Low Voltage
General Purpose Motors

LV Global motor section

Making you more competitive

ABB’s General purpose motor is designed for use in general industry, meeting the demands of standard applications for OEM's. Motors are readily available from central stock locations and distributors around the world. The motors have high build quality, are available with all the features needed by the OEM market and can be modified to meet most specifications.

ABB is a global leader in power and automation technologies that enable utility and industry customers to improve their performance while lowering environmental impact. The ABB Group of companies operates in around 100 countries and employs about 107,000 people.

Low Voltage General Purpose Motors

Sizes 56 to 400, from 0.055 to 630 kW

ABB reserves the right to change the design, technical specification and dimensions without prior notice.

General information

Standards

ABB motors are of the totally enclosed and open drip proof, single or three phase squirrel cage type, built to comply with international IEC and EN standards. Motors conforming to other national and international specifications are also available on request.

All production units are certified to ISO 9001 international quality standard as well ISO 14000 environmental standard and confirm to all applicable EU Directives.

IEC / EN

Electrical	Mechanical
IEC/EN 60034-1	IEC 60072
IEC/EN 60034-2	IEC/EN 60034-5
IEC 60034-8	IEC/EN 60034-6
IEC 60034-12	IEC/EN 60034-7
	IEC/EN 60034-9
	IEC 60034-14

M000001

M000002

M000003

M000329

Motors for EU motor efficiency levels

A Europe-wide agreement will ensure that the efficiency levels of electric motors manufactured in Europe are clearly displayed. In contrast to the American legislation on motor efficiency the European agreement does not establish mandatory efficiency levels.

It basically establishes three classes giving motor manufacturers an incentive to qualify for a higher class.

ABB is one of only a handful of leading motor manufacturers in Europe to have a motor range to meet or exceed the minimum efficiencies stated in the highest level of the EU agreement of LV motors.

These efficiency levels apply to 2- and 4-pole, three phase squirrel cage induction motors rated for 400V, 50Hz with S1 duty class with the output 1.1 to 90 kW, which account for the largest volume on the market.

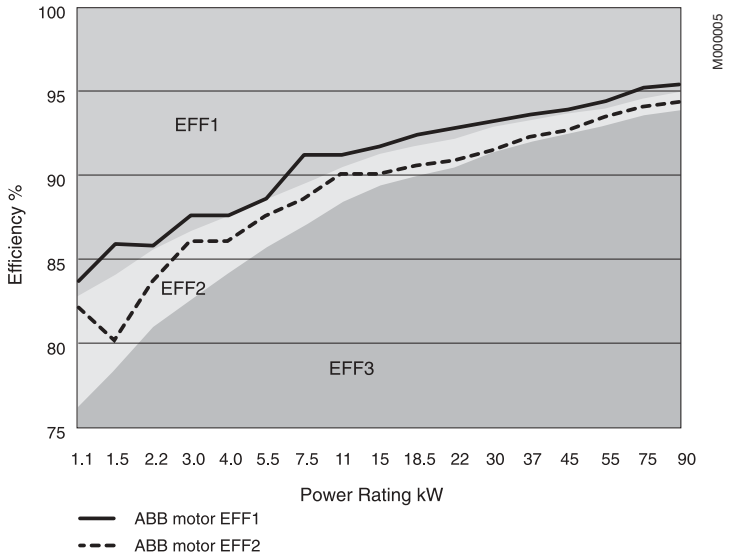
The efficiency of motors from different manufacturers are collated in a database, EURODEEM, published by the European Commission. It is accessible over the Internet at http://iamest.jrc.it/projects/eem/eurodeem.htm.

EU efficiency classes for 2-pole motors

Output kW	2-pole Boarderline EFF2/EFF3	EFF1/EFF2
1.1	76.2	82.8
1.5	78.5	84.1
2.2	81.0	85.6
3	82.6	86.7
4	84.2	87.6
5.5	85.7	88.6
7.5	87.0	89.5
11	88.4	90.5
15	89.4	91.3
18.5	90.0	91.8
22	90.5	92.2
30	91.4	92.9
37	92.0	93.3
45	92.5	93.7
55	93.0	94.0
75	93.6	94.6
90	93.9	95.0

ABB Three phase induction motors, 400 V 50 Hz - EU motor efficiency levels

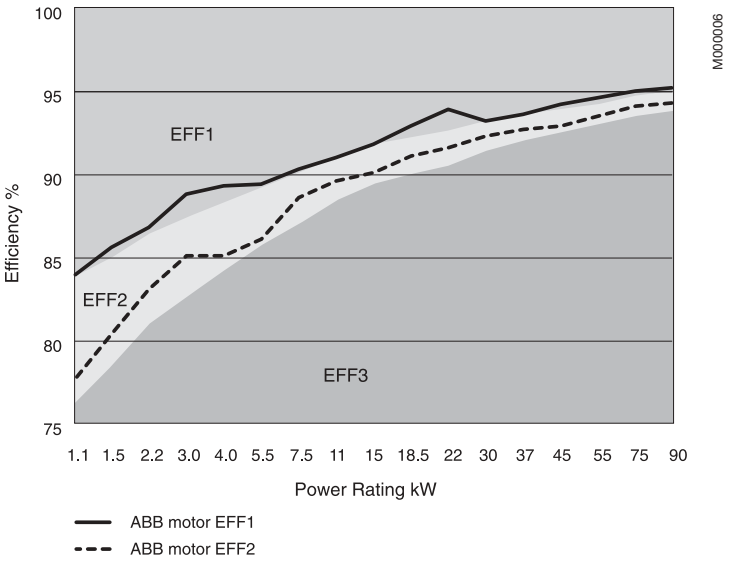
2-pole



EU efficiency classes for 4-pole motors

Output kW	4-pole Boarderline EFF2/EFF3	EFF1/EFF2
1.1	76.2	83.8
1.5	78.5	85.0
2.2	81.0	86.4
3	82.6	87.4
4	84.2	88.3
5.5	85.7	89.2
7.5	87.0	90.1
11	88.4	91.0
15	89.4	91.8
18.5	90.0	92.2
22	90.5	92.6
30	91.4	93.2
37	92.0	93.6
45	92.5	93.9
55	93.0	94.2
75	93.6	94.7
90	93.9	95.0

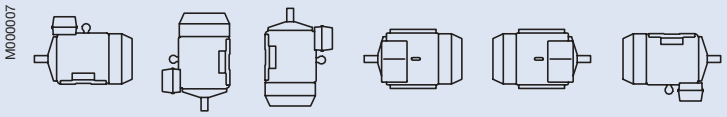
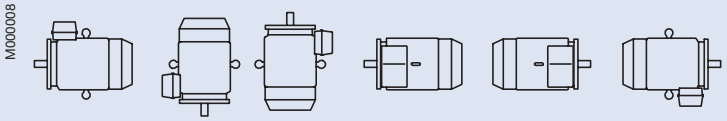
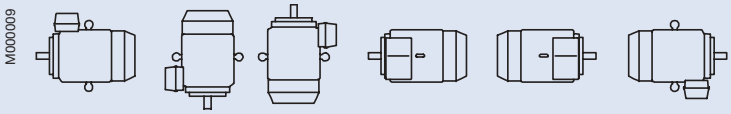
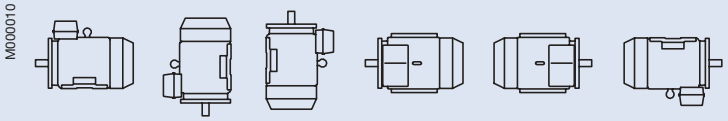
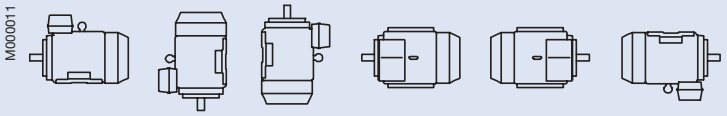
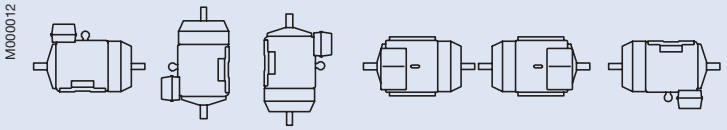
4-pole



General technical specification

Mechanical and electrical design

Mounting arrangements

	Codel/CodeII						Product code pos. 12
Foot-mounted motor.	IM B3 IM 1001	IM V5 IM 1011	IM V6 IM 1031	IM B6 IM 1051	IM B7 IM 1061	IM B8 IM 1071	A = foot-mounted, term.box top R = foot-mounted, term.box RHS L = foot-mounted, term.box LHS
	 M000007						
Flange-mounted motor, large flange	IM B5 IM 3001	IM V1 IM 3011	IM V3 IM 3031	*) IM 3051	*) IM 3061	*) IM 3071	B = flange mounted, large flange
	 M000008						
Flange-mounted motor, small flange	IM B14 IM 3601	IM V18 IM 3611	IM V19 IM 3631	*) IM 3651	*) IM 3661	*) IM 3671	C = flange mounted, small flange
	 M000009						
Foot- and flange-mounted motor with feet, large flange	IM B35 IM 2001	IM V15 IM 2011	IM V36 IM 2031	*) IM 2051	*) IM 2061	*) IM 2071	H = foot/flange-mounted, term.box top S = foot/flange-mounted, term.box RHS T = foot/flange-mounted, term.box LHS
	 M000010						
Foot- and flange-mounted motor with feet, small flange	IM B34 IM 2101	IM V17 IM 2111	IM 2131	IM 2151	IM 2161	IM 2171	J = foot/flange-mounted, small flange
	 M000011						
Foot-mounted motor, shaft with free extensions	IM 1002	IM 1012	IM 1032	IM 1052	IM 1062	IM 1072	
	 M000012						

*) Not stated in IEC 60034-7.

Cooling

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

Example

IC 4 (A) 1 (A) 6

International Cooling

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

Primary coolant
A for air (omitted for simplified designation)

Method of movement of primary coolant
0: Free convection
1: Self-circulation
6: Machine-mounted independent component

Secondary coolant
A for air (omitted for simplified designation)
W for water

Method of movement of secondary coolant
0: Free convection
1: Self-circulation
6: Machine-mounted independent component
8: Relative displacement

Degrees of protection: IP code/IK code

Classification of degrees of protection provided by enclosures of rotating machines are refers to:
- Standard IEC 60034-5 or EN 60529 for IP code
- Standard EN 50102 for IK code

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

IP 5 5

Characteristic letter

Degree of protection to persons and to parts of the motors inside the enclosure
2: Motors protected against solid objects greater than 12 mm
4: Motors protected against solid objects greater than 1 mm
5: Dust-protected motors

Degree of protection provided by the enclosure with respect to harmful effects due to ingress of water
3: Motors protected against spraying water
4: Motors protected against splashing water
5: Motors protected against water jets
6: Motors protected against heavy seas

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

IK 08

International mechanical protection

Characteristic group

Relation between IK code and impact energy:

IK cod	IK 0	IK 01	IK 02	IK 03	IK 04	IK 05	IK 06	IK 07	IK 08	IK 09	IK 10
Impact energy Joule	*	0.15	0.2	0.35	0.5	0.7	1	2	5 ABB Standard	10	20

** not protected according to EN 50102*

Insulation

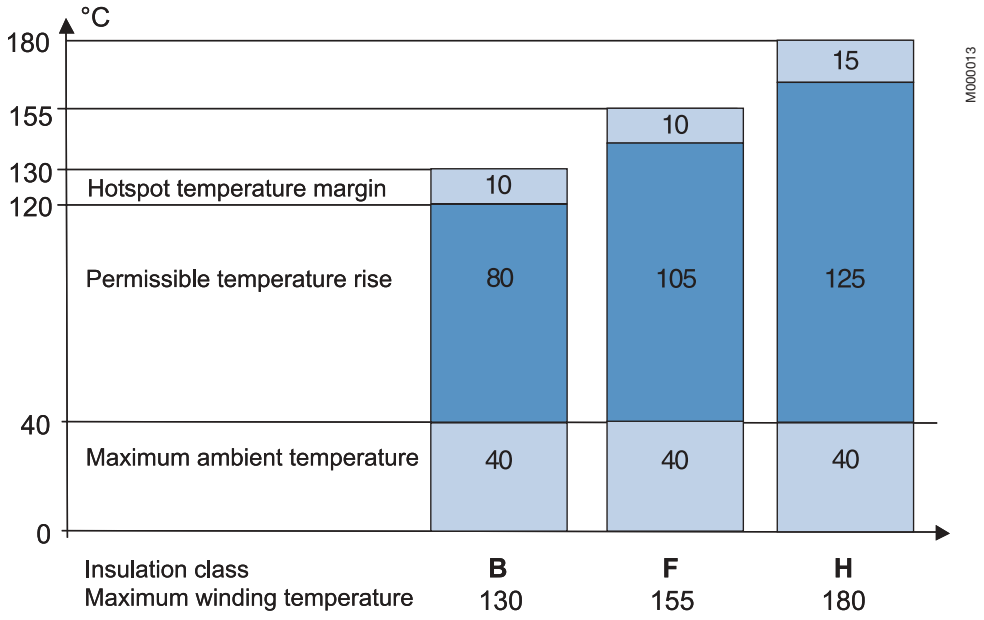
ABB uses class F insulation systems, which, with temperature rise B, is the most common requirement among industry today.

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 by up to 12 per cent for limited periods, to operate at higher ambient temperatures or altitudes, or with greater voltage and frequency tolerances. It can also be used to extend insulation life. For instance, a 10 K temperature reduction will extend the insulation life.

