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M2QA 系列突出特点

高效节能，降低运营成本，能够让最终用户在6-18个月内收回高出的采购成本。

可靠性高，保障设备连续平稳运行，故障率低，降低维护成本。

采用NSK或SKF轴承，先进工艺，使电机寿命更长，一次采购，多年受益。

柔性设计，能够根据客户要求加装多种附件。

M2QA Motors

High efficiency and energy saving in combination with high reliability reduces the operation costs.

Advanced production technology assures accurate products.

Motors are equipped with NSK or SKF bearings.

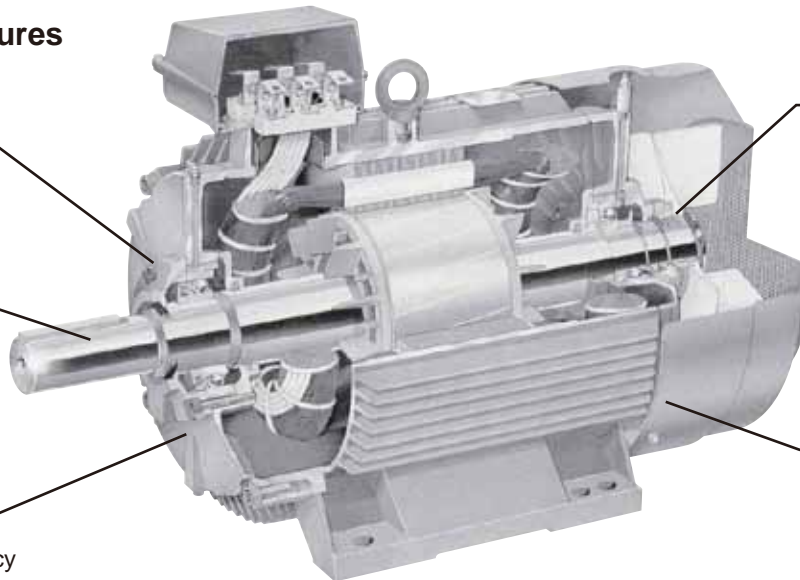
Flexible design with choice of additional accessories fulfills most customers' requirements.

ABB电机产品特点 ABB Motors Features

可靠
High Reliability

高效
High Efficiency

一致
Excellent Consistency



低噪音
Low Noise

高灵活性
High Flexibility

产品概述

M2QA系列标准三相异步电动机 (H71-H355)

M2QA Series Low-voltage Three-phase Induction Motors (H71-H355)

M2QA系列标准三相异步电动机是ABB公司2000系列产品中的基本系列，高效可靠，节能环保。该系列电机引进全套欧洲生产工艺，噪音低，寿命长，适用于各种恶劣的环境，被广泛地运用于各行各业。

As the standard series of ABB M2000 family, high efficiency assures energy savings, and high reliability reduces the faulty time and the maintenance costs. The motors are designed and manufactured according to European technology, including features such as low noise level and long life cycle. M2QA motors are suitable for various environments and operate in a wide range of different industrial areas.



标准

- ❖ **轴承具有较高承载能力**
配置深沟球轴承，大大延长电动机的工作寿命。71-225 铸铁电动机配有免润滑轴承，250-355电动机标准配置装有注排油装置。
- ❖ **宽电压设计**
高至690V且可应用于50Hz和60Hz电网。
- ❖ **低噪音水平**
M2QA系列通过改善电磁和电气设计、冷却系统及结构优化和技术，使电机的噪音降低到最小程度。
- ❖ **可靠的绕组**
绕组采用最新技术的绝缘材料，可达到F级绝缘和B级温升(80K)，确保绕组具有较长的使用寿命。
- ❖ **防腐蚀能力强**
电动机防腐蚀能力强。可在恶劣的条件下正常运行，使用寿命较长。
- ❖ **额外的绕组保护**
根据客户要求可加装PTC热敏电阻、热敏开关和防冷凝装置。

机械设计

- ❖ **全封闭自扇冷设计，标准防护等级IP55，也可提供IP56或IP65**
重负载设计，同时采用强抗腐蚀铸铁材料，使M2QA系列电动机可适应各种环境。电动机的机械结构极其坚固。
- ❖ **灵活的进线方式**
接线盒可安装在电动机顶部、右侧或左侧。71-132电动机接线盒可旋转4×90°，160-355电动机接线盒可旋转2×180°。所有规格的电动机都易于改装。
- ❖ **强大的改装能力**
电动机针对不同环境及应用有多种可选配置，如更高的防护等级、绝缘等级、重新润滑装置、防尘保护、密封圈、防护罩等等。

