibration measurement	●	●	●	●	●	●	○	○	○	○	○	○	○	○	-	-
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	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-
Branch standard designs																	
178	Stainless steel / acid proof bolts.	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
204	Jacking bolts for foot mounted motors.	-	-	-	-	-	-	●	●	●	●	●	●	●	○	○	○
209	Non-standard voltage or frequency, (special winding).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
396	Motor designed for minimum ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
399	Motor designed for minimum ambient temperature -40 °C to -55 °C	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
425	Corrosion protected stator and rotor core.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
524	Special run-out tolerances on flange and shaft for close coupled pump applications.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
786	Special design shaft upwards (V3, V35, V6) for outdoor mounting.	-	●	●	●	●	●	●	●	●	●	●	●	●	-	-	-
Cooling system																	
044	Unidirectional fan for reduced noise level. Rotation clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
045	Unidirectional fan for reduced noise level. Rotation counter clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
068	Light alloy metal fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
183	Separate motor cooling (fan axial, N-end).	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
206	Steel fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
537	Advanced data sheet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
722	Rotor dimension drawing (incl. torsional stiffness).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
777	Premium documentation package	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Drain holes																	
065	Plugged existing drain holes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
448	Draining holes with metal plugs.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
Earthing Bolt																	
525	External earthing bolts on motor feet	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hazardous Environments																	
334	Ex t, Dust group III B T125C Db, IP6X (non-conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
335	Ex t, Dust group III B T125C Dc, IP5X (non-conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
336	Ex t, Dust group III C T125 Db, IP6X (conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
337	Ex t, Dust group III C T125 Dc, IP6X (conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
338	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIB T125C Dc (non-conductive dust), IP5X.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
339	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIC T125C Dc (conductive dust), IP6X.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
516	Temperature detectors approved to be connected to an Ex i circuit	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
807	UL certified Class 1, Div.2 Group A, B, C and D, T3.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
810	UL certified Class II, Div. 2 Group F and G, T4.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
813	Thermistor-based surface temperature protection T4 for frequency converter duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
814	Ex t (DIP) motors, temperature class T 150C.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●
406	Winding insulation for supply > 690 <= 1000 volts	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
Marine																	
024	Fulfilling Bureau Veritas (BV) requirements, with certificate.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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).	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
235	Flange FF 165.	-	○	●	●	●	●	-	-	-	-	-	-	-	-	-	-
236	Flange FT 165.	-	-	●	●	●	●	-	-	-	-	-	-	-	-	-	-
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
Painting																	
105	Paint thickness report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
114	Special paint color, standard grade	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
115	Painting system C4,durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
168	Primer paint only.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
303	Painted insulation layer on inside of the terminal boxes.	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
710	Norsok M-501 rev. 7 Coating system no. 2B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
711	Painting system C5, durability High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
712	Painting system C5-M according to Petrobras specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
713	Painting system according Total Egina specification.	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
717	Painting system C4, durability High	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
719	Painting system CX	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
754	Painting system C5, durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
755	Norsok M-501 revision 6, 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.	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
Rating & instruction plates																	
002	Restamping voltage, frequency and output, continuous duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code	Variants	Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
004	Additional text on std rating plate (max 12 digits on free text line).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
095	Restamping output (maintained voltage, frequency), intermittent duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
126	Tag plate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
135	Mounting of additional identification plate, stainless.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
332	Baldor Catalogue #	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
333	Not for use in the USA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
528	Rating plate sticker	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shaft & rotor																	
069	Two shaft extensions according to catalog drawings.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
070	Special shaft extension at D-End, standard shaft material	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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																	
331	Motor not for sale for use in EU or UK.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
381	Frame agreement betw. ABB and Shell according to Shell DEP 33.66.05.31-GEN February 2018	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
509	Fulfilling US Integral Horsepower Motor Rule (IHP).	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
523	Neste Rotterdam design.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
535	NBR IR3 design	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
540	Fulfilling energy efficiency requirements for China	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
541	Inmetro certification	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
543	Australian MEPS	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
544	Australian HE MEPS	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
551	IA certificate of conformity for South Africa	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
558	Saudi Arabian MEPS (SASO)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
586	Fulfilling UK Conformity Assessment (UKCA) requirements.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
599	EQM – Emirates Quality Mark	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
682	CCC Ex certificate for China	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
758	Saudi Aramco design.	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
803	PESO/CCoE certificate for India	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
811	JIP-33 standard design	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
827	Petrobras N-2919 Specification design	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
841	Shell DEP 33.66.05.31-GEN February 2022	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
Stator winding temperature sensors																	
328	PTC - thermistors (3 in series), 120ºC, in stator winding	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
435	PTC - thermistors (3 in series), 130 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
439	PTC - thermistors (2x3 in series), 150 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
441	PTC - thermistors (3 in series, 130 ºC & 3 in series, 150 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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Terminal box																	
019	Larger than standard 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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
292	Adapter C-C	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-
293	Adapter D-D	-	-	-	-	-	-	-	-	-	-	-	-	●	●	-	-
294	Adapter E-D	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●
295	Adapter E-2D	-	-	-	-	-	-	-	-	-	-	-	-	●	●	○	-
296	Adapter E-3D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
351	Terminal block turned according to cable entry	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
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.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
466	Terminal box at N-end.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
468	Cable entry from D-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
469	Cable entry from N-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
553	Terminal box degree of protection IP66.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
554	Cast iron flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
557	Nickel plated cable glands mounted according to order.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
565	Adapter for terminal box on the side (RHS)	-	-	-	-	-	-	-	-	-	●	●	●	●	●	-	-
566	Adapter for terminal box on the side (LHS)	-	-	-	-	-	-	-	-	-	●	●	●	●	●	-	-
567	Separate terminal box material: cast Iron	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
568	Separate terminal box for heating elements, std. material	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
624	Prepared for inch cable glands according to BSPP standard.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	-
727	Stainless steel flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
730	Prepared for NPT cable glands.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
731	Two standard metal cable glands.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
734	Standard cable gland, Ex d IIC, armoured cable.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
735	Standard cable gland, Ex d IIC, non-armoured cable.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
741	Motor equipped with Ex eb terminal box (IEC/EN 60079-7).	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
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																	
145	Type test report from a catalogue motor, 400V 50Hz.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
146	Type test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
148	Routine test report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
150	Customer witnessed testing. Specify test procedure with other codes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
222	Torque/speed test, type test and multi-point load test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
560	Shaft voltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
561	Overspeed test,for one motor from specific delivery batch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
562	Overvoltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
470	Prepared for hollow shaft pulse tacho (L&L equivalent).	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
479	Mounting of other type of pulse tacho with shaft extension, tacho not included.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
701	Insulated bearing at N-end.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
704	EMC cable entry.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
747	1024 pulse tacho, Ex d, tD, L&L 841910002	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●

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

Mechanical design

Motor frame and drain holes

Motor frame

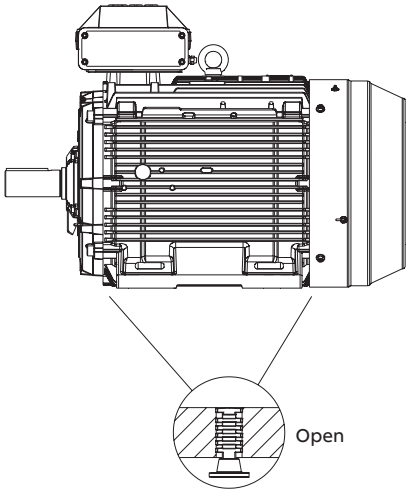
The motor frame, end shields and main terminal box are made of cast iron. Feet are integrated with the frame.

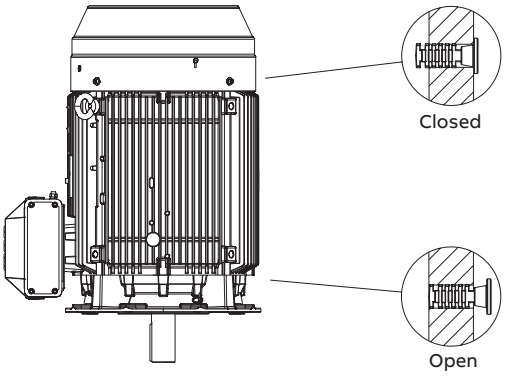
Motors can be supplied for foot mounting, flange mounting, and combinations of these.

Drain holes

Increased safety motors are provided with drain holes fitted with closable plugs as standard. The plugs are made of plastic material and are delivered in open position.

When mounting arrangement differs from foot mounted IM B3, mention variant code 066 when ordering to ensure the drain plug is mounted in the lowest position.





Mechanical design
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
71, 80	No lugs, weight of motors is less than 25kg	–	–
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
355	Detachable eye bolt	1 pcs close to terminal box on top, size M30	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 M30 delivered with each motor
400	Detachable eye bolt	1 pcs close to terminal box on top, size M36	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 M36 delivered with each motor
450	Detachable eye bolt	Locations for eye bolts: 4 pcs at N-end and 4 pcs at D-end, one location on top close to terminal box. 3 pcs eye bolts size M42 delivered with each motor	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 M42 delivered with each motor

Mechanical design

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	71	80	90	100	112	132	160	180
Power (W)	25	25	25	25	25	25	25	25

Motor size	200	225	250	280	315	355	400
Power (W)	25	60	60	60	2x60	2x60	2x60

Mechanical design
Bearings

ABB's increased safety Ex ec motors are normally fitted with single-row deep-groove grease lubricated ball bearings, as shown in the table below.

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

Axially-locked bearings

All motors with deep groove ball bearings are equipped with an axially locked bearing at the D-end, as a standard feature.

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 label is attached to motors when transport locking is used.

When high axial forces are involved, angular-contact ball bearings should be used. 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 optimal bearing system design is chosen. The variant codes for ordering angular-contact ball bearings are 058 and 059.

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

Standard and alternative bearing designs

Standard and alternative designs

Motor size	Number of poles	Standard design	Alternative designs		
		Deep groove ball bearings	Roller bearings (037)		Ang. contact ball bearings (058, 059)
		D-end	N-end	D-end	D-end
71	2-8	6203-2Z/C3	6202-2Z/C3	NA	NA
80	2-8	6204-2Z/C3	6203-2Z/C3	NA	NA
90	2-8	6205-2Z/C3	6204-2Z/C3	NA	NA
100	2-8	6206-2Z/C3	6205-2Z/C3	NA	NA
112	2-8	6206-2Z/C3	6205-2Z/C3 [1]	NA	NA
132	2-8	6208-2Z/C3	6208-2Z/C3	NA	NA
160	2-12	6309/C3	6209/C3	NU 309 ECP/C3	7309 B
180	2-12	6310/C3	6209/C3	NU 310 ECP/C3	7310 B
200	4-12	6312/C3	6210/C3	NU 312 ECP/C3	7312 B
225	4-12	6313/C3	6212/C3	NU 313 ECP/C3	7313 B
250	4-12	6315/C3	6213/C3	NU 315 ECP/C3	7315 B
280	2	6316/C3	6316/C3	[2]	7316 B
	4-12	6316/C3	6316/C3	NU 316 ECP/C3	7316 B
315	2	6316/C3	6316/C3	[2]	7316 B
	4-12	6319/C3	6316/C3	NU 319 ECP/C3	7319 B
355	2	6316M/C3	6316M/C3	[2]	7316 B
	4-12	6322/C3	6316/C3	NU 322 ECP/C3	7322 B
400	2	6317M/C3	6317M/C3	[2]	7317 B
	4-12	6324/C3	6319/C3	NU 324 ECP/C3	7324 B
450	2	6317M/C3	6317M/C3	[2]	7317 B
	4-12	6326M/C3	6322/C3	NU 326 ECP/C3	7326 B

[1] N-end bearing 6206-2Z/C3 on IE3 and IE4 motors

[2] On request

Bearing seals

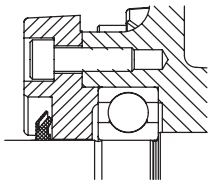
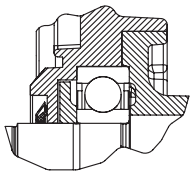
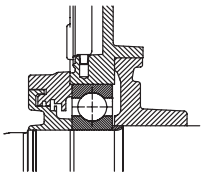
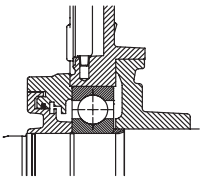
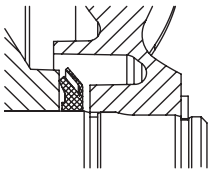
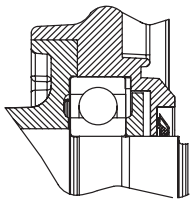
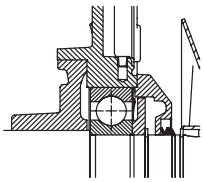
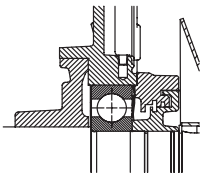
Table below present the standard and alternative and types of bearing seals per motor size.

Bearing seals

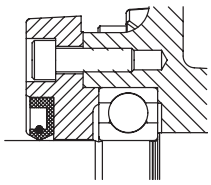
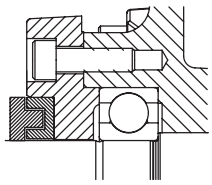
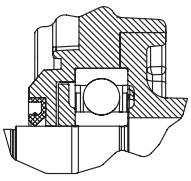
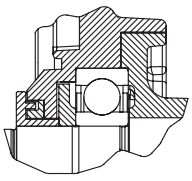
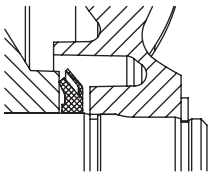
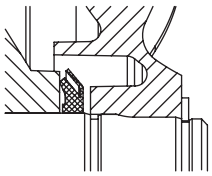
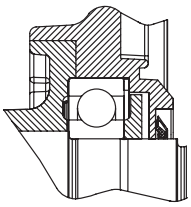
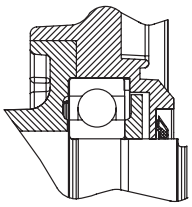
Motor size	Number of poles	Standard design		Alternative design	
		D-end	N-end	Radial seal at D-end (variant code 072 [1]	Labyrinth seal at D-end (variant code 783) [1]
71	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
80	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
90	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
100	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
112	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
132	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
160	2.elo	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
180	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
200	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
225	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
250	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
280	2	Labyrinth seal	V-ring	NA	Standard
	4 - 8	V-ring	V-ring	NA	Labyrinth seal
315SM, ML	2	Labyrinth seal	V-ring	NA	Standard
	4 - 8	V-ring	V-ring	NA	Labyrinth seal
315LK	2- 8	Labyrinth seal	V-ring	NA	Standard
355	2 - 12	Labyrinth seal	V-ring	NA	Standard
400	2	Labyrinth seal	Labyrinth seal	NA	Standard
400	4 - 12	Labyrinth seal	V-ring	NA	Standard
450	2 - 12	Labyrinth seal	Labyrinth seal	NA	Standard

[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request

Standard design

D-end				
N-end				
Motor size, seal type D-end/N-end	71-132, gamma/ gamma seal	160-250, gamma/ gamma seal	280, 315 2pole, 335 all pole numbers and 400 4-12 pole, labyrinth/ V-ring seal	400 2-pole, labyrinth/ labyrinth seal

Alternative design

D-end				
N-end				
Motor size, seal type D-end/N-end	80-132, VC072 radial/ gamma seals	80-132, VC783 labyrinth/ gamma seals	160-250, VC072 radial/ gamma seals	160-250, VC783 labyrinth/gamma seals

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 up to 315 ≥ 100,000 hours.

Lubrication

On delivery, motors in frame size 160 and above are pre-lubricated with high-quality grease. Before first start-up, see instructions for re-lubrication and recommended grease in the installation, operation, maintenance and safety manual for low voltage motors for explosive atmospheres delivered together with the motor, or see the lubrication plate on the motor.

Motors with bearings greased for life

Motors in frame sizes 71-132 are equipped with bearings greased for life, while this is available as an option for frame sizes 160-250. Bearings are lubricated with high-quality, high-temperature grease. Bearing types are stated on the rating plate.

The approximate lifetime of bearings in four-pole motors is about 40 0000 duty hours. Lifetime is subject to the load conditions of the application run by the motor.

Motors with re-lubrication nipples

In frame sizes 160-400, the bearing system is provided with valve discs 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 re-greasing. 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 L1 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

Lubrication intervals in duty hours for ball bearings

Frame size	Amount of grease g/ bearing	Amount of grease g/N- end	Speed 3600 r/min	Speed 3000 r/min	Speed 1800 r/min	Speed 1500 r/min	Speed 1000 r/min	Speed 500-900 r/min
Ball bearings								
Lubrication intervals in duty hours								
160	13	13	7100	8900	14300	16300	20500	21600
180	15	15	6100	7800	13100	15100	19400	20500
200	20	15	4300	5900	11000	13000	17300	18400
225	23	20	3600	5100	10100	12000	16400	17500
250	30	23	2400	3700	8500	10400	14700	15800
280	35	35	1900	3200	-	-	-	-
280	40	40	-	-	7800	9600	13 900	15 000
315	35	35	1900	3200	-	-	-	-
315	55	40	-	-	5900	7600	11 800	12 900
355	35	35	1900	3200	-	-	-	-
355	70	40	-	-	4000	5600	9600	10 700
400	40	40	1500	2700	-	-	-	-
400	85	55	-	-	3200	4700	8600	9700
450	95	70	-	-	2500	3900	7700	8700

Lubrication intervals in duty hours for roller bearings

Frame size	Amount of grease g/ bearing	Amount of grease g/N- end	Output kW	Speed 3600 r/min	Speed 3000 r/min	Output kW	Speed 1800 r/ min	Speed 1500 r/ min	Output kW	Speed 1000 r/ min	Output kW	Speed 500-900 r/ min
Ball bearings												
Lubrication intervals in duty hours												
160	13	13	all	3600	4500	all	all 7200	8100	all	10300	all	10800
180	15	15		3000	3900	all	all 6600	7500	all	9700	all	10200
200	20	15		2100	3000	all	all 5500	6500	all	8600	all	9200
225	23	20		1800	1600	all	all 5100	6000	all	8200	all	8700
250	30	23		1200	1900	all	all 4200	5200	all	7300	all	7900
280	40	40		-	-	all	all 4000	5300	all	7000	all	8500
315	55	40		-	-	all	all 2900	3800	all	5900	all	6500

Mechanical design
Radial forces

Pulley diameter

When the desired bearing life has been determined, the minimum permissible pulley diameter can be calculated with FR as follows:

$$D = \frac{1.9 \cdot 10^7 \cdot K \cdot P}{n \cdot F_R}$$

Where:	
D:	pulley diameter, mm
P:	power requirement, kW
n:	motor speed, r/min.
K:	belt tension factor, dependent on belt type and type of duty. A common value for V-belts is 2.5
F_R:	permissible radial force, refer to tables below.

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 L_{10h} of 40 000 hours per motor size.

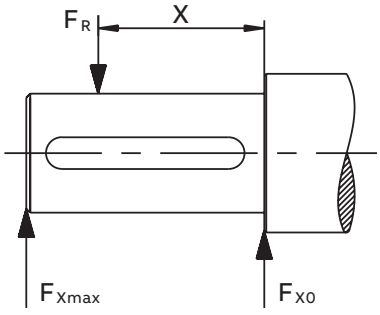
Permissible loads of simultaneous radial and axial forces can be supplied on request.

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

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 radial forces

Motor size	Poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings				Roller bearings		Roller bearings	
			Mounting arrangement IM B3							
			Ball bearings							
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{x0}(N)	F_{xmax}(N)	F_{x0}(N)	F_{xmax}(N)	F_{x0}(N)	F_{xmax}(N)	F_{x0}(N)	F_{xmax}(N)
71	2	30	540	460	420	360	1285	650	1040	650
	4	30	700	605	555	480	1615	650	1310	650
	6	30	780	665	620	530	1640	650	1450	650
	8	30	860	730	685	580	1640	600	1580	650
80	2	40	710	600	385	350	1910	865	1555	865
	4	40	940	810	725	625	2335	865	1945	865
	6	40	1060	895	840	710	2335	865	2160	865
	8	40	1185	1020	940	810	2335	865	2335	865
90	2	50	820	690	650	545	2205	1330	1790	1330
	4	50	1035	870	820	690	2715	1330	2205	1330
	6	50	1185	995	940	790	3054	1330	2490	1330
	8	50	1300	1095	1035	870	3340	1330	2715	1330
100	2	60	1130	925	900	735	2905	1900	2360	1900
	4	60	1425	1165	1135	925	3575	1900	2905	1900
	6	60	1635	1335	1295	1060	4040	1900	3280	1900
	8	60	1820	1520	1445	1205	4460	1900	3620	1900
112	2	60	1170	980	925	775	3000	1970	2435	1970
	4	60	1475	1235	1170	980	3695	1970	3000	1970
	6	60	1690	1310	1340	1120	4170	1970	3390	1970
	8	60	1860	1310	1475	1235	4450	1970	3695	1970
132	2	80	1840	1500	1460	1190	4255	3465	3455	2815
	4	80	2320	1890	1840	1500	5240	4265	4255	3465
	6	80	2660	2165	2110	1715	5915	3680	4805	3680
	8	80	2925	2380	2320	1890	6450	3680	5240	3680
160 MLA	2	110	3540	2740	2955	2285	7100	4300	6140	4300
	4	110	4000	3100	3325	2570	8000	4300	6870	4300
	6	110	4170	3200	3440	2655	8600	4300	7270	4300
	8	110	4600	3585	3855	2985	9300	4300	7955	4300
160 MLB	2	110	3540	2740	2955	2270	7085	4300	6070	4300
	4	110	4085	3300	3370	2725	8300	4300	7055	4300
	6	110	4100	3355	3400	2755	8600	4300	7300	4300
	8	110	4200	3270	3455	2670	9000	4300	7570	4300
160 MLC	2	110	3400	2600	2855	2200	6800	4300	5885	4300
	4	110	3700	3000	3070	2485	7800	4300	6640	4300
	6	110	3600	2900	2870	2325	8000	4300	6700	4300
	8	110	4170	3370	3370	2725	9000	4300	7585	4300
160 MLD	2	110	3585	2900	3000	2440	7100	4300	6140	4300
	4	110	3400	2755	2755	2240	7600	4300	6370	4300
160 MLE	2	110	3185	2570	2640	2140	6785	4300	5770	4300
180 MLA	2	110	4100	3385	3455	2825	8125	5500	7025	5500
	4	110	4270	3485	3525	2885	8600	5500	7300	5500
	6	110	4700	3800	3855	3155	9400	5500	7900	5500
	8	110	4785	3900	3870	3170	9800	5500	8255	5500
180 MLB	2	110	4170	3400	3470	2825	7900	5500	6770	5500
	4	110	4185	3400	3440	2810	8500	5500	7200	5500
	6	110	4370	3570	3525	2885	9000	5500	7600	5500
180 MLC	4	110	3700	3055	3010	2470	7900	5500	6655	5440
200 MLA	2	110	5600	4685	4700	3925	10900	9100	9470	7900
	4	110	6285	5200	5240	4370	12500	9550	10700	8900
	6	110	6800	5700	5700	4770	13600	9550	11670	9550
	8	110	6800	5700	5600	4685	14100	9550	12000	9550
200 MLB	2	110	5670	4700	4700	3925	11000	9200	9500	7900
	4	110	5700	4700	4700	3925	12000	9550	10185	8500
	6	110	6400	5370	5300	4425	13200	9550	11200	9385
200 MLC	2	110	5000	4185	4185	3500	10400	8700	8900	7455
	4	110	5400	4500	4425	3685	11600	9550	9800	8200
	6	110	5800	4885	4740	3955	12500	9550	10600	8800
200 MLD	2	110	4985	4170	4170	3485	10400	8700	8900	7400
225 SMA	2	110	6400	5400	5355	4500	13300	10700	11500	9700
	4	140	7300	5900	6155	4970	15400	10250	13200	10250
	6	140	7600	6200	6370	5140	16400	10250	14000	10250
	8	140	8500	6900	7100	5725	17900	10250	15300	10250

Motor size	Poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings				Roller bearings		Roller bearings	
			Mounting arrangement IM B3							
			Ball bearings							
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)
225 SMB	2	110	6100	5185	5155	4340	13000	10700	11200	9455
	4	140	7085	5700	5885	4755	15100	10250	12900	10250
	6	140	7100	5700	5840	4700	16000	10250	13500	10250
	8	140	8000	6485	6600	5340	17300	10250	14700	10250
225 SMC	2	110	5600	4700	4685	3940	12600	10600	10770	9070
	4	140	6400	5200	5300	4285	14500	10250	12385	10000
225 SMD	2	110	5500	4640	4600	3880	12420	10460	10640	8960
	4	140	5800	4700	4725	3800	13500	10250	11400	9270
250 SMA	2	140	7700	6285	6500	5285	17100	10900	14900	10900
	4	140	8700	7000	7300	5900	19800	13800	17000	13785
	6	140	9400	7600	7800	6355	21600	13800	18400	13800
	8	140	9600	7800	7900	6400	22700	13800	19300	13800
250 SMB	2	140	7100	5800	6000	4885	16700	10900	14400	10900
	4	140	7800	6300	6470	5240	18900	13800	16200	13100
	6	140	8900	7200	7355	5955	21200	13800	18000	13800
250 SMC	2	140	6800	5500	5670	4600	16300	10900	14000	10900
	4	140	7400	6000	6055	4900	18100	13800	15400	12485
	6	140	8200	6600	6670	5400	20300	13800	17200	13800
280 SM_	2	140	7300	6000	5800	4900	20400	6000	16500	6000
	4	140	9200	7800	7300	6200	25100	9200	20300	9200
	6	140	10600	8900	8400	7000	28300	9200	23000	9200
	8	140	11700	9200	9200	7800	30900	9200	25100	9200
280 ML_	2	140	7400	6200	5800	5000	20600	6200	16700	6200
	4	140	9200	7900	7300	6200	25000	9500	20300	9500
	6	140	10500	9000	8300	7100	28300	9400	22900	9400
	8	140	11600	9500	9200	7900	30800	9500	25000	9500
315 SM_	2	140	7300	6000	5800	4950	20300	6000	16500	6000
	4	170	11400	9400	9000	7450	32500	9600	26600	9600
	6	170	13000	9600	10300	8500	37000	9600	30000	9600
	8	170	14400	9600	11400	9400	40300	9600	32700	9600
315 ML_	2	140	7400	6400	5850	5050	20600	5850	16700	5850
	4	170	11500	9700	9100	7650	32700	13600	26500	13600
	6	170	13200	11100	10400	8800	36900	13600	29900	13600
	8	170	14500	12200	11500	9700	40200	13600	32600	13600
315 LK_	2	140	7400	6550	5800	5150	20800	5550	16800	5550
	4	170	11500	10000	9100	7850	33100	13350	26800	13350
	6	170	13200	11400	10450	9050	37300	13350	30300	13350
	8	170	14600	12600	11550	10000	40800	13350	33100	13350
355 SM_	2	140	7350	6450	5750	5050	20600	7200	16700	7200
	4	210	15200	12600	12000	9950	45500	14000	36900	14000
	6	210	17500	14000	13800	11400	51400	14000	41700	14000
	8	210	19300	14000	15250	12600	56000	14000	45500	14000
355 ML_	2	140	7350	6550	5750	5100	20800	6750	16800	6750
	4	210	15300	12900	12000	10100	45900	13600	37200	13600
	6	210	17600	13600	13900	11600	51500	13600	42100	13600
	8	210	19400	13600	15300	12900	56000	13600	45900	13600
355 LK_	2	140	7350	6650	5650	5100	21000	6550	17000	6550
	4	210	15200	13000	11850	10200	46000	13000	37300	13000
	6	210	17500	13000	13700	11900	52000	13000	42000	13000
	8	210	19400	13000	15200	13000	56500	13000	46000	13000
400 L_	2	170	7650	6850	4400	3900	23900	9050	19350	9050
	4	210	15600	13550	12150	10550	52500	16000	43300	16000
	6	210	17800	15450	13850	12000	60000	16000	48800	16000
	8	210	19700	16000	15350	13350	65700	16000	53200	16000
400 LK_	2	170	7650	6850	4400	3900	23900	9050	19350	9050
	4	210	15600	11500	12150	10550	52500	11500	43300	11500
	6	210	17800	11500	13850	11500	60000	11500	48800	11500
	8	210	19700	11500	15350	11500	65700	11500	53200	11500
450 L_	2	170	7400	6700	3500	3300	24000	7500	19000	7500
	4	210	17000	15200	13000	11600	62000	25000	50000	25000
	6	210	19000	17000	14000	13000	70000	24000	56000	24000
	8	210	21300	19000	16500	14600	76000	23000	62000	23000

Mechanical design

Axial forces

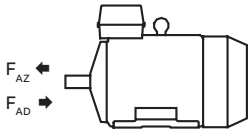
— 01 Mounting arrangement IM B3

01 Mounting arrangement IM V1

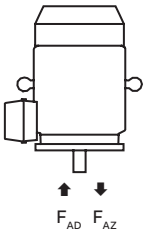
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



01



02

Permissible axial forces

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
71	2	30	615	285	505	175	630	275	520	165
	4	30	760	430	615	285	790	410	645	265
	6	30	870	540	695	365	890	525	720	355
	8	30	960	630	765	435	985	615	785	415
80	2	40	880	300	735	155	915	280	770	135
	4	40	1075	495	880	300	1130	455	935	260
	6	40	1215	635	985	405	1270	600	1040	370
	8	40	1330	750	1070	490	1400	705	1140	450
90	2	50	780	500	620	340	840	455	680	300
	4	50	985	705	775	495	1070	650	860	440
	6	50	1140	860	890	610	1225	800	975	555
	8	50	1265	985	985	705	1355	925	1075	645
100	2	60	925	570	735	350	1285	510	1060	290
	4	60	1480	860	1190	570	1600	780	1305	490
	6	60	1690	1070	1350	730	1815	995	1470	650
	8	60	1865	1245	1480	860	1995	1160	1610	775
112	2	60	1155	595	935	375	1290	505	1070	280
	4	60	1445	885	1155	595	1595	785	1300	495
	6	60	1655	1095	1315	755	1810	995	1465	650
	8	60	1830	1270	1445	885	1985	1170	1600	780
132	2	80	1765	965	1420	620	1925	855	1580	510
	4	80	2210	1410	1755	955	2420	1270	1965	815
	6	80	2535	1735	2000	1200	2770	1580	2235	1045
	8	80	2800	2000	2205	1405	3055	1835	2455	1235
160 MLA	2	110	2850	2850	2325	2325	3100	2578	2570	2048
	4	110	3450	3450	2775	2775	3820	3150	3120	2450
	6	110	3690	3690	2970	2970	4100	3410	3325	2635
	8	110	4155	4155	3315	3315	4440	3845	3640	3045
160 MLB	2	110	2850	2850	2325	2325	3120	2570	2580	2030
	4	110	3435	3435	2760	2760	3880	3085	3180	2385
	6	110	3600	3600	2880	2880	4120	3240	3360	2480
	8	110	3750	3750	2970	2970	4140	3450	3340	2650
160 MLC	2	110	2775	2775	2280	2280	3080	2500	2560	1980
	4	110	3150	3150	2535	2535	3620	2770	2985	2135
	6	110	3135	3135	2490	2490	3680	2700	3005	2025
	8	110	3675	3675	2910	2910	4240	3260	3445	2465
160 MLD	2	110	2865	2865	2330	2330	3220	2540	2665	1985
	4	110	2900	2900	2320	2320	3420	2470	2820	1870
160 MLE	2	110	2500	2500	2025	2025	2900	2150	2420	1670
180 MLA	2	110	3300	3300	2700	2700	3660	2940	3060	2340
	4	110	3600	3600	2920	2920	4160	3150	3460	2450
	6	110	4140	4140	3320	3320	4800	3675	3940	2815
	8	110	4220	4220	3360	3360	4960	3740	4040	2820
180 MLB	2	110	3340	3340	2725	2725	3760	2960	3125	2320
	4	110	3580	3580	2900	2900	4220	3095	3500	2375
	6	110	3800	3800	3040	3040	4500	3285	3700	2485
180 MLC	4	110	3220	3220	2560	2560	3880	2660	3220	2000
200 MLA	2	110	4460	4460	3640	3640	5000	3965	4200	3125
	4	110	5000	5260	4260	4260	5000	4680	5000	3640
	6	110	5000	5480	4720	4720	5000	5265	5000	4065
	8	110	5000	5880	4700	4700	5000	5195	5000	3955
200 MLB	2	110	4440	4440	3620	3620	5000	3905	4220	3085
	4	110	4720	4720	3840	3840	5000	4060	4700	3120
	6	110	5000	5480	4420	4420	5000	4800	5000	3660
200 MLC	2	110	3940	3940	3180	3180	4600	3385	3880	2665
	4	110	4480	4480	3620	3620	5000	3775	4520	2875
	6	110	4980	4980	3980	3980	5000	4165	5000	3105
200 MLD	2	110	3940	3940	3200	3200	4660	3370	3925	2635
225 SMA	2	110	4980	4980	4060	4060	5000	4375	4780	3455
	4	140	5000	6080	4920	4920	5000	5445	5000	4225
	6	140	5000	6520	5000	5260	5000	5735	5000	4395
	8	140	5000	7420	5000	5960	5000	6535	5000	5095

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
225 SMB	2	110	4860	4860	3960	3960	5000	4245	4780	3345
	4	140	5000	5880	4780	4780	5000	5175	5000	3995
	6	140	5000	6020	4840	4840	5000	5155	5000	3915
	8	140	5000	6940	5000	5560	5000	6055	5000	4635
225 SMC	2	110	4380	4380	3540	3540	5000	3670	4440	2900
	4	140	5000	5240	4260	4260	5000	4445	5000	3425
225 SMD	2	110	4320	4320	3480	3480	5000	3590	4400	2790
	4	140	4800	4800	3820	3820	5000	3895	5000	2935
250 SMA	2	140	6000	6080	4920	4920	6000	5345	5840	4225
	4	140	6000	7140	5820	5820	6000	6300	6000	4920
	6	140	6000	7880	6000	6380	6000	6950	6000	5350
	8	140	6000	8200	6000	6600	6000	7125	6000	5385
250 SMB	2	140	5620	5620	4540	4540	6000	4830	5640	3810
	4	140	6000	6320	5100	5100	6000	5325	6000	4085
	6	140	6000	7480	6000	6040	6000	6370	6000	4830
250 SMC	2	140	5260	5260	4220	4220	6000	4395	5400	3415
	4	140	5960	5960	4760	4760	6000	4900	6000	3700
	6	140	6000	6860	5520	5520	6000	5575	6000	4135
280 SM_	2	140	6200	4250	4900	2900	7550	3150	6200	1800
	4	140	8000	6000	6250	4250	9600	4550	7800	2750
	6	140	7250	9250	7150	5150	11150	5500	9000	3350
	8	140	10300	8300	7950	5950	12200	7000	9850	4700
280 ML_	2	140	6100	4100	4800	2800	8150	2750	6800	1400
	4	140	7800	5800	6000	4000	10450	4050	8650	2250
	6	140	8950	6950	6900	4900	12350	4750	10250	2600
	8	140	10000	8000	7700	5700	13450	5800	11050	3450
315 SM_	2	140	6180	4200	4850	2850	7950	2600	6600	1300
	4	170	9400	7400	7250	5250	11750	5500	9550	3300
	6	170	10900	8900	8350	6350	13600	6300	11050	3750
	8	170	12000	10000	9200	7000	15350	7900	12450	5000
315 ML_	2	140	6050	4050	4750	2750	8650	2300	7300	[1]
	4	170	9250	7250	7100	5100	12500	5050	10300	2900
	6	170	10650	8650	8100	6100	14900	5800	12350	3250
	8	170	11500	9900	8900	6800	15400	6300	13600	3400
315 LK_	2	140	6000	3950	4650	2650	9100	1350	7750	[1]
	4	170	9100	7150	7000	5000	13100	3850	10900	1700
	6	170	10500	8500	7950	5950	15700	4100	13100	1550
	8	170	11750	9750	8900	6900	16900	6300	14100	3450
355 SM_	2	140	3050	6850	1750	5550	6350	4250	4950	2900
	4	210	8600	12400	5900	9700	13250	8600	10450	5850
	6	210	10550	14350	7300	11100	15650	9580	12350	6270
	8	210	12200	16000	8550	12350	17350	12500	13600	8900
355 ML_	2	140	2900	6700	1600	5400	7100	3700	5750	2350
	4	210	8360	12150	5650	9450	14600	7950	11850	5150
	6	210	10100	13900	6900	10700	18050	8600	14700	5300
	8	210	12000	15800	7300	11000	21100	11650	17000	7600
355 LK_	2	140	2650	6450	1350	5150	8250	2650	6900	1300
	4	210	8200	12000	5450	9250	15650	6600	12850	3800
	6	210	9900	13700	6700	10500	19100	7050	15800	3750
	8	210	11450	15250	7800	11600	21200	8700	17500	5000
400 L, LK_	2	170	2150	7150	[1]	5800	8650	2150	7220	[1]
	4	210	7100	13100	4300	10300	16050	6400	13150	3400
	6	210	8850	14850	5500	11500	18450	6750	15100	3400
	8	210	10450	16450	6750	12750	20100	8350	16450	4700
450 L_	2	170	1800	6800	[1]	5500	11500	[1]	10000	[1]
	4	210	7600	13500	4500	10500	20000	4400	17700	1200
	6	210	9000	15000	5600	11500	26000	3700	22200	[1]
	8	210	10800	16800	7000	12900	27800	5500	23700	1350

[1] On request.

Terminal box

Standard terminal box

Protection and mounting options

The degree of protection for the standard terminal box is IP 55.It complies with the requirements of the protection method ‘e’ protection level ‘c’ increased safety and prevents all ignition sources such as sparks, excessive over heating etc. The features of the terminal box are: No self loosening terminals, compliance with creepage and clearance distances as defined in standard for increased safety ‘ec’ protection.

By default, terminal boxes are mounted on top of the motor at D-end. Side mounted terminal box is possible in frame sizes 160 and 400. Mounting at N-end is also possible for the larger frame sizes. Please refer to the variant code section for more details.

Turnability

The standard terminal boxes for motor sizes 160–315 can be turned 4*90°, and in sizes 355–500, 2*180° after delivery. For sizes 355–500, it is also possible to mount a terminal box with an opening towards the D or N-end, using the relevant variant codes when ordering, this is needed to get the terminal block turned in the right position. For motors in size 71–132, a 4*90° turnable terminal box is optional- this can be ordered with variant code 400.

Cable entries

Terminal box is provided as standard with tapped holes for cable glands, no cable glands are included as standard. The entry holes are closed with Ex eb approved blanking plugs made of nickel-plated brass, one of the main entries is closed with a plastic plug as transport and storage protection

Very large motors have an angle adapter between the terminal box and gland plate. Please refer to the table on next page for further information about amount and size of threaded holes, plugs provided as standard.

Different types of cable glands are available as option, suitable for either armoured and nonarmoured cables, please refer to the Terminal box alternatives section for more details.

Cable type and terminations

Terminations are suitable for copper and aluminum cables (Al- cables on request for motor sizes 160 to 250). Cables are connected to terminals by cable lugs, which are not included in the delivery.

Earthing bolts

The motors are as standard provided with at least one earthing bolt inside the terminal box and another on the frame. The earthing bolt on the frame is located on top close to the terminal box, motors in size 160-250 is the earthing bolt located on RHS foot (seen from D-end).

Ordering

To ensure the delivery of desired terminations and cable entries for the motor, state the cable type, quantity, size, outer diameter and possibly type of cable glands needed when ordering.

See section Variant codes for all options available.

Standard delivery

Standard delivery if no other information is provided.

Motor size	Design letter	Voltage code	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adapter	Amount and size of threaded plugged holes, or cable sealing end unit	Max. connectable core cross section mm² / phase	Number and size of terminal bolts
IE2 and IE3 motors									
71			2-8	integr.	-	-	2xM16x1.5	1x2.5	6 x M4
80			2-8	integr.	-	-	2xM25x1.5	1x4	6 x M4
90			2-8	integr.	-	-	2xM25x1.5	1x6	6 x M5
100-132			2-8	integr.	-	-	2x M32x1.5	1x10	6 x M5
160-180			2-8	63	B	-	2xM40x1.5	1x35	6 x M6
200-250			2-8	160	C	-	2xM63x1.5	1x70	6 x M10
280 SM				210	C	-	2xM63x1.5	2x150	6 x M12
280 ML			2-4	370	D	-	2xM63x1.5	2x240	6 x M12
280 ML			6-8	210	C	-	2xM63x1.5	2x150	6 x M12
315SM_, ML_			2-8	370	D	-	2xM63x1.5	2x240	6 x M12
315LKB			2	370	D	-	2xM63x1.5	2x240	6 x M12
315LKC			2	750	E	E-2D	4x M75x1.5	4x240	6 x M12
315LK_			4-8	370	D	-	2xM63x1.5	2x240	6 x M12
355SMA - SMB		D,S	2-4	750	E	-	2x M75x1.5	4x240	6 x M12
355SMA		E,F	2-4	370	D	-	2xM63x1.5	2x240	6 x M12
355SMB	K	E,F	2-4	370	D	-	2xM63x1.5	2x240	6 x M12
355SMB	G,L,M	E,F	2-4	750	E	-	2x M75x1.5	4x240	6 x M12
355SMA-SMB			6-12	370	D	-	2xM63x1.5	2x240	6 x M12
355SMC			2-4	750	E	-	2x M75x1.5	4x240	6 x M12
355SMC	K,M	D,S	6	370	D	-	2xM63x1.5	2x240	6 x M12
355SMC	G,L	D,S	6	750	E	-	2x M75x1.5	4x240	6 x M12
355SMC		E,F	6	370	D	-	2xM63x1.5	2x240	6 x M12
355SMC			8-12	370	D	-	2xM63x1.5	2x240	6 x M12
355ML_, LK_			2-4	750	E	E-2D	4x M75x1.5	4x240	6 x M12
355ML_, LK_	G,L	E,F	6	750	E	-	2x M75x1.5	4x240	6 x M12
355ML_, LK_	K,M	E,F	6	370	D	-	2xM63x1.5	2x240	6 x M12
355ML_, LK_		D,S	6-8	750	E	-	2x M75x1.5	4x240	6 x M12
355ML_		E,F	8	370	D	-	2xM63x1.5	2x240	6 x M12
355LK_		E,F	8	750	E	-	2x M75x1.5	4x240	6 x M12
355ML_, LK_			10-12	750	E	-	2x M75x1.5	4x240	6 x M12
400			2-8	750	E	E-2D	4x M75x1.5	4x240	6 x M12
450 LA, LKA			2	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450 LA, LKA	M		4	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450 LA, LKA	G,K	D,S	4	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450 LA, LKA	G,K	E,F	4	750	E	E-2D	4x M75x1.5	4x240	6 x M12
450 LA, LKA			6	750	E	E-2D	4x M75x1.5	4x240	6 x M12
450 LB, LC, LKB, LKC			2-6	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450			8	750	E	E-2D	4x M75x1.5	4x240	6 x M12

Auxiliary cable entries	Pole numbers	Amount and size of threaded plugged holes	Max. connectable corecross section mm2 /phase
160 - 450	2-8	2x M20x1.5	1x 2.5

Terminal box

Terminal box dimensions

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01 Terminal box type 63 and 160

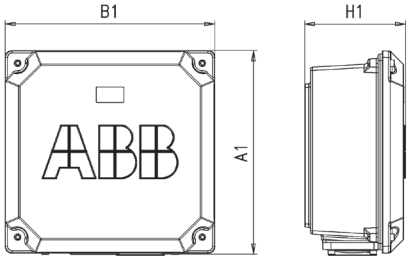
02 Terminal box types 210 and 370

03 Terminal box type 750 + adapter

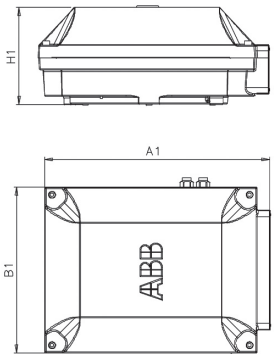
04 Terminal box type 1200 + adapter

For motor sizes 71 to 132 the terminal box is integrated in motor frame and the dimensions for terminal boxes can be found in the motor dimension drawings in ABB Library.