Class F insulation system
- Max ambient temperature 40° C
- Max permissible temperature rise 105 K
- Hotspot temperature margin + 10 K

Class B rise
- Max ambient temperature 40° C
- Max permissible temperature rise 80 K
- Hotspot temperature margin + 10 K

Insulation system temperature class
- Class F 155° C
- Class B 130° C
- Class H 180° C



Safety margins per insulation class

Frequency converter drives

Squirrel cage induction motors offer excellent availability, reliability and efficiency. With a frequency converter – a variable speed drive (VSD) – the motor will deliver even better value. A variable speed drive motor can be started softly with low starting current, and the speed can be controlled and adjusted to suit the application demand without steps over a wide range. Also the use of a frequency converter together with a squirrel cage motor usually leads to remarkable energy and environmental savings.

However, all motors are not suitable for variable speed drive. There are several points that have to be taken into account in the design and selection of the motor, if it is intended for variable speed operation.

Within the General purpose motor range ABB offers motors designed for both Direct On Line (DOL) and variable speed applications.

For more demanding applications the use of ABB Process performance motors is recommended.

When selecting general purpose motors to variable speed drives, following points shall be taken into consideration:

1. Dimensioning

The voltage (or current) fed by the frequency converter is not purely sinusoidal. This may increase the losses, vibration, and noise of the motor. Furthermore, a change in the distribution of the losses may affect to the temperature rise of the motor. In each case, the motor must be correctly sized according to the instructions supplied with the selected frequency converter.

When using ABB converters, please use ABB's DriveSize dimensioning programme or the loadability curves of the corresponding converter type for sizing the motors. The loadability curve for applicable General purpose motors used with ABB's ACS 800- frequency converters with DTC-control can be found in figure 3.

2. Speed range

In a frequency converter drive, the actual operating speed of the motor may deviate considerably from its nominal speed (i.e. the speed stamped on the rating plate).

For higher speeds, ensure that the highest permissible rotational speed of the motor or the critical speed of the entire equipment is not exceeded. When high speed operation exceeds the nominal speed of the motor, the following points should be checked:

– Maximum torque of the motor
– Bearing construction
– Lubrication
– Balancing
– Critical speeds
– Shaft seals
– Ventilation
– Fan noise

Guideline values of maximum speeds for General purpose aluminum motors described in figure 1. Exact values are available on request.

Figure 1. Guideline values of maximum speeds for General purpose motor in aluminum frame:

Motor size	Speed r/min	
	2-pole	4-pole
63-80	6000	4500
90-100	6000	6000
112-200	4500	4500
225-280	3600	3600

At low speed operation the cooling capacity of the fan decreases, which may cause higher temperature rises in the motor. A separate constant speed fan can be used to increase cooling capacity and loadability at low speed. It is also important to check the performance of the grease at low speeds.

3. Lubrication

Variable speed operation affects on the bearing temperature, which must be taken into account when selecting the lubrication method and grease type. For example the life time of sealed bearings can be remarkably shorter than in direct on line operation.

4. Insulation protection

Frequency converter supply causes higher voltage stresses at the windings of the motor than the sinusoidal supply. Thus, the insulation system and possible filters must be selected according to the used voltage and converter type. For selection of insulation system and filters, see figure 2.

5. Bearing currents

Bearing voltages and currents must be avoided in all motors. For reliability issues, insulated bearings and/or properly dimensioned filters at the converter output must be used according to the instructions in figure 2. When ordering, clearly state which alternative will be used.

For more information about bearing currents and voltages, please contact ABB.

6. Cabling, grounding and EMC

The use of a frequency converter puts higher demands on the cabling and grounding of the drive system. The motor must be cabled by using shielded symmetrical cables and cable glands providing 360° bonding (also called EMC-glands). For motors up to 30 kW unsymmetrical cables can be used, but shielded cables are always recommended.

More information about grounding and cabling of a variable speed drive can be found from the manual "Grounding and cabling of the drive system" (Code: 3AFY 61201998 R0125 REV B) and the ABB's Low Voltage Motors Manual.

For fulfilling the EMC requirements, special EMC cable(s) must be used in addition to the correct cable gland mounting, with special, extra earthing pieces. Please refer to the manuals of the frequency converter.

1

Validity of figure 2

Measures mentioned in Figure 2 apply to the applicable motors within the General motors range (not high-output versions) with ACS 800 and ACS 550 drives with uncontrolled DC-voltage. For other alternatives and converter types, please contact ABB.

Figure 2. Selection rules for insulation and filtering in variable speed drives

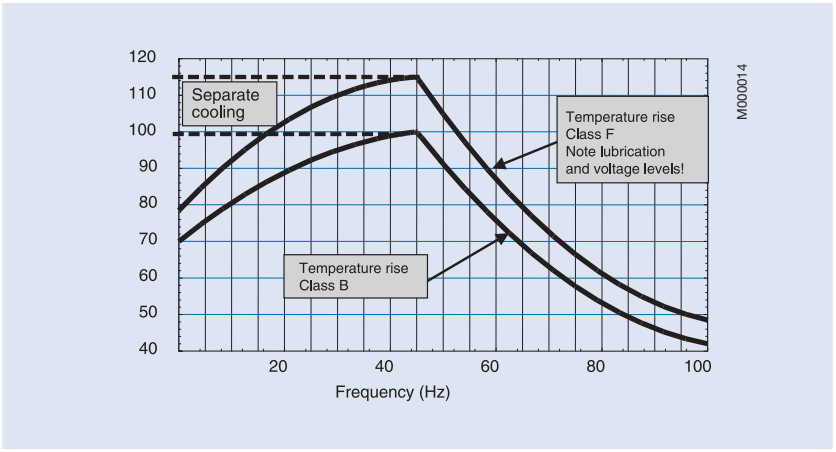
	Motor nominal power P_N or frame size		
	P_N < 100 kW	**P_N ≥ 100 kW or IEC 315 ≤ Frame size ≤ IEC 355**	**P_N ≥ 350 kW or IEC 400**
U_N ≤ 500 V	Standard motor	Standard motor + Insulated N-bearing	Standard motor + Insulated N-bearing + Common mode filter
U_N ≤ 600 V	Standard motor + dU/dt-filter (reactor) **OR** Reinforced insulation	Standard motor + dU/dt-filter (reactor) + Insulated N-bearing **OR** Reinforced insulation + Insulated N-bearing	Standard motor + Insulated N-bearing + dU/dt-filter (reactor) + Common mode filter **OR** Reinforced insulation + Insulated N-bearing + Common mode filter
U_N ≤ 690 V	Reinforced insulation + dU/dt-filter (reactor)	Reinforced insulation + dU/dt-filter (reactor) + Insulated N-bearing	Reinforced insulation + Insulated N-bearing + dU/dt-filter (reactor) + Common mode filter

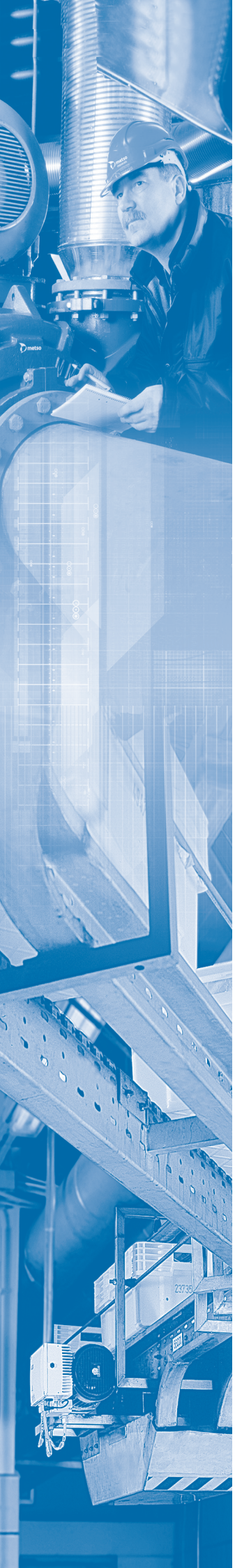
dU/dt filter (reactor)
Series reactor. DU/dt -filter decreases the changing rate of the phase and main voltages and thus reduces voltage stresses in the windings. DU/dt -filters also decrease so-called common mode currents and the risk of bearing currents.

Common mode
Common mode filters reduce so-called common mode currents in VSD applications and thus decrease the risk of bearing currents. Common mode filters do not significantly affect the phase or main voltages on the motor terminals.

Insulated Bearings
Bearings with insulated inner or outer races are used as the standard solution. So-called hybrid bearings, i.e. bearings with non-conductive ceramic balls, can also be used in special applications. More information for spare part selection is available on request.

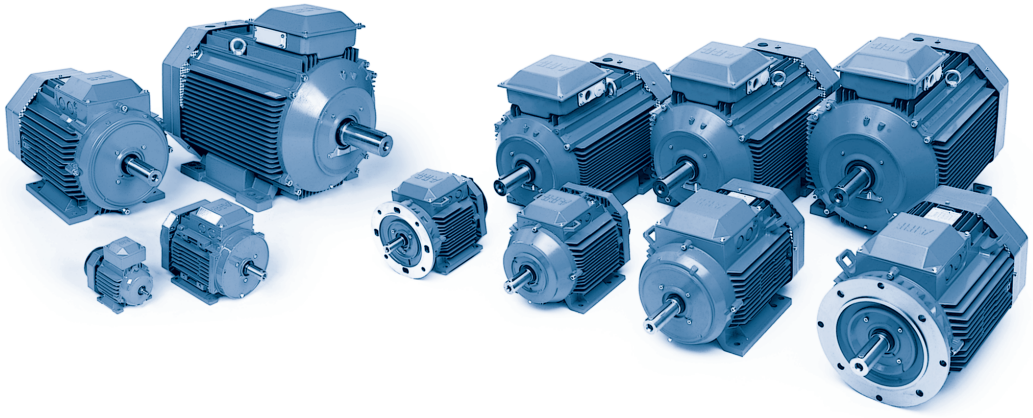
Figure 3. Motor loadability with ACS 800, Field weakening point 50 Hz.





General Purpose Global Motors

Totally enclosed squirrel cage three phase low voltage motors, Sizes 63 - 280, 0.12 to 75 kW



www.abb.com/motors&drives
> Motors
> Low voltage motors
> General purpose motors

6

Global motors

Features

The global economy connects multinational companies with engineering and production in many countries around the world.

Once a motor is specified and put into use, production equipment, including the motors, may need to move from one country to another, Very often the new country will have different voltage, efficiency and safety label requirements.

The new Global motor from ABB puts an end to the confusion and waste. ABB has designed a motor that is multi-labeled and certified for use virtually anywhere. The motors are harmonized to IEC - CENELEC power and frame size standards and are readily available from any of the ABB central stock locations in Europe, Asia and/or America.

Certified for global use

Global motors are certified, labeled and will fulfill requirements for global use:

CE	European safety certified
EFF1	European Community efficiency classification, highest class EFF1
CSA	Canadian safety certified
EEV	Canadian Energy Efficient certified
UR	US safety certified
EPAct	US Energy Efficiency certified

Note: A product that bears the UR logo is approved by Underwriter's Laboratories. This ensures that the product can be used in any machine or application that will be subject to UL certification – without additional testing.

Certificates for ABB Global motors can be found on www.ul.com pages.

EPAct requirements for importing products for the U.S.

Motors, rated from 1 to 200 horsepower (0.7 kW to 150 kW), for use within the United States are subject to EPAct legislation. Requirements defined by EPAct include:

– Foot mounted and foot-flange mounted
– 2, 4 and 6 pole motors
– 230 and 460 V ± 10% 60 Hz
– Outputs defined, no derating allowed
– Efficiency must meet NEMA minimum efficiency requirements
– Ambient temperature 40°C

Flange mounted motors will be delivered as global motors however the CC number cannot be printed on the rating plate.

Motors with voltage rating outside 230 and 460 V ± 10% 60 Hz will be delivered as global motors however the CC number cannot be printed on the rating plate.

CC number

Motors covered by EPAct must have the EPAct compliance number stamped on the rating plate. The number for all ABB low voltage motors is CC031A.

The number is mandatory for all motors included in the EPAct scope and will be checked by US Customs inspectors before clearance into the United States.

Voltage

The Global motors can be delivered for all voltages in the range from 200 up to 600 V 60 Hz. The most common voltage in the U.S. is 460 V 60 Hz, however 480 volt systems are frequently specified. In the case of a 480 volt system with a variable frequency drive, the output of the drive to the motor will be 460 volts, therefore allowing a standard motor to be used.

Mechanical design

Stator

Stator framework, bearing shields and feet are made of an extra corrosion resistant aluminum alloy with low copper content with the following exceptions:

M3AA 250-280 has feet and D-end shield of cast iron. M3AA 250-280 2-pole, have also N-end shield of cast iron.

The flange bearing shields of sizes 180 to 280 are made of cast iron.

