ABB motors
Low voltage general performance motors
M2000 Cast Iron Frames

Power and productivity
for a better world™

We provide motors and generators, services and expertise to save energy and improve customers' processes over the total lifecycle of our products, and beyond.

Making you more competitive

ABB has been manufacturing motors for over 100 years. Our products are designed to be reliable, efficient and cost effective, and we can supply motors for practically any application. A full range of services is available through our worldwide service organization, with the latest eBusiness systems providing round-the-clock access, easy ordering and fast delivery.

M2000 motors

Our M2000 range offers quality motors in the eff2 class, providing you with the ideal efficiency level for your needs. And our 24-hour availability helps make your life easier. Through our extended support and services such as eBusiness solutions and an efficient global stock concept, we provide you with easy ordering and quick delivery.

The Leader in Motors

ABB is a global engineering and technology group serving customers in electrical power generation; transmission and distribution; automation; oil, gas and petrochemicals; industrial products and contracting; and financial services. The product range includes a full range of industrial electric motors, both AC and DC, LV and HV meeting the needs of most application, with virtually any power rating.

Within the Group, ABB Motors is the world's leading manufacturer of low-voltage induction motors, having over 100 years experience and a presence in more than 100 countries. ABB Motors's broad understanding of customer applications enables it to work closely to solve individual problems or to supply custom-designed motors for any project-no matter how demanding.

For customers, this all represents a solid value and commitment revealed in the dependable quality of ABB Motor's products and in its unrivalled customer service and back up. The hallmarks of its products are efficiency, robustness and reliability, combined to represent the best value available. Customers the world over rely on ABB Motors as the most solid and reliable supplier of electric motors. But above all, ABB Motors values its customers.

The best value is also enhanced by ABB Motors's worldwide customer service network guaranteeing fast delivery, rapid response and local back-up, as well as by worldwide ABB Service network supporting the after sales service.

ABB Motors has manufacturing facilities in Finland, Italy, Spain, Sweden, China and India. The comprehensive Motor stocks at each of these sites are reinforced by large and versatile stocks at Central Stock Nordic in Vasteras, Sweden; Central Stock, Europe in Menden, Germany and Central Stock Asia in Singapore, and by numerous distribution stocks.

Industrial

As a key element of its business strategy, ABB has committed to a broad program of product development and positioning under the Industrial ^{IT} umbrella. This initiative is geared towards increasing integration of ABB products as the "building blocks" of larger solutions, while incorporating functionality that will allow multiple products to interact seamlessly as components of real-time automation and information systems.

Motors and generators represent one of the fundamental building blocks in the Industrial ^{IT} architecture.

ABB (www.abb.com) is a leader in power and automation technologies that enable utility and industry customers to improve performance while lowering environmental impacts. The ABB Group of companies operates in around 100 countries and employs about 107,000 peoples.

Technical features

The new M2QA series of three phase induction motors are a member of the ABB M2000 family with EU efficiency class. The motors are designed and manufactured according to the international standards of IEC34, IEC72, DIN432673, BS4999, AS1359, GB10069, and Q/JBQS27.
The electrical and mechanical performances of ABB M2QA motors are excellent and keeping long.

High efficiency

The output power 1.1kW-90kW 2P and 4P, in S1 duty, M2QA motors are among the class 2 of CEMEP-EU standard, saving energy and operating costs.

Voltage ranges of extra versatility

A wide range of voltages can be up to max. 690 V for 50 Hz and 60 Hz available.

Reliable windings

To ensure long lifetime, the windings are made of the latest available materials in class F protection and temperature rise limited to class B (80k) in standard motors.

Bearings with high load capacity

All motors are provided with deep-groove ball bearings as standard and they are designed for long lifetime is extended. Cast iron motors in sizes 71-225 are greased for life and motors in sizes 250-355 have a regreasing device as a standard.

Strong corrosion protection

The motors are made to withstand aggressive environment as standard and they are designed for long lifetime. For motors with regreasing, they have strong and effective protection against corrosion.

Low niose level

An important objective in our design work is to minimize the noise level. And we have been successful.

Additional windings protection

Fix thermistors(PTC), them-switches, anti condensation heaters on request.

International motor efficiency standards

A worldwide energy efficiency classification system now exists for low voltage three-phase asynchronous motors. This system increases the level of harmonization in efficiency regulations around the world.

International Electrotechnical Commission (IEC) standard IEC/EN 60034-30:2008 defines energy-efficiency (IE code) classes for single speed, three-phase, 50 and 60 Hz induction motors. The standard is part of an effort to unify motor testing procedures and efficiency and product labeling requirements to enable motor purchasers worldwide to easily recognize premium efficiency products. The efficiency levels defined in IEC/EN 60034-30 are based on test methods specified in IEC/EN 60034-2-1:2007.Efficiency testing standad IEC/EN 60034-2-1:2007 Direct methodIndirect method:- Measurement; PLL calculated from load tests- Estimation; PLL at 2.5% – 1.0% of input power at rated load between 0.1 kW and 1000 kW- Mathematical calculation; Eh star – alternative indirect method with mathematical calculation of PLLWinding losses in stator and rotor determined at [25°C + actual temperature rise measured]To promote transparency in the market, IEC 60034-30 states that both the efficiency class and efficiency value must be shown on the motor rating plate and in product documentation. The documentation must clearly indicate the efficiency testing method used as the different methods can produce differing results.

IEC/EN 60034-2-1:2007

IEC/EN 60034-2-1, which came into force in September 2007, introduces new rules concerning the testing methods to be used for determining losses and efficiency.It offers two ways of determining efficiency; the direct and indirect methods. The standard specifies the following parameters for determining efficiency using the indirect method: –reference temperature –three options for determining PLL (additional load losses): measurement, estimation and mathematical calculation. The resulting efficiency values differ from those obtained under the previous IEC testing standard, IEC 60034-2:1996. It must be noted that efficiency values are only comparable if they are measured using the same method.

– reference temperature
– three options for determining PLL (additional load losses): measurement, estimation and mathematical calculation.

The resulting efficiency values differ from those obtained under the previous IEC testing standard, IEC 60034-2:1996. It must be noted that efficiency values are only comparable if they are measured using the same method.

Efficiency testing standad
IEC/EN 60034-2-1:2007

Direct methodIndirect method:
- Measurement; PLL calculated from load tests
- Estimation; PLL at 2.5% – 1.0% of input power at rated load between 0.1 kW and 1000 kW
- Mathematical calculation; Eh star
– alternative indirect method with mathematical calculation of PLL

Winding losses in stator and rotor determined at
[25°C + actual temperature rise measured]

IEC/EN 60034-30:2008

IEC/EN 60034-30:2008 defines three International Efficiency (IE) classes for single speed, three-phase, cage induction motors.
– IE1 = Standard efficiency (EFF2 in the former European classification scheme)
– IE2 = High efficiency (EFF1 in the former European classification scheme and identical to EPAct in the USA for 60 Hz)
– IE3 = Premium efficiency (identical to "NEMA Premium" in the USA for 60 Hz)
– IE4 = A future level above IE3

Efficiency levels defined in IEC/EN 60034-30 are based on test methods specified in IEC/EN 60034-2-1:2007.

Compared to the former European efficiency classes defined by the CEMEP agreement the scope has been expanded.

IEC/EN 60034-30 covers almost all motors (for example standard, hazardous area, marine, brake motors)

– Single speed, three-phase, 50 Hz and 60 Hz
– 2-, 4- or 6-pole
– Rated output from 0.75 to 375 kW
– Rated voltage UN up to 1000 V
– Duty type S1 (continuous duty) or S3 (intermittent periodic duty) with a rated cyclic duration factor of 80 % or higher
– Capable of operating direct online

The following motors are excluded from IEC 60034-30:

– Motors made solely for converter operation
– Motors completely integrated into a machine (for example, pump, fan or compressor) that cannot be tested separately from the machine

Minimum efficiency values defined in IEC 60034-30:2008 standard (based on test methods specified in IEC 60034-2-1:2007)

	IE1			IE2			IE3		
Output	Standard efficiency			High efficiency			Premium efficiency		
kw	2 pole	4 pole	6 pole	2 pole	4 pole	6 pole	2 pole	4 pole	6 pole
0.75	72.1	72.1	70.0	77.4	79.6	75.9	80.7	82.5	78.9
1.1	75.0	75.0	72.9	79.6	81.4	78.1	82.7	84.1	81.0
1.5	77.2	77.2	75.2	81.3	82.8	79.8	84.2	85.3	82.5
2.2	79.7	79.7	77.7	83.2	84.3	81.8	85.9	86.7	84.3
3	81.5	81.5	79.7	84.6	85.5	83.3	87.1	87.7	85.6
4	83.1	83.1	81.4	85.8	86.6	84.6	88.1	88.6	86.8
5.5	84.7	84.7	83.1	87.0	87.7	86.0	89.2	89.6	88.0
7.5	86.0	86.0	84.7	88.1	88.7	87.2	90.1	90.4	89.1
11	87.6	87.6	86.4	89.4	89.8	88.7	91.2	91.4	90.3
15	88.7	88.7	87.7	90.3	90.6	89.7	91.9	92.1	91.2
18.5	89.3	89.3	88.6	90.9	91.2	90.4	92.4	92.6	91.7
22	89.9	89.9	89.2	91.3	91.6	90.9	92.7	93.0	92.2
30	90.7	90.7	90.2	92.0	92.3	91.7	93.3	93.6	92.9
37	91.2	91.2	90.8	92.5	92.7	92.2	93.7	93.9	93.3
45	91.7	91.7	91.4	92.9	93.1	92.7	94.0	94.2	93.7
55	92.1	92.1	91.9	93.2	93.5	93.1	94.3	94.6	94.1
75	92.7	92.7	92.6	93.8	94.0	93.7	94.7	95.0	94.6
90	93.0	93.0	92.9	94.1	94.2	94.0	95.0	95.2	94.9
110	93.3	93.3	93.3	94.3	94.5	94.3	95.2	95.4	95.1
132	93.5	93.5	93.5	94.6	94.7	94.6	95.4	95.6	95.4
160	93.7	93.8	93.8	94.8	94.9	94.8	95.6	95.8	95.6
200	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
250	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
315	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
355	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8
375	94.0	94.0	94.0	95.0	95.1	95.0	95.8	96.0	95.8

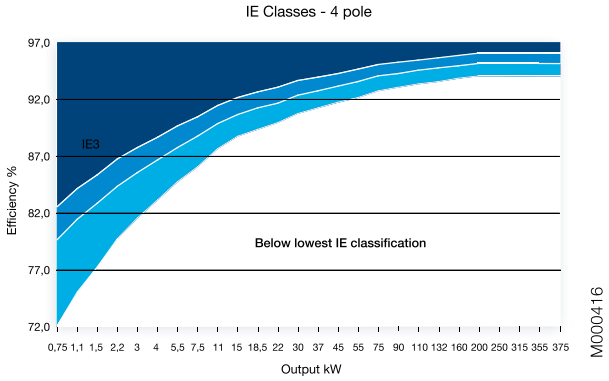


ABB and efficiency standards

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

ABB has a full range of IE2 motors – with many available from stock – and a broad range of IE3 motors.

