

样本

IE4 低压一般用途电机

IE4 - Low voltage

General performance motors



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ABB 低压电机拥有了 ABB 的一流品质和雄厚支持，这些电机的性能得到大量客户和 OEM（原始设备制造商）的认可。电机达到 IE4 效率。

ABB Low voltage motors are with ABB quality and support. These motors have the features appreciated by volume customers and serial OEMs. Motors achieve IE4 efficiency.

产品概述

General information

标准

ABB 电机采用全封闭三相鼠笼型设计，其工艺符合 IEC 和 EN 国际标准。同时，可按要求提供符合其他国家规范的电机。

所有生产厂家均通过 ISO 9001 国际质量认证及 ISO 14000 环境标准，并符合所有适用的欧盟指令。



产品简介

ABB M2BAX IE4系列产品是用于一般用途的低压高效三相异步电动机。该系列电机通过ABB全球研发平台设计，面对全球及中国市场。设计遵循IEC国际标准以及中国GB标准，效率高达IE4能效等级。符合中国2级能效标准（GB18613-2020）。

M2BAX IE4系列电机主要是针对大批量购买电机的OEM客户设计，其应用包括风机、水泵、减速机、压缩机、通用机械等，可适用于水处理、暖通空调、食品饮料、纺织、电力、机床、造纸、冶金等行业。M2BAX的优异品质及服务为客户提供了增值的空间，更高的产品灵活性可满足各类客户需求。

Standards

ABB motors are of the totally enclosed, 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 conform to all applicable EU Directives.

IEC/EN

电气 Electrical	机械 Mechanical
IEC/EN 60034-1	IEC 60072
IEC/EN 60034-2-1	IEC/EN 60034-5
IEC/EN 60034-30	IEC/EN 60034-6
IEC/EN 60034-8	IEC/EN 60034-7
IEC/EN 60034-12	IEC/EN 60034-8
	IEC 60034-14

Brief

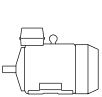
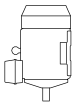
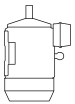
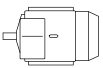
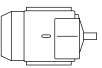
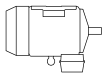
M2BAX IE4 - Low voltage general performance motors are ABB high efficiency products. This series of motors are designed for both the Chinese market and export. Product development is on ABB strong R&D platform. The design is in line with international IEC standards and China local GB standards. The efficiency level reaches IE4, equivalent to Grade 2(GB18613-2020).

M2BAX IE4 is specially designed for OEM customers, mainly integrated with fans, pumps, gear boxes, compressors and general machineries. Targeted industry is Water treatment, HVAC, Food & Beverage, Textile, Power, Pulp & Paper, Metal, etc. The high quality of M2BAX and the excellent service of ABB continuously make value for the customers. Higher product flexibilities lead to meet the ever-changing need from our customers.

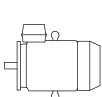
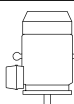
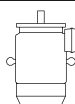
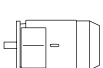
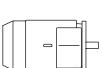
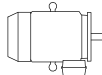
产品概述 - 安装结构形式

General information - Mounting arrangements

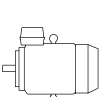

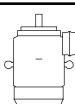
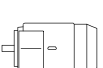

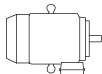
底脚安装型电机 Foot-mounted motor

代码 I / 代码 II Code I / code II						产品代码位置 12 Product code pos. 12
						A = 底脚安装型, 接线盒在顶部 foot-mounted, term.box top
IM B3	IM V5	IM V6	IM B6	IM B7	IM B8	
IM 1001	IM 1011	IM 1031	IM 1051	IM 1061	IM 1071	


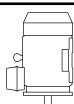
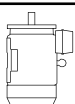


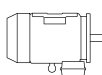
凸缘安装型电机, 大凸缘 Flange-mounted motor, large flange

代码 I / 代码 II Code I / code II						产品代码位置 12 Product code pos. 12
						B = 凸缘安装型, 大凸缘 flange mounted, large flange
IM B5	IM V1	IM V3	*)	*)	*)	
IM 3001	IM 3011	IM 3031	IM 3051	IM 3061	IM 3071	

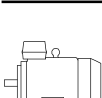
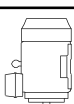
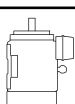


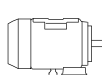
凸缘安装型电机, 小凸缘 Flange-mounted motor, small flange

代码 I / 代码 II Code I / code II						变量代码 Variant code
						047 = B5 派生出 B14 B14 from B5
IM B14	IM V18	IM V19	*)	*)	*)	
IM 3601	IM 3611	IM 3631	IM 3651	IM 3661	IM 3671	

底脚和凸缘安装型电机, 大凸缘 Foot- and flange-mounted motor with feet, large flange

代码 I / 代码 II Code I / code II						变量代码 Variant code
						009 = B3 派生出 B35 B35 from B3
IM B35	IM V15	IM V35	*)	*)	*)	
IM 2001	IM 2011	IM 2031	IM 2051	IM 2061	IM 2071	

底脚和凸缘安装型电机, 小凸缘 Foot- and flange-mounted motor with feet, small flange

代码 I / 代码 II Code I / code II						变量代码 Variant code
						008 = B3 派生出 B34 B34 from B3
IM B34	IM V17	IM 2131	IM 2151	IM 2161	IM 2171	
IM 2101	IM 2111	IM 2131	IM 2151	IM 2161	IM 2171	

*) Not Stated in IEC 60034-7.
IEC 60034-7 无规定

产品概述 - 防护等级: IP 代码 / IK 代码

General information - Degrees of protection: IP code/IK code

按旋转电机外壳提供的防护等级分类符合

- 对于 IP 代码, 适用 IEC 60034-5 或 EN 60529
- 对于 IK 代码, 适用 EN 50102

IP 防护

防止人员接触 (或接近) 带电部件, 以及机壳内的运转部件。同时避免外界固体异物侵入机器内, 保护机器, 避免进水防止受到有害影响。

IK 代码

机壳保护电机不受外部机械冲击不利影响的程度分级。

Classification of degrees of protection provided by enclosures of rotating machines 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.

IK code

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

IP 代码说明

Explanation of the IP code

特征字母 Ingress protection	对人和机壳内电机部件的保护程度 Degree of protection to persons and to parts of the motors inside the enclosure	机壳防止机器进水, 遭受有害影响的防水程度 Degree of protection provided by the enclosure with respect to harmful effects due to ingress of water
IP	5	5
	1	2

位置1

Position 1

- 2: 防止大于 12mm 的固体进入机壳
Motors protected against solid objects greater than 12 mm
- 4: 防止大于 1mm 的固体进入机壳
Motors protected against solid objects greater than 1 mm

- 5: 防尘保护电机
Dust-protected motors

- 6: 隔尘电机
Dust-tight motors

位置2

Position 2

- 3: 使电机被溅水后不受损害
Motors protected against spraying water
- 4: 使电机被淋水后不受损害
Motors protected against splashing water
- 5: 使电机被喷水后不受损害
Motors protected against water jets
- 6: 使电机遭大浪后不受损害
Motors protected against heavy seas

IK 代码说明

Explanation of the IK code

国际机械保护 International mechanical protection	特征组 Characteristic group
IK	08
	1

位置1

Position 1

IK代码和冲击能量之间的关系:

Relation between IK code and impact energy:

IK代码 IK code	冲击能量焦耳 Impact energy/Joule
0:	不按照EN 50102提供保护 Not protected according to EN 50102
01:	0.15
02:	0.2
03:	0.35
04:	0.5
05:	0.7
06:	1
07:	2
08:	5 (ABB 标准) 5 (ABB Standard)
09:	10
10:	20

订购信息

Ordering information

订购时，请按照示例在订单中说明以下最小数据。电机产品代码根据以下示例编写。

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.