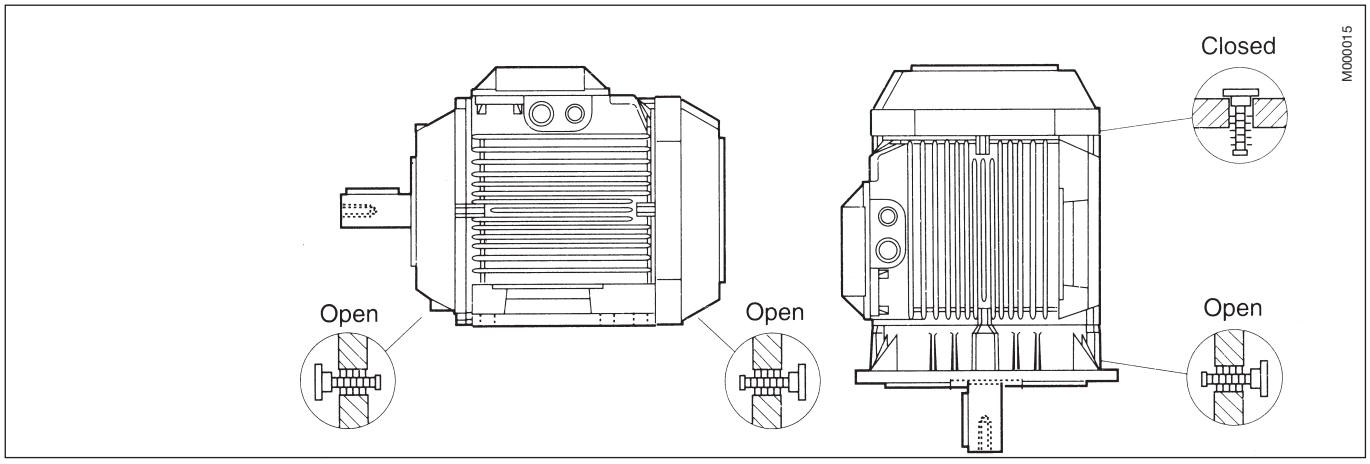
Drain holes

Motors that will be operated in very humid or wet environments and especially under intermittent duty should be provided with drain holes. The appropriate IM designation, such as IM 3031, is specified on the basis of the method of mounting the motor.

Motors are provided with closable plastic plugs in the drain holes (see diagram below). The plugs will be open on delivery. When mounting the motors it should be ensured that the drain holes face downwards. In the case of vertical mounting, the upper plug must be hammered home completely. In very dusty environments both plugs should be hammered home.

Size 63 is supplied as standard with drain holes on D-end while sizes 71 to 280 are supplied with drain holes both on D-end and N-end.

When mounting arrangement differs from foot mounted IM B3, please mention variant code 066 when ordering. See variant codes 065, 066 and 076 under the heading “Drain holes”.



Terminal box

Sizes 63 to 180
The terminal box is made of aluminum alloy and is located on top of the stator. The lower part of the box is integrated with the stator. It is provided with 2 knockout openings on each side. Sizes 160-180 also have a third smaller opening. Cable glands are not included.

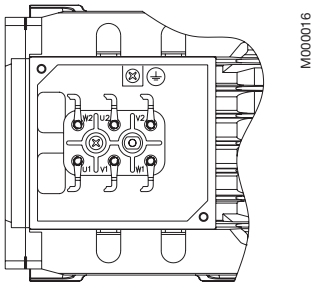
Sizes 200 to 280
The terminal box and cover are made of deep drawn steel and mounted on top of the stator. The box is bolted to the stator and is not rotatable. The size of the box is the same for all motors.

In the basic design the terminal box is provided with two FL 13 flange openings, one on each side. The opening on the right side, seen from the D-end, is supplied with a flange with two holes for M40 cable glands. On delivery the holes are sealed by means of plastic plugs. Cable glands are not supplied. The opening on the other side is provided with a cover flange.

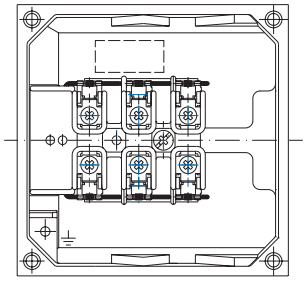
The motors can also be provided with an extra large terminal box, standard for voltage code S and frame size 280. See variant code 019 under the heading

"Terminal box". This will increase the dimension HD by 32 mm. The box is supplied with two FL 21 openings. The right opening is provided with a flange with two holes for M63 cable glands. The holes are sealed by means of plastic plugs. Cable glands are not supplied. The opening on the other side is provided with a cover flange. The box can also be provided with an FL 13 opening towards the N-end.

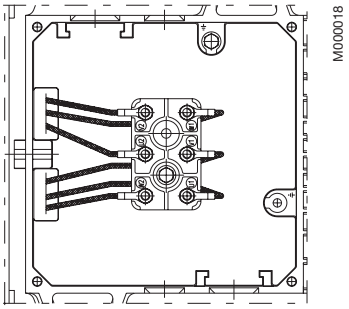
When new motors are manufactured the terminal box can be mounted on the left or the right side. See variant codes 021 and 180 under the heading "Terminal box".



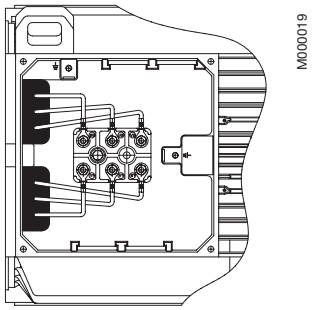
Terminal box size 63-80.



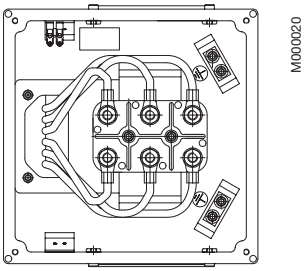
Terminal box size 90-100.



Terminal box size 112-132.



Terminal box size 160-180



Terminal box size 200-280.

6

Connections

The terminal block is provided with 6 terminals for connecting Cu-cable. The terminals are marked in accordance with IEC 60034-8.

Connection openings

Motor size	Opening	Metric cable entry	Method of connection	Terminal bolt size	Maximum connectable Cu-cable area, mm²
63	Knock-out opening	1 x M16 x 1.5 1 x Pg 11	Screw terminal	M4	2.5
71-80	Knock-out opening	2 x M20 x 1.5 2 x Pg 16	Screw terminal	M4	4
90-100	Knock-out opening	2 x (M25 + M20)	Screw terminal	M4	6
112-132	Knock-out opening	2 x (M25 + M20)	Cable lug	M5	10
160-180	Knock-out opening	2 x (2 x M40 + M16)	Cable lug	M6	35
200-250 [1)]	2 x FL 13	1 x (2 x M40 + M16)	Cable lug	M10	70
280	2 x FL 21	1 x (2 x M63 + M16)	Cable lug	M10	70

Bearings

The motors are provided with bearings according to the tables below.

Greater axial forces can be tolerated if the motors are provided with angular contact ball bearings. Note that in such cases the axial force must only operate in one direction.

Motor versions with roller bearings tolerate greater radial forces.

Basic version with deep groove ball bearings

Basic design motors Motor size		Foot- and flange-mounted motor D-end	 N-end
63		6202-2Z/C3	6201-2Z/C3
71		6203-2Z/C3	6202-2Z/C3
80		6204-2Z/C3	6203-2Z/C3
90		6205-2Z/C3	6204-2Z/C3
100		6306-2Z/C3	6205-2Z/C3
112 [2]	short	6206-2Z/C3	6205-2Z/C3
112 [2]	long	6206-2Z/C3	6206-2Z/C3
132 [2]	short	6208-2Z/C3	6206-2Z/C3
132 [2]	long	6208-2Z/C3	6208-2Z/C3
160		6309-2Z/C3	6209-2Z/C3
180		6310-2Z/C3	6209-2Z/C3
200		6312/C3	6210/C3
225		6313/C3	6210/C3
225		6313/C3	6212/C3
250		6315/C3	6212/C3
250		6315/C3	6213/C3
280	2-pole	6315/C3	6213/C3
280	4-8 pole	6316/C3	6213/C3

[2] short: 132: SA-2, S-4
long: remaining versions

Alternative designs:

Version with roller bearings

It is recommended to use roller bearings in belt drives for motor sizes 160 - 280.

See variant code 037 under the heading “Bearings and lubrication”.

Motor size		D-end	N-end
90		NU 205	–
100		NU 306	–
160		NU 309 ECP	–
180		NU 310 ECP	–
200		NU 312 ECP	–
225		NU 313 ECP	–
250		NU 315 ECP	–
280	2-pole	NU 315 ECP	–
280	4-8 pole	NU 316 ECP	–

Version with angular contact ball bearings

See variant codes 058 and 059 under the heading “Bearings and lubrication”.

Motor size		D-end 058	N-end 059
90		7205 B	7204 B
100		7306 B	7205 B
112 [1]	short	7206 BE	7205 BE
112 [1]	long	7206 BE	7206 BE
132 [1]	short	7208 BE	7206 BE
132 [1]	long	7208 BE	7208 BE
160		7309 BE	7209 BE
180		7310 BE	7209 BE
200		7312 BE	7210 BE
225		7313 BE	7212 BE
250		7315 BE	7213 BE
280	2-pole	7315 BE	7213 BE
280	4-8 pole	7316 BE	7213 BE

[1] short: 132: SA-2, S-4,
long: remaining versions

Transport locking

Motors provided with roller bearings or angular contact ball bearings are fitted with a transport lock to prevent damage to the bearings, due to vibration, during transport.

Axially-locked bearings

The table below shows which of the motor's bearings are axially locked in the bearing seat. In motor sizes 56 to 80 the locking is done by an inner bearing circlip, in motor sizes 90 to 280 by an inner bearing cover.

See also variant code 042 under the heading "Bearings and lubrication".

Motor size	Foot-mounted motors	Flange-mounted motors	
		Large flange	Small flange
63	On request at D-end	On request at D-end	On request at D-end
71-80	On request at D-end	D-end	On request at D-end
90-100	D-end [1)]	D-end [1)]	D-end [1)]
112-132	D-end [1)]	D-end	D-end
160-280	D-end	D-end	–

[1)] A spring-washer at the N-end presses the rotor toward the D-end.

Lubrication

The motors are delivered with bearing grease for use at normal temperatures in dry or humid environments. The motors are lubricated for ambient temperatures 40°C and in some cases even above 40°C, see table 1 next page.

Motor sizes 63-180 are provided with shielded bearings. On request, motor sizes 90 to 180 are provided with grease nipples for regreasing, see variant code 041 under the heading "Bearings and lubrications".

Motor sizes 200-280 are provided with grease nipples for re-greasing as standard.

The lubrication interval L_1, suitable for relubricated bearings, is defined as the number of operating hours after which 99 per cent of the bearings are adequately lubricated.

Lubrication intervals and grease quantities are specified on a plate on the motor as well as in the manual supplied with the motor.

The grease lifetime $L_{10,}$ suitable for permanent lubricated bearings, is defined as the number of operating hours after which 90 per cent of the bearings are adequately lubricated. 50 per cent of the bearings achieve two times this figure. Maximum lifetime, however, should be regarded as 40000 hours.

In case of high ambient temperatures the shaft loads must be reduced compared to permissible loadings in the table (see pages 172 to 175), please contact ABB.

Table 1: Grease lifetime L_{10} in deep groove ball bearings of type 2Z in horizontally mounted motors in continuous running

Motor	r/min	Ambient temperature and rated output											
		25 °C		40 °C		50 °C		60 °C		70 °C		80 °C	
		Basic	High	Basic	High	Basic	High	Basic	High	Basic	High	Basic	High
63		40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	
71	3000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	40000	27000
	1500												37000
80	3000	40000	40000	40000	40000	40000	40000	40000	30000	24000	19000		
	1500								40000	40000	29000		
												40000	
90	3000	40000	40000	40000	40000	40000	40000	30000	24000	19000	15000		
	1500								40000	24000	40000	40000	
100	3000	40000	40000	40000	40000	40000	35000	40000	22000	27000	14000	17000	
	1500				33000		21000			33000		21000	
112	3000	40000	40000	40000	40000	40000	30000	26000	17000				
	1500				40000			27000					
132	3000	40000	40000	40000	24000	40000		23000					
	1500				40000		22000	40000		35000			
160	3000	40000	40000	40000	31000	26000	17000	14000	9000				
	1500				40000	40000	25000	37000					
180	3000	40000	38000	38000	34000	34000	29000	20000	15000	10000	8000		
	1500		40000	40000	38000	40000	20000	28000		15000			

In vertically mounted motors, the grease lifetime is half the figures above.
For applications corresponding to the empty cells in the table, please contact ABB. These applications can imply reduced lifetime for bearings and winding.

Lubrication intervals

ABB follows the L1-principle in defining lubrication interval. That means that 99% of the motors are sure to make the interval time. The lubrication intervals can also be calculated according to the L10-principle, which are normally doubled compared to L1-values. Values available from ABB at request.

The table below gives lubrication intervals according to the L1-principle for different speeds. The values are valid for horizontal mounted motors (B3), with about 80°C bearing temperature and using good quality grease with lithium complex soap and with mineral or PAO-oil.

For more information, see ABB's Low Voltage Motors Manual.

Frame size	Amount of grease g	3600 r/min	3000 r/min	1800 r/min	1500 r/min
Ball bearings: lubrication intervals in duty hours					
180	30	6000	8000	13500	16000
200	40	4000	6000	11000	13000
225	50	3000	5000	10000	12500
250	60	2500	4000	9000	11500
280	35	2000	3500	-	-
280	70	-	-	8000	10500

Frame size	Amount of grease g	3600 r/min	3000 r/min	1800 r/min	1500 r/min
Roller bearings: lubrication intervals in duty hours					
180	30	3000	4000	7000	8000
200	40	2000	3000	5500	6500
225	50	1500	2500	5000	6000
250	60	1300	2200	4500	5700
280	35	1000	1800	-	-
280	70	-	-	4000	5300

Permissible loading on shaft

Pulley diameter

When the desired bearing life has been determined the minimum permissible pulley diameter can be calculated with FR, according to the formula:

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

where:

D = diameter of pulley, 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 K = 2.5
F_R = permissible radial force according to the tables

Bearing life

The nominal life is defined as the number of hours that are attained or exceeded by 90% of identical bearings, in a large test series, under certain specified conditions. 50% of the bearings attain a life of as much as 5 times this figure.

