INNOMOTICS

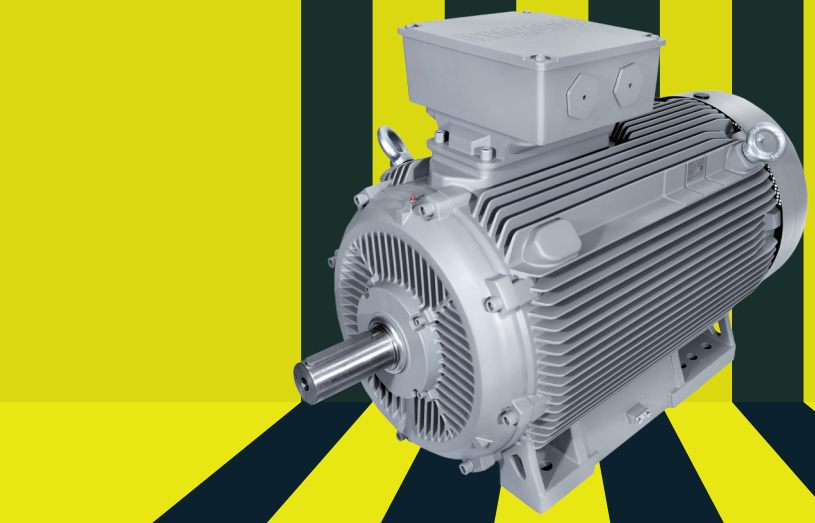
产品样本 05/2024

Innomotics Moves!

Low Voltage motors 1LE8 increased power series

低压大功率异步电动机 1LE8 系列

INNOMOTICS



为更好应对气候变化，快速响应市场需求，聚焦提升能效与可靠性的创新，推动产业绿色低碳转型和可持续发展。2023年7月1日，西门子将其低压至高压电机、齿轮电机、中压变频器和电主轴领域等相关业务进行整合，成立了独立运营的全资子公司——茵梦达（ Innomotics GmbH ）。茵梦达总部位于德国纽伦堡，业务遍及全球49个国家，拥有16家工厂，全球员工约15000名。

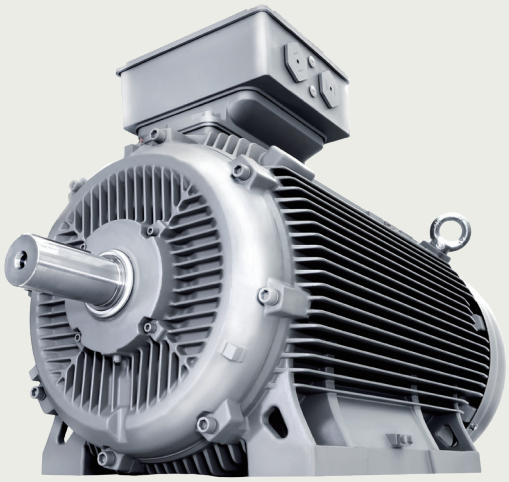
凭借百余年技术积淀和创新，茵梦达将专注于电机和大型传动专业领域。作为行业领军企业，茵梦达将不断推动工业化进程和可持续发展。

茵梦达在华拥有5家运营公司（包括一家区域总部和4家工厂），13家分公司和6家研发中心，其中在南京设立了“茵梦达低压电机事业部全球研发中心”，员工总数约3500人，是茵梦达在全球主要的研发和制造基地。

茵梦达电机（中国）有限公司原名西门子电机（中国）有限公司，于2006年3月1日合正式运营，2024年5月正式更名。

从2018年荣获国家绿色工厂，到2019年被认定为国家高新技术企业，再到累计五次荣获西门子中国最佳运营工厂殊荣，茵梦达电机（中国）有限公司一直致力于为客户提供创新、高效、可持续的电机解决方案。

公司拥有员工约 2000 余人，占地面积 18.2万平方米，年产电机约 100 万台，为茵梦达在华最大的低压、高效电机研发和生产基地。



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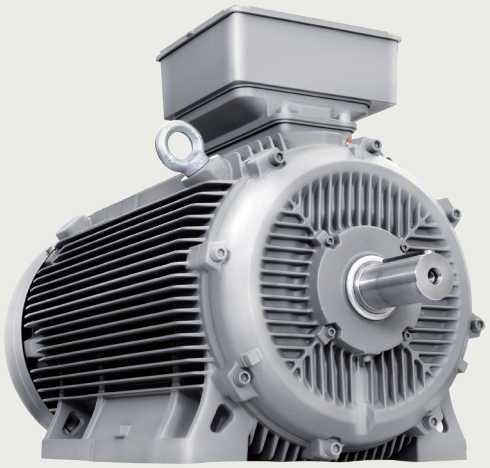


总体介绍 Overview

INNOMOTICS 1LE8 是基于 INNOMOTICS 全球设计平台，针对中国市场开发的适用于一般用途和严苛环境大负荷应用的新一代低压大功率电机；

INNOMOTICS 1LE8 新一代低压大功率电动机的特点是可靠、功率大，通过设计优化，使电机结构非常紧凑且具有高功率密度，可适用于最高到 690V 变频使用。标准 IE3效率，紧凑高效，坚固耐用。

INNOMOTICS 1LE8 电动机技术特性

- 机座材料：灰铸铁；
- 标准颜色：石头灰（RAL7030）；
- 额定功率：132 ~ 500 kW 50Hz；
- 达到 GB18613-2020 标准能效等级 3 级，且能满足 IEC 60034-30 标准中的IE3效率等级（50Hz）；
- 优化的紧凑结构设计，具有很高的功率密度；
- 标准安装结构类型（符合 IEC 60034-7 标准规定）：IM B3、IM V1、IM B35 等；
- 所有的电动机设计防护等级为 IP55（IEC 60034-5）且可达到 IP56，IP65 防护等级；

INNOMOTICS 1LE8, based on INNOMOTICS global design platform, is a new generation of low-voltage high-power motor suitable for general purpose and severe duty application and developed for the Chinese market.

INNOMOTICS 1LE8 new generation low-voltage high-power motor is characterized by reliability and high power. Optimized design, the motor structure is very compact, can be up to 690V VSD operation. 1LE8 with high energy efficiency (IE3), rugged design, compact dimensions/high power density.

Features of INNOMOTICS 1LE8

- Frame material: grey cast iron;
- Standard color: stone grey (RAL 7030);
- Rated power output: 132 ~ 500 kW at 50Hz;
- With efficiency grade 3 according to GB18613-2020 and efficiency class IE3 (50Hz) according to IEC 60034-30;
- Optimized compact style construction design, characterized by reliable and powerful performance;
- Standard mounting construction according to IEC 60034-7: IM B3, IM V1, IM B35 and etc;
- All motors are designed to IP55 degree of protection (IEC 60034-5) and optionally meet IP56, IP65 degree of protection;

- 标配再润滑装置；
- 可选择增强悬臂力设计；
- 电动机可选 PTC 或 PT100 热敏电阻或 PT1000 进行绕组保护；
- 接线盒标准位置处于机座顶端，进线孔处于右侧（从驱动端看），选项中接线盒位置和进线方向可变化；
- 绝缘系统按 155（F）温度等级设计，在额定输出和直接供电时按 130（B）温度等级使用，在变频使用时，按155（F）温度等级使用；
- 电动机标准冷却方式为自扇冷却 IEC 60034-6 规定的 IC 411，可提供独立驱动风扇强制冷却；

运行环境

- 防护等级 IP55（IEC 60034-5）；
- 高度不超过海拔 1000 m（IEC 60034-1）；
- 允许的环境温度在 -20 °C ~ 40 °C（IEC 60034-1）；
- 所允许的相对湿度：
  - -20 °C ≤ T ≤ 20 °C：100 %
  - 20 °C < T ≤ 30 °C：95 %
  - 30 °C < T ≤ 40 °C：55 %

对于更高的环境温度、以及（或者）高于海拔 1000 m 的地点，电动机的额定功率换算系数为 k_{HT}。所允许的功率值（P_{adm}）：

$$P_{adm} = P_{rated} \bullet k_{HT}$$

- Re-greasing devices as standard;
- Reinforced bearings for increased cantilever forces as option;
- Winding protections with PTC, PT100 and PT1000 as option;
- Terminal box on top, and cable entry on right side (viewed from driven end). Variable location of connection boxes and cable entries as option;
- Insulation system is designed for Temperature class 155 (F), At VSD operation, the motors can be used in temperature class 155 (F);. At rated output with line-fed operation, the motors can be used in temperature class 130 (B);
- Self ventilated motors with radial-flow fans (cooling method IC411 according to IEC 60034-6) as standard, forced air cool with external separately driven fans as option.

Environmental

- Degrees of motor protection IP55 (IEC 60034-5);
- Altitude shall not exceed 1000m above sea-level (IEC 60034-1);
- Allowed air temperature between -20 °C and 40 °C (IEC 60034-1);
- Permitted relative humidity:
  - -20 °C ≤ T ≤ 20 °C：100 %
  - 20 °C < T ≤ 30 °C：95 %
  - 30 °C < T ≤ 40 °C：55 %

For higher coolant temperatures and / or site altitudes higher than 1000 m above sea level, the specified motor output must be reduced by using the factor k_{HT}. The results in an admissible output (P_{adm}) of the motor:

$$P_{adm} = P_{rated} \bullet k_{HT}$$

对于不同高度和（或）不同环境温度的功率换算系数 k_{HT} Factor k_{HT} for different side 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

参考标准 Reference standards

名称 Title	中国国家标准 Chinese standard	IEC标准 IEC standard
	Q/321081 KJA015-2018	
《旋转电机 定额和性能》 Rotating electrical machines - Part 1: Rating and performance	GB/T 755	IEC 60034-1
《旋转电机(牵引电机除外)确定损耗和效率的试验方法》 Rotating electrical machines - Part 2: Methods for determining losses and efficiency of rotating electrical machinery from tests (excluding machines for traction vehicles)	GB/T 755.2	IEC 60034-2
《旋转电机结构型式、安装型式及接线盒位置的分类（IM代码）》 Rotating electrical machines; part 7: classification of types of constructions and mounting arrangements (IM code)	GB/T 997	IEC 60034-7
《三相异步电动机试验方法》 Rotating electrical machines - Part 2-1: Standard methods for determining losses and efficiency from tests (excluding machines for traction vehicles)	GB/T 1032	IEC 60034-2-1
《旋转电机 线端标志与旋转方向》 Rotating electrical machines - Part 8: Terminal markings and direction of rotation	GB/T 1971	IEC 60034-8
《旋转电机冷却方法》 Rotating electrical machines; part 6: methods of cooling (IC code)	GB/T 1993	IEC 60034-6
《电工电子产品环境试验 第2部分：试验方法 试验Db 交变湿热（12h＋12h循环）》 Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	GB/T 2423.4	IEC 60068-2-30
《旋转电机尺寸和输出功率等级 第1部分：机座号56 ~ 400和凸缘号55 ~ 1080》 Dimensions and output series for rotating electrical machines; part 1: frame numbers 56 to 400 and flange numbers 55 to 1080	GB/T 4772.1	IEC 60072-1
《旋转电机整体结构的防护等级（IP代码）-分级》 Rotating electrical machines - Part 5: Degrees of protection provided by the integral design of rotating electrical machines (IP code); Classification	GB/T 4942.1	IEC 60034-5
《轴中心高为56 mm及以上电机的机械振动 振动的测量、评定及限值》 Rotating electrical machines - Part 14: Mechanical vibration of certain machines with shaft heights 56 mm and higher; Measurement, evaluation and limits of vibration severity	GB/T 10068	IEC 60034-14
《旋转电机噪声测定方法及限值 第1部分：旋转电机噪声测定方法》 Acoustics - Test code for the measurement of airborne noise emitted by rotating electrical machines	GB/T 10069.1	ISO 1680
《旋转电机噪声测定方法及限值 第3部分：噪声限值》 Rotating electrical machines - Part 9: Noise limits	GB/T 10069.3	IEC 60034-9
《中小型旋转电机通用安全要求》 General requirements for safety of small and medium size rotating electrical machines	GB/T 14711	
《中小型三相异步电动机能效限定值及能效等级》 Minimum allowable values of energy efficiency and energy efficiency grades for small and medium three-phase asynchronous motors	GB 18613	IEC 60034-30
《电气绝缘 耐热性和表示方法》 Electrical insulation - Thermal evaluation and designation	GB/T 11021	IEC 60085
《电工电子产品自然环境条件温度和湿度》 Classification of environmental conditions - Part 2-1: Environmental conditions appearing in nature - Temperature and humidity	GB/T 4797.1	IEC 60721-2-1
《标准电压》 IEC standard voltages	GB/T 156	IEC 60038
《旋转电机热保护》 Rotating electrical machines - Part 11: Thermal protection	GB/T 13002	IEC 60034-11
《单速三相笼型感应电动机起动性能》 Rotating electrical machines - Part 12: Starting performance of single-speed three-phase cage induction motors	GB/T 21210	IEC 60034-12
《旋转电机绝缘结构功能性评定 总则》 Rotating electrical machines -Functional evaluation of insulation systems -General guidelines	GB/T 17948.7	IEC 60034-18-1
《旋转电机电压型变频器供电的旋转电机无局部放电 (I 型) 电气绝缘结构的鉴别和质量控制试验》 Rotating electrical machines - Part 18-41: Partial discharge free electrical insulation systems (Type I) used in rotating electrical machines fed from voltage converters - Qualification and quality control tests	GB/T 22720.1	IEC 60034-18-41
《旋转电机效率分级（IE代码） 第1部分：电网供电的交流电动机》 Rotating electrical machines. Part 30-1. Efficiency classes of line operated AC motors (IE code)	GB/T 32891.1	IEC 60034-30-1
《电工电子产品应用环境条件第3部分：有气候防护场所固定使用》 Environmental conditions existing in the application of electric and electronic products - Section 3: Stationary use at weather-protected locations	GB/T 4798.3	IEC 60721-3-3