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 (EFF1 in the former European classification scheme) have formed the core of its portfolio for many years.

Mechanical design

Totally enclosed, fan cooled IP55

Heavy duty design, manufactured from extra corrosion resistant cast iron materials to be used in all kind of environment. The motor is mechanically very strong and robust and as standard designed for additional energy saving through frequency converter drives.

Flexible cable entry direction

Terminal boxes are mounted on the top of the motors, right or left. Terminal boxes of motor size 71-132 can rotate 4x90°,and those of 160-355 can rotate 2x180°. All are easy to refit.

Powerful refit available

The motors satisfy the requirements of a wide range of environments and applications, such as improving protection, insulation level, regreasing facilities, dust-proof, sealing rings, rainproof are available, a full range of options are listed in page 13.

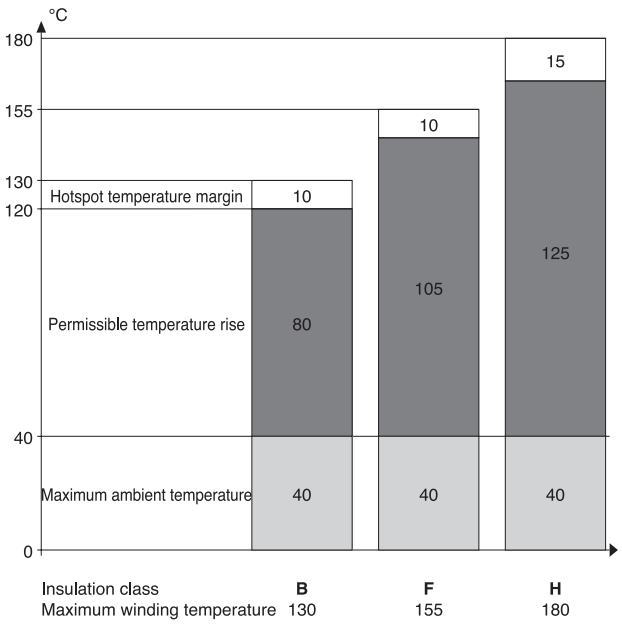
Insulation and insulation classes

According to IEC60085, insulating materials are divided into insulation classes. Each class has a designation corresponding to the temperature that is the upper limit of the range of application of the insulating material under normal operating condition.

The winding insulation of a motor is determined on the basis of the temperature rise in the motor and the ambient temperature. The insulation is normally dimensioned for the hottest point in the motor at its normal rated output and at ambient temperature of 40°C. Motors subjected to ambient temperatures above 40°C will generally have to be derated. In most cases, the standard rated outputs of motors from ABB Motors are based on the temperature rise for insulation classes B. Where the temperature rise is according to class F, this is specified in the data tables.

However, all the motors are designed with class F insulation, which permits a higher temperature rise than class B. The motors, therefore, have a generous over-load margin. If temperature rise to class F is allowed, the outputs given in the tables can generally be increased by about 12 %

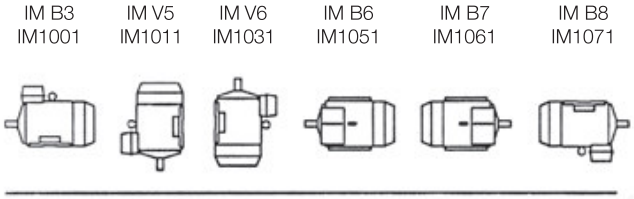
Temperature limits are according to standards. The extra thermal margin when using class F insulation with class B temperature rise makes the motors more reliable.



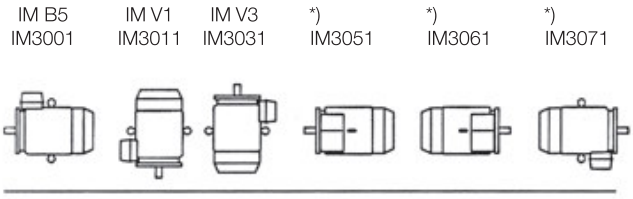
Safty margins per insulation class

Mounting arrangements

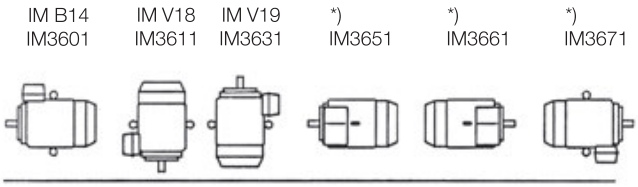
Foot-mounted motor



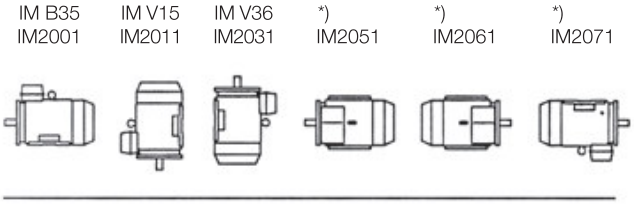
Flange-mounted motor, large flange



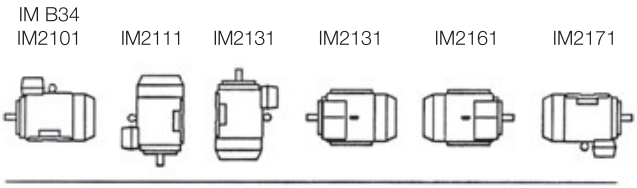
Flange-mounted motor, small flange



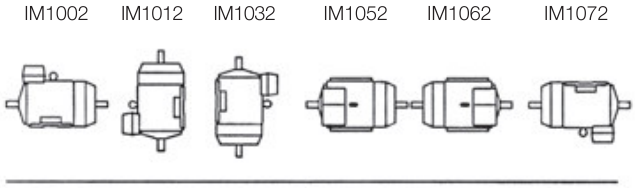
Foot-and flange-mounted motor with feet, large flange



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



Foot-mounted motor, shaft with free extensions



*) Not stated in IEC 60034-7

Product code pos.12

A = foot-mounted, term.box top
L = foot-mounted, term.box LHS
R = foot-mounted, term.box RHS
H = foot/flange-mounted, term.box top
J = foot/flange-mounted, small flange
B = flange mounted, large flange
C = flange mounted, small flange
T = foot/flange -mounted, term.box LHS
S = foot/flange-mounted, term.box RHS

Motors for other voltages

Motors wound for a given voltage at 50Hz can also be used for other voltages. Recalculation factors for current and torque given are beside; efficiency, power factor and speed remain approximately the same. Guaranteed values available on request.

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

Motor wound for	230V		400V		500V		690V	
Connected to 50Hz	220V	230V	380V	415V	500V	550V	660V	690V
% of values at 400V, 50Hz								
Output	100	100	100	100	100	100	100	100
I_N	182	174	105	98	80	75	61	58
I_S/I_N	90	100	90	106	100	119	90	100
T_S/T_N	90	100	90	106	100	119	90	100
I_{MAX}/T_N	90	100	90	106	100	119	90	100

Motors wound for certain voltage at 50 Hz can be operated at 60 Hz, without modification, subject to the following changes in their data.

Motor wound for 50Hz	220V	380V			
Connected to 60Hz	220V	380V	415V	440V	460V
Data at 60Hz in percentage of values at 50Hz					
Output	100	100	110	115	120
r/min	120	120	120	120	120
I_N	98	98	98	100	100
I_S/I_N	83	83	95	100	105
T_N	83	83	91	96	100
T_S/T_N	70	70	85	95	100
I_{MAX}/T_N	85	85	93	98	103

Bearings and terminal boxes

The motors are normally fitted with single-row deep groove ball bearings as listed in the table below. Degree of protection of the standard terminal box is IP55. The motors are supplied with 2 cable entries as standard according to the table below.

Terminal boxes are mounted on top of the motor. The terminal box of moter sizes 71 to 132 can be turned 4 x 90° and in motors sizes 160 to 355 rotated 2 x 180°.