The life of bearings is dependent on various factors such as bearing load, motor speed, operating temperature and the purity of the grease. The permissible radial and axial loading for different motor sizes is shown in the table on the following pages.

The table is valid for 50 Hz. For 60 Hz and/or some other bearing life than specified in the table the values are changed according to the table on the right.

The table values assume the occurrence of only radial or axial forces. In the case of simultaneous radial and axial forces information can be supplied on request. It is assumed that the radial force is applied at the end of the motor shaft.

Permissible force at changed bearing life or supply frequency

Bearing life in hours at		Permissible force, as percentage of value in tables
50 Hz	60 Hz	
25,000	21,000	100% of value for 25,000 hours
40,000	33,000	100% of value for 40,000 hours
63,000	52,000	86% of value for 40,000 hours
80,000	67,000	80% of value for 40,000 hours

Permissible radial forces

The table at right shows the permissible radial force in Newton assuming zero axial force.

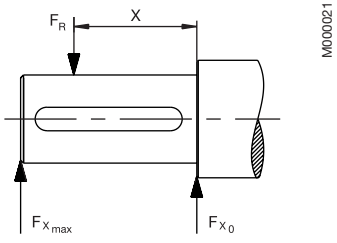
Permissible loads of simultaneous radial and axial forces will be supplied on request.

The bearing life, L_{10}, is calculated according to SKF's theory on bearing life $L10_{aah}$, which also takes the purity of the grease into consideration. An adequate lubrication is a necessary prerequisite for the table at right.

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

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

E = length of shaft extension in basic version.



Motor size	No. of poles	Length of shaft extension E (mm)	Ball bearings Basic design with deep groove ball bearings 25,000 hrs FX_0 (N)	25,000 hrs FX_{max} (N)	40,000 hrs FX_0 (N)	40,000 hrs FX_{max} (N)
63	2	23	490	400	490	400
	4	23	490	400	490	400
71	2	30	680	570	680	570
	4	30	680	570	680	570
80	2	40	630	750	930	750
	4	40	930	750	930	750
90	2	50	1010	810	1010	810
	4	50	1010	810	1010	810
	8	50	1010	810	1010	810
100[1)]	2	60	2280	1800	2280	1800
	4	60	2280	1800	2280	1800

[1)] Basic design with 63-series bearings at the D-end.

Permissible radial forces
Motor sizes 112 to 180

Motor size	No. of poles	Length of shaft extention E (mm)	Ball bearings – Basic design with deep groove ball bearings – 25,000 hrs		40,000 hrs		Alternative design with 63-series bearings – 25,000 hrs		40,000 hrs		Roller bearings – Alternative design with roller bearings – 25,000 hrs		40,000 hrs	
			FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)
112 M	2	60	1800	1420	1620	1280	2160	1700	2160	1700				
	4	60	1790	1410	1590	1250	2160	1700	2160	1700				
132 SA	2	80	3020	2360	2740	2140	4070	3180	3670	2870				
132 SB	2	80	3020	2360	2730	2130	4060	3170	3670	2870				
132 S	4	80	3120	2440	2790	2180	4090	3200	3830	2990				
132 M	4	80	3080	2410	2750	2150	4100	3200	3780	2950				
160 MA	2	110	4470	3500	4470	3500					4470	3500	4470	3500
160 M	2	110	4470	3500	4470	3500					4470	3500	4470	3500
	4	110	4470	3500	4470	3500					4470	3500	4470	3500
160 L	2	110	4470	3500	4470	3500					4470	3500	4470	3500
	4	110	4470	3500	4470	3500					4470	3500	4470	3500
180 M	2	110	6900	5550	6360	5110					7338	5900	7340	5900
	4	110	7100	5710	6470	5200					7338	5900	7340	5900

Permissible radial forces
Motor sizes 180 to 280

Motor size	No. of poles	Length of shaft extention E (mm)	Ball bearings – Basic design with deep groove ball bearings – 25,000 hrs		40,000 hrs		Roller bearings – Alternative design with roller bearings – 25,000 hrs		40,000 hrs	
			FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)	FX_0 (N)	FX_{max} (N)
180 L	4	110	7050	5670	6410	5150	7340	5900	7340	5900
200 MLB	2	110	4930	4060	4360	3590	9460	7790	9460	7790
	4	110	5290	4360	4630	3810	9460	7790	9460	7790
200 MLC	2	110	4920	4050	4360	3590	9460	7790	9460	7790
225 SMB	4	140	5750	4870	5030	4260	9810	8300	9810	8300
225 SMC	2	110	5370	4510	4750	3990	10600	8900	10600	8900
	4	140	5720	4840	5000	4230	9810	8300	9810	8300
250 SMB	2	140	6960	5610	6150	4960	11290	9100	11290	9100
	4	140	7620	6140	6680	5380	14330	11550	14330	11550
250 SMC	2	140	6960	5610	6150	4960	11290	9100	11290	9100
280 SMB	4	140	7510	6100	6590	5350	17850	14500	16060	13050
280 SMC	4	140	7510	6100	6590	5350	17850	14500	16060	13050

Permissible axial forces

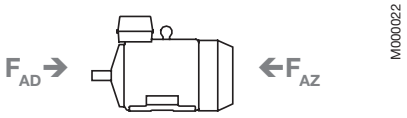
The following tables give the permissible axial forces in Newton, assuming zero radial force. The values are based on normal conditions at 50 Hz with standard bearings and calculated bearing lives of 20,000 and 40,000 hours.

At 60 Hz the values are to be reduced by 10%.

For two-speed motors, the values are to be based on the higher speed. The permissible loads of simultaneous radial and axial forces will be supplied on request.

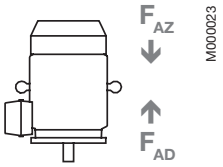
Given axial forces F_{AD}, assumes D-bearing locked by means of locking ring.

Mounting arrangement IM B3



Motor size	20,000 hours				40,000 hours			
	2-pole		4-pole		2-pole		4-pole	
	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N
63	790	390	865	465	720	320	780	380
71	985	485	1070	570	900	400	970	470
80	1305	705	1420	820	1185	585	1285	685
90	1360	930	1490	1070	1225	800	1335	915
100	2805	1945	3075	2215	2540	1680	2760	1900
112 M	1500	1500	1600	1600	1320	1320	1390	1390
132 SA	2570	2570	-	-	2260	2260	-	-
132 SB	2570	2570	-	-	2260	2260	-	-
132 S	-	-	2770	2770	-	-	2440	2440
132 M	-	-	2750	2750	-	-	2420	2420
132 MA	-	-	-	-	-	-	-	-
160 MA	4730	4730	-	-	4220	4220	-	-
160 M	4730	4730	5230	5230	4220	4220	4640	4640
160 L	5240	5240	5220	5220	4650	4650	4630	4630
180 M	4660	4660	4950	4950	4250	4250	4500	4500
180 L	-	-	4870	4870	-	-	4390	4390
200 MLB	3050	3050	3850	3850	2430	2430	3050	3050
200 MLC	3050	3050	-	-	2430	2430	-	-
225 SMB	3440	3440	4340	4340	2730	2730	3440	3440
225 SMC	3440	3440	4340	4340	2730	2730	3440	3440
250 SMB	4180	4180	5260	5260	3320	3320	4180	4180
250 SMC	4180	4180	5260	5260	3320	3320	4180	4180
280 SMB	5000	5000	6100	6100	4400	4400	5300	5300
280 SMC	5000	5000	6100	6100	4400	4400	5300	5300

Mounting arrangement IM V1



Motor size	20,000 hours				40,000 hours			
	2-pole		4-pole		2-pole		4-pole	
	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N
63	790	380	875	455	725	310	790	370
71	998	470	1085	555	910	385	985	455
80	1320	685	1445	790	1200	565	1310	655
90	1390	900	1525	1035	1255	770	1370	880
100	2855	1890	3135	2155	3320	2340	3420	2425
112 M	2290	2170	2490	2330	2680	2510	2770	2590
132 SA	3550	3370	-	-	-	-	-	-
132 SB	3560	3360	-	-	-	-	-	-
132 S	-	-	3910	3630	4160	3880	4320	3990
132 M	-	-	3910	3590	-	-	4330	3930
132 MA	-	-	-	-	4180	3850	-	-
160 MA	4940	4520	-	-	-	-	5520	4960
160 M	4960	4500	5500	4960	5540	4900	5540	4900
160 L	5520	4960	5560	4880	5420	4680	5170	4280
180 M	4990	4330	5400	4500	-	-	-	-
180 L	-	-	5390	4350	5770	4630	5930	4810
200 MLB	3600	2500	4580	3120	5280	3530	5720	3980
200 MLC	3600	2500	-	-	5280	3530	-	-
225 SMB	4140	2740	5230	3440	6030	3900	6530	4400
225 SMC	4140	2740	5230	3440	6030	3900	6530	4400
250 SMB	5020	3330	6380	4150	7440	4610	8050	5210
250 SMC	5020	3330	6380	4150	7440	4610	8050	5210
280 SMB	5950	4050	7380	5010	-	-	-	-

Ordering information

When placing an order, please state the following minimum data in the order, as in the example.

The product code of the motor is composed in accordance with the following example.

Type designation	M3AA 112 M
Pole number	4
Mounting arrangement (IM-code)	IM B3 (IM 1001)
Rated output	4 kW
Product code	112022-ADC
Variant codes if needed	

Motor size

A	B	C	D, E, F
M3AA	112 M	3GAA 112 022 -	ADCG2, 122, 043, etc.
		1 2 3 4 5 6 7 8 9 10 11 12 13 14...	

A Motor type
B Motor size
C Product code
D Code for mounting arrangement
E Voltage and frequency code
F Generation code followed by variant codes

Explanation of the product code

Positions 1 to 4
3GAA/3GVA =
Totally enclosed motor with Aluminum stator frame

Position 4
Type of rotor
A = Squirrel cage rotor

Positions 5 and 6
IEC size

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

Position 7
Pole pairs
1 = 2 poles
2 = 4 poles

Positions 8 to 10
Running number

Position 11
- (dash)

Position 12
Mounting arrangement
A = Foot-mounted motor
B = Flange-mounted motor.
Large flange with clearance holes.
Flange motors come without CC-number in the rating plate due to American legislation.
H = Foot- and flange-mounted motor.
Large flange with clearance holes.
Must be ordered using variant code 009.

Position 13
Voltage and frequency: See tables below

Position 14
Version **A,B,C, CG2...** =
Generation code followed by variant codes

The bullets in the product code description:

Voltage and frequency code

Frame sizes	S
63-100	200-240 VD 50 Hz
	380-420 VY 50 Hz
	440-480 VY 60 Hz
	D
112-132	380-420 VD 50 Hz
	440-480 VD 60 Hz
	660-690 VY 50 Hz

Frame sizes	D
160-280	380 VD 50 Hz
	400 VD 50 Hz
	415 VD 50 Hz
	660 VY 50 Hz
	690 VY 50 Hz
	460 VD 60 Hz

Other voltages available on request.