示例	
电机型号	M2BAX 112 MLA
极数	4
安装方式 (IM 代码)	IM B3 (IM1001)
额定输出	4 kW
产品代码	3GBA 112 410-ADNCN
附加代码 (如需)	

Example	
Motor type	M2BAX 112 MLA
Pole number	4
Mounting arrangement (IM-code)	IM B3 (IM1001)
Rated output	4 kW
Product code	3GBA 112 410-ADNCN
Variant codes if needed	

产品代码说明

Explanation of the product code

电机型号 Motor type	电机尺寸 Motor size	产品代码 Product code	安装方式代码, 电压及频率代码, 产品族代码 Mounting arrangement, voltage and frequency code, generation codes	变量代码 Variant codes
M2BAX	112MLA	3GBA 112 410 - ADNCN		002, etc
		1 2 3 4 5 6 7 8 9 10 11 12 13 14		

位置 1-4 3GBA = 全封闭铸铁机座电机
位置 5-6 IEC 机座
08 = 80 13 = 132 22 = 225 35 = 355 09 = 90 16 = 160 25 = 250 10 = 100 18 = 180 28 = 280 11 = 112 20 = 200 31 = 315
位置 7 极对数
1=2 极 2=4 极 3=6 极
位置 8 -10 序列号
位置 11 -(破折号)
位置 12 安装方式
A = 底脚安装型电机 B = 凸缘安装型电机带通孔的大凸缘。
位置 13 电压和频率
D 380 VΔ, 400 VΔ, 660 VY, 690VY 50 Hz S 220VΔ, 230VΔ, 380 VY, 400 VY 50 Hz
位置 14 产品族代码

Positions 1 to 4 3GBA = Totally enclosed motor with cast iron frame
Positions 5 to 6 IEC size
08 = 80 13 = 132 22 = 225 35 = 355 09 = 90 16 = 160 25 = 250 10 = 100 18 = 180 28 = 280 11 = 112 20 = 200 31 = 315
Positions 7 Speed (pole pairs)
1=2 poles 2=4 poles 3=6 poles
Positions 8 to 10 Serial number
Positions 11 -(dash)
Position 12 Mounting arrangement
A = Foot-mounted motor B = Flange-mounted motor. Large flange with clearance holes.
Position 13 Voltage and frequency
D 380 VΔ, 400 VΔ, 660 VY, 690VY 50 Hz S 220VΔ, 230VΔ, 380 VY, 400 VY 50 Hz
Position 14 Generation code

铭牌

Rating plates



铭牌以表格形式提供六个电压的转速、电流和功率因数的数值。

The rating plates are in table form giving values for speed current and power factor for six voltages.

IE4

机座号 80-355



铭牌示例

		ABB Shanghai Motors Co., Ltd Shanghai 200245 P.R. of China					
IE4		IEC60034-1					
3~ Motor		IE4 M2BAX 80MA 2 IMB3/IM1001				2022	
↔							
No.		Ins. cl.		F		IP 55	
V	Hz	kW	r/min	A	cos φ	Duty	
400	Y 50	0.75	2887	1.56	0.83	S1	
230	D 50	0.75	2887	2.72	0.83	S1	
380	Y 50	0.75	2872	1.59	0.86	S1	
220	D 50	0.75	2872	2.74	0.86	S1	
440	Y 60	0.75	3489	1.42	0.84	S1	
460	Y 60	0.75	3500	1.41	0.81	S1	
IE4-50Hz-83.5%(100%)							
Product code		3GBA081310-ASNCN					
		6204-2Z/C3 				6204-2Z/C3	
						19 kg	

IE4

Motor sizes 80 to 355

Rating Plate sample

		ABB Shanghai Motors Co., Ltd Shanghai 200245 P.R. of China					
IE4		IEC60034-1					
3~ Motor		IE4 M2BAX 160MLA 4 IMB3/IM1001				2022	
↔							
No.		Ins. cl.		F		IP 55	
V	Hz	kW	r/min	A	cos φ	Duty	
690	Y 50	11	1478	12.8	0.77	S1	
400	D 50	11	1478	22.0	0.77	S1	
660	Y 50	11	1475	13.0	0.80	S1	
380	D 50	11	1475	22.5	0.80	S1	
440	D 60	11	1779	19.8	0.77	S1	
460	D 60	11	1781	19.4	0.75	S1	
IE4-50Hz-93.3%(100%)							
Product code		3GBA162410-ADNCN					
		6309-2Z/C3 				6209-2Z/C3	
						181 kg	

说明:

铭牌图片仅供格式参考，最终数据以实际铭牌为准。

Remark:

The format of the rating plate is for reference only. The final figure will be subject to the actual rating plate.

电气特性

Electrical design

额定输出

M2BAX 系列电机的额定功率是指电机运行在 S1- 连续工作制的情况下 (IEC 60034-1)，此时周围环境温度范围为 -20°C ~ 40°C，海拔高度不超过 1000m。

电压、频率

IEC 60034-1 定义了电压和频率的波动对温升的影响。标准将电压和频率的综合变化分为 A 和 B 两个区域。区域 A 是电压偏差 ±5% 和频率偏差 ±2% 的情况；区域 B 是电压偏差 ±10% 和频率偏差 +3%/-5% 的情况。

电机均能在 A 和 B 两区域内提供额定转矩，但温升会高于在额定电压和频率情况下的值。电机只允许在区域 B 中短时间运行。

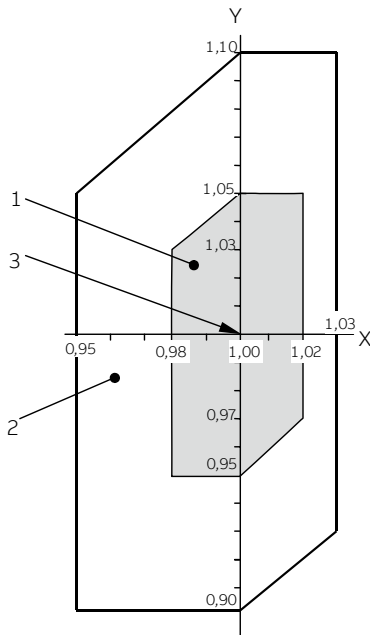
Rated Output

M2BAX motors rated outputs means that the motor runs under continuous duty S1 (IEC 60034-1) operation at ambient temperature from -20°C ~ 40°C and at altitudes of up to 1000 m above sea level.