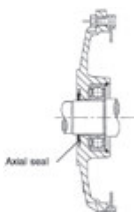
		Standard bearing type				Cable entry
Type	Poles	D-end		N-end		mm
71M	2,4,6	6202	VVC3	6202	VVC3	2-M16X1.5
80M	2,4,6	6204	DDUC3	6204	DDUC3	2-M25X1.5
90S	2,4,6	6205	DDUC3	6205	DDUC3	2-M25X1.5
90L	2,4,6	6205	DDUC3	6205	DDUC3	2-M25X1.5
100L	2,4,6,8	6206	DDUC3	6206	DDUC3	2-M32X1.5
112M	2,4,6,8	6207	DDUC3	6206	DDUC3	2-M32X1.5
132S	2,4,6,8	6208	DDUC3	6207	DDUC3	2-M32X1.5
132M	2,4,6,8	6208	DDUC3	6207	DDUC3	2-M32X1.5
160M	2,4,6,8	6309	ZZC3	6209	ZZC3	2-M40X1.5
160L	2,4,6,8	6309	ZZC3	6209	ZZC3	2-M40X1.5
180M	2,4,6,8	6310	ZZC3	6210	ZZC3	2-M40X1.5
180L	2,4,6,8	6310	ZZC3	6210	ZZC3	2-M40X1.5
200L	2,4,6,8	6312	ZZC3	6212	ZZC3	2-M50X1.5
225S	4,6,8	6313	ZZC3	6213	ZZC3	2-M50X1.5
225M	2	6313	ZZC3	6213	ZZC3	2-M50X1.5
225M	4,6,8	6313	ZZC3	6213	ZZC3	2-M50X1.5
250M	2	6314	C3	6214	C3	2-M63X1.5
250M	4,6,8	6314	C3	6214	C3	2-M63X1.5
280S	2	6316	C4	6316	C4	2-M63X1.5
280S	4,6,8	6316	C3	6316	C3	2-M63X1.5
280M	2	6316	C4	6316	C4	2-M63X1.5
280M	4,6,8	6316	C3	6316	C3	2-M63X1.5
315S	2	6316	C4	6316	C4	2-M63X1.5
315S	4,6,8	6319	C3	6319	C3	2-M63X1.5
315M	2	6316	C4	6316	C4	2-M63X1.5
315M	4,6,8	6319	C3	6319	C3	2-M63X1.5
315L	2	6316	C4	6316	C4	2-M63X1.5
315L	4,6,8	6319	C3	6319	C3	2-M63X1.5
355M	2	6319M	C4	6319M	C4	2-M63X1.5
355M	4,6,8	6322	C3	6319	C3	2-M63X1.5
355L	2	6319M	C4	6319M	C4	2-M63X1.5
355L	4,6,8	6322	C3	6319	C3	2-M63X1.5

Terminal boxes for motor sizes 71-132

Terminal boxes for motor sizes 160-250

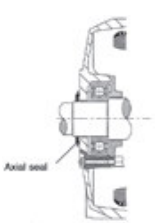
Terminal boxes for motor sizes 280-355

Bearing seals for motor sizes 71-132



Motor size	Standard design Axial seal D-end
71	RB15 x 30 x 4
80	RB20 x 35 x 4
90	RB25 x 40 x 4
100	RB30 x 47 x 4.5
112	RB35 x 52 x 4.5
132	RB40 x 57 x 4.5

Bearing seals for motor sizes 160-225



Motor size	Standard design Axial seal D-end
160	RB45 x 62 x 4.5
180	RB50 x 70 x 5.5
200	RB60 x 80 x 5.5
225	RB65 x 85 x 5.5

Bearing seals for motor sizes 250-355

Motor size	Standard design Radial seal D-end
250	TC70 x 85 x 10
280	TC80 x 100 x 10
315	TC80 x 100 x 10 (2P)
	TC95 x 120 x 12 (4-8P)
355	TC95 x 120 x 12 (2P)
	TC95 x 120 x 12 (4-8P)
	TC110 x 140 x 12 (4-8P)

Permissible loadings on the shaft end

The tables below give the permissible radial force in Newton, assuming zero axial force. The values are based on normal conditions at 50 Hz and calculated bearing lives for motor sizes 71 to 355 of 20000 hours and 40000 hours.

Motors are foot-mounted IM B3 version with force directed sideways. In some cases the strength of the shaft affects the permissible forces.

At 60 Hz the values must be reduced by 10%. For two-speed motors,the values must be based on the higher speed.

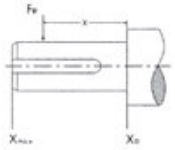
Permissible loads of simultaneous radial and axial forces will be supplied on request.

Permissible radial forces

Motor size 71 to 355

	20000 hours Ball bearings							
	2-pole		4-pole		6-pole		8-pole	
Motor size	X_0 N	X_{max} N	X_0 N	X_{max} N	X_0 N	X_{max} N	X_0 N	X_{max} N
71M	381.1	322.2	479.6	405.4	555.1	469.2	-	-
80M	624.2	509.4	788.3	643.3	906.7	739.9	996.7	813.4
90S	686.0	542.2	869.5	687.2	1000.1	790.4	1095.4	865.8
90L	696.4	564.2	884.7	716.8	1015.1	822.5	1112.0	901.0
100L	979.4	784.8	1233.9	988.8	1419.1	1137.2	1565.7	1254.6
112M	1257.8	1014.4	1592.1	1283.9	1831.1	1476.7	2020.1	1629.1
132S	1435.0	1121.7	1820.5	1423.1	2079.1	1625.3	2299.1	1797.2
132M	-	-	1840.2	1476.3	2106.5	1689.9	2329.4	1868.7
160M	1544.0	1199.8	1947.5	1513.4	2231.9	1734.4	2465.0	1615.6
160L	1562.7	1242.9	1971.2	1567.8	2259.0	1796.7	2495.0	1984.4
180M	2983.6	2371.3	3759.1	2987.7	-	-	-	-
180L	-	-	3801.5	3073.0	4351.6	3517.7	4800.4	3880.5
200L	4089.8	3376.8	5161.5	4261.7	5908.5	4878.5	6517.9	5381.7
225S	-	-	5762.8	4526.4	-	-	7260.7	5702.9
225M	4591.0	3811.1	5790.9	4594.2	6643.9	5271.0	7296.0	5788.4
250M	5111.6	4170.0	6439.9	5253.6	7388.1	6027.2	8113.0	6618.5
280S	6000.2	4956.7	7570.1	6253.5	8679.2	7169.8	9537.5	7878.8
280M	6048.5	5059.3	7631.5	6383.4	8750.0	7318.9	9615.4	8042.8
315S	6602.4	5627.1	9533.5	7882.0	10916.1	9025.1	12028.5	9944.8
315M	6677.1	5793.3	9647.8	8145.0	11047.2	9326.4	12173.2	10277.0
315L	6675.9	5792.3	9648.0	8145.1	11045.3	9324.7	12171.2	10275.3
355M	8280.0	6790.0	14060.0	11529.0	16089.0	13193.0	-	-
355L	8372.0	6865.0	14136.0	11592.0	16175.0	13264.0	-	-

	40000 hours Ball bearings							
	2-pole		4-pole		6-pole		8-pole	
Motor size	X_0 N	X_{max} N	X_0 N	X_{max} N	X_0 N	X_{max} N	X_0 N	X_{max} N
71M	302.5	255.7	380.7	321.8	440.5	372.4	-	-
80M	495.4	404.3	625.7	510.6	719.6	587.3	791.1	645.6
90S	544.5	430.4	690.1	545.4	793.8	627.3	869.5	687.2
90L	552.7	447.8	702.2	568.9	805.7	652.8	882.6	715.1
100L	777.3	622.9	979.4	784.8	1126.4	902.6	1242.7	995.8
112M	998.3	805.1	1263.6	1019.1	1453.3	1172.0	1603.4	1293.1
132S	1138.9	890.3	1444.9	1129.5	1650.2	1290.0	1824.8	1426.5
132M	-	-	1460.6	1171.7	1672.0	1341.3	1848.8	1483.2
160M	1225.5	952.3	1545.7	1201.2	1771.5	1376.6	1956.5	1520.4
160L	1240.4	986.5	1564.5	1244.3	1793.0	1426.0	1980.3	1575.0
180M	2368.1	1882.1	2983.6	2371.3	-	-	-	-
180L	-	-	3017.2	2439.0	3453.9	2792.0	3810.1	3080.0
200L	3246.1	2680.2	4096.7	3382.6	4689.6	3872.1	5173.3	4271.5
225S	-	-	4574.0	3592.6	-	-	5762.8	4526.4
225M	3643.9	3024.9	4596.2	3646.4	5273.3	4183.6	5790.9	4594.2
250M	4057.0	3309.7	5111.1	5169.6	5863.7	4783.5	6438.9	5252.8
280S	4761.8	3933.7	6007.7	4962.9	6888.0	5690.1	7569.1	6252.7
280M	4799.8	4014.8	6056.1	5065.6	6943.7	5808.1	7630.5	6382.5
315S	5239.0	4465.1	7565.3	6254.8	8662.6	7162.0	9545.4	7891.8
315M	5297.9	4596.7	7655.6	6463.1	8766.3	7400.7	9659.8	8155.1
315L	5296.6	4595.6	7655.4	6462.9	8764.6	7399.1	9657.9	8153.5
355M	5612.0	4602.0	11100.0	9102.0	12741.0	10448.0	-	-
355L	5612.0	4658.0	11100.0	9213.0	12741.0	10575.0	-	-



If the radial force is applied between points X_o and X_{max},the permissible force F_R can calculated form the following formula: $F_R=F_{xo}-X/E$ (Fxo-Fxmax) E=length of shaft extension in basic version

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 life time of 20000 and 40000 hours.

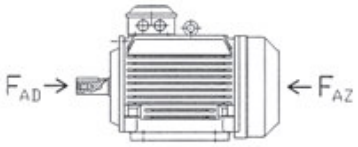
At 60 Hz the values are to be reduced by 10% For two-speed motors, the values are to be based on the higher speed. The permissible loads of simultaneous radial and axial forces will be supplied on request.