Global Motors acc. to EFF1, EPAct, CSA, EEV, UR

Technical data

Totally enclosed squirrel cagethree phase motors, aluminum frame

Power Hp	Power kW	Motor type	Product code	Speed r/min	Efficiency acc. to IEC 100%	Efficiency 75%	Power factor cos φ	Current I_N A	Current I_s/I_N	Torque Nm	Torque T_s/T_N	Torque T_{max}/T_N	Moment of inertia kgm^2	Weight kg	Weight lbs	Sound pressure level Lp dB(A)
3000 r/min (2-pole)			**400 V 50 Hz**													
0.25	**0.18**	**M3VA 63 A**	3GVA 061 391-••	2820	73.7	70.6	0.64	0.56	4.2	0.62	3.5	3.1	0.00013	3.9	8.6	[3]
0.35	**0.25**	**M3VA 63 B**	3GVA 061 392-••	2810	77.5	75.8	0.71	0.66	4.5	0.87	3.6	3.3	0.00016	4.4	9.7	[3]
0.50	**0.37**	**M3VA 71 A**	3GVA 071 391-••	2840	77.1	76.5	0.72	1.00	5.5	1.25	3.8	3.9	0.00040	5.5	12	[3]
0.75	**0.55**	**M3VA 71B**	3GVA 071 392-••	2830	79.2	78.2	0.76	1.35	5.7	1.86	3.6	3.7	0.00045	6.5	14	[3]
1	**0.75**	**M3VA 80 A**	3GVA 081 731-••	2860	79.2	78.6	0.81	1.7	7.1	2.5	4.5	3.7	0.00072	9	20	[3]
1.5	**1.1**	**M3VA 80 C**	3GVA 081 773-••	2860	82.5	82.7	0.88	2.20	8	3.7	4.6	3.8	0.00109	12	25	[3]
2	**1.5**	**M3AA 90 L**	3GAA 091 312-••CG2	2900	85.9	86.5	0.87	3.00	7.7	5.0	2.7	3.6	0.0024	16	35	[3]
3 [1]	**2.2**	**M3AA 90 LB**	3GAA 091 313-••CG2	2880	85.8	87.1	0.87	4.40	7.4	7.3	3.0	3.6	0.0027	18	40	[3]
4	**3**	**M3AA 100 LB**	3GAA 101 312-••CG2	2920	87.6	87.5	0.86	5.90	10	9.9	3.9	4.9	0.0005	25	55	[3]
5	**4**	**M3AA 112 M**	3GAA 111 022-••CG2	2860	87.7	89.4	0.93	7.1	7.5	13.4	2.6	3.4	0.012	33	73	63
7.5	**5.5**	**M3AA 132 SA**	3GAA 131 023-••CG2	2900	88.6	88.9	0.88	10.3	9.9	18.1	4.0	4.5	0.016	42	93	69
10	**7.5**	**M3AA 132 SB**	3GAA 131 024-••CG2	2915	90.9	91.3	0.90	13.3	11.0	24.6	5.1	5.2	0.022	56	123	69
15	**11**	**M3AA 160 MA**	3GAA 161 121-••CG2	2935	91.5	91.9	0.90	19.2	7.4	36	2.7	2.9	0.047	84	185	69
20	**15**	**M3AA 160 M**	3GAA 161 122-••CG2	2940	92.3	92.7	0.90	26	8.0	49	3.0	3.3	0.053	94	207	69
25	**18.5**	**M3AA 160 L**	3GAA 161 123-••CG2	2935	93.1	93.6	0.89	32.5	8.3	60	3.1	3.3	0.058	100	220	69
30	**22**	**M3AA 180 M**	3GAA 181 121-••CG2	2945	93.2	93.8	0.91	37.5	7.1	71	2.7	2.9	0.092	137	302	70
40	**30**	**M3AA 200 MLB**	3GAA 201 021-••CG2	2950	93.0	93.3	0.90	52	7.9	97	3.0	2.9	0.18	200	441	72
50	**37**	**M3AA 200 MLC**	3GAA 201 022-••CG2	2960	93.9	94.1	0.89	64	8.8	120	3.6	3.3	0.19	205	452	72
60	**45**	**M3AA 225 SMC**	3GAA 221 021-••CG2	2970	94.4	94.4	0.88	78	6.9	145	2.3	2.9	0.29	260	573	74
75	**55**	**M3AA 250 SMB**	3GAA 251 021-••CG2	2970	94.1	94.1	0.91	93	7.5	177	2.5	3.0	0.57	330	727	75
100 [2]	**75**	**M3AA 250 SMC**	3GAA 251 022-••CG2	2965	94.8	95.0	0.93	124	7.7	242	2.3	2.8	0.59	345	760	75
100	**75**	**M3AA 280 SMC**	3GAA 281 021-••CG2	2965	94.8	95.0	0.93	124	7.7	242	2.3	2.8	0.6	390	859	75

EFF1 Efficiency classification is valid for motors from 1.1 kW to 90 kW.

[1] Efficiency class EFF2.
[2] High output designs are non-CENELEC harmonized.
[3] On request.

Global Motors acc. to EFF1, EPAct, CSA, EEV, UR

Technical data

Totally enclosed squirrel cagethree phase motors, aluminum frame

Power Hp	kW	Motor type	Product code	Speed r/min	Efficiency acc. to IEC 100%	75%	Power factor cos φ	Current I_N A	I_s/I_N	Torque Nm	T_s/T_N	T_{max}/T_N	Moment of inertia kgm²	Weight kg	lbs	Sound pressure level Lp dB(A)
1500 r/min (4-pole)			**400 V 50 Hz**													
0.16	**0.12**	**M3VA 63 A**	3GVA 062 391-••	1400	63.7	58.4	0.59	0.46	3.1	0.82	2.6	2.6	0.00019	4	8.8	[3]
0.25	**0.18**	**M3VA 63 B**	3GVA 062 392-••	1380	65.6	62.1	0.64	0.63	3.1	1.25	2.5	2.6	0.00026	4.5	9.9	[3]
0.35	**0.25**	**M3VA 71 A**	3GVA 072 391-••	1410	70.4	69.1	0.71	0.74	4.3	1.71	2.7	2.9	0.00066	5.5	12	[3]
0.50	**0.37**	**M3VA 71 B**	3GVA 072 392-••	1420	74.6	72.1	0.69	1.05	4.4	2.51	2.6	2.8	0.00089	6.5	14	[3]
0.75	**0.55**	**M3VA 80 A**	3GVA 082 391-••	1390	75.3	73.1	0.76	1.40	4.6	3.75	2.6	2.9	0.00125	9.0	20	[3]
1	**0.75**	**M3VA 80 C**	3GVA 082 733-••	1380	82.5	83.2	0.82	1.60	5.6	5.2	4	2.6	0.00194	11	24	[3]
1.5	**1**	**M3AA 90 L**	3GAA 092 312-••CG2	1420	83.9	84.3	0.80	2.40	6.1	7.4	2.9	3.4	0.0043	16	35	[3]
2	**1.5**	**M3AA 100 LA**	3GAA 102 311-••CG2	1440	85.6	85.5	0.82	3.20	6.9	10	2.8	3.4	0.0069	21	46	[3]
3 [1]	**2.2**	**M3AA 100 LC**	3GAA 102 313-••CG2	1450	86.8	86.6	0.77	4.80	8.5	14.5	4.0	4.6	0.009	25	55	[3]
4	**3**	**M3AA 100LB**	3GAA 102 342-••CG2	1450	85.5	85.5	0.84	5.90	7.6	17.2	3.3	3.8	0.0082	25	55	[3]
5	**4**	**M3AA 112 M**	3GAA 112 022-••CG2	1455	88.3	88.6	0.76	8.6	8.5	26.3	3.3	4.3	0.018	34	75	56
7.5	**5.5**	**M3AA 132 S**	3GAA 132 023-••CG2	1460	89.3	90.5	0.84	10.6	7.0	36.2	2.2	2.8	0.038	48	106	59
10	**7.5**	**M3AA 132 M**	3GAA 132 024-••CG2	1450	90.3	91.0	0.87	14	7.8	49	2.2	3.1	0.048	59	130	59
15	**11**	**M3AA 160 M**	3GAA 162 121-••CG2	1470	91.5	92.1	0.83	21	8.1	72	3.4	3.3	0.091	94	207	62
20	**15**	**M3AA 160 L**	3GAA 162 122-••CG2	1460	91.3	92.1	0.83	28.5	7.6	98	3.3	3.1	0.102	103	227	62
25	**18.5**	**M3AA 180 M**	3GAA 182 121-••CG2	1470	92.5	93.4	0.84	34	6.6	121	2.7	2.8	0.191	141	311	62
30	**22**	**M3AA 180 L**	3GAA 182 122-••CG2	1475	93.2	93.9	0.84	41	7.8	143	3.1	3.4	0.225	161	355	62
40	**30**	**M3AA 200 MLB**	3GAA 202 021-••CG2	1475	93.7	94.3	0.84	55	8.0	194	4.0	3.1	0.34	205	452	63
50	**37**	**M3AA 225 SMB**	3GAA 222 021-••CG2	1480	93.7	94.0	0.85	68	8.1	239	3.9	2.9	0.42	230	507	66
60	**45**	**M3AA 225 SMC**	3GAA 222 022-••CG2	1480	94.4	94.8	0.86	80	8.0	291	3.8	3.2	0.49	265	584	66
75 [2]	**55**	**M3AA 225 SMD**	3GAA 222 023-••CG2	1480	94.5	94.8	0.86	98	8.5	355	4.3	3.8	0.56	290	639	66
75	**55**	**M3AA 250 SMB**	3GAA 252 021-••CG2	1480	94.5	94.9	0.87	96	7.4	356	3.0	3.1	0.88	335	738	67
100 [2]	**75**	**M3AA 250 SMC**	3GAA 252 022-••CG2	1480	95.2	95.6	0.85	135	8.4	484	3.4	5.1	0.95	360	793	66
100	**75**	**M3AA 280 SMB**	3GAA 282 021-••CG2	1480	95.2	95.6	0.85	135	8.4	484	3.4	5.1	0.95	405	892	66

EFF1 Efficiency classification is valid for motors from 1.1 kW to 90 kW.

[1] Efficiency class EFF2.
[2] High output designs are non-CENELEC harmonized.
[3] On request.

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Global Motors acc. to EFF1, EPAct, CSA, EEV, UR

Technical data

Totally enclosed squirrel cagethree phase motors, aluminum frame

Power		Motor type		Product code		Speed	NEMA	Efficiency		Power	Current		Torque			Moment	Weight	
Hp	kW					r/min	Nom. Eff. % [1]	acc. to IEC 100%	75%	factor cos φ	I_N A	I_s/I_N	Nm	T_s/T_N	T_{max}/T_N	of inertia kgm²	kg	lbs
3600 r/min (2-pole)					**460 V 60 Hz**													
0.25	**0.18**	**M3VA**	**63 A**	3GVA	061 391-••	3400	[2]	70.1	67.5	0.60	0.5	4.6	0.5	4.0	4.0	0.00013	3.9	8.6
0.35	**0.25**	**M3VA**	**63 B**	3GVA	061 392-••	3400	[2]	76.4	75.3	0.70	0.6	5.4	0.7	3.9	3.9	0.00016	4.4	9.7
0.50	**0.37**	**M3VA**	**71 A**	3GVA	071 391-••	3450	[2]	76.5	74.5	0.70	0.9	6.6	1.0	4.2	4.4	0.00040	5.5	12
0.75	**0.55**	**M3VA**	**71B**	3GVA	071 392-••	3450	[2]	79.8	78.6	0.75	1.2	7.1	1.5	4.2	4.5	0.00045	6.5	14
1	**0.75**	**M3VA**	**80 A**	3GVA	081 731-••	3480	75.5	80.6	79.2	0.81	1.45	8.4	2.06	4.9	4.5	0.00072	9	20
1.5	**1.1**	**M3VA**	**80 C**	3GVA	081 773-••	3460	82.5	83.5	83.1	0.85	2.0	9.5	3.04	4.8	4.7	0.00109	11	24
2	**1.5**	**M3AA**	**90 L**	3GAA	091 312-••CG2	3535	86.5	87.5	86.5	0.85	2.6	8.1	4.1	2.8	3.8	0.0024	16	35
3	**2.2**	**M3AA**	**90 LB**	3GAA	091 313-••CG2	3530	87.5	87.9	87.5	0.85	3.7	7.5	6.0	3.2	3.7	0.0027	18	40
4	**3**	**M3AA**	**100 LB**	3GAA	101 312-••CG2	3560	88.0	88.0	88.0	0.85	5.1	11.0	8.0	3.9	5.0	0.0005	25	55
5	**4**	**M3AA**	**112 M**	3GAA	111 022-••CG2	3475	87.5	87.8	88.3	0.93	6.1	9.0	11	2.6	4.1	0.012	33	73
7.5	**5.5**	**M3AA**	**132 SA**	3GAA	131 023-••CG2	3500	88.5	87.8	86.9	0.88	8.7	9.4	15	3.3	4	0.016	42	93
10	**7.5**	**M3AA**	**132 SB**	3GAA	131 024-••CG2	3465	89.5	90.8	90.6	0.92	11.5	14.5	20.7	4.5	6	0.022	56	123
15	**11**	**M3AA**	**160 MA**	3GAA	161 121-••CG2	3545	90.2	91.9	91.4	0.90	16.8	8.6	30	2.8	3.3	0.047	84	185
20	**15**	**M3AA**	**160 M**	3GAA	161 122-••CG2	3545	90.2	92.6	92.4	0.90	22.5	9.2	40	3.2	3.7	0.053	94	207
25	**18.5**	**M3AA**	**160 L**	3GAA	161 123-••CG2	3545	91	93.5	93.3	0.89	27.5	9.8	50	2.8	3.5	0.058	100	220
30	**22**	**M3AA**	**180 M**	3GAA	181 121-••CG2	3560	91	93.9	93.8	0.90	32.5	8.3	59	2.6	3	0.092	137	302
40	**30**	**M3AA**	**200 MLB**	3GAA	201 021-••CG2	3555	91.7	93.1	92.8	0.90	44.5	9.0	81	3.2	3.2	0.18	200	441
50	**37**	**M3AA**	**200 MLC**	3GAA	201 022-••CG2	3560	92.4	93.9	93.6	0.88	56	9.7	99	3.7	3.6	0.19	205	452
60	**45**	**M3AA**	**225 SMC**	3GAA	221 021-••CG2	3575	93	94.2	93.7	0.88	68	7.9	121	2.5	3.2	0.29	260	573
75	**55**	**M3AA**	**250 SMB**	3GAA	251 021-••CG2	3570	93	93.8	93.3	0.90	81	8.7	147	2.7	3.2	0.57	330	727
100 [3]	**75**	**M3AA**	**250 SMC**	3GAA	251 022-••CG2	3565	93.6	94.9	94.6	0.92	108	9.9	201	2.4	3.1	0.59	345	760
100	**75**	**M3AA**	**280 SMC**	3GAA	281 021-••CG2	3565	93.6	94.9	94.6	0.92	108	9.9	201	2.4	3.1	0.6	390	859

Global motor fulfilling EFF1, CSA-EEV and EPAct certification requirements CC031A.

[1] NEMA Nominal efficiency acc. to IEEE112.
[2] EPAct classification is valid for motors from 1 HP to 200 HP.
[3] High output designs are non-CENELEC harmonized.

