Catalog | February 2016

Low voltage
Motors for explosive atmospheres

Power and productivity
for a better world™

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, 0.25 to 1000 kW

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 94/9/EC and end users must prepare an Explosion Protection Document based on risk assessments of their “work places” and “work equipment” to fulfil the “minimum requirements” listed in the Worker Protection Directive 1999/92/EC.
The new ATEX products directive 2014/34/EU dated 26th February 2014 will be applicable from the 20th April 2016, this directive replaces current Products directive 94/9/EC.

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

According to the regulations, low voltage motors for explosive atmospheres are exempted from the Low Voltage Directive, the EMC Directive and the Machinery Directive.

IECEx System

The IECEx System is a certification system which verifies compliance with IEC (International Electrotechnical Commission) standards relating to safety in explosive atmospheres. It covers equipment, service facilities and the competency of personnel.

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. The voluntary and international aspects of the IECEx System differentiate it from certification under ATEX, for example, which is mandatory but applies only within the European Economic Area.

The IECEx System comprises global certification programs for both equipment and service facilities.

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.

In addition, IECEx has established a comprehensive set of operational documents and procedures to develop a single internationally standardized approach to Ex testing and certification.

The approach includes:

- A standardized “IECEx way of Ex Testing and Certification”. There is a single set of operational procedures, and Ex test procedures are always applied in the same way.
- A dedicated Technical and Operational Secretariat to maintain operations. Ex test procedures are evaluated and monitored on a centralized basis.

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).

Type testing of product samples is performed on behalf of the ExCB by an IECEx Assessment and Testing Laboratory (ExTL). On completion of its work the ExTL’s assessment engineer prepares an IECEx Test Report (ExTR).

The ExTR is then submitted to the ExCB for endorsement. Based on the QAR and ExTR, the ExCB then issues the Certificate of Conformity (CoC). The CoC provides internationally accepted verification that the equipment in question is in compliance with the relevant IEC standards. Once formally issued by the ExCB, both the ExTR and QAR are registered on the IECEx Internet site. This provides verification that an ExTR and QAR exist for the product and manufacturer.

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.

IECEx certification is particularly useful in certain markets. In Australia, New Zealand, and Singapore, for example, IECEx certificates are accepted, but not all IEC certificates are accepted. Certain other countries, including Russia, China and Korea, are prepared to accept ExTRs as a basis for their own national certificates. There are also many countries that are willing to accept products covered by current IECEx certificates, even though the countries in question are not members of the IECEx Management Framework.

IECEx Conformity Mark License

The IECEx Conformity Mark System was introduced in 2008. IECEx Conformity Mark Licenses are issued by approved Certification Bodies in IECEx participating countries.

The IECEx Conformity Mark shows that a product has been granted an IECEx Certificate of Conformity. IECEx Certification confirms that the product has the appropriate protection for use in explosive atmospheres and that it has been manufactured under systems subject to ongoing surveillance by Certification Bodies. It is recognized in all the countries participating in the IECEx System, and it also means that the product can be supplied to the market without the need for additional tests.

ABB has been granted IECEx Certification for a wide range of low and high voltage motors, and these can therefore display the IECEx Conformity Mark. The hazardous area protection types provided by these motors include

- Flameproof Ex d, Ex de
- Non-sparking Ex nA
- Dust protection Ex t

The IECEx Conformity Mark License will considerably enhance ABB’s ability to market its products globally. It complements ABB’s existing ATEX and other approvals.

Benefits of IECEx System for end users

A significant advantage of IECEx is that vendor certificates are available for inspection on the IECEx website. End users can therefore confirm the validity of IECEx certificates at any time - which is not possible with ATEX, for example. This increases end user confidence that the motor vendor will be committed to maintaining the necessary quality systems.

Under the quality based IECEx certification approach the interpretation of the standard is shared throughout the 30 participating countries and individual interpretations by Notified Bodies are not allowed. Another advantage of IECEx is that the Certificate of Conformity also covers EPL (equipment protection level) “c”, see table on next page.

Which ABB motors and generators are IECEx certified?

All M3JP/M3KP 80–450 motors with protection types Ex d and Ex de, M3GP 71-450 with protection type Ex nA and M3GP 71-450 with protection type Ex t are IECEx certified, together with a part of the M3AA range with Ex nA and Ex t protection.

Compliance on basis of recently updated standards

In complying with the ATEX 95 directives, ABB follows the requirements of recently updated IEC and 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 60079-15	Equipment protection by type of protection “n”*
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

* Moved to IEC 60079-7 in 2015 revision.

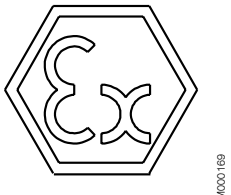
Equipment protection levels (EPLs)

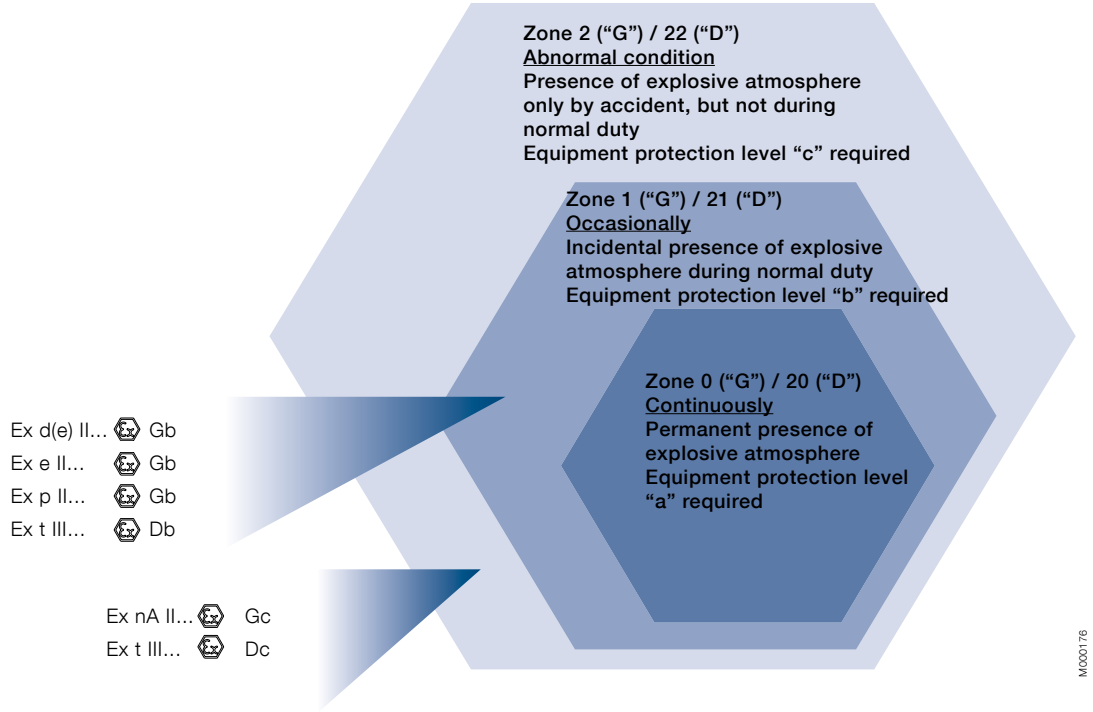
The latest revisions of the IEC and EN standards introduce the new concept of “equipment protection levels”, which identify products according to the ignition risk they might cause. A motor's EPL therefore indicates its inherent ignition risk, regardless of its protection type. This makes the selection 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.

All ATEX and IECEx certificates related to ABB's motors for explosive atmospheres have been updated to refer EPL standards, and consequently have EPL markings on the rating plate.

Explosive atmospheres

There are systems in place worldwide to classify explosive atmospheres by zones, according to the risk posed by explosive gas (“G”) or dust (“D”).





Classification of explosive atmospheres according to CENELEC and IEC

The following standards define areas according to the presence of gas or dust in the atmosphere:
IEC/EN 60079-10-1 Gas
IEC/EN 60079-10-2 Dust

Standard IEC 60079-0 EN 60079-0			Installation Zone acc. to IEC 60079-10-x EN 60079-10-x	ATEX Directive 94/9/EC		Main motor protection types
Group	EPL	Protection level	Zones	Equipment group	Equipment category	
I (Mines)	Ma	very high	NA	I (Mines)	M1	NA
	Mb	high			M2	
II (Gas)	Ga	very high	0	II (Surface)	1G	NA
	Gb	high	1		2G	Ex d/Ex de Ex p, Ex e
	Gc	enhanced	2		3G	Ex nA
III (Dust)	Da	very high	20		1D	NA
	Db	high	21		2D	Ex tb IP 65
	Dc	enhanced	22		3D	Ex tc IP 65/IP 55

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. flame proof protection).

Classification

Gas classification

Temperature class	Ignition temp. of gas/ vapor °C	Max. permitted 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 disulfide

Gas subdivision

IIA	~120 gases and vapors, e.g. butane / petroleum / propane
IIB	~30 gases and vapors, e.g. ethylene / dimethyl ether / coke oven gas
IIC	three gases: hydrogen H_2/acetylene C_2H_2carbon disulfide CS_2

Marking of equipment protection for gas according to ATEX

CE Conformity marking

CE 0081 Ex II 2G

- CE marking
- Identification of the notified body responsible for the approval. 0081 is the identification number of LCIE
- The European Commission mark for Ex products
- Equipment group: II for surface industry
- Equipment category: 2G for gas environment demanding a high level of protection

Equipment protection marking for gas:

Ex d IIB T4 Gb

- Protection type Ex d = flameproof
- Equipment group IIB for gas group B
- Temperature class T4 = max. permitted 135 °C
- Equipment protection level = level b for gas

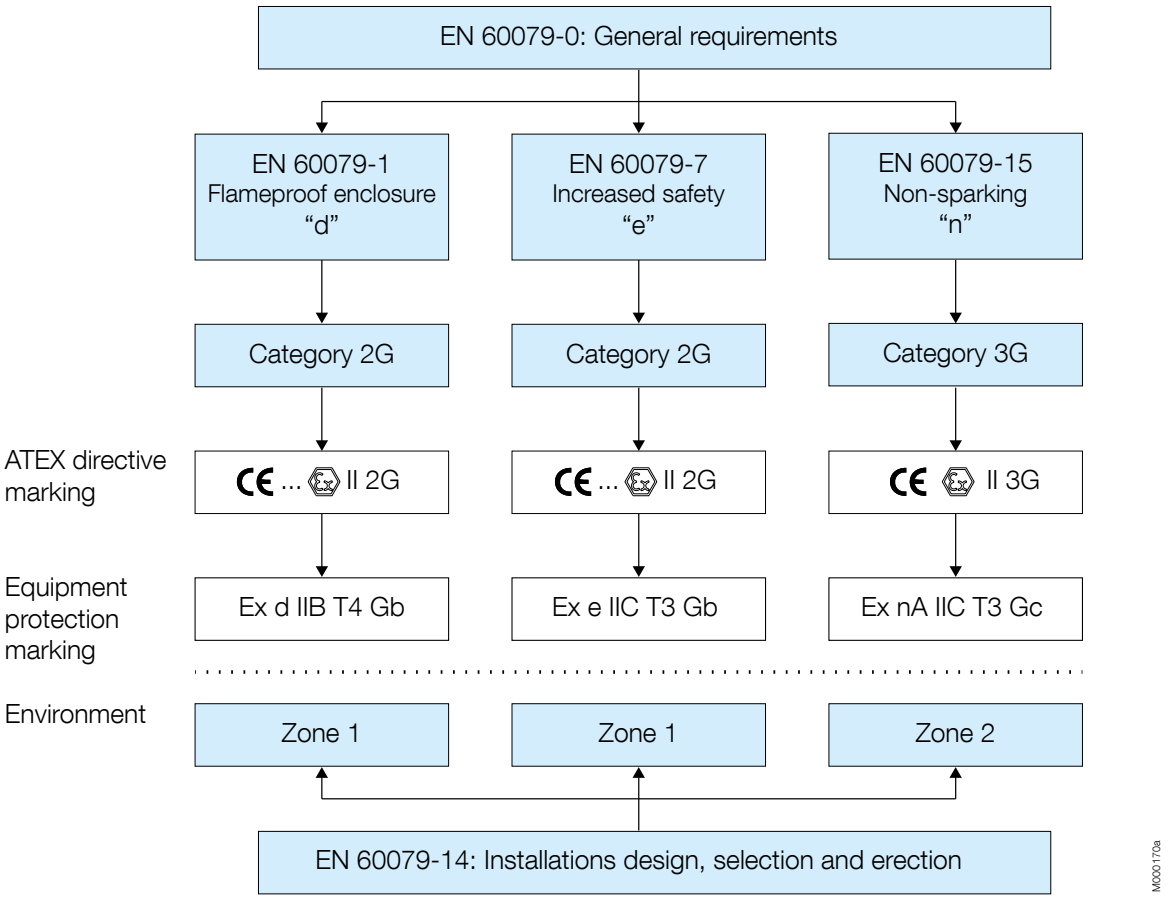
Marking of equipment protection for gas according to IEC

Example for gas:

Ex d IIB T4 Gb

- Protection type Ex d = flameproof
- Equipment group IIB for gas group B
- Temperature class T4 = max. permitted 135 °C
- Equipment protection level = level b for gas

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



General information about 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 regulations concerning both the design and use of such apparatus. These regulations 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 d and Ex de

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 componenets 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 flame proof 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 high electrical connection requirements of increased safety motors.

Alleinschutz – thermistors as sole protection (optional)
Flameproof motors from ABB have been designed to use thermistors as the sole method of protection against overload. This construction, “Alleinschutz”, is available as an option, see variant codes.

“Alleinschutz” refers to the protection of a flameproof motor by a protective device which is triggered by thermistors. The thermistors and relays will switch off the motor in case of overheating before the temperature of the motor's external enclosure exceeds the temperature marking stamped on the rating plate.

Each motor ordered with thermistors as sole protection will be tested, with locked rotor, up to the point where the thermistors trigger the relay to turn off the motor. At the triggering temperature, the motor has to be within the certified temperature class limit.

Only approved relays can be used for “Alleinschutz”.

Please note that sizes 315 to 450 require special technical solutions, consult ABB.

Increased safety design, Ex e

The design of this motor type prevents the occurence in operation (including starting and locked rotor situations), in all inner and outer parts of the machine, 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.

Temperature rise limits under normal operating conditions

The expected electrical lifespan of a motor depends on its temperature rise for a given insulation class, and on the motor winding temperature, during operation, which is not homogeneous due to the appearance of hot spots. For these reasons, a safety margin of 10 K is allowed between the winding's temperature rise at rated output, as measured by the change of resistance method, and the maximum temperature rise permitted by the winding insulation class.

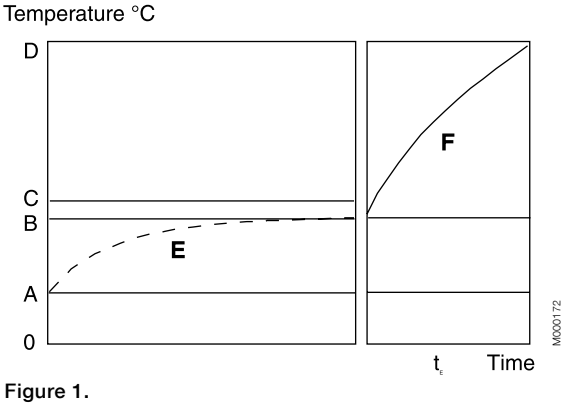


Figure 1.
O = Temperature 0 °C
A = Max. ambient temperature, reference 40 °C
B = Temperature at rated load and under worst voltage conditions
C = Max temperature as permitted by the insul. class
D = Max limit temperature as set by the nature of the potentially explosive atmosphere
E = Temperature-rise curve of motor at rated output and under worst voltage conditions
F = Temp. rise curve under stalled rotor conditions
tE = Stalled rotor time

Temperature rise limits during short circuit under accidental stalling conditions

Should the machine stall while in operation, a shortcircuit current nearly equal to the starting current will develop, and stator and rotor winding temperatures will rise rapidly (see Figure 1).

To prevent this temperature value from exceeding the maximum limit temperature as set by the nature of the potentially explosive atmosphere (D in Figure 1), protection devices must trip within a specified time (t_E). This tripping time depends on the short-circuit current level or the short-circuit current to rated current ratio (I_A/I_N). Figures 2 and 3 show, for commonly used protection devices, the limiting ratio between short-circuit current inrush I_A/I_N and rotor stalling time t_E, according to the EN and IEC standards and “VIK” specification. VIK is an industry specification originating in Germany.

This type of protection is inappropriate for commutator machines or brake-motors which, by principle, are capable of producing arcs, sparks or hot spots.

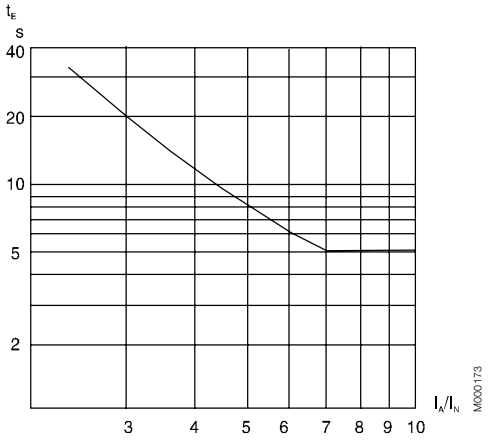


Figure 2. Min. value of time tE as a function of IA/IN acc. to IEC/EN 60019-7

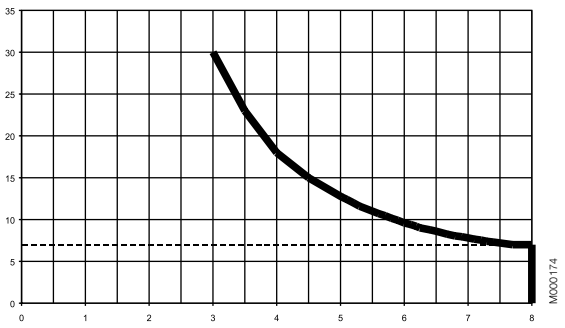


Figure 3. Min. value of time tE as a function of IA/IN acc. to VIK.

Non-sparking design, Ex nA

The use of this type of protection is allowed in hazardous areas corresponding to zone 2. The design is known as “non-sparking” 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.

Ex nA motors are certified according to the ATEX 95 Directive with a “voluntary type examination certificate”, and according to the IEC Ex System with a normal certificate.

ABB also provides self-certified non-sparking motors, with a manufacturer Declaration of Conformity.

Risk assessment and gas tests

Non-sparking (Ex nA) and increased safety (Ex e) 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.

Dual certification

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. Certification does not include use in a hybrid atmosphere containing both potentially explosive gas and dust at the same time.

The following combinations are possible:

- Ex d IIB/C T4 Gb / Ex tb IIIB/C T125°C Db
- Ex de IIB/C T4 Gb / Ex tb IIIB/C T125°C Db
- Ex e IIC T3 Gb / Ex tb IIIB/C T125°C Db
- Ex nA IIC T3 Gc / Ex tc IIIB/C T125°C Dc

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

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:

1. 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.

2. Characteristics of the dust:
- Is the dust electrically conductive or non-conductive?

3. Ignition temperature of the dust:
- T_{Cl}: Ignition temperature of dust in a “cloud” or
- T_{5mm}: 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 on the pages 12 and 13. Please see the table on page 14.

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 classification

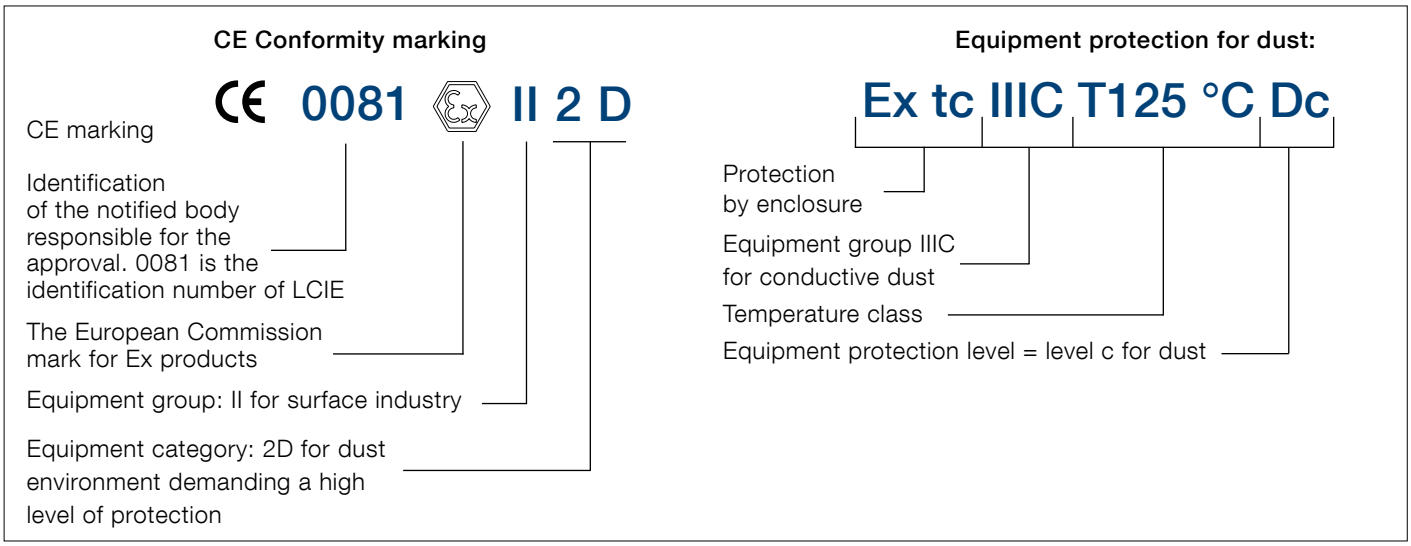
		T_{CL} (cloud) °C	T_{5mm} (layer) °C	Surface temperature provided that dust layer below 5 mm
Food/Feeder industry	Wheat	350	270	195
	Barley, corn	380	280	205
	Sugar	350	430	233
Natural materials	Wood	330	280	205
	Charcoal	520	230	195
	Hard coal	460	240	165
Chemicals	PVC	450	330	255
	Synth. rubber	470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

Source BIA-report 13/97 HVBG

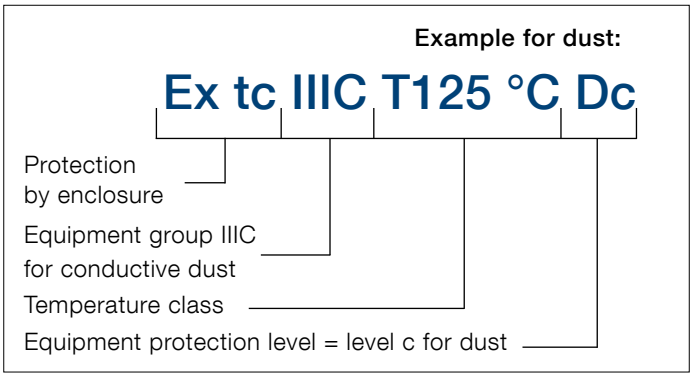
Dust subdivisions

IIIA	combustible flyings
IIIB	non-conductive dust
IIIC	conductive dust

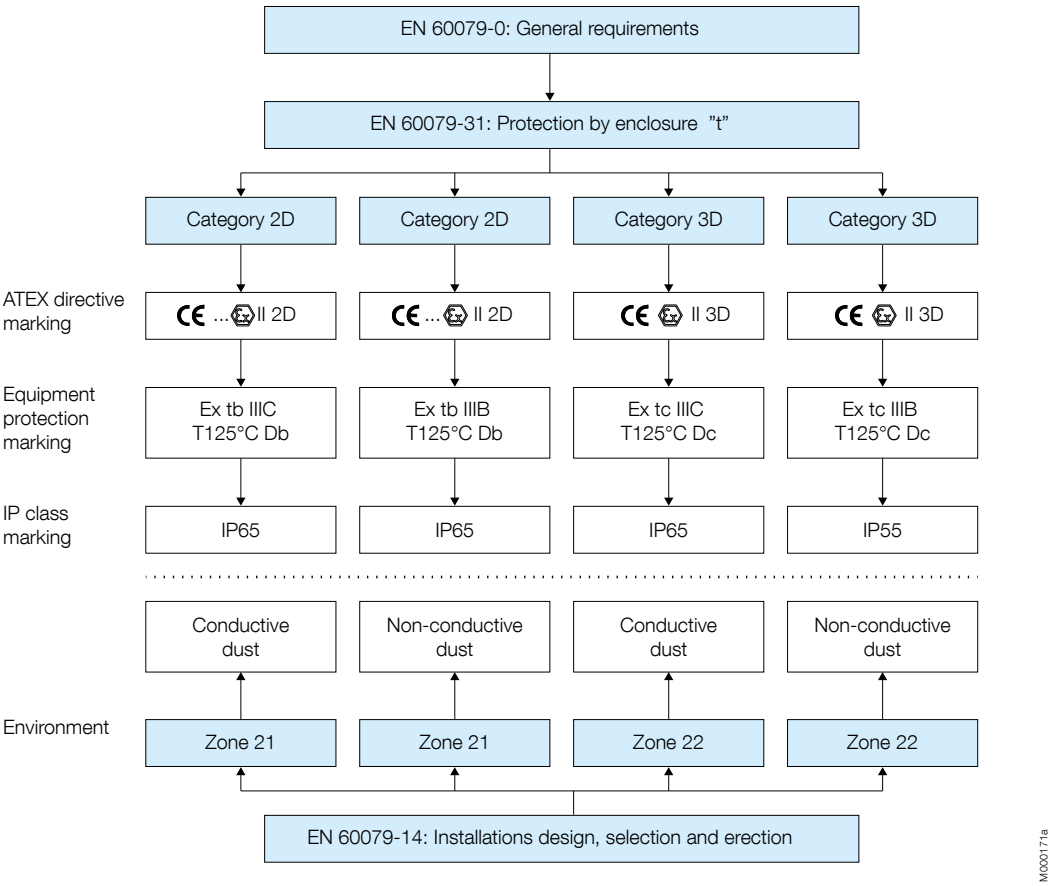
Marking of equipment protection for dust according to ATEX



Marking of equipment protection for dust according to IEC



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



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 motors. These certificates can be issued by any registered IECEx certification body (ExCB) worldwide.

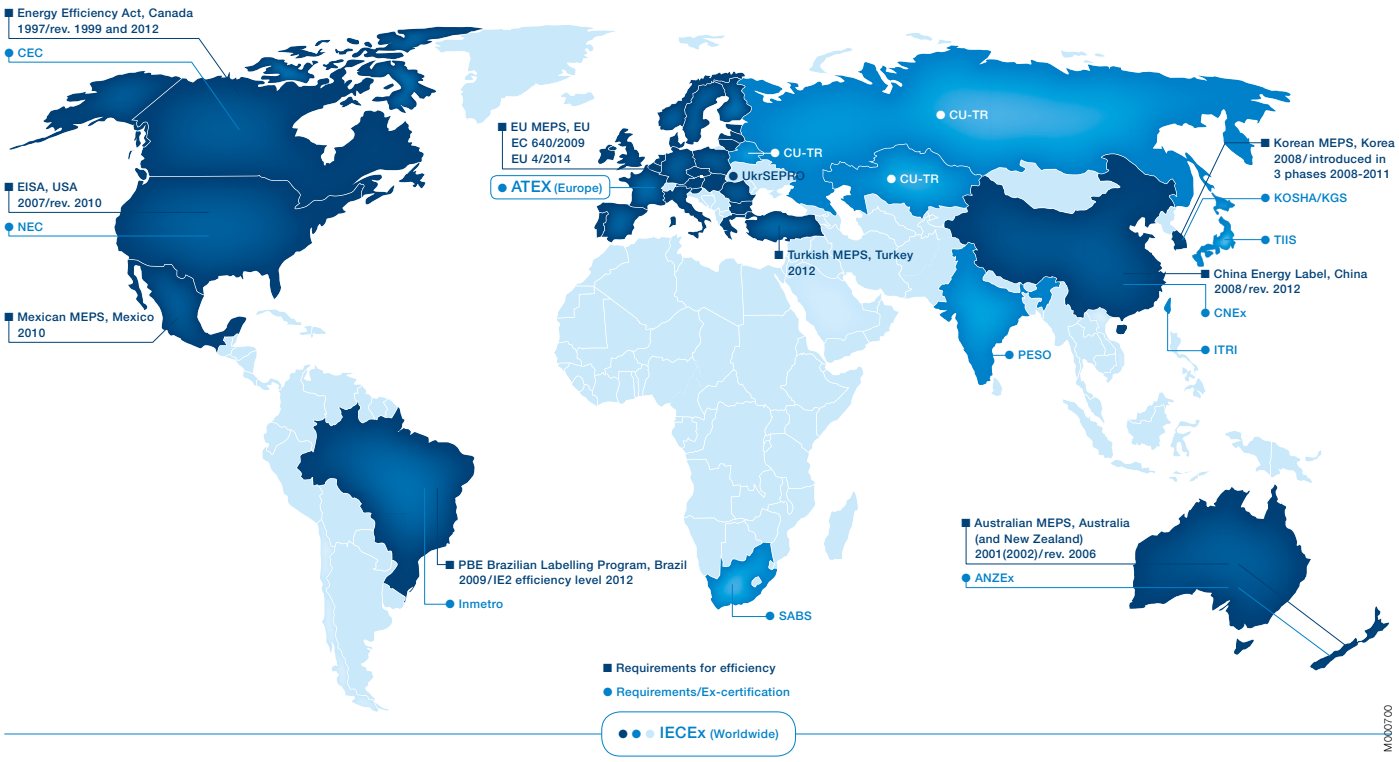
Typical national certificates available include CU-TR for Russia, Kazakhstan and Belarus, INMETRO for Brazil and CQST for China. KOSHA certification for Korea is different, because the organization importing the motor to Korea has to apply on a case-by-case basis.

International motor efficiency standards

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

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

As the scope of IEC/EN 60034-30 also covers for explosive atmospheres, these motors can be labeled with the IE -code. Ex-motors are already included in many MEPS (Minimum Energy Performance Standard) schemes around the world; Australia, the US, Canada, China, Korea and Brazil.



IEC/EN 60034-30-1:2014

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

- IE4 = Super premium effi ciency
- IE3 = Premium efficiency, identical to ‘NEMA Premium’ in the USA for 60 Hz
- IE2 = High efficiency, identical to EPAct in the USA for 60 Hz
- IE1 = Standard effi ciency

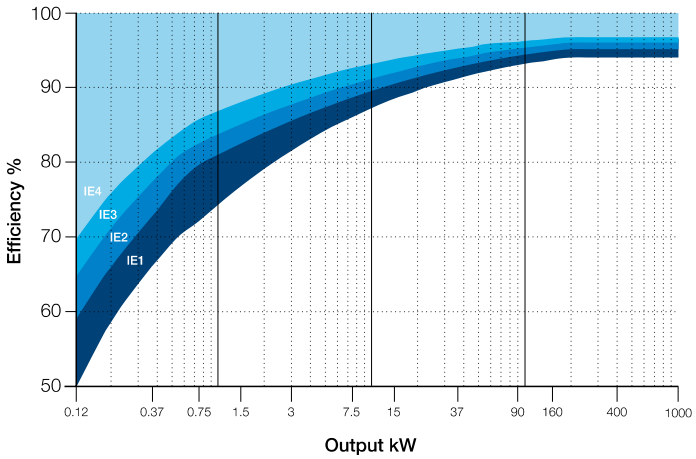
Efficiency levels defined in IEC/EN 60034-30-1 are based on test methods specified in IEC 60034-2-1.

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

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

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

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



IE Classes - 4-pole motors

ABB and efficiency standards

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

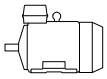
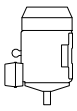
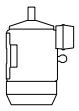
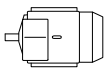
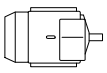
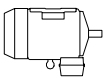
As the world market leader, ABB offers the largest range of LV motors available. It has long advocated the need for efficiency in motors, and high efficiency products have formed the core of its portfolio for many years. The core of ABB’s Process performance range is based on full range in IE2 and IE3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

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

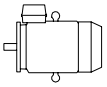
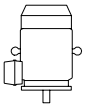
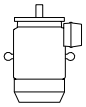
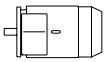
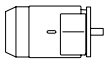
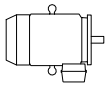
Output	IE1 Standard efficiency				IE2 High efficiency				IE3 Premium efficiency				IE4 Super Premium efficiency			
kW	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole	2 pole	4 pole	6 pole	8 pole
0.12	45.0	50.0	38.3	31.0	53.6	59.1	50.6	39.8	60.8	64.8	57.7	50.7	66.5	69.8	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
075	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	82.4	92.6	91.7	90.1	93.7	94.2	93.4	91.7
22	89.9	89.9	89.2	87.4	91.3	91.6	90.9	89.1	92.7	93.0	92.2	90.6	94.0	94.5	93.7	92.1
30	90.7	90.7	90.2	88.3	92.0	92.3	91.7	89.8	93.3	93.6	92.9	91.3	94.5	94.9	94.2	92.7
37	91.2	91.2	90.8	88.8	92.5	92.7	92.2	90.3	93.7	93.9	93.3	91.8	94.8	95.2	94.5	93.1
45	91.7	91.7	91.4	89.2	92.9	93.1	92.7	90.7	94.0	94.2	93.7	92.2	95.0	95.4	94.8	93.4
55	92.1	92.1	91.9	89.7	93.2	93.5	93.1	91.0	94.3	94.6	94.1	92.5	95.3	95.7	95.1	93.7
75	92.7	92.7	92.6	90.3	93.8	94.0	93.7	91.6	94.7	95.0	94.6	93.1	95.6	96.0	95.4	94.2
90	93.0	93.0	92.9	90.7	94.1	94.2	94.0	91.9	95.0	95.2	94.9	93.4	95.8	96.1	95.6	94.4
110	93.3	93.3	93.3	91.1	94.3	94.5	94.3	92.3	95.2	95.4	95.1	93.7	96.0	96.3	95.8	94.7
132	93.5	93.5	93.5	91.5	94.6	94.7	94.6	92.6	95.4	95.6	95.4	94.0	96.2	96.4	96.0	94.9
160	93.8	93.8	93.8	91.9	94.8	94.9	94.8	93.0	95.6	95.8	95.6	94.3	96.3	96.6	96.2	95.1
200	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.3	95.4
250	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.5	95.4
315	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
355	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
400	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
450	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4
500-1000	94.0	94.0	94.0	92.5	95.0	95.1	95.0	93.5	95.8	96.0	95.8	94.6	96.5	96.7	96.6	95.4

Mounting arrangements

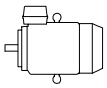
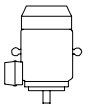
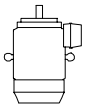
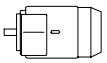
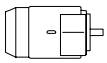
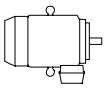
Foot-mounted motor

Code I / code II						Product code pos. 12
					 M0002007	A: foot-mounted, term.box top R: foot-mounted, term.box RHS L: foot-mounted, term.box LHS
IM B3	IM V5	IM V6	IM B6	IM B7	IM B8	
IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071	

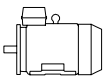
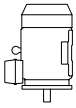
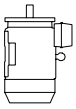
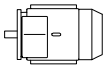
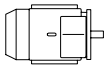
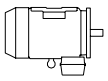
Flange-mounted motor, large flange

Code I / code II						Product code pos. 12
					 M0002008	B: flange mounted, large flange
IM B5	IM V1	IM V3	*)	*)	*)	
IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071	

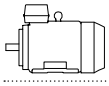
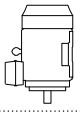
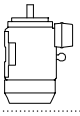
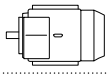
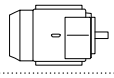
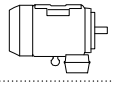
Flange-mounted motor, small flange

Code I / code II						Product code pos. 12
					 M0002009	C: flange mounted, small flange
IM B14	IM V18	IM V19	*)	*)	*)	
IM 3601	IM 3611	IM 3631	IM 3651	IM 3661	IM 3671	

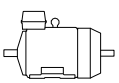
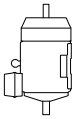
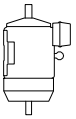
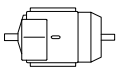
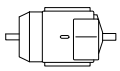
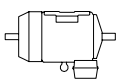
Foot- and flange-mounted motor with feet, large flange

Code I / code II						Product code pos. 12
					 M0002010	H: foot/flange-mounted, term. box top S: foot/flange-mounted, term. box RHS T: foot/flangemounted, term. box LHS
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
					 M0002011	J: foot/flangemounted, 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
					 M0002012	
IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072	

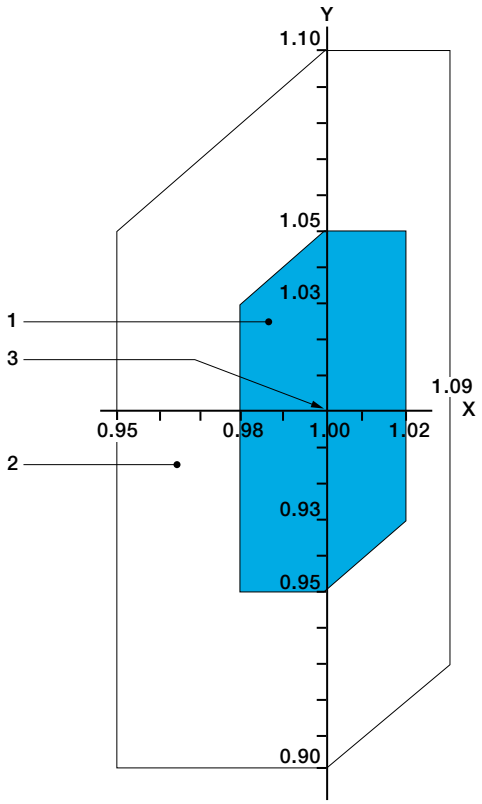
*) Not stated in IEC 60034-7.
Note: If the motor is mounted shaft upwards, take measures to prevent water or any other liquid from running down the shaft into the motor.

Voltage and frequency

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.



Voltage and frequency deviation in zones A and B

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

Cooling

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.

Explanation of the product code

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

Position 1

0:	Free circulation (open circuit)
4:	Frame surface cooled

Position 2

A:	For air (omitted for simplified designation)

Position 3

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

Position 4

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

Position 5

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

Degrees of protection: IP code and resistance to impact

Classification of degrees of protection provided by enclosures of rotating machines are refers to:
Standard IEC 60034-5 or EN 60529 for IP code

IP protection

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

Explanation of the IP code

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

Position 1	
2:	Motors protected against solid objects greater than 12 mm
4:	Motors protected against solid objects greater than 1 mm
5:	Dust-protected motors
6:	Dust-tight motors
Position 2	
3:	Motors protected against spraying water
4:	Motors protected against splashing water
5:	Motors protected against water jets
6:	Motors protected against heavy seas

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 means an impact energy strenght of 7J for both enclosure and fan cover.

Insulation

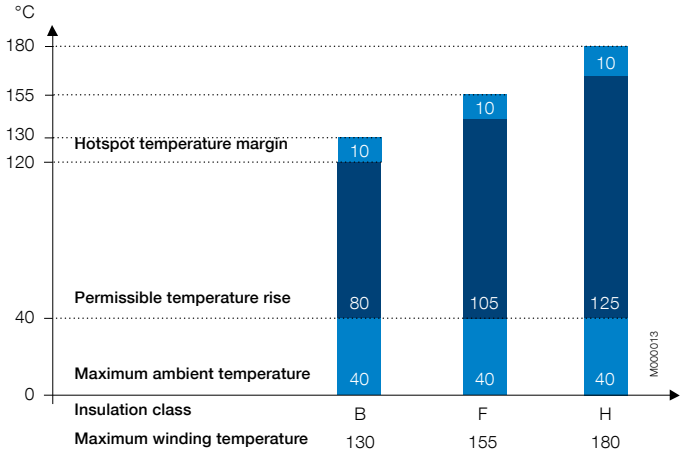
ABB uses class F insulation, which, with temperature rise B, is the most common requirement among industry today.

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

Thermal class 180 (H)
- Nominal ambient temperature 40°C
- Max permissible temperature rise 125 K
- Hot spot temperature margin 10 K



Safety margins per thermal class.

Surface treatment

The surface treatment categorization of ABB motors is based on the ISO 12944 standard. ISO 12994-5 divides paint system durability into three categories: low (L), medium (M), and high (H). Low durability corresponds to a lifetime of 2 – 5 years, medium to 5 – 15 years, and high durability to over 15 years.

The durability range is not a guaranteed lifetime. Its purpose is to help the owner of the motor plan for appropriate maintenance intervals. More frequent maintenance may be required because of fading, chalking, contamination, wear and tear, or for other reasons.

ABB's standard surface treatment is corrosivity category C3, durability range M (which equal to medium corrosivity and medium durability). Special surface treatment is available in corrosivity categories C4 and C5-M, durability class M for both. In addition, surface treatment according to the NORSOK standard for offshore environments is available as an option.

The standard ABB paint color for motors is Munsell blue 8B 4.5/3.25.

Corrositivity categories	Outdoor atmospheres	Indoor atmospheres	Use in ABB motors
C1, very low	Not used	Heated buildings with clean atmospheres	Not available
C2, low	Atmospheres with low level pollution, mostlyrural areas	Unheated buildings where condensation mayoccur, such as depots and sports halls	Not available
C3, medium	Urban and industrial atmospheres, moderatesulfur dioxide pollution. Coastal areas withlow salinity	Production rooms with high humidity andsome air pollution; food processing plants,laundries, breweries, dairies	Standard treatment
C4, high	Industrial areas and coastal areas with moderatesalinity	Chemical plants, swimming pools, coastalship- and boatyards	Optional treatment for cast iron motors, variantcode 115
C5-I, very high (industrial)	Industrial areas and coastal areas with highhumidity and aggressive atmosphere	Buildings or areas with nearly permanentcondensation and high pollution	Not available
C5-M, very high (marine)	Coastal and offshore areas with high salinity	Buildings or areas with nearly permanentcondensation and high pollution	Optional treatment for cast iron motors, variantcode 754, 710 and 711

Atmospheric corrosivity categories and recommended environments.

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 (on request), non-sparking, and dust ignition protection. These motors are designed and certified for operation with frequency converters. Instructions for the different protection types, as well as for the most common types of converter, are provided below. If further information is needed, please do not hesitate to contact ABB.

A. Main requirements for hazardous area motors used with variable speed drives

1. Flameproof motors (Ex d, Ex de)

The standards specify that the motor must be dimensioned so that its maximum outer surface temperature is limited according to the temperature class. In most cases this requires either type tests or control of the outer surface temperature of the motor.

Most ABB flameproof motors for temperature class T4 have been type tested with ABB ACS800 and ACS880 converters utilizing Direct Torque Control (DTC) as well as with ABB ACS550 frequency converters, and these combinations can be selected using the loadability curves shown in Figures 2 and 4. Combined tests with the above mentioned converters are needed only if the limits of the loadability curves are exceeded. In such cases separate certification of the motor and converter combination may also be required.

In the case of other voltage source converters using pulse width modulation (PWM) with scalar or vector control, combined tests are needed to confirm the correct thermal performance of the motor. These tests can be avoided if the motor is fitted with thermal sensors to control the surface temperature. Such motors have the following additional markings on their rating plate: -“PTC” with the tripping temperature and “DIN 44081/82”. Alternatively can Pt100s be used to monitor the surface temperature, in that case is the motor provided with an additional plate telling the tripping temperature that should be set.

In the case of voltage source PWM converters, with a minimum switching frequency of 3 kHz or higher, the instructions provided in section B/2.4 can be used for preliminary dimensioning.

For more information on using flameproof motors for temperature classes T5 and T6 with variable speed drives, please contact ABB.

2. Increased safety motors (Ex e)

The motor should always be tested together with the specified converter, and ABB therefore does not recommend the use of low voltage increased safety motors with variable speed drives.

3. Non-sparking motors (Ex nA)

According to the standards, the combination of motor and converter must be tested as a unit with the specified converter or a comparable one or dimensioned by calculation.

ABB non-sparking cast iron motors have been type tested with ABB ACS800 and ACS880 converters utilizing DTC control as well as with ABB ACS550 converters, and these combinations can be selected using the dimensioning instructions provided in section B/2.2. Combined tests with the above mentioned converters are needed only if the limits of the loadability curves are exceeded. In such cases separate certification of the motor and converter combination may also be required.

In the case of other voltage source PWM converters, combined tests are needed to confirm the correct thermal behavior of the motor. For preliminary dimensioning purposes, the instructions provided in section B/2.4 can be used. The final values must be verified by combined tests.

4. Dust ignition protection motors (Ex t)

The standards specify that the motor must be dimensioned so that its maximum outer surface temperature is limited according to the temperature class (e.g. T125 °C or T150 °C). For more information on temperature classes lower than 125 °C, please contact ABB.

ABB Ex t motors (T125 °C and T150 °C) have been type tested with ACS800 and ACS880 converters utilizing DTC control as well as with ABB ACS550 converters, and these combinations can be selected using the dimensioning instructions provided in section B/2.4. Combined tests with above mentioned converters are needed only if the limits of the loadability curves are exceeded. On such cases also separate certification of the motor and converter combination may be required.

In the case of any other voltage source PWM converter, combined tests are needed to confirm the correct thermal performance of the motor. These tests can be avoided if the motor is fitted with thermal sensors to control the surface temperature. Such motors have the following additional markings on their rating plate: -“PTC” with the tripping temperature and “DIN 44081/82”.

In the case of voltage source PWM converters with a minimum switching frequency of 3 kHz or higher, the instructions provided in section B/2.2 can be used for preliminary dimensioning.

B. Other safety criteria

These criteria are imposed by the competent bodies in order to ensure the safe use of motors with converters in explosive atmospheres.

1. Type tests and certification

ABB has certified the complete range of Ex d, Ex de, Ex nA and Ex t motors for operation with frequency converters.
The certification is based on extensive type testing of the different motor types together with ABB ACS 800, ACS 880 and ACS 550 converters.

2. Motor dimensioning for variable speed applications

2.1 General

The voltage (or current) fed by the frequency converter is not purely sinusoidal. This may increase motor losses, vibration, and noise. Furthermore, a change in the distribution of the losses may affect the motor temperature balance and lead to increased temperature.

When the motor is operating at low speeds the cooling capacity of the ventilation fan is decreased, which reduces the motor’s loadability. A separate constant speed fan can be used to increase cooling capacity and loadability at low speeds.

When dimensioning a motor for variable speed applications, the continuous thermal dimensioning and short time overloads should be considered.

2.2 Thermal dimensioning with ABB ACS800 and ACS880 converters utilizing DTC control

In the case of ABB ACS800 and ACS880 converters utilizing DTC control, dimensioning can be done using the loadability curves (or load capacity curves) in Figures 2 and 3. The loadability curves show the maximum permitted continuous output torque of the motor as a function of supply frequency. The output torque is given as a percentage of the motor’s nominal torque.

In case scalar control mode is used might a further reduce of load be required.

The most convenient method to dimension the motor is to utilize ABB’s DriveSize program. This tool can be downloaded from the ABB website (www.abb.com/motors&generators)
The loadability curves are based on nominal supply voltage.

Note: the maximum speed of the motor must not be exceeded even if the loadability curves extend to 100 Hz.

2.3 Thermal dimensioning with ABB ACS550 converters

In the case of ABB ACS550 converters, dimensioning can be done using the loadability curves in Figures 4 and 5. Also in the case of ACS550 driven applications, the most convenient method to dimension the motor is to utilize ABB’s DriveSize program.

Note 1. The loadability curves in Figures 4 and 5 are based on a switching frequency of 3 kHz.

Note 2. For constant torque applications the lowest permitted continuous operating frequency is 15 Hz.

Note 3. For quadratic torque applications the lowest continuous operating frequency is 5 Hz.

2.4 Thermal dimensioning with other voltage source PWM-type converters

For VSDs other than DTC-controlled, ACS800, ACS880 and ACS550 converters, preliminary dimensioning can be done using the loadability curves in Figures 4 and 5. The utilization of these curves assumes a minimum switching frequency of 3 kHz.

To ensure safe operation, the combination of motor and frequency converter must either be tested for the specific protection type or thermal sensors must be fitted to control the surface temperature. Frequencies below 15 Hz shall be avoided or tested separately.

Note: the actual thermal loadability of a motor may be lower than shown by the guideline curves.

2.5 Short time overloads

Short time overloading is usually possible with ABB flameproof motors. For the exact values, please see the motor’s rating plate.

Overloadability is specified by three factors:

I_{OL} Maximum short time current
T_{OL} Length of permitted overload period
T_{COOL} Cooling time required after each overload period.

During the cooling period the motor current and torque must remain below the limit of permitted continuous loadability.

3. Operating speed

When a motor is used with a frequency converter, its actual operating speed may deviate considerably from its nominal speed (i.e. the speed stamped on the rating plate). When operating at higher speeds, ensure that the highest permissible rotational speed of the motor, or the critical speed of the equipment as a whole, is not exceeded.

The permitted maximum speed must be stated on a rating plate. This can be either a separate plate or the regular plate required for variable speed drive motors.

4. Thermal protection of windings

Most ABB Ex motors are equipped with PTC thermistors to prevent the winding temperatures from exceeding the thermal limits of the insulation materials (usually Insulation Class F). Please check the product specific data in the corresponding section of this catalog.

In countries where the ATEX requirements are in force must, if the motor certificate so requires, the thermistors be connected to a thermistor circuit relay. The relay must function independently and that is dedicated to reliably trip off the supply to the motor according to the requirements of the “Essential Health and Safety Requirements” in Annex II, item 1.5.1 of the ATEX Directive 94/9/EC or 2014/34/EU. The latest motor certificates, like for the flame proof motor range do no longer require connection of thermistors but connection is still recommended due to the additional protection the thermistors give.

In countries where the ATEX requirements are not in force, it is nevertheless recommended that the thermistors are connected to a thermistor circuit relay that functions independently and will reliably trip off the supply to the motor. Note: local installation rules may either require certification of the relay or allow the thermistors to be connected to equipment other than a thermistor relay, such as the control inputs of a frequency converter.

Note: the above recommendations do not apply to increased safety “e” motors.

5. Rating plates

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

ABB CONVERTER SUPPLY

Valid for			380-415 V	FWP	50 Hz
3~ Motor	M3KP 132SME 4 IMB3/IM1001				
No. 3G1F1518262869					
Min. switching frequency: DTC: 2 kHz PWM: 3 kHz					
I = 1,5 x IN	tOL = 10 s		tCOOL = 10 min		
Duty S9	ACS800/880 with DTC CONTROL				
f [Hz]	5	20	45	50	60
T/Tn [%]	55	90	100	92	76
	ACS550				
f [Hz]	15	20	45	50	60
T/Tn [%]	75	85	95	87	71
IEC60034-1					

M000732

ABB CONVERTER SUPPLY

3~ Motor	M3KP 132SMD 6 IMB3/IM1001					
No. 3G1F1519263888						
Frequency converter type	ACS800/DTC					
Switching frequency	2 kHz					
FWP 400V 50Hz						
V	Hz	kW	r/min	A	Nm	Duty
400 D	52	5	1000	12	48	S9
QUADRATIC TORQUE: 0-1000rpm						

M000733a

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.

C. Technical criteria

1. Lubrication

The effectiveness of the motor lubrication should be checked by measuring the surface temperature of the bearing endshields under normal operating conditions. For more information, see the “Manual for Motors for explosive atmospheres”.

In continuous operation at very low speeds, as well as at low temperatures, the lubrication capabilities of standard greases may not be sufficient, making it necessary to use special greases with additives.

If the motor is equipped with sealed bearings (i.e. bearings greased for life) any deviation in the operating temperature from the design temperature will result in a change in the lifetime of the bearing.

2. Winding insulation

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

2.1 Phase to phase voltages

The maximum permitted phase to phase voltage peaks at the motor terminals as a function of pulse rise time can be seen in Figure 1.

The highest curve (“ABB Special Insulation”) applies to random wound motors with a special winding insulation for frequency converter supply, variant code 405. The “ABB Standard Insulation” curve applies to all other random wound motors covered by this catalog.

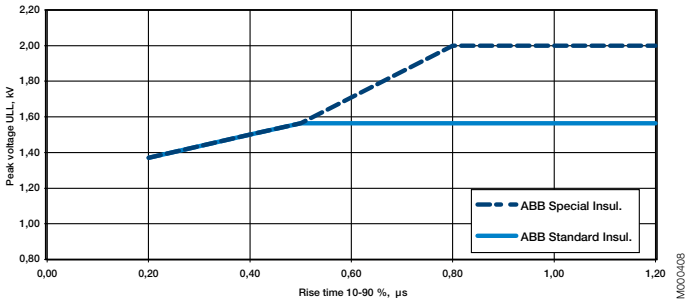


Figure 1. Permitted phase to phase voltage peaks at motor terminals as a function of rise time.

2.2 Phase to ground voltages

The permitted phase to ground voltage peaks at the motor terminals are:

– Standard Insulation 1300 V peak
– Special Insulation 1800 V peak

2.3 Selection of winding insulation for ACS800, ACS880 and ACS550 supplied motors

In the case of ABB ACS800, ACS 880 and ACS550 single drives with a diode supply unit (uncontrolled DC voltage), the motor winding insulation and frequency converter output filters can be selected using Table 2.

Nominal supply voltage U_N of converter	Winding insulation and filters required
Nominal supply voltage U_N of converter $U_N \leq 500$ V	ABB Standard insulation
Nominal supply voltage U_N of converter $U_N \leq 600$ V	ABB Standard insulation + dU/dt filters OR ABB Special insulation (variant code 405)
Nominal supply voltage U_N of converter $U_N \leq 690$ V	ABB Special insulation (variant code 405) AND dU/dt-filters at converter output
Nominal supply voltage U_N of converter $600 \text{ V} < U_N \leq 690$ V cable length > 150 m	ABB Special insulation (variant code 405)

Table 2. Selection of motor winding insulation and converter output filters for motors supplied by ABB ACS800, ACS880 or ACS550 drives with uncontrolled DC voltage.

For more information on dU/dt filters, please see relevant ABB Drives catalogs.

For more information on resistor braking and converters with controlled supply units, please contact ABB.

2.4 Selection of winding insulation with all other converters

The voltage stresses must be restricted so they remain below the accepted limits. The effect of any filters that are fitted must be taken into account when dimensioning the motor.

3. 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 cabling and grounding methods must be used.

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

In the case of ABB ACS800, ACS880 and ACS550 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. 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.

3.2 Elimination of bearing currents with all other converters

The user is responsible for protecting the motor and driven equipment from harmful bearing currents. The instructions provided in section 3.1 can be followed, but their effectiveness cannot be guaranteed in all cases.

4. Cabling, grounding and EMC

The use of a frequency converter places greater demands on the cabling and grounding of the drive system. To provide proper grounding and ensure compliance with any applicable EMC requirements, motors above 30 kW shall be cabled using shielded symmetrical cables and EMC glands, i.e. cable glands providing 360° bonding. Symmetrical and shielded cables are also highly recommended for smaller motors.
For motors in frame size IEC 280 and upward, additional potential equalization between the motor frame and the driven equipment is needed, unless both are mounted on a common steel base. In this case, the high frequency conductivity of the connection provided by the steel base should be checked.

More information about grounding and cabling of variable speed drives can be found in the manual “Grounding and cabling of the drive system” (Code: 3AFY 61201998) and material on fulfilling the EMC requirements can be found in the relevant converter manuals.

Please note that proper cable glands providing 360° bonding, or equivalent, must also be used for the converter and safety switch, if fitted.

The correct grounding of the motor and driven equipment is also necessary for the avoidance of bearing voltages and currents.

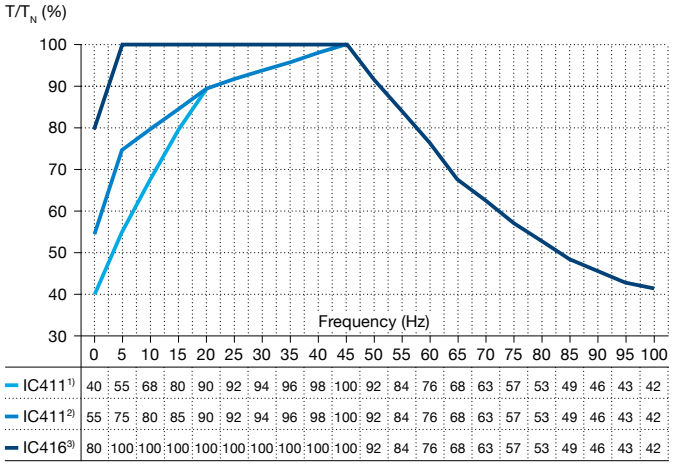
D. Loadability curves of motors for explosive atmospheres

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. See paragraphs B2.2, 2.3 and 2.4 in this chapter for more information about how to apply the curves.

In case of motors with dual certification, rated for either gas or dust, should both loadability be checked for both cases. The curve giving the lower loadability within the desired speed range should be selected for the final dimensioning.

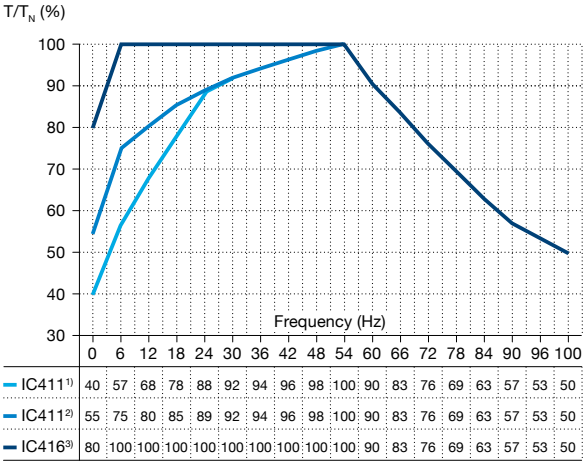
Loadability curves with ACS800/880 converters utilizing DTC control

Loadability with ABB ACS 800/880 converters, DTC control, Flameproof motors Ex d / Ex de T4, frame size 80 - 400 and Dust ignition protection motors Ex t T150°C, frame sizes 71 - 400 / 50Hz



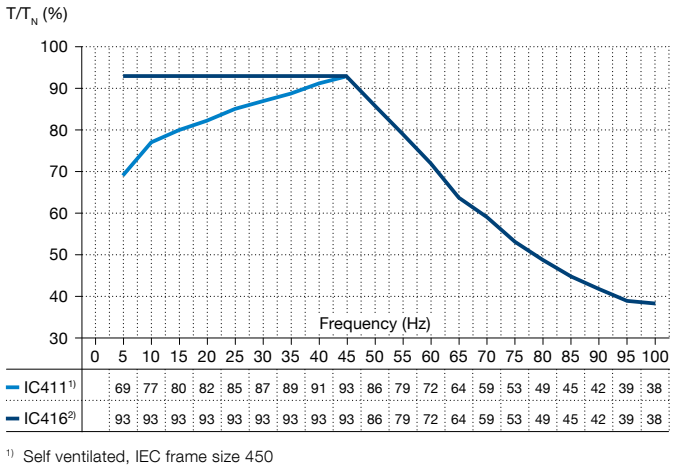
[1] Self ventilated, IEC frame size 71 - 132
[2] Self ventilated, IEC frame size 160 - 400
[3] Separate motor cooling (force ventilated), IEC frame size 160 - 400

Loadability with ABB ACS 800/880 converters, DTC control, Flameproof motors Ex d / Ex de T4, frame size 80 - 400 and Dust ignition protection motors Ex t T150°C, frame sizes 71 - 400 / 60Hz



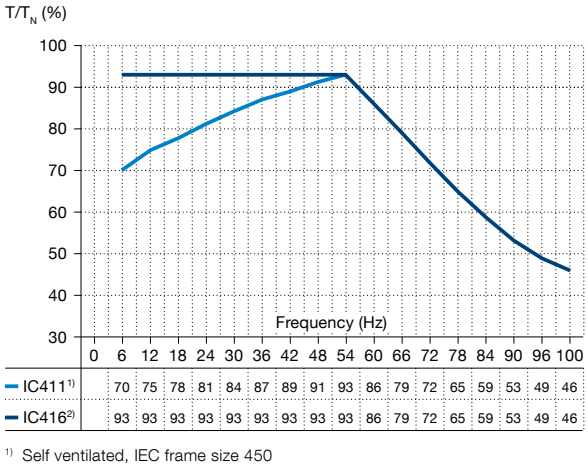
[1] Self ventilated, IEC frame size 71 - 132
[2] Self ventilated, IEC frame size 160 - 400
[3] Separate motor cooling (force ventilated), IEC frame size 160 - 400

Loadability with ABB ACS 800/880 converters, DTC control, Flameproof motors Ex d / Ex de T4, frame size 450 and Dust ignition protection motors Ex t T150°C, frame size 450 / 50Hz



[1] Self ventilated, IEC frame size 450
[2] Separate motor cooling (force ventilated)

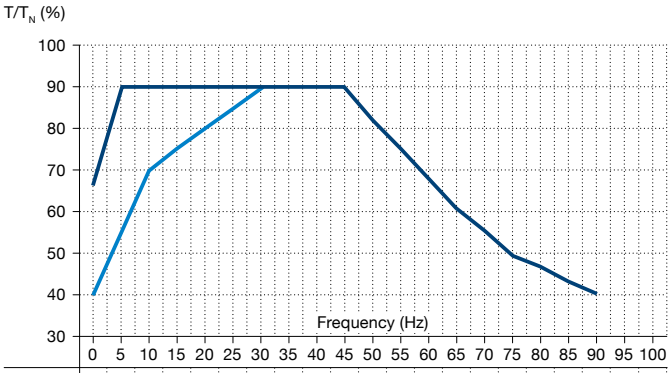
Loadability with ABB ACS 800/880 converters, DTC control, Flameproof motors Ex d / Ex de T4, frame size 450 and Dust ignition protection motors Ex t T150°C, frame size 450 / 60Hz



[1] Self ventilated, IEC frame size 450
[2] Separate motor cooling (force ventilated)

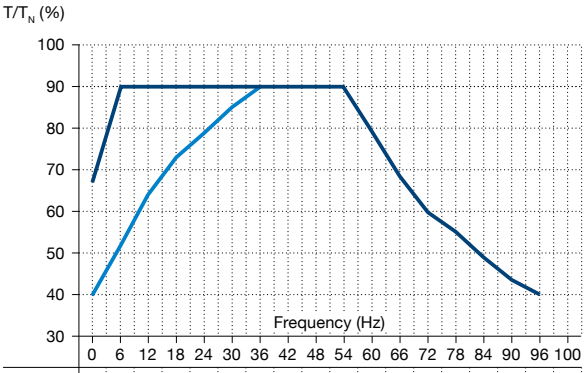
Figure 2. Flameproof motors Ex d, Ex de T4, cast iron dust ignition protection motors Ex t T150 °C; nominal frequency of motor 50/60 Hz

Loadability with ABB ACS 800/880 converters, DTC control, Non-sparking motors Ex nA T3, frame size 71 - 450 and Dust ignition protection motors Ex t T125°C, frame sizes 71 - 450 / 50Hz



[1] Self ventilated, IEC frame size 71 - 450
[2] Separate motor cooling (force ventilated)

Loadability with ABB ACS 800/880 converters, DTC control, Non-sparking motors Ex nA T3, frame size 71 - 450 and Dust ignition protection motors Ex t T125°C, frame sizes 71 - 450 / 60Hz

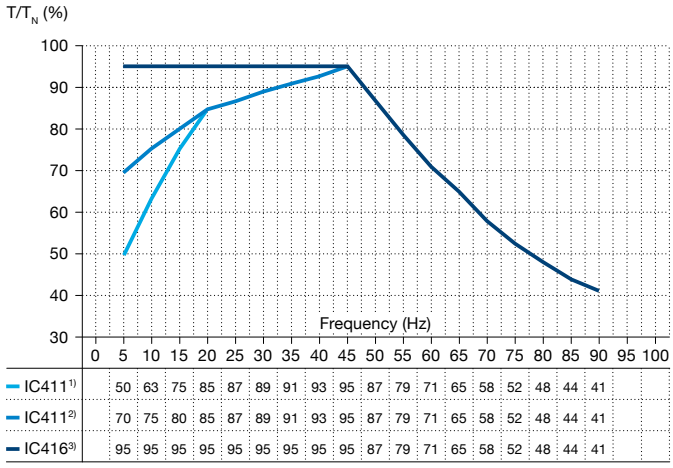


[1] Self ventilated, IEC frame size 71 - 450
[2] Separate motor cooling (force ventilated)

Figure 3. Non-sparking motors Ex nA, cast iron and aluminum dust ignition protection motors Ex t T125 °C; nominal frequency of motor 50/60 Hz

Guideline loadability curves with ACS550 converters and other voltage source PWM-type convereters

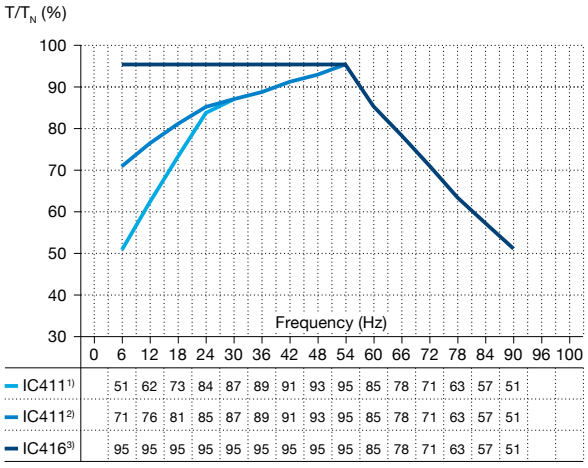
Loadability with ABB ACS 550 (vector or scalar control) and other voltage source converters, Flameproof motors Ex d / Ex de T4, frame size 80 - 400 and Dust ignition protection motors Ex t T150°C, frame sizes 71 - 400 / 50Hz



[1] Self ventilated, IEC frame size 71 - 132
[2] Self ventilated, IEC frame size 160 - 400
[3] Separate motor cooling (force ventilated), IEC frame size 160 - 400

Note: Lower speed limit for constant torque loads is 15Hz

Loadability with ABB ACS 550 (vector or scalar control) and other voltage source converters, Flameproof motors Ex d / Ex de T4, frame size 80 - 400 and Dust ignition protection motors Ex t T150°C, frame sizes 71 - 400 / 60Hz



[1] Self ventilated, IEC frame size 71 - 132
[2] Self ventilated, IEC frame size 160 - 400
[3] Separate motor cooling (force ventilated), IEC frame size 160 - 400

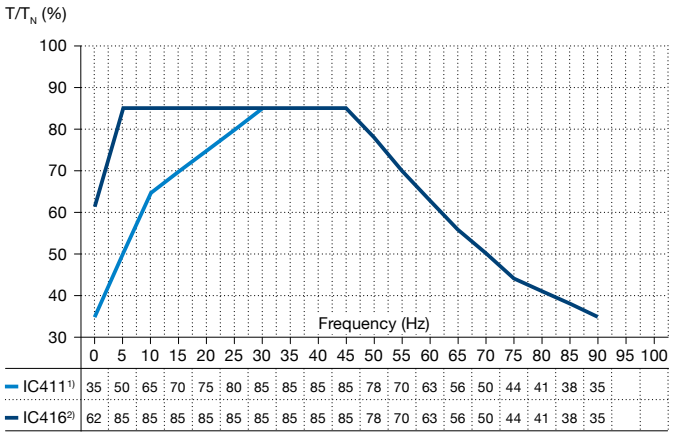
Note: Lower speed limit for constant torque loads is 18Hz

Note: In case of use with other voltage source converters than ACS550 must the motor be protected against excessive surface temperature by inbuilt direct temperature control.

Figure 4. Flameproof motors Ex d, Ex de T4, cast iron dust ignition protection motors Ex t T150 °C; nominal frequency of motor 50/60 Hz

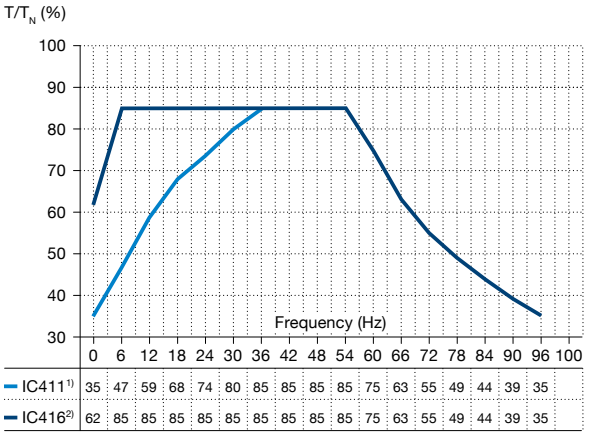
Loadability curves with ACS 550 converters

Loadability with ABB ACS 550 (vector or scalar control) converters, Non-sparking motors Ex nA T3, frame size 71 - 450 and Dust ignition protection motors Ex t T125°C, frame sizes 71 - 450 / 50Hz



[1] Self ventilated, IEC frame size 71 - 450
[2] Separate motor cooling (force ventilated)

Loadability with ABB ACS 550 (vector or scalar control) converters, Non-sparking motors Ex nA T3, frame size 71 - 450 and Dust ignition protection motors Ex t T125°C, frame sizes 71 - 450 / 60Hz



[1] Self ventilated, IEC frame size 71 - 4500
[2] Separate motor cooling (force ventilated)

Figure 5. Non-sparking motors Ex nA , cast iron dust ignition protection motors Ex t T125 °C; nominal frequency of motor 50/60 Hz

Flameproof motors Ex d IIB/IIC T4 Gb

Totally enclosed squirrel cage three phase low voltage motors, Sizes 80 to 450, 0.55 to 710 kW

Ordering information

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

Example	
Motor type	M3JP 160 MLA
Pole number	2
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	11 kW
Product code	3GJP161410-ADH
Variant codes if needed	

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 - 4

3GJP:	Totally enclosed frameproof motor E xd 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

Serial number

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 with clearance holes
C:	Flange-mounted, small flange with tapped holes
V:	Flange-mounted, special flange
H:	Foot/flange-mounted, large flange with clearance holes
J:	Foot/flange-mounted, small flange with tapped holes
S:	Foot/flange-mounted, terminal box RHS seen from D-end
T:	Foot/flange-mounted, terminal box LHS seen from D-end
F:	Foot/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**

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

The two bullets in the product code indicate choice of mounting arrangements, voltage and frequency code.

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

Rating plates

The rating plates are in table form giving values for speed, current and power factor for three voltages: 400V-415V-690V as standard. Other voltage and frequency combinations are possible and can be ordered with variant codes 002 or 209. Please see Variant code section.