Voltage and Frequency

The impact on temperature rise caused by voltage and frequency fluctuation is defined in IEC 60034-1. The standard divides the combinations into two zones, zone A and B. Zone A is the combination of voltage deviation ±5% and frequency deviation ±2%. Zone B is the combination of voltage deviation ±10% and frequency deviation +3%/-5%.

The motors are capable of supplying the rated torque in both zone A and B, but the temperature rise will be higher than at rated voltage and frequency. The motors are to be in operation only for a short period of time in zone B.



- X 轴 频率标么值
- Y 轴 电压标么值
- 1 区域 A
- 2 区域 B (区域 A 外)
- 3 额定点

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

电气特性

Electrical design

绝缘系统

ABB 采用 F 级绝缘材料，B 级温升，是当今业界通用的要求。

F 级绝缘系统 B 级温升的采用，使 ABB 产品可获得 25°C 的安全裕度。这使电机在短时间内过载使用，或在较高环境温度和海拔，或在高电压和频率容差下使用成为可能。这一设计同样可用于延长绝缘寿命。例如，温度降低 10K，绝缘寿命延长。

B 级绝缘 (130°C)

- 额定环境温度 40°C
- 最大允许温升 80K
- 热点温升裕度 10K

F 级绝缘 (155°C)

- 额定环境温度 40°C
- 最大允许温升 105K
- 热点温升裕度 10K

H 级绝缘 (180°C)

- 额定环境温度 40°C
- 最大允许温升 125K
- 热点温升裕度 10K

Insulation

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

Thermal class 130 (B)

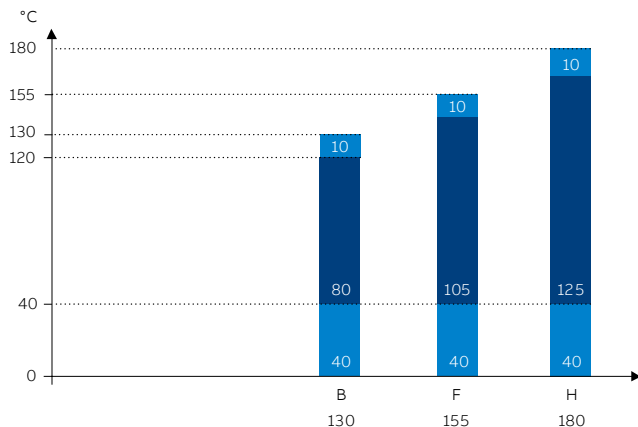
- Nominal ambient temperature 40 °C
- Max permissible temperature rise 80K
- Hot spot temperature margin 10K

Thermal class 155 (F)

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

Thermal class 180 (H)

- Nominal ambient temperature 40 °C
- Max permissible temperature rise 125K
- Hot spot temperature margin 10K



各绝缘等级的安全裕度
Safety margins per thermal class

电气特性

Electrical design

运行环境

根据 IEC 60034-1 规定，容差是指测试值与铭牌（或样本）标称值之间的最大允许偏差。测试结果基于按照 IEC 60034-2-1, IEC 60034-9, IEC 60034-12 所规定的测试。

Environmental

In accordance with IEC 60034-1, tolerance is the maximum allowed deviation between the test result and the declared value on the rating plate (or in the catalog). Test results are based on test procedures in accordance with IEC 60034-2-1, IEC 60034-9, and IEC 60034-12.

过载倍数

根据 IEC 60034, M2BAX 系列电机能够在额定电压和频率下承受 1.5 倍的额定电流达 2 分钟。

Overload times

According to IEC 60034, M2BAX motors are designed to withstand overload capacity of 1.5 times rated current for 2 minutes at rated voltage and frequency.

电气数据容差

Tolerance for electrical data

	效率 Efficiency	功率因数 * Power factor	启动电流 Locked rotor current I_s / I_N	堵转转矩 Locked rotor torque T_l / T_N	最大转矩 Breakdown torque T_b / T_N	转动惯量 Moment of inertia	噪声等级 Noise level
PN (kW) ≤ 150	-15 % (1-η)	-1/6 (1-cos φ)	+20 % of the current	[-15 % + 25 %] of the torque	-10 % of the value	± 10 % of the value	+3 dB(A)
PN (kW) > 150	-10 % (1-η)						
转差率 Slip							
PN (kW) < 1	± 30 %						
PN (kW) ≥ 1	± 20 %						

* 功率因数容差最小绝对值: 0.02, 最大绝对值: 0.07.

* Power factor minimum absolute value 0.02, maximum absolute value 0.07.

环境温度及海拔高度

标准电机设计的最大环境温度为 40°C，最高海拔为 1000m。如果当电机在较高的环境温度或海拔下运行，输出功率相应降低。详情请咨询 ABB。

Ambient temperatures and high altitudes

Normal motors are designed for operation at a maximum ambient temperature of 40°C and at a maximum altitude of 1000 meters above sea level. If a motor is operated at higher ambient temperatures or altitude, it should be derated. Detailed information, please contact your ABB sales office.

对于不同高度和（或）不同环境温度的功率换算系数 kHT

Factor kHT for different site altitudes and / or coolant temperature

海拔高度 Site altitude above sea level	对应海拔高度的环境温度 Site altitude above sea level coolant temperature					
	< 30°C	30 ~ 40°C	45°C	50°C	55°C	60°C
1000 m	1.07	1.00	0.96	0.92	0.87	0.82
1500 m	1.04	0.97	0.93	0.89	0.84	0.79
2000 m	1.00	0.94	0.90	0.86	0.82	0.77
2500 m	0.96	0.90	0.86	0.83	0.78	0.74
3000 m	0.92	0.86	0.82	0.79	0.75	0.70
3500 m	0.88	0.82	0.79	0.75	0.71	0.67
4000 m	0.82	0.77	0.74	0.71	0.67	0.63

机械设计

Mechanical design

表面处理

ABB 低压电机标准喷漆系统符合 ISO/ EN 12944:2 的腐蚀类别 C3M（相当于中等耐腐蚀性及耐用性）。其它耐腐蚀类别 C4M 和 C5M，可以使用变量代码 115, 754 进行订购。

ABB 的标准色为蒙赛尔蓝 8B 4.5/3.25。其它颜色，请用变量代码 114, 646 进行订购。

机械振动

ABB 标准电机满足 IEC60034-14 标准中的 A 级振动。如需 B 级振动，请使用变量代码 417。

Surface treatment

ABB's standard surface treatment is corrosivity category C3, durability range M (which equal to medium corrosivity and medium durability) based on the ISO 12944 standard. Special surface treatment is available in corrosivity categories C4 and C5, durability class M for both. See variant code 115, 754.

The standard ABB paint color for motors is Munsell blue 8B 4.5/3.25. Other colors are also available, see variant code 114, 646.