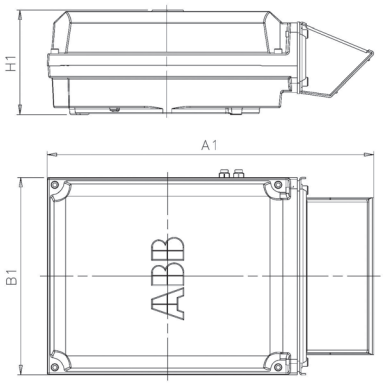
To match the correct terminal box with motor sizes 160-450, find the motor type and correspondent terminal box type on the previous page. The box types and heir dimensions are presented on this page.



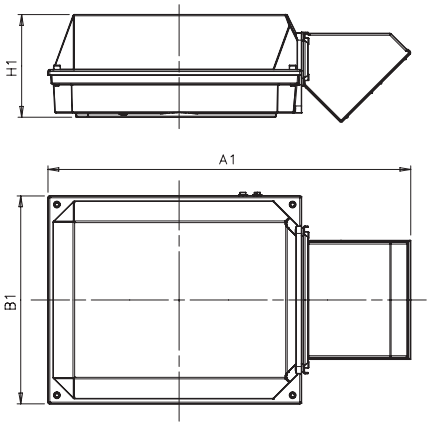
01



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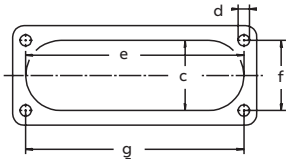


04

Terminal box types acc acc. to current capacity	A1 mm	B1 mm	H1 mm	Gland plate opening
63	247	247	109	B
160	300	310	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
1200 with E-2D adapter	1000	578	285	2xD
1200 without E-2D adapter	697	578	285	E
1200 with E-2E adapter	1195	578	285	2xE
1200 with E-3D adapter	1250	578	285	3xD

Dimensions for terminal box inlets

Corresponds to motor sizes 160 and above



Flange opening	c mm	e mm	f mm	g mm	d thread type
B	31	120	30	120	M6
C *)	71	194	62	193	M6
C **)	67	193	62	193	M8
D	100	300	80	292	M10
E	115	370	100	360	M12

Note: The C flange is different depending on frame size.

*) for frame sizes 200-225

**) for frame size 280

Terminal box

Terminal boxes and boards

01 Integrated terminal box for motor sizes 71-112. Tapped holes for cable entries

02 Terminal board for motor sizes 90-112, IE2, and 90-100, IE3

03 Terminal board for motor sizes 71-80

04 Terminal board for motor sizes 112, IE3

05 Integrated terminal box for motor sizes 132. Tapped holes for cable entries

06 Terminal board for motor size 132

07 Terminal box for motor sizes 160-250. Connection flanges with tapped cable entries

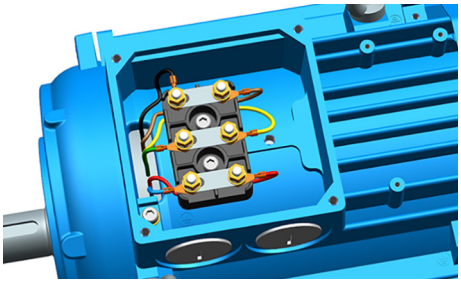
08 Terminal board for motor sizes 160-250

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

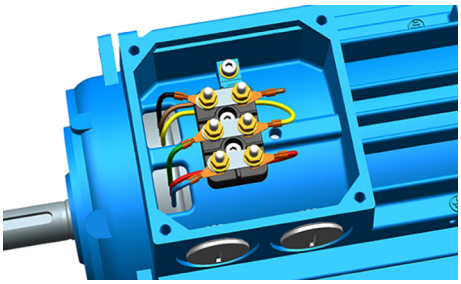
Motor sizes 71-112



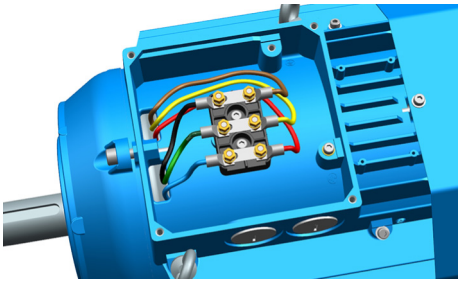
01



02

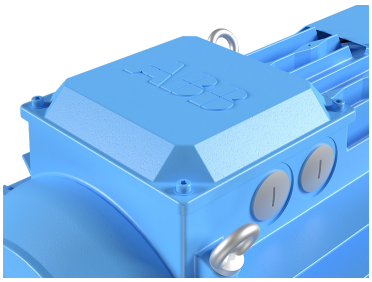


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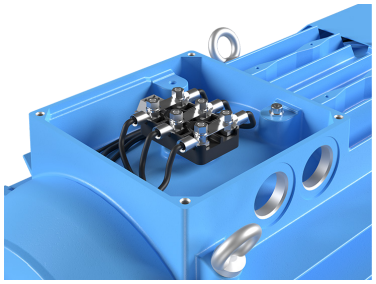


04

Motor size 132

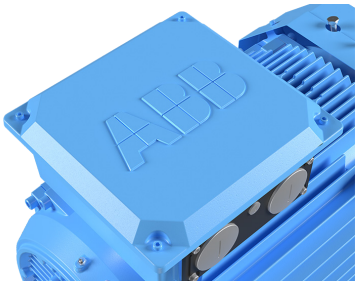


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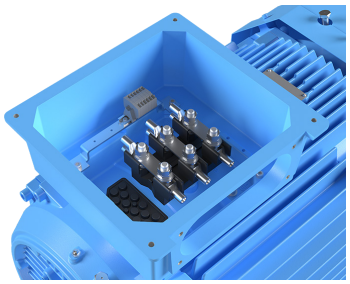


06

Motor sizes 160-250



07



08

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09 Terminal box for motor sizes 280 - 315, except LKC. Connection flange with tapped cable entries

10 Terminal board for motor sizes 280 - 315, except LKC

11 Terminal box for motor sizes 315LKC

12 Terminal board for motor sizes 315 LKC

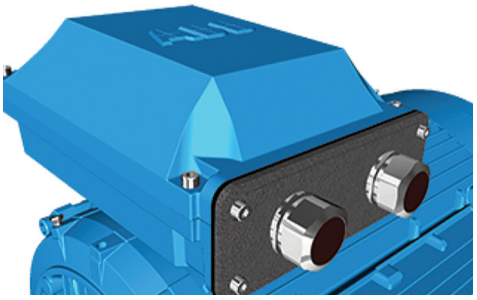
13 Terminal box for motor sizes 355SM

14 Terminal box with angle adapter for motor sizes 355ML - 450

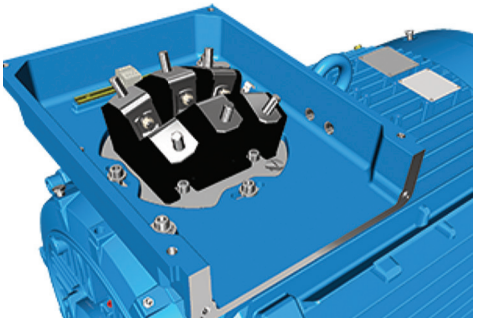
15 Terminal board for motor sizes 355 to 400

16 Terminal board for motor size 450

Motor sizes 280 - 315



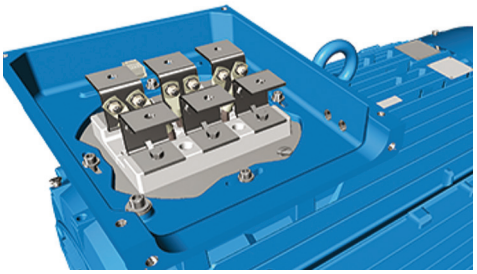
09



10

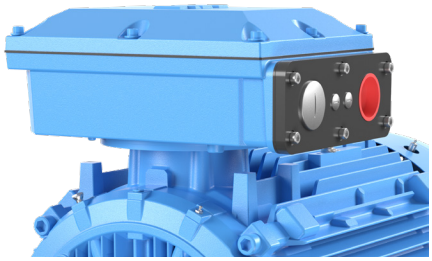


11

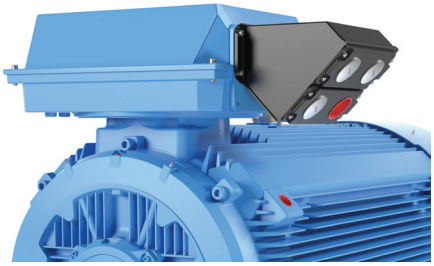


12

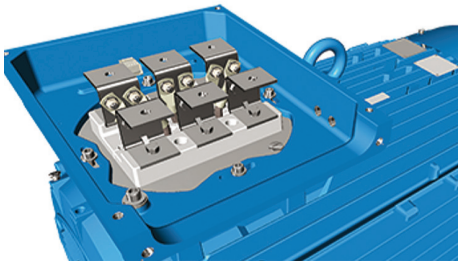
Motor sizes 355-450



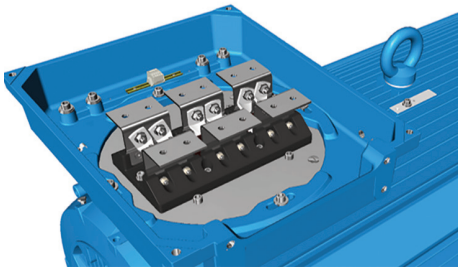
13



14



15



16

Terminal box

Terminal box alternatives

Optional cable termination parts

There is a broad selection of cable termination accessories available to allow a safe and reliable termination of one or several supply cables. The most common options are explained in this chapter.

How to order

- Check first that the terminal box itself allows mounting of the desired cable and cores (refer to table showing standard delivery for each motor size). If very large cable are used might it be necessary to use a larger terminal box and larger terminal board than standard.
- Select the right cable gland(s) or cable sealing end unit based on the diameter of the cables(s) and suitability for cable type.
- Select appropriate adapter or flange to allow mounting on opening in terminal box.
- Note that turning the terminal box might be prevented by use of some adapters

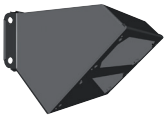
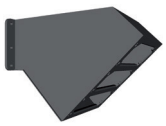
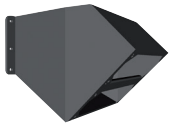
Ordering example

Ordering example for M3GP motors

Motor and supply cables	110kW, 4-pole, 400V 50Hz, IE3. Cables needed: 1 pcs outer diameter 42mm steel wire armoured cable, single cross section 120 mm2. Cables coming from below.
Motor	M3GP 315SMC 4, B3
Adapter (to allow entry of cables coming from below)	Not possible
Cable glands Ex t suitable for armoured cables (an M50 gland will suit this cable)	Variant code 734 (specify cable dimensions)
Gland plate made of steel drilled and tapped with 1 pcs M50 hole (non-std size)	Variant code 554 (1 pcs M50 x 1.5 threaded hole to be specified)

Optional adapters

To allow easy termination of cables entering the terminal box from above or below, an angle adapter is recommended. These can be used to allow the mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the 'terminal box opening' column in section Standard terminal box.

Adapater						
Variant code	292	293	294	295	296	444
Opening to terminal box	C	D	E	E	E	E
Flange or opening for end unit	C	D	D	2 x D	3 x D	2 x E
Material	Cast iron	Cast iron	Cast iron	Steel	Steel	Steel
Notes				Included as standard delivery for some types.	Only possible on type 1200 terminal box.	Only possible on type 1200 terminal box.

Cable glands

The motors are delivered as standard with plugged cable entries as described in the previous section. There is a broad selection of different type of cable glands available 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, Ex t, for non armoured cable, variant code 230 or 731**	**EMC Cable gland(s) nickel plated brass, Ex t, for non armoured cable, variant code 704**	**Cable gland Ex d / Ex t for armoured cable with double sealing, variant code 734**	
Metric (std)	**Cable outer diameter, mm**	**Cable outer diameter, mm**	**Cable outer diameter, mm**	**Inner sheath diameter, mm**
M16 x 1.5	4-8	4-8	7-12	4.5-8
M20 x 1.5	4-12	4-12	10-16	6-10
M25 x 1.5	-	-	13.5-19	10-14
M25 x 1.5 *)	10-18	10-18	19-25	14-18
M32 x 1.5	14-24	14-24	25-30	18-23
M40 x 1.5	22-32	22-32	30-36	23-28
M50 x 1.5	-	-	36-40	28-32
M50 x 1.5 *)	26-35	26-35	40-46	32-37
M63 x 1.5	-	-	46-53	37-43
M63 x 1.5 *)	35-45	35-45	53-60	43-50
M75 x 1.5	46-62	46-62	58-70	48-60
M90 x 1.5	-	-	78-90	68-80
M100 x 1.5	-	-	88-100	78-90

*) = High capacity version, delivered as standard with the variant code

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

The motors are delivered as standard with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If glands with NPT threads will be used must variant code 730 be ordered. If nothing else is stated on the orderer will the sizes in tables below be delivered.

Motor frame size	Main cable entries	NPT plug
160-180	2 x 1 ¼”	1 x 1 ¼”
200-250	2 x 1 ½”	1 x 1 ½”
280	2 x 2”	1 x 2”
315	2 x 21/2”	1 x 21/2”
355-450	2 x 3”	1 x 3”

Motor frame size	Cable entries for auxiliaries	NPT plug
160-450	2 x ¾”	2 x ¾”

Threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands does not suit the gland size and cable that will be used can openings of nonstandard size also be delivered, either by fitting a 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 using variant codes 554 and 555.

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

Gland plates of non-standard material

The standard material used in gland plates is steel. Gland plates made of stainless steel are optional, either with cable glands or blind without threaded holes. Please refer to the variant code section for more information.

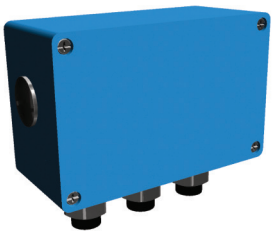
Auxiliary terminal box

It is possible to equip motors from frame size 132 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of aluminum, except frame sizes 160-250 where cast iron boxes are used.

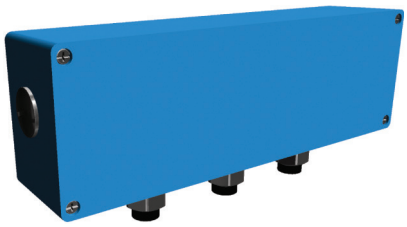
Connection terminals are of spring-loaded type for quick and easy connection. These are suitable for up to 2.5 mm^2 wires. The auxiliary terminal boxes are equipped with an earthing terminal. The first auxiliary terminal box is located on the right-hand side at D-end as standard.

The standard cable entry is 2 x M20 with plugged entries. If cable glands are needed must these be ordered using the variant codes described earlier in this section.

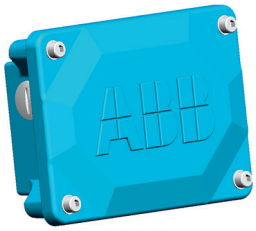
Related variant codes	
380	Separate terminal box for temperature detectors
418	Separate terminal box for auxiliaries
567	Separate terminal box material: cast Iron
568	Separate terminal box for heating elements



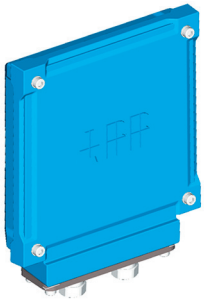
Small auxiliary aluminum terminal box for motor sizes 280- 450 (variant codes 418, 568, 380, 569). The size of terminal box ordered with these codes depends on the number of accessories ordered. 80 x 125 mm, max 12 strips. Earthing size M4.



Large auxiliary aluminum terminal box for motor sizes 280-450. 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.



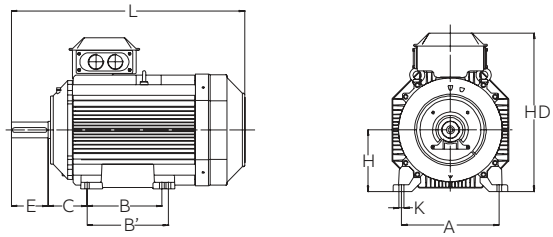
Auxiliary cast iron terminal box for motor size 160-250 (variant code 418). 111 x 162 mm.



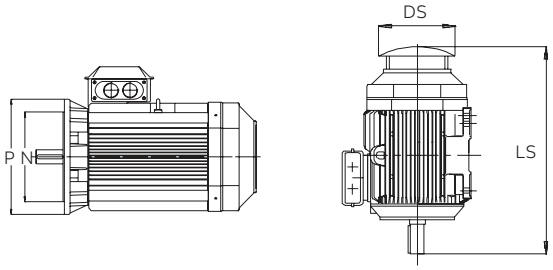
Auxiliary cast iron terminal box for motor sizes 280-450 (variant code 567). 208 x 180 mm.

Dimension drawings

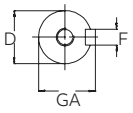
Increased safety cast iron motors, Ex ec

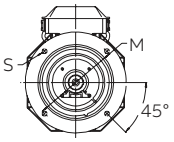


Foot-mounted motor IM 1001, IM B3

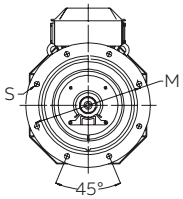


Flange-mounted motor IM 3001, IM B5

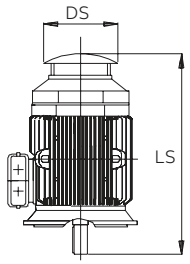




Sizes 80 to 200



Sizes 225 to 450



Protective roof, variant code 005

Motor size	IM 1001, IM B3 AND IM 3001, IM B5										IM 1001, IM B3								IM 3001, IM B5				Protective roof		
	D		GA		F		E		L max		A	B	B'	C	HD	K	H	O	M	N	P	S	DS	LS	
	poles		poles		poles		poles		poles															poles	
	2	4-8	2	4-8	2	4-8	2	4-8	2	4-6														2	4-8
71 M_	14	14	16	16	5	5	30	30	264	264	112	90	-	45	178	7	71	20	130	110	160	10	-	272.5	-
71 ML_	14	14	16	16	5	5	30	30	264	264	112	90	-	45	178	7	71	20	130	110	160	10	-	272.5	-
80 M_	19	19	21.5	21.5	6	6	40	40	331	331	125	100	-	50	194	10	80	20	165	130	200	12	331	331	360
80 ML_	19	19	21.5	21.5	6	6	40	40	363	363	125	100	112	50	194	10	80	20	165	130	200	12	331	331	360
90 SL_	24	24	27	27	8	8	50	50	356	356	140	100	125	56	218	10	90	20	165	130	200	12	-	368.5	430
90 L_	24	24	27	27	8	8	50	50	390	390	140	100	125	56	218	10	90	20	165	130	200	12	-	368.5	430
100 L_	28	28	31	31	8	8	60	60	381	381	160	140	-	63	247	12	100	25	215	180	250	15	395	395	505
100 ML_	28	28	31	31	8	8	60	60	403	403	160	140	-	63	247	12	100	25	215	180	250	15	395	395	505
100 LK_	28	28	31	31	8	8	60	60	435	435	160	140	160	63	247	12	100	25	215	180	250	15	395	395	505
IE2 112	28	28	31	31	8	8	60	60	403	403	190	140	-	70	259	12	112	25	215	180	250	15	417	417	505
IE3 112	28	28	31	31	8	8	60	60	442	442	190	140	-	70	258	12	112	25	215	180	250	15	417	417	505
132	38	38	41	41	10	10	80	80	532	532	216	140	178	89	300	12	132	30	265	230	300	15	-	551.5	590
160	42	42	45	45	12	12	110	110	681	681	254	210	254	108	421	14.5	160	-	300	250	350	18.5	328	756	756
180	48	48	51.5	51.5	14	14	110	110	726	726	279	241	279	121	461	14.6	180	-	300	250	350	18.5	359	756	756
200	55	55	59	59	16	16	110	110	821	821	318	267	305	133	528	18.5	200	-	350	300	400	18.5	414	844	844
225	55	60	59	64	16	18	110	140	849	849	356	286	311	149	573	18.6	225	-	400	350	450	18.5	462	921	951
250	60	65	64	69	18	18	140	140	884	884	406	311	349	168	626	24	250	-	500	450	550	18.5	506	965	965
280	65	75	69	79.5	18	20	140	140	1088	1088	457	368	419	190	759	24	280	-	500	450	550	18	555	1190	1190
315 SM_	65	80	69	85	18	22	140	170	1174	1204	508	406	457	216	852	30	315	-	600	550	660	23	624	1290	1320
315 ML_	65	90	69	95	18	25	140	170	1285	1315	508	457	508	216	852	30	315	-	600	550	660	23	624	1401	1431
355 SM_	70	100	62.5	90	20	28	140	210	1409	1479	610	500	560	254	958	35	355	-	740	680	800	23	720	1476	1546
355 ML_	70	100	62.5	90	20	28	140	210	1514	1584	610	560	630	254	958	35	355	-	740	680	800	23	720	1528	1703
355 LK_	70	100	62.5	90	20	28	140	210	1764	1834	610	710	900	254	958	35	355	-	740	680	800	23	720	1633	1703
400 L_	80	110	85	126	22	28	170	210	1851	1891	710	900	1000	224	1045	35	400	-	940	880	1000	28	810	1860	1900
400 LK_	80	100	85	106	22	28	170	210	1851	1891	686	710	800	280	1045	35	400	-	740	680	800	24	810	1860	1900
450	-	120	-	127	-	32	-	210	-	2 187	800	1000	1120	250	1169	42	450	-	1080	1000	1150	28	On request		

Tolerances:		Tolerances:	
A, B	± 0,8	H	-0.5
D, DA	ISO k6 < Ø 48mm	N	ISO j6
	ISO m6 > Ø 48mm	C, CA	± 0.8
F, FA	ISO h9		

IM B14 (IM3601), IM 3602

Motor size	LA	M	N	P	S	T	S	T
71	8	85	70	105	M6	2.5	M6	2.5
80	8	100	80	120	M6	3	M6	3
90	10	115	95	140	M8	3	M8	3
100	10	130	110	160	M8	3.5	M8	3.5
112	10	130	110	160	M8	3.5	M8	3.5
132	12	165	130	200	M10	3.5	M10	3.5

In all dimension drawings: The tables give the main dimensions in mm.

For detailed drawings please see our web-pages or contact ABB.

Certificate examples

01 EU Declaration of Conformity

02 EU Type Examination certificate

03 IECEx Certificate of Conformity

ABB

EU Declaration of Conformity

The products: 3-phase induction motors for potentially explosive atmospheres as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The Manufacturer:

ABB Oy
Motors and Generators
P.O. Box 633
Strömbergin Puistotie 5A
FIN - 65101 Vaasa, Finland

ABB Sp.z.o.o
27 Placydowska Str.
PL-95-070 Aleksandrow Lodzki
Poland

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The products of the declaration described above are in conformity with the relevant Union harmonization legislation:

Directive 2014/34/EU
The following harmonized standards are applied in relation to which conformity is declared: EN 60079-0/A11:2013[D], EN 60079-1:2014[D], EN 60079-7:2015, EN 60079-31:2014[D] and relevant parts of the EN 60034 -series of standards.

Directive 2009/125/EC
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EC) No. 640/2009 and the amending Regulation (EU) No. 4/2014.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU and the amending Annex II to this Directive of the Delegated Directive (EU) 2015/863 of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Notes:

Motors shall be installed and maintained according to the relevant standards and instructions of ABB Oy, Motors and Generators. When installed in converter supplied applications, additional requirements must be respected regarding the motor as well as the installation as described in the appropriate dedicated addendum

The conformity of the incorporation into a finished product according to the Directive 2006/42/EC shall be established by the commissioning party when a motor is fitted to the machinery.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc. 33, 92266 Fontenay-aux-Roses, France,
VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland
UL International Demko A/S (0539), Borupvang 5A, 2750 Ballerup, Denmark

Signed for and on behalf of: ABB Oy, Motors and Generators
Place and dateof issue: Vaasa, Finland, 2019-09-04
Harri Mykkänen
Vice President

3GZF500930-309L

01

TYPE EXAMINATION CERTIFICATE

[1]

[2] **Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU**

[3] Type Examination Certificate Number: **DEMKO 18 ATEX 2076X** Rev. 3

[4] Product: **M3GP, M3BP, M3LP, M3BN Motors Frame Sizes 71 to 450**

[5] Manufacturer: **ABB Oy, IEC LV Motors**

[6] Address: **Strömbergin Puistotie 5A Vaasa, Finland FI 65320**

[7] This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.

The examination and test results are recorded in confidential report no. **US/UL/ExTR18.0093/03.**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 **EN IEC 60079-7:2015/A1:2018** **EN 60079-31:2014**

Where additional criteria beyond those given here have been used, they are listed at item 18 in the Schedule.

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the "Specific Conditions of Use" listed under item 17 of this certificate.

[11] This Type examination certificate relates only to the design of the specified product, and not to specific items of product subsequently manufactured.

[12] The marking of the product shall include the following (marking is provided in the Schedule as a part of item 15, if applicable):

Ex II 3 G Ex ec IIC T3...T1 Gc

Ex II 3 D Ex tc IIIC T100°C... T150°C Dc

Certification Manager
Thomas Wilson

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Date of issue: 2018-08-02
Re-issued: 2024-06-25

Certification Body UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark
Tel. +45 44 85 65 65, info.dk@ul.com, www.ul.com

Solutions

This certificate may only be reproduced in its entirety and without any change.

Form-ULID-000218 (DCS:00-IC-F0060-1) – Issue 21.0

Page 1 of 3

02

IECEx

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx UL 18.0081X** Page 1 of 4
Certificate history:
Issue 2 (2021-09-24)
Issue 1 (2019-08-07)
Issue 0 (2018-08-02)

Status: **Current** Issue No: 3

Date of Issue: 2024-06-25

Applicant: **ABB Oy, IEC LV Motors**
Strömbergin Puistotie 5A
Vaasa FI 65320
Finland

Equipment: **Asynchronous Motors - M3GP*****, M3BP*****, M3BN*****, M3LP***** Frame Sizes 71 to 450**

Optional accessory:

Type of Protection: **Increased Safety "ec", Dust Ignition Protection by Enclosure "tc, tb"**

Marking: Ex ec IIC T3...T1 Gc
Ex tc IIIC T100°C...T150°C Dc
Ex tb IIIC T100°C...T150°C Db
-40°C to +60°C (71-132 Frame Sizes)
-55°C to +80°C (160-450 Frame Sizes)

Approved for issue on behalf of the IECEx Certification Body: **Katy A. Holdredge**

Position: **Senior Staff Engineer**

Signature: (for printed version)

Date: (for printed version) 2024-06-25

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

UL Solutions (US)
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America

Solutions

03

Motors in brief

Cast iron Ex ec and Ex t motors, sizes 71 to 180

Motor size		71	80	90	100	112	132	160	180
Stator and end shields	Material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better, integrated with stator	
	Paint color shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Feet		Cast iron, EN-GLJ-150 or better, integrated with stator						Forged steel, detachable feet	
Bearing end shields	Material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Paint color shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Bearings	D-end 2-8 poles	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3
	N-end 2-8 poles	6202-2Z/C3	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6205-2Z/C3	6208-2Z/C3	6209/C3	6209/C3
Axially locked bearings	Inner bearing cover	As standard, locked at D-end							
Bearing seal		Gamma ring							
Lubrication		Permanent grease lubrication.						Regreasable bearings	
SPM nipples		Optional						As standard	
Rating plate	Material	Stainless steel							
Terminal box	Frame material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Cover material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Cover screws material	Stainless A4-80						Steel 8.8, zinc electroplated and chromated	
Connections	Cable entries	2xM16 plugged	2 x M25 plugged		2 x M32 plugged			2 x M40 + 2 x M20 plugged	
	Terminals	6 terminals for connection with cable lugs (not included)							
Fan	Material	Polypropylene. Reinforced with glass fibre.							
Fan cover	Material	Steel							
	Paint color shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Stator winding	Material	Copper							
	Insulation	Insulation class F							
	Winding protection	3 pcs thermistors							
Rotor winding	Material	Pressure die-cast aluminum							
Balancing		Half key balancing							
Key ways		Closed							
Heating elements	On request	25 W							
Drain holes		Closed							
External earthing bolt		As standard							
Enclosure		IP 55							
Cooling method		IC 411							

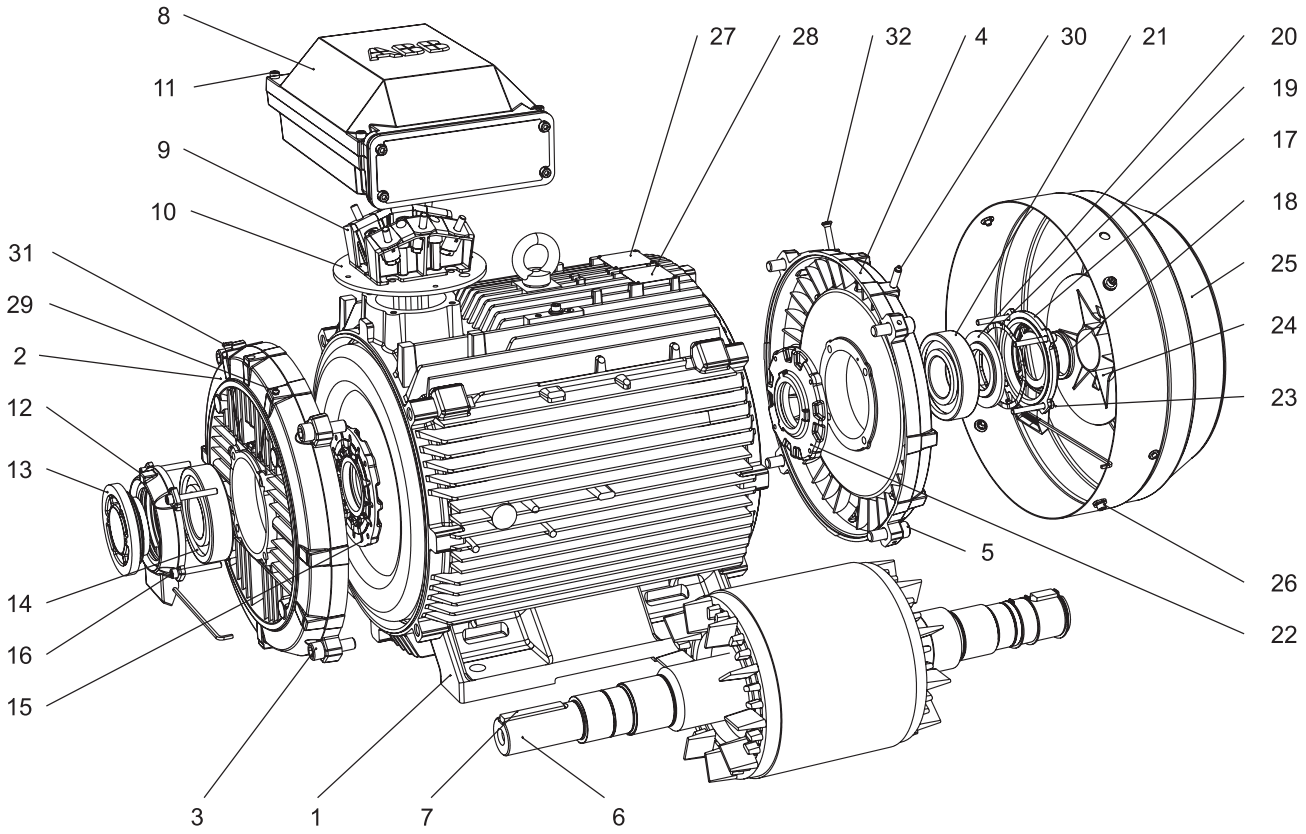
Motors in brief

Cast iron Ex ec and Ex t motors, sizes 200 to 450

Motor size		200	225	250	280	315	355	400	450
Stator	Material	Cast iron, EN-GJL-200 or better							
	Paint color shade	Munsell blue 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Feet	Material	Cast iron, EN-GJL-200 or better, integrated with stator							
Bearing end shields	Material	Cast iron, EN-GJL-200 or better							
	Paint colour shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Bearings	D-end 2-pole	6312/C3	6313/C3	6315/C3	6316/C3	6316/C3	6316M/C3	6317/C3	6316M/C3
	D-end 4-12-pole	6312/C3	6313/C3	6315/C3	6316/C3	6319/C3	6322/C3	6324/C3	6326M/C3
	N-end 2-pole	6210/C3	6212/C3	6213/C3	6316/C3	6316/C3	6316M/C3	6317/C3	6317M/C3
	N-end 4-12-pole	6210/C3	6212/C3	6213/C3	6316/C3	6316/C3	6313/C3	6319/C3	6322/C3
Axially locked bearings	Inner bearing cover	As standard, locked at D-end							
Bearing seals		Gamma ring			V-ring or labyrinth seal				
Lubrication		Regreasable bearings							
SPM nipples		As standard							
Rating plate	Material	Stainless steel							
Terminal box	Frame material	Cast iron, EN-GJL-200 or better							
	Cover material	Cast iron, EN-GJL-200 or better							
	Cover screws material	Steel 8.8, zinc electroplated and chromated							
Connections	Cable-entries	2 x M63 + 2 x M20 plugged					xx		
	Terminals	6 terminals for connection with cable lugs (not included)							
Fan	Material	Polypropylene. Reinforced with glass fibre.					Polypropylene reinforced with glass fibre or aluminum.		
Fan cover	Material	Hot dip galvanized steel							
	Paint color shade	Munsell blue 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Stator winding	Material	Copper							
	Insulation	Insulation class F.							
	Winding protection	3 pcs thermistors as standard							
Rotor winding	Material	Pressure die-cast aluminum							
Balancing		Half key balancing							
Keyway		Closed			Open				
Heating elements	On request	25 W	60 W			120 W			200 W
Drain holes		As standard. open on delivery							
External earthing bolt		As standard							
Enclosure		IP 55							
Cooling method		IC 411							

Motor construction

Increased safety motors, Ex ec



1 Stator frame
2 Endshield, D-end
3 Screws for endshield, D-end
4 Endshield, N-end
5 Screws for endshield, N-end
6 Rotor with shaft
7 Key, D-end
8 Terminal box
9 Terminal board
10 Intermediate flange
11 Screws for terminal box cover
12 Outer bearing cover, D-end
13 Valve disc with labyrinth seal, D-end; standard in 2-pole motors (V-ring in 4-8 pole)
14 Bearing, D-end
15 Inner bearing cover, D-end
16 Screws for bearing cover, D-end
17 Outer bearing cover, N-end
18 Seal, N-end
19 Wave spring
20 Valve disc, N-end
21 Bearing, N-end
22 Inner bearing cover, N-end
23 Screws for bearing cover, N-end
24 Fan
25 Fan cover
26 Screws for fan cover
27 Rating plate
28 Regreasing plate
29 Grease nipple, D-end
30 Grease nipple, N-end
31 SPM nipple, D-end
32 SPM nipple, N-end

Dust ignition protection cast iron motors

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167 IE4 Ex t cast iron motors, 1000 r/min
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205 Cast iron Ex ec and Ex t motors, sizes 200 to 450

206 **Motor construction**
206 Dust ignition protection cast iron motors, Ex t

Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3GP	160MLA	3GGP 161	410 - ADD	002, etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 to 4	
3GGP:	Totally enclosed fan cooled squirrel cage motor with cast iron frame, dust ignition proof
3GAA:	Totally enclosed fan cooled squirrel cage motor with aluminum frame, dust ignition proof

Positions 5 and 6	
IEC size	
63	63
71	71
08:	80
09:	90
10:	100
11:	112
13:	132
16:	160
18:	180
20:	200
22:	225
25:	250
28:	280
31:	315
35:	355
40:	400

Position 7	
Speed (Pole pairs)	
1:	2 poles
2:	4 poles
3:	6 poles
4:	8 poles
5:	10 poles

Positions 8 to 10	
8:	Frame lenght
9:	Stator package length
10:	Speed for two-speed induction, Permanent Magnet, SynRM and High Speed motors

Position 11
-(dash)

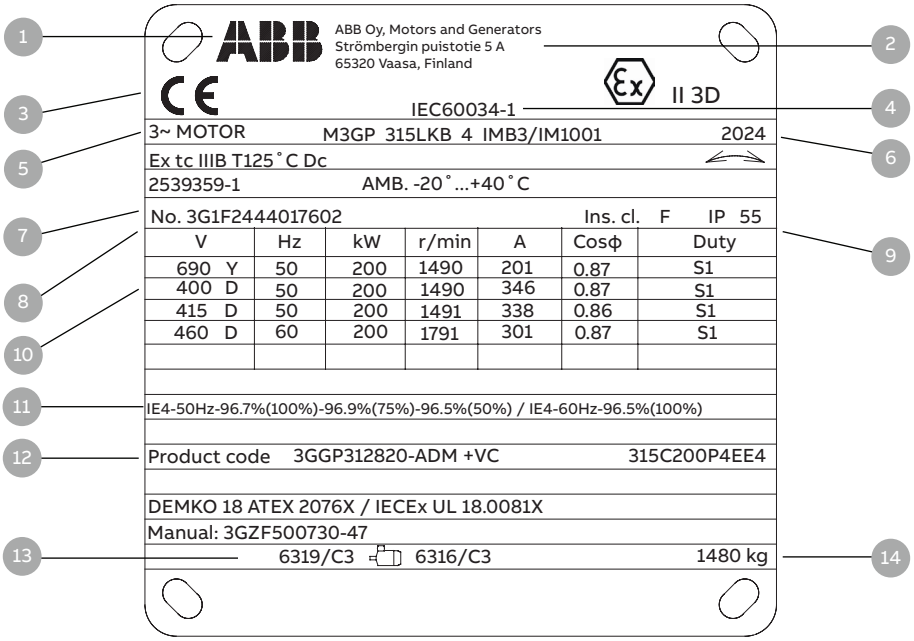
Position 12	
Mounting arrangement	
A:	Foot-mounted, top-mounted terminal box
R:	Foot-mounted, terminal box RHS seen from D-end
L:	Foot-mounted, terminal box LHS seen from D-end
B:	Flange-mounted, large flange
C:	Flange-mounted, small flange (sizes 71 to 112)
H:	Foot- and flange-mounted, terminal box top-mounted
J:	Foot- and flange-mounted, small flange with tapped holes
S:	Foot- and flange-mounted, terminal box RHS seen from D-end
T:	Foot- and flange-mounted, terminal box LHS seen from D-end
V:	Flange-mounted, special flange
F:	Foot- and flange-mounted. Special flange

Position 13	
Voltage and frequency	
Single-speed motors	
B:	380 VΔ 50 Hz
D:	400 VΔ, 415 VΔ, 690 VY 50 Hz
E:	500 VΔ 50 Hz
F:	500 VY 50 Hz
S:	230 VΔ, 400 VY, 415 VY 50 Hz
T:	660 VΔ 50 Hz
U:	690 VΔ 50 Hz
X:	Other rated voltage, connection or frequency, 690 V maximum

Position 14	
Generation code	
G, H...	The product code must be, if needed, followed by variant codes.