The following information will be shown on the motor rating plate:

- Lowest nominal efficiency at 100 %, 75 % and 50 % rated load
- Efficiency level
- Year of manufacture
- Type of protection
- Apparatus group
- Temperature class
- Identification number of the certification body
- Certificate number (both ATEX and IECEx are stamped on the rating plate as standard)

Motor sizes 80 to 450

ABB Oy, Motors and Generators
Vaasa, Finland

CE 0081 IE2 IEC60034-1 Ex II 2G

3~ Motor M3JP 315SMB 4 IMB3/IM1001 2015

Ex d II B T4 Gb

1011259-3

No. 3G1F1506253204 Ins. cl. F IP 55

V		Hz	kW	r/min	A	cos φ	Duty
690	Y	50	132	1487	134	0.86	S1
400	D	50	132	1487	232	0.86	S1
415	D	50	132	1488	226	0.85	S1

IE2-95.4%(100%)-95.4%(75%)-94.7%(50%)

Product code 3GJP312220-ADG

LCIE 11 ATEX 3090 X / IECEx LCI 04.0007X

Manual: 3GZF500730-47

6319/C3 6316/C3 1060 kg

M000737

Technical data for Ex d IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2 poles				400 V 50 Hz				CENELEC-design							
0.75	M3JP 80MA 2	3GJP081310-••H	2877	80.7	80.2	76.5	0.85	1.54	7.1	2.4	4.0	4.6	0.0006	37	59
1.1	M3JP 80MB 2	3GJP081320-••H	2831	81.6	82.3	80.5	0.87	2.26	6.2	3.7	2.6	3.3	0.0007	39	59
1.5	M3JP 90SLA 2	3GJP091010-••H	2881	82.0	82.2	79.9	0.88	3.0	6.7	4.9	3.0	3.5	0.001	50	61
2.2	M3JP 90SLC 2	3GJP091030-••H	2877	83.7	84.3	83.0	0.89	4.2	7.8	7.3	2.7	3.5	0.0014	53	61
3	M3JP 100LA 2	3GJP101510-••H	2896	86.0	86.5	84.8	0.90	5.7	6.6	9.9	2.0	2.6	0.0036	70	65
4	M3JP 112MB 2	3GJP111320-••H	2891	86.0	87.0	87.0	0.89	7.59	6.9	13.2	2.0	3.0	0.0043	73	65
5.5	M3JP 132SMB 2	3GJP131220-••H	2905	87.0	86.4	84.4	0.89	10.5	6.8	17.99	2.6	3.4	0.009	101	71
7.5	M3JP 132SMD 2	3GJP131240-••H	2914	89.2	89.7	88.7	0.90	13.7	7.5	24.6	3.3	3.6	0.012	109	71
11	M3JP 160MLA 2	3GJP161410-••H	2931	90.1	90.4	89.3	0.89	20.2	6.7	35.81	2.5	3.2	0.043	213	71
15	M3JP 160MLB 2	3GJP161420-••H	2929	91.2	91.7	90.8	0.89	27.0	7.2	48.9	2.9	3.4	0.052	222	71
18.5	M3JP 160MLC 2	3GJP161430-••H	2934	91.6	92.4	92.3	0.90	32.4	7.4	60.3	3.1	3.5	0.062	233	69
22	M3JP 180MLA 2	3GJP181410-••H	2938	91.7	92.3	91.8	0.90	39.1	7.0	71.4	2.5	3.2	0.089	265	69
30	M3JP 200MLA 2	3GJP201410-••G	2956	93.2	93.6	93.0	0.88	52.7	7.4	96.9	3.0	3.2	0.15	310	74
37	M3JP 200MLC 2	3GJP201430-••G	2954	93.6	94.0	93.4	0.89	64.7	7.5	119.9	2.8	3.2	0.19	340	75
45	M3JP 225SMB 2	3GJP221220-••G	2968	93.8	93.9	93.0	0.87	78.8	7.2	144	2.7	3.0	0.26	400	76
55	M3JP 250SMA 2	3GJP251210-••G	2975	94.3	94.2	93.2	0.89	95.1	7.8	176	2.4	3.1	0.49	460	75
75 [1]	M3JP 280SMA 2	3GJP281210-••G	2977	94.3	93.8	92.2	0.88	131	7.6	240	2.1	3.0	0.8	625	77
90 [1]	M3JP 280SMB 2	3GJP281220-••G	2976	94.6	94.7	93.8	0.89	154	7.4	288	2.1	2.9	0.9	665	77
110 [1]	M3JP 315SMA 2	3GJP311210-••G	2982	94.9	94.4	92.9	0.86	197	7.4	352	2.2	3.2	1.2	980	78
132 [1]	M3JP 315SMB 2	3GJP311220-••G	2982	95.1	94.8	93.6	0.88	227	7.4	422	2.2	3.0	1.4	940	78
160 [1]	M3JP 315SMC 2	3GJP311230-••G	2981	95.4	95.2	94.2	0.89	271	7.5	512	2.3	3.0	1.7	1025	78
200 [1]	M3JP 315MLA 2	3GJP311410-••G	2980	95.7	95.7	94.9	0.90	335	7.7	640	2.6	3.0	2.1	1190	78
250 [1]	M3JP 355SMA 2	3GJP351210-••G	2984	95.7	95.5	94.5	0.89	423	7.7	800	2.1	3.3	3.0	1600	83
315 [1]	M3JP 355SMB 2	3GJP351220-••G	2980	95.7	95.6	95.0	0.89	531	7.0	1009	2.1	3.0	3.4	1680	83
355 [1]	M3JP 355SMC 2	3GJP351230-••G	2984	95.7	95.7	94.9	0.88	603	7.2	1136	2.2	3.0	3.6	1940	83
400 [1]	M3JP 355MLA 2	3GJP351410-••G	2982	96.9	96.6	95.9	0.88	677	7.1	1280	2.3	2.9	4.1	2190	83
450 [1]	M3JP 355MLB 2	3GJP351420-••G	2983	97.1	97.0	96.4	0.90	743	7.9	1440	2.2	2.9	4.3	2270	83
500 [1]	M3JP 355LKA 2	3GJP351810-••G	2982	96.9	96.9	96.5	0.90	827	7.5	1601	2.0	3.9	4.8	2510	83
560 [3]	M3JP 400LA 2	3GJP401510-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	3230	82
560 [3]	M3JP 400LKA 2	3GJP401810-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	3230	82
630 [3]	M3JP 400LB 2	3GJP401520-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3330	82
630 [3]	M3JP 400LKB 2	3GJP401820-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3330	82
710 [3]	M3JP 400LC 2	3GJP401530-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3580	82
710 [3]	M3JP 400LKC 2	3GJP401830-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3580	82
3000 r/min = 2 poles				400 V 50 Hz				High-output design							
9.2 [2]	M3JP 132SME 2	3GJP131250-••H	2875	86.9	88.2	87.9	0.91	16.9	6.0	30.6	2.6	2.9	0.012	109	71
22 [2]	M3JP 160MLD 2	3GJP161440-••H	2929	91.2	91.9	91.4	0.90	38.3	7.5	71.7	3.1	3.3	0.07	239	77
30	M3JP 180MLB 2	3GJP181420-••H	2943	92.5	93.2	92.6	0.90	52.2	7.1	97.23	2.3	3.2	0.13	298	78
37	M3JP 180MLC 2	3GJP181430-••H	2950	92.8	93.1	92.8	0.90	64.9	8.1	119.9	3.3	3.7	0.13	298	77
45	M3JP 200MLE 2	3GJP201450-••G	2945	93.3	93.5	93.1	0.88	79.4	7.3	146	2.9	3.1	0.22	345	79
55	M3JP 225SMC 2	3GJP221230-••G	2965	93.9	94.2	93.5	0.88	95.8	7.1	177	2.6	3.0	0.29	420	80
67 [4]	M3JP 225SMD 2	3GJP221240-••G	2966	93.9	93.9	93.0	0.86	120	7.4	215	2.8	3.2	0.31	430	78
75	M3JP 250SMB 2	3GJP251220-••G	2969	93.8	93.9	93.2	0.89	129	7.9	241	2.6	3.1	0.57	500	80
90 [4]	M3JP 250SMC 2	3GJP251230-••G	2965	94.4	94.5	93.9	0.89	153	7.7	289	2.5	3.0	0.59	510	80
110 [1]	M3JP 280SMC 2	3GJP281230-••G	2978	95.1	95.1	94.5	0.90	186	7.9	352	2.4	3.0	1.15	725	77

[1] 3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering, see variant codes 044 and 045
[2] Efficiency class IE1
[3] Unidirectional fan construction as standard. Direction of rotation must be stated when ordering, see variant codes 044 and 045
[4] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Technical data for Ex d IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4 poles				400 V 50 Hz				CENELEC-design							
0.55 [2]	M3JP 80MA 4	3GJP082310-••H	1421	76.6	76.9	74.1	0.73	1.49	4.7	3.7	2.2	2.7	0.001	38	59
0.75	M3JP 80MB 4	3GJP082320-••H	1416	80.2	80.1	77.5	0.75	1.87	5.4	5.0	2.7	3.1	0.0012	40	59
1.1	M3JP 90SLA 4	3GJP092010-••H	1432	82.2	82.1	79.6	0.77	2.5	6.5	7.3	3.0	3.5	0.002	51	54
1.5	M3JP 90SLC 4	3GJP092030-••H	1431	83.2	83.6	81.9	0.78	3.3	6.6	10.0	3.3	3.7	0.003	53	54
2.2	M3JP 100LA 4	3GJP102510-••H	1437	85.5	86.5	85.8	0.84	4.4	5.9	14.6	2.3	3.0	0.0075	70	52
3	M3JP 100LB 4	3GJP102520-••H	1444	86.5	87.5	86.8	0.83	6.1	6.4	19.9	2.7	3.4	0.0081	72	59
4	M3JP 112MC 4	3GJP112330-••H	1458	88.2	87.7	85.4	0.78	8.6	9.2	26.3	3.4	4.9	0.013	81	61
5.5	M3JP 132SMB 4	3GJP132220-••H	1458	89.5	89.2	87.3	0.80	11.7	7.9	36.0	3.7	3.8	0.023	111	60
7.5	M3JP 132SMD 4	3GJP132240-••H	1460	89.2	89.0	87.3	0.76	16.7	8.4	49.2	4.0	3.9	0.034	114	60
11	M3JP 160MLC 4	3GJP162430-••H	1470	91.2	91.3	90.0	0.82	21.5	8.0	71.5	3.3	3.8	0.096	232	62
15	M3JP 160MLE 4	3GJP162450-••H	1467	92.0	92.3	91.8	0.84	28.5	8.0	97.7	3.3	3.2	0.13	255	61
18.5	M3JP 180MLA 4	3GJP182410-••H	1474	91.6	92.1	91.5	0.83	35.7	7.2	120	2.6	3.1	0.19	277	62
22	M3JP 180MLB 4	3GJP182420-••H	1474	92.2	92.5	91.9	0.82	42.0	7.7	142	2.8	3.4	0.23	296	62
30	M3JP 200MLB 4	3GJP202420-••G	1471	92.5	93.2	93.1	0.84	55.0	7.4	194	3.0	2.8	0.34	340	61
37	M3JP 225SMB 4	3GJP222220-••G	1480	93.6	93.9	93.4	0.85	69.0	7.6	239	3.2	2.9	0.42	390	67
45	M3JP 225SMC 4	3GJP222230-••G	1477	94.1	94.4	94.3	0.86	78.4	7.6	291	3.2	2.7	0.49	425	67
55	M3JP 250SMA 4	3GJP252210-••G	1479	94.7	94.7	94.1	0.84	100	7.2	355	2.5	3.1	0.72	415	66
75	M3JP 280SMA 4	3GJP282210-••G	1484	94.5	94.7	94.4	0.85	134	6.9	482	2.5	2.8	1.25	625	68
90	M3JP 280SMB 4	3GJP282220-••G	1483	94.7	95.0	94.5	0.85	160	7.2	579	2.5	2.7	1.5	765	68
110	M3JP 315SMA 4	3GJP312210-••G	1487	95.1	95.1	94.3	0.86	194	7.2	706	2.3	2.8	2.3	900	70
132	M3JP 315SMB 4	3GJP312220-••G	1487	95.4	95.4	94.7	0.86	232	7.1	847	2.3	2.7	2.6	960	70
160	M3JP 315SMC 4	3GJP312230-••G	1487	95.3	95.3	94.8	0.85	284	7.2	1027	2.4	2.9	2.9	1000	70
200	M3JP 315MLA 4	3GJP312410-••G	1486	95.6	95.6	95.3	0.86	351	7.2	1285	2.5	2.9	3.5	1160	70
250	M3JP 355SMA 4	3GJP352210-••G	1488	95.9	96.0	95.5	0.85	442	7.1	1604	2.3	2.7	5.9	1610	74
315	M3JP 355SMB 4	3GJP352220-••G	1488	95.9	96.2	95.8	0.86	550	7.3	2021	2.3	2.8	6.9	1780	74
355	M3JP 355SMC 4	3GJP352230-••G	1487	95.9	96.2	95.9	0.87	614	6.8	2279	2.4	2.7	7.2	2010	78
400	M3JP 355MLA 4	3GJP352410-••G	1489	96.3	96.3	95.9	0.85	705	6.8	2565	2.3	2.6	8.4	2330	78
450	M3JP 355MLB 4	3GJP352420-••G	1490	96.7	96.7	96.1	0.86	780	6.9	2884	2.3	2.9	8.4	2330	78
500	M3JP 355LKA 4	3GJP352810-••G	1490	97.0	97.0	96.5	0.86	865	6.8	3204	2.0	3.0	10	2690	78
560	M3JP 400LA 4	3GJP402510-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3200	78
560	M3JP 400LKA 4	3GJP402810-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3200	78
630	M3JP 400LB 4	3GJP402520-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3580	78
630	M3JP 400LKB 4	3GJP402820-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3580	78
710 [1]	M3JP 400LC 4	3GJP402530-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3680	78
710 [1]	M3JP 400LKC 4	3GJP402830-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3680	78
1500 r/min = 4 poles				400 V 50 Hz				High-output design							
9.2 [2]	M3JP 132SME 4	3GJP132250-••H	1446	88.4	89.2	88.1	0.80	18.7	6.0	60.7	2.7	3.0	0.034	114	60
18.5	M3JP 160MLF 4	3GJP162460-••H	1469	91.8	92.2	91.6	0.84	35.0	8.2	120	3.5	3.8	0.13	255	68
22 [2]	M3JP 160MLG 4	3GJP162470-••H	1466	90.8	91.1	90.3	0.81	43.9	8.3	143	2.9	3.9	0.13	255	68
30 [2]	M3JP 180MLC 4	3GJP182430-••H	1466	92.1	92.4	91.8	0.81	59.6	7.6	195	2.2	3.3	0.248	304	66
37	M3JP 200MLC 4	3GJP202430-••G	1475	93.0	93.1	92.4	0.82	70.5	7.5	239	3.5	3.2	0.34	340	73
55	M3JP 225SMD 4	3GJP222240-••G	1483	94.3	94.4	93.9	0.83	101	7.4	354	3.4	2.9	0.55	445	68
60 [2]	M3JP 225SME 4	3GJP222250-••G	1477	93.6	93.7	92.9	0.84	110	8.0	387	3.6	3.0	0.55	445	74
75 [2]	M3JP 250SMB 4	3GJP252220-••G	1476	93.8	94.2	93.9	0.86	135	7.0	485	2.6	2.9	0.88	505	73
86	M3JP 250SMC 4	3GJP252230-••G	1477	94.9	95.3	95.0	0.85	155	7.8	556	2.9	3.5	0.98	495	74
110	M3JP 280SMC 4	3GJP282230-••G	1485	95.1	95.4	95.1	0.86	193	7.6	707	3.0	3.0	1.85	725	68

[1] Temperature rise class F
[2] Efficiency class IE1

Technical data for Ex d IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6 poles				400 V 50 Hz				CENELEC-design							
0.37	M3JP 80MA 6	3GJP083310-••H	952	71.6	68.4	61.4	0.58	1.28	4.6	3.7	3.5	3.9	0.0022	38	50
0.55 [2]	M3JP 80MB 6	3GJP083320-••H	938	70.3	68.1	61.8	0.65	1.73	4.2	5.5	2.7	3.1	0.0022	38	50
0.75	M3JP 90SLA 6	3GJP093010-••H	946	79.2	78.2	74.1	0.64	2.1	5.5	7.6	3.1	3.6	0.0037	52	44
1.1	M3JP 90SLC 6	3GJP093030-••H	938	78.5	77.9	74.3	0.70	3.1	4.6	11.3	2.7	3.0	0.0048	53	44
1.5	M3JP 100LA 6	3GJP103510-••H	951	81.6	81.4	78.8	0.72	3.7	5.3	15.1	2.2	3.0	0.012	69	54
2.2	M3JP 112MB 6	3GJP113320-••H	950	82.5	82.2	79.4	0.72	5.5	5.0	22.1	2.1	2.8	0.014	72	54
3	M3JP 132SMB 6	3GJP133220-••H	961	84.0	84.3	82.5	0.75	6.8	6.0	29.8	1.9	3.2	0.032	105	57
4	M3JP 132SMC 6	3GJP133230-••H	967	85.7	85.6	83.6	0.75	9.3	6.3	39.5	2.1	3.4	0.034	107	57
5.5	M3JP 132SMD 6	3GJP133240-••H	967	87.5	87.7	86.2	0.72	12.7	7.2	54.3	2.3	3.6	0.039	109	62
7.5	M3JP 160MLA 6	3GJP163410-••H	965	87.6	88.6	88.3	0.78	15.8	6.4	74.2	1.7	2.9	0.126	253	65
11	M3JP 160MLB 6	3GJP163420-••H	972	90.1	91.0	90.4	0.81	22.1	6.9	108	2.4	3.5	0.126	253	65
15	M3JP 180MLB 6	3GJP183420-••H	973	90.5	91.0	90.5	0.82	29.7	6.8	147	1.8	3.0	0.25	304	58
18.5	M3JP 200MLA 6	3GJP203410-••G	983	90.5	90.9	90.2	0.82	36.2	7.1	179	3.2	3.1	0.37	300	66
22	M3JP 200MLB 6	3GJP203420-••G	983	91.6	92.0	91.5	0.82	42.8	7.5	213	3.2	3.2	0.43	320	61
30	M3JP 225SMB 6	3GJP223220-••G	985	92.2	92.7	92.4	0.82	57.9	7.4	290	3.4	3.0	0.64	385	61
37	M3JP 250SMA 6	3GJP253210-••G	990	93.4	93.8	93.3	0.81	70.6	6.5	357	2.4	3.1	1.16	455	66
[45]	M3JP 280SMA 6	3GJP283210-••G	990	93.4	93.8	93.5	0.83	83.8	7.0	434	2.5	2.5	1.85	705	66
55	M3JP 280SMB 6	3GJP283220-••G	990	93.8	94.2	93.9	0.84	100	7.0	530	2.7	2.6	2.2	645	66
75	M3JP 315SMA 6	3GJP313210-••G	992	94.4	94.4	93.5	0.82	139	7.4	721	2.4	2.8	3.2	830	70
90	M3JP 315SMB 6	3GJP313220-••G	992	94.8	94.7	94.1	0.84	166	7.5	866	2.4	2.8	4.1	930	70
110	M3JP 315SMC 6	3GJP313230-••G	991	95.0	95.0	94.6	0.83	201	7.4	1059	2.5	2.9	4.9	1100	70
132	M3JP 315MLA 6	3GJP313410-••G	991	95.3	95.4	94.9	0.83	240	7.5	1271	2.7	3.0	5.8	1150	68
160	M3JP 355SMA 6	3GJP353210-••G	993	95.4	95.6	95.2	0.83	291	7.0	1538	2.0	2.6	7.9	1520	75
200	M3JP 355SMB 6	3GJP353220-••G	993	95.7	95.9	95.7	0.83	364	7.2	1923	2.2	2.7	9.7	1680	75
250	M3JP 355SMC 6	3GJP353230-••G	993	95.7	95.8	95.4	0.82	460	7.4	2404	2.6	2.9	11.3	1820	75
315	M3JP 355MLB 6	3GJP353420-••G	992	95.7	96.0	95.5	0.83	570	7.0	3032	2.5	2.7	13.5	2180	75
355	M3JP 355LKA 6	3GJP353810-••G	992	95.7	95.9	95.4	0.81	658	7.6	3417	2.7	2.9	15.5	2690	75
400	M3JP 400LA 6	3GJP403510-••G	993	96.2	96.2	95.6	0.82	731	7.1	3846	2.3	2.7	17	3180	76
400	M3JP 400LKA 6	3GJP403810-••G	993	96.2	96.2	95.6	0.82	731	7.1	3846	2.3	2.7	17	3180	76
450	M3JP 400LB 6	3GJP403520-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3430	76
450	M3JP 400LKB 6	3GJP403820-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3430	76
500	M3JP 400LC 6	3GJP403530-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3580	76
500	M3JP 400LKC 6	3GJP403830-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3580	76
560	M3JP 400LD 6	3GJP403540-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3680	77
560	M3JP 400LKD 6	3GJP403840-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3680	77
630	M3JP 450LA 6	3GJP453510-••G	994	96.7	96.7	96.3	0.84	1127	6.5	6053	1.1	2.5	31	4320	81
1000 r/min = 6 poles				400 V 50 Hz				High-output design							
14 [1] [2]	M3JP 160MLC 6	3GJP163430-••H	969	89.2	89.5	88.5	0.75	30.1	7.5	138	2.8	4.0	0.126	253	64
18.5 [2]	M3JP 180MLC 6	3GJP183430-••H	971	90.1	90.1	88.5	0.74	41.2	7.3	181	2.5	3.7	0.25	304	61
30 [2]	M3JP 200MLC 6	3GJP203430-••G	983	90.6	90.8	89.6	0.81	59.3	7.5	291	3.5	3.4	0.49	340	65
37 [2]	M3JP 225SMC 6	3GJP223230-••G	983	91.8	92.1	92.2	0.83	69.6	7.1	359	3.0	2.8	0.75	415	64
45	M3JP 250SMB 6	3GJP253220-••G	986	93.1	93.4	93.2	0.84	84.0	7.2	435	3.3	2.8	1.49	500	65
75	M3JP 280SMC 6	3GJP283230-••G	990	94.2	94.7	94.5	0.84	137	7.3	723	2.8	2.7	2.85	725	66

[1] Temperature rise class F
[2] Efficiency class IE1

Technical data for Ex d IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8 poles				400 V 50 Hz				CENELEC-design							
0.18	M3JP 80MA 8	3GJP084310-••H	720	57.7	52.0	43.4	0.42	1.15	3.3	2.4	3.7	4.0	0.0022	38	36
0.25	M3JP 80MB 8	3GJP084320-••H	705	61.4	57.2	49.5	0.51	1.21	3.2	3.4	2.6	2.8	0.0022	38	36
0.37	M3JP 90SLA 8	3GJP094010-••H	697	65.5	63.7	57.6	0.63	1.33	3.0	5.1	2.0	2.2	0.0036	50	36
0.55	M3JP 90SLC 8	3GJP094030-••H	695	68.7	67.7	63.2	0.61	2.0	3.0	7.5	2.2	2.4	0.0037	52	36
0.75	M3JP 100LA 8	3GJP104510-••H	720	76.5	74.1	68.3	0.54	2.7	4.2	9.9	2.4	3.1	0.012	69	54
1.1	M3JP 100LB 8	3GJP104520-••H	717	76.4	74.9	70.2	0.57	3.6	3.7	14.6	2.1	2.9	0.012	69	54
1.5	M3JP 112MC 8	3GJP114330-••H	713	75.3	73.3	67.6	0.54	5.4	3.4	20.1	2.0	3.2	0.014	73	54
2.2	M3JP 132SMC 8	3GJP134230-••H	720	80.3	79.2	75.4	0.65	6.1	4.5	29.1	1.7	2.7	0.034	107	59
3 [2]	M3JP 132SMD 8	3GJP134240-••H	711	79.9	80.3	78.1	0.71	8.0	4.1	40.4	1.5	2.8	0.036	109	59
4	M3JP 160MLA 8	3GJP164410-••H	722	83.3	84.7	84.2	0.70	10.3	4.7	52.9	1.6	2.6	0.133	251	59
5.5	M3JP 160MLB 8	3GJP164420-••H	723	86.8	87.2	86.0	0.71	13.5	5.8	72.7	1.9	3.1	0.133	251	53
7.5 [1] [2]	M3JP 160MLC 8	3GJP164430-••H	718	82.0	84.0	84.0	0.70	19.3	5.7	99.8	2.1	2.9	0.133	251	55
11	M3JP 180MLB 8	3GJP184420-••H	723	88.3	89.2	88.7	0.72	25.5	5.6	145	2.0	3.0	0.245	298	63
15	M3JP 200MLA 8	3GJP204410-••G	734	89.9	90.4	89.5	0.79	30.6	6.9	195	2.4	3.2	0.45	315	56
18.5	M3JP 225SMA 8	3GJP224210-••G	734	90.0	90.7	90.2	0.74	39.2	6.1	240	2.2	3.0	0.61	370	55
22	M3JP 225SMB 8	3GJP224220-••G	732	90.6	91.4	91.2	0.81	45.3	6.5	287	1.9	2.9	0.68	350	56
30	M3JP 250SMA 8	3GJP254210-••G	735	91.6	91.0	90.5	0.79	60.7	6.7	389	2.0	2.9	1.25	420	56
37	M3JP 280SMA 8	3GJP284210-••G	742	92.7	92.9	92.2	0.79	72.6	7.3	476	1.7	3.0	1.85	605	65
45	M3JP 280SMB 8	3GJP284220-••G	741	93.2	93.4	92.8	0.78	89.2	7.6	579	1.8	3.1	2.2	645	65
55	M3JP 315SMA 8	3GJP314210-••G	742	93.4	93.9	93.4	0.79	106	7.1	707	1.6	2.7	3.2	830	62
75	M3JP 315SMB 8	3GJP314220-••G	741	93.7	93.8	93.7	0.82	146	7.1	966	1.7	2.7	4.1	930	62
90	M3JP 315SMC 8	3GJP314230-••G	741	94.0	94.3	94.0	0.82	170	7.4	1159	1.8	2.7	4.9	1000	64
110	M3JP 315MLA 8	3GJP314410-••G	740	94.0	94.2	94.3	0.83	211	7.3	1419	1.8	2.7	5.8	1150	72
132	M3JP 355SMA 8	3GJP354210-••G	744	94.7	94.6	94.2	0.80	256	7.5	1694	1.5	2.6	7.9	1520	69
160	M3JP 355SMB 8	3GJP354220-••G	744	95.2	95.2	94.8	0.77	293	7.6	1926	1.6	2.6	9.7	1680	69
200	M3JP 355SMC 8	3GJP354230-••G	742	95.3	95.7	95.5	0.79	385	7.4	2576	1.6	2.6	11.3	1930	69
250	M3JP 355MLB 8	3GJP354420-••G	743	95.4	95.5	95.0	0.80	472	7.5	3213	1.6	2.7	13.5	2370	72
315	M3JP 400LA 8	3GJP404510-••G	743	96.1	96.0	95.6	0.81	592	7.0	4043	1.2	2.6	17	3180	71
315	M3JP 400LKA 8	3GJP404810-••G	743	96.1	96.0	95.6	0.81	592	7.0	4043	1.2	2.6	17	3180	71
355	M3JP 400LB 8	3GJP404520-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3480	71
355	M3JP 400LKB 8	3GJP404820-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3480	71
400	M3JP 400LC 8	3GJP404530-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3680	71
400	M3JP 400LKC 8	3GJP404830-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3680	71
450	M3JP 450LA 8	3GJP454510-••G	744	96.2	96.5	96.2	0.83	813	6.0	5775	1.0	2.5	26	3920	80
500	M3JP 450LB 8	3GJP454520-••G	744	96.3	96.4	96.2	0.83	902	6.4	6417	1.0	2.6	29	4160	80
560	M3JP 450LC 8	3GJP454530-••G	744	96.4	96.5	96.1	0.82	1038	7.0	7188	1.2	2.9	35	4520	80
630 [1]	M3JP 450LD 8	3GJP454540-••G	745	96.6	96.7	96.2	0.81	1162	7.6	8075	1.3	3.2	41	4960	80
750 r/min = 8 poles				400 V 50 Hz				High-output design							
18.5	M3JP 200MLB 8	3GJP204420-••G	734	89.2	89.8	88.8	0.80	37.1	6.9	240	2.2	3.2	0.54	335	57
30	M3JP 225SMC 8	3GJP224230-••G	731	90.7	91.6	91.6	0.78	61.2	6.3	391	2.3	3.0	0.75	410	59
37	M3JP 250SMB 8	3GJP254220-••G	737	92.2	92.9	92.5	0.79	73.0	7.5	479	2.3	3.4	1.52	500	59
55	M3JP 280SMC 8	3GJP284230-••G	741	93.4	93.7	93.6	0.80	107	7.9	708	1.9	3.1	2.85	725	65

[1] Temperature rise class F
[2] Efficiency class IE1

Technical data for Ex d IIB/IIC T4 Gb
Flameproof IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2 poles				400 V 50 Hz				CENELEC-design							
11	M3JP 160MLA 2	3GJP161410-••L	2943	91.2	92.0	91.6	0.91	19.1	7.2	35.6	2.6	3.6	0.057	225	69
15	M3JP 160MLB 2	3GJP161420-••L	2947	91.9	92.2	91.8	0.88	26.5	8.2	48.5	3.2	4.2	0.063	232	69
18.5	M3JP 160MLC 2	3GJP161430-••L	2949	92.4	93.0	92.6	0.90	32.0	9.0	59.8	3.3	3.9	0.076	246	73
22	M3JP 180MLA 2	3GJP181410-••L	2956	92.7	93.1	92.7	0.90	37.7	7.8	71.0	3.4	3.8	0.110	282	73
30	M3JP 200MLA 2	3GJP201410-••L	2957	93.3	93.8	93.6	0.88	52.4	7.5	96.9	2.5	3.1	0.182	332	73
37	M3JP 200MLB 2	3GJP201420-••L	2960	93.7	94.2	94.1	0.89	64.2	8.2	119.5	3.1	3.4	0.222	359	73
45	M3JP 225SMA 2	3GJP221210-••L	2968	94.0	94.0	93.0	0.87	79.6	7.3	144.8	3.2	3.1	0.296	405	76
55	M3JP 250SMA 2	3GJP251210-••L	2968	94.3	93.7	93.6	0.89	94.8	6.8	177	2.4	3.0	0.426	470	76
75	M3JP 280SMB 2	3GJP281220-••L	2978	94.7	94.4	93.5	0.88	130	7.0	240	2.3	3.0	0.90	766	74
90	M3JP 280SMC 2	3GJP281230-••L	2975	95.0	95.0	94.2	0.88	158	6.4	289	2.1	2.8	0.99	795	74
110	M3JP 315SMB 2	3GJP311220-••L	2982	95.2	94.9	93.9	0.87	192	7.0	352	1.8	2.7	1.3	1008	78
132	M3JP 315SMC 2	3GJP311230-••L	2982	95.4	95.4	94.6	0.87	229	6.8	422	2.0	2.8	1.5	1063	78
160	M3JP 315SMD 2	3GJP311240-••L	2983	95.6	95.6	94.9	0.87	275	7.4	512	2.2	2.8	1.7	1120	78
200	M3JP 315MLA 2	3GJP311410-••L	2983	95.8	95.8	95.3	0.88	342	7.7	640	2.5	3.1	2.1	1190	81
250	M3JP 355SMA 2	3GJP351210-••L	2985	95.8	95.6	94.6	0.89	423	7.7	800	2.1	3.3	3.0	1790	83
315	M3JP 355SMB 2	3GJP351220-••L	2980	95.8	95.7	95.0	0.89	529	7.0	1009	2.1	3.0	3.4	1870	83
355	M3JP 355SMC 2	3GJP351230-••L	2984	95.8	95.8	95.0	0.88	605	7.2	1136	2.2	3.0	3.6	1940	83
3000 r/min = 2 poles				400 V 50 Hz				High-output design							
250	M3JP 315LKB 2	3GJP311820-••L	2983	95.8	96.0	95.5	0.90	419	7.7	800	2.5	3.3	2.9	1630	81
1500 r/min = 4 poles				400 V 50 Hz				CENELEC-design							
11	M3JP 160MLA 4	3GJP162410-••L	1477	91.4	91.8	91.1	0.82	21.1	7.6	71.3	2.6	3.3	0.110	240	61
15	M3JP 160MLB 4	3GJP162420-••L	1477	92.1	92.4	91.6	0.82	28.5	8.2	97.0	3.0	3.7	0.135	259	61
18.5	M3JP 180MLA 4	3GJP182410-••L	1481	92.6	93.2	92.9	0.83	34.9	7.2	119	2.8	3.0	0.219	291	60
22	M3JP 180MLB 4	3GJP182420-••L	1481	93.0	93.5	93.3	0.82	41.4	6.5	142	3.0	3.2	0.243	296	60
30	M3JP 200MLA 4	3GJP202410-••L	1483	93.6	93.8	93.4	0.84	54.8	7.5	193	2.7	3.2	0.385	360	63
37	M3JP 225SMA 4	3GJP222210-••L	1482	93.9	94.1	93.8	0.83	68.9	7.2	239	3.1	3.1	0.427	394	67
45	M3JP 225SMB 4	3GJP222220-••L	1482	94.2	94.4	94.0	0.84	82.3	8.0	290	3.2	3.5	0.525	431	66
55	M3JP 250SMA 4	3GJP252210-••L	1482	94.6	94.7	94.0	0.84	100	7.1	354	2.9	3.4	0.694	442	68
75	M3JP 280SMB 4	3GJP282220-••L	1485	95.0	95.2	94.8	0.86	133	6.4	483	2.3	2.8	1.38	749	75
90	M3JP 280SMC 4	3GJP282230-••L	1485	95.2	95.5	95.2	0.86	158	7.1	578	2.5	2.9	1.73	809	75
110	M3JP 315SMB 4	3GJP312220-••L	1489	95.4	95.5	94.9	0.84	195	7.0	705	2.1	3.0	2.43	1026	71
132	M3JP 315SMC 4	3GJP312230-••L	1488	95.6	95.9	95.5	0.86	231	6.7	847	2.2	2.9	2.9	1099	71
160	M3JP 315SMD 4	3GJP312240-••L	1488	95.8	96.0	95.8	0.85	282	6.9	1026	2.2	3.0	3.2	1139	71
200	M3JP 315MLB 4	3GJP312420-••L	1487	96.0	96.4	96.4	0.86	351	6.8	1284	2.4	3.0	3.9	1312	74
250	M3JP 355SMA 4	3GJP352210-••L	1491	96.0	96.0	95.6	0.86	435	6.4	1601	2.1	2.9	5.9	1791	78
315	M3JP 355SMB 4	3GJP352220-••L	1491	96.0	96.1	95.7	0.85	550	7.3	2018	2.4	3.3	6.9	1959	78
355	M3JP 355SMC 4	3GJP352230-••L	1490	96.0	96.2	95.8	0.86	616	6.3	2273	2.3	2.8	7.2	1999	78
1500 r/min = 4 poles				400 V 50 Hz				High-output design							
250	M3JP 315LKA 4	3GJP312810-••L	1488	96.0	96.3	96.1	0.85	442	6.9	1604	2.5	3.2	4.4	1500	78

Technical data for Ex d IIB/IIC T4 Gb
Flameproof IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6 poles				400 V 50 Hz				CENELEC-design							
7.5	M3JP 160MLA 6	3GJP163410-••L	975	89.1	90.0	90.0	0.77	15.7	5.7	73.2	1.4	3.0	0.089	225	59
11	M3JP 160MLB 6	3GJP163420-••L	975	90.3	91.1	91.1	0.78	22.5	6.4	108	1.6	3.1	0.138	259	64
15	M3JP 180MLA 6	3GJP183410-••L	979	91.2	91.9	91.6	0.79	30.1	5.2	147	1.5	2.7	0.212	288	63
18.5	M3JP 200MLA 6	3GJP203410-••L	989	91.7	91.9	91.2	0.82	35.2	6.5	179	2.2	3.2	0.496	340	59
22	M3JP 200MLB 6	3GJP203420-••L	989	92.2	92.4	91.4	0.81	42.4	7.3	212	2.6	3.5	0.585	367	59
30	M3JP 225SMA 6	3GJP223210-••L	988	92.9	93.0	92.2	0.77	60.4	7.7	291	2.9	3.6	0.724	419	63
37	M3JP 250SMA 6	3GJP253210-••L	990	93.3	93.7	93.5	0.80	71.1	6.5	357	2.4	3.1	1.30	503	58
45	M3JP 280SMB 6	3GJP283220-••L	991	93.7	94.0	93.5	0.84	82	7.4	433	2.7	3.0	1.87	735	72
55	M3JP 280SMC 6	3GJP283230-••L	992	94.1	94.3	93.8	0.86	99	7.5	528	2.8	3.0	2.57	785	71
75	M3JP 315SMB 6	3GJP313220-••L	994	94.6	94.9	94.6	0.84	136	6.8	720	1.8	2.6	4.1	994	75
90	M3JP 315SMC 6	3GJP313230-••L	994	94.9	95.1	94.7	0.84	164	7.2	864	2.0	3.0	4.6	1070	76
110	M3JP 315SMD 6	3GJP313240-••L	994	95.1	95.3	95.0	0.83	200	7.3	1056	2.2	3.1	4.9	1118	75
132	M3JP 315MLB 6	3GJP313420-••L	995	95.4	95.5	95.1	0.82	242	7.3	1266	2.3	3.2	6.3	1292	72
160	M3JP 355SMA 6	3GJP353210-••L	993	95.6	95.8	95.6	0.82	292	6.7	1538	2.5	2.6	7.9	1633	75
200	M3JP 355SMB 6	3GJP353220-••L	993	95.8	96.2	96.1	0.82	365	6.7	1923	2.6	2.5	9.7	1792	75
250	M3JP 355SMC 6	3GJP353230-••L	993	95.8	96.1	95.8	0.81	465	7.7	2404	3.0	3.1	11.3	2009	75
315	M3JP 355MLB 6	3GJP353420-••L	993	95.8	96.1	96.0	0.83	571	6.8	3029	2.6	3.2	13.5	2370	76
355	M3JP 355LKA 6	3GJP353810-••L	993	95.8	96.0	95.9	0.81	653	7.5	3413	2.9	3.2	15.5	2670	76
1000 r/min = 6 poles				400 V 50 Hz				High-output design							
160	M3JP 315LKA 6	3GJP313810-••L	994	95.6	95.8	95.4	0.81	298	7.5	1535	2.2	3.1	7.3	1500	76
750 r/min = 8 poles				400 V 50 Hz				CENELEC-design							
37	M3JP 280SMA 8	3GJP284210-••L	742	91.8	92.1	91.4	0.79	73.0	7.3	476	1.7	3.0	1.85	705	65
45	M3JP 280SMB 8	3GJP284220-••L	741	92.2	92.4	91.8	0.78	89.6	7.6	579	1.8	3.1	2.2	745	65
55	M3JP 315SMA 8	3GJP314210-••L	742	92.5	93.1	92.5	0.80	106	7.7	707	1.8	2.7	3.2	930	62
75	M3JP 315SMB 8	3GJP314220-••L	740	93.1	93.3	93.1	0.79	146	7.1	966	1.7	2.7	4.1	1030	62
90	M3JP 315SMC 8	3GJP314230-••L	739	93.4	93.8	93.4	0.81	171	7.4	1159	1.8	2.7	4.9	1100	64
110	M3JP 315MLA 8	3GJP314410-••L	740	93.7	94.0	94.1	0.80	211	7.3	1419	1.8	2.7	5.8	1250	72
132	M3JP 355SMA 8	3GJP354210-••L	744	94.0	93.9	93.4	0.77	256	7.5	1694	1.5	2.6	7.9	1630	69
160	M3JP 355SMB 8	3GJP354220-••L	744	94.3	94.3	93.9	0.77	293	7.6	1926	1.6	2.6	9.7	1790	69
200	M3JP 355SMC 8	3GJP354230-••L	742	94.6	95.1	94.9	0.79	385	7.4	2576	1.6	2.6	11.3	1930	69
250	M3JP 355MLB 8	3GJP354420-••L	743	94.6	94.8	94.2	0.80	472	7.5	3213	1.6	2.7	13.5	2180	72

Variant codes
Flameproof motors, Ex d 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.

		Frame size														
Code/ Variants		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Administration																
531	Sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
532	Packing of motor in vertical mounting position	-	-	-	-	-	-	-	•	•	•	•	•	-	-	-
533	Wooden sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
590	Mounting of customer supplied part other than coupling.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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	○	○	○	○	○	•	•	•	•	•	•	•	•	•	•
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	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
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 ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
397	Motor designed for ambient temperature -40 °C to -55 °C, with space heaters (code 450/451 must be added)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
398	Motor designed for ambient temperature -20 °C to -40 °C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
399	Motor designed for 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, V36, 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).	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•

○ 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
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 dimension drawing.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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.	•	•	•	•	•	•	•	•	•	•	•	-	-	-	-
508	Exde from Exd.	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-
516	Ex i approved temperature detectors (Pt100)	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
813	Thermistor-based surface temperature protection T4 for frequency convertor 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 Det Norske Veritas (DNV) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
026	Fulfilling Lloyds Register of Shipping (LR) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
027	Fulfilling American Bureau of Shipping (ABS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
049	Fulfilling Germanischer Lloyd (GL) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
050	Fulfilling Registro Italiano Navale (RINA) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
051	Fulfilling Russian Maritime Register of Shipping (RS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
096	Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
186	Fulfilling Det Norske Veritas (DNV) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
676	Fulfilling Germanischer Lloyd (GL) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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).	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-

○ 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
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
093	IM 3601 flange mounted, IEC flange, from IM 1001 (B14 from B3).	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-
228	Flange FF 130.	•	•	•	•	-	-	-	-	-	-	-	-	-	-	-
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.	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-
258	Flange FT 100.	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	Flange FF 115.	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-
260	Flange FT 115.	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
309	IM 1001 foot mounted, from IM 3001 (B3 from B5).	•	•	•	•	•	•	•	-	-	-	-	-	-	-	-
311	IM 2001 foot/flange mounted, IEC flange, from IM 3001 (B35 from B5).	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-
Painting																
105	Paint thickness report.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
115	Painting system C4M acc. to ISO 12944-2: 1998.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
168	Primer paint only.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
303	Painted insulation layer on inside of the terminal boxes.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
710	Thermally sprayed zink metallizing with acrylic top coat	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
711	Painting system C5-M very high, acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
754	Painting system C5M acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Protection																
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
135	Mounting of additional identification plate, stainless.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
139	Additional identification plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
159	Additional plate with text “Made in ....”	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
161	Additional rating plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
163	Frequency converter rating plate. Rating data according to quotation.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
528	Rating plate sticker	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Shaft & rotor																
069	Two shaft extensions according to catalog drawings.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
070	Special shaft extension at D-End, standard shaft material	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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																
248	Design according to Petronas PTS 33.66.05.31-GEN. February 2010.	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
251	Shell DEP 33.66.05.31-GEN. February 2012.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
252	Shell DEP 33.66.05.31-GEN. February 2012, with standard winding >55 kW.	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-
408	Fulfilling EISA Subtype II efficiency requirements, CC031A.	-	-	-	-	-	•	•	•	•	•	•	•	-	-	-

○ 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
540	China energy label	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
541	Inmetro certification	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
543	Australian MEPS	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
544	Australian HE MEPS	-	-	-	-	-	•	•	•	•	•	•	•	•	-	-
547	Certificate of conformity according TR-CU 012/2011 for customs union RU, KZ, BY.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
782	Fulfilling CQST Certification requirements (China)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
Stator winding temperature sensors																
121	Bimetal detectors, break type (NCC), (3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
122	Bimetal detectors, break type (NCC), (3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
123	Bimetal detectors, break type (NCC), (3 in series), 170 °C, in stator winding	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
125	Bimetal detectors, break type (NCC), (2x3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
127	Bimetal detectors, break type (NCC), (3 in series, 130 °C & 3 in series, 150 °C), in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
328	PTC - thermistors (3 in series), 120°C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
435	PTC - thermistors (3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
439	PTC - thermistors (2x3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
441	PTC - thermistors (3 in series, 130 °C & 3 in series, 150 °C), in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
445	Pt100 2-wire in stator winding, 1 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
446	Pt100 2-wire in stator winding, 2 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
502	Pt100 3-wire in stator winding, 1 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
503	Pt100 3-wire in stator winding, 2 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
511	PTC thermistors (2 x 3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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).	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-
380	Separate terminal box for temperature detectors, std. material	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
568	Separate terminal box for heating elements, std. material	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
730	Prepared for NPT cable glands.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
734	Standard cable gland, Ex d IIC, armoured cable.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
735	Standard cable gland, Ex d IIC, non-armoured cable.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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 curve, type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
560	Shaft voltage test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
561	Overspeed test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
562	Overvoltage test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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																
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.	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
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 terminal box are made of cast iron. Motors in frame size 200 and larger have integrated feet for rigid and vibration free mounting, motors in frame size 80-180 have detachable feet made of forged steel for maximum flexibility and rigidity.

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

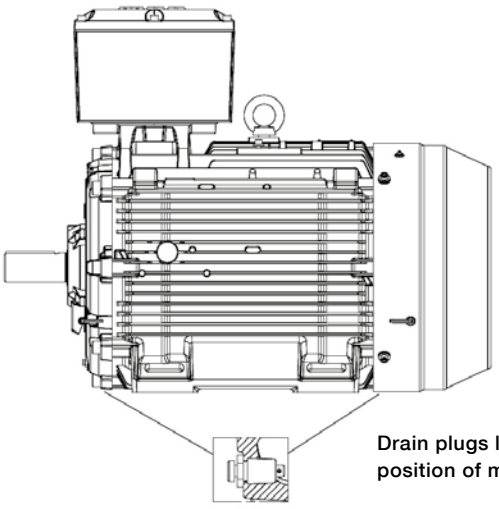
Drain holes
Flame proof Ex d motors are provided without drain holes and plugs as standard.

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. Flame proof 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".

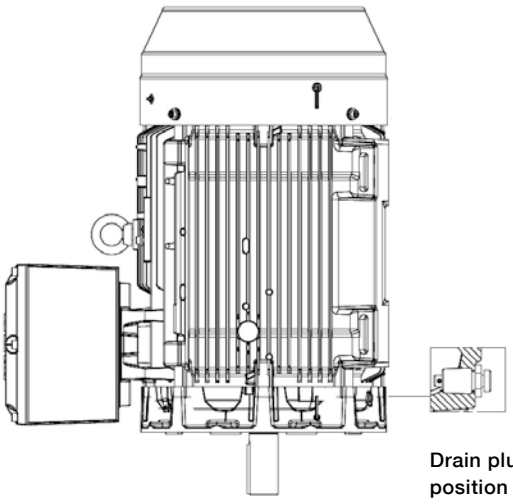
When mounting arrangement differs from foot mounted IM B3, mention variant code 066 when ordering to ensure the drain plug is mounted in the lowest position.

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	Detachable lifting eye	1 pcs close to terminal box	1 pcs close to terminal box
90-112	Integrated in casting	2 pcs close to terminal 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



Drain plugs located in lowest position of motor



Drain plug in lowest position of motor

Heating elements

Heating elements are installed on stator winding coil heads to keep the winding 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.

Bearings

ABB's flame proof 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 flame proof 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.

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.

Standard and alternative designs

		Standard design		Alternative design		
		Deep groove ball bearings		Roller bearings (037)	Roller bearings (037)	Angular contact ball bearing (058)
Motor size	Number of poles	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	6205-2Z/C3	NA	NA	NA
100	2 - 8	6206-2Z/C3	6206-2Z/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	6310M/C3	NU 312 ECP/C3	NU 312 ECP/C3	NA
200	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
225	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
250	4 - 12	6315/C3	6313/C3	NU 315 ECP/C3	NA	NA
280	2	6316/C3	6316/C3	[1]	NA	7316 B
	4 - 12	6316/C3	6316/C3	NU 316 ECP/C3	NA	7316 B
315	2	6316/C3	6316/C3	[1]	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	6322M/C3	NA	NA	7326 B

[1] On request

Axially-locked bearings

All motors with deep groove ball bearings 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.

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

Bearing seals

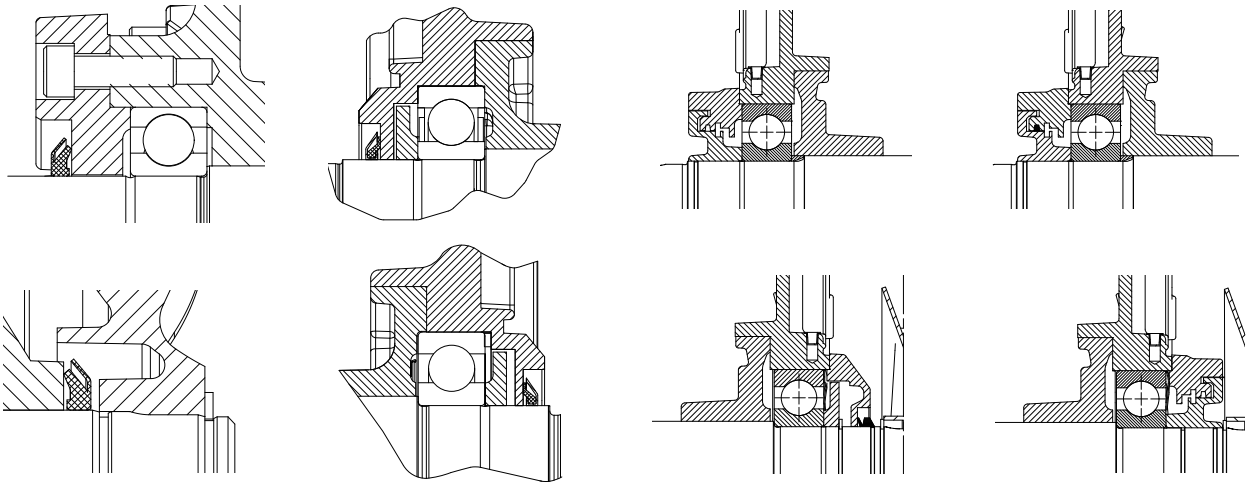
Table on next page present the standard and alternative and types of bearing seals per motor size.

Bearing seals for motor sizes 80 - 450

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 motors

Standard design



Motor size, seal type D-end / N-end

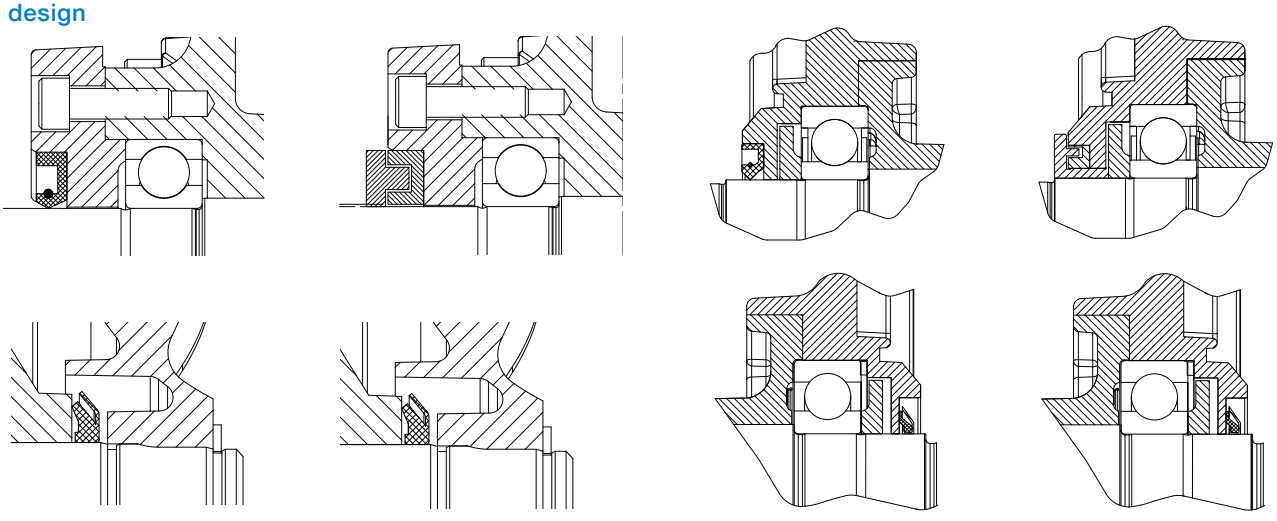
80-132, gamma/gamma seal

160-250, gamma/ gamma seal

280-355, 400 4-12 pole, labyrinth/V-ring seal

400 2-pole, 450 4-12 pole, labyrinth/labyrinth seal

Alternative design



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 and lubrication

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 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 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 160-450, 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 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 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	8500	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	10700
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	10300	all	10800
180	15	15		3000	3900	all	6600	7500	all	9700	all	10200
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

Radial forces

Pulley diameter

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

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

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.

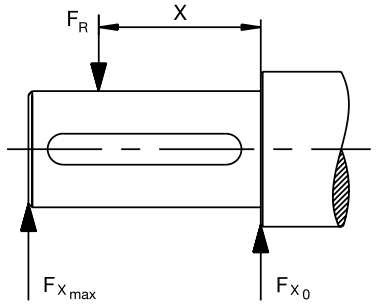
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft together with flame path dimensions affects permissible forces.

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 FR 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 sizes 80-132

			Basic design with deep groove ball bearings L_{10h}=40,000h				Roller bearings L_{10h}=40,000h			
			Mounting arrangement IM B3				Mounting arrangement IM B3			
			Gas group IIB		Gas group IIC		Gas group IIB		Gas group IIC	
Motor size	No. of poles	Length of shaft extension E (mm)	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	619	524	619	524	NA		NA	
	4	40	780	663	780	663	NA		NA	
	6	40	893	759	893	759	NA		NA	
	8	40	983	834	983	834	NA		NA	
90	2	50	561	473	561	473	NA		NA	
	4	50	803	677	803	677	NA		NA	
	6	50	919	775	919	775	NA		NA	
	8	50	1011	853	1011	853	NA		NA	
100	2	60	553	457	553	457	NA		NA	
	4	60	1050	868	1050	868	NA		NA	
	6	60	1267	1047	1267	1047	NA		NA	
	8	60	1395	1153	1395	1153	NA		NA	
112	2	60	553	457	553	457	NA		NA	
	4	60	1050	868	1050	868	NA		NA	
	6	60	1267	1047	1267	1047	NA		NA	
	8	60	1394	1152	1394	1152	NA		NA	
132	2	80	1354	1112	1354	1112	NA		NA	
	4	80	1772	1454	1772	1454	NA		NA	
	6	80	2028	1665	2028	1665	NA		NA	
	8	80	2234	1833	2234	1833	NA		NA	

Permissible radial forces, motor sizes 160 to 450

Motor size	Poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings L_{10h}=40,000h				Roller bearings L_{10h}=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)
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	
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	

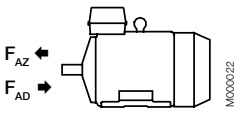
[1] only allowed for direct coupling duty

Axial forces

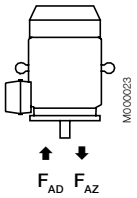
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



Mounting arrangement IM B3



Mounting arrangement IM V1

Permissible axial forces, motor sizes 80-450

			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	
Motor size	Poles	Length of shaft extension E (mm)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
80	2	40	660	300	690	280
	4	40	820	460	860	440
	6	40	940	580	970	550
	8	40	1030	670	1070	650
90	2	50	740	220	780	190
	4	50	900	380	950	340
	6	50	1010	490	1080	450
	8	50	1110	590	1170	540
100	2	60	1100	220	1180	170
	4	60	1320	430	1430	360
	6	60	1480	590	1600	510
	8	60	1610	720	1730	640
112	2	60	1100	220	1180	170
	4	60	1320	430	1430	360
	6	60	1480	590	1600	510
	8	60	1610	720	1730	640
132	2	80	1530	500	1700	390
	4	80	1870	840	2080	690
	6	80	2110	1080	2380	900
	8	80	2320	1280	2580	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

			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	
Motor size	Poles	Length of shaft extension E (mm)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
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
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, LK_	2	170	810	5810	8010	730
	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 table below. No cable glands are included as standard, the entry holes are closed with Ex d approved blanking plugs made of brass according table below. 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. Note: For other network voltages, contact your ABB sales office.

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							
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 M75x1.5	-	1 x M75	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 SM_	6	370	2 x M75x1.5	-	1 x M75	2x240	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	

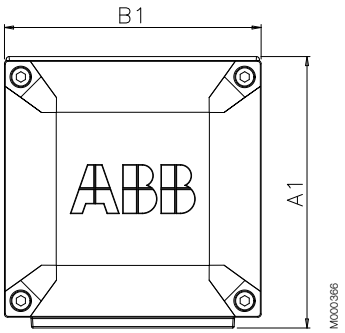
Motor size	Earthing on frame	Earthing in main terminal box
80 - 132	M6	M6
160 – 180	M6	M6
200 - 250	M8	M8
280 - 450	M10	2xM10

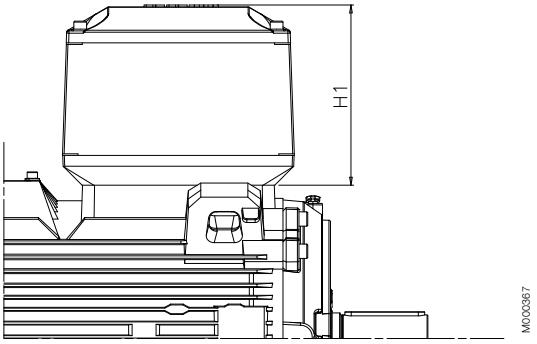
Terminal box
Terminal box dimensions

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.

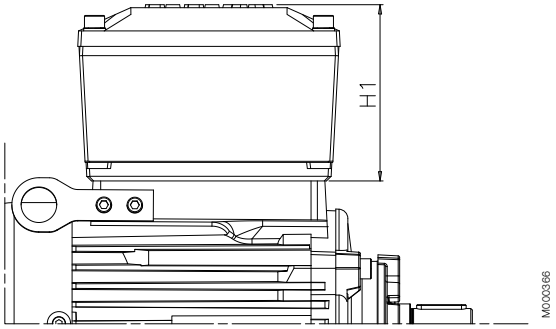
Terminal box types acc. to current capacity	A1	B1	H1
25	192	170	124
63	256	243	174
160	339	290	226
210	465	360	283
370	465	360	283
750	707	467	387

Terminal boxes, standard with 6 terminals

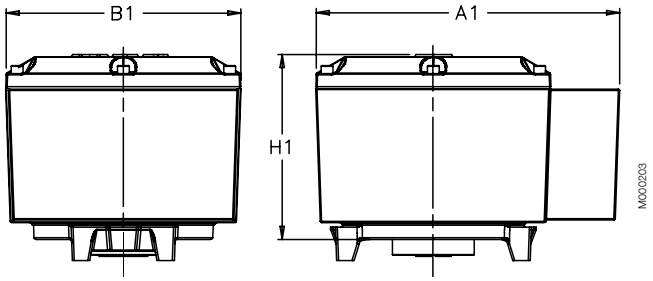




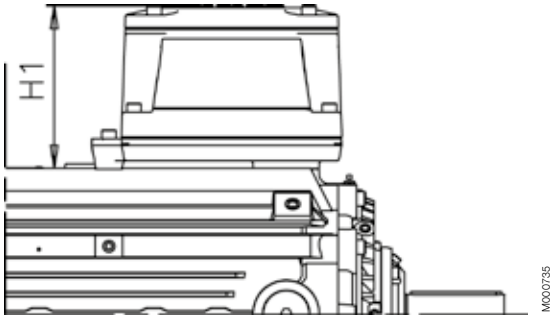
Motor sizes 200 to 250



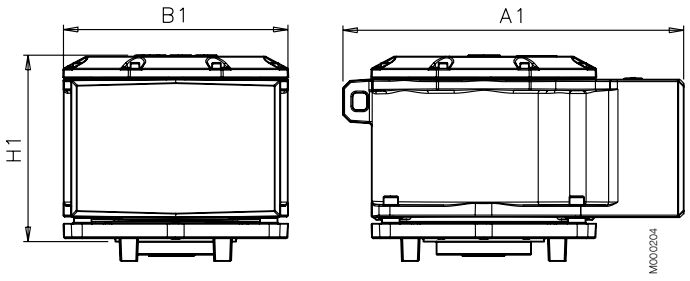
Motor sizes 80 to 132



Motor sizes 280 to 355



Motor sizes 160 to 180

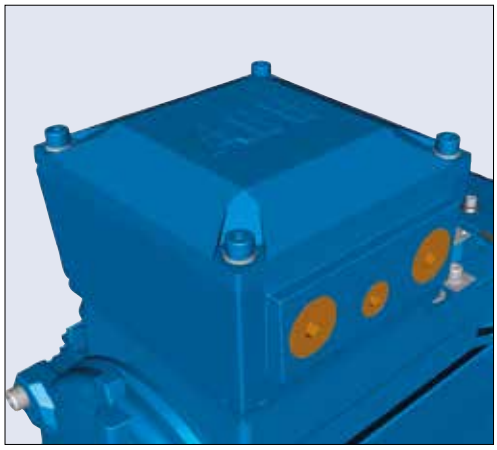


Motor sizes 355 to 450

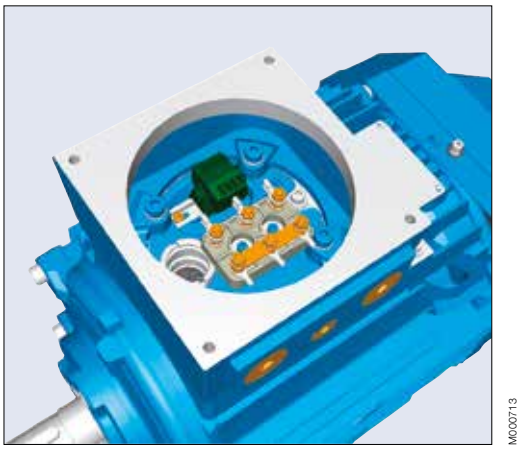
Terminal box
Terminal boxes and boards

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

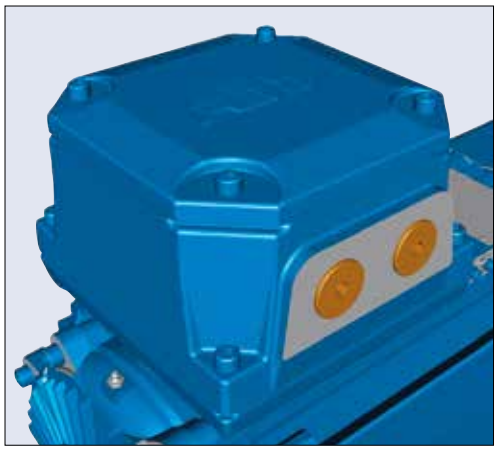


Terminal box for motor sizes 80-132, type 25.

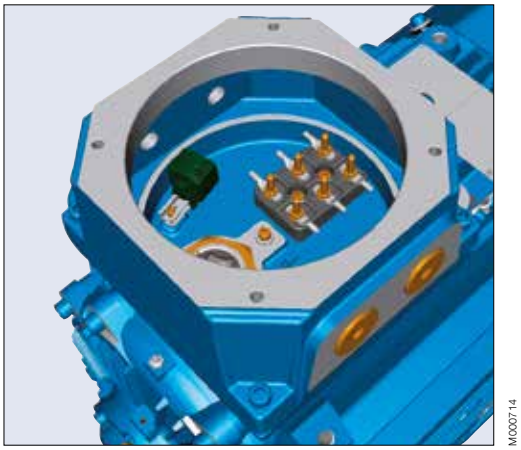


Terminal board for motor sizes 80-132, box type 25.

Motor sizes 160-180

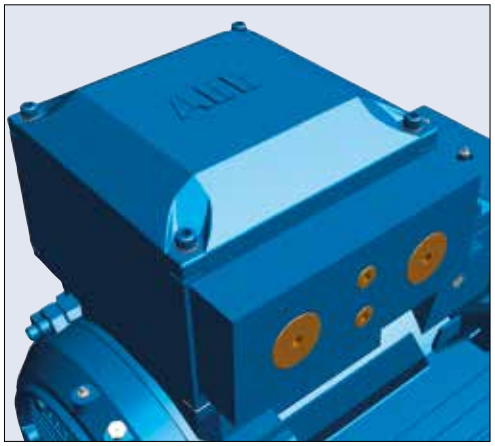


Terminal box for motor sizes 160-180, type 63. Entries for auxiliaries are located on opposite side of terminal box.

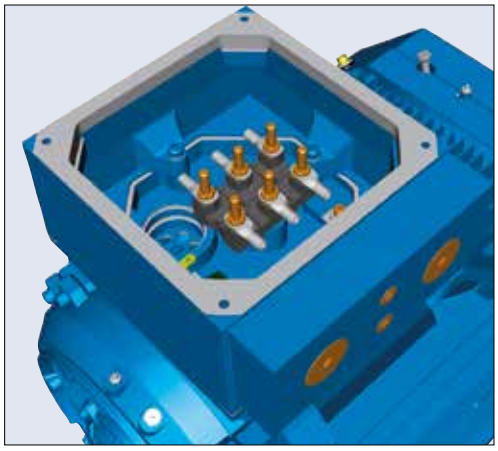


Terminal board for motor sizes 160-180, box type 63.

Motor sizes 200-250

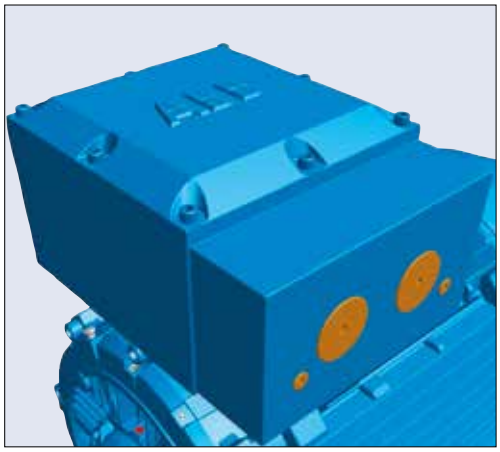


Terminal box for motor sizes 200-250, type 160.

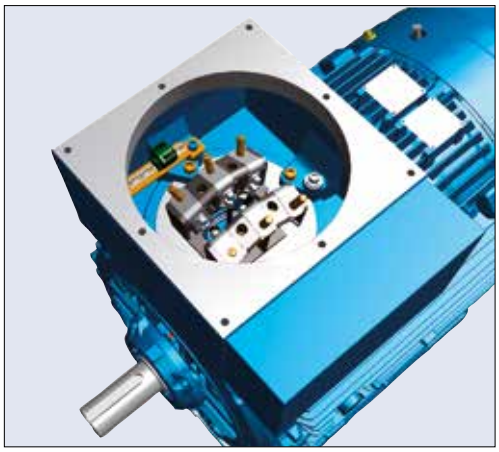


Terminal board for motor sizes 200-250, box type 160.

Motor sizes 280-355

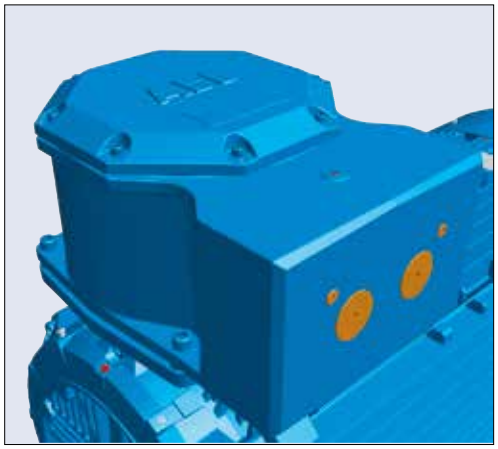


Terminal box for motor sizes 280-355, type 210 and 370.

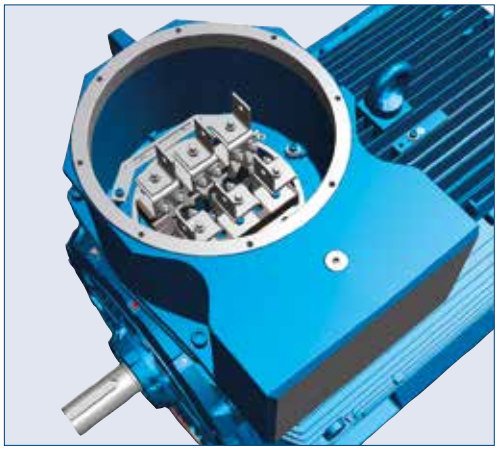


Terminal board 280-355, box type 210 and 370

Motor sizes 355-450



Terminal box for motor sizes 355-450, type 750



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

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. 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		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
M90 x 1.5	NPT 3 1/2"	78-90	68-80	55-70
M100 x 1.5	NPT 4"	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"
315-450	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.

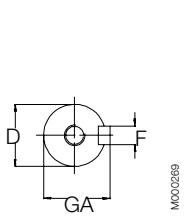
Motor frame size	Main cable entries, metric	Main cable entries, NPT
80-132	1 x M32	1 x 1"
160-180	1 or 2 x M50	1 or 2 x 1 ½"
200-250	1 or 2 x M63	1 or 2 x 2"
280-450	1 or 2 x M75	1 or 2 x 3"

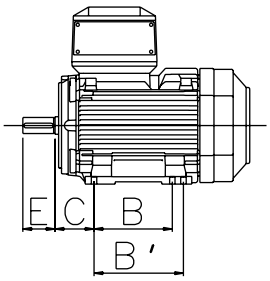
Auxiliary terminal box

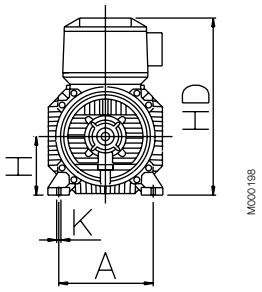
It is possible to equip motors from frame size 160 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of cast iron with Ex d type of protection. Connection terminals are of spring-loaded 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

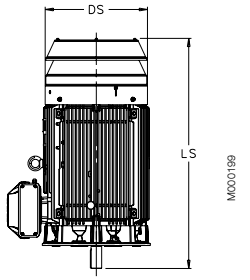
Dimension drawings
Flameproof motors, Ex d



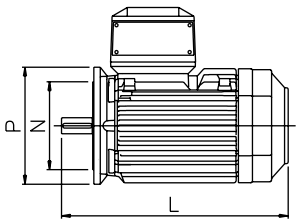




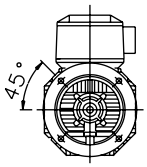
Foot-mounted motor IM 1001, IM B3



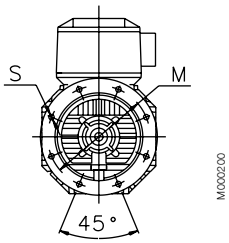
Motor with protection cover



Flange-mounted motor IM 3001, IM B5



Sizes 80 to 200



Sizes 225 to 450

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		O [2]	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	4-8														2	4-8
80	19	19	21.5	21.5	6	6	40	40	340	340	20	125	100	125	50	290	10	80	165	130	200	12	160	360	360
90	24	24	27	27	8	8	50	50	405	405	20	140	100	125	56	315	10	90	165	130	200	12	180	430	430
100	28	28	31	31	8	8	60	60	480	480	25	160	140	–	63	335	10	100	215	180	250	14.5	195	505	505
112	28	28	31	31	8	8	60	60	480	480	25	190	140	–	70	350	12	112	215	180	250	14.5	195	505	505
132	38	38	41	41	10	10	80	80	560	560	30	216	140	178	89	390	12	132	265	230	300	14.5	260	590	590
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	30	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	30	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	800	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

IM 3601, IM B14 - Available flange alternatives; see also variant codes.

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	S	M	NA	NA	NA
FT115	260	140	115	95	M8	M	S	NA	NA	NA
FT130	229	160	130	110	M8	M	M	S	S	NA
FT165	236	200	165	130	M10	M	M	M	M	S
FT215	246	250	215	180	M12	NA	NA	M	M	M
FT265	256	300	265	230	M12	NA	NA	NA	NA	M
FF100	257	120	100	80	Ø7	M	M	NA	NA	NA
FF115	259	140	115	95	Ø10	M	M	NA	NA	NA
FF130	228	160	130	110	Ø10	M	M	M	M	NA
FF165	235	200	165	130	Ø12	S	S	M	M	M
FF215	245	250	215	180	Ø14.5	NA	NA	S	S	M
FF265	255	300	265	230	Ø14.5	NA	NA	NA	NA	S

S = Standard flange M = Modification NA = Not applicable

Tolerances:	
A, B	± 0,8
D, DA	ISO k6 < Ø 50mm
	ISO m6 > Ø 50mm
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

IECEx Certificate of Conformity

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

Certificate No.: IECEx LCI 04.0006X — Issue No.:1
Certificate history: Issue No. 1 (2011-11-21) Issue No. 0 (2004-3-26)
Status: Current
Date of Issue: 2011-11-21 — Page 1 of 6

Applicant: ABB Oy Motors and Generators
P.O. Box 633
Strömbergin Puistotie 5A
FIN-65101 VAASA
Finland

Electrical Apparatus: Three-phase AC motor - M3JP / M3KP 280
Optional accessory:

Type of Protection: Ex d, Ex de , Ex t

Marking: Ex d or de IIB or IIC T3 to T6 (*) Gb
Ex t IIIA or IIIB or IIIC T...°C (*) Db
IECEx LCI 04.0006X
IP5X, IP54, IP6X or IP64 (*)
(*) = depending on motor type and model as specified in manufacturer specifications.
For complete marking see additional information section

Approved for issue on behalf of the IECEx Certification Body: Michel BRENON
Position: Certification Officer — Rémi HANOT
Signature: (for printed version)
Date: 21/11/2011

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 the Official IECEx Website.

Certificate issued by:
Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

M000726a

1 ATTESTATION D'EXAMEN CE DE TYPE
2 Appareil ou système de protection destiné à être utilisé en atmosphères explosibles (Directive 94/9/CE)
3 Numéro de l'attestation d'examen CE de type: LCIE 11 ATEX 3089 X
4 Appareil ou système de protection : Moteur triphasé à courant alternatif Type: M3J_280 ..., M3K_280 ...
5 Demandeur : ABB OY Motors and Generators
Adresse : P.O. Box 633, Strömberg Puistotie 5A, 65100 VAASA - FINLAND
6 Fabricant : ABB OY Motors and Generators
Adresse : P.O. Box 633, Strömberg Puistotie 5A, 65100 VAASA - FINLAND
7 Cet appareil ou système de protection et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence.
8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles de sécurité et de santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive.
Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 96457-592190-05.
9 Le respect des exigences essentielles de sécurité et de santé est assuré par la conformité à :
- EN 60079-0 (2009) - EN 60079-31 (2009)
- EN 60079-1 (2007) - EN 60079-7 (2007)
10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.
11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à l'annexe III de la directive 94/9/CE.
Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection. Ces dernières ne sont pas couvertes par la présente attestation.
12 Le marquage de l'appareil ou du système de protection doit comporter les informations détaillées au point 15.

Fontenay Aux Roses
21 NOV. 2011

1 EC TYPE EXAMINATION CERTIFICATE
2 Equipment or protective system intended for use in potentially explosive atmospheres (Directive 94/9/EC)
3 EC type examination certificate number: LCIE 11 ATEX 3089 X
4 Equipment or protective system : Three-phase AC motor Type : M3J_280 ..., M3K_280 ...
5 Applicant : ABB OY Motors and Generators
Address : P.O. Box 633, Strömberg Puistotie 5A, 65100 VAASA - FINLAND
6 Manufacturer : ABB OY Motors and Generators
Address : P.O. Box 633, Strömberg Puistotie 5A, 65100 VAASA - FINLAND
7 This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994 certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in confidential report N° 96457-592190-05.
9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
- EN 60079-0 (2009) - EN 60079-31 (2009)
- EN 60079-1 (2007) - EN 60079-7 (2007)
10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.
11 This EC type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with annex III to the directive 94/9/EC.
Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.
12 The marking of the equipment or protective system shall include ... as detailed at 15.

... de certification ATEX
manager
Rémi HANOT

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LCIE — Laboratoire Central des Industries Electriques — Une société de Bureau Veritas — France

M000727a

ABB

EU DECLARATION OF CONFORMITY

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: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC as listed in this document on the pages 2 ...3 having correspondent name plate markings covered by those as listed.

The motors of the declaration described above are in conformity with the relevant Union harmonisation legislation:

Directive 94/9/EC (until April 19th, 2016) and Directive 2014/34/EU (from April 20th, of April 2016)

Directive 2009/125/EC (ErP of 20th November 2009)
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EU) No. 4/2014 of 5 January 2014 amending Regulation (EC) No. 640/2009.

Efficiency classes as defined in the standard EN 60034-30:2009.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Technical documentation based on the standard EN 50581:2012.

The following harmonised standards are applied in relation to which conformity is declared:
EN 60079-0:2012, EN 60079-1:2007, EN 60079-7:2007, EN 60079-15:2010, EN 60079-31:2009 and relevant parts of the EN 60034 –series of standards.

The conformity of the end product according to the Directive 2006/42/EC has to be established by the commissioning party when the motor is fitted to the machinery.

Note: Motors have to 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.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc, 33, 92260 Fontenay-aux-Roses, France and VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland

Signed for and on behalf of: ABB Oy, Motors and Generators and ABB Sp.z.o.o
Place and date of issue: Vaasa, Finland, 2015-11-26
Name: Harri Mykkänen
Title: Vice President

Document 3GZF500930-309G

ABB Oy

Motors and Generators — Visiting Address: Strömbergin Puistotie 5 A, FI-65320 Vaasa, FINLAND — Telephone: +358 10 22 11, Telefax: +358 10 22 47372 — Internet: www.abb.fi, e-mail: first name.last name@fi.abb.com — Business Identity Code: 0763403-0, Domicile: Helsinki — Page 1/3

M000725-1

ABB

	M3DP 160 – M3DP 250 (gen.K, L)	LCIE 13 ATEX 3067X	2015
	M3GP 160 – M3GP 250 (gen.D)	LCIE 13 ATEX 3067X	2013
	M3GP 160 – M3GP 250 (gen.K, L)	LCIE 13 ATEX 3067X	2015
Protection by increased safety "e"	M3HP 90 – M3HP 90	LCIE 06 ATEX 6047	2006
II 2G Ex e IIB / IIC T3 Gb	M3HP 100 – M3HP 112	LCIE 06 ATEX 6048	2006
	M3HP 132	LCIE 06 ATEX 6049	2006
	M3HP 160 (gen.H)	LCIE 09 ATEX 3022	2009
Protection by increased safety "e"	M3HP 180 (gen.H)	LCIE 09 ATEX 3023	2009
II 2G Ex e IIB / IIC T2 / T3 Gb	M3HP 200	LCIE 01 ATEX 6022	2001
	M3HP 225	LCIE 01 ATEX 6023	2001
	M3HP 250	LCIE 01 ATEX 6024	2001
In addition:	M3HP 280	LCIE 02 ATEX 6071	2002
Dust ignition protection by enclosure	M3HP 315	LCIE 02 ATEX 6072	2002
II 2D Ex tb IIIB / IIIC T85 °C - T150°C Db	M3HP 355	LCIE 03 ATEX 6022	2003
	M3HP 400	LCIE 04 ATEX 6013	2004
Type of protection "n"	M3AA 90 – M3AA 132	VTT 13 ATEX 050X	2015
II 3G Ex nA IIB / IIC T3 Gc	M3GP 71 – M3GP 132	VTT 12 ATEX 050X	2012
	M3GP 71 – M3GP 132 (gen.K, L)	VTT 12 ATEX 050X	2015
In addition:	M3GP 80 – M3GP 450	LCIE 12 ATEX 1006X	2012
Dust ignition protection by enclosure	M3GP 280 – M3GP 355 (gen.K, L)	LCIE 12 ATEX 1006X	2012
II 3D Ex tc IIIB / IIIC T ..°C Dc	M3GP 160 – M3GP 250 (gen.D)	LCIE 13 ATEX 1034X	2013
	M3GP 160 – M3GP 250 (gen.K, L)	LCIE 13 ATEX 1034X	2015

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M000725-2

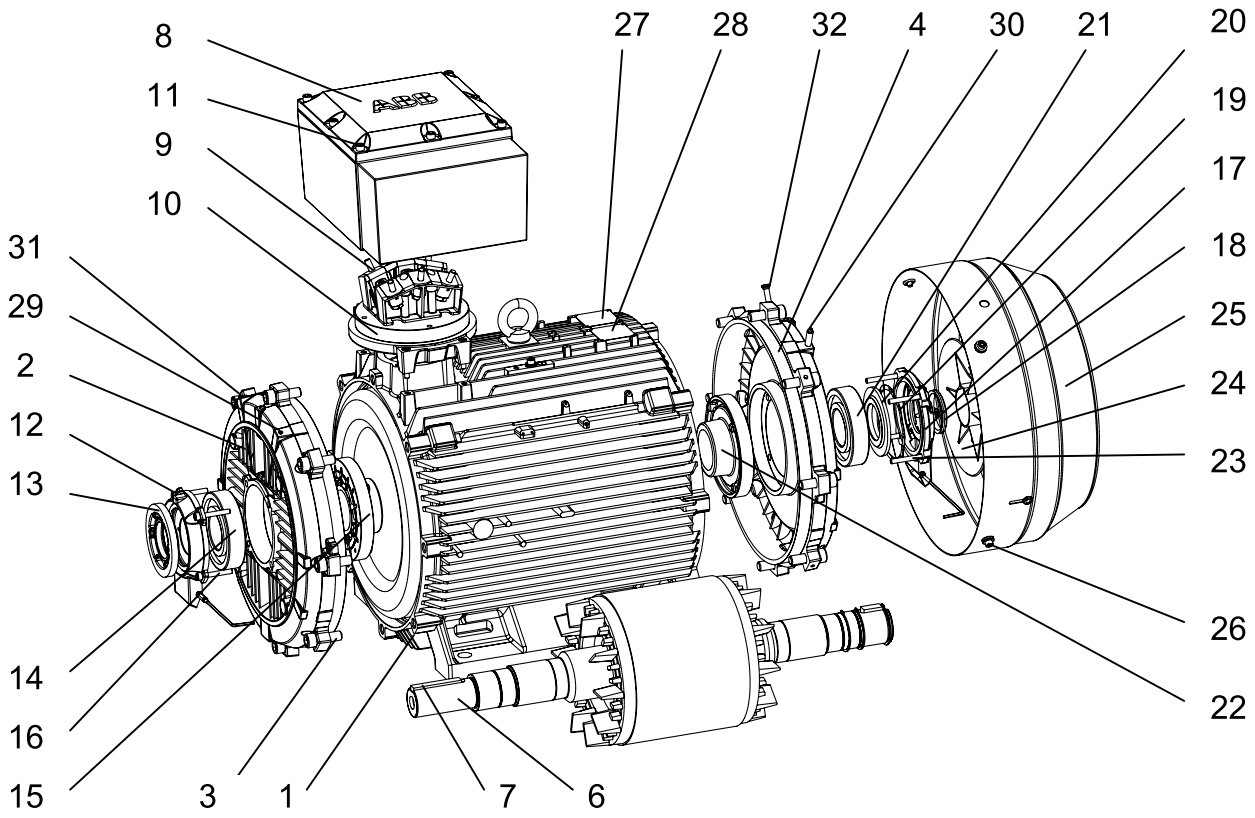
Motors in brief
Flameproof motors Ex d, sizes 80 to 132

Motor size			80	90	100	112	132	160	180
Stator	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						
Feet			Forged steel, detachable feet						
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	2-12 -pole	6205-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3
	N-end	2-12 -pole	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 seal			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 colour 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 as standard						
Rotor winding	Material		Pressure die-cast aluminum						
Balancing			Half key balancing						
Key way			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 d, sizes 200 to 450

Motor size			200	225	250	280	315	355	400	450
Stator	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							
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 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	6316/C3	6319/C3	6322M/C3
Axially-locked bearings	Inner bearing cover		As standard, locked at D-end							
Bearing seal			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	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 colour 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 as standard							
Rotor winding	Material		Pressure die-cast aluminum							
Balancing			Half key balancing							
Key way			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 411							

Motor construction
Cast iron flameproof motors, Ex d



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	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 (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, 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

Flameproof motors, Ex de IIB/IIC T4 Gb
Totally enclosed squirrel cage three phase low voltage motors, Sizes 80 to 450, 0.55 to 950 kW

Ordering information

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

Example	
Motor type	M3KP 160 MLA
Pole number	2
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	11 kW
Product code	3GKP161410-ADH
Variant codes if needed	

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 - 4

3GKP:	Totally enclosed frameproof motor Ex d 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

Serial number

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 with clearance holes
C:	Flange-mounted, small flange with tapped holes
V:	Flange-mounted, special flange
H:	Foot/flange-mounted, large flange with clearance holes
J:	Foot/flange-mounted, small flange with tapped holes
S:	Foot/flange-mounted, terminal box RHS seen from D-end
T:	Foot/flange-mounted, terminal box LHS seen from D-end
F:	Foot/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**

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

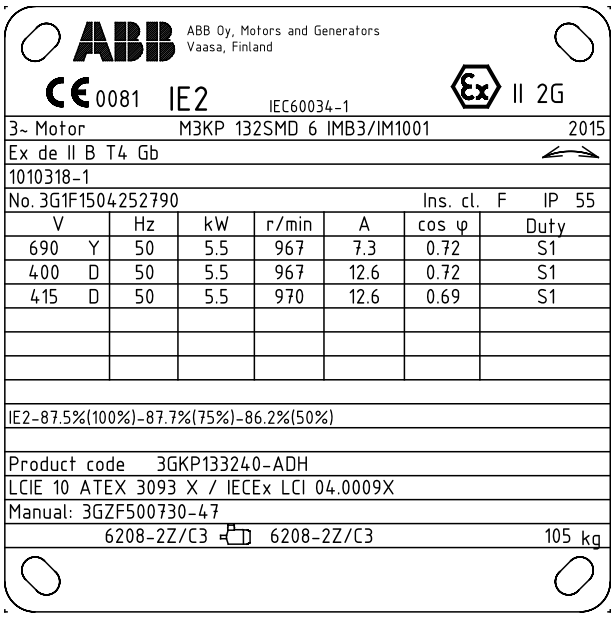
Rating plates

The rating plates are in table form giving values for speed, current and power factor for three voltages: 400V-415V-690V as standard. Other voltage and frequency combinations are possible and can be ordered with variant codes 002 or 209. Please see Variant code section.