Vibration

ABB motor meets the requirements of class A vibration based on IEC60034-14 standard. For class B vibration, use variant code 417.

机械设计

Mechanical design

机座

包括底脚在内的电机机座是铸铁制成的。整体式铸铁底脚能够实现稳固的安装及降低振动。可提供底脚安装型、凸缘安装型及二者结合的电机。

Motor frame

The motor frame is made of cast iron, and the standard design includes cast iron feet. Integrated cast iron feet provide rigid mounting, and lower vibration. Motors can be supplied for foot mounting, flange mounting, and combinations of these.

排水孔

如果在非常湿润或潮湿的环境下，特别是在断续负载下操作电机，则应设置排水孔。根据电机安装方法，指定相应的 IM 标号，如 IM 3031。

Drain holes

Motors that will be operated in very humid or wet environments, and especially under intermittent duty, should be provided with drain holes. The IM designation, such as IM 3031, determines the intended mounting arrangement for the motor.

机座号为 80 到 355 的电机安装了排水孔及闭合塞。孔塞在出厂时打开。安装电机时，确保排水孔朝下。

Motor sizes 80 - 355 are fitted with drain holes and closable plugs. The plugs are open on delivery. When mounting the motors, ensure that the drain holes face downwards.

垂直安装时，上塞必须完全闭合。在灰尘过多的环境中，两个塞都应闭合。

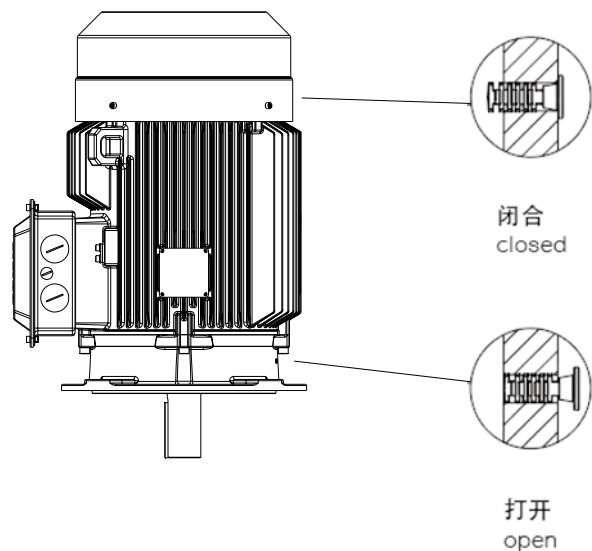
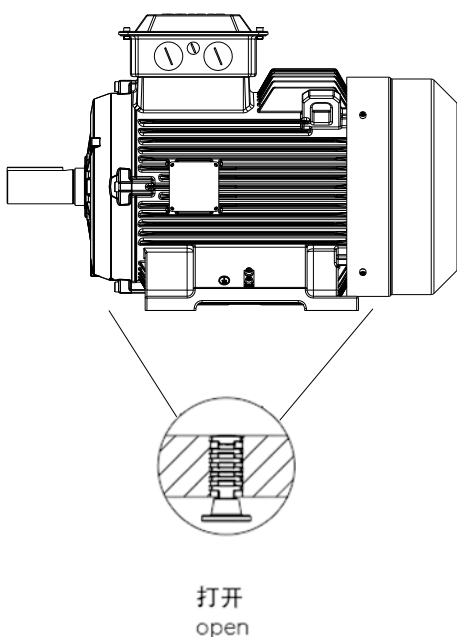
In the case of vertical mounting, the upper plug must be hammered home completely. In very dusty environments, both plugs should be hammered home.

安装方式不同于底脚安装型 IM B3 时，请在订购时使用变量代码 066。

When mounting arrangement differs from foot mounted IM B3, mention variant code 066 when ordering.

请参阅“排水孔”标题下的变量代码 066。

See variant codes 066 under the heading “Drain holes”.



机座号 80-355
标准情况下配备排水孔及闭合塞

As standard, motor sizes 80 - 355 are delivered with drain holes and closable plugs.

机械设计

Mechanical design

轴承

电机通常安装以下单列深沟球轴承。

标准及可选设计

机座号	极数	标准设计		可选设计
		深沟球轴承		圆柱滚子轴承 (VC037)
		D 端	N 端	D 端
80	2-6	6204-2Z/C3	6204-2Z/C3	
90	2-6	6205-2Z/C3	6205-2Z/C3	
100	2-6	6206-2Z/C3	6206-2Z/C3	
112	2-6	6207-2Z/C3	6206-2Z/C3	
132	2-6	6208-2Z/C3	6208-2Z/C3	
160	2-6	6309-2Z/C3	6209-2Z/C3	NU309ECP/C3
180	2-6	6310-2Z/C3	6210-2Z/C3	NU310ECP/C3
200	2-6	6312-2Z/C3	6212-2Z/C3	NU312ECP/C3
225	2-6	6313-2Z/C3	6213-2Z/C3	NU313ECP/C3
250	2-6	6315-2Z/C3	6215-2Z/C3	NU315ECP/C3
280	2-6	6316/C3	6316/C3	NU316ECP/C3
315	2	6316/C3	6316/C3	NU316ECP/C3
	4-6	6319/C3	6316/C3	NU319ECP/C3
355	2	6316/C3	6316/C3	NU316ECP/C3
	4-6	6322/C3	6316/C3	NU322ECP/C3

说明：

电机铭牌上显示轴承型号及描述方式仅供客户更换、维修轴承作参考，不代表轴承品牌，具体的轴承品牌以公司实际使用的为准。

轴向锁定轴承

所有电机在 D 端标配轴向锁定轴承。

Bearings

General performance motors are normally fitted with single-row deep-groove ball bearings, as shown in the table below.

Standard and alternative designs

Motor size	Number of poles	Standard design		Alternative design
		Deep groove ball bearings		Roller bearings (VC037)
		D-end	N-end	D-end
80	2-6	6204-2Z/C3	6204-2Z/C3	
90	2-6	6205-2Z/C3	6205-2Z/C3	
100	2-6	6206-2Z/C3	6206-2Z/C3	
112	2-6	6207-2Z/C3	6206-2Z/C3	
132	2-6	6208-2Z/C3	6208-2Z/C3	
160	2-6	6309-2Z/C3	6209-2Z/C3	NU309ECP/C3
180	2-6	6310-2Z/C3	6210-2Z/C3	NU310ECP/C3
200	2-6	6312-2Z/C3	6212-2Z/C3	NU312ECP/C3
225	2-6	6313-2Z/C3	6213-2Z/C3	NU313ECP/C3
250	2-6	6315-2Z/C3	6215-2Z/C3	NU315ECP/C3
280	2-6	6316/C3	6316/C3	NU316ECP/C3
315	2	6316/C3	6316/C3	NU316ECP/C3
	4-6	6319/C3	6316/C3	NU319ECP/C3
355	2	6316/C3	6316/C3	NU316ECP/C3
	4-6	6322/C3	6316/C3	NU322ECP/C3

Remark:

The bearing type and description on rating plate do not represent the bearing brand, instead it is a technical consideration that can help the owner to make replacement and set up a maintenance program. The brand is subject to the bearing installed.