Standards

- ❖ **Voltage ranges of extra versatility**
A wide range of voltages can be up to max. 690 V, for 50 Hz and 60 Hz is 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.
- ❖ **Strong corrosion protection**
The motors are made to withstand aggressive environment as standard and they are designed for long lifetime. For motors with regreasable elements, they have strong and effective protection against corrosion.
- ❖ **Bearings with high load capacity**
All motors are provided with deep-groove ball bearings, the lifetime is extended. Cast iron motors in sizes 71-225 are greased for life, and those in sizes 250-355 have a regreasing device as a standard.
- ❖ **Low noise level**
The M2QA range has been designed to minimize motors noise levels by means of improving magnetic and electrical design, ventilating condition, structural assembling size and technology.
- ❖ **Additional winding protection**
PTC thermistors, thermal switches and anticondensation on request.

Mechanical Design

- ❖ **Totally enclosed fan cooled IP55 as standard,IP56 or IP65 as option**
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.
- ❖ **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 4×90°, and those of 160-355 can rotate 2×180°. 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, protective roof are available.

绝缘和绝缘等级

IEC 60085标准将绝缘材料分为不同的绝缘等级。每个等级的标识都与该绝缘材料在正常运行情况下所能达到的温度极限值相对应。

一台电动机的绕组绝缘是按电动机内的温升和环境温度而定的。通常根据电动机在额定输出功率和40°C环境温度下的最高温度值确定其绝缘等级。工作温度高于40°C的电动机通常需要重新定级。大多数情况下，ABB电动机在标准额定输出下可达到F级绝缘，B级温升，能够满足当今工业中的绝大多数的要求。

标准电动机按F级绝缘，B级温升(*标记除外)设计。因此，电动机有充分的过负荷裕量。如果能够达到F级温升，则各表中给出的输出功率一般可增加大约12%。

图中的温度极限值符合各标准规定。采用F级绝缘和B级温升设计时，额外的耐热裕度可确保电动机的性能更可靠。

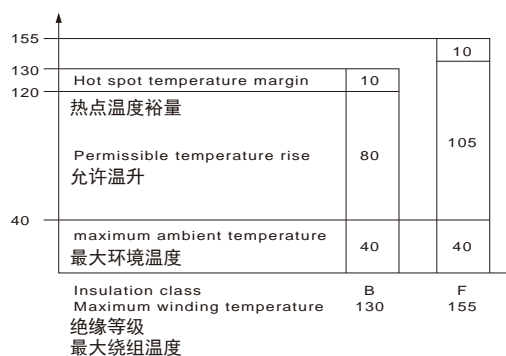
Insulation and Insulation Classes

According to IEC 60085, 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 uses class F insulation systems, which, with temperature rise B, is the most common requirement among industry today.

However, all the motors are designed with class F insulation, which permits a higher temperature rise than class B(*The mark is excluded). 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.



用于其它电压值的电动机

在50Hz频率某一电压下工作的电动机，也可以在其它电压值下运行。下表中给出了电流和转矩换算系数，效率、功率因数和转速略有变化。

如用户需要可提供保证值。

Motors for Other Voltages

Motors wound for a given voltage at 50Hz can also be used for other voltage. Recalculation factors for current and torque are given below, efficiency, power factor and speed remain. Approximately the same.

Guaranteed values available on request.

电动机额定电压 Motor wound for	230V	400V	500V	690V				
连接到50Hz Connected to 50Hz	220V	230V	380V	415V	500V	550V	660V	690V
电动机性能值(400V, 50Hz), % % of values at 400V, 50Hz								
输出功率 Output	100	100	100	100	100	100	100	100
IN	182	174	105	98	80	75	61	58
Is/IN	90	100	90	106	100	119	90	100
Ts/TN	90	100	90	106	100	119	90	100
Tmax/TN	90	100	90	106	100	119	90	100

在60Hz频率某一电压下工作的电动机，也可以在其它电压值下运行。右表中给出了电流和转矩的近似换算系数，效率、功率因数和转速略有变化。

如用户需要可提供保证值。

Motors wound for a given voltage at 60Hz can also be used for other voltages. Approximate recalculation factors for current and torque given are beside; efficiency, power factor and speed remain approximately the same.