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

Mounting arrengement IM B3

	20000 hours Ball bearings							
	2-pole		4-pole		6-pole		8-pole	
Motor size	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N
71M	268.3	268.3	362.9	362.9	438.6	438.6	-	-
80M	434.8	434.8	592.9	592.9	712.6	712.6	804.0	804.0
90S	471.8	471.8	647.0	647.0	778.2	778.2	873.0	873.0
90L	471.8	471.8	648.9	648.9	778.2	778.2	873.0	873.0
100L	648.3	648.3	883.7	883.7	1058.3	1058.3	1202.6	1202.6
112M	843.0	843.0	1157.0	1157.0	1382.8	1382.8	1574.2	1574.2
132S	947.2	947.2	1302.3	1302.3	1542.7	1542.7	1764.0	1764.0
132M	-	-	1297.9	1297.9	1542.7	1542.7	1764.0	1764.0
160M	1017.7	1017.7	1382.1	1382.1	1651.2	1651.2	1881.4	1881.4
160L	1017.7	1017.7	1382.1	1382.1	1651.2	1651.2	1881.4	1881.4
180M	1972.9	1972.9	2665.0	2665.0	-	-	-	-
180L	-	-	2665.0	2665.0	3197.1	3197.1	3626.4	3626.4
200L	2569.6	2569.6	3489.1	3489.1	4197.9	4197.9	4754.7	4754.7
225S	-	-	3904.5	3904.5	-	-	5309.0	5309.0
225M	2873.4	2873.4	3904.5	3904.5	4718.4	4718.4	5309.0	5309.0
250M	3225.3	3225.3	4378.4	4378.4	5293.1	5293.1	5955.9	5955.9
280S	3714.9	3714.9	5007.7	5007.7	6087.7	6087.7	6924.2	6924.2
280M	3714.9	3714.9	5077.7	5077.7	6087.7	6087.7	6924.2	6924.2
315S	3963.9	3963.9	6141.0	6141.0	7292.2	7292.2	8300.9	8300.9
315M	3963.9	3963.9	6141.0	6141.0	7292.2	7292.2	8300.9	8300.9
315L	3964.7	3964.7	6143.0	6143.0	7292.2	7292.2	8300.9	8300.9
355-	5775.0	2310.0	8100.0	4050.0	9484.0	5160.0	10080.0	8420.0

	40000 hours Ball bearings							
	2-pole		4-pole		6-pole		8-pole	
Motor size	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N	F_{AD} N	F_{AZ} N
71M	198.6	198.6	267.8	267.8	325.0	325.0	-	-
80M	320.6	320.6	436.1	436.1	528.4	528.4	595.6	595.6
90S	347.1	347.1	475.4	475.4	576.4	576.4	647.0	647.0
90L	341.7	341.7	477.0	477.0	576.4	576.4	647.0	647.0
100L	475.6	475.6	648.3	648.3	781.5	781.5	891.5	891.5
112M	617.1	617.1	848.0	848.0	1019.4	1019.4	1167.3	1167.3
132S	692.5	692.5	955.5	955.5	1135.8	1135.8	1306.7	1306.7
132M	-	-	952.6	952.6	1135.8	1135.8	1306.7	1306.7
160M	743.1	743.1	1019.2	1019.2	1214.3	1214.3	1391.0	1391.0
160L	743.1	743.1	1019.2	1019.2	1214.3	1214.3	1391.0	1391.0
180M	1441.7	1441.7	1972.9	1972.9	-	-	-	-
180L	-	-	1972.9	1972.9	2346.4	2346.4	2673.2	2673.2
200L	1888.2	1888.2	2575.9	2575.9	3077.9	3077.9	3499.8	3499.8
225S	-	-	2878.0	2878.0	-	-	3904.5	3904.5
225M	2117.4	2117.4	2878.0	2878.0	3457.5	3457.5	3904.5	3904.5
250M	2379.2	2379.2	3225.3	3225.3	3879.3	3879.3	4378.4	4378.4
280S	2766.7	2766.7	3721.9	3721.9	4509.5	4509.5	5077.7	5077.7
280M	2766.7	2766.7	3721.9	3721.9	4509.5	4509.5	5077.7	5077.7
315S	2965.5	2965.5	4478.5	4478.5	5357.8	5357.8	6153.3	6153.3
315M	2965.5	2965.5	4478.5	4478.5	5357.8	5357.8	6153.3	6153.3
315L	2965.8	2965.8	4479.5	4479.5	5357.8	5357.8	6153.3	6153.3
355-	4675.0	1460.0	5770.0	2030.0	6411.0	2611.0	7106.0	3366.0



Rating plate

The rating plates are in table form giving values for speed, current and power factor for three voltages.The following information must be shown on the motor rating plate according to IEC 60034-30; 2008 and European MEPS (Commission Regulation, EC, No 640/2009):

– Lowest nominal efficiency at 100 %, 75 % and 50 % rated load
– Efficiency level IE1

ABB Motors					
3~motor M2QA9OL4A					IEC 60034-1
3GQA092501-CSA				IP55	Ins Cl F
62052RSH/C3			62052RSH/C3		
V	Hz	r/min	kw	cosΦ	A
230Y/400Y	50	1400	1.5	0.79	6.17/3.54
460Y	60	1700	1.73	0.700	3.41
IE1-78.3(100%)-80.6(75%) 90.2(50%)					21 KG
No 32911117711					

ABB Motors							
3~motor M2QA160M4A B3							
IEC 160M42							
S1				No. 36C12500524493006006			
Cert.no				Ins.Cl. F		IP 55	
V	Hz	kw	r/min	A	cosΦ	IA/IN	tE/S
400Δ	50	11	1460	21.2	0.85		
690Y	50	11	1460	12.3	0.85		
460Δ	60	12.7	1755	20.5	0.87		
IE1 - 88.2(100%)-89.1(75%)-88.7(50%)							
Prod.code 3GQA162301-ADA							
6309/C3			6209/C3			116 kg	
Date 2012.1					IEC 60034-1		

Ordering information

Sample order

When placing an order, the motor type, size and product code must be specified. The product code of the motor is composed in various way, in accordance with the following examples.

A	B	C					D,	E,	F		G
M2QA	100L2A	3GQA	10	1	501	-	A	D	A	+	033
		1-4	5-6	7	8-10	11	12	13	14	15	16

A Motor type
B Motor size
C Product code
D Mounting arrangement code
E Voldtage and frequency code
F Generation code
G Variant codes

Explanation of the product code (C,D,E,F) :

Positions 1 to 4

M2QA = Totally enclosed fan cooled squirel cage motor with cast iron frame

Positions 5 and 6

IEC frame

07 = 71	13 = 132	25 = 250
08 = 80	16 = 160	28 = 280
09 = 90	18 = 180	31 = 315
10 = 100	20 = 200	35 = 355
11 = 112	22 = 225	

Position 7

Speed (pole pairs)

1 = 2 poles	6 = 12 poles
2 = 4 poles	7 = >12 poles
3 = 6 poles	8 = Two-speed motors for fan drive motors for constant torque
4 = 8 poles	
5 = 10 poles	9 = Multi-speed motors, two-speed

Position 8 to 10

Serial number

Position 11

- (dash)

Positions 12

Mounting arrangement

A = Foot-mounted, top-mounted terminal box
R = Foot-mounted, terminal box on RHS, seen from D-end
L = Foot-mounted, terminal box on LHS, seen from D-end
B = Flange-mounted, large flange
C = Flange-mounted, small flange size (71-112)
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

Positions 13

Voltage and frequency

Single-speed motors
B 380 V 50Hz
D 400 V / 690VY 50Hz, 460V 60Hz
E 500 V 50Hz
F 500 VY 50Hz
S 230 V / 400VY 50Hz, 460VY 60Hz
T 660 V 50Hz
U 690 V 50Hz
X Other rated voltage, connection or frequency, 690 V maximum

Remark

For voltage code X the variant code 209 non-stamdard voltage or frequency (special winding) must be ordered.

Positions 14

Generation code

A, B, C, ...

Positions 15

+ (plus)

Positions 16

Variant codes

The product code must be, if need, followed by variant codes: Please see page 15-16.

Totally enclosed squirrel cage three phase motors, cast iron frame IP55 IC411

IE1-2 Poles, IE1-4 Poles

Insulation class F
Temperature rise class B

Output kW	Type designation M2QA	Product code 3GQA	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Power factor cosφ	Current I_N A	Current $\frac{I_S}{I_N}$	Torque T_N Nm	Torque $\frac{T_S}{T_N}$	Torque $\frac{T_{MAX}}{T_N}$	Moment of inertia J=GD²/4 kgm²	Weight kg	Sound pressure level Lp dB(A)
3000 r/min = 2 poles							**400V 50Hz**		**Basic design**					
0.37	**71M2A**	**071301-**	2870	72.0	73.47	0.82	0.90	6.0	1.27	2.2	2.4	0.00030	10	56
0.55	**71M2B**	**071302-**	2785	75.5	77.68	0.83	1.27	5.5	1.89	2.2	2.4	0.00037	11	56
0.75	**80M2A**	**081301-**	2840	75.5	75.82	0.85	1.69	6.1	2.52	2.2	2.2	0.00091	16	57
1.1	**80M2B**	**081302-**	2855	77.5	78.82	0.86	2.38	7.0	3.68	2.2	2.2	0.00107	17	58
1.5	**90S2A**	**091101-**	2850	79.0	79.98	0.87	3.15	7.0	5.03	2.2	2.2	0.00135	21	61
2.2	**90L2A**	**091501-**	2850	81.5	82.07	0.86	4.53	7.0	7.37	2.2	2.2	0.00163	24	61
3	**100L2A**	**101501-**	2860	83.0	83.58	0.87	6.0	7.0	10.0	2.2	2.2	0.00402	33	65
4	**112M2A**	**111301-**	2875	85.0	85.80	0.90	7.55	7.0	13.3	2.2	2.2	0.00671	42	67
5.5	**132S2A**	**131101-**	2905	87.5	87.66	0.89	10.2	7.0	18.1	2.2	2.2	0.01241	58	70
7.5	**132S2B**	**131102-**	2910	88.5	88.88	0.90	13.7	7.0	24.6	2.2	2.2	0.01491	63	70
11	**160M2A**	**161301-**	2920	90.0	89.69	0.88	20.2	6.5	36.0	2.5	3.0	0.0436	112	72
15	**160M2B**	**161302-**	2920	90.0	89.96	0.88	27.2	6.5	49.1	2.5	3.2	0.0551	122	72
18.5	**160L2A**	**161501-**	2920	90.5	90.55	0.90	33.0	6.5	60.5	2.5	3.2	0.06549	142	72
22	**180M2A**	**181301-**	2940	90.8	90.60	0.90	38.9	6.5	71.5	2.3	2.8	0.08805	170	75
30	**200L2A**	**201501-**	2955	91.4	90.62	0.90	52.6	6.5	97.0	2.2	2.7	0.14821	235	81
37	**200L2B**	**201502-**	2955	92.2	91.59	0.90	64.0	6.5	120	2.3	2.7	0.16822	254	81
45	**225M2A**	**221301-**	2970	92.6	92.06	0.89	78.8	7.0	145	2.5	2.8	0.29345	328	81
55	**250M2A**	**251301-**	2960	93.4	92.93	0.89	95.5	7.5	177	2.4	3.0	0.3784	390	84
75	**280S2A**	**281101-**	2970	94.0	93.49	0.90	127	7.5	241	2.5	3.3	0.587	504	85
90	**280M2A**	**281301-**	2970	94.3	93.93	0.91	151	7.5	289	2.3	3.2	0.615	560	85
110	**315S2A**	**311101-**	2980	94.0	93.07	0.90	187	7.1	353	1.8	2.2	1.4083	910	88
132	**315M2A**	**311301-**	2980	94.5	93.76	0.90	223	7.1	423	1.8	2.2	1.5584	1010	88
160	**315L2A**	**311501-**	2975	94.6	93.87	0.91	268	7.2	514	1.8	2.2	1.7256	1070	88
***200**	**315L2B**	**311502-**	2975	94.8	94.36	0.92	331	7.2	642	1.8	2.2	1.9405	1120	88
***250**	**355M2A**	**351301-**	2980	95.4	94.70	0.9	420	7.1	801	2.3	2.8	3.05	1438	89
***315**	**355L2A**	**351501-**	2980	96.0	95.43	0.9	526	6.9	1009	2.0	2.8	3.6	1726	89