Axially-locked bearings

All motors are equipped as standard with an axially locked bearing. General at D-end.

机械设计

Mechanical design

轴密封件

机座号为 80-355 的密封件尺寸和类型符合下表：

Bearing seals

This table presents the standard sizes and types of bearing seals per motor size.

机座号 Motor size	极数 Number of Poles	标准设计 Standard design		可选设计 Optional design	
		轴向密封件 Axial seal		D 端伽玛密封 Gamma seal at D-end	D 端径向密封 Radial seal at D-end
		D 端 D-end	N 端 N-end	变量代码 784 Variant codes 784	变量代码 072 Variant codes 072
80	2-6	V-20A	V-20A	20 x 35 x 4	20 x 40 x 7
90	2-6	V-25A	V-25A	25 x 40 x 4	25 x 42 x 7
100	2-6	V-30A	V-30A	30 x 47 x 4.5	30 x 52 x 7
112	2-6	V-35A	V-30A	35 x 52 x 4.5	35 x 55 x 7
132	2-6	V-40A	V-40A	40 x 57 x 4.5	40 x 62 x 7
160	2-6	V-45A	V-45A	45 x 62 x 4.5	45 x 72 x 8
180	2-6	V-50A	V-50A	50 x 70 x 5.5	50 x 80 x 8
200	2-6	V-60A	V-60A	60 x 80 x 5.5	60 x 85 x 8
225	2-6	V-65A	V-65A	65 x 85 x 5.5	65 x 90 x 10
250	2-6	V-75A	V-75A	75 x 95 x 5.5	75 x 100 x 10
280	2	VS80	VS80	80 x 100 x 5.5	NA
	4-6	VS80	VS80	80 x 100 x 5.5	80 x 110 x 10
315	2	VS80	VS80	80 x 100 x 5.5	NA
	4-6	VS95	VS80	95 x 115 x 5.5	95 x 120 x 12
355	2	VS80	VS80	80 x 100 x 5.5	NA
	4-6	VS110	VS80	110 x 130 x 5.5	NA

机械设计

Mechanical design

轴承寿命

根据 ISO 281, 轴承的正常寿命 L_{10h} 定义为在特定条件下 90% 的相同轴承在一系列测试中所达到或超过的运行小时数。50% 的轴承至少达到这一数字的五倍。

润滑

装有封闭式轴承的电机

机座号为 80-250 的电机采用封闭式轴承。封闭式轴承中装有优质的润滑脂。铭牌上印有轴承型号。

以下数值可作为轴承使用寿命指导值，具体寿命取决于应用和负载情况：2-8 极电机约为 40,000 小时。

皮带轮直径

所需轴承寿命确定后，最小允许皮带轮直径可使用 F_R 计算，如下所示：

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

其中：

D:	带轮直径, 单位 (mm)
P:	功率要求, kW
n:	电机转速, r/min
K:	皮带张力因数, 取决于皮带类型和负载类型。 V 形皮带通用值为 2.5。
F_R :	允许径向力

Bearing life

The nominal life L_{10h} of a bearing is defined according to ISO 281 as the number of operating hours achieved or exceeded by 90% of identical bearings in a large test series under specified conditions. 50% of bearings achieve at least five times this lifetime.

Lubrication

Motors with bearings greased for life

Motors in frame sizes 80-250 are equipped with bearings greased for life. Bearings are lubricated with high-quality grease. Bearing types are stated on the rating plate.

The following values can be used as a guide for bearing lifetime, depending on application and load conditions: 2-8 pole motors about 40,000h.

Pulley diameter

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

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

Where:

D:	Pulley diameter, mm
P:	Power requirement, kW
n:	Motor speed, r/min
K:	Belt tension factor, dependent on belt type and type of duty A common value of V-belts is 2.5
F_R :	Permissible radial force

机械设计

Mechanical design

轴上允许负载

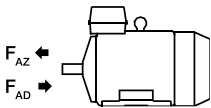
允许轴向力

表中提供了环境温度为 25°C 时，50Hz 的正常条件下，径向力为零时的轴伸允许轴向力 (N)。分别对轴承寿命满足 20000 和 40000 小时进行计算。

在 60 Hz 时，数值将相应减少 10%。

需提供同时存在径向力和轴向力的允许负载值，请联系 ABB。

给定轴向力 F_{AD} ，假设 D 端轴承由锁环锁定。



安装方式 IM B3

机座号 Motor size	极数 No. of poles	轴伸长度 Length of shaft extension E (mm)	轴伸长度 深沟球轴承 Basic design with deep groove ball bearings			
			20,000 小时 20,000 h		40,000 小时 40,000 h	
			F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)
80	2	40	750	430	595	275
	4	40	920	600	710	390
	6	40	1060	740	815	495
90	2	50	930	370	770	210
	4	50	1160	600	930	370
	6	50	1315	755	1050	490
100	2	60	1220	560	1000	340
	4	60	1510	850	1215	555
	6	60	1745	1085	1375	715
112	2	60	1580	920	1275	615
	4	60	2025	1365	1580	920
	6	60	2320	1660	1805	1145
132	2	80	1760	880	1435	555
	4	80	2185	1305	1755	875
	6	80	2540	1660	1990	1110
160	2	110	2905	2205	2280	1580
	4	110	3815	3115	2905	2205
	6	110	4415	3715	3360	2660
180	2	110	3385	2585	2655	1855
	4	110	4365	3565	3385	2585
	6	110	5155	4355	3920	3120
200	2	110	4330	3430	3380	2480
	4	110	5590	4690	4325	3425
	6	110	6630	5730	5015	4115

Permissible loading on the shaft

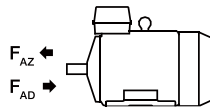
Permissible axial forces

The following table gives the permissible axial forces on shaft in Newton, assuming zero radial force, ambient temperature of 25°C, and normal conditions at 50Hz. The values are given for calculated bearing life of 20000 and 40000 hours per motor size.

At 60 Hz, the values must be reduced by 10 percent.