Rating plates

01 Sample rating plate for IE4 Dust ignition protection Ex t motors.



01

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

Technical data

IE4 Ex t cast iron motors, 3000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
30	M3GP 200MLA 2	3GGP201410-**M	2967	94,5	94,6	93,9	0,88	51,7	9,2	96,6	3,3	3,7	0,217	309	72
37	M3GP 200MLB 2	3GGP201420-**M	2955	94,8	95,4	95,5	0,89	63,4	7,5	121	2,7	3,4	0,217	309	72
45	M3GP 225SMA 2	3GGP221210-**M	2971	95	95,2	94,5	0,88	77,3	8	145	3,4	3,6	0,323	395	74
55	M3GP 250SMA 2	3GGP251210-**M	2976	95,3	95,5	95,2	0,88	94,4	8,4	178	3,3	3,6	0,634	483	75
75	M3GP 280SMB 2	3GGP281220-**M	2980	95,6	95,6	95	0,87	129	7,8	240	2,5	3,3	0,9	665	77
90	M3GP 280SMC 2	3GGP281230-**M	2981	95,8	95,6	95	0,88	153	8	288	3	3,1	1,15	725	77
110	M3GP 315SMB 2	3GGP311220-**M	2982	96	96	95,3	0,88	189	6,7	352	1,9	2,6	1,4	940	77
132	M3GP 315SMC 2	3GGP311230-**M	2986	96,2	96,3	95,9	0,88	226	7,9	422	2,4	3	1,7	1025	77
160	M3GP 315MLA 2	3GGP311410-**M	2983	96,3	96,5	96,3	0,9	268	7,3	512	2,2	2,7	2,1	1190	77
200	M3GP 355SMA 2	3GGP351210-**M	2985	96,5	96,2	95,4	0,9	336	7,6	640	2	3,1	3	1600	83
250	M3GP 355SMB 2	3GGP351220-**M	2983	96,5	96,6	96,2	0,9	415	7,6	800	2,2	3	3,4	1680	83
315	M3GP 355SMC 2	3GGP351230-**M	2984	96,5	96,5	95,9	0,89	533	7,8	1008	2,3	2,8	3,6	1750	83
355	M3GP 355MLA 2	3GGP351410-**M	2981	96,5	96,7	96,3	0,9	595	7,5	1137	2,3	2,6	4,1	2000	83
400	M3GP 355MLB 2	3GGP351420-**M	2982	96,5	96,2	95,5	0,88	677	7,1	1280	2,3	2,9	4,1	2000	83
450	M3GP 355MLC 2	3GGP351430-**M	2983	96,5	96,5	95,7	0,9	743	7,9	1440	2,2	2,9	4,3	2080	83
500	M3GP 355LKA 2	3GGP351810-**M	2982	96,5	96,5	96	0,9	827	7,5	1601	2	3,9	4,8	2320	83
560	M3GP 400LA 2	3GGP401510-**M	2988	96,5	96,5	95,7	0,89	934	7,8	1789	2,5	3,7	7,9	2950	82
560	M3GP 355LKB 2	3GGP351820-**M	2983	96,5	96,4	95,9	0,92	903	10	1793	2,2	4,1	5,2	2460	83
630	M3GP 400LB 2	3GGP401520-**M	2987	96,5	96,2	95,6	0,89	1049	7,6	2014	2,6	3,7	8,2	2950	82
710	M3GP 400LC 2	3GGP401530-**M	2987	96,5	96,3	95,7	0,89	1178	7,2	2270	2,6	3,4	9,3	3050	82
800	M3GP 450LA 2	3GGP451510-**M	2990	96,5	96,2	95,4	0,87	1362	7,8	2555	1,3	3,4	12,2	4000	85
900	M3GP 450LB 2	3GGP451520-**M	2990	96,5	96,3	95,6	0,87	1534	7,6	2874	1,5	3,1	13,5	4000	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3GP 280SMD 2	3GGP281240-**M	2979	96	96	95,3	0,85	192	8,4	352	2,9	3,7	1,15	725	77
132	M3GP 280MLA 2	3GGP281410-**M	2979	96,2	96,2	95,6	0,87	225	8,2	423	3	3,5	1,4	840	81
160	M3GP 280MLB 2	3GGP281420-**M	2968	96,3	96,6	96,6	0,9	266	6,7	515	2,4	2,6	1,55	890	81
200	M3GP 315MLB 2	3GGP311420-**M	2983	96,5	96,8	96,7	0,9	333	6,8	640	1,9	2,6	2,2	1220	77
250	M3GP 315LKB 2	3GGP311820-**M	2982	96,5	96,8	96,8	0,91	413	7,9	800	2,5	2,7	2,9	1540	77
315	M3GP 315LKC 2	3GGP311830-**M	2981	96,5	96,6	96,2	0,89	528	8,8	1009	3,2	3,2	3,3	1630	78

Technical data

IE4 Ex t cast iron motors, 1500 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
30	M3GP 200MLA 4	3GGP202410-**M	1486	94,9	94,9	94,3	0,76	59,8	8,7	194	4,1	4,2	0,369	304	63
37	M3GP 225SMA 4	3GGP222210-**M	1480	95,2	95,7	95,6	0,84	66,8	7,5	239	3,1	3,2	0,536	383	66
45	M3GP 225SMC 4	3GGP222230-**M	1484	95,4	95,7	95,5	0,82	83,4	8,5	290	3,6	3,8	0,607	433	66
55	M3GP 250SMA 4	3GGP252210-**M	1483	95,7	95,8	95,4	0,83	100	7,8	354	3,3	3,6	0,933	467	67
75	M3GP 280SMC 4	3GGP282230-**M	1487	96	96,4	96,1	0,86	130	7,8	481	2,8	2,9	1,85	725	72
90	M3GP 280MLA 4	3GGP282410-**M	1489	96,1	96,5	96,4	0,85	160	8,8	577	3,4	3,2	2,3	840	72
110	M3GP 315SMC 4	3GGP312230-**M	1491	96,3	96,5	96,1	0,85	194	7,8	704	2,4	3,1	2,9	1000	68
132	M3GP 315SMD 4	3GGP312240-**M	1490	96,4	96,6	96,2	0,85	234	7,9	846	2,6	3,2	3,2	1065	68
160	M3GP 315MLB 4	3GGP312420-**M	1490	96,6	96,8	96,4	0,86	278	7,9	1026	2,7	3	3,9	1220	68
200	M3GP 355SMA 4	3GGP352210-**M	1491	96,7	96,8	96,4	0,87	345	7,3	1282	2,1	2,7	5,9	1610	74
250	M3GP 355SMB 4	3GGP352220-**M	1491	96,7	96,8	96,5	0,87	433	7,8	1601	2,5	2,9	6,9	1780	74
315	M3GP 355SMC 4	3GGP352230-**M	1490	96,7	96,8	96,5	0,86	554	7,4	2017	2,4	2,9	7,2	1820	74
355	M3GP 355MLA 4	3GGP352410-**M	1491	96,7	96,9	96,5	0,87	616	7,9	2274	2,7	2,9	8,4	2140	78
400	M3GP 355MLB 4	3GGP352420-**M	1490	96,7	96,7	96,4	0,85	700	6,8	2563	2,1	2,8	8,4	2140	78
450	M3GP 355MLC 4	3GGP352430-**M	1489	96,7	96,8	96,5	0,86	779	6,8	2886	2,4	2,8	8,4	2140	78
500	M3GP 355LKA 4	3GGP352810-**M	1490	96,7	96,7	96,1	0,86	865	6,8	3204	2	3	10	2500	78
560	M3GP 400LA 4	3GGP402510-**M	1491	96,7	96,7	96,3	0,85	982	7,4	3586	2,4	2,8	15	3200	78
630	M3GP 400LB 4	3GGP402520-**M	1491	96,7	96,7	96,2	0,86	1091	7,6	4034	2,2	2,9	16	3300	78
800	M3GP 450LA 4	3GGP452510-**M	1491	96,7	96,7	96,2	0,86	1388	7	5121	1,3	2,8	23	4050	85
900	M3GP 450LB 4	3GGP452520-**M	1491	96,7	96,5	96	0,85	1575	7	5761	1,3	2,8	25	4050	85
1000	M3GP 450LC 4	3GGP452530-**M	1491	96,7	96,7	96,1	0,86	1724	6,8	6404	1,3	2,7	30	4350	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
110	M3GP 280MLB 4	3GGP282420-**M	1489	96,3	96,3	95,7	0,8	205	8,8	706	4	4	2,5	890	75
132	M3GP 280MLC 4	3GGP282430-**M	1489	96,4	96,4	95,8	0,8	247	8,3	846	3,5	4,1	2,5	890	75
200	M3GP 315LKB 4	3GGP312820-**M	1490	96,7	96,9	96,8	0,87	346	7,6	1282	2,5	2,9	5	1480	74
250	M3GP 315LKC 4	3GGP312830-**M	1490	96,7	96,9	96,8	0,87	432	7,8	1601	2,3	3	5,5	1600	74
315	M3GP 315LKE 4	3GGP312850-**M	1488	96,7	97	97	0,84	558	7,3	2029	2,5	3,1	4,6	1540	72

Technical data

IE4 Ex t cast iron motors, 1000 r/min

IP 55 - IC 411 - Insulation class F, temperature rise class B
IE4 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
18.5	M3GP 200MLA 6	3GGP203410-**M	991	93,4	93,7	93,2	0,8	35,7	8,1	178	3	3,6	0,531	306	63
22	M3GP 200MLC 6	3GGP203430-**M	990	93,7	93,7	93,2	0,77	44,3	8,6	212	3	3,8	0,545	311	63
30	M3GP 225SMA 6	3GGP223210-**M	988	94,2	94,5	94,1	0,78	59,2	7,3	290	3	3,4	0,813	369	63
37	M3GP 250SMA 6	3GGP253210-**M	992	94,5	94,9	94,8	0,76	74	8,6	357	3,7	3,7	1,49	457	63
45	M3GP 280SMB 6	3GGP283220-**M	992	94,8	95,1	94,6	0,85	80,9	7,5	434	2,4	2,6	2,2	680	65
55	M3GP 280SMC 6	3GGP283230-**M	990	95,1	95,4	95,1	0,85	99,4	6,8	506	2,4	2,6	2,85	725	65
75	M3GP 315SMC 6	3GGP313230-**M	994	95,4	95,6	95,2	0,83	138	7	721	2,2	2,8	4,9	1000	67
90	M3GP 315SMD 6	3GGP313240-**M	994	95,6	95,8	95,4	0,81	170	7,2	864	2,4	2,9	4,9	1040	67
110	M3GP 315MLB 6	3GGP313420-**M	994	95,8	96	95,8	0,83	202	6,9	1057	2,3	2,7	6,3	1200	68
132	M3GP 315LKA 6	3GGP313810-**M	993	96	96,2	96	0,82	243	6,9	1269	2,4	2,7	7,3	1410	68
160	M3GP 355SMB 6	3GGP353220-**M	995	96,2	96,2	95,7	0,82	294	7	1536	2,1	2,7	9,7	1680	73
200	M3GP 355SMC 6	3GGP353230-**M	995	96,3	96,5	96,1	0,82	367	7,3	1920	2,3	2,8	11,3	1820	73
250	M3GP 355MLB 6	3GGP353420-**M	995	96,5	96,7	96,6	0,83	456	7,1	2399	2,3	2,7	13,5	2180	73
315	M3GP 355LKA 6	3GGP353810-**M	994	96,6	96,7	96,5	0,83	576	6,9	3026	2,3	2,6	15,5	2500	76
355	M3GP 355LKB 6	3GGP353820-**M	995	96,6	96,6	96	0,81	668	7,7	3407	2,7	2,9	16,5	2600	76
400	M3GP 400LA 6	3GGP403510-**M	994	96,6	96,7	96,3	0,8	747	7,5	3843	2,8	3,1	17	2900	76
450	M3GP 400LB 6	3GGP403520-**M	995	96,6	96,5	95,7	0,81	830	8,3	4319	3,4	3,6	22	3300	76
500	M3GP 400LC 6	3GGP403530-**M	995	96,6	96,5	95,9	0,82	911	7,8	4799	3,2	3,4	22	3300	76
560	M3GP 400LD 6	3GGP403540-**M	993	96,6	96,6	96,1	0,85	984	7,4	5386	2,4	2,8	24	3400	77
630	M3GP 450LA 6	3GGP453510-**M	995	96,6	96,6	95,9	0,82	1146	7,5	6046	1,4	3,2	31	4150	81
710	M3GP 450LB 6	3GGP453520-**M	995	96,6	96,7	96,2	0,85	1244	7	6814	1,3	2,5	37	4500	81
800	M3GP 450LC 6	3GGP453530-**M	995	96,6	96,6	96,1	0,84	1415	7,2	7677	1,3	2,7	41	4800	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
75	M3GP 280SMD 6	3GGP283240-**M	990	95,4	95,7	95,5	0,81	141	7	726	2,8	2,8	2,5	730	65
160	M3GP 315LKC 6	3GGP313830-**M	994	96,2	96,4	96,3	0,82	297	7,4	1537	2,7	2,9	9,2	1600	68
200	M3GP 315LKE 6	3GGP313850-**M	993	96,3	96,5	96,2	0,81	372	7	1923	2,2	2,8	9,2	1600	76

Technical data

IE3 Ex t cast iron motors, 3000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
0.37	M3GP 71MC 2	3GGP071330-**K	2743	73,8	74,4	71,7	0,76	0,94	4,9	1,26	2,33	2,81	0,00088	10	58
0.55	M3GP 71ME 2	3GGP071350-**K	2755	77,8	79,6	78,8	0,83	1,25	6,8	1,9	2,8	3,1	0,00045	11	56
0.75	M3GP 80MD 2	3GGP081340-**K	2872	80,7	81,1	79,4	0,87	1,51	6,2	2,43	2,88	3,43	0,0012	18	57
1.1	M3GP 80MG 2	3GGP081370-**K	2862	82,7	83,7	82,8	0,87	2,1	6,3	3,65	3,03	3,5	0,0014	19	60
1.5	M3GP 90LB 2	3GGP091520-**K	2892	84,2	85,3	84,5	0,89	2,7	7,3	4,8	1,97	3,24	0,0031	31	69
2.2	M3GP 90LC 2	3GGP091530-**K	2900	85,9	86,7	85,7	0,89	4	9,1	7,27	3,35	4,09	0,0044	35	64
3	M3GP 100LKA 2	3GGP101810-**K	2907	87,1	87,6	86,5	0,89	5,4	8,8	9,9	3,25	4,32	0,0086	50	68
4	M3GP 112MG 2	3GGP111370-**K	2882	88,1	89,7	90,3	0,93	7	8,1	13,3	2,8	3,6	0,0132	56	70
5.5	M3GP 132SMF 2	3GGP131260-**K	2902	89,2	89,9	89,4	0,9	9,7	7,3	18,2	2,72	3,6	0,0218	77	67
7.5	M3GP 132SMG 2	3GGP131270-**K	2907	90,1	91	91	0,9	13,2	8,1	24,7	2,66	3,74	0,0218	77	70
11	M3GP 160MLA 2	3GGP161410-**K	2943	91,2	91,7	91,3	0,92	18,7	8,1	35,6	2,7	3,4	0,052	141	69
15	M3GP 160MLB 2	3GGP161420-**K	2943	91,9	92,8	92,6	0,92	25,4	8,4	48,6	3,1	3,4	0,062	170	69
18.5	M3GP 160MLC 2	3GGP161430-**K	2942	92,4	93	92,8	0,93	30,8	8,3	60	3,1	3,6	0,072	183	69
22	M3GP 180MLA 2	3GGP181410-**K	2957	92,7	93,2	93	0,91	37,4	8,1	71	2,6	3,2	0,116	234	69
30	M3GP 200MLA 2	3GGP201410-**K	2958	93,3	93,7	93,6	0,9	51	7,8	96,8	2,8	3,1	0,196	289	77
37	M3GP 200MLB 2	3GGP201420-**K	2960	93,7	94,1	93,9	0,86	65,5	8,8	119	3,1	3,4	0,217	314	72
45	M3GP 225SMA 2	3GGP221210-**K	2972	94	94,2	93,8	0,89	76,8	7,8	144	3,1	3	0,323	409	74
55	M3GP 250SMA 2	3GGP251210-**K	2975	94,3	94,5	94,1	0,89	93,6	8	176	2,8	3,3	0,579	452	75
75	M3GP 280SMB 2	3GGP281220-**K	2980	94,7	94,7	94	0,87	129	7,8	240	2,5	3,3	0,9	665	77
90	M3GP 280SMC 2	3GGP281230-**K	2981	95	94,8	94,1	0,88	153	8	288	2,95	3,1	1,15	725	77
110	M3GP 315SMB 2	3GGP311220-**K	2982	95,2	95,2	94,3	0,88	189	6,7	352	1,9	2,6	1,4	940	77
132	M3GP 315SMC 2	3GGP311230-**K	2986	95,4	95,5	95,1	0,88	226	7,9	422	2,4	3	1,7	1025	77
160	M3GP 315MLA 2	3GGP311410-**K	2983	95,6	95,9	95,6	0,9	268	7,3	512	2,2	2,7	2,1	1190	77
200	M3GP 355SMA 2	3GGP351210-**K	2985	95,8	95,5	94,5	0,89	336	7,6	640	2	3,1	3	1600	83
250	M3GP 355SMB 2	3GGP351220-**K	2983	95,8	96	95,5	0,9	415	7,6	800	2,2	3	3,4	1680	83
315	M3GP 355SMC 2	3GGP351230-**K	2984	95,8	95,8	95,1	0,89	533	7,8	1008	2,3	2,8	3,6	1750	83
355	M3GP 355MLA 2	3GGP351410-**K	2981	95,8	96,1	95,7	0,9	595	7,5	1137	2,3	2,6	4,1	2000	83
400	M3GP 355MLB 2	3GGP351420-**K	2982	95,8	95,6	94,7	0,88	677	7,1	1280	2,3	2,9	4,1	2000	83
450	M3GP 355MLC 2	3GGP351430-**K	2983	95,8	95,8	95	0,9	743	7,9	1440	2,2	2,9	4,3	2080	83
500	M3GP 355LKA 2	3GGP351810-**K	2982	95,8	95,8	95,3	0,9	827	7,5	1601	2	3,9	4,8	2320	83
560	M3GP 400LA 2	3GGP401510-**K	2988	95,8	95,8	94,9	0,89	934	7,8	1789	2,46	3,67	7,9	2950	82
560	M3GP 355LKB 2	3GGP351820-**K	2983	95,8	95,8	95,1	0,9	925	8	1792	2,2	4,1	5,2	2460	83
630	M3GP 400LB 2	3GGP401520-**K	2987	95,8	95,5	94,8	0,89	1049	7,6	2014	2,56	3,7	8,2	3050	82
710	M3GP 400LC 2	3GGP401530-**K	2987	95,8	95,7	94,9	0,89	1178	7,2	2270	2,56	3,4	9,3	3300	82
800	M3GP 450LA 2	3GGP451510-**K	2990	95,8	95,5	94,5	0,87	1362	7,8	2555	1,26	3,39	12,2	4000	85
900	M3GP 450LB 2	3GGP451520-**K	2990	95,8	95,5	94,7	0,87	1534	7,6	2874	1,49	3,09	13,5	4200	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3GP 315MLB 2	3GGP311420-**K	2983	96,4	96,7	96,6	0,9	333	6,8	640	1,9	2,6	2,2	1220	77
250	M3GP 315LKB 2	3GGP311820-**K	2982	95,8	96,2	96,2	0,91	413	7,9	800	2,5	2,7	2,9	1540	77

Technical data

IE3 Ex t cast iron motors, 1500 r/min

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

Out-put kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
0.25	M3GP 71MD 4	3GGP072340-**K	1416	73,5	75,1	73,8	0,8	0,6	4,8	1,68	2	2,6	0,0009	11	45
0.37	M3GP 71MLE 4	3GGP072450-**K	1432	77,3	77,4	74,5	0,76	0,9	5,8	2,46	2,7	3,3	0,00122	15	45
0.55	M3GP 80MLD 4	3GGP082440-**K	1439	80,8	82,2	81,4	0,81	1,18	6,3	3,6	2,3	3,29	0,0028	20	45
0.75	M3GP 80MLG 4	3GGP082470-**K	1445	82,5	83,5	82,2	0,79	1,62	6,9	4,97	2,6	3,76	0,0033	22	57
1.1	M3GP 90LC 4	3GGP092530-**K	1444	84,1	84,6	83,2	0,79	2,3	7,2	7,28	3,64	4,2	0,0067	33	56
1.5	M3GP 90LD 4	3GGP092540-**K	1439	85,3	86,4	85,9	0,78	3,1	7,8	9,95	3,35	4,47	0,0072	34	56
2.2	M3GP 100LKA 4	3GGP102810-**K	1452	86,7	87,8	87,7	0,83	4,2	8,9	14,46	3,4	4,1	0,0146	49	56
3	M3GP 100LKB 4	3GGP102820-**K	1452	87,7	89	89	0,83	5,8	9	19,7	3,2	4	0,0146	49	58
4	M3GP 112MG 4	3GGP112370-**K	1454	88,6	89,2	88,3	0,75	8,7	6,9	26,3	3,1	3,3	0,0176	52	59
5.5	M3GP 132SMF 4	3GGP132260-**K	1462	89,6	90,6	90,6	0,81	10,8	7,3	35,87	2,41	3,39	0,0401	81	67
7.5	M3GP 132SMG 4	3GGP132270-**K	1457	90,4	91,4	91,5	0,81	14,8	7,3	49,1	2,39	3,38	0,0401	81	64
11	M3GP 160MLA 4	3GGP162410-**K	1473	91,4	91,8	91,3	0,84	20,4	7,7	71,3	2,6	2,9	0,108	188	62
15	M3GP 160MLB 4	3GGP162420-**K	1474	92,1	92,7	92,4	0,84	27,8	7,9	97,1	2,8	3,3	0,125	187	62
18.5	M3GP 180MLA 4	3GGP182410-**K	1481	92,6	92,9	92,3	0,82	34,9	7,6	119	3	3,1	0,217	235	62
22	M3GP 180MLB 4	3GGP182420-**K	1480	93	93,5	93,2	0,82	41,5	8,2	141	2,8	3,1	0,217	235	62
30	M3GP 200MLA 4	3GGP202410-**K	1484	93,6	93,8	93,2	0,84	54,6	8,3	193	3	3,3	0,366	319	63
37	M3GP 225SMA 4	3GGP222210-**K	1482	93,9	94,6	94,5	0,86	65,4	7,7	238	2,8	3,1	0,536	398	66
45	M3GP 225SMB 4	3GGP222220-**K	1482	94,2	94,7	94,6	0,85	80,2	7,9	289	2,8	3,2	0,536	398	66
55	M3GP 250SMA 4	3GGP252210-**K	1485	94,6	95,2	94,9	0,85	97,8	7,9	353	3	3,3	0,933	476	67
75	M3GP 280SMB 4	3GGP282220-**K	1486	95	95,4	95,3	0,85	134	7,4	482	2,5	2,8	1,5	665	72
90	M3GP 280SMC 4	3GGP282230-**K	1487	95,2	95,5	95,1	0,85	161	7,9	578	2,9	3	1,85	725	72
110	M3GP 315SMC 4	3GGP312230-**K	1491	95,4	95,7	95,2	0,85	194	7,8	704	2,4	3,1	2,9	1000	68
132	M3GP 315SMD 4	3GGP312240-**K	1490	95,6	95,8	95,4	0,85	234	7,9	846	2,6	3,2	3,2	1065	68
160	M3GP 315MLB 4	3GGP312420-**K	1490	95,8	96	95,6	0,86	278	7,9	1026	2,7	3	3,9	1220	68
200	M3GP 355SMA 4	3GGP352210-**K	1491	96	96,1	95,7	0,87	345	7,3	1282	2,1	2,7	5,9	1610	74
250	M3GP 355SMB 4	3GGP352220-**K	1491	96	96,1	95,9	0,87	433	7,8	1601	2,5	2,9	6,9	1780	74
315	M3GP 355SMC 4	3GGP352230-**K	1490	96	96,1	95,9	0,85	554	7,4	2017	2,4	2,9	7,2	1820	74
355	M3GP 355MLA 4	3GGP352410-**K	1491	96	96,3	95,9	0,87	616	7,9	2274	2,7	2,9	8,4	2140	78
400	M3GP 355MLB 4	3GGP352420-**K	1489	96	96	95,5	0,85	705	6,8	2565	2,3	2,6	8,4	2140	78
450	M3GP 355MLC 4	3GGP352430-**K	1490	96	96,1	95,6	0,86	780	6,9	2884	2,3	2,9	8,4	2140	78
500	M3GP 355LKA 4	3GGP352810-**K	1490	96	96	95,3	0,86	865	6,8	3204	2	3	10	2500	78
560	M3GP 400LA 4	3GGP402510-**K	1491	96	96	95,4	0,85	982	7,4	3586	2,4	2,8	15	3200	78
630	M3GP 400LB 4	3GGP402520-**K	1491	96	96	95,4	0,86	1077	7,6	4034	2,2	2,9	16	3300	78
680	M3GP 400LC 4	3GGP402530-**K	1491	96	96	95,4	0,85	1206	7,7	4354	2,5	3,1	17	3400	78
800	M3GP 450LA 4	3GGP452510-**K	1491	96	96	95,4	0,86	1396	7	5121	1,3	2,8	23	4050	85
900	M3GP 450LB 4	3GGP452520-**K	1492	96	95,9	95,2	0,86	1573	7	5761	1,3	2,8	25	4350	85
1000	M3GP 450LC 4	3GGP452530-**K	1491	96	96	95,3	0,86	1724	6,8	6404	1,3	2,7	30	4700	85

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
200	M3GP 315LKB 4	3GGP312820-**K	1490	96,6	96,8	96,7	0,87	346	7,6	1282	2,5	2,9	5	1480	74
250	M3GP 315LKC 4	3GGP312830-**K	1490	96	96,2	96,1	0,87	432	7,8	1601	2,3	3	5,5	1600	74

Technical data

IE3 Ex t cast iron motors, 1000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
0.18	M3GP 71ME 6	3GGP073350-**K	887	63,9	63,3	57,6	0,74	0,57	3,2	1,9	1,9	2,2	0,0009	10	45
0.25	M3GP 80MA 6	3GGP083310-**K	937	68,6	67,3	61,9	0,64	0,76	2,6	2,52	2,8	3,4	0,0019	14	47
0.37	M3GP 80MD 6	3GGP083340-**K	930	73,5	74,3	72	0,68	1	4,6	3,75	2,8	3,2	0,0028	16	47
0.55	M3GP 80MLG 6	3GGP083470-**K	937	77,2	77,9	76,1	0,63	1,56	4,4	5,6	2,8	3,2	0,0044	21	60
0.75	M3GP 90LG 6	3GGP093570-**K	938	78,9	80,4	79,7	0,74	1,8	4,8	7,7	2,42	2,73	0,0072	34	44
1.1	M3GP 100LKG 6	3GGP103870-**K	969	81	81,1	79	0,68	2,6	5,9	10,9	1,99	2,18	0,0025	47	49
1.5	M3GP 112MH 6	3GGP113380-**K	972	82,5	82,2	79,6	0,64	3,8	7	14,7	2,66	4,45	0,0196	53	66
2.2	M3GP 132SMC 6	3GGP133230-**K	978	84,3	84,4	82,7	0,69	5,1	5,4	21,5	1,96	2,6	0,0416	81	57
3	M3GP 132SMD 6	3GGP133240-**K	977	85,6	85,9	84,3	0,69	6,9	5,9	29	1,9	3,3	0,0416	82	57
4	M3GP 132SMG 6	3GGP133270-**K	974	86,8	87,4	86,6	0,69	9,3	5,6	38,7	1,8	2,84	0,0416	82	57
5.5	M3GP 132SMH 6	3GGP133280-**K	966	88	88,9	88,7	0,73	12,1	5	54,1	1,83	2,7	0,0654	79	57
7.5	M3GP 160MLA 6	3GGP163410-**K	980	89,1	89,9	89,3	0,78	15,2	7,9	73	1,7	2,8	0,114	172	59
11	M3GP 160MLB 6	3GGP163420-**K	979	90,3	90,9	90,2	0,74	23,5	8,5	107	2,2	3,9	0,131	198,7	59
15	M3GP 180MLA 6	3GGP183410-**K	981	91,2	91,5	90,4	0,77	30,4	5,5	146	1,7	2,7	0,225	234	59
18.5	M3GP 200MLA 6	3GGP203410-**K	990	91,7	92,1	91,4	0,77	37,3	7,5	178	2,6	3,2	0,448	291	63
22	M3GP 200MLB 6	3GGP203420-**K	990	92,2	92,6	91,9	0,79	43	7,8	212	2,6	3,2	0,531	318	63
30	M3GP 225SMA 6	3GGP223210-**K	989	92,9	93,5	93,3	0,81	56,8	7,9	289	2,8	3,1	0,813	392	63
37	M3GP 250SMA 6	3GGP253210-**K	991	93,3	93,8	93,6	0,83	68	7,7	356	2,7	2,9	1,49	467	63
45	M3GP 280SMB 6	3GGP283220-**K	992	93,7	94,1	93,5	0,85	80,9	7,5	434	2,4	2,6	2,2	680	65
55	M3GP 280SMC 6	3GGP283230-**K	990	94,1	94,4	94,1	0,85	99,4	6,8	506	2,4	2,6	2,85	725	65
75	M3GP 315SMC 6	3GGP313230-**K	994	94,6	94,8	94,4	0,83	138	7	721	2,2	2,8	4,9	1000	67
90	M3GP 315SMD 6	3GGP313240-**K	994	94,9	95,1	94,7	0,81	170	7,2	864	2,4	2,9	4,9	1040	67
110	M3GP 315MLB 6	3GGP313420-**K	994	95,1	95,3	95,1	0,83	202	6,9	1058	2,3	2,7	6,3	1200	68
132	M3GP 315LKA 6	3GGP313810-**K	993	95,4	95,6	95,4	0,82	243	6,9	1269	2,4	2,7	7,3	1410	68
160	M3GP 355SMB 6	3GGP353220-**K	995	95,6	95,6	95	0,82	294	7	1536	2,1	2,7	9,7	1680	73
200	M3GP 355SMC 6	3GGP353230-**K	995	95,8	96	95,6	0,82	367	7,3	1920	2,3	2,8	11,3	1820	73
250	M3GP 355MLB 6	3GGP353420-**K	995	95,8	96	95,9	0,83	456	7,1	2399	2,3	2,7	13,5	2180	73
315	M3GP 355LKA 6	3GGP353810-**K	994	95,8	96	95,6	0,83	576	6,9	3026	2,3	2,6	15,5	2500	76
355	M3GP 355LKB 6	3GGP353820-**K	995	95,8	95,9	95,3	0,81	668	7,7	3407	2,7	2,9	16,5	2600	76
400	M3GP 400LA 6	3GGP403510-**K	993	95,8	95,8	95,1	0,82	731	7,1	3846	2,3	2,7	17	2900	76
450	M3GP 400LB 6	3GGP403520-**K	994	95,8	95,8	95,2	0,82	819	7,4	4323	2,4	2,5	20,5	3150	76
500	M3GP 400LC 6	3GGP403530-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3300	76
500	M3GP 400LKC 6	3GGP403830-**K	993	95,8	95,6	95,2	0,83	891	7,2	4809	2,5	2,7	22	3300	76
560	M3GP 400LD 6	3GGP403540-**K	993	95,8	95,8	95,2	0,85	984	7,4	5386	2,4	2,8	24	3400	77
630	M3GP 450LA 6	3GGP453510-**K	994	95,8	95,9	95,3	0,84	1127	6,5	6053	1,1	2,5	31	4150	81
710	M3GP 450LB 6	3GGP453520-**K	995	95,8	95,9	95,3	0,85	1244	7	6814	1,3	2,5	37	4500	81
800	M3GP 450LC 6	3GGP453530-**K	995	95,8	95,8	95,1	0,84	1415	7,2	7677	1,3	2,7	41	4800	81

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
160	M3GP 315LKC 6	3GGP313830-**K	994	95,6	95,8	95,7	0,82	297	7,4	1537	2,7	2,9	9,2	1600	68

Technical data

IE3 Ex t cast iron motors, 800 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
800 r/min = 8 poles				**400 V 50Hz**				**BASIC-design**							
0.12	M3GP 71ME 8	3GGP074350-**K	659	50,7	48,9	41,9	0,68	0,49	2,5	1,7	1,9	2,1	0,00107	11	43
0.75	M3GP 100LKA 8	3GGP104810-**K	710	75	74,5	70,5	0,65	2,13	4,4	10	2,35	2,8	0,00855	37	53
1.1	M3GP 100LKB 8	3GGP104820-**K	703	77,7	77,7	74,7	0,65	3,08	4,4	14,9	2,7	2,9	0,0128	45	53
1.5	M3GP 112MC 8	3GGP114330-**K	717	79,7	80,1	78,8	0,62	4,12	4,3	19,9	1,8	2,6	0,0194	53	55
2.2	M3GP 132SMA 8	3GGP134210-**K	725	81,9	82,3	80,2	0,64	5,8	5,2	28,9	2	3	0,0291	66	57
3	M3GP 132SMG 8	3GGP134270-**K	723	83,5	84,1	82,8	0,66	7,5	4,8	39,6	1,8	2,8	0,0375	76	57
4	M3GP 160MLA 8	3GGP164410-**K	734	84,8	85,1	83,2	0,65	10,3	4,5	52	1,8	2,3	0,091	148	59
5.5	M3GP 160MLB 8	3GGP164420-**K	732	86,2	87,1	86,1	0,69	13	5	71,7	2	2,35	0,091	150	59
7.5	M3GP 160MLC 8	3GGP164430-**K	733	87,3	88,2	87,2	0,69	17,6	5,1	97,7	2	2,4	0,12	167	59
11	M3GP 180MLA 8	3GGP184410-**K	731	88,6	89,2	88,4	0,7	25,3	5	143,6	2,1	2,1	0,2	219	59
15	M3GP 200MLA 8	3GGP204410-**K	737	89,6	90,5	90,1	0,74	32,5	5,2	194	2,1	2,4	0,45	290	60
18.5	M3GP 225SMA 8	3GGP224210-**K	736	90,1	90,8	90,1	0,74	39,8	5,2	240	2	2,25	0,669	350	63
22	M3GP 225SMB 8	3GGP224220-**K	736	90,6	91,6	91,5	0,73	47,5	5,3	285	2,26	2,47	0,722	363	63
30	M3GP 250SMA 8	3GGP254210-**K	741	91,3	91,7	91	0,71	67	5,6	386	2,7	2,7	1,4	440	63
37	M3GP 280SMA 8	3GGP284210-**K	741	91,8	92	91,3	0,79	72,6	7,3	476	1,7	3	1,85	605	65
45	M3GP 280SMB 8	3GGP284220-**K	741	92,2	92,3	91,7	0,78	89,2	7,6	579	1,8	3,1	2,2	645	65
55	M3GP 315SMA 8	3GGP314210-**K	742	92,5	93,1	92,5	0,8	106	7,1	707	1,6	2,7	3,2	830	62
75	M3GP 315SMB 8	3GGP314220-**K	741	93,1	93,2	93,1	0,82	146	7,1	966	1,7	2,7	4,1	930	62
90	M3GP 315SMC 8	3GGP314230-**K	741	93,4	93,7	93,4	0,82	170	7,4	1159	1,8	2,7	4,9	1000	64
110	M3GP 315MLA 8	3GGP314410-**K	740	93,7	94	94,1	0,83	211	7,3	1419	1,8	2,7	5,8	1150	72
132	M3GP 355SMA 8	3GGP354210-**K	744	94	93,9	93,4	0,79	256	7,5	1694	1,5	2,6	7,9	1520	69
160	M3GP 355SMB 8	3GGP354220-**K	744	94,3	94,3	93,8	0,79	293	7,6	2053	1,6	2,6	9,7	1680	69
200	M3GP 355SMC 8	3GGP354230-**K	742	94,6	95	94,8	0,79	385	7,4	2576	1,6	2,6	11,3	1820	69
250	M3GP 355MLB 8	3GGP354420-**K	743	94,6	94,7	94,1	0,8	472	7,5	3213	1,6	2,7	13,5	2180	72
315	M3GP 400LA 8	3GGP404510-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	2900	71
315	M3GP 400LKA 8	3GGP404810-**K	744	94,6	94,5	94	0,8	592	7	4043	1,2	2,6	17	2900	71
355	M3GP 400LB 8	3GGP404520-**K	743	94,6	94,9	94,6	0,83	641	6,8	4562	1,2	2,5	21	3200	71
400	M3GP 400LC 8	3GGP404530-**K	744	94,6	94,9	94,3	0,81	735	6	5134	1,3	2,7	24	3400	71
450	M3GP 450LA 8	3GGP454510-**K	744	94,6	95	94,6	0,83	813	6	5775	1	2,5	26	3750	80
500	M3GP 450LB 8	3GGP454520-**K	744	94,6	94,7	94,5	0,83	902	6,4	6417	1	2,6	29	4000	80
560	M3GP 450LC 8	3GGP454530-**K	744	94,6	94,9	94,2	0,81	1038	7	7188	1,2	2,9	35	4350	80
630	M3GP 450LD 8	3GGP454540-**K	745	94,6	94,8	94	0,82	1162	7,6	8075	1,3	3,2	41	4800	80

Variant codes

Cast iron motors

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

Most of the variant codes apply to IE2, IE3, and IE4 motors. However, confirm the availability of variants for IE3 motors with your ABB sales office before making an order.

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
040	Heat-resistant grease	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
043	SPM compatible nipples for vibration measurement	●	●	●	●	●	●	○	○	○	○	○	○	○	○	-	-
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.	○	○	○	○	○	○	●	●	●	●	●	-	-	-	-	-
433	Outlet grease collector	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
506	Nipples for vibration measurement : SKF Marlin Quick Connect stud CMSS-2600-3	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
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																	
178	Stainless steel / acid proof bolts.	○	○	○	○	○	○	●	●	●	●	●	●	●	●	●	●
204	Jacking bolts for foot mounted motors.	-	-	-	-	-	-	●	●	●	●	●	●	●	○	○	○
209	Non-standard voltage or frequency, (special winding).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
396	Motor designed for minimum ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
397	Motor designed for minimum ambient temperature -40 °C to -55 °C, with space heaters (code 450/451 must be added)	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
398	Motor designed for minimum ambient temperature -20 °C to -40 °C	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
399	Motor designed for minimum ambient temperature -40 °C to -55 °C	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
425	Corrosion protected stator and rotor core.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
524	Special run-out tolerances on flange and shaft for close coupled pump applications.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
786	Special design shaft upwards (V3, V35, V6) for outdoor mounting.	-	●	●	●	●	●	●	●	●	●	●	●	●	-	-	-
Cooling system																	
044	Unidirectional fan for reduced noise level. Rotation clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
045	Unidirectional fan for reduced noise level. Rotation counter clockwise seen from D-end. Available only for 2-pole motors.	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
068	Light alloy metal fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
183	Separate motor cooling (fan axial, N-end).	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
206	Steel fan	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
537	Advanced data sheet	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
722	Rotor dimension drawing (incl. torsional stiffness).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
777	Premium documentation package	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Drain holes																	
065	Plugged existing drain holes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
448	Draining holes with metal plugs.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
Earthing Bolt																	
525	External earthing bolts on motor feet	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hazardous Environments																	
336	Ex t, Dust group III C T125 Db, IP6X (conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
337	Ex t, Dust group III C T125 Dc, IP6X (conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
338	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIB T125C Dc (non-conductive dust), IP5X.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
339	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIC T125C Dc (conductive dust), IP6X.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
516	Temperature detectors approved to be connected to an Ex i circuit	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
807	UL certified Class 1, Div.2 Group A, B, C and D, T3.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
810	UL certified Class II, Div. 2 Group F and G, T4.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
813	Thermistor-based surface temperature protection T4 for frequency converter duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
814	Ex t (DIP) motors, temperature class T 150C.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
334	Ex t, Dust group III B T125C Db, IP6X (non-conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
335	Ex t, Dust group III B T125C Dc, IP5X (non-conductive dust) acc. IEC/EN60079-31.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●
406	Winding insulation for supply > 690 <= 1000 volts	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code	Variants	Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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).	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
235	Flange FF 165.	-	○	●	●	●	●	-	-	-	-	-	-	-	-	-	-
236	Flange FT 165.	-	-	●	●	●	●	-	-	-	-	-	-	-	-	-	-
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
Painting																	
105	Paint thickness report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
114	Special paint color, standard grade	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
115	Painting system C4,durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
168	Primer paint only.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
303	Painted insulation layer on inside of the terminal boxes.	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
710	Norsok M-501 rev. 7 Coating system no. 2B	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
711	Painting system C5, durability High	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
712	Painting system C5-M according to Petrobras specification.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
713	Painting system according Total Egina specification.	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
717	Painting system C4, durability High	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
719	Painting system CX	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
754	Painting system C5, durability Medium	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
755	Norsok M-501 revision 6, 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.	●	●	●	●	●	●	●	●	●	●	●	○	○	○	○	○
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).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
095	Restamping output (maintained voltage, frequency), intermittent duty.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
126	Tag plate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
135	Mounting of additional identification plate, stainless.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
332	Baldor Catalogue #	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
333	Not for use in the USA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
528	Rating plate sticker	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Shaft & rotor																	
069	Two shaft extensions according to catalog drawings.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
070	Special shaft extension at D-End, standard shaft material	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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																	
331	Motor not for sale for use in EU or UK.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
381	Frame agreement betw. ABB and Shell according to Shell DEP 33.66.05.31-GEN February 2018	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
509	Fulfilling US Integral Horsepower Motor Rule (IHP).	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
523	Neste Rotterdam design.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
535	NBR IR3 design	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
540	Fulfilling energy efficiency requirements for China	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
541	Inmetro certification	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
543	Australian MEPS	-	-	-	-	-	-	●	●	●	●	●	●	●	●	-	-
544	Australian HE MEPS	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
551	IA certificate of conformity for South Africa	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
558	Saudi Arabian MEPS (SASO)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
586	Fulfilling UK Conformity Assessment (UKCA) requirements.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
599	EQM – Emirates Quality Mark	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
682	CCC Ex certificate for China	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
758	Saudi Aramco design.	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
803	PESO/CCoE certificate for India	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
811	JIP-33 standard design	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
827	Petrobras N-2919 Specification design	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
841	Shell DEP 33.66.05.31-GEN February 2022	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
Stator winding temperature sensors																	
328	PTC - thermistors (3 in series), 120ºC, in stator winding	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
435	PTC - thermistors (3 in series), 130 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
439	PTC - thermistors (2x3 in series), 150 ºC, in stator winding	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
441	PTC - thermistors (3 in series, 130 ºC & 3 in series, 150 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	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Terminal box																	
019	Larger than standard 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.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
292	Adapter C-C	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-

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

Code/Variants		Frame size															
		71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
293	Adapter D-D	-	-	-	-	-	-	-	-	-	-	-	-	●	●	-	-
294	Adapter E-D	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●
295	Adapter E-2D	-	-	-	-	-	-	-	-	-	-	-	-	●	●	○	-
296	Adapter E-3D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●
351	Terminal block turned according to cable entry	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●	●
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.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
466	Terminal box at N-end.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
468	Cable entry from D-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
469	Cable entry from N-end.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
553	Terminal box degree of protection IP66.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
554	Cast iron flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
557	Nickel plated cable glands mounted according to order.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
565	Adapter for terminal box on the side (RHS)	-	-	-	-	-	-	-	-	-	●	●	●	●	●	-	-
566	Adapter for terminal box on the side (LHS)	-	-	-	-	-	-	-	-	-	●	●	●	●	●	-	-
567	Separate terminal box material: cast Iron	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
568	Separate terminal box for heating elements, std. material	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
624	Prepared for inch cable glands according to BSPP standard.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	-
727	Stainless steel flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
730	Prepared for NPT cable glands.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
731	Two standard metal cable glands.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
734	Standard cable gland, Ex d IIC, armoured cable.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
735	Standard cable gland, Ex d IIC, non-armoured cable.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
741	Motor equipped with Ex eb terminal box (IEC/EN 60079-7).	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
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																	
145	Type test report from a catalogue motor, 400V 50Hz.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
146	Type test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
148	Routine test report.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
150	Customer witnessed testing. Specify test procedure with other codes.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
222	Torque/speed test, type test and multi-point load test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
560	Shaft voltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
561	Overspeed test,for one motor from specific delivery batch	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
562	Overvoltage test, for one motor from specific delivery batch.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
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.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
470	Prepared for hollow shaft pulse tacho (L&L equivalent).	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
479	Mounting of other type of pulse tacho with shaft extension, tacho not included.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
701	Insulated bearing at N-end.	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●
704	EMC cable entry.	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
747	1024 pulse tacho, Ex d, tD, L&L 841910002	-	-	-	-	-	-	●	●	●	●	●	●	●	●	●	●

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

Mechanical design

Motor frame and drain holes

Motor frame

The motor frame, end shields and main terminal box are made of cast iron. Feet are integrated with the frame.

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

Drain holes

Dust ignition protection motors are provided with drain holes fitted with plugs as standard. The plugs are made of plastic material and delivered in closed position.

When mounting arrangement differs from foot mounted IM B3, mention variant code 066 when ordering to ensure the drain plug is mounted in the lowest position.

Mechanical design
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
71, 80	No lugs, weight of motors is less than 25kg	–	–
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
355	Detachable eye bolt	1 pcs close to terminal box on top, size M30	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 M30 delivered with each motor
400	Detachable eye bolt	1 pcs close to terminal box on top, size M36	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 M36 delivered with each motor
450	Detachable eye bolt	Locations for eye bolts: 4 pcs at N-end and 4 pcs at D-end, one location on top close to terminal box. 3 pcs eye bolts size M42 delivered with each motor	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 M42 delivered with each motor

Mechanical design

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	71	80	90	100	112	132	160	180
Power (W)	25	25	25	25	25	25	25	25

Motor size	200	225	250	280	315	355	400
Power (W)	25	60	60	60	2x60	2x60	2x60

Mechanical design
Bearings

ABB's dust ignition protection motors are normally fitted with single-row deep-groove grease lubricated ball bearings, as shown in the table below.

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

When high axial forces are involved, angular-contact ball bearings should be used. 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 optimal bearing system design is chosen. The variant codes for ordering angular-contact ball bearings at D-end are 058 and 060.

Axially-locked bearings

All motors with deep groove ball bearings are equipped with an axially locked bearing at the D-end, as a standard feature.

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 label is attached to motors when transport locking is used.

When high axial forces are involved, angular-contact ball bearings should be used. 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 optimal bearing system design is chosen. The variant codes for ordering angular-contact ball bearings are 058 and 059.

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

Standard and alternative bearing designs

Standard and alternative designs

Motor size	Number of poles	Standard design	Alternative designs		
		Deep groove ball bearings	Roller bearings (037)		Ang. contact ball bearings (058, 059)
		D-end	N-end	D-end	D-end
71	2-8	6203-2Z/C3	6202-2Z/C3	NA	NA
80	2-8	6204-2Z/C3	6203-2Z/C3	NA	NA
90	2-8	6205-2Z/C3	6204-2Z/C3	NA	NA
100	2-8	6206-2Z/C3	6205-2Z/C3	NA	NA
112	2-8	6206-2Z/C3	6205-2Z/C3 [1]	NA	NA
132	2-8	6208-2Z/C3	6208-2Z/C3	NA	NA
160	2-12	6309/C3	6209/C3	NU 309 ECP/C3	7309 B
180	2-12	6310/C3	6209/C3	NU 310 ECP/C3	7310 B
200	4-12	6312/C3	6210/C3	NU 312 ECP/C3	7312 B
225	4-12	6313/C3	6212/C3	NU 313 ECP/C3	7313 B
250	4-12	6315/C3	6213/C3	NU 315 ECP/C3	7315 B
280	2	6316/C3	6316/C3	[2]	7316 B
	4-12	6316/C3	6316/C3	NU 316 ECP/C3	7316 B
315	2	6316/C3	6316/C3	[2]	7316 B
	4-12	6319/C3	6316/C3	NU 319 ECP/C3	7319 B
355	2	6316M/C3	6316M/C3	[2]	7316 B
	4-12	6322/C3	6316/C3	NU 322 ECP/C3	7322 B
400	2	6317M/C3	6317M/C3	[2]	7317 B
	4-12	6324/C3	6319/C3	NU 324 ECP/C3	7324 B
450	2	6317M/C3	6317M/C3	[2]	7317 B
	4-12	6326M/C3	6322/C3	NU 326 ECP/C3	7326 B

[1] N-end bearing 6206-2Z/C3 on IE3 and IE4 motors

[2] On request

Bearing seals

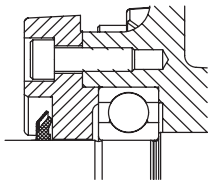
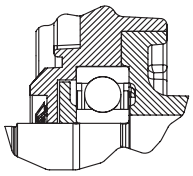
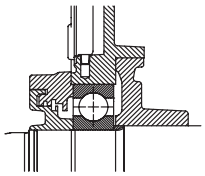
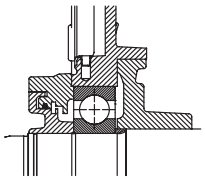
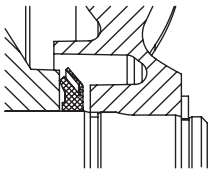
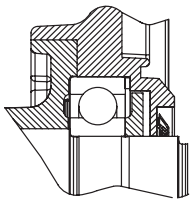
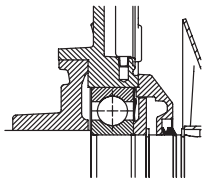
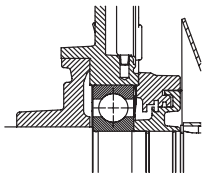
Table below present the standard and alternative and types of bearing seals per motor size.