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Global Motors acc. to EFF1, EPAct, CSA, EEV, UR

Technical data

Totally enclosed squirrel cagethree phase motors, aluminum frame

Power		Motor type		Product code		Speed	NEMA	Efficiency		Power	Current		Torque			Moment	Weight	
Hp	kW					r/min	Nom. Eff. % [1]	acc. to IEC 100%	75%	factor cos φ	I_N A	$\frac{I_s}{I_N}$	Nm	$\frac{T_s}{T_N}$	$\frac{T_{max}}{T_N}$	of inertia kgm²	kg	lbs
1800 r/min (4-pole)					**460 V 60 Hz**													
0.16	**0.12**	**M3VA**	**63 A**	3GVA	062 391-••	1680	[2]	58.8	54.5	0.55	0.5	2.8	0.7	2.6	2.7	0.00019	4	8.8
0.25	**0.18**	**M3VA**	**63 B**	3GVA	062 392-••	1680	[2]	62.8	59.5	0.57	0.6	2.9	1.0	2.5	2.6	0.00026	4.5	9.9
0.35	**0.25**	**M3VA**	**71 A**	3GVA	072 391-••	1700	[2]	66.7	63.9	0.68	0.7	4.3	1.4	3.1	3.1	0.00066	5.5	12
0.50	**0.37**	**M3VA**	**71 B**	3GVA	072 392-••	1700	[2]	70.6	68.3	0.69	0.9	4.5	2.1	3.2	3.2	0.00089	6.5	14
0.75	**0.55**	**M3VA**	**80 A**	3GVA	082 391-••	1700	[2]	73.3	71.6	0.74	1.3	5.1	3.1	3.0	3.0	0.00125	9.0	20
1	**0.75**	**M3VA**	**80 C**	3GVA	082 733-••	1730	82.5	82.5	82.1	0.78	1.5	6.6	4.14	4.1	3.1	0.00185	11	24
1.5	**1.1**	**M3AA**	**90 L**	3GAA	092 312-••CG2	1750	84.0	85.5	84.0	0.78	2.1	7.1	6.1	3.0	3.8	0.0043	16	35
2	**1.5**	**M3AA**	**100 LA**	3GAA	102 311-••CG2	1765	86.5	87.2	86.0	0.79	2.8	7.5	8.2	3.0	4.0	0.0069	21	46
3	**2.2**	**M3AA**	**100 LC**	3GAA	102 313-••CG2	1770	87.5	87.5	87.5	0.75	4.2	9.0	11.9	4.1	4.8	0.009	25	55
4	**3**	**M3AA**	**100LB**	3GAA	102 342-••CG2	1740	87.5	87.5	87.5	0.82	5.4	7.6	16.5	3.1	3.7	0.0082	25	55
5	**4**	**M3AA**	**112 M**	3GAA	112 022-••CG2	1775	87.5	88.0	87.4	0.80	7.1	10.4	21.8	3.9	4.6	0.018	34	75
7.5	**5.5**	**M3AA**	**132 S**	3GAA	132 023-••CG2	1760	89.5	89.7	89.9	0.83	9.3	8.9	30	2.7	3.5	0.038	48	106
10	**7.5**	**M3AA**	**132 M**	3GAA	132 024-••CG2	1765	89.5	90.5	90.9	0.85	12.4	9.7	41	3.5	3.6	0.048	59	130
15	**11**	**M3AA**	**160 M**	3GAA	162 121-••CG2	1775	91.0	92.5	92.4	0.81	18.4	8.9	59	3.5	3.7	0.091	94	207
20	**15**	**M3AA**	**160 L**	3GAA	162 122-••CG2	1770	91.0	92.4	92.5	0.83	24.5	8.8	81	3.5	3.6	0.102	103	227
25	**18.5**	**M3AA**	**180 M**	3GAA	182 121-••CG2	1775	92.4	93.5	93.8	0.84	29.5	7.7	100	3	3.1	0.191	141	311
30	**22**	**M3AA**	**180 L**	3GAA	182 122-••CG2	1780	92.4	94.1	94.0	0.83	35	9.1	118	3.4	3.8	0.225	161	355
40	**30**	**M3AA**	**200 MLB**	3GAA	202 021-••CG2	1780	93.0	94.4	94.5	0.83	48.5	9.2	161	4.1	3.4	0.34	205	452
50	**37**	**M3AA**	**225 SMB**	3GAA	222 021-••CG2	1785	93.0	94.0	93.8	0.84	59	9.1	198	3.9	3.3	0.42	230	507
60	**45**	**M3AA**	**225 SMC**	3GAA	222 022-••CG2	1780	93.6	94.9	94.7	0.86	69	9.1	241	3.9	3.5	0.49	265	584
75 [3]	**55**	**M3AA**	**225 SMD**	3GAA	222 023-••CG2	1785	94.1	94.8	94.7	0.86	85	9.9	295	4.5	3.7	0.56	290	639
75	**55**	**M3AA**	**250 SMB**	3GAA	252 021-••CG2	1780	94.1	95.0	94.9	0.86	85	8.5	295	3.2	3.4	0.88	335	738
100 [3]	**75**	**M3AA**	**250 SMC**	3GAA	252 022-••CG2	1785	94.5	95.6	95.6	0.84	117	9.8	402	3.2	3.4	0.95	360	793
100	**75**	**M3AA**	**280 SMB**	3GAA	282 021-••CG2	1785	94.5	95.6	95.6	0.84	117	9.8	402	3.2	3.4	0.95	405	892

Global motor fulfilling EFF1, CSA-EEV and EPAct certification requirements CC031A.

[1] NEMA Nominal efficiency acc. to IEEE112.
[2] EPAct classification is valid for motors from 1 HP to 200 HP.
[3] High output designs are non-CENELEC harmonized.

General purpose global motors - Variant codes

Code [1]	Variant	Motor size 63	71-80	90-100	112-132	160-180	200-250	280
	Balancing							
052	Vibration acc. to grade A (IEC 60034-14).	P	P	P	S	S	S	S
417	Vibration acc. to grade B (IEC 60034-14).	NA	NA	R	R	R	R	R
423	Balancing without key.	P	P	P	R	R	R	R
424	Full key balancing.	P	P	P	R	R	R	R
	Bearings and lubrication							
036	Transport lock for bearings.	NA	NA	NA	M	M	M	M
037	Roller bearing at D-end.	NA	NA	NA	NA	M	M	M
039	Cold resistant grease (-55... +100° C).	M	M	NA	P	P	P	P
040	Heat resistant grease (-25... +150° C).	M	M	P	S	S	S	S
041	Bearings regreasable via grease nipples.	NA	NA	NA	M	M	S	S
042	Locked drive-end. Standard for sizes 112-132, flanged versions.	NA	M	S	M	S	S	S
043	SPM nipples.	NA	NA	R	M	M	M	M
057	2RS bearings at both ends. Grease for bearing temperatures -20 - +110° C.	M	M	P	M	M	M	M
058	Angular contact ball bearing at D-end, shaft force away from bearing. Transport lock included.	NA	NA	M	M	M	M	M
059	Angular contact ball bearing at N-end, shaft force towards bearing. Transport lock included.	NA	NA	M	M	M	M	M
188	63-series bearings.	NA	NA	M	M	S	S	S
796	Grease nipples JIS B 1575 PT 1/8 Type A. Stainless steel.	NA	NA	NA	M	M	M	M
797	Stainless steel SPM nipples.	NA	NA	NA	M	M	M	M
798	Stainless steel grease nipples.	NA	NA	NA	M	M	M	M
	Branch standard designs							
142	”Manilla” winding connection. (440 VD series, 220 VD parallel, 60Hz).	NA	NA	M	M	M	M	M
178	Stainless steel/acid proof bolts.	M	M	M	M	M	M	M
209	Non-standard voltage or frequency (special winding).	NA	NA	R	R	R	R	R
425	Corrosion protected stator and rotor core.	P	P	P	P	P	P	P
	Coupling							
035	Assembly of customer supplied coupling-half.	NA	NA	R	R	R	R	R
	Dimension drawing							
141	Binding dimension drawing.	M	M	M	M	M	M	M
	Drain holes							
065	Plugged existing drain holes.	M	M	M	M	M	M	M
	Earthing bolt							
067	External earthing bolt.	M	M	M	M	M	M	M

[1] Certain variant codes cannot be used simultaneously.

S = Included as standard.
M = On modification of a stocked motor, or on new manufacture, the number per order may be limited.
P = New manufacture only.
R = On request.
NA = Not applicable.

Code [1]	Variant	Motor size 63	71-80	90-100	112-132	160-180	200-250	280
	Heating elements							
	Motor size **Element capacity** 63-71 8 W 80-160 25 W 180-280 50 W							
450	Heating element 100-120 V.	M	M	NA	M	M	M	M
451	Heating element 200-240 V.	M	M	NA	M	M	M	M
	Mounting arrangements							
	NOTE: Multiple flange sizes available using two-piece flange system, see page 48.							
007	IM 3001 flange mounted, IEC flange, from IM 1001 (B5 from B3).	NA	NA	NA	NA	NA	M	M
008	IM 2101 foot/flange mounted, from IM 1001 (B34 from B3).	NA	M	M	M	M	NA	NA
009	IM 2001 foot/flange mounted, from IM 1001 (B35 from B3).	NA	M	M	M	M	M	M
066	Modified for non-standard mounting position (please specify IM xxxx). (must be ordered for all mounting arrangements excluding IM B3 (1001) and B5 (3001).	M	M	M	M	M	M	M
	Painting							
114	Special paint colour, standard grade. RAL-colour no. must be specified.	M	M	P	M	M	M	M
179	Special paint specification.	R	R	R	R	R	R	R
	Protection							
005	Metal protective roof, vertical motor, shaft down.	M	M	M	M	M	M	M
072	Radial seal at D-end.	NA	NA	NA	M	M	M	M
158	Degree of protection IP65. Dust proof version.	M	M	NA	M	M	M	M
211	Weather protected, IP xx W.	NA	NA	NA	P	P	P	P
403	Degree of protection IP 56.	M	M	NA	M	M	M	M
784	Gamma-seal at D-end.	NA	NA	NA	M	M	M	M
	Rating and instruction plates							
003	Individual serial number.	P	P	M	M	M	M	M
138	Mounting of additional identification plate, aluminum.	M	M	M	M	M	M	M
139	Additional indentification plate delivered loose.	M	M	M	M	M	M	M
163	Frequency converter rating plate. Rating data according to quotation.	NA	NA	M	M	M	M	M
	Shaft and rotor							
069	Two shaft extensions as per basic catalogue.	P	P	NA	P	P	P	P
070	One or two special shaft extensions, std shaft material.	R	R	R	R	R	R	R
165	Shaft extension with open keyway.	P	P	R	P	P	P	P
	Standards and regulations							
010	Fulfilling CSA Safety Certificate.	P	P	S	S	S	S	S
011	Fulfilling CSA Energy Efficiency Verification (010 included).	NA	NA	NA	S	S	S	S
029	Fulfilling Underwriters Laboratory (UL) requirements.	NA	NA	S	S	S	S	S
408	Fulfilling EPAct certification requirements, CC031A.	NA	P	R	S	S	S	S

[1] Certain variant codes cannot be used simultaneously.

S = Included as standard.
M = On modification of a stocked motor, or on new manufacture, the number per order may be limited.
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R = On request.
NA = Not applicable.

Code [1]	Variant	Motor size 63	71-80	90-100	112-132	160-180	200-250	280
	Stator winding temperature sensors							
121	Bimetal detectors, break type (NCC), (3 in series), 130°C, in stator winding.	M	M	P	P	P	P	P
122	Bimetal detectors, break type (NCC), (3 in series), 150°C, in stator winding.	M	M	P	M	M	M	M
123	Bimetal detectors, break type (NCC), (3 in series), 170°C, in stator winding.	M	M	P	P	P	P	P
124	Bimetal detectors, break type (NCC), (2x3 in series), 140°C, in stator winding.	NA	NA	P	P	P	P	P
125	Bimetal detectors, break type (NCC), (2 x 3 in series), 150°C, in stator winding.	M	M	P	P	P	P	P
127	Bimetal detectors, break type (NCC), (3 in series, 130°C & 3 in series, 150°C), in stator winding.	M	M	P	P	P	P	P
321	Bimetal detectors, closing type (NO), (3 in parallel), 130°C, in stator winding.	NA	NA	P	R	R	R	R
322	Bimetal detectors, closing type (NO), (3 in parallel), 150°C, in stator winding.	NA	NA	P	R	R	R	R
323	Bimetal detectors, closing type (NO), (3 in parallel), 170°C, in stator winding.	NA	NA	P	R	R	R	R
325	Bimetal detectors, closing type (NO), (2x3 in parallel), 150°C, in stator winding.	NA	NA	R	R	R	R	R
327	Bimetal detectors, closing type (NO), (3 in parallel, 130°C & 3 in parallel, 150°C), in stator winding.	NA	NA	R	R	R	R	R
435	PTC-thermistors, (3 in series), 130°C, in stator winding.	M	M	R	P	P	P	P
436	PTC-thermistors (3 in series), 150°C, in stator winding.	M	M	M	M	M	S	S
437	PTC thermistors (3 in series), 170°C, in stator winding.	M	M	R	P	P	P	P
439	PTC-thermistors (2x3 in series), 150°C, in stator winding.	M	M	R	P	P	P	P
440	PTC-thermistors, (3 in series, 110 °C & 3 in series, 130°C), in stator winding.	M	M	R	R	R	R	R
441	PTC-thermistors, (3 in series, 130 °C & 3 in series, 150°C), in stator winding.	M	M	R	P	P	P	P
442	PTC thermistors, (3 in series, 150 °C & 3 in series, 170°C), in stator winding.	M	M	R	P	P	P	P
445	Pt100 2-wire in in stator winding, 1 per phase.	NA	NA	NA	P	P	P	P
446	Pt100 2-wire in in stator winding, 2 per phase.	NA	NA	NA	NA	P	P	P
	Terminal box							
015	Motor supplied in D-connection.	M	M	M	M	M	M	M
017	Motor supplied in Y-connection.	M	M	M	M	M	M	M
021	Terminal box LHS, seen from D-end (= L prod.code).	NA	M	M	NA	NA	P	P
180	Terminal box RHS, seen from D-end (= R prod.code).	NA	M	M	NA	NA	P	P
230	Standard metal cable gland.	M	M	M	M	M	M	M
731	Two standard metal cable glands.	M	M	M	M	M	M	M