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

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



Mounting arrangement IM B3

机座号 Motor size	极数 No. of poles	轴伸长度 Length of shaft extension E (mm)	轴伸长度 深沟球轴承 Basic design with deep groove ball bearings			
			20,000 小时 20,000 h		40,000 小时 40,000 h	
			F_{AD} (N)	F_{AZ} (N)	F_{AD} (N)	F_{AZ} (N)
225	2	110	4810	4060	3720	2970
	4	140	6245	5495	4805	4055
	6	140	7435	6685	5590	4840
250	2	140	5945	4785	4625	3465
	4	140	7675	6515	5935	4775
	6	140	9130	7970	6885	5725
280	2	140	6395	4395	5065	3065
	4	140	8130	6130	6385	4385
	6	140	9415	7415	7345	5345
315SM	2	140	6385	4385	5060	3060
	4	170	9450	7450	7380	5380
	6	170	10950	8950	8510	6510
315ML	2	140	6380	4380	5050	3050
	4	170	9445	7445	7375	5375
	6	170	10940	8940	8495	6495
315LK	4	170	9430	7430	7360	5360
	6	170	10925	8925	8485	6485
	355SM	2	140	6217	4505	4887
355ML	4	210	12117	10405	9337	7625
	6	210	14112	12400	10852	9140
	355ML	2	140	6217	4505	4887
355ML	4	210	12102	10390	9322	7610
	6	210	14097	12385	10837	9125

允许径向力

表中提供了环境温度为 25°C 时, 50Hz 的正常条件下, 轴向力为零时的轴伸允许径向力 (N)。分别对轴承寿命满足 20,000 小时和 40,000 小时进行计算。

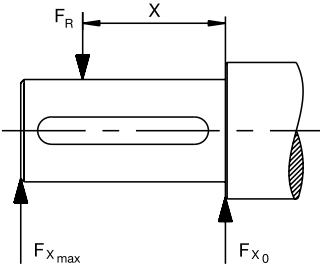
电机为底座安装型 IM B3, 并且含横向力。在某些情况下, 轴的强度影响允许负载力。在 60Hz 时, 数值将相应减少 10%。对于双速电机, 数值应以较高的速度为准。

需提供同时存在径向力和轴向力的允许负载值, 请联系 ABB。

如果径向力作用于点 X_0 和 X_{max} 之间, 则允许负载力 F_R 可以通过以下公式计算:

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

E : 基本型号中的轴伸长度



机座号 Motor size	极数 No. of poles	轴伸长度 Length of shaft extension E (mm)	深沟球轴承 Basic design with deep groove ball bearings			
			20,000 小时 20,000 h	40,000 小时 40,000 h	F_{X_0} (N)	$F_{X_{max}}$ (N)
80	2	40	740	620	585	490
	4	40	950	825	755	655
	6	40	1090	945	865	750
90S	2	50	805	655	600	470
90SL	2	50	820	695	650	550
	4	50	1035	875	820	695
	6	50	1185	1000	940	795
100	2	60	1145	965	875	740
	4	60	1445	1220	1145	965
	6	60	1655	1395	1315	1105
112	2	60	1580	1340	1255	1065
	4	60	1990	1690	1580	1340
	6	60	2280	1935	1810	1535
132S	2	80	1680	1330	1330	1055
	4	80	2115	1675	1675	1325
	6	80	2425	1920	1920	1520
132SM	2	80	1710	1395	1355	1105
	4	80	2150	1755	1705	1390
	6	80	2465	2010	1955	1595
160	2	110	3295	2615	2615	2075
	4	110	4195	3410	3325	2705
	6	110	4795	3900	3800	3090
180	2	110	3840	3150	3045	2495
	4	110	4840	3970	3835	3145
	6	110	5540	4545	4395	3600
200	2	110	5045	4220	3995	3345
	4	110	6355	5315	5035	4215
	6	110	7275	6085	5760	4820

Permissible radial forces

The following table gives the permissible radial forces on shaft in Newton, assuming zero axial force, ambient temperature of 25°C, and normal conditions at 50Hz. The values are given for calculated bearing life of 20,000 and 40,000 hours per motor size.

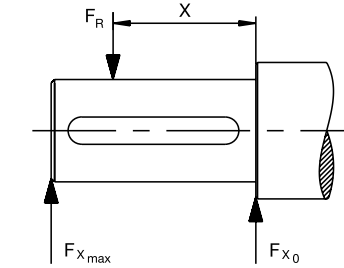
These calculated values further assume mounting position IM B3 (foot-mounted), with force directed sideways. In some cases, the strength of the shaft affects permissible forces.

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

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

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

E : Length of the shaft extension in the standard version



机座号 Motor size	极数 No. of poles	轴伸长度 Length of shaft extension E (mm)	深沟球轴承 Basic design with deep groove ball bearings			
			20,000 小时 20,000 h	40,000 小时 40,000 h	F_{X_0} (N)	$F_{X_{max}}$ (N)
225	2	110	5805	4920	4600	3900
	4	140	7315	5950	5795	4715
	6	140	8370	6810	6630	5395
250	2	140	7100	5790	5625	4585
	4	140	8940	7290	7080	5775
	6	140	10225	8340	8100	6610
280	2	140	7225	6165	5720	4885
	4	140	9095	7760	7195	6145
	6	140	10420	8895	8250	7040
315SM	2	140	7150	6090	5660	4820
	4	170	10755	8880	8515	7030
	6	170	12295	10150	9725	8030
315ML	2	140	7220	6265	5710	4950
	4	170	10870	9170	8600	7255
	6	170	12425	10480	9825	8285
315LK	4	170	10940	9375	8650	7410
	6	170	12505	10715	9880	8465
355SM	2	140	7115	6235	5615	4920
	4	210	14925	12325	11800	9745
	6	210	17080	14100	13500	11150
355ML	2	140	7120	6240	5620	4925
	4	210	15050	12655	11890	10000
	6	210	17220	14480	13605	11440

机械设计

Mechanical design

标准接线盒交付

标准接线盒的防护等级为 IP55。标准情况下，接线盒安装在电机 D 端顶部。此外，还可以将接线盒安装在左侧或右侧，请参考订购信息。机座号 80-132 的电机，采用一体式接线盒。机座号 160-355 的电机，采用分体式接线盒。

机座号为 160-355 的电机接线盒可 4x90° 转动。因此电机的两侧都可以接入电缆。但对于机座号为 80-132 的标准电机，接线盒无法转动，如需实现接线盒电缆入口 2x180° 转向，可使用变量代码 (VC022)。

如果未另行规定，则采用标准交付。

注意：对于 500V 及 / 或侧面安装的电机，请联系 ABB！

Standard terminal box

The degree of protection for the standard terminal box is IP 55. By default, terminal boxes are mounted on top of the motor at D-end. In motor sizes 80-132, the terminal box is integrated in motor frame. In motor sizes 160-355, the terminal box is separate from motor frame.

The terminal boxes of motor sizes 160-355 can be turned 4x90°, to allow cable entry from either side of motor. For motor sizes 80-132, turning is not possible in the standard motor, but 2x180° turning is available as an option (variant code 022).

Standard delivery if no other information is provided.

Note: For other network voltages and/or side-mounted motors, contact your ABB sales office.