The following information will be shown on the motor rating plate:

- Lowest nominal efficiency at 100 %, 75 % and 50 % rated load
- Efficiency level
- Year of manufacture
- Type of protection
- Apparatus group
- Temperature class
- Identification number of the certification body
- Certificate number (both ATEX and IECEx are stamped on the rating plate as standard)

Motor sizes 80 to 450



Technical data for Ex de IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2 poles				**400 V 50 Hz**				**CENELEC-design**							
0.75	M3KP 80MA 2	3GKP081310-••H	2877	80.1	79.5	75.7	0.85	1.54	7.1	7.3	4.0	4.6	0.0006	28	59
1.1	M3KP 80MB 2	3GKP081320-••H	2831	81.6	82.3	80.5	0.87	2.3	6.2	3.7	2.6	3.3	0.0007	30	59
1.5	M3KP 90SLA 2	3GKP091010-••H	2881	82.0	82.2	79.9	0.88	3.0	6.7	4.9	3.0	3.5	0.001	41	61
2.2	M3KP 90SLC 2	3GKP091030-••H	2877	83.7	84.4	83.7	0.89	4.3	7.8	7.3	2.7	3.5	0.0014	44	61
3	M3KP 100LA 2	3GKP101510-••H	2896	86.0	86.5	84.8	0.90	5.7	6.6	9.9	2.0	2.6	0.0036	61	65
4	M3KP 112MB 2	3GKP111320-••H	2891	86.0	87.0	87.0	0.89	7.6	6.9	13.2	2.0	3.0	0.0043	64	65
5.5	M3KP 132SMB 2	3GKP131220-••H	2905	87.0	86.4	84.4	0.89	10.5	6.8	18.0	2.6	3.4	0.009	92	71
7.5	M3KP 132SMD 2	3GKP131240-••H	2914	89.2	89.7	88.7	0.90	13.7	7.5	24.6	3.3	3.6	0.012	100	71
11	M3KP 160MLA 2	3GKP161410-••H	2931	90.1	90.4	89.3	0.89	20.2	6.7	35.8	2.5	3.2	0.043	207	71
15	M3KP 160MLB 2	3GKP161420-••H	2929	91.2	91.7	90.8	0.89	27.0	7.2	48.9	2.9	3.4	0.052	216	71
18.5	M3KP 160MLC 2	3GKP161430-••H	2934	91.6	92.4	92.3	0.90	32.4	7.4	60.3	3.1	3.5	0.062	227	69
22	M3KP 180MLA 2	3GKP181410-••H	2938	91.7	92.3	91.8	0.90	39.1	7.0	71.4	2.5	3.2	0.089	259	69
30	M3KP 200MLA 2	3GKP201410-••G	2956	93.2	93.6	93.0	0.88	52.7	7.4	96.9	3.0	3.2	0.15	290	74
37	M3KP 200MLC 2	3GKP201430-••G	2954	93.6	94.0	93.4	0.89	64.7	7.5	120	2.8	3.2	0.19	320	75
45	M3KP 225SMB 2	3GKP221220-••G	2968	93.8	93.9	93.0	0.87	78.8	7.2	144	2.7	3.0	0.26	380	76
55	M3KP 250SMA 2	3GKP251210-••G	2975	94.3	94.2	93.2	0.89	95.1	7.8	176	2.4	3.1	0.49	440	75
75 [1]	M3KP 280SMA 2	3GKP281210-••G	2977	94.3	93.8	92.2	0.88	131	7.6	240	2.1	3.0	0.8	645	77
90 [1]	M3KP 280SMB 2	3GKP281220-••G	2976	94.6	94.7	93.8	0.89	154	7.4	288	2.1	2.9	0.9	685	77
110 [1]	M3KP 315SMA 2	3GKP311210-••G	2982	94.9	94.4	92.9	0.86	197	7.4	352	2.2	3.2	1.2	900	78
132 [1]	M3KP 315SMB 2	3GKP311220-••G	2982	95.1	94.8	93.6	0.88	227	7.4	422	2.2	3.0	1.4	960	78
160 [1]	M3KP 315SMC 2	3GKP311230-••G	2981	95.4	95.2	94.2	0.89	271	7.5	512	2.3	3.0	1.7	1045	78
200 [1]	M3KP 315MLA 2	3GKP311410-••G	2980	95.7	95.7	94.9	0.90	335	7.7	640	2.6	3.0	2.1	1210	78
250 [1]	M3KP 355SMA 2	3GKP351210-••G	2984	95.7	95.5	94.5	0.89	423	7.7	800	2.1	3.3	3.0	1630	83
315 [1]	M3KP 355SMB 2	3GKP351220-••G	2980	95.7	95.6	95.0	0.89	531	7.0	1009	2.1	3.0	3.4	1710	83
355 [1]	M3KP 355SMC 2	3GKP351230-••G	2984	95.7	95.7	94.9	0.88	603	7.2	1136	2.2	3.0	3.6	1780	83
400 [1]	M3KP 355MLA 2	3GKP351410-••G	2982	96.9	96.6	95.9	0.88	677	7.1	1280	2.3	2.9	4.1	2030	83
450 [1]	M3KP 355MLB 2	3GKP351420-••G	2983	97.1	97.0	96.4	0.90	743	7.9	1440	2.2	2.9	4.3	2110	83
500 [1]	M3KP 355LKA 2	3GKP351810-••G	2982	96.9	96.9	96.5	0.90	827	7.5	1601	2.0	3.9	4.8	2350	83
560 [3]	M3KP 400LA 2	3GKP401510-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	3070	82
560 [3]	M3KP 400LKA 2	3GKP401810-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	3070	82
630 [3]	M3KP 400LB 2	3GKP401520-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3170	82
630 [3]	M3KP 400LKB 2	3GKP401820-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3170	82
710 [3]	M3KP 400LC 2	3GKP401530-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3420	82
710 [3]	M3KP 400LKC 2	3GKP401830-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3420	82
3000 r/min = 2 poles				**400 V 50 Hz**				**High-output design**							
9.2 [2]	M3KP 132SME 2	3GKP131250-••H	2875	86.9	88.2	87.9	0.91	16.9	6.0	30.6	2.6	2.9	0.012	100	71
22 [2]	M3KP 160MLD 2	3GKP161440-••H	2929	91.2	91.9	91.4	0.90	38.3	7.5	71.7	3.1	3.3	0.07	233	77
30	M3KP 180MLB 2	3GKP181420-••H	2943	92.5	93.2	92.6	0.90	52.2	7.1	97.2	2.3	3.2	0.13	292	78
37	M3KP 180MLC 2	3GKP181430-••H	2950	92.8	93.1	92.8	0.90	64.9	8.1	120	3.3	3.7	0.13	292	77
45	M3KP 200MLE 2	3GKP201450-••G	2945	93.3	93.5	93.1	0.88	79.4	7.3	146	2.9	3.1	0.22	325	79
55	M3KP 225SMC 2	3GKP221230-••G	2965	93.9	94.2	93.5	0.88	95.8	7.1	177	2.6	3.0	0.29	400	80
67 [4]	M3KP 225SMD 2	3GKP221240-••G	2966	93.9	93.9	93.0	0.86	120	7.4	215	2.8	3.2	0.31	410	78
75	M3KP 250SMB 2	3GKP251220-••G	2969	93.8	93.9	93.2	0.89	129	7.9	241	2.6	3.1	0.57	480	80
90 [4]	M3KP 250SMC 2	3GKP251230-••G	2965	94.4	94.5	93.9	0.89	153	7.7	289	2.5	3.0	0.59	490	80
110 [3]	M3KP 280SMC 2	3GKP281230-••G	2978	95.1	95.1	94.5	0.90	186	7.9	352	2.4	3.0	1.15	745	77

[1] 3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering, see variant codes 044 and 045
[2] Efficiency class IE1
[3] Unidirectional fan construction as standard. Direction of rotation must be stated when ordering, see variant codes 044 and 045
[4] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Technical data for Ex de IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4 poles				400 V 50 Hz				CENELEC-design							
0.55 [2]	M3KP 80MA 4	3GKP082310-••H	1421	76.6	76.9	74.1	0.73	1.49	4.7	3.7	2.2	2.7	0.001	29	59
0.75	M3KP 80MB 4	3GKP082320-••H	1416	80.2	80.1	77.5	0.75	1.87	5.4	5.0	2.7	3.1	0.0012	31	59
1.1	M3KP 90SLA 4	3GKP092010-••H	1432	82.2	82.1	79.6	0.77	2.5	6.5	7.3	3.0	3.5	0.002	42	54
1.5	M3KP 90SLC 4	3GKP092030-••H	1431	83.2	83.6	81.9	0.78	3.3	6.6	10.0	3.3	3.7	0.003	44	54
2.2	M3KP 100LA 4	3GKP102510-••H	1437	85.5	86.5	85.8	0.84	4.4	5.9	14.6	2.3	3.0	0.0075	61	52
3	M3KP 100LB 4	3GKP102520-••H	1444	86.5	87.5	86.8	0.83	6.1	6.4	19.9	2.7	3.4	0.0081	63	59
4	M3KP 112MC 4	3GKP112330-••H	1458	88.2	87.7	85.4	0.78	8.6	9.2	26.3	3.4	4.9	0.013	72	61
5.5	M3KP 132SMB 4	3GKP132220-••H	1458	89.5	89.2	87.3	0.80	11.7	7.9	36.0	3.7	3.8	0.023	102	60
7.5	M3KP 132SMD 4	3GKP132240-••H	1460	89.2	89.0	87.3	0.76	16.7	8.4	49.2	4.0	3.9	0.034	105	60
11	M3KP 160MLC 4	3GKP162430-••H	1470	91.2	91.3	90.0	0.82	21.5	8.0	71.5	3.3	3.8	0.096	226	62
15	M3KP 160MLE 4	3GKP162450-••H	1467	92.0	92.3	91.8	0.84	28.5	8.0	97.7	3.3	3.2	0.13	249	61
18.5	M3KP 180MLA 4	3GKP182410-••H	1474	91.6	92.1	91.5	0.83	35.7	7.2	120	2.6	3.1	0.19	271	62
22	M3KP 180MLB 4	3GKP182420-••H	1474	92.2	92.5	91.9	0.82	42.0	7.7	142	2.8	3.4	0.23	290	62
30	M3KP 200MLB 4	3GKP202420-••G	1471	92.5	93.2	93.1	0.84	55.0	7.4	194	3.0	2.8	0.34	320	61
37	M3KP 225SMB 4	3GKP222220-••G	1480	93.6	93.9	93.4	0.85	69.0	7.6	239	3.2	2.9	0.42	370	67
45	M3KP 225SMC 4	3GKP222230-••G	1477	94.1	94.4	94.3	0.86	78.4	7.6	291	3.2	2.7	0.49	405	67
55	M3KP 250SMA 4	3GKP252210-••G	1479	94.7	94.7	94.1	0.84	100	7.2	355	2.5	3.1	0.72	430	66
75	M3KP 280SMA 4	3GKP282210-••G	1484	94.5	94.7	94.4	0.85	134	6.9	482	2.5	2.8	1.25	645	68
90	M3KP 280SMB 4	3GKP282220-••G	1483	94.7	95.0	94.5	0.85	160	7.2	579	2.5	2.7	1.5	685	68
110	M3KP 315SMA 4	3GKP312210-••G	1487	95.1	95.1	94.3	0.86	194	7.2	706	2.3	2.8	2.3	920	70
132	M3KP 315SMB 4	3GKP312220-••G	1487	95.4	95.4	94.7	0.86	232	7.1	847	2.3	2.7	2.6	980	70
160	M3KP 315SMC 4	3GKP312230-••G	1487	95.3	95.3	94.8	0.85	284	7.2	1027	2.4	2.9	2.9	1020	70
200	M3KP 315MLA 4	3GKP312410-••G	1486	95.6	95.6	95.3	0.86	351	7.2	1285	2.5	2.9	3.5	1180	70
250	M3KP 355SMA 4	3GKP352210-••G	1488	95.9	96.0	95.5	0.85	442	7.1	1604	2.3	2.7	5.9	1640	74
315	M3KP 355SMB 4	3GKP352220-••G	1488	95.9	96.2	95.8	0.86	550	7.3	2021	2.3	2.8	6.9	1810	74
355	M3KP 355SMC 4	3GKP352230-••G	1487	95.9	96.2	95.9	0.87	614	6.8	2279	2.4	2.7	7.2	1850	78
400	M3KP 355MLA 4	3GKP352410-••G	1489	96.3	96.3	95.9	0.85	705	6.8	2565	2.3	2.6	8.4	2170	78
450	M3KP 355MLB 4	3GKP352420-••G	1490	96.7	96.7	96.1	0.86	780	6.9	2884	2.3	2.9	8.4	2170	78
500	M3KP 355LKA 4	3GKP352810-••G	1490	97.0	97.0	96.5	0.86	865	6.8	3204	2.0	3.0	10	2530	78
560	M3KP 400LA 4	3GKP402510-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3040	78
630	M3KP 400LB 4	3GKP402520-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3420	78
710 [1]	M3KP 400LC 4	3GKP402530-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3520	78
560	M3KP 400LKA 4	3GKP402810-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3040	78
630	M3KP 400LKB 4	3GKP402820-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3420	78
710 [1]	M3KP 400LKC 4	3GKP402830-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3520	78
780	M3KP 450LA 4	3GKP452510-••G	1491	96.7	96.6	96.0	0.85	1369	7.1	4995	1.4	3.0	23	4050	85
870	M3KP 450LB 4	3GKP452520-••G	1492	96.8	96.7	96.2	0.85	1526	7.2	5568	1.4	3.0	25	4350	85
950	M3KP 450LC 4	3GKP452530-••G	1491	96.9	96.9	96.5	0.85	1664	7.3	6084	1.4	3.0	30	4700	85
1500 r/min = 4 poles				400 V 50 Hz				High-output design							
18.5	M3KP 160MLF 4	3GKP162460-••H	1469	91.8	92.2	91.6	0.83	35	8.2	120.3	3.5	3.8	0.13	249	68
22 [2]	M3KP 160MLG 4	3GKP162470-••H	1466	90.8	91.1	90.3	0.81	43.9	8.3	143.3	2.9	3.9	0.13	249	68
30 [2]	M3KP 180MLC 4	3GKP182430-••H	1466	92.1	92.4	91.8	0.81	59.6	7.6	194.5	2.2	3.3	0.248	298	66
37	M3KP 200MLC 4	3GKP202430-••G	1475	93.0	93.1	92.4	0.82	70.5	7.5	239	3.5	3.2	0.34	320	73
55	M3KP 225SMD 4	3GKP222240-••G	1483	94.3	94.4	93.9	0.83	101	7.4	354	3.4	2.9	0.55	425	68
60 [3]	M3KP 225SME 4	3GKP222250-••G	1477	93.6	93.7	92.9	0.84	110	8.0	387	3.6	3.0	0.55	425	74
62 [2, 3]	M3KP 225SME 4	3GKP222250-••G	1480	93.5	93.6	92.8	0.84	114	7.7	400	3.5	2.9	0.55	425	74
75 [2]	M3KP 250SMB 4	3GKP252220-••G	1476	93.8	94.2	93.9	0.86	135	7.0	485	2.6	2.9	0.88	485	73
86	M3KP 250SMC 4	3GKP252230-••G	1477	94.9	95.3	95.0	0.85	155	7.8	556	2.9	3.5	0.98	510	74
110	M3KP 280SMC 4	3GKP282230-••G	1485	95.1	95.4	95.1	0.86	193	7.6	707	3.0	3.0	1.85	745	68

[1] Temperature rise class F
[2] Efficiency class IE1
[3] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Technical data for Ex de IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6 poles				400 V 50 Hz				CENELEC-design							
0.37	M3KP 80MA 6	3GKP083310-••H	952	71.6	69.3	63.5	0.58	1.37	4.3	3.7	3.6	3.9	0.0022	29	50
0.55 [2]	M3KP 80MB 6	3GKP083320-••H	938	70.3	69.0	63.6	0.65	1.80	4.1	5.6	2.7	3.1	0.0022	29	50
0.75	M3KP 90SLA 6	3GKP093010-••H	946	79.2	78.2	74.1	0.64	2.1	5.5	7.6	3.1	3.6	0.0037	41	44
1.1	M3KP 90SLC 6	3GKP093030-••H	938	78.5	77.9	74.3	0.70	3.1	4.6	11.3	2.7	3.0	0.0048	44	44
1.5	M3KP 100LA 6	3GKP103510-••H	951	81.6	81.4	78.8	0.72	3.7	5.3	15.1	2.2	3.0	0.012	60	54
2.2	M3KP 112MB 6	3GKP113320-••H	950	82.5	82.2	79.4	0.72	5.5	5.0	22.1	2.1	2.8	0.014	63	54
3	M3KP 132SMB 6	3GKP133220-••H	961	84.0	84.3	82.5	0.75	6.8	6.0	29.8	1.9	3.2	0.032	96	57
4	M3KP 132SMC 6	3GKP133230-••H	967	85.7	85.6	83.6	0.75	9.3	6.3	39.5	2.1	3.4	0.034	98	57
5.5	M3KP 132SMD 6	3GKP133240-••H	967	87.5	87.7	86.2	0.72	12.7	7.2	54.3	2.3	3.6	0.039	105	62
7.5	M3KP 160MLA 6	3GKP163410-••H	965	87.6	88.6	88.3	0.78	15.8	6.4	74.2	1.7	2.9	0.126	247	65
11	M3KP 160MLB 6	3GKP163420-••H	972	90.1	91.0	90.4	0.81	22.1	6.9	108	2.4	3.5	0.126	247	65
15	M3KP 180MLB 6	3GKP183420-••H	973	90.5	91.0	90.5	0.82	29.7	6.8	147	1.8	3.0	0.25	298	58
18.5	M3KP 200MLA 6	3GKP203410-••G	983	90.5	90.9	90.2	0.82	36.2	7.1	179	3.2	3.1	0.37	280	66
22	M3KP 200MLB 6	3GKP203420-••G	983	91.6	92.0	91.5	0.82	42.8	7.5	213	3.2	3.2	0.43	300	61
30	M3KP 225SMB 6	3GKP223220-••G	985	92.2	92.7	92.4	0.82	57.9	7.4	290	3.4	3.0	0.64	365	61
37	M3KP 250SMA 6	3GKP253210-••G	990	93.4	93.8	93.3	0.81	70.6	6.5	357	2.4	3.1	1.16	435	66
45	M3KP 280SMA 6	3GKP283210-••G	990	93.4	93.8	93.5	0.83	83.8	7.0	434	2.5	2.5	1.85	625	66
55	M3KP 280SMB 6	3GKP283220-••G	990	93.8	94.2	93.9	0.84	100	7.0	530	2.7	2.6	2.2	665	66
75	M3KP 315SMA 6	3GKP313210-••G	992	94.4	94.4	93.5	0.82	139	7.4	721	2.4	2.8	3.2	850	70
90	M3KP 315SMB 6	3GKP313220-••G	992	94.8	94.7	94.1	0.84	166	7.5	866	2.4	2.8	4.1	950	70
110	M3KP 315SMC 6	3GKP313230-••G	991	95.0	95.0	94.6	0.83	201	7.4	1059	2.5	2.9	4.9	1020	70
132	M3KP 315MLA 6	3GKP313410-••G	991	95.3	95.4	94.9	0.83	240	7.5	1271	2.7	3.0	5.8	1170	68
160	M3KP 355SMA 6	3GKP353210-••G	993	95.4	95.6	95.2	0.83	291	7.0	1538	2.0	2.6	7.9	1550	75
200	M3KP 355SMB 6	3GKP353220-••G	993	95.7	95.9	95.7	0.83	364	7.2	1923	2.2	2.7	9.7	1710	75
250	M3KP 355SMC 6	3GKP353230-••G	993	95.7	95.8	95.4	0.82	460	7.4	2404	2.6	2.9	11.3	1850	75
315	M3KP 355MLB 6	3GKP353420-••G	992	95.7	96.0	95.5	0.83	570	7.0	3032	2.5	2.7	13.5	2210	75
355	M3KP 355LKA 6	3GKP353810-••G	992	95.7	95.9	95.4	0.81	658	7.6	3417	2.7	2.9	15.5	2530	75
400	M3KP 400LA 6	3GKP403510-••G	993	96.2	96.2	95.6	0.82	731	7.1	3846	2.3	2.7	17	3020	76
400	M3KP 400LKA 6	3GKP403810-••G	993	96.2	96.2	95.6	0.82	731	7.1	3846	2.3	2.7	17	3020	76
450	M3KP 400LB 6	3GKP403520-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3270	76
450	M3KP 400LKB 6	3GKP403820-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3270	76
500	M3KP 400LC 6	3GKP403530-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3420	76
500	M3KP 400LKC 6	3GKP403830-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3420	76
560	M3KP 400LD 6	3GKP403540-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3520	77
560	M3KP 400LKD 6	3GKP403840-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3520	77
610	M3KP 450LA 6	3GKP453510-••G	994	96.6	96.6	96.2	0.83	1098	7.1	5860	1.4	2.9	31	4150	81
680	M3KP 450LB 6	3GKP453520-••G	995	96.7	96.7	96.2	0.84	1208	7.6	6526	1.5	2.9	37	4500	81
760	M3KP 450LC 6	3GKP453530-••G	995	96.7	96.7	96.3	0.83	1366	7.8	7293	1.6	3.2	41	4800	81
1000 r/min = 6 poles				400 V 50 Hz				High-output design							
14 [1] [2]	M3KP 160MLC 6	3GKP163430-••H	969	89.2	89.5	88.5	0.75	30.1	7.5	138	2.8	4.0	0.126	247	64
18.5 [2]	M3KP 180MLC 6	3GKP183430-••H	971	90.1	90.1	88.5	0.74	41.2	7.3	181	2.5	3.7	0.25	298	61
30 [2]	M3KP 200MLC 6	3GKP203430-••G	983	90.6	90.8	89.6	0.81	59.3	7.5	291	3.5	3.4	0.49	320	65
37 [2]	M3KP 225SMC 6	3GKP223230-••G	983	91.8	92.1	92.2	0.83	69.6	7.1	359	3.0	2.8	0.75	395	64
45	M3KP 250SMB 6	3GKP253220-••G	986	93.1	93.4	93.2	0.84	84.0	7.2	435	3.3	2.8	1.49	480	65
75	M3KP 280SMC 6	3GKP283230-••G	990	94.2	94.7	94.5	0.84	137	7.3	723	2.8	2.7	2.85	745	66

[1] Temperature rise class F
[2] Efficiency class IE1

Technical data for Ex de IIB/IIC T4 Gb
Flameproof IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8 poles				400 V 50 Hz				CENELEC-design							
0.18	M3KP 80MA 8	3GKP084310-••H	720	57.7	52.0	43.4	0.42	1.15	3.3	2.4	3.7	4.0	0.0022	29	36
0.25	M3KP 80MB 8	3GKP084320-••H	705	61.4	57.2	49.5	0.51	1.21	3.2	3.4	2.6	2.8	0.0022	29	36
0.37	M3KP 90SLA 8	3GKP094010-••H	697	65.5	63.7	57.6	0.63	1.33	3.0	5.1	2.0	2.2	0.0036	41	36
0.55	M3KP 90SLC 8	3GKP094030-••H	695	68.7	67.7	63.2	0.61	2.0	3.0	7.5	2.2	2.4	0.0037	43	36
0.75	M3KP 100LA 8	3GKP104510-••H	720	76.5	74.1	68.3	0.54	2.7	4.2	9.9	2.4	3.1	0.012	60	54
1.1	M3KP 100LB 8	3GKP104520-••H	717	76.4	74.2	68.7	0.57	3.6	3.7	14.6	2.1	2.9	0.012	60	54
1.5	M3KP 112MC 8	3GKP114330-••H	713	75.3	73.3	67.6	0.54	5.4	3.4	20.1	2.0	3.2	0.014	64	54
2.2	M3KP 132SMC 8	3GKP134230-••H	720	80.3	79.2	75.4	0.65	6.1	4.5	29.1	1.7	2.7	0.034	98	59
3 [2]	M3KP 132SMD 8	3GKP134240-••H	711	79.9	80.3	78.1	0.71	8.0	4.1	40.4	1.5	2.8	0.036	100	59
4	M3KP 160MLA 8	3GKP164410-••H	722	83.3	84.7	84.2	0.70	10.3	4.7	52.9	1.6	2.6	0.133	245	59
5.5	M3KP 160MLB 8	3GKP164420-••H	723	86.8	87.2	86.0	0.71	13.5	5.8	72.7	1.9	3.1	0.133	245	53
7.5 [1] [2]	M3KP 160MLC 8	3GKP164430-••H	718	82.0	84.0	84.0	0.70	19.3	5.7	99.8	2.1	2.9	0.133	245	55
11	M3KP 180MLB 8	3GKP184420-••H	723	88.3	89.2	88.7	0.72	25.5	5.6	145	2.0	3.0	0.245	292	63
15	M3KP 200MLA 8	3GKP204410-••G	734	89.9	90.4	89.5	0.79	30.6	6.9	195	2.4	3.2	0.45	295	56
18.5	M3KP 225SMA 8	3GKP224210-••G	734	90.0	90.7	90.2	0.74	39.2	6.1	240	2.2	3.0	0.61	350	55
22	M3KP 225SMB 8	3GKP224220-••G	732	90.6	91.4	91.2	0.81	45.3	6.5	287	1.9	2.9	0.68	365	56
30	M3KP 250SMA 8	3GKP254210-••G	735	91.6	91.0	90.5	0.79	60.7	6.7	389	2.0	2.9	1.25	435	56
37	M3KP 280SMA 8	3GKP284210-••G	742	92.7	92.9	92.2	0.79	72.6	7.3	476	1.7	3.0	1.85	625	65
45	M3KP 280SMB 8	3GKP284220-••G	741	93.2	93.4	92.8	0.78	89.2	7.6	579	1.8	3.1	2.2	665	65
55	M3KP 315SMA 8	3GKP314210-••G	742	93.4	93.9	93.4	0.79	106	7.1	707	1.6	2.7	3.2	850	62
75	M3KP 315SMB 8	3GKP314220-••G	741	93.7	93.8	93.7	0.82	146	7.1	966	1.7	2.7	4.1	950	62
90	M3KP 315SMC 8	3GKP314230-••G	741	94.0	94.3	94.0	0.82	170	7.4	1159	1.8	2.7	4.9	1020	64
110	M3KP 315MLA 8	3GKP314410-••G	740	94.0	94.2	94.3	0.83	211	7.3	1419	1.8	2.7	5.8	1170	72
132	M3KP 355SMA 8	3GKP354210-••G	744	94.7	94.6	94.2	0.80	256	7.5	1694	1.5	2.6	7.9	1550	69
160	M3KP 355SMB 8	3GKP354220-••G	744	95.2	95.2	94.8	0.77	293	7.6	1926	1.6	2.6	9.7	1710	69
200	M3KP 355SMC 8	3GKP354230-••G	742	95.3	95.7	95.5	0.79	385	7.4	2576	1.6	2.6	11.3	1850	69
250	M3KP 355MLB 8	3GKP354420-••G	743	95.4	95.5	95.0	0.80	472	7.5	3213	1.6	2.7	13.5	2210	72
315	M3KP 400LA 8	3GKP404510-••G	743	96.1	96.0	95.6	0.81	592	7.0	4043	1.2	2.6	17	3020	71
315	M3KP 400LKA 8	3GKP404810-••G	743	96.1	96.0	95.6	0.81	592	7.0	4043	1.2	2.6	17	3020	71
355	M3KP 400LB 8	3GKP404520-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3320	71
355	M3KP 400LKB 8	3GKP404820-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3320	71
400	M3KP 400LC 8	3GKP404530-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3520	71
400	M3KP 400LKC 8	3GKP404830-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3520	71
430	M3KP 450LA 8	3GKP454510-••G	744	95.9	96.1	95.8	0.82	789	6.2	5519	1.0	2.6	26	3750	80
470	M3KP 450LB 8	3GKP454520-••G	744	96.0	96.2	95.8	0.82	861	6.6	6032	1.1	2.7	29	4000	80
530	M3KP 450LC 8	3GKP454530-••G	745	96.1	96.2	95.8	0.81	982	7.3	6793	1.3	3.0	35	4350	80
600	M3KP 450LD 8	3GKP454540-••G	745	96.3	96.3	95.9	0.80	1124	7.9	7690	1.4	3.3	41	4800	80
750 r/min = 8 poles				400 V 50 Hz				High-output design							
18.5	M3KP 200MLB 8	3GKP204420-••G	734	89.2	89.8	88.8	0.80	37.1	6.9	240	2.2	3.2	0.54	315	57
30	M3KP 225SMC 8	3GKP224230-••G	731	90.7	91.6	91.6	0.78	61.2	6.3	391	2.3	3.0	0.75	390	59
37	M3KP 250SMB 8	3GKP254220-••G	737	92.2	92.9	92.5	0.79	73.0	7.5	479	2.3	3.4	1.52	480	59
55	M3KP 280SMC 8	3GKP284230-••G	741	93.4	93.7	93.6	0.80	107	7.9	708	1.9	3.1	2.85	745	65

[1] Temperature rise class F
[2] Efficiency class IE1

Technical data for Ex de IIB/IIC T4 Gb
Flameproof IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2 poles				400 V 50 Hz				CENELEC-design							
11	M3KP 160MLA 2	3GKP161410-••L	2943	91.2	92.0	91.6	0.91	19.1	7.2	35.6	2.6	3.6	0.057	219	69
15	M3KP 160MLB 2	3GKP161420-••L	2947	91.9	92.2	91.8	0.88	26.5	8.2	48.5	3.2	4.2	0.063	226	69
18.5	M3KP 160MLC 2	3GKP161430-••L	2949	92.4	93.0	92.6	0.90	32.0	9.0	59.8	3.3	3.9	0.076	240	73
22	M3KP 180MLA 2	3GKP181410-••L	2956	92.7	93.1	92.7	0.90	37.7	7.8	71.0	3.4	3.8	0.11	276	73
30	M3KP 200MLA 2	3GKP201410-••L	2957	93.3	93.8	93.6	0.88	52.4	7.5	96.9	2.5	3.1	0.182	312	73
37	M3KP 200MLB 2	3GKP201420-••L	2960	93.7	94.2	94.1	0.89	64.2	8.2	120	3.1	3.4	0.222	339	73
45	M3KP 225SMA 2	3GKP221210-••L	2968	94.0	94.0	93.0	0.87	79.6	7.3	145	3.2	3.1	0.296	405	76
55	M3KP 250SMA 2	3GKP251210-••L	2968	94.3	93.7	93.6	0.89	94.8	6.8	177	2.4	3.0	0.426	470	76
75	M3KP 280SMB 2	3GKP281220-••L	2978	94.7	94.4	93.5	0.88	130	7.0	240	2.3	3.0	0.9	686	74
110	M3KP 315SMB 2	3GKP311220-••L	2982	95.2	94.9	93.9	0.87	192	7.0	352	1.8	2.7	1.3	928	78
132	M3KP 315SMC 2	3GKP311230-••L	2982	95.4	95.4	94.6	0.87	229	6.8	422	2.0	2.8	1.5	983	78
160	M3KP 315SMD 2	3GKP311240-••L	2983	95.6	95.6	94.9	0.87	275	7.4	512	2.2	2.8	1.7	1040	78
200	M3KP 315MLA 2	3GKP311410-••L	2983	95.8	95.8	95.3	0.88	342	7.7	640	2.5	3.1	2.1	1190	81
250	M3KP 355SMA 2	3GKP351210-••L	2985	95.8	95.6	94.6	0.89	423	7.7	800	2.1	3.3	3	1630	83
315	M3KP 355SMB 2	3GKP351220-••L	2980	95.8	95.7	95.0	0.89	529	7.0	1009	2.1	3.0	3.4	1710	83
355	M3KP 355SMC 2	3GKP351230-••L	2984	95.8	95.8	95.0	0.88	605	7.2	1136	2.2	3.0	3.6	1780	83
3000 r/min = 2 poles				400 V 50 Hz				High-output design							
250	M3KP 315LKB 2	3GKP311820-••L	2983	95.8	96.0	95.5	0.90	419	7.7	800	2.5	3.3	2.9	1550	81
1500 r/min = 4 poles				400 V 50 Hz				CENELEC-design							
11	M3KP 160MLA 4	3GKP162410-••L	1477	91.4	91.8	91.1	0.82	21.1	7.6	71	2.6	3.3	0.11	234	61
15	M3KP 160MLB 4	3GKP162420-••L	1477	92.1	92.4	91.6	0.82	28.5	8.2	97	3.0	3.7	0.135	253	61
18.5	M3KP 180MLA 4	3GKP182410-••L	1481	92.6	93.2	92.9	0.83	34.9	7.2	119	2.8	3.0	0.219	285	60
22	M3KP 180MLB 4	3GKP182420-••L	1481	93.0	93.5	93.3	0.82	41.4	6.5	142	3.0	3.2	0.243	290	60
30	M3KP 200MLA 4	3GKP202410-••L	1483	93.6	93.8	93.4	0.84	54.8	7.5	193	2.7	3.2	0.385	340	63
37	M3KP 225SMA 4	3GKP222210-••L	1482	93.9	94.1	93.8	0.83	68.9	7.2	239	3.1	3.1	0.427	394	67
45	M3KP 225SMB 4	3GKP222220-••L	1482	94.2	94.4	94.0	0.84	82.3	8.0	290	3.2	3.5	0.525	431	66
55	M3KP 250SMA 4	3GKP252210-••L	1482	94.6	94.7	94.0	0.84	100	7.1	354	2.9	3.4	0.694	442	68
75	M3KP 280SMB 4	3GKP282220-••L	1485	95.0	95.2	94.8	0.86	133	6.4	483	2.3	2.8	1.38	669	75
90	M3KP 280SMC 4	3GKP282230-••L	1485	95.2	95.5	95.2	0.86	158	7.1	578	2.5	2.9	1.73	729	75
110	M3KP 315SMB 4	3GKP312220-••L	1489	95.4	95.5	94.9	0.84	195	7.0	705	2.1	3.0	2.43	946	71
132	M3KP 315SMC 4	3GKP312230-••L	1488	95.6	95.9	95.5	0.86	231	6.7	847	2.2	2.9	2.9	1019	71
160	M3KP 315SMD 4	3GKP312240-••L	1488	95.8	96.0	95.8	0.85	282	6.9	1026	2.2	3.0	3.2	1059	71
200	M3KP 315MLB 4	3GKP312420-••L	1487	96.0	96.4	96.4	0.86	351	6.8	1284	2.4	3.0	3.9	1232	74
250	M3KP 355SMA 4	3GKP352210-••L	1491	96.0	96.0	95.6	0.86	435	6.4	1601	2.1	2.9	5.9	1631	78
315	M3KP 355SMB 4	3GKP352220-••L	1491	96.0	96.1	95.7	0.85	550	7.3	2018	2.4	3.3	6.9	1799	78
355	M3KP 355SMC 4	3GKP352230-••L	1490	96.0	96.2	95.8	0.86	616	6.3	2273	2.3	2.8	7.2	1839	78
1500 r/min = 4 poles				400 V 50 Hz				CENELEC-design							
250	M3KP 315LKA 4	3GKP312810-••L	1488	96.0	96.3	96.1	0.85	442	6.9	1604	2.5	3.2	4.4	1420	78

Technical data for Ex de IIB/IIC T4 Gb
Flameproof IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cosphi	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J=1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6 poles				400 V 50 Hz				CENELEC-design							
11	M3KP 160MLB 6	3GKP163420-••L	975	90.3	91.1	91.1	0.78	22.5	6.4	108	1.6	3.1	0.138	253	64
15	M3KP 180MLA 6	3GKP183410-••L	979	91.2	91.9	91.6	0.79	30.1	5.2	147	1.5	2.7	0.212	282	63
18.5	M3KP 200MLA 6	3GKP203410-••L	989	91.7	91.9	91.2	0.82	35.2	6.5	179	2.2	3.2	0.496	320	59
22	M3KP 200MLB 6	3GKP203420-••L	989	92.2	92.4	91.4	0.81	42.4	7.3	212	2.6	3.5	0.585	347	59
30	M3KP 225SMA 6	3GKP223210-••L	988	92.9	93.0	92.2	0.77	60.4	7.7	291	2.9	3.6	0.724	419	63
37	M3KP 250SMA 6	3GKP253210-••L	990	93.3	93.7	93.5	0.80	71.1	6.5	357	2.4	3.1	1.3	503	58
45	M3KP 280SMB 6	3GKP283220-••L	991	93.7	94.0	93.5	0.84	82.0	7.4	433	2.7	3.0	1.87	655	72
55	M3KP 280SMC 6	3GKP283230-••L	992	94.1	94.3	93.8	0.86	99.0	7.5	528	2.8	3.0	2.57	705	71
75	M3KP 315SMB 6	3GKP313220-••L	994	94.6	94.9	94.6	0.84	136	6.8	720	1.8	2.6	4.1	914	75
90	M3KP 315SMC 6	3GKP313230-••L	994	94.9	95.1	94.7	0.84	164	7.2	864	2.0	3.0	4.6	990	76
110	M3KP 315SMD 6	3GKP313240-••L	994	95.1	95.3	95.0	0.83	200	7.3	1056	2.2	3.1	4.9	1038	75
132	M3KP 315MLB 6	3GKP313420-••L	995	95.4	95.5	95.1	0.82	242	7.3	1266	2.3	3.2	6.3	1212	72
160	M3KP 355SMA 6	3GKP353210-••L	993	95.6	95.8	95.6	0.82	292	6.7	1538	2.5	2.6	7.9	1553	75
200	M3KP 355SMB 6	3GKP353220-••L	993	95.8	96.2	96.1	0.82	365	6.7	1923	2.6	2.5	9.7	1712	75
250	M3KP 355SMC 6	3GKP353230-••L	993	95.8	96.1	95.8	0.81	465	7.7	2404	3.0	3.1	11.3	1849	75
315	M3KP 355MLB 6	3GKP353420-••L	993	95.8	96.1	96.0	0.83	571	6.8	3029	2.6	3.2	13.5	2210	76
355	M3KP 355LKA 6	3GKP353810-••L	993	95.8	96.0	95.9	0.81	653	7.5	3413	2.9	3.2	15.5	2510	76
1000 r/min = 6 poles				400 V 50 Hz				CENELEC-design							
160	M3KP 315LKA 6	3GKP313810-••L	994	95.6	95.8	95.4	0.81	298	7.5	1535	2.2	3.1	7.3	1420	76
750 r/min = 8 poles				400 V 50 Hz				CENELEC-design							
37	M3KP 280SMA 8	3GKP284210-••L	742	91.8	92.1	91.4	0.79	73.0	7.3	476	1.7	3.0	1.85	625	65
45	M3KP 280SMB 8	3GKP284220-••L	741	92.2	92.4	91.8	0.78	89.6	7.6	579	1.8	3.1	2.2	665	65
55	M3KP 315SMA 8	3GKP314210-••L	742	92.5	93.1	92.5	0.80	106	7.7	707	1.8	2.7	3.2	850	62
75	M3KP 315SMB 8	3GKP314220-••L	740	93.1	93.3	93.1	0.79	146	7.1	966	1.7	2.7	4.1	950	62
90	M3KP 315SMC 8	3GKP314230-••L	739	93.4	93.8	93.4	0.81	171	7.4	1159	1.8	2.7	4.9	1020	64
110	M3KP 315MLA 8	3GKP314410-••L	740	93.7	94.0	94.1	0.80	211	7.3	1419	1.8	2.7	5.8	1170	72
132	M3KP 355SMA 8	3GKP354210-••L	744	94.0	93.9	93.4	0.77	256	7.5	1694	1.5	2.6	7.9	1550	69
132	M3KP 355SMA 8	3GKP354210-••L	744	94.0	93.9	93.4	0.77	256	7.5	1694	1.5	2.6	7.9	1550	69
160	M3KP 355SMB 8	3GKP354220-••L	744	94.3	94.3	93.9	0.77	293	7.6	1926	1.6	2.6	9.7	1710	69
200	M3KP 355SMC 8	3GKP354230-••L	742	94.6	95.1	94.9	0.79	385	7.4	2576	1.6	2.6	11.3	1850	69
250	M3KP 355MLB 8	3GKP354420-••L	743	94.6	94.8	94.2	0.80	472	7.5	3213	1.6	2.7	13.5	2210	72

Variant codes
Flameproof motors Ex de 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/ variant		Frame size 80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Administration																
531	Sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
532	Packing of motor in vertical mounting position	-	-	-	-	-	-	-	•	•	•	•	•	-	-	-
533	Wooden sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
590	Mounting of customer supplied part other than coupling.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
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	○	○	○	○	○	•	•	•	•	•	•	•	•	•	•
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	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
Branch standard designs																
178	Stainless steel / acid proof bolts.	○	○	○	○	○	•	•	•	•	•	•	•	•	•	•
204	Jacking bolts for foot mounted motors.	-	-	-	-	-	•	•	•	•	•	•	•	○	○	○
209	Non-standard voltage or frequency, (special winding).	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
265	Assembly of line # to #	•	•	•	•	•	•	•	•	•	•	•	-	-	-	-
396	Motor designed for ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
397	Motor designed for ambient temperature -40 °C to -55 °C, with space heaters (code 450/451 must be added)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
398	Motor designed for ambient temperature -20 °C to -40 °C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
399	Motor designed for 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, V36, 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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

○ Included as standard
• Available as option
- Not applicable

Code/ variant		Frame size 80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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 dimension drawing.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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.	•	•	•	•	•	•	•	•	•	•	•	-	-	-	-
507	Exd from Exde	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-
516	Ex i approved temperature detectors (Pt100)	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
813	Thermistor-based surface temperature protection T4 for frequency convertor 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 Det Norske Veritas (DNV) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
026	Fulfilling Lloyds Register of Shipping (LR) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
027	Fulfilling American Bureau of Shipping (ABS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
049	Fulfilling Germanischer Lloyd (GL) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
050	Fulfilling Registro Italiano Navale (RINA) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
051	Fulfilling Russian Maritime Register of Shipping (RS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
096	Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
186	Fulfilling Det Norske Veritas (DNV) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
676	Fulfilling Germanischer Lloyd (GL) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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).	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-

○ Included as standard
• Available as option
- Not applicable

Code/ variant		Frame size 80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
066	Modified for specified mounting position differing from IM B3 (1001), IM B5 (3001), B14 (3601), IM B35 (2001), IM B34 (2101)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
093	IM 3601 flange mounted, IEC flange, from IM 1001 (B14 from B3).	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-
228	Flange FF 130.	•	•	•	•	-	-	-	-	-	-	-	-	-	-	-
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.	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-
258	Flange FT 100.	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-
259	Flange FF 115.	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-
260	Flange FT 115.	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
309	IM 1001 foot mounted, from IM 3001 (B3 from B5).	•	•	•	•	•	•	•	-	-	-	-	-	-	-	-
311	IM 2001 foot/flange mounted, IEC flange, from IM 3001 (B35 from B5).	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-
Painting																
105	Paint thickness report.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
115	Painting system C4M acc. to ISO 12944-2: 1998.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
168	Primer paint only.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
303	Painted insulation layer on inside of the terminal boxes.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
710	Thermally sprayed zink metallizing with acrylic top coat	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
711	Painting system C5-M very high, acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
754	Painting system C5M acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Protection																
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
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 ....”	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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																
248	Design according to Petronas PTS 33.66.05.31-GEN. February 2010.	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
251	Shell DEP 33.66.05.31-GEN. February 2012.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
252	Shell DEP 33.66.05.31-GEN. February 2012, with standard winding >55 kW.	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-

○ Included as standard
• Available as option
- Not applicable

Code/ variant		Frame size 80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
408	Fulfilling EISA Subtype II efficiency requirements, CC031A.	-	-	-	-	-	•	•	•	•	•	•	•	-	-	-
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
505	VIK design with ABB standard shaft dimensions (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
540	China energy label	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
541	Inmetro certification	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
543	Australian MEPS	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
544	Australian HE MEPS	-	-	-	-	-	•	•	•	•	•	•	•	-	-	-
547	Certificate of conformity according TR-CU 012/2011 for customs union RU, KZ, BY.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
782	Fulfilling CQST Certification requirements (China)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stator winding temperature sensors																
121	Bimetal detectors, break type (NCC), (3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
122	Bimetal detectors, break type (NCC), (3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
123	Bimetal detectors, break type (NCC), (3 in series), 170 °C, in stator winding	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
125	Bimetal detectors, break type (NCC), (2x3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
127	Bimetal detectors, break type (NCC), (3 in series, 130 °C & 3 in series, 150 °C), in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
328	PTC - thermistors (3 in series), 120°C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
435	PTC - thermistors (3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
439	PTC - thermistors (2x3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
441	PTC - thermistors (3 in series, 130 °C & 3 in series, 150 °C), in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
445	Pt100 2-wire in stator winding, 1 per phase	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
446	Pt100 2-wire in stator winding, 2 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
502	Pt100 3-wire in stator winding, 1 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
503	Pt100 3-wire in stator winding, 2 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
511	PTC thermistors (2 x 3 in series), 130 °C, 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	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
277	Cable sealing end unit, size small for C-opening	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-
278	Cable sealing end unit, size medium for D-opening	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•
279	Cable sealing end unit, size large for D-opening	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•
292	Adapter C-C	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-
293	Adapter D-D	-	-	-	-	-	-	-	-	-	-	-	•	•	•	-
294	Adapter E-D	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•
295	Adapter E-2D	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•
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.	•	•	•	•	•	•	•	•	•	•	•	•	-	-	-
526	Existing cable entries plugged	○	○	○	○	○	○	○	○	○	○	○	○	○	•	•
553	Terminal box degree of protection IP66.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
554	Painted steel flange for cable glands drilled and tapped according to order.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
555	Aluminum 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 BSP cable glands.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
727	Stainless steel flange for cable glands drilled and tapped according to order.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
729	Aluminum non-drilled flange for cable glands	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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	Painted non-drilled flange in steel for cable glands	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
744	Stainless steel non-drilled flange for cable glands.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

○ Included as standard
• Available as option
- Not applicable

Code/ variant		Frame size														
		80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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																
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 curve, type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
241	Nuclear motor testing	•	•	•	•	•	-	-	-	-	-	-	-	-	-	-
560	Shaft voltage test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
561	Overspeed test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
562	Overvoltage test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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																
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

Mechanical design
Motor frame and drain holes

Motor frame
The motor frame, end shields and main terminal box are made of cast iron. Motors in frame size 200 and larger have integrated feet for rigid and vibration free mounting, motors in frame size 80-180 have detachable feet made of forged steel for maximum flexibility and rigidity.

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

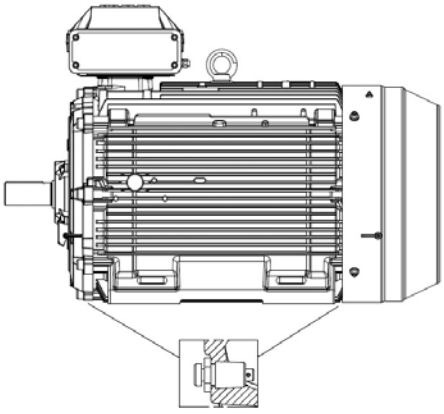
Drain holes
Flame proof Ex de motors are provided without drain holes and plugs as standard.

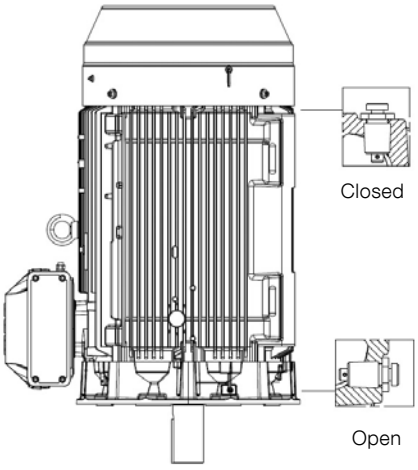
It's recommended that motors that will be operated in very humid or wet environments, and especially under intermittent duty, should be provided with drain holes with plugs to ensure that water possibly condensed inside the enclosure can easily be drained. Flame proof drain plugs which can be easily 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.

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	Detachable lifting eye	1 pcs close to terminal box	1 pcs close to terminal box
90-112	Integrated in casting	2 pcs close to terminal 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





Heating elements

Heating elements are installed on stator winding coil heads to keep the winding 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.

Bearings

ABB's flame proof 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 flame proof 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.

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.

Standard and alternative designs

		Standard design		Alternative design		
		Deep groove ball bearings		Roller bearings (037)	Roller bearings (037)	Angular contact ball bearing (058)
Motor size	Number of poles	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	6205-2Z/C3	NA	NA	NA
100	2 - 8	6206-2Z/C3	6206-2Z/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	6310M/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	NA	NA
280	2	6316/C3	6316/C3	[1]	NA	7316 B
	4 - 12	6316/C3	6316/C3	NU 316 ECP/C3	NA	7316 B
315	2	6316/C3	6316/C3	[1]	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	6322M/C3	NA	NA	7326 B

[1] On request

Axially-locked bearings

All motors with deep groove ball bearings 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.

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 for motor sizes 80-450

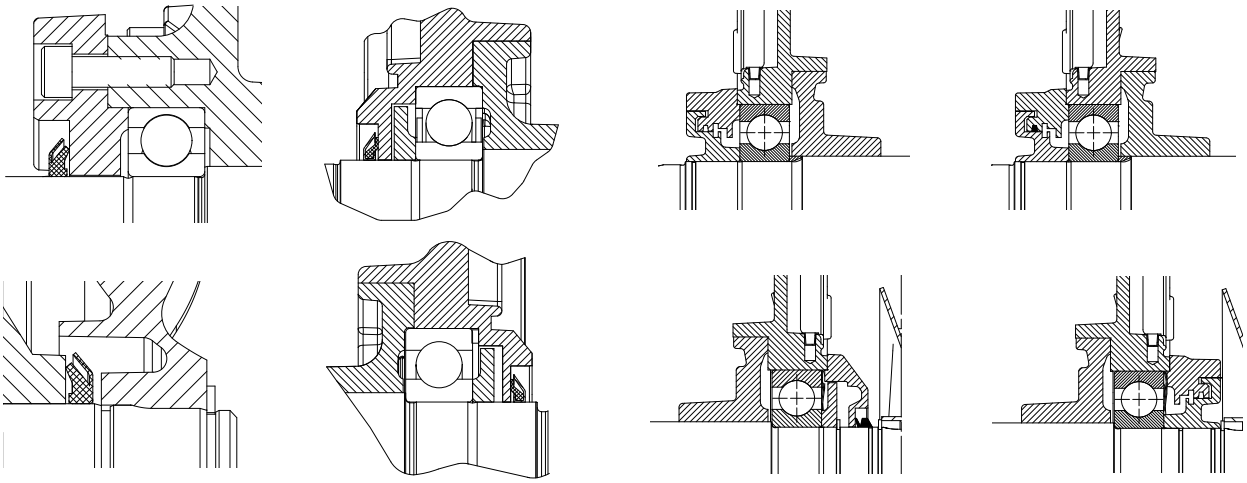
Motor size	Number of poles	Standard design		Alternative design	
		D-end	N-end	Radial seal at D-end (variant code 072) [1]	Labyrinth seal at D-end (variant code 783) [1]
80	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
90	2 – 8	Gamma seal	Gamma seal	Radial seal	Labyrinth seal
100	2 - 8	Gamma 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 IE2 motors, IE3 motors have labyrinth seal

Standard design

D-end

N-end



Motor size, seal type D-end / N-end

80-132, gamma/gamma seal

160-250, gamma/gamma seal

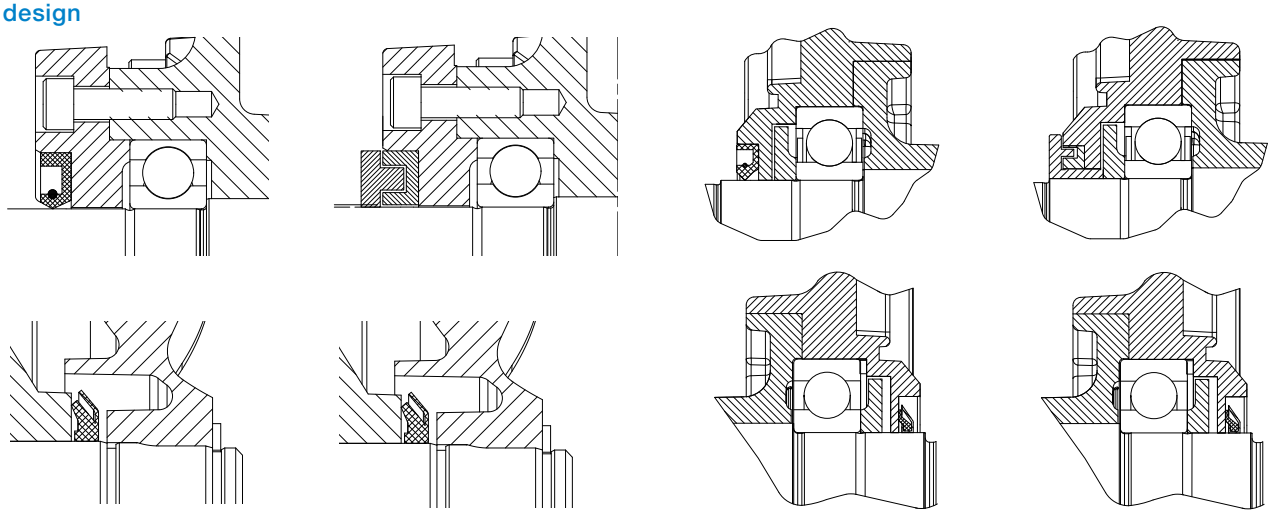
280-355, 400 4-12 pole, labyrinth/V-ring seal

400 2-pole, 450 4-12 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 and lubrication

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 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 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 160-450, 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 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 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	8500	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	10700
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	10300	all	10800
180	15	15		3000	3900	all	6600	7500	all	9700	all	10200
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

Radial forces

Pulley diameter

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

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

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.

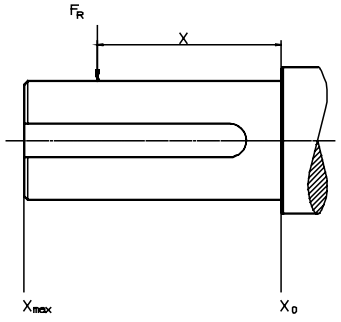
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft together with flame path dimensions affects permissible forces.

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 FR 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 sizes 80-132

			Basic design with deep groove ball bearings L_{10h}=40,000h				Roller bearings L_{10h}=40,000h			
			Mounting arrangement IM B3				Mounting arrangement IM B3			
			Gas group IIB		Gas group IIC		Gas group IIB		Gas group IIC	
Motor size	No. of poles	Length of shaft extension E (mm)	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	619	524	619	524	NA		NA	
	4	40	780	663	780	663	NA		NA	
	6	40	893	759	893	759	NA		NA	
	8	40	983	834	983	834	NA		NA	
90	2	50	561	473	561	473	NA		NA	
	4	50	803	677	803	677	NA		NA	
	6	50	919	775	919	775	NA		NA	
	8	50	1011	853	1011	853	NA		NA	
100	2	60	553	457	553	457	NA		NA	
	4	60	1050	868	1050	868	NA		NA	
	6	60	1267	1047	1267	1047	NA		NA	
	8	60	1395	1153	1395	1153	NA		NA	
112	2	60	553	457	553	457	NA		NA	
	4	60	1050	868	1050	868	NA		NA	
	6	60	1267	1047	1267	1047	NA		NA	
	8	60	1394	1152	1394	1152	NA		NA	
132	2	80	1354	1112	1354	1112	NA		NA	
	4	80	1772	1454	1772	1454	NA		NA	
	6	80	2028	1665	2028	1665	NA		NA	
	8	80	2234	1833	2234	1833	NA		NA	

Permissible radial forces, motor sizes 160 to 450

Motor size	Poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings L_{10h}=40,000h				Roller bearings L_{10h}=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)
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	
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	

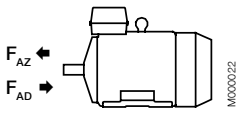
[1] only allowed for direct coupling duty

Axial forces

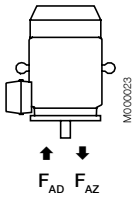
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



Mounting arrangement IM B3



Mounting arrangement IM V1

Permissible axial forces, motor sizes 80 - 450

			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	
Motor size	Poles	Length of shaft extension E (mm)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
80	2	40	660	300	690	280
	4	40	820	460	860	440
	6	40	940	580	970	550
	8	40	1030	670	1070	650
90	2	50	740	220	780	190
	4	50	900	380	950	340
	6	50	1010	490	1080	450
	8	50	1110	590	1170	540
100	2	60	1100	220	1180	170
	4	60	1320	430	1430	360
	6	60	1480	590	1600	510
	8	60	1610	720	1730	640
112	2	60	1100	220	1180	170
	4	60	1320	430	1430	360
	6	60	1480	590	1600	510
	8	60	1610	720	1730	640
132	2	80	1530	500	1700	390
	4	80	1870	840	2080	690
	6	80	2110	1080	2380	900
	8	80	2320	1280	2580	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

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)
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
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, LK_	2	170	810	5810	8010	730
	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’ increased safety and prevents all ignition sources such as sparks, excessive over hating 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 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 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, no cable glands are included as standard, the entry holes are closed with Ex e approved blanking plugs made of nickel plated brass. Very large motors have angle adapters and cable sealing units as standard. Please refer to the table on next page for further information about amount and size of threaded holes, plugs and cable sealing units 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. Note: For other network voltages, contact your ABB sales office.

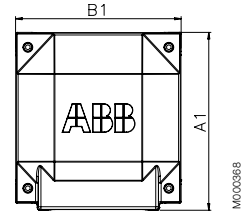
Cable entries for supply cables Motor size	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adapter	Gland plate with threaded holes, amount and size, holes plugged	Cable sealing end unit, size	Max. connect-able core cross-section mm2/ phase	Number and size of terminal bolts
IE2 motors								
80 - 90	2-8	25	B	-	1x M25x1.5	-	1x10	6x M5
100 - 132	2-8	25	B	-	2x M32x1.5	-	1x10	6x M5
160 - 180	2-8	63	2x B	-	2x M40x1.5	-	1x35	6x M6
200 - 250	2-8	160	C	-	2x M50x1.5	-	1x70	6x M10
280 SM_	2-8	210	C	-	2x M63x1.5	-	2x150	6x M12
315 SM_, ML_	2-8	370	D	-	2x M63x1.5	-	2x240	6x M12
355 SMA - SMC	2-4	750	E	E-D	-	Medium	4x240	6x M12
355 SMA, SMB	6-8	370	D	-	2x M63x1.5	-	2x240	6x M12
355 SMC	6	750	E	E-D	-	Medium	4x240	6x M12
355 SMC	8	370	D	-	2x M63x1.5	-	2x240	6x M12
355 ML_, LK_	2-4	750	E	E-D	-	Large	4x240	6x M12
355 ML_, LK_	6-8	750	E	E-D	-	Medium	4x240	6x M12
400	2-6	750	E	E-D	-	Large	4x240	6x M12
400	8	750	E	E-D	-	Medium	4x240	6x M12
450	4-8	1200	E	E-2D	-	2xLarge	6x240	12x M12
IE3 motors								
160 - 180	2-8	63	2x B	-	2x M40x1.5	-	1x35	6x M6
200 - 250	2-8	160	C	-	2x M50x1.5	-	1x70	6x M10
280	2-8	210	C	-	2x M63x1.5	-	2x150	6x M12
315	2-8	370	D	-	2x M63x1.5	-	2x240	6x M12
355 SM_	2-4	750	E	E-D	-	Medium	4x240	6x M12
355 SM_	6	370	D	-	2x M63x1.5	-	2x240	6x M12
355 ML_, LK_	2-6	750	E	E-D	-	Medium	4x240	6x M12
Auxiliary cable entries								
80 - 132	2-8				1x M20x1.5		1x 2.5 mm^2 per terminal	
160-450	2-8				1x M20x1.5		1x 2.5 mm^2 per terminal	

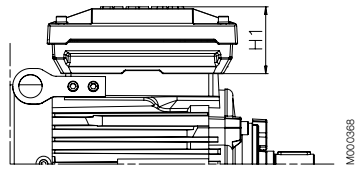
Motor size	Earthing on frame	Earthing in main terminal box
80 - 132	M6	M6
160 – 180	M6	M6
200 - 250	M8	M8
280 - 400	M10	2xM10
450	M10	4xM12

Terminal box
Terminal box dimensions

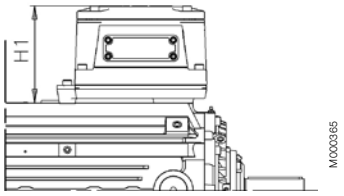
To match the correct terminal box with motor size, find the motor type and correspondent terminal box type on the previous page. The box types and their dimensions are presented on this page.

Terminal boxes, standard with 6 terminals

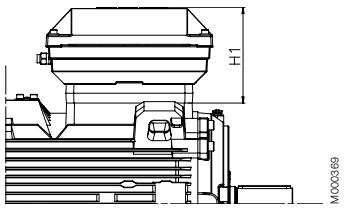




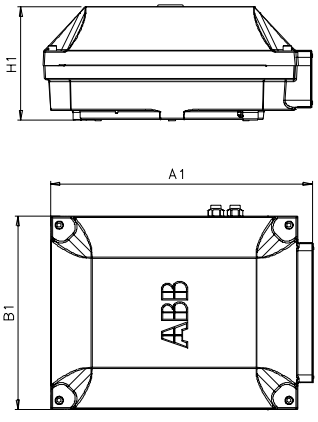
Motor sizes 80 to 132



Motor sizes 160 to 180

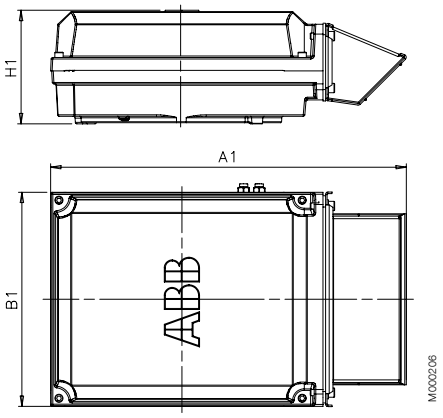


Motor sizes 200 to 250

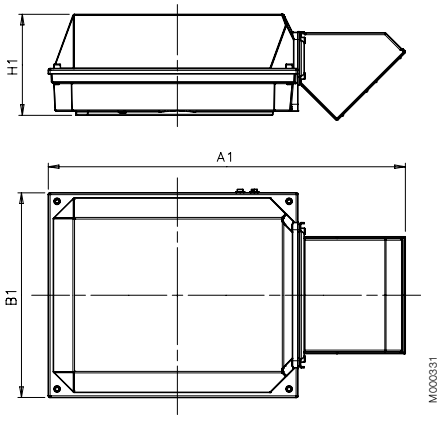


Motor sizes 280 to 315

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



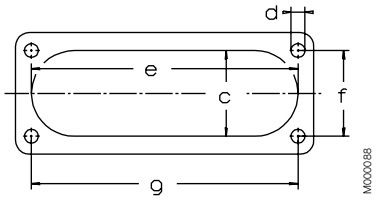
Motor sizes 355 to 400



Motor sizes 450

Dimensions of opening for gland plate

To match the correct terminal box with motor size, find the



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

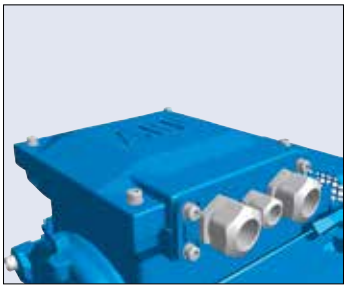


Fig 1. Terminal box for motor sizes 80 to132

Fig 2. Terminal box for motor sizes 160 to 180

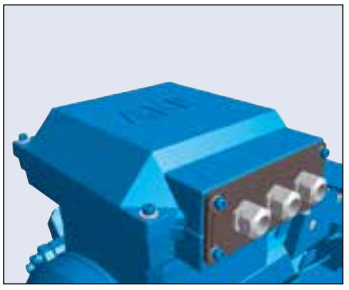


Fig 3. Terminal box for motor sizes 200 to 250

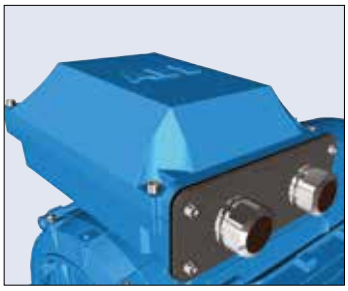


Fig 4. Terminal box for motor sizes 280 to 315 with connection flange and cable glands.

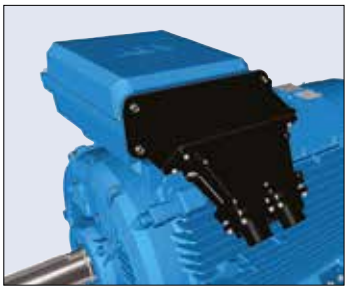


Fig 5. Terminal box for motor sizes 355 to 400, with adapter and cable sealing end unit.

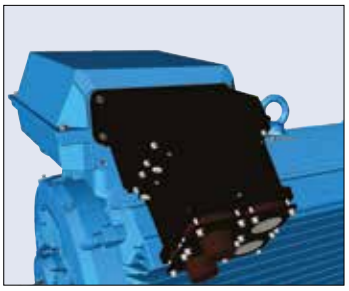


Fig 6. Terminal box for motor sizes 450, with adapter and cable sealing end unit.

Terminal boards

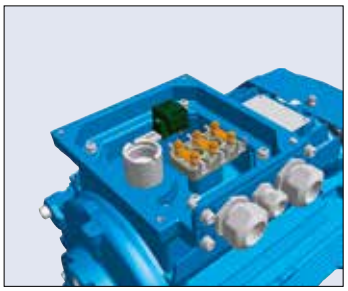


Fig 7. Terminal board for motor sizes 80 to 132

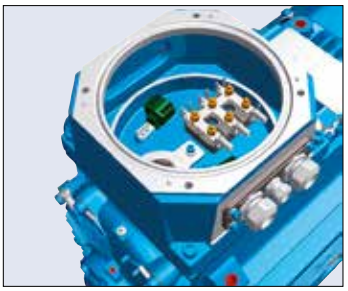


Fig 8. Terminal board for motor sizes 160 to 180

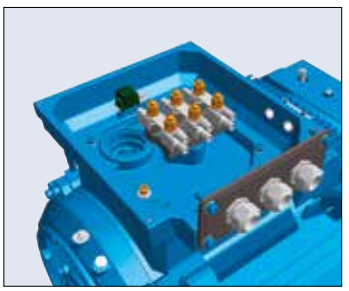


Fig 9. Terminal board for motor sizes 200 to 250

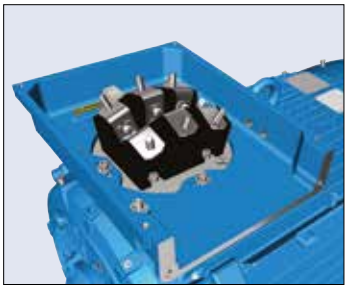


Fig 10. Terminal board for motor sizes 280 to 315.

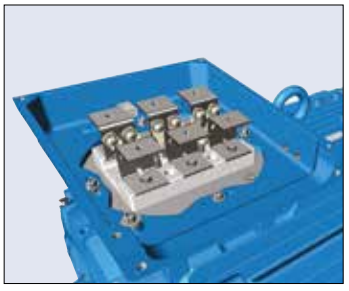


Fig 11. Terminal board for motor sizes 355 to 400.

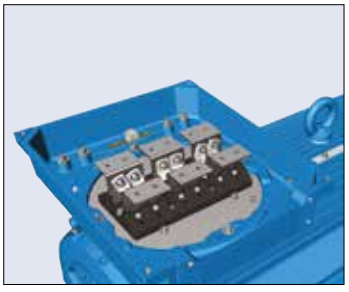


Fig 12. Terminal board for motor size 450.

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

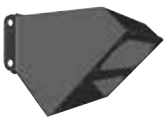
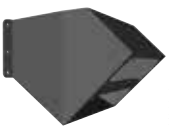
- Check first that the terminal box itself allows mounting of the desired cable and cores (refer to table showing standard delivery for each motor size). If very large cable are used might it be necessary to use a larger terminal box and larger terminal board than standard
- Select the right cable gland(s) 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

Motor and supply cables	200kW, 4-pole, 400V 50Hz, IE2. Cables needed: 1 pcs outer diameter 42 mm steel wire armoured cable, single cross section 120 mm². Cables coming from below. Gland plate material steel.
Motor	M3KP 315MLA 2, B3
Adapter (to allow entry of cables coming from below)	Variant code 293 (adaptor D-D)
Cable glands Ex d 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, is an angle adapter recommended. These are available for motor sizes 280 and above and can also be used to allow mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the “size of gland plate opening on terminal box” column in section Standard terminal box.column in section Standard terminal box.

Adapter	 M000430	 M000431	 M000432	 M000433	 M000434	 M000434
Variant code	292	293	294	295	296	444
Suited for motor sizes	280	315, 355	315 LKC, 355 - 450	315 LKC, 355 - 450	315 LKC, 355 - 450	315 LKC, 355 - 450
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	Steel	Steel	Steel	Steel	Steel	Steel
Notes			Included in type 750 terminal box when 750 is the standard size.	Included in type 1200 terminal box when 1200 is the standard size.	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 or cable sealing units 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, variant code 230 or 731	EMC Cable gland(s) nickel plated brass, Ex e, for non armoured cable, variant code 704	Cable gland Ex d IIC / Ex e 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 ordered will the sizes in tables below be delivered.

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”
315-450	2 x 3”	1 x 3”

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

Gland plates with threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands 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 aluminum or stainless steel are optional, either with cable glands or blind without threaded holes. Please refer to the variant code section for more information.

Cable sealing end units

As an alternative to gland plates and cable glands, cable sealing end units can be used. These allow more space for spreading the cores for easy termination. Cable sealing units have rubber sealed entries for one or two main cables. In addition there are two plugged M20 holes for auxiliary cables. The cable sealing end units are Ex e certified, as option can they be equipped with EMC modules or cable clamping devices by adding variant codes 704 or 231.

End unit	 M000436	 M000437	 M000438
Variant code	277	278	279
Suited for motor sizes	280	315, 355	315, 355
Opening to terminal box	C	D	D
Cable outer diameter	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 60 - 80 mm
Cable entry for auxiliary cable	2 x M20 plugged holes	2 x M20 plugged holes	2 x M20 plugged holes
Additional optional variants	EMC cable gland (704); Standard gland with clamping device (231)	EMC cable gland (704); Standard gland with clamping device (231)	EMC cable gland (704); Standard gland with clamping device (231)

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 aluminium, except frame sizes 160, 180 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.

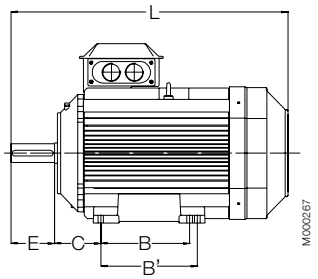
Related variant codes	
380	Separate terminal box for temperature detectors
418	Separate terminal box for auxiliaries
567	Separate terminal box material: cast Iron
568	Separate terminal box for heating elements

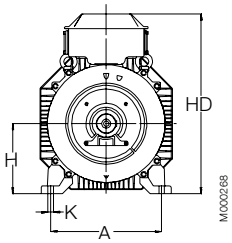
Small auxiliary aluminum terminal box for motor sizes 280-450
(variant codes 418, 568, 380, 569)
The size of terminal box ordered with these codes depends on the number of accessories ordered.
80 x 125 mm, max 12 strips. Earthing size M4

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

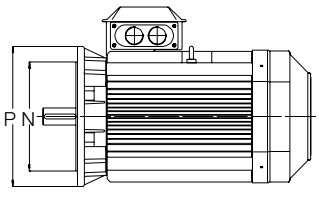
Auxiliary cast iron terminal box (variant code 567). 208 x 180 mm, max 30 strips. Earthing M6

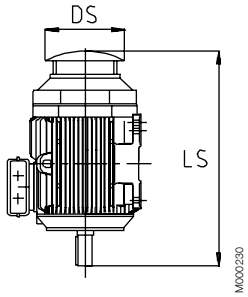
Dimension drawings
Flameproof motors, Ex de



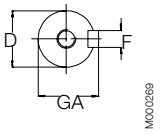


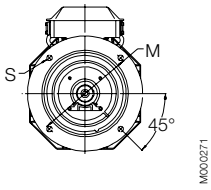
Foot-mounted motor IM 1001, IM B3



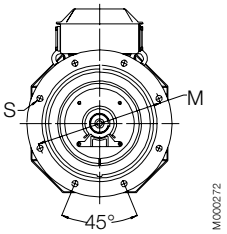


Flange-mounted motor IM 3001, IM B5

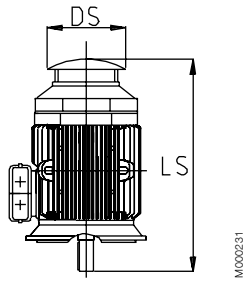




Sizes 80 to 200



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														LS poles		
	2	4-8	2	4-8	2	4-8	2	4-8	2	4-8	O [1]	A	B	B'	C	HD	K	H	M	N	P	S	DS	2	4-8
80	19	19	21.5	21.5	6	6	40	40	340	340	20	125	100	125	50	241	10	80	165	130	200	12	160	360	360
90	24	24	27	27	8	8	50	50	405	405	20	140	100	125	56	266	10	90	165	130	200	12	180	430	430
100	28	28	31	31	8	8	60	60	480	480	25	160	140	–	63	286	12	100	215	180	250	14.5	195	505	505
112	28	28	31	31	8	8	60	60	480	480	25	190	140	–	70	301	12	112	215	180	250	14.5	195	505	505
132	38	38	41	41	10	10	80	80	560	560	30	216	140	178	89	246	12	132	265	230	300	14.5	260	590	590
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	560/710	216	858	28	315	600	550	660	23	624	1552	1589
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

IM 3601, IM B14 - Available flange alternative; see also variant codes.

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

Tolerances:	
A, B	± 0,8
D, DA	ISO k6 < Ø 50mm
	ISO m6 > Ø 50mm
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

IECEx Certificate of Conformity

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

Certificate No.: IECEx LCI 04.0006X — issue No.:1

Certificate history: Issue No. 1 (2011-11-21); Issue No. 0 (2004-3-26)

Status: Current

Date of Issue: 2011-11-21 — Page 1 of 6

Applicant: **ABB Oy Motors and Generators**
P.O. Box 633
Strombergin Puistotie 5A
FIN-65101 VAASA
Finland

Electrical Apparatus: **Three-phase AC motor - M3JP / M3KP 280**
Optional accessory:

Type of Protection: **Ex d, Ex de , Ex t**

Marking: **Ex d or de IIB or IIC T3 to T6 (*) Gb**
Ex t IIIA or IIIB or IIIC T...°C (*) Db
IECEx LCI 04.0006X
IP5X, IP54, IP6X or IP64 (*)
(*) = depending on motor type and model as specified in manufacturer specifications.
For complete marking see additional information section

Approved for issue on behalf of the IECEx Certification Body: Michel BRENON

Position: Certification Officer — Rémi HANOT

Signature: (for printed version)

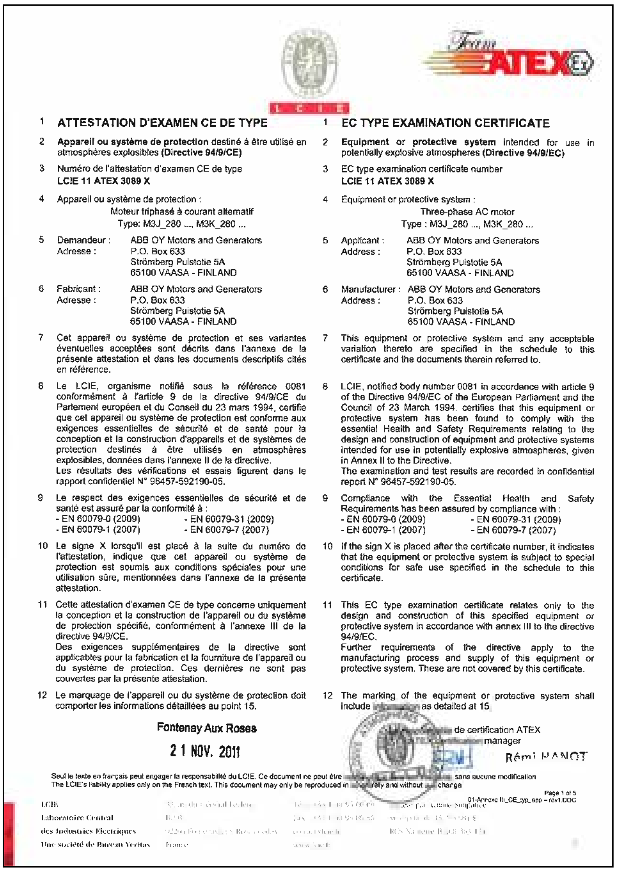
Date: 21/11/2011

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 the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

M000726a



1 **ATTESTATION D'EXAMEN CE DE TYPE**

2 **Appareil ou système de protection** destiné à être utilisé en atmosphères explosibles **(Directive 94/9/CE)**

3 Numéro de l'attestation d'examen CE de type
LCIE 11 ATEX 3089 X

4 Appareil ou système de protection :
Moteur triphasé à courant alternatif
Type: M3J_280 ..., M3K_280 ...

5 Demandeur : ABB OY Motors and Generators
Adresse : P.O. Box 633
Strömberg Puistotie 5A
65100 VAASA - FINLAND

6 Fabricant : ABB OY Motors and Generators
Adresse : P.O. Box 633
Strömberg Puistotie 5A
65100 VAASA - FINLAND

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles de sécurité et de santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive.
Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 96457-592190-05.

9 Le respect des exigences essentielles de sécurité et de santé est assuré par la conformité à :
- EN 60079-0 (2009) - EN 60079-31 (2009)
- EN 60079-1 (2007) - EN 60079-7 (2007)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à l'annexe III de la directive 94/9/CE.
Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection. Ces dernières ne sont pas couvertes par la présente attestation.

12 Le marquage de l'appareil ou du système de protection doit comporter les informations détaillées au point 15.

1 **EC TYPE EXAMINATION CERTIFICATE**

2 **Equipment or protective system** intended for use in potentially explosive atmospheres **(Directive 94/9/EC)**

3 EC type examination certificate number
LCIE 11 ATEX 3089 X

4 Equipment or protective system :
Three-phase AC motor
Type : M3J_280 ..., M3K_280 ...

5 Applicant : ABB OY Motors and Generators
Address : P.O. Box 633
Strömberg Puistotie 5A
65100 VAASA - FINLAND

6 Manufacturer : ABB OY Motors and Generators
Address : P.O. Box 633
Strömberg Puistotie 5A
65100 VAASA - FINLAND

7 This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in confidential report N° 96457-592190-05.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
- EN 60079-0 (2009) - EN 60079-31 (2009)
- EN 60079-1 (2007) - EN 60079-7 (2007)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with annex III to the directive 94/9/EC.
Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include information as detailed at 15.

Fontenay Aux Roses
21 NOV. 2011

... de certification ATEX
... manager
Rémi HANOT

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être ... sans aucune modification
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Page 1 of 5
01-Annexe III_CE_typ_app – rev1.DOC

LCIE
Laboratoire Central
des Industries Electriques
Une société de Bureau Veritas

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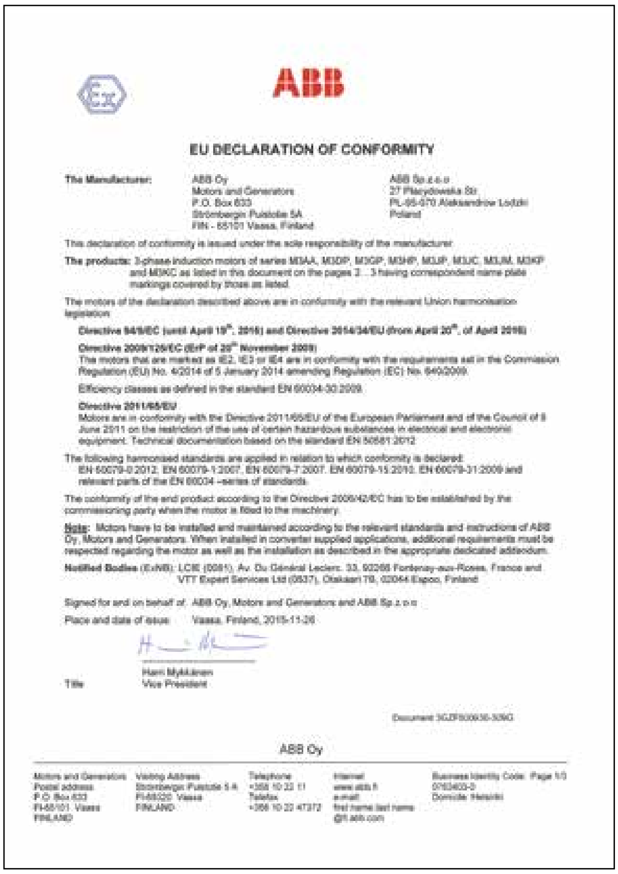


EU DECLARATION OF CONFORMITY

The Manufacturer: ABB Oy
Motors and Generators
P.O. Box 633
Strombergin 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: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The motors of the declaration described above are in conformity with the relevant Union harmonisation legislation:

Directive 94/9/EC (until April 19th, 2016) and Directive 2014/34/EU (from April 20th, of April 2016)

Directive 2009/125/EC (ErP of 20th November 2009)
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EU) No. 4/2014 of 5 January 2014 amending Regulation (EC) No. 640/2009.