Guaranteed values available on request.

电动机额定电压 Motor wound for	460V		575V
连接到60Hz Connected to 60Hz	440V	480V	575V
电动机性能值(460V, 60Hz), % % of values at 460V. 60Hz			
输出功率 Output	100	100	100
IN	105	96	80
Is/IN	90	109	100
Ts/TN	90	109	100
Tmax/TN	90	109	100

轴承和接线盒

下表列出了标准配置下的单列深沟球轴承。71-225标配封闭轴承，250-355标配开启式轴承。接线盒安装在电动机的顶部。71-132电动机的接线盒可旋转4×90°，160-355电动机的接线盒可旋转2×180°。标准接线盒的防护等级为IP55。电动机标准配有2个电缆接口见下。

Bearings and Terminal Boxes

The motors are normally fitted with single-row deep groove ball bearings as listed in the table below. Close-type bearing is provided as standard for 71-255, regreasable bearing for 250-355. Terminal boxes are mounted on top of the motor. The terminal box of motor sizes 71 to 132 can be turned 4 x 90° and in motors sizes 160 to 355 rotated 2 x 180°. Degree of protection of the standard terminal box is IP55. The motors are supplied with 2 cable entries as a standard according to the table below.

型号	极数	标准 驱动端	轴承型号 非驱动端	电缆接口 mm	型号	极数	标准 驱动端	轴承型号 非驱动端	电缆接线孔口 mm				
Type	Poles	Standard D-end	bearing type N-end	Cable entry mm	Type	Poles	Standard D-end	bearing type N-end	Cable entry mm				
71M	2, 4, 6	6202	C3	6202	C3	2-M16 X 1.5	250M	2	6314	C3	6214	C3	2-M63 X 1.5
80M	2, 4, 6, 8	6204	C3	6204	C3	2-M25 X 1.5	250M	4, 6, 8	6314	C3	6214	C3	2-M63 X 1.5
90S	2, 4, 6, 8	6205	C3	6205	C3	2-M25 X 1.5	280S	2	6316	C4	6316	C4	2-M63 X 1.5
90L	2, 4, 6	6205	C3	6205	C3	2-M25 X 1.5	280S	4, 6, 8	6316	C3	6316	C3	2-M63 X 1.5
100L	2, 4, 6, 8	6206	C3	6206	C3	2-M32 X 1.5	280M	2	6316	C4	6316	C4	2-M63 X 1.5
112M	2, 4, 6, 8	6207	C3	6206	C3	2-M32 X 1.5	280M	4, 6, 8	6316	C3	6316	C3	2-M63 X 1.5
132S	2, 4, 6, 8	6208	C3	6207	C3	2-M32 X 1.5	315S	2	6316	C4	6316	C4	2-M63 X 1.5
132M	2, 4, 6, 8	6208	C3	6207	C3	2-M32 X 1.5	315S	4, 6, 8	6319	C3	6319	C3	2-M63 X 1.5
160M	2, 4, 6, 8	6309	C3	6209	C3	2-M40 X 1.5	315M	2	6316	C4	6316	C4	2-M63 X 1.5
160L	2, 4, 6, 8	6309	C3	6209	C3	2-M40 X 1.5	315M	4, 6, 8	6319	C3	6319	C3	2-M63 X 1.5
180M	2, 4, 6, 8	6310	C3	6210	C3	2-M40 X 1.5	315L	2	6316	C4	6316	C4	2-M63 X 1.5
180L	2, 4, 6, 8	6310	C3	6210	C3	2-M40 X 1.5	315L	4, 6, 8	6319	C3	6319	C3	2-M63 X 1.5
200L	2, 4, 6, 8	6312	C3	6212	C3	2-M50 X 1.5	355M	2	6319M	C4	6319M	C4	2-M63 X 1.5
225S	4, 6, 8	6313	C3	6213	C3	2-M50 X 1.5	355M	4, 6, 8	6322	C3	6319	C3	2-M63 X 1.5
225M	2	6313	C3	6213	C3	2-M50 X 1.5	355L	2	6319M	C4	6319M	C4	2-M63 X 1.5
225M	4, 6, 8	6313	C3	6213	C3	2-M50 X 1.5	355L	4, 6, 8	6322	C3	6319	C3	2-M63 X 1.5

* 注：详见24-25页。

*Note: see page 24-25 for detail.