Bearing seals

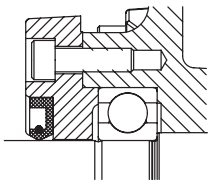
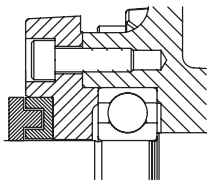
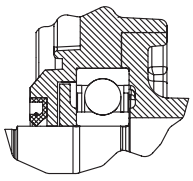
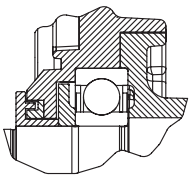
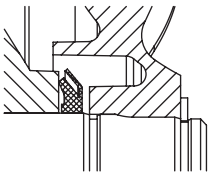
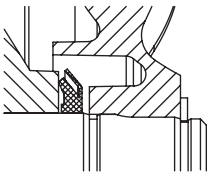
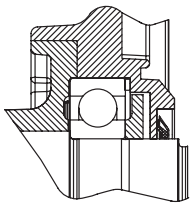
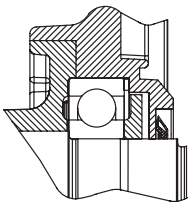
Motor size	Number of poles	Standard design		Alternative design	
		D-end	N-end	Radial seal at D-end (variant code 072 [1]	Labyrinth seal at D-end (variant code 783) [1]
71	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
80	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
90	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
100	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
112	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
132	2 – 8	Gamma seal	Gamma seal	Radial seal	NA
160	2.elo	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
180	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
200	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
225	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
250	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
280	2	Labyrinth seal	V-ring	NA	Standard
	4 - 8	V-ring	V-ring	NA	Labyrinth seal
315SM, ML	2	Labyrinth seal	V-ring	NA	Standard
	4 - 8	V-ring	V-ring	NA	Labyrinth seal
315LK	2- 8	Labyrinth seal	V-ring	NA	Standard
355	2 - 12	Labyrinth seal	V-ring	NA	Standard
400	2	Labyrinth seal	Labyrinth seal	NA	Standard
400	4 - 12	Labyrinth seal	V-ring	NA	Standard
450	2 - 12	Labyrinth seal	Labyrinth seal	NA	Standard

[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request

Standard design

D-end				
N-end				
Motor size, seal type D-end/N-end	71-132, gamma/ gamma seal	160-250, gamma/ gamma seal	280, 315 2pole, 335 all pole numbers and 400 4-12 pole, labyrinth/ V-ring seal	400 2-pole, labyrinth/ labyrinth seal

Alternative design

D-end				
N-end				
Motor size, seal type D-end/N-end	80-132, VC072 radial/ gamma seals	80-132, VC783 labyrinth/ gamma seals	160-250, VC072 radial/ gamma seals	160-250, VC783 labyrinth/gamma seals

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 up to 315 ≥ 100,000 hours.

Lubrication

On delivery, motors in frame size 160 and above are pre-lubricated with high-quality grease. Before first start-up, see instructions for re-lubrication and recommended grease in the installation, operation, maintenance and safety manual for low voltage motors for explosive atmospheres delivered together with the motor, or see the lubrication plate on the motor.

Motors with bearings greased for life

Motors in frame sizes 71-132 are equipped with bearings greased for life, while this is available as an option for frame sizes 160-250. Bearings are lubricated with high-quality, high-temperature grease. Bearing types are stated on the rating plate.

The approximate lifetime of bearings in four-pole motors is about 40 0000 duty hours. Lifetime is subject to the load conditions of the application run by the motor.

Motors with re-lubrication nipples

In frame sizes 160-400, the bearing system is provided with valve discs 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 re-greasing. 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 L1 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

Lubrication intervals in duty hours for ball bearings

Frame size	Amount of grease g/ bearing	Amount of grease g/N- end	Speed 3600 r/ min	Speed 3000 r/ min	Speed 1800 r/ min	Speed 1500 r/ min	Speed 1000 r/ min	Speed 500-900 r/min
Ball bearings								
Lubrication intervals in duty hours								
160	13	13	7100	8900	14300	16300	20500	21600
180	15	15	6100	7800	13100	15100	19400	20500
200	20	15	4300	5900	11000	13000	17300	18400
225	23	20	3600	5100	10100	12000	16400	17500
250	30	23	2400	3700	8500	10400	14700	15800
280	35	35	1900	3200	-	-	-	-
280	40	40	-	-	7800	9600	13 900	15 000
315	35	35	1900	3200	-	-	-	-
315	55	40	-	-	5900	7600	11 800	12 900
355	35	35	1900	3200	-	-	-	-
355	70	40	-	-	4000	5600	9600	10 700
400	40	40	1500	2700	-	-	-	-
400	85	55	-	-	3200	4700	8600	9700
450	95	70	-	-	2500	3900	7700	8700

Lubrication intervals in duty hours for roller bearings

Frame size	Amount of grease g/ bearing	Amount of grease g/N- end	Output kW	Speed 3600 r/min	Speed 3000 r/min	Output kW	Speed 1800 r/min	Speed 1500 r/min	Output kW	Speed 1000 r/min	Output kW	Speed 500-900 r/min
Ball bearings												
Lubrication intervals in duty hours												
160	13	13	all	3600	4500	all	all 7200	8100	all	10300	all	10800
180	15	15		3000	3900	all	all 6600	7500	all	9700	all	10200
200	20	15		2100	3000	all	all 5500	6500	all	8600	all	9200
225	23	20		1800	1600	all	all 5100	6000	all	8200	all	8700
250	30	23		1200	1900	all	all 4200	5200	all	7300	all	7900
280	40	40		-	-	all	all 4000	5300	all	7000	all	8500
315	55	40		-	-	all	all 2900	3800	all	5900	all	6500

Mechanical design
Radial forces

Pulley diameter

When the desired bearing life has been determined, the minimum permissible pulley diameter can be calculated with FR as follows:

$$D = \frac{1.9 \cdot 10^7 \cdot K \cdot P}{n \cdot F_R}$$

Where:	
D:	pulley diameter, mm
P:	power requirement, kW
n:	motor speed, r/min.
K:	belt tension factor, dependent on belt type and type of duty. A common value for V-belts is 2.5
F_R:	permissible radial force, refer to tables below.

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 L_{10h} of 40 000 hours per motor size.

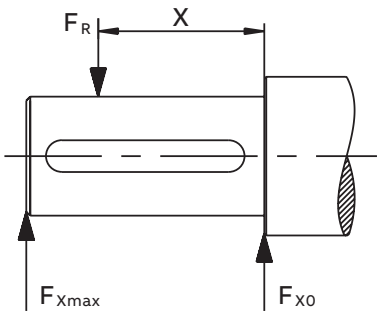
Permissible loads of simultaneous radial and axial forces can be supplied on request.

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

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 radial forces

Motor size	Poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings				Roller bearings		Roller bearings	
			Mounting arrangement IM B3							
			Ball bearings							
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)
71	2	30	540	460	420	360	1285	650	1040	650
	4	30	700	605	555	480	1615	650	1310	650
	6	30	780	665	620	530	1640	650	1450	650
	8	30	860	730	685	580	1640	600	1580	650
80	2	40	710	600	385	350	1910	865	1555	865
	4	40	940	810	725	625	2335	865	1945	865
	6	40	1060	895	840	710	2335	865	2160	865
	8	40	1185	1020	940	810	2335	865	2335	865
90	2	50	820	690	650	545	2205	1330	1790	1330
	4	50	1035	870	820	690	2715	1330	2205	1330
	6	50	1185	995	940	790	3054	1330	2490	1330
	8	50	1300	1095	1035	870	3340	1330	2715	1330
100	2	60	1130	925	900	735	2905	1900	2360	1900
	4	60	1425	1165	1135	925	3575	1900	2905	1900
	6	60	1635	1335	1295	1060	4040	1900	3280	1900
	8	60	1820	1520	1445	1205	4460	1900	3620	1900
112	2	60	1170	980	925	775	3000	1970	2435	1970
	4	60	1475	1235	1170	980	3695	1970	3000	1970
	6	60	1690	1310	1340	1120	4170	1970	3390	1970
	8	60	1860	1310	1475	1235	4450	1970	3695	1970
132	2	80	1840	1500	1460	1190	4255	3465	3455	2815
	4	80	2320	1890	1840	1500	5240	4265	4255	3465
	6	80	2660	2165	2110	1715	5915	3680	4805	3680
	8	80	2925	2380	2320	1890	6450	3680	5240	3680
160 MLA	2	110	3540	2740	2955	2285	7100	4300	6140	4300
	4	110	4000	3100	3325	2570	8000	4300	6870	4300
	6	110	4170	3200	3440	2655	8600	4300	7270	4300
	8	110	4600	3585	3855	2985	9300	4300	7955	4300
160 MLB	2	110	3540	2740	2955	2270	7085	4300	6070	4300
	4	110	4085	3300	3370	2725	8300	4300	7055	4300
	6	110	4100	3355	3400	2755	8600	4300	7300	4300
	8	110	4200	3270	3455	2670	9000	4300	7570	4300
160 MLC	2	110	3400	2600	2855	2200	6800	4300	5885	4300
	4	110	3700	3000	3070	2485	7800	4300	6640	4300
	6	110	3600	2900	2870	2325	8000	4300	6700	4300
	8	110	4170	3370	3370	2725	9000	4300	7585	4300
160 MLD	2	110	3585	2900	3000	2440	7100	4300	6140	4300
	4	110	3400	2755	2755	2240	7600	4300	6370	4300
160 MLE	2	110	3185	2570	2640	2140	6785	4300	5770	4300
180 MLA	2	110	4100	3385	3455	2825	8125	5500	7025	5500
	4	110	4270	3485	3525	2885	8600	5500	7300	5500
	6	110	4700	3800	3855	3155	9400	5500	7900	5500
	8	110	4785	3900	3870	3170	9800	5500	8255	5500
180 MLB	2	110	4170	3400	3470	2825	7900	5500	6770	5500
	4	110	4185	3400	3440	2810	8500	5500	7200	5500
	6	110	4370	3570	3525	2885	9000	5500	7600	5500
180 MLC	4	110	3700	3055	3010	2470	7900	5500	6655	5440
200 MLA	2	110	5600	4685	4700	3925	10900	9100	9470	7900
	4	110	6285	5200	5240	4370	12500	9550	10700	8900
	6	110	6800	5700	5700	4770	13600	9550	11670	9550
	8	110	6800	5700	5600	4685	14100	9550	12000	9550
200 MLB	2	110	5670	4700	4700	3925	11000	9200	9500	7900
	4	110	5700	4700	4700	3925	12000	9550	10185	8500
	6	110	6400	5370	5300	4425	13200	9550	11200	9385
200 MLC	2	110	5000	4185	4185	3500	10400	8700	8900	7455
	4	110	5400	4500	4425	3685	11600	9550	9800	8200
	6	110	5800	4885	4740	3955	12500	9550	10600	8800
200 MLD	2	110	4985	4170	4170	3485	10400	8700	8900	7400
225 SMA	2	110	6400	5400	5355	4500	13300	10700	11500	9700
	4	140	7300	5900	6155	4970	15400	10250	13200	10250
	6	140	7600	6200	6370	5140	16400	10250	14000	10250
	8	140	8500	6900	7100	5725	17900	10250	15300	10250

Motor size	Poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings				Roller bearings		Roller bearings	
			Mounting arrangement IM B3							
			Ball bearings							
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
225 SMB	2	110	6100	5185	5155	4340	13000	10700	11200	9455
	4	140	7085	5700	5885	4755	15100	10250	12900	10250
	6	140	7100	5700	5840	4700	16000	10250	13500	10250
	8	140	8000	6485	6600	5340	17300	10250	14700	10250
225 SMC	2	110	5600	4700	4685	3940	12600	10600	10770	9070
	4	140	6400	5200	5300	4285	14500	10250	12385	10000
225 SMD	2	110	5500	4640	4600	3880	12420	10460	10640	8960
	4	140	5800	4700	4725	3800	13500	10250	11400	9270
250 SMA	2	140	7700	6285	6500	5285	17100	10900	14900	10900
	4	140	8700	7000	7300	5900	19800	13800	17000	13785
	6	140	9400	7600	7800	6355	21600	13800	18400	13800
	8	140	9600	7800	7900	6400	22700	13800	19300	13800
250 SMB	2	140	7100	5800	6000	4885	16700	10900	14400	10900
	4	140	7800	6300	6470	5240	18900	13800	16200	13100
	6	140	8900	7200	7355	5955	21200	13800	18000	13800
250 SMC	2	140	6800	5500	5670	4600	16300	10900	14000	10900
	4	140	7400	6000	6055	4900	18100	13800	15400	12485
	6	140	8200	6600	6670	5400	20300	13800	17200	13800
280 SM_	2	140	7300	6000	5800	4900	20400	6000	16500	6000
	4	140	9200	7800	7300	6200	25100	9200	20300	9200
	6	140	10600	8900	8400	7000	28300	9200	23000	9200
	8	140	11700	9200	9200	7800	30900	9200	25100	9200
280 ML_	2	140	7400	6200	5800	5000	20600	6200	16700	6200
	4	140	9200	7900	7300	6200	25000	9500	20300	9500
	6	140	10500	9000	8300	7100	28300	9400	22900	9400
	8	140	11600	9500	9200	7900	30800	9500	25000	9500
315 SM_	2	140	7300	6000	5800	4950	20300	6000	16500	6000
	4	170	11400	9400	9000	7450	32500	9600	26600	9600
	6	170	13000	9600	10300	8500	37000	9600	30000	9600
	8	170	14400	9600	11400	9400	40300	9600	32700	9600
315 ML_	2	140	7400	6400	5850	5050	20600	5850	16700	5850
	4	170	11500	9700	9100	7650	32700	13600	26500	13600
	6	170	13200	11100	10400	8800	36900	13600	29900	13600
	8	170	14500	12200	11500	9700	40200	13600	32600	13600
315 LK_	2	140	7400	6550	5800	5150	20800	5550	16800	5550
	4	170	11500	10000	9100	7850	33100	13350	26800	13350
	6	170	13200	11400	10450	9050	37300	13350	30300	13350
	8	170	14600	12600	11550	10000	40800	13350	33100	13350
355 SM_	2	140	7350	6450	5750	5050	20600	7200	16700	7200
	4	210	15200	12600	12000	9950	45500	14000	36900	14000
	6	210	17500	14000	13800	11400	51400	14000	41700	14000
	8	210	19300	14000	15250	12600	56000	14000	45500	14000
355 ML_	2	140	7350	6550	5750	5100	20800	6750	16800	6750
	4	210	15300	12900	12000	10100	45900	13600	37200	13600
	6	210	17600	13600	13900	11600	51500	13600	42100	13600
	8	210	19400	13600	15300	12900	56000	13600	45900	13600
355 LK_	2	140	7350	6650	5650	5100	21000	6550	17000	6550
	4	210	15200	13000	11850	10200	46000	13000	37300	13000
	6	210	17500	13000	13700	11900	52000	13000	42000	13000
	8	210	19400	13000	15200	13000	56500	13000	46000	13000
400 L_	2	170	7650	6850	4400	3900	23900	9050	19350	9050
	4	210	15600	13550	12150	10550	52500	16000	43300	16000
	6	210	17800	15450	13850	12000	60000	16000	48800	16000
	8	210	19700	16000	15350	13350	65700	16000	53200	16000
400 LK_	2	170	7650	6850	4400	3900	23900	9050	19350	9050
	4	210	15600	11500	12150	10550	52500	11500	43300	11500
	6	210	17800	11500	13850	11500	60000	11500	48800	11500
	8	210	19700	11500	15350	11500	65700	11500	53200	11500
450 L_	2	170	7400	6700	3500	3300	24000	7500	19000	7500
	4	210	17000	15200	13000	11600	62000	25000	50000	25000
	6	210	19000	17000	14000	13000	70000	24000	56000	24000
	8	210	21300	19000	16500	14600	76000	23000	62000	23000

Mechanical design
Axial forces

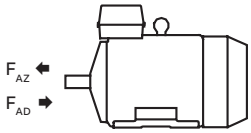
— 01 Mounting arrangement IM B3

02 Mounting arrangement IM V1

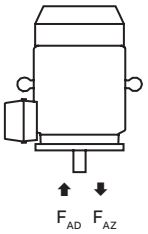
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



01



02

Permissible axial forces

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
71	2	30	615	285	505	175	630	275	520	165
	4	30	760	430	615	285	790	410	645	265
	6	30	870	540	695	365	890	525	720	355
	8	30	960	630	765	435	985	615	785	415
80	2	40	880	300	735	155	915	280	770	135
	4	40	1075	495	880	300	1130	455	935	260
	6	40	1215	635	985	405	1270	600	1040	370
	8	40	1330	750	1070	490	1400	705	1140	450
90	2	50	780	500	620	340	840	455	680	300
	4	50	985	705	775	495	1070	650	860	440
	6	50	1140	860	890	610	1225	800	975	555
	8	50	1265	985	985	705	1355	925	1075	645
100	2	60	925	570	735	350	1285	510	1060	290
	4	60	1480	860	1190	570	1600	780	1305	490
	6	60	1690	1070	1350	730	1815	995	1470	650
	8	60	1865	1245	1480	860	1995	1160	1610	775
112	2	60	1155	595	935	375	1290	505	1070	280
	4	60	1445	885	1155	595	1595	785	1300	495
	6	60	1655	1095	1315	755	1810	995	1465	650
	8	60	1830	1270	1445	885	1985	1170	1600	780
132	2	80	1765	965	1420	620	1925	855	1580	510
	4	80	2210	1410	1755	955	2420	1270	1965	815
	6	80	2535	1735	2000	1200	2770	1580	2235	1045
	8	80	2800	2000	2205	1405	3055	1835	2455	1235
160 MLA	2	110	2850	2850	2325	2325	3100	2578	2570	2048
	4	110	3450	3450	2775	2775	3820	3150	3120	2450
	6	110	3690	3690	2970	2970	4100	3410	3325	2635
	8	110	4155	4155	3315	3315	4440	3845	3640	3045
160 MLB	2	110	2850	2850	2325	2325	3120	2570	2580	2030
	4	110	3435	3435	2760	2760	3880	3085	3180	2385
	6	110	3600	3600	2880	2880	4120	3240	3360	2480
	8	110	3750	3750	2970	2970	4140	3450	3340	2650
160 MLC	2	110	2775	2775	2280	2280	3080	2500	2560	1980
	4	110	3150	3150	2535	2535	3620	2770	2985	2135
	6	110	3135	3135	2490	2490	3680	2700	3005	2025
	8	110	3675	3675	2910	2910	4240	3260	3445	2465
160 MLD	2	110	2865	2865	2330	2330	3220	2540	2665	1985
	4	110	2900	2900	2320	2320	3420	2470	2820	1870
160 MLE	2	110	2500	2500	2025	2025	2900	2150	2420	1670
180 MLA	2	110	3300	3300	2700	2700	3660	2940	3060	2340
	4	110	3600	3600	2920	2920	4160	3150	3460	2450
	6	110	4140	4140	3320	3320	4800	3675	3940	2815
	8	110	4220	4220	3360	3360	4960	3740	4040	2820
180 MLB	2	110	3340	3340	2725	2725	3760	2960	3125	2320
	4	110	3580	3580	2900	2900	4220	3095	3500	2375
	6	110	3800	3800	3040	3040	4500	3285	3700	2485
180 MLC	4	110	3220	3220	2560	2560	3880	2660	3220	2000
200 MLA	2	110	4460	4460	3640	3640	5000	3965	4200	3125
	4	110	5000	5260	4260	4260	5000	4680	5000	3640
	6	110	5000	5480	4720	4720	5000	5265	5000	4065
	8	110	5000	5880	4700	4700	5000	5195	5000	3955
200 MLB	2	110	4440	4440	3620	3620	5000	3905	4220	3085
	4	110	4720	4720	3840	3840	5000	4060	4700	3120
	6	110	5000	5480	4420	4420	5000	4800	5000	3660
200 MLC	2	110	3940	3940	3180	3180	4600	3385	3880	2665
	4	110	4480	4480	3620	3620	5000	3775	4520	2875
	6	110	4980	4980	3980	3980	5000	4165	5000	3105
200 MLD	2	110	3940	3940	3200	3200	4660	3370	3925	2635
225 SMA	2	110	4980	4980	4060	4060	5000	4375	4780	3455
	4	140	5000	6080	4920	4920	5000	5445	5000	4225
	6	140	5000	6520	5000	5260	5000	5735	5000	4395
	8	140	5000	7420	5000	5960	5000	6535	5000	5095

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
225 SMB	2	110	4860	4860	3960	3960	5000	4245	4780	3345
	4	140	5000	5880	4780	4780	5000	5175	5000	3995
	6	140	5000	6020	4840	4840	5000	5155	5000	3915
	8	140	5000	6940	5000	5560	5000	6055	5000	4635
225 SMC	2	110	4380	4380	3540	3540	5000	3670	4440	2900
	4	140	5000	5240	4260	4260	5000	4445	5000	3425
225 SMD	2	110	4320	4320	3480	3480	5000	3590	4400	2790
	4	140	4800	4800	3820	3820	5000	3895	5000	2935
250 SMA	2	140	6000	6080	4920	4920	6000	5345	5840	4225
	4	140	6000	7140	5820	5820	6000	6300	6000	4920
	6	140	6000	7880	6000	6380	6000	6950	6000	5350
	8	140	6000	8200	6000	6600	6000	7125	6000	5385
250 SMB	2	140	5620	5620	4540	4540	6000	4830	5640	3810
	4	140	6000	6320	5100	5100	6000	5325	6000	4085
	6	140	6000	7480	6000	6040	6000	6370	6000	4830
250 SMC	2	140	5260	5260	4220	4220	6000	4395	5400	3415
	4	140	5960	5960	4760	4760	6000	4900	6000	3700
	6	140	6000	6860	5520	5520	6000	5575	6000	4135
280 SM_	2	140	6200	4250	4900	2900	7550	3150	6200	1800
	4	140	8000	6000	6250	4250	9600	4550	7800	2750
	6	140	7250	9250	7150	5150	11150	5500	9000	3350
	8	140	10300	8300	7950	5950	12200	7000	9850	4700
280 ML_	2	140	6100	4100	4800	2800	8150	2750	6800	1400
	4	140	7800	5800	6000	4000	10450	4050	8650	2250
	6	140	8950	6950	6900	4900	12350	4750	10250	2600
	8	140	10000	8000	7700	5700	13450	5800	11050	3450
315 SM_	2	140	6180	4200	4850	2850	7950	2600	6600	1300
	4	170	9400	7400	7250	5250	11750	5500	9550	3300
	6	170	10900	8900	8350	6350	13600	6300	11050	3750
	8	170	12000	10000	9200	7000	15350	7900	12450	5000
315 ML_	2	140	6050	4050	4750	2750	8650	2300	7300	[1]
	4	170	9250	7250	7100	5100	12500	5050	10300	2900
	6	170	10650	8650	8100	6100	14900	5800	12350	3250
	8	170	11500	9900	8900	6800	15400	6300	13600	3400
315 LK_	2	140	6000	3950	4650	2650	9100	1350	7750	[1]
	4	170	9100	7150	7000	5000	13100	3850	10900	1700
	6	170	10500	8500	7950	5950	15700	4100	13100	1550
	8	170	11750	9750	8900	6900	16900	6300	14100	3450
355 SM_	2	140	3050	6850	1750	5550	6350	4250	4950	2900
	4	210	8600	12400	5900	9700	13250	8600	10450	5850
	6	210	10550	14350	7300	11100	15650	9580	12350	6270
	8	210	12200	16000	8550	12350	17350	12500	13600	8900
355 ML_	2	140	2900	6700	1600	5400	7100	3700	5750	2350
	4	210	8360	12150	5650	9450	14600	7950	11850	5150
	6	210	10100	13900	6900	10700	18050	8600	14700	5300
	8	210	12000	15800	7300	11000	21100	11650	17000	7600
355 LK_	2	140	2650	6450	1350	5150	8250	2650	6900	1300
	4	210	8200	12000	5450	9250	15650	6600	12850	3800
	6	210	9900	13700	6700	10500	19100	7050	15800	3750
	8	210	11450	15250	7800	11600	21200	8700	17500	5000
400 L, LK_	2	170	2150	7150	[1]	5800	8650	2150	7220	[1]
	4	210	7100	13100	4300	10300	16050	6400	13150	3400
	6	210	8850	14850	5500	11500	18450	6750	15100	3400
	8	210	10450	16450	6750	12750	20100	8350	16450	4700
450 L_	2	170	1800	6800	[1]	5500	11500	[1]	10000	[1]
	4	210	7600	13500	4500	10500	20000	4400	17700	1200
	6	210	9000	15000	5600	11500	26000	3700	22200	[1]
	8	210	10800	16800	7000	12900	27800	5500	23700	1350

[1] On request.

Terminal box

Standard terminal box

Protection and mounting options

The degree of protection for the standard terminal box is IP 55 or IP65 depending on the equipment protection level and dust category. It complies with the requirements of the protection method ‘t’ dust ignition protection and prevents all ignition sources such as sparks, excessive over heating etc. All terminal box seals are of uninterrupted type fulfilling the requirements for Ex t motors. By default, terminal boxes are mounted on top of the motor at D-end. Side mounted terminal box is possible in frame sizes 160-400. Mounting at N-end is possible for the larger frame sizes. Please refer to the variant code section for more details.

Turnability

The standard terminal boxes for motor sizes 160–315 can be turned 4*90°, and in sizes 355–500, 2*180° after delivery. For sizes 355–500, it is also possible to mount a terminal box with an opening towards the D or N-end, using the relevant variant codes when ordering, this is needed to get the terminal block turned in the right position. For motors in size 71–132, a 4*90° turnable terminal box is optional- this can be ordered with variant code 400.

Cable entries

Terminal box is provided as standard with tapped holes for cable glands, no cable glands are included as standard. The entry holes are closed with Ex eb approved blanking plugs made of nickel-plated brass, one of the main entries is closed with a plastic plug as transport and storage protection

Very large motors have an angle adapter between the terminal box and gland plate. Please refer to the table on next page for further information about amount and size of threaded holes, plugs provided as standard.

Different types of cable glands are available as option, suitable for either armoured and nonarmoured cables, please refer to the Terminal box alternatives section for more details.

Cable type and terminations

Terminations are suitable for copper and aluminum cables (Al- cables on request for motor sizes 160 to 250). Cables are connected to terminals by cable lugs, which are not included in the delivery.

Earthing bolts

The motors are as standard provided with at least one earthing bolt inside the terminal box and another on the frame. The earthing bolt on the frame is located on top close to the terminal box, motors in size 160-250 is the earthing bolt located on RHS foot (seen from D-end).

Ordering

To ensure the delivery of desired terminations and cable entries for the motor, state the cable type, quantity, size, outer diameter and possibly type of cable glands needed when ordering.

See section Variant codes for all options available.

Standard delivery

Standard delivery if no other information is provided.

Motor size	Design letter	Voltage code	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adapter	Amount and size of threaded plugged holes, or cable sealing end unit	Max. connectable core cross section mm² / phase	Number and size of terminal bolts
IE2 and IE3 motors									
71			2-8	integr.	-	-	2xM16x1.5	1x2.5	6 x M4
80			2-8	integr.	-	-	2xM25x1.5	1x4	6 x M4
90			2-8	integr.	-	-	2xM25x1.5	1x6	6 x M5
100-132			2-8	integr.	-	-	2x M32x1.5	1x10	6 x M5
160-180			2-8	63	B	-	2xM40x1.5	1x35	6 x M6
200-250			2-8	160	C	-	2xM63x1.5	1x70	6 x M10
280 SM				210	C	-	2xM63x1.5	2x150	6 x M12
280 ML			2-4	370	D	-	2xM63x1.5	2x240	6 x M12
280 ML			6-8	210	C	-	2xM63x1.5	2x150	6 x M12
315SM_, ML_			2-8	370	D	-	2xM63x1.5	2x240	6 x M12
315LKB			2	370	D	-	2xM63x1.5	2x240	6 x M12
315LKC			2	750	E	E-2D	4x M75x1.5	4x240	6 x M12
315LK_			4-8	370	D	-	2xM63x1.5	2x240	6 x M12
355SMA - SMB		D,S	2-4	750	E	-	2x M75x1.5	4x240	6 x M12
355SMA		E,F	2-4	370	D	-	2xM63x1.5	2x240	6 x M12
355SMB	K	E,F	2-4	370	D	-	2xM63x1.5	2x240	6 x M12
355SMB	G,L,M	E,F	2-4	750	E	-	2x M75x1.5	4x240	6 x M12
355SMA-SMB			6-12	370	D	-	2xM63x1.5	2x240	6 x M12
355SMC			2-4	750	E	-	2x M75x1.5	4x240	6 x M12
355SMC	K,M	D,S	6	370	D	-	2xM63x1.5	2x240	6 x M12
355SMC	G,L	D,S	6	750	E	-	2x M75x1.5	4x240	6 x M12
355SMC		E,F	6	370	D	-	2xM63x1.5	2x240	6 x M12
355SMC			8-12	370	D	-	2xM63x1.5	2x240	6 x M12
355ML_, LK_			2-4	750	E	E-2D	4x M75x1.5	4x240	6 x M12
355ML_, LK_	G,L	E,F	6	750	E	-	2x M75x1.5	4x240	6 x M12
355ML_, LK_	K,M	E,F	6	370	D	-	2xM63x1.5	2x240	6 x M12
355ML_, LK_		D,S	6-8	750	E	-	2x M75x1.5	4x240	6 x M12
355ML_		E,F	8	370	D	-	2xM63x1.5	2x240	6 x M12
355LK_		E,F	8	750	E	-	2x M75x1.5	4x240	6 x M12
355ML_, LK_			10-12	750	E	-	2x M75x1.5	4x240	6 x M12
400			2-8	750	E	E-2D	4x M75x1.5	4x240	6 x M12
450 LA, LKA			2	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450 LA, LKA	M		4	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450 LA, LKA	G,K	D,S	4	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450 LA, LKA	G,K	E,F	4	750	E	E-2D	4x M75x1.5	4x240	6 x M12
450 LA, LKA			6	750	E	E-2D	4x M75x1.5	4x240	6 x M12
450 LB, LC, LKB, LKC			2-6	1200	E	E-2D	4x M75x1.5	6x240	6 x M12
450			8	750	E	E-2D	4x M75x1.5	4x240	6 x M12

Auxiliary cable entries	Pole numbers	Amount and size of threaded plugged holes	Max. connectable corecross section mm2 /phase
160 - 450	2-8	2x M20x1.5	1x 2.5

Terminal box

Terminal box dimensions

01 Terminal box type 63 and 160

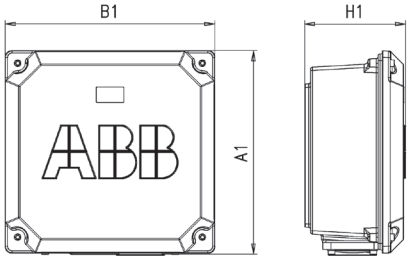
02 Terminal box types 210 and 370

03 Terminal box type 750 + adapter

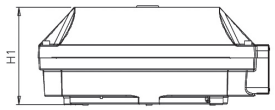
04 Terminal box type 1200 + adapter

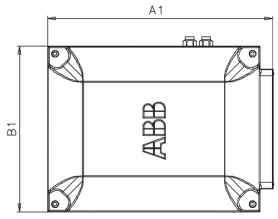
For motor sizes 71 to 132 the terminal box is integrated in motor frame and the dimensions for terminal boxes can be found in the motor dimension drawings in ABB Library.

To match the correct terminal box with motor sizes 160-450, find the motor type and correspondent terminal box type on the previous page. The box types and heir dimensions are presented on this page.

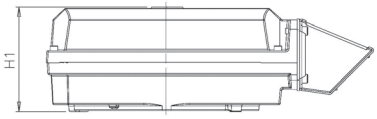


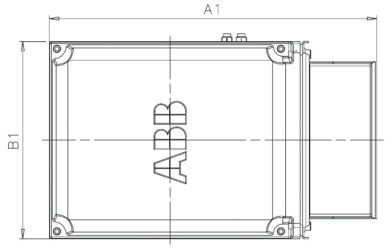
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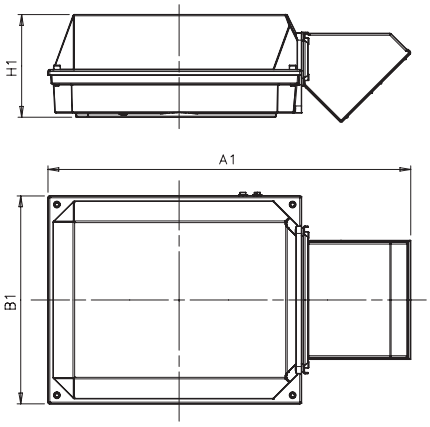


02





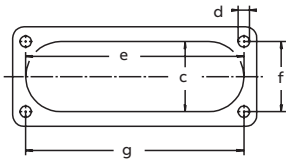
03



04

Dimensions for terminal box inlets

Corresponds to motor sizes 160 and above



Terminal box types acc. to current capacity	A1	B1	H1	Gland plate opening
63	247	247	109	B
160	300	310	154	C
370/1	467	348	207	D
750 /1	549	433	231	E
1200/1	740	591	290	E

Flange opening	c mm	e mm	f mm	g mm	d thread type
B	31	120	30	120	M6
C *)	71	194	62	193	M6
C **)	67	193	62	193	M8
D	100	300	80	292	M10
E	115	370	100	360	M12

Note: The C flange is different depending on frame size.

*) for frame sizes 200-225

**) for frame size 280

Terminal box

Terminal boxes and boards

—
01 Integrated terminal box for motor sizes 71-112. Tapped holes for cable entries

02 Terminal board for motor sizes 90-112, IE2, and 90-100, IE3

03 Terminal board for motor sizes 71-80

04 Terminal board for motor sizes 112, IE3

05 Integrated terminal box for motor sizes 132. Tapped holes for cable entries

06 Terminal board for motor size 132

07 Terminal box for motor sizes 160-250. Connection flanges with tapped cable entries

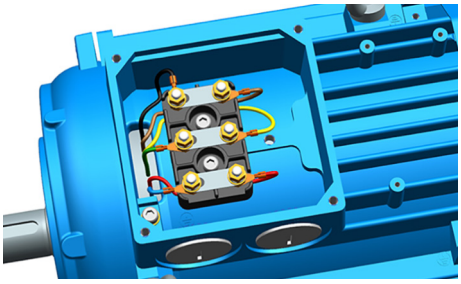
08 Terminal board for motor sizes 160-250

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

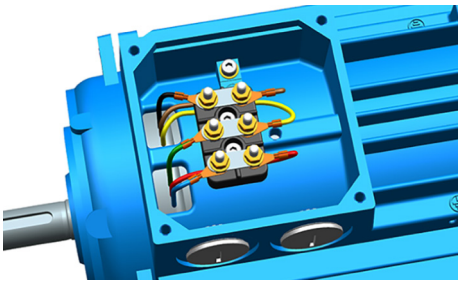
Motor sizes 71-112



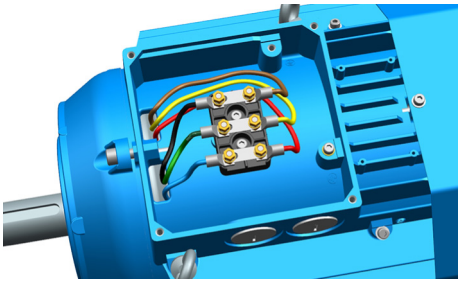
01



02

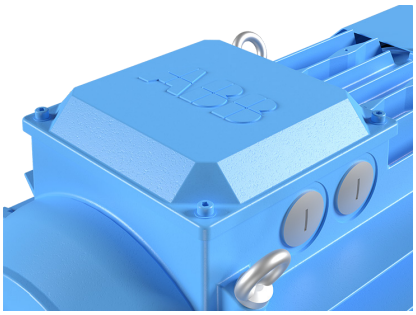


03

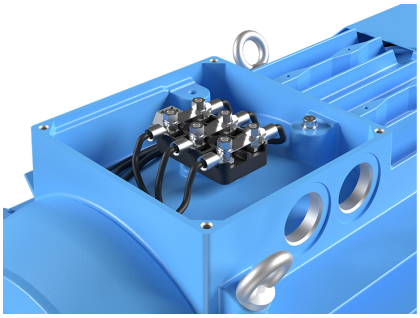


04

Motor size 132

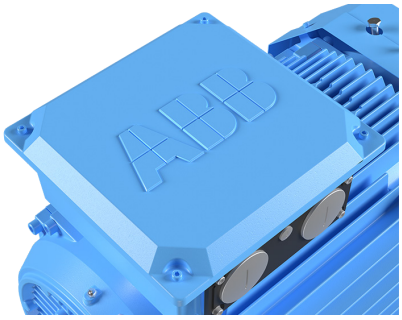


05

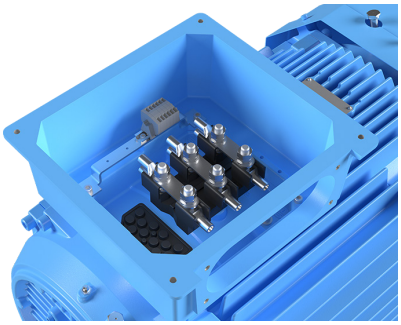


06

Motor sizes 160-250



07



08

—
09 Terminal box for motor sizes 280 - 315, except LKC. Connection flange with tapped cable entries

10 Terminal board for motor sizes 280 - 315, except LKC.

11 Terminal box for motor sizes 315LKC

12 Terminal board for motor sizes 315 LKC

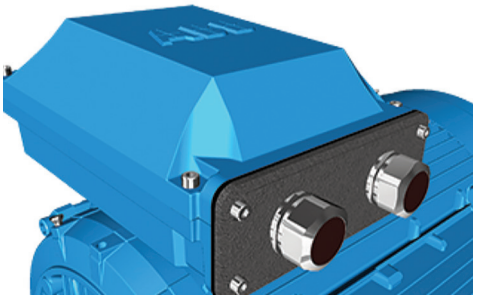
13 Terminal box for motor sizes 355SM

14 Terminal box with angle adapter for motor sizes 355ML - 450

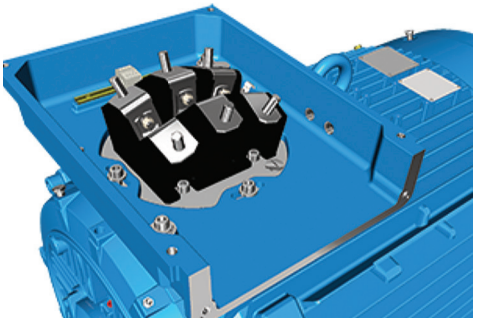
15 Terminal board for motor sizes 355 to 400

16 Terminal board for motor size 450

Motor sizes 280 - 315



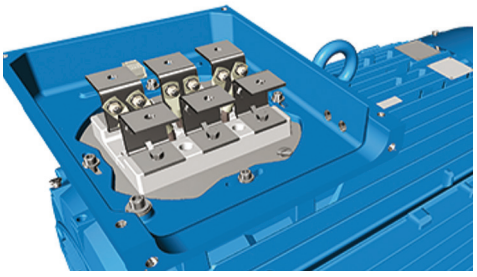
09



10

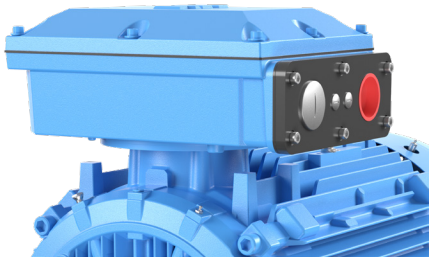


11

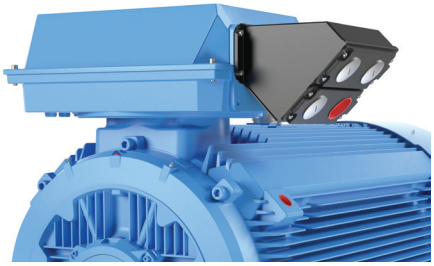


12

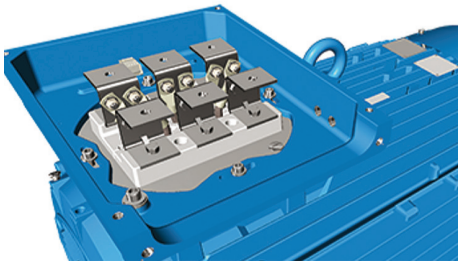
Motor sizes 355-450



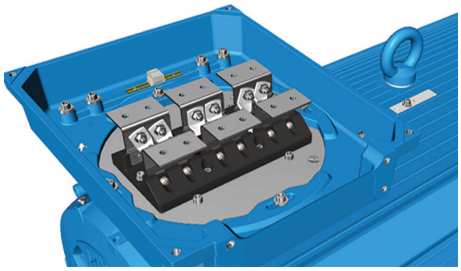
13



14



15



16

Terminal box

Terminal box alternatives

Optional cable termination parts

There is a broad selection of cable termination accessories available to allow a safe and reliable termination of one or several supply cables. The most common options are explained in this chapter.

How to order

- Check first that the terminal box itself allows mounting of the desired cable and cores (refer to table showing standard delivery for each motor size). If very large cable are used might it be necessary to use a larger terminal box and larger terminal board than standard.
- Select the right cable gland(s) or cable sealing end unit based on the diameter of the cables(s) and suitability for cable type.
- Select appropriate adapter or flange to allow mounting on opening in terminal box.
- Note that turning the terminal box might be prevented by use of some adapters

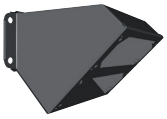
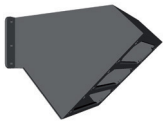
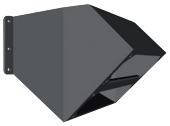
Ordering example

Ordering example for M3GP motors

Motor and supply cables	110kW, 4-pole, 400V 50Hz, IE3. Cables needed: 1 pcs outer diameter 42mm steel wire armoured cable, single cross section 120 mm2. Cables coming from below.
Motor	M3GP 315SMC 4, B3
Adapter (to allow entry of cables coming from below)	Not possible
Cable glands Ex d/ Ex e suitable for armoured cables (an M50 gland will suit this cable)	Variant code 734 (specify cable dimensions)
Gland plate made of steel drilled and tapped with 1 pcs M50 hole (non-std size)	Variant code 554 (1 pcs M50 x 1.5 threaded hole to be specified)

Optional adapters

To allow easy termination of cables entering the terminal box from above or below, an angle adapter is recommended. These can be used to allow the mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the ‘terminal box opening’ column in section Standard terminal box.

Adapater						
Variant code	292	293	294	295	296	444
Opening to terminal box	C	D	E	E	E	E
Flange or opening for end unit	C	D	D	2 x D	3 x D	2 x E
Material	Cast iron	Cast iron	Cast iron	Steel	Steel	Steel
Notes				Included as standard delivery for some types.	Only possible on type 1200 terminal box.	Only possible on type 1200 terminal box.