Efficiency classes as defined in the standard EN 60034-30:2009.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Technical documentation based on the standard EN 50581:2012

The following harmonised standards are applied in relation to which conformity is declared:
EN 60079-0:2012, EN 60079-1:2007, EN 60079-7:2007, EN 60079-15:2010, EN 60079-31:2009 and relevant parts of the EN 60034 –series of standards.

The conformity of the end product according to the Directive 2006/42/EC has to be established by the commissioning party when the motor is fitted to the machinery.

Note: Motors have to 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.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc, 33, 92260 Fontenay-aux-Roses, France and VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland

Signed for and on behalf of: ABB Oy, Motors and Generators and ABB Sp.z.o.o

Place and date of issue: Vaasa, Finland, 2015-11-26

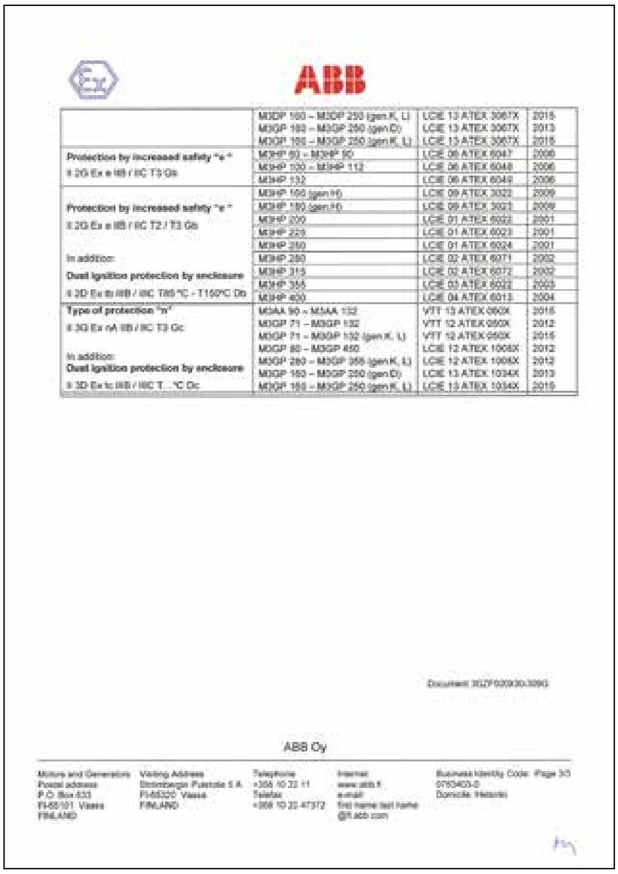
Harri Mykkänen
Title Vice President

Document 3GZF500930-309G

ABB Oy

Motors and Generators	Visiting Address	Telephone	Internet	Business Identity Code: Page 1/3
Postal address	Strombergin Puistotie 5 A	+358 10 22 11	www.abb.fi	0763403-0
P.O. Box 633	FI-65320 Vaasa	Telefax	e-mail:	Domicile: Helsinki
FI-65101 Vaasa	FINLAND	+358 10 22 47372	first name.last name	
FINLAND			@fi.abb.com	

M000725-1



	M3DP 160 – M3DP 250 (gen.K, L)	LCIE 13 ATEX 3067X	2015
	M3GP 160 – M3GP 250 (gen.D)	LCIE 13 ATEX 3067X	2013
	M3GP 160 – M3GP 250 (gen.K, L)	LCIE 13 ATEX 3067X	2015
Protection by increased safety "e" II 2G Ex e IIB / IIC T3 Gb	M3HP 80 – M3HP 90	LCIE 06 ATEX 6047	2006
	M3HP 100 – M3HP 112	LCIE 06 ATEX 6048	2006
	M3HP 132	LCIE 06 ATEX 6049	2006
Protection by increased safety "e" II 2G Ex e IIB / IIC T2 / T3 Gb In addition: Dust ignition protection by enclosure II 2D Ex tb IIIB / IIIC T85 °C - T150°C Db	M3HP 160 (gen H)	LCIE 09 ATEX 3022	2009
	M3HP 180 (gen H)	LCIE 09 ATEX 3023	2009
	M3HP 200	LCIE 01 ATEX 6022	2001
	M3HP 225	LCIE 01 ATEX 6023	2001
	M3HP 250	LCIE 01 ATEX 6024	2001
	M3HP 280	LCIE 02 ATEX 6071	2002
	M3HP 315	LCIE 02 ATEX 6072	2002
	M3HP 355	LCIE 03 ATEX 6022	2003
	M3HP 400	LCIE 04 ATEX 6013	2004
Type of protection "n" II 3G Ex nA IIB / IIC T3 Gc In addition: Dust ignition protection by enclosure II 3D Ex tc IIIB / IIIC T...°C Dc	M3AA 90 – M3AA 132	VTT 13 ATEX 060X	2015
	M3GP 71 – M3GP 132	VTT 12 ATEX 050X	2012
	M3GP 71 – M3GP 132 (gen.K, L)	VTT 12 ATEX 050X	2015
	M3GP 80 – M3GP 450	LCIE 12 ATEX 1008X	2012
	M3GP 280 – M3GP 355 (gen.K, L)	LCIE 12 ATEX 1008X	2012
	M3GP 160 – M3GP 250 (gen.D)	LCIE 13 ATEX 1034X	2013
	M3GP 160 – M3GP 250 (gen.K, L)	LCIE 13 ATEX 1034X	2015

Document 3GZF500930-309G

ABB Oy

Motors and Generators	Visiting Address	Telephone	Internet	Business Identity Code: Page 3/3
Postal address	Strombergin Puistotie 5 A	+358 10 22 11	www.abb.fi	0763403-0
P.O. Box 633	FI-65320 Vaasa	Telefax	e-mail:	Domicile: Helsinki
FI-65101 Vaasa	FINLAND	+358 10 22 47372	first name.last name	
FINLAND			@fi.abb.com	

M000725-2

Motors in brief
Flameproof motors Ex de, sizes 80 to 180

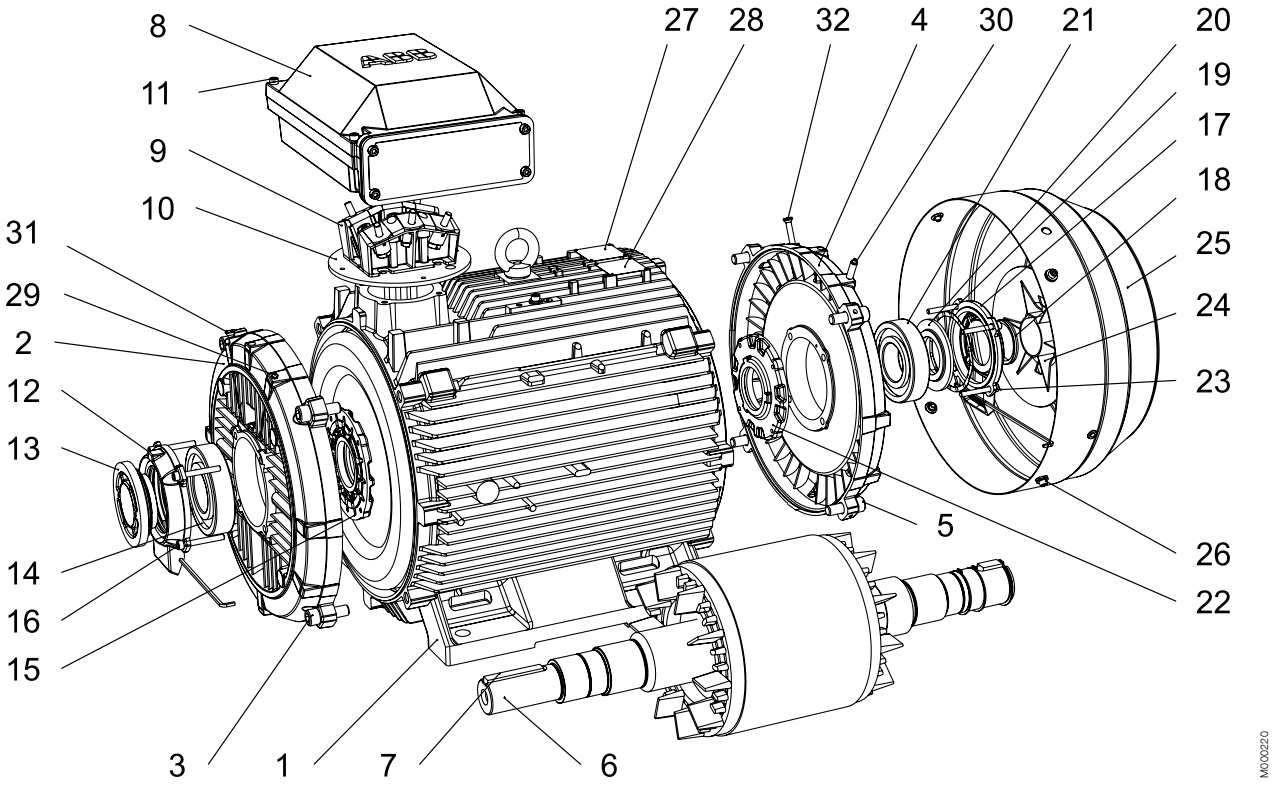
Motor size			80	90	100	112	132	160	180
Stator	Material		Cast iron, EN-GJL-200 or better						
	Paint colour shade		Blue, Munsell 8B 4.5/3.25						
	Corrosion class		C3 medium according to ISO/EN 12944-5						
Feet			Forged steel, detachable feet						
Bearing end shields	Material		Cast iron, EN-GJL-200 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	2-12 pole	6205-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3
	N-end	2-12 pole	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 seal			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 colour 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 as standard						
Rotor winding	Material		Pressure die-cast aluminum						
Balancing			Half key balancing						
Key way			Closed key-way						
Drain holes			-					Optional	
External earthing bolt			As standard						
Enclosure			IP 55						
Cooling method			IC 411						

Motors in brief
Flameproof motors Ex de, sizes 200 to 450

Motor size			200	225	250	280	315	355	400	450
Stator	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							
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 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	6316/C3	6319/C3	6322/C3
Axially-locked bearings	Inner bearing cover		As standard, locked at D-end							
Bearing seal			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							Steel
	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 colour 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 as standard							
Rotor winding	Material		Pressure die-cast aluminum							
Balancing			Half key balancing							
Key way			Close			Open				
Heating elements	On request		25 W	60 W			120 W			200W
Drain holes			Optional							
External earthing bolt			As standard							
Enclosure			IP 55							
Cooling method			IC 411							

Motor construction
Flameproof motors, Ex de

Typical exploded view of cast iron motors, frame size 315



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

Increased safety motors, Ex e IIC T3 Gb
Totally enclosed squirrel cage three phase low voltage motors, Sizes 80 to 400, 0.55 to 390 kW

Ordering information

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

Example	
Motor type	M3HP 160 MLB
Pole number	2
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	8 kW
Product code	3GHP161420-ADH
Variant codes if needed	

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3HP	160MLB	3GHP 161	420 - ADH	002, etc.
		1 2 3 4	5 6 7 8 9 10 11 12 13 14	

Positions 1 - 4

3GHP:	Totally enclosed fan cooled squirrel cage motor with cast iron frame, increased safety

Positions 5 and 6

IEC-frame

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

Serial number

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 (size 90 to 132)
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

The rating plates are in table form giving values for speed, current and power factor for one voltage: 400 V as standard. Other voltage and frequency combinations are possible and can be ordered with variant codes 002 or 209. Please see Variant code section.

The following information will be shown on the motor rating plate:

- Lowest nominal efficiency at 100 %, 75 % and 50 % rated load
- Efficiency level
- Year of manufacture
- Type of protection
- Apparatus group
- Temperature class
- Identification number of the certification body
- Certificate number: ATEX
- I_A/I_N
- t_E

Motor sizes 80 to 400

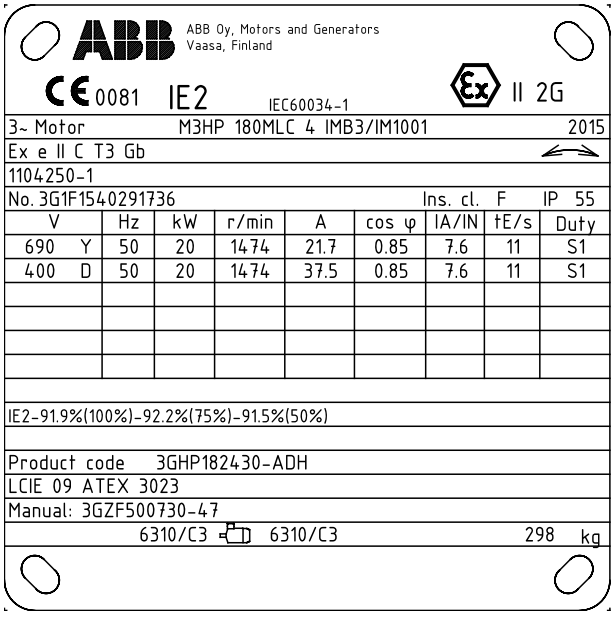


ABB Oy, Motors and Generators
Vaasa, Finland

CE 0081 IE2 IEC60034-1 Ex II 2G

3~ Motor M3HP 180MLC 4 IMB3/IM1001 2015

Ex e II C T3 Gb

1104250-1

No. 3G1F1540291736 Ins. cl. F IP 55

V	Hz	kW	r/min	A	cos φ	IA/IN	tE/s	Duty
690 Y	50	20	1474	21.7	0.85	7.6	11	S1
400 D	50	20	1474	37.5	0.85	7.6	11	S1

IE2-91.9%(100%)-92.2%(75%)-91.5%(50%)

Product code 3GHP182430-ADH

LCIE 09 ATEX 3023

Manual: 3GZF500730-47

6310/C3 6310/C3 298 kg

M000738

Technical data for Ex e IIC T3 Gb according to EN
Increased safety IE2 cast iron motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	I_s/I_N	Torque T_N N_m	T_l/T_N	T_b/T_N	tE-time	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2 poles				400 V 50 Hz				CENELEC-design								
0.75	M3HP 80MA 2	3GHP081310-••H	2877	82.9	82.7	80.4	0.85	1.5	7.1	2.4	4.0	4.6	15	0.0006	28	59
1.1	M3HP 80MB 2	3GHP081320-••H	2833	81.6	82.2	80.6	0.87	2.2	5.7	3.7	3.0	3.2	11	0.0007	30	59
1.5	M3HP 90SLA 2	3GHP091010-••H	2881	81.9	82.1	80.1	0.88	3.0	6.7	4.9	3.0	3.5	12	0.001	41	61
2.2	M3HP 90SLC 2	3GHP091030-••H	2877	84.5	85.0	83.8	0.89	4.2	7.3	7.3	2.7	3.5	6	0.0014	44	61
3	M3HP 100LA 2	3GHP101510-••H	2896	86.0	86.4	84.8	0.90	5.5	7.2	9.8	2.2	3.0	7	0.0036	61	65
3.7	M3HP 112MB 2	3GHP111320-••H	2910	86.9	87.7	87.4	0.89	6.9	7.8	12.1	3.9	4.0	5	0.0043	64	65
5.5 [2]	M3HP 132SMB 2	3GHP131220-••H	2905	86.9	87.3	85.8	0.90	10.1	7.0	18.0	2.4	3.3	9	0.009	92	71
7.5	M3HP 132SMD 2	3GHP131240-••H	2913	89.2	89.7	88.7	0.90	13.4	7.6	24.5	3.0	4.0	5	0.012	100	71
8	M3HP 160MLB 2	3GHP161420-••H	2939	91.0	90.7	88.8	0.91	14.0	7.2	25.9	2.8	3.5	15	0.052	216	69
11	M3HP 160MLC 2	3GHP161430-••H	2932	90.3	90.4	89.3	0.92	20.0	6.9	35.8	2.6	3.4	9	0.062	227	69
12.5	M3HP 160MLD 2	3GHP161440-••H	2944	92.5	92.6	92.2	0.91	21.4	7.6	40.5	2.8	3.4	8	0.07	233	69
15	M3HP 180MLB 2	3GHP181420-••H	2947	91.0	91.1	90.1	0.91	26.0	7.1	48.6	2.2	3.0	15	0.13	292	69
18	M3HP 180MLC 2	3GHP181430-••H	2960	93.3	93.6	93.0	0.91	31.0	7.6	58.0	2.4	3.2	11	0.13	292	69
22	M3HP 200MLC 2	3GHP201430-••G	2956	91.9	91.7	90.2	0.90	38.5	6.9	71.0	2.6	3.5	10	0.21	305	72
25	M3HP 200MLE 2	3GHP201450-••G	2957	93.8	93.9	93.0	0.90	44.0	7.0	80.7	2.9	3.8	9	0.22	310	72
30	M3HP 225SMB 2	3GHP221220-••G	2963	92.3	92.0	90.5	0.91	51.0	7.4	96.6	2.1	3.0	10	0.31	365	74
36	M3HP 225SMD 2	3GHP221240-••G	2965	93.3	93.2	92.1	0.92	60.0	8.0	115	2.3	3.2	7	0.36	395	74
40	M3HP 250SMB 2	3GHP251220-••G	2973	92.9	92.6	91.2	0.91	67.0	7.8	128	2.2	3.0	8	0.66	475	74
47	M3HP 250SMC 2	3GHP251230-••G	2972	93.7	93.6	92.5	0.91	79.5	7.8	151	2.3	3.0	6	0.69	495	74
60 [1]	M3HP 280SMA 2	3GHP281210-••G	2975	93.9	93.6	92.4	0.91	100	7.3	192	1.2	2.9	10	0.8	625	77
75 [1]	M3HP 280SMB 2	3GHP281220-••G	2975	94.2	94.0	92.9	0.91	125	7.6	240	1.2	2.9	8	0.9	665	77
80 [1]	M3HP 280SMC 2	3GHP281230-••G	2975	94.3	94.2	93.2	0.92	132	7.4	256	1.2	2.8	7	1.15	725	77
77 [1]	M3HP 315SMA 2	3GHP311210-••G	2984	94.1	93.5	91.7	0.90	132	7.3	246	0.9	2.9	13	1.2	880	78
90 [1]	M3HP 315SMB 2	3GHP311220-••G	2983	94.6	94.2	92.7	0.90	152	7.2	288	0.9	2.8	10	1.4	940	78
135 [1]	M3HP 315MLA 2	3GHP311410-••G	2983	95.3	95.1	94.1	0.92	222	8.0	432	1.2	3.0	6	2.1	1190	78
175 [1]	M3HP 355SMA 2	3GHP351210-••G	2987	95.9	95.5	94.4	0.91	290	7.4	559	0.8	3.2	10	3	1600	83
200 [1]	M3HP 355SMB 2	3GHP351220-••G	2986	96.1	95.8	94.8	0.91	333	7.3	639	0.8	3.2	7	3.4	1680	83
220 [1]	M3HP 355MLA 2	3GHP351410-••G	2983	96.2	96.0	94.9	0.91	363	7.1	704	0.9	3.0	8	4.1	2000	83
300 [1]	M3HP 355LKA 2	3GHP351810-••G	2986	96.7	96.6	96.0	0.92	488	7.4	959	0.9	3.2	6	4.8	2320	83
355 [3]	M3HP 400LB 2	3GHP401520-••G	2989	97.1	96.9	96.2	0.91	580	7.6	1134	0.7	3.4	7	8.2	3050	82
400 [3]	M3HP 400LC 2	3GHP401530-••G	2988	97.1	97.0	96.4	0.92	645	7.5	1278	0.8	3.4	6	9.3	3300	82
355 [3]	M3HP 400LKB 2	3GHP401820-••G	2989	97.1	96.9	96.2	0.91	580	7.6	1134	0.7	3.4	7	8.2	3050	82
400 [3]	M3HP 400LKC 2	3GHP401830-••G	2988	97.1	97.0	96.4	0.92	645	7.5	1278	0.8	3.4	6	9.3	3300	82

[1] 3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering. see variant codes 044 and 045

[2] Efficiency class IE1

[3] Unidirectional fan construction as standard. Direction of rotation must be stated when ordering. see variant codes 044 and 045

Technical data for Ex e IIC T3 Gb according to EN
Increased safety IE2 cast iron motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cos φ	Current I_N A	Current I_s/I_N	Torque T_N N_m	Torque T_l/T_N	Torque T_b/T_N	tE-time	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4 poles				400 V 50 Hz				CENELEC-design								
0.55 [2]	M3HP 80MA 4	3GHP082310-••H	1421	76.6	76.6	73.7	0.73	1.41	4.9	3.6	2.3	2.7	20	0.001	29	59
0.75	M3HP 80MB 4	3GHP082320-••H	1416	80.2	80.1	77.5	0.75	1.87	5.4	5.0	2.7	3.1	20	0.0012	31	59
1.1	M3HP 90SLA 4	3GHP092010-••H	1431	82.2	82.1	79.6	0.77	2.4	6.5	7.3	3.0	3.5	20	0.002	42	54
1.1	M3HP 90SLA 4	3GHP092010-••H	1431	82.1	82.0	79.5	0.77	2.5	6.5	7.3	3.0	3.5	20	0.002	42	54
1.5	M3HP 90SLC 4	3GHP092030-••H	1431	83.2	83.6	81.9	0.78	3.3	6.6	10.0	3.3	3.7	20	0.003	44	54
2.2	M3HP 100LA 4	3GHP102510-••H	1437	85.5	86.3	85.6	0.84	4.4	7.1	14.6	2.7	3.3	20	0.0075	61	52
3	M3HP 100LB 4	3GHP102520-••H	1442	86.5	87.2	86.3	0.83	6.0	7.3	19.8	2.7	3.4	12	0.0081	63	52
4	M3HP 112MC 4	3GHP112330-••H	1458	88.2	87.7	85.4	0.78	8.6	9.2	26.3	3.4	4.9	12	0.013	72	61
5.5	M3HP 132SMB 4	3GHP132220-••H	1458	89.5	89.2	87.3	0.80	11.7	7.9	36.0	3.7	3.8	14	0.023	102	60
7.5	M3HP 132SMD 4	3GHP132240-••H	1460	89.2	89.0	87.3	0.76	16.7	8.4	49.2	4.0	3.9	8	0.034	105	60
11	M3HP 160MLC 4	3GHP162430-••H	1459	90.0	90.8	90.4	0.85	21.0	6.7	71.9	2.6	3.1	12	0.096	226	62
15	M3HP 160MLE 4	3GHP162450-••H	1469	91.7	92.1	91.3	0.84	29.0	8.0	97.5	3.1	3.6	9	0.13	249	68
17	M3HP 180MLB 4	3GHP182420-••H	1478	91.6	92.2	91.9	0.83	32.0	7.8	109	2.7	3.1	11	0.23	290	66
20	M3HP 180MLC 4	3GHP182430-••H	1474	91.9	92.2	91.5	0.85	37.5	7.6	129	2.7	3.1	11	0.248	298	66
26	M3HP 200MLA 4	3GHP202410-••G	1479	92.9	93.2	92.7	0.88	47.0	7.9	167	1.9	3.1	13	0.3	280	73
30	M3HP 200MLB 4	3GHP202420-••G	1477	93.2	93.7	93.4	0.89	52.2	7.4	193	1.9	3.0	9	0.35	305	73
38	M3HP 225SMB 4	3GHP222220••-G	1479	92.8	93.0	92.6	0.89	67.0	7.3	245	1.7	3.1	9	0.45	365	74
43	M3HP 225SMC 4	3GHP222230-••G	1479	93.4	93.6	92.9	0.90	76.0	7.7	277	1.8	3.1	5	0.53	390	74
50	M3HP 250SMA 4	3GHP252210-••G	1482	94.3	94.6	94.0	0.88	88.0	7.1	322	1.5	3.1	8	0.77	425	73
60	M3HP 250SMB 4	3GHP252220-••G	1483	94.8	95.0	94.6	0.89	102	7.3	386	1.7	3.2	8	0.98	470	73
65	M3HP 280SMA 4	3GHP282210-••G	1485	94.5	94.7	94.3	0.88	113	7.4	417	1.5	3.0	8	1.25	625	68
75	M3HP 280SMB 4	3GHP282220-••G	1484	94.6	94.8	94.4	0.89	130	7.2	482	1.5	3.0	6	1.5	665	68
82	M3HP 280SMC 4	3GHP282230-••G	1483	94.8	95.0	94.9	0.90	139	7.0	528	1.5	2.8	6	1.85	725	68
95	M3HP 315SMA 4	3GHP312210-••G	1488	95.0	95.1	94.7	0.88	165	6.9	609	1.1	2.5	8	2.3	900	73
110	M3HP 315SMB 4	3GHP312220-••G	1488	95.1	95.3	94.9	0.88	188	6.8	705	1.1	2.6	8	2.6	960	73
128	M3HP 315SMC 4	3GHP312230-••G	1486	95.2	95.4	95.2	0.89	217	6.8	822	1.1	2.6	5	2.9	1000	73
145	M3HP 315MLA 4	3GHP312410-••G	1487	95.6	95.8	95.5	0.89	245	6.9	931	1.1	2.6	5	3.5	1160	73
190	M3HP 355SMA 4	3GHP352210-••G	1492	96.3	96.3	95.7	0.87	330	7.1	1216	1.0	2.9	9	5.9	1610	75
230	M3HP 355SMB 4	3GHP352220-••G	1492	96.4	96.4	95.7	0.87	393	7.3	1472	1.1	3.1	6	6.9	1780	78
280	M3HP 355MLA 4	3GHP352410-••G	1491	96.6	96.7	96.2	0.88	475	7.0	1793	1.1	3.0	5	8.4	2140	78
310	M3HP 355LKA 4	3GHP352810-••G	1490	96.5	96.6	96.2	0.88	525	6.9	1986	1.1	2.9	7	10	2500	78
350	M3HP 400LA 4	3GHP402510-••G	1491	96.9	96.9	96.5	0.89	590	6.4	2241	1.2	2.5	6	15	3200	78
390	M3HP 400LC 4	3GHP402530-••G	1493	97.1	97.1	96.6	0.88	660	7.4	2494	1.0	2.7	6	17	3400	78
350	M3HP 400LKA 4	3GHP402810-••G	1491	96.9	96.9	96.5	0.89	590	6.4	2241	1.2	2.5	6	15	3200	78
390	M3HP 400LKC 4	3GHP402830-••G	1493	97.1	97.1	96.6	0.88	660	7.4	2494	1.0	2.7	6	17	3400	78

[2] Efficiency class IE1

Technical data for Ex e IIC T3 Gb according to EN
Increased safety IE2 cast iron motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	I_s/I_N	Torque T_N N_m	T_l/T_N	T_b/T_N	tE-time	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6 poles				400 V 50 Hz				CENELEC-design								
0.37	M3HP 80MA 6	3GHP083310-••H	952	71.6	68.4	61.4	0.58	1.28	4.6	3.7	3.5	3.9	20	0.0022	29	50
0.55 [2]	M3HP 80MB 6	3GHP083320-••H	938	70.3	68.1	61.8	0.65	1.73	4.2	5.5	2.7	3.1	20	0.0022	29	50
0.75	M3HP 90SLA 6	3GHP093010-••H	946	79.2	78.2	74.1	0.64	2.1	5.5	7.6	3.1	3.6	20	0.0037	41	44
1.5	M3HP 100LA 6	3GHP103510-••H	954	81.6	81.4	78.8	0.72	3.6	5.8	15.0	2.5	3.0	20	0.012	60	54
2.2	M3HP 112MB 6	3GHP113320-••H	951	82.5	82.2	79.4	0.73	5.3	6.2	22.0	2.5	3.1	18	0.014	63	54
3	M3HP 132SMB 6	3GHP133220-••H	966	84.0	84.3	82.5	0.76	6.7	6.2	29.6	2.0	3.0	20	0.032	96	57
4	M3HP 132SMC 6	3GHP133230-••H	966	85.7	85.9	84.6	0.75	8.9	6.8	39.5	2.3	3.4	17	0.034	98	57
5.5	M3HP 132SMD 6	3GHP133240-••H	967	87.5	87.7	86.2	0.72	12.7	7.2	54.3	2.3	3.6	15	0.039	105	62
6.6	M3HP 160MLA 6	3GHP163410-••H	977	88.0	89.0	88.8	0.76	13.8	7.6	64.5	2.1	3.3	14	0.126	247	65
7.5	M3HP 160MLB 6	3GHP163420-••H	971	88.2	88.6	87.7	0.78	16.0	7.5	73.7	2.4	3.6	18	0.126	247	65
11 [2]	M3HP 160MLC 6	3GHP163430-••H	971	88.4	88.9	88.1	0.77	24.0	7.8	108	2.6	3.8	7	0.126	247	65
14 [2]	M3HP 180MLB 6	3GHP183420-••H	975	87.9	89.5	90.0	0.84	29.0	7.2	137	1.8	3.0	9	0.25	298	67
16.5	M3HP 200MLB 6	3GHP203420-••G	984	91.8	92.0	91.1	0.85	31.0	7.0	160	3.2	3.3	23	0.47	290	65
20	M3HP 200MLC 6	3GHP203430-••G	983	92.4	92.9	92.3	0.85	38.0	7.1	194	3.0	2.7	17	0.52	305	65
30	M3HP 225SMC 6	3GHP223230-••G	985	92.9	93.1	92.7	0.84	56.5	7.0	290	2.9	3.0	7	0.78	380	64
37	M3HP 250SMB 6	3GHP253220-••G	988	93.0	93.4	92.9	0.87	66.5	7.2	357	2.6	2.8	10	1.6	465	65
45	M3HP 280SMA 6	3GHP283210-••G	986	93.1	93.5	93.3	0.88	79.0	6.7	435	1.5	2.8	13	1.85	605	66
50	M3HP 280SMB 6	3GHP283220-••G	987	93.6	94.0	93.8	0.88	87.0	7.3	483	1.4	2.6	9	2.2	645	66
62	M3HP 280SMC 6	3GHP283230-••G	986	93.8	94.3	94.2	0.88	106	7.6	600	1.5	2.6	6	2.85	725	66
72	M3HP 315SMA 6	3GHP313210-••G	992	93.8	93.9	93.1	0.84	130	7.2	693	1.3	2.5	7	3.2	830	72
85	M3HP 315SMB 6	3GHP313220-••G	991	94.0	94.3	93.8	0.87	148	7.3	819	1.3	2.4	6	4.1	930	72
100	M3HP 315SMC 6	3GHP313230-••G	991	94.3	94.7	94.5	0.86	177	6.7	963	1.2	2.2	14	4.9	1000	72
120	M3HP 315MLA 6	3GHP313410-••G	991	94.8	94.9	94.6	0.86	212	7.6	1156	1.3	2.5	5	5.8	1150	72
150	M3HP 355SMA 6	3GHP353210-••G	993	95.5	95.5	94.9	0.84	265	6.8	1442	1.3	2.6	6	7.9	1510	75
180	M3HP 355SMB 6	3GHP353220-••G	994	95.7	95.7	95.0	0.86	315	7.2	1729	1.3	2.6	5	9.7	1680	75
260	M3HP 355LKA 6	3GHP353810-••G	993	96.0	96.1	95.5	0.85	458	7.1	2500	1.4	2.6	6	15.5	2500	75
300	M3HP 400LA 6	3GHP403510-••G	995	96.5	96.5	96.0	0.84	532	6.9	2879	1.3	2.5	6	17	2900	76
350	M3HP 400LB 6	3GHP403520-••G	995	96.7	96.7	96.2	0.84	620	7.4	3359	1.4	2.6	6	20.5	3150	76
300	M3HP 400LKA 6	3GHP403810-••G	995	96.5	96.5	96.0	0.84	532	6.9	2879	1.3	2.5	6	17	2900	76
350	M3HP 400LKB 6	3GHP403820-••G	995	96.7	96.7	96.2	0.84	620	7.4	3359	1.4	2.6	6	20.5	3150	76

[2] Efficiency class IE1

Technical data for Ex e IIC T3 Gb according to EN
Increased safety IE2 cast iron motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	tE-time	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8 poles				400 V 50 Hz				CENELEC-design								
0.18	M3HP 80MA 8	3GHP084310-••H	720	61.0	56.4	48.3	0.48	0.88	3.3	2.3	3.7	4.0	30	0.0022	29	36
0.25	M3HP 80MB 8	3GHP084320-••H	705	63.8	61.1	54.6	0.58	0.97	3.2	3.3	2.6	2.8	30	0.0022	29	36
0.55	M3HP 90SLC 8	3GHP094030-••H	695	68.7	68.5	64.4	0.61	1.89	3.1	7.5	2.2	2.4	20	0.0037	43	36
0.75	M3HP 100LA 8	3GHP104510-••H	720	76.5	74.2	68.1	0.54	2.6	4.3	9.9	2.5	3.1	20	0.012	60	54
1.1	M3HP 100LB 8	3GHP104520-••H	717	76.4	74.9	70.2	0.57	3.9	4.2	14.6	2.1	2.9	20	0.012	60	54
1.5	M3HP 112MC 8	3GHP114330-••H	716	75.3	73.1	67.7	0.54	5.3	3.4	20.0	2.0	2.7	20	0.014	64	54
2.2	M3HP 132SMC 8	3GHP134230-••H	720	80.1	79.8	76.7	0.65	6.0	4.7	29.1	2.0	2.9	20	0.034	98	59
3 [2]	M3HP 132SMD 8	3GHP134240-••H	711	79.9	80.3	78.1	0.71	8.0	4.1	40.4	1.5	2.8	20	0.036	100	59
3.5	M3HP 160MLA 8	3GHP164410-••H	720	84.7	84.6	82.5	0.69	9.0	5.4	46.4	1.8	3.2	20	0.133	245	55
4.8	M3HP 160MLB 8	3GHP164420-••H	724	85.8	85.8	83.6	0.70	12.0	5.9	63.3	2.0	3.4	20	0.133	245	55
6.6	M3HP 160MLC 8	3GHP164430-••H	718	85.5	86.2	85.0	0.71	16.0	5.6	87.7	1.8	3.0	17	0.133	245	55
9.7	M3HP 180MLB 8	3GHP184420-••H	722	86.6	86.7	85.4	0.79	21.0	6.0	128	1.7	2.8	20	0.245	292	63
15	M3HP 200MLB 8	3GHP204420-••G	736	90.5	90.7	89.7	0.81	30.5	7.1	194	2.2	3.4	20	0.54	300	64
22	M3HP 225SMC 8	3GHP224230-••G	735	91.5	91.8	90.9	0.82	43.0	6.8	285	2.1	3.3	21	0.75	375	65
27	M3HP 250SMA 8	3GHP254210-••G	736	91.7	92.2	91.7	0.83	51.0	6.6	350	1.9	2.8	21	1.25	420	65
37	M3HP 280SMA 8	3GHP284210-••G	741	92.6	92.8	92.1	0.80	72.0	6.6	476	1.5	2.6	19	1.85	605	65
45	M3HP 280SMB 8	3GHP284220-••G	738	92.8	93.2	92.9	0.82	85.0	6.4	582	1.3	2.6	10	2.2	645	65
55	M3HP 280SMC 8	3GHP284230-••G	741	93.3	93.5	92.8	0.80	105	7.8	708	1.6	2.8	5	2.85	725	65
75	M3HP 315SMB 8	3GHP314220-••G	743	94.0	94.3	94.1	0.80	145	6.5	963	1.1	2.2	10	4.1	930	62
90	M3HP 315SMC 8	3GHP314230-••G	743	94.3	94.5	94.4	0.80	172	6.9	1156	1.2	2.3	6	4.9	1000	64
105	M3HP 315MLA 8	3GHP314410-••G	743	94.3	94.5	94.3	0.80	200	7.2	1349	1.2	2.3	6	5.8	1150	72
132	M3HP 355SMB 8	3GHP354220-••G	744	95.3	95.4	94.8	0.83	241	7.6	1694	1.3	2.4	7	9.7	1680	75
150	M3HP 355SMC 8	3GHP354230-••G	744	95.5	95.5	94.9	0.80	283	7.3	1925	1.3	2.5	10	11.3	1820	75
180	M3HP 355MLB 8	3GHP354420-••G	743	95.6	95.7	95.1	0.82	330	6.7	2313	1.2	2.4	6	13.5	2180	75
215	M3HP 355LKB 8	3GHP354820-••G	744	95.8	95.8	95.1	0.81	400	7.5	2759	1.3	2.6	5	16.5	2600	75
230	M3HP 400LA 8	3GHP404510-••G	745	96.3	96.3	95.7	0.82	420	7.0	2948	1.2	2.5	7	17	2900	71
280	M3HP 400LB 8	3GHP404520-••G	744	96.3	96.4	96.0	0.83	505	6.7	3593	1.1	2.2	6	21	3200	71
315	M3HP 400LC 8	3GHP404530-••G	744	96.4	96.5	96.1	0.83	566	6.8	4043	1.2	2.3	6	24	3400	71
230	M3HP 400LKA 8	3GHP404810-••G	745	96.3	96.3	95.7	0.82	420	7.0	2948	1.2	2.5	7	17	2900	71
280	M3HP 400LKB 8	3GHP404820-••G	744	96.3	96.4	96.0	0.83	505	6.7	3593	1.1	2.2	6	21	3200	71
315	M3HP 400LKC 8	3GHP404830-••G	744	96.4	96.5	96.1	0.83	566	6.8	4043	1.2	2.3	6	24	3400	71

[2] Efficiency class IE1

Technical data for Ex e IIC T3 Gb according to VIK
Increased safety IE2 cast iron motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	I_s/I_N	Torque T_N N_m	T_l/T_N	T_b/T_N	Time tE 50 Hz	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2 poles		**400 V 50 Hz**						**CENELEC-design**								
7.5	M3HP 160 MLB	3GHP 161 420-••H	2943	91.0	90.5	88.4	0.91	13.2	7.6	24.3	3.0	3.7	18	0.052	216	69
10	M3HP 160 MLC	3GHP 161 430-••H	2938	90.5	90.5	89.4	0.92	17.8	7.5	32.5	2.9	3.7	12	0.062	227	69
12.5	M3HP 160 MLD	3GHP 161 440-••H	2944	92.5	92.6	92.2	0.91	21.4	7.6	40.5	2.8	4.5	8	0.07	233	69
15	M3HP 180 MLB	3GHP 181 420-••H	2947	91.0	91.1	90.2	0.91	26	7.1	48.6	2.2	3.0	15	0.13	292	69
20	M3HP 200 MLC	3GHP 201 430-••G	2960	93.2	93.2	92.2	0.90	35	7.5	64.5	2.9	3.9	10	0.21	305	72
24	M3HP 200 MLE	3GHP 201 450-••G	2959	93.8	93.8	92.9	0.90	42	7.2	77.4	3.0	3.9	9	0.22	310	72
28 [1]	M3HP 225 SMC	3GHP 221 230-••G	2963	91.8	91.2	89.1	0.91	49	7.0	90.2	2.1	3.1	14	0.34	385	74
36	M3HP 250 SMB	3GHP 251 220-••G	2969	92.9	92.7	91.1	0.91	61	7.2	115	1.9	2.7	11	0.66	475	74
47 [2]	M3HP 280 SMA	3GHP 281 210-••G	2982	93.4	92.8	91.0	0.91	80	7.1	150	1.2	3.0	17	0.8	625	77
58 [2]	M3HP 280 SMB	3GHP 281 220-••G	2975	93.5	93.3	91.9	0.92	97	7.0	186	1.2	2.8	12	0.9	665	77
68 [2]	M3HP 315 SMA	3GHP 311 210-••G	2982	93.7	92.9	91.0	0.90	116	7.2	217	0.9	2.8	10	1.2	880	78
80 [2]	M3HP 315 SMB	3GHP 311 220-••G	2980	94.1	93.6	92.0	0.91	134	7.0	256	0.8	2.7	10	1.4	940	78
110 [2]	M3HP 315 SMC	3GHP 311 230-••G	2978	94.7	94.5	93.5	0.91	183	7.0	352	0.9	2.7	8	1.7	1025	78
125 [2]	M3HP 315 MLA	3GHP 311 410-••G	2983	95.0	94.9	94.1	0.92	205	7.6	400	1.0	2.8	10	2.1	1190	78
1500 r/min = 4 poles		**400 V 50 Hz**						**CENELEC-design**								
10	M3HP 160 MLC	3GHP 162 430-••H	1463	90.5	90.9	90.2	0.84	19.5	7.3	65.2	2.8	3.4	16	0.096	226	62
13.5	M3HP 160 MLE	3GHP 162 450-••H	1470	91.7	92.0	91.2	0.84	26	8.0	87.6	3.0	3.6	14	0.13	249	68
15	M3HP 180 MLB	3GHP 182 420-••H	1473	91.5	91.7	90.9	0.83	29.5	6.9	97.2	2.6	3.3	12	0.21	279	66
17.5	M3HP 180 MLC	3GHP 182 430-••H	1477	91.9	92.1	91.3	0.84	33	7.4	113	2.7	3.2	15	0.248	298	66
24	M3HP 200 MLA	3GHP 202 410-••G	1480	93.0	93.2	92.5	0.88	44	7.7	154	2.0	3.2	14	0.3	280	73
30	M3HP 225 SMB	3GHP 222 220-••G	1481	92.3	92.3	91.3	0.89	54	7.2	193	1.8	2.6	17	0.45	365	74
36	M3HP 225 SMC	3GHP 222 230-••G	1480	93.4	93.5	92.8	0.90	64	7.4	232	1.7	3.1	8	0.53	390	74
44	M3HP 250 SMB	3GHP 252 220-••G	1482	94.4	94.6	94.1	0.89	77	6.8	283	1.3	3.0	15	0.98	470	73
58	M3HP 280 SMA	3GHP 282 210-••G	1484	94.4	94.5	93.7	0.88	100	7.6	373	1.3	2.9	8	1.25	625	68
70	M3HP 280 SMB	3GHP 282 220-••G	1484	94.5	94.9	94.6	0.89	120	7.2	450	1.4	2.9	7	1.5	665	68
84	M3HP 315 SMA	3GHP 312 210-••G	1489	95.0	95.0	94.4	0.88	145	7.0	538	1.2	2.9	14	2.3	900	73
100	M3HP 315 SMB	3GHP 312 220-••G	1489	95.2	95.3	94.8	0.88	171	7.6	641	1.2	2.9	10	2.6	960	73
115	M3HP 315 SMC	3GHP 312 230-••G	1488	95.2	95.4	95.1	0.89	196	6.7	738	1.1	2.7	10	2.9	1000	73
135	M3HP 315 MLA	3GHP 312 410-••G	1489	95.6	95.7	95.3	0.89	227	7.4	865	1.3	2.8	7	3.5	1160	73
1000 r/min = 6 poles		**400 V 50 Hz**						**CENELEC-design**								
6.6	M3HP 160 MLA	3GHP 163 410-••H	973	87.4	87.8	86.9	0.80	13.8	7.3	64.7	2.1	3.4	14	0.088	220	57
9.7 [1]	M3HP 160 MLC	3GHP 163 430-••H	971	88.0	88.4	87.4	0.79	20	7.1	95.3	2.4	3.7	11	0.126	247	65
13.2	M3HP 180 MLB	3GHP 183 420-••H	965	89.9	90.7	89.2	0.81	26.1	7.4	130	1.7	3.0	12	0.25	298	67
16.5	M3HP 200 MLB	3GHP 203 420-••G	984	91.8	92.0	91.1	0.85	31	7.0	160	3.2	3.3	25	0.47	290	65
20	M3HP 200 MLC	3GHP 203 430-••G	983	92.4	92.9	92.3	0.85	38	7.1	194	3.0	2.7	16	0.52	305	65
27	M3HP 225 SMC	3GHP 223 230-••G	987	93.0	93.1	92.3	0.83	50	8.0	261	3.2	3.4	11	0.78	380	64
33	M3HP 250 SMB	3GHP 253 220-••G	989	93.8	94.1	93.4	0.87	59	7.4	318	2.8	3.0	10	1.6	465	65
40	M3HP 280 SMA	3GHP 283 210-••G	987	93.1	93.5	93.1	0.88	70	6.7	387	1.2	2.7	15	1.85	605	66
46	M3HP 280 SMB	3GHP 283 220-••G	988	93.4	93.8	93.7	0.88	80	7.0	444	1.3	2.7	11	2.2	645	66
64	M3HP 315 SMA	3GHP 313 210-••G	992	94.2	94.4	93.9	0.85	114	7.1	616	1.2	2.5	10	3.2	830	72
76	M3HP 315 SMB	3GHP 313 220-••G	992	94.2	94.5	94.2	0.87	133	7.3	731	1.2	2.3	8	4.1	930	72
92	M3HP 315 SMC	3GHP 313 230-••G	992	94.4	94.7	94.4	0.85	164	7.2	885	1.3	2.4	15	4.9	1000	72
110	M3HP 315 MLA	3GHP 313 410-••G	992	94.9	95.1	94.8	0.86	193	7.6	1058	1.3	2.5	7	5.8	1150	72

[1] Efficiency class IE1

[2] 3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering, see variant codes 044 and 045

Increased safety motors according VIK must be ordered with variant code 421

Technical data for Ex e IIC T3 Gb according to VIK
Increased safety IE2 cast iron motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_i}{T_N}$	$\frac{T_b}{T_N}$	Time tE 50 Hz	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8 poles		400 V 50 Hz						CENELEC-design								
3.5	M3HP 160 MLA	3GHP 164 410-••H	720	84.8	84.7	82.6	0.69	8.6	5.4	46.4	1.8	3.2	20	0.133	245	55
4.8	M3HP 160 MLB	3GHP 164 420-••H	724	85.8	85.8	83.6	0.70	11.5	5.9	63.3	2.0	3.4	20	0.133	245	55
6.6	M3HP 160 MLC	3GHP 164 430-••H	718	85.5	86.2	85.0	0.71	15.6	5.6	87.7	1.8	3.0	17	0.133	245	55
9.7	M3HP 180 MLB	3GHP 184 420-••H	722	86.7	86.8	85.4	0.79	21	6.0	128	1.7	2.8	20	0.245	292	63
13.2	M3HP 200 MLB	3GHP 204 420-••G	734	90.1	90.7	90.1	0.83	26	6.1	171	1.8	3.0	32	0.54	300	64
16.5	M3HP 225 SMB	3GHP 224 220-••G	736	91.3	91.4	90.2	0.81	33	6.6	214	2.0	3.0	25	0.68	350	65
20	M3HP 225 SMC	3GHP 224 230-••G	736	92.0	92.4	91.7	0.82	39	6.9	259	2.1	3.3	24	0.75	375	65
27	M3HP 250 SMA	3GHP 254 210-••G	736	91.7	92.2	91.7	0.83	51	6.6	350	1.9	2.8	16	1.25	420	59
33	M3HP 280 SMA	3GHP 284 210-••G	740	92.8	93.0	92.0	0.80	64	6.9	425	1.4	2.8	12	1.85	605	65
40	M3HP 280 SMB	3GHP 284 220-••G	741	93.1	93.3	92.7	0.80	77	7.0	515	1.5	2.9	15	2.2	645	65
50	M3HP 315 SMA	3GHP 314 210-••G	742	93.5	93.6	92.8	0.82	93	7.1	643	1.2	2.8	15	3.2	830	62
68	M3HP 315 SMB	3GHP 314 220-••G	744	94.0	94.1	93.3	0.79	131	7.2	872	1.2	2.4	12	4.1	930	62
80	M3HP 315 SMC	3GHP 314 230-••G	744	94.3	94.4	93.7	0.80	152	7.7	1026	1.3	2.6	10	4.9	1000	64
95	M3HP 315 MLA	3GHP 314 410-••G	743	94.3	94.6	94.3	0.81	178	7.1	1220	1.1	2.3	7	5.8	1150	72

Increased safety motors according VIK must be ordered with variant code 421

Variant codes
Increased safety motors, Ex e IIC T3 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

		Frame size													
Code/ Variants		**80**	**90**	**100**	**112**	**132**	**160**	**180**	**200**	**225**	**250**	**280**	**315**	**355**	**400**
Administration															
531	Sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•
532	Packing of motor in vertical mounting position	-	-	-	-	-	-	-	•	•	•	•	•	-	-
533	Wooden sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•
590	Mounting of customer supplied part other than coupling.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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	○	○	○	○	○	•	•	•	•	•	•	•	•	•
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	-	-	-	-	-	•	•	•	•	•	•	•	•	•
Branch standard designs															
178	Stainless steel / acid proof bolts.	○	○	○	○	○	•	•	•	•	•	•	•	•	•
204	Jacking bolts for foot mounted motors.	-	-	-	-	-	•	•	•	•	•	•	•	○	○
209	Non-standard voltage or frequency, (special winding).	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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, V36, 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	•	•	•	•	•	•	•	•	•	•	•	•	•	•
206	Steel fan	-	-	-	-	-	•	•	•	•	•	•	•	•	•
791	Stainless steel fan cover	-	-	-	-	-	-	-	-	•	•	•	•	•	•
Coupling															
035	Assembly of customer supplied coupling-half.	-	-	-	-	-	-	-	-	-	-	•	•	•	•

○ 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
Documentation															
141	Binding dimension drawing.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Drain holes															
065	Plugged existing drain holes.	-	-	-	-	-	•	•	•	•	•	•	•	•	•
448	Draining holes with metal plugs.	-	-	-	-	-	•	•	•	•	•	•	•	•	•
Earthing Bolt															
525	External earthing bolts on motor feet	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hazardous Environments															
272	Ex e II acc. to ATEX directive 94/9/EC , temp. class T2.	-	-	-	-	-	•	•	•	•	•	•	•	•	•
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.	-	-	-	-	-	•	•	•	•	•	•	•	•	•
Heating elements															
450	Heating element, 100-120 V	•	•	•	•	•	•	•	•	•	•	•	•	•	•
451	Heating element, 200 - 240 V	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Marine															
024	Fulfilling Bureau Veritas (BV) requirements, with certificate.	-	-	-	-	-	•	•	•	•	•	•	•	•	•
025	Fulfilling Det Norske Veritas (DNV) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
026	Fulfilling Lloyds Register of Shipping (LR) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
027	Fulfilling American Bureau of Shipping (ABS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
049	Fulfilling Germanischer Lloyd (GL) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
050	Fulfilling Registro Italiano Navale (RINA) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
051	Fulfilling Russian Maritime Register of Shipping (RS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
096	Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
186	Fulfilling Det Norske Veritas (DNV) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
676	Fulfilling Germanischer Lloyd (GL) 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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
228	Flange FF 130.	•	•	•	•	-	-	-	-	-	-	-	-	-	-
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.	•	-	-	-	-	-	-	-	-	-	-	-	-	-
258	Flange FT 100.	•	-	-	-	-	-	-	-	-	-	-	-	-	-
259	Flange FF 115.	•	•	-	-	-	-	-	-	-	-	-	-	-	-
260	Flange FT 115.	•	•	-	-	-	-	-	-	-	-	-	-	-	-
Painting															
105	Paint thickness report.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•	•	•	•	•
115	Painting system C4M acc. to ISO 12944-2: 1998.	•	•	•	•	•	•	•	•	•	•	•	•	•	•

○ 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
168	Primer paint only.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
710	Thermally sprayed zink metallizing with acrylic top coat	•	•	•	•	•	•	•	•	•	•	•	•	•	•
711	Painting system C5-M very high, acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•
754	Painting system C5M acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Protection															
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
072	Radial seal at D-end. Not possible for 2-pole , 280 and 315 frames	•	•	•	•	•	•	•	•	•	•	-	-	-	-
073	Sealed against oil at D-end.	•	•	•	•	•	•	•	•	•	•	•	•	-	-
076	Draining holes with plugs in open position.	•	•	•	•	•	○	○	○	○	○	○	○	○	○
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).	•	•	•	•	•	•	•	•	•	•	•	•	•	•
126	Tag plate	•	•	•	•	•	•	•	•	•	•	•	•	•	•
135	Mounting of additional identification plate, stainless.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
139	Additional identification plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
159	Additional plate with text „Made in ....“	•	•	•	•	•	•	•	•	•	•	•	•	•	•
161	Additional rating plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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															
251	Shell DEP 33.66.05.31-GEN. February 2012.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	-	-	-	-	-	•	•	•	•	•	•	•	-	-
Stator winding temperature sensors															
440	PTC - thermistors (3 in series, 110°C & 3 in series, 130°C), in stator winding.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
445	Pt100 2-wire in stator winding, 1 per phase	•	•	•	•	•	•	•	•	•	•	•	•	•	•
446	Pt100 2-wire in stator winding, 2 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•
502	Pt100 3-wire in stator winding, 1 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•
503	Pt100 3-wire in stator winding, 2 per phase	-	-	-	-	-	•	•	•	•	•	•	•	•	•
511	PTC thermistors (2 x 3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Terminal box															
021	Terminal box LHS (seen from D-end).	-	-	-	-	-	•	•	•	•	•	•	•	•	•
022	Cable entry LHS (seen from D-end).	•	•	•	•	•	•	•	•	•	•	•	•	•	•
157	Terminal box degree of protection IP65.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
180	Terminal box RHS (seen from D-end).	-	-	-	-	-	•	•	•	•	•	•	•	•	•
230	Standard metal cable gland.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
277	Cable sealing end unit, size small for C-opening	-	-	-	-	-	-	-	-	-	-	•	-	-	-
278	Cable sealing end unit, size medium for D-opening	-	-	-	-	-	-	-	-	-	-	-	•	•	•
279	Cable sealing end unit, size large for D-opening	-	-	-	-	-	-	-	-	-	-	-	•	•	•
292	Adapter C-C	-	-	-	-	-	-	-	-	-	-	•	-	-	-
293	Adapter D-D	-	-	-	-	-	-	-	-	-	-	-	•	•	-
294	Adapter E-D	-	-	-	-	-	-	-	-	-	-	-	•	•	•
295	Adapter E-2D	-	-	-	-	-	-	-	-	-	-	-	•	•	•
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.	-	-	-	-	-	•	•	•	•	•	•	•	•	•

○ 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
466	Terminal box at N-end.	-	-	-	-	-	-	-	•	•	•	•	•	•	•
468	Cable entry from D-end.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
469	Cable entry from N-end.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
526	Existing cable entries plugged	•	•	•	•	•	•	•	•	•	•	•	•	•	-
553	Terminal box degree of protection IP66.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
554	Painted steel flange for cable glands drilled and tapped according to order.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
555	Aluminum flange for cable glands drilled and tapped according to order.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
556	Aluminum cable glands mounted 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	-	-	-	-	-	•	•	•	•	•	•	•	•	•
727	Stainless steel flange for cable glands drilled and tapped according to order.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
729	Aluminum non-drilled flange for cable glands	•	•	•	•	•	•	•	•	•	•	•	•	•	•
730	Prepared for NPT cable glands.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
731	Two standard metal cable glands, musta täppä 80-400	•	•	•	•	•	•	•	•	•	•	•	•	•	•
734	Standard cable gland, Ex d IIC	•	•	•	•	•	•	•	•	•	•	•	•	•	•
743	Painted non-drilled flange in steel 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															
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 curve, type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
560	Shaft voltage test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
561	Overspeed test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
562	Overvoltage test.	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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

Mechanical design
Motor frame and drain holes

Motor frame
The motor frame, end shields and main terminal box are made of cast iron. Motors in frame size 200 and larger have integrated feet for rigid and vibration free mounting, motors in frame size 80-180 have detachable feet made of forged steel for maximum flexibility and rigidity.

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

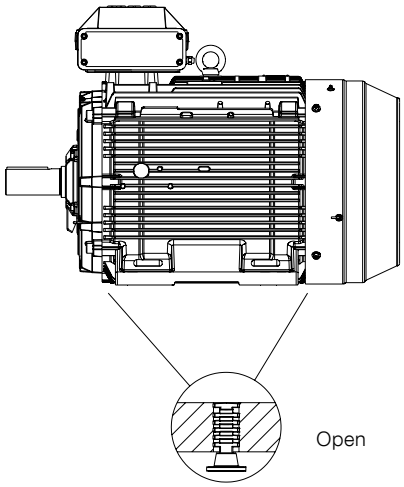
Drain holes
Increased safety motors in frame size 200-400 are provided with drain holes fitted with plugs as standard. The plugs are made of plastic material and delivered in open position. Drain holes and plugs are available for frame size 80 to 180 as an option, please refer to variant code section.

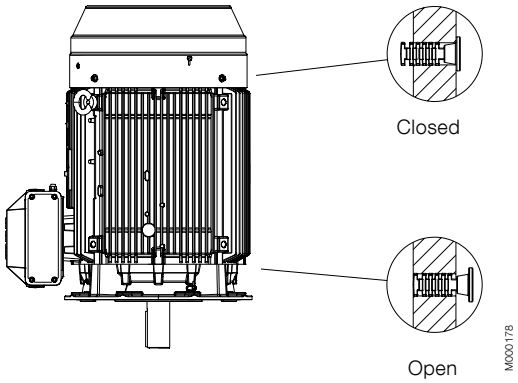
It's recommended that motors that will be operated in very humid or wet environments, and especially under intermittent duty, should be provided with drain holes with plugs to ensure that water possibly condensed inside the enclosure can easily be drained.

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.

Lifting lugs
The motors are provided as standard with lifting lugs according to 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
80	Detachable lifting eye	1 pcs close to terminal box	1 pcs close to terminal box
90-112	Integrated in casting	2 pcs close to terminal box on top	2 pcs close to terminal box
132	Integrated in casting	2 pcs on top of motor diagonally placed, integrated in frame casting	2 pcs on top of motor diagonally placed, integrated in frame casting
160	Detachable eye bolt	Several mounting locations for lugs on the frame, 2 pcs M12 delivered with each motor	Several mounting locations for lugs on the frame, 2 pcs M12 delivered with each motor
180	Detachable eye bolt	Several mounting locations for lugs on the frame, 2 pcs M16 delivered with each motor	Several mounting locations for lugs on the frame, 2 pcs M16 delivered with each motor
225-250	Integrated in casting	2 pcs on top of motor diagonally placed	2 pcs at N-end, 2 pcs at D-end diagonally placed
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





Heating elements

Heating elements are installed on stator winding coil heads to keep the winding 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
Power (W)	25	60	60	60	2x60	2x60	2x60

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

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.

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.

Standard and alternative designs

		Standard design		Alternative design D-end	
		Deep groove ball bearings		Roller bearings (037)	Angular contact ball bearing (058, 060)
Motor size	Number of poles	D-end	N-end	D-end	D-end
80	2-8	6205-2Z/C3	6204-2Z/C3	NA	NA
90	2-8	6205-2Z/C3	6205-2Z/C3	NA	NA
100	2-8	6206-2Z/C3	6206-2Z/C3	NA	NA
112	2-8	6206-2Z/C3	6206-2Z/C3	NA	NA
132	2-8	6208-2Z/C3	6208-2Z/C3	NA	NA
160	2-12	6309/C3	6309/C3	NU 309 ECP/C3	7309 B
180	2-12	6310/C3	6310/C3	NU 310 ECP/C3	7310 B
200	2	6312M/C3	6310M/C3	NU 312 ECP/C3	7312 B
200	4-12	6312/C3	6310/C3	NU 312 ECP/C3	7312 B
225	2	6313M/C3	6312M/C3	NU 313 ECP/C3	7313 B
225	4-12	6313/C3	6312/C3	NU 313 ECP/C3	7313 B
250	2	6315M/C3	6313M/C3	NU 315 ECP/C3	7315 B
250	4-12	6315/C3	6313/C3	NU 315 ECP/C3	7315 B
280	2	6316/C3	6316/C3	[1]	7316 B
	4-12	6316/C3	6316/C3	NU 316 ECP/C3	7316 B
315	2	6316/C3	6316/C3	[1]	7316 B
	4-12	6319/C3	6316/C3	NU 319 ECP/C3	7319 B
355	2	6316M/C3	6316M/C3	[1]	7316 B
	4-12	6322/C3	6316/C3	NU 322 ECP/C3	7322 B
400	2	6317M/C3	6317M/C3	[1]	7317 B
	4-12	6324/C3	6319/C3	NU 324 ECP/C3	7324 B

[1] On request

Axially-locked bearings

All motors with deep groove ball bearings 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.

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

Bearing seals

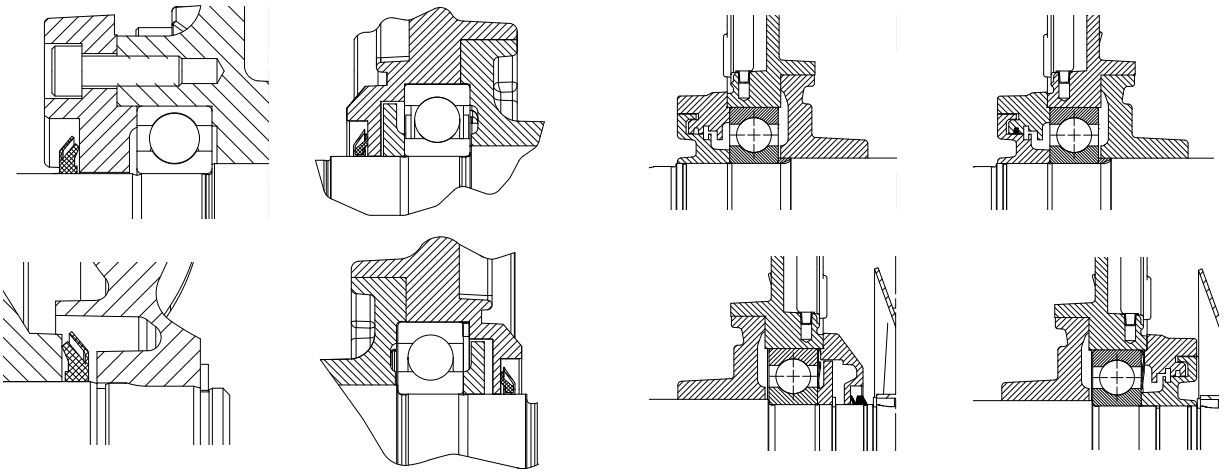
Table below present the standard and alternative and types of bearing seals per motor size

Bearing seals for motor sizes 80-400

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	2-8	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
315	2	Labyrinth seal	V-ring	NA	Standard
	4-8	V-ring	V-ring	NA	Labyrinth seal
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

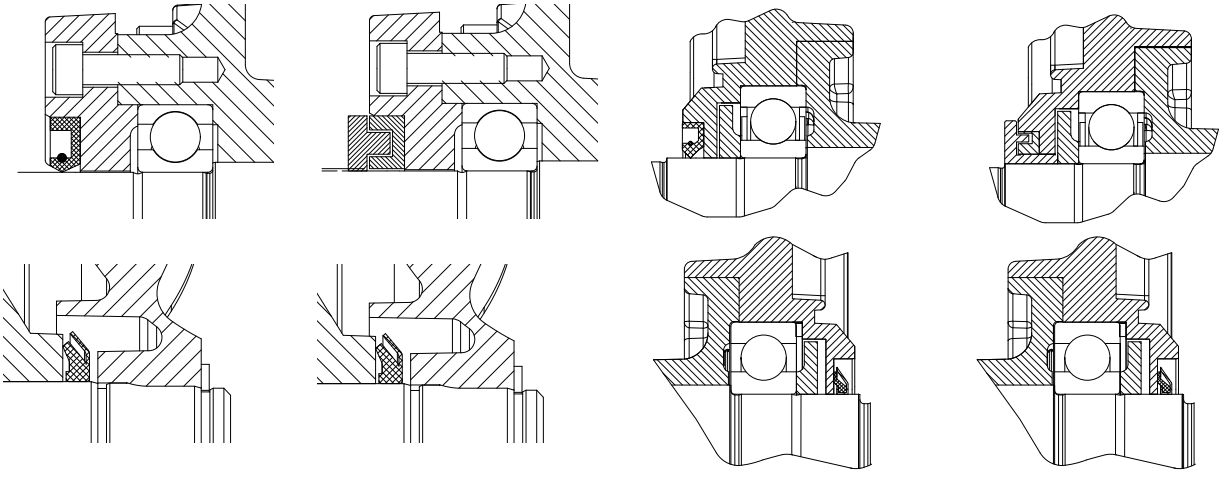
[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request

Standard design



Motor size, seal type D-end / N-end	80-132, 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



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 and lubrication

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 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 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 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	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
Roller bearings												
Lubrication intervals in duty hours												
160	13	13	all	3600	4500	all	7200	8100	all	10300	all	10800
180	15	15		3000	3900	all	6600	7500	all	9700	all	10200
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

Radial forces

Pulley diameter

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

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

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.

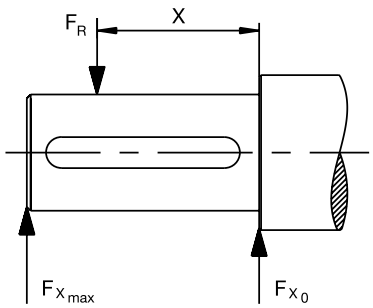
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft together with flame path dimensions affects permissible forces.

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 sizes 80-132

Motor size	No. of poles	Length of shaft extension E (mm)	Basic design with deep groove ball bearings L_{10h}=40,000h		Roller bearings	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{X0}(N)
80	2	40	619	524	NA	NA
	4	40	780	663	NA	NA
	6	40	893	759	NA	NA
	8	40	983	834	NA	NA
90	2	50	561	473	NA	NA
	4	50	803	677	NA	NA
	6	50	919	775	NA	NA
	8	50	1011	853	NA	NA
100	2	60	553	457	NA	NA
	4	60	1050	868	NA	NA
	6	60	1267	1047	NA	NA
	8	60	1395	1153	NA	NA
112	2	60	553	457	NA	NA
	4	60	1050	868	NA	NA
	6	60	1267	1047	NA	NA
	8	60	1394	1152	NA	NA
132	2	80	1354	1112	NA	NA
	4	80	1772	1454	NA	NA
	6	80	2028	1665	NA	NA
	8	80	2234	1833	NA	NA

Permissible radial forces, motor sizes 160 to 400

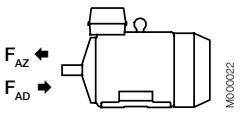
Motor size	Poles	Lengt of shaft extension E (mm)	Basic design with deep groove ball bearings L_{10h}=40,000h		Roller bearings L_{10h}=40,000h	
			Mounting arrangement IM B3		Mounting arrangement IM B3	
			F_{X0} (N)	F_{Xmax} (N)	F_{X0} (N)	F_{Xmax} (N)
160 ML_	2	110	2530	2120	6400	3160
	4	110	3180	2670	7880	3130
	6	110	3650	3060	8900	3140
	8	110	4020	3370	9700	3150
180 ML_	2	110	2900	2440	6970	4380
	4	110	3660	3080	8580	4360
	6	110	4190	3520	9700	4360
	8	110	4620	3880	10570	4370
200 ML_	2	110	3830	3160	9500	7100
	4	110	4830	3980	11710	7090
	6	110	5520	4550	13230	7080
	8	110	6080	5010	14420	7090
225 SM_	2	110	4350	3660	11650	7090
	4	140	5490	4420	14340	7340
	6	140	6280	5060	16190	7330
	8	140	6920	5570	17660	7330
250 SM_	2	140	4390	4350	15420	7360
	4	140	6790	5480	18980	9320
	6	140	7760	6270	21440	9330
	8	140	8550	6900	23370	9320
280 SM_	2	140	5840	4900	16500	6350
	4	140	7260	6110	20100	9690
	6	140	8300	6980	22690	9680
	8	140	9150	7700	24740	9690
315 SM_	2	140	5810	4960	16540	6280
	4	170	9030	7470	26590	10170
	6	170	10310	8530	30030	10160
	8	170	11360	9400	32740	10100
315 ML_	2	140	5850	5080	16710	6200
	4	170	9000	7620	26580	14570
	6	170	10270	8700	30010	14580
	8	170	11330	9590	32720	14510
355 SM_	2	140	5790	5090	16790	7470
	4	210	11930	9890	36660	14590
	6	210	13630	11300	41390	14530
	8	210	15050	12470	45140	14460
355 ML_	2	140	5770	5120	16880	7110
	4	210	11980	10090	36960	14290
	6	210	13650	11500	41720	14210
	8	210	15090	12710	45503	14110
355 LK_	2	140	5670	5140	17030	6570
	4	210	12020	10420	37470	13850
	6	210	13680	11860	42290	13660
	8	210	15160	13150	46130	13510
400 L_	2	170	4550	3970	19390	8760
	4	210	12120	10550	43040	18600
	6	210	13750	11970	48570	17980
	8	210	15280	13310	52990	18180
400 LK_	2	170	4450	3970	19390	8760
	4	210	12120	10550	43040	18600
	6	210	13750	11970	48570	17980
	8	210	15280	13310	52990	18180

Axial forces

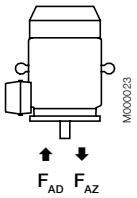
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 40,000 hours per motor size.

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

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



Mounting arrangement IM B3



Mounting arrangement IM V1

Permissible axial forces, motor sizes 80-400

			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	
Motor size	Poles	Length of shaft extension E (mm)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
80	2	40	660	300	690	280
	4	40	820	460	860	440
	6	40	940	580	970	550
	8	40	1030	670	1070	650
90	2	50	740	220	780	190
	4	50	900	380	950	340
	6	50	1010	490	1080	450
	8	50	1110	590	1170	540
100	2	60	1100	220	1180	170
	4	60	1320	430	1430	360
	6	60	1480	590	1600	510
	8	60	1610	720	1730	640
112	2	60	1100	220	1180	170
	4	60	1320	430	1430	360
	6	60	1480	590	1600	510
	8	60	1610	720	1730	640
132	2	80	1530	500	1700	390
	4	80	1870	840	2080	690
	6	80	2110	1080	2380	900
	8	80	2320	1280	2580	1110
160 ML_	2	110	2050	1440	2440	1180
	4	110	2620	2010	3160	1650
	6	110	3060	2440	3590	2090
	8	110	3410	2790	3950	2430
180 ML_	2	110	2570	1470	3120	1100
	4	110	3230	2130	3980	1630
	6	110	3730	2630	4490	2130
	8	110	4140	3040	4890	2550

			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	
Motor size	Poles	Length of shaft extension E (mm)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
200 ML_	2	110	3300	2040	3960	1590
	4	110	4180	2920	5030	2340
	6	110	4820	3560	5820	2890
	8	110	5360	4100	6370	3430
225 SM_	2	110	3710	2240	4570	1650
	4	140	4690	3230	5770	2500
	6	140	5410	3940	6660	3100
	8	140	6010	4540	7280	3700
250 SM_	2	140	5200	2100	6240	1380
	4	140	6400	3310	7720	2410
	6	140	7260	4160	8930	3047
	8	140	8000	4900	9690	3780
280 SM_	2	140	4870	2870	6440	1780
	4	140	6140	4140	8170	2760
	6	140	7040	5040	9580	3340
	8	140	7840	5840	10380	4150
315 SM_	2	140	4780	2780	6950	1270
	4	170	7170	5170	9820	3350
	6	170	8210	6210	11760	3810
	8	170	9180	7180	12740	4780
315 ML_	2	140	4730	2730	7280	940
	4	170	7080	5080	10300	2870
	6	170	8100	6100	12330	3240
	8	170	9060	7070	13310	4210
355 SM_	2	140	1660	5460	5330	2890
	4	210	5760	9560	11110	5820
	6	210	7060	10860	13720	6270
	8	210	8290	12090	14980	7530
355 ML_	2	140	1570	5370	5860	2360
	4	210	5640	9440	11810	5130
	6	210	6880	10680	14718	5280
	8	210	8100	11900	15970	6540
355 LK_	2	140	1440	5240	6600	1630
	4	210	5460	9260	12850	4080
	6	210	6680	10480	15800	4190
	8	210	7810	11610	17500	5000
400 L, LK_	2	170	810	5810	8010	730
	4	210	4250	10250	13610	3650
	6	210	5510	11510	16610	3840
	8	210	6630	12630	18480	4530

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’ increased safety and prevents all ignition sources such as sparks, excessive over hating 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 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 above. 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 280-400 2*180° after delivery. For sizes 280-400 is also mounting of terminal box with opening towards D or N-end possible using the relevant variant codes when ordering.

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.

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 e approved blanking plugs made of nickel plated brass. Very large motors have angle adapters and cable sealing units as standard. Please refer to the table below for further information about amount and size of threaded holes, plugs and cable sealing units 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.

Standard delivery

Standard delivery if no other information is provided.

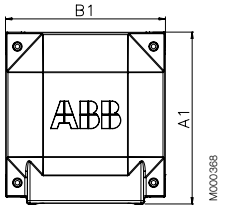
Cable entries for supply cables Motor size	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adapter	Gland plate with threaded holes, amount and size, holes plugged	Cable sealing end unit, size	Max. connectable core cross-section mm²/phase	Number and size of terminal bolts
IE2 motors								
80 - 90	2-8	25	B	-	1x M25x1.5	-	1x10	6x M5
100 - 132	2-8	25	B	-	2x M32x1.5	-	1x10	6x M5
160 - 180	2-8	63	2x B	-	2x M40x1.5	-	1x35	6x M6
200 - 250	2-8	160	C	-	2x M40x1.5	-	1x70	6x M10
280 SM_	2-8	210	C	-	2x M63x1.5	-	2x150	6x M12
315 SM_, ML_	2-8	370	D	-	2x M63x1.5	-	2x240	6x M12
355 SMA - SMC	2-4	750	E	E-D	-	Medium	4x240	6x M12
355 SMA, SMB	6-8	370	D	-	2x M63x1.5	-	2x240	6x M12
355 SMC	6	750	E	E-D	-	Medium	4x240	6x M12
355 SMC	8	370	D	-	2x M63x1.5	-	2x240	6x M12
355 ML_, LK_	2-4	750	E	E-D	-	Large	4x240	6x M12
355 ML_, LK_	6-8	750	E	E-D	-	Medium	4x240	6x M12
400	2-6	750	E	E-D	-	Large	4x240	6x M12
400	8	750	E	E-D	-	Medium	4x240	6x M12

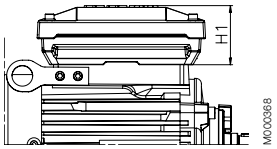
Auxiliary cable entries			
80 - 132	2-8	1x M20x1.5	1x 2.5 mm² per terminal
280 - 450	2-8	2x M20x1.5	1x 2.5 mm² per terminal

Motor size	Earthing on frame	Earthing in main terminal box
80 - 132	M6	M6
160 – 180	M6	M6
200 - 250	M8	M8
280 - 400	M10	2xM10

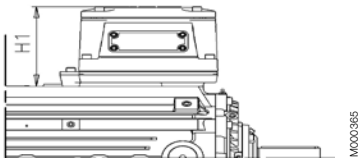
Terminal box
Terminal box dimensions

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.

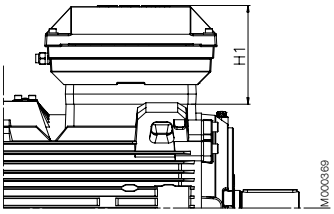




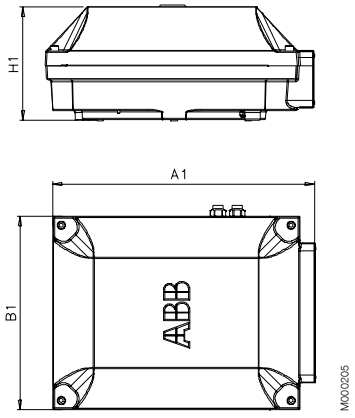
Motor sizes 80 to 132



Motor sizes 160 to 180

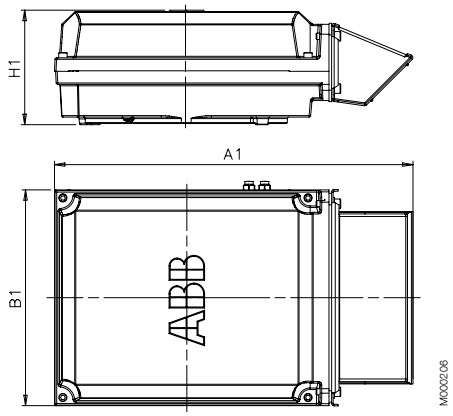


Motor sizes 200 to 250

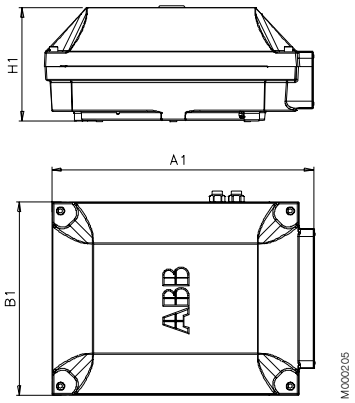


Motor sizes 280 to 315. top- and side-mounted. terminal boxes 210.370

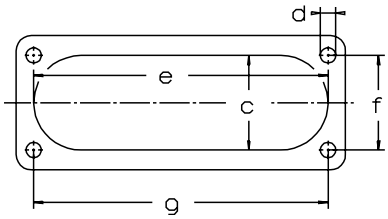
Terminal box types acc. to current capacity	A1 mm	B1 mm	H1 mm	Gland plate opening
25	208	180	74	B
63	243	243	178	2x B
160	352	319	186	B
210	416	306	186	C
370	451	347	200	D
750 with E-D adapter	686	413	219	D
750 without E-D adapter	523	413	219	E



Motor sizes 355 to 400. top-mounted. Terminal box 750 + adapter



Motor sizes 355 to 400. side-mounted. terminal box 750



Dimensions of opening for gland plate

To match the correct terminal box with motor size, find the

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

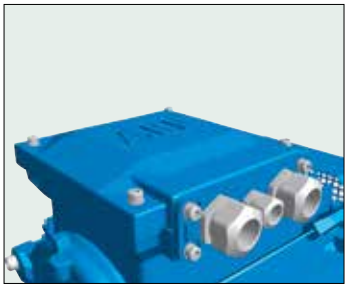

M000718

Fig 1. Terminal box for motor sizes 80 to132


M000719

Fig 2. Terminal box for motor sizes 160 to 180

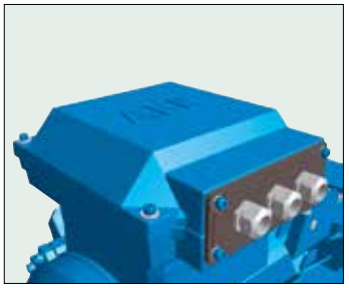

M000720

Fig 3. Terminal box for motor sizes 200 to 250

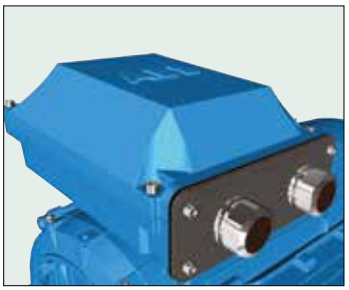

M000423

Fig 4. Terminal box for motor sizes 280 to 315 with connection flange and cable glands.