Output kW	Type designation M2QA	Product code 3GQA	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Power factor cosφ	Current I_N A	Current $\frac{I_S}{I_N}$	Torque T_N Nm	Torque $\frac{T_S}{T_N}$	Torque $\frac{T_{MAX}}{T_N}$	Moment of inertia J=GD²/4 kgm²	Weight kg	Sound pressure level Lp dB(A)
1500 r/min = 4 poles							**400V 50Hz**		**Basic design**					
0.25	**71M4A**	**072301-**	1395	69.0	71.19	0.70	0.75	4.5	1.71	2.1	2.4	0.00053	11	43
0.37	**71M4B**	**072302-**	1395	69.0	70.72	0.72	1.07	4.5	2.53	2.1	2.4	0.00066	11	45
0.55	**80M4A**	**082301-**	1410	72.0	72.52	0.73	1.51	5.2	3.73	2.4	2.0	0.00145	16	46
0.75	**80M4B**	**082302-**	1415	74.5	75.74	0.76	1.92	6.0	5.06	2.4	2.2	0.00174	17	46
1.1	**90S4A**	**092101-**	1395	76.8	77.22	0.76	2.70	6.0	7.53	2.3	2.2	0.00254	21	52
1.5	**90L4A**	**092501-**	1400	79.0	80.81	0.78	3.51	6.0	10.2	2.3	2.2	0.00317	25	52
2.2	**100L4A**	**102501-**	1430	82.2	82.51	0.79	4.89	6.0	14.7	2.3	2.2	0.00679	32	53
3	**100L4B**	**102502-**	1425	83.7	84.60	0.81	6.39	6.5	20.1	2.3	2.2	0.00862	36	53
4	**112M4A**	**112301-**	1435	85.1	85.66	0.48	8.75	6.5	26.6	2.3	2.2	0.01306	45	56
5.5	**132S4A**	**132101-**	1435	86.5	87.20	0.82	11.2	6.5	36.6	2.3	2.2	0.02673	60	59
7.5	**132M4A**	**132301-**	1440	87.6	88.07	0.83	14.9	6.5	49.7	2.3	2.2	0.03432	73	59
11	**160M4A**	**162301-**	1460	89.5	89.81	0.85	20.9	6.5	72.0	2.4	2.8	0.06543	116	66
15	**160L4A**	**162501-**	1455	90.0	90.61	0.86	28.0	6.5	98.5	2.3	2.4	0.09349	137	66
18.5	**180M4A**	**182301-**	1470	91.0	91.06	0.86	34.1	6.5	120	2.3	3.0	0.16049	170	66
22	**180L4A**	**182501-**	1470	91.5	91.65	0.88	39.7	6.5	143	2.4	3.1	0.18046	186	66
30	**200L4A**	**202501-**	1475	92.2	92.13	0.87	54.0	6.5	194	2.2	2.8	0.2819	254	71
37	**225S4A**	**222101-**	1480	92.6	92.47	0.86	67.1	7.0	239	2.2	2.8	0.37	308	73
45	**225M4A**	**222301-**	1480	92.8	92.65	0.87	80.4	7.0	290	2.2	2.8	0.42	335	73
55	**250M4A**	**252301-**	1475	93.4	93.29	0.88	97.1	7.0	356	2.4	3.0	0.78	450	76
75	**280S4A**	**282101-**	1480	94.0	93.96	0.87	132	6.5	484	2.4	2.6	1.10	534	78
90	**280M4A**	**282301-**	1480	94.3	94.19	0.87	158	7.2	581	2.3	2.8	1.35	592	78
110	**315S4A**	**312101-**	1485	94.5	94.18	0.87	193	6.9	707	2.1	2.2	2.8596	930	80
132	**315M4A**	**312301-**	1485	94.8	94.55	0.88	230	6.9	849	2.1	2.2	3.1848	1030	80
160	**315L4A**	**312501-**	1485	94.9	94.59	0.88	278	6.9	1029	2.1	2.2	3.6765	1050	86
200	**315L4B**	**312502-**	1485	95.0	94.77	0.88	347	6.9	1086	2.1	2.2	4.2516	1100	86
***250**	**355M4A**	**352301-**	1490	95.3	94.99	0.90	423	6.9	1602	2.1	2.6	6.77	1546	87
***315**	**355L4A**	**352501-**	1490	95.5	95.28	0.90	529	7.0	2019	2.1	2.3	8.2	1821	87

*Insulation Class F Tmperature rise Class F

Totally enclosed squirrel cage three phase motors, cast iron frame IP55 IC411

IE1-6 Poles

Insulation class F
Temperature rise class B

Output kW	Type designation M2QA	Product code 3GQA	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Power factor cosφ	Current I_N A	Current $\frac{I_S}{I_N}$	Torque T_N Nm	Torque $\frac{T_S}{T_N}$	Torque $\frac{T_{MAX}}{T_N}$	Moment of inertia J=GD²/4 kgm²	Weight kg	Sound pressure level Lp dB(A)
1000 r/min = 6 poles							**400V 50Hz**		**Basic design**					
0.18	**71M6A**	**073301-**	885	55.0	54.00	0.67	0.71	3.5	1.94	2.1	2.3	0.00056	10	42
0.25	**71M6B**	**073302-**	885	58.0	59.57	0.67	0.93	4.0	2.70	2.0	2.0	0.00074	11	42
0.37	**80M6A**	**083301-**	930	63.5	63.93	0.66	1.27	5.0	3.80	1.9	1.8	0.00159	17	45
0.55	**80M6B**	**083302-**	925	65.7	66.88	0.68	1.79	5.0	5.68	1.9	1.8	0.00196	18	45
0.75	**90S6A**	**093101-**	920	71.0	72.10	0.72	2.12	5.0	7.79	2.0	2.2	0.00292	21	48
1.1	**90L6A**	**093501-**	920	73.0	74.83	0.74	2.94	5.0	11.4	2.0	2.2	0.00379	25	48
1.5	**100L6A**	**103501-**	940	77.2	77.87	0.74	3.79	5.5	15.2	2.0	2.2	0.00999	32	51
2.2	**112M6A**	**113301-**	940	79.6	80.54	0.73	5.46	5.5	22.4	2.0	2.2	0.01559	40	54
3	**132S6A**	**133101-**	945	81.6	82.69	0.77	6.89	6.5	30.3	2.0	2.2	0.03116	55	56
4	**132M6A**	**133301-**	950	84.0	84.60	0.77	8.93	6.5	40.2	2.0	2.2	0.04074	65	56
5.5	**132M6B**	**133302-**	950	85.0	85.94	0.78	12.0	6.5	55.3	2.0	2.2	0.05332	75	56
7.5	**160M6A**	**163301-**	960	88.0	88.30	0.78	15.8	6.0	74.6	2.0	2.3	0.09231	119	61
11	**160L6A**	**163501-**	970	88.5	88.87	0.78	23.0	6.0	108	2.2	2.3	0.12970	140	62
15	**180L6A**	**183501-**	975	89.5	89.69	0.82	29.5	6.0	147	2.3	2.8	0.2418	180	63
18.5	**200L6A**	**203501-**	980	90.3	90.37	0.82	36.1	6.0	180	2.2	2.8	0.34174	231	64
22	**200L6B**	**203502-**	980	90.4	90.63	0.83	42.3	6.0	214	2.1	2.8	0.46837	254	64
30	**225M6A**	**223301-**	985	91.5	91.35	0.82	58.1	6.6	291	2.2	2.8	0.62691	308	66
37	**250M6A**	**253301-**	980	92.2	92.53	8.88	65.8	6.8	361	2.3	2.8	0.97	382	68
45	**280S6A**	**283101-**	980	92.6	92.42	0.86	81.6	6.5	439	2.3	2.4	1.25	482	69
55	**280M6A**	**283301-**	980	93.0	92.82	0.86	98.7	7.0	536	2.3	2.5	1.485	532	70
75	**315S6A**	**313101-**	990	93.5	93.24	0.86	135	7.4	723	2.0	2.0	3.1942	920	70
90	**315M6A**	**313301-**	990	93.8	93.60	0.86	161	7.4	868	2.0	2.0	3.723	1010	70
110	**315L6A**	**313501-**	990	94.3	94.16	0.87	194	6.8	1061	2.0	2.0	4.2564	1060	70
132	**315L6B**	**313502-**	985	94.5	94.42	0.88	230	6.8	1280	2.0	2.0	5.1577	1120	70
***160**	**355M6A**	**353301-**	990	94.7	94.26	0.88	277	6.8	1543	2.1	2.4	7.8	1360	75
***200**	**355M6B**	**353302-**	990	95.0	94.66	0.88	345	6.7	1929	2.0	2.3	9.1	1551	75
***250**	**355L6A**	**353501-**	990	95,4	95,05	0,88	430	6,7	2412	2,0	2,3	11.4	2057	75