Cable glands

The motors are delivered as standard with plugged cable entries as described in the previous section. There is a broad selection of different type of cable glands available 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, Ex t, for non armoured cable, variant code 230 or 731	EMC Cable gland(s) nickel plated brass, Ex t, for non armoured cable, variant code 704	Cable gland Ex d / Ex t for armoured cable with double sealing, variant code 734	
Metric (std)	**Cable outer diameter, mm**	**Cable outer diameter, mm**	**Cable outer diameter, mm**	**Inner sheath diameter, mm**
M16 x 1.5	4-8	4-8	7-12	4.5-8
M20 x 1.5	4-12	4-12	10-16	6-10
M25 x 1.5	-	-	13.5-19	10-14
M25 x 1.5 *)	10-18	10-18	19-25	14-18
M32 x 1.5	14-24	14-24	25-30	18-23
M40 x 1.5	22-32	22-32	30-36	23-28
M50 x 1.5	-	-	36-40	28-32
M50 x 1.5 *)	26-35	26-35	40-46	32-37
M63 x 1.5	-	-	46-53	37-43
M63 x 1.5 *)	35-45	35-45	53-60	43-50
M75 x 1.5	46-62	46-62	58-70	48-60
M90 x 1.5	-	-	78-90	68-80
M100 x 1.5	-	-	88-100	78-90

*) = High capacity version, delivered as standard with the variant code

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

The motors are delivered as standard with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If glands with NPT threads will be used must variant code 730 be ordered. If nothing else is stated on the orderer will the sizes in tables below be delivered.

Motor frame size	Main cable entries	NPT plug
160-180	2 x 1 ¼”	1 x 1 ¼”
200-250	2 x 1 ½”	1 x 1 ½”
280	2 x 2”	1 x 2”
315	2 x 21/2”	1 x 21/2”
355-450	2 x 3”	1 x 3”

Motor frame size	Cable entries for auxiliaries	NPT plug
160-450	2 x ¾”	2 x ¾”

Threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands does not suit the gland size and cable that will be used can openings of nonstandard size also be delivered, either by fitting a 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 using variant codes 554 and 555.

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

Gland plates of non-standard material

The standard material used in gland plates is steel. Gland plates made of stainless steel are optional, either with cable glands or blind without threaded holes. Please refer to the variant code section for more information.

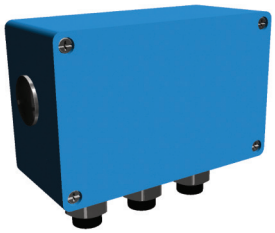
Auxiliary terminal box

It is possible to equip motors from frame size 132 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of aluminum, except frame sizes 160-250 where cast iron boxes are used.

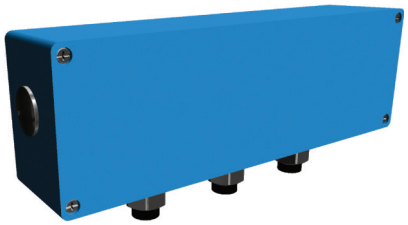
Connection terminals are of spring-loaded type for quick and easy connection. These are suitable for up to 2.5 mm^2 wires. The auxiliary terminal boxes are equipped with an earthing terminal. The first auxiliary terminal box is located on the right-hand side at D-end as standard.

The standard cable entry is 2 x M20 with plugged entries. If cable glands are needed must these be ordered using the variant codes described earlier in this section.

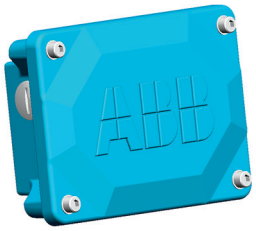
Related variant codes	
380	Separate terminal box for temperature detectors
418	Separate terminal box for auxiliaries
567	Separate terminal box material: cast Iron
568	Separate terminal box for heating elements



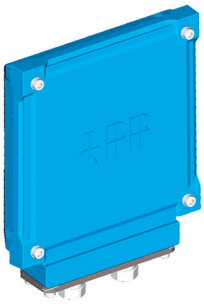
Small auxiliary aluminum terminal box for motor sizes 280- 450 (variant codes 418, 568, 380, 569). The size of terminal box ordered with these codes depends on the number of accessories ordered. 80 x 125 mm, max 12 strips. Earthing size M4.



Large auxiliary aluminum terminal box for motor sizes 280-450. 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.



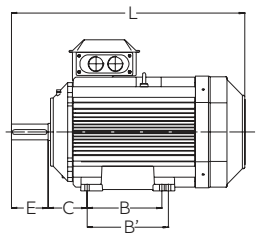
Auxiliary cast iron terminal box for motor size 160-250 (variant code 418). 111 x 162 mm.

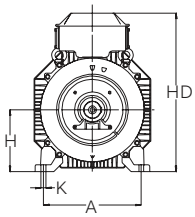


Auxiliary cast iron terminal box for motor sizes 280-450 (variant code 567). 208 x 180 mm.

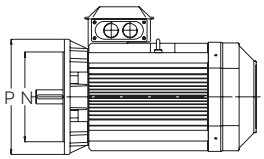
Dimension drawings

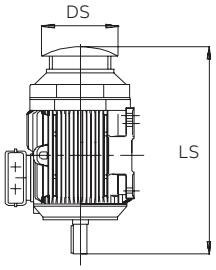
Dust ignition protection Ex t cast iron motors, 2D and 3D



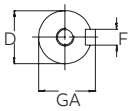


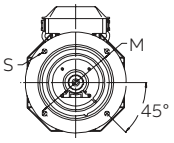
Foot-mounted motor IM 1001, IM B3



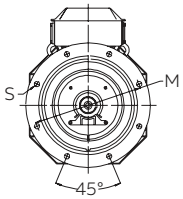


Flange-mounted motor IM 3001, IM B5

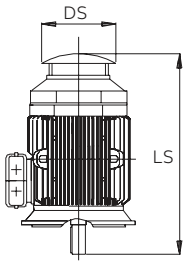




Sizes 80 to 200



Sizes 225 to 450



Protective roof, variant code 005

Motor size	IM 1001, IM B3 AND IM 3001, IM B5										IM 1001, IM B3							IM 3001, IM B5					Protective roof		
	D poles		GA poles		F poles		E poles		L max poles		A	B	B'	C	HD	K	H	M	N	P	S	DS	LS	
	2	4-8	2	4-8	2	4-8	2	4-8	2	4-6													2	4-8
71M_	14	14	16	16	5	5	30	30	264	264	112	90	-	45	178	7	71	130	110	160	10	139	272	272
71ML_	14	14	16	16	5	5	30	30	294	294	112	90	-	45	178	7	71	130	110	160	10	139	302	302
80M_	19	19	21.5	21.5	6	6	40	40	331	331	125	100	-	50	194	10	80	165	130	200	12	157	331	331
80ML_	19	19	21.5	21.5	6	6	40	40	363	363	125	100	112	50	194	10	80	165	130	200	12	157	363	363
90SL_	24	24	27	27	8	8	50	50	356	356	140	100	125	56	218	10	90	165	130	200	12	177	368	368
90L_	24	24	27	27	8	8	50	50	390	390	140	100	125	56	218	10	90	165	130	200	12	177	402	402
100L_	28	28	31	31	8	8	60	60	381	381	160	140	-	63	247	12	100	215	180	250	15	197	395	395
100ML_	28	28	31	31	8	8	60	60	403	403	160	140	-	63	247	12	100	215	180	250	15	197	417	417
100LK_	28	28	31	31	8	8	60	60	435	435	160	140	160	63	247	12	100	215	180	250	15	197	449	449
112 (IE2)	28	28	31	31	8	8	60	60	403	403	190	140	-	70	259	12	112	215	180	250	15	197	417	417
112 (IE3)	28	28	31	31	8	8	60	60	442	403	190	140	-	70	258	12	112	215	180	250	15	222	483	483
132	38	38	41	41	10	10	80	80	532	532	216	140	178	89	300	12	132	265	230	300	15	261	552	552
160	42	42	45	45	12	12	110	110	681	681	254	210	254	108	421	14.5	160	300	250	350	19	305	733	733
180	48	48	51.5	51.5	14	14	110	110	726	726	279	241	279	121	461	14.6	180	300	250	350	19	346	779	779
200	55	55	59	59	16	16	110	110	821	821	318	267	305	133	528	18.5	200	350	300	400	19	386	875	875
225	55	60	59	64	16	18	110	140	849	849	356	286	311	149	573	18.5	225	400	350	450	19	425	902	932
250	60	65	64	69	18	18	140	140	884	884	406	311	349	168	626	24	250	500	450	550	19	471	937	937
280	65	75	69	79.5	18	20	140	140	1088	1088	457	368	419	190	784	24	280	500	450	550	18	555	1180	1190
315SM_	65	80	69	85	18	22	140	170	1174	1204	508	406	457	216	852	30	315	600	550	660	23	624	1290	1320
315ML_	65	90	69	95	18	25	140	170	1285	1315	508	457	508	216	852	30	315	600	550	660	23	624	1401	1431
315LK_	65	90	69	95	18	25	140	170	1491	1521	508	508	560	216	852	28	315	600	550	660	23	624	1607	1637
355SM_	70	100	74.5	106	20	28	140	210	1409	1479	610	500	560	254	978/968 [1]	35	355	740	680	800	23	720	1476	1546
355ML_	70	100	74.5	106	20	28	140	210	1514	1584	610	560	630	254	978	35	355	740	680	800	23	720	1528	1703
355LK_	70	100	74.5	106	20	28	140	210	1764	1834	610	630	710/900	254	978	35	355	740	680	800	23	720	1633	1703
400L_	80	110	85	116	22	28	170	210	1851	1891	710	900	1000	224	1065	35	400	940	880	1000	28	810	1860	1900
400LK_	80	100	85	106	22	28	170	210	1851	1891	686	710	800	280	1065	35	400	740	680	800	24	810	1860	1900
450	-	120	-	127	-	32	-	210	-	2187	800	1000	1120	250	1183/1256 [2]	42	450	1080	1000	1150	28	966	-	2342

[1] With 750/370 terminal box

[2] With 1200/750 terminal box

IM B14 (IM3601), IM 3602

Motor size	LA	M	N	P	S	T	S	T
71	8	85	70	105	M6	2.5	M6	2.5
80	8	100	80	120	M6	3	M6	3
90	10	115	95	140	M8	3	M8	3
100	10	130	110	160	M8	3.5	M8	3.5
112	10	130	110	160	M8	3.5	M8	3.5
132	12	165	130	200	M10	3.5	M10	3.5

Tolerances	
A, B	± 0.8
D, DA	ISO k6 < Ø 48mm
	ISO m6 > Ø 48mm
F, FA	ISO h9
H	-0.5
N	ISO j6
C, CA	± 0.8

In all dimension drawings: The tables give the main dimensions in mm.

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

Certificate examples

01 EU Declaration of Conformity

02 EU Type Examination certificate

03 IECEx Certificate of Conformity

ABB

EU Declaration of Conformity

The products: 3-phase induction motors for potentially explosive atmospheres as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The Manufacturer:

ABB Oy
Motors and Generators
P.O. Box 633
Strömbergin Puistotie 5A
FIN - 65101 Vaasa, Finland

ABB Sp.z.o.o
27 Placydowska Str.
PL-95-070 Aleksandrow Lodzki
Poland

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The products of the declaration described above are in conformity with the relevant Union harmonization legislation:

Directive 2014/34/EU
The following harmonized standards are applied in relation to which conformity is declared: EN 60079-0/A11:2013[1], EN 60079-1:2014[2], EN 60079-7:2015, EN 60079-31:2014[3] and relevant parts of the EN 60034 –series of standards.

Directive 2009/125/EC
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EC) No. 640/2009 and the amending Regulation (EU) No. 4/2014.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU and the amending Annex II to this Directive of the Delegated Directive (EU) 2015/863 of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Notes:

Motors shall be installed and maintained according to the relevant standards and instructions of ABB Oy, Motors and Generators. When installed in converter supplied applications, additional requirements must be respected regarding the motor as well as the installation as described in the appropriate dedicated addendum

The conformity of the incorporation into a finished product according to the Directive 2006/42/EC shall be established by the commissioning party when a motor is fitted to the machinery.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc. 33, 92266 Fontenay-aux-Roses, France,
VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland
UL International Demko A/S (0539), Borupvang 5A, 2750 Ballerup, Denmark

Signed for and on behalf of: ABB Oy, Motors and Generators
Place and date of issue: Vaasa, Finland, 2019-09-04

Harri Mykkänen
Vice President

3GZF500930-309L

01

TYPE EXAMINATION CERTIFICATE

[1]

[2] **Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU**

[3] Type Examination Certificate Number: **DEMKO 18 ATEX 2076X Rev. 3**

[4] Product: **M3GP, M3BP, M3LP, M3BN Motors Frame Sizes 71 to 450**

[5] Manufacturer: **ABB Oy, IEC LV Motors**

[6] Address: **Strömbergin Puistotie 5A Vaasa, Finland FI 65320**

[7] This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014.

The examination and test results are recorded in confidential report no. **US/UL/ExTR18.0093/03.**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 **EN IEC 60079-7:2015/A1:2018** **EN 60079-31:2014**

Where additional criteria beyond those given here have been used, they are listed at item 18 in the Schedule.

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the "Specific Conditions of Use" listed under item 17 of this certificate.

[11] This Type examination certificate relates only to the design of the specified product, and not to specific items of product subsequently manufactured.

[12] The marking of the product shall include the following (marking is provided in the Schedule as a part of item 15, if applicable):

Ex II 3 G Ex ec IIC T3...T1 Gc

Ex II 3 D Ex tc IIIC T100°C... T150°C Dc

Certification Manager
Thomas Willson

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of further manufactured product. UL has not established Follow Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Date of issue: 2018-08-02
Re-issued: 2024-06-25

Certification Body UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark
Tel. +45 44 85 65 65, info.dk@ul.com, www.ul.com

Solutions

This certificate may only be reproduced in its entirety and without any change.

Form-ULID-000218 (DCS:00-IC-F0080-1) – Issue 21.0

Page 1 of 3

02

IECEx

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx UL 18.0081X** Page 1 of 4
Status: **Current** Issue No: 3
Date of Issue: 2024-06-25
Applicant: **ABB Oy, IEC LV Motors**
Strömbergin Puistotie 5A
Vaasa FI 65320
Finland

Certificate history:
Issue 2 (2021-09-24)
Issue 1 (2019-08-07)
Issue 0 (2018-08-02)

Equipment: **Asynchronous Motors - M3GP*****, M3BP*****, M3BN*****, M3LP***** Frame Sizes 71 to 450**
Optional accessory:
Type of Protection: **Increased Safety "ec", Dust Ignition Protection by Enclosure "tc, tb"**
Marking: Ex ec IIC T3...T1 Gc
Ex tc IIIC T100°C...T150°C Dc
Ex tb IIIC T100°C...T150°C Db
-40°C to +60°C (71-132 Frame Sizes)
-55°C to +80°C (160-450 Frame Sizes)

Approved for issue on behalf of the IECEx Certification Body: **Katy A. Holdredge**
Position: **Senior Staff Engineer**
Signature: (for printed version)
Date: (for printed version) 2024-06-25

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:
UL Solutions (US)
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America

Solutions

03

Motors in brief

Cast iron Ex ec and Ex t motors, sizes 71 to 180

Motor size		71	80	90	100	112	132	160	180
Stator and end shields	Material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better, integrated with stator	
	Paint color shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Feet		Cast iron, EN-GLJ-150 or better, integrated with stator						Forged steel, detachable feet	
Bearing end shields	Material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Paint color shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Bearings	D-end 2-8 poles	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3
	N-end 2-8 poles	6202-2Z/C3	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6205-2Z/C3	6208-2Z/C3	6209/C3	6209/C3
Axially locked bearings	Inner bearing cover	As standard, locked at D-end							
Bearing seal		Gamma ring							
Lubrication		Permanent grease lubrication.						Regreasable bearings	
SPM nipples		Optional						As standard	
Rating plate	Material	Stainless steel							
Terminal box	Frame material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Cover material	Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Cover screws material	Stainless A4-80						Steel 8.8, zinc electroplated and chromated	
Connections	Cable entries	2xM16 plugged	2 x M25 plugged		2 x M32 plugged			2 x M40 + 2 x M20 plugged	
	Terminals	6 terminals for connection with cable lugs (not included)							
Fan	Material	Polypropylene. Reinforced with glass fibre.							
Fan cover	Material	Steel							
	Paint color shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Stator winding	Material	Copper							
	Insulation	Insulation class F							
	Winding protection	3 pcs thermistors							
Rotor winding	Material	Pressure die-cast aluminum							
Balancing		Half key balancing							
Key ways		Closed							
Heating elements	On request	25 W							
Drain holes		Closed							
External earthing bolt		As standard							
Enclosure		IP 55							
Cooling method		IC 411							

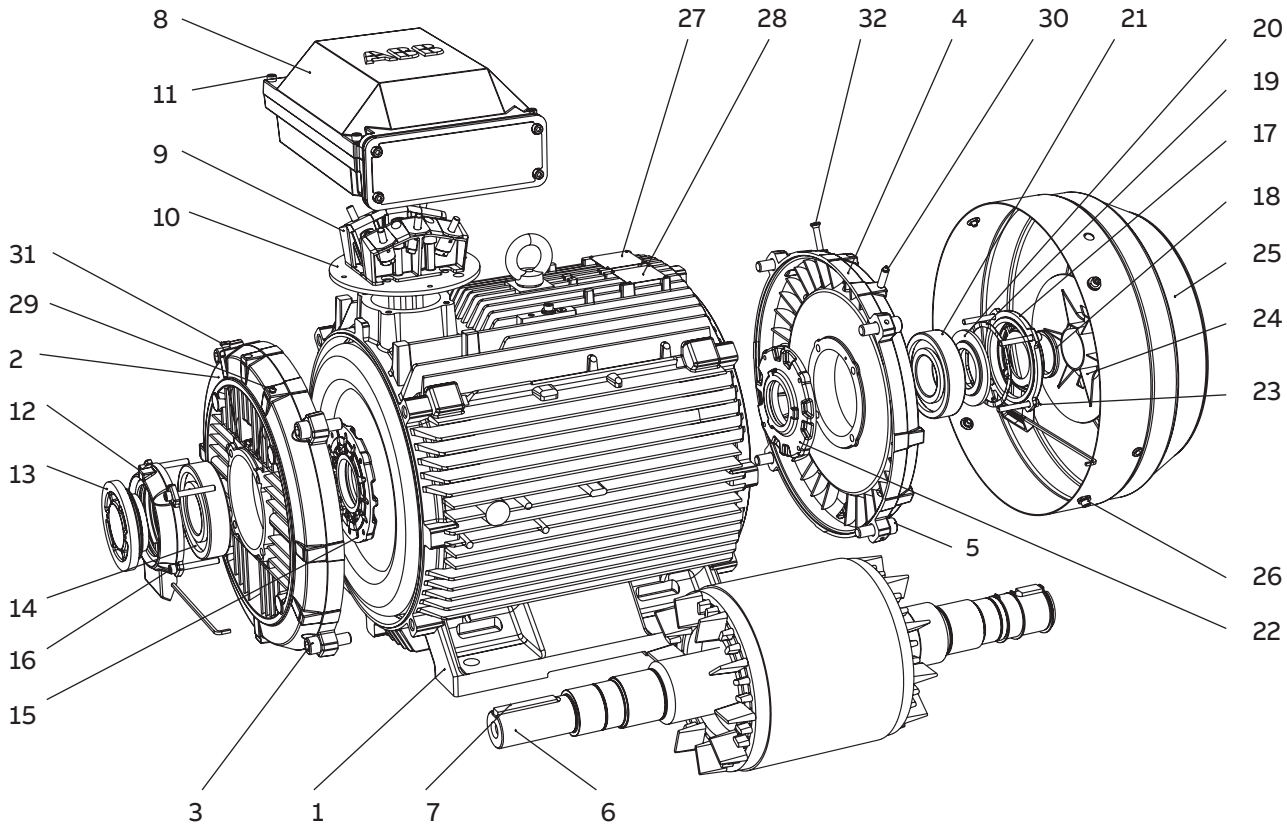
Motors in brief

Cast iron Ex ec and Ex t motors, sizes 200 to 450

Motor size		200	225	250	280	315	355	400	450
Stator	Material	Cast iron, EN-GJL-200 or better							
	Paint color shade	Munsell blue 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Feet	Material	Cast iron, EN-GJL-200 or better, integrated with stator							
Bearing end shields	Material	Cast iron, EN-GJL-200 or better							
	Paint colour shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Bearings	D-end 2-pole	6312/C3	6313/C3	6315/C3	6316/C3	6316/C3	6316M/C3	6317/C3	6316M/C3
	D-end 4-12-pole	6312/C3	6313/C3	6315/C3	6316/C3	6319/C3	6322/C3	6324/C3	6326M/C3
	N-end 2-pole	6210/C3	6212/C3	6213/C3	6316/C3	6316/C3	6316M/C3	6317/C3	6317M/C3
	N-end 4-12-pole	6210/C3	6212/C3	6213/C3	6316/C3	6316/C3	6313/C3	6319/C3	6322/C3
Axially locked bearings	Inner bearing cover	As standard, locked at D-end							
Bearing seals		Gamma ring			V-ring or labyrinth seal				
Lubrication		Regreasable bearings							
SPM nipples		As standard							
Rating plate	Material	Stainless steel							
Terminal box	Frame material	Cast iron, EN-GJL-200 or better							
	Cover material	Cast iron, EN-GJL-200 or better							
	Cover screws material	Steel 8.8, zinc electroplated and chromated							
Connections	Cable-entries	2 x M63 + 2 x M20 plugged					xx		
	Terminals	6 terminals for connection with cable lugs (not included)							
Fan	Material	Polypropylene. Reinforced with glass fibre.					Polypropylene reinforced with glass fibre or aluminum.		
Fan cover	Material	Hot dip galvanized steel							
	Paint color shade	Munsell blue 8B 4.5/3.25							
	Corrosion class	C3 medium according to ISO/EN 12944-5							
Stator winding	Material	Copper							
	Insulation	Insulation class F.							
	Winding protection	3 pcs thermistors as standard							
Rotor winding	Material	Pressure die-cast aluminum							
Balancing		Half key balancing							
Keyway		Closed			Open				
Heating elements	On request	25 W	60 W			120 W			200 W
Drain holes		As standard. open on delivery							
External earthing bolt		As standard							
Enclosure		IP 55							
Cooling method		IC 411							

Motor construction

Dust ignition protection cast iron motors, Ex t



Typical exploded view of cast iron motors, frame size 315

1 Stator frame
2 End shield, D-end
3 Screws for end shield, D-end
4 End shield, N-end
5 Screws for end shield, N-end
6 Rotor with shaft
7 Key, D-end
8 Terminal box
9 Terminal board
10 Intermediate flange
11 Screws for terminal box cover
12 Outer bearing cover, D-end
13 Valve disc with labyrinth seal, D-end; standard in 2-pole motors, V-ring in 4-8 pole motors
14 Bearing, D-end
15 Inner bearing cover, D-end
16 Screws for bearing cover
17 Outer bearing cover, N-end
18 Seal, N-end
19 Wave spring
20 Valve disc, N-end
21 Bearing, N-end
22 Inner bearing cover, N-end
23 Screws for bearing cover
24 Fan
25 Fan cover
26 Screws for fan cover
27 Rating plate
28 Lubrication plate
29 Grease nipple, D-end
30 Grease nipple, N-end
31 SPM nipple, D-end
32 SPM nipple, N-end

IE5 SynRM Increased safety motors

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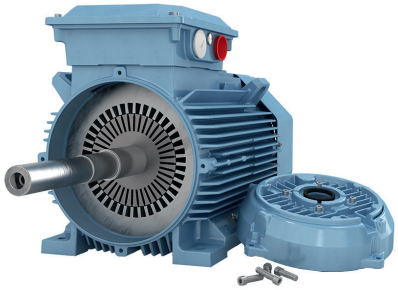
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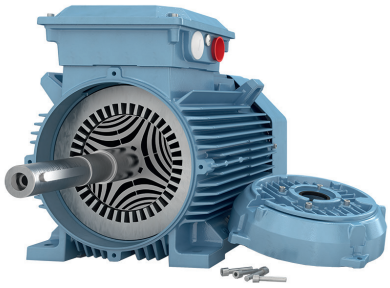
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Introduction to Synchronous Reluctance technology

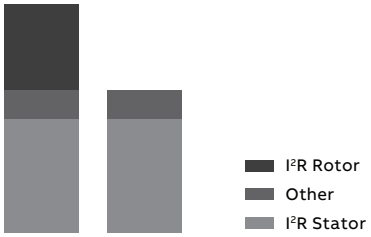
Synchronous reluctance motors - Ultimate efficiency and reliability to optimize your cost of ownership



Traditional induction motor



IE5 SynRM motor



Losses

Innovation inside

The idea is simple. Take a conventional, proven stator technology and a innovative rotor design. Then combine them with a best-in-class ABB drive loaded with new, purpose-designed software.

Magnet-free design

Synchronous reluctance technology combines the performance of the permanent magnet motor with the simplicity and service-friendliness of an induction motor. The rotor has neither magnets nor windings and suffers virtually no power losses. And because there are no magnetic forces in the rotor, maintenance is as straightforward as with induction motors.

SynRM technology	Benefit
Higher efficiency IE5	Lowest energy consumption
No rare earth metals	Environmental sustainability
Magnet-free rotor	Easy service
Lower winding and bearing temperatures	Longer life time, extended service intervals
Better controllability	Accurate speed and torque control
Lower noise level	Better working environment
Same size with IE2	Drop-in replacement

Highest reliability to minimize the cost of not running

IE5 synchronous reluctance motors have very low winding temperatures, which increases the reliability and lifetime of the winding. More importantly, the cool synchronous reluctance rotor means significantly lower bearing temperatures – an important factor because bearing failures cause about 70 percent of unplanned motor outages.

Full motor control, down to zero speed

Many processes require accurate speed control. As the name says, SynRM is a synchronous motor that always runs at reference speed with practically no error, without an encoder. Even the best slip compensation systems in an induction motor inverter will never match the precision of SynRM. Sometimes your application may require you to run your motor at slow speeds, for example at less than 40 rpm. If you are using SynRM and your drive cannot provide the necessaire torque, it may trip. This means you may have downtime while the problem is being debugged. ABB drives provide full control and torque down to zero speed, even without speed sensors.

For all applications

The SynRM motor can be used in any application where an induction motor is used, like pumps, fans, compressors, extruders, conveyors and wire drawing machines to name some.

Drop-in replacement

The IE5 SynRM motor is an ideal solution for motor retrofits. It is the same size as an IE2 induction motor, eliminating the need for mechanical modifications. The increased efficiency will, on the other hand, reduce the payback time of the investment.

IE5 according to IEC TS 60034-30-2

New technical specification IEC TS 60034-30-2 (2016) specify 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 new IEC TS 60034-30-2 are reduced by adding the additional harmonic losses caused by the drive:
  - 15% additional losses for motors up to 90kW
  - 25% additional losses for motors above 90kW
- Limit values available also for 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.

Example:

110 kW 4-pole motor efficiency	
IEC 60034-30-1 (DOL)	IEC TS 60034-30-2 (VSD)
Losses 4,2 kW	Losses 4,2 kW x 1,25 = 5,25 kW
Eff. (110kw/114,2 kw) = 96,3%	Eff. (110 kW/ (110 + 5,25 kw) = 95,4%
IE4 limit 96,3%	IE4 limit 95,4% %
Same motor is IE4 according to both standards	

IE5 SynRM efficiency with VSD duty for same rating is 96,8 %.

In practice, IE5 motor has 20% less losses compared to an IE4 motor. In the technical tables you can see the measured SynRM motor efficiency with VSD supply. Typical values of IE3 induction motor efficiency with VSD supply are listed for comparison.

Introduction to Synchronous Reluctance technology

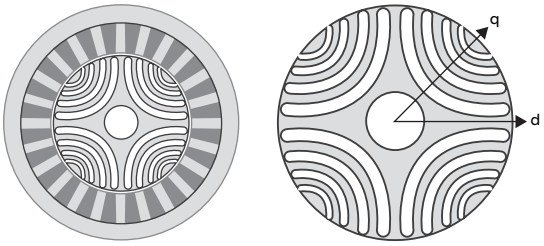
Technology

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

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).

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.

Introduction to Synchronous Reluctance technology

SynRM motors and frequency converters for explosive atmospheres



ACS580 general purpose drive highlights

- A scalable offering from 0.75 kW to 500 kW.
- All compatible drive for typical light indus-try applications such as compressors, con-veyors, mixers, pumps and fans, as well as many other linear, variable and constant torque applica-tions.
- The assistant control panel with multiple lan-guage choices as standard.
- An optional Bluetooth control panel for wire-less commissioning and monitoring. Primary settings and application control macros en-sure quick product setup.
- Enclosure IP55 for harsh conditions.
- Integrated safety, including the safe-torque off (STO) feature as standard.
- Supports various motor types: induction, per-manent magnet, and synchronous re-luctance motors.

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 de-manding industries and applications such as cranes, extruders, winches, winders, conveyors and compressors, among others.
- Compact design for easy installation, commis-sioning, 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, per-manent 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 .

Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3GL	160 MLA	3GGL 162 413	- ASC	445
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 to 4	
3GHL	Totally enclosed fan-cooled synchronous reluctance Increased safety Ex eb motor with cast iron frame, sizes 132-315
3GGL	Totally enclosed fan-cooled synchronous reluctance Increased safety Ex ec motor with cast iron frame, sizes 132-315

Positions 5 to 6	
IEC size	
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 lenght
9:	Stator package length
10:	Speed for two-speed induction, Permanent Magnet, SynRM and High Speed motors

Position 11
-(dash)

Position 12 (marked with black dot in data tables)	
Mounting arrangement	
A:	Foot-mounted
B:	Flange-mounted, large flange
C:	Flange-mounted,small flange (sizes 90-112)
Use a variant code for ordering any other mounting arrange- ment	

Position 13 (marked with black dot in data tables)	
Voltage and frequency	
D:	400 VΔ, 415 VΔ, 690 VY 50 Hz, 460VΔ 60 Hz
E:	500 VΔ 50 Hz
F:	500 VY 50 Hz
S:	230 VΔ, 400 VY, 415 VY 50 Hz
U:	690 VΔ 50 Hz

Position 14	
Generation code	
C	IE5 synchronous reluctance motors

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

Rating plates

01 Sample rating plate for IE5 Increased safety SynRM motors



01

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

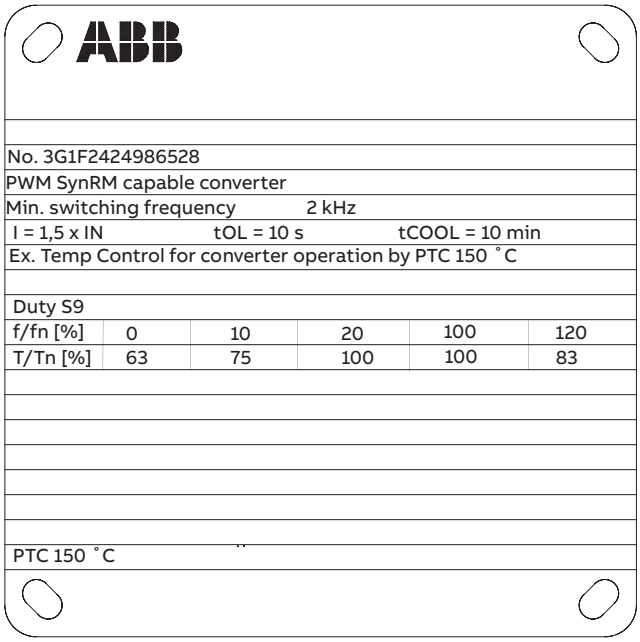
10 Voltage, Frequency, output, speed, current, power factory, duty

11 Product code

12 Bearing type

13 Weight

—
02 Converter supply plate
as standard



—
02

Technical data

IE5 Increased safety Ex eb SynRM motors, network 400 V

IP 55 - IC 411 - Temperature rise class B
IE5 efficiency class according to IEC TS 60034-30-2;2016

Output kW	Motor type	Product code	Efficiency at 100% %	Current in A	Torque T_N Nm	Overload-ability TOL/T_N	Rotor inertia J=1/4 GD_2 kgm_2	Weight kg	Sound pressure level L_{PA} dB	Voltage V	Max. speed
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**					
5.5	M3HL 132SMA 4	3GHL132217-**C	92,8	12,1	17,5	2.1	0,0145	63	64	380	3600
7.5	M3HL 132SMB 4	3GHL132227-**C	93,1	16,5	23,9	2	0,0145	63	64	380	3600
11	M3HL 132SMC 4	3GHL132237-**C	94	24,5	35	2.5	0,0184	69	64	380	3600
11	M3HL 160MLA 4	3GHL162417-**C	93,6	25,5	35	1.8	0,0579	133	70	370	3600
15	M3HL 132SMD 4	3GHL132247-**C	94,1	32,9	47,8	2.1	0,0184	69	64	380	3600
15	M3HL 160MLB 4	3GHL162427-**C	95,1	34,6	48	1.6	0,0579	133	71	370	3600
18.5	M3HL 160MLC 4	3GHL162437-**C	94,6	43	59	1.7	0,0579	133	67	370	3600
22	M3HL 180MLB 4	3GHL182427-**C	95,5	50	70	1.5	0,116	190	66	370	3600
30	M3HL 200MLC 4	3GHL202437-**C	95,9	68,9	95,6	1.5	0,207	277	72	370	3600
37	M3HL 200MLD 4	3GHL202447-**C	96,1	84,5	117,77	1.5	0,207	277	72	370	3600
45	M3HL 225SMB 4	3GHL222227-**C	96,1	99,8	143,24	1.5	0,302	330	73	370	3600
55	M3HL 250SMA 4	3GHL252217-**C	96,4	123	175	1.5	0,499	396	74	370	3600
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**					
5.5	M3HL 132SMA 4	3GHL132213-**C	93,7	11,7	35	2.1	0,0277	85	60	380	1800
7.5	M3HL 132SMB 4	3GHL132223-**C	93,7	15,7	47,8	2	0,0277	85	60	380	1800
11	M3HL 160MLA 4	3GHL162413-**C	94	24,2	70	1.8	0,0702	160	62	370	1800
15	M3HL 160MLB 4	3GHL162423-**C	94,8	32,1	95,5	1.8	0,0864	177	62	370	1800
18.5	M3HL 180MLB 4	3GHL182423-**C	95	42,8	118	1.5	0,156	222	60	370	1800
22	M3HL 180MLC 4	3GHL182433-**C	95,4	49,4	140	1.5	0,156	222	60	370	1800
30	M3HL 200MLB 4	3GHL202423-**C	95,9	65	191	1.5	0,287	304	61	370	1800
37	M3HL 225SMB 4	3GHL222223-**C	96,3	79,3	236	1.5	0,38	385	64	370	1800
45	M3HL 225SMC 4	3GHL222233-**C	96,3	98,5	286	1.5	0,38	350	64	370	1800
55	M3HL 250SMB 4	3GHL252223-**C	96,5	117	350	1.5	0,632	454	65	370	1800
75	M3HL 280SMA 4	3GHL282213-**C	96,2	166	478	2.2	1	639	72	370	1800
90	M3HL 280SMB 4	3GHL282223-**C	96,5	199	573	2	1	639	72	370	1800
110	M3HL 280SMC 4	3GHL282233-**C	96,7	241	699	2.1	1,21	697	68	370	1800
110	M3HL 315SMA 4	3GHL312213-**C	96,8	243	702	2.2	1,64	873	68	370	1800
132	M3HL 315SMB 4	3GHL312223-**C	96,8	290	842	2.2	1,87	925	68	370	1800
160	M3HL 315SMC 4	3GHL312233-**C	97,1	343	1018	2	2,04	965	68	370	1800
200	M3HL 315MLA 4	3GHL312413-**C	97,2	427	1272	2	2,45	1116	74	370	1800
250	M3HL 315LKA 4	3GHL312813-**C	97,1	552	1591	2.2	3,04	1357	74	370	1800
315	M3HL 315LKC 4	3GHL312833-**C	97,2	662	2006	1.9	3,77	1533	74	370	1800
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**					
7.5	M3HL 160MLA 4	3GHL162412-**C	93,1	16,5	72	1.9	0,0702	160	59	370	1200
11	M3HL 160MLB 4	3GHL162422-**C	93,7	24,1	105	1.9	0,0864	177	59	370	1200
15	M3HL 180MLC 4	3GHL182432-**C	94,2	34,1	143	1.5	0,156	216	57	370	1200
18.5	M3HL 200MLA 4	3GHL202412-**C	95,2	39,9	177	2.3	0,287	304	63	370	1200
22	M3HL 200MLB 4	3GHL202422-**C	95	47	210	2.1	0,287	304	63	370	1200
30	M3HL 225SMB 4	3GHL222222-**C	95,5	64,7	287	1.5	0,38	348	61	370	1200
37	M3HL 250SMA 4	3GHL252212-**C	95,6	80,5	353	1.7	0,575	428	63	370	1200
45	M3HL 280SMA 4	3GHL282212-**C	96,2	98,6	430	2.3	1	639	65	370	1200
55	M3HL 280SMB 4	3GHL282222-**C	96	119	526	2	1	639	65	370	1200
75	M3HL 280SMC 4	3GHL282232-**C	96,2	160	715	1.9	1,21	697	67	370	1200
75	M3HL 315SMA 4	3GHL312212-**C	96,5	164	717	2.1	1,64	873	67	370	1200
90	M3HL 315SMB 4	3GHL312222-**C	96,8	199	859	2.1	1,87	925	67	370	1200
110	M3HL 315SMC 4	3GHL312232-**C	96,8	241	1051	2	2,04	965	68	370	1200
132	M3HL 315MLA 4	3GHL312412-**C	97,1	278	1261	1.8	2,45	1116	68	370	1200
160	M3HL 315LKA 4	3GHL312812-**C	97,1	341	1527	2	3,04	1357	73	370	1200
200	M3HL 315LKC 4	3GHL312832-**C	97,3	416	1910	2	3,77	1533	73	370	1200

Technical data

IE5 Increased safety Ex eb SynRM motors, network 500 V

IP 55 - IC 411 - Temperature rise class B
IE5 efficiency class according to IEC TS 60034-30-2;2016

Output kW	Motor type	Product code	Efficiency at 100% %	Current in A	Torque T_N Nm	Overload-ability TOL/T_N	Rotor inertia J=1/4 GD_2 kgm_2	Weight kg	Sound pressure level L_{PA} dB	Voltage V	Max. speed
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**					
5.5	M3HL 132SMA 4	3GHL132217-**C	92,8	9,6	17,5	2.2	0,0145	63	64	470	3600
7.5	M3HL 132SMB 4	3GHL132227-**C	93,1	13,3	23,9	2.1	0,0145	63	64	470	3600
11	M3HL 132SMC 4	3GHL132237-**C	93,1	19,8	35	2.3	0,0184	69	64	470	3600
11	M3HL 160MLA 4	3GHL162417-**C	93,6	20,8	35	1.8	0,0579	133	70	470	3600
15	M3HL 132SMD 4	3GHL132247-**C	94,1	26,6	47,8	2.3	0,0184	69	64	470	3600
15	M3HL 160MLB 4	3GHL162427-**C	95,1	27,2	47,8	1.7	0,0579	133	71	470	3600
18.5	M3HL 160MLC 4	3GHL162437-**C	94,5	34,1	58,89	1.7	0,0579	133	70	470	3600
22	M3HL 180MLB 4	3GHL182427-**C	95,5	39,7	70	1.5	0,116	190	66	470	3600
30	M3HL 200MLC 4	3GHL202437-**C	95,9	50,9	95,5	1.5	0,207	277	72	470	3600
37	M3HL 200MLD 4	3GHL202447-**C	96,1	66,4	117,77	1.5	0,207	277	72	470	3600
45	M3HL 225SMB 4	3GHL222227-**C	96,1	78,4	143,24	1.5	0,302	330	73	470	3600
55	M3HL 250SMA 4	3GHL252217-**C	96,9	97	175	1.5	0,499	396	74	470	3600
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**					
5.5	M3HL 132SMA 4	3GHL132213-**C	93,7	9,5	35	2.1	0,0277	85	60	470	1800
7.5	M3HL 132SMB 4	3GHL132223-**C	93,7	12,8	47,8	2	0,0277	85	60	470	1800
11	M3HL 160MLA 4	3GHL162413-**C	94	19,1	70,03	1.9	0,0702	160	62	470	1800
15	M3HL 160MLB 4	3GHL162423-**C	94,8	25,3	95,5	2	0,0864	177	62	470	1800
18.5	M3HL 180MLB 4	3GHL182423-**C	95	33,2	118	1.5	0,156	222	60	470	1800
22	M3HL 180MLC 4	3GHL182433-**C	95,4	39,5	140	1.5	0,156	222	60	470	1800
30	M3HL 200MLB 4	3GHL202423-**C	95,9	51,2	191	1.5	0,287	304	61	470	1800
37	M3HL 225SMB 4	3GHL222223-**C	96,3	61,2	236	1.5	0,38	385	64	470	1800
45	M3HL 225SMC 4	3GHL222233-**C	96,3	78,2	286	1.5	0,389	350	64	470	1800
55	M3HL 250SMB 4	3GHL252223-**C	96,5	91,6	350	1.5	0,632	454	65	470	1800
75	M3HL 280SMA 4	3GHL282213-**C	96,2	131	477	2.1	1	639	72	470	1800
90	M3HL 280SMB 4	3GHL282223-**C	96,5	157	573	1.9	1	639	72	470	1800
110	M3HL 280SMC 4	3GHL282233-**C	96,7	190	700	2	1,21	697	68	470	1800
110	M3HL 315SMA 4	3GHL312213-**C	96,8	191	700	2.2	1,64	873	68	470	1800
132	M3HL 315SMB 4	3GHL312223-**C	96,8	232	840	2.3	1,87	925	68	470	1800
160	M3HL 315SMC 4	3GHL312233-**C	97,1	271	1019	2	2,04	965	68	470	1800
200	M3HL 315MLA 4	3GHL312413-**C	97,2	326	1273	1.9	2,45	1116	74	470	1800
250	M3HL 315LKA 4	3GHL312813-**C	97,1	434	1592	2.2	3,04	1357	74	470	1800
315	M3HL 315LKC 4	3GHL312833-**C	97,2	517	2005,35	1.7	3,77	1533	74	470	1800
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**					
7.5	M3HL 160MLA 4	3GHL162412-**C	93,3	13,1	71,6	2	0,0702	160	59	470	1200
11	M3HL 160MLB 4	3GHL162422-**C	93,7	19	105	1.9	0,0864	177	59	470	1200
15	M3HL 180MLC 4	3GHL182432-**C	94,2	25,2	143	1.5	0,156	216	57	470	1200
18.5	M3HL 200MLA 4	3GHL202412-**C	95,4	31,5	177	2.4	0,287	304	63	470	1200
22	M3HL 200MLB 4	3GHL202422-**C	95,2	37	210	2.2	0,287	304	63	470	1200
30	M3HL 225SMB 4	3GHL222222-**C	95,5	51,3	287	1.5	0,38	348	61	470	1200
37	M3HL 250SMA 4	3GHL252212-**C	95,8	63,4	353	1.9	0,575	428	63	470	1200
45	M3HL 280SMA 4	3GHL282212-**C	96,2	77,6	430	2.3	1	639	65	470	1200
55	M3HL 280SMB 4	3GHL282222-**C	96,1	93,7	525	2	1	639	65	470	1200
75	M3HL 280SMC 4	3GHL282232-**C	96,2	126	716	1.8	1,21	697	67	470	1200
75	M3HL 315SMA 4	3GHL312212-**C	96,5	129	716	2.1	1,64	873	67	470	1200
90	M3HL 315SMB 4	3GHL312222-**C	96,8	157	859	2.1	1,87	925	67	470	1200
110	M3HL 315SMC 4	3GHL312232-**C	96,8	190	1050	2.1	2,04	965	68	470	1200
132	M3HL 315MLA 4	3GHL312412-**C	97,1	219	1261	1.8	2,45	1116	68	470	1200
160	M3HL 315LKA 4	3GHL312812-**C	97,1	269	1527,89	2	3,04	1357	73	470	1200
200	M3HL 315LKC 4	3GHL312832-**C	97,3	327	1910	1.8	3,77	1533	73	470	1200