噪声

噪声值（直接供电运行）

噪声值根据 DIN EN ISO 1680 标准在噪音室测得。表面声压级噪声 L_{pfa} 计算表示单位为 dB（A）。声压级噪声的空间平均值是在其测量面上测得的。测量面是距离电动机表面一立方米的地方。声功率级噪声用 L_{WA} 来表示，单位为 dB（A）。选型数据表中所给出的噪声值仅适用于全封闭自扇冷却（冷却方式：IC411）电动机在 50 Hz 电源供电空载运行时的情况，容差为 +3 dB。当在 60 Hz 电源下空载运行时，偏差值大约为 +4 dB。

振动

所有电动机转子都使用半键按照 A 级（标准）振动等级进行动态平衡。

电动机在空载时测得振动速度有效值不超过下表中的 A 级所列值。

Noise levels

Noise levels for mains-fed operation

The noise levels are measured in accordance with DIN EN ISO 1680 in a dead room. It is specified as the A-valued measuring-surface sound pressure level L_{pfa} in dB (A). This is the spatial mean value of the sound pressure levels measured on the measuring surface. The measuring surface is a cube 1 m away from the motor surface. The sound power level is also specified as L_{WA} in dB (A). The specified values in Technical data table are only valid for totally enclosed fan cooling (cooling method: IC411) motor with no load at 50 Hz with no load, and the tolerance is +3 dB. While motor operating 60 Hz with no load, the values are approximately +4 dB (A) higher.

Vibration

1LE8 rotors are dynamically balanced to severity grade A using a half key.

Table below contains the effective vibration values for unloaded motors.

振动等级 Vibration Grade	机座号 Frame size (mm)	H>132	
	安装方式 Mounting	位移 Vibration displacement/(μm)	速度 Vibration velocity/(mm/s)
A	自由悬置 Free suspension	45	2.8
	刚性安装 Rigid mounting	37	2.3
			2.8[1)]
B	自由悬置 Free suspension	29	1.8
	刚性安装 Rigid mounting	24	1.5
			1.8[1)]

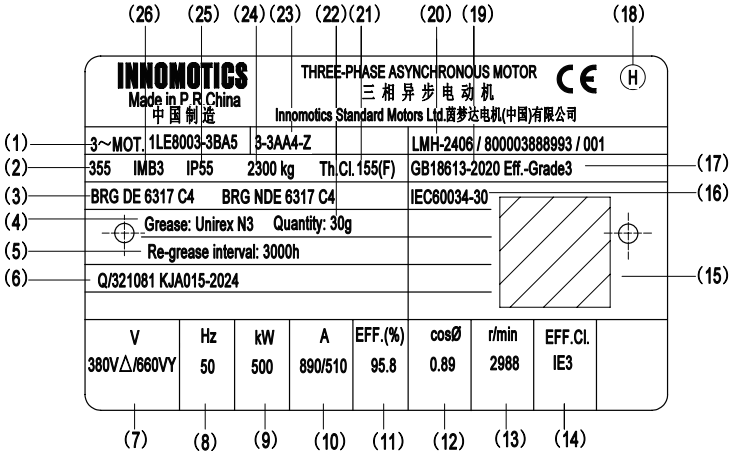
注：

[1)] 该值为 GB/T 10068-2020 中定义的轴中心高 H>132 mm 的两极电机，当两倍电网频率占主导时的振动速度限值。

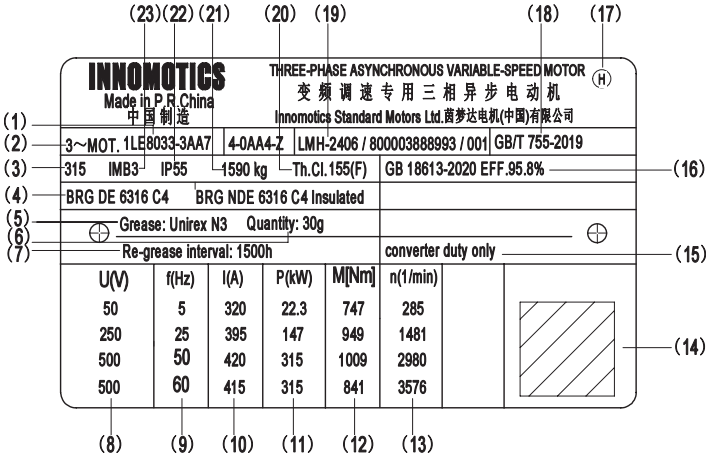
Note:

[1)] The level are vibration velocity limit when the twice line frequency vibration level is dominant defined by GB/T 10068-2020, for 2p motors that frame size bigger than 132mm.

铭牌信息 Nameplate



1	三相异步电动机	Three-phase low-voltage motor	14	IEC能效等级	IEC efficiency class
2	机座号	Frame size	15	二维码	Scan code
3	轴承	Bearing	16	IEC标准	IEC standard
4	润滑脂类型	Grease type	17	中国能效等级	China efficiency class
5	再润滑周期	Re-grease interval	18	平衡方式	Balance method
6	执行标准	Standards	19	中国国家标准	GB standard
7	额定电压	Rated voltage and Winding connections	20	产品序列号	Series number
8	频率	Frequency	21	热分级	Thermal class
9	额定功率	Rated output	22	加注润滑脂重量	Re-greasing quantity
10	额定电流	Rated current	23	电机重量	Motor weight
11	效率	Efficiency	24	订货号	Order No.
12	功率因数	Power factor	25	防护等级	Degree of protection
13	额定转速	Rated speed	26	安装结构形式	Type of construction



1	订货号	Order No.	13	额定转速	Rated speed
2	三相异步电动机	Three-phase low-voltage motor	14	二维码	Scan code
3	机座号	Frame Size	15	变频专用	Converter duty only
4	轴承	Bearing	16	中国国家标准	GB standard
5	润滑脂类型	Grease type	17	平衡方式	Balance method
6	加注润滑脂重量	Re-greasing quantity	18	IEC标准	IEC standard
7	再润滑周期	Re-grease interval	19	产品序列号	Series number
8	额定电压	Rated voltage and Winding connections	20	热分级	Thermal class
9	频率	Frequency	21	电机重量	Motor weight
10	额定电流	Rated current	22	防护等级	Degree of protection
11	额定功率	Rated output	23	安装结构形式	Type of construction
12	额定转矩	Rated torque			

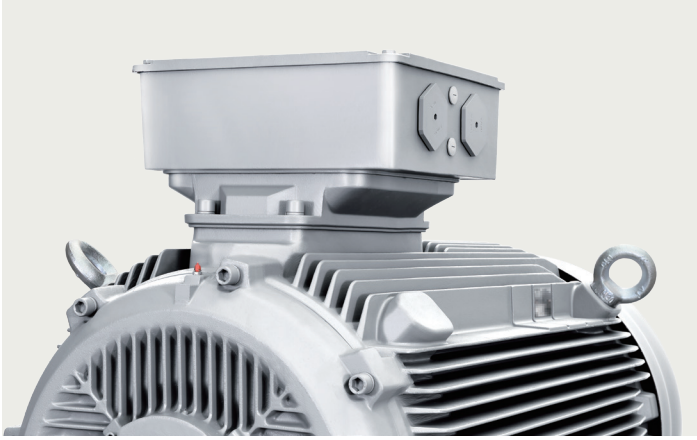
机械特性 Mechanical design

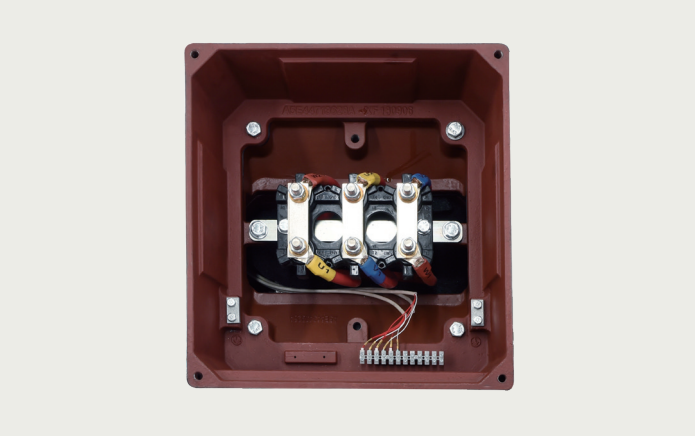
接线盒

接线盒标准位置处于机座顶端，且自身可4×90° 旋转安装，从而使电缆可以从各个方向进入。315机座的接线盒有两个主进线孔，355机座的接线盒有三个主进线孔，所有进线孔采用螺塞密封。

Connection box

The connection box is located on the top of motor housing as standard, and can be rotated by 4×90° to allow for cable entry from each direction. The connection box of FS315 have 2 main cable entries，the connection box of FS355 have 3 main cable entries，all cable entries sealed by screwed plug.





标准接线盒 Connection boxes technical data

机座号 Frame Size	主接线端子数 No. of main terminal	主接线端子螺纹 Main terminal thread	主进线孔 Main cable entry	最大辅助端子数 [1] Max. auxiliary terminal	辅助电缆进线孔 [2] Auxiliary cable entry
315	6	M12	2xM72×2	24	2xM20×1.5
355	6	M16	3xM72×2	24	2xM20×1.5

注：
[1] 当电机所需辅助接线端子数量超过 24 个时，应选用辅助接线盒（选件号 L97）。辅助接线盒有 2 个 M20×1.5 的螺纹孔用于安装葛兰，这两个螺纹孔由闷盖密封
[2] 当电机配置了温度传感器、热敏电阻或防潮加热带时，接线盒上会带有 2 个辅助电缆进线孔

[1] If the number of auxiliary terminal is over 24, the auxiliary terminal box shall be selected (option code L97). Two M20×1.5 thread holes are provided for gland, and these two holes are sealed with plugs when motor delivered
[2] When equipped with temperature sensor, thermistor，resistance thermometer or anti-condensation heating, the junction box will have two auxiliary cable inlet holes

接线盒位置

接线盒除标准位置外，还可处于电动机机座的左上侧或右上侧。电动机接线盒位置可以在电动机订货号的第 16 位用数字 表示出。

接线盒的位置是指从电动机驱动端来看的位置。

- 标配接线盒在顶部，电动机订货号的第 16 位数字为 4；
- 接线盒在右上侧，电动机订货号的第 16 位数字为 5；
- 接线盒在左上侧，电动机订货号的第 16 位数字为 6。

Location of the connection box

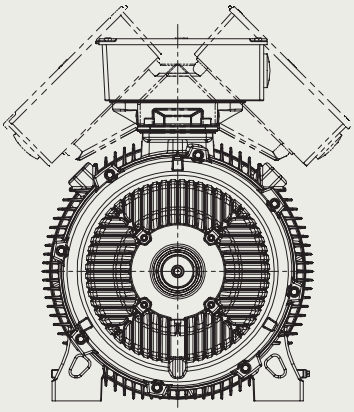
Besides standard position, the connection box also can be on the right or left of motor housing. The position of terminal box can be indicated on the 16th digit of motor order code.

The position of connection box is described by viewed from drive end (DE).

- On top (Standard), 16th position of Motor Order No. digit 4.
- On RHS, 16th position of Motor Order No. digit 5.
- On LHS, 16th position of Motor Order No. digit 6.

在顶部的（标配），电动机订货号的
第 16 位数字为 4
On top (Standard), 16th position of
Motor Order No. digit 4.