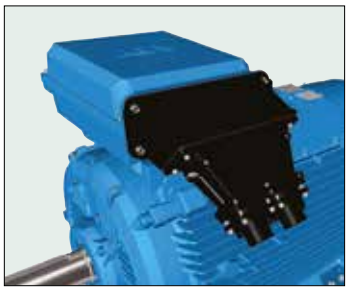

M000424

Fig 5. Terminal box for motor sizes 355 to 400, with adapter and cable sealing end unit.

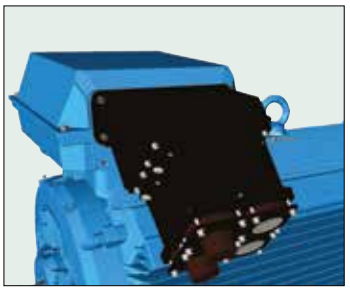

M000425

Fig 6. Terminal box for motor sizes 450, with adapter and cable sealing end unit.

Terminal boards


M000721

Fig 7. Terminal board for motor sizes 80 to 132


M000722

Fig 8. Terminal board for motor sizes 160 to 180

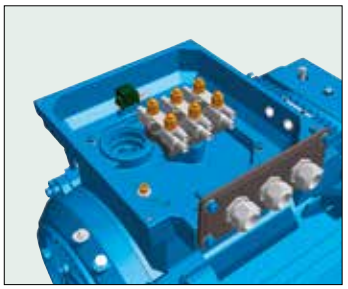

M000723

Fig 9. Terminal board for motor sizes 200 to 250

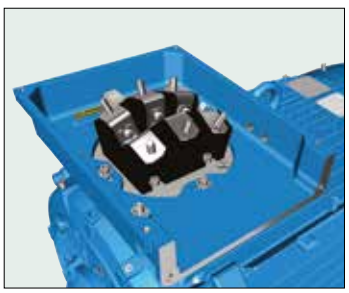

M000427

Fig 10. Terminal board for motor sizes 280 to 315.

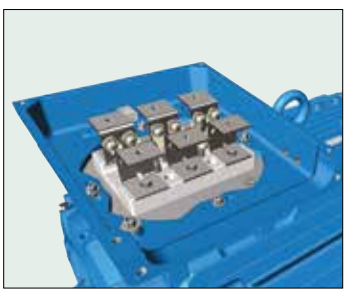

M000428

Fig 11. Terminal board for motor sizes 355 to 400.

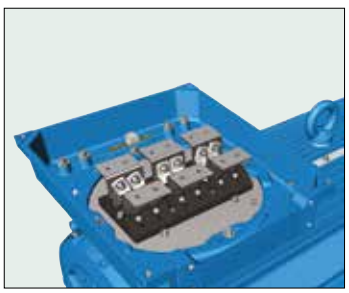

M000429

Fig 12. Terminal board for motor size 450.

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

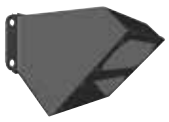
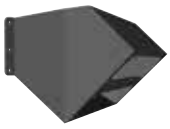
- Check first that the terminal box itself allows mounting of the desired cable and cores (refer to table showing standard delivery for each motor size). If very large cable are used might it be necessary to use a larger terminal box and larger terminal board than standard
- Select the right cable gland(s) 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

Motor and supply cables	145kW, 4-pole, 400V 50Hz, IE2. Cables needed: 1 pcs outer diameter 42mm steel wire armoured cable, single cross section 120 mm². Cables coming from below. Gland plate material steel.
Motor	M3HP 315MLA 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, is an angle adapter recommended. These are available for motor sizes 280 and above and can also be used to allow mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the “size of gland plate opening on terminal box” column in section Standard terminal box.

Adapter	 M000430	 M000431	 M000432	 M000433	 M000434	 M000434
Variant code	292	293	294	295	296	444
Suited for motor sizes	280	315, 355	315 LKC, 355 - 450	315 LKC, 355 - 450	315 LKC, 355 - 450	315 LKC, 355 - 450
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	Steel	Steel	Steel	Steel	Steel	Steel
Notes			Included in type 750 terminal box when 750 is the standard size.	Included in type 1200 terminal box when 1200 is the standard size.	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 or cable sealing units 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, variant code 230 or 731	EMC Cable gland(s) nickel plated brass, Ex e, for non armoured cable, variant code 704	Cable gland Ex d IIC / Ex e 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 ordered will the sizes in tables below be delivered.

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”
315-450	2 x 3”	1 x 3”

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

Gland plates with threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands 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 aluminum or stainless steel are optional, either with cable glands or blind without threaded holes. Please refer to the variant code section for more information.

Cable sealing end units

As an alternative to gland plates and cable glands, cable sealing end units can be used. These allow more space for spreading the cores for easy termination. Cable sealing units have rubber sealed entries for one or two main cables. In addition there are two plugged M20 holes for auxiliary cables. The cable sealing end units are Ex e certified, as option can they be equipped with EMC modules or cable clamping devices by adding variant codes 704 or 231.

End unit	 M000436	 M000437	 M000438
Variant code	277	278	279
Suited for motor sizes	280	315, 355	315, 355
Opening to terminal box	C	D	D
Cable outer diameter	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 60 - 80 mm
Cable entry for auxiliary cable	2 x M20 plugged holes	2 x M20 plugged holes	2 x M20 plugged holes
Additional optional variants	EMC cable gland (704); Standard gland with clamping device (231)	EMC cable gland (704); Standard gland with clamping device (231)	EMC cable gland (704); Standard gland with clamping device (231)

Auxiliary terminal box

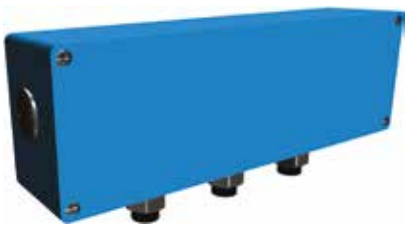
It is possible to equip motors from frame size 160 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of aluminium, except frame sizes 160, 180 where cast iron boxes are used.

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

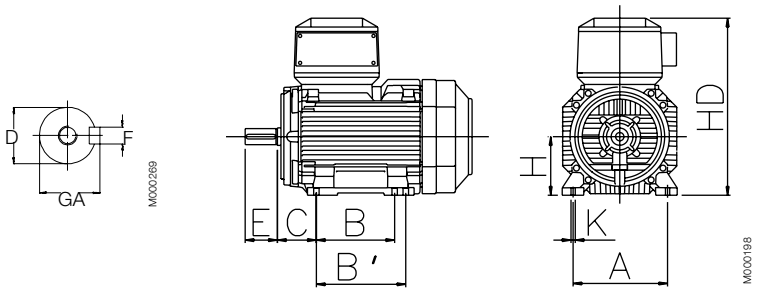
Small auxiliary aluminum terminal box for motor sizes 280-450
(variant codes 418, 568, 380, 569)
The size of terminal box ordered with these codes depends on the number of accessories ordered.
80 x 125 mm, max 12 strips. Earthing size M4



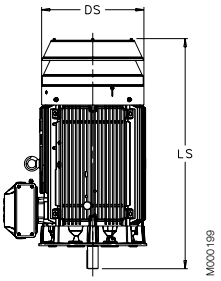
Large auxiliary aluminum terminal box for motor sizes 280-450.
The size of terminal box ordered with these codes depends on the number of accessories ordered.
80 x 250 mm, max 30 strips. Earthing size M4

Auxiliary cast iron terminal box
(variant code 567).
208 x 180mm, max 30 strips.
Earthing M6

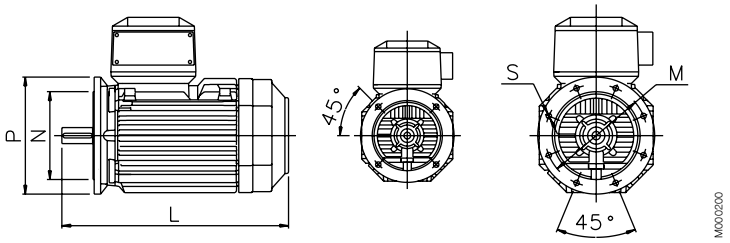
Dimension drawings
Increased safety cast iron motors



Foot-mounted motor IM 1001, IM B3



Protective roof, variant code 005



Flange-mounted motor IM 3001, IM B5 — Sizes 80 to 200 — Sizes 225 to 400

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		O [1]	A	B	B'	C	HD	K	H	M	N	P	S	DS	LS 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	340	340	20	125	100	125	50	241	10	80	165	130	200	12	160	360	360
90	24	24	27	27	8	8	50	50	405	405	20	140	100	125	56	266	10	90	165	130	200	12	180	430	430
100	28	28	31	31	8	8	60	60	480	480	25	160	140	–	63	286	12	100	215	180	250	14.5	195	505	505
112	28	28	31	31	8	8	60	60	480	480	25	190	140	–	70	301	12	112	215	180	250	14.5	195	505	505
132	38	38	41	41	10	10	80	80	560	560	30	216	140	178	89	346	12	132	265	230	300	14.5	260	590	590
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	14.5	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	536	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	583	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	646	24	250	500	450	550	18.5	506	965	965
280	65	75	69	79.5	18	20	140	140	1088	1088	100	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	115	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	115	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	130	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	130	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	130	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	150	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	150	686	710	800	280	1045	35	400	740	680	800	24	810	1860	1900

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

IM 3601, IM B14 - Available flange alternatives; see also variant codes.

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	S	M	NA	NA	NA
FT115	260	140	115	95	M8	M	S	NA	NA	NA
FT130	229	160	130	110	M8	M	M	S	S	NA
FT165	236	200	165	130	M10	M	M	M	M	S
FT215	246	250	215	180	M12	NA	NA	M	M	M
FT265	256	300	265	230	M12	NA	NA	NA	NA	M
FF100	257	120	100	80	Ø7	M	M	NA	NA	NA
FF115	259	140	115	95	Ø10	M	M	NA	NA	NA
FF130	228	160	130	110	Ø10	M	M	M	M	NA
FF165	235	200	165	130	Ø12	S	S	M	M	M
FF215	245	250	215	180	Ø14.5	NA	NA	S	S	M
FF265	255	300	265	230	Ø14.5	NA	NA	NA	NA	S

S = Standard flange M = Modification NA = Not applicable

Tolerances:	
A, B	± 0.8
D, DA	ISO k6 < Ø 50mm
	ISO m6 > Ø 50mm
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

1 ATTESTATION D'EXAMEN CE DE TYPE

2 **Appareil ou système de protection** destiné à être utilisé en atmosphères explosibles **(Directive 94/9/CE)**

3 Numéro de l'attestation d'examen CE de type
LCIE 09 ATEX 3023

4 Appareil ou système de protection :
Moteur asynchrone
Type : M3HP180... (Génération H)

5 Demandeur : ABB Oy Motors
Adresse : Strombergin Puistotie 5A
FIN - 65101 VAASA - Finland

6 Fabricant : ABB Oy Motors
Adresse : Strombergin Puistotie 5A
FIN - 65101 VAASA - Finland

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles de sécurité et de santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive.
Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 91307-582851.

9 Le respect des exigences essentielles de sécurité et de santé est assuré par la conformité à :
- EN 60079-0 (2006) - EN 60079-7 (2007)
- EN 61241-0 (2006) - EN 61241-1 (2004)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil ou système de protection est soumis aux conditions spécifiées pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à l'annexe III de la directive 94/9/CE.
Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection. Ces dernières ne sont pas couvertes par la présente attestation.

12 Le marquage de l'appareil ou du système de protection doit comporter les informations détaillées au point 15.

Fontenay-aux-Roses, le 9 avril 2009

1 EC TYPE EXAMINATION CERTIFICATE

2 **Equipment or protective system** intended for use in potentially explosive atmospheres **(Directive 94/9/EC)**

3 EC type examination certificate number
LCIE 09 ATEX 3023

4 Equipment or protective system :
Asynchronous motor
Type : M3HP180... (Generation H)

5 Applicant : ABB Oy Motors
Address : Strombergin Puistotie 5A
FIN - 65101 VAASA - Finland

6 Manufacturer : ABB Oy Motors
Address : Strombergin Puistotie 5A
FIN - 65101 VAASA - Finland

7 This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in confidential report N° 91307-582851.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
- EN 60079-0 (2006) - EN 60079-7 (2007)
- EN 61241-0 (2006) - EN 61241-1 (2004)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with annex III to the directive 94/9/EC.
Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include the information as detailed at 15.

Marc GILLAUX
Responsable certification ATEX
ATEX certification manager

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01-Annexe III_CE_typ_app - rev0.DOC

M000728

ABB

EU DECLARATION OF CONFORMITY

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: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The motors of the declaration described above are in conformity with the relevant Union harmonisation legislation:

Directive 94/9/EC (until April 19th, 2016) and Directive 2014/34/EU (from April 20th, of April 2016)

Directive 2009/125/EC (ErP of 28th November 2009)
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EU) No. 4/2014 of 5 January 2014 amending Regulation (EC) No. 640/2009.

Efficiency classes as defined in the standard EN 60034-30:2009.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Technical documentation based on the standard EN 50581:2012.

The following harmonised standards are applied in relation to which conformity is declared:
EN 60079-0:2012, EN 60079-1:2007, EN 60079-7:2007, EN 60079-15:2010, EN 60079-31:2009 and relevant parts of the EN 60034 –series of standards.

The conformity of the end product according to the Directive 2006/42/EC has to be established by the commissioning party when the motor is fitted to the machinery.

Note: Motors have to 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.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc, 33, 92260 Fontenay-aux-Roses, France and VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland

Signed for and on behalf of: ABB Oy, Motors and Generators and ABB Sp.z.o.o

Place and date of issue: Vaasa, Finland, 2015-11-26

Harri Mykkänen
Title: Vice President

Document 3GJF500630-3090

ABB Oy

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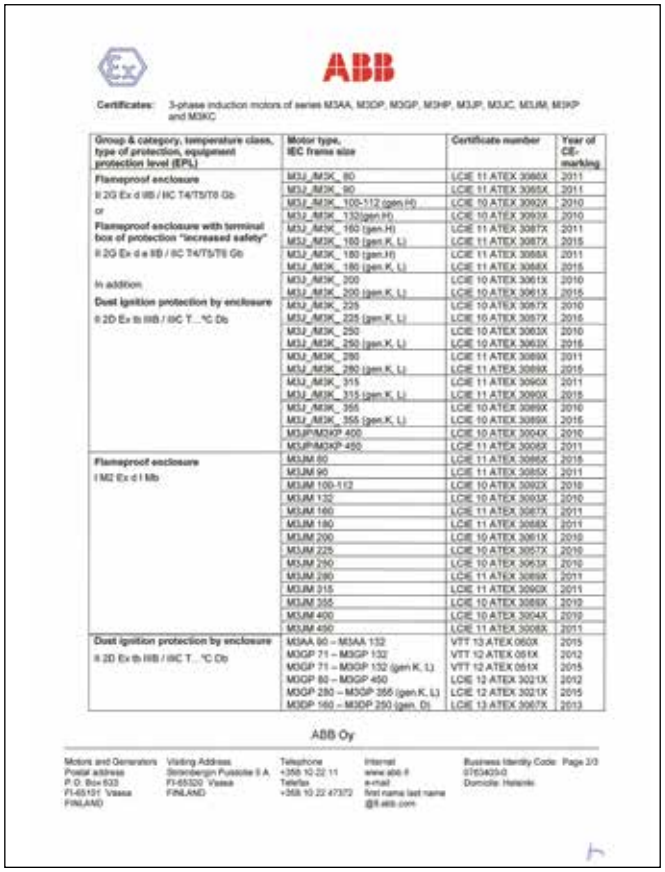
M000725-1a



ABB

Certificates: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC

Group & category, temperature class, type of protection, equipment protection level (EPL)	Motor type, IEC frame size	Certificate number	Year of CE-marking
Flameproof enclosure	M3J_/M3K_ 80	LCIE 11 ATEX 3066X	2011
II 2G Ex d IIB / IIC T4/T5/T6 Gb	M3J_/M3K_ 90	LCIE 11 ATEX 3065X	2011
or	M3J_/M3K_ 100-112 (gen.H)	LCIE 10 ATEX 3092X	2010
Flameproof enclosure with terminal box of protection "increased safety"	M3J_/M3K_ 132(gen.H)	LCIE 10 ATEX 3093X	2010
II 2G Ex d e IIB / IIC T4/T5/T6 Gb	M3J_/M3K_ 160 (gen.H)	LCIE 11 ATEX 3087X	2011
	M3J_/M3K_ 160 (gen.K, L)	LCIE 11 ATEX 3087X	2015
	M3J_/M3K_ 180 (gen.H)	LCIE 11 ATEX 3088X	2011
In addition	M3J_/M3K_ 180 (gen.K, L)	LCIE 11 ATEX 3088X	2015
Dust ignition protection by enclosure	M3J_/M3K_ 200	LCIE 10 ATEX 3061X	2010
II 2D Ex tb IIIB / IIIC T...°C Db	M3J_/M3K_ 200 (gen.K, L)	LCIE 10 ATEX 3061X	2015
	M3J_/M3K_ 225	LCIE 10 ATEX 3057X	2010
	M3J_/M3K_ 225 (gen.K, L)	LCIE 10 ATEX 3057X	2015
	M3J_/M3K_ 250	LCIE 10 ATEX 3063X	2010
	M3J_/M3K_ 250 (gen.K, L)	LCIE 10 ATEX 3063X	2015
	M3J_/M3K_ 280	LCIE 11 ATEX 3089X	2011
	M3J_/M3K_ 280 (gen.K, L)	LCIE 11 ATEX 3089X	2015
	M3J_/M3K_ 315	LCIE 10 ATEX 3090X	2011
	M3J_/M3K_ 315 (gen.K, L)	LCIE 11 ATEX 3090X	2015
	M3J_/M3K_ 355	LCIE 10 ATEX 3089X	2010
	M3J_/M3K_ 355 (gen.K, L)	LCIE 10 ATEX 3089X	2015
	M3JP/M3KP 400	LCIE 10 ATEX 3004X	2010
	M3JP/M3KP 450	LCIE 11 ATEX 3006X	2011
Flameproof enclosure	M3JM 80	LCIE 11 ATEX 3065X	2015
I M2 Ex d I Mb	M3JM 90	LCIE 11 ATEX 3065X	2011
	M3JM 100-112	LCIE 10 ATEX 3092X	2010
	M3JM 132	LCIE 10 ATEX 3093X	2010
	M3JM 160	LCIE 11 ATEX 3087X	2011
	M3JM 180	LCIE 11 ATEX 3088X	2011
	M3JM 200	LCIE 10 ATEX 3061X	2010
	M3JM 225	LCIE 10 ATEX 3057X	2010
	M3JM 250	LCIE 10 ATEX 3063X	2010
	M3JM 280	LCIE 11 ATEX 3089X	2011
	M3JM 315	LCIE 11 ATEX 3090X	2011
	M3JM 355	LCIE 10 ATEX 3089X	2010
	M3JM 400	LCIE 10 ATEX 3004X	2010
	M3JM 450	LCIE 11 ATEX 3006X	2011
Dust ignition protection by enclosure	M3AA 90 – M3AA 132	VTT 13 ATEX 0602X	2015
II 2D Ex tb IIIB / IIIC T...°C Db	M3GP 71 – M3GP 132	VTT 12 ATEX 0511X	2012
	M3GP 71 – M3GP 132 (gen.K, L)	VTT 12 ATEX 0511X	2015
	M3GP 80 – M3GP 450	LCIE 12 ATEX 3021X	2012
	M3DP 280 – M3GP 355 (gen.K, L)	LCIE 12 ATEX 3021X	2015
	M3DP 160 – M3DP 250 (gen. D)	LCIE 13 ATEX 3067X	2013

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M000725-2a

Motors in brief
Increased safety cast iron motors, size 80 to 180

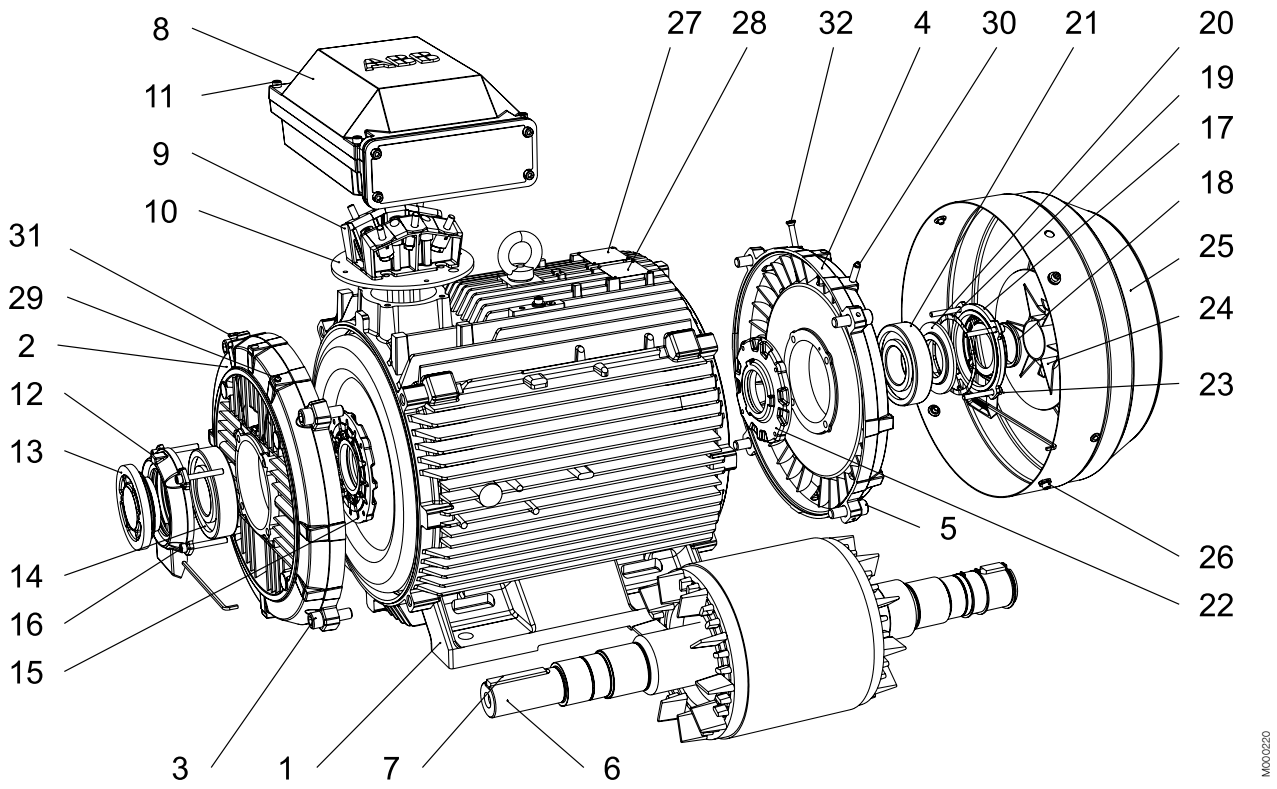
Motor size			80	90	100	112	132	160	180
Stator	Material		Cast iron. EN-GJL-200 or better						
	Paint colour shade		Blue. Munsell 8B 4.5/3.25						
	Corrosion class		C3 medium according to ISO/EN 12944-5						
Feet			Forged steel. detachable feet						
Bearing end shields	Material		Cast iron. EN-GJL-200 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	2-12 pole	6204-2Z/C3	6205-2Z/C3	6206-2Z/C3	6206-2Z/C3	6208-2Z/C3	6309/C3	6310/C3
	N-end	2-12 pole	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 seal			Gamma-ring as standard						
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 20 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 colour 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 as standard						
Rotor winding	Material		Pressure die-cast aluminum						
Balancing			Half key balancing						
Key way			Closed						
Heating elements	On request		25 W						
Drain holes			-					As standard. closed on delivery	
External earthing bolt			As standard						
Enclosure			IP 55						
Cooling method			IC 411						

Motors in brief
Increased safety cast iron motors, sizes 200 to 400

Motor size			200	225	250	280	315	355	400
Stator	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						
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 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
	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
Axially-locked bearings	Inner bearing cover		As standard. locked at D-end						
Bearing seal			Gamma ring			V-ring or labyrinth seal. refer to table on page 84			
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 M40 + 2 x M20 plugged			2 x M63 + 2 x M20 plugged		Refer to table on page 126	
	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 colour 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 as standard						
Rotor winding	Material		Pressure die-cast aluminum						
Balancing			Half key balancing						
Heating elements	On request		25 W	60 W			120 W		
Key way			Closed			Open			
Drain holes			As standard. open on delivery						
External earthing bolt			As standard						
Enclosure			IP 55						
Cooling method			IC 411						

Motor construction
Increased safety cast iron motors, Ex e

Typical exploded view of cast iron motors. frame size 315



1	Stator frame	**17**	Outer bearing cover. N-end
2	Endshield. D-end	**18**	Seal. N-end
3	Screws for endshield. D-end	**19**	Wave spring (280-315)
4	Endshield. N-end		Coil spring (355-400)
5	Screws for endshield. N-end	**20**	Valve disc. N-end
6	Rotor with shaft	**21**	Bearing. N-end
7	Key. D-end	**22**	Inner bearing cover. N-end
8	Terminal box	**23**	Screws for bearing cover. N-end
9	Terminal board	**24**	Fan
10	Intermediate flange	**25**	Fan cover
11	Screws for terminal box cover	**26**	Screws for fan cover
12	Outer bearing cover. D-end	**27**	Rating plate
13	Valve disc with labyrinth seal. D-end; standard in 2-pole motors (V-ring in 4-8 pole)	**28**	Regreasing plate
14	Bearing. D-end	**29**	Grease nipple. D-end
15	Inner bearing cover. D-end	**30**	Grease nipple. N-end
16	Screws for bearing cover. D-end	**31**	SPM nipple. D-end
		32	SPM nipple. N-end

Non-sparking cast iron motors Ex nA
Totally enclosed squirrel cage three phase low voltage motors, Sizes 71 to 450, 0.25 to 1000 kW

Ordering information

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

Example	
Motor type	M3GP 160 MLA
Pole number	2
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	11 kW
Product code	3GGP161410-ADD
Variant codes if needed	

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 - 4

3GGP: Totally enclosed fan cooled squirrel cage motor with cast iron frame, non-sparking
3GAA: Totally enclosed fan cooled squirrel cage motor with aluminum frame, non-sparking

Positions 5 and 6

IEC-frame

06	63
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
45	450

Position 7

Speed (Pole pairs)

1:	2 poles
2:	4 poles
3:	6 poles
4:	8 poles
5:	10 poles

Positions 8 to 10

Serial number

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

The rating plates are in table form giving values for speed, current and power factor for cast iron motors: 400V-415V-690V as standard. For aluminum motors there are one or two voltages in use; 230V-400V depending on the frame size. Other voltage and frequency combinations are possible and can be ordered with variant codes 002 or 209. Please see Variant code section.

The following information will be shown on the motor rating plate:

- Lowest nominal efficiency at 100 %, 75 % and 50 % rated load
- Efficiency level
- Year of manufacture
- Type of protection
- Apparatus group
- Temperature class
- Identification number of the certification body
- Certificate number : for cast iron motors both ATEX and IECEx are stamped on the rating plate as standard. For aluminum motors self certification.

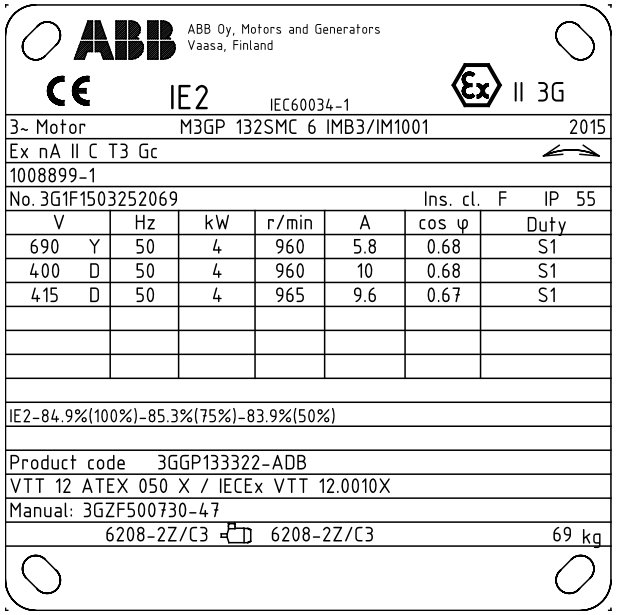


ABB Oy, Motors and Generators
Vaasa, Finland

CE IE2 IEC60034-1 Ex II 3G

3~ Motor	M3GP 132SMC 6 IMB3/IM1001					2015
Ex nA II C T3 Gc						
1008899-1						
No. 3G1F1503252069					Ins. cl. F	IP 55
V	Hz	kW	r/min	A	cos φ	Duty
690 Y	50	4	960	5.8	0.68	S1
400 D	50	4	960	10	0.68	S1
415 D	50	4	965	9.6	0.67	S1

IE2-84.9%(100%)-85.3%(75%)-83.9%(50%)

Product code 3GGP133322-ADB
VTT 12 ATEX 050 X / IECEx VTT 12.0010X
Manual: 3GZF500730-47
6208-2Z/C3 6208-2Z/C3 69 kg

Technical data for Ex nA IIC T3 Gc
Non-sparking IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cos φ	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2-poles		400 V 50 Hz						CENELEC-design							
0.37	M3GP 71MA 2	3GGP071321-••B	2768	74.8	75.4	72.4	0.78	0.89	4.5	1.27	2.2	2.3	0.00039	11	58
0.55	M3GP 71MB 2	3GGP071322-••B	2813	77.8	78.3	76.0	0.79	1.29	4.3	1.86	2.4	2.5	0.00051	11	56
0.75	M3GP 80MB 2	3GGP081322-••B	2895	80.6	79.6	75.6	0.74	1.8	7.7	2.4	4.2	4.2	0.001	16	57
1.1	M3GP 80MC 2	3GGP081323-••B	2870	81.8	81.7	79.0	0.80	2.48	7.5	3.6	3.7	4.6	0.0012	18	60
1.5	M3GP 90SLB 2	3GGP091322-••B	2900	82.2	82.9	81.3	0.89	2.94	7.5	4.9	2.5	2.6	0.00254	24	69
2.2	M3GP 90SLC 2	3GGP091323-••B	2885	84.7	86.8	85.7	0.88	4.2	6.8	7.2	1.9	2.5	0.0028	25	64
3	M3GP 100LB 2	3GGP101322-••B	2925	85.2	84.9	82.7	0.87	5.75	9.1	9.7	3.1	3.5	0.0053	36	68
4	M3GP 112MB 2	3GGP111322-••B	2895	86.1	87.0	86.6	0.89	7.52	8.7	13.08	3.3	3.5	0.00575	37	70
5.5	M3GP 132SMB 2	3GGP131322-••B	2865	87.7	88.4	87.7	0.86	10	7.0	18.3	2.6	2.7	0.0128	68	70
7.5	M3GP 132SMC 2	3GGP131324-••B	2890	88.2	88.5	87.5	0.88	13.7	8.3	24.7	2.6	3.6	0.0136	70	70
11	M3GP 160MLA 2	3GGP161410-••D	2931	90.1	90.4	89.3	0.89	20.2	6.7	35.81	2.5	3.2	0.043	139	71
15	M3GP 160MLB 2	3GGP161420-••D	2929	91.2	91.7	90.8	0.89	27	7.2	48.9	2.9	3.4	0.052	149	71
18.5	M3GP 160MLC 2	3GGP161430-••D	2934	91.6	92.4	92.3	0.90	32.4	7.4	60.3	3.1	3.5	0.062	159	69
22	M3GP 180MLA 2	3GGP181410-••D	2938	91.7	92.3	91.8	0.90	39.1	7.0	71.4	2.5	3.2	0.089	199	69
30	M3GP 200MLA 2	3GGP201410-••D	2956	93.2	93.6	93.0	0.88	52.7	7.4	96.9	3.0	3.2	0.15	275	74
37	M3GP 200MLC 2	3GGP201430-••D	2954	93.6	94.0	93.4	0.89	64.7	7.5	119.9	2.8	3.2	0.19	304	75
45	M3GP 225SMB 2	3GGP221220-••D	2968	93.8	93.9	93.0	0.87	78.8	7.2	144	2.7	3.0	0.26	357	76
55	M3GP 250SMA 2	3GGP251210-••D	2975	94.3	94.2	93.2	0.89	95.1	7.8	176	2.4	3.1	0.49	445	75
75 [3]	M3GP 280SMA 2	3GGP281210-••G	2977	94.3	93.8	92.2	0.88	131	7.6	240	2.1	3.0	0.8	625	77
90 [3]	M3GP 280SMB 2	3GGP281220-••G	2976	94.6	94.7	93.8	0.89	154	7.4	288	2.1	2.9	0.9	665	77
110 [3]	M3GP 315SMA 2	3GGP311210-••G	2982	94.9	94.4	92.9	0.86	197	7.4	352	2.2	3.2	1.2	880	78
132 [3]	M3GP 315SMB 2	3GGP311220-••G	2982	95.1	94.8	93.6	0.88	227	7.4	422	2.2	3.0	1.4	940	78
160 [3]	M3GP 315SMC 2	3GGP311230-••G	2981	95.4	95.2	94.2	0.89	271	7.5	512	2.3	3.0	1.7	1025	78
200 [3]	M3GP 315MLA 2	3GGP311410-••G	2980	95.7	95.7	94.9	0.90	335	7.7	640	2.6	3.0	2.1	1190	78
250 [3]	M3GP 355SMA 2	3GGP351210-••G	2984	95.7	95.5	94.5	0.89	423	7.7	800	2.1	3.3	3.0	1600	83
315 [3]	M3GP 355SMB 2	3GGP351220-••G	2980	95.7	95.6	95.0	0.89	531	7.0	1009	2.1	3.0	3.4	1680	83
355 [3]	M3GP 355SMC 2	3GGP351230-••G	2984	95.7	95.7	94.9	0.88	603	7.2	1136	2.2	3.0	3.6	1750	83
400 [3]	M3GP 355MLA 2	3GGP351410-••G	2982	96.9	96.6	95.9	0.88	677	7.1	1280	2.3	2.9	4.1	2000	83
450 [3]	M3GP 355MLB 2	3GGP351420-••G	2983	97.1	97.0	96.4	0.90	743	7.9	1440	2.2	2.9	4.3	2080	83
500 [3]	M3GP 355LKA 2	3GGP351810-••G	2982	96.9	96.9	96.5	0.90	827	7.5	1601	2.0	3.9	4.8	2320	83
560 [3]	M3GP 355LKB 2	3GGP351820-••G	2983	97.0	97.0	96.5	0.90	925	8.0	1792	2.2	4.1	5.2	2460	83
560 [2]	M3GP 400LA 2	3GGP401510-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	2950	82
560 [2]	M3GP 400LKA 2	3GGP401810-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	2950	82
630 [2]	M3GP 400LB 2	3GGP401520-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3050	82
630 [2]	M3GP 400LKB 2	3GGP401820-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3050	82
710 [2]	M3GP 400LC 2	3GGP401530-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3300	82
710 [2]	M3GP 400LKC 2	3GGP401830-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3300	82
3000 r/min = 2-poles		400 V 50 Hz						High-output design							
22 [1]	M3GP 160MLD 2	3GGP161440-••D	2929	91.2	91.9	91.4	0.90	38.3	7.5	71.7	3.1	3.3	0.07	166	77
30	M3GP 180MLB 2	3GGP181420-••D	2943	92.5	93.2	92.6	0.90	52.2	7.1	97.23	2.3	3.2	0.13	236	78
37	M3GP 180MLC 2	3GGP181430-••D	2950	92.8	93.1	92.8	0.90	64.9	8.1	119.9	3.3	3.7	0.13	237	77
45	M3GP 200MLE 2	3GGP201450-••D	2944	93.3	93.6	93.0	0.88	79.1	7.3	145	2.9	3.1	0.22	312	79
55	M3GP 225SMC 2	3GGP221230-••D	2965	93.9	94.2	93.5	0.88	95.8	7.1	177	2.6	3.0	0.29	377	80
67	M3GP 225SMD 2	3GGP221240-••D	2966	93.9	93.9	93.0	0.86	120	7.4	215	2.8	3.2	0.31	388	78
75	M3GP 250SMB 2	3GGP251220-••D	2969	93.8	93.9	93.2	0.89	129	7.9	241	2.6	3.1	0.57	487	80
90	M3GP 250SMC 2	3GGP251230-••D	2965	94.4	94.5	93.9	0.89	153	7.7	289	2.5	3.0	0.59	500	80
110 [3]	M3GP 280SMC 2	3GGP281230-••G	2978	95.1	95.1	94.5	0.90	186	7.9	352	2.4	3.0	1.15	725	77
132 [3]	M3GP 280MLA 2	3GGP281410-••G	2977	95.3	95.3	94.8	0.90	221	7.5	423	2.5	3.0	1.4	840	81
160	M3GP 280MLB 2	3GGP281420-••G	2976	95.5	95.7	95.3	0.91	265	7.6	513	2.8	3.0	1.55	890	81

[1] Efficiency class IE1

[2] Unidirectional fan construction as standard. Direction of rotation must be stated when ordering, see variant codes 044 and 045

[3] -3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering, see variant codes 044 and 045

Technical data for Ex nA IIC T3 Gc
Non-sparking IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cos φ	Current I_N A	Current I_s/I_N	Torque T_N N_m	Torque T_l/T_N	Torque T_b/T_N	Moment of inertia $J = 1/4\ GD^2$ kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4-poles		400 V 50 Hz						CENELEC-design							
0.25 [1]	M3GP 71MA 4	3GGP072321-••B	1365	68.3	70.7	69.6	0.81	0.64	3.5	1.74	1.9	2.0	0.00074	10	45
0.37 [1]	M3GP 71MB 4	3GGP072322-••B	1380	72.4	74.5	74.7	0.83	0.87	4.6	2.5	1.6	2.1	0.00088	11	45
0.55 [1]	M3GP 80MA 4	3GGP082321-••B	1415	70.0	69.2	64.7	0.73	1.44	5.6	3.7	2.0	2.8	0.00144	15	45
0.75	M3GP 80MD 4	3GGP082324-••B	1430	81.0	81.0	78.2	0.73	1.82	5.3	5	2.7	3.2	0.00205	17	50
1.1	M3GP 90SLB 4	3GGP092322-••B	1435	83.6	84.1	82.4	0.80	2.36	6.5	7.3	2.4	3.4	0.0044	25	50
1.5	M3GP 90SLD 4	3GGP092325-••B	1430	84.3	85.1	83.9	0.82	3	6.3	10	2.7	3.4	0.0053	27	56
2.2	M3GP 100LC 4	3GGP102323-••B	1450	85.9	85.1	83.4	0.78	4.6	7.7	14.5	2.7	4.1	0.00948	36	56
3	M3GP 100LD 4	3GGP102324-••B	1450	86.8	86.9	85.3	0.79	6.1	7.7	19.8	2.9	3.4	0.011	38	58
4	M3GP 112MB 4	3GGP112322-••B	1440	86.8	87.7	87.4	0.82	7.94	7.0	26.5	2.5	2.9	0.0125	44	59
5.5	M3GP 132SMB 4	3GGP132322-••B	1460	89.0	89.8	88.9	0.80	10.8	6.7	36	2.2	3.2	0.0328	70	67
7.5	M3GP 132SMC 4	3GGP132323-••B	1450	89.3	90.1	90.0	0.81	14.5	7.2	49.4	2.5	3.5	0.0366	73	64
11	M3GP 160MLC 4	3GGP162430-••D	1470	91.2	91.3	90.0	0.82	21.5	8.0	71.5	3.3	3.8	0.096	160	62
15	M3GP 160MLE 4	3GGP162450-••D	1467	92.0	92.3	91.8	0.84	28.5	8.0	97.7	3.3	3.2	0.13	183	61
18.5	M3GP 180MLA 4	3GGP182410-••D	1474	91.6	92.1	91.5	0.83	35.7	7.2	119.9	2.6	3.1	0.19	213	62
22	M3GP 180MLB 4	3GGP182420-••D	1474	92.2	92.5	91.9	0.82	42	7.7	142.3	2.8	3.4	0.23	232	62
30	M3GP 200MLB 4	3GGP202420-••D	1471	92.5	93.2	93.1	0.84	55	7.4	194	3.0	2.8	0.34	306	61
37	M3GP 225SMB 4	3GGP222220-••D	1480	93.6	93.9	93.4	0.85	69	7.6	239	3.2	2.9	0.42	347	67
45	M3GP 225SMC 4	3GGP222230-••D	1477	94.1	94.4	94.3	0.86	78.4	7.6	291	3.2	2.7	0.49	379	67
55	M3GP 250SMA 4	3GGP252210-••D	1479	94.3	94.3	93.6	0.84	100	7.2	355	2.5	3.1	0.72	436	66
75	M3GP 280SMA 4	3GGP282210-••G	1484	94.5	94.7	94.4	0.85	134	6.9	482	2.5	2.8	1.25	625	68
90	M3GP 280SMB 4	3GGP282220-••G	1483	94.7	95.0	94.5	0.85	160	7.2	579	2.5	2.7	1.5	665	68
110	M3GP 315SMA 4	3GGP312210-••G	1487	95.1	95.1	94.3	0.86	194	7.2	706	2.3	2.8	2.3	900	70
132	M3GP 315SMB 4	3GGP312220-••G	1487	95.4	95.4	94.7	0.86	232	7.1	847	2.3	2.7	2.6	960	70
160	M3GP 315SMC 4	3GGP312230-••G	1487	95.3	95.3	94.8	0.85	284	7.2	1027	2.4	2.9	2.9	1000	70
200	M3GP 315MLA 4	3GGP312410-••G	1486	95.6	95.8	95.5	0.86	351	7.2	1285	2.5	2.9	3.5	1160	70
250	M3GP 355SMA 4	3GGP352210-••G	1488	95.9	96.0	95.5	0.85	442	7.1	1604	2.3	2.7	5.9	1610	74
315	M3GP 355SMB 4	3GGP352220-••G	1488	95.9	96.2	95.8	0.86	550	7.3	2021	2.3	2.8	6.9	1780	74
350 [4]	M3GP 355SMC 4	3GGP352230-••G	1487	95.9	95.9	95.7	0.86	612	6.9	2247	2.4	2.7	7.2	1820	78
400 [4]	M3GP 355MLA 4	3GGP352410-••G	1489	96.3	96.3	95.9	0.85	705	6.8	2565	2.3	2.6	8.4	2140	78
450 [4]	M3GP 355MLB 4	3GGP352420-••G	1490	96.8	96.8	96.3	0.86	784	6.9	2884	2.3	2.9	8.4	2140	78
500	M3GP 355LKA 4	3GGP352810-••G	1490	97.0	97.0	96.5	0.86	865	6.8	3204	2.0	3.0	10	2500	78
560 [3]	M3GP 400LA 4	3GGP402510-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3200	78
560 [3]	M3GP 400LKA 4	3GGP402810-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3200	78
630 [4]	M3GP 400LB 4	3GGP402520-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3300	78
630 [4]	M3GP 400LKB 4	3GGP402820-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3300	78
710 [3]	M3GP 400LC 4	3GGP402530-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3400	78
710 [3]	M3GP 400LKC 4	3GGP402830-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3400	78
800	M3GP 450LA 4	3GGP452510-••G	1491	96.9	96.9	96.4	0.86	1396	7.0	5121	1.3	2.8	23	4050	85
900	M3GP 450LB 4	3GGP452520-••G	1492	97.1	97.0	96.5	0.86	1573	7.0	5761	1.3	2.8	25	4350	85
1000 [2]	M3GP 450LC 4	3GGP452530-••G	1491	97.2	97.2	96.7	0.86	1724	6.8	6404	1.3	2.7	30	4700	85
1500 r/min = 4-poles		400 V 50 Hz						High-output design							
18.5	M3GP 160MLF 4	3GGP162460-••H	2929	91.2	91.9	91.4	0.90	38.3	7.5	71.7	3.1	3.3	0.07	166	77
22 [1]	M3GP 160MLG 4	3GGP162470-••H	2943	92.5	93.2	92.6	0.90	52.2	7.1	97.23	2.3	3.2	0.13	236	78
30 [1]	M3GP 180MLC 4	3GGP182430-••H	2950	92.8	93.1	92.8	0.90	64.9	8.1	119.9	3.3	3.7	0.13	237	77
37	M3GP 200MLC 4	3GGP202430-••G	2944	93.3	93.6	93.0	0.88	79.1	7.3	145	2.9	3.1	0.22	312	79
55	M3GP 225SMD 4	3GGP222240-••D	2965	93.9	94.2	93.5	0.88	95.8	7.1	177	2.6	3.0	0.29	377	80
60 [1]	M3GP 225SME 4	3GGP222250-••D	2966	93.9	93.9	93.0	0.86	120	7.4	215	2.8	3.2	0.31	388	78
75	M3GP 250SMB 4	3GGP252220-••D	2969	93.8	93.9	93.2	0.89	129	7.9	241	2.6	3.1	0.57	487	80
86 [1]	M3GP 250SMC 4	3GGP252230-••D	2965	94.4	94.5	93.9	0.89	153	7.7	289	2.5	3.0	0.59	500	80
110	M3GP 280SMC 4	3GGP282230-••G	2978	95.1	95.1	94.5	0.90	186	7.9	352	2.4	3.0	1.15	725	77
132	M3GP 280MLA 4	3GGP282410-••G	2977	95.3	95.3	94.8	0.90	221	7.5	423	2.5	3.0	1.4	840	81

[1] Efficiency class IE1
[2] Temperature rise class F
[3] Temp. Rise class F, For 400-415 V 50 Hz (380 V 50 Hz voltage code B)
[4] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Technical data for Ex nA IIC T3 Gc
Non-sparking IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	I_s/I_N	Torque T_N N_m	T_l/T_N	T_b/T_N	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6-poles		400 V 50 Hz						CENELEC-design							
0.18	M3GP 71MA 6	3GGP073321-••B	900	63.7	63.8	59.0	0.71	0.57	3.1	1.91	2.0	2.1	0.00089	10	42
0.25	M3GP 71MB 6	3GGP073322-••B	915	67.2	65.5	59.5	0.69	0.77	3.7	2.6	2.6	2.7	0.0011	12	42
0.37	M3GP 80MA 6	3GGP083321-••B	925	71.0	70.0	65.0	0.69	1.09	4.1	3.8	2.4	2.5	0.00187	15	47
0.55	M3GP 80MB 6	3GGP083322-••B	920	73.1	74.2	71.9	0.71	1.51	3.8	5.7	1.8	2.2	0.00239	17	47
0.75	M3GP 90SLC 6	3GGP093323-••B	960	78.7	77.2	72.5	0.58	2.3	4.5	7.4	2.4	3.1	0.00491	25	44
1.1	M3GP 90SLE 6	3GGP093324-••B	930	78.2	78.7	76.5	0.66	3	4.0	11.2	1.9	2.3	0.0054	28	44
1.5	M3GP 100L 6	3GGP103322-••B	950	82.2	83.0	81.6	0.69	3.7	4.3	15	1.5	2.7	0.00873	37	49
2.2	M3GP 112MB 6	3GGP113322-••B	950	82.5	83.7	81.6	0.71	5.5	4.4	22.1	1.7	2.3	0.0125	44	66
3	M3GP 132SMB 6	3GGP133321-••B	975	85.3	84.2	81.2	0.63	8	5.5	29.4	1.8	2.9	0.0334	69	57
4	M3GP 132SMC 6	3GGP133322-••B	960	84.9	85.3	83.9	0.68	10	4.6	39.7	1.5	2.2	0.0334	69	57
5.5	M3GP 132SMF 6	3GGP133324-••B	965	86.1	86.5	85.4	0.71	12.9	5.1	54.4	2.0	2.3	0.0487	86	57
7.5	M3GP 160MLA 6	3GGP163410-••D	965	87.6	88.6	88.3	0.78	15.8	6.4	74.2	1.7	2.9	0.126	181	65
11	M3GP 160MLB 6	3GGP163420-••D	972	90.1	91.0	90.4	0.81	22.1	6.9	108	2.4	3.5	0.126	181	65
15	M3GP 180MLB 6	3GGP183420-••D	973	90.5	91.0	90.5	0.82	29.7	6.8	147.3	1.8	3.0	0.25	240	58
18.5	M3GP 200MLA 6	3GGP203410-••D	983	90.5	90.9	90.2	0.82	36.2	7.1	179	3.2	3.1	0.37	266	66
22	M3GP 200MLB 6	3GGP203420-••D	983	91.6	92.0	91.5	0.82	42.8	7.5	213	3.2	3.2	0.43	283	61
30	M3GP 225SMB 6	3GGP223220-••D	985	92.2	92.7	92.4	0.82	57.9	7.4	290	3.4	3.0	0.64	344	61
37	M3GP 250SMA 6	3GGP253210-••D	990	93.2	93.7	93.1	0.81	70.6	6.5	357	2.4	3.1	1.16	440	66
45	M3GP 280SMA 6	3GGP283210-••G	990	93.4	93.8	93.5	0.83	83.8	7.0	434	2.5	2.5	1.85	605	66
55	M3GP 280SMB 6	3GGP283220-••G	990	93.8	94.2	93.9	0.84	100	7.0	530	2.7	2.6	2.2	645	66
75	M3GP 315SMA 6	3GGP313210-••G	992	94.4	94.4	93.5	0.82	139	7.4	721	2.4	2.8	3.2	830	70
90	M3GP 315SMB 6	3GGP313220-••G	992	94.8	94.7	94.1	0.84	166	7.5	866	2.4	2.8	4.1	930	70
110	M3GP 315SMC 6	3GGP313230-••G	991	95.0	95.0	94.6	0.83	201	7.4	1059	2.5	2.9	4.9	1000	70
132	M3GP 315MLA 6	3GGP313410-••G	991	95.3	95.4	94.9	0.83	240	7.5	1271	2.7	3.0	5.8	1150	68
160	M3GP 355SMA 6	3GGP353210-••G	993	95.4	95.6	95.2	0.83	291	7.0	1538	2.0	2.6	7.9	1520	75
200	M3GP 355SMB 6	3GGP353220-••G	993	95.7	95.9	95.7	0.83	364	7.2	1923	2.2	2.7	9.7	1680	75
250	M3GP 355SMC 6	3GGP353230-••G	993	95.7	95.8	95.4	0.82	460	7.4	2404	2.6	2.9	11.3	1820	75
315	M3GP 355MLB 6	3GGP353420-••G	992	95.7	96.0	95.5	0.83	570	7.0	3032	2.5	2.7	13.5	2180	75
355	M3GP 355LKA 6	3GGP353810-••G	992	95.7	95.9	95.4	0.81	658	7.6	3417	2.7	2.9	15.5	2500	75
400 [3]	M3GP 400LA 6	3GGP403510-••G	993	96.2	96.3	95.8	0.82	730	7.1	3846	2.3	2.7	17	2900	76
400 [3]	M3GP 400LKA 6	3GGP403810-••G	993	96.2	96.3	95.8	0.82	730	7.1	3846	2.3	2.7	17	2900	76
450 [3]	M3GP 400LB 6	3GGP403520-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3150	76
450 [3]	M3GP 400LKB 6	3GGP403820-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3150	76
500 [3]	M3GP 400LC 6	3GGP403530-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3300	76
500 [3]	M3GP 400LKC 6	3GGP403830-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3300	76
560 [3]	M3GP 400LD 6	3GGP403540-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3400	77
560	M3GP 400LKD 6	3GGP403840-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3400	77
630	M3GP 450LA 6	3GGP453510-••G	994	96.7	96.7	96.3	0.84	1127	6.5	6053	1.1	2.5	31	4150	81
710	M3GP 450LB 6	3GGP453520-••G	995	96.9	97.0	96.5	0.85	1244	7.0	6814	1.3	2.5	37	4500	81
800 [2]	M3GP 450LC 6	3GGP453530-••G	995	96.9	96.9	96.4	0.84	1415	7.2	7677	1.3	2.7	41	4800	81
1000 r/min = 6-poles		400 V 50 Hz						High-output design							
14 [1]	M3GP 160MLC 6	3GGP163430-••D	969	89.2	89.5	88.5	0.75	30.1	7.5	138	2.8	4.0	0.126	181	64
18.5 [1] [2]	M3GP 180MLC 6	3GGP183430-••D	971	90.1	90.1	88.5	0.74	41.2	7.3	181.2	2.5	3.7	0.25	240	61
30 [1]	M3GP 200MLC 6	3GGP203430-••D	983	90.6	90.8	89.6	0.81	59.3	7.5	291	3.5	3.4	0.49	302	65
37 [1]	M3GP 225SMC 6	3GGP223230-••D	983	91.8	92.1	92.2	0.83	69.6	7.1	359	3.0	2.8	0.75	371	64
45	M3GP 250SMB 6	3GGP253220-••D	986	93.1	93.4	93.2	0.84	84	7.2	435	3.3	2.8	1.49	487	65
75	M3GP 280SMC 6	3GGP283230-••G	990	94.2	94.7	94.5	0.84	137	7.3	723	2.8	2.7	2.85	725	66
90	M3GP 280MLA 6	3GGP283410-••G	990	94.1	94.3	93.7	0.81	170	7.1	868	2.4	2.5	3.1	840	70

[1] Efficiency class IE1
[2] Temperature rise class F
[3] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Technical data for Ex nA IIC T3 Gc
Non-sparking IE2 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8-poles		400 V 50 Hz						CENELEC-design							
0.09	M3GP 71MA 8	3GGP074101-••B	660	49.4	46.3	39.6	0.6	0.44	2.7	1.3	2	2.5	0.00089	11	40
0.12	M3GP 71MB 8	3GGP074102-••B	670	51.4	47.5	39.9	0.56	0.6	2.7	1.7	2	2.5	0.0011	12	43
0.18	M3GP 80MA 8	3GGP084101-••B	700	57.4	53.7	46.1	0.62	0.78	3.2	2.5	2.1	2.8	0.00187	15	45
0.25	M3GP 80MB 8	3GGP084102-••B	680	61.5	61.3	53.5	0.65	0.94	3.1	3.5	1.9	2.6	0.00239	17	50
0.37	M3GP 90SLB 8	3GGP094102-••B	705	66.3	64	57	0.54	1.47	2.8	5	1.9	2.5	0.00444	24	50
0.55	M3GP 90SLC 8	3GGP094103-••B	655	61.8	65.6	65.2	0.67	1.92	2.6	8	1.4	1.9	0.00491	25	53
0.75	M3GP 100LA 8	3GGP104101-••B	710	74	72.3	67.1	0.61	2.48	3.7	10.1	1.8	2.6	0.0072	30	46
1.1	M3GP 100LB 8	3GGP104102-••B	695	76	76.4	74.5	0.66	3.12	3.6	15.1	1.6	2.3	0.00871	30	53
1.5	M3GP 112M 8	3GGP114101-••B	690	74.4	75.9	74.1	0.74	4.11	3.5	20.9	1.9	2.6	0.0106	39	55
2.2	M3GP 132SMA 8	3GGP134101-••B	715	79.7	79.5	77.1	0.66	6.51	4.7	29.2	1.6	2.8	0.0334	70	56
3 [1]	M3GP 132SMB 8	3GGP134102-••B	715	79.9	79.7	76.6	0.64	8.5	4.7	39.7	1.7	2.8	0.04	75	58
4	M3GP 160MLA 8	3GGP164410-••D	722	83.3	84.7	84.2	0.7	10.3	4.7	52.9	1.6	2.6	0.133	181	59
5.5	M3GP 160MLB 8	3GGP164420-••D	723	86.8	87.2	86	0.71	13.5	5.8	72.7	1.9	3.1	0.133	182	53
7.5 [3]	M3GP 160MLC 8	3GGP164430-••H	718	82	84	84	0.7	19.3	5.7	99.8	2.1	2.9	0.133	245	55
11	M3GP 180MLB 8	3GGP184420-••H	723	88.3	89.2	88.7	0.72	25.5	5.6	145	2	3	0.245	292	63
15	M3GP 200MLA 8	3GGP204410-••G	734	89.9	90.4	89.5	0.79	30.6	6.9	195	2.4	3.2	0.45	280	56
18.5	M3GP 225SMA 8	3GGP224210-••D	734	90	90.7	90.2	0.74	39.2	6.1	240	2.2	3	0.61	326	55
22	M3GP 225SMB 8	3GGP224220-••D	732	90.6	91.4	91.2	0.81	45.3	6.5	287	1.9	2.9	0.68	343	56
30	M3GP 250SMA 8	3GGP254210-••D	735	91.6	91	90.5	0.78	60.7	6.7	389	2	2.9	1.25	440	56
37	M3GP 280SMA 8	3GGP284210-••G	741	91.7	92	91.2	0.79	72.6	7.3	476	1.7	3	1.85	605	65
45	M3GP 280SMB 8	3GGP284220-••G	741	92.1	92.3	91.7	0.78	89.2	7.6	579	1.8	3.1	2.2	645	65
55	M3GP 315SMA 8	3GGP314210-••G	742	92.4	93	92.4	0.79	106	7.1	707	1.6	2.7	3.2	830	62
75	M3GP 315SMB 8	3GGP314220-••G	741	93	93.2	93	0.82	146	7.1	966	1.7	2.7	4.1	930	62
90	M3GP 315SMC 8	3GGP314230-••G	741	93.3	93.7	93.3	0.82	170	7.4	1159	1.8	2.7	4.9	1000	64
110	M3GP 315MLA 8	3GGP314410-••G	740	93.6	93.9	94	0.83	211	7.3	1419	1.8	2.7	5.8	1150	72
132	M3GP 355SMA 8	3GGP354210-••G	744	93.9	93.8	93.3	0.8	256	7.5	1694	1.5	2.6	7.9	1520	69
160	M3GP 355SMB 8	3GGP354220-••G	744	94.3	94.3	93.8	0.77	293	7.6	1926	1.6	2.6	9.7	1680	69
200	M3GP 355SMC 8	3GGP354230-••G	742	94.5	95	94.8	0.79	385	7.4	2576	1.6	2.6	11.3	1820	69
250 [4]	M3GP 355MLB 8	3GGP354420-••G	743	95.4	95.5	95	0.8	476	7.5	3213	1.6	2.7	13.5	2180	72
315 [4]	M3GP 400LA 8	3GGP404510-••G	744	96.1	96	95.6	0.81	592	7	4043	1.2	2.6	17	2900	71
315 [4]	M3GP 400LKA 8	3GGP404810-••G	744	96.1	96	95.6	0.81	592	7	4043	1.2	2.6	17	2900	71
355 [4]	M3GP 400LB 8	3GGP404520-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3200	71
355 [4]	M3GP 400LKB 8	3GGP404820-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3200	71
400 [4]	M3GP 400LC 8	3GGP404530-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3400	71
400 [4]	M3GP 400LKC 8	3GGP404830-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3400	71
450	M3GP 450LA 8	3GGP454510-••G	744	96.2	96.5	96.2	0.83	813	6	5775	1	2.5	26	3750	80
500	M3GP 450LB 8	3GGP454520-••G	744	96.3	96.4	96.2	0.83	902	6.4	6417	1	2.6	29	4000	80
560	M3GP 450LC 8	3GGP454530-••G	744	96.4	96.5	96.1	0.82	1038	7	7188	1.2	2.9	35	4350	80
630 [2]	M3GP 450LD 8	3GGP454540-••G	745	96.6	96.7	96.2	0.81	1162	7.6	8075	1.3	3.2	41	4800	80
750 r/min = 8-poles		400 V 50 Hz						High-output design							
18.5	M3GP 200MLB 8	3GGP204420-••G	734	89.2	89.8	88.8	0.8	37.1	6.9	240	2.2	3.2	0.54	300	57
30	M3GP 225SMC 8	3GGP224230-••D	731	90.7	91.6	91.6	0.78	61.2	6.3	391	2.3	3	0.75	369	59
37	M3GP 250SMB 8	3GGP254220-••D	737	92.2	92.9	92.5	0.79	73	7.5	479	2.3	3.4	1.52	487	59
55	M3GP 280SMC 8	3GGP284230-••G	741	93.4	93.7	93.6	0.8	107	7.9	708	1.9	3.1	2.85	725	65

[1] Efficiency class IE1
[2] Temperature rise class F
[3] IE0, Temperature rise class F
[4] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Technical data for Ex nA IIC T3 Gc
Non-sparking IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cos φ	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2-poles		400 V 50 Hz						CENELEC-design							
0.37	M3GP 71MC 2	3GGP071330-••L	2743	73.8	74.4	71.7	0.8	0.94	4.9	1.26	2.3	2.8	0.00088	10	58
0.55	M3GP 71ME 2	3GGP071350-••L	2755	77.8	79.3	78.4	0.8	1.25	6.8	1.9	2.8	3.1	0.00045	11	56
0.75	M3GP 80MC 2	3GGP081330-••L	2879	80.7	81.0	78.8	0.8	1.6	7.2	2.5	3.4	4.2	0.001	17	57
1.1	M3GP 80ME 2	3GGP081350-••L	2865	82.7	83.8	83.1	0.8	2.3	7.2	3.7	3.5	4.1	0.0012	18	60
1.5	M3GP 90SLA 2	3GGP091010-••L	2901	84.2	84.8	83.8	0.9	2.9	7.7	4.93	2.1	3.5	0.0028	27	69
2.2	M3GP 90LA 2	3GGP091510-••L	2904	85.9	86.3	84.8	0.9	4.2	8.8	7.2	3.1	3.8	0.0036	30	64
3	M3GP 100MLA 2	3GGP101410-••L	2895	87.1	87.9	87.3	0.9	5.4	8.2	9.9	3.3	3.9	0.0013	42	68
4	M3GP 112ME 2	3GGP111350-••L	2882	88.1	89.9	90.9	0.9	6.9	8.3	13	2.9	3.7	0.0139	56	70
5.5	M3GP 132SMC 2	3GGP131230-••L	2908	89.2	89.5	88.5	0.9	9.8	7.6	18	2.3	3.8	0.0182	69	70
7.5	M3GP 132SME 2	3GGP131250-••L	2916	90.1	90.5	90.1	0.9	13.3	8.4	24.6	2.5	4.3	0.0203	75	70
11	M3GP 160MLA 2	3GGP161410-••L	2943	91.2	92.0	91.6	0.9	19.1	7.2	35.57	2.6	3.6	0.057	144	69
15	M3GP 160MLB 2	3GGP161420-••L	2947	91.9	92.2	91.8	0.9	26.5	8.2	48.49	3.2	4.2	0.063	152	69
18.5	M3GP 160MLC 2	3GGP161430-••L	2949	92.4	93.0	92.6	0.9	32	9.0	59.81	3.3	3.9	0.076	164	73
22	M3GP 180MLA 2	3GGP181410-••L	2956	92.7	93.1	92.7	0.9	37.7	7.8	70.98	3.4	3.8	0.11	205	73
30	M3GP 200MLA 2	3GGP201410-••L	2957	93.3	93.8	93.6	0.9	52.4	7.5	96.92	2.5	3.1	0.182	263	73
37	M3GP 200MLB 2	3GGP201420-••L	2960	93.7	94.2	94.1	0.9	64.2	8.2	119.5	3.1	3.4	0.222	289	73
45	M3GP 225SMA 2	3GGP221210-••L	2968	94.0	94.0	93.0	0.9	79.6	7.3	144.8	3.2	3.1	0.296	335	76
55	M3GP 250SMA 2	3GGP251210-••L	2968	94.3	93.7	93.6	0.9	94.8	6.8	177	2.4	3.0	0.426	400	76
75	M3GP 280SMB 2	3GGP281220-••L	2978	94.7	94.4	93.5	0.9	130	7.0	240	2.3	3.0	0.9	665	74
90	M3GP 280SMC 2	3GGP281230-••L	2975	95.0	95.0	94.2	0.9	158	6.4	289	2.1	2.8	0.99	690	74
110	M3GP 315SMB 2	3GGP311220-••L	2982	95.2	94.9	93.9	0.9	192	7.0	352	1.8	2.7	1.3	910	78
132	M3GP 315SMC 2	3GGP311230-••L	2982	95.4	95.4	94.6	0.9	229	6.8	422	2.0	2.8	1.5	965	78
160	M3GP 315SMD 2	3GGP311240-••L	2983	95.6	95.6	94.9	0.9	275	7.4	512	2.2	2.8	1.7	1025	78
200	M3GP 315MLA 2	3GGP311410-••L	2983	95.8	95.8	95.3	0.9	342	7.7	640	2.5	3.1	2.1	1190	81
250 [1]	M3GP 355SMA 2	3GGP351210-••L	2985	95.8	95.6	94.6	0.9	423	7.7	800	2.1	3.3	3	1600	83
315 [1]	M3GP 355SMB 2	3GGP351220-••L	2980	95.8	95.7	95.0	0.9	529	7.0	1009	2.1	3.0	3.4	1680	83
355 [1]	M3GP 355SMC 2	3GGP351230-••L	2984	95.8	95.8	95.0	0.9	605	7.2	1136	2.2	3.0	3.6	1750	83
3000 r/min = 2-poles		400 V 50 Hz						High-output design							
250	M3GP 315LKB 2	3GGP311820-••L	2983	95.8	96.0	95.5	0.9	419	7.7	800	2.5	3.3	2.9	1540	81

[1] -3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering, see variant codes 044 and 045

Technical data for Ex nA IIC T3 Gc
Non-sparking IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cos φ	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4-poles		400 V 50 Hz						CENELEC-design							
0.25	M3GP 71MD 4	3GGP072340-••L	1416	73.5	75.1	73.8	0.8	0.6	4.8	1.68	2.0	2.6	0.0009	11	45
0.37	M3GP 71MLE 4	3GGP072450-••L	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 80MLC 4	3GGP082430-••L	1444	80.8	81.6	80.1	0.8	1.2	6.7	4	3.0	3.5	0.0028	20	45
0.75	M3GP 80MLE 4	3GGP082450-••L	1448	82.5	82.5	80.1	0.78	1.7	7.4	4.9	3.5	4.0	0.0033	22	50
1.1	M3GP 90LA 4	3GGP092510-••L	1443	84.1	84.6	83.5	0.76	2.4	5.2	7.26	3.4	4.2	0.0049	28	56
1.5	M3GP 90LB 4	3GGP092520-••L	1445	85.3	85.0	82.6	0.77	3.3	5.7	9.9	3.8	4.6	0.0067	32	56
2.2	M3GP 100LA 4	3GGP102510-••L	1448	86.7	89.0	86.1	0.81	4.5	7.5	14	2.3	3.6	0.0109	38	56
3	M3GP 100MLB 4	3GGP102420-••L	1444	87.7	88.4	87.6	0.81	6.1	7.0	19.8	3.3	4.1	0.0121	42	58
4	M3GP 112ME 4	3GGP112350-••L	1453	88.6	88.9	88.0	0.74	8.9	7.8	26	3.5	4.3	0.0188	52	59
5.5	M3GP 132SMB 4	3GGP132220-••L	1463	89.6	89.8	88.7	0.74	11.9	7.6	36	2.8	3.9	0.0295	68	70
7.5	M3GP 132SME 4	3GGP132250-••L	1462	90.4	90.8	90.2	0.76	15.7	7.9	49	3.0	4.0	0.0376	78	64
11	M3GP 160MLA 4	3GGP162410-••L	1477	91.4	91.8	91.1	0.82	21.1	7.6	71.27	2.6	3.3	0.11	160	61
15	M3GP 160MLB 4	3GGP162420-••L	1477	92.1	92.4	91.6	0.82	28.5	8.2	96.99	3.0	3.7	0.135	179	61
18.5	M3GP 180MLA 4	3GGP182410-••L	1481	92.6	93.2	92.9	0.83	34.9	7.2	119.3	2.8	3.0	0.219	215	60
22	M3GP 180MLB 4	3GGP182420-••L	1481	93.0	93.5	93.3	0.82	41.4	6.5	142	3.0	3.2	0.243	229	60
30	M3GP 200MLA 4	3GGP202410-••L	1483	93.6	93.8	93.4	0.84	54.8	7.5	193.2	2.7	3.2	0.385	292	63
37	M3GP 225SMA 4	3GGP222210-••L	1482	93.9	94.1	93.8	0.83	68.9	7.2	238.6	3.1	3.1	0.427	322	67
45	M3GP 225SMB 4	3GGP222220-••L	1482	94.2	94.4	94.0	0.84	82.3	8.0	290	3.2	3.5	0.525	357	66
55	M3GP 250SMA 4	3GGP252210-••L	1482	94.6	94.7	94.0	0.84	100	7.1	354.2	2.9	3.4	0.694	406	68
75	M3GP 280SMB 4	3GGP282220-••L	1485	95.0	95.2	94.8	0.86	133	6.4	483	2.3	2.8	1.38	645	75
90	M3GP 280SMC 4	3GGP282230-••L	1485	95.2	95.5	95.2	0.86	158	7.1	578	2.5	2.9	1.73	700	75
110	M3GP 315SMB 4	3GGP312220-••L	1489	95.4	95.5	94.9	0.84	198	7.0	705	2.1	3.0	2.43	930	71
132	M3GP 315SMC 4	3GGP312230-••L	1488	95.6	95.9	95.5	0.86	231	6.7	847	2.2	2.9	2.9	1000	71
160	M3GP 315SMD 4	3GGP312240-••L	1488	95.8	96.0	95.8	0.85	282	6.9	1026	2.2	3.0	3.2	1065	71
200	M3GP 315MLB 4	3GGP312420-••L	1487	96.0	96.4	96.4	0.86	351	6.8	1284	2.4	3.0	3.9	1220	74
250	M3GP 355SMA 4	3GGP352210-••L	1491	96.0	96.0	95.6	0.86	435	6.4	1601	2.1	2.9	5.9	1610	78
315	M3GP 355SMB 4	3GGP352220-••L	1491	96.0	96.1	95.7	0.85	550	7.3	2018	2.4	3.3	6.9	1780	78
355	M3GP 355SMC 4	3GGP352230-••L	1490	96.0	96.2	95.8	0.86	616	6.3	2273	2.3	2.8	7.2	1820	78
1500 r/min = 4-poles		400 V 50 Hz						High-output design							
250	M3GP 315LKA 4	3GGP312810-••L	1488	96.0	96.3	96.1	0.85	442	6.9	1604	2.5	3.2	4.4	1410	78

Technical data for Ex nA IIC T3 Gc
Non-sparking IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cos φ	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6-poles		400 V 50 Hz						CENELEC-design							
0.18	M3GP 71ME 6	3GGP073350-••L	887	63.9	64.3	59.8	0.74	0.57	3.2	1.9	1.9	2.2	0.0009	10	45
0.25	M3GP 80MB 6	3GGP083320-••L	942	68.6	67.0	61.7	0.61	0.82	4.8	2.5	2.7	2.9	0.0019	14	47
0.37	M3GP 80MC 6	3GGP083330-••L	936	73.5	73.9	71.1	0.67	1.06	5.1	3.8	2.6	2.9	0.0028	16	50
0.55	M3GP 80ME 6	3GGP083350-••L	933	77.2	77.9	75.9	0.68	1.52	5.0	5.6	2.7	2.9	0.0035	18	47
0.75	M3GP 90SLD 6	3GGP093040-••L	940	78.9	80.3	79.2	0.75	1.8	4.4	7.57	2.1	2.8	0.0056	29	44
1.1	M3GP 90LF 6	3GGP093560-••L	944	81.0	81.7	80.1	0.75	2.62	4.7	11.1	2.1	2.8	0.0068	33	44
1.5	M3GP 100MLB 6	3GGP103420-••L	960	82.5	82.5	80.1	0.68	3.8	5.4	14.9	2.7	3.4	0.012	41	49
2.2	M3GP 112MJ 6	3GGP113390-••L	962	84.3	85.5	84.7	0.68	5.3	4.2	21.8	1.4	2.3	0.0196	53	66
3	M3GP 132SMB 6	3GGP133220-••L	973	85.6	85.1	82.9	0.62	8	6.6	29.2	2.7	3.8	0.0355	75	57
4	M3GP 132SMF 6	3GGP133260-••L	971	86.8	86.5	84.7	0.62	10.7	6.6	39	2.7	3.8	0.0416	82	57
5.5	M3GP 132SMJ 6	3GGP133290-••L	966	88.0	89.1	88.9	0.73	12.3	4.2	54	1.7	2.7	0.0408	81	57
7.5	M3GP 160MLA 6	3GGP163410-••L	975	89.1	90.0	90.0	0.77	15.7	5.7	73.24	1.4	3.0	0.089	146	59
11	M3GP 160MLB 6	3GGP163420-••L	975	90.3	91.1	91.1	0.78	22.5	6.4	107.5	1.6	3.1	0.138	180	64
15	M3GP 180MLA 6	3GGP183410-••L	979	91.2	91.9	91.6	0.79	30.1	5.2	146.9	1.5	2.7	0.212	212	63
18.5	M3GP 200MLA 6	3GGP203410-••L	989	91.7	91.9	91.2	0.82	35.2	6.5	178.8	2.2	3.2	0.496	272	59
22	M3GP 200MLB 6	3GGP203420-••L	989	92.2	92.4	91.4	0.81	42.4	7.3	212.4	2.6	3.5	0.585	297	59
30	M3GP 225SMA 6	3GGP223210-••L	988	92.9	93.0	92.2	0.77	60.4	7.7	290.6	2.9	3.6	0.724	349	63
37	M3GP 250SMA 6	3GGP253210-••L	990	93.3	93.7	93.5	0.80	71.1	6.5	357	2.4	3.1	1.3	431	58
45	M3GP 280SMB 6	3GGP283220-••L	991	93.7	94.0	93.5	0.84	82	7.4	433	2.7	3.0	1.87	645	72
55	M3GP 280SMC 6	3GGP283230-••L	992	94.1	94.3	93.8	0.86	99	7.5	528	2.8	3.0	2.57	725	71
75	M3GP 315SMB 6	3GGP313220-••L	994	94.6	94.9	94.6	0.84	136	6.8	720	1.8	2.6	4.1	930	75
90	M3GP 315SMC 6	3GGP313230-••L	994	94.9	95.1	94.7	0.84	164	7.2	864	2.0	3.0	4.6	1000	76
110	M3GP 315SMD 6	3GGP313240-••L	994	95.1	95.3	95.0	0.83	200	7.3	1056	2.2	3.1	4.9	1040	75
132	M3GP 315MLB 6	3GGP313420-••L	995	95.4	95.5	95.1	0.82	242	7.3	1266	2.3	3.2	6.3	1200	72
160	M3GP 355SMA 6	3GGP353210-••L	993	95.6	95.8	95.6	0.82	292	6.7	1538	2.5	2.6	7.9	1520	75
200	M3GP 355SMB 6	3GGP353220-••L	993	95.8	96.2	96.1	0.82	365	6.7	1923	2.6	2.5	9.7	1680	75
250	M3GP 355SMC 6	3GGP353230-••L	993	95.8	96.1	95.8	0.81	465	7.7	2404	3.0	3.1	11.3	1820	75
315	M3GP 355MLB 6	3GGP353420-••L	993	95.8	96.1	96.0	0.83	571	6.8	3029	2.6	3.2	13.5	2180	76
355	M3GP 355LKA 6	3GGP353810-••L	993	95.8	96.0	95.9	0.81	653	7.5	3413	2.9	3.2	15.5	2500	76
1000 r/min = 6-poles		400 V 50 Hz						High-output design							
160	M3GP 315LKA 6	3GGP313810-••L	994	95.6	95.8	95.4	0.81	298	7.5	1535	2.2	3.1	7.3	1410	76

Technical data for Ex nA IIC T3 Gc
Non-sparking IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8-poles		400 V 50 Hz						CENELEC-design							
0.12	M3GP 71ME 8	3GGP074350-••L	659	50.7	48.9	41.9	0.68	0.49	2.5	1.7	1.9	2.1	0.00107	11	43
0.18	M3GP 80MF 8	3GGP084360-••L	679	58.8	57.3	51.7	0.55	0.8	2.2	2.6	1.3	1.9	0.0035	18	45
0.25	M3GP 80MLG 8	3GGP084470-••L	674	64.1	66.4	64.1	0.58	0.92	2.3	3.5	1.3	1.9	0.0044	21	50
0.37	M3GP 90SLF 8	3GGP094060-••L	710	69.3	67.8	62.5	0.54	1.37	3.3	4.96	2.3	3.3	0.0056	28	50
0.55	M3GP 90LG 8	3GGP094570-••L	710	73.0	70.8	64.6	0.53	2	4.1	7.7	2.5	3.2	0.0072	32	53
0.75	M3GP 100LKD 8	3GGP104840-••L	713	75.0	75.3	71.7	0.63	2.2	3.3	10	1.6	2.3	0.0132	45	46
1.1	M3GP 100LKF 8	3GGP104860-••L	708	77.7	78.1	75.5	0.64	3.2	3.5	14.7	1.7	2.4	0.0132	45	53
1.5	M3GP 112MF 8	3GGP114360-••L	714	79.7	80.7	79.5	0.61	4.3	3.9	20.2	1.5	2.3	0.0204	53	55
2.2	M3GP 132SMD 8	3GGP134240-••L	707	81.9	82.4	81.1	0.64	5.9	4.1	29.7	1.9	2.6	0.0361	73	56
3	M3GP 132SMJ 8	3GGP134290-••L	706	83.5	85.2	84.8	0.65	7.9	4.4	40	2.0	2.6	0.0435	83	58
37	M3GP 280SMA 8	3GGP284210-••L	742	91.8	92.1	91.4	0.79	73	7.3	476	1.7	3.0	1.85	605	65
45	M3GP 280SMB 8	3GGP284220-••L	741	92.2	92.4	91.8	0.78	89.6	7.6	579	1.8	3.1	2.2	645	65
55	M3GP 315SMA 8	3GGP314210-••L	742	92.5	93.1	92.5	0.80	106	7.7	707	1.8	2.7	3.2	830	62
75	M3GP 315SMB 8	3GGP314220-••L	740	93.1	93.3	93.1	0.79	146	7.1	966	1.7	2.7	4.1	930	62
90	M3GP 315SMC 8	3GGP314230-••L	739	93.4	93.8	93.4	0.81	171	7.4	1159	1.8	2.7	4.9	1000	64
110	M3GP 315MLA 8	3GGP314410-••L	740	93.7	94.0	94.1	0.80	211	7.3	1419	1.8	2.7	5.8	1150	72
132	M3GP 355SMA 8	3GGP354210-••L	744	94.0	93.9	93.4	0.77	256	7.5	1694	1.5	2.6	7.9	1520	69
132	M3GP 355SMA 8	3GGP354210-••L	744	94.0	93.9	93.4	0.77	256	7.5	1694	1.5	2.6	7.9	1520	69
160	M3GP 355SMB 8	3GGP354220-••L	744	94.3	94.3	93.9	0.77	293	7.6	1926	1.6	2.6	9.7	1680	69
200	M3GP 355SMC 8	3GGP354230-••L	742	94.6	95.1	94.9	0.79	385	7.4	2576	1.6	2.6	11.3	1820	69
250 [1]	M3GP 355MLB 8	3GGP354420-••L	743	94.6	94.8	94.2	0.80	472	7.5	3213	1.6	2.7	13.5	2180	72

[1] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Variant codes
Non-sparking cast iron motors, Ex nA

Code/Variants		Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Administration																	
531	Sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
532	Packing of motor in vertical mounting position	-	-	-	-	-	-	-	-	•	•	•	•	•	-	-	-
533	Wooden sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
590	Mounting of customer supplied part other than coupling.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
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.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
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 ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
397	Motor designed for ambient temperature -40 °C to -55 °C, with space heaters (code 450/451 must be added)	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
398	Motor designed for ambient temperature -20 °C to -40 °C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
399	Motor designed for 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, V36, 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.	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•

Code/Variants		Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Documentation																	
141	Binding 2D main dimension drawing.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
374	Binding 2D motor detailed drawing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
722	Rotor dimension drawing (incl. torosional stiffness)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Drain holes																	
065	Plugged existing drain holes.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
448	Draining holes with metal plugs.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
Earthing Bolt																	
525	External earthing bolts on motor feet	-	•	•	•	•	•	○	○	○	○	○	•	•	•	•	•
Hazardous Environments																	
338	Rated for gas or dust, Ex nA IIC T3 Gc / Ex tc IIIB T125C Dc (non-conductive dust), IP5X.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
339	Rated for gas or dust, Ex nA IIC T3 Gc / Ex tc IIIC T125C Dc (conductive dust), IP6X.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
516	Ex i approved temperature detectors (Pt100)	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
807	CSA design, Class I, Div 2 Group A, B, C, D T3	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	-
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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Marine																	
024	Fulfilling Bureau Veritas (BV) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
025	Fulfilling Det Norske Veritas (DNV) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
026	Fulfilling Lloyds Register of Shipping (LR) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
027	Fulfilling American Bureau of Shipping (ABS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
049	Fulfilling Germanischer Lloyd (GL) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
050	Fulfilling Registro Italiano Navale (RINA) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
051	Fulfilling Russian Maritime Register of Shipping (RS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
096	Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
186	Fulfilling Det Norske Veritas (DNV) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
676	Fulfilling Germanischer Lloyd (GL) 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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•

Code/Variants		Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Painting																	
105	Paint thickness report.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
115	Painting system C4M acc. to ISO 12944-2: 1998.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
168	Primer paint only.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
303	Painted insulation layer on inside of the terminal boxes.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
710	Thermally sprayed zink metallizing with acrylic top coat	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
711	Painting system C5-M very high, acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
754	Painting system C5M acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Protection																	
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
135	Mounting of additional identification plate, stainless.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
139	Additional identification plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
159	Additional plate with text “Made in ....”	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
161	Additional rating plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
163	Frequency converter rating plate. Rating data according to quotation.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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																	
248	Design according to Petronas PTS 33.66.05.31-GEN. February 2010.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	-	-
251	Shell DEP 33.66.05.31-GEN. February 2012.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
408	Fulfilling EISA Subtype II efficiency requirements, CC031A.									•	•	•	•	•	-	-	-
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	-
505	VIK design with ABB standard shaft dimensions (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	-	-	-	-	-	-	-	-	-	-	-	-	•	•	•	-
540	China energy label	-	-	-	-	-	-	•	•	•	•	•	•	•	•	-	-
541	Inmetro certification												•	•	•	•	•
542	NBR design												•	•	-	-	-
543	Australian MEPS	-	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
544	Australian HE MEPS, musta täppä 160-355	-	-	-	-	-	-	•	•	•	•	•	•	•	•	-	-
547	Certificate of conformity according TR-CU 012/2011 for customs union RU, KZ, BY.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
782	Fulfilling CQST Certification requirements (China)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stator winding temperature sensors																	
120	KTY 84-130 (1 per phase) 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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Code	Variants	Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
441	PTC - thermistors (3 in series, 130 °C & 3 in series, 150 °C), in stator winding	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
445	Pt100 2-wire in stator winding, 1 per phase	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
446	Pt100 2-wire in stator winding, 2 per phase	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
502	Pt100 3-wire in stator winding, 1 per phase	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
503	Pt100 3-wire in stator winding, 2 per phase	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
511	PTC thermistors (2 x 3 in series), 130 °C, 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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
277	Cable sealing end unit, size small for C-opening	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-
278	Cable sealing end unit, size medium for D-opening	-	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•
279	Cable sealing end unit, size large for D-opening	-	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•
292	Adapter C-C	-	-	-	-	-	-	-	-	-	-	-	•	-	-	-	-
293	Adapter D-D	-	-	-	-	-	-	-	-	-	-	-	-	•	•	-	-
294	Adapter E-D	-	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•
295	Adapter E-2D	-	-	-	-	-	-	-	-	-	-	-	-	•	•	•	○
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.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
447	Top mounted separate terminal box for monitoring equipment.	-	-	-	-	-	-	-	-	-	-	-	•	•	•	-	-
466	Terminal box at N-end.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
468	Cable entry from D-end.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	-
469	Cable entry from N-end.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	-
526	Existing cable entries plugged	○	○	○	○	○	○	○	○	○	○	○	○	○	•	•	•
553	Terminal box degree of protection IP66.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
554	Painted steel flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
555	Aluminum 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 BSP cable glands.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
727	Stainless steel flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
729	Aluminum non-drilled flange for cable glands	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
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 e terminal box (EN 50019).	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
743	Painted non-drilled flange in steel 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																	
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 curve, type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
560	Shaft voltage test.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
561	Overspeed test.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
562	Overvoltage test.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
760	Vibration level test	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
761	Vibration spectrum test for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

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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

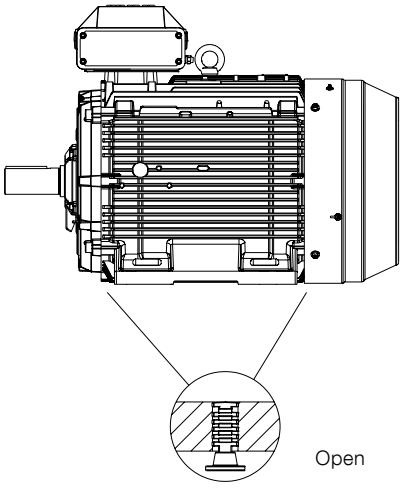
Mechanical design
Motor frame and drain holes

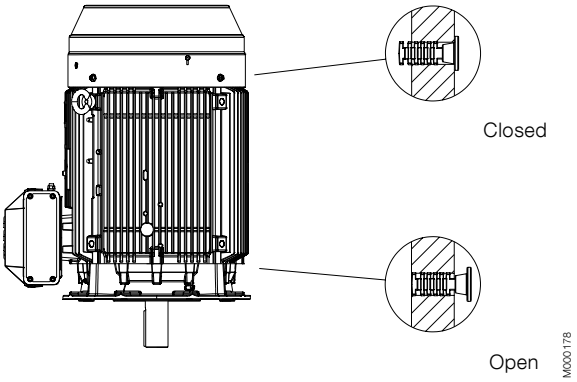
Motor frame
The motor frame, end shields and main terminal box are made of cast iron. Feet are integrated with the frame, except for sizes 160-250 with side mounted terminal box, which have detachable feet.