Technical data

IE5 Increased safety Ex eb SynRM motors, network 690 V

IP 55 - IC 411 - Temperature rise class B
IE5 efficiency class according to IEC TS 60034-30-2;2016

Output kW	Motor type	Product code	Efficiency at 100% %	Current in A	Torque T_N Nm	Overload-ability TOL/T_N	Rotor inertia J=1/4 GD_2 kgm_2	Weight kg	Sound pressure level L_{PA} dB	Voltage V	Max. speed
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**					
5.5	M3HL 132SMA 4	3GHL132217-**C	92,5	7	17,5	2.4	0,0145	63	64	650	3600
5.5	M3HL 132SMA 4	3GHL132217-**C	92,5	7	17,5	2.4	0,0145	63	64	650	3600
7.5	M3HL 132SMB 4	3GHL132227-**C	92,8	9,5	23,9	2.1	0,0145	63	64	650	3600
11	M3HL 132SMC 4	3GHL132237-**C	92,9	14,1	35	2.2	0,0184	69	64	650	3600
11	M3HL 160MLA 4	3GHL162417-**C	93,6	14,8	35	1.9	0,0579	133	70	650	3600
15	M3HL 132SMD 4	3GHL132247-**C	93,7	18,9	47,8	2.1	0,0184	69	64	650	3600
15	M3HL 160MLB 4	3GHL162427-**C	94,9	20	47,8	1.6	0,0579	133	71	650	3600
18.5	M3HL 160MLC 4	3GHL162437-**C	94,5	25,1	58,89	1.8	0,0579	133	70	650	3600
22	M3HL 180MLB 4	3GHL182427-**C	95,4	28,9	70	1.5	0,116	190	66	650	3600
30	M3HL 200MLC 4	3GHL202437-**C	95,9	39,3	95,5	1.5	0,207	277	72	650	3600
37	M3HL 200MLD 4	3GHL202447-**C	96,1	47,8	117,77	1.5	0,207	277	72	650	3600
45	M3HL 225SMB 4	3GHL222227-**C	96,1	57,2	143,24	1.5	0,302	330	73	650	3600
55	M3HL 250SMA 4	3GHL252217-**C	94,4	70	175	1.5	0,499	396	74	650	3600
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**					
5.5	M3HL 132SMA 4	3GHL132213-**C	93,3	6,8	35	2.1	0,0277	85	60	650	1800
7.5	M3HL 132SMB 4	3GHL132223-**C	93,3	9,2	47,8	2.1	0,0277	85	60	650	1800
11	M3HL 160MLA 4	3GHL162413-**C	93,6	14,1	70,03	1.8	0,0702	160	62	650	1800
15	M3HL 160MLB 4	3GHL162423-**C	94,6	18,4	95,5	1.9	0,0864	177	62	650	1800
18.5	M3HL 180MLB 4	3GHL182423-**C	95	24,3	118	1.5	0,156	222	60	650	1800
22	M3HL 180MLC 4	3GHL182433-**C	95,4	28	140	1.5	0,156	222	60	650	1800
30	M3HL 200MLB 4	3GHL202423-**C	95,5	37,3	191	1.5	0,287	304	61	650	1800
37	M3HL 225SMB 4	3GHL222223-**C	96,3	45,2	236	1.5	0,38	385	64	650	1800
45	M3HL 225SMC 4	3GHL222233-**C	96,3	54,8	286	1.5	0,38	350	64	650	1800
55	M3HL 250SMB 4	3GHL252223-**C	96,5	67	350	1.5	0,632	454	65	650	1800
75	M3HL 280SMA 4	3GHL282213-**C	96,2	92,6	477	2	1	639	72	650	1800
90	M3HL 280SMB 4	3GHL282223-**C	96,3	110	573	1.8	1	639	72	650	1800
110	M3HL 280SMC 4	3GHL282233-**C	96,6	133	700	1.8	1,21	697	68	650	1800
110	M3HL 315SMA 4	3GHL312213-**C	96,7	138	700	1.9	1,64	873	68	650	1800
132	M3HL 315SMB 4	3GHL312223-**C	96,7	165	840	1.9	1,87	925	68	650	1800
160	M3HL 315SMC 4	3GHL312233-**C	97	195	1019	1.7	2,04	965	68	650	1800
200	M3HL 315MLA 4	3GHL312413-**C	97,1	244	1273	2.1	2,45	1116	74	650	1800
250	M3HL 315LKA 4	3GHL312813-**C	97	314	1592	1.6	3,04	1357	74	650	1800
315	M3HL 315LKC 4	3GHL312833-**C	97,1	377	2005,35	2	3,77	1533	74	650	1800
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**					
7.5	M3HL 160MLA 4	3GHL162412-**C	93	9,5	71,6	2.1	0,0702	160	59	650	1200
11	M3HL 160MLB 4	3GHL162422-**C	93,4	13,8	105	2	0,0864	177	59	650	1200
15	M3HL 180MLC 4	3GHL182432-**C	94,2	19,3	143	1.5	0,156	216	57	650	1200
18.5	M3HL 200MLA 4	3GHL202412-**C	95	22,6	177	2.1	0,287	304	63	650	1200
22	M3HL 200MLB 4	3GHL202422-**C	94,9	26,5	210	2	0,287	304	63	650	1200
30	M3HL 225SMB 4	3GHL222222-**C	95,5	36,7	287	1.5	0,38	348	61	650	1200
37	M3HL 250SMA 4	3GHL252212-**C	95,6	46	353	1.8	0,575	428	63	650	1200
45	M3HL 280SMA 4	3GHL282212-**C	96	54,6	430	2	1	639	65	650	1200
55	M3HL 280SMB 4	3GHL282222-**C	95,8	66,8	525	1.9	1	639	65	650	1200
75	M3HL 280SMC 4	3GHL282232-**C	96	89,8	716	1.7	1,21	697	67	650	1200
75	M3HL 315SMA 4	3GHL312212-**C	96,4	91,6	716	1.9	1,64	873	67	650	1200
90	M3HL 315SMB 4	3GHL312222-**C	96,6	111	860	1.9	1,87	925	67	650	1200
110	M3HL 315SMC 4	3GHL312232-**C	96,7	134	1051	1.8	2,04	965	68	650	1200
132	M3HL 315MLA 4	3GHL312412-**C	96,9	156	1261	1.6	2,45	1116	68	650	1200
160	M3HL 315LKA 4	3GHL312812-**C	96,9	189	1528,04	1.7	3,04	1357	73	650	1200
200	M3HL 315LKC 4	3GHL312832-**C	97	232	1910	1.6	3,77	1533	73	650	1200

Technical data

IE5 Increased safety Ex ec SynRM motors, network 400 V

IP 55 - IC 411 - Temperature rise class B
IE5 efficiency class according to IEC TS 60034-30-2;2016

Output kW	Motor type	Product code	Efficiency at 100% %	Current in A	Torque T_N Nm	Overload-ability TOL/T_N	Rotor inertia J=1/4 GD_2 kgm_2	Weight kg	Sound pressure level L_{PA} dB	Voltage V	Max. speed
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**					
5.5	M3GL 132SMA 4	3GGL132217-**C	92,8	12,1	17,5	2.1	0,0145	63	64	380	3600
7.5	M3GL 132SMB 4	3GGL132227-**C	93,1	16,5	23,9	2	0,0145	63	64	380	3600
11	M3GL 132SMC 4	3GGL132237-**C	94	24,5	35	2.5	0,0184	69	64	380	3600
11	M3GL 160MLA 4	3GGL162417-**C	93,6	25,5	35	1.8	0,0579	133	70	370	3600
15	M3GL 132SMD 4	3GGL132247-**C	94,1	32,9	47,8	2.1	0,0184	69	64	380	3600
15	M3GL 160MLB 4	3GGL162427-**C	95,1	34,6	48	1.6	0,0579	133	71	370	3600
18.5	M3GL 160MLC 4	3GGL162437-**C	94,6	43	59	1.7	0,0579	133	69	370	3600
22	M3GL 180MLB 4	3GGL182427-**C	95,5	50	70	1.5	0,116	190	66	370	3600
30	M3GL 200MLC 4	3GGL202437-**C	95,9	68,9	95,6	1.5	0,207	277	72	370	3600
37	M3GL 200MLD 4	3GGL202447-**C	96,1	84,5	118	1.5	0,207	277	72	370	3600
45	M3GL 225SMB 4	3GGL222227-**C	96,1	99,8	143	1.5	0,302	330	73	370	3600
55	M3GL 250SMA 4	3GGL252217-**C	96,4	123	175	1.5	0,499	396	74	370	3600
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**					
5.5	M3GL 132SMA 4	3GGL132213-**C	93,7	11,7	35	2.1	0,0277	85	60	380	1800
7.5	M3GL 132SMB 4	3GGL132223-**C	93,7	15,7	47,8	2	0,0277	85	60	380	1800
11	M3GL 160MLA 4	3GGL162413-**C	94	24,2	70	1.8	0,0702	160	62	370	1800
15	M3GL 160MLB 4	3GGL162423-**C	94,8	32,1	95,5	1.8	0,0864	177	62	370	1800
18.5	M3GL 180MLB 4	3GGL182423-**C	95	42,8	118	1.5	0,156	222	60	370	1800
22	M3GL 180MLC 4	3GGL182433-**C	95,4	49,4	140	1.5	0,156	222	60	370	1800
30	M3GL 200MLB 4	3GGL202423-**C	95,9	65	191	1.5	0,287	304	61	370	1800
37	M3GL 225SMB 4	3GGL222223-**C	96,3	79,3	236	1.5	0,38	385	64	370	1800
45	M3GL 225SMC 4	3GGL222233-**C	96,3	98,5	286	1.5	0,38	350	64	370	1800
55	M3GL 250SMB 4	3GGL252223-**C	96,5	117	350	1.5	0,632	454	65	370	1800
75	M3GL 280SMA 4	3GGL282213-**C	96,2	166	478	2.2	1	639	72	370	1800
90	M3GL 280SMB 4	3GGL282223-**C	96,5	199	573	2	1	639	72	370	1800
110	M3GL 280SMC 4	3GGL282233-**C	96,7	241	699	2.1	1,21	697	68	370	1800
110	M3GL 315SMA 4	3GGL312213-**C	96,8	243	702	2.2	1,64	873	68	370	1800
132	M3GL 315SMB 4	3GGL312223-**C	96,8	290	842	2.2	1,87	925	68	370	1800
160	M3GL 315SMC 4	3GGL312233-**C	97,1	343	1018	2	2,04	965	68	370	1800
200	M3GL 315MLA 4	3GGL312413-**C	97,2	427	1272	2	2,45	1116	74	370	1800
250	M3GL 315LKA 4	3GGL312813-**C	97,1	552	1591	2.2	3,04	1357	74	370	2000
315	M3GL 315LKC 4	3GGL312833-**C	97,2	662	2006	1.9	3,77	1533	74	370	1800
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**					
7.5	M3GL 160MLA 4	3GGL162412-**C	93,1	16,5	72	1.9	0,0702	160	59	370	1200
11	M3GL 160MLB 4	3GGL162422-**C	93,7	24,1	105	1.9	0,0864	177	59	370	1200
15	M3GL 180MLC 4	3GGL182432-**C	94,2	34,1	143	1.5	0,156	216	57	370	1200
18.5	M3GL 200MLA 4	3GGL202412-**C	95,2	39,9	177	2.3	0,287	304	63	370	1200
22	M3GL 200MLB 4	3GGL202422-**C	95	47	210	2.1	0,287	304	63	370	1200
30	M3GL 225SMB 4	3GGL222222-**C	95,5	64,7	287	1.5	0,38	348	61	370	1200
37	M3GL 250SMA 4	3GGL252212-**C	95,6	80,5	353	1.7	0,575	428	63	370	1200
45	M3GL 280SMA 4	3GGL282212-**C	96,2	98,6	430	2.3	1	639	65	370	1200
55	M3GL 280SMB 4	3GGL282222-**C	96	119	526	2	1	639	65	370	1200
75	M3GL 280SMC 4	3GGL282232-**C	96,2	160	715	1.9	1,21	697	67	370	1200
75	M3GL 315SMA 4	3GGL312212-**C	96,5	164	717	2.1	1,64	873	67	370	1200
90	M3GL 315SMB 4	3GGL312222-**C	96,8	199	859	2.1	1,87	925	67	370	1200
110	M3GL 315SMC 4	3GGL312232-**C	96,8	241	1051	2	2,04	965	68	370	1200
132	M3GL 315MLA 4	3GGL312412-**C	97,1	278	1261	1.8	2,45	1116	68	370	1200
160	M3GL 315LKA 4	3GGL312812-**C	97,1	341	1527	2	3,04	1357	73	370	1200
200	M3GL 315LKC 4	3GGL312832-**C	97,3	416	1910	2	3,77	1533	73	370	1200

Technical data

IE5 Increased safety Ex ec SynRM motors, network 500 V

IP 55 - IC 411 - Temperature rise class B
IE5 efficiency class according to IEC TS 60034-30-2;2016

Output kW	Motor type	Product code	Efficiency at 100% %	Current in A	Torque T_N Nm	Overload-ability TOL/T_N	Rotor inertia J=1/4 GD_2 kgm_2	Weight kg	Sound pressure level L_{PA} dB	Voltage V	Max. speed
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**					
5.5	M3GL 132SMA 4	3GGL132217-**C	92,8	9,6	17,5	2.2	0,0145	63	64	470	3600
7.5	M3GL 132SMB 4	3GGL132227-**C	93,1	13,3	23,9	2.1	0,0145	63	64	470	3600
11	M3GL 132SMC 4	3GGL132237-**C	93,1	19,8	35	2.3	0,0184	69	64	470	3600
11	M3GL 160MLA 4	3GGL162417-**C	93,6	20,8	35	1.8	0,0579	133	70	470	3600
15	M3GL 132SMD 4	3GGL132247-**C	94,1	26,6	47,8	2.3	0,0184	69	64	470	3600
15	M3GL 160MLB 4	3GGL162427-**C	95,1	27,2	47,8	1.7	0,0579	133	71	470	3600
18.5	M3GL 160MLC 4	3GGL162437-**C	94,5	34,1	58,9	1.7	0,0579	133	69	470	3600
22	M3GL 180MLB 4	3GGL182427-**C	95,5	39,7	70	1.5	0,116	190	66	470	3600
30	M3GL 200MLC 4	3GGL202437-**C	95,9	50,9	95,5	1.5	0,207	277	72	470	3600
37	M3GL 200MLD 4	3GGL202447-**C	96,1	66,4	118	1.5	0,207	277	72	470	3600
45	M3GL 225SMB 4	3GGL222227-**C	96,1	78,4	143	1.5	0,302	330	73	470	3600
55	M3GL 250SMA 4	3GGL252217-**C	96,9	97	175	1.5	0,499	396	74	470	3600
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**					
5.5	M3GL 132SMA 4	3GGL132213-**C	93,7	9,5	35	2.1	0,0277	85	60	470	1800
7.5	M3GL 132SMB 4	3GGL132223-**C	93,7	12,8	47,8	2	0,0277	85	60	470	1800
11	M3GL 160MLA 4	3GGL162413-**C	94	19,1	70	1.9	0,0702	160	62	470	1800
15	M3GL 160MLB 4	3GGL162423-**C	94,8	25,3	95,5	2	0,0864	177	62	470	1800
18.5	M3GL 180MLB 4	3GGL182423-**C	95	33,2	118	1.5	0,156	222	60	470	1800
22	M3GL 180MLC 4	3GGL182433-**C	95,4	39,5	140	1.5	0,156	222	60	470	1800
30	M3GL 200MLB 4	3GGL202423-**C	95,9	51,2	190,99	1.5	0,287	304	61	470	1800
37	M3GL 225SMB 4	3GGL222223-**C	96,3	61,2	236	1.5	0,38	385	64	470	1800
45	M3GL 225SMC 4	3GGL222233-**C	96,3	78,2	286	1.5	0,389	350	64	470	1800
55	M3GL 250SMB 4	3GGL252223-**C	96,5	91,6	350	1.5	0,632	454	65	470	1800
75	M3GL 280SMA 4	3GGL282213-**C	96,2	131	477	2.1	1	639	72	470	1800
90	M3GL 280SMB 4	3GGL282223-**C	96,5	157	573	1.9	1	639	72	470	1800
110	M3GL 280SMC 4	3GGL282233-**C	96,7	190	700	2	1,21	697	68	470	1800
110	M3GL 315SMA 4	3GGL312213-**C	96,8	191	700	2.2	1,64	873	68	470	1800
132	M3GL 315SMB 4	3GGL312223-**C	96,8	232	840	2.3	1,87	925	68	470	1800
160	M3GL 315SMC 4	3GGL312233-**C	97,1	271	1019	2	2,04	965	68	470	1800
200	M3GL 315MLA 4	3GGL312413-**C	97,2	326	1273	1.9	2,45	1116	74	470	1800
250	M3GL 315LKA 4	3GGL312813-**C	97,1	434	1592	2.2	3,04	1357	74	470	2000
315	M3GL 315LKC 4	3GGL312833-**C	97,2	517	2005	1.7	3,77	1533	74	470	1800
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**					
7.5	M3GL 160MLA 4	3GGL162412-**C	93,3	13,1	71,6	2	0,0702	160	59	470	1200
11	M3GL 160MLB 4	3GGL162422-**C	93,7	19	105	1.9	0,0864	177	59	470	1200
15	M3GL 180MLC 4	3GGL182432-**C	94,2	25,2	143	1.5	0,156	216	57	470	1200
18.5	M3GL 200MLA 4	3GGL202412-**C	95,4	31,5	177	2.4	0,287	304	63	470	1200
22	M3GL 200MLB 4	3GGL202422-**C	95,2	37	210	2.2	0,287	304	63	470	1200
30	M3GL 225SMB 4	3GGL222222-**C	95,5	51,3	287	1.5	0,38	348	61	470	1200
37	M3GL 250SMA 4	3GGL252212-**C	95,8	63,4	353	1.9	0,575	428	63	470	1200
45	M3GL 280SMA 4	3GGL282212-**C	96,2	77,6	430	2.3	1	639	65	470	1200
55	M3GL 280SMB 4	3GGL282222-**C	96,1	93,7	525	2	1	639	65	470	1200
75	M3GL 280SMC 4	3GGL282232-**C	96,2	126	716	1.8	1,21	697	67	470	1200
75	M3GL 315SMA 4	3GGL312212-**C	96,5	129	716	2.1	1,64	873	67	470	1200
90	M3GL 315SMB 4	3GGL312222-**C	96,8	157	859	2.1	1,87	925	67	470	1200
110	M3GL 315SMC 4	3GGL312232-**C	96,8	190	1050	2.1	2,04	965	68	470	1200
132	M3GL 315MLA 4	3GGL312412-**C	97,1	219	1261	1.8	2,45	1116	68	470	1200
160	M3GL 315LKA 4	3GGL312812-**C	97,1	269	1528	2	3,04	1357	73	470	1200
200	M3GL 315LKC 4	3GGL312832-**C	97,3	327	1909,86	1.8	3,77	1533	73	470	1200

Technical data

IE5 Increased safety Ex ec SynRM motors, network 690 V

IP 55 - IC 411 - Temperature rise class B
IE5 efficiency class according to IEC TS 60034-30-2;2016

Output kW	Motor type	Product code	Efficiency at 100% %	Current in A	Torque T_N Nm	Overload-ability TOL/T_N	Rotor inertia J=1/4 GD_2 kgm_2	Weight kg	Sound pressure level L_{PA} dB	Voltage V	Max. speed
3000 r/min = 4 poles				**100 Hz**		**BASIC-design**					
5.5	M3GL 132SMA 4	3GGL132217-**C	92,5	7	17,5	2.4	0,0145	63	64	650	3600
7.5	M3GL 132SMB 4	3GGL132227-**C	92,8	9,5	23,9	2.1	0,0145	63	64	650	3600
11	M3GL 132SMC 4	3GGL132237-**C	92,9	14,1	35	2.2	0,0184	69	64	650	3600
11	M3GL 160MLA 4	3GGL162417-**C	93,6	14,8	35	1.9	0,0579	133	70	650	3600
15	M3GL 132SMD 4	3GGL132247-**C	93,7	18,9	47,8	2.1	0,0184	69	64	650	3600
15	M3GL 160MLB 4	3GGL162427-**C	94,9	20	47,8	1.6	0,0579	133	71	650	3600
18.5	M3GL 160MLC 4	3GGL162437-**C	94,5	25,1	58,9	1.8	0,0579	133	69	650	3600
22	M3GL 180MLB 4	3GGL182427-**C	95,4	28,9	70	1.5	0,116	190	66	650	3600
30	M3GL 200MLC 4	3GGL202437-**C	95,9	39,3	95,5	1.5	0,207	277	72	650	3600
37	M3GL 200MLD 4	3GGL202447-**C	96,1	47,8	118	1.5	0,207	277	72	650	3600
45	M3GL 225SMB 4	3GGL222227-**C	96,1	57,2	143	1.5	0,302	330	73	650	3600
55	M3GL 250SMA 4	3GGL252217-**C	94,4	70	175	1.5	0,499	396	74	650	3600
1500 r/min = 4 poles				**50 Hz**		**BASIC-design**					
5.5	M3GL 132SMA 4	3GGL132213-**C	93,3	6,8	35	2.1	0,0277	85	60	650	1800
7.5	M3GL 132SMB 4	3GGL132223-**C	93,3	9,2	47,8	2.1	0,0277	85	60	650	1800
11	M3GL 160MLA 4	3GGL162413-**C	93,6	14,1	70	1.8	0,0702	160	62	650	1800
15	M3GL 160MLB 4	3GGL162423-**C	94,6	18,4	95,5	1.9	0,0864	177	62	650	1800
18.5	M3GL 180MLB 4	3GGL182423-**C	95	24,3	118	1.5	0,156	222	60	650	1800
22	M3GL 180MLC 4	3GGL182433-**C	95,4	28	140	1.5	0,156	222	60	650	1800
30	M3GL 200MLB 4	3GGL202423-**C	95,5	37,3	190,99	1.5	0,287	304	61	650	1800
37	M3GL 225SMB 4	3GGL222223-**C	96,3	45,2	236	1.5	0,38	385	64	650	1800
45	M3GL 225SMC 4	3GGL222233-**C	96,3	54,8	286	1.5	0,38	350	64	650	1800
55	M3GL 250SMB 4	3GGL252223-**C	96,5	67	350	1.5	0,632	454	65	650	1800
75	M3GL 280SMA 4	3GGL282213-**C	96,2	92,6	477	2	1	639	72	650	1800
90	M3GL 280SMB 4	3GGL282223-**C	96,3	110	573	1.8	1	639	72	650	1800
110	M3GL 280SMC 4	3GGL282233-**C	96,6	133	700	1.8	1,21	697	68	650	1800
110	M3GL 315SMA 4	3GGL312213-**C	96,7	138	700	1.9	1,64	873	68	650	1800
132	M3GL 315SMB 4	3GGL312223-**C	96,7	165	840	1.9	1,87	925	68	650	1800
160	M3GL 315SMC 4	3GGL312233-**C	97	195	1019	1.7	2,04	965	68	650	1800
200	M3GL 315MLA 4	3GGL312413-**C	97,1	244	1273	2.1	2,45	1116	74	650	1800
250	M3GL 315LKA 4	3GGL312813-**C	97	314	1592	1.6	3,04	1357	74	650	2000
315	M3GL 315LKC 4	3GGL312833-**C	97,1	377	2005	2	3,77	1533	74	650	1800
1000 r/min = 4 poles				**33,3 Hz**		**BASIC-design**					
7.5	M3GL 160MLA 4	3GGL162412-**C	93	9,5	71,6	2.1	0,0702	160	59	650	1200
11	M3GL 160MLB 4	3GGL162422-**C	93,4	13,8	105	2	0,0864	177	59	650	1200
15	M3GL 180MLC 4	3GGL182432-**C	94,2	19,3	143	1.5	0,156	216	57	650	1200
18.5	M3GL 200MLA 4	3GGL202412-**C	95	22,6	177	2.1	0,287	304	63	650	1200
22	M3GL 200MLB 4	3GGL202422-**C	94,9	26,5	210	2	0,287	304	63	650	1200
30	M3GL 225SMB 4	3GGL222222-**C	95,5	36,7	287	1.5	0,38	348	61	650	1200
37	M3GL 250SMA 4	3GGL252212-**C	95,6	46	353	1.8	0,575	428	63	650	1200
45	M3GL 280SMA 4	3GGL282212-**C	96	54,6	430	2	1	639	65	650	1200
55	M3GL 280SMB 4	3GGL282222-**C	95,8	66,8	525	1.9	1	639	65	650	1200
75	M3GL 280SMC 4	3GGL282232-**C	96	89,8	716	1.7	1,21	697	67	650	1200
75	M3GL 315SMA 4	3GGL312212-**C	96,4	91,6	716	1.9	1,64	873	67	650	1200
90	M3GL 315SMB 4	3GGL312222-**C	96,6	111	860	1.9	1,87	925	67	650	1200
110	M3GL 315SMC 4	3GGL312232-**C	96,7	134	1051	1.8	2,04	965	68	650	1200
132	M3GL 315MLA 4	3GGL312412-**C	96,9	156	1261	1.6	2,45	1116	68	650	1200
160	M3GL 315LKA 4	3GGL312812-**C	96,9	189	1528	1.7	3,04	1357	73	650	1200
200	M3GL 315LKC 4	3GGL312832-**C	97	232	1910,05	1.6	3,77	1533	73	650	1200

Variant codes

IE5 Increased safety 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.

Code/Variants		Frame size							
		132	160	180	200	225	250	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	●	●	●	●	●	●	●	●
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.	○	●	●	●	●	●	-	-
433	Outlet grease collector	-	-	-	-	-	-	●	●
506	Nipples for vibration measurement : SKF Marlin Quick Connect stud CMSS-2600-3	-	●	●	●	●	●	●	●
593	Bearings grease suitable for food and beverage industry.	●	●	●	●	●	●	●	●
654	Provision for vibration sensors (M8x1)	-	●	●	●	●	●	●	●
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	-	●	●	●	●	●	●	●
Brakes									
412	Assembly of built-in brake	-	-	-	-	-	-	-	-
Branch standard designs									
178	Stainless steel / acid proof bolts.	●	●	●	●	●	●	●	●
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	●	●	●	●	●	●	●	●
399	Motor designed for minimum ambient temperature -40 °C to -55 °C	●	●	●	●	●	●	●	●
204	Jacking bolts for foot mounted motors.	-	●	●	●	●	●	●	●
209	Non-standard voltage or frequency, (special winding).	●	●	●	●	●	●	●	●
425	Corrosion protected stator and rotor core.	●	●	●	●	●	●	●	●

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

Code/Variants		Frame size							
		132	160	180	200	225	250	280	315
Cooling system									
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	-	●	●	●	●	●	●	●
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).	●	●	●	●	●	●	●	●
777	Premium documentation package	●	●	●	●	●	●	●	●
Coupling									
035	Assembly of customer supplied coupling-half.	-	-	-	-	-	-	●	●
Drain holes									
065	Plugged existing drain holes.	●	●	●	●	●	●	●	●
448	Draining holes with metal plugs.	-	●	●	●	●	●	●	●
Earthing Bolt									
067	External earthing bolt.	○	○	○	○	○	○	○	○
525	External earthing bolts on motor feet	●	●	●	●	●	●	●	●
Hazardous environments									
334	Ex t, Dust group III B T125C Db, IP6X (non-conductive dust) acc. IEC/ EN60079-31	54	●	●	●	●	●	●	●
335	Ex t, Dust group III B T125C Dc, IP5X (non-conductive dust) acc. IEC/ EN60079-31 1)	●	●	●	●	●	●	●	●
336	Ex t, Dust group III C T125 Db, IP6X (conductive dust) acc. IEC/ EN60079-31	54	●	●	●	●	●	●	●
337	Ex t, Dust group III C T125 Dc, IP6X (conductive dust) acc. IEC/EN60079-31 1)	●	●	●	●	●	●	●	●
338	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIB T125C Dc (non-conductive dust), IP5X 1)	●	●	●	●	●	●	●	●
339	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIC T125C Dc (conductive dust), IP6X. 1)	●	●	●	●	●	●	●	●
814	Ex t (DIP) motors, temperature class T 150C	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●
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).	●	-	-	-	-	-	-	-
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	●	●	●	●	●	●	●	●
305	Additional lifting lugs.	-	●	●	●	●	●	●	●
786	Special design shaft upwards (V3, V36, V6) for outdoor mounting.	-	●	●	●	●	●	●	●
Noise reduction									
055	Noise reduction cover for foot mounted motor	-	-	-	-	-	-	-	-
Painting									
105	Paint thickness report.	●	●	●	●	●	●	●	●
111	Painting system C3,durability Medium	○	○	○	○	○	○	○	○
114	Special paint color, standard grade	●	●	●	●	●	●	●	●
115	Painting system C4,durability Medium	●	●	●	●	●	●	●	●
168	Primer paint only.	●	●	●	●	●	●	●	●
179	Special paint specification	-	-	-	-	-	-	-	-
710	Thermally sprayed zink metallizing with acrylic top coat	●	●	●	●	●	●	●	●
754	Painting system C5, durability Medium	●	●	●	●	●	●	●	●
711	Painting system C5, durability High	●	●	●	●	●	●	●	●
719	Painting system CX	●	●	●	●	●	●	●	●
755	Norsok M-501 revision 6, Coating system no. 1	-	●	●	●	●	●	●	●

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

Code/Variants		Frame size							
		132	160	180	200	225	250	280	315
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.	●	●	●	●	●	●	●	●
003	Individual serial number.	○	○	○	○	○	○	○	○
004	Additional text on std rating plate (max 12 digits on free text line).	●	●	●	●	●	●	●	●
098	Stainless rating plate	○	○	○	○	○	○	○	○
126	Tag plate	●	●	●	●	●	●	●	●
135	Mounting of additional identification plate, stainless.	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●
Standards and Regulations									
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.)	●	●	●	●	●	●	●	●
Stator winding temperature sensors									
435	PTC - thermistors (3 in series), 130 ºC, in stator winding 1)	●	●	●	●	●	●	●	●
436	PTC - thermistors (3 in series), 150 ºC, in stator winding 2)	○	○	○	○	○	○	○	○
435	PTC - thermistors (3 in series), 130 ºC, in stator winding 3)	○	○	○	○	○	○	○	○
436	PTC - thermistors (3 in series), 150 ºC, in stator winding 4)	●	●	●	●	●	●	●	●
439	PTC - thermistors (2x3 in series), 150 ºC, in stator winding	●	●	●	●	●	●	●	●
441	PTC - thermistors (3 in series, 130 ºC & 3 in series, 150 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	●	●	●	●	●	●	●	●
516	Temperature detectors approved to be connected to an Ex i circuit	-	●	●	●	●	●	●	●
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.	●	●	●	●	●	●	●	●
292	Adapter C-C	-	-	-	-	-	-	●	-
293	Adapter D-D	-	-	-	-	-	-	-	●
294	Adapter E-D	-	-	-	-	-	-	-	●
295	Adapter E-2D	-	-	-	-	-	-	-	●
380	Separate terminal box for temperature detectors, std. material	-	●	●	●	●	●	●	●
418	Separate terminal box for auxiliaries, standard material.	-	●	●	●	●	●	●	●
447	Top mounted separate terminal box for monitoring equipment.	-	-	-	-	-	-	●	●

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

Code/Variants		Frame size							
		132	160	180	200	225	250	280	315
466	Terminal box at N-end.	-	-	-	-	-	-	●	●
468	Cable entry from D-end.	●	●	●	●	●	●	●	●
469	Cable entry from N-end.	●	●	●	●	●	●	●	●
526	Existing cable entries plugged	○	○	○	○	○	○	○	○
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	-	●	●	●	●	●	●	●
400	4 x 90 degr turnable terminal box	156	○	○	○	○	○	○	○
730	Prepared for NPT cable glands.	●	●	●	●	●	●	●	●
731	Two standard metal cable glands.	●	●	●	●	●	●	●	●
734	Standard cable gland, Ex d IIC, armoured cable	-	●	●	●	●	●	●	●
735	Standard cable gland, Ex d IIC, non-armoured cable	-	●	●	●	●	●	●	●
743	Non-drilled cast iron flange for cable glands	-	●	●	●	●	●	●	●
744	Stainless steel non-drilled flange for cable glands.	-	-	-	-	-	-	●	●
745	Painted steel flange equipped with nickel plated brass cable glands	-	●	●	●	●	●	●	●
746	Stainless steel cable flange equipped with standard nickel plated brass cable glands	-	●	●	●	●	●	●	●
Testing									
146	Type test with report for one motor from specific delivery batch.	●	●	●	●	●	●	●	●
148	Routine test report.	●	●	●	●	●	●	●	●
149	Test according to separate test specification	-	-	-	-	-	-	-	-
150	Customer witnessed testing. Specify test procedure with other codes.	●	●	●	●	●	●	●	●
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									
470	Prepared for hollow shaft pulse tacho (L&L equivalent).	-	●	●	●	●	●	●	●
479	Mounting of other type of pulse tacho with shaft extension, tacho not included.	-	●	●	●	●	●	●	●
680	2048 pulse tacho, Ex d, tD, L&L 841910001	-	-	-	-	-	-	-	-
701	Insulated bearing at N-end.	-	-	-	-	-	-	○	○
704	EMC cable entry.	●	●	●	●	●	●	●	●
747	1024 pulse tacho, Ex d, tD, L&L 841910002	-	□	□	□	□	□	□	□

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

1) M3GL

2) M3GL as standard

3) M3HL as standard

4) M3HL

Mechanical design

Motor frame and drain holes

Motor frame

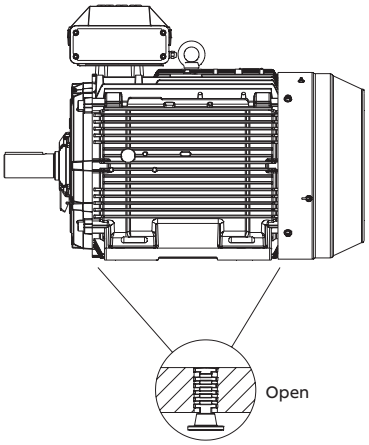
The motor frame, end shields and main terminal box are made of cast iron. Feet are integrated with the frame, except for sizes 160-250 with side mounted terminal box, which have detachable feet.

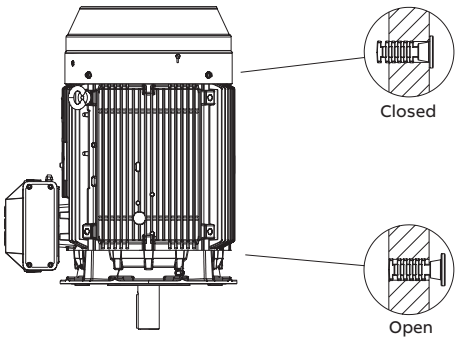
Motors can be supplied for foot mounting, flange mounting, and combinations of these.

Drain holes

Increased safety motors are provided with drain holes fitted with closable plugs as standard. The plugs are made of plastic material and are delivered in open position.

When mounting arrangement differs from foot mounted IM B3, mention variant code 066 when ordering to ensure the drain plug is mounted in the lowest position.





Mechanical design
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
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

Mechanical design

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	132	160	180	200	225	250	280	315
Heating element power (W)	25	25	50	50	50	50	60	2x60

Mechanical design
Bearings

ABB's increased safety motors are normally fitted with single-row deep-groove grease lubricated ball bearings, as shown in the table below.

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

Standard and alternative designs

When high axial forces are involved, angular-contact ball bearings should be used. 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 optimal bearing system design is chosen. Thevariant codes for ordering angular-contact ball bearings at D-end are 058 and 060.

Standard and alternative designs

Motor size	Number of poles	Standard design		Alternative design D-end	
		Deep groove ball bearings		Roller bearings (037)	Angular contact ball bear- ing (058, 060)
		D-end	N-end	D-end	D-end
132	4	6208-2Z/C3	6208-2Z/C3	NU 308 ECP/C3	7208 B
160	4	6309/C3	6209/C3	NU 309 ECP/C3	7309 B
180	4	6310/C3	6209/C3	NU 310 ECP/C3	7310 B
200	4	6312/C3	6210/C3	NU 312 ECP/C3	7312 B
225	4	6313/C3	6212/C3	NU 313 ECP/C3	7313 B
250	4	6315/C3	6213/C3	NU 315 ECP/C3	7315 B
280	4	6316/C3	6316/C3	NU 316/C3	7316 B
315	4	6319/C3	6316/C3	NU 319/C3	7319 B

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

Table below present the standard and alternative and types of bearing seals per motor size.

Bearing seals

Motor size	Number of poles	Standard design		Alternative design	
		D-end	N-end	Radial seal at D-end (variant code 072 [1])	Labyrinth seal at D-end (variant code 783) [1]
132	4	Gamma seal	Gamma seal	Radial seal	NA
160	4	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
180	4	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
200	4	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
225	4	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
250	4	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
280	4	Labyrinth seal	Labyrinth seal	NA	Standard
315SM, ML	4	Labyrinth seal	Labyrinth seal	NA	Standard
315LK	4	Labyrinth seal	Labyrinth seal	NA	Standard

[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request

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 size 160 and above are pre-lubricated with high-quality grease. Before first start-up, see instructions for re-lubrication and recommended grease in the installation, operation, maintenance and safety manual for low voltage motors for explosive atmospheres delivered together with the motor, or see the lubrication plate on the motor.

Motors with re-lubrication nipples

In frame sizes 160-315, the bearing system is provided with valve discs 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 re-greasing. 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 L1 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

ABB follows the L_1principle 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 intervaltimes. L_{10} values are available from ABB at request.

Motors in frame size 132 are equipped with bearings greased for life, while this is available as an option for frame sizes 160-250. Bearings are lubricated with high-quality, high-temperature grease. Bearing types are stated on the rating plate.

The approximate lifetime of bearings in four-pole motors is about 40 0000 duty hours. Lifetime is subject to the load conditions of the application run by the motor.

Lubrication intervals in duty hours for ball bearings

Deep Groove ball bearing			Interval hours at		
Frame size	**Amount of grease g/DE**	**Amount of grease, g/NDE**	**3000**	**1500**	**1000**
132	Greased for life				
160	13	8	14900	27100	34200
180	15	8	13000	25100	32300
200	20	9	9900	21600	28800
225	23	9	8500	20100	27300
250	30	15	6200	17300	24400
280	40	40		16000	23100
315	55	40			19600

Lubrication intervals in duty hours for roller bearings

Cylidrical roller bearing			Interval hours at		
Frame size	**Amount of grease g/DE**	**Amount of grease, g/NDE**	**3000**	**1500**	**1000**
132	Greased for life				
160	13	8	7500	13500	17100
180	15	8	6500	12600	16100
200	20	9	4900	10800	14400
225	23	9	4300	10000	13600
250	30	15	3100	8600	12200
280	40	40		8000	11600
315	55	40			9800

Grease lifetime

Grease lifetime information is relevant for motors equipped with bearings greased for life. Synchronous reluctance motors in frame sizes 132 are equipped with them, while this is also available as an option for frame sizes 160 - 250.

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 r/min	Ambient temperature and grease lifetime					
		25 °C	40 °C	50 °C	60 °C	70 °C	80 °C
132	3000	40000	31000	20000	12000	6000	3000
132	1500	40000	40000	40000	24000	13000	7000
132	1000	40000	40000	40000	33000	18000	9000
160	3000	40000	40000	40000	26000	14000	8000
160	1500-1000	40000	40000	40000	40000	40000	37000
180	3000	38000	38000	38000	38000	23000	13000
180	1500	40000	40000	40000	32000	28000	15000
200	3000	27000	27000	27000	24000	14000	8000
200	1500-1000	40000	40000	40000	40000	40000	30000

Mechanical design
Radial forces

Pulley diameter

When the desired bearing life has been determined, the minimum permissible pulley diameter can be calculated with FR as follows:

$$D = \frac{1.9 \cdot 10^7 \cdot K \cdot P}{n \cdot F_R}$$

Where:	
D:	pulley diameter, mm
P:	power requirement, kW
n:	motor speed, r/min.
K:	belt tension factor, dependent on belt type and type of duty. A common value for V-belts is 2.5
F_R:	permissible radial force, refer to tables below.

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.

Permissible loading on the shaft

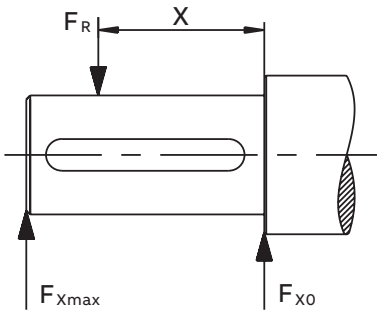
Permissible radial forces, motor sizes 132 – 315

Motor size	Speed r/min	Length of shaft extension E (mm)	Ball bearings				Roller bearings			
			20 000 hours		40 000 hours		20 000 hours		40 000 hours	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
132	3000	80	2120	1610	2120	1610	-	-	-	-
132	1500	80	2120	1610	2120	1610	-	-	-	-
160	3000	110	3540	2740	2955	2285	7100	4300	6140	4300
160	1500	110	4000	3100	3325	2570	8000	4300	6870	4300
160	1000	110	4170	3200	3440	2655	8600	4300	7270	4300
180	3000	110	4100	3385	3455	2825	8125	5500	7025	5500
180	1500	110	4270	3485	3525	2885	8600	5500	7300	5500
180	1000	110	4700	3800	3855	3155	9400	5500	7900	5500
200	3000	110	5600	4685	4700	3925	10900	9100	9470	9700
200	1500	110	6285	5200	5240	4370	12500	9550	10700	8900
200	1000	110	6800	5700	5700	4770	13600	9550	11670	9550
225	3000	110	6400	5400	5355	4500	13300	10700	11500	9700
225	1500	140	7300	5900	6155	4970	15400	10250	13200	10250
225	1000	140	7600	6200	6370	5140	16400	10250	14000	12500
250	3000	140	7700	6285	6500	5285	17100	10900	14900	10900
250	1500	140	8700	7000	7300	5900	19800	13800	17000	13800
250	1000	140	8900	7200	7355	5955	21200	13800	18000	13800
280	1500	140	9200	7800	7300	6200	25100	9200	20300	9200
280	1000	140	10600	8900	8400	7000	28300	9200	23000	9200
315 SM_	1500	170	11400	9400	9000	7450	32500	9600	26600	9600
315 SM_	1000	170	13000	9600	10300	8500	37000	9600	30000	9600
315 ML_	1500	170	11500	9700	9100	7650	32700	13600	26500	13600
315 ML_	1000	170	13200	11100	10400	8800	36900	13600	29900	13600
315 LK_	1500	170	11500	10000	9100	7850	33100	13350	26800	13350
315 LK_	1000	170	13200	11400	10450	9050	37300	13350	30300	13350

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



Mechanical design
Axial forces

— 01 Mounting arrangement IM B3

02 Mounting arrangement IM V1

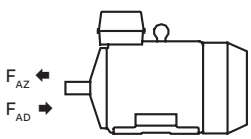
Axial forces

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.

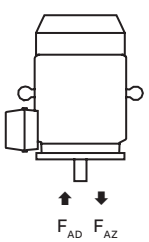
Permissible loads of simultaneous radial and axial forces can be supplied on request. For axial force FAD, it is assumed that the D-bearing is locked with a locking ring.