电动机铭牌

71-132电动机铭牌上标有电压范围的一个电流值，这是电动机在达到规定输出功率时，电压范围内产生的最大电流值。

Rating Plate

For motor sizes 71 to 132 the rating plate gives one current value for the voltage area. That is the highest current that can occur within the voltage area with the given output.

ABB ABB Motors						
3~Mot. M2QA132S4A				IEC60034-1		
3GQA132101-BDA				Cl. F IP 55		
6208 DDU/C3		6207 DDU/C3		Date 2012.2		
V	Hz	r/min	kW	cosφ	A	
220-240 Δ	50	1435	5.5	0.82	20.1	
380-420 Y	50	1435	5.5	0.82	11.6	
440-480 Y	60	1735	6.33	0.82	11.4	kg
No. 3GC11500123456						

ABB ABB Motors						
3~Mot. M2QA132S4A				IEC60034-1		
3GQA132101-BDA				Cl. F IP 55		
6208 DDU/C3		6207 DDU/C3		Date 2012.2		
V	Hz	r/min	kW	cosφ	A	
380-420 Δ	50	1435	5.5	0.82	11.6	
660-690 Y	50	1435	5.5	0.82	6.68	
440-480 Δ	60	1735	6.33	0.82	11.4	kg
No. 3GC11500123456						

M2QA71-132

160-355的电动机铭牌上以表格形式给出了6个电压值的转速、电流和功率因数。

For motor size 160 to 355 the rating plate is in table form giving values for speed, current and power factor for six voltages.

ABB ABB Motors						
3 motor M2QA250M4A				IEC 250M65		
S1				No. 3GC11500123456		
Cert.no.				Ins.cl. F		IP 55
V	Hz	kW	r/min	A	cosφ	IA/IN tE/s
690 Y	50	55	1475	56.0	0.88	
400 Δ	50	55	1475	96.6	0.88	
660 Y	50	55	1475	57.9	0.89	
380 Δ	50	55	1475	101	0.89	
415 Δ	50	55	1480	94.1	0.87	
440 Δ	60	63	1775	99.3	0.89	
Cat.no 3GQA252301-ADA						
6314/C3		6214/C3		kg		
Date 2012.2				IEC 60034-1		

M2QA160-355

滑轮直径

确定所需的轴承工作寿命以后，可用 F_R 按下面的公式计算出允许的最小滑轮直径：

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

式中：

D=滑轮直径，mm

P=功率要求，kW

n=电动机转速，r/min

K=皮带张紧系数，视皮带型式和荷载型式而定，三角带的公共系数为2.5

F_R =允许的径向力

Pulley Diameter

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

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

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 2.5.

F_R =permissible radial force

轴端的允许荷载

下表给出的允许径向力(N)假定轴向力为零。以数据是50Hz的正常条件，71-355电动机的轴承工作寿命为20000小时和40000小时为依据。

IM B3底脚式安装的电动机使作用力向两侧延伸。

有些情况下，轴的强度会影响能够承载的允许作用力。额定频率为60Hz时，这些值必须减少10%。如果是双速电动机，则必须以更高的转速为计算依据。根据用户要求可提供径向力和轴向力同时存在时的允许荷载。

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 size 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 60Hz 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.