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

Drain holes
Non-sparking motors are provided with drain holes fitted with plugs as standard. The plugs are made of plastic material and 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.





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

Heating elements

Heating elements are installed on stator winding coil heads to keep the winding 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	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	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.

Bearings

ABB's non-sparking 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.

Standard and alternative designs

		Standard design		Alternative design D-end	
		Deep groove ball bearings		Roller bearings (037)	Angular contact ball bearing (058, 060)
Motor size	Number of poles	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 motors
[2] On request

Axially-locked bearings

All motors with deep groove ball bearings 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.

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

Bearing seals

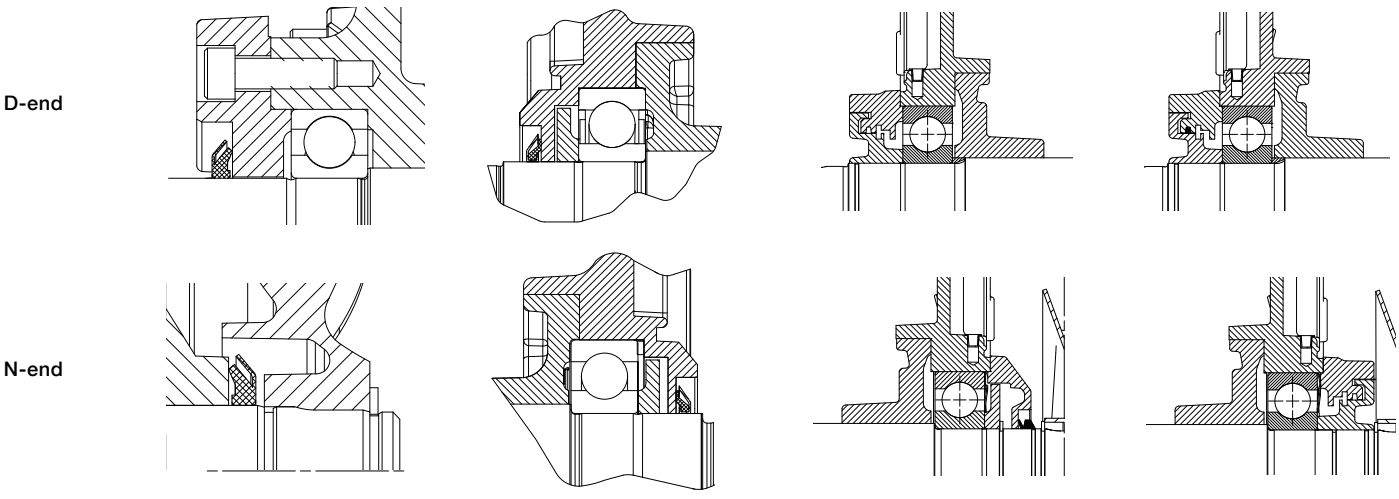
Table below present the standard and alternative and types of bearing seals per motor size.

Bearing seals for motor sizes 71 - 450

		Standard design		Alternative design	
Motor size	Number of poles	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- 8	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

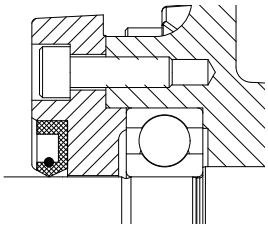
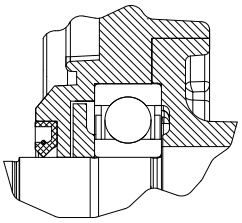
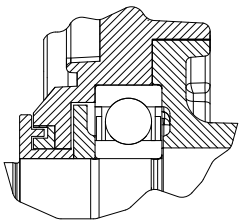
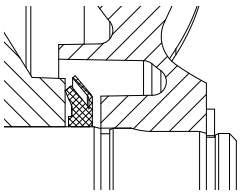
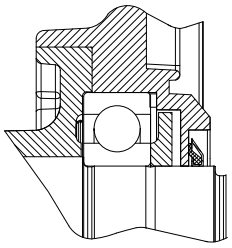
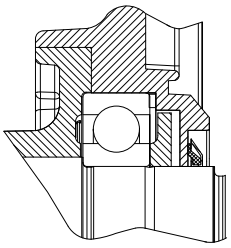
[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request

Standard design



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, 450 all pole numbes labyrinth/labyrinth seal

Alternative design

D-end			
N-end			
Motor size, seal type D-end / N-end	**71-132, VC072 radial/ gamma seals**	**160-250, VC072 radial/ gamma seals**	**160-250, VC783 labyrinth/ gamma seals**

Bearing life and lubrication

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 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	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	≤ 18.5	9000	12 000	≤ 15	18 000	21 500	≤ 11	24 000	all	24 000
160	13	13	> 18.5	7500	10 000	> 15	15 000	18 000	> 11	22 500	all	24 000
180	15	15	≤ 22	7000	9000	≤ 22	15 500	18 500	≤ 15	24 000	all	24 000
180	15	15	> 22	6000	8500	> 22	14 000	17 000	> 15	21 000	all	24 000
200	20	15	≤ 37	5500	8000	≤ 30	14 500	17 500	≤ 22	23 000	all	24 000
200	20	15	> 37	3000	5500	> 30	10 000	12 000	> 22	16 000	all	20 000
225	23	20	≤ 45	4000	6500	≤ 45	13 000	16 500	≤ 30	22 000	all	24 000
250	23	20	> 45	1500	2500	> 45	5000	6000	> 30	8000	all	10 000
250	30	23	≤ 55	2500	4000	≤ 55	9000	11 500	≤ 37	15 000	all	18 000
250	30	23	> 55	1000	1500	> 55	3500	4500	> 37	6000	all	7000
280	35	35	all	1900	3200		-	-		-		-
280	40	40		-	-	all	7800	9600	all	13 900	all	15 000
315	35	35	all	1900	3200		-	-		-		-
315	55	40		-	-	all	5900	7600	all	11 800	all	12 900
355	35	35	all	1900	3200		-	-		-		-
355	70	40		-	-	all	4000	5600	all	9600	all	10 700
400	40	40	all	1500	2700		-			-	-	-
400	85	55		-	-	all	3200	4700	all	8600	all	9700
450	40	40	all	1500	2700		-	-		-		-
450	95	70		-	-	all	2500	3900	all	7700	all	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	≤ 18.5	4500	6000	≤ 15	9000	10 500	≤ 11	12 000	all	12 000
160	13	13	> 18.5	3500	5000	> 15	7500	9000	> 11	11 000	all	12 000
180	15	15	≤ 22	3500	4500	≤ 22	7500	9000	≤ 15	12 000	all	12 000
180	15	15	> 22	3000	4000	> 22	7000	8500	> 15	10500	all	12 000
200	20	15	≤ 37	2750	4000	≤ 30	7000	8500	≤ 22	11 500	all	12 000
200	20	15	> 37	1500	2500	> 30	5000	6000	> 22	8000	all	10 000
225	23	20	≤ 45	2000	3000	≤ 45	6500	8000	≤ 30	11 000	all	12 000
225	23	20	> 45	750	1250	> 45	2500	3000	> 30	4000	all	5000
250	30	23	≤ 55	1000	2000	≤ 55	4500	5500	≤ 37	7500	all	9000
250	30	23	> 55	500	750	> 55	1500	2000	> 37	3000	all	3500
280	35	35	all	900	1600		-	-		-		-
280	40	40		-	-	all	4000	5300	all	7000	all	8500
315	35	35	all	900	1600		-	-		-		-
315	55	40		-	-	all	2900	3800	all	5900	all	6500
355	35	35	all	900	1600		-	-		-		-
355	70	40		-	-	all	2000	2800	all	4800	all	5400
400	40	40	all	-	1300		-	-		-		-
400	85	55		-	-	all	1600	2400	all	4300	all	4800
450	40	40	all	-	1300		-	-		-		-
450	95	70		-	-	all	1300	2000	all	3800	all	4400

Radial forces

Pulley diameter

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

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

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.

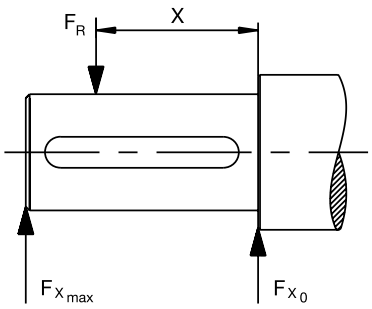
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft together with flame path dimensions affects permissible forces.

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 sizes 71–132

			Basic design with deep groove ball bearings			
			Mounting arrangement IM B3			
			20,000 h		40,000 h	
Motor size	No. of poles	Length of shaft extension E (mm)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
71	2	30	540	460	420	360
	4	30	700	605	555	480
	6	30	780	665	620	530
	8	30	860	730	685	580
80	2	40	710	600	385	350
	4	40	940	810	725	625
	6	40	1060	895	840	710
	8	40	1185	1020	940	810
90	2	50	820	690	650	545
	4	50	1035	870	820	690
	6	50	1185	995	940	790
	8	50	1300	1095	1035	870
100	2	60	1130	925	900	735
	4	60	1425	1165	1135	925
	6	60	1635	1335	1295	1060
	8	60	1820	1520	1445	1205
112	2	60	1170	980	925	775
	4	60	1475	1235	1170	980
	6	60	1690	1310	1340	1120
	8	60	1860	1310	1475	1235
132	2	80	1840	1500	1460	1190
	4	80	2320	1890	1840	1500
	6	80	2660	2165	2110	1715
	8	80	2925	2380	2320	1890

Permissible radial forces, motor sizes 160-280

Motor size	Poles	Length of shaft extension E (mm)	Ball bearings				Roller bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
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
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

Permissible radial forces, motor sizes 315-400

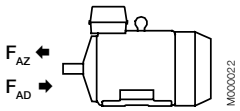
Motor size	Poles	Length of shaft extension E (mm)	Ball bearings				Roller bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
315 SM_	2	140	7300	6000	5800	4950	20300	6000	16500	6000
	4	170	11400	9400	9000	7450	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

Axial forces

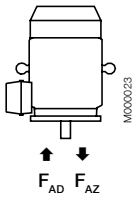
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



Mounting arrangement IM B3



Mounting arrangement IM V1

Permissible axial forces, motor sizes 71-132

			Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
Motor size	Poles	Length of shaft extension E (mm)	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

Permissible axial forces, motor sizes 160-280

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
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
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

Permissible axial forces, motor sizes 315-400

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
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 ‘nA’ non-sparking 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 non-sparking protection. Terminal box with increased safety 'e' protection is optional by ordering variant code 741, see variant code section for more details.

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 355-450 2*180° after delivery. For sizes 355-450 is also mounting of terminal box with opening towards D or N-end possible 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 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 e approved blanking plugs made of nickel plated brass. Very large motors have angle adapters and cable sealing units as standard. Please refer to the table on next page for further information about amount and size of threaded holes, plugs and cable sealing units 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.

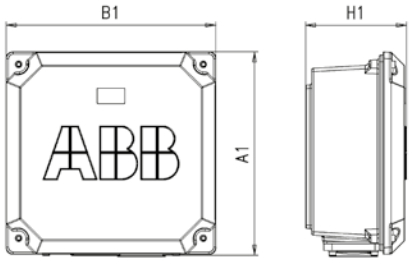
Motor size	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adaper	Amount and size of threaded plugged holes or cable sealing end unit	Cable outer diameter mm	Max. Connect-able core cross section mm2/ phase	Number and size of terminal bolts
IE2 and IE3 motors								
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	2-8	210	C	-	2xM63x1.5		2x150	6 x M12
315SM_, ML_	2-8	370	D	-	2xM63x1.5		2x240	6 x M12
315LKA, LKB	2-4	370	D	-	2xM63x1.5		2x240	6 x M12
315LKC	2-4	750	E	E-D	Medium	2xØ48-60	4x240	6 x M12
315LK_	6-8	370	D	-	2xM63x1.5		2x240	6 x M12
355SMA - SMC	2-4	750	E	E-D	Medium	2xØ48-60	4x240	6 x M12
355SMA, SMB	6-8	370	D	-	2xM63x1.5		2x240	6 x M12
355SMC	6	750	E	E-D	Medium	2xØ48-60	4x240	6 x M12
355SMC	8	370	D	-	2xM63x1.5		2x240	6 x M12
355MLA	2-4	750	E	E-D	Medium	2xØ48-60	4x240	6 x M12
355MLB, LK_	2-4	750	E	E-D	Large	2xØ60-80	4x240	6 x M12
355ML_, LK_	6-8	750	E	E-D	Medium	2xØ48-60	4x240	6 x M12
400	2-6	750	E	E-D	Large	2xØ60-80	4x240	6 x M12
400LA, LB	8	750	E	E-D	Medium	2xØ48-60	4x240	6 x M12
400LC	8	750	E	E-D	Large	2xØ60-80	4x240	6 x M12
450 LA	2	1200	E	E-2D	2 x Large	4xØ60-80	6x240	6 x M12
450 LA	4	1200	E	E-D	Large	2xØ60-80	6x240	6 x M12
450 LB, LC	2-4	1200	E	E-2D	2 x Large	4xØ60-80	6x240	6 x M12
450 LA	6	750	E	E-D	Large	2xØ60-80	4x240	6 x M12
450 LB, LC	6	1200	E	E-D	Large	2xØ60-80	6x240	6 x M12
450	8	750	E	E-D	Large	2xØ60-80	4x240	6 x M12
Auxilary cable entries								
160-450	2-8				2xM20x1.5		1 x 2.5	

Motor size	Earthing on frame	Earthing in main terminal box
71 - 112	M4	M4
132	M5	M5
160 - 250	clamp	M6
280 - 400	M10	2xM10
450	M10	4xM12

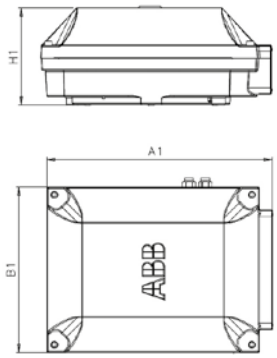
Terminal box
Terminal box dimensions

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.

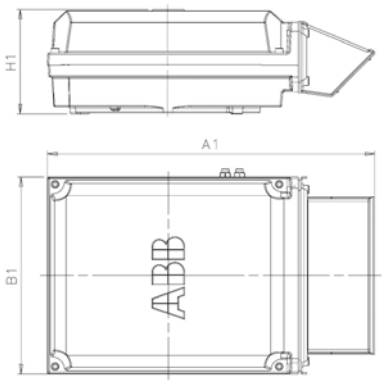
To match the correct terminal box with motor sizes 160-450, find the motor type and correspondent terminal box type on the previous page. The box types and heir dimensions are presented on this page.



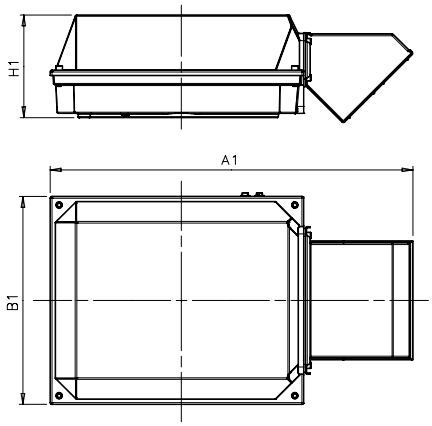
Terminal box type 63 and 160



Terminal box types 210 and 370



Terminal box type 750 + adapter

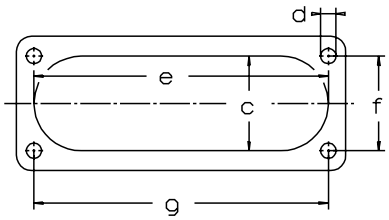


Terminal box type 1200 + adapter

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

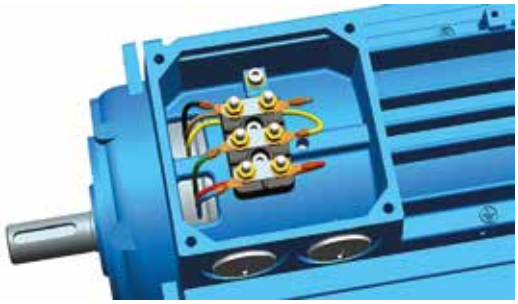
Note! The C flange is different depending on frame size
*) for frame sizes 200-225
**) for frame size 280

Terminal box
Terminal boxes and boards

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

Motor sizes 71-132

Integrated terminal box for motor sizes 71-132. Tapped holes for cable entries.



Terminal board for motor sizes 71-80.

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

Terminal board for motor size 132, IE2, and motor sizes 112-132, IE3.

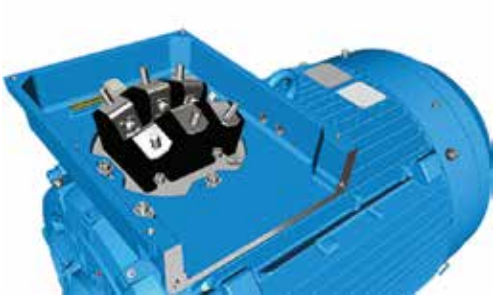
Motor sizes 160-250

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

Terminal board for motor sizes 160-250.

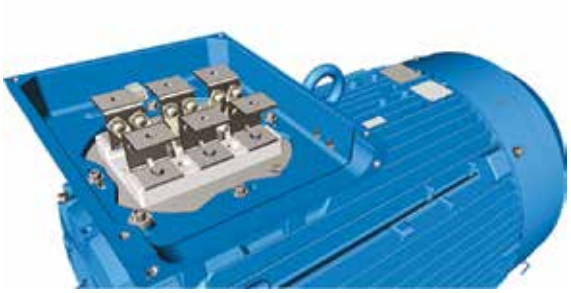
Motor sizes 280-315

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



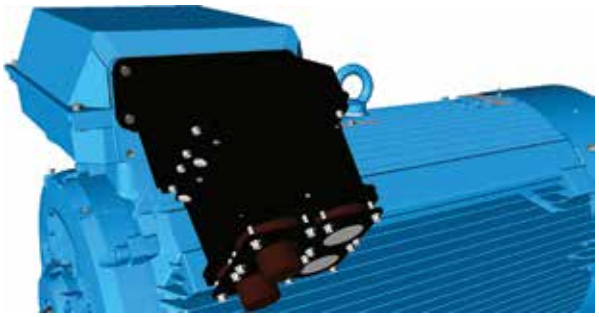
Terminal board for motor sizes 280-315, except LKC.

Terminal box for motor sizes 315 LKC and 355-400. Adapter and cable sealing end unit.

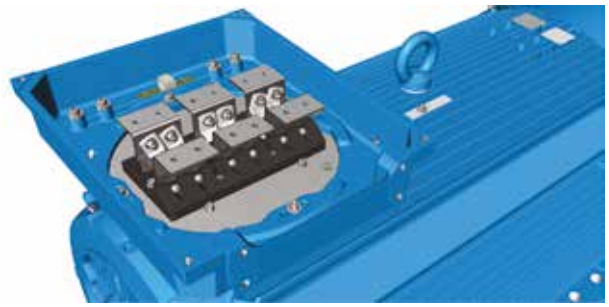


Terminal board for motor sizes 315 LKC and 355-400.

Motor size 450



Terminal box for motor sizes 450, with adapter and cable sealing end unit.



Terminal board for motor size 450.

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

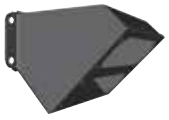
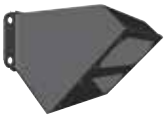
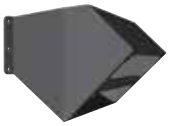
- Check first that the terminal box itself allows mounting of the desired cable and cores (refer to table showing standard delivery for each motor size). If very large cable are used might it be necessary to use a larger terminal box and larger terminal board than standard
- Select the right cable gland(s) 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

Motor and supply cables	110kW, 4-pole, 400V 50Hz, IE2. Cables needed: 1 pcs outer diameter 42 mm steel wire armoured cable, single cross section 120 mm². Cables coming from below.
Motor	M3GP 315SMA 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, is an angle adapter recommended. These are available for motor sizes 280 and above and can also be used to allow mounting of several cable sealing end units or gland plates. For exact suitability on a certain motor size, refer to the “size of gland plate opening on terminal box ” column in section Standard terminal box.

Adapter						
Variant code	292	293	294	295	296	444
Suited for motor sizes	280	315, 355	315 LKC IE2, 355 SM_ 2-4 poles, 400 - 450	315 LKC IE2, 355 SM_ 2-4 poles, 400 - 450	315 LKC IE2, 355 SM_ 2-4 poles, 400 - 450	315 LKC IE2, 355 SM_ 2-4 poles, 400 - 450
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	Steel	Steel	Steel	Steel	Steel	Steel
Notes			Included in type 750 terminal box when 750 is the standard size.	Included in type 1200 terminal box when 1200 is the standard size.	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 or cable sealing units 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, variant code 230 or 731	EMC Cable gland(s) nickel plated brass, Ex e, for non armoured cable, variant code 704	Cable gland Ex d IIC / Ex e 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”
315-450	2 x 3”	1 x 3”

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

Gland plates with threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands 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 aluminum or stainless steel are optional, either with cable glands or blind without threaded holes. Please refer to the variant code section for more information.

Cable sealing end units

As an alternative to gland plates and cable glands, cable sealing end units can be used. These allow more space for spreading the cores for easy termination. Cable sealing units have rubber sealed entries for one or two main cables. In addition there are two plugged M20 holes for auxiliary cables. The cable sealing end units are Ex e certified, as option can they be equipped with EMC modules or cable clamping devices by adding variant codes 704 or 231.

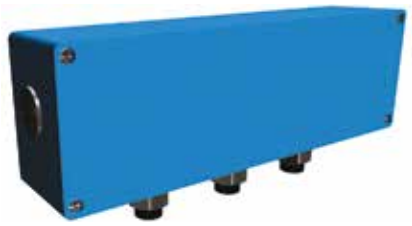
	Small	Medium	Large
End unit			
Variant code	277	278	279
Suited for motor sizes	280	315, 355, except 315 LKC IE2, 355 SM_ 2-4 poles	315, 355, except 315 LKC IE2, 355 SM_ 2-4 poles
Opening to terminal box	C	D	D
Cable outer diameter	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 48 - 60 mm	1 - 2 cables, 60 - 80 mm
Cable entry for auxiliary cable	2 x M20 plugged holes	2 x M20 plugged holes	2 x M20 plugged holes
Additional optional variants	EMC cable gland (704); Standard gland with clamping device (231)	EMC cable gland (704); Standard gland with clamping device (231)	EMC cable gland (704); Standard gland with clamping device (231)

Auxiliary terminal box

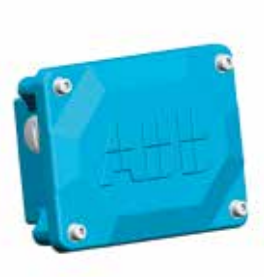
It is possible to equip motors from frame size 160 upwards with one or several auxiliary terminal boxes for connection of auxiliaries like heaters or temperature detectors. The standard auxiliary terminal box is made of aluminium, except frame sizes 160-250, where cast iron boxes are used. Connection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



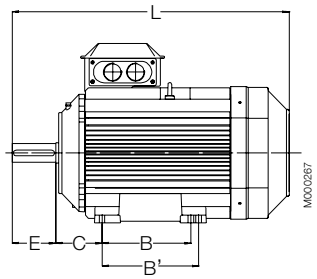
Large auxiliary aluminum terminal box for motor sizes 280-450.
The size of terminal box ordered with these codes depends on the number of accessories ordered.
80 x 250 mm, max 30 strips. Earthing size M4

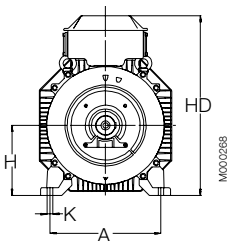


Auxiliary cast iron terminal box for motor size 160-250 (variant code 418).
111 x 162 mm

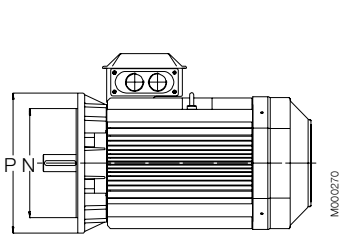
Auxiliary cast iron terminal box for motor sizes 280-450
(variant code 567)
208 x 180 mm

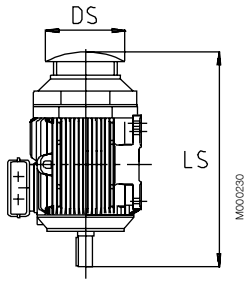
Dimension drawings
Non-sparking cast iron motors, Ex nA



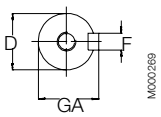


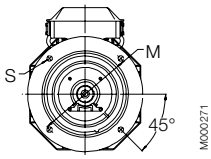
Foot-mounted motor IM 1001, IM B3



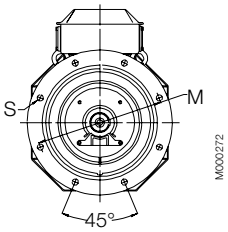


Flange-mounted motor IM 3001, IM B5

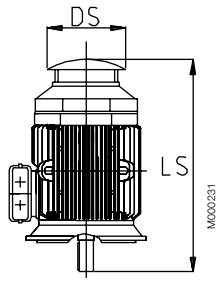




Sizes 80 to 200



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
71	14	14	16	16	5	5	30	30	264	264	112	90	-	45	178	7	130	110	160	10	-	272.5	272.5	
80	19	19	21.5	21.5	6	6	40	40	321	321	125	100	-	50	195	10	165	130	200	12	-	331	331	360
90	24	24	27	27	8	8	50	50	357	357	140	100	125	56	219	10	165	130	200	12	-	368.5	368.5	430
100	28	28	31	31	8	8	60	60	381	381	160	140	-	63	247	12	215	180	250	15	-	395	395	505
112	28	28	31	31	8	8	60	60	403	403	190	140	-	70	259	12	215	180	250	15	-	417	417	505
132	38	38	41	41	10	10	80	80	533	533	216	140	178	89	300	12	265	230	300	15	-	551.5	551.5	590
160	42	42	45	45	12	12	110	110	808	808	254	210	254	108	499	14.5	160	300	250	350	18.5	328	756	756
180	48	48	51.5	51.5	14	14	110	110	826	826	279	241	279	121	539	14.6	180	300	250	350	18.5	359	756	756
200	55	55	59	59	16	16	110	110	774	774	318	267	305	133	536	18.5	200	350	300	400	18.5	414	844	844
225	55	60	59	64	16	18	110	140	841	871	356	286	311	149	583	18.6	225	400	350	450	18.5	462	921	951
250	60	65	64	69	18	18	140	140	875	875	406	311	349	168	646	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	-	2187	800	1000	1120	250	1169	42	450	1080	1000	1150	28	On request		

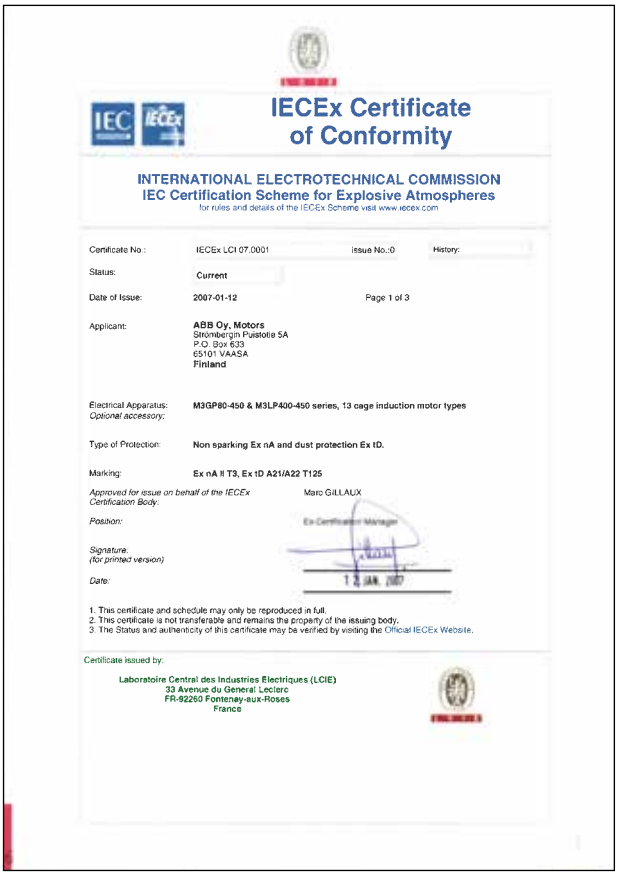
IM B14 (IM3601), IM 3602

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 50mm
	ISO m6 > Ø 50mm
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



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
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Certificate No.: IECEx LCI 07.0001 Issue No.:0 History:

Status: Current

Date of Issue: 2007-01-12 Page 1 of 3

Applicant: ABB Oy, Motors
Strömbergin Puistotie 5A
P.O. Box 633
65101 VAASA
Finland

Electrical Apparatus: M3GP80-450 & M3LP400-450 series, 13 cage induction motor types
Optional accessory:

Type of Protection: Non sparking Ex nA and dust protection Ex tD.

Marking: Ex nA II T3, Ex tD A21/A22 T125

Approved for issue on behalf of the IECEx Certification Body: Marc GILLAUX

Position: Ex-Certification Manager

Signature: (for printed version)

Date: 12 JAN. 2007

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FR-92260 Fontenay-aux-Roses
France

M000730

1 ATTESTATION D'EXAMEN CE DE TYPE

2 Appareil ou système de protection destiné à être utilisé en atmosphères explosibles (Directive 94/9/CE)

3 Numéro de l'attestation d'examen CE de type
LCIE 09 ATEX 3016

4 Appareil ou système de protection :
Moteur asynchrone
Type : M3GP160 ..., M3GP180 ... (Génération H)

5 Demandeur : ABB Oy Motors
Adresse : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

6 Fabricant : ABB Oy Motors
Adresse : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles de sécurité et de santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive.
Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 90248-581521.

9 Le respect des exigences essentielles de sécurité et de santé est assuré par la conformité à :
- EN 61241-0 (2006)
- EN 61241-1 (2004)

10 La signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à l'annexe III de la directive 94/9/CE.
Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection. Ces dernières ne sont pas couvertes par la présente attestation.

12 Le marquage de l'appareil ou du système de protection doit comporter les informations détaillées au point 15.

Fontenay-aux-Roses, le 16 mars 2009

Le responsable de certification ATEX
ATEX certification manager

Marc GILLAUX

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or protective system intended for use in potentially explosive atmospheres (Directive 94/9/EC)

3 EC type examination certificate number
LCIE 09 ATEX 3016

4 Equipment or protective system :
Asynchronous motor
Type : M3GP160 ..., M3GP180 ... (Generation H)

5 Applicant : ABB Oy Motors
Address : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

6 Manufacturer : ABB Oy Motors
Address : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

7 This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in confidential report N° 90248-581521.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
- EN 61241-0 (2006)
- EN 61241-1 (2004)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with annex III to the directive 94/9/EC.
Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include informations as detailed at 15.

M000731

EU DECLARATION OF CONFORMITY

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: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC as listed in this document on the pages 2 ...3 having correspondent name plate markings covered by those as listed.

The motors of the declaration described above are in conformity with the relevant Union harmonisation legislation:

Directive 94/9/EC (until April 19th, 2016) and Directive 2014/34/EU (from April 20th, of April 2016)

Directive 2009/125/EC (ErP of 20th November 2009)
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EU) No. 4/2014 of 5 January 2014 amending Regulation (EC) No. 640/2009.

Efficiency classes as defined in the standard EN 60034-30:2009.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Technical documentation based on the standard EN 50581:2012

The following harmonised standards are applied in relation to which conformity is declared:
EN 60079-0:2012, EN 60079-1:2007, EN 60079-7:2007, EN 60079-15:2010, EN 60079-31:2009 and relevant parts of the EN 60034 –series of standards.

The conformity of the end product according to the Directive 2006/42/EC has to be established by the commissioning party when the motor is fitted to the machinery.

Note: Motors have to 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.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc. 33, 92260 Fontenay-aux-Roses, France and VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland

Signed for and on behalf of: ABB Oy, Motors and Generators and ABB Sp.z.o.o

Place and date of issue: Vaasa, Finland, 2015-11-26

Hem Mykkänen
Vice President

Title

Document 3GZF500930-309G

ABB Oy

Motors and Generators
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Domicile: Helsinki

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M000725-1a

	M3DP 160 – M3DP 250 (gen.K, L)	LCIE 13 ATEX 3067X	2015
	M3GP 160 – M3GP 250 (gen.D)	LCIE 13 ATEX 3067X	2013
	M3GP 160 – M3GP 250 (gen.K, L)	LCIE 13 ATEX 3067X	2015
Protection by increased safety "e"	M3HP 80 – M3HP 90	LCIE 06 ATEX 6047	2006
II 2G Ex e IIB / IIC T3 Gb	M3HP 100 – M3HP 112	LCIE 06 ATEX 6048	2006
	M3HP 132	LCIE 06 ATEX 6049	2006
	M3HP 160 (gen.H)	LCIE 09 ATEX 3022	2009
Protection by increased safety "e"	M3HP 180 (gen.H)	LCIE 09 ATEX 3023	2009
II 2G Ex e IIB / IIC T2 / T3 Gb	M3HP 200	LCIE 01 ATEX 6022	2001
	M3HP 225	LCIE 01 ATEX 6023	2001
	M3HP 250	LCIE 01 ATEX 6024	2001
In addition:	M3HP 280	LCIE 02 ATEX 6071	2002
Dust ignition protection by enclosure	M3HP 315	LCIE 02 ATEX 6072	2002
II 2D Ex tb IIIB / IIIC T85 °C - T150°C Db	M3HP 355	LCIE 03 ATEX 6022	2003
	M3HP 400	LCIE 04 ATEX 6013	2004
Type of protection "n"	M3AA 90 – M3AA 132	VTT 13 ATEX 050X	2015
II 3G Ex nA IIB / IIC T3 Gc	M3GP 71 – M3GP 132	VTT 12 ATEX 050X	2012
	M3GP 71 – M3GP 132 (gen.K, L)	VTT 12 ATEX 050X	2015
In addition:	M3GP 80 – M3GP 450	LCIE 12 ATEX 1006X	2012
Dust ignition protection by enclosure	M3GP 280 – M3GP 355 (gen.K, L)	LCIE 12 ATEX 1006X	2012
II 3D Ex tc IIIB / IIIC T...°C Dc	M3GP 160 – M3GP 250 (gen.D)	LCIE 13 ATEX 1034X	2013
	M3GP 160 – M3GP 250 (gen.K, L)	LCIE 13 ATEX 1034X	2015

Document 3GZF500930-309G

ABB Oy

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M000725-2a

Motors in brief
Non-sparking cast iron motors, sizes 71 to 80

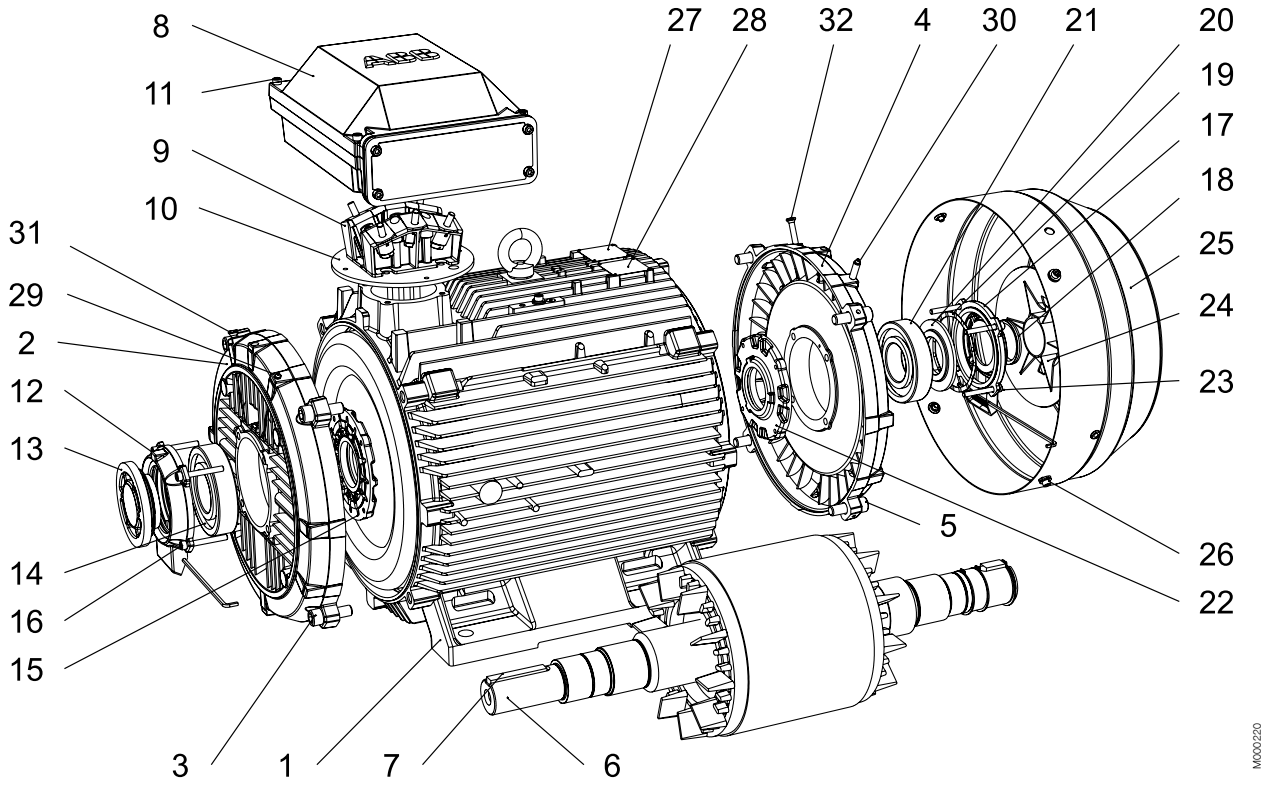
Motor size			71	80	90	100	112	132	160	180
Stator	Material		Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Paint colour shade		Blue, Munsell 8B 4.5/3.25							
	Corrosion class		C3 medium according to ISO/EN 12944-5							
Feet			Cast iron, EN-GLJ-150 or better, integrated with stator						Cast iron, EN-GJL-200 or better	
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 medium according to ISO/EN 12944-5							
Bearings	D-end	2-8 pole	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 pole	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			-						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	
	Screws		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						Hot dip galvanized steel	
	Paint colour 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
Non-sparking cast iron 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 colour shade		Blue, Munsell 8B 4.5/3.25							
	Corrosion class		C3 medium according to ISO/EN 12944-5							
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 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	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	6210/C3	6212/C3	6213/C3	6316/C3	6316/C3	6316M/C3	6317/C3	6317M/C3
		4-12 -pole	6210/C3	6212/C3	6213/C3	6316/C3	6316/C3	6316/C3	6319/C3	6322/C3
Axially-locked bearings	Inner bearing cover		As standard, locked at D-end							
Bearing seal			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					Refer to table on page 166		
	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 colour 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			Open				
Heating elements	Optional		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
Non-sparking motors Ex nA

Typical exploded view of cast iron motors, frame size 315



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

Non-sparking aluminum motors Ex nA
Totally enclosed squirrel cage three phase low voltage motors, Sizes 90 to 280, 2.2 to 90 kW

Ordering information

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

Example	
Motor type	M3AA 160 MLA
Pole number	4
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	11 kW
Product code	3GAA162410-ADG
Variant codes if needed	

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3AA	160MLA	3GAA 162 410 - ADG		480, etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 - 4

3GGP:	Totally enclosed fan cooled squirrel cage motor with cast iron frame, non-sparking
3GAA:	Totally enclosed fan cooled squirrel cage motor with aluminum frame, non-sparking

Positions 5 and 6

IEC-frame

06	63
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
45	450

Position 7

Speed (Pole pairs)

1:	2 poles
2:	4 poles
3:	6 poles
4:	8 poles
5:	10 poles

Positions 8 to 10

Serial number

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

The rating plates are in table form giving values for speed, output, current and power factor at different voltages, there are two rows available for different voltages, usually is the corresponding voltages for star and delta connection stamped. Other voltage and frequency combinations are possible and can be ordered with variant codes 002 or 209. Please refer to the variant code section.

The following information will be shown on the motor rating plate:

- Lowest nominal efficiency at 100%, 75% and 50% rated load
- Efficiency level
- Year of manufacture
- Type of protection
- Apparatus group
- Temperature class
- Identification number for notified body (category 2 motors only)
- Certificate number ATEX and IECEx (if available)

Aluminum motors size 90-132

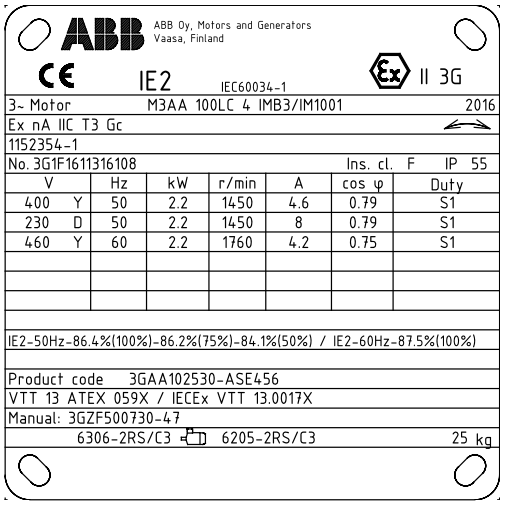


ABB Oy, Motors and Generators
Vaasa, Finland

IE2 IEC60034-1 II 3G

3~ Motor M3AA 100LC 4 IMB3/IM1001 2016
Ex nA IIC T3 Gc
1152354-1
No. 3G1F1611316108 Ins. cl. F IP 55

V		Hz	kW	r/min	A	cos φ	Duty
400	Y	50	2.2	1450	4.6	0.79	S1
230	D	50	2.2	1450	8	0.79	S1
460	Y	60	2.2	1760	4.2	0.75	S1

IE2-50Hz-86.4%(100%)-86.2%(75%)-84.1%(50%) / IE2-60Hz-87.5%(100%)

Product code 3GAA102530-ASE456
VTT 13 ATEX 059X / IECEx VTT 13.0017X
Manual: 3GZF500730-47
6306-2RS/C3 6205-2RS/C3 25 kg

Aluminum motors size 200-250

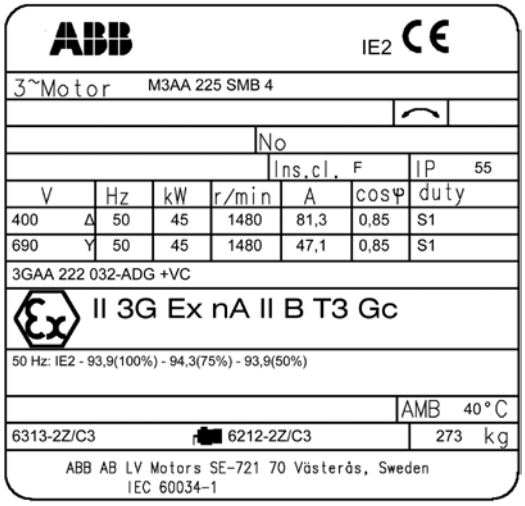


ABB IE2

3~Motor M3AA 225 SMB 4
No
Ins.cl. F IP 55

V		Hz	kW	r/min	A	cosφ	duty
400	Δ	50	45	1480	81,3	0,85	S1
690	Y	50	45	1480	47,1	0,85	S1

3GAA 222 032-ADG +VC
II 3G Ex nA II B T3 Gc
50 Hz: IE2 - 93,9(100%) - 94,3(75%) - 93,9(50%)
AMB 40°C
6313-2Z/C3 6212-2Z/C3 273 kg
ABB AB LV Motors SE-721 70 Västerås, Sweden
IEC 60034-1

M000752a

Aluminum motors size 160-180

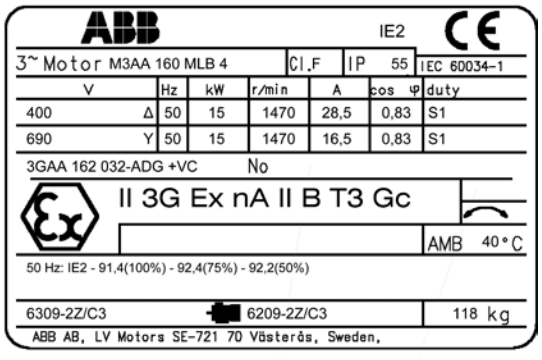


ABB IE2

3~ Motor M3AA 160 MLB 4 Cl.F IP 55 IEC 60034-1

V		Hz	kW	r/min	A	cos φ	duty
400	Δ	50	15	1470	28,5	0,83	S1
690	Y	50	15	1470	16,5	0,83	S1

3GAA 162 032-ADG +VC No
II 3G Ex nA II B T3 Gc
AMB 40°C
50 Hz: IE2 - 91,4(100%) - 92,4(75%) - 92,2(50%)
6309-2Z/C3 6209-2Z/C3 118 kg
ABB AB, LV Motors SE-721 70 Västerås, Sweden.

M000751a

Technical data for Ex nA IIB/C T3 Gc
Non-sparking aluminum motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Efficiency 1/2 load 50%	Power factor cos φ	Current I_N A	Current $\frac{I_s}{I_N}$	Torque T_N N_m	Torque $\frac{T_l}{T_N}$	Torque $\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2-poles		400 V 50 Hz						CENELEC-design							
1.5	M3AA 90L 2	3GAA091500-••E	2900	84.1	85.0	83.5	0.86	2.9	7.6	4.9	2.5	3.3	0.0024	16	60
2.2	M3AA 90LB 2	3GAA091520-••E	2870	84.6	85.6	84.8	0.86	4.4	6.9	7.3	2.8	3.2	0.0027	18	63
3	M3AA 100LB 2	3GAA101520-••E	2920	86.4	86.1	84.0	0.86	5.8	9.3	9.8	3.3	3.9	0.005	25	62
4	M3AA 112MB 2	3GAA111320-••E	2885	86.1	87.0	88.0	0.88	7.6	7.6	13.2	2.5	2.8	0.0062	30	68
5.5	M3AA 132SB 2	3GAA131120-••E	2915	88.0	88.1	86.9	0.82	11.0	7.9	18.0	2.6	3.6	0.016	42	73
7.5	M3AA 132SC 2	3GAA131130-••E	2915	88.5	89.1	88.5	0.88	13.6	7.6	24.5	2.2	3.2	0.022	56	73
11	M3AA 160MLA 2	3GAA161410-••G	2938	90.6	91.5	91.1	0.90	19.2	7.5	35.7	2.4	3.1	0.044	91	69
15	M3AA 160MLB 2	3GAA161420-••G	2934	91.5	92.4	92.2	0.90	26.0	7.5	48.8	2.5	3.3	0.053	105	69
18.5	M3AA 160MLC 2	3GAA161430-••G	2932	92.0	93.1	93.1	0.92	31.5	7.5	60.2	2.9	3.4	0.063	123	69
22	M3AA 180MLA 2	3GAA181410-••G	2952	92.2	92.7	92.2	0.87	39.5	7.7	71.1	2.8	3.3	0.076	132	69
30	M3AA 200MLA 2	3GAA201410-••G	2956	93.1	93.5	92.8	0.90	51.6	7.7	96.9	2.7	3.1	0.178	210	72
37	M3AA 200MLB 2	3GAA201420-••G	2959	93.4	93.7	92.9	0.90	63.5	8.2	119	3.0	3.3	0.196	225	72
45	M3AA 225SMA 2	3GAA221210-••G	2961	93.6	93.9	93.1	0.88	78.8	6.7	145	2.5	2.5	0.244	263	74
55	M3AA 250SMA 2	3GAA251210-••G	2967	94.1	94.4	93.8	0.88	95.8	6.8	177	2.2	2.7	0.507	304	75
75	M3AA 280SMA 2	3GAA281210-••G	2968	94.4	94.7	94.3	0.89	128	7.1	241	2.5	2.8	0.583	389	75
90 [1]	M3AA 280SMB 2	3GAA281220-••G	2971	94.9	95.2	94.7	0.89	153	7.8	289	2.6	3.2	0.644	425	75
3000 r/min = 2-poles		400 V 50 Hz						High-output design							
30	M3AA 180MLB 2	3GAA181420-••G	2950	92.7	93.5	93.3	0.88	53.0	7.9	97.1	2.8	3.3	0.092	149	69
45	M3AA 200MLC 2	3GAA201430-••G	2957	93.3	93.8	93.2	0.88	79.1	8.1	145	3.1	3.3	0.196	225	72
55	M3AA 225SMB 2	3GAA221220-••G	2961	93.9	94.3	93.6	0.88	96.0	6.5	177	2.4	2.5	0.274	286	74
75	M3AA 250SMB 2	3GAA251220-••G	2970	94.5	94.8	94.4	0.89	128	7.6	241	2.8	3.1	0.583	351	75

[1] Temperature rise class F

The following variant codes must be selected for aluminum non-sparking motors:
Sizes 90-132 variant 456, sizes 160-280 variant 480.

Motors in frame size 90-132 are marked for gas group IIC and sizes 160-280 IIB

Technical data for Ex nA IIB/C T3 Gc
Non-sparking aluminum motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4-poles		400 V 50 Hz						CENELEC-design							
2.2	M3AA 100LC 4	3GAA102530-••E	1450	86.4	86.2	84.1	0.79	4.6	7.3	14.4	2.8	3.4	0.009	25	54
3	M3AA 100LD 4	3GAA102540-••E	1445	85.7	86.1	85.1	0.79	6.3	7.0	19.8	2.4	3.0	0.011	28	63
4	M3AA 112MB 4	3GAA112320-••E	1445	86.7	86.5	85.2	0.75	8.8	7.3	26.4	3.1	3.4	0.0126	34	64
5.5	M3AA 132M 4	3GAA132300-••E	1465	89.0	89.5	88.6	0.79	10.9	6.3	36.0	1.9	2.6	0.038	48	66
7.5	M3AA 132MA 4	3GAA132310-••E	1460	89.1	89.8	89.4	0.79	14.7	6.4	49.0	1.8	2.6	0.048	59	63
11	M3AA 160MLA 4	3GAA162410-••G	1466	90.4	91.6	91.3	0.84	20.9	6.8	71.6	2.2	2.8	0.081	99	62
15	M3AA 160MLB 4	3GAA162420-••G	1470	91.4	92.3	92.2	0.83	28.5	7.1	97.4	2.6	3.0	0.099	118	62
18.5	M3AA 180MLA 4	3GAA182410-••G	1477	91.9	92.8	92.6	0.84	34.5	7.2	119	2.6	2.9	0.166	146	62
22	M3AA 180MLB 4	3GAA182420-••G	1475	92.3	93.3	93.2	0.84	40.9	7.3	142	2.6	3.0	0.195	163	62
30	M3AA 200MLA 4	3GAA202410-••G	1480	93.2	94.0	93.7	0.84	55.2	7.4	193	2.8	3.0	0.309	218	63
37	M3AA 225SMA 4	3GAA222210-••G	1479	93.4	93.9	93.4	0.84	68.0	7.1	238	2.6	2.9	0.356	240	66
45	M3AA 225SMB 4	3GAA222220-••G	1480	93.9	94.3	93.9	0.85	81.3	7.5	290	2.8	3.2	0.44	273	66
55	M3AA 250SMA 4	3GAA252210-••G	1480	94.4	94.9	94.6	0.85	98.9	7.0	354	2.6	2.9	0.765	314	67
75	M3AA 280SMA 4	3GAA282210-••G	1478	94.3	94.9	94.6	0.85	135	7.1	484	2.8	3.0	0.866	389	67
90	M3AA 280SMB 4	3GAA282220-••G	1478	94.6	95.4	95.2	0.84	163	7.7	581	3.2	3.4	0.941	418	67
1500 r/min = 4-poles		400 V 50 Hz						High-output design							
18.5	M3AA 160MLC 4	3GAA162430-••G	1469	91.4	92.4	92.2	0.84	34.7	7.6	120	3.0	3.2	0.11	127	62
22	M3AA 160MLD 4	3GAA162440-••G	1463	91.6	93.0	93.2	0.85	40.7	6.9	143	2.5	2.9	0.125	140	62
37	M3AA 200MLB 4	3GAA202420-••G	1479	93.4	94.4	94.4	0.85	67.2	7.1	238	2.6	2.9	0.343	234	63
55	M3AA 225SMC 4	3GAA222230-••G	1478	94.0	94.6	94.4	0.85	99.3	7.4	355	2.9	3.1	0.474	287	66
68	M3AA 250SMB 4	3GAA252220-••G	1481	94.6	95.0	94.7	0.84	123	7.9	438	3.1	3.5	0.866	350	67
75	M3AA 250SMB 4	3GAA252220-••G	1478	94.4	95.1	94.8	0.85	134	7.3	484	2.8	3.1	0.866	350	67

The following variant codes must be selected for aluminum non-sparking motors:
Sizes 90-132 variant 456, sizes 160-280 variant 480.

Motors in frame size 90-132 are marked for gas group IIC and sizes 160-280 IIB

Technical data for Ex nA IIB/C T3 Gc
Non-sparking aluminum motors

ATEX Certified

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

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	I_s/I_N	Torque T_N N_m	T_l/T_N	T_b/T_N	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6-poles		400 V 50 Hz						CENELEC-design							
1.5	M3AA 100LC 6	3GAA103530-••E	945	80.3	81.4	80.7	0.73	3.6	3.9	15.1	1.7	2.0	0.009	26	49
2.2	M3AA 112MB 6	3GAA113320-••E	955	81.9	81.8	79.2	0.72	5.3	5.2	21.9	1.8	2.2	0.01	34	56
3	M3AA 132S 6	3GAA133100-••E	960	83.3	82.9	80.5	0.65	7.7	4.3	29.8	1.6	2.3	0.031	46	57
4	M3AA 132MB 6	3GAA133320-••E	975	86.4	85.8	83.1	0.70	9.4	7.3	39.2	2.1	4.4	0.045	54	57
5.5	M3AA 132MC 6	3GAA133330-••E	965	86.1	85.6	83.0	0.67	13.3	6.2	54.3	2.5	2.8	0.049	59	61
7.5	M3AA 160MLA 6	3GAA163410-••G	975	88.5	89.9	89.7	0.79	15.4	7.4	73.4	1.7	3.2	0.087	98	59
11	M3AA 160MLB 6	3GAA163420-••G	972	89.3	90.6	90.5	0.79	22.5	7.5	108	1.9	2.9	0.114	125	59
18.5	M3AA 200MLA 6	3GAA203410-••G	988	91.6	92.2	91.7	0.80	36.4	6.7	178	2.3	2.9	0.382	196	63
22	M3AA 200MLB 6	3GAA203420-••G	987	92.0	92.9	92.7	0.82	42.0	6.6	212	2.2	2.8	0.448	218	63
30	M3AA 225SMA 6	3GAA223210-••G	986	92.6	93.3	92.8	0.83	56.2	7.0	290	2.6	2.9	0.663	266	63
37	M3AA 250SMA 6	3GAA253210-••G	989	93.1	93.8	93.4	0.82	69.9	6.8	357	2.4	2.7	1.13	294	63
45 [1]	M3AA 280SMA 6	3GAA283210-••G	988	93.2	94.0	93.9	0.84	82.9	6.8	434	2.4	2.6	1.37	378	63
55 [1]	M3AA 280SMB 6	3GAA283220-••G	988	93.2	94.1	94.0	0.84	101	7.1	531	2.6	2.8	1.5	404	63
1000 r/min = 6-poles		400 V 50 Hz						High-output design							
15	M3AA 160MLC 6	3GAA163430-••G	971	89.7	91.2	91.2	0.77	31.3	7.3	147	1.8	3.6	0.131	138	59
30 [1]	M3AA 200MLC 6	3GAA203430-••G	985	92.0	93.1	92.8	0.83	56.7	6.9	290	2.3	2.8	0.531	245	63
37	M3AA 225SMB 6	3GAA223220-••G	985	93.1	94.0	94.0	0.83	69.1	6.6	358	2.3	2.6	0.821	300	63
45	M3AA 250SMB 6	3GAA253220-••G	989	93.4	94.1	93.9	0.83	83.7	7.0	434	2.5	2.7	1.37	341	63
55 [1]	M3AA 250SMC 6	3GAA253230-••G	988	93.2	94.1	94.0	0.84	101	7.1	531	2.6	2.8	1.5	367	63

[1] Temperature rise class F

The following variant codes must be selected for aluminum non-sparking motors:
Sizes 90-132 variant 456, sizes 160-280 variant 480.

Motors in frame size 90-132 are marked for gas group IIC and sizes 160-280 IIB

Variant codes
Non-sparking aluminum motors, Ex nA

Code/Variant		Frame size M3AA 90	M3AA 100	M3AA 112	M3AA 132	M3AA 160	M3AA 180	M3AA 200	M3AA 225	M3AA 250	M3AA 280
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.	•	•	•	•	•	•	•	•	•	•
188	63-series bearing in D-end	•	○	○	•	○	○	○	○	○	○
796	Grease nipples JIS B 1575 PT 1/8 Type A	-	-	-	-	•	•	•	•	•	•
797	Stainless steel SPM nipples	-	-	•	•	•	•	•	•	•	•
798	Stainless steel grease nipples	-	-	-	-	•	•	•	•	•	•
Branch standard designs											
071	Cooling Tower duty	-	-	•	•	•	•	•	•	•	•
142	Manilla connection.	•	•	•	•	•	•	•	•	•	•
178	Stainless steel / acid proof bolts.	•	•	•	•	•	•	•	•	•	•
209	Non-standard voltage or frequency, (special winding).	•	•	•	•	•	•	•	•	•	•
217	Cast iron D-end shield (on aluminum motor).	•	•	•	•	○	○	○	○	○	○
425	Corrosion protected stator and rotor core.	•	•	•	•	•	•	•	•	•	•
Cooling system											
053	Metal fan cover.	○	○	○	○	○	○	○	○	○	○
068	Light alloy metal fan	•	•	•	•	•	•	•	•	•	•
075	Cooling method IC418 (without fan).	-	-	-	-	-	-	-	-	-	-
183	Separate motor cooling (fan axial, N-end).	-	-	-	-	-	-	-	-	-	-
189	Separate motor cooling, IP44, 400V, 50Hz (fan axial, N-end).	-	-	-	-	-	-	-	-	-	-
Documentation											
141	Binding 2D main dimension drawing.	•	•	•	•	•	•	•	•	•	•
Drain holes											
065	Plugged existing drain holes.	•	•	•	•	•	•	•	•	•	•
Earthing Bolt											
067	External earthing bolt.	○	○	○	○	○	○	○	○	○	○
Hazardous Environments											
456	Ex nA IIC T3 Gc acc. IEC/EN 60079-15 with certificates.	•	•	•	•	-	-	-	-	-	-
480	Ex nA II acc. to ATEX directive 94/9/EC, temp. class T3.	-	-	-	-	•	•	•	•	•	•
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 for supply > 690 <= 1000 volts	-	-	-	-	-	-	-	-	-	-
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)	•	•	•	•	•	•	•	•	•	•
080	(IM 3001) Flange mounted, DIN A-flange.	•	•	-	-	-	-	-	-	-	-
090	(IM 2101) foot/flange mounted, DIN C-flange, from IM 1001 (B34 from B3).	•	•	-	-	-	-	-	-	-	-

Code/Variant		Frame size									
		M3AA 90	M3AA 100	M3AA 112	M3AA 132	M3AA 160	M3AA 180	M3AA 200	M3AA 225	M3AA 250	M3AA 280
091	(IM 2001) foot/flange mounted, DIN A-flange, from IM 1001 (B35 from B3).	•	•	-	-	-	-	-	-	-	-
093	IM 3601 flange mounted, IEC flange, from IM 1001 (B14 from B3).	•	•	•	-	-	-	-	-	-	-
200	Flange ring holder.	•	•	•	•	-	-	-	-	-	-
218	Flange ring FT 85.	•	-	-	-	-	-	-	-	-	-
219	Flange ring FT 100.	•	-	-	-	-	-	-	-	-	-
220	Flange ring FF 100.	•	-	-	-	-	-	-	-	-	-
223	Flange ring FF 115.	•	-	-	-	-	-	-	-	-	-
224	Flange ring FT 115.	•	-	-	-	-	-	-	-	-	-
226	Flange ring FF 130.	•	•	•	-	-	-	-	-	-	-
227	Flange ring FT 130.	•	•	•	-	-	-	-	-	-	-
229	Flange FT 130.	-	•	•	-	-	-	-	-	-	-
233	Flange ring FF 165.	•	•	•	-	-	-	-	-	-	-
234	Flange ring FT 165.	•	•	•	-	-	-	-	-	-	-
235	Flange FF 165.	•	-	-	-	-	-	-	-	-	-
236	Flange FT 165.	-	-	-	•	-	-	-	-	-	-
243	Flange ring FF 215.	-	-	•	•	-	-	-	-	-	-
244	Flange ring FT 215.	-	•	•	•	-	-	-	-	-	-
245	Flange FF 215.	-	•	•	-	-	-	-	-	-	-
253	Flange ring FF 265.	-	-	-	•	-	-	-	-	-	-
254	Flange ring FT 265.	-	-	-	•	-	-	-	-	-	-
255	Flange FF 265.	-	-	-	•	-	-	-	-	-	-
260	Flange FT 115.	•	-	-	-	-	-	-	-	-	-
306	IM 1001 foot mounted, from IM 3601 (B3 from B14).	•	•	•	•	-	-	-	-	-	-
307	IM 2101 foot/flange mounted, IEC flange, from IM 3601 (B34 from B14).	•	•	•	•	-	-	-	-	-	-
308	IM 2001 foot/flange mounted, IEC flange, from IM 3601 (B35 from B14).	•	•	•	•	-	-	-	-	-	-
309	IM 1001 foot mounted, from IM 3001 (B3 from B5).	•	•	•	•	-	-	-	-	-	-
310	IM 2101 foot/flange mounted, IEC flange, from IM 3001 (B34 from B5).	•	•	•	•	-	-	-	-	-	-
311	IM 2001 foot/flange mounted, IEC flange, from IM 3001 (B35 from B5).	•	•	•	•	-	-	-	-	-	-
312	IM 1001 foot mounted, from IM 2101 (B3 from B34).	•	•	•	•	-	-	-	-	-	-
313	IM 3601 flange mounted, IEC flange, from IM 2101 (B14 from B34).	•	•	•	-	-	-	-	-	-	-
314	IM 3001 flange mounted, IEC flange, from IM 2101 (B5 from B34).	•	•	•	-	-	-	-	-	-	-
315	IM 2001 foot/flange mounted, IEC flange, from IM 2101 (B35 from B34).	•	•	•	•	-	-	-	-	-	-
316	IM 1001 foot mounted, from IM 2001 (B3 from B35).	•	•	•	•	-	-	-	-	-	-
317	IM 3601 flange mounted, IEC flange, from IM 2001 (B14 from B35).	•	•	•	-	-	-	-	-	-	-
319	IM 2101 foot/flange mounted, IEC flange, from IM 2001 (B34 from B35).	•	•	•	•	-	-	-	-	-	-
Painting											
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•
Protection											
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•
072	Radial seal at D-end. Not possible for 2-pole , 280 and 315 frames	•	•	•	•	•	•	•	•	•	•
158	Degree of protection IP65.	•	•	•	•	•	•	•	•	•	•
211	Weather protected, IP xx W	•	•	•	•	•	•	•	•	•	•
403	Degree of protection IP56.	•	•	•	•	•	•	•	•	•	•
404	Degree of protection IP56, without fan and fan cover.	-	-	-	-	-	-	-	-	-	-
784	Gamma-seal at D-end.	○	○	○	○	•	•	•	•	•	•
Rating & instruction plates											
002	Restamping voltage, frequency and output, continuous duty.	•	•	•	•	•	•	•	•	•	•
004	Additional text on std rating plate (max 12 digits on free text line).	•	•	•	•	•	•	•	•	•	•
095	Restamping output (maintained voltage, frequency), intermittent duty.	•	•	•	•	•	•	•	•	•	•
098	Stainless rating plate.	•	•	•	•	•	•	•	•	•	•
135	Mounting of additional identification plate, stainless.	•	•	•	•	•	•	•	•	•	-
138	Mounting of additional identification plate, aluminium.	•	•	•	•	•	•	•	•	•	•
139	Additional identification plate delivered loose.	•	•	•	•	•	•	•	•	•	•
159	Additional plate with text “Made in ....”	•	•	•	•	•	•	•	•	•	•
160	Additional rating plate affixed.	•	•	•	•	•	•	•	•	•	•
161	Additional rating plate delivered loose.	•	•	•	•	•	•	•	•	•	•
163	Frequency converter rating plate. Rating data according to quotation.	•	•	•	•	•	•	•	•	•	•
198	Aluminum rating plate.	○	○	○	•	○	○	○	○	○	○
332	Baldor Catalogue #	•	•	•	•	•	•	•	•	•	•
333	Not for use in the USA	•	•	•	•	•	•	•	•	•	•

Code/Variant		Frame size M3AA 90	M3AA 100	M3AA 112	M3AA 132	M3AA 160	M3AA 180	M3AA 200	M3AA 225	M3AA 250	M3AA 280
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)	•	•	•	•	•	•	•	•	•	•
156	Cylindrical shaft extension, N-end, without key-way.	•	•	•	•	-	-	-	-	-	-
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											
010	Fulfilling CSA Safety Certificate.	•	•	•	•	•	•	•	•	•	•
242	Fulfilling CSA Energy Efficiency Verification IE2 (code 010 included)	-	-	-	-	•	•	•	•	•	•
408	Fulfilling EISA Subtype II efficiency requirements, CC031A.	-	-	-	-	•	•	•	•	•	•
543	Australian MEPS	•	•	•	•	•	•	•	•	•	-
Stator winding temperature sensors											
435	PTC - thermistors (3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•
436	PTC - thermistors (3 in series), 150 °C, in stator winding	•	•	•	•	○	○	○	○	○	○
437	PTC - thermistors (3 in series), 170 °C, in stator winding	•	•	•	•	•	•	•	•	•	•
439	PTC - thermistors (2x3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•
440	PTC - thermistors (3 in series, 110°C & 3 in series, 130°C), in stator winding.	•	•	•	•	-	-	-	-	-	-
441	PTC - thermistors (3 in series, 130 °C & 3 in series, 150 °C), in stator winding	•	•	•	•	•	•	•	•	•	•
442	PTC - thermistors (3 in series, 150 °C & 3 in series, 170 °C), in stator winding	•	•	•	•	•	•	•	•	•	•
Terminal box											
015	Motor supplied in D connection.	•	•	•	•	•	•	•	•	•	•
017	Motor supplied in Y connection.	•	•	-	-	•	•	•	•	•	•
021	Terminal box LHS (seen from D-end).	-	-	-	-	-	-	•	•	•	•
136	Extended cable connection, standard terminal box.	•	•	•	•	-	-	-	-	-	-
137	Extended cable connection, low terminal box, “Flying leads”.	•	•	•	•	-	-	-	-	-	-
180	Terminal box RHS (seen from D-end).	-	-	-	-	-	-	•	•	•	•
230	Standard metal cable gland.	•	•	•	•	•	•	•	•	•	•
467	Lower than standard terminal box and rubber extended cable. Cable length 2 m	-	-	•	•	•	•	•	•	•	•
729	Aluminum non-drilled flange for cable glands	-	-	-	-	-	-	•	•	•	•
731	Two standard metal cable glands.	-	•	•	•	•	•	•	•	•	•
739	Prepared for metric cable glands according to DIN 42925, draft aug. 1999.	-	-	•	•	-	-	-	-	-	-
Testing											
140	Test confirmation.	-	-	-	-	•	•	•	•	•	•
145	Type test report from a catalogue motor, 400V 50Hz.	•	•	•	•	•	•	•	•	•	•
146	Type test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
147	Type test with report for motor from specific delivery batch, customer witnessed.	•	•	•	•	•	•	•	•	•	•
148	Routine test report.	•	•	•	•	•	•	•	•	•	•
153	Reduced test for classification society.	•	•	•	•	•	•	•	•	•	•
221	Type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
222	Torque/speed curve, type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
760	Vibration level test	•	•	•	•	•	•	•	•	•	•
762	Noise level test for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
763	Noise spectrum test for one motor from specific delivery batch.	•	•	-	-	-	-	-	-	-	-
Variable speed drives											
701	Insulated bearing at N-end.	-	-	-	-	•	•	•	•	•	•
704	EMC cable entry.	•	•	•	•	•	•	•	•	•	•

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

Mechanical design
Motor frame and drain holes

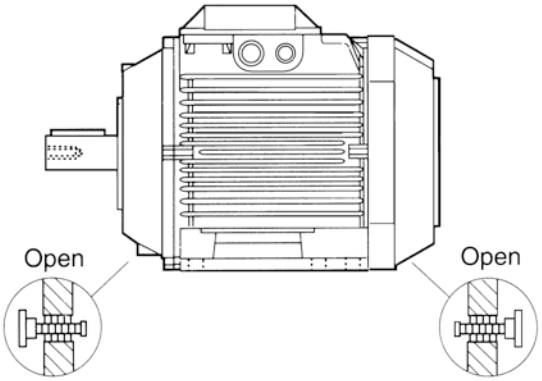
Motor frame
The motor frame is made of aluminum alloy. Frame size 90-180 have aluminum feet and sizes 200-280 have cast iron feet.

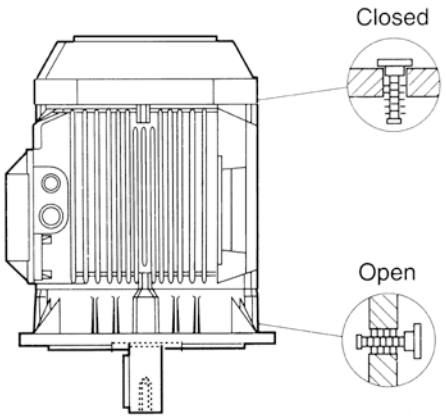
The bearing end shield of sizes 90-132 are made of aluminum, and those of 160 to 280 are made of cast iron.

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

Drain holes
Non-sparking motors are provided with drain holes fitted with plugs as standard. The plugs are made of plastic material and 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.





Bearings

ABB's alumimum non-sparking 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		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
280	2-pole	6315/C3	6213/C3
280	4-8 pole	6316/C3	6213/C3

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 90-132 is the locking done by a spring washer at N-end pushing the rotor towards D-end.

Bearing seals

Motors in sizes 90-132 are provided with gamma seals at both D and N-end, motors in sizes 160-280 have V-rings at both ends. The sizes 90-132 have in addition to the shaft seals 2RS type bearings with rubber seals for improved protection.

Bearing life and lubrication

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 life time 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 tables on following pages.

The tables are valid for 50Hz.

Lubrication

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. Motors of size 280 are provided with regreasable bearings as standard.

Radial forces

Pulley diameter

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

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

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.

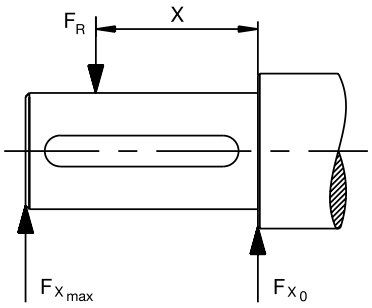
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft together with flame path dimensions affects permissible forces.

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 sizes 90-132

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	2-8	50	1010	810	1010	810
100	2-8	60	2280	1800	2280	1800
112	2-8	60	2280	1800	2280	1800
132	2-8	80	2120	1610	2120	1610
132	2-8	80	2600	2100	2600	2100

Permissible radial forces, motor sizes 160-280

Motor size	Poles	Length of shaft extension E (mm)	Ball bearings Basic design with deep groove ball bearings			
			20 000 hours		40 000 hours	
			F_{x0}(N)	F_{Xmax}(N)	F_{x0}(N)	F_{Xmax}(N)
160	2	110	4760	3860	4100	3320
	4	110	5180	4200	4380	3545
	6	110	5160	4180	4360	3540
	8	110	6280	4300	5320	4300
180	2	110	6060	4960	5280 [1)]	4305 [1)]
	4	110	4800	3940	4020	3300
	6	110	6280	5140	5280	4380
	8	110	6960	5500	5880	4800
200	2	110	7800	6500	6760 [2)]	5640 [2)]
	4	110	8400	7020	7180	5980
	6	110	8960	7480	7600	6340
	8	110	10480	8740	8940	7400
225	2	110	8520	7180	7360 [3)]	6200 [3)]
	4	140	8380	6780	7200	5820
	6	140	10 960	8860	9360	7560
	8	140	12 100	9780	10 340	8360
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
	8	140	14 660	11 880	12 540	10 160
280	2	140	6780	5500	5680	4600
	4	140	8060	6540	6640	5380
	6	140	8980	7280	7360	5960
	8	140	9180	7460	7460	6060

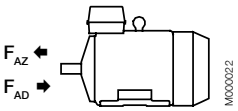
[1)] The maximum lifetime of the grease is 38000 h
[2)] The maximum lifetime of the grease is 27000 h
[3)] The maximum lifetime of the grease is 23000 h
[4)] The maximum lifetime of the grease is 16000 h

Axial forces

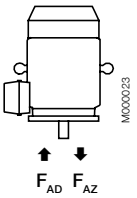
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

At 60 Hz, the values must be reduced by 10 percent, Permissible loads of simultaneous radial and axial forces can be supplied on request.