Permissible axial forces, motor sizes 132 – 315

Motor size	Speed, r/min	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			Ball bearings				Ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
132	3000	80	2245	1645	1760	1160	2460	1505	1970	1015
132	1500	80	2595	1980	2025	1425	2815	1850	2245	1280
160	3000	110	4650	4650	3850	3850	4950	4350	4200	3600
160	1500	110	5000	5000	4200	4200	5450	4650	4600	3800
160	1000	110	4840	4840	4000	4000	5400	4420	4540	3560
180	3000	110	5480	5480	4600	4600	5920	5515	5060	4255
180	1500	110	4360	4360	3540	3540	5080	3860	4240	3020
180	1000	110	3990	3990	2820	2820	5240	3780	4060	2610
200	3000	110	5000	7350	5000	6150	5000	7050	5000	5800
200	1500	110	5000	8050	5000	6700	5000	7550	5000	6200
200	1000	110	5000	8300	5000	6880	5000	7505	5000	6025
225	3000	110	4860	4860	3960	3960	5000	4245	4780	3345
225	1500	140	4820	4820	3470	3470	6770	4320	5420	2960
225	1000	140	5960	5960	4210	4210	7910	5450	6160	3700
250	3000	140	6000	6050	4900	4900	6000	5300	5800	4200
250	1500	140	6000	7100	5800	5800	6000	6300	6000	4900
250	1000	140	6000	7480	6000	6040	6000	6370	6000	4830
280	1500	140	8000	6000	6250	4250	9600	4550	7800	2750
280	1000	140	7250	9250	7150	5150	11150	5500	9000	3350
315 SM_	1500	170	9400	7400	7250	5250	11750	5500	9500	3300
315 SM_	1000	170	10 900	8900	8350	6350	13600	6300	11 050	3750
315 ML_	1500	170	9250	7250	7100	5100	12 500	5500	10 300	2900
315 ML_	1000	170	10650	8650	8100	6100	14 900	5800	12 350	3250
315 LK_	1500	170	9100	7150	7000	5000	13 100	3850	10900	1700
315 LK_	1000	170	10 500	8500	7950	5950	15700	4100	13100	1550



01



02

Terminal box

Standard terminal box

Protection and mounting options

The degree of protection for the standard terminal box is IP 55.It complies with the requirements of the protection method ‘e’ protection level ‘c’ increased safety and prevents all ignition sources such as sparks, excessive over heating etc. The features of the terminal box are: No self loosening terminals, compliance with creepage and clearance distances as defined in standard for increased safety ‘ec’ protection.

By default, terminal boxes are mounted on top of the motor at D-end. Side mounted terminal box is possible in frame sizes 160 and 400. Mounting at N-end is also possible for the larger frame sizes. Please refer to the variant code section for more details.

Turnability

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

Cable entries

Terminal box is provided as standard with tapped holes for cable glands, no cable glands are included as standard. The entry holes are closed with Ex eb approved blanking plugs made of nickel-plated brass, one of the main entries is closed with a plastic plug as transport and storage protection. Very large motors have an angle adapter between the terminal box and gland plate. Please refer to the table on next page for further information about amount and size of threaded holes, plugs provided as standard.

Different types of cable glands are available as option, suitable for either armoured and non-armoured cables, please refer to the Terminal box alternatives section for more details.

Cable type and terminations

Terminations are suitable for copper and aluminum cables (Al- cables on request for motor sizes 160 to 250). Cables are connected to terminals by cable lugs, which are not included in the delivery.

Earthing bolts

The motors are as standard provided with at least one earthing bolt inside the terminal box and another on the frame. The earthing bolt on the frame is located on top close to the terminal box, motors in size 160-250 is the earthing bolt located on RHS foot (seen from D-end).

Ordering

To ensure the delivery of desired terminations and cable entries for the motor, state the cable type, quantity, size, outer diameter and possibly type of cable glands needed when ordering.

See section Variant codes for all options available.

Standard delivery

Standard delivery if no other information is provided.

Motor size	Speed/ min	Terminal box type	Size of gland plate opening on terminal box	45° angle adapter	Amount and size of threaded plugged holes, or cable sealing end unit	Max. connectable core cross section mm² / phase	Number and size of terminal bolts
132	3000-1500	integr.	-	-	2xM32x1.5	1x10	6xM5
160	3000-1000	63	B	-	2xM40x1.5	1x35	6xM6
180	3000-1500	63	B		2xM40x1.5	1x35	6xM6
200	3000-1500	160	C	-	2xM63x1.5	1x70	6xM10
225	3000	160	C		2xM63x1.5	1x70	6xM10
250	3000-1000	160	C		2xM63x1.5	1x70	6xM10
280	1500-1000	210	C	-	2xM63x1.5	2x150	6xM12
315SM_, ML_	1500-1000	370	D	-	2xM63x1.5	2x240	6xM12
315LKA, LKC	1500-1000	750	E	E-D	2xM75x1.5	4x240	6xM12

Auxiliary cable entries			
132	3000, 1500	2x M12	
160-250	3000-1500	2xM20x1.5	1x 2.5
280 - 315	1500-1000	2xM20x1.5	1x 2.5

Motor size	Earthing on frame	Earthing in main terminal box
132	M5	M5
160-250	clamp	M6
280-315	M10	2xM10

Terminal box

Terminal box dimensions

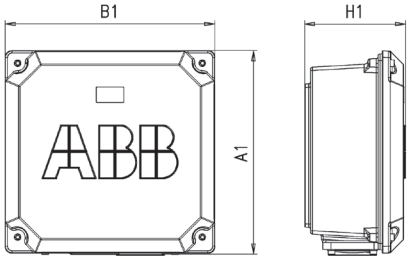
— 01 Terminal box type 63 and 160

02 Terminal box types 210 and 370

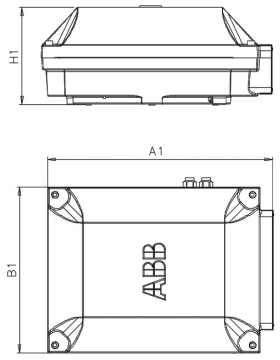
03 Terminal box type 750 + adapter

For motor size 132 the terminal box is integrated in motor frame and the dimensions for terminal boxes can be found in the motor dimension drawings in ABB Library.

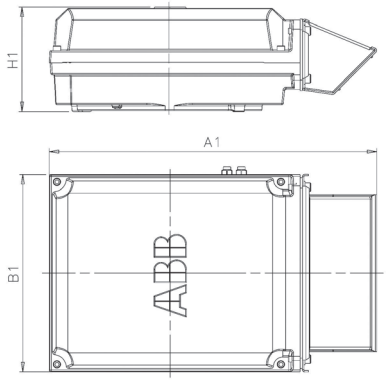
To match the correct terminal box with motor sizes 160-315, find the motor type and correspondent terminal box type on the previous page. The box types and their dimensions are presented on this page.



01



02

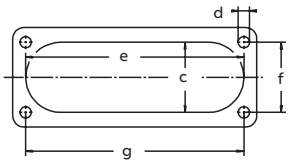


03

Terminal box types acc. to current capacity	A1	B1	H1	Gland plate opening
63	247	247	109	B
160	300	310	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

Dimensions for terminal box inlets

Corresponds to motor sizes 160 and above



Flange opening	c mm	e mm	f mm	g mm	d thread type
B	31	120	30	120	M6
C *)	71	194	62	193	M6
C **)	67	193	62	193	M8
D	100	300	80	292	M10
E	115	370	100	360	M12

Note: The C flange is different depending on frame size.

*) for frame sizes 200-225

**) for frame size 280

Terminal box

Terminal boxes and boards

01 Integrated terminal box for motor sizes 132. Tapped holes 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 motor sizes 160-250

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

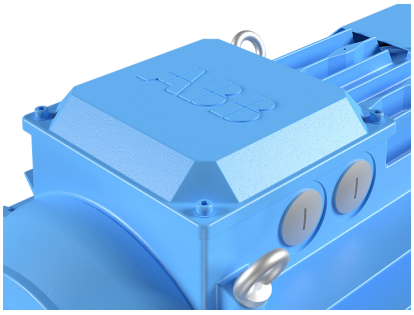
06 Terminal board for motor sizes 280 - 315, except LKC

07 Terminal box for motor sizes 315LKC

08 Terminal board for motor sizes 315 LKC

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

Motor size 132

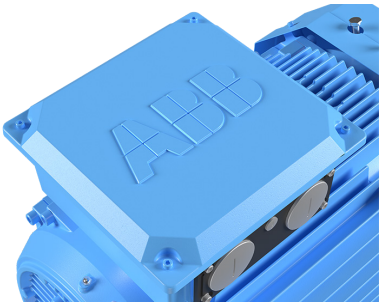


01



02

Motor sizes 160-250

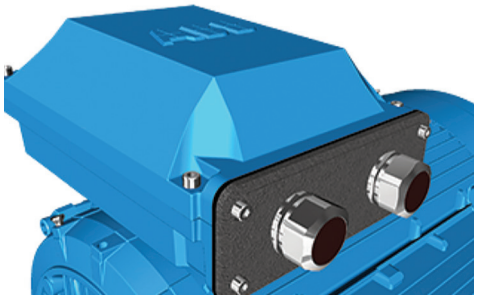


03

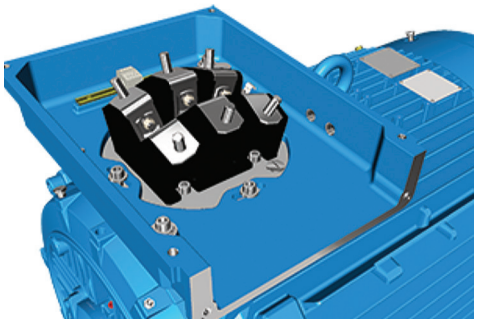


04

Motor sizes 280 - 315



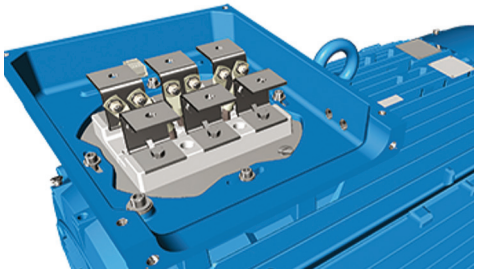
05



06



07



08

Terminal box

Terminal box alternatives

Optional cable termination parts

There is a broad selection of cable termination accessories available to allow a safe and reliable termination of one or several supply cables. The most common options are explained in this chapter.

How to order

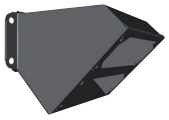
- Check first that the terminal box itself allows mounting of the desired cable and cores (refer to table showing standard delivery for each motor size). If very large cable are used might it be necessary to use a larger terminal box and larger terminal board than standard.
- Select the right cable gland(s) or cable sealing end unit based on the diameter of the cables(s) and suitability for cable type.
- Select appropriate adapter or flange to allow mounting on opening in terminal box.

Ordering example

Motor and supply cables	110kW, 4-pole, 400V 50Hz, IE5. Cables needed: 1 pcs outer diameter 42mm steel wire armoured cable, single cross section 120 mm2. Cables coming from below.
Motor	M3GL 315SMA 4, B3
Adapter (to allow entry of cables coming from below)	Not possible
Cable glands Ex t suitable for armoured cables (an M50 gland will suit this cable)	Variant code 734 (specify cable dimensions)
Gland plate made of steel drilled and tapped with 1 pcs M50 hole (non-std size)	Variant code 554 (1 pcs M50 x 1.5 threaded hole to be specified)

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 and above and can also be used to allow the mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the ‘terminal box opening’ column in section Standard terminal box.

Adapater				
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	315 with gland plate opening E in the terminal box	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
Notes				Included in type 750 terminal box when 750 is the standard size

Cable glands

The motors are delivered as standard with plugged cable entries as described in the previous section. There is a broad selection of different type of cable glands available 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, Ex e, for non armoured cable**	**EMC Cable gland(s) nickel plated brass, Ex e, for non armoured cable**	**Cable gland Ex d IIC / Ex e for armoured cable with double sealing**	
	Variant codes 230 or 731	**Variant code 704**	**Variant code 734**	
Metric (std)	**Cable outer diameter, mm**	**Cable outer diameter, mm**	**Cable outer diameter, mm**	**Inner sheath diameter, mm**
M16 x 1.5	4-8	4-8	7-12	4.5-8
M20 x 1.5	4-12	4-12	10-16	6-10
M25 x 1.5	-	-	13.5-19	10-14
M25 x 1.5 *)	10-18	10-18	19-25	14-18
M32 x 1.5	14-24	14-24	25-30	18-23
M40 x 1.5	22-32	22-32	30-36	23-28
M50 x 1.5	-	-	36-40	28-32
M50 x 1.5 *)	26-35	26-35	40-46	32-37
M63 x 1.5	-	-	46-53	37-43
M63 x 1.5 *)	35-45	35-45	53-60	43-50
M75 x 1.5	46-62	46-62	58-70	48-60

*) = High capacity version, delivered as standard with the variant code

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

The motors are delivered as standard with openings for cable glands with metric threads as listed in the section describing the standard terminal box. If glands with NPT threads will be used must variant code 730 be ordered. If nothing else is stated on the ordered will the sizes in tables below be delivered.

Motor frame size	Main cable entries	NPT plug
132	2 x ¾”	1 x ¾”
160-180	2 x 1 ¼”	1 x 1 ¼”
200-250	2 x 1 ½”	1 x 1 ½”
280	2 x 2”	1 x 2”
315	2 x 3”	1 x 3”

Motor frame size	Cable entries for auxiliaries	NPT plug
132	1 x ¾”	1 x ¾”
160-315	2 x ¾”	2 x ¾”

Threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands does not suit the gland size and cable that will be used can openings of nonstandard size also be delivered, either by fitting a 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 using variant codes 554 and 555.

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

Gland plates of non-standard material

The standard material used in gland plates is steel. Gland plates made of stainless steel are optional, either with cable glands or blind without threaded holes. Please refer to the variant code section for more information.

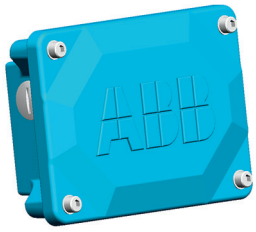
Auxiliary terminal box

It is possible to equip motors from frame size 160 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of cast iron.

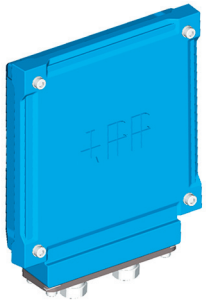
Connection terminals are of spring-loaded type for quick and easy connection. These are suitable for up to 2.5 mm^2 wires. The auxiliary terminal boxes are equipped with an earthing terminal. The first auxiliary terminal box is located on the right-hand side at D-end as standard.

The standard cable entry is 2 x M20 with plugged entries. If cable glands are needed must these be ordered using the variant codes described earlier in this section.

Related variant codes	
380	Separate terminal box for temperature detectors
418	Separate terminal box for auxiliaries
568	Separate terminal box for heating elements



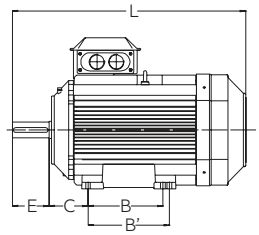
Auxiliary cast iron terminal box for motor size 160-250 (variant code 418). 111 x 162 mm.

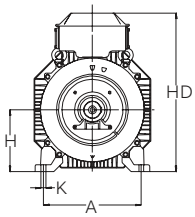


Auxiliary cast iron terminal box for motor sizes 280-450 (variant code 567). 208 x 180 mm.

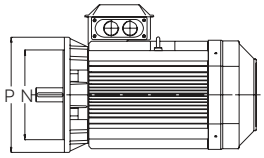
Dimension drawings

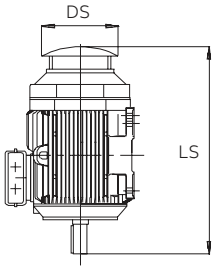
IE5 SynRM Increased safety cast iron motors



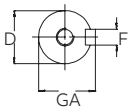


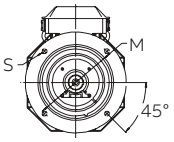
Foot-mounted motor IM 1001, IM B3



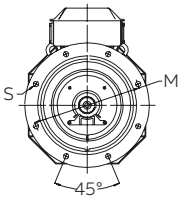


Flange-mounted motor IM 3001, IM B5

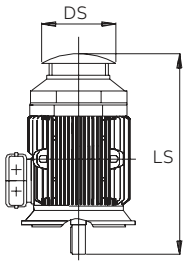




Sizes 80 to 200



Sizes 225 to 450



Protective roof, variant code 005

Main dimensions for IE5 SynRM motors (C-generation)

Motor size	Speed r/min	IM1001, IMB3 and IM3001, IMB5					IM1001, IMB3							IM B5 (IM3001)					IM B14 (IM 3601), IM 3602					Protective roof	
		D	GA	F	E	L max	A	B	B1	C	H	HD max	K	M	N	P	S	T	M	N	P	S	T	DS	LS
132 SM_	3000-1500	38	41	10	80	624	216	140	178	89	132	321	12	265	230	300	14.5	4	165	130	200	M10	3.5	-	590
160 ML_	3000	42	45	12	110	584	254	210	254	108	160	421	14.5	300	250	350	19	5	300	250	350	19	5	328	756
160 ML_	1500-1000	42	45	12	110	681	254	210	254	108	160	421	14.5	300	250	350	19	5	300	250	350	19	5	328	756
180 ML_	3000	48	51.5	14	110	726	279	241	279	121	180	461	14.5	300	250	350	19	5	300	250	350	19	5	359	756
180 ML_	1500-1000	48	51.5	14	110	766	279	241	279	121	180	461	14.5	300	250	350	19	5	300	250	350	19	5	359	756
200 ML_	3000-1000	55	59	16	110	821	318	267	305	133	200	528	18.5	350	300	400	19	5	350	300	400	19	5	414	844
225 SM_	3000	55	59	16	110	849	356	286	311	149	225	573	18.5	400	350	450	19	5	400	350	450	19	5	462	951
225 SM_	1500-1000	60	64	16	110	879	356	286	311	149	225	573	18.5	400	350	450	19	5	400	350	450	19	5	462	951
250 SM_	3000	60	64	18	140	884	406	311	349	168	250	626	24	500	450	550	19	5	500	450	550	19	5	506	965
250 SM_	1500-1000	65	69	18	140	884	406	311	349	168	250	626	24	500	450	550	19	5	500	450	550	19	5	506	965
280	1500-1000	75	79.5	20	140	1088	457	368	419	190	280	762	24	500	450	550	23	5	500	450	550	23	5	555	1190
315 SM_	1500-1000	80	85	22	170	1204	508	406	457	216	315	852	28	600	550	660	23	6	600	550	660	23	6	624	1420
315 ML_	1500-1000	90	95	25	170	1315	508	457	508	216	315	852	28	600	550	660	23	6	600	550	660	23	6	624	1431
315 LK_	1500-1000	90	95	25	170	1521	508	508	560	216	315	880	28	600	550	660	23	6	600	550	660	23	6	624	1431

Tolerances:		Tolerances:	
A, B	± 0,8	H	-0.5
D, DA	ISO k6 < Ø 48mm	N	ISO j6
	ISO m6 > Ø 48mm	C, CA	± 0.8
F, FA	ISO h9		

In all dimension drawings: The tables give the main dimensions in mm.

For detailed drawings please see our web-pages or contact ABB.

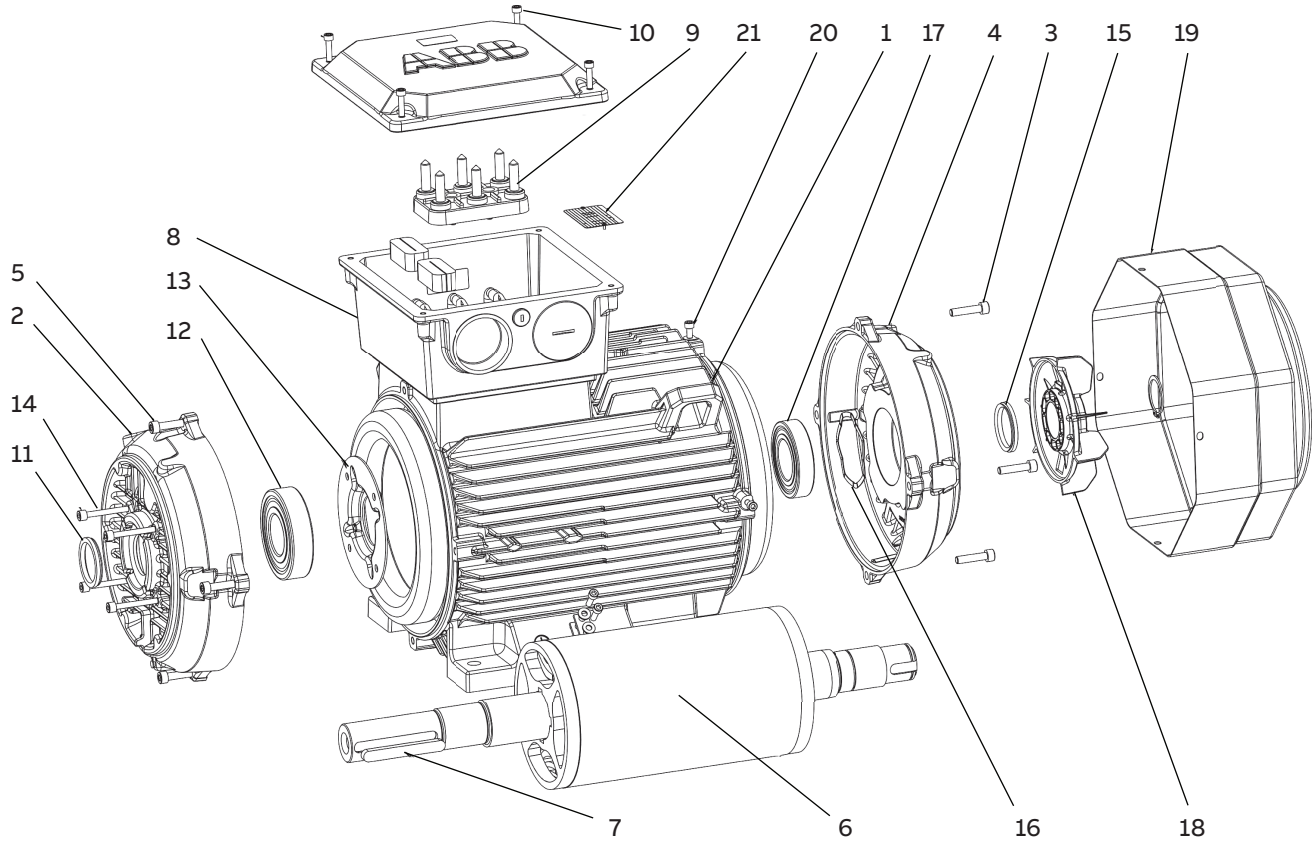
Motors in brief

IE5 SynRM Increased safety cast iron motors, sizes 132 - 315

Motor size		132	160	180	200	225	250	280	315
Stator	Material	Cast iron, EN-GLJ-150 or better	Cast iron, EN-GJL-200 or better						
	Paint color shade	Munsell blue 8B 4.5/3.25							
	Corrosion class	C3							
Feet	Material	Cast iron, EN-GLJ-150 or better, integrated with stator	Integrated cast iron feet, bolted feet when terminal box on LHS/RHS					Cast iron, EN-GJL-200 or better, integrated with stator	
Bearing end shields	Material	Cast iron, EN-GLJ-150 or better	Cast iron, EN-GJL-200 or better						
	Paint colour shade	Blue, Munsell 8B 4.5/3.25							
	Corrosion class	C3							
Bearings	D-end	6308-2Z/C3	6309/C3	6310/C3	6312/C3	6313/C3	6315/C3	6316/C3	6319/C3
	N-end	6206-2Z/C3	6209/C3	6209/C3	6210/C3	6212/C3	6213/C3	6316/C3*	6316/C3*
Axially locked bearings	Inner bearing cover	As standard, locked at D-end							
Bearing seals		Gamma ring						Labyrinth seal	
Lubrication		Permanent grease lubrication.	Regreasable bearings						
SPM nipples		Optional	As standard						
Rating plate	Material	Stainless steel							
Terminal box	Frame material	Cast iron, EN-GLJ-150 or better	Cast iron, EN-GJL-200 or better						
	Cover material	Cast iron, EN-GLJ-150 or better	Cast iron, EN-GJL-200 or better						
	Cover screws material	Stainless A4-80	Steel 8.8, zinc electroplated and chromated						
Connections	Cable-entries	2 x M32 plugged	2 x M40 + 2 x M20 plugged		2 x M63 + 2 x M20 plugged				
	Terminals	6 terminals for connection with cable lugs (not included)							
Fan	Material	Polypropylene. Reinforced with glass fibre.							
Fan cover	Material	Steel			Hot dip galvanized steel				
	Paint color shade	Munsell blue 8B 4.5/3.25							
	Corrosion class	C3							
Stator winding	Material	Copper							
	Insulation	Insulation class F							
	Winding protection	3 pcs PTC thermistors as standard							
Rotor winding	Material	Pressure die-cast aluminum							
Balancing		Half key balancing							
Keyway		Closed						Open	
Heating elements	On request	25 W				60 W			120 W
Drain holes		As standard, open on delivery							
External earthing bolt		As standard							
Enclosure		IP 55							
Cooling method		IC 411							

*Insulated bearing at N-end as standard

Motor construction



Typical exploded view of cast iron motors, frame size 160

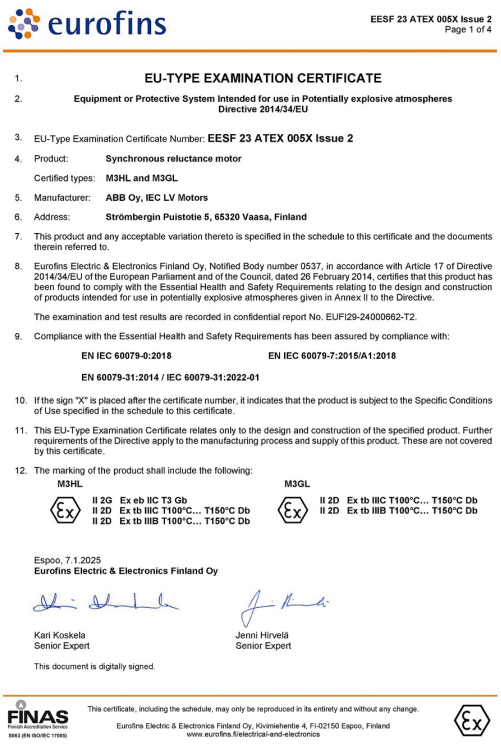
1 Stator frame
2 End shield, D-end
3 Screws for end shield, N-end
4 End shield, N-end
5 Screws for end shield, D-end
6 Rotor with shaft
7 Key, D-end
8 Terminal box
9 Terminal board
10Screws for terminal box cover
11 Seal, D-end
12 Bearing, D-end
13 Inner bearing cover, D-end
14 Screws for bearing cover
15 Seal, N-end
16 Wave spring
17 Bearing, N-end
18 Fan
19 Fan cover
20 Screws for fan cover
21 Rating plate

Certicate examples

01 EU Type ATEX Examination Certificate

02 Eurofins ATEX Type Examination Certificate

03 IECEx Certificate of Conformity



eurofins

EESF 23 ATEX 005X Issue 2
Page 1 of 4

1. **EU-TYPE EXAMINATION CERTIFICATE**

2. **Equipment or Protective System Intended for use in Potentially explosive atmospheres Directive 2014/34/EU**

3. EU-Type Examination Certificate Number: **EESF 23 ATEX 005X Issue 2**

4. Product: **Synchronous reluctance motor**

   Certified types: **M3HL and M3GL**

5. Manufacturer: **ABB Oy, IEC LV Motors**

6. Address: **Strömbergin Puistotie 5, 65320 Vaasa, Finland**

7. This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Eurofins Electric & Electronics Finland Oy, Notified Body number 0537, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

   The examination and test results are recorded in confidential report No. EUFI29-24000662-T2.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

   EN IEC 60079-0:2018 **EN IEC 60079-7:2015/A1:2018**

   EN 60079-31:2014 / IEC 60079-31:2022-01

10. If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11. This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12. The marking of the product shall include the following:

M3HL	M3GL
II 2G Ex eb IIC T3 Gb II 2D Ex tb IIIC T100°C… T150°C Db II 2D Ex tb IIIB T100°C… T150°C Db	II 2D Ex tb IIIC T100°C… T150°C Db II 2D Ex tb IIIB T100°C… T150°C Db

Espoo, 7.1.2025
Eurofins Electric & Electronics Finland Oy

Kari Koskela
Senior Expert

Jenni Hirvelä
Senior Expert

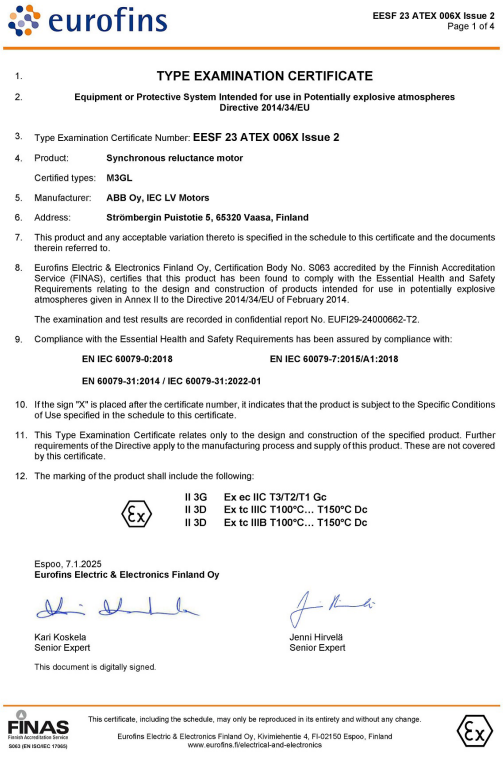
This document is digitally signed.

FINAS Finnish Accreditation Service S063 (EN ISO/IEC 17065)

This certificate, including the schedule, may only be reproduced in its entirety and without any change.

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www.eurofins.fi/electrical-and-electronics

01



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EESF 23 ATEX 006X Issue 2
Page 1 of 4

1. **TYPE EXAMINATION CERTIFICATE**

2. **Equipment or Protective System Intended for use in Potentially explosive atmospheres Directive 2014/34/EU**

3. Type Examination Certificate Number: **EESF 23 ATEX 006X Issue 2**

4. Product: **Synchronous reluctance motor**

   Certified types: **M3GL**

5. Manufacturer: **ABB Oy, IEC LV Motors**

6. Address: **Strömbergin Puistotie 5, 65320 Vaasa, Finland**

7. This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8. Eurofins Electric & Electronics Finland Oy, Certification Body No. S063 accredited by the Finnish Accreditation Service (FINAS), certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive 2014/34/EU of February 2014.

   The examination and test results are recorded in confidential report No. EUFI29-24000662-T2.

9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

   EN IEC 60079-0:2018 **EN IEC 60079-7:2015/A1:2018**

   EN 60079-31:2014 / IEC 60079-31:2022-01

10. If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11. This Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12. The marking of the product shall include the following:

II 3G Ex ec IIC T3/T2/T1 Gc II 3D Ex tc IIIC T100°C… T150°C Dc II 3D Ex tc IIIB T100°C… T150°C Dc

Espoo, 7.1.2025
Eurofins Electric & Electronics Finland Oy

Kari Koskela
Senior Expert

Jenni Hirvelä
Senior Expert

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02



IECEx

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx EESF 23.0004X** Page 1 of 4 Certificate history: Issue 1 (2023-09-04) Issue 0 (2023-06-07)

Status: **Current** Issue No: 2

Date of Issue: 2025-01-07

Applicant: **ABB Oy, IEC LV Motors**
Strömbergin Puistotie 5A
Vaasa FI 65320
Finland

Equipment: **Series of synchronous reluctance motors; M3HL and M3GL**

Optional accessory:

Type of Protection: **Increased safety and dust ignition protection by enclosure**

Marking: **M3HL**
Ex eb IIC T3 Gb
Ex tb IIIB T100°C… T150°C Db
Ex tb IIIC T100°C… T150°C Db
M3GL
Ex ec IIC T3/T2/T1 Gc
Ex tb IIIB T100°C… T150°C Db
Ex tb IIIC T100°C… T150°C Db
Ex tc IIIB T100°C… T150°C Dc
Ex tc IIIC T100°C… T150°C Dc

Approved for issue on behalf of the IECEx Certification Body: **Kari Koskela**

Position: **Senior Expert**

Signature: (for printed version)

Date: (for printed version) 2024-01-07

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

Eurofins Electric & Electronics Finland Oy
Kivimiehentie 4
Espoo FI-02150
Finland

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03

Aluminum Ex ec and Ex t motors

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255 IE3 Aluminum Ex ec and Ex t motors, 1000 r/min

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Ordering information

Explanation of the product code

Motor type	Motor size	Product code	Code for mounting arrangement, Voltage and frequency code, Generation code followed by variant codes
M3AA	132MC	3GAA 132 330	- BDK338, 003 etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14...

Explanation of the product code

Motor type	Motor size	Product code	Code for mounting arrangement, Voltage and frequency code, Generation code followed by variant codes
M3AA	160MLB	3GAA 163 420	- ADK 531 etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14...

Positions 1 to 4	
3GAA:	Totally enclosed motor with aluminum stator frame

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

Position 7	
Speed (Pole pairs)	
1:	2 poles
2:	4 poles
3:	6 poles

Positions 8 to 10	
8:	Frame lenght
9:	Stator package length
10:	Speed for two-speed induction, Permanent Magnet, SynRM and High Speed motors

Position 11
- (Dash)

Position 12 (marked with black dot in data tables)	
Mounting arrangement	
A:	Foot-mounted
B:	Flange-mounted motor. Large flange with clearance holes
C:	Flange-mounted motor. Small flange with tapped holes.
H:	Foot- and flange-mounted motor. Large flange with clearance holes
J:	Foot- and flange-mounted motor. Small flange with tapped holes.

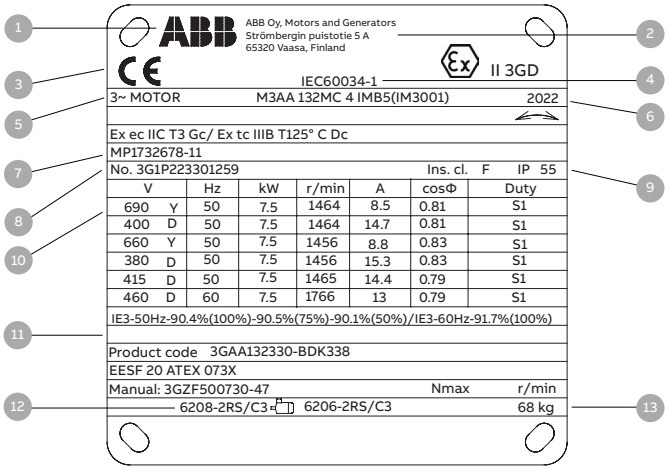
Position 13 (marked with black dot in data tables)	
Voltage and frequency code	
Single-speed motors	
D:	400 VΔ, 415 VΔ, 690 VY 50 Hz
S:	230 VΔ, 400 VY, 415 VY 50 Hz

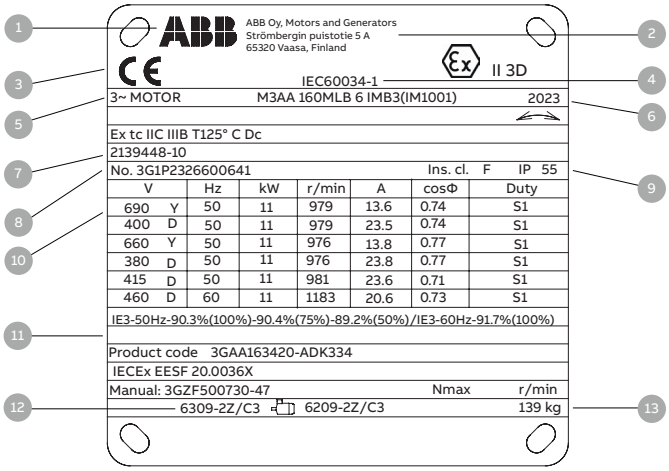
Position 14	
Version	
A, B, C...	Generation code followed by variant codes

Frame sizes 90-132 are available as premodified motors with following variant codes:	
338	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIB T125C Dc (non-conductive dust), IP5X.
339	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIC T125C Dc (conductive dust), IP6X.

When ordering frame sizes 160-250, select appropriate variant code:	
335	Ex t, Dust group III B T125C Dc, IP5X.
336	Ex t, Dust group III C T125 Db, IP6X.
456	Ex ec IIC T3 Gc acc. IEC/EN 60079-7

Rating plates





1 ABB Logo

2 Manufacturing place

3 CE mark on Ecodesign 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

Technical data

IE3 Aluminum Ex ec and Ex t motors, 3000 r/min

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

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**BASIC-design**							
1.5	M3AA 90LB 2	3GAA091520-**K	2906	84,2	84,8	84,7	0,89	2,8	7,9	4,9	3	3,7	0,0027	17	60
2.2	M3AA 90LC 2	3GAA091530-**K	2900	85,9	87,4	87,5	0,89	4	8,3	7,2	2,9	3,5	0,0032	20	60
3	M3AA 100LC 2	3GAA101530-**K	2896	87,1	88,2	88	0,9	5,4	8,4	9,8	3,2	3,9	0,0057	28	62
4	M3AA 112MB 2	3GAA111320-**K	2888	88,1	89,4	89,6	0,91	7,1	8,4	13,2	3,2	4	0,0104	38	68
5.5	M3AA 132SB 2	3GAA131120-**K	2901	89,2	89,9	90,1	0,91	9,7	7,9	18,1	2,3	3,4	0,0154	58	68
7.5	M3AA 132SC 2	3GAA131130-**K	2909	90,1	91,2	91,4	0,9	13,1	8,3	24,6	3	3,9	0,0173	63	70
11	M3AA 160MLA 2	3GAA161410-**K	2943	91,2	91,9	91,6	0,91	19,1	7,2	35,57	2,6	3,3	0,057	106	69,4
15	M3AA 160MLB 2	3GAA161420-**K	2947	91,9	92,2	91,8	0,88	26,7	8,2	48,6	3,2	4,2	0,063	123	69,4
18.5	M3AA 160MLC 2	3GAA161430-**K	2949	92,4	93	92,6	0,9	32,1	9	59,9	3,3	3,9	0,076	137	73,3
22	M3AA 180MLA 2	3GAA181410-**K	2956	92,7	93,1	92,7	0,9	37,7	7,8	70,98	3	3,83	0,11	176	72,9
30	M3AA 200MLA 2	3GAA201410-**K	2962	93,3	93,5	92,8	0,87	53,2	7,6	96,76	3,09	3,76	0,159	225	72
37	M3AA 200MLB 2	3GAA201420-**K	2961	93,7	94,1	93,8	0,88	64,4	8,2	119,3	3	3,3	0,196	241	72
45	M3AA 225SMA 2	3GAA221210-**K	2968	94	94	93	0,87	79,6	7,3	144,8	2,7	3,07	0,296	326	75,7
55	M3AA 250SMA 2	3GAA251210-**K	2968	94,3	93,7	93,6	0,89	94,8	6,8	177	2,35	3	0,426	351	75,9

Output kW	Motor type	Product code		Efficiency IEC 60034-30-1: 2014				Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_I/T_N	T_b/T_N			
3000 r/min = 2 poles				**400 V 50Hz**				**COMPACT-design**							
22	M3AA 160MLD 2	3GAA161440-**K	2944	92,7	93,5	93,4	0,9	38	8,4	71,36	3,2	3,7	0,071	131	74
30	M3AA 180MLB 2	3GAA181420-**K	2957	93,3	94	93,9	0,88	52,7	8,7	96,88	3	3,8	0,104	162	74
37	M3AA 180MLC 2	3GAA181430-**K	2950	93,7	94,2	94,2	0,86	66	8,5	119,5	3,38	4,35	0,117	176	74
45	M3AA 200MLC 2	3GAA201430-**K	2956	94	94,6	94,8	0,89	77,2	7,8	145,24	2,91	3,27	0,216	250	77
55	M3AA 225SMB 2	3GAA221220-**K	2964	94,3	94,4	93,9	0,86	97,4	7,2	177,3	3,14	3,22	0,299	288	79
75	M3AA 225SMC 2	3GAA221230-**K	2966	94,7	95	94,7	0,86	132	7,6	241,7	3,08	3,06	0,362	328	79
75	M3AA 250SMB 2	3GAA251220-**K	2971	94,7	95,1	94,8	0,9	127	7,9	241,06	2,8	3,3	0,644	405	81
90	M3AA 250SMC 2	3GAA251230-**K	2975	95	95,2	94,6	0,87	156	8,5	288,6	2,91	3,6	0,514	414	81

Technical data

IE3 Aluminum Ex ec and Ex t motors, 1500 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**BASIC-design**							
1.1	M3AA 90LC 4	3GAA092530-**K	1442	84,1	83,5	81,7	0,8	2,3	7,9	7,2	3,3	3,9	0,0055	19	56
1.5	M3AA 90LD 4	3GAA092540-**K	1439	85,3	84,7	82,8	0,78	3,2	8,2	9,9	3,5	4	0,0055	19	55
2.2	M3AA 100LE 4	3GAA102550-**K	1454	86,7	87,1	86	0,83	4,3	8,9	14,5	3,1	4,1	0,0144	36	54
3	M3AA 100LF 4	3GAA102560-**K	1452	87,7	88,1	87,1	0,83	5,9	9	19,7	3,5	4,2	0,0144	36	54
4	M3AA 112MB 4	3GAA112320-**K	1451	88,6	89,5	89	0,77	8,6	7,6	26,3	3,1	4,1	0,018	44	64
5.5	M3AA 132MB 4	3GAA132320-**K	1464	89,6	90,2	89,5	0,78	11,4	7	35,87	2,8	3,9	0,0295	68	70
7.5	M3AA 132MC 4	3GAA132330-**K	1464	90,4	90,8	90,7	0,81	14,7	7,7	48,9	2,5	3,6	0,0414	68	64
11	M3AA 160MLA 4	3GAA162410-**K	1477	91,4	91,8	91,1	0,82	21,1	7,6	71,27	2,62	3,34	0,11	126	61,1
15	M3AA 160MLB 4	3GAA162420-**K	1474	92,1	92,2	91,3	0,81	29	7,8	97,15	3,01	3,65	0,135	140	60,8
18.5	M3AA 180MLA 4	3GAA182410-**K	1481	92,6	93,2	92,9	0,83	34,9	7,2	119,3	2,8	3,03	0,219	177	59,8
22	M3AA 180MLB 4	3GAA182420-**K	1480	93	93,8	93,8	0,82	41,5	8,2	141	2,8	3,1	0,217	176	62
30	M3AA 200MLA 4	3GAA202410-**K	1481	93,6	93,9	93,4	0,84	55,1	7,5	193,42	2,8	3	0,385	246	62,8
37	M3AA 225SMA 4	3GAA222210-**K	1481	93,9	94,1	93,4	0,82	69,8	8	235,4	3,32	3,46	0,433	315	66
45	M3AA 225SMB 4	3GAA222220-**K	1482	94,2	94,3	93,9	0,84	82,3	8	290	3,15	3,45	0,525	316	66
55	M3AA 250SMA 4	3GAA252210-**K	1485	94,6	95,2	94,9	0,85	97,8	7,9	353	3	3,3	0,933	376	67

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1500 r/min = 4 poles				**400 V 50Hz**				**COMPACT-design**							
18.5	M3AA 160MLC 4	3GAA162430-**K	1476	92,6	93,1	92,7	0,77	37,2	8,3	119,9	3,32	3,58	0,121	135	67
28	M3AA 180MLC 4	3GAA182430-**K	1482	93,4	93,3	92,3	0,77	56,5	8,2	180,36	2,98	3,56	0,191	176	62
37	M3AA 200MLB 4	3GAA202420-**K	1482	93,9	94,1	93,7	0,82	69,3	7,8	237,9	3,13	3,28	0,362	244	68
51	M3AA 225SMC 4	3GAA222230-**K	1481	94,4	94,5	93,9	0,81	95,9	9,3	328,35	3,39	3,67	0,532	318	71
75	M3AA 250SMB 4	3GAA252220-**K	1483	95	95,3	95	0,82	139	7,8	485,8	3,28	3,46	0,796	389	73