允许的径向力

71-355电动机

Permissible Radial Forces

Motors sizes 71 to 355

Motor size	20000 hours Ball bearings								40000 hours Ball bearings							
	2-pole		4-pole		6-pole		8-pole		2-pole		4-pole		6-pole		8-pole	
	X ₀	X _{max}	X ₀	X _{max}	X ₀	X _{max}	X ₀	X _{max}	X ₀	X _{max}	X ₀	X _{max}	X ₀	X _{max}	X ₀	X _{max}
N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
71M	381.1	322.2	479.6	405.4	555.1	469.2	-	-	302.5	255.7	380.7	321.8	440.5	372.4	-	-
80M	624.2	509.4	788.3	643.3	906.7	739.9	996.7	813.4	495.4	404.3	625.7	510.6	719.6	587.3	791.1	645.6
90S	686.0	542.2	869.5	687.2	1000.1	790.4	1095.4	865.8	544.5	430.4	690.1	545.4	793.8	627.3	869.5	687.2
90L	696.4	564.2	884.7	716.8	1015.1	822.5	1112.0	901.0	552.7	447.8	702.2	568.9	805.7	652.8	882.6	715.1
100L	979.4	784.8	1233.9	988.8	1419.1	1137.2	1565.7	1254.6	777.3	622.9	979.4	784.8	1126.4	902.6	1242.7	995.8
112M	1257.8	1014.4	1592.1	1283.9	1831.1	1476.7	2020.1	1629.1	998.3	805.1	1263.6	1019.1	1453.3	1172.0	1603.4	1293.1
132S	1435.0	1121.7	1820.5	1423.1	2079.1	1625.3	2299.1	1797.2	1138.9	890.3	1444.9	1129.5	1650.2	1290.0	1824.8	1426.5
132M	-	-	1840.2	1476.3	2106.5	1689.9	2329.4	1868.7	-	-	1460.6	1171.7	1672.0	1341.3	1848.8	1483.2
160M	2018.8	2597.8	2546.4	3276.8	2918.2	3755.3	3223.0	4147.5	1602.3	2061.9	2021.1	2600.8	2316.2	2980.5	2558.1	3291.9
160L	2091.3	2629.4	2637.8	3316.6	3023.0	3800.9	3338.8	4197.9	1659.8	2086.9	2093.7	2632.4	2399.4	3016.8	2650.0	3331.9
180M	2983.6	2371.3	3759.1	2987.7	-	-	-	-	2368.1	1882.1	2983.6	2371.3	-	-	-	-
180L	-	-	3801.5	3073.0	4351.6	3517.7	4800.4	3880.5	-	-	3017.2	2439.0	3453.9	2792.0	3810.1	3080.0
200L	4089.8	3376.8	5161.5	4261.7	5908.5	4878.5	6517.9	5381.7	3246.1	2680.2	4096.7	3382.6	4689.6	3872.1	5173.3	4271.5
225S	-	-	5762.8	4526.4	-	-	7260.7	5702.9	-	-	4574.0	3592.6	-	-	5762.8	4526.4
225M	4591.0	3811.1	5790.9	4594.2	6643.9	5271.0	7260.7	5788.4	3643.9	3024.9	4596.2	3646.4	5273.3	4183.6	5790.9	4594.2
250M	5111.6	4170.0	6439.9	5253.6	7388.1	6027.2	8113.0	6618.5	4057.0	3309.7	5111.1	4169.6	5863.7	4783.5	6438.9	5252.8
280S	6000.2	4956.7	7570.1	6253.5	8679.2	7169.8	9573.5	7878.8	4761.8	3933.7	6007.7	4962.9	6888.0	5690.1	7569.1	6252.7
280M	6048.5	5059.3	7631.5	6383.4	8750.0	7318.9	9615.4	8042.8	4799.8	4014.8	6056.1	5065.6	6943.7	5808.1	7630.5	6382.5
315S	6602.4	5627.1	9533.5	7882.0	10916.1	9025.1	12028.5	9944.8	5239.0	4465.1	7565.3	6254.8	8662.6	7162.0	9545.4	7891.8
315M	6677.1	5793.3	9647.8	8145.0	11047.2	9326.4	12173.2	10277.0	5297.9	4596.7	7655.6	6463.1	8766.3	7400.7	965938	8155.1
315L	6675.9	5792.3	9648.0	8145.1	11045.3	9324.7	12171.2	10275.3	5296.6	4595.6	7655.4	6462.9	8764.6	7399.1	9657.9	8153.5
355M	8280.0	6790.0	14060.0	11529.0	16089.0	13193.0	-	-	5612.0	4602.0	11100.0	9102.0	12741.0	10448.0	-	-
355L	8372.0	6865.0	14136.0	11592.0	16175.0	13264.0	-	-	5612.0	4652.0	11100.0	9213.0	12741.0	10575.0	-	-

径向力位于X₀和X_{max}之间时，按照下面的公式计算允许的作用力

$$F_R = F_{X_0} - X/E(F_{X_0} - F_{X_{max}})$$

E=基本型号的轴伸长度

If the radial force is applied between points X₀ and X_{max}, the permissible force F_R can be calculated from the following formula:

$$F_R = F_{X_0} - X/E(F_{X_0} - F_{X_{max}})$$

E=length of shaft extension in basic version