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NA = Not applicable

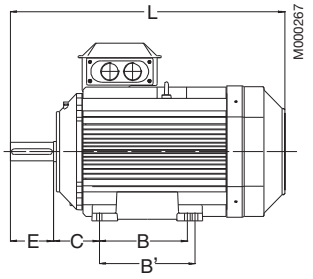
Code [1]	Variant	Motor size 63	71-80	90-100	112-132	160-180	200-250	280
	Testing							
140	Test confirmation.	M	M	R	P	P	P	P
145	Type test report from a catalogue motor, 400 V 50 Hz.	M	M	R	P	P	P	P
146	Type test with report for motor from specific delivery batch.	P	P	R	P	P	P	P
147	Type test report with motor from spec. del. batch, customer witnessed.	P	P	R	P	P	P	P
148	Routine test report. Witnessed routine test = 146.	P	P	R	P	P	P	P
149	Test according to separate test specification.	NA	NA	R	R	R	R	R
221	Type test and multi-point load test with report for motor from specific delivery batch.	R	R	R	P	P	P	P
222	Torque/speed curve, type test and multi-point load test with report for motor from spec del batch.	R	R	R	P	P	P	P
760	Vibration level test.	P	P	R	P	P	P	P
762	Noise level test.	R	R	R	P	P	P	P

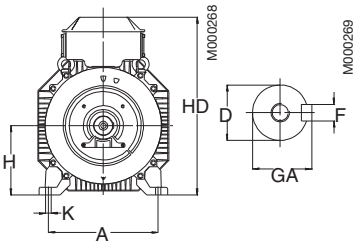
[1] Certain variant codes cannot be used simultaneously.

S = Included as standard.
M = On modification of a stocked motor, or on new manufacture, the number per order may be limited.
P = New manufacture only.
R = On request.
NA = Not applicable.

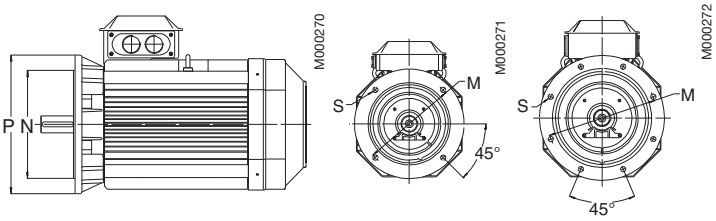
Dimension drawings

Foot-mounted motor IM 1001 / B3





Foot-mounted motor IM 3001 / B5



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	H	HD	K	M	N	P	S
	2	4	2	4	2	4	2	4	2	4											
63	11	11	12.5	12.5	4	4	23	23	205	205	100	80	–	40	63	171	7	115	95	140	10
71	14	14	16	16	5	5	30	30	238	238	112	90	–	45	70	176	7	130	110	160	10
80	19	19	21.5	21.5	6	6	40	40	265	265	125	100	–	50	80	190	10	165	130	200	12
90	24	24	27	27	8	8	50	50	320	320	140	125		56	90	212	10	165	130	200	12
100	28	28	31	31	8	8	60	60	358.5	358.5	160	140		63	100	236	12	215	180	250	15
112	28	28	31	31	8	8	60	60	388	388	190	140	–	70	112	258	12	215	180	250	14.5
132 S, SA	38	38	41	41	10	10	80	80	447	447	216	140	178	89	132	295.5	12	265	230	300	14.5
132 SB, M	38	38	41	41	10	10	80	80	481.5	481.5	216	140	178	89	132	295.5	12	265	230	300	14.5
160	42	42	45	45	12	12	110	110	602.5	602.5	254	210	254	108	160	370	15	300	250	350	19
180 M	48	48	51.5	51.5	14	14	110	110	680	680	279	241	279	121	180	405	15	300	250	350	19
180 L	48	48	51.5	51.5	14	14	110	110	700.5	700.5	279	241	279	121	180	405	15	300	250	350	19
200	55	55	59	59	16	16	110	110	774	774	318	267	305	133	200	533	18	350	300	400	19
225 SMB,SMC	55	60	59	64	16	18	110	140	836	866	356	286	311	149	225	578	18	400	350	450	19
225 SMD	55	60	59	64	16	18	110	140	861	891	356	286	311	149	225	578	18	400	350	450	19
250 SMB	60	65	64	69	18	18	140	140	875	875	406	311	349	168	250	626	22	500	450	550	19
250 SMC	60	65	64	69	18	18	140	140	900	900	406	311	349	168	250	626	22	500	450	550	19
280	65	75	69	79.5	18	20	140	140	900	900	457	368	419	190	280	656	24	500	450	550	19

6

IM 3601, IM B14

Motor size	M	N	P	S
63	75	60	90	M5
71	85	70	105	M6
80	100	80	120	M6
90	115	95	140	M8
100	130	110	160	M8
112	130	130	160	M8
132	165	165	200	M10

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

Above table gives the main dimensions in mm.

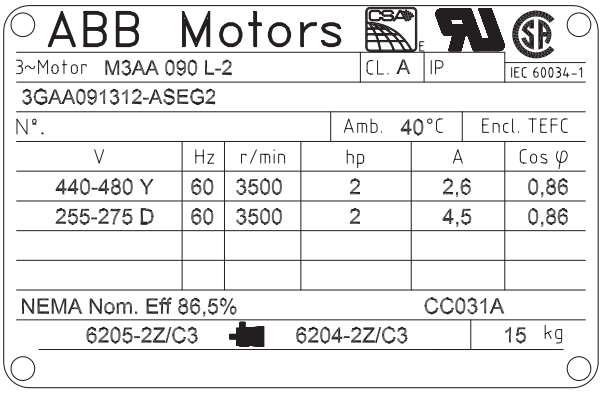
For detailed drawings please see our web-pages 'www.abb.com/motors&drives' or contact us.

Rating plates

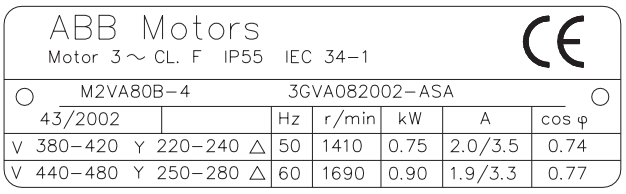
The applicable Global motor standards provide the following minimum requirements for markings to be shown on the rating plate.

– NEMA Nominal efficiency
– ”EPAct CC031A” when applicable
– Output in kW and hp
– Ambient temperature
– Serial number
– Logos according to certifications

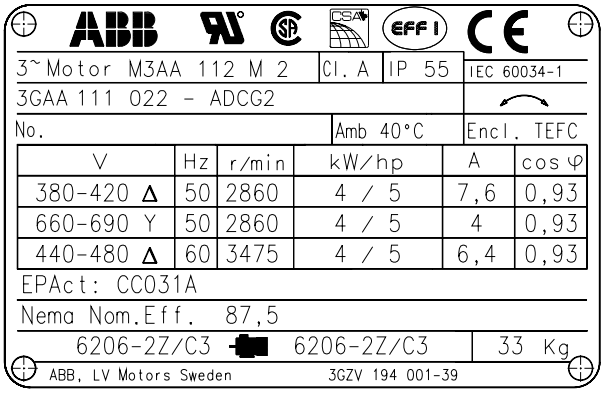
Flange mounted motors will be delivered as global motors however the CC number cannot be printed on the rating plate.



M000117



M000025



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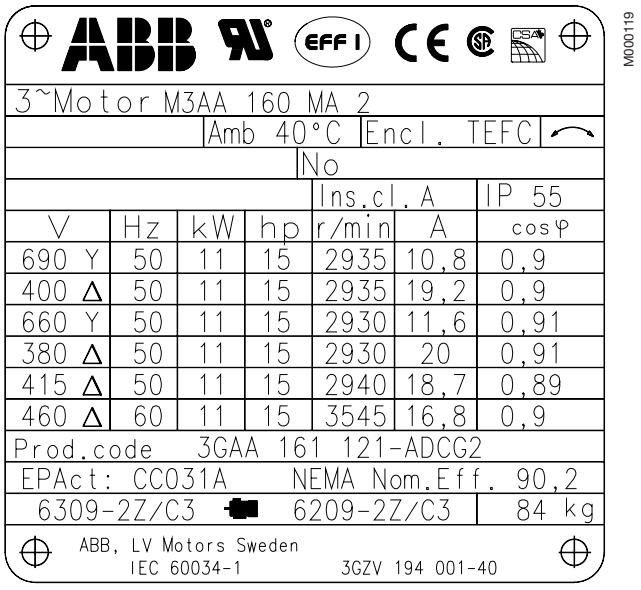

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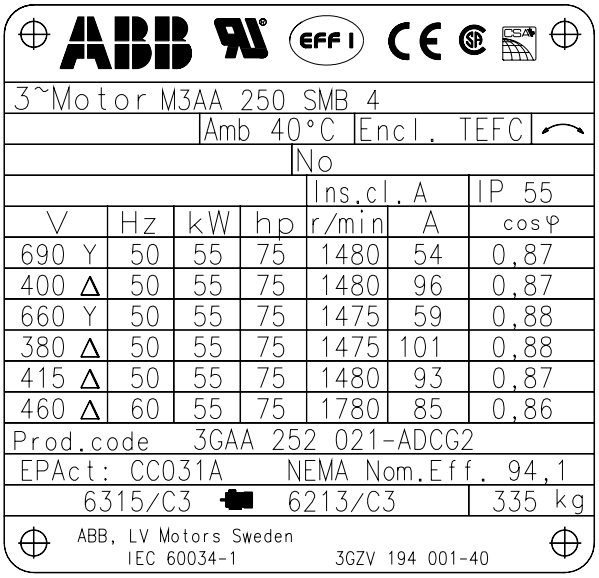

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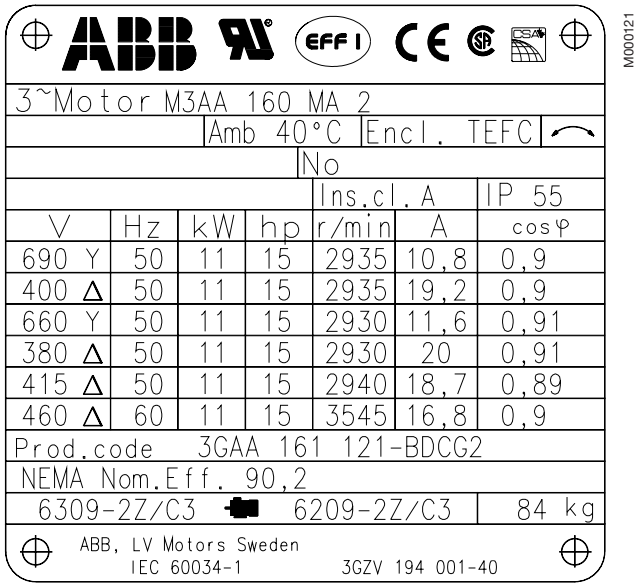


M000121

It’s the details that make the difference

■ Designed, certified and labeled to meet the safety requirements according to CE, UL/UR and CSA, and the efficiency requirements according to CE, EFF1, EPAct and CSA/EEV.