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



Mounting arrangement IM B3



Mounting arrangement IM V1

Permissible axial forces, motor sizes 90-280

		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	
Motor size	Poles	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
	8	1410	1010	1110	710	1485	960	1185	660
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
	8	2660	2160	2065	1565	2780	2080	2185	1485
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
	8	2655	2155	2060	1560	2790	2055	2195	1475
132 M, MA	4	2245	1645	1760	1160	2460	1505	1970	1015
	6	2595	1980	2025	1425	2815	1850	2245	1280
	8	2875	2270	2240	1640	3130	2115	2490	1470
132 MC	6	2580	1980	2010	1410	2885	1780	2315	1210
132 MBA	4	2235	1635	1750	1150	2495	1465	2010	980
132 S	6	2600	2000	2030	1435	2780	1885	2210	1315
	8	2885	2285	2245	1645	3100	2145	2460	1505
132 SB	2	1760	1160	1400	800	1910	1075	1540	705
132 SBB, SC	2	1760	1160	1395	795	1945	1045	1575	670
132 SMB, SMC	2	2210	1610	1740	1140	2435	1470	1950	985
	4	2840	2240	2205	1605	3150	2035	2515	1400
132 SMD	4	2830	2200	2230	1595	3195	1995	2560	1355
132 SME	2	2210	1610	1730	1130	2490	1425	2005	940
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
	8	5980	5980	4920	4920	6560	5580	5460	4480
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
	8	6000	6620	5460	5460	6000	6120	6000	4900
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
	8	5000	9880	5000	8160	5000	9215	5000	7435
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
	8	5000	11 420	5000	9460	5000	10 595	5000	8535
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
	8	6000	13 700	6000	11 380	6000	12 645	6000	10 205
280	2	5260	5260	4220	4220	6400	4400	5420	3420
	4	6500	6500	5160	5160	7920	5400	6640	4120
	6	7500	7500	6040	6040	8500	6180	7840	4640
	8	7740	7740	6180	6180	8500	6435	7980	4775

[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

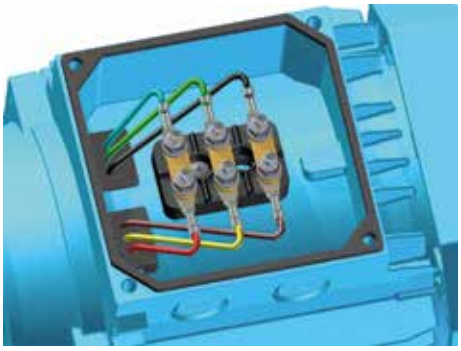
Protection and mounting
The degree of protection for the standard terminal box is IP 55. It complies with the requirements of the protection method ‘nA’ non-sparking and prevents all ignition sources such as sparks, excessive over heating etc. The features of the terminal box are: No self loosening terminals, compliance with creepage and clearance distances as defined in standard for non-sparking protection.
By default, terminal boxes are mounted on top of the motor at D-end.

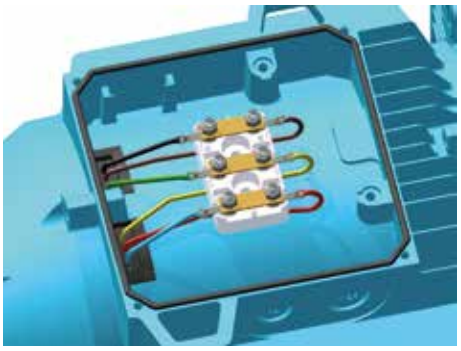
Turnability
The terminal box of motors in size 90-180 are integrated with the frame which means that the box itself cannot be rotated. There are however cable entries both on RHS and LHS to allow cabling from either side. Motors in size 200-280 have a terminal box made of deep drawn steel mounted on top of the stator, the box itself cannot be rotated but there are two openings with detachable gland plates, one on RHS and another on LHS of the box allowing cable entry from both sides.

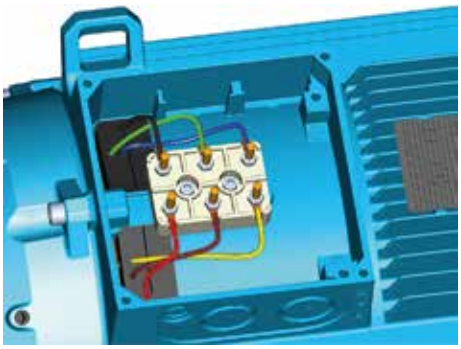
Cable entries
Terminal box is provided as standard with plugged holes for cable glands, no cable glands are included as standard, the knockout entry holes and cable flange holes are closed with Ex e approved blanking plugs.

Cable type and terminations
Terminations are suitable for copper cables. Cables are connected to terminals by cable lugs, the lugs 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


Terminal board for motor sizes 90-112


Terminal board for motor size 132

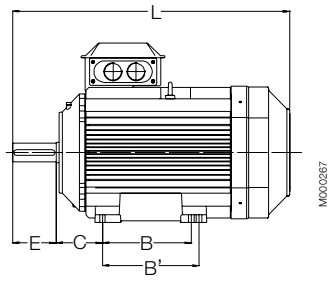

Terminal board for motor sizes 160 and 180

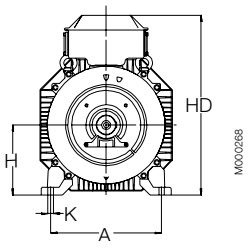

Terminal box for motor sizes 200-280

Terminal box openings

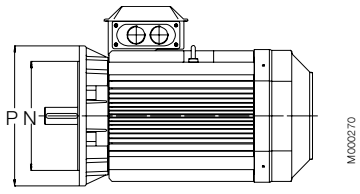
Motor size	Plugged cable entry	Terminal bolt size	Maximum connectable Cu-cable area, mm²
90-112	2 x (M25 + M20)	6 x M5	6
132	2 x (M25 + M20)	6 x M5	10
160, 180	2 x (2 x M40) + M16	6 x M6	35
200-250	1 x (2 x M40 + M16)	6 x M10	70
280	1 x (2 x M63 + M16)	6 x M10	70

Dimension drawings
Non-sparking aluminum motors, Ex nA

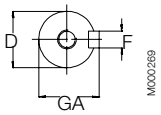


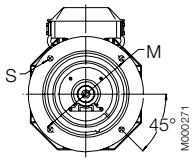


Foot-mounted motor IM 1001, IM B3

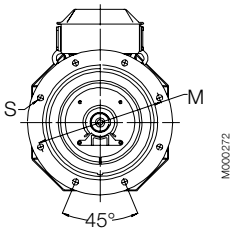


Flange-mounted motor IM 3001, IM B5





Sizes 90 to 200



Sizes 225 to 250

Motor size		IM 1001, IM B3 AND IM 3001, IM B5										IM 1001, IM B3							IM 3001, IM B5				
		D poles		GA poles		F poles		E poles		L max poles		A	B	B'	C	HD	K	H	M	N	P	S	
		2	4-8	2	4-8	2	4-8	2	4-8	2	4-8												
M3AA	90S	24	24	27	27	8	8	50	50	288	288	30	140	100	-	56	217	10	90	165	130	200	12
	90L	24	24	27	27	8	8	50	50	313	313	30	140	125	-	56	217	10	90	165	130	200	12
	90LD	24	24	27	27	8	8	50	50	335	335	30	140	125	-	56	217	10	90	165	130	200	12
	100	28	28	31	31	8	8	60	60	355	355	35	160	140	-	63	237	12	100	215	180	250	15
	100LD	28	28	31	31	8	8	60	60	377	377	35	160	140	-	63	237	12	100	215	180	250	15
	112	28	28	31	31	8	8	60	60	397	397	35	190	140	-	70	249	12	112	215	180	250	15
	132 [1]	38	38	41	41	10	10	80	80	458.5	458.5	50	216	140	178	89	296	12	132	265	230	300	14.5
	132 [2]	38	38	41	41	10	10	80	80	498.5	498.5	50	216	140	178	89	321	12	132	265	230	300	14.5
	160 [3]	42	42	45	45	12	12	110	110	584	584	50	254	210	254	108	370	15	160	300	250	350	19
	160 [4]	42	42	45	45	12	12	110	110	681	681	50	254	210	254	108	370	15	160	300	250	350	19
	180	48	48	51.5	51.5	14	14	110	110	726	726	55	279	241	279	121	405	15	180	300	250	350	19
	200	55	55	59	59	16	16	110	110	821	821	55	318	267	305	133	532	18	200	350	300	400	19
	225	55	60	59	64	16	18	110	140	850	880	60	356	286	311	149	579	18	225	400	350	450	19
	250	60	65	64	69	18	18	140	140	884	884	65	406	311	349	168	627	22	250	500	450	550	19
	280	65	75	69	79.5	18	20	140	140	884	884	65	457	368	419	190	627	24	280	500	450	550	19

[1] All types except [2]
[2] SM_
[3] MLA 2, MLB 2, MLA 4, MLA 6, MLA 8 and MLB 8
[4] All remining types, i.e. MLC 2, MLD 2, MLE 2, MLB 4, MLC 4, MLD 4 and MLC 8
[5] O = minimum free distance between fan cover air inlet and obstacle preventing air flow

IM 3601, IM B14

Motor size	LA	M	N	P	S	T
90	13	115	95	140	M8	3
100	14	130	110	160	M8	3.5
112	14	130	110	160	M8	3.5
132	18	165	165	200	M10	3.5

Tolerances:	
A, B	ISO js14
C	± 0.8
D	ISO k6 < Ø 50mm
	ISO m6 > Ø 50mm
F	ISO h9
H	-0,5
N	ISO j6

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.

Motors in brief
M3AA Non-sparking motors

Motor size		90	100	112	132	160	180	200	225	250	280
Stator and end shields	Material	Die-cast aluminum alloy						Extruded aluminum alloy			
	Paint colour shade	Minsell blue 8B 4.5/3.25									
	Corrosion class	C3 medium accrding ISO/EN 12944-5									
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	6316/C3 [1]
	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	6213/C3
Axially-locked bearings		Locked at D-end									
Bearing seal	D-end	Gamma seal				V-ring					
	N-end	Gamma seal				V-ring					
Lubrication		Permanently lubricated shielded bearing									Regreasable
Measuring nipples for condition monitoring of the bearings	Material	Optional									
Rating plate	Material	Aluminum									
Terminal box	Frame and cover	Die-cast aluminum alloy, integrated in stator						Deep-drawn steel sheet, bolted on stator			
	Openings	2x (M25+M20)				(2x M40 + M16) + (2x M40)		2x M40 + M16			2x M63 + M16
	Terminals	6 terminals									
Fan	Material	Polypropylene				Glass fibre reinforced polypropylene					
Fan cover	Material	Steel									
Stator winding	Material	Copper									
	Insulation	Insulation class F									
	Winding protection	Optional				3 PCS PTC Thermistors					
Rotor winding	Material	Die cast aluminum									
Balancing method		Half key balancing									
Key way		Closed key way									
Drain holes		Drain holes with closable plastic plugs, open on delivery									
Enclosure		IP55									
Cooling method		IC411									

[1] 6315/C3 for 2-pole motors

Dust ignition protection cast iron motors / Protection by enclosure Ex t IIIB/IIIC T125 °C, Db/Dc

Totally enclosed squirrel cage three phase low voltage motors, Sizes 71 to 400, 0.25 to 1000 kW

Ordering information

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

Example	
Motor type	M3GP 160 MLA
Pole number	2
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	11 kW
Product code	3GGP161410-ADD
Variant codes if needed	

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 - 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-frame

06	63
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
5:	10 poles

Positions 8 to 10

Serial number

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.

Explanation of technical data pages:

The two bullets in the product code indicate choice of mounting arrangements, voltage and frequency code (see ordering information page).

Efficiency values are given according to IEC 60034-2-1; 2007. Please note that the values are not comparable without knowing the testing method. ABB has calculated the efficiency values according to indirect method, stray load losses (additional losses) determined from measuring.

I_s / I_N = Starting current
T_l / T_N = Locked rotor torque
T_b / T_N = Pull-out torque

Rating plates

The rating plates are in table form giving values for speed, current and power factor for three voltages for cast iron motors: 400V-415V-690V as standard. Other voltage and frequency combinations are possible and can be ordered with variant codes 002 or 209. Please see Variant code section.

The following information will be shown on the motor rating plate:

- Lowest nominal efficiency at 100 %, 75 % and 50 % rated load
- Efficiency level
- Year of manufacture
- Type of protection
- Apparatus group
- Temperature class
- Identification number of the certification body
- Certificate number: for cast iron motors both ATEX and IECEx are stamped on the rating plate as standard.

ABB Oy, Motors and Generators
Vaasa, Finland

CE 0081 IE2 IEC60034-1 Ex II 2D

3~ Motor		M3GP 180MLB 6 IMB3/IM1001					2016
Ex tb III B T125C Db							
1130309-2							
No. 3G1F1601303810						Ins. cl. F	IP 65
V		Hz	kW	r/min	A	cos φ	Duty
690	Y	50	15	973	16.9	0.82	S1
400	D	50	15	973	29.7	0.82	S1
415	D	50	15	975	29.3	0.80	S1
IE2-90.5%(100%)-91.0%(75%)-90.5%(50%)							
Product code 3GGP183420-ADD334435							
LCIE 13 ATEX 3067 X / IECEx LCIE 13.0047X							
Manual: 3GZF500730-47							
6310/C3 6209/C3							240 kg

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE2 cast iron motors

IP 65/55 - IC 411 - Insulation class F, temperature rise class B
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2-poles		400 V 50 Hz						CENELEC-design							
0.37	M3GP 71MA 2	3GGP071321-••B	2768	74.8	75.4	72.4	0.78	0.89	4.5	1.27	2.2	2.3	0.00039	11	58
0.55	M3GP 71MB 2	3GGP071322-••B	2813	77.8	78.3	76.0	0.79	1.29	4.3	1.86	2.4	2.5	0.00051	11	56
0.75	M3GP 80MB 2	3GGP081322-••B	2895	80.6	79.6	75.6	0.74	1.8	7.7	2.4	4.2	4.2	0.001	16	57
1.1	M3GP 80MC 2	3GGP081323-••B	2870	81.8	81.7	79.0	0.80	2.48	7.5	3.6	3.7	4.6	0.0012	18	60
1.5	M3GP 90SLB 2	3GGP091322-••B	2900	82.2	82.9	81.3	0.89	2.94	7.5	4.9	2.5	2.6	0.00254	24	69
2.2	M3GP 90SLC 2	3GGP091323-••B	2885	84.7	86.8	85.7	0.88	4.2	6.8	7.2	1.9	2.5	0.0028	25	64
3	M3GP 100LB 2	3GGP101322-••B	2925	85.2	84.9	82.7	0.87	5.75	9.1	9.7	3.1	3.5	0.0053	36	68
4	M3GP 112MB 2	3GGP111322-••B	2895	86.1	87.0	86.6	0.89	7.52	8.7	13.08	3.3	3.5	0.00575	37	70
5.5	M3GP 132SMB 2	3GGP131322-••B	2865	87.7	88.4	87.7	0.86	10	7.0	18.3	2.6	2.7	0.0128	68	70
7.5	M3GP 132SMC 2	3GGP131324-••B	2890	88.2	88.5	87.5	0.88	13.7	8.3	24.7	2.6	3.6	0.0136	70	70
11	M3GP 160MLA 2	3GGP161410-••D	2931	90.1	90.4	89.3	0.89	20.2	6.7	35.81	2.5	3.2	0.043	139	71
15	M3GP 160MLB 2	3GGP161420-••D	2929	91.2	91.7	90.8	0.89	27	7.2	48.9	2.9	3.4	0.052	149	71
18.5	M3GP 160MLC 2	3GGP161430-••D	2934	91.6	92.4	92.3	0.90	32.4	7.4	60.3	3.1	3.5	0.062	159	69
22	M3GP 180MLA 2	3GGP181410-••D	2938	91.7	92.3	91.8	0.90	39.1	7.0	71.4	2.5	3.2	0.089	199	69
30	M3GP 200MLA 2	3GGP201410-••D	2956	93.2	93.6	93.0	0.88	52.7	7.4	96.9	3.0	3.2	0.15	275	74
37	M3GP 200MLC 2	3GGP201430-••D	2954	93.6	94.0	93.4	0.89	64.7	7.5	119.9	2.8	3.2	0.19	304	75
45	M3GP 225SMB 2	3GGP221220-••D	2968	93.8	93.9	93.0	0.87	78.8	7.2	144	2.7	3.0	0.26	357	76
55	M3GP 250SMA 2	3GGP251210-••D	2975	94.3	94.2	93.2	0.89	95.1	7.8	176	2.4	3.1	0.49	445	75
75 [3]	M3GP 280SMA 2	3GGP281210-••G	2977	94.3	93.8	92.2	0.88	131	7.6	240	2.1	3.0	0.8	625	77
90 [3]	M3GP 280SMB 2	3GGP281220-••G	2976	94.6	94.7	93.8	0.89	154	7.4	288	2.1	2.9	0.9	665	77
110 [3]	M3GP 315SMA 2	3GGP311210-••G	2982	94.9	94.4	92.9	0.86	197	7.4	352	2.2	3.2	1.2	880	78
132 [3]	M3GP 315SMB 2	3GGP311220-••G	2982	95.1	94.8	93.6	0.88	227	7.4	422	2.2	3.0	1.4	940	78
160 [3]	M3GP 315SMC 2	3GGP311230-••G	2981	95.4	95.2	94.2	0.89	271	7.5	512	2.3	3.0	1.7	1025	78
200 [3]	M3GP 315MLA 2	3GGP311410-••G	2980	95.7	95.7	94.9	0.90	335	7.7	640	2.6	3.0	2.1	1190	78
250 [3]	M3GP 355SMA 2	3GGP351210-••G	2984	95.7	95.5	94.5	0.89	423	7.7	800	2.1	3.3	3.0	1600	83
315 [3]	M3GP 355SMB 2	3GGP351220-••G	2980	95.7	95.6	95.0	0.89	531	7.0	1009	2.1	3.0	3.4	1680	83
355 [3]	M3GP 355SMC 2	3GGP351230-••G	2984	95.7	95.7	94.9	0.88	603	7.2	1136	2.2	3.0	3.6	1750	83
400 [3]	M3GP 355MLA 2	3GGP351410-••G	2982	96.9	96.6	95.9	0.88	677	7.1	1280	2.3	2.9	4.1	2000	83
450 [3]	M3GP 355MLB 2	3GGP351420-••G	2983	97.1	97.0	96.4	0.90	743	7.9	1440	2.2	2.9	4.3	2080	83
500 [3]	M3GP 355LKA 2	3GGP351810-••G	2982	96.9	96.9	96.5	0.90	827	7.5	1601	2.0	3.9	4.8	2320	83
560 [3]	M3GP 355LKB 2	3GGP351820-••G	2983	97.0	97.0	96.5	0.90	925	8.0	1792	2.2	4.1	5.2	2460	83
560 [2]	M3GP 400LA 2	3GGP401510-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	2950	82
560 [2]	M3GP 400LKA 2	3GGP401810-••G	2988	97.2	97.2	96.6	0.89	934	7.8	1789	2.5	3.7	7.9	2950	82
630 [2]	M3GP 400LB 2	3GGP401520-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3050	82
630 [2]	M3GP 400LKB 2	3GGP401820-••G	2987	97.4	97.2	96.7	0.89	1049	7.6	2014	2.6	3.7	8.2	3050	82
710 [2]	M3GP 400LC 2	3GGP401530-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3300	82
710 [2]	M3GP 400LKC 2	3GGP401830-••G	2987	97.5	97.4	96.9	0.89	1178	7.2	2270	2.6	3.4	9.3	3300	82
3000 r/min = 2-poles		400 V 50 Hz						High-output design							
22 [1]	M3GP 160MLD 2	3GGP161440-••D	2929	91.2	91.9	91.4	0.90	38.3	7.5	71.7	3.1	3.3	0.07	166	77
30	M3GP 180MLB 2	3GGP181420-••D	2943	92.5	93.2	92.6	0.90	52.2	7.1	97.23	2.3	3.2	0.13	236	78
37	M3GP 180MLC 2	3GGP181430-••D	2950	92.8	93.1	92.8	0.90	64.9	8.1	119.9	3.3	3.7	0.13	237	77
45	M3GP 200MLE 2	3GGP201450-••D	2944	93.3	93.6	93.0	0.88	79.1	7.3	145	2.9	3.1	0.22	312	79
55	M3GP 225SMC 2	3GGP221230-••D	2965	93.9	94.2	93.5	0.88	95.8	7.1	177	2.6	3.0	0.29	377	80
67	M3GP 225SMD 2	3GGP221240-••D	2966	93.9	93.9	93.0	0.86	120	7.4	215	2.8	3.2	0.31	388	78
75	M3GP 250SMB 2	3GGP251220-••D	2969	93.8	93.9	93.2	0.89	129	7.9	241	2.6	3.1	0.57	487	80
90	M3GP 250SMC 2	3GGP251230-••D	2965	94.4	94.5	93.9	0.89	153	7.7	289	2.5	3.0	0.59	500	80
110 [3]	M3GP 280SMC 2	3GGP281230-••G	2978	95.1	95.1	94.5	0.90	186	7.9	352	2.4	3.0	1.15	725	77
132 [3]	M3GP 280MLA 2	3GGP281410-••G	2977	95.3	95.3	94.8	0.90	221	7.5	423	2.5	3.0	1.4	840	81
160	M3GP 280MLB 2	3GGP281420-••G	2976	95.5	95.7	95.3	0.91	265	7.6	513	2.8	3.0	1.55	890	81

[1] Efficiency class IE1

[2] Unidirectional fan construction as standard. Direction of rotation must be stated when ordering, see variant codes 044 and 045

[3] -3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering, see variant codes 044 and 045

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE2 cast iron motors

IP 65/55 - IC 411 - Insulation class F, temperature rise class B
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	I_s/I_N	Torque T_N N_m	T_l/T_N	T_b/T_N	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4-poles		400 V 50 Hz						CENELEC-design							
0.25 [1]	M3GP 71MA 4	3GGP072321-••B	1365	68.3	70.7	69.6	0.81	0.64	3.5	1.74	1.9	2.0	0.00074	10	45
0.37 [1]	M3GP 71MB 4	3GGP072322-••B	1380	72.4	74.5	74.7	0.83	0.87	4.6	2.5	1.6	2.1	0.00088	11	45
0.55 [1]	M3GP 80MA 4	3GGP082321-••B	1415	70.0	69.2	64.7	0.73	1.44	5.6	3.7	2.0	2.8	0.00144	15	45
0.75	M3GP 80MD 4	3GGP082324-••B	1430	81.0	81.0	78.2	0.73	1.82	5.3	5	2.7	3.2	0.00205	17	50
1.1	M3GP 90SLB 4	3GGP092322-••B	1435	83.6	84.1	82.4	0.80	2.36	6.5	7.3	2.4	3.4	0.0044	25	50
1.5	M3GP 90SLD 4	3GGP092325-••B	1430	84.3	85.1	83.9	0.82	3	6.3	10	2.7	3.4	0.0053	27	56
2.2	M3GP 100LC 4	3GGP102323-••B	1450	85.9	85.1	83.4	0.78	4.6	7.7	14.5	2.7	4.1	0.00948	36	56
3	M3GP 100LD 4	3GGP102324-••B	1450	86.8	86.9	85.3	0.79	6.1	7.7	19.8	2.9	3.4	0.011	38	58
4	M3GP 112MB 4	3GGP112322-••B	1440	86.8	87.7	87.4	0.82	7.94	7.0	26.5	2.5	2.9	0.0125	44	59
5.5	M3GP 132SMB 4	3GGP132322-••B	1460	89.0	89.8	88.9	0.80	10.8	6.7	36	2.2	3.2	0.0328	70	67
7.5	M3GP 132SMC 4	3GGP132323-••B	1450	89.3	90.1	90.0	0.81	14.5	7.2	49.4	2.5	3.5	0.0366	73	64
11	M3GP 160MLC 4	3GGP162430-••D	1470	91.2	91.3	90.0	0.82	21.5	8.0	71.5	3.3	3.8	0.096	160	62
15	M3GP 160MLE 4	3GGP162450-••D	1467	92.0	92.3	91.8	0.84	28.5	8.0	97.7	3.3	3.2	0.13	183	61
18.5	M3GP 180MLA 4	3GGP182410-••D	1474	91.6	92.1	91.5	0.83	35.7	7.2	119.9	2.6	3.1	0.19	213	62
22	M3GP 180MLB 4	3GGP182420-••D	1474	92.2	92.5	91.9	0.82	42	7.7	142.3	2.8	3.4	0.23	232	62
30	M3GP 200MLB 4	3GGP202420-••D	1471	92.5	93.2	93.1	0.84	55	7.4	194	3.0	2.8	0.34	306	61
37	M3GP 225SMB 4	3GGP222220-••D	1480	93.6	93.9	93.4	0.85	69	7.6	239	3.2	2.9	0.42	347	67
45	M3GP 225SMC 4	3GGP222230-••D	1477	94.1	94.4	94.3	0.86	78.4	7.6	291	3.2	2.7	0.49	379	67
55	M3GP 250SMA 4	3GGP252210-••D	1479	94.3	94.3	93.6	0.84	100	7.2	355	2.5	3.1	0.72	436	66
75	M3GP 280SMA 4	3GGP282210-••G	1484	94.5	94.7	94.4	0.85	134	6.9	482	2.5	2.8	1.25	625	68
90	M3GP 280SMB 4	3GGP282220-••G	1483	94.7	95.0	94.5	0.85	160	7.2	579	2.5	2.7	1.5	665	68
110	M3GP 315SMA 4	3GGP312210-••G	1487	95.1	95.1	94.3	0.86	194	7.2	706	2.3	2.8	2.3	900	70
132	M3GP 315SMB 4	3GGP312220-••G	1487	95.4	95.4	94.7	0.86	232	7.1	847	2.3	2.7	2.6	960	70
160	M3GP 315SMC 4	3GGP312230-••G	1487	95.3	95.3	94.8	0.85	284	7.2	1027	2.4	2.9	2.9	1000	70
200	M3GP 315MLA 4	3GGP312410-••G	1486	95.6	95.8	95.5	0.86	351	7.2	1285	2.5	2.9	3.5	1160	70
250	M3GP 355SMA 4	3GGP352210-••G	1488	95.9	96.0	95.5	0.85	442	7.1	1604	2.3	2.7	5.9	1610	74
315	M3GP 355SMB 4	3GGP352220-••G	1488	95.9	96.2	95.8	0.86	550	7.3	2021	2.3	2.8	6.9	1780	74
350 [4]	M3GP 355SMC 4	3GGP352230-••G	1487	95.9	95.9	95.7	0.86	612	6.9	2247	2.4	2.7	7.2	1820	78
400 [4]	M3GP 355MLA 4	3GGP352410-••G	1489	96.3	96.3	95.9	0.85	705	6.8	2565	2.3	2.6	8.4	2140	78
450 [4]	M3GP 355MLB 4	3GGP352420-••G	1490	96.8	96.8	96.3	0.86	784	6.9	2884	2.3	2.9	8.4	2140	78
500	M3GP 355LKA 4	3GGP352810-••G	1490	97.0	97.0	96.5	0.86	865	6.8	3204	2.0	3.0	10	2500	78
560 [3]	M3GP 400LA 4	3GGP402510-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3200	78
560 [3]	M3GP 400LKA 4	3GGP402810-••G	1491	96.8	96.8	96.3	0.85	982	7.4	3586	2.4	2.8	15	3200	78
630 [4]	M3GP 400LB 4	3GGP402520-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3300	78
630 [4]	M3GP 400LKB 4	3GGP402820-••G	1491	97.0	97.0	96.5	0.87	1077	7.6	4034	2.2	2.9	16	3300	78
710 [3]	M3GP 400LC 4	3GGP402530-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3400	78
710 [3]	M3GP 400LKC 4	3GGP402830-••G	1491	97.1	97.1	96.7	0.86	1227	7.6	4547	2.4	3.0	17	3400	78
800	M3GP 450LA 4	3GGP452510-••G	1491	96.9	96.9	96.4	0.86	1396	7.0	5121	1.3	2.8	23	4050	85
900	M3GP 450LB 4	3GGP452520-••G	1492	97.1	97.0	96.5	0.86	1573	7.0	5761	1.3	2.8	25	4350	85
1000 [2]	M3GP 450LC 4	3GGP452530-••G	1491	97.2	97.2	96.7	0.86	1724	6.8	6404	1.3	2.7	30	4700	85
1500 r/min = 4-poles		400 V 50 Hz						High-output design							
18.5	M3GP 160MLF 4	3GGP162460-••H	2929	91.2	91.9	91.4	0.90	38.3	7.5	71.7	3.1	3.3	0.07	166	77
22 [1]	M3GP 160MLG 4	3GGP162470-••H	2943	92.5	93.2	92.6	0.90	52.2	7.1	97.23	2.3	3.2	0.13	236	78
30 [1]	M3GP 180MLC 4	3GGP182430-••H	2950	92.8	93.1	92.8	0.90	64.9	8.1	119.9	3.3	3.7	0.13	237	77
37	M3GP 200MLC 4	3GGP202430-••G	2944	93.3	93.6	93.0	0.88	79.1	7.3	145	2.9	3.1	0.22	312	79
55	M3GP 225SMD 4	3GGP222240-••D	2965	93.9	94.2	93.5	0.88	95.8	7.1	177	2.6	3.0	0.29	377	80
60 [1]	M3GP 225SME 4	3GGP222250-••D	2966	93.9	93.9	93.0	0.86	120	7.4	215	2.8	3.2	0.31	388	78
75	M3GP 250SMB 4	3GGP252220-••D	2969	93.8	93.9	93.2	0.89	129	7.9	241	2.6	3.1	0.57	487	80
86 [1]	M3GP 250SMC 4	3GGP252230-••D	2965	94.4	94.5	93.9	0.89	153	7.7	289	2.5	3.0	0.59	500	80
110	M3GP 280SMC 4	3GGP282230-••G	2978	95.1	95.1	94.5	0.90	186	7.9	352	2.4	3.0	1.15	725	77
132	M3GP 280MLA 4	3GGP282410-••G	2977	95.3	95.3	94.8	0.90	221	7.5	423	2.5	3.0	1.4	840	81

[1] Efficiency class IE1
[2] Temperature rise class F
[3] Temp. Rise class F, For 400-415 V 50 Hz (380 V 50 Hz voltage code B)
[4] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE2 cast iron motors

IP 65/55 - IC 411 - Insulation class F, temperature rise class B
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6-poles		400 V 50 Hz						CENELEC-design							
0.18	M3GP 71MA 6	3GGP073321-••B	900	63.7	63.8	59.0	0.71	0.57	3.1	1.91	2.0	2.1	0.00089	10	42
0.25	M3GP 71MB 6	3GGP073322-••B	915	67.2	65.5	59.5	0.69	0.77	3.7	2.6	2.6	2.7	0.0011	12	42
0.37	M3GP 80MA 6	3GGP083321-••B	925	71.0	70.0	65.0	0.69	1.09	4.1	3.8	2.4	2.5	0.00187	15	47
0.55	M3GP 80MB 6	3GGP083322-••B	920	73.1	74.2	71.9	0.71	1.51	3.8	5.7	1.8	2.2	0.00239	17	47
0.75	M3GP 90SLC 6	3GGP093323-••B	960	78.7	77.2	72.5	0.58	2.3	4.5	7.4	2.4	3.1	0.00491	25	44
1.1	M3GP 90SLE 6	3GGP093324-••B	930	78.2	78.7	76.5	0.66	3	4.0	11.2	1.9	2.3	0.0054	28	44
1.5	M3GP 100L 6	3GGP103322-••B	950	82.2	83.0	81.6	0.69	3.7	4.3	15	1.5	2.7	0.00873	37	49
2.2	M3GP 112MB 6	3GGP113322-••B	950	82.5	83.7	81.6	0.71	5.5	4.4	22.1	1.7	2.3	0.0125	44	66
3	M3GP 132SMB 6	3GGP133321-••B	975	85.3	84.2	81.2	0.63	8	5.5	29.4	1.8	2.9	0.0334	69	57
4	M3GP 132SMC 6	3GGP133322-••B	960	84.9	85.3	83.9	0.68	10	4.6	39.7	1.5	2.2	0.0334	69	57
5.5	M3GP 132SMF 6	3GGP133324-••B	965	86.1	86.5	85.4	0.71	12.9	5.1	54.4	2.0	2.3	0.0487	86	57
7.5	M3GP 160MLA 6	3GGP163410-••D	965	87.6	88.6	88.3	0.78	15.8	6.4	74.2	1.7	2.9	0.126	181	65
11	M3GP 160MLB 6	3GGP163420-••D	972	90.1	91.0	90.4	0.81	22.1	6.9	108	2.4	3.5	0.126	181	65
15	M3GP 180MLB 6	3GGP183420-••D	973	90.5	91.0	90.5	0.82	29.7	6.8	147.3	1.8	3.0	0.25	240	58
18.5	M3GP 200MLA 6	3GGP203410-••D	983	90.5	90.9	90.2	0.82	36.2	7.1	179	3.2	3.1	0.37	266	66
22	M3GP 200MLB 6	3GGP203420-••D	983	91.6	92.0	91.5	0.82	42.8	7.5	213	3.2	3.2	0.43	283	61
30	M3GP 225SMB 6	3GGP223220-••D	985	92.2	92.7	92.4	0.82	57.9	7.4	290	3.4	3.0	0.64	344	61
37	M3GP 250SMA 6	3GGP253210-••D	990	93.2	93.7	93.1	0.81	70.6	6.5	357	2.4	3.1	1.16	440	66
45	M3GP 280SMA 6	3GGP283210-••G	990	93.4	93.8	93.5	0.83	83.8	7.0	434	2.5	2.5	1.85	605	66
55	M3GP 280SMB 6	3GGP283220-••G	990	93.8	94.2	93.9	0.84	100	7.0	530	2.7	2.6	2.2	645	66
75	M3GP 315SMA 6	3GGP313210-••G	992	94.4	94.4	93.5	0.82	139	7.4	721	2.4	2.8	3.2	830	70
90	M3GP 315SMB 6	3GGP313220-••G	992	94.8	94.7	94.1	0.84	166	7.5	866	2.4	2.8	4.1	930	70
110	M3GP 315SMC 6	3GGP313230-••G	991	95.0	95.0	94.6	0.83	201	7.4	1059	2.5	2.9	4.9	1000	70
132	M3GP 315MLA 6	3GGP313410-••G	991	95.3	95.4	94.9	0.83	240	7.5	1271	2.7	3.0	5.8	1150	68
160	M3GP 355SMA 6	3GGP353210-••G	993	95.4	95.6	95.2	0.83	291	7.0	1538	2.0	2.6	7.9	1520	75
200	M3GP 355SMB 6	3GGP353220-••G	993	95.7	95.9	95.7	0.83	364	7.2	1923	2.2	2.7	9.7	1680	75
250	M3GP 355SMC 6	3GGP353230-••G	993	95.7	95.8	95.4	0.82	460	7.4	2404	2.6	2.9	11.3	1820	75
315	M3GP 355MLB 6	3GGP353420-••G	992	95.7	96.0	95.5	0.83	570	7.0	3032	2.5	2.7	13.5	2180	75
355	M3GP 355LKA 6	3GGP353810-••G	992	95.7	95.9	95.4	0.81	658	7.6	3417	2.7	2.9	15.5	2500	75
400 [3]	M3GP 400LA 6	3GGP403510-••G	993	96.2	96.3	95.8	0.82	730	7.1	3846	2.3	2.7	17	2900	76
400 [3]	M3GP 400LKA 6	3GGP403810-••G	993	96.2	96.3	95.8	0.82	730	7.1	3846	2.3	2.7	17	2900	76
450 [3]	M3GP 400LB 6	3GGP403520-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3150	76
450 [3]	M3GP 400LKB 6	3GGP403820-••G	994	96.6	96.6	96.1	0.82	819	7.4	4323	2.4	2.8	20.5	3150	76
500 [3]	M3GP 400LC 6	3GGP403530-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3300	76
500 [3]	M3GP 400LKC 6	3GGP403830-••G	993	96.6	96.5	96.1	0.83	891	7.2	4809	2.5	2.7	22	3300	76
560 [3]	M3GP 400LD 6	3GGP403540-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3400	77
560	M3GP 400LKD 6	3GGP403840-••G	993	96.9	96.9	96.4	0.85	984	7.4	5386	2.4	2.8	24	3400	77
630	M3GP 450LA 6	3GGP453510-••G	994	96.7	96.7	96.3	0.84	1127	6.5	6053	1.1	2.5	31	4150	81
710	M3GP 450LB 6	3GGP453520-••G	995	96.9	97.0	96.5	0.85	1244	7.0	6814	1.3	2.5	37	4500	81
800 [2]	M3GP 450LC 6	3GGP453530-••G	995	96.9	96.9	96.4	0.84	1415	7.2	7677	1.3	2.7	41	4800	81
1000 r/min = 6-poles		400 V 50 Hz						High-output design							
14 [1]	M3GP 160MLC 6	3GGP163430-••D	969	89.2	89.5	88.5	0.75	30.1	7.5	138	2.8	4.0	0.126	181	64
18.5 [1] [2]	M3GP 180MLC 6	3GGP183430-••D	971	90.1	90.1	88.5	0.74	41.2	7.3	181.2	2.5	3.7	0.25	240	61
30 [1]	M3GP 200MLC 6	3GGP203430-••D	983	90.6	90.8	89.6	0.81	59.3	7.5	291	3.5	3.4	0.49	302	65
37 [1]	M3GP 225SMC 6	3GGP223230-••D	983	91.8	92.1	92.2	0.83	69.6	7.1	359	3.0	2.8	0.75	371	64
45	M3GP 250SMB 6	3GGP253220-••D	986	93.1	93.4	93.2	0.84	84	7.2	435	3.3	2.8	1.49	487	65
75	M3GP 280SMC 6	3GGP283230-••G	990	94.2	94.7	94.5	0.84	137	7.3	723	2.8	2.7	2.85	725	66
90	M3GP 280MLA 6	3GGP283410-••G	990	94.1	94.3	93.7	0.81	170	7.1	868	2.4	2.5	3.1	840	70

[1] Efficiency class IE1
[2] Temperature rise class F
[3] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE2 cast iron motors

IP 65/55 - IC 411 - Insulation class F, temperature rise class B
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8-poles		400 V 50 Hz						CENELEC-design							
0.09	M3GP 71MA 8	3GGP074101-••B	660	49.4	46.3	39.6	0.6	0.44	2.7	1.3	2	2.5	0.00089	11	40
0.12	M3GP 71MB 8	3GGP074102-••B	670	51.4	47.5	39.9	0.56	0.6	2.7	1.7	2	2.5	0.0011	12	43
0.18	M3GP 80MA 8	3GGP084101-••B	700	57.4	53.7	46.1	0.62	0.78	3.2	2.5	2.1	2.8	0.00187	15	45
0.25	M3GP 80MB 8	3GGP084102-••B	680	61.5	61.3	53.5	0.65	0.94	3.1	3.5	1.9	2.6	0.00239	17	50
0.37	M3GP 90SLB 8	3GGP094102-••B	705	66.3	64	57	0.54	1.47	2.8	5	1.9	2.5	0.00444	24	50
0.55	M3GP 90SLC 8	3GGP094103-••B	655	61.8	65.6	65.2	0.67	1.92	2.6	8	1.4	1.9	0.00491	25	53
0.75	M3GP 100LA 8	3GGP104101-••B	710	74	72.3	67.1	0.61	2.48	3.7	10.1	1.8	2.6	0.0072	30	46
1.1	M3GP 100LB 8	3GGP104102-••B	695	76	76.4	74.5	0.66	3.12	3.6	15.1	1.6	2.3	0.00871	30	53
1.5	M3GP 112M 8	3GGP114101-••B	690	74.4	75.9	74.1	0.74	4.11	3.5	20.9	1.9	2.6	0.0106	39	55
2.2	M3GP 132SMA 8	3GGP134101-••B	715	79.7	79.5	77.1	0.66	6.51	4.7	29.2	1.6	2.8	0.0334	70	56
3 [1]	M3GP 132SMB 8	3GGP134102-••B	715	79.9	79.7	76.6	0.64	8.5	4.7	39.7	1.7	2.8	0.04	75	58
4	M3GP 160MLA 8	3GGP164410-••D	722	83.3	84.7	84.2	0.7	10.3	4.7	52.9	1.6	2.6	0.133	181	59
5.5	M3GP 160MLB 8	3GGP164420-••D	723	86.8	87.2	86	0.71	13.5	5.8	72.7	1.9	3.1	0.133	182	53
7.5 [3]	M3GP 160MLC 8	3GGP164430-••H	718	82	84	84	0.7	19.3	5.7	99.8	2.1	2.9	0.133	245	55
11	M3GP 180MLB 8	3GGP184420-••H	723	88.3	89.2	88.7	0.72	25.5	5.6	145	2	3	0.245	292	63
15	M3GP 200MLA 8	3GGP204410-••G	734	89.9	90.4	89.5	0.79	30.6	6.9	195	2.4	3.2	0.45	280	56
18.5	M3GP 225SMA 8	3GGP224210-••D	734	90	90.7	90.2	0.74	39.2	6.1	240	2.2	3	0.61	326	55
22	M3GP 225SMB 8	3GGP224220-••D	732	90.6	91.4	91.2	0.81	45.3	6.5	287	1.9	2.9	0.68	343	56
30	M3GP 250SMA 8	3GGP254210-••D	735	91.6	91	90.5	0.78	60.7	6.7	389	2	2.9	1.25	440	56
37	M3GP 280SMA 8	3GGP284210-••G	741	91.7	92	91.2	0.79	72.6	7.3	476	1.7	3	1.85	605	65
45	M3GP 280SMB 8	3GGP284220-••G	741	92.1	92.3	91.7	0.78	89.2	7.6	579	1.8	3.1	2.2	645	65
55	M3GP 315SMA 8	3GGP314210-••G	742	92.4	93	92.4	0.79	106	7.1	707	1.6	2.7	3.2	830	62
75	M3GP 315SMB 8	3GGP314220-••G	741	93	93.2	93	0.82	146	7.1	966	1.7	2.7	4.1	930	62
90	M3GP 315SMC 8	3GGP314230-••G	741	93.3	93.7	93.3	0.82	170	7.4	1159	1.8	2.7	4.9	1000	64
110	M3GP 315MLA 8	3GGP314410-••G	740	93.6	93.9	94	0.83	211	7.3	1419	1.8	2.7	5.8	1150	72
132	M3GP 355SMA 8	3GGP354210-••G	744	93.9	93.8	93.3	0.8	256	7.5	1694	1.5	2.6	7.9	1520	69
160	M3GP 355SMB 8	3GGP354220-••G	744	94.3	94.3	93.8	0.77	293	7.6	1926	1.6	2.6	9.7	1680	69
200	M3GP 355SMC 8	3GGP354230-••G	742	94.5	95	94.8	0.79	385	7.4	2576	1.6	2.6	11.3	1820	69
250 [4]	M3GP 355MLB 8	3GGP354420-••G	743	95.4	95.5	95	0.8	476	7.5	3213	1.6	2.7	13.5	2180	72
315 [4]	M3GP 400LA 8	3GGP404510-••G	744	96.1	96	95.6	0.81	592	7	4043	1.2	2.6	17	2900	71
315 [4]	M3GP 400LKA 8	3GGP404810-••G	744	96.1	96	95.6	0.81	592	7	4043	1.2	2.6	17	2900	71
355 [4]	M3GP 400LB 8	3GGP404520-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3200	71
355 [4]	M3GP 400LKB 8	3GGP404820-••G	743	96.2	96.3	96.1	0.83	641	6.8	4562	1.2	2.5	21	3200	71
400 [4]	M3GP 400LC 8	3GGP404530-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3400	71
400 [4]	M3GP 400LKC 8	3GGP404830-••G	744	96.3	96.4	96.1	0.82	735	7.4	5134	1.3	2.7	24	3400	71
450	M3GP 450LA 8	3GGP454510-••G	744	96.2	96.5	96.2	0.83	813	6	5775	1	2.5	26	3750	80
500	M3GP 450LB 8	3GGP454520-••G	744	96.3	96.4	96.2	0.83	902	6.4	6417	1	2.6	29	4000	80
560	M3GP 450LC 8	3GGP454530-••G	744	96.4	96.5	96.1	0.82	1038	7	7188	1.2	2.9	35	4350	80
630 [2]	M3GP 450LD 8	3GGP454540-••G	745	96.6	96.7	96.2	0.81	1162	7.6	8075	1.3	3.2	41	4800	80
750 r/min = 8-poles		400 V 50 Hz						High-output design							
18.5	M3GP 200MLB 8	3GGP204420-••G	734	89.2	89.8	88.8	0.8	37.1	6.9	240	2.2	3.2	0.54	300	57
30	M3GP 225SMC 8	3GGP224230-••D	731	90.7	91.6	91.6	0.78	61.2	6.3	391	2.3	3	0.75	369	59
37	M3GP 250SMB 8	3GGP254220-••D	737	92.2	92.9	92.5	0.79	73	7.5	479	2.3	3.4	1.52	487	59
55	M3GP 280SMC 8	3GGP284230-••G	741	93.4	93.7	93.6	0.8	107	7.9	708	1.9	3.1	2.85	725	65

[1] Efficiency class IE1
[2] Temperature rise class F
[3] IE0, Temperature rise class F
[4] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2-poles		400 V 50 Hz						CENELEC-design							
0.37	M3GP 71MC 2	3GGP071330-••L	2743	73.8	74.4	71.7	0.8	0.94	4.9	1.26	2.3	2.8	0.00088	10	58
0.55	M3GP 71ME 2	3GGP071350-••L	2755	77.8	79.3	78.4	0.8	1.25	6.8	1.9	2.8	3.1	0.00045	11	56
0.75	M3GP 80MC 2	3GGP081330-••L	2879	80.7	81.0	78.8	0.8	1.6	7.2	2.5	3.4	4.2	0.001	17	57
1.1	M3GP 80ME 2	3GGP081350-••L	2865	82.7	83.8	83.1	0.8	2.3	7.2	3.7	3.5	4.1	0.0012	18	60
1.5	M3GP 90SLA 2	3GGP091010-••L	2901	84.2	84.8	83.8	0.9	2.9	7.7	4.93	2.1	3.5	0.0028	27	69
2.2	M3GP 90LA 2	3GGP091510-••L	2904	85.9	86.3	84.8	0.9	4.2	8.8	7.2	3.1	3.8	0.0036	30	64
3	M3GP 100MLA 2	3GGP101410-••L	2895	87.1	87.9	87.3	0.9	5.4	8.2	9.9	3.3	3.9	0.0013	42	68
4	M3GP 112ME 2	3GGP111350-••L	2882	88.1	89.9	90.9	0.9	6.9	8.3	13	2.9	3.7	0.0139	56	70
5.5	M3GP 132SMC 2	3GGP131230-••L	2908	89.2	89.5	88.5	0.9	9.8	7.6	18	2.3	3.8	0.0182	69	70
7.5	M3GP 132SME 2	3GGP131250-••L	2916	90.1	90.5	90.1	0.9	13.3	8.4	24.6	2.5	4.3	0.0203	75	70
11	M3GP 160MLA 2	3GGP161410-••L	2943	91.2	92.0	91.6	0.9	19.1	7.2	35.57	2.6	3.6	0.057	144	69
15	M3GP 160MLB 2	3GGP161420-••L	2947	91.9	92.2	91.8	0.9	26.5	8.2	48.49	3.2	4.2	0.063	152	69
18.5	M3GP 160MLC 2	3GGP161430-••L	2949	92.4	93.0	92.6	0.9	32	9.0	59.81	3.3	3.9	0.076	164	73
22	M3GP 180MLA 2	3GGP181410-••L	2956	92.7	93.1	92.7	0.9	37.7	7.8	70.98	3.4	3.8	0.11	205	73
30	M3GP 200MLA 2	3GGP201410-••L	2957	93.3	93.8	93.6	0.9	52.4	7.5	96.92	2.5	3.1	0.182	263	73
37	M3GP 200MLB 2	3GGP201420-••L	2960	93.7	94.2	94.1	0.9	64.2	8.2	119.5	3.1	3.4	0.222	289	73
45	M3GP 225SMA 2	3GGP221210-••L	2968	94.0	94.0	93.0	0.9	79.6	7.3	144.8	3.2	3.1	0.296	335	76
55	M3GP 250SMA 2	3GGP251210-••L	2968	94.3	93.7	93.6	0.9	94.8	6.8	177	2.4	3.0	0.426	400	76
75	M3GP 280SMB 2	3GGP281220-••L	2978	94.7	94.4	93.5	0.9	130	7.0	240	2.3	3.0	0.9	665	74
90	M3GP 280SMC 2	3GGP281230-••L	2975	95.0	95.0	94.2	0.9	158	6.4	289	2.1	2.8	0.99	690	74
110	M3GP 315SMB 2	3GGP311220-••L	2982	95.2	94.9	93.9	0.9	192	7.0	352	1.8	2.7	1.3	910	78
132	M3GP 315SMC 2	3GGP311230-••L	2982	95.4	95.4	94.6	0.9	229	6.8	422	2.0	2.8	1.5	965	78
160	M3GP 315SMD 2	3GGP311240-••L	2983	95.6	95.6	94.9	0.9	275	7.4	512	2.2	2.8	1.7	1025	78
200	M3GP 315MLA 2	3GGP311410-••L	2983	95.8	95.8	95.3	0.9	342	7.7	640	2.5	3.1	2.1	1190	81
250 [1]	M3GP 355SMA 2	3GGP351210-••L	2985	95.8	95.6	94.6	0.9	423	7.7	800	2.1	3.3	3	1600	83
315 [1]	M3GP 355SMB 2	3GGP351220-••L	2980	95.8	95.7	95.0	0.9	529	7.0	1009	2.1	3.0	3.4	1680	83
355 [1]	M3GP 355SMC 2	3GGP351230-••L	2984	95.8	95.8	95.0	0.9	605	7.2	1136	2.2	3.0	3.6	1750	83
3000 r/min = 2-poles		400 V 50 Hz						High-output design							
250	M3GP 315LKB 2	3GGP311820-••L	2983	95.8	96.0	95.5	0.9	419	7.7	800	2.5	3.3	2.9	1540	81

[1] -3dB(A) sound pressure level reduction with unidirectional fan construction. Direction of rotation must be stated when ordering, see variant codes 044 and 045

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4-poles		400 V 50 Hz						CENELEC-design							
0.25	M3GP 71MD 4	3GGP072340-••L	1416	73.5	75.1	73.8	0.8	0.6	4.8	1.68	2.0	2.6	0.0009	11	45
0.37	M3GP 71MLE 4	3GGP072450-••L	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 80MLC 4	3GGP082430-••L	1444	80.8	81.6	80.1	0.8	1.2	6.7	4	3.0	3.5	0.0028	20	45
0.75	M3GP 80MLE 4	3GGP082450-••L	1448	82.5	82.5	80.1	0.78	1.7	7.4	4.9	3.5	4.0	0.0033	22	50
1.1	M3GP 90LA 4	3GGP092510-••L	1443	84.1	84.6	83.5	0.76	2.4	5.2	7.26	3.4	4.2	0.0049	28	56
1.5	M3GP 90LB 4	3GGP092520-••L	1445	85.3	85.0	82.6	0.77	3.3	5.7	9.9	3.8	4.6	0.0067	32	56
2.2	M3GP 100LA 4	3GGP102510-••L	1448	86.7	89.0	86.1	0.81	4.5	7.5	14	2.3	3.6	0.0109	38	56
3	M3GP 100MLB 4	3GGP102420-••L	1444	87.7	88.4	87.6	0.81	6.1	7.0	19.8	3.3	4.1	0.0121	42	58
4	M3GP 112ME 4	3GGP112350-••L	1453	88.6	88.9	88.0	0.74	8.9	7.8	26	3.5	4.3	0.0188	52	59
5.5	M3GP 132SMB 4	3GGP132220-••L	1463	89.6	89.8	88.7	0.74	11.9	7.6	36	2.8	3.9	0.0295	68	70
7.5	M3GP 132SME 4	3GGP132250-••L	1462	90.4	90.8	90.2	0.76	15.7	7.9	49	3.0	4.0	0.0376	78	64
11	M3GP 160MLA 4	3GGP162410-••L	1477	91.4	91.8	91.1	0.82	21.1	7.6	71.27	2.6	3.3	0.11	160	61
15	M3GP 160MLB 4	3GGP162420-••L	1477	92.1	92.4	91.6	0.82	28.5	8.2	96.99	3.0	3.7	0.135	179	61
18.5	M3GP 180MLA 4	3GGP182410-••L	1481	92.6	93.2	92.9	0.83	34.9	7.2	119.3	2.8	3.0	0.219	215	60
22	M3GP 180MLB 4	3GGP182420-••L	1481	93.0	93.5	93.3	0.82	41.4	6.5	142	3.0	3.2	0.243	229	60
30	M3GP 200MLA 4	3GGP202410-••L	1483	93.6	93.8	93.4	0.84	54.8	7.5	193.2	2.7	3.2	0.385	292	63
37	M3GP 225SMA 4	3GGP222210-••L	1482	93.9	94.1	93.8	0.83	68.9	7.2	238.6	3.1	3.1	0.427	322	67
45	M3GP 225SMB 4	3GGP222220-••L	1482	94.2	94.4	94.0	0.84	82.3	8.0	290	3.2	3.5	0.525	357	66
55	M3GP 250SMA 4	3GGP252210-••L	1482	94.6	94.7	94.0	0.84	100	7.1	354.2	2.9	3.4	0.694	406	68
75	M3GP 280SMB 4	3GGP282220-••L	1485	95.0	95.2	94.8	0.86	133	6.4	483	2.3	2.8	1.38	645	75
90	M3GP 280SMC 4	3GGP282230-••L	1485	95.2	95.5	95.2	0.86	158	7.1	578	2.5	2.9	1.73	700	75
110	M3GP 315SMB 4	3GGP312220-••L	1489	95.4	95.5	94.9	0.84	198	7.0	705	2.1	3.0	2.43	930	71
132	M3GP 315SMC 4	3GGP312230-••L	1488	95.6	95.9	95.5	0.86	231	6.7	847	2.2	2.9	2.9	1000	71
160	M3GP 315SMD 4	3GGP312240-••L	1488	95.8	96.0	95.8	0.85	282	6.9	1026	2.2	3.0	3.2	1065	71
200	M3GP 315MLB 4	3GGP312420-••L	1487	96.0	96.4	96.4	0.86	351	6.8	1284	2.4	3.0	3.9	1220	74
250	M3GP 355SMA 4	3GGP352210-••L	1491	96.0	96.0	95.6	0.86	435	6.4	1601	2.1	2.9	5.9	1610	78
315	M3GP 355SMB 4	3GGP352220-••L	1491	96.0	96.1	95.7	0.85	550	7.3	2018	2.4	3.3	6.9	1780	78
355	M3GP 355SMC 4	3GGP352230-••L	1490	96.0	96.2	95.8	0.86	616	6.3	2273	2.3	2.8	7.2	1820	78
1500 r/min = 4-poles		400 V 50 Hz						High-output design							
250	M3GP 315LKA 4	3GGP312810-••L	1488	96.0	96.3	96.1	0.85	442	6.9	1604	2.5	3.2	4.4	1410	78

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6-poles		400 V 50 Hz						CENELEC-design							
0.18	M3GP 71ME 6	3GGP073350-••L	887	63.9	64.3	59.8	0.74	0.57	3.2	1.9	1.9	2.2	0.0009	10	45
0.25	M3GP 80MB 6	3GGP083320-••L	942	68.6	67.0	61.7	0.61	0.82	4.8	2.5	2.7	2.9	0.0019	14	47
0.37	M3GP 80MC 6	3GGP083330-••L	936	73.5	73.9	71.1	0.67	1.06	5.1	3.8	2.6	2.9	0.0028	16	50
0.55	M3GP 80ME 6	3GGP083350-••L	933	77.2	77.9	75.9	0.68	1.52	5.0	5.6	2.7	2.9	0.0035	18	47
0.75	M3GP 90SLD 6	3GGP093040-••L	940	78.9	80.3	79.2	0.75	1.8	4.4	7.57	2.1	2.8	0.0056	29	44
1.1	M3GP 90LF 6	3GGP093560-••L	944	81.0	81.7	80.1	0.75	2.62	4.7	11.1	2.1	2.8	0.0068	33	44
1.5	M3GP 100MLB 6	3GGP103420-••L	960	82.5	82.5	80.1	0.68	3.8	5.4	14.9	2.7	3.4	0.012	41	49
2.2	M3GP 112MJ 6	3GGP113390-••L	962	84.3	85.5	84.7	0.68	5.3	4.2	21.8	1.4	2.3	0.0196	53	66
3	M3GP 132SMB 6	3GGP133220-••L	973	85.6	85.1	82.9	0.62	8	6.6	29.2	2.7	3.8	0.0355	75	57
4	M3GP 132SMF 6	3GGP133260-••L	971	86.8	86.5	84.7	0.62	10.7	6.6	39	2.7	3.8	0.0416	82	57
5.5	M3GP 132SMJ 6	3GGP133290-••L	966	88.0	89.1	88.9	0.73	12.3	4.2	54	1.7	2.7	0.0408	81	57
7.5	M3GP 160MLA 6	3GGP163410-••L	975	89.1	90.0	90.0	0.77	15.7	5.7	73.24	1.4	3.0	0.089	146	59
11	M3GP 160MLB 6	3GGP163420-••L	975	90.3	91.1	91.1	0.78	22.5	6.4	107.5	1.6	3.1	0.138	180	64
15	M3GP 180MLA 6	3GGP183410-••L	979	91.2	91.9	91.6	0.79	30.1	5.2	146.9	1.5	2.7	0.212	212	63
18.5	M3GP 200MLA 6	3GGP203410-••L	989	91.7	91.9	91.2	0.82	35.2	6.5	178.8	2.2	3.2	0.496	272	59
22	M3GP 200MLB 6	3GGP203420-••L	989	92.2	92.4	91.4	0.81	42.4	7.3	212.4	2.6	3.5	0.585	297	59
30	M3GP 225SMA 6	3GGP223210-••L	988	92.9	93.0	92.2	0.77	60.4	7.7	290.6	2.9	3.6	0.724	349	63
37	M3GP 250SMA 6	3GGP253210-••L	990	93.3	93.7	93.5	0.80	71.1	6.5	357	2.4	3.1	1.3	431	58
45	M3GP 280SMB 6	3GGP283220-••L	991	93.7	94.0	93.5	0.84	82	7.4	433	2.7	3.0	1.87	645	72
55	M3GP 280SMC 6	3GGP283230-••L	992	94.1	94.3	93.8	0.86	99	7.5	528	2.8	3.0	2.57	725	71
75	M3GP 315SMB 6	3GGP313220-••L	994	94.6	94.9	94.6	0.84	136	6.8	720	1.8	2.6	4.1	930	75
90	M3GP 315SMC 6	3GGP313230-••L	994	94.9	95.1	94.7	0.84	164	7.2	864	2.0	3.0	4.6	1000	76
110	M3GP 315SMD 6	3GGP313240-••L	994	95.1	95.3	95.0	0.83	200	7.3	1056	2.2	3.1	4.9	1040	75
132	M3GP 315MLB 6	3GGP313420-••L	995	95.4	95.5	95.1	0.82	242	7.3	1266	2.3	3.2	6.3	1200	72
160	M3GP 355SMA 6	3GGP353210-••L	993	95.6	95.8	95.6	0.82	292	6.7	1538	2.5	2.6	7.9	1520	75
200	M3GP 355SMB 6	3GGP353220-••L	993	95.8	96.2	96.1	0.82	365	6.7	1923	2.6	2.5	9.7	1680	75
250	M3GP 355SMC 6	3GGP353230-••L	993	95.8	96.1	95.8	0.81	465	7.7	2404	3.0	3.1	11.3	1820	75
315	M3GP 355MLB 6	3GGP353420-••L	993	95.8	96.1	96.0	0.83	571	6.8	3029	2.6	3.2	13.5	2180	76
355	M3GP 355LKA 6	3GGP353810-••L	993	95.8	96.0	95.9	0.81	653	7.5	3413	2.9	3.2	15.5	2500	76
1000 r/min = 6-poles		400 V 50 Hz						High-output design							
160	M3GP 315LKA 6	3GGP313810-••L	994	95.6	95.8	95.4	0.81	298	7.5	1535	2.2	3.1	7.3	1410	76

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Technical data for Ex t IIIB/IIIC T125 °C, Db/Dc, IP 65/IP 55
Dust ignition protection IE3 cast iron motors

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

Output kW	Motor type	Product code	Speed r/min	Efficiency IEC 60034--2-1; 2007 Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
750 r/min = 8-poles		400 V 50 Hz						CENELEC-design							
0.12	M3GP 71ME 8	3GGP074350-••L	659	50.7	48.9	41.9	0.68	0.49	2.5	1.7	1.9	2.1	0.00107	11	43
0.18	M3GP 80MF 8	3GGP084360-••L	679	58.8	57.3	51.7	0.55	0.8	2.2	2.6	1.3	1.9	0.0035	18	45
0.25	M3GP 80MLG 8	3GGP084470-••L	674	64.1	66.4	64.1	0.58	0.92	2.3	3.5	1.3	1.9	0.0044	21	50
0.37	M3GP 90SLF 8	3GGP094060-••L	710	69.3	67.8	62.5	0.54	1.37	3.3	4.96	2.3	3.3	0.0056	28	50
0.55	M3GP 90LG 8	3GGP094570-••L	710	73.0	70.8	64.6	0.53	2	4.1	7.7	2.5	3.2	0.0072	32	53
0.75	M3GP 100LKD 8	3GGP104840-••L	713	75.0	75.3	71.7	0.63	2.2	3.3	10	1.6	2.3	0.0132	45	46
1.1	M3GP 100LKF 8	3GGP104860-••L	708	77.7	78.1	75.5	0.64	3.2	3.5	14.7	1.7	2.4	0.0132	45	53
1.5	M3GP 112MF 8	3GGP114360-••L	714	79.7	80.7	79.5	0.61	4.3	3.9	20.2	1.5	2.3	0.0204	53	55
2.2	M3GP 132SMD 8	3GGP134240-••L	707	81.9	82.4	81.1	0.64	5.9	4.1	29.7	1.9	2.6	0.0361	73	56
3	M3GP 132SMJ 8	3GGP134290-••L	706	83.5	85.2	84.8	0.65	7.9	4.4	40	2.0	2.6	0.0435	83	58
37	M3GP 280SMA 8	3GGP284210-••L	742	91.8	92.1	91.4	0.79	73	7.3	476	1.7	3.0	1.85	605	65
45	M3GP 280SMB 8	3GGP284220-••L	741	92.2	92.4	91.8	0.78	89.6	7.6	579	1.8	3.1	2.2	645	65
55	M3GP 315SMA 8	3GGP314210-••L	742	92.5	93.1	92.5	0.80	106	7.7	707	1.8	2.7	3.2	830	62
75	M3GP 315SMB 8	3GGP314220-••L	740	93.1	93.3	93.1	0.79	146	7.1	966	1.7	2.7	4.1	930	62
90	M3GP 315SMC 8	3GGP314230-••L	739	93.4	93.8	93.4	0.81	171	7.4	1159	1.8	2.7	4.9	1000	64
110	M3GP 315MLA 8	3GGP314410-••L	740	93.7	94.0	94.1	0.80	211	7.3	1419	1.8	2.7	5.8	1150	72
132	M3GP 355SMA 8	3GGP354210-••L	744	94.0	93.9	93.4	0.77	256	7.5	1694	1.5	2.6	7.9	1520	69
132	M3GP 355SMA 8	3GGP354210-••L	744	94.0	93.9	93.4	0.77	256	7.5	1694	1.5	2.6	7.9	1520	69
160	M3GP 355SMB 8	3GGP354220-••L	744	94.3	94.3	93.9	0.77	293	7.6	1926	1.6	2.6	9.7	1680	69
200	M3GP 355SMC 8	3GGP354230-••L	742	94.6	95.1	94.9	0.79	385	7.4	2576	1.6	2.6	11.3	1820	69
250 [1]	M3GP 355MLB 8	3GGP354420-••L	743	94.6	94.8	94.2	0.80	472	7.5	3213	1.6	2.7	13.5	2180	72

[1] For 400-415 V 50 Hz (380 V 50 Hz voltage code B)
Note: IE3 motors in frame sizes 160-250 on request

Equipment protection level and equipment group subdivision must be selected when ordering by selecting appropriate variant code;

334 Ex t, dust group IIIB T125 Db (non-conductive dust) acc. to IEC/EN60079-31
335 Ex t, dust group IIIB T125 Dc (non-conductive dust) acc. to IEC/EN60079-31
336 Ex t, dust group IIIC T125 Db (conductive dust) acc. to IEC/EN60079-31
337 Ex t, dust group IIIC T125 Dc (conductive dust) acc. to IEC/EN60079-31

Variant codes
Dust ignition protection Ex t cast iron motors

Code/Variants		Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
Administration																	
531	Sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
532	Packing of motor in vertical mounting position	-	-	-	-	-	-	-	-	•	•	•	•	•	-	-	-
533	Wooden sea freight packing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
590	Mounting of customer supplied part other than coupling.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
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.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
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 ambient temperature -20 °C to -40 °C, with space heaters (code 450/451 must be added)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
397	Motor designed for ambient temperature -40 °C to -55 °C, with space heaters (code 450/451 must be added)	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
398	Motor designed for ambient temperature -20 °C to -40 °C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
399	Motor designed for 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, V36, 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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Code/Variants		Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
374	Binding 2D motor detailed drawing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
722	Rotor dimension drawing (incl. torosional stiffness)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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 nA IIC T3 Gc / Ex tc IIIB T125C Dc (non-conductive dust), IP5X.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
339	Rated for gas or dust, Ex nA IIC T3 Gc / Ex tc IIIC T125C Dc (conductive dust), IP6X.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
516	Ex i approved temperature detectors (Pt100)	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
807	CSA design, Class I, Div 2 Group A, B, C, D T3	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	-
813	Thermistor-based surface temperature protection T4 for frequency convertor 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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Marine																	
024	Fulfilling Bureau Veritas (BV) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
025	Fulfilling Det Norske Veritas (DNV) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
026	Fulfilling Lloyds Register of Shipping (LR) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
027	Fulfilling American Bureau of Shipping (ABS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
049	Fulfilling Germanischer Lloyd (GL) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
050	Fulfilling Registro Italiano Navale (RINA) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
051	Fulfilling Russian Maritime Register of Shipping (RS) requirements, with certificate.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
096	Fulfilling Lloyds Register of Shipping (LR) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
186	Fulfilling Det Norske Veritas (DNV) requirements, without certificate (non-essential duty only)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Code/Variants		Frame size 71	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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
676	Fulfilling Germanischer Lloyd (GL) 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)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
305	Additional lifting lugs.	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	•
Painting																	
105	Paint thickness report.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
115	Painting system C4M acc. to ISO 12944-2: 1998.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
168	Primer paint only.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
303	Painted insulation layer on inside of the terminal boxes.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
710	Thermally sprayed zink metallizing with acrylic top coat	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
711	Painting system C5-M very high, acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
754	Painting system C5M acc. to ISO 12944-2:1998	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Protection																	
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
135	Mounting of additional identification plate, stainless.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
139	Additional identification plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
159	Additional plate with text „Made in ....“	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
161	Additional rating plate delivered loose.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
163	Frequency converter rating plate. Rating data according to quotation.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
181	Rating plate with ABB standard loadability values for VSD operation. Other auxiliaries for VSD operation to be selected as necessary.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Code/Variants		Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
630	Shaft material certificate 3.1/3.2 according to EN10204:2004	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•	•
Standards and Regulations																	
248	Design according to Petronas PTS 33.66.05.31-GEN. February 2010.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	-	-
251	Shell DEP 33.66.05.31-GEN. February 2012.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
408	Fulfilling EISA Subtype II efficiency requirements, CC031A.									•	•	•	•	•	-	-	-
421	VIK design (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	-	-	-	-	-	-	-	-	-	-	-	•	•	•	•	-
505	VIK design with ABB standard shaft dimensions (Verband der Industriellen Energie- und Kraftwirtschaft e.V.).	-	-	-	-	-	-	-	-	-	-	-	-	•	•	•	-
540	China energy label	-	-	-	-	-	-	•	•	•	•	•	•	•	•	-	-
541	Inmetro certification												•	•	•	•	•
542	NBR design												•	•	-	-	-
543	Australian MEPS	-	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
547	Certificate of conformity according TR-CU 012/2011 for customs union RU, KZ, BY.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
782	Fulfilling CQST Certification requirements (China)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stator winding temperature sensors																	
120	KTY 84-130 (1 per phase) 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.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-	-
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.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
447	Top mounted separate terminal box for monitoring equipment.	-	-	-	-	-	-	-	-	-	-	-	•	•	•	-	-
466	Terminal box at N-end.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
468	Cable entry from D-end.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	-
469	Cable entry from N-end.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	-
526	Existing cable entries plugged	○	○	○	○	○	○	○	○	○	○	○	○	○	•	•	•
553	Terminal box degree of protection IP66.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	-
554	Painted steel flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
555	Aluminum 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 BSP cable glands.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
727	Stainless steel flange for cable glands drilled and tapped according to order.	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
729	Aluminum non-drilled flange for cable glands	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
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 e terminal box (EN 50019).	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•
743	Painted non-drilled flange in steel for cable glands	-	-	-	-	-	-	•	•	•	•	•	•	•	•	•	•

Code/Variants		Frame size 71	80	90	100	112	132	160	180	200	225	250	280	315	355	400	450
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																	
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 curve, type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
560	Shaft voltage test.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
561	Overspeed test.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
562	Overvoltage test.	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
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

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
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.

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 25 kg	-	-
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

Heating elements

Heating elements are installed on stator winding coil heads to keep the winding 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	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	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.

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.

Standard and alternative designs

		Standard design		Alternative design D-end	
		Deep groove ball bearings		Roller bearings (037)	Angular contact ball bearing (058, 060)
Motor size	Number of poles	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 motors
[2] On request

Axially-locked bearings

All motors with deep groove ball bearings 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.

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

Bearing seals

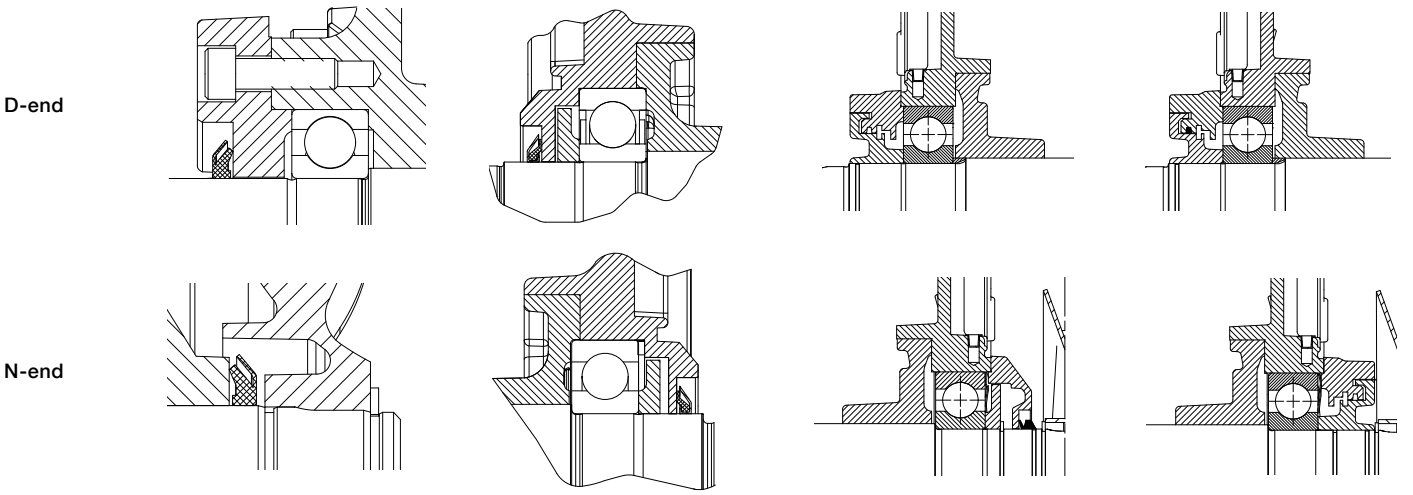
Table below present the standard and alternative and types of bearing seals per motor size.

Bearing seals for motor sizes 71-450

		Standard design		Alternative design	
Motor size	Number of poles	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- 8	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 [2]	NA	Standard
	4 - 8	V-ring [2]	V-ring [2]	NA	Labyrinth seal
315SM, ML	2	Labyrinth seal	V-ring [2]	NA	Standard
	4 - 8	V-ring [2]	V-ring [2]	NA	Labyrinth seal
315LK	2- 8	Labyrinth seal	V-ring [2]	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

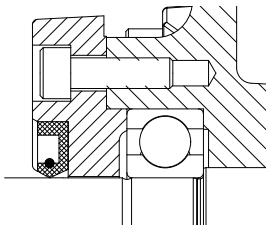
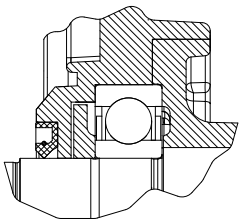
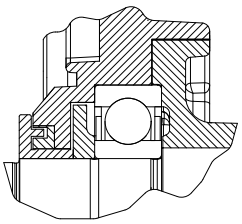
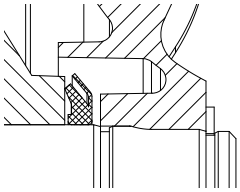
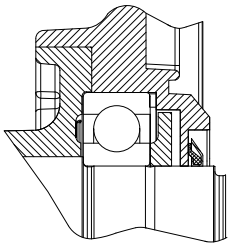
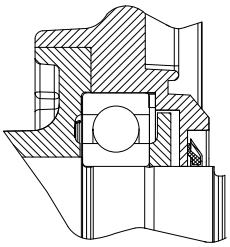
[1] N-end bearing seal of standard design, special N-end bearing seal arrangements on request
[2] Labyrinth seal as standard on IE3 version

Standard design



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, 450 all pole numbes labyrinth/labyrinth seal

Alternative design

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

Bearing life and lubrication

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 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	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	≤ 18.5	9000	12 000	≤ 15	18 000	21 500	≤ 11	24 000	all	24 000
160	13	13	> 18.5	7500	10 000	> 15	15 000	18 000	> 11	22 500	all	24 000
180	15	15	≤ 22	7000	9000	≤ 22	15 500	18 500	≤ 15	24 000	all	24 000
180	15	15	> 22	6000	8500	> 22	14 000	17 000	> 15	21 000	all	24 000
200	20	15	≤ 37	5500	8000	≤ 30	14 500	17 500	≤ 22	23 000	all	24 000
200	20	15	> 37	3000	5500	> 30	10 000	12 000	> 22	16 000	all	20 000
225	23	20	≤ 45	4000	6500	≤ 45	13 000	16 500	≤ 30	22 000	all	24 000
250	23	20	> 45	1500	2500	> 45	5000	6000	> 30	8000	all	10 000
250	30	23	≤ 55	2500	4000	≤ 55	9000	11 500	≤ 37	15 000	all	18 000
250	30	23	> 55	1000	1500	> 55	3500	4500	> 37	6000	all	7000
280	35	35	all	1900	3200		-	-		-		-
280	40	40		-	-	all	7800	9600	all	13 900	all	15 000
315	35	35	all	1900	3200		-	-		-		-
315	55	40		-	-	all	5900	7600	all	11 800	all	12 900
355	35	35	all	1900	3200		-	-		-		-
355	70	40		-	-	all	4000	5600	all	9600	all	10 700
400	40	40	all	1500	2700		-			-	-	-
400	85	55		-	-	all	3200	4700	all	8600	all	9700
450	40	40	all	1500	2700		-	-		-		-
450	95	70		-	-	all	2500	3900	all	7700	all	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	≤ 18.5	4500	6000	≤ 15	9000	10 500	≤ 11	12 000	all	12 000
160	13	13	> 18.5	3500	5000	> 15	7500	9000	> 11	11 000	all	12 000
180	15	15	≤ 22	3500	4500	≤ 22	7500	9000	≤ 15	12 000	all	12 000
180	15	15	> 22	3000	4000	> 22	7000	8500	> 15	10500	all	12 000
200	20	15	≤ 37	2750	4000	≤ 30	7000	8500	≤ 22	11 500	all	12 000
200	20	15	> 37	1500	2500	> 30	5000	6000	> 22	8000	all	10 000
225	23	20	≤ 45	2000	3000	≤ 45	6500	8000	≤ 30	11 000	all	12 000
225	23	20	> 45	750	1250	> 45	2500	3000	> 30	4000	all	5000
250	30	23	≤ 55	1000	2000	≤ 55	4500	5500	≤ 37	7500	all	9000
250	30	23	> 55	500	750	> 55	1500	2000	> 37	3000	all	3500
280	35	35	all	900	1600		-	-		-		-
280	40	40		-	-	all	4000	5300	all	7000	all	8500
315	35	35	all	900	1600		-	-		-		-
315	55	40		-	-	all	2900	3800	all	5900	all	6500
355	35	35	all	900	1600		-	-		-		-
355	70	40		-	-	all	2000	2800	all	4800	all	5400
400	40	40	all	-	1300		-	-		-		-
400	85	55		-	-	all	1600	2400	all	4300	all	4800
450	40	40	all	-	1300		-	-		-		-
450	95	70		-	-	all	1300	2000	all	3800	all	4400

Radial forces

Pulley diameter

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

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

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.

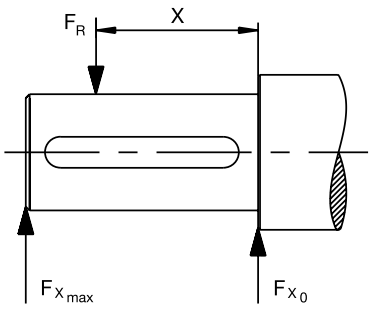
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft together with flame path dimensions affects permissible forces.