机座号 Motor size	极数 Pole number	螺纹孔 Threaded holes	电缆外径 mm Cable outer diameter mm	单芯横截面 平方毫米/相 Single core cross-section mm ² /phase	端子螺栓尺寸 6x terminal bolt size 6x
80-90	2-6	2xM25x1.5	2xØ11-16	4	M4
100-132	2-6	2xM32x1.5	2xØ14-21	10	M5
160-180	2-6	2xM40x1.5, M16x1.5	2xØ19-27, Ø5-9	35	M6
200-250	2-6	2xM63x1.5, M16x1.5	2xØ37-44, Ø5-9	70	M10
280	2-6	2xM63x1.5, 2xM20x1.5	2xØ37-44, 2xØ8-14	2x150	M12
315	2-6	2xM63x1.5, 2xM20x1.5	2xØ37-44, 2xØ8-14	2x240	M12
355	2-6	2xM75x1.5, 2xM20x1.5	2xØ48-60, 2xØ8-14	2x240	M12

电机接地 Earthing	机座接地 Earthing on frame	主接线盒接地 Earthing in main terminal box
80-132	M5	M5
160-250	M6	M6
280-355	M10	M10

变频器驱动

Variable speed drives

鼠笼式感应电机具有很好的的可用性、可靠性与效率。通过变频器—一种变速驱动器（VSD），该电机的性能将更优异。电机不是一直处于全速运转状态，相反，变速驱动器能够根据实际需要调节速度。这样，就能够准确地控制工艺过程，在某些情况下，甚至可以达到比标称速度更快的运转速度，从而提高产能。

与传统的全压启动（DOL）不同，变速驱动器（VSD）能够平滑地进行启动。这样就大大地减少了电机及驱动应用中的压力。平滑启动还意味着供电网络不受高启动电流的影响。在电网设计时，应将该因素纳入考虑。

由于在速度和工艺用电方面的优化，ABB 低压一般用途电机以及变频器的使用，尤其是 ABB 变频器的使用，通常能够在很大程度上实现节能。节能不仅能够产生环境效益，还能够带来经济效益。ABB 低压一般用途电机适用于 DOL 运行，也适用于变速运行。选择面广，电机能够适应严苛的应用要求。

在为变速驱动器选择低压一般用途电机时，应考虑以下方面：

1. 确定规格

变频器所馈送的电压（或电流）并非完全是正弦的。这可能会增加电机的损耗、振动以及噪音等级。此外，这些损耗分布的变化可能影响电机的温升。因此，在任何情况下，需要根据特定的变频器说明书正确选择电机规格。

使用 ABB 变频器时，请使用 ABB 的 DriveSize 程序来确定电机规格。该工具利用的是基本综合性组合型式试验的规格确定规则。

当手动确定规格时，请注意，此目录中以及相关手册中给出的负载率（负载能力）曲线仅供参考。可根据要求提供针对各个电机和变频器的精确数值。除确定热容量外，必须保持一个转矩裕度，以保持稳定。电机的最大转矩在整个工作周期内应至少高于负载转矩 30%。

尤其是在使用较长的供电电缆时，还必须考虑供电电缆的压降。

Squirrel cage induction motors offer excellent availability, reliability and efficiency. With a variable speed drive (VSD) – a frequency converter – the motor performance can be further improved. Instead of running the motor continuously at full speed, the VSD enables speed adjustment according to actual need. The VSD makes it possible to control the process accurately and in some cases even to improve the capacity of the process by operating at higher than nominal speeds.

In contrast with conventional applications operating with a direct-on-line (DOL) supply, a VSD makes smooth starting possible. This significantly reduces the stress on the motor and driven application. Smooth starting also means that the supply network will not be affected by high starting current transients, a fact that can be taken into account in the design of the network.

The use of ABB industrial drives together with General performance motors usually provides substantial energy savings as the speed and therefore the power required by the process can be optimized. General performance motors are designed for both DOL and variable speed operation. A wide range of options is available, so motors can be adapted to the demanding applications.

When selecting general performance motors for VSDs, the following points must be taken into consideration.

1. Dimensioning

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

ABB's DriveSize program utilizes dimensioning rules that are based on comprehensive motor and drive type tests. Please use DriveSize for selecting the correct motor and drive combination for a desired load profile.

In case of manual dimensioning, note that the loadability (or load capacity) curves provided in this catalog and in the respective manuals are indicative only. Values for a specific motor and drive are available on request. In addition to thermal dimensioning, an adequate torque margin must be maintained for stability. The maximum torque of the motor must be at least 30 % higher than the load torque over the whole duty range.

Voltage drop in the supply cable must also be taken into consideration, especially in cases where long supply cables are needed.

变频器驱动

Variable speed drives

2. 工作转速、振动及轴密封

低压一般用途电机设计可以在宽转速范围下工作，在大多数情况下，也可以显著高于额定转速（即铭牌上印制的转速）的较高转速运行。可以通过铭牌或 DriveSize 工具获知最大转速。除电机转速范围外，请确保不超出整个应用的最大或临界转速。

下表 1 给出了低压一般用途电机的最大规定转速值。

表 1 低压一般用途电机的最大规定转速值

机座号	转速 r/min	
	2 极	4 极
80	6000	4500
90-100	6000	6000
112-200	4500	4500
225-250	3600	3600
280	3600	2600
315	3600	2300
355	3600	2000

3. 通风

电机低速运行时，风扇的冷却能力下降，进而降低电机的负载能力。可以另外使用一个独立的恒速风扇（变量代码 183）来提升冷却能力。

高速运行时，应考虑使用金属风扇在（变量代码 068），而不是塑料风扇。

4. 润滑

在变速应用场合中，轴承温度的变化是由于速度和电机负载变化的结果。这时，在正常工作条件下，通过测量轴承温度，可以得到精确的润滑间隔时间。如果测量温度高于 +80°C，则需要缩短在润滑铭牌或电机手册中规定的润滑间隔时间，或使用适用于高温工况的润滑脂。请参见 ABB 低压电机手册。

在非常低的速度和温度（低于 20°C）下连续工作时，标准润滑脂的润滑能力可能不足，而需要使用含添加剂的特定润滑脂。更多详情，请联系 ABB。

2. Operating speed, vibrations and shaft seals

General performance motors are designed to work over a wide speed range and also at significantly higher than nominal speeds. The maximum speeds can be found on motor rating plates or in DriveSize. In addition to motor speed, make sure that the maximum or critical speed of the entire application is not exceeded.

Guideline maximum speed values for general performance motors are shown in Table 1.

Table 1. Guideline maximum speed values for general performance cast iron motors.

Motor size	Maximum speed, r/min	
	2-pole motors	4-pole motors
80	6000	4500
90-100	6000	6000
112-200	4500	4500
225-250	3600	3600
280	3600	2600
315	3600	2300
355	3600	2000

3. Ventilation

When the motor is operated at low speeds, the cooling capacity of the fan decreases, which again reduces the motor's load capacity. A separate constant speed fan (variant codes 183) can be used to increase cooling capacity.

At high speeds, the use of metal fans (variant code 068) instead of plastic ones should be considered.

4. Lubrication

In variable speed applications, bearing temperature varies as a function of speed and motor load. In such cases, the accurate relubrication intervals can be obtained by measuring the bearing temperature under normal operating conditions. If the measured temperature is higher than +80°C, the relubrication intervals specified on the lubrication plate or in the maintenance manual must be shortened, or lubricants suitable for high operating temperatures must be used. See ABB Low voltage motor manual.

In case of continuous operation at very low speeds and at very low temperatures (below -20°C), the lubrication properties of standard greases may not be sufficient, and special greases with additives are needed.