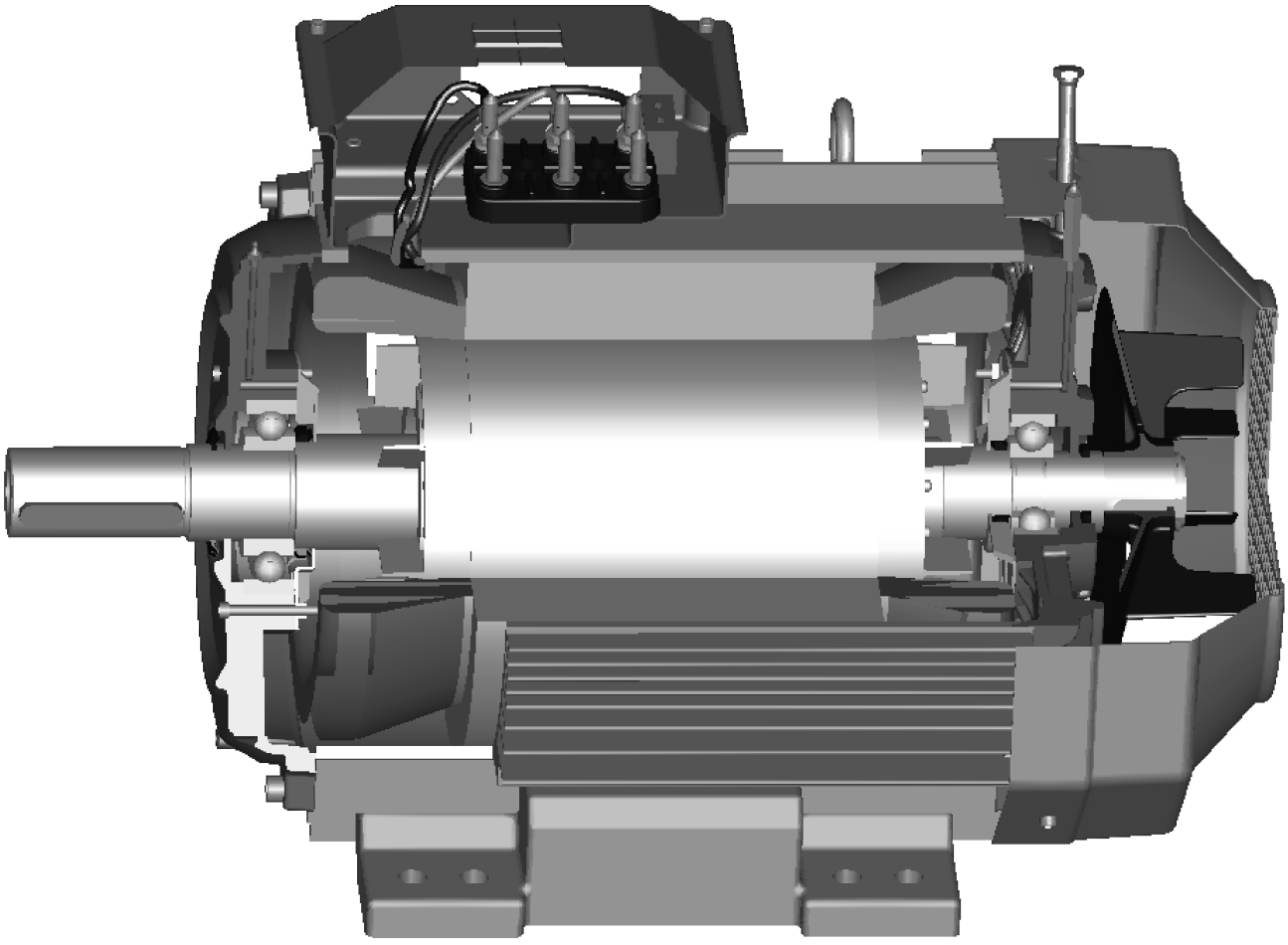
■ Terminal box with 6 lead terminal board, the winding can be connected in either D or Y configuration. The terminal box has plenty of space and is designed for easy and secure installation.

■ Degree of protection / Enclosure: IP 55 / Totally enclosed (TEFC) WaterProof Motor

- Protected against Dust / Limited ingress permitted (no harmful deposit)
- Protected against low pressure jets of water from all directions / Limited ingress permitted.

Other protections available on request.

■ Suitable for variable frequency drive applications.



M000122

■ The frame is made of corrosion resistant die-cast aluminum with low copper content. Together with a surface treatment and final powder painting with Epoxy/Polyester powder, it gives a very high corrosion protection suitable for industrial applications, indoors and outdoors.

■ Reliable grease-lubricated ball bearings with C3 clearance as standard, designed for low running temperature and long service life.

■ Made by ABB according to the highest quality standards.

General purpose global motors in brief, basic design

Motor size		63	71	80	90	100	112	132
Stator	Material	Diecast aluminum alloy.						
	Paint colour shade	Munsell blue 8B 4.5/3.25 / NCS 4822-B05G / RAL 5014						
	Paint	Epoxy polyester powder paint, ≥ 30 µm.			Polyester powder paint, ≥ 30 µm.		Polyester powder paint, ≥ 50 µm.	
Feet	Material	Aluminum alloy, loose feet in sizes 71-100, feet integrated with stator in size 63.					Aluminum alloy, integrated with stator.	
Bearing end shields	Material	Diecast aluminum alloy.						
	Paint colour shade	Munsell blue 8B 4.5/3.25 / NCS 4822-B05G / RAL 5014						
	Paint	Epoxy polyester powder paint, ≥ 30 µm.		Polyester powder paint, ≥ 30 µm.			Polyester powder paint, ≥ 50 µm.	
Bearings	D-end	6202-2Z/C3	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6306-2Z/C3	6206-2Z/C3	6208-2Z/C3
	N-end	6201-2Z/C3	6202-2Z/C3	6203-2Z/C3	6204-2Z/C3	6205-2Z/C3	6205-2Z/C3	6206-2Z/C3
Axially-locked bearings	Inner bearing cover	Spring washer at N-end.			D-end			
		112-132: Foot-mounted - a spring washer at N-end presses the rotor against D-end. Flange-mounted - inner bearing cover and spring-washer at N-end.						
Bearing seals	D-end	V-ring.						
	N-end	Labyrinth seal.						
Lubrication		Permanent grease lubrication. Grease for bearing temperatures -30 to +110°C.					Grease for bearing temperatures -40 to +160°C.	
Terminal box	Material	Die-cast aluminum alloy.						
	Surface treatment	Similar to stator.						
	Screws	Steel 5G. Chromated.						
Connections	Knock-out openings	1 x M16 x Pg11	2 x M20 x Pg16		4 x M25		2 x (M25 + M20)	
	Terminal box	Screw terminal, 6 terminals.					Cable lugs, 6 terminals.	
	Screws						M5	
	Max Cu-area, mm^2	2,5	4		6		10	
Fan	Material	Polypropylene. Reinforced with 20% glass fibre.						
Fan cover	Material	Steel.					Polypropylene.	
Stator winding	Material	Copper						
	Impregnation	Polyester vanish. Tropicalised.						
	Insulation class	Insulation class F. Temperature rise class B, unless otherwise stated.						
	Winding protection	Optional.						
Rotor winding	Material	Die-cast aluminum.						
Balancing method		Half key balancing.						
Key ways		Closed key way						
Heating elements		25 W						
Drain holes		Drain holes with closable plastic plugs. Open on delivery.						
Enclosure		IP 55						
Cooling method		IC 411						

General purpose global motors in brief, basic design

Motor size		160	180	200	225	250	280
Stator	Material	Die-cast aluminum alloy.		Extruded aluminum alloy.			
		Munsell blue 8B 4.5/3.25 / NCS 4822-B05G / RAL 5014 Polyester powder paint, ≥ 50 µm.					
Feet	Material	Aluminum alloy, integrated with stator.		Aluminum alloy, bolted to the stator. Size 250, 2p cast iron.			Cast iron
Bearing end shields	Material	Die-cast aluminum alloy.	Flanged bearing end shields of cast iron, other die-cast aluminum alloy				Cast iron
		Munsell blue 8B 4.5/3.25 / NCS 4822-B05G / RAL 5014 Polyester powder paint, ≥ 50 µm.					
Bearings **Single-speed motors**	D-end N-end	6309-2Z/C3 6209-2Z/C3	6310-2Z/C3 6209-2Z/C3	6312/C3 6210/C3	6313/C3 6212/C3	6315/C3 6213/C3	6316/C3 [1] 6213/C3
		[1] 6315/C3 for 2-pole motor					
Axially-locked bearings	Inner bearing cover	D-end					
Bearing seals	D-end N-end	V-ring. Labyrinth seal.		Outer and inner V-rings. Outer and inner V-rings.			
Lubrication		Permanent grease lubrication. Grease for bearing temperatures -40 to +160°C.		Regreasable bearings. Grease for bearing temperatures -40 to 150°C.			
Terminal box	Material	Die-cast aluminum alloy. Base integrated with stator.		Deep-drawn steel sheet, bolted to stator.			
	Surface treatment	Similar to stator.		Phosphated. Polyester paint.			
	Screws	Steel 5G. Galvanised.					
Connections	Knock-out openings	2 x (2 x M40 + M16)					
	Flange-openings			2 x FL 13.2 x M40 2 x FL 21.2 x M63 voltage code S			2 x FL21, 2 x M63,1 x M16
		Cable lugs, 6 terminals.					
	Screws	M6		M10			
	Max Cu-area, mm²	35		70			
Fan	Material	Polypropylene. Reinforced with 20% glass fibre.					
Fan cover	Material	Steel sheet. Phosphated. Polyester paint.					
Stator winding	Material	Copper					
	Impregnation	Polyester vanish. Tropicalised.					
	Insulation class	Insulation class F. Temperature rise class B, unless otherwise stated.					
	Winding protection	Optional.		PTC-thermistors, 150°C			
Rotor winding	Material	Die-cast aluminum.					
Balancing method		Half key balancing.					
Key way		Closed key way					
Heating elements		25 W 50 W					
Drain holes		Drain holes with closable plastic plugs. Open on delivery.					
Enclosure		IP 55					
Cooling method		IC 411					

ABB Motors' total product offer

ABB offers several comprehensive ranges of AC motors and generators. We manufacture synchronous motors for even the most demanding applications, and a full range of low and high voltage induction motors. Our in-depth knowledge of virtually every type of industrial processing ensures we always specify the best solution for your needs.

Low voltage motors and generators

General purpose motor for standard applications
– Aluminum motors
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– Global motors
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– Single phase motors
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Process performance motors for more demanding applications
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– High speed motors
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– Smoke venting motors
– Water cooled motors
– Motors for roller table drives

Motors for hazardous areas
– Flameproof motors
– Increased safety motors
– Non-sparking motors
– Dust ignition proof motors

Marine motors
– Aluminum motors
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– Open drip proof motors

High voltage and synchronous motors and generators

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– DC motors and generators

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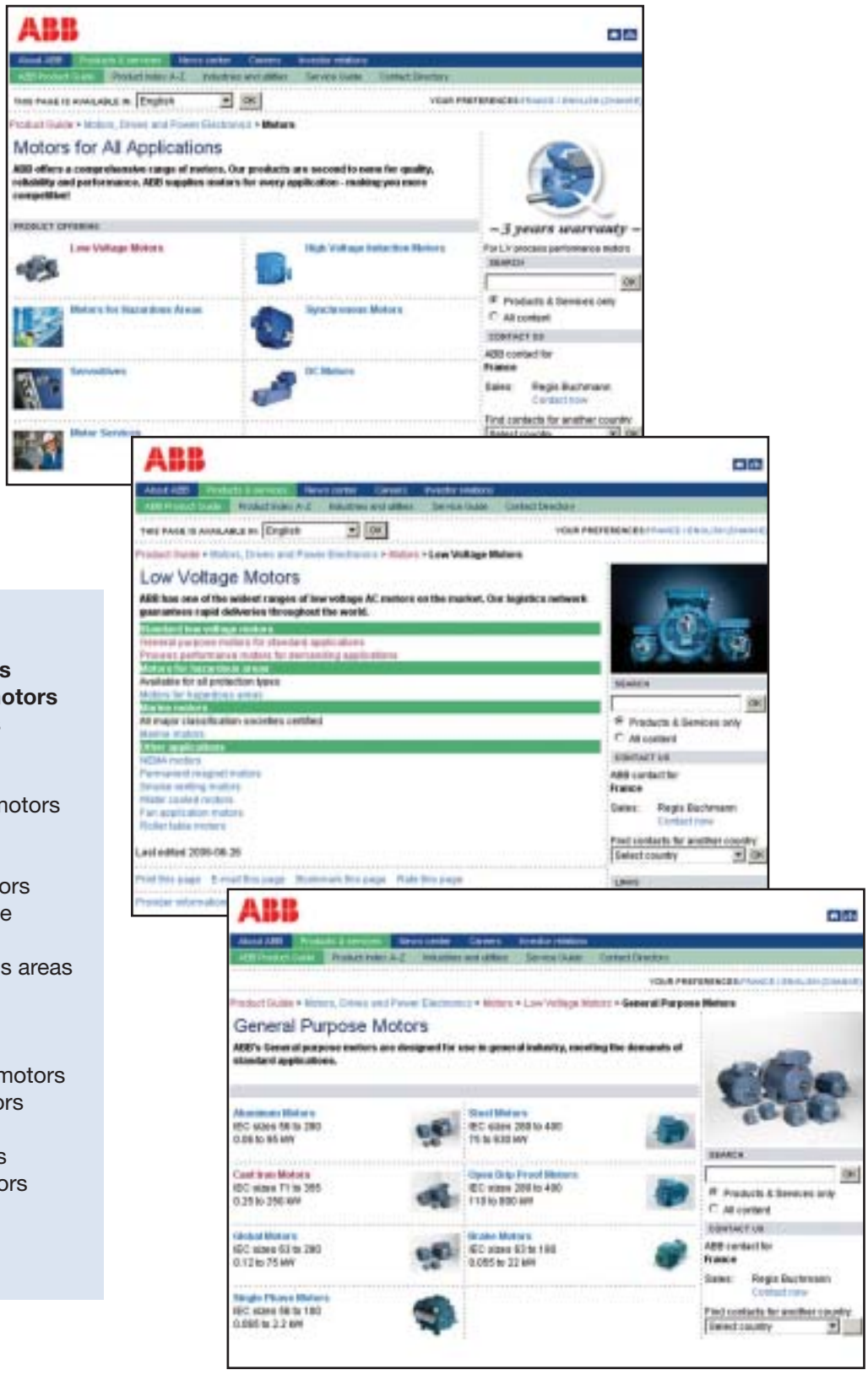

Motors & Drives
> Motors
>> Low Voltage Motors
>>> General purpose motors
- Aluminum motors
- Steel motors
- Cast iron motors
- Open drip proof motors
- Global motors
- Brake motors
- Single phase motors

>>> Process performance motors
>>> Motors for hazardous areas
>>> Marine motors
>>> Other applications
- NEMA motors
- Permanent magnet motors
- Smoke venting motors
- Roller table motors
- Water cooled motors
- Fan application motors
- Roller table motors

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