Output kW	Type designation M2QA	Product code 3GQA	Speed r/min	Efficiency Full load 100%	Efficiency 3/4 load 75%	Power factor cosφ	Current I_N A	Current $\frac{I_S}{I_N}$	Torque T_N Nm	Torque $\frac{T_S}{T_N}$	Torque $\frac{T_{MAX}}{T_N}$	Moment of inertia J=GD²/4 kgm²	Weight kg	Sound pressure level Lp dB(A)
750 r/min = 8 poles							**400V 50Hz**		**Basic design**					
0.18	**80M8A**	**084301-**	700	51.0	50.12	0.60	0.85	3.3	2.46	1.8	1.9	0.00111	16	42
0.25	**80M8B**	**084302-**	700	54.5	53.28	0.60	1.10	3.6	3.41	1.8	1.9	0.00326	17	42
0.37	**90S8A**	**094101-**	700	62.5	62.07	0.60	1.41	4.4	5.05	1.8	1.9	0.00541	21	46
0.55	**90L8A**	**094501-**	700	63.5	63.34	0.62	2.03	4.7	7.50	1.8	2.0	0.00756	24	46
0.75	**100L8A**	**104501-**	690	70.0	70.08	0.64	2.42	5.0	10.4	1.8	2.0	0.00971	31	53
1.1	**100L8B**	**104502-**	675	71.5	70.28	0.64	3.44	5.0	15.6	1.8	2.0	0.01186	34	53
1.5	**112M8A**	**114301-**	695	75.0	75.39	0.68	4.58	5.0	20.6	1.8	2.0	0.01559	42	55
2.2	**132S8A**	**134101-**	710	81.0	81.78	0.70	5.60	5.5	29.6	1.8	2.0	0.03625	56	55
3	**132M8A**	**134301-**	710	81.0	81.38	0.75	7.13	5.5	40.4	1.8	2.0	0.04141	64	56
4	**160M8A**	**164301-**	720	84.0	83.98	0.73	9.42	5.5	53.1	2.1	2.5	0.0676	105	58
5.5	**160M8B**	**164302-**	720	85.5	95.62	0.74	12.5	5.5	73.0	2.1	2.5	0.09524	125	58
7.5	**160L8A**	**164501-**	720	86.5	85.82	0.74	16.9	5.5	99.5	2.1	2.5	0.12122	142	58
11	**180L8A**	**184501-**	730	87.7	86.96	0.77	23.5	5.4	144	2.0	2.8	0.23645	176	61
15	**200L8A**	**204501-**	730	89.0	89.38	0.78	31.4	5.5	196	2.3	2.8	0.37103	235	63
18.5	**225S8A**	**224101-**	735	90.0	89.12	0.73	40.6	5.5	240	2.1	2.8	0.53287	290	65
22	**225M8A**	**224301-**	735	90.5	89.60	0.74	47.4	6.0	286	2.2	2.8	0.65825	302	65
30	**250M8A**	**254301-**	735	91.3	90.10	0.79	60.0	6.5	390	2.3	2.6	0.975	392	67
37	**280S8A**	**284101-**	740	91.8	91.7	0.79	73.6	6.0	478	2.1	2.6	1.25	488	68
45	**280M8A**	**284301-**	740	92.4	91.1	0.79	89.0	6.0	581	2.1	2.7	1.485	548	68
55	**315S8A**	**314101-**	740	92.8	91.52	0.82	104	6.9	710	1.8	2.0	3.6842	930	65
75	**315M8A**	**314301-**	740	93.0	91.93	0.82	142	7.0	968	1.8	2.0	4.9591	1010	68
90	**315L8A**	**314501-**	740	93.8	93.22	0.82	169	7.1	1161	1.8	2.0	5.8205	1070	68
110	**315L8B**	**314502-**	740	94.0	92.38	0.82	206	6.4	1420	1.8	2.0	6.7537	1140	68
***132**	**355M8A**	**354301-**	740	94.3	93.89	0.82	248	6.2	1704	1.8	2.0	8.6	1424	71
***160**	**355M8B**	**354302-**	740	94.5	94.13	0.82	298	6.2	2065	1.8	2.0	10.01	1578	71
***200**	**355L8A**	**354501-**	740	94.7	94.53	0.82	372	6.2	2581	1.8	2.0	12.5	2121	71

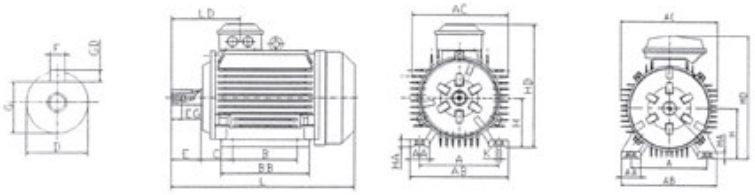
*Insulation Class F Tmperature rise Class F

Dimension drawing

Foot-mounted motor designation IM B3, IM B6, IM B7, IM B8, IM V5, IM V6
Flange-mounted, mounting designation IM B5, IM V1, IM V3
Foot-and flange-mounted, mounting designation IM B35, IM V15, IM V36

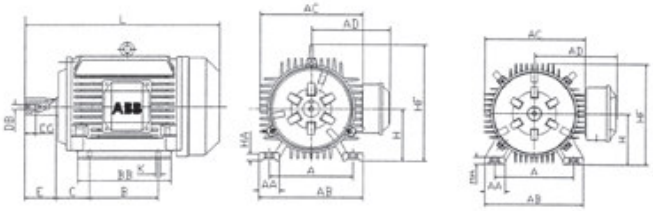
Cast iron motor
Type M2QA71-355

three phase motor, foot mounted, terminal box top-mounted



Size 71-132 Size 160-355

three phase motor, foot mounted, terminal box on right hand side (on request)



Size 71-132 Size 160-355

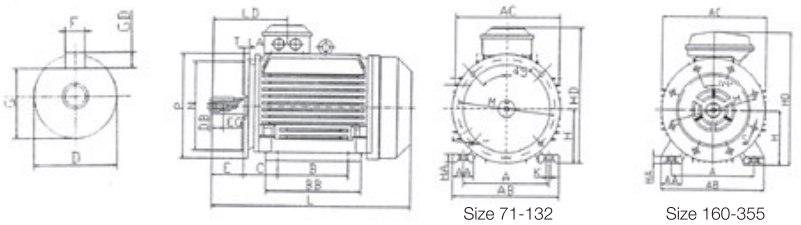
Type M2QA	Poles	A	AA	AB	AC	B	BB	C	D	E	F	G	GD	DB	EG
71M	2-6	112	30	145	145	90	110	45	14-j6	30	5	11	5	M5	12.5
80M	2-8	125	35	160	165	100	135	50	19-j6	40	6	15.5	6	M6	16
90S	2-8	140	35	175	180	100	140	56	24-j6	50	8	20	7	M8	19
90L	2-8	140	35	175	180	125	165	56	24-j6	50	8	20	7	M8	19
100L	2-8	160	40	200	205	140	180	63	28-j6	60	8	24	7	M10	22
112M	2-8	190	50	235	225	140	190	70	28-j6	60	8	24	7	M10	22
132S	2-8	216	55	270	265	140	205	89	38-k6	80	10	33	8	M12	28
132M	2-8	216	55	270	265	178	240	89	38-k6	80	10	33	8	M12	28
160M	2-8	254	60	325	330	210	265	108	42-k6	110	12	37	8	M16	36
160L	2-8	254	60	325	330	254	310	108	42-k6	110	12	37	8	M16	36
180M	2-4	279	70	350	355	241	315	121	48-k6	110	14	42.5	9	M16	36
180L	4-8	279	70	355	355	279	350	121	48-k6	110	14	42.5	9	M16	36
200L	2-8	318	70	390	395	305	380	133	55-m6	110	16	49	10	M20	39
225S	4-8	356	75	435	440	286	380	149	60-m6	140	18	53	11	M20	39
225M	2	356	75	435	450	311	405	149	55-m6	110	16	49	10	M20	39
225M	4-8	356	75	435	450	311	405	149	60-m6	140	18	53	11	M20	39
250M	2	406	80	490	515	349	455	168	60-m6	140	18	53	11	M20	39
250M	4-8	406	80	490	515	349	455	168	65-m6	140	18	58	11	M20	39
280S	2	457	85	555	585	368	490	190	65-m6	140	18	58	11	M20	39
280S	4-8	457	85	555	585	368	490	190	75-m6	140	20	67.5	12	M20	39
280M	2	457	85	555	585	419	540	190	65-m6	140	18	58	11	M20	39
280M	4-8	457	85	555	585	419	540	190	75-m6	140	20	67.5	12	M20	39
315S	2	508	120	640	630	406	575	216	65-m6	140	18	58	11	M20	42
315S	4-8	508	120	640	630	406	575	216	80-m6	170	22	71	14	M20	42
315M	2	508	120	640	630	457	685	216	65-m6	140	18	58	11	M20	42
315M	4-8	508	120	640	630	457	685	216	80-m6	170	22	71	14	M20	42
315L	2	508	120	640	630	508	685	216	65-m6	140	18	58	11	M20	42
315L	4-8	508	120	640	630	508	685	216	80-m6	170	22	71	14	M20	42
355M	2	610	120	730	710	560	750	250	70-m6	140	20	62.5	12	M20	42
355M	4-8	610	120	730	710	560	750	250	100-m6	210	28	90	16	M24	47
355L	2	610	120	730	710	630	750	250	70-m6	140	20	62.5	12	M20	42
355L	4-8	610	120	730	710	630	750	250	100-m6	210	28	90	16	M24	47

Dimension drawing

Foot-mounted motor designation IM B3, IM B6, IM B7, IM B8, IM V5, IM V6
Flange-mounted, mounting designation IM B5, IM V1, IM V3
Foot-and flange-mounted, mounting designation IM B35, IM V15, IM V36