Technical data

IE3 Aluminum Ex ec and Ex t motors, 1000 r/min

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

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**BASIC-design**							
0.75	M3AA 90LD 6	3GAA093540-**K	938	78,9	79,6	77,3	0,74	1,82	4,8	7,59	2,27	2,56	0,0055	19	44
1.1	M3AA 100LE 6	3GAA103550-**K	963	81	82,2	81	0,69	2,6	5,6	10,9	2,3	3,1	0,0138	35	49
1.5	M3AA 100LF 6	3GAA103560-**K	969	82,5	81,4	77,5	0,65	3,77	7	14,8	3,31	4,11	0,0138	35	49
2.2	M3AA 112MC 6	3GAA113330-**K	967	84,3	85,2	84,1	0,69	5,2	6,5	21,7	2,4	3,5	0,0187	43	68
3	M3AA 132MC 6	3GAA133330-**K	978	85,6	86	84,5	0,69	7	6,2	29,2	2	3	0,0402	66	61
4	M3AA 132MD 6	3GAA133340-**K	973	86,8	87,7	87,5	0,72	9,1	5,6	39,2	1,9	2,7	0,0402	67	61
5.5	M3AA 132ME 6	3GAA133350-**K	973	88	88,8	88,2	0,74	12	5,8	53,9	2	2,9	0,039	63	61
7.5	M3AA 160MLA 6	3GAA163410-**K	980	89,1	89,9	89,3	0,78	15,2	7,9	73	1,7	2,8	0,114	125	59
11	M3AA 160MLB 6	3GAA163420-**K	979	90,3	90,9	90,2	0,74	23,5	8,5	107	2,2	3,9	0,131	139	59
15	M3AA 180MLA 6	3GAA183410-**K	987	91,2	91,5	90,5	0,77	30,4	5,5	146	1,7	2,7	0,225	175	59
18.5	M3AA 200MLA 6	3GAA203410-**K	990	91,7	92,1	91,5	0,77	37,3	7,5	178	2,6	3,2	0,448	218	63
22	M3AA 200MLB 6	3GAA203420-**K	990	92,2	92,7	92	0,79	43	7,8	212	2,6	3,2	0,531	245	63
30	M3AA 225SMA 6	3GAA223210-**K	989	92,9	93,6	93,3	0,81	56,8	7,9	289	2,8	3,1	0,813	310	63
37	M3AA 250SMA 6	3GAA253210-**K	991	93,3	93,9	93,6	0,83	68	7,7	356	2,7	2,9	1,49	367	63

Output kW	Motor type	Product code	Efficiency IEC 60034-30-1: 2014					Current		Torque			Moment of inertia J = 1/4 GD_2kgm_2	Weight kg	Sound pressure Level L_{PA} dB
			Speed r/min	Full load 100%	3/4 load 75%	1/2 load 50%	Power factor Cos	I_nA	I_S/I_N	T_N Nm	T_l/T_N	T_b/T_N			
1000 r/min = 6 poles				**400 V 50Hz**				**COMPACT-design**							
18.5	M3AA 180MLB 6	3GAA183420-**K	980	91,7	92,1	91,5	0,72	40,3	6,8	179,5	2,3	3,21	0,191	168	65
37	M3AA 225SMB 6	3GAA223220-**K	986	93,3	93,6	93	0,76	75,1	7,7	357,6	3,16	3,35	0,799	307	68
45	M3AA 250SMB 6	3GAA253220-**K	991	93,7	93,8	93,1	0,79	87,3	8	433,2	3,06	3,24	1,33	389	68

Variant codes

Aluminum Ex ec and Ex t motors

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

Code/Variants		Frame size								
		90	100	112	132	160	180	200	225	250
Administration										
531	Sea freight packing	●	●	●	●	●	●	●	●	●
Balancing										
052	Vibration acc. to Grade A (IEC 60034-14).	○	○	○	○	○	○	○	○	○
426	Half key balancing.	○	○	○	○	○	○	○	○	○
Bearings and Lubrication										
037	Roller bearing at D-end.	-	-	-	-	●	●	●	●	●
039	Cold-resistant grease	○	○	○	○	○	○	○	○	○
040	Heat-resistant grease	○	○	○	○	○	○	○	○	○
041	Bearings regreasable via grease nipples.	●	●	●	●	●	●	●	●	●
042	Locked D-end	○	○	○	○	○	○	○	○	○
043	SPM compatible nipples for vibration measurement	-	-	-	-	●	●	●	●	●
057	2RS bearings at both ends.	○	○	○	○	●	●	●	●	●
188	63-series bearing in D-end	●	○	○	●	○	○	○	○	○
194	2Z bearings greased for life at both ends.	-	-	-	-	○	○	○	○	○
195	Bearings greased for life.	○	○	○	○	○	○	○	○	○
593	Bearings grease suitable for food and beverage industry.	-	-	-	-	●	●	●	●	●
798	Stainless steel grease nipples	-	-	-	-	●	●	●	●	●
Branch standard designs										
178	Stainless steel / acid proof bolts.	-	-	-	-	●	●	●	●	●
217	Cast iron D-end shield (on aluminum motor).	●	●	●	●	○	○	○	○	○
232	Cast iron N-end shield (on aluminium motor).	-	-	-	-	○	○	○	○	○
425	Corrosion protected stator and rotor core.	-	-	-	-	●	●	●	●	●
Cooling system										
046	Two-directional fan.	○	○	○	○	○	○	○	○	○
053	Metal fan cover.	○	○	○	○	○	○	○	○	○
068	Light alloy metal fan	○	○	○	○	●	●	●	●	●
792	Metal fasteners for fan cover	○	○	○	○	○	○	○	○	○
Documentation										
141	Binding 2D main dimension drawing.	-	-	-	-	●	●	●	●	●
Drain holes										
065	Plugged existing drain holes.	-	-	-	-	●	●	●	●	●
Earthing Bolt										
067	External earthing bolt.	○	○	○	○	○	○	○	○	○
Hazardous Environments										
335	Ex t, Dust group III B T125C Dc, IP5X (non-conductive dust) acc. IEC/EN60079-31.	-	-	-	-	●	●	●	●	●
336	Ex t, Dust group III C T125 Db, IP6X (conductive dust) acc. IEC/EN60079-31.	-	-	-	-	●	●	●	●	●
338	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIB T125C Dc (non-conductive dust), IP5X.	○	○	○	○	-	-	-	-	-
339	Rated for gas or dust, Ex ec IIC T3 Gc / Ex tc IIIC T125C Dc (conductive dust), IP6X.	○	○	○	○	-	-	-	-	-
456	Ex ec IIC T3 Gc acc. IEC/EN 60079-7 with certificates.	-	-	-	-	●	●	●	●	●
Heating elements										
450	Heating element, 100-120 V	●	●	●	●	●	●	●	●	●
451	Heating element, 200 - 240 V	●	●	●	●	●	●	●	●	●
Mounting arrangements										
007	IM 3001 flange mounted, IEC flange, from IM 1001 (B5 from B3).	-	-	-	-	●	●	●	●	●
008	IM 2101 foot/flange mounted, IEC flange, from IM 1001 (B34 from B3).	●	●	●	●	-	-	-	-	-
009	IM 2001 foot/flange mounted, IEC flange, from IM 1001 (B35 from B3).	●	●	●	●	●	●	●	●	●
047	IM 3601 flange mounted, IEC flange, from IM 3001 (B14 from B5).	●	●	●	●	-	-	-	-	-
048	IM 3001 flange mounted, IEC flange, from IM 3601 (B5 from B14).	●	●	●	●	-	-	-	-	-
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	●	●	●	●	●	●	●	●	●

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

Code	Variants	Frame size								
		90	100	112	132	160	180	200	225	250
200	Flange ring holder.	●	●	●	●	-	-	-	-	-
224	Flange ring FT 115.	●	-	-	-	-	-	-	-	-
226	Flange ring FF 130.	●	●	●	-	-	-	-	-	-
227	Flange ring FT 130.	●	●	●	-	-	-	-	-	-
233	Flange ring FF 165.	●	●	●	-	-	-	-	-	-
234	Flange ring FT 165.	●	●	●	-	-	-	-	-	-
243	Flange ring FF 215.	-	-	●	●	-	-	-	-	-
Painting										
114	Special paint color, standard grade	●	●	●	●	●	●	●	●	●
Protection										
005	Protective roof	●	●	●	●	●	●	●	●	●
072	Radial seal at D-end. Not possible for 2-pole , 280 and 315 frames	-	-	-	-	●	●	●	●	●
074	Degree of protection IP55.	○	○	○	○	○	○	○	○	○
158	Degree of protection IP65.	○	○	○	○	●	●	●	●	●
250	Degree of protection IP66	-	-	-	-	●	●	●	●	●
403	Degree of protection IP56.	-	-	-	-	●	●	●	●	●
784	Gamma-seal at D-end.	○	○	○	○	○	○	○	○	○
Rating & instruction plates										
002	Restamping voltage, frequency and output, continuous duty.	●	●	●	●	●	●	●	●	●
003	Individual serial number.	○	○	○	○	○	○	○	○	○
004	Additional text on std rating plate (max 12 digits on free text line).	●	●	●	●	●	●	●	●	●
095	Restamping output (maintained voltage, frequency), intermittent duty.	-	-	-	-	●	●	●	●	●
098	Stainless rating plate.	●	●	●	●	●	●	●	●	●
126	Tag plate	●	●	●	●	●	●	●	●	●
135	Mounting of additional identification plate, stainless.	●	●	●	●	●	●	●	●	●
138	Mounting of additional identification plate, aluminium.	●	●	●	●	●	●	●	●	●
159	Additional plate with text "Made in ...."	-	-	-	-	●	●	●	●	●
160	Additional rating plate affixed.	-	-	-	-	●	●	●	●	●
161	Additional rating plate delivered loose.	-	-	-	-	●	●	●	●	●
162	Rating plate fixed to stator.	○	○	○	○	○	○	○	○	○
163	Frequency converter rating plate. Rating data according to quotation.	●	●	●	●	●	●	●	●	●
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	●	●	●	●	●	●	●	●	●
Shaft & rotor										
164	Shaft extension with closed keyway	○	○	○	○	○	○	○	○	○
Standards and Regulations										
331	Motor not for sale for use in EU or UK.	●	●	●	●	●	●	●	●	●
538	CE mark	○	○	○	○	○	○	○	○	○
Stator winding temperature sensors										
436	PTC - thermistors (3 in series), 150 ºC, in stator winding	○	○	○	○	○	○	○	○	○
445	Pt100 2-wire in stator winding, 1 per phase	-	-	-	-	●	●	●	●	●
Terminal box										
015	Motor supplied in D connection.	-	-	-	-	●	●	●	●	●
017	Motor supplied in Y connection.	-	-	-	-	●	●	●	●	●
230	Standard metal cable gland.	●	●	●	●	●	●	●	●	●
465	Terminal box on top.	○	○	○	○	○	○	○	○	○
731	Two standard metal cable glands.	-	-	-	-	●	●	●	●	●
738	Prepared for metric cable glands.	○	○	○	○	○	○	○	○	○
Testing										
145	Type test report from a catalogue motor, 400V 50Hz.	●	●	●	●	●	●	●	●	●
148	Routine test report.	●	●	●	●	●	●	●	●	●
Variable speed drives										
701	Insulated bearing at N-end.	-	-	-	-	●	●	●	●	●
704	EMC cable entry.	●	●	●	●	●	●	●	●	●
Y/D starting										
023	6 terminals (for Y/D start, single speed), in terminal box.	○	○	○	○	○	○	○	○	○

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

Mechanical design

Motor frame and drain holes

Motor frame

The motor frame is made of aluminum alloy. Frame size 90-180 have aluminum feet and sizes 200-250 have cast iron feet.

The bearing end shield of sizes 90-132 are made of aluminum, and those of 160 to 250 are made of cast iron.

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

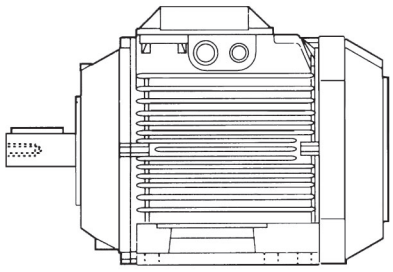
Drain holes

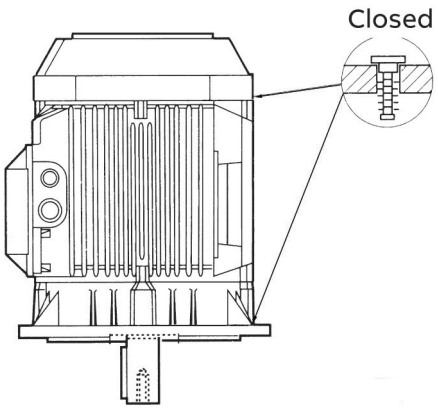
Motors that will be operated in very humid or wet environments and especially under intermittent duty should be provided with drain holes. The IM designation, such as IM 3031, determines the intended mounting arrangement for the motor.

Motors are provided with closable plastic plugs in the drain holes. In explosive environments requiring IP55 or IP65 protection, the both plugs should be hammered home. In the case of vertical mounting, the upper plug must be hammered home completely.

Motors are supplied with drain holes both at the D-end and N-end.

When mounting arrangement differs from foot mounted IM B3, please use variant code 065 when ordering.





Mechanical design
Bearings

—
01 Motor sizes 90–132

02 Motor sizes 160–250

ABB's alumimum motors are as standard fitted with single-row ball bearings according to the table below.

Standard design: Deep groove ball bearings

Motor size	Foot and flange mounted motor	
	D-end	N-end
90	6205-2RSH/C3	6204-2RSH/C3
100	6306-2RS1/C3	6205-2RSH/C3
112	6306-2RS1/C3	6205-2RSH/C3
132 [1)]	6208-2RS1/C3	6206-2RS1/C3
160	6309-2Z/C3	6209-2Z/C3
180	6310-2Z/C3	6209-2Z/C3
200	6312-2Z/C3	6210-2Z/C3
225	6313-2Z/C3	6212-2Z/C3
250	6315-2Z/C3	6213-2Z/C3

[1)] all types except

Note that in such cases the axial force must only operate in one direction. Motor versions with roller bearings tolerate greater radial forces

Alternative design with roller bearings

It is recommended to use roller bearings in belt drives for motor sizes 160 to 250.

See variant code 037 under the heading "Bearings and lubrication".

Motor size	Number of poles	Alternative designs	
		Roller bearings (037)	
		D-end	N-end
160	–	NU 309 ECP	6209-2Z/C3
180	–	NU 310 ECP	6209-2Z/C3
200	–	NU 312 ECP	6210-2Z/C3
225	–	NU 313 ECP	6212-2Z/C3
250	–	NU 315 ECP	6213-2Z/C3

[1)] all types except

Axially-locked bearings

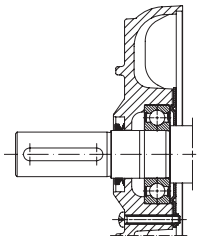
All motors with deep groove ball bearings are equipped as standard with an axially locked bearing at the D-end. For sizes 90-250 is the locking done by a spring washer at N-end pushing the rotor towards D-end.

Motor size	Foot-mounted motors	Flange-mounted motors	
		Large flange	Small flange
90–132	D-end [1)]	D-end [1)]	D-end [1)]
160–250	D-end	D-end	–

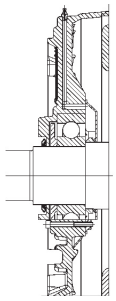
[1)] A spring-washer at the N-end presses the rotor toward the D-end.

Bearing seals

Motors in sizes 90-250 are provided with gamma seals at both D and N-end.The sizes 90-132 have in addition to the shaft seals 2RS type bearings with rubber seals for improved protection.



01



02

Bearing life

The nominal life is defined as the number of hours that are attained or exceeded by 90 percent of identical bearings, in a large test series, under certain specified conditions. 50 percent of the bearings attain a life of as much as 5 times this figure.

The life of bearings is dependent on various factors such as bearing load, motor speed, operating temperature and the purity of the grease. The permissible radial and axial loading for different motor sizes is shown in the table on the following pages.

The table is valid for 50 Hz. For 60 Hz and/or some other bearing life than specified in the table the values are changed according to the table below.

The table values assume the occurrence of only radial or axial forces. In the case of simultaneous radial and axial forces information can be supplied on request. It is assumed that the radial force is applied at the end of the motor shaft.

Permissible force at changed bearing life or supply frequency

Bearing life in hours at		
50 Hz	60 Hz	
25 000	21 000	100 % of value for 25.000 hours
40 000	33 000	100 % of value for 40.000 hours
63 000	52 000	86 % of value for 40.000 hours
80 000	67 000	80 % of value for 40.000 hours

Lubrication

The motors are delivered with bearing grease for use at normal temperatures in dry or humid environments. The motors are lubricated for ambient temperatures 40°C and in other temperatures above 40°C, see table next page.

Motors in size 90-250 are delivered with greased for life shielded bearings as standard, as an option are also regreasable bearings with grease nipples available for sizes 160-250.

Lubrication intervals and grease quantities are specified on a plate on the motor as well as in the manual supplied with the motor.

The grease lifetime L_{10}, suitable for permanent lubricated bearings, is defined as the number of operating hours after which 90 percent of the bearings are adequately lubricated. 50 percent of the bearings achieve two times this figure. Maximum lifetime, however, should be regarded as 40,000 hours.

In case of high ambient temperatures the shaft loads must be reduced compared to permissible loadings in the table, please contact ABB.

Lubrication intervals

ABB follows the L_1-principle in defining lubrication interval. That means that 99 percent of the motors are sure to make the interval time. The lubrication intervals can also be calculated according to the L_{10}-principle, which are normally doubled compared to L_1-values. Values available from ABB at request.

The table below gives lubrication intervals according to the L_1-principle for different speeds. The values are valid for horizontal mounted motors (B3), with about 80°C bearing temperature and using good quality grease with lithium complex soap and with mineral or PAO-oil.

For more information, see ABB's Low Voltage Motors Manual.

Grease lifetime

In vertically mounted motors, the grease lifetime is half the figures as in following table. For applications corresponding to the empty cells in the table, please contact ABB. These applications can imply reduced lifetime for bearings and winding. Motors with roller bearings (optional) have considerably shorter grease life. For continuous operation regreasing nipples should be considered.

Ambient temperature and rated output													
		25 °C		40 °C		50 °C		60 °C		70 °C		80 °C	
Motor	r/min	Basic	High	Basic	High	Basic	High	Basic	High	Basic	High	Basic	High
90	3000	40 000	40 000	40 000	40 000	33 000	33 000	20 000	20 000	11 000	11 000	6000	6000
	1500	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
	750	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
100	3000	40 000	40 000	39 000	39 000	25 000	25 000	15 000	15 000	8000	8000	4000	4000
	1500	40 000	40 000	40 000	40 000	40 000	40 000	30 000	30 000	17 000	17 000	9000	9000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
	750	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
112	3000	40 000	40 000	39 000	39 000	25 000	25 000	15 000	15 000	8000	8000	4000	4000
	1500	40 000	40 000	40 000	40 000	40 000	40 000	30 000	30 000	17 000	17 000	9000	9000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
	750	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
132	3000	40 000	40 000	33 000	33 000	21 000	21 000	13 000	13 000	7000	7000	4000	4000
	1500	40 000	40 000	40 000	40 000	40 000	40 000	26 000	26 000	14 000	14 000	7000	7000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
	750	40 000	40 000	40 000	40 000	40 000	40 000	33 000	33 000	18 000	18 000	9000	9000
160	3000	40 000	40 000	40 000	36 000	40 000	19 000	26 000	9000	14 000	5000	8000	2000
	1500	40 000	40 000	40 000	40 000	40 000	40 000	40 000	38 000	40 000	20 000	37000	10 000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	24 000	40 000	12 000
	750	40 000		40 000		40 000		40 000		40 000		40 000	
180	3000	38 000	38 000	38 000	38 000	38 000	38 000	38 000	23 000	23 000	12 000	13 000	7000
	1500	40 000	40 000	40 000	40 000	40 000	24 000	40 000	12 000	26 000	6000	13 000	3000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	24 000	29 000	12 000
	750	40 000		40 000		40 000		40 000		37000		21 000	
200	3000	27 000	27 000	27 000	27 000	27 000	18 000	24 000	10 000	14 000	5000	8000	3000
	1500	40 000	40 000	40 000	40 000	40 000	40 000	40 000	32000	40 000	18 000	30 000	10 000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	30 000	38 000	17 000
	750	40 000		40 000		40 000		40 000		40 000		40 000	
225	3000	23 000	23 000	23 000	18 000	23 000	10 000	20 000	6000	12 000	3000	7000	1000
	1500	40 000	40 000	40 000	40 000	40 000	23 000	40 000	12 000	40 000	6000	25 000	3000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	27 000
	750	40 000		40 000		40 000		40 000		40 000		40 000	
250	3000	16 000	16 000	16 000	13 000	16 000	7000	12 000	4000	7000	2000	4000	1000
	1500	40 000	40 000	40 000	39 000	40 000	21 000	40 000	11 000	33 000	6000	19 000	3000
	1000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	40 000	25 000	36 000	13 000
	750	40 000		40 000		40 000		40 000		40 000		40 000	

Grease lifetime L_{10} in deep groove ball bearings of type 2Z in horizontally mounted motors in continuous running duty.

Mechanical design
Radial forces

Pulley diameter

When the desired bearing life has been determined, the minimum permissible pulley diameter can be calculated with FR as follows:

$$D = \frac{1.9 \cdot 10^7 \cdot K \cdot P}{n \cdot F_R}$$

Where:	
D:	pulley diameter, mm
P:	power requirement, kW
n:	motor speed, r/min.
K:	belt tension factor, dependent on belt type and type of duty. A common value for V-belts is 2.5
F_R:	permissible radial force, refer to tables below.

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 L_{10h} of 40 000 hours per motor size.

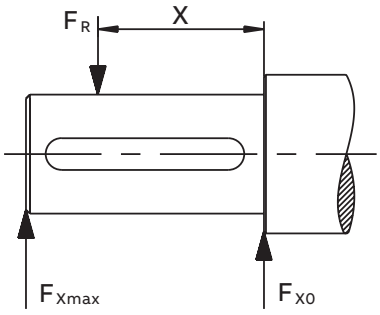
Permissible loads of simultaneous radial and axial forces can be supplied on request.

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

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 radial forces

Motor size	Poles	Length of shaft extension E (mm)	Ball bearings			
			Basic design with deep groove ball bearings			
			25 000 hours		40 000 hours	
			F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)
90	2-6	50	1010	810	1010	810
100	2-6	60	2280	1800	2280	1800
112	2-6	60	2280	1800	2280	1800
132	2-6	80	2120	1610	2120	1610
132	2-6	80	2600	2100	2600	2100
160	2	110	4760	3860	4100	3320
	4	110	5180	4200	4380	3545
	6	110	5160	4180	4360	3540
180	2	110	6060	4960	5280 [1]	4305 [1]
	4	110	4800	3940	4020	3300
	6	110	6280	5140	5280	4380
200	2	110	7800	6500	6760 [2]	5640 [2]
	4	110	8400	7020	7180	5980
	6	110	8960	7480	7600	6340
225	2	110	8520	7180	7360 [3]	6200 [3]
	4	140	8380	6780	7200	5820
	6	140	10 960	8860	9360	7560
250	2	140	10 480 [4]	8500 [4]	9080 [4]	7360 [4]
	4	140	10 840	8780	9380	7600
	6	140	12 600	10 220	10 700	8680

[1] The maximum lifetime of the grease is 38000 h

[2] The maximum lifetime of the grease is 27000 h

[3] The maximum lifetime of the grease is 23000 h

[4] The maximum lifetime of the grease is 16000 h

Mechanical design
Axial forces

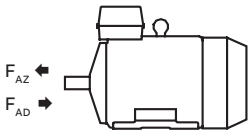
— 01 Mounting arrangement IM B3

02 Mounting arrangement IM V1

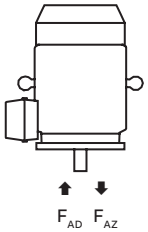
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



01



02

Permissible axial forces

Motor size	Poles	Mounting arrangement IM B3, deep groove ball bearings				Mounting arrangement IM V1, deep groove ball bearings			
		20 000 hours		40 000 hours		20 000 hours		40 000 hours	
		F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
90	2	885	485	720	320	945	450	775	280
	4	1170	650	945	425	1245	600	1020	375
	6	1270	870	1005	605	1360	815	1095	550
100	2	1620	1120	1280	780	1710	1060	1370	715
	4	2065	1565	1615	1115	2180	1485	1735	1035
	6	2390	1890	1860	1360	2510	1815	1980	1285
112 M, MB	2	1615	1115	1275	775	1725	1040	1385	700
	4	2060	1560	1610	1110	2210	1460	1110	1010
	6	2385	1885	1860	1360	2540	1785	2010	1260
132 M, MA	4	2245	1645	1760	1160	2460	1505	1970	1015
	6	2595	1980	2025	1425	2815	1850	2245	1280
132 MC	6	2580	1980	2010	1410	2885	1780	2315	1210
132 S	6	2600	2000	2030	1435	2780	1885	2210	1315
132 SB	2	1760	1160	1400	800	1910	1075	1540	705
160	2	4160	4160	3425	3425	4560	3810	3860	3110
	4	4740	4740	3920	3920	5260	4310	4440	3490
	6	4840	4840	4000	4000	5400	4420	4540	3560
180	2	5480	5480	4600 [1)]	4600 [1)]	5920	5115	5060 [1)]	4255 [1)]
	4	4360	4360	3540	3540	5080	3860	4240	3020
	6	5980	5980	4940	4630	6000	5445	5600	4385
200	2	5000	6880	5000 [2)]	5700 [2)]	5000	6350	5000 [2)]	5230 [2)]
	4	5000	7660	5000	6340	5000	6950	5000	5650
	6	5000	8300	5000	6880	5000	7505	5000	6025
225	2	5000	7380	5000 [3)]	6120 [3)]	5000	6770	5000 [3)]	5490 [3)]
	4	5000	7600	5000	6220	5000	6795	5000	5475
	6	5000	10140	5000	8420	5000	9270	5000	7490
250	2	6000 [4)]	9020 [4)]	6000 [4)]	7500 [4)]	6000 [4)]	8335 [4)]	6000 [4)]	6755 [4)]
	4	6000	9800	6000	8040	6000	8820	6000	7120
	6	6000	11520	6000	9520	6000	10 275	6000	8235

[1)] The maximum lifetime of the grease is 38 000 h

[2)] The maximum lifetime of the grease is 27 000 h

[3)] The maximum lifetime of the grease is 23 000 h

[4)] The maximum lifetime of the grease is 16 000 h

Terminal box

Standard terminal box

Protection and mounting

The degree of protection of the standard terminal-box is IP55 or IP65 depending on the equipment protection level and dust category. It complies with the requirements of the protection methods ‘Ex ec’ and 'Ex t' and prevents all ignition sources such as sparks, excessive over heating etc. All terminal box seals are of uninterrupted type fulfilling the requirements for Ex ec and Ex t motors. By default, terminal boxes are mounted on top of the motor at D-end.

Turnability

The terminal box of motors in size 90-180 are integrated with the frame which means that the box itself cannot be rotated. There are however cable entries both on RHS and LHS to allow cabling from either side. Motors in size 200-250 have a terminal box made of casted aluminum mounted on top of the stator, the box itself cannot be rotated but there are two openings, one on RHS and another on LHS of the box allowing cable entry from both sides.

Sizes 90–180

The terminal box is made of aluminum alloy and is located on top of the stator. The lower part of the box is integrated with the stator. It is provided with two knockout openings on each side. Sizes 160–180 also have a third smaller opening. Cable glands are not included.

Sizes 200–250

The terminal box and cover are made of aluminum and mounted on top of the stator. The box is bolted to the stator and is not rotatable. The size of the box is the same for all frame sizes. Cable glands are not supplied. The opening on the other side is provided with a Ex (ATEX) certified plugs.

The motors can also be provided with an extralarge terminal box, standard for voltage code S and frame size 280. See variant code 019 under the heading “Terminal box”. This will increase the dimension HD by 32 mm. The box is supplied with two FL 21 openings. The right opening is provided with a flange with two holes for M63 cable glands. The holes are sealed by means of plastic plugs. Cable glands are not supplied. The opening onthe other side is provided with a cover flange. The box can also be provided with an FL 13 opening towards the N-end.

When new motors are manufactured the terminal box can be mounted on the left or the right side. See variant codes 021 and 180 under the heading “Terminal box”.

In the basic design the terminal box is provided with twoFL 13 flange openings, one on each side. The opening on the right side, seen from the D end, is supplied with a flange with two holes for M40 cable glands. On delivery the holes are sealed by means of plastic plugs. Cable glands are not supplied. The opening on the other side is provided with a cover flange.

Cable entries

Terminal box is provided as standard with plugged holes for cable glands, no cable glands are included as standard, the knockout entry holes and cable flange holes are closed with Ex (ATEX) approved blanking plugs.

Connection openings

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

Motor size	Opening	Metric cable entry	Method of connection	Terminal bolt size	Maximum connectable Cu-cable area, mm^2
90–112	Knock-out opening	2 x (M25 + M20)	Screw terminal	M4	6
132	Knock-out opening	2 x (M25 + M20)	Cable lug	M5	10
160–180	Knock-out opening	2 x (2 x M40) + M16	Cable lug	M6	35
200–250	Knock-out opening	2x (2x M40 +2xM16) or 2x (2x M63 +2xM16)	Cable lug	M10	70

Earthing bolts

The motors are as standard provided with at least one earthing bolt inside the terminal box and another on the frame. The earthing bolt on the frame is located on top close to the terminal box.

Motor size	Earthing on frame	Earthing in terminal box
90–100	–	M4 (use self tapping screw)
112	–	M5 (use self tapping screw)
132	–	M5 (use self tapping screw)
160–180	–	M6 (use self tapping screw)
200–250	–	-

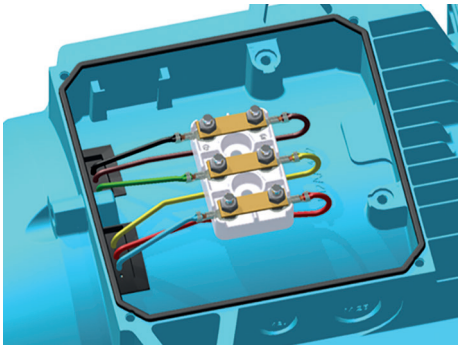
Terminal box

Terminal boxes and boards

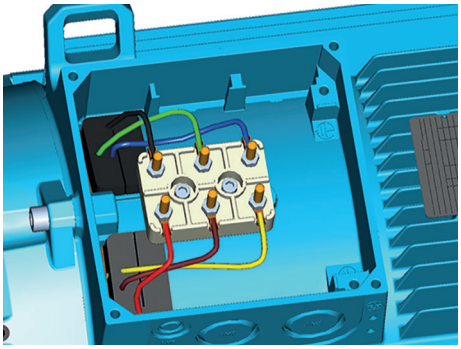
01 Terminal box size 90-132

02 Terminal box size 160 and 180

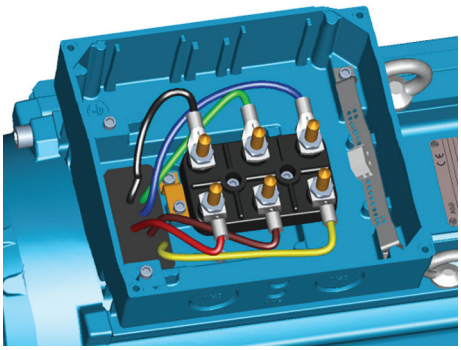
03 Terminal box size 200-250



01



02

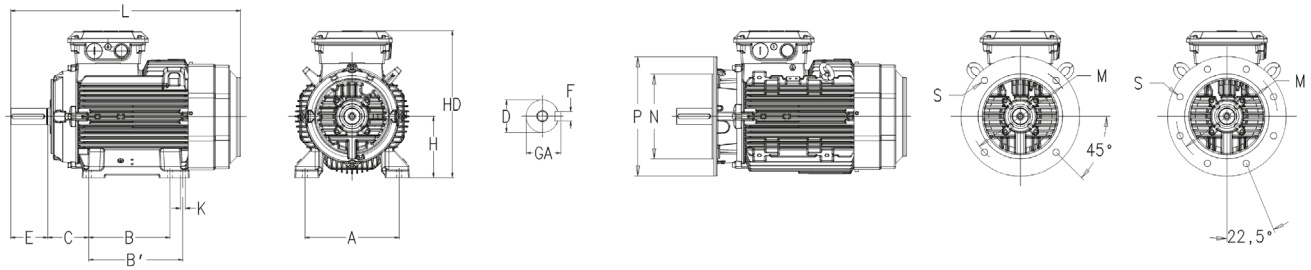


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Motor size	Plugged cable entry	Terminal bolt size	Maximum connectable Cu-cable area, mm²
90-112	2 x (M25 + M20)	6 x M4 (screw)	6
132	2 x (M25 + M20)	6 x M5	10
160, 180	2 x (2 x M40) + M16	6 x M6	35
200-250	2x (2x M40 +2xM16) or 2x (2x M63 +2xM16)	6 x M10	70

Dimension drawings

Aluminum Ex ec & Ex t motors



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

Motor size	Poles	D	GA	F	E	L max	A	B	B'	C	HD	H	K	M	N	P	S
90	2-6	24	27	8	50	336.5	140	125	-	56	217	90	10	165	130	200	12
100	2-6	28	31	8	60	437	160	140	-	63	237	100	12	215	180	250	15
112	2-6[1)]	28	31	8	60	436	190	140	-	70	260	112	12	215	180	250	15
112	4[2)]	28	31	8	60	482	190	140	-	70	260	112	12	215	180	250	15
132	2-6[1)]	38	41	10	80	492	216	140	178	89	298	132	12	265	230	300	14.5
160	MLA 2-6, MLB2	42	45	12	110	584	254	210	254	108	370	160	15	300	250	350	19
160	MLB 4-6, MLC 2-6, MLD 2-4	42	45	12	110	681	254	210	254	108	370	160	15	300	250	350	19
180	2-6	48	51.5	14	110	726	279	241	279	121	405	180	15	300	250	350	19
200	2-6	55	59	16	110	821	318	267	305	133	506	200	18	400	350	400	19
225	2	55	59	16	110	850	356	286	311	149	533	225	18	400	350	450	19
225	4-6	60	64	18	140	880	356	286	311	149	533	250	18	400	350	450	19
250	2	60	64	18	140	884	406	311	349	168	601	250	22	500	450	550	19
250	4-6	65	69	18	140	884	406	311	349	168	601	250	22	500	450	550	19

[1)] 1) all types except, [2)]4p 5,5kW (HO), [3)]2p 11/15kW (HO)

IMB14 (IM3601)

Motor size	M	N	P	S	Tolerances:		Tolerances:	
90	115	95	140	8	A, B	ISO js14	F	ISO h9
100	130	110	160	8	C	± 0,8	H	-0,5
112	130	110	160	8	D	ISO k6 < Ø 48mm	N	ISO j6
132	165	165	200	10		ISO m6 > Ø 48mm		

Tolerances:		Tolerances:	
A, B	± 0,8	F	ISO h9
D	ISO j6 < Ø 28 mm	H	-0,5
	ISO k6 < Ø 38 mm	N	ISO js6
	ISO m6 > Ø 55 mm	C	± 0,8

The tables give the main dimensions in mm.

For detailed drawings please see our web-pages or contact ABB.

Certificate examples

01 EU Declaration of Conformity

02 EU Type Examination certificate

03 IECEx Certificate of Conformity

04 IECEx Certificate of Conformity

EU Declaration of Conformity

The products: 3-phase induction motors for potentially explosive atmospheres as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The Manufacturer:

ABB Oy
Motors and Generators
P.O. Box 633
Strömbergin Puistotie 5A
FIN - 65101 Vaasa, Finland

ABB Sp.z.o.o
27 Placydowska Str.
PL-95-070 Aleksandrow Lodzki
Poland

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The products of the declaration described above are in conformity with the relevant Union harmonization legislation:

Directive 2014/34/EU
The following harmonized standards are applied in relation to which conformity is declared: EN 60079-0/A11:2013[2], EN 60079-1:2014[2], EN 60079-7:2015, EN 60079-31:2014[1] and relevant parts of the EN 60034 -series of standards.

Directive 2009/125/EC
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EC) No. 640/2009 and the amending Regulation (EU) No. 4/2014.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU and the amending Annex II to this Directive of the Delegated Directive (EU) 2015/863 of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Notes:

Motors shall be installed and maintained according to the relevant standards and instructions of ABB Oy, Motors and Generators. When installed in converter supplied applications, additional requirements must be respected regarding the motor as well as the installation as described in the appropriate dedicated addendum

The conformity of the incorporation into a finished product according to the Directive 2006/42/EC shall be established by the commissioning party when a motor is fitted to the machinery.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc. 33, 92266 Fontenay-aux-Roses, France,
VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland
UL International Demko A/S (0539), Borupvang 5A, 2750 Ballerup, Denmark

Signed for and on behalf of: ABB Oy, Motors and Generators
Place and date of issue: Vaasa, Finland, 2019-09-04
Harri Mykkänen
Vice President

3GZF500930-309L

01

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx EESF 20.0036X** Page 1 of 4 Certificate history:
Status: **Current** Issue No: 0
Date of Issue: 2021-04-29
Applicant: **ABB Oy, IEC LV Motors**
Strömbergin Puistotie 5A
VAASA 65100
Finland
Equipment: **Range of cage induction motors; types M3AA 90..., M3AA 100..., M3AA 112..., M3AA 132..., M3AA 160..., M3AA 180..., M3AA 200..., M3AA 225..., M3AA 250..., and M3AA 280...**
Optional accessory:
Type of Protection: **Ex ec, Ex tb and Ex tc**
Marking: Ex ec IIB/IIC T3 Gc
Ex tb IIIB/ IIIC T125°C Db or
Ex tc IIIB/ IIIC T125°C Dc

Approved for issue on behalf of the IECEx Certification Body: **Kari Koskela**
Position: **Senior Expert**
Signature: (for printed version)
Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:
Eurofins Expert Services Oy
Kivimiehentie 4
FI-02150 Espoo
Finland

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03

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EESF 20 ATEX 074X
Page 1 of 3

1. **EU-TYPE EXAMINATION CERTIFICATE**
2. **Equipment or Protective System Intended for use in Potentially explosive atmospheres Directive 2014/34/EU**
3. EU-Type Examination Certificate Number: **EESF 20 ATEX 074X**
4. Product: **Range of cage induction motors**
   Certified types: **M3AA 90..., M3AA 100..., M3AA 112..., M3AA 132..., M3AA 160..., M3AA 180..., M3AA 200..., M3AA 225..., M3AA 250..., and M3AA 280...**
5. Manufacturer: **ABB Oy, IEC LV Motors**
6. Address: **Strömbergin puistotie 5A, FI-65320 Vaasa, Finland**
   Additional manufacturing locations:
   ABB Sp.z.o.o, ul. Placydowska, 95-070 Aleksandrow Lodzki, Poland
   ABB Logistics Center Europe GmbH, Bräuckerweg 132, 58708 Menden, Germany
7. This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
8. Eurofins Expert Services Oy, Notified Body number 0537, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
   The examination and test results are recorded in confidential report No. EUFI29-20005204-T1.
9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
   EN IEC 60079-0:2018 **EN 60079-31:2014**
10. If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.
11. This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
12. The marking of the product shall include the following:
    II 2D Ex tb IIIB or IIIC T125°C Db

Espoo, 29.04.2021
Eurofins Expert Services Oy
Kari Koskela
Senior Expert
Jenni Hirvelä
Senior Expert
This document is digitally signed.

FINAS 5017 (EN ISO/IEC 17065)
This certificate, including the schedule, may only be reproduced in its entirety and without any change.
Eurofins Expert Services Oy, Kivimiehentie 4, FI-02150 Espoo, Finland
www.eurofins.fi/expertservices

02

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EESF 20 ATEX 073X
Page 1 of 3

1. **TYPE EXAMINATION CERTIFICATE**
2. **Equipment or Protective System Intended for use in Potentially explosive atmospheres Directive 2014/34/EU**
3. Type Examination Certificate Number: **EESF 20 ATEX 073X**
4. Product: **Range of cage induction motors**
   Certified types: **M3AA 90..., M3AA 100..., M3AA 112..., M3AA 132..., M3AA 160..., M3AA 180..., M3AA 200..., M3AA 225..., M3AA 250..., and M3AA 280...**
5. Manufacturer: **ABB Oy, IEC LV Motors**
6. Address: **Strömbergin puistotie 5A, FI-65320 Vaasa, Finland**
   Additional manufacturing locations:
   ABB Sp.z.o.o, ul. Placydowska, 95-070 Aleksandrow Lodzki, Poland
   ABB Logistics Center Europe GmbH, Bräuckerweg 132, 58708 Menden, Germany
7. This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
8. Eurofins Expert Services Oy, Certification Body No. S017 accredited by the Finnish Accreditation Service (FINAS), certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive 2014/34/EU of February 2014.
   The examination and test results are recorded in confidential report No. EUFI29-20005204-T1.
9. Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
   EN IEC 60079-0:2018 **EN IEC 60079-7:2015/A1:2018** **EN 60079-31:2014**
10. If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.
11. This Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
12. The marking of the product shall include the following:
    II 3G Ex ec IIB or IIC T3 Gc
    II 3D Ex tc IIIB or IIIC T125°C Dc

Espoo, 29.04.2021
Eurofins Expert Services Oy
Kari Koskela
Senior Expert
Jenni Hirvelä
Senior Expert
This document is digitally signed.

FINAS 5017 (EN ISO/IEC 17065)
This certificate, including the schedule, may only be reproduced in its entirety and without any change.
Eurofins Expert Services Oy, Kivimiehentie 4, FI-02150 Espoo, Finland
www.eurofins.fi/expertservices

04

Motors in brief

Aluminum Ex ec & Ex t motors

Motor size		90	100	112	132	160	180	200	225	250
Stator frame	Material	Die-cast aluminum alloy								
	Paint colour shade	Minsell blue 8B 4.5/3.25								
	Corrosion class	C3								
Feet	Material	Integrated aluminum feet				Separate aluminum feet		Separate cast iron feet		
End shields	Material	Die-cast aluminum alloy				Cast iron				
Bearings	D-end	6205-2RSH/C3	6306-2RS1/C3	6306-2RS1/C3	6208-2RS1/C3	6309-2Z/C3	6310-2Z/C3	6312-2Z/C3	6313-2Z/C3	6315-2Z/C3
	N-end	6204-2RSH/C3	6205-2RSH/C3	6205-2RSH/C3	6206-2RS1/C3	6209-2Z/C3	6209-2Z/C3	6210-2Z/C3	6212-2Z/C3	6213-2Z/C3
Axially-locked bearings		Locked at D-end								
Bearing seal	D-end	Gamma ring								
	N-end	Gamma ring								
Lubrication		Permanently lubricated shielded bearing								
Measuring nipples for condition monitoring of the bearings		Not included								
Rating plate	Material	Aluminum								
Terminal box	Frame and cover	Die-cast aluminum alloy, integrated in stator						Die-cast aluminum alloy		
	Corrosion class	C3								
	Cover screws material	Zinc-electroplated steel								
Connections	Openings	2x(M20+M25)				2x(2xM40+M16)				
	Blank with Ex plugs							2x (2xM40+2xM16) or 2x (2xM63+2xM16)		
	Terminals	6 terminals								
	Cable glands	Optional								
Fan	Material	Light alloy metal fan								
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								
	Winding protection	3 PTC thermistors, 150 °C								
Rotor winding	Material	Die cast aluminum								
Balancing method		Half key balancing								
Key way		Closed key way								
Drain holes		Drain holes with closable plastic plugs, closed for IP55 and IP65								
External earthing bolt		As standard								
Enclosure		IP55 or IP65								
Cooling method		IC411								

Total product offering

ABB Access



With ABB Access, you can unlock all aspects of your drives, motors or PLCs, from one central location, the palm of your hand.

Simply scan the QR code on the ABB product to get started

ABB Access helps you easily find up-to-date product online data. It also provides easy access to documentation and manuals. If you happen to experience issues with your ABB product, this can be fastly and easily reported online to reach expert support from ABB.

- Device information - Easy Access to detailed product information and EcoDesign data
- Documentation - Quick Access to user manuals and step-by-step instructions
- Report issues - Fast Access to online issue reporting
- Contact - Access ABB contacts and search Channel partners

Motors and generators with a complete portfolio of services



IEC motors

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

NEMA motors

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

Generators

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

Life cycle services

ABB's portfolio of drives

Optimal solution for you



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:

www.abb.com/motors&generators

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