变频器驱动

Variable speed drives

如果电机配备密封轴承，即一次性润滑轴承，则务必注意，当工作温度与设计温度不同时，轴承的工作寿命也会与设计值不同。有关轴承工作寿命的详细信息，请参见本目录及相关手册中与产品相关的章节。

我们不建议使用所谓的导电润滑脂来消除轴承电流，因为此类产品的润滑性能不良，因此导电性很弱。

5. 绕组绝缘

为确保电机的可靠性，当为电机选择正确的绝缘系统和为变频器选择正确的输出滤波器时，必须考虑变频器的非正弦输出电压的影响。

当使用具有非受控直流电压的变频器时，应根据表 2 选择绝缘和滤波器。

表 2 变频器（其具有非受控直流电压）电机的绕组绝缘及变频器输出滤波器选择

所要求的绕组绝缘和滤波器	
$500V < U_N \leq 600V$	ABB 变频绝缘 +dU/dt 滤波器或 ABB 变频加强绝缘（变量代码 405）
$600V < U_N \leq 690V$	ABB 变频加强绝缘（变量代码 405） 及变频器输出端的 dU/dt 滤波器

dU/dt 滤波器的详细信息，请参见相关的 ABB 驱动目录。

如果表 2 中的内容不适用，以及对于其它类型的变频器，则应根据电机端子电压进行选择。

电机端子处允许的相对地电压峰值为：

- ABB 变频绝缘 1300V
- ABB 变频加强绝缘（变量代码 405）1800V

受脉冲上升时间的影响，电机端子处允许的最大相对地电压峰值见图 1。最高的曲线（即“ABB 变频加强绝缘”）适用于变频器电源采用特殊绕组绝缘的电机，变量代码为 405。“ABB 变频绝缘”适用于具有标准设计的电机。

Operating temperatures also affect bearing life. When motors are equipped with sealed bearings, that is, bearings greased for life, it must be noted that if the operating temperature differs from the design temperature, the bearing life will also be different. More information on bearing lifetimes can be found in section Mechanical design of this catalog and in the relevant manuals.

The use of so-called conductive greases for elimination of bearing currents is not recommended because of their poor lubrication characteristics and low conductivity.

5. Winding insulation

To ensure that motors operate reliably, the effects of non-sinusoidal output voltages from the converter must be taken into consideration when selecting the correct insulation system for the motor and output filters for the converter.

Insulation and filters must be selected according to Table 2.

Table 2. Selection of motor winding insulation and converter output filters

Winding insulation and filters required	
$500V < U_N \leq 600V$	VSD insulation + dU/dt filters OR VSD reinforced insulation (variant code 405)
$600V < U_N \leq 690V$	VSD reinforced insulation (variant code 405) AND dU/dt filters at converter output

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

For other converters and cases where the guidelines shown in Table 2 cannot be applied, selection must be based on the voltages present at motor terminals.

The allowed phase-to-ground voltage peaks at motor terminals:

- 1300 V peak: VSD insulation
- 1800 V peak: VSD reinforced insulation, variant code 405

The maximum allowed phase-to-phase voltage peaks at the motor terminals as a function of pulse rise time are shown in Figure 1. The higher curve, VSD reinforced insulation, applies to motors with special winding insulation for frequency converter supply, variant code 405. VSD insulation applies to motors with standard design.

变频器驱动 Variable speed drives

图 1 受脉冲上升时间的影响，电机端子处允许的最大相对地电压峰值

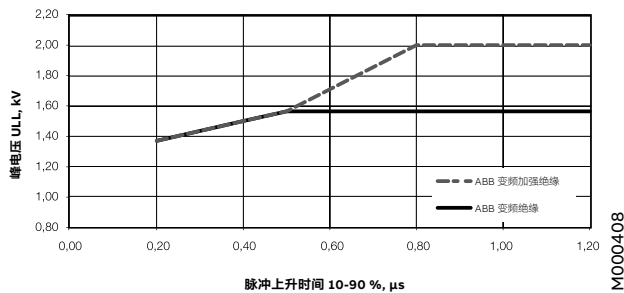
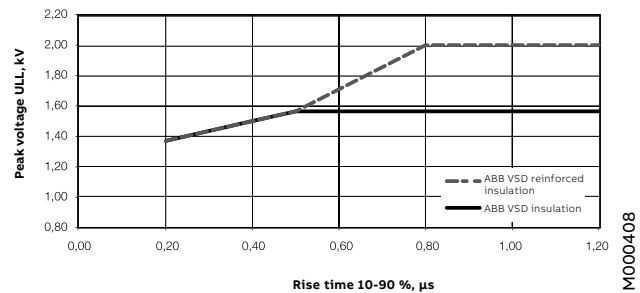


Figure 1. Maximum allowed phase-to-phase voltage peaks at motor terminals, as a function pulse rise time.



6. 轴承电流

必须在所有电机中消除轴承电压和电流,确保整项工作的可靠开展。如果使用具有非受控直流电压的 ABB ACS800 or ACS550 驱动器,则必须按照下表 3 所示,使用绝缘轴承(变量代码 701)和/或在变频器输出上加上适当规格的滤波器。有关其它代替产品和变频器类型,请联系 ABB。订购时,请明确注明将使用的代替产品。

有关轴承电流和电压的详细资料,请参见“AC 驱动系统中的轴承电流”工厂文件或联系 ABB。

表 3 与变频器(其具有非受控直流电压)配合使用的电机中的轴承电流防护。

标称功率 (P _N) 及 / 或机座号 (IEC)	防护措施
P _N ≤ 100 kW	无需采取措施
P _N ≥ 100 kW 或 IEC 315 ≤ 机座号 ≤ IEC 355	非驱动端绝缘轴承
P _N ≥ 350 kW	非驱动端绝缘轴承, 关在变频器中设置共模滤波器

共模滤波器

共模滤波器减少了共模电流,从而减少了出现轴承电流的风险。共模滤波器不会严重影响电机接线端子的相电压或电源电压。更多详情,请参见 ABB 驱动器目录。

6. Bearing currents

Bearing voltages and currents must be avoided in all motors to ensure reliable operation of the entire application. With ACS800 or ACS550 drives and uncontrolled DC voltage, insulated bearings (variant code 701) and/or properly dimensioned filters at the converter must be used, as indicated in Table 3.

For information on other converter types, contact ABB Sales. When ordering, clearly state which alternative will be used.

Table 3. Precautionary measures to avoid bearing currents in variable speed drives.

Nominal Output (P _N) AND / OR Motor size (IEC)	Precautionary measures
P _N ≤ 100 kW	No action needed
P _N ≥ 100 kW OR IEC 315 ≤ Frame size ≤ IEC 355	Insulated non-drive end bearing
P _N ≥ 350 kW	Insulated non-drive end bearing AND Common mode filter at the converter

Common mode filters

Common mode filters reduce common mode currents and so decrease the risk of bearing currents. Common mode filters do not significantly affect the phase of main voltages on motor terminals. For more information, see ABB drives catalogs.