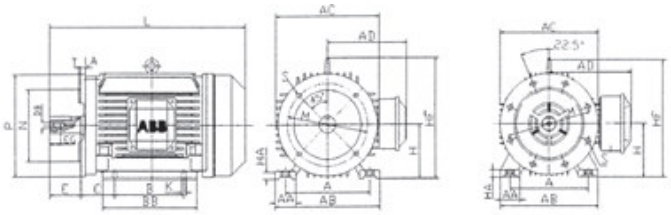
Cast iron motor
Type M2QA71-355

three phase motor, foot-and flange-mounted, terminal box top-mounted



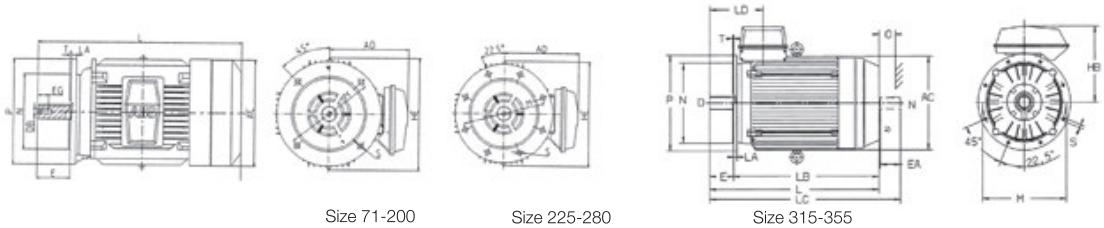
Size 71-132 Size 160-355

three phase motor, foot-and flange-mounted, terminal box mounted on right hand side (on request)



Size 71-132 Size 160-355

three phase motor, flange-mounted



Size 71-200 Size 225-280 Size 315-355

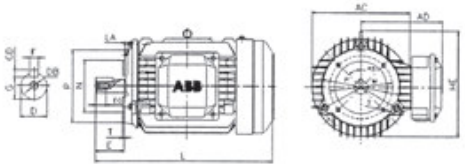
Type M2QA	Poles	H	HA	HD	HF	K	L	LD	AD	LA	M	N	P	S	T	HE
71M	2-6	71	10	200	---	7	255	100	120	9	130	110	160	4-10	3.5	165
80M	2-8	80	12	255	170	10	285	116	145	9	165	130	200	4-12	3.5	200
90S	2-8	90	12	240	185	10	310	128	150	10	165	130	200	4-12	3.5	200
90L	2-8	90	12	240	185	10	335	128	150	10	165	130	200	4-12	3.5	200
100L	2-8	100	14	275	245	12	380	138	175	11	215	180	250	4-15	4	270
112M	2-8	112	15	290	265	12	395	144	185	11	215	180	250	4-15	4	278
132S	2-8	132	18	335	300	12	465	169	205	12	265	230	300	4-15	4	320
132M	2-8	132	18	335	300	12	505	169	205	12	265	230	300	4-15	4	320
160M	2-8	160	22	415	380	15	600	250	255	15	300	250	350	4-19	5	400
160L	2-8	160	22	415	380	15	645	250	255	15	300	250	350	4-19	5	400
180M	2-4	180	22	450	420	15	670	270	270	18	300	250	350	4-19	5	420
180L	4-8	180	22	450	420	15	710	270	270	18	300	250	350	4-19	5	420
200L	2-8	200	25	510	470	19	770	285	305	20	350	300	400	4-19	5	470
225S	4-8	225	28	560	520	19	820	340	335	20	400	350	450	8-19	5	520
225M	2	225	28	560	520	19	815	310	335	20	400	350	450	8-19	5	520
225M	4-8	225	28	560	520	19	840	340	335	20	400	350	450	8-19	5	520
250M	2	250	30	645	580	24	930	360	395	22	500	450	550	8-19	5	655
250M	4-8	250	30	645	580	24	930	360	395	22	500	450	550	8-19	5	655
280S	2	280	35	715	645	24	975	355	435	22	500	450	550	8-19	5	725
280S	4-8	280	35	715	645	24	975	355	435	22	500	450	550	8-19	5	725
280M	2	280	35	715	645	24	1040	355	435	22	500	450	550	8-19	5	725
280M	4-8	280	35	715	645	24	1040	355	435	22	500	450	550	8-19	5	725
315S	2	315	45	870	---	28	1190	400	555	24	600	550	660	8-24	6	905
315S	4-8	315	45	870	---	28	1220	430	555	24	600	550	660	8-24	6	905
315M	2	315	45	870	---	28	1300	400	555	24	600	550	660	8-24	6	905
315M	4-8	315	45	870	---	28	1330	430	555	24	600	550	660	8-24	6	905
315L	2	315	45	870	---	28	1300	400	555	24	600	550	660	8-24	6	905
315L	4-8	315	45	870	---	28	1330	430	555	24	600	550	660	8-24	6	905
355M	2	355	52	1010	---	35	1495	424	655	25	740	680	800	8-24	6	1010
355M	4-8	355	52	1010	---	35	1565	494	655	25	740	680	800	8-24	6	1010
355L	2	355	52	1010	---	35	1495	424	655	25	740	680	800	8-24	6	1010
355L	4-8	355	52	1010	---	35	1565	494	655	25	740	680	800	8-24	6	1010

Dimension drawing

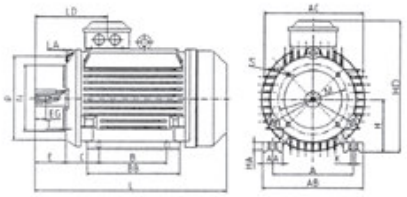
Flange-mounted; IM B14, IM V18, IM V19
Foot-and flange-mounted; IM B34

Cast iron motor
Type M2QA71-355

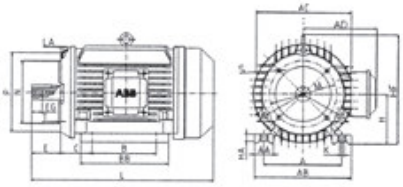
flange-mounted motor, small flange IM B14 (on request)



terminal box top-mounted IM B34 (on request)



terminal box side-mounted IM B34 (on request)



Type M2QA	Pole	A	AA	AB	AC	B	BB	C	D	E	F	G	GD	DB	EG	H	H A	HD	K	L	LD	AD	LA	T	HE	HF
71M	2-6	112	30	145	145	90	120	45	14	30	5	11	5	M5	12.5	71	10	200	7	255	100	120	9	3.5	145	-
80M	2-8	125	35	165	165	100	135	50	19	40	6	15.5	6	M6	16	80	12	225	10	285	116	145	9	3.5	200	185
90S	2-8	140	35	175	180	100	140	56	24	50	8	20	7	M8	19	90	12	240	10	310	128	150	10	3.5	200	195
90L	2-8	140	35	175	180	125	165	56	24	50	8	20	7	M8	19	90	12	240	10	335	128	150	10	3.5	200	195
100L	2-8	160	40	200	205	140	180	63	28	60	8	24	7	M10	22	100	14	275	12	380	138	175	11	3.5	270	245
112M	2-8	190	50	235	225	140	190	70	28	60	8	24	7	M10	22	112	15	290	12	395	144	185	11	3.5	278	265
132S	2-8	216	55	270	265	140	205	89	38	80	10	33	8	M12	28	132	18	335	12	465	169	205	15	3.5	320	300
132M	2-8	216	55	270	265	178	240	89	38	80	10	33	8	M12	28	132	18	335	12	505	169	205	15	3.5	320	300
160M	2-8	254	60	325	330	210	265	108	42	110	12	37	8	M16	36	160	22	415	15	600	250	255	20	4	400	380
160L	2-8	254	60	325	330	254	310	108	42	110	12	37	8	M16	36	160	22	415	15	645	250	255	20	4	400	380

Type M2QA	Pole	Size	P	M	N	S
71M	2-6	C105	105	85	70	M6
71M	2-6	C140	140	115	95	M6
80M	2-8	C120	120	100	80	M6
80M	2-8	C160	160	130	110	M8
90S	2-8	C140	140	115	95	M8
90S	2-8	C160	160	130	110	M8
90L	2-8	C140	140	115	95	M8
90L	2-8	C160	160	130	110	M8
100L	2-8	C160	160	130	110	M8
100L	2-8	C200	200	165	130	M10
112M	2-8	C160	160	130	110	M8
112M	2-8	C200	200	165	130	M10
132S	2-8	C200	200	165	130	M10
132M	2-8	C200	200	165	130	M10
160M	2-8	C250	250	215	180	M12
160L	2-8	C250	250	215	180	M12

General performance variant codes

Code	Variant	71	80	90	100	112	132	160	180	200	225	250	280	315	355
	Balancing														
052	Vibration acc. to grade A (IEC 60034-14).	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
426	Half key balancing.	S	S	S	S	S	S	S	S	S	S	S	S	S	S
	Bearings and lubrication														
037	Roller bearing at D-end	NA	NA	NA	NA	NA	NA	P	P	P	P	P	NA	NA	NA
039	Cold resistant grease (-55…+100°C)	R	R	R	R	R	R	P	P	P	P	P	NA	NA	NA
041	Bearings regreasable via grease nipples	NA	NA	NA	NA	NA	P	P	P	P	P	S	NA	NA	NA
	Branch standard design														
178	Stainless steel/acid proof bolts	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
209	Non-standard voltage or frequency (special winding).	R	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
785	Reinforced tropicalisation.	R	R	R	R	R	R	R	R	R	R	R	R	R	R
	Cooling system														
068	Metal fan	P	P	P	P	P	P	P	P	P	P	P	P	P	P
183	Separate motor cooling fan (fax axial, N-end).	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
	Drain holes														
065	Plugged existing drain holes	P	P	P	P	P	P	NA	NA	NA	NA	NA	P	P	P
076	Draining holes with plugs	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
	Earthing bolt														
067	External earthing bolt	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
	Heating elements														
450	Heating element 110-120 V	P	P	P	P	P	P	P	P	P	P	P	P	P	P
451	Heating element 200-240 V	P	P	P	P	P	P	P	P	P	P	P	P	P	P
	Insulation systems														
014	Winding insulation class H.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
405	Special winding insulation for frequency converter supply.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
	Mounting arrangements														
008	IM 2101 foot/flange mounted, from IM 1001 (B34 from B3)	P	P	P	P	P	P	P	NA	NA	NA	NA	NA	NA	NA
009	IM 2001 foot/flange mounted, from IM 1001 (B35 from B3)	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
047	IM 3601 flange mounted, IEC flange, from IM 3001 (B14 from B5)	P	P	P	P	P	P	P	NA	NA	NA	NA	NA	NA	NA
066	Modified for non-standard mounting position	P	P	P	P	P	P	NA	NA	NA	NA	NA	P	P	P
078	IM 3601 flange mounted, DIN C-flange	P	P	P	P	P	NA	NA	NA	NA	NA	NA	NA	NA	NA
090	IM 2101 foot/flange mounted, DIN C-flange, from IM 1001, (B34 from B3)	P	P	P	P	P	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Painting														
114	Special paint colour, standard grade. RAL-colour no. must be specified.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
	Protection														
005	Protective roof, vertical motor, shaft down.	P	P	P	P	P	P	P	P	P	P	P	P	P	P
072	Radial seal at D-end.	P	P	P	P	P	P	R	R	R	R	S	P	P	P
073	Sealed against oil at D-end.	P	P	P	P	P	P	R	R	R	R	R	P	P	P
158	Degree of protection IP65.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
401	Protective roof, horizontal motor.	NA	NA	NA	NA	NA	NA	P	P	P	P	P	R	R	R
211	Weather protected, IP xx W	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
403	Degree of protection IP56.	P	P	P	P	P	P	P	P	P	P	P	P	P	P
	Rating & instruction plates														
002	Restamping voltage, frequency and output, continuous duty	P	P	P	P	P	P	P	P	P	P	P	P	P	P
095	Restamping output, intermittent duty	P	P	P	P	P	P	P	P	P	P	P	P	P	P
135	Mounting of additional identification plate, stainless	P	P	P	P	P	P	P	P	P	P	P	P	P	P
138	Mounting of additional identification plate, aluminum.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
139	Additional identification plate delivered loose	P	P	P	P	P	P	P	P	P	P	P	P	P	P
161	Additional rating plate delivered loose	P	P	P	P	P	P	P	P	P	P	P	P	P	P
	Shaft & rotor														
070	One or two special shaft extensions, standard shaft material.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA

S = Standard motor
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General performance variant codes

Code	Variant	71	80	90	100	112	132	160	180	200	225	250	280	315	355
	Stator winding temperature sensors														
121	Bimetal detectors, break type (NCC), (3 in series), 130°C	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
122	Bimetal detectors, break type (NCC), (3 in series), 150°C	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
123	Bimetal detectors, break type (NCC), (3 in series), 170°C	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
125	Bimetal detectors, break type (NCC), (2x3 in series), 150°C	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
127	Bimetal detectors, break type (NCC), (3 in series 130°C & 3 in series, 150°C)	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
321	Bimetal detectors, closing type (NO), (3 in parallel), 130°C.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
322	Bimetal detectors, closing type (NO), (3 in parallel), 150°C.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
323	Bimetal detectors, closing type (NO), (3 in parallel), 170°C.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
325	Bimetal detectors, closing type (NO), (2x3 in parallel), 150°C.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
327	Bimetal detectors, closing type (NO), (3 in parallel, 130°C & 3 in parallel, 150°C), in stator winding	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
435	PTC-thermistors (3 in series), 130°C	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
436	PTC-thermistors (3 in series), 150°C	S	S	S	S	S	S	S	S	S	S	S	S	S	S
437	PTC-thermistors (3 in series), 170°C	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
439	PTC-thermistors (2x3 in series), 150°C	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
441	PTC-thermistors (3 in series, 130°C & 3 in series,150°C)	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
442	PTC-thermistors (3 in series, 150°C & 3 in series,170°C)	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
445	PT100 resistance element (1 per phase)	NA	P	P	P	P	P	P	P	P	P	P	P	P	P
446	PT100 resistance element (2 per phase)	NA	NA	NA	P	P	P	P	P	P	P	P	P	P	P
	Terminal box														
015	Motor supplied in D-connection.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
017	Motor supplied in Y-connection.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
021	Terminal box LHS, seen from D-end.	NA	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
137	Extended cable connection, low terminal box.	R	R	R	R	R	R	R	R	R	R	R	NA	NA	NA
157	Terminal box degree of protection IP 65.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
180	Terminal box RHS, seen from D-end.	NA	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
230	Standard cable gland	P	P	P	P	P	P	P	P	P	P	P	S	S	S
231	Standard cable glands with clamping device.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
400	4x90 degrees turnable terminal box.	S	S	S	S	S	S	P	P	P	P	P	NA	NA	NA
418	Separate terminal box for temperature detectors.	NA	NA	NA	NA	NA	NA	R	R	R	R	R	P	P	P
467	Lower than standard terminal box and rubber extended cable, length 2 m included.	R	R	R	R	R	R	R	R	R	R	R	NA	NA	NA
468	Cable entry from D-end.	P	P	P	P	P	P	P	P	P	P	P	P	P	R
469	Cable entry from N-end.	P	P	P	P	P	P	P	P	P	P	P	P	P	R
731	Two standard cable glands.	P	P	P	P	P	P	P	P	P	P	P	S	S	S
	Testing														
140	Test confirmation.	P	P	P	P	P	P	P	P	P	P	P	NA	NA	NA
145	Type test report from catalogue motor, 400V 50Hz.	P	P	P	P	P	P	P	P	P	P	P	P	P	P
146	Type test with report for motor from specific delivery batch.	R	R	R	R	R	R	R	R	R	R	R	R	R	R
148	Routine test report (only at 400 V 50 Hz). Witnessed routine test (146)	P	P	P	P	P	P	P	P	P	P	P	P	P	P
760	Vibrarion level test	P	P	P	P	P	P	P	P	P	P	P	P	P	P
762	Noise level test.	R	R	R	R	R	R	NA	NA	NA	NA	NA	R	R	R
	Variable speed drives														
701	Insulated bearing at N-end.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	P	P	P
704	EMC cable gland.	NA	NA	NA	NA	NA	NA	NA	P	P	P	P	P	P	P

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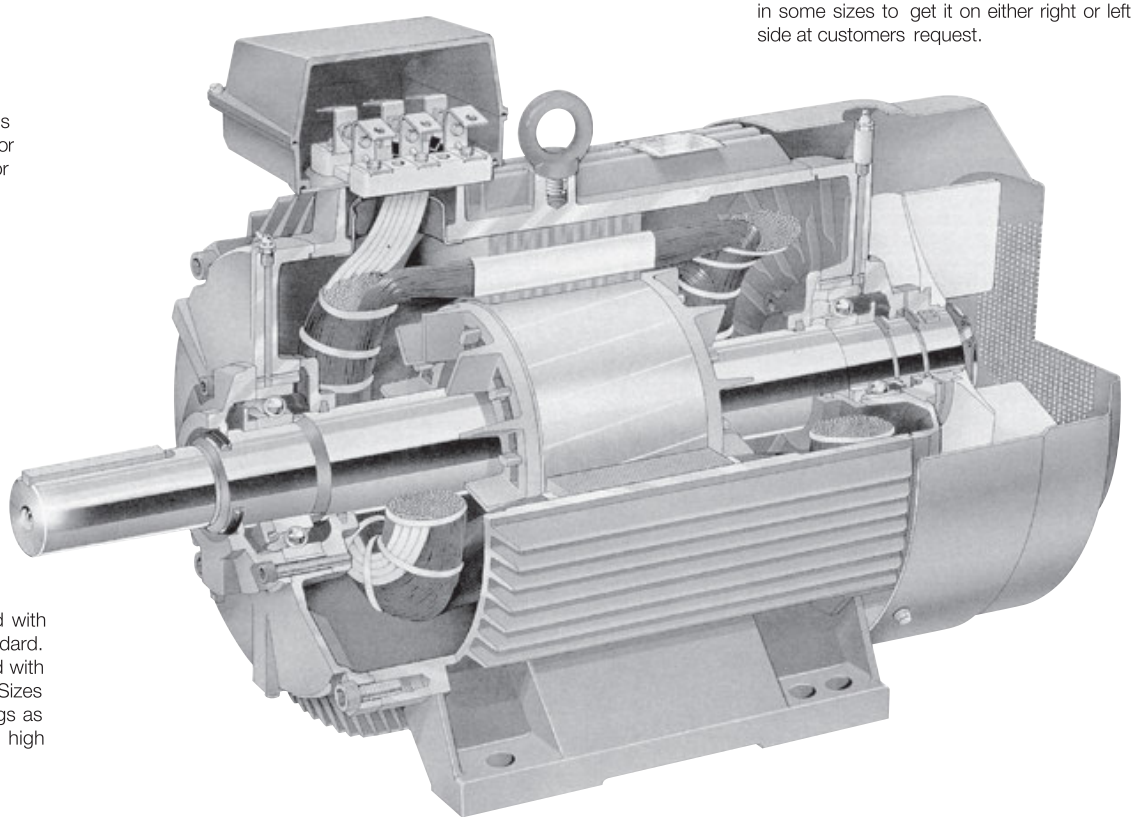
M2000 Cast iron motors - totally enclosed squirrel cage three phase motors

Lubrication
Motor sizes 71-225 are fitted with bearings that are regreased for life. For size 250-355 are equipped with bearing that are regreasable via grease nipples.

Terminal box
The spacious terminal box of cast iron makes the motor quick and easy to connect. The terminal box of motor sizes 71-132 can be turned 4x90 degrees and for sizes 160-355 it is possible to turn the terminal box 2x180 degrees. As standard the terminal box is on top of the motor but it is also possible in some sizes to get it on either right or left hand side at customers request.

Insulation
Phase insulation and generous electrical dimensioning give the motor a high overload capacity. (Suitable for frequency converter drive)



Rotor winding
The rotor winding is made of pressure diecast aluminium, a design that provides high starting capacity and low noise level.

Endshields, flanges
The endshield and different variants of flanges are of cast iron.

Low noise level
The high efficiency of the motor means that a smaller, quieter fan can be used.

Bearings
The motor sizes 71-132 are fitted with enclosed DDU C3 bearings as standard. The frame sizes 160-225 are fitted with enclosed 2Z bearing as standard. Sizes 250-355 have regreasable bearings as standard. Modern design secure high load capacity run.

Corrosion protection
Effective corrossion protection means that the motor can be used in all environments.

Stator
The stator is made of cast iron, including feet, which make the motor mechanically very strong and robust. Integrally cast iron feet allow a very rigid mounting and minimal vibration.