左上侧（选配），电动机订货号的
第 16 位数字为 6
On LHS, 16th position of Motor
Order No. digit 6.



右上侧（选配），电动机订货号的
第 16 位数字为 5
On RHS, 16th position of Motor
Order No. digit 5.

安装结构型式 Construction and mounting type

结构型式 Construction type	机座带底脚，端盖无法兰 With feet and without flange on the end-shield (DE)					
适用范围 Range of application	1LE8003&1LE8033	1LE8003	1LE8003	1LE8003	1LE8003	1LE8003
安装型式 Mounting type	IM B3 FS315~355	IM B6 FS315	IM B7 FS315	IM B8 FS315	IM V5 [1] FS315	IM V6 [2] FS315
示意图 Diagram						
电机编号第14位号上对应的字母 Letter, position 14th of Motor code	A	T	U	V	C	D

结构型式 Construction type	机座不带底脚，端盖有法兰 Without feet and with flange on the end-shield (DE)	机座带底脚，端盖有法兰 With feet and with flange on the end-shield (DE)		
适用范围 Range of application	1LE8003&1LE8033	1LE8003&1LE8033	1LE8003	1LE8003
安装型式 Mounting type	IM V1 [1] FS315~355	IM B35 FS315~355	IM V15 [1] FS315	IM V35 [2] FS315
示意图 Diagram				
电机编号第14位号上对应的字母 Letter, position 14th of Motor code	G	J	W	Y

[1] 室外使用时推荐使用护罩（选件号H00）；
[2] 当户外安装时，推荐对电机轴采取防护措施，避免水直接喷射到电机轴上；

[1] At outdoor application, the using of protective cover (option code H00) is recommended;
[2] At outdoor application the protection of shaft against jet-water is recommended;

冷却与通风

INNOMOTICS 1LE8标配装有径流（离心）式冷却风扇，其冷却效能与电动机的旋转方向无关（冷却方法符合 IEC60034-6 标准的 IC411）。

对于某些应用，可以考虑配置独立驱动风扇 ，如，

- 电动机在低速运行时，推荐使用独立驱动风扇，从而使电动机得到有效利用；
- 电动机在明显高于额定同步转速的速度运行时，同样推荐选用独立驱动风扇，这样有助于降低电动机噪声。

独立驱动风扇的选件号为 F70。当安装独立驱动风扇时，电动机的长度将增加 ΔL。

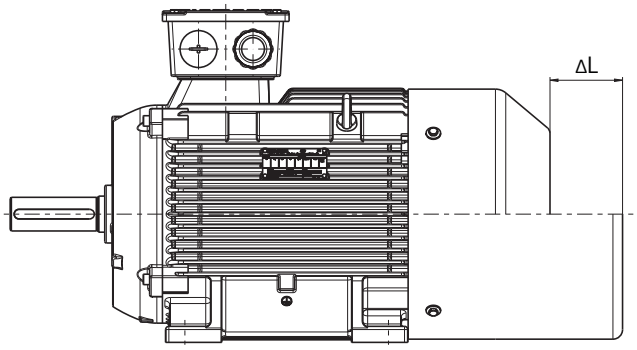
Cooling and ventilation

Standard motors are fitted with an radial flow fan for cooling in accordance with IEC 60034-6 cooling method.

For some special application, separately driven fan should be considered to be configurated.

- The use of a separately driven fan is recommended to increase motor utilization at low speed;
- When motor speed significantly higher than the synchronous speed, the separately fan is also recommended to be used. It can help reduce the motor noise.

The separately driven fan can be supplied already fitted, Option code F70. When the separately driven fan is mounted, the length of the motor increase by ΔL.



独立驱动风扇技术参数 Technical data for separately fan

对应电动机机座号 Motor frame size	电压 Voltage (V)	频率 Frequency (Hz)	功率 Rated output (W)	电流 Current (A)	转速 Speed (r/min)	ΔL (mm)
315	220 Δ / 380Y	50	1100	4.33/2.5	1350	180
355	220 Δ / 380Y	50	2200	8.8/5.1	1410	300

注：风扇可以在 210 ~ 240VD/360 ~ 420VY 50Hz 电源供电下运行，也可以在 220 ~ 260VD/380 ~ 480VY 60Hz 电源供电下运行。其他电源供电，须特殊询价。

Note: The fan can be running with supply 210 ~ 240VD/360 ~ 420VY 50Hz, and also 220 ~ 260VD/380 ~ 480VY 60Hz. Other voltage supply, possible on request.

轴承系统

INNOMOTICS 1LE8 系列电机标准配置深沟球轴承或角接触球轴承，这些轴承是可再润滑型的。

电机驱动端轴承浮动，非驱动端轴承固定。

标准配置的轴承可以承受一定的悬臂力，关于悬臂力参考第 12 页“电机轴允许的最大悬臂力”。当电机轴上需要承受的悬臂力较大时，可以考虑选择增强悬臂力的选项（选件号：L22），此时驱动端使用圆柱滚子轴承。

Bearing system

INNOMOTICS 1LE8 series motors are supplied with the ball bearing or angular contact ball bearing as standard. These bearings are regreasable type.

The bearing at DE is floating，and NDE bearing is fixed.

The standard bearing can endure a maximum cantilever force, referred to page 12 - Permissible cantilever forces. If higher cantilever force on the shaft required, the increased cantilever bearing design (Option code: L22) should be considered, accordingly roller bearing used at DE.

轴承选配 Bearing Assignment

机座号 Frame size	极数 Number of poles	标准配置 Standard design				选项配置 Optional design		
		水平安装 Horizontal		竖直安装 Vertical		增强悬臂力的设计（选项代码L22） Increased cantilever force (option code L22)		
		驱动端轴承 DE bearing	非驱动端轴承 NDE bearing	驱动端轴承 DE bearing	非驱动端轴承 NDE bearing	驱动端轴承 DE bearing	非驱动端轴承（水平安装） NDE beari（Horizontal）	非驱动段轴承（竖直安装） NDE bearing（Vertical）
315	2	6316 C4	6316 C4	6316 C4	7316 B	NU316	6316 C4	O.R.
	4 to 8	6319 C4	6319 C4	6319 C4	7319 B	NU319	6319 C4	O.R.
355	2	6317 C4	6317 C4	6317 C4	7317 B	NU317	6317 C4	O.R.
	4 to 8	6320 C4	6320 C4	6320 C4	7320 B	NU320	6320 C4	O.R.

注：当 1LE8003 电机选择 L27 选项（非驱动端使用绝缘轴承）时，绝缘轴承的游隙为 C3，1LE8033 电机水平安装时，非驱动端标配绝缘轴承，竖直安装时驱动端标配绝缘轴承。

Note: When 1LE8003 motor using insulated bearings for NDE, option code L27, the clearance of the insulated bearings is C3.When the 1LE8033 motor is horizontal, insulation bearing is standard configuration in NDE side, and vertical insulation bearing is standard configuration in DE side.

轴承寿命（标称寿命）

轴承的标称额定寿命可根据 ISO 281 标准规定的标准计算程序计算出来的。如果电动机在该样本中所规定条件下运行，90 % 甚至更高比例的轴承的运行时间可达到标称寿命。通常，轴承的使用寿命取决于轴承规格、轴承载荷、运行条件、转速以及润滑脂寿命。

当电动机水平安装，且不受轴向力的情况下，电动机的轴承寿命至少能够达到 40,000 小时。在承受最大容许载荷的情况下，其寿命也至少有 20,000 小时，这里所说的轴承寿命，指的都是电动机在 50 Hz 下正常运行的情况。

当电动机在非正常的条件下运行时，轴承的寿命会缩短。如下面几种情况：

- 当电动机的运行速度高于额定速度时，由于电动机的振动增大，使得轴承受到额外的径向力和轴向力，导致其寿命减少；
- 当环境或设备等因素引起电动机振动加大时，同样轴承也会因此受到额外的径向力和轴向力，而导致其寿命减少；
- 当环境温度每升高 10 °C，润滑脂寿命以及再润滑时间缩短一半。

Bearing lifetime (nominal lifetime)

The nominal bearing lifetime is defined according standardized calculation procedures (ISO 281) and is reached or even exceeded for 90% of the bearings when the motors are operated in compliance with the data provide in the catalog. Generally, the bearing lifetime is defined by the bearing size, the bearing load, the operating condition, the speed and the grease lifetime.

The bearing lifetime of motors with horizontal type of construction is at least 40,000 hours if there is no additional axial loading at the coupling output and at least 20,000 hours with the maximum admissible loads. This assumes that the motor is operated at 50Hz.

When the motor runs outside of normal conditions, the bearing life will be reduced, such as the following conditions.

- When 1LE8 motor runs beyond the rated speed, the increase of motor vibration will result in the extra radial and axial force on bearing. This will reduce the life of bearing;
- When the motor vibration increase due to the environment or other equipment, the bearing also will endure more radial and axial force. This also will reduce the life of bearing;
- If the coolant temperature is increased by 10 °C, the grease lifetime and regreasing interval is halved.

润滑脂寿命和再润滑周期（电动机水平安装） Grease life (Horizontal installation）

机座号 Frame size	极数 Poles	再润滑周期（小时） Re-greasing interval(40 °C [1]) (h)		加注油脂量（克） Re-greasing quantity (g)
		1LE8003	1LE8033	
315	2	3000	1500	30
	4	4000	2000	40
	6，8	6000	3000	40
355	2	3000	1500	30
	4	4000	2000	60
	6，8	6000	3000	60

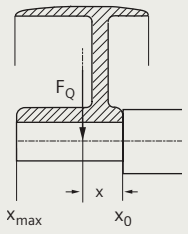
注：

[1] 当环境温度每升高 10 °C，润滑脂寿命以及再润滑时间缩短一半。

Note:

[1] If the coolant temperature is increased by 10 K, the grease lifetime and regreasing interval are halved.

电动机轴驱动端允许的最大悬臂力 Permissible cantilever forces on DE shaft



为了计算径向负载的最大悬臂力，据轴肩处的悬臂力 F_Q（N）必须位于轴伸端以内，（长度为 x）。长度 x［mm］是距离轴肩的距离。长度最长为 x_{max}，与轴伸长度相同。总的悬臂力 F_Q 使用以下公式计算。

$$F_Q = c \bullet F_U$$

预紧力系数 c 是从皮带制造商那得到的经验数值，下面的估算值可以应用。

- 对于一般扁平的皮带，c = 2；
- 对于 V 型皮带，c = 2 ~ 2.5；
- 对于特殊的皮带（取决于皮带类型和负载），c = 2 ~ 2.5。

计算切向力 F_U（N）使用下列公式：

$$F_U = 2 \bullet 10^7 \frac{P}{n \times D}$$

F_U 切向力（N）
P 额定功率（kW）
n 额定转速
D 滑轮直径（mm）

In order to calculate the admissible cantilever forces for a radial load, the line of force (i.e. the centerline of the pulley) of the cantilever force F_Q(N) must lie within the free shaft extension (dimension x).Dimension x [mm] is the distance between the point of application of force F_Q and the shaft shoulder. Dimension x_{max}. Corresponds to the length of the shaft extension. Total cantilever force is calculated using the following equation.

$$F_Q = c \bullet F_U$$

The pre-tension factor c is a value gained from experience from
the belt manufacturer. The following approximate value can be assumed.

- For normal flat leather belts with an idler pulley, c = 2.
- For v-belts, c = 2 to 2.5.
- For special synthetic belts (depending on the type and load),
  c = 2 to 2.5.

The circumferential force F_U(N) is calculated using the following equation.

$$F_U = 2 \bullet 10^7 \frac{P}{n \times D}$$

F_U circumferential force in N
P rated motor power (transmitted power) in kW
n rated motor speed
D pulleys in mm.

假设电动机不受任何轴向力，下面的表格中列出了允许的径向悬臂力值（单位：牛顿）。

The table below contains the permissible Radial Force values in Newtons with the assumption of zero axial forces.

机座号 Frame size	极数 poles	最大悬臂力 Admissible cantilever force		水平安装时最大轴向力 Admissible axial force at horizontal mounting type	
		x_0 N	x_{max} N	轴向力为向外的拉力时 Tensile load (N)	轴向力为向内的推力时 Thrust load (N)
315	2	5100	4530	6260	3660
	4	7850	6810	9290	6490
	6	8220	7120	10150	6970
	8	9400	8150	11380	7900
355	2	4870	4370	6350	3170
	4	8110	7120	10000	6520
	6	8870	7790	11050	7870
	8	9910	8700	12030	8550

机座号 Frame size	极数 Number of poles	轴伸朝下竖直安装时最大轴向力 Admissible cantilever force at vertical mounting type when DE downward		轴伸朝上竖直安装时最大轴向力 Admissible cantilever force at vertical mounting type when DE upward	
		轴向力为向下的拉力时 Tensile load (N)	轴向力为向上的推力时 Thrust load (N)	轴向力为向上的拉力时 Tensile load (N)	轴向力为向下的推力时 Thrust load (N)
315	2	13200	162	2762	10600
	4	20500	2043	5223	17300
	6	22100	3720	6900	19000
	8	24400	4006	7186	21200
355	2	13400	853	3653	10600
	4	24400	2894	6374	20900
	6	26600	5171	8651	23100
	8	29300	5509	8989	25800

电气特性 Electrical design

额定输出

INNOMOTICS 1LE8电动机的额定功率是指电动机在S1连续运行的情况下（IEC 60034-1），此时周围环境温度为 -20 °C ~ 40 °C，海拔高度不超过 1000 m。

电压、频率

IEC 60034-1 将电压和频率的偏差分为 A 类（电压偏差 ±5 %，频率偏差 ±2 %）和 B 类（电压偏差 ±10 %，频率偏差 +3 % / -5 %）。电动机均能够在 A 类和 B 类提供额定转矩。在 A 类中，温度比正常运行下温度大约提升 10 K。

Rated Output

INNOMOTICS 1LE8 motors rated output powers means that the motor runs under continuous duty S1 (IEC 60034 - 1) operation when operated at ambient temperature from -20 °C to 40 °C and at altitudes of up to 1000 m over sea.

Voltage and Frequency

IEC 60034-1 differentiates between Category A (combination of voltage deviation ±5 % and frequency deviation ±2 %) and Category B (combination of voltage deviation ±10 % and frequency deviation +3 % / -5 %) for voltage and frequency fluctuations. The motors can supply their rated torque in both Category A and B. In Category A, the temperature rise is approximately 10 K higher than during normal operation.

标准 Standard 60034 - 1	类别 Category A	类别 Category B
电压偏差 Voltage deviation	±5 %	±10 %
频率偏差 Frequency deviation	±2 %	+3 % / -5 %
根据标准，不推荐电动机在 B 类情况下长时间运行 According to the standard, longer operation is not recommended for Category B.		

电气数据公差

- 效率 η
  P_{rated} ≤ 150 kW：- 0.15 x (1 – η)
  P_{rated} > 150 kW：- 0.10 x (1 – η)
  效率 η 为小于 1 的值
- 功率因数：(1 – cos φ) / 6
  最小绝对值：0.02
  最大绝对值：0.07
- 转差率：±20 %（电动机的偏差 < 1 kW ± 30 % 时是允许的）
- 堵转电流：+20 %
- 堵转转矩：-15 % ~ +25 %
- 最大转矩：-10 %
- 转动惯量：±10 %

过载倍数

根据 IEC60034 标准要求，INNOMOTICS 1LE8 系列电动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。

绝缘系统

INNOMOTICS 1LE8 电动机绝缘系统具有可靠性、耐用性好和寿命长、耐冲击能力强的特点。

INNOMOTICS 1LE8 系列电动机标准设计温度等级为 155（F）。当 1LE8 电动机变频使用时，其绝缘系统按 155（F）温度等级使用。

Tolerance for electrical data

- Efficiency η at
  P_{rated} ≤ 150 kW: - 0.15 x (1 – η)
  P_{rated} > 150 kW: - 0.10 x (1 – η)
  With η being a decimal number
- Power factor - (1 – cos φ) / 6
  Minimum absolute value: 0.02
  Maximum absolute value: 0.07
- Slip ±20 % (for motors < 1 kW ±30 % is admissible)
- Locked-rotor current +20 %
- Locked-rotor torque -15 % to +25 %
- Breakdown torque -10 %
- Moment of inertia ±10 %

Overload times

According to IEC60034, INNOMOTICS 1LE8 series motors are designed to withstand overload capacity of 1.5 times rated current for 2 minutes at rated voltage and frequency.

Insulation system

The insulation system of INNOMOTICS 1LE8 results in high reliability, a long service life and high resistance to stress, for example, during starting or under overload conditions.

INNOMOTICS 1LE8 series motors are designed for temperature class 155 (F). at VSD operation, the motors can be used in temperature class 155 (F).

电动机保护

电动机过热保护

电动机热保护是指将温度保护传感器或温度检测传感器嵌入电动机定子绕组或其他适当的地方，从而使其不会因为过热而受到破坏。

不同的电动机热保护方式可以在 1LE8 电动机订货号的第 15 位采用不同的字母或者选件号来表示。下面是电动机的绕组保护和轴承保护的几种保护方式。

绕阻保护

■ **PTC 热敏电阻温度保护**

目前，最常用的电动机绕组过热保护方式是采用在电动机绕组中安装 PTC 热敏电阻进行保护。由于热敏电阻的热容量较低以及其在绕足间优良的热传导特性，绕组温度可被准确的监控。当达到极限温度时（标称跳闸温度），PTC 热敏电阻阻值会出现一个阶跃变化。这一变化被跳闸装置捕捉后，即可断开辅助回路。

PTC 热敏电阻本身不能耐受大电流和高电压。否则会导致半导体器件损坏。PTC 热敏电阻和跳闸装置的开关滞后效应小，因此可以实现快速重起。对于重载起动、起动频率高、负载变化大、环境温度高或电源波动大等应用场合，建议电动机使用该类保护。1LE8033 电机标配两组三芯串联的 PTC 热敏电阻，其中一组用于在电动机跳闸前报警，一组用于跳闸，报警温度为 145 °C，跳闸温度为 155 °C。

Motor protection

Motor thermal overload protection

Motor thermal protection means to use of thermal protectors and thermal detectors incorporated into the stator windings or placed in other suitable positions in motor in order to protect them against serious damage due to thermal overloads.

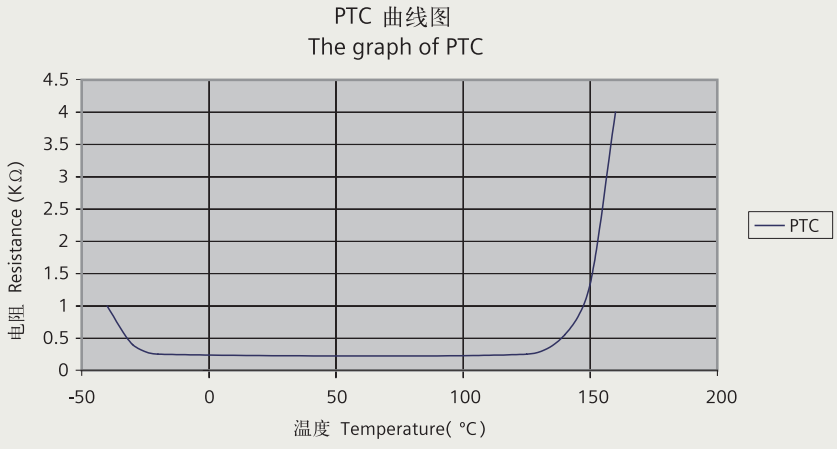
The order variants for motor protection are coded with letters in the 15th position of the Motor Order No., or ordered with Option code. Some protection method about winding protection and bearing protection are shown in the following.

Winding protection

■ **PTC thermistors protection**

The most comprehensive protection against thermal overloading of the motor is provided by PTC thermistors (thermistor motor protection) installed in the motor winding. The temperature of the winding can be accurately monitored thanks to its lowheating capacity and the excellent heat contact with the winding. When a limit temperature is reached (nominal tripping temperature), the resistance of PTC thermistors will have a step change. This is evaluated by a tripping unit and can be used to open auxiliary circuits.

The PTC thermistors themselves cannot be subjected to high currents and voltages. This would result in destruction of the semiconductor. The switching hysteresis of the PTC thermistor and tripping unit is low, which supports fast restarting of the drive. Motors with this type of protection are recommended for heavy duty starting, switching duty, extreme changes in load, high ambient temperatures or fluctuating supply systems. 1LE8033 Motor winding is protected with two sets of three temperature sensors as standard, one set is for warning, another set for tripping. The warning temperature is 145 °C, and tripping temperature is 155 °C.



两种 PTC 热敏电阻温度保护

- 电动机绕组带一组三芯串联的 PTC 热敏电阻用于跳闸，跳闸温度为 155 °C，电动机订货号第 15 位字母为“B”，需 2 个辅助接线端子。
- 电动机绕组带两组三芯串联的 PTC 热敏电阻，其中一组用于在电动机跳闸前报警，一组用于跳闸，报警温度为 145 °C，跳闸温度为 155 °C，电动机订货号第 15 位字母为“C”，需 4 个辅助接线端子。

■ PT100 热敏电阻传感器温度保护

PT100 热敏电阻是一种精确高、灵敏度高的传感器，其线性温度阻值优于其他电阻式传感器，性能稳定、可靠性高，其特性曲线如下。

四种 PT100 热敏电阻温度保护

- 电动机绕组带 3 个 2 线制 PT100 测温元件，电动机订货号第 15 位字母为“H”，需 6 个辅助接线端子。
- 电动机绕组带 6 个 2 线制 PT100 测温元件，电动机订货号第 15 位字母为“J”，需 12 个辅助接线端子。
- 电动机绕组带 3 个 3 线制 PT100 测温元件，电动机订货号第 15 位字母为“Q”，需 9 个辅助接线端子。
- 电动机绕组带 6 个 3 线制 PT100 测温元件，电动机订货号第 15 位字母为“R”，需 18 个辅助接线端子。

2 alternatives of PTC protection

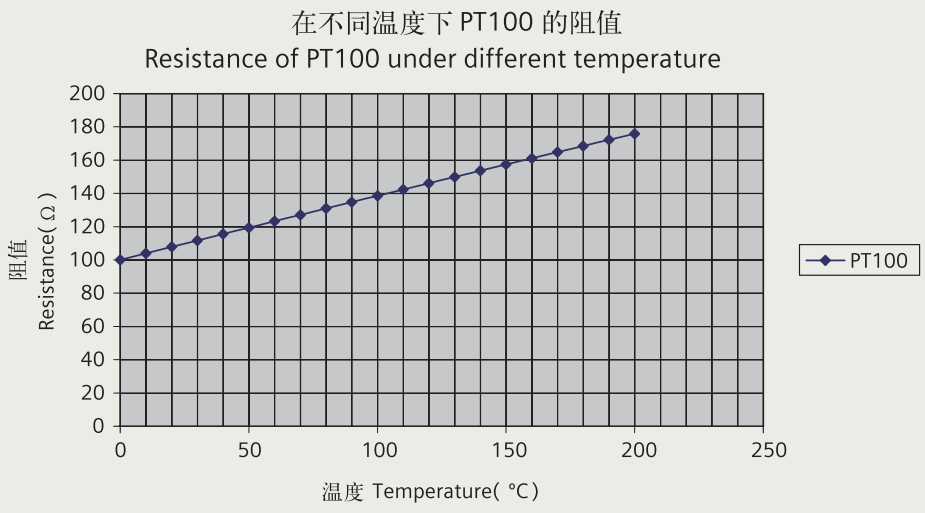
- Motor winding is protected with PTC thermistors with 3 embedded temperature sensors for tripping. Connection be done through 2 auxiliary terminals in the connection box. 15th position of Motor Order No. letter B.
- Motor winding is protected with two sets of three temperature sensors, one set is for warning, another set for tripping. The warning temperature is 145 °C, and tripping temperature is 155 °C. Connection be done through 4 auxiliary terminals in the connection box. 15th position of Motor Order No. letter C.

■ PT100 resistance thermometers protection

PT100 thermometers are a high precision, high sensitivity, better linear temperature resistance, more stable performance, and high reliability sensor, whose characteristics are as following.

4 alternatives of PT100

- Installation of 3 PT100 resistance thermometers. Connection be done through 6 auxiliary terminals in the connection box. 15th position of Motor Order No. letter H.
- Installation of 6 PT100 resistance thermometers. Connection be done through 12 auxiliary terminals in the connection box. 15th position of Motor Order No. letter J.
- Installation of 3 PT100 resistance thermometers in 3-wire connection, through 9 auxiliary terminals in the connection box. 15th position of Motor Order No. letter Q.
- Installation of 6 PT100 resistance thermometers in 3-wire connection, through 18 auxiliary terminals in the connection box. 15th position of Motor Order No. letter R.



■ PT1000 热敏电阻传感器温度保护

PT1000 热敏电阻可对电机绕组温度进行更精确地监测。

- 绕组中带一个单支两线制 PT1000 测温元件，电机订货号第 15 位字母为“K”，需 2 个辅助接线端子。
- 绕组中带两个单支两线制 PT1000 测温元件，电机订货号第 15 位字母为“L”，需 4 个辅助接线端子。

轴承保护

INNOMOTICS 1LE8 电动机轴承标配不带任何保护。对于某些苛刻的应用，推荐对轴承采取保护措施。轴承保护是通过在电动机驱动端和非驱动端的轴承端盖拧入温度传感器来进行保护。温度传感器的引接线引入电动机主接线盒内。

电机驱动端和非驱动端轴承位置各安装 1 个热电阻传感器，其中：
安装单支两线制热电阻传感器，选项代码为 Q72，需 4 个辅助接线端子；
安装单支三线制热电阻传感器，选项代码为 Q78，需 6 个辅助接线端子；
安装双支三线制热电阻传感器，选项代码为 Q79，需 12 个辅助接线端子。

防潮加热保护

当电动机处于较为恶劣的环境时，比如湿度非常大或者昼夜温差比较大，电动机的绕组很可能出现凝露的现象，这样会带来电动机烧毁的风险。对于这种情况，建议选用防潮加热带对电机进行保护，电机驱动端和非驱动端的绕组将各配一防潮加热带，需4个辅助接线端子。

电动机防潮加热带必须在电动机工作过程中处于不工作状态；当电动机停机时，防潮加热带必须启动工作，为绕组加热。防潮加热带的电气参数如下表所示。

■ PT1000 resistance thermometers protection

The PT1000 thermistor can monitor the temperature of the motor winding more accurately.

- Installation of 1 single 2 wires PT1000 resistance thermometers. Connection be done through 2 auxiliary terminals in the connection box. 15th position of Motor Order No. letter K.
- Installation of 2 single 2 wires PT1000 resistance thermometers. Connection be done through 4 auxiliary terminals in the connection box. 15th position of Motor Order No. letter L.

Bearing protection

INNOMOTICS 1LE8 motors bearing has no protection as standard. For some severe application, such as high load, high coolant temperature and etc., the bearing is recommended to be protected. The bearing is protected through thermometers screwed into the bearing plates of motor driven end (DE) and non-drive-end (NDE). The wires are routed through the main connection box.

The resistance thermometer is installed at each position of DE and NDE bearing, where:
1 PT100 resistance thermometer - 2-wire input (4 terminals), option code Q72;
1 PT100 resistance thermometer - 3-wire input (6 terminals), option code Q78;
2 PT100 resistance thermometer - 3-wire input (12 terminals), option code Q79。

Anti-condensation heater

Motors whose windings are at risk of condensation due to the climatic conditions, e.g. inactive motors in humid atmospheres or motors that are subjected to widely fluctuating temperatures can be equipped with anti-condensation heaters, 2 auxiliary terminals in connection box are needed.”

Anti-condensation heaters must be switched off during operation. When motor shut down, the heaters must be switched on.

防潮加热带电气参数 Electrical data of Anti-condensation heater

机座号 Frame size	功率 Power（W）	电压 Vlotage
315	100	220/230 V
355	100	220 V

变频应用 Converter fed application

INNOMOTICS 1LE8 电动机适于变转速、恒转速的各种应用，如风机、泵、压缩机、钢铁、起重、造纸等。

当变频器驱动电动机时，电磁干扰的程度大小取决于变频器的类型（种类，IGBT 数量，干扰控制措施及制造商）、布线、距离以及应用需求。在设计和应用阶段必须参考变频器制造商关于电磁兼容性的安装指导。

当 INNOMOTICS 1L8003/033 电动机变频应用（变频器供电），且输出额定功率时，电动机的使用温度等级为 155（F）。为了避免杂散电流对电动机轴承的损坏，其中 1LE8033 标配绝缘轴承，1LE8003变频使用时推荐使用绝缘轴承。请向茵梦达咨询关于绝缘轴承的详细信息。

变频器驱动运行

INNOMOTICS 1LE8003 电动机的标准绝缘系统设计要求，能够保证其在变频器供电电压不超过 460 V 时正常运行；1LE8033 采用加强绝缘系统设计要求，能够保证，其在变频器供电电压不超过500V时正常运行，选项支持最高到 690V。

INNOMOTICS 1LE8 电动机带有特定的负载时能够使用变频器驱动，其特定的负载扭矩如以下图表所示：

INNOMOTICS 1LE8 motors are suitable for pumps, fans, compressors, metal, crane, P&P and mechanical machine applications where variable or constant speed is required.

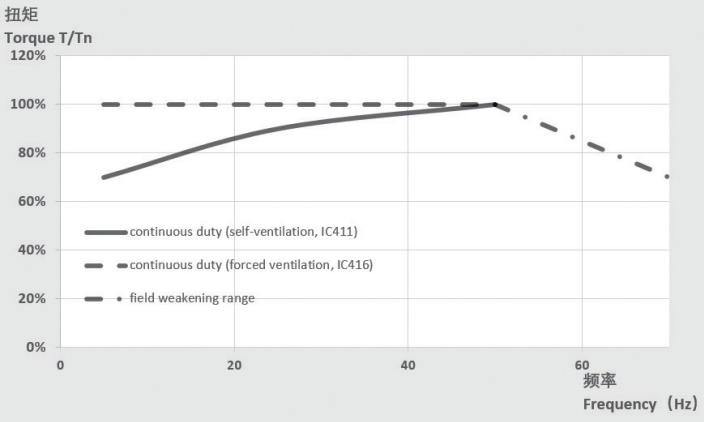
In application where the motor is driven by a converter, the degree of electrical interference depends on the type of converter used (type, number of IGBTs, interference suppression measures, and manufacturer), cabling, distance and application requirements.The installation guidelines of the converter manufacturer with regards to electromagnetic compatibility must be considered at all times during the design and implementation phases.

At rated output with converter fed operation, the motors will be used in temperature class 155 (F). To prevent damage as a result of bearing currents, insulated bearings are recommended to be assembled for 1LE8003 motor.Insulated bearing are standardized for 1LE8033 motor. Please inquire INNOMOTICS about the detailed information of insulated bearing.

Converter-fed operation

The standard insulation of the INNOMOTICS 1LE8 motors is designed such that operation is possible on the converter at mains voltage up to 460 V. The reinforced insulation of the INNOMOTICS 1LE8033 motors is designed such that operation is possible on the converter at mains voltage up to 500 V, max 690 V as option.

INNOMOTICS 1LE8 motors are capable for converter-fed operation with certain characteristics load, of which the load torque characteristics is referred in the following diagram:



当负载转矩在允许的转矩范围内时，电动机能够自扇冷却；当负载转矩超过所允许的转矩时，电动机需要强迫冷却。

在电动机运行速度超过额定转速时，噪声和振动值将增加，并且轴承的寿命将缩短。需要注意再润滑周期和润滑脂的寿命。

变频运行时当频率超过 60 Hz 时，必需按照特定的限值进行动平衡。

By usage with admissible torque and below, the motor can be operated with self cooling; by usage over the admissible torque line, the motor with forced ventilation is needed.

At operating speeds above rated speed the noise and vibration levels increase and the bearing life time reduce. Attention should be paid to the re-greasing intervals and the grease service life.

For converter-fed operation with frequencies greater than 60 Hz special balancing is required for compliance with the specified limit values.

INNOMOTICS 1LE8003 电动机所允许的最大安全转速如下表

The allowed maximum safe operating speed of INNOMOTICS 1LE8003 motors shows the diagram

机座号 Frame Size	2 极 2 pole		4 极 4 pole		6 极 6 pole		8 极 8 pole	
	最高转速 Max. rpm	最大频率 fmax	最高转速 Max. rpm	最大频率 fmax	最高转速 Max. rpm	最大频率 fmax	最高转速 Max. rpm	最大频率 fmax
315	3600	60	2300	77	1800	90	1400	93
355	3600	60	2300	77	1800	90	1400	93

INNOMOTICS 1LE8033 电动机所允许的最大安全转速如下表

The allowed maximum safe operating speed of INNOMOTICS 1LE8033 motors shows the diagram

机座号 Frame Size	2 极 2 pole		4 极 4 pole		6 极 6 pole		8 极 8 pole	
	最高转速 Max. rpm	最大频率 fmax	最高转速 Max. rpm	最大频率 fmax	最高转速 Max. rpm	最大频率 fmax	最高转速 Max. rpm	最大频率 fmax
315	3600	60	3000	100	2950	147	2950	196
355	3600	60	2500	83	2950	125	2500	166

电压承受值

绕组绝缘的电介质应力决定于：

- 电压峰值，上升时间以及变频器产生的脉冲频率；
- 变频器与电动机连接电缆的特性和长度；
- 绕组结构和其他系统参数，尤其是绝缘系统中不同绕组的对地电压（代表了绝缘系统的电介质应力）。

图表所示为 INNOMOTICS 1LE8 电动机标准绝缘能承受电压的峰值和上升时间：

Voltage withstand levels

The dielectric stress of the winding insulation is determined by:

- the peak voltage, rise time and frequency of the impulses produced by the converter.
- the characteristics and the length of the connection leads between the converter and motor.
- the winding construction and other system parameters, especially the voltages between the different parts of the winding and the ground represent dielectric stress at the insulation system.

The standard insulation of the INNOMOTICS 1LE8 motors is designed to withstand voltage peak and rise time which is showed in the diagram:

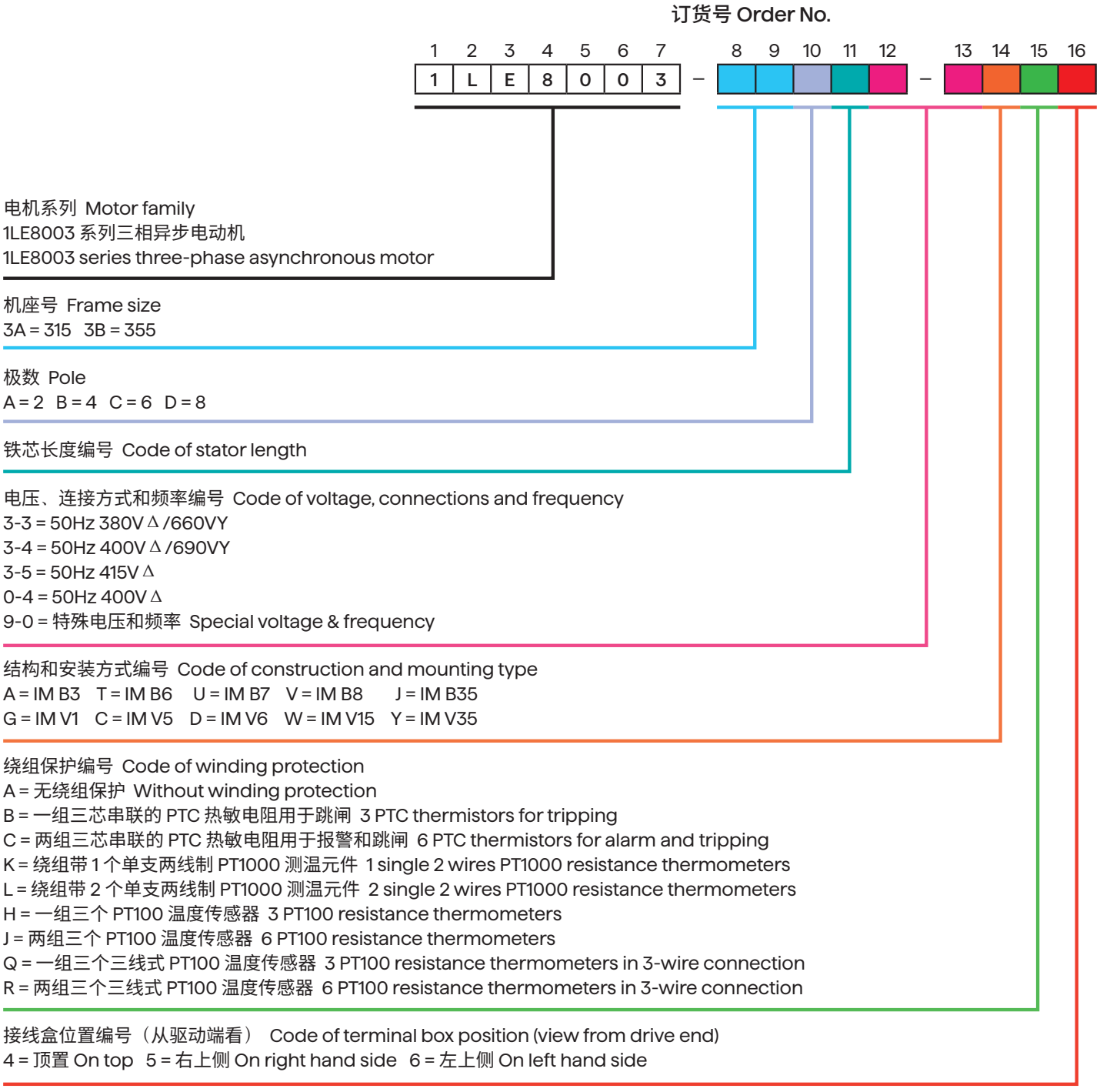
有限变频应用数据 Limited VSD application data

型号 Type	电机额定电压 Rated voltage	允许的电压峰值 Permitted voltage peaks		升压时间&最大压差 Rise time & Max dU
1LE8003	≤690 V DOL	U_{PG} = 2200 V_{PP}	U_{PP} = 3000 V_{PP}	0.1μs Max. dU=900V 0.2μs Max. dU=1050V 0.4μs Max. dU=1260V
	≤480 V Inverter			
1LE8033	500 V Inverter	$U_{Phase-Ground}$ = 2800 V_{PP}	$U_{Phase-Phase}$ = 3200 V_{PP}	
	690 V Inverter	$U_{Phase-Ground}$ = 3000 V_{PP}	$U_{Phase-Phase}$ = 4400 V_{PP}	

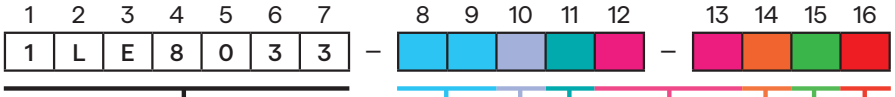
注：表格中峰值电压为峰峰值电压

Note: Voltages specified are peak-peak values（Vpk/pk）

订货号 Order No.


订货号 Order No.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
1 L E 8 0 0 3 – –
电机系列 Motor family
1LE8003 系列三相异步电动机
1LE8003 series three-phase asynchronous motor
机座号 Frame size
3A = 315 3B = 355
极数 Pole
A = 2 B = 4 C = 6 D = 8
铁芯长度编号 Code of stator length
电压、连接方式和频率编号 Code of voltage, connections and frequency
3-3 = 50Hz 380V Δ /660VY
3-4 = 50Hz 400V Δ /690VY
3-5 = 50Hz 415V Δ
0-4 = 50Hz 400V Δ
9-0 = 特殊电压和频率 Special voltage & frequency
结构和安装方式编号 Code of construction and mounting type
A = IM B3 T = IM B6 U = IM B7 V = IM B8 J = IM B35
G = IM V1 C = IM V5 D = IM V6 W = IM V15 Y = IM V35
绕组保护编号 Code of winding protection
A = 无绕组保护 Without winding protection
B = 一组三芯串联的 PTC 热敏电阻用于跳闸 3 PTC thermistors for tripping
C = 两组三芯串联的 PTC 热敏电阻用于报警和跳闸 6 PTC thermistors for alarm and tripping
K = 绕组带 1 个单支两线制 PT1000 测温元件 1 single 2 wires PT1000 resistance thermometers
L = 绕组带 2 个单支两线制 PT1000 测温元件 2 single 2 wires PT1000 resistance thermometers
H = 一组三个 PT100 温度传感器 3 PT100 resistance thermometers
J = 两组三个 PT100 温度传感器 6 PT100 resistance thermometers
Q = 一组三个三线式 PT100 温度传感器 3 PT100 resistance thermometers in 3-wire connection
R = 两组三个三线式 PT100 温度传感器 6 PT100 resistance thermometers in 3-wire connection
接线盒位置编号（从驱动端看） Code of terminal box position (view from drive end)
4 = 顶置 On top 5 = 右上侧 On right hand side 6 = 左上侧 On left hand side

订货号 Order No.



电机系列 Motor family
1LE8033 系列三相异步电动机
1LE8033 series three-phase asynchronous motor

机座号 Frame size
3A = 315 3B = 355

极数 Pole
A = 2 B = 4 C = 6 D = 8

铁芯长度编号 Code of stator length

电压、连接方式和频率编号 Code of voltage, connections and frequency
4-0 = 500V Δ
0-6 = 690VY

结构和安装方式编号 Code of construction and mounting type
A = IM B3 J = IM B35 G = IM V1

绕组保护编号 Code of winding protection
C = 两组三芯串联的 PTC 热敏电阻用于报警和跳闸 6 PTC thermistors for alarm and tripping
K = 绕组带 1 个单支两线制 PT1000 测温元件 1 single 2 wires PT1000 resistance thermometers
L = 绕组带 2 个单支两线制 PT1000 测温元件 2 single 2 wires PT1000 resistance thermometers
H = 一组三个 PT100 温度传感器 3 PT100 resistance thermometers
J = 两组三个 PT100 温度传感器 6 PT100 resistance thermometers
Q = 一组三个三线式 PT100 温度传感器 3 PT100 resistance thermometers in 3-wire connection
R = 两组三个三线式 PT100 温度传感器 6 PT100 resistance thermometers in 3-wire connection

接线盒位置编号（从驱动端看） Code of terminal box position (view from drive end)
4 = 顶置 On top 5 = 右上侧 On right hand side 6 = 左上侧 On left hand side

选型技术数据表 Technical data table

铸铁壳系列电机，Cast Iron Motors
IE3，中国能效等级 3 级

机座号 Frame Size	订货号 MLFB	额定功率 Rated Output	额定转速 Rated Speed 50Hz	额定转速 Rated Speed 60Hz	效率 Effeciency at (50HZ) 2/4load	效率 Effeciency at (50HZ) 3/4 load
		kW	rpm	rpm	%	%
	3000rpm 2-pole 380VD/660VY 50Hz					
315	1LE8003-3AA33-3□□□	220	2982	3578.4	95.8	95.86
315	1LE8003-3AA63-3□□□	250	2978	3573.6	95.8	95.86
315	1LE8003-3AA83-3□□□	280	2982	3578.4	95.8	95.86
315	1LE8003-3AA73-3□□□	315	2980	3576	95.8	95.86
355	1LE8003-3BA33-3□□□	355	2986	3583.2	95.8	95.71
355	1LE8003-3BA43-3□□□	400	2982	3578.4	95.8	95.71
355	1LE8003-3BA73-3□□□	450	2990	3588	95.8	95.71
355	1LE8003-3BA53-3□□□	500	2988	3585.6	95.8	95.71
	1500rpm 4-pole 380VD/660VY 50Hz					
315	1LE8003-3AB33-3□□□	220	1491	1789.2	96	96.16
315	1LE8003-3AB63-3□□□	250	1490	1788	96	96.16
315	1LE8003-3AB83-3□□□	280	1490	1788	96	96.16
315	1LE8003-3AB73-3□□□	315	1490	1788	96	96.16
355	1LE8003-3BB33-3□□□	355	1491	1789.2	96	96.28
355	1LE8003-3BB43-3□□□	400	1491	1789.2	96	96.28
355	1LE8003-3BB73-3□□□	450	1491	1789.2	96	96.28
355	1LE8003-3BB53-3□□□	500 [1)]	1490	1788	96	96.28
	1000rpm 6-pole 380VD/660VY 50Hz					
315	1LE8003-3AC63-3□□□	160	991	1189.2	95.8	96.11
315	1LE8003-3AC13-3□□□	185	991	1189.2	95.8	96.11
315	1LE8003-3AC73-3□□□	200	990	1188	95.8	96.11
315	1LE8003-3AC33-3□□□	220	991	1189.2	95.8	96.11
315	1LE8003-3AC83-3□□□	250	990	1188	95.8	96.11
355	1LE8003-3BC83-3□□□	280	993	1191.6	95.8	95.92
355	1LE8003-3BC23-3□□□	315	993	1191.6	95.8	95.92
355	1LE8003-3BC33-3□□□	355	993	1191.6	95.8	95.92
355	1LE8003-3BC43-3□□□	400 [1)]	993	1191.6	95.8	95.92
	750rpm 8-pole 380VD/660VY 50Hz					
315	1LE8003-3AD63-3□□□	132	740	888	94	94.4
315	1LE8003-3AD73-3□□□	160	740	888	94.3	94.7
315	1LE8003-3AD13-3□□□	185	741	889.2	94.5	94.9
315	1LE8003-3AD83-3□□□	200	740	888	94.6	95
355	1LE8003-3BD73-3□□□	220	745	894	94.6	95.01
355	1LE8003-3BD13-3□□□	250	743	891.6	94.6	95.01
355	1LE8003-3BD83-3□□□	280	744	892.8	94.6	95.01
355	1LE8003-3BD23-3□□□	315	743	891.6	94.6	95.01

注：[1)] 绝缘系统按 155（F）温度等级设计，在额定输出和直接供电时按 155（F）温度等级使用；
Note: [1)] Insulation system is designed for temperature class 155 (F). At rated output with line-fed operation, the motors can be utilized according to 155 (F).

机座号 Frame Size	订货号 MLFB	效率 Effeciency at (60HZ) 4/4 load	功率因数 Power factor at (50Hz) 4/4 load	功率因数 Power factor at (60Hz) 4/4 load	额定电流 Rated current at 380V 50Hz	额定电流 Rated current at 660V 50Hz
		%	–	–	A	A
	3000rpm 2-pole 380VD/660VY 50Hz					
315	1LE8003-3AA33-3□□□	95.8	0.9	0.91	390	225
315	1LE8003-3AA63-3□□□	95.8	0.9	0.91	440	255
315	1LE8003-3AA83-3□□□	95.8	0.9	0.91	495	285
315	1LE8003-3AA73-3□□□	95.8	0.91	0.91	550	315
355	1LE8003-3BA33-3□□□	95.8	0.89	0.89	630	365
355	1LE8003-3BA43-3□□□	95.8	0.89	0.89	710	410
355	1LE8003-3BA73-3□□□	95.8	0.89	0.89	800	460
355	1LE8003-3BA53-3□□□	95.8	0.89	0.89	890	510
	1500rpm 4-pole 380VD/660VY 50Hz					
315	1LE8003-3AB33-3□□□	96.2	0.85	0.85	410	235
315	1LE8003-3AB63-3□□□	96.2	0.85	0.85	465	270
315	1LE8003-3AB83-3□□□	96.2	0.85	0.85	520	300
315	1LE8003-3AB73-3□□□	96.2	0.85	0.85	590	340
355	1LE8003-3BB33-3□□□	96.2	0.85	0.85	660	380
355	1LE8003-3BB43-3□□□	96.2	0.86	0.86	740	425
355	1LE8003-3BB73-3□□□	96.2	0.86	0.86	830	475
355	1LE8003-3BB53-3□□□	96.2	0.87	0.87	910	520
	1000rpm 6-pole 380VD/660VY 50Hz					
315	1LE8003-3AC63-3□□□	95.8	0.85	0.85	300	172
315	1LE8003-3AC13-3□□□	95.8	0.85	0.85	345	199
315	1LE8003-3AC73-3□□□	95.8	0.85	0.85	375	215
315	1LE8003-3AC33-3□□□	95.8	0.85	0.85	410	235
315	1LE8003-3AC83-3□□□	95.8	0.85	0.85	465	270
355	1LE8003-3BC83-3□□□	95.8	0.85	0.85	520	300
355	1LE8003-3BC23-3□□□	95.8	0.85	0.85	590	340
355	1LE8003-3BC33-3□□□	95.8	0.85	0.85	660	380
355	1LE8003-3BC43-3□□□	95.8	0.85	0.85	750	430
	750rpm 8-pole 380VD/660VY 50Hz					
315	1LE8003-3AD63-3□□□	94.5	0.8	0.8	265	154
315	1LE8003-3AD73-3□□□	94.5	0.8	0.8	320	186
315	1LE8003-3AD13-3□□□	95	0.8	0.8	370	215
315	1LE8003-3AD83-3□□□	95	0.8	0.8	400	230
355	1LE8003-3BD73-3□□□	95	0.81	0.81	435	250
355	1LE8003-3BD13-3□□□	95	0.81	0.81	495	285
355	1LE8003-3BD83-3□□□	95	0.81	0.81	560	320
355	1LE8003-3BD23-3□□□	95	0.81	0.81	620	360

选型技术数据表 Technical data table

铸铁壳系列电机，Cast Iron Motors
IE3，中国能效等级 3 级

机座号 Frame Size	订货号 MLFB	额定功率 Rated Output	额定转速 Rated Speed 50Hz	额定转矩 Rated torque	起动电流 Starting Current	起动转矩 Starting torqueStarting torque	最大转矩 Max torque
		kW	rpm	Nm	直接起动对额定转矩 (电流) 的倍数 For direct-on-line starting as multiple of the rated		
	3000rpm 2-pole 380VD/660VY 50Hz						
315	1LE8003-3AA33-3□□□	220	330	705	7.8	2.8	3.5
315	1LE8003-3AA63-3□□□	250	375	802	7.8	2.8	3.5
315	1LE8003-3AA83-3□□□	280	420	897	8	3.2	3.5
315	1LE8003-3AA73-3□□□	315	475	1009	8	3.2	3.5
355	1LE8003-3BA33-3□□□	355	550	1135	7.5	2.2	2.6
355	1LE8003-3BA43-3□□□	400	620	1281	7	2	2.4
355	1LE8003-3BA73-3□□□	450	690	1437	8.5	2.8	3.2
355	1LE8003-3BA53-3□□□	500	770	1598	8.5	2.8	3.2
	1500rpm 4-pole 380VD/660VY 50Hz						
315	1LE8003-3AB33-3□□□	220	355	1409	7	2.2	2.4
315	1LE8003-3AB63-3□□□	250	400	1602	7	2.2	2.4
315	1LE8003-3AB83-3□□□	280	450	1795	7	2.2	2.4
315	1LE8003-3AB73-3□□□	315	510	2019	7	2.2	2.4
355	1LE8003-3BB33-3□□□	355	570	2274	8.5	2.7	2.8
355	1LE8003-3BB43-3□□□	400	630	2562	8.5	2.7	2.8
355	1LE8003-3BB73-3□□□	450	710	2882	8.5	2.7	2.8
355	1LE8003-3BB53-3□□□	500 [1)]	780	3205	8	2.4	2.8
	1000rpm 6-pole 380VD/660VY 50Hz						
315	1LE8003-3AC63-3□□□	160	260	1542	7.8	2.3	2.4
315	1LE8003-3AC13-3□□□	185	300	1783	7.8	2.3	2.4
315	1LE8003-3AC73-3□□□	200	320	1929	7.8	2.3	2.4
315	1LE8003-3AC33-3□□□	220	355	2120	7.8	2.3	2.4
315	1LE8003-3AC83-3□□□	250	405	2412	7.8	2.3	2.4
355	1LE8003-3BC83-3□□□	280	450	2693	8.0	2	2.3
355	1LE8003-3BC23-3□□□	315	510	3029	8.0	2	2.3
355	1LE8003-3BC33-3□□□	355	570	3414	8.0	2	2.3
355	1LE8003-3BC43-3□□□	400 [1)]	640	3847	8	2.5	2.5
	750rpm 8-pole 380VD/660VY 50Hz						
315	1LE8003-3AD63-3□□□	132	230	1704	7	2.3	2.5
315	1LE8003-3AD73-3□□□	160	280	2065	7	2.3	2.5
315	1LE8003-3AD13-3□□□	185	320	2384	7	2.3	2.5
315	1LE8003-3AD83-3□□□	200	345	2581	7	2.3	2.5
355	1LE8003-3BD73-3□□□	220	375	2820	7.5	2.6	3
355	1LE8003-3BD13-3□□□	250	425	3213	7.5	2.6	3
355	1LE8003-3BD83-3□□□	280	475	3594	7.5	2.6	3
355	1LE8003-3BD23-3□□□	315	540	4049	7.5	2.6	3

注：[1)] 绝缘系统按 155（F）温度等级设计，在额定输出和直接供电时按 155（F）温度等级使用；

Note: [1)] Insulation system is designed for temperature class 155 (F). At rated output with line-fed operation, the motors can be utilized according to 155 (F).

机座号 Frame Size	订货号 MLFB	重量 Weight IMB3	转动惯量 Moment of inertia(J)	噪声 Noise LpfA	噪声 Noise LWA
		kg	kgm²	dB(A)	dB(A)
			3000rpm 2-pole 380VD/660VY 50Hz		
315	1LE8003-3AA33-3□□□	1380	2.9	81	96
315	1LE8003-3AA63-3□□□	1500	3.4	81	96
315	1LE8003-3AA83-3□□□	1520	3.4	81	96
315	1LE8003-3AA73-3□□□	1590	3.8	81	96
355	1LE8003-3BA33-3□□□	2020	5.5	86	101
355	1LE8003-3BA43-3□□□	2200	6.1	86	101
355	1LE8003-3BA73-3□□□	2270	6.5	86	101
355	1LE8003-3BA53-3□□□	2300	6.5	86	101
			1500rpm 4-pole 380VD/660VY 50Hz		
315	1LE8003-3AB33-3□□□	1480	5.1	73	88
315	1LE8003-3AB63-3□□□	1530	5.5	73	88
315	1LE8003-3AB83-3□□□	1610	6.0	73	88
315	1LE8003-3AB73-3□□□	1650	6.2	73	88
355	1LE8003-3BB33-3□□□	1960	7.2	81	96
355	1LE8003-3BB43-3□□□	2070	8.0	81	96
355	1LE8003-3BB73-3□□□	2290	9.4	81	96
355	1LE8003-3BB53-3□□□	2290	9.4	81	96
			1000rpm 6-pole 380VD/660VY 50Hz		
315	1LE8003-3AC63-3□□□	1370	6.5	68	83
315	1LE8003-3AC13-3□□□	1470	7.2	68	83
315	1LE8003-3AC73-3□□□	1540	7.8	68	83
315	1LE8003-3AC33-3□□□	1660	9.1	68	83
315	1LE8003-3AC83-3□□□	1700	9.3	68	83
355	1LE8003-3BC83-3□□□	2150	14.3	78	93
355	1LE8003-3BC23-3□□□	2180	14.3	78	93
355	1LE8003-3BC33-3□□□	2270	15.3	78	93
355	1LE8003-3BC43-3□□□	2270	15.3	78	93
			750rpm 8-pole 380VD/660VY 50Hz		
315	1LE8003-3AD63-3□□□	1320	5.9	72	87
315	1LE8003-3AD73-3□□□	1480	7.4	72	87
315	1LE8003-3AD13-3□□□	1680	9.3	72	87
315	1LE8003-3AD83-3□□□	1690	9.3	72	87
355	1LE8003-3BD73-3□□□	2140	14.2	73	88
355	1LE8003-3BD13-3□□□	2160	14.2	73	88
355	1LE8003-3BD83-3□□□	2230	15.2	73	88
355	1LE8003-3BD23-3□□□	2250	15.2	73	88

选型技术数据表 Technical data table

铸铁壳系列电机，Cast Iron Motors
IE3，中国能效等级 3 级

机座号 Frame Size	订货号 MLFB	额定功率 Rated Output	额定转速 Rated Speed 50Hz	效率 Efficiency at 50Hz 4/4 load	额定电流 Rated current at 500V 50Hz	额定转矩 Rated torque
		kW	rpm	%	A	Nm
	3000rpm 2-pole 500VD					
315	1LE8033-3AA34-0□□□	220	2982	95.8	295	705
315	1LE8033-3AA64-0□□□	250	2978	95.8	335	802
315	1LE8033-3AA84-0□□□	280	2982	95.8	375	897
315	1LE8033-3AA74-0□□□	315	2980	95.8	420	1009
355	1LE8033-3BA34-0□□□	355	2986	95.8	470	1135
355	1LE8033-3BA44-0□□□	400	2982	95.8	520	1281
355	1LE8033-3BA74-0□□□	450	2990	95.8	595	1437
355	1LE8033-3BA54-0□□□	485	2988	95.8	640	1550
	1500rpm 4-pole 500VD					
315	1LE8033-3AB34-0□□□	220	1491	96	315	1409
315	1LE8033-3AB64-0□□□	250	1490	96	360	1602
315	1LE8033-3AB84-0□□□	280	1490	96	400	1795
315	1LE8033-3AB74-0□□□	315	1490	96	450	2019
355	1LE8033-3BB34-0□□□	355	1491	96	495	2274
355	1LE8033-3BB44-0□□□	400	1491	96	580	2562
355	1LE8033-3BB74-0□□□	450	1491	96	630	2882
355	1LE8033-3BB54-0□□□	480	1490	96	660	3077
	1000rpm 6-pole 500VD					
315	1LE8033-3AC64-0□□□	155	991	95.5	225	1494
315	1LE8033-3AC14-0□□□	180	991	95.7	265	1735
315	1LE8033-3AC74-0□□□	190	992	95.7	275	1829
315	1LE8033-3AC34-0□□□	215	992	95.8	305	2070
315	1LE8033-3AC84-0□□□	245	991	95.8	350	2363
355	1LE8033-3BC84-0□□□	280	994	95.8	395	2693
355	1LE8033-3BC24-0□□□	315	994	95.8	445	3029
355	1LE8033-3BC34-0□□□	340	994	95.8	490	3270
355	1LE8033-3BC44-0□□□	380	993	95.8	575	3655
	750rpm 8-pole 500VD					
315	1LE8033-3AD64-0□□□	125	740	93.9	200	1613
315	1LE8033-3AD74-0□□□	155	740	94.2	235	2000
315	1LE8033-3AD14-0□□□	185	741	94.5	285	2384
315	1LE8033-3AD84-0□□□	200	740	94.6	300	2581
355	1LE8033-3BD74-0□□□	220	745	94.6	335	2820
355	1LE8033-3BD14-0□□□	250	743	94.6	375	3213
355	1LE8033-3BD84-0□□□	280	744	94.6	425	3594
355	1LE8033-3BD24-0□□□	315	733	94.6	470	4049

机座号 Frame Size	订货号 MLFB	起动转矩 Starting torqueStarting torque	最大转矩 Max torque	重量 Weight IMB3	转动惯量 Moment of inertia(J)
		直接起动对额定转矩（电流）的倍数 For direct-on-line starting as multiple of the rated		kg	kgm²
		3000rpm 2-pole 500VD			
315	1LE8033-3AA34-0□□□	2.8	3.5	1380	2.9
315	1LE8033-3AA64-0□□□	2.8	3.5	1510	3.4
315	1LE8033-3AA84-0□□□	3.2	3.5	1520	3.4
315	1LE8033-3AA74-0□□□	3.2	3.5	1590	3.8
355	1LE8033-3BA34-0□□□	2.2	2.6	2020	5.5
355	1LE8033-3BA44-0□□□	2	2.4	2200	6.1
355	1LE8033-3BA74-0□□□	2.8	3.2	2280	6.5
355	1LE8033-3BA54-0□□□	2.8	3.2	2300	6.5
		1500rpm 4-pole 500VD			
315	1LE8033-3AB34-0□□□	2.2	2.4	1480	5.1
315	1LE8033-3AB64-0□□□	2.2	2.4	1530	5.5
315	1LE8033-3AB84-0□□□	2.2	2.4	1610	6
315	1LE8033-3AB74-0□□□	2.2	2.4	1650	6.2
355	1LE8033-3BB34-0□□□	2.7	2.8	1960	7.2
355	1LE8033-3BB44-0□□□	2.7	2.8	2080	8
355	1LE8033-3BB74-0□□□	2.7	2.8	2290	9.4
355	1LE8033-3BB54-0□□□	2.4	2.8	2290	9.4
		1000rpm 6-pole 500VD			
315	1LE8033-3AC64-0□□□	2.3	2.4	1390	6.5
315	1LE8033-3AC14-0□□□	2.3	2.4	1480	7.2
315	1LE8033-3AC74-0□□□	2.3	2.4	1540	7.8
315	1LE8033-3AC34-0□□□	2.3	2.4	1670	9.1
315	1LE8033-3AC84-0□□□	2.3	2.4	1700	9.3
355	1LE8033-3BC84-0□□□	2	2.3	2150	14.3
355	1LE8033-3BC24-0□□□	2	2.3	2180	14.3
355	1LE8033-3BC34-0□□□	2	2.3	2270	15.3
355	1LE8033-3BC44-0□□□	2.5	2.5	2270	15.3
		750rpm 8-pole 500VD			
315	1LE8033-3AD64-0□□□	2.3	2.5	1320	5.9
315	1LE8033-3AD74-0□□□	2.3	2.5	1480	7.4
315	1LE8033-3AD14-0□□□	2.3	2.5	1680	9.3
315	1LE8033-3AD84-0□□□	2.3	2.5	1690	9.3
355	1LE8033-3BD74-0□□□	2.6	3	2140	14.2
355	1LE8033-3BD14-0□□□	2.6	3	2160	14.2
355	1LE8033-3BD84-0□□□	2.6	3	2230	15.2
355	1LE8033-3BD24-0□□□	2.6	3	2250	15.2

选件 Options

电动机订货号 Motor order code	选件号 Option Code [1]	描述 Description	应用范围 Application Scope
电压与频率 Voltages and frequency			
1LE8003-□□□□3-3□□□	–	380VD / 660VY 50Hz [2]	FS315-355
1LE8003-□□□□3-4□□□	–	400VD / 690VY 50Hz	FS315-355
1LE8003-□□□□0-4□□□	–	400VD 50Hz	FS315-355
1LE8003-□□□□3-5□□□	–	415VD 50Hz	FS315-355
1LE8003-□□□□9-0□□□	M2H	575VD，50Hz 功率输出 50Hz output	FS315-355
1LE8003-□□□□9-0□□□	M2B	380VD/660VY 60Hz（50Hz 功率输出 50Hz output）	FS315-355
1LE8003-□□□□9-0□□□	M2D	440VD 60Hz（50Hz 功率输出 50Hz output）	FS315-355
1LE8003-□□□□9-0□□□	M2F	460VD 60Hz（50Hz 功率输出 50Hz output）	FS315-355
1LE8033-□□□□0-6□□□	–	690VY 50Hz	FS315-355
绕组保护和轴承保护 Winding protection and bearing protection			
1LE8003-□□□□□-□□A□	A (15th digit)	无绕组保护 Without motor protection	FS315-355
1LE8003-□□□□□-□□B□	B (15th digit)	绕组带一组三芯串联的 PTC 热敏电阻用于跳闸，需用 2 个辅助接线端子 Motor protection with PTC thermistors with three embedded temperature sensors for tripping	FS315-355
1LE8003-□□□□□-□□C□ 1LE8033-□□□□□-□□C□	C (15th digit) [3]	绕组带两组三芯串联的 PTC 热敏电阻用于报警和跳闸，需用 4 个辅助接线端子 Motor protection with PTC thermistors with six embedded temperature sensors for alarm & tripping	FS315-355
1LE8003-□□□□□-□□K□ 1LE8033-□□□□□-□□K□	K (15th digit)	绕组带 1 个单支两线制 PT1000 测温元件，需用 2 个辅助接线端子 Installation of 1 single 2 wires PT1000 resistance thermometers, need 2 terminals	FS315-355
1LE8003-□□□□□-□□L□ 1LE8033-□□□□□-□□L□	L (15th digit)	绕组带 2 个单支两线制 PT1000 测温元件，需用 4 个辅助接线端子 Installation of 2 single 2 wires PT1000 resistance thermometers, need 4 terminals	FS315-355
1LE8003-□□□□□-□□Q□ 1LE8033-□□□□□-□□Q□	Q (15th digit)	绕组带 3 个单支三线制 PT100 测温元件，需用 9 个辅助接线端子 3 PT100 resistance thermometers in stator winding, 3-wire circuit	FS315-355
1LE8003-□□□□□-□□R□ 1LE8033-□□□□□-□□R□	R (15th digit)	绕组带 6 个单支三线制 PT100 测温元件，需用 18 个辅助接线端子 6 PT100 resistance thermometers in stator winding, 3-wire circuit	FS315-355

电动机订货号 Motor order code	选件号 Option Code [1]	描述 Description	应用范围 Application Scope
1LE8003-□□□□□-□□H□ 1LE8033-□□□□□-□□H□	H (1^{5th} digit)	绕组带3个单支两线制PT100测温元件，需用6个辅助接线端子 Installation of three PT100 resistance thermometers	FS315-355
1LE8003-□□□□□-□□J□ 1LE8033-□□□□□-□□J□	J (15th digit)	绕组带6个单支两线制PT100测温元件，需用12个辅助接线端子 Installation of six PT100 resistance thermometers	FS315-355
–	Q72	前后轴承各带1个单支两线制PT100测温元件，需用4个辅助接线端子 1 PT100 resistance thermometer - 2-wire input (4 terminals), at each position of DE and NDE bearing	FS315-355
–	Q78	前后轴承各带1个单支三线制PT100测温元件，需用6个辅助接线端子 1 PT100 resistance thermometer - 3-wire inpu (6 terminals), at each position of DE and NDE bearing	FS315-355
–	Q79	前后轴承各带1个双支三线制PT100测温元件，需用12个辅助接线端子 2 PT100 resistance thermometers - 3-wire input (12 terminals), at each position of DE and NDE bearing	FS315-355
电动机接线盒 Motor connection box			
1LE8003-□□□□□-□□□4 1LE8033-□□□□□-□□□4	4 (16th digit) [2]	接线盒在顶端 Connection box on top 进线孔在右侧（从驱动端看）（标准电动机） cable entry on right (view from DE) (Standard version)	FS315-355
1LE8003-□□□□□-□□□5 1LE8033-□□□□□-□□□5	5 (16th digit)	接线盒在右边（从驱动端看） Connection box on RHS (view from DE)	FS315-355
1LE8003-□□□□□-□□□6 1LE8033-□□□□□-□□□6	6 (16th digit)	接线盒在左边（从驱动端看） Connection box on LHS (view from DE)	FS315-355
–	R15	带一个金属葛兰 One metal cable gland	FS315-355
–	R10 [4]	接线盒顺时针旋转 90° Clockwise rotate the connection box through 90°	FS315-355
–	R11 [4]	接线盒逆时针旋转 90° Counter-clockwise rotate the connection box through 90°	FS315-355
–	R12 [4]	接线盒直接旋转 180° Rotation of the connection box through 180°	FS315-355
–	L97	辅助接线盒 Auxiliary terminal box	FS315-355
–	R50	加大接线盒 Larger terminal box	1LE8033 FS315-355

选件 Options

电动机订货号 Motor order code	选件号 Option Code [1]	描述 Description	应用范围 Application Scope
绕组与绝缘 Windings and insulation			
–	N01 [5]	耐热等级155(F)，按照155(F)使用，服务系数1.15 Temperature class 155 (F), used according to 155 (F), with service factor (SF1.15)	1LE8003 FS315-355
–	N90	特殊绝缘系统，适用于690V变频应用，无需在变频器端加滤波器 Premium insulation system, capable for VSD operation up to 690V, without filter	1LE8033 FS315-355
–	N10	耐热等级180(H) Temperature class 180(H)	FS315-355
–	Q04	绕组带 220 V 防潮加热带 Anti-condensation heating for 220 V	1LE8003 FS315-355
–	Q02	绕组带230V防潮加热带 Anti-condensation heating for 230V	1LE8033 FS315-355
轴承 bearing			
–	L27 [6] [3]	非驱动端使用绝缘轴承 Bearing insulation NDE	FS315-355
–	L80 [3]	使用SKF轴承 SKF Bearing	FS315-355
–	L20	驱动端轴承固定 Fixed bearing on DE side	FS315-355
–	L22 [6]	增强悬臂力轴承设计 Bearing design for increased cantilever forces	FS315-355
–	Q01	驱动端预留SPM测量接头 Measuring nipple for SPM shock pulse at DE measurement for bearing	FS315-355

电动机订货号 Motor order code	选件号 Option Code [1]	描述 Description	应用范围 Application Scope
平衡 Balance and Vibration quantity			
–	L00	B 级振动等级 Vibration quantity level B	FS315-355
质保 Warranty			
–	Q80	延长质保期到 24 个月（从交货日起） Extension of the liability for defects by 12 to a total of 24 months as of delivery	1LE8033 FS315-355
机械设计和防护等级 Mechanical design and degrees of protection			
–	H80	适用于N-Compact底脚安装尺寸的机座 Housing design for N-Compact motor feet dimension	1LE8033 FS315-355
–	H20	防护等级IP65 IP65 degree of protection	FS315-355
–	H22	防护等级IP56（非高海拔） IP56 degree of protection (non-high altitude)	FS315-355
–	H70	第二接地 Second external grounding	FS315-355
–	L05 [7]	第二标准轴伸 Second standard shaft extension	FS315-355
–	H00 [8]	防雨罩 Motor with protective cover	FS315-355
–	H03	冷凝水排放孔 Condensation drainage holes	FS315-355
–	F70 [9]	独立风机 Mounting of separately driven fan	FS315-355
–	F90 [10]	风机电机（不带风扇和风罩，非驱动端轴孔封闭） Fan motor (Without fan and fan cover, NDE closed)	1LE8003 FS315-355
–	X05	用于使用LL861900220编码器 Prepared for of LL861900220 encoder	FS315-355

选件 Options

电动机订货号 Motor order code	选件号 Option Code [1)]	描述 Description	应用范围 Application Scope
–	G04	安装LL861900220编码器 Mounting of LL861900220 rotary pulse encoder	FS315-355
–	G05	安装HOG 10 D 1024 I编码器 Mounting of HOG 10 D 1024 I rotary pulse encoder	1LE8033 FS315-355
–	X50	安装欧姆龙编码器（E6B2-C）和独立风机 Mounting of Omron rotary pulse encoder (E6B2-C) and separately driven fan	FS315-355
–	W74	安装欧姆龙编码器（E6B2-CWZ1X）和独立风机。 Mounting of Omron encoder (E6B2-CWZ1X) and separated driven fan	1LE8003 FS315-355
颜色和喷漆 Colors and Paint finish			
–	S01	不喷漆，只带底漆 Unpainted, only primed	FS315-355
–	X84	RAL 9005 外观漆 Standard finish in RAL 9005	FS315-355
–	X86	RAL 5015 外观漆 Standard finish in RAL 5015	FS315-355
–	X80	RAL 7035 外观漆 Standard finish in RAL 7035	FS315-355
–	X90	RAL 9010 外观漆 Standard finish in RAL 9010	FS315-355
–	S80	RAL 7032 外观漆 Standard finish in RAL 7032	FS315-355
–	S81	RAL 9006 外观漆 Standard finish in RAL 9006	FS315-355
–	W88	适用于防腐蚀环境TH、W、F1、WF1和海洋气候环境 Design for TH, W, F1, WF1 and Sea air resistant	FS315-355

电动机订货号 Motor order code	选件号 Option Code [1]	描述 Description	应用范围 Application Scope
测试证书 Test certificates			
–	B02	出厂检验报告3.1，按照EN10204标准 Acceptance test certificate 3.1 in accordance with EN 10204	FS315-355
环境温度 Coolant temperature			
–	D03	环境温度-40 °C ~ 40 °C Ambient temperature - 40 °C to 40 °C	FS315-355
–	N05	绝缘等级155（F），按照130（B）使用，环境温度45℃时，降低功率约4% Temperature class 155 (F), utilized acc. To 130 (B), collant temperature 45 °C, derating approx 4%	1LE8003 FS315-355
–	N06	绝缘等级155（F），按照130（B）使用，环境温度50 °C时，降低功率约8% Temperature class 155 (F), utilized acc. To 130 (B), collant temperature 50 °C, derating 8%	1LE8003 FS315-355

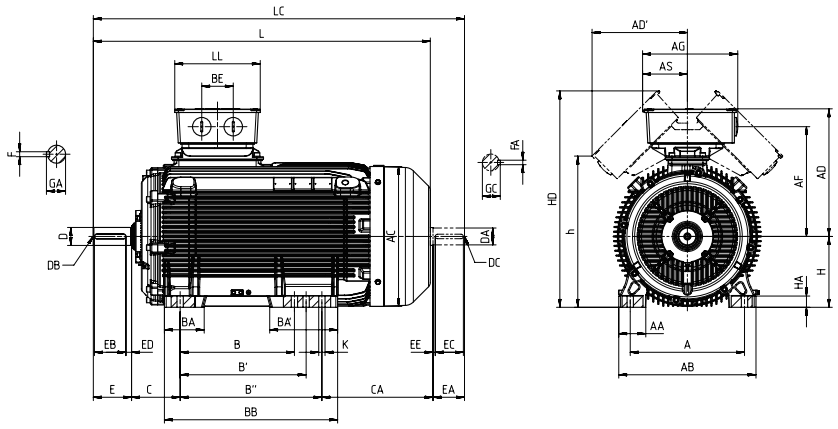
[1] 订货时，电动机订货号需带“-Z”，然后再附带上选件号；
[2] 无需附加费用；
[3] 1LE8033 标配；
[4] 接线盒旋转方向为从接线盒盖正上方观察时的方向；
[5] 不适用于500kW-4P(3BB5)和400kW-6P(3BC4)两个规格；
[6] 水平安装时，绝缘轴承在非驱动端；竖直安装时，绝缘轴承在驱动端；
[7] 带防雨罩或独立驱动风扇的电机不能选此选件，第二标准轴伸尺寸与驱动端不一致，详见外形尺寸图；
[8] 不可与选件 L05 并用；
[9] 当安装独立风机时，电机长度会增加。具体增加尺寸和风机技术参数见第 9 页。500kW-4P（3BB5）和 400kW-6P（3BC4）两个规格不能选此选件；
[10] 电机非驱动端无风扇和风罩，电机长度会因此缩短。用户应当采取适当的冷却措施，没有或错误的冷却措施都将缩短电机的使用寿命，甚至会损坏电机。

[1] When ordering, need supplement "-Z" after order number. Add option code after that.
[2] Without additional charge.
[3] 1LE8033 standard configuration.