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 sizes 71–132

			Basic design with deep groove ball bearings			
			Mounting arrangement IM B3			
			20,000 h		40,000 h	
Motor size	No. of poles	Length of shaft extension E (mm)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
71	2	30	540	460	420	360
	4	30	700	605	555	480
	6	30	780	665	620	530
	8	30	860	730	685	580
80	2	40	710	600	385	350
	4	40	940	810	725	625
	6	40	1060	895	840	710
	8	40	1185	1020	940	810
90	2	50	820	690	650	545
	4	50	1035	870	820	690
	6	50	1185	995	940	790
	8	50	1300	1095	1035	870
100	2	60	1130	925	900	735
	4	60	1425	1165	1135	925
	6	60	1635	1335	1295	1060
	8	60	1820	1520	1445	1205
112	2	60	1170	980	925	775
	4	60	1475	1235	1170	980
	6	60	1690	1310	1340	1120
	8	60	1860	1310	1475	1235
132	2	80	1840	1500	1460	1190
	4	80	2320	1890	1840	1500
	6	80	2660	2165	2110	1715
	8	80	2925	2380	2320	1890

Permissible radial forces, motor sizes 160-280

Motor size	Poles	Length of shaft extension E (mm)	Ball bearings				Roller bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
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
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

Permissible radial forces, motor sizes 315-400

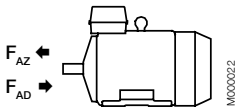
Motor size	Poles	Length of shaft extension E (mm)	Ball bearings				Roller bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
315 SM_	2	140	7300	6000	5800	4950	20300	6000	16500	6000
	4	170	11400	9400	9000	7450	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

Axial forces

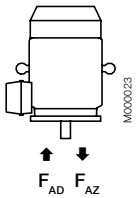
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

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

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



Mounting arrangement IM B3



Mounting arrangement IM V1

Permissible axial forces, motor sizes 71-132

			Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
		Length of shaft extension	20,000 h		40,000 h		20,000 h		40,000 h	
Motor size	Poles	E (mm)	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

Permissible axial forces, motor sizes 160-280

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
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
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

Permissible axial forces, motor sizes 315-400

Motor size	Poles	Length of shaft extension E (mm)	Mounting arrangement IM B3				Mounting arrangement IM V1			
			Deep groove ball bearings				Deep groove ball bearings			
			20,000 h		40,000 h		20,000 h		40,000 h	
			F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)	F_{AD}(N)	F_{AZ}(N)
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

[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 355-450 2*180° after delivery. For sizes 355-450 is also mounting of terminal box with opening towards D or N-end possible 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 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 t approved blanking plugs made of nickel plated brass. Please refer to the table on next page for further information about amount and size of threaded holes and plugs.

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.

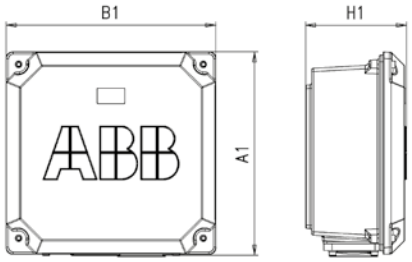
Motor size	Pole number	Terminal box type	Size of gland plate opening on terminal box	45° angle adaper	Amount and size of threaded plugged holes or cable sealing end unit	Max. Connectable core cross section mm2/phase	Number and size of terminal bolts
IE2 and IE3 motors							
71	2-8	integr.	-	-	2xM16x1.5	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.	-	-	2xM32x1.5	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	2-8	370/1	D	-	2xM63x1.5	2x150	6 x M12
315SM_, ML_	2-8	370/1	D	-	2xM63x1.5	2x240	6 x M12
315LKA, LKB	2-4	370/1	D	-	2xM63x1.5	2x240	6 x M12
315LKC	2-4	750/1	E	-	2xM75x1.5	4x240	6 x M12
315LK_	6-8	370/1	D	-	2xM63x1.5	2x240	6 x M12
355SMA - SMC	2-4	750/1	E	-	2xM75x1.5	4x240	6 x M12
355SMA, SMB	6-8	370/1	D	-	2xM63x1.5	2x240	6 x M12
355SMC	6	750/1	E	-	2xM75x1.5	4x240	6 x M12
355SMC	8	370/1	D	-	2xM63x1.5	2x240	6 x M12
355MLA	2-4	750/1	E	-	2xM75x1.5	4x240	6 x M12
355MLB, LK_	2-4	750/1	E	-	2xM75x1.5	4x240	6 x M12
355ML_, LK_	6-8	750/1	E	-	2xM75x1.5	4x240	6 x M12
400	2-8	750/1	E	-	2xM75x1.5	4x240	6 x M12
450 LA	2	1200/1	E	-	2xM75x1.5	6x240	6 x M12
450 LA	4	1200/1	E	-	2xM75x1.5	6x240	6 x M12
450 LB, LC	2-4	1200/1	E	-	2xM75x1.5	6x240	6 x M12
450 LA	6	750/1	E	-	2xM75x1.5	4x240	6 x M12
450 LB, LC	6	1200/1	E	-	2xM75x1.5	6x240	6 x M12
450	8	750/1	E	-	2xM75x1.5	4x240	6 x M12
Auxilary cable entries							
160-450	2-8				2xM20x1.5	1 x 2.5	

Motor size	Earthing on frame	Earthing in main terminal box
71 - 112	M4	M4
132	M5	M5
160 - 250	clamp	M6
280 - 400	M10	2xM10
450	M10	4xM12

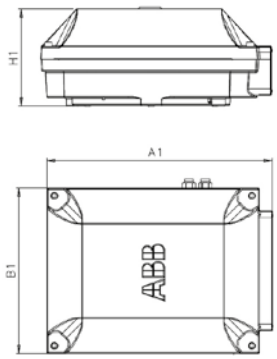
Terminal box
Terminal box dimensions

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.



Terminal box type 63 and 160

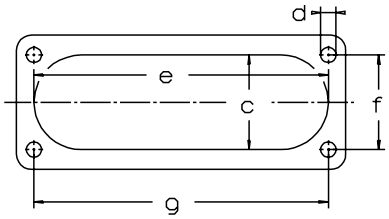


Terminal box type 370/1, 750/1 and 1200/1

Terminal box types acc. to current capacity	A1	B1	H1	Gland plate opening
63	248	248	109	B
160	291	302	154	C
370/1	467	348	207	D
750 /1	549	433	231	E
1200/1	740	591	290	E

Dimensions for terminal box inlets

Corresponds to motor sizes 160 and above



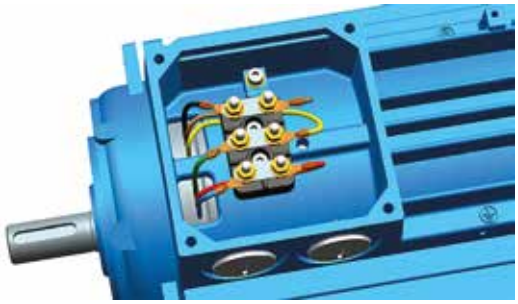
Flange opening	c mm	e mm	f mm	g mm	d amount and sizes of bolts
B	31	120	30	120	4xM6
C	71	194	62	193	4xM6
D	98	284	80	292	6xM10
E	120	365	100	360	6xM12

Terminal box
Terminal boxes and boards

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

Motor sizes 71-132

Integrated terminal box for motor sizes 71-132. Tapped holes for cable entries.



Terminal board for motor sizes 71-80.

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

Terminal board for motor size 132, IE2, and motor sizes 112-132, IE3.

Motor sizes 160-250

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

Terminal board for motor sizes 160-250.

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 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, IE2. Cables needed: 1 pcs outer diameter 42mm steel wire armoured cable, single cross section 120 mm². Cables coming from below.
Motor	M3GP 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)

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”
315-450	2 x 3”	1 x 3”

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

Gland plates with threaded openings for cable glands of nonstandard size

If the standard size of threaded openings for cable glands 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 code 554.

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 aluminum or 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 aluminium, 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

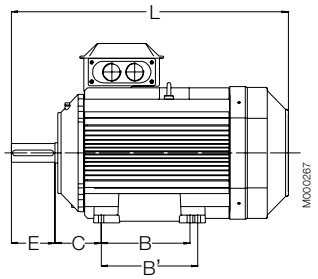
Small auxiliary aluminum terminal box for motor sizes 280-450
(variant codes 418, 568, 380, 569)
The size of terminal box ordered with these codes depends on the number of accessories ordered.
80 x 125 mm, max 12 strips.
Earthing size M4

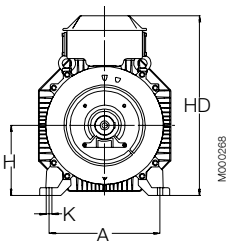
Large auxiliary aluminum terminal box for motor sizes 280-450.
The size of terminal box ordered with these codes depends on the number of accessories ordered.
80 x 250 mm, max 30 strips. Earthing size M4

Auxiliary cast iron terminal box for motor size 160-250 (variant code 418).
111x162 mm

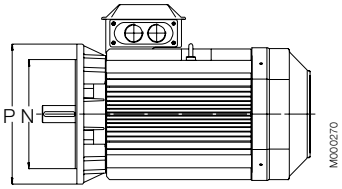
Auxiliary cast iron terminal box for motor sizes 280-450
(variant code 567)
208 x 180 mm

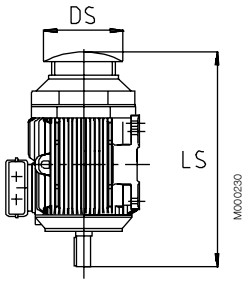
Dimension drawings
Dust ignition protection Ex t case iron motors, 2D and 3D



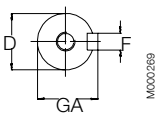


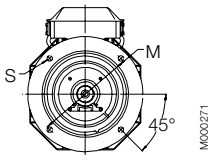
Foot-mounted motor IM 1001, IM B3



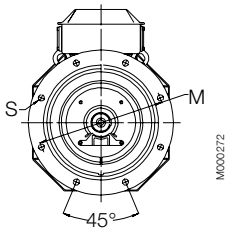


Flange-mounted motor IM 3001, IM B5

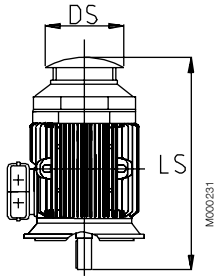




Sizes 80 to 200



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	759	24	280	500	450	550	18	555	1 180	1190
315SM_	65	80	69	85	18	22	140	170	1174	1204	508	406	457	216	852	30	315	600	550	660	23	624	1 290	1320
315ML_	65	90	69	95	18	25	140	170	1285	1315	508	457	508	216	852	30	315	600	550	660	23	624	1 401	1431
315LK_	65	90	69	95	18	25	140	170	1491	1521	508	508	560	216	852	28	315	600	550	660	23	624	1 607	1637
355SM_	70	100	74.5	106	20	28	140	210	1409	1479	610	500	560	254	958/944 [1]	35	355	740	680	800	23	720	1 476	1546
355ML_	70	100	74.5	106	20	28	140	210	1514	1584	610	560	630	254	958	35	355	740	680	800	23	720	1 528	1703
355LK_	70	100	74.5	106	20	28	140	210	1764	1834	610	630	710/900	254	958	35	355	740	680	800	23	720	1 633	1703
400L_	80	110	85	116	22	28	170	210	1851	1891	710	900	1000	224	1045	35	400	940	880	1000	28	810	1 860	1900
400LK_	80	100	85	106	22	28	170	210	1851	1891	686	710	800	280	1045	35	400	740	680	800	24	810	1 860	1900
450	-	120	-	127	-	32	-	210	-	2187	800	1000	1120	250	1169/1293 [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

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.

Tolerances:	
A, B	± 0,8
D, DA	ISO k6 < Ø 50mm
	ISO m6 > Ø 50mm
F, FA	ISO h9
H	-0.5
N	ISO j6
C, CA	± 0.8

Certificate examples

IECEx Certificate of Conformity

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

Certificate No.: IECEx LCI 07.0001 Issue No.:0 History:

Status: Current

Date of Issue: 2007-01-12 Page 1 of 3

Applicant: **ABB Oy, Motors**
Strömbergin Puistotie 5A
P.O. Box 633
65101 VAASA
Finland

Electrical Apparatus: **M3GP80-450 & M3LP400-450 series, 13 cage induction motor types**
Optional accessory:

Type of Protection: **Non sparking Ex nA and dust protection Ex tD.**

Marking: **Ex nA II T3, Ex tD A21/A22 T125**

Approved for issue on behalf of the IECEx Certification Body: Marc GILLAUX

Position: Ex-Certification Manager

Signature. (for printed version)

Date: 12 JAN. 2007

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 the Official IECEx Website.

Certificate issued by:

Laboratoire Central des Industries Electriques (LCIE)
33 Avenue du General Leclerc
FR-92260 Fontenay-aux-Roses
France

M000730

1 ATTESTATION D'EXAMEN CE DE TYPE

2 **Appareil ou système de protection** destiné à être utilisé en atmosphères explosibles **(Directive 94/9/CE)**

3 Numéro de l'attestation d'examen CE de type
LCIE 00 ATEX 3016

4 Appareil ou système de protection :
Moteur asynchrone
Type : M3GP160 ..., M3GP180 ... (Génération H)

5 Demandeur : ABB Oy Motors
Adresse : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

6 Fabricant : ABB Oy Motors
Adresse : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées sont décrits dans l'annexe de la présente attestation et dans les documents descriptifs cités en référence.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles de sécurité et de santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive.
Les résultats des vérifications et essais figurent dans le rapport confidentiel N° 90248-581521.

9 Le respect des exigences essentielles de sécurité et de santé est assuré par la conformité à :
- EN 61241-0 (2006)
- EN 61241-1 (2004)

10 La signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que cet appareil ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à l'annexe III de la directive 94/9/CE.
Des exigences supplémentaires de la directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection. Ces dernières ne sont pas couvertes par la présente attestation.

12 Le marquage de l'appareil ou du système de protection doit comporter les informations détaillées au point 15.

Fontenay-aux-Roses, le 16 mars 2009

Le responsable de certification ATEX
ATEX certification manager

Marc GILLAUX

1 EC TYPE EXAMINATION CERTIFICATE

2 **Equipment or protective system** intended for use in potentially explosive atmosphere **(Directive 94/9/EC)**

3 EC type examination certificate number
LCIE 00 ATEX 3016

4 Equipment or protective system :
Asynchronous motor
Type : M3GP160 ..., M3GP180 ... (Generation H)

5 Applicant : ABB Oy Motors
Address : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

6 Manufacturer : ABB Oy Motors
Address : Strömbergin Puistotie 5A
FIN - 65101 VAASA - Finland

7 This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in confidential report N° 90248-581521.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
- EN 61241-0 (2006)
- EN 61241-1 (2004)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with annex III to the directive 94/9/EC.
Further requirements of the directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include informations as detailed at 15.

M000731

ABB

EU DECLARATION OF CONFORMITY

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: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC as listed in this document on the pages 2 ...3 having correspondent name plate markings covered by those as listed.

The motors of the declaration described above are in conformity with the relevant Union harmonisation legislation:

Directive 94/9/EC (until April 19th, 2016) and Directive 2014/34/EU (from April 20th, of April 2016)

Directive 2009/125/EC (ErP of 20th November 2009)
The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EU) No. 4/2014 of 5 January 2014 amending Regulation (EC) No. 640/2009.

Efficiency classes as defined in the standard EN 60034-30:2009.

Directive 2011/65/EU
Motors are in conformity with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Technical documentation based on the standard EN 50581:2012

The following harmonised standards are applied in relation to which conformity is declared:
EN 60079-0:2012, EN 60079-1:2007, EN 60079-7:2007, EN 60079-15:2010, EN 60079-31:2009 and relevant parts of the EN 60034 –series of standards.

The conformity of the end product according to the Directive 2006/42/EC has to be established by the commissioning party when the motor is fitted to the machinery.

Note: Motors have to 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.

Notified Bodies (ExNB): LCIE (0081), Av. Du Général Leclerc, 33, 92260 Fontenay-aux-Roses, France and VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland

Signed for and on behalf of: ABB Oy, Motors and Generators and ABB Sp.z.o.o

Place and date of issue: Vaasa, Finland, 2015-11-26

Harri Mykkänen
Vice President

Title

Document: 3GZF500630-309G

ABB Oy

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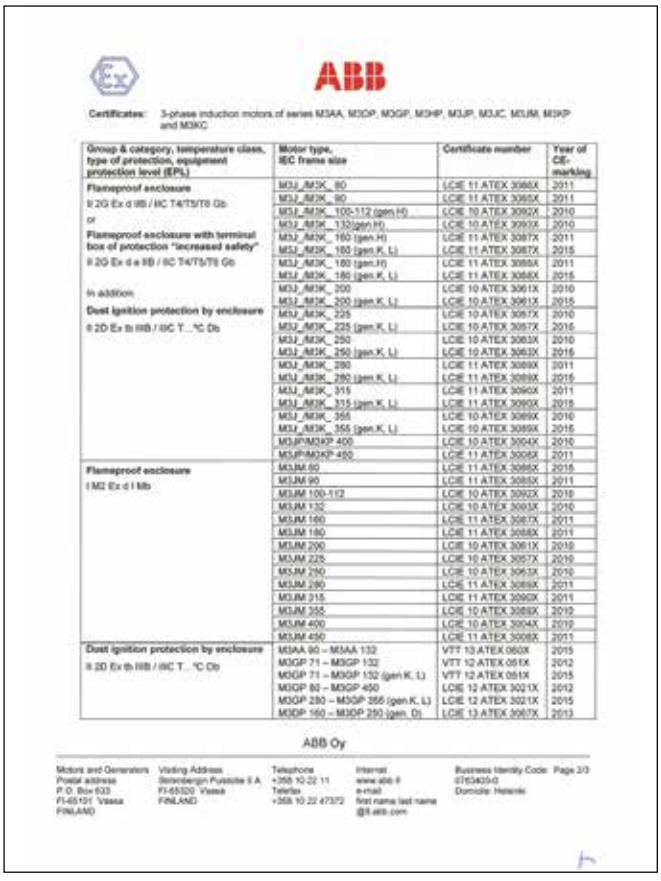
0763403-0
Domicile: Helsinki

M000725-1a



ABB

Certificates: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC

Group & category, temperature class, type of protection, equipment protection level (EPL)	Motor type, IEC frame size	Certificate number	Year of CE-marking
Flameproof enclosure	M3J_M3K_ 80	LCIE 11 ATEX 3086X	2011
II 2G Ex d IIB / IIC T4/T5/T6 Gb	M3J_M3K_ 90	LCIE 11 ATEX 3085X	2011
or	M3J_M3K_ 100-112 (gen.H)	LCIE 10 ATEX 3092X	2010
Flameproof enclosure with terminal box of protection "increased safety"	M3J_M3K_ 132(gen.H)	LCIE 10 ATEX 3093X	2010
II 2G Ex d e IIB / IIC T4/T5/T6 Gb	M3J_M3K_ 160 (gen.H)	LCIE 11 ATEX 3087X	2011
	M3J_M3K_ 160 (gen.K, L)	LCIE 11 ATEX 3087X	2015
In addition:	M3J_M3K_ 180 (gen.H)	LCIE 11 ATEX 3088X	2011
Dust ignition protection by enclosure	M3J_M3K_ 180 (gen.K, L)	LCIE 11 ATEX 3088X	2015
II 2D Ex tb IIIB / IIIC T...°C Db	M3J_M3K_ 200	LCIE 10 ATEX 3091X	2010
	M3J_M3K_ 200 (gen.K, L)	LCIE 10 ATEX 3091X	2015
	M3J_M3K_ 225	LCIE 10 ATEX 3057X	2010
	M3J_M3K_ 225 (gen.K, L)	LCIE 10 ATEX 3057X	2016
	M3J_M3K_ 250	LCIE 10 ATEX 3063X	2010
	M3J_M3K_ 250 (gen.K, L)	LCIE 10 ATEX 3063X	2016
	M3J_M3K_ 280	LCIE 11 ATEX 3089X	2011
	M3J_M3K_ 280 (gen.K, L)	LCIE 11 ATEX 3089X	2015
	M3J_M3K_ 315	LCIE 11 ATEX 3090X	2011
	M3J_M3K_ 315 (gen.K, L)	LCIE 11 ATEX 3090X	2015
	M3J_M3K_ 355	LCIE 10 ATEX 3089X	2010
	M3J_M3K_ 355 (gen.K, L)	LCIE 10 ATEX 3089X	2016
	M3JP/M3KP 400	LCIE 10 ATEX 3004X	2010
	M3JP/M3KP 450	LCIE 11 ATEX 3006X	2011
Flameproof enclosure	M3JM 80	LCIE 11 ATEX 3086X	2015
I M2 Ex d I Mb	M3JM 90	LCIE 11 ATEX 3085X	2011
	M3JM 100-112	LCIE 10 ATEX 3092X	2010
	M3JM 132	LCIE 10 ATEX 3093X	2010
	M3JM 160	LCIE 11 ATEX 3087X	2011
	M3JM 180	LCIE 11 ATEX 3088X	2011
	M3JM 200	LCIE 10 ATEX 3091X	2010
	M3JM 225	LCIE 10 ATEX 3057X	2010
	M3JM 250	LCIE 10 ATEX 3063X	2010
	M3JM 280	LCIE 11 ATEX 3089X	2011
	M3JM 315	LCIE 11 ATEX 3090X	2011
	M3JM 355	LCIE 10 ATEX 3089X	2010
	M3JM 400	LCIE 10 ATEX 3004X	2010
	M3JM 450	LCIE 11 ATEX 3006X	2011
Dust ignition protection by enclosure	M3AA 90 – M3AA 132	VTT 13 ATEX 060X	2015
II 2D Ex tb IIIB / IIIC T...°C Db	M3GP 71 – M3GP 132	VTT 12 ATEX 051X	2012
	M3GP 71 – M3GP 132 (gen.K, L)	VTT 12 ATEX 051X	2015
	M3GP 80 – M3GP 450	LCIE 12 ATEX 3021X	2012
	M3GP 280 – M3GP 355 (gen.K, L)	LCIE 12 ATEX 3021X	2015
	M3DP 160 – M3DP 250 (gen. D)	LCIE 13 ATEX 3067X	2013

ABB Oy

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Business Identity Code: Page 2/3
0763403-0
Domicile: Helsinki

M000725-2a

Motors in brief
Dust ignition protection cast iron motors, size 71 to 180

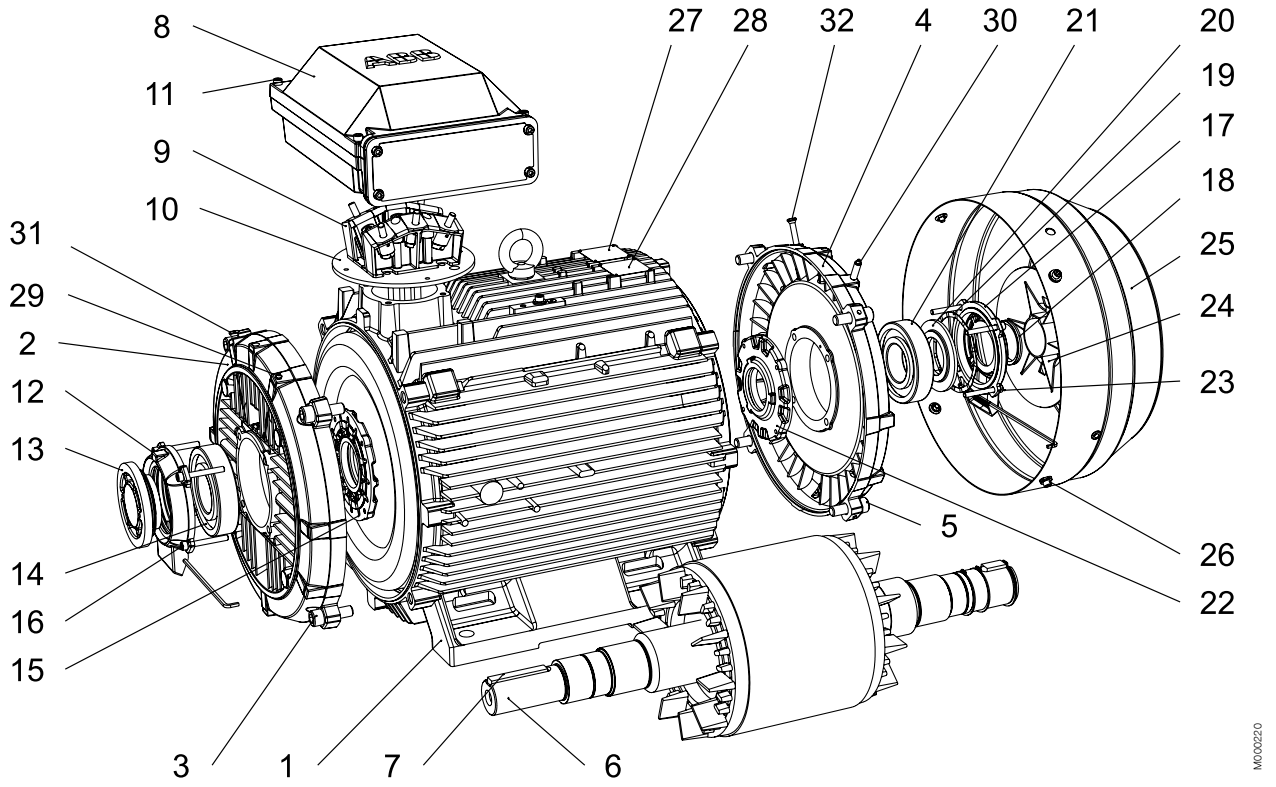
Motor size			71	80	90	100	112	132	160	180
Stator	Material		Cast iron, EN-GLJ-150 or better						Cast iron, EN-GJL-200 or better	
	Paint colour shade		Blue, Munsell 8B 4.5/3.25							
	Corrosion class		C3 medium according to ISO/EN 12944-5							
Feet			Cast iron, EN-GLJ-150 or better, integrated with stator						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 medium according to ISO/EN 12944-5							
Bearings	D-end	2-8 pole	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 pole	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	
	Screws		Acid proof steel A4-80							
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						Hot dip galvanized steel	
	Paint colour 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
Dust ignition protection cast iron motors, size 200 to 400

Motor size			200	225	250	280	315	355	400
Stator	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						
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 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
		4-12 -pole	6312/C3	6313/C3	6315/C3	6316/C3	6319/C3	6322/C3	6324/C3
	N-end	2-pole	6210/C3	6212/C3	6213/C3	6316/C3	6319/C3	6316M/C3	6317/C3
		4-12 -pole	6210/C3	6212/C3	6213/C3	6316/C3	6316/C3	6316/C3	6319/C3
Axially-locked bearings	Inner bearing cover		As standard, locked at D-end						
Bearing seal			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			2 x M63 + 2 x M20 plugged		Refer to page 226	
	Terminals		6 terminals for connection with cable lugs (not included)						
Fan	Material		Aluminum						
Fan cover	Material		Hot dip galvanized steel						
	Paint colour 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 key way			Open key away			
Heating elements	Optional		25 W	60 W			120 W		
Drain holes			As standard						
External earthing bolt			As standard						
Enclosure			IP 55 or IP 65 depending on EPL and dust group						
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	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 aluminum motors / Protection by enclosure Ex t IIIB/IIIC T125 °C, Db/Dc

Totally enclosed squirrel cage three phase low voltage motors, Sizes 71-280, 2.2 to 90 kW

Ordering information

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

Example	
Motor type	M3AA 160 MLA
Pole number	4
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	11 kW
Product code	3GAA162410-ADG
Variant codes if needed	

Explanation of the product code

Motor type	Motor size	Product code	Mounting arrangement code, Voltage and frequency code, Generation code	Variant codes
M3AA	160MLA	3GAA 162 410 - ADG		340, etc.
		1 2 3 4 5 6 7	8 9 10 11 12 13 14	

Positions 1 - 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-frame

06	63
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
5:	10 poles

Positions 8 to 10

Serial number

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.

Explanation of technical data pages:

The two bullets in the product code indicate choice of mounting arrangements, voltage and frequency code (see ordering information page).

Efficiency values are given according to IEC 60034-2-1; 2007. Please note that the values are not comparable without knowing the testing method. ABB has calculated the efficiency values according to indirect method, stray load losses (additional losses) determined from measuring.

I_s / I_N = Starting current
T_l / T_N = Locked rotor torque
T_b / T_N = Pull-out torque

Rating plates

The rating plates are in table form giving values for speed, output, current and power factor at different voltages, there are two rows available for different voltages, usually is the corresponding voltages for star and delta connection stamped. Other voltage and frequency combinations are possible and can be ordered with variant codes 002 or 209. Please refer to the variant code section.

The following information will be shown on the motor rating plate:

- Lowest nominal efficiency at 100%, 75% and 50% rated load
- Efficiency level
- Year of manufacture
- Type of protection
- Apparatus group
- Temperature class
- Identification number for notified body (category 2 motors only)
- Certificate number ATEX and IECEx (if available)

Aluminum motors size 90-132

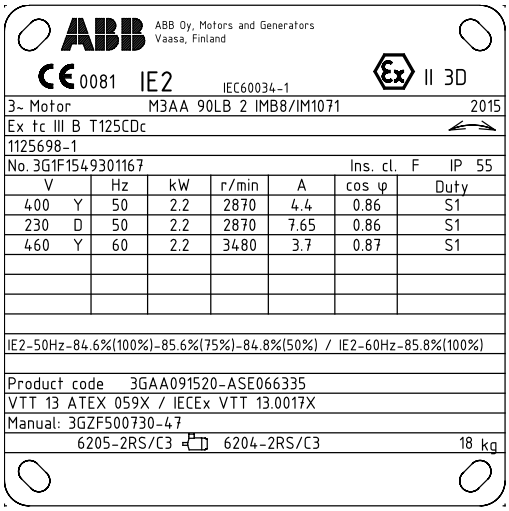


ABB Oy, Motors and Generators
Vaasa, Finland

CE 0081 IE2 IEC60034-1 Ex II 3D

3~ Motor	M3AA 90LB 2 IMB8/IM1071					2015
Ex tc III B T125CDc						
1125698-1						
No. 3G1F1549301167					Ins. cl. F	IP 55
V	Hz	kW	r/min	A	cos φ	Duty
400 Y	50	2.2	2870	4.4	0.86	S1
230 D	50	2.2	2870	7.65	0.86	S1
460 Y	60	2.2	3480	3.7	0.87	S1
IE2-50Hz-84.6%(100%)-85.6%(75%)-84.8%(50%) / IE2-60Hz-85.8%(100%)						
Product code 3GAA091520-ASE066335						
VTT 13 ATEX 059X / IECEx VTT 13.0017X						
Manual: 3GZF500730-47						
6205-2RS/C3		6204-2RS/C3				18 kg

Aluminum motors size 160, 180

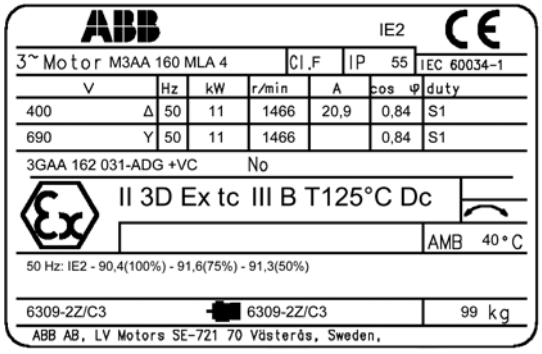


ABB IE2 CE

3~ Motor M3AA 160 MLA 4				Cl.F	IP 55	IEC 60034-1
V	Hz	kW	r/min	A	cos φ	duty
400 Δ	50	11	1466	20,9	0,84	S1
690 Y	50	11	1466		0,84	S1
3GAA 162 031-ADG +VC			No			
Ex II 3D Ex tc III B T125°C Dc						
				AMB	40 °C	
50 Hz: IE2 - 90,4(100%) - 91,6(75%) - 91,3(50%)						
6309-2Z/C3		6309-2Z/C3			99 kg	
ABB AB, LV Motors SE-721 70 Västerås, Sweden.						

M000761a

Aluminum motors size 200-250

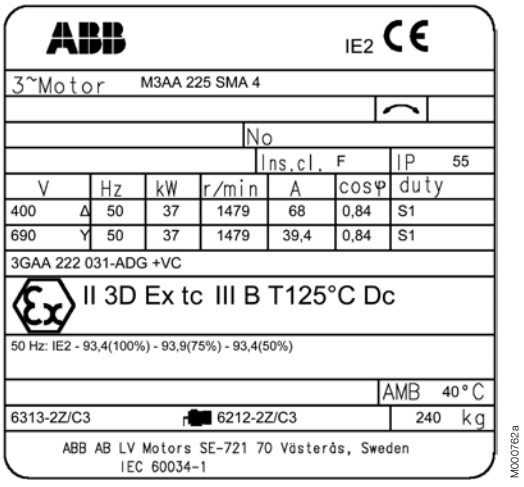


ABB IE2 CE

3~Motor M3AA 225 SMA 4						
No						
Ins.cl. F					IP 55	
V	Hz	kW	r/min	A	cosφ	duty
400 Δ	50	37	1479	68	0,84	S1
690 Y	50	37	1479	39,4	0,84	S1
3GAA 222 031-ADG +VC						
Ex II 3D Ex tc III B T125°C Dc						
50 Hz: IE2 - 93,4(100%) - 93,9(75%) - 93,4(50%)						
				AMB	40°C	
6313-2Z/C3		6212-2Z/C3			240 kg	
ABB AB LV Motors SE-721 70 Västerås, Sweden IEC 60034-1						

M000762a

Technical data for Ex t IIIB/IIIC T125 °C Db/Dc, IP 65/IP 55
Dust ignition protection aluminum motors

ATEX Certified

IP 65/55 - IC 411 - Insulation class F, temperature rise class B
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
3000 r/min = 2-poles		400 V 50 Hz						CENELEC-design							
3	M3AA 100LB 2	3GAA101520-••E	2920	86.40	86.10	84.00	0.9	5.8	9.3	9.8	3.3	3.9	0.005	25	62
4	M3AA 112MB 2	3GAA111320-••E	2885	86.10	87.00	88.00	0.9	7.6	7.6	13.2	2.5	2.8	0.0062	30	68
5.5	M3AA 132SB 2	3GAA131120-••E	2915	88.00	88.10	86.90	0.8	11.0	7.9	18.0	2.6	3.6	0.016	52	73
7.5	M3AA 132SC 2	3GAA131130-••E	2915	88.50	89.10	88.50	0.9	13.6	7.6	24.5	2.2	3.2	0.022	52	73
11	M3AA 160MLA 2	3GAA161410-••G	2938	90.60	91.50	91.10	0.9	19.2	7.5	35.7	2.4	3.1	0.044	91	69
15	M3AA 160MLB 2	3GAA161420-••G	2934	91.50	92.40	92.20	0.9	26.0	7.5	48.8	2.5	3.3	0.053	105	69
18.5	M3AA 160MLC 2	3GAA161430-••G	2932	92.00	93.10	93.10	0.9	31.5	7.5	60.2	2.9	3.4	0.063	123	69
22	M3AA 180MLA 2	3GAA181410-••G	2952	92.20	92.70	92.20	0.9	39.5	7.7	71.1	2.8	3.3	0.076	132	69
30	M3AA 200MLA 2	3GAA201410-••G	2956	93.10	93.50	92.80	0.9	51.6	7.7	96.9	2.7	3.1	0.178	210	72
37	M3AA 200MLB 2	3GAA201420-••G	2959	93.40	93.70	92.90	0.9	63.5	8.2	119	3.0	3.3	0.196	225	72
45	M3AA 225SMA 2	3GAA221210-••G	2961	93.60	93.90	93.10	0.9	78.8	6.7	145	2.5	2.5	0.244	263	74
55	M3AA 250SMA 2	3GAA251210-••G	2967	94.10	94.40	93.80	0.9	95.8	6.8	177	2.2	2.7	0.507	304	75
75	M3AA 280SMA 2	3GAA281210-••G	2968	94.40	94.70	94.30	0.9	128	7.1	241	2.5	2.8	0.583	389	75
90 [1]	M3AA 280SMB 2	3GAA281220-••G	2971	94.90	95.20	94.70	0.9	153	7.8	289	2.6	3.2	0.644	425	75
3000 r/min = 2-poles		400 V 50 Hz						High-output design							
30	M3AA 180MLB 2	3GAA181420-••G	2950	92.70	93.50	93.30	0.9	53.0	7.9	97.1	2.8	3.3	0.092	149	69
45	M3AA 200MLC 2	3GAA201430-••G	2957	93.30	93.80	93.20	0.9	79.1	8.1	145	3.1	3.3	0.196	225	72
55	M3AA 225SMB 2	3GAA221220-••G	2961	93.90	94.30	93.60	0.9	96.0	6.5	177	2.4	2.5	0.274	286	74
75	M3AA 250SMB 2	3GAA251220-••G	2970	94.50	94.80	94.40	0.9	128	7.6	241	2.8	3.1	0.583	351	75

[1] Temperature rise class F

Equipment protection level and equipment group subdivison must be selected when ordering by choosing appropriate variant code;

Sizes 90-132
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

Sizes 160-280
340 Ex t, Dust group III B T125C Dc (non-conductive dust) with manufacturers declaration

Technical data for Ex t IIIB/IIIC T125 °C Db/Dc, IP 65/IP 55
Dust ignition protection aluminum motors

ATEX Certified

IP 65/55 - IC 411 - Insulation class F, temperature rise class B
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1500 r/min = 4-poles		400 V 50 Hz						CENELEC-design							
2.2	M3AA 100LC 4	3GAA102530-••E	1450	86.4	86.2	84.1	0.79	4.6	7.3	14.4	2.8	3.4	0.009	25	54
3	M3AA 100LD 4	3GAA102540-••E	1445	85.7	86.1	85.1	0.79	6.3	7.0	19.8	2.4	3.0	0.011	28	63
4	M3AA 112MB 4	3GAA112320-••E	1445	86.7	86.5	85.2	0.75	8.8	7.3	26.4	3.1	3.4	0.0126	34	64
5.5	M3AA 132M 4	3GAA132300-••E	1465	89.0	89.5	88.6	0.79	10.9	6.3	36.0	1.9	2.6	0.038	48	66
7.5	M3AA 132MA 4	3GAA132310-••E	1460	89.1	89.8	89.4	0.79	14.7	6.4	49.0	1.8	2.6	0.048	59	63
11	M3AA 160MLA 4	3GAA162410-••G	1466	90.4	91.6	91.3	0.84	20.9	6.8	71.6	2.2	2.8	0.081	99	62
15	M3AA 160MLB 4	3GAA162420-••G	1470	91.4	92.3	92.2	0.83	28.5	7.1	97.4	2.6	3.0	0.099	118	62
18.5	M3AA 180MLA 4	3GAA182410-••G	1477	91.9	92.8	92.6	0.84	34.5	7.2	119	2.6	2.9	0.166	146	62
22	M3AA 180MLB 4	3GAA182420-••G	1475	92.3	93.3	93.2	0.84	40.9	7.3	142	2.6	3.0	0.195	163	62
30	M3AA 200MLA 4	3GAA202410-••G	1480	93.2	94.0	93.7	0.84	55.2	7.4	193	2.8	3.0	0.309	218	63
37	M3AA 225SMA 4	3GAA222210-••G	1479	93.4	93.9	93.4	0.84	68.0	7.1	238	2.6	2.9	0.356	240	66
45	M3AA 225SMB 4	3GAA222220-••G	1480	93.9	94.3	93.9	0.85	81.3	7.5	290	2.8	3.2	0.44	273	66
55	M3AA 250SMA 4	3GAA252210-••G	1480	94.4	94.9	94.6	0.85	98.9	7.0	354	2.6	2.9	0.765	314	67
75	M3AA 280SMA 4	3GAA282210-••G	1478	94.3	94.9	94.6	0.85	135	7.1	484	2.8	3.0	0.866	389	67
90 [1]	M3AA 280SMB 4	3GAA282220-••G	1478	94.6	95.4	95.2	0.84	163	7.7	581	3.2	3.4	0.941	418	67
1500 r/min = 4-poles		400 V 50 Hz						High-output design							
18.5	M3AA 160MLC 4	3GAA162430-••G	1469	91.4	92.4	92.2	0.84	34.7	7.6	120	3.0	3.2	0.11	127	62
22 [1]	M3AA 160MLD 4	3GAA162440-••G	1463	91.6	93.0	93.2	0.85	40.7	6.9	143	2.5	2.9	0.125	140	62
37	M3AA 200MLB 4	3GAA202420-••G	1479	93.4	94.4	94.4	0.85	67.2	7.1	238	2.6	2.9	0.343	234	63
55	M3AA 225SMC 4	3GAA222230-••G	1478	94.0	94.6	94.4	0.85	99.3	7.4	355	2.9	3.1	0.474	287	66
68	M3AA 250SMB 4	3GAA252220-••G	1481	94.6	95.0	94.7	0.84	123	7.9	438	3.1	3.5	0.866	350	67
75 [1]	M3AA 250SMB 4	3GAA252220-••G	1478	94.4	95.1	94.8	0.85	134	7.3	484	2.8	3.1	0.866	350	67

[1] Temperature rise class F

Equipment protection level and equipment group subdivison must be selected when ordering by choosing appropriate variant code;

Sizes 90-132
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

Sizes 160-280
340 Ex t, Dust group III B T125C Dc (non-conductive dust) with manufacturers declaration

Technical data for Ex t IIIB/IIIC T125 °C Db/Dc, IP 65/IP 55
Dust ignition protection aluminum motors

IP 65/55 - IC 411 - Insulation class F, temperature rise class B
IE2 efficiency class according to IEC 60034-30-1; 2014

Output kW	Motor type	Product code	Speed r/min	Efficiency Full load 100%	3/4 load 75%	1/2 load 50%	Power factor cos φ	Current I_N A	$\frac{I_s}{I_N}$	Torque T_N N_m	$\frac{T_l}{T_N}$	$\frac{T_b}{T_N}$	Moment of inertia J = 1/4 GD² kgm²	Weight kg	Sound pressure level L_{PA} dB
1000 r/min = 6-poles		400 V 50 Hz						CENELEC-design							
1.5	M3AA 100LC 6	3GAA103530-••E	945	80.3	81.4	80.7	0.73	3.6	3.9	15.1	1.7	2.0	0.009	26	49
2.2	M3AA 112MB 6	3GAA113320-••E	955	81.9	81.8	79.2	0.72	5.3	5.2	21.9	1.8	2.2	0.01	34	56
3	M3AA 132S 6	3GAA133100-••E	960	83.3	82.9	80.5	0.65	7.7	4.3	29.8	1.6	2.3	0.031	46	57
4	M3AA 132MB 6	3GAA133320-••E	975	86.4	85.8	83.1	0.70	9.4	7.3	39.2	2.1	4.4	0.045	54	57
5.5	M3AA 132MC 6	3GAA133330-••E	965	86.1	85.6	83.0	0.67	13.3	6.2	54.3	2.5	2.8	0.049	59	61
7.5	M3AA 160MLA 6	3GAA163410-••G	975	88.5	89.9	89.7	0.79	15.4	7.4	73.4	1.7	3.2	0.087	98	59
11	M3AA 160MLB 6	3GAA163420-••G	972	89.3	90.6	90.5	0.79	22.5	7.5	108	1.9	2.9	0.114	125	59
18.5	M3AA 200MLA 6	3GAA203410-••G	988	91.6	92.2	91.7	0.80	36.4	6.7	178	2.3	2.9	0.382	196	63
22	M3AA 200MLB 6	3GAA203420-••G	987	92.0	92.9	92.7	0.82	42.0	6.6	212	2.2	2.8	0.448	218	63
30	M3AA 225SMA 6	3GAA223210-••G	986	92.6	93.3	92.8	0.83	56.2	7.0	290	2.6	2.9	0.663	266	63
37	M3AA 250SMA 6	3GAA253210-••G	989	93.1	93.8	93.4	0.82	69.9	6.8	357	2.4	2.7	1.13	294	63
45 [1]	M3AA 280SMA 6	3GAA283210-••G	988	93.2	94.0	93.9	0.84	82.9	6.8	434	2.4	2.6	1.37	378	63
55 [1]	M3AA 280SMB 6	3GAA283220-••G	988	93.2	94.1	94.0	0.84	101	7.1	531	2.6	2.8	1.5	404	63
1000 r/min = 6-poles		400 V 50 Hz						High-output design							
15	M3AA 160MLC 6	3GAA163430-••G	971	89.7	91.2	91.2	0.77	31.3	7.3	147	1.8	3.6	0.131	138	59
30 [1]	M3AA 200MLC 6	3GAA203430-••G	985	92.0	93.1	92.8	0.83	56.7	6.9	290	2.3	2.8	0.531	245	63
37	M3AA 225SMB 6	3GAA223220-••G	985	93.1	94.0	94.0	0.83	69.1	6.6	358	2.3	2.6	0.821	300	63
45	M3AA 250SMB 6	3GAA253220-••G	989	93.4	94.1	93.9	0.83	83.7	7.0	434	2.5	2.7	1.37	341	63
52 [1]	M3AA 250SMC 6	3GAA253230-••G	989	93.3	94.0	93.8	0.83	96.9	7.4	502	2.8	2.9	1.5	367	63
55 [1]	M3AA 250SMC 6	3GAA253230-••G	988	93.2	94.1	94.0	0.84	101	7.1	531	2.6	2.8	1.5	367	63

[1] Temperature rise class F

Equipment protection level and equipment group subdivison must be selected when ordering by choosing appropriate variant code;

Sizes 90-132
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

Sizes 160-280
340 Ex t, Dust group III B T125C Dc (non-conductive dust) with manufacturers declaration

Variant codes
Dust ignition protection Ex t aluminum motors

Code/Variant		Frame size 90	100	112	132	160	180	200	225	250	280
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.	•	•	•	•	•	•	•	•	•	•
188	63-series bearing in D-end	○	○	○	•	○	○	○	○	○	○
796	Grease nipples JIS B 1575 PT 1/8 Type A	-	-	-	-	•	•	•	•	•	•
797	Stainless steel SPM nipples	-	-	•	•	•	•	•	•	•	•
798	Stainless steel grease nipples	-	-	-	-	•	•	•	•	•	•
Branch standard designs											
071	Cooling Tower duty	-	-	•	•	•	•	•	•	•	•
142	Manilla connection.	•	•	•	•	•	•	•	•	•	•
178	Stainless steel / acid proof bolts.	•	•	•	•	•	•	•	•	•	•
209	Non-standard voltage or frequency, (special winding).	•	•	•	•	•	•	•	•	•	•
217	Cast iron D-end shield (on aluminum motor).	•	•	•	•	○	○	○	○	○	○
425	Corrosion protected stator and rotor core.	•	•	•	•	•	•	•	•	•	•
Cooling system											
053	Metal fan cover.	○	○	○	○	○	○	○	○	○	○
068	Light alloy metal fan	○	○	○	○	○	○	○	○	○	○
075	Cooling method IC418 (without fan).	-	-	-	-	-	-	-	-	-	-
183	Separate motor cooling (fan axial, N-end).	-	-	-	-	-	-	-	-	-	-
189	Separate motor cooling, IP44, 400V, 50Hz (fan axial, N-end).	-	-	-	-	-	-	-	-	-	-
141	Binding 2D main dimension drawing.	•	•	•	•	•	•	•	•	•	•
Drain holes											
065	Plugged existing drain holes.	•	•	•	•	•	•	•	•	•	•
Earthing Bolt											
067	External earthing bolt.	○	○	○	○	○	○	○	○	○	○
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.	•	•	•	•	-	-	-	-	-	-
340	Dust group III B T125C Dc (non-conductive dust) with manufacturers declaration. Musta täppä 160-280	-	-	-	-	•	•	•	•	•	•
452	DIP/Ex tD acc. to ATEX directive 94/9/EC , T= 125 °C, cat. 3D, IP55	-	-	-	-	•	•	•	•	•	•
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 for supply > 690 <= 1000 volts	-	-	-	-	-	-	-	-	-	-
Mounting arrangements											
007	IM 3001 flange mounted, IEC flange, from IM 1001 (B5 from B3).	-	-	-	-	•	•	•	•	•	•

Code/Variant		Frame size 90	100	112	132	160	180	200	225	250	280
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)	•	•	•	•	•	•	•	•	•	•
080	(IM 3001) Flange mounted, DIN A-flange.	•	•	-	-	-	-	-	-	-	-
090	(IM 2101) foot/flange mounted, DIN C-flange, from IM 1001 (B34 from B3).	•	•	-	-	-	-	-	-	-	-
091	(IM 2001) foot/flange mounted, DIN A-flange, from IM 1001 (B35 from B3).	•	•	-	-	-	-	-	-	-	-
093	IM 3601 flange mounted, IEC flange, from IM 1001 (B14 from B3).	•	•	•	-	-	-	-	-	-	-
200	Flange ring holder.	•	•	•	•	-	-	-	-	-	-
218	Flange ring FT 85.	•	-	-	-	-	-	-	-	-	-
219	Flange ring FT 100.	•	-	-	-	-	-	-	-	-	-
220	Flange ring FF 100.	•	-	-	-	-	-	-	-	-	-
223	Flange ring FF 115.	•	-	-	-	-	-	-	-	-	-
224	Flange ring FT 115.	•	-	-	-	-	-	-	-	-	-
226	Flange ring FF 130.	•	•	•	-	-	-	-	-	-	-
227	Flange ring FT 130.	•	•	•	-	-	-	-	-	-	-
229	Flange FT 130.	-	•	•	-	-	-	-	-	-	-
233	Flange ring FF 165.	•	•	•	-	-	-	-	-	-	-
234	Flange ring FT 165.	•	•	•	-	-	-	-	-	-	-
235	Flange FF 165.	•	-	-	-	-	-	-	-	-	-
236	Flange FT 165.	-	-	-	•	-	-	-	-	-	-
243	Flange ring FF 215.	-	-	•	•	-	-	-	-	-	-
244	Flange ring FT 215.	-	•	•	•	-	-	-	-	-	-
245	Flange FF 215.	-	•	•	-	-	-	-	-	-	-
253	Flange ring FF 265.	-	-	-	•	-	-	-	-	-	-
254	Flange ring FT 265.	-	-	-	•	-	-	-	-	-	-
255	Flange FF 265.	-	-	-	•	-	-	-	-	-	-
260	Flange FT 115.	•	-	-	-	-	-	-	-	-	-
306	IM 1001 foot mounted, from IM 3601 (B3 from B14).	•	•	•	•	-	-	-	-	-	-
307	IM 2101 foot/flange mounted, IEC flange, from IM 3601 (B34 from B14).	•	•	•	•	-	-	-	-	-	-
308	IM 2001 foot/flange mounted, IEC flange, from IM 3601 (B35 from B14).	•	•	•	•	-	-	-	-	-	-
309	IM 1001 foot mounted, from IM 3001 (B3 from B5).	•	•	•	•	-	-	-	-	-	-
310	IM 2101 foot/flange mounted, IEC flange, from IM 3001 (B34 from B5).	•	•	•	•	-	-	-	-	-	-
311	IM 2001 foot/flange mounted, IEC flange, from IM 3001 (B35 from B5).	•	•	•	•	-	-	-	-	-	-
312	IM 1001 foot mounted, from IM 2101 (B3 from B34).	•	•	•	•	-	-	-	-	-	-
313	IM 3601 flange mounted, IEC flange, from IM 2101 (B14 from B34).	•	•	•	-	-	-	-	-	-	-
314	IM 3001 flange mounted, IEC flange, from IM 2101 (B5 from B34).	•	•	•	-	-	-	-	-	-	-
315	IM 2001 foot/flange mounted, IEC flange, from IM 2101 (B35 from B34).	•	•	•	•	-	-	-	-	-	-
316	IM 1001 foot mounted, from IM 2001 (B3 from B35).	•	•	•	•	-	-	-	-	-	-
317	IM 3601 flange mounted, IEC flange, from IM 2001 (B14 from B35).	•	•	•	-	-	-	-	-	-	-
319	IM 2101 foot/flange mounted, IEC flange, from IM 2001 (B34 from B35).	•	•	•	•	-	-	-	-	-	-
Painting											
114	Special paint color, standard grade	•	•	•	•	•	•	•	•	•	•
Protection											
005	Protective roof, vertical motor, shaft down.	•	•	•	•	•	•	•	•	•	•
072	Radial seal at D-end. Not possible for 2-pole , 280 and 315 frames	•	•	•	•	•	•	•	•	•	•
158	Degree of protection IP65.	•	•	•	•	•	•	•	•	•	•
211	Weather protected, IP xx W	•	•	•	•	•	•	•	•	•	•
403	Degree of protection IP56.	•	•	•	•	•	•	•	•	•	•

Code/Variant		Frame size 90	100	112	132	160	180	200	225	250	280
404	Degree of protection IP56, without fan and fan cover.	-	-	-	-	-	-	-	-	-	-
784	Gamma-seal at D-end.	○	○	○	○	•	•	•	•	•	•
Rating & instruction plates											
002	Restamping voltage, frequency and output, continuous duty.	•	•	•	•	•	•	•	•	•	•
004	Additional text on std rating plate (max 12 digits on free text line).	•	•	•	•	•	•	•	•	•	•
095	Restamping output (maintained voltage, frequency), intermittent duty.	•	•	•	•	•	•	•	•	•	•
098	Stainless rating plate.	•	•	•	•	•	•	•	•	•	•
135	Mounting of additional identification plate, stainless.	•	•	•	•	•	•	•	•	•	-
138	Mounting of additional identification plate, aluminium.	•	•	•	•	•	•	•	•	•	•
139	Additional identification plate delivered loose.	•	•	•	•	•	•	•	•	•	•
159	Additional plate with text „Made in ....“	•	•	•	•	•	•	•	•	•	•
160	Additional rating plate affixed.	•	•	•	•	•	•	•	•	•	•
161	Additional rating plate delivered loose.	•	•	•	•	•	•	•	•	•	•
163	Frequency converter rating plate. Rating data according to quotation.	•	•	•	•	•	•	•	•	•	•
198	Aluminum rating plate.	○	○	○	•	○	○	○	○	○	○
332	Baldor Catalogue #	•	•	•	•	•	•	•	•	•	•
333	Not for use in the USA	•	•	•	•	•	•	•	•	•	•
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)	•	•	•	•	•	•	•	•	•	•
156	Cylindrical shaft extension, N-end, without key-way.	•	•	•	•	-	-	-	-	-	-
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											
010	Fulfilling CSA Safety Certificate.	•	•	•	•	•	•	•	•	•	•
242	Fulfilling CSA Energy Efficiency Verification IE2 (code 010 included)	-	-	-	-	•	•	•	•	•	•
408	Fulfilling EISA Subtype II efficiency requirements, CC031A.	-	-	-	-	•	•	•	•	•	•
543	Australian MEPS	•	•	•	•	•	•	•	•	•	-
Stator winding temperature sensors											
435	PTC - thermistors (3 in series), 130 °C, in stator winding	•	•	•	•	•	•	•	•	•	•
436	PTC - thermistors (3 in series), 150 °C, in stator winding	•	•	•	•	○	○	○	○	○	○
437	PTC - thermistors (3 in series), 170 °C, in stator winding	•	•	•	•	•	•	•	•	•	•
439	PTC - thermistors (2x3 in series), 150 °C, in stator winding	•	•	•	•	•	•	•	•	•	•
440	PTC - thermistors (3 in series, 110°C & 3 in series, 130°C), in stator winding.	•	•	•	•	-	-	-	-	-	-
441	PTC - thermistors (3 in series, 130 °C & 3 in series, 150 °C), in stator winding	•	•	•	•	•	•	•	•	•	•
442	PTC - thermistors (3 in series, 150 °C & 3 in series, 170 °C), in stator winding	•	•	•	•	•	•	•	•	•	•
Terminal box											
015	Motor supplied in D connection.	•	•	•	•	•	•	•	•	•	•
017	Motor supplied in Y connection.	•	•	-	-	•	•	•	•	•	•
021	Terminal box LHS (seen from D-end).	-	-	-	-	-	-	•	•	•	•
136	Extended cable connection, standard terminal box.	•	•	•	•	-	-	-	-	-	-
137	Extended cable connection, low terminal box, „Flying leads“.	•	•	•	•	-	-	-	-	-	-
180	Terminal box RHS (seen from D-end).	-	-	-	-	-	-	•	•	•	•
230	Standard metal cable gland.	•	•	•	•	•	•	•	•	•	•
467	Lower than standard terminal box and rubber extended cable. Cable length 2 m	-	-	•	•	•	•	•	•	•	•
729	Aluminum non-drilled flange for cable glands	-	-	-	-	-	-	•	•	•	•
731	Two standard metal cable glands.	-	•	•	•	•	•	•	•	•	•
739	Prepared for metric cable glands according to DIN 42925, draft aug. 1999.	-	-	•	•	-	-	-	-	-	-
Testing											
140	Test confirmation.	-	-	-	-	•	•	•	•	•	•
145	Type test report from a catalogue motor, 400V 50Hz.	•	•	•	•	•	•	•	•	•	•
146	Type test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
147	Type test with report for motor from specific delivery batch, customer witnessed.	•	•	•	•	•	•	•	•	•	•

Code/Variant		Frame size									
		90	100	112	132	160	180	200	225	250	280
148	Routine test report.	•	•	•	•	•	•	•	•	•	•
153	Reduced test for classification society.	•	•	•	•	•	•	•	•	•	•
221	Type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
222	Torque/speed curve, type test and multi-point load test with report for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
760	Vibration level test	•	•	•	•	•	•	•	•	•	•
762	Noise level test for one motor from specific delivery batch.	•	•	•	•	•	•	•	•	•	•
763	Noise spectrum test for one motor from specific delivery batch.	•	•	-	-	-	-	-	-	-	-
Variable speed drives											
701	Insulated bearing at N-end.	-	-	-	-	•	•	•	•	•	•
704	EMC cable entry.	•	•	•	•	•	•	•	•	•	•

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

Mechanical design
Motor frame and drain holes

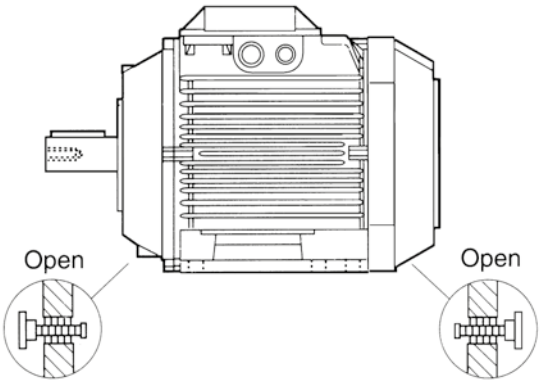
Motor frame
The motor frame is made of aluminum alloy. Frame size 90-180 have aluminum feet and sizes 200-280 have cast iron feet.

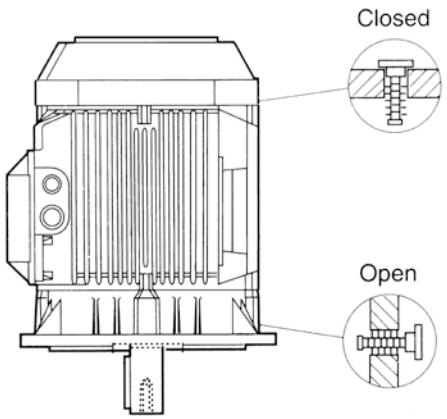
The bearing end shield of sizes 90-132 are made of aluminum, and those of 160 to 280 are made of cast iron.

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.





Bearings

ABB's alumimum dust ignition protrection motors are as standard fitted with single-row ball bearings according to the table below.

Standard design: Deep groove ball bearings

		Foot and flange mounted motor	
Motor size		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		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
280	2-pole	6315/C3	6213/C3
280	4-8 pole	6316/C3	6213/C3

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 90-132 is the locking done by a spring washer at N-end pushing the rotor towards D-end.

Bearing seals

Motors in sizes 90-132 are provided with gamma seals at both D and N-end, motors in sizes 160-280 have V-rings at both ends. The sizes 90-132 have in addition to the shaft seals 2RS type bearings with rubber seals for improved protection.

Bearing life and lubrication

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 life time 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 tables on following pages.

The tables are valid for 50Hz.

Lubrication

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. Motors of size 280 are provided with regreasable bearings as standard.

Radial forces

Pulley diameter

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

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

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.

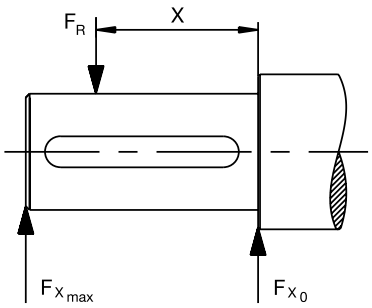
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft together with flame path dimensions affects permissible forces

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 sizes 90-132

Motor size	Poles	Length of shaft extension E (mm)	Ball bearings Basic design with deep groove ball bearings			
			25000 hours		40000 hours	
			F_{X0} (N)	F_{Xmax} (N)	F_{X0} (N)	F_{Xmax} (N)
90	2-8	50	1010	810	1010	810
100	2-8	60	2280	1800	2280	1800
112	2-8	60	2280	1800	2280	1800
132	2-8	80	2120	1610	2120	1610

Permissible radial forces, motor sizes 160-280

Motor size	Poles	Length of shaft extension E (mm)	Ball bearings Basic design with deep groove ball bearings			
			20 000 hrs		40 000 hrs	
			F_{X0}(N)	F_{Xmax}(N)	F_{X0}(N)	F_{Xmax}(N)
160	2	110	4760	3860	4100	3320
	4	110	5180	4200	4380	3545
	6	110	5160	4180	4360	3540
	8	110	6280	4300	5320	4300
180	2	110	6060	4960	5280 [1]	4305 [1]
	4	110	4800	3940	4020	3300
	6	110	6280	5140	5280	4380
	8	110	6960	5500	5880	4800
200	2	110	7800	6500	6760 [2]	5640 [2]
	4	110	8400	7020	7180	5980
	6	110	8960	7480	7600	6340
	8	110	10480	8740	8940	7400
225	2	110	8520	7180	7360 [3]	6200 [3]
	4	140	8380	6780	7200	5820
	6	140	10 960	8860	9360	7560
	8	140	12 100	9780	10 340	8360
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
	8	140	14 660	11 880	12 540	10 160
280	2	140	6780	5500	5680	4600
	4	140	8060	6540	6640	5380
	6	140	8980	7280	7360	5960
	8	140	9180	7460	7460	6060

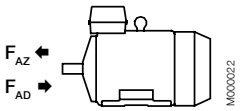
[1] The maximum lifetime of the grease is 38000 h
[2] The maximum lifetime of the grease is 27000 h
[3] The maximum lifetime of the grease is 23000 h
[4] The maximum lifetime of the grease is 16000 h

Axial forces

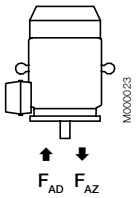
The following tables present permissible axial forces on the shaft in Newtons, assuming zero radial force, a 25 °C ambient temperature, and normal conditions. The values are given for a calculated bearing life of 20,000 and 40,000 hours per motor size.

At 60 Hz, the values must be reduced by 10 percent, Permissible loads of simultaneous radial and axial forces can be supplied on request.

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



Mounting arrangement IM B3



Mounting arrangement IM V1

Permissible axial forces, motor sizes 90-280

		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	
Motor size	Poles	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
	8	1410	1010	1110	710	1485	960	1185	660
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
	8	2660	2160	2065	1565	2780	2080	2185	1485
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
	8	2655	2155	2060	1560	2790	2055	2195	1475
132 M, MA	4	2245	1645	1760	1160	2460	1505	1970	1015
	6	2595	1980	2025	1425	2815	1850	2245	1280
	8	2875	2270	2240	1640	3130	2115	2490	1470
132 MC	6	2580	1980	2010	1410	2885	1780	2315	1210
132 MBA	4	2235	1635	1750	1150	2495	1465	2010	980
132 S	6	2600	2000	2030	1435	2780	1885	2210	1315
	8	2885	2285	2245	1645	3100	2145	2460	1505
132 SB	2	1760	1160	1400	800	1910	1075	1540	705
132 SBB, SC	2	1760	1160	1395	795	1945	1045	1575	670
132 SMB, SMC	2	2210	1610	1740	1140	2435	1470	1950	985
	4	2840	2240	2205	1605	3150	2035	2515	1400
132 SMD	4	2830	2200	2230	1595	3195	1995	2560	1355
132 SME	2	2210	1610	1730	1130	2490	1425	2005	940
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
	8	5980	5980	4920	4920	6560	5580	5460	4480
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
	8	6000	6620	5460	5460	6000	6120	6000	4900
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
	8	5000	9880	5000	8160	5000	9215	5000	7435
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
	8	5000	11 420	5000	9460	5000	10 595	5000	8535
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
	8	6000	13 700	6000	11 380	6000	12 645	6000	10 205
280	2	5260	5260	4220	4220	6400	4400	5420	3420
	4	6500	6500	5160	5160	7920	5400	6640	4120
	6	7500	7500	6040	6040	8500	6180	7840	4640
	8	7740	7740	6180	6180	8500	6435	7980	4775

[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

Protection and mounting
The degree of protection for the standard terminal box is IP 55. 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.

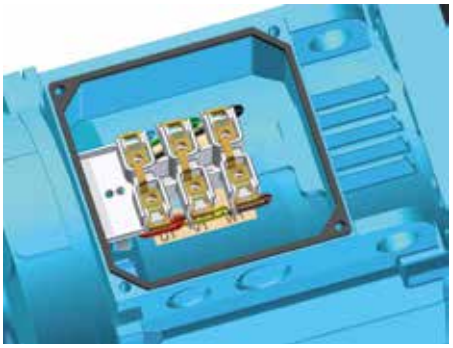
Turnability
The terminal box of motors in size 90-180 are integrated with the frame which means that the box itself cannot be rotated. There are however cable entries both on RHS and LHS to allow cabling from either side. Motors in size 200-280 have a terminal box made of deep drawn steel mounted on top of the stator, the box itself cannot be rotated but there are two openings with detachable gland plates, one on RHS and another on LHS of the box allowing cable entry from both sides.

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 t approved blanking plugs.

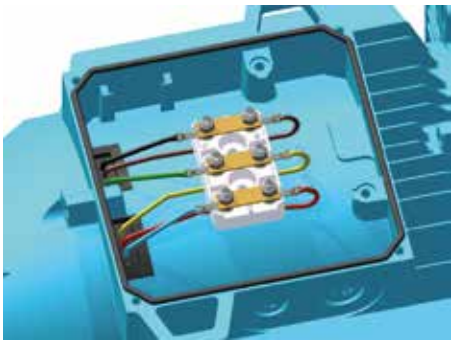
Cable type and terminations
Terminations are suitable for copper cables. Cables are connected to terminals by cable lugs, the lugs are not included in the delivery.

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.

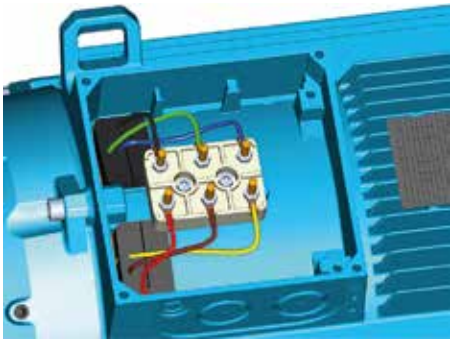
Terminal box
Terminal boxes and boards



Terminal box size 90-112



Terminal box size 132



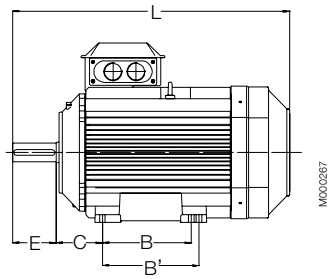
Terminal box size 160 and 180

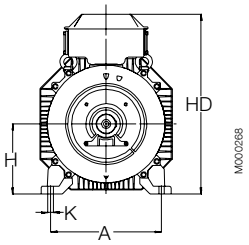
Terminal box size 200-280

Terminal box openings

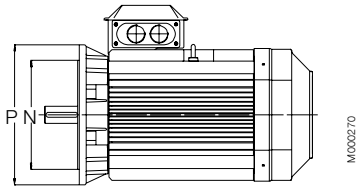
Motor size	Plugged cable entry	Terminal bolt size	Maximum connectable Cu-cable earea, mm^2
90-112	2 x (M25 + M20)	6 x M4 (screw)	6
132	2 x (M25 + M20)	6 x M5	10
160, 180	2 x (2 x M40) + M16	6 x M6	35
200-250	1 x (2 x M40 + M16)	6 x M10	70
280	1 x (2 x M63 + M16)	6 x M10	70

Dimension drawings
Dust ignition proof Ex tD (DIP) aluminum motors

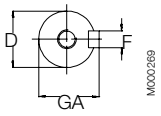


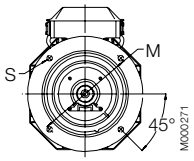


Foot-mounted motor IM 1001, IM B3

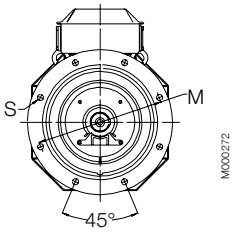


Flange-mounted motor IM 3001, IM B5





Sizes 90 to 200



Sizes 225 to 250

	IM 1001, IM B3 AND IM 3001, IM B5											IM 1001, IM B3							IM3001, IM B5			
	D poles		GA poles		F poles		E poles		L max poles		O	A	B	B'	C	HD	K	H	M	N	P	S
Motor size	2	4-8	2	4-8	2	4-8	2	4-8	2	4-8												
M3AA 90S	24	24	27	27	8	8	50	50	288	288	30	140	100	-	56	217	10	90	165	130	200	12
90L	24	24	27	27	8	8	50	50	313	313	30	140	125	-	56	217	10	90	165	130	200	12
90LD	24	24	27	27	8	8	50	50	335	335	30	140	125	-	56	217	10	90	165	130	200	12
100	28	28	31	31	8	8	60	60	355	355	35	160	140	-	63	237	12	100	215	180	250	15
100LD	28	28	31	31	8	8	60	60	377	377	35	160	140	-	63	237	12	100	215	180	250	15
112	28	28	31	31	8	8	60	60	397	397	35	190	140	-	70	249	12	112	215	180	250	15
132 [1]	38	38	41	41	10	10	80	80	458.5	458.5	50	216	140	178	89	296	12	132	265	230	300	14.5
132 [2]	38	38	41	41	10	10	80	80	498.5	498.5	50	216	140	178	89	321	12	132	265	230	300	14.5
160 [3]	42	42	45	45	12	12	110	110	584	584	50	254	210	254	108	370	15	160	300	250	350	19
160 [4]	42	42	45	45	12	12	110	110	681	681	50	254	210	254	108	370	15	160	300	250	350	19
180	48	48	51.5	51.5	14	14	110	110	726	726	55	279	241	279	121	405	15	180	300	250	350	19
200	55	55	59	59	16	16	110	110	821	821	55	318	267	305	133	532	18	200	350	300	400	19
225	55	60	59	64	16	18	110	140	850	880	60	356	286	311	149	579	18	225	400	350	450	19
250	60	65	64	69	18	18	140	140	884	884	65	406	311	349	168	627	22	250	500	450	550	19
280	65	75	69	79.5	18	20	140	140	884	884	65	457	368	419	190	627	24	280	500	450	550	19

[1] All types except [2]
[2] SM_
[3] MLA 2, MLB 2, MLA 4, MLA 6, MLA 8 and MLB 8
[4] All remining types, i.e. MLC 2, MLD 2, MLE 2, MLB 4, MLC 4, MLD 4 and MLC 8
[5] O = minimum free distance between fan cover air inlet and obstacle preventing air flow

IM 3601, IM B14

Motor size	LA	M	N	P	S	T
90	13	115	95	140	M8	3
100	14	130	110	160	M8	3.5
112	14	130	110	160	M8	3.5
132	18	165	165	200	M10	3.5

Tolerances:	
A, B	ISO js14
C	± 0.8
D	ISO k6 < Ø 50mm
	ISO m6 > Ø 50mm
F	ISO h9
H	-0,5
N	ISO j6

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.

Motors in brief

Dust ignition protection aluminum motors, 2D and 3D, size 90 to 280

Motor size	M3AA	90	100	112	132	160	180	200	225	250	280
Stator and end shields	Material	Die-cast aluminum alloy						Extruded aluminum alloy			
	Paint colour shade	Minsell blue 8B 4.5/3.25									
	Corrosion class	C3 medium accrding ISO/EN 12944-5									
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	6316/C3 1)
	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	6213/C3
Axially-locked bearings		Locked at D-end									
Bearing seal	D-end	Gamma seal				V-ring					
	N-end	Gamma seal				V-ring					
Lubrication		Permanently lubricated shielded bearing									Regreasable
Measuring nipples for condition monitoring of the bearings	Material	Optional									
Rating plate	Material	Aluminum									
Terminal box	Frame and cover	Die-cast aluminum alloy, integrated in stator						Deep-drawn steel sheet, bolted on stator			
	Openings	2x (M25+M20) plugged				(2x M40 + M16) + (2x M40) plugged		2x M40 + M16 plugged			2x M63 + M16 plugged
	Terminals	6 terminals									
Fan	Material	Aluminum									
Fan cover	Material	Steel									
Stator winding	Material	Copper									
	Insulation	Insulation class F									
	Winding protection	Optional				3 PCS PTC Thermistors					
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 on delivery									
Enclosure		IP65 or IP55 depending on dust group and EPL				IP55					
Cooling method		IC411									

1) 6315/C3 for 2-pole motors

Total product offering

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

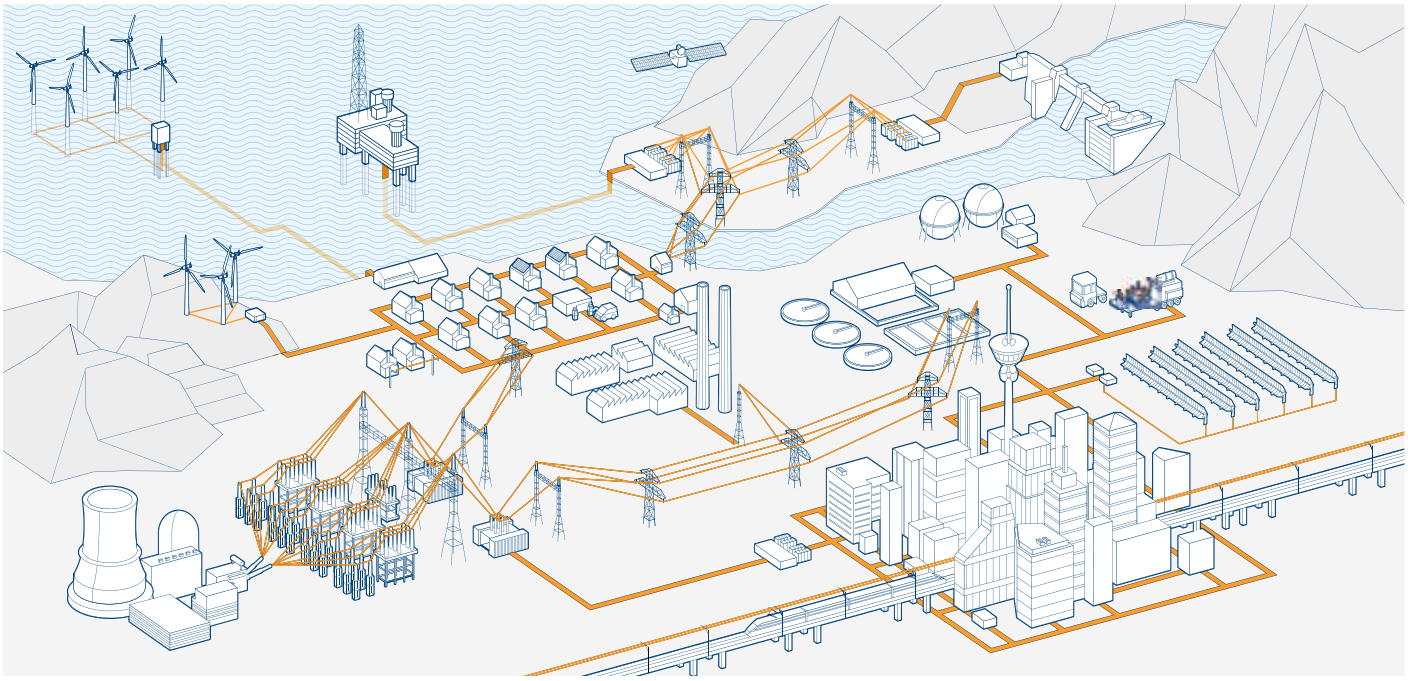


ABB is the leading manufacturer of low, medium and high voltage motors and generators, and mechanical power transmission products. ABB products are backed by a complete portfolio of services. Our in-depth knowledge of virtually every type of industrial process ensures we always specify the best solution for your needs.

Low and high voltage IEC induction motors

- Process performance motors
- General performance motors
- High voltage cast iron motors
- Induction modular motors
- Slip-ring modular motors

Low and medium voltage NEMA motors

- Steel frame open drip proof (ODP) motors
- Weather protected, water cooled,fan ventilated
- Cast iron frame (TEFC)
- Air to air cooled (TEAAC) motors

Motors and generators forexplosive atmospheres

- IEC and NEMA motors andgenerators, for all protection types

Synchronous motors

Synchronous generators

- Synchronous generators fordiesel and gas engines
- Synchronous generators forsteam and gas turbines

Wind power generators

Generators for small hydro

Other motors and generators

- Brake motors
- DC motors and generators
- Gear motors
- Marine motors and generators
- Single phase motors
- Motors for high ambient temperatures
- Synchronous reluctance motors
- Permanent magnet motors and generators
- High speed motors
- Smoke extraction motors
- Wash down motors
- Water cooled motors
- Generator sets
- Roller table motors
- Low inertia motors
- Traction motors and generators

Life cycle services

Mechanical power transmissioncomponents, bearings, gearings

Life cycle services and support
From pre-purchase to migration and upgrades

ABB offers a complete portfolio of services to ensure trouble-free operation and long product lifetimes. These services cover the entire life cycle. Local support is provided through a global network of ABB service centers and certified partners.

Pre-purchase
ABB's front-end sales organization can help customers to quickly and efficiently select, configure and optimize the right motor or generator for their application.

Installation and commissioning
Professional installation and commissioning by ABB's certified engineers represent an investment in availability and reliability over the entire life cycle.

Engineering and consulting
ABB's experts provide energy efficiency and reliability appraisals, advanced condition and performance assessments and technical studies.

Condition monitoring and diagnosis
Unique services collect and analyze data to provide early warnings of problems before failures can occur. All critical areas of the equipment are covered.

Maintenance and field services
ABB offers life cycle management plans and preventive maintenance products. The recommended four-level maintenance program covers the entire product lifetime.

Spare parts
Spare parts and support are offered throughout the life cycle of ABB products. In addition to individual spares, tailored spare part packages are also available.

Repair and refurbishment
Support for all ABB motors and generators and other brands is provided by ABB's global service organization. Specialist teams can also deliver emergency support.

Migration and upgrades
Life cycle audits determine the optimum upgrades and migration paths. Upgrades range from individual components to direct replacement motors and generators.

Training
Product and service training courses take a practical approach. The training ranges from standard courses to specially tailored programs to suit customer requirements.

Specialized support
Specialized support is offered through ABB's global service organization. Local units provide major and minor repairs as well as overhauls and reconditioning.

Service contracts
Service contracts are tailored to the customer's needs. The contracts combine ABB's entire service portfolio and 120 years of experience to deploy the optimal service practices.

Contact us

www.abb.com/motors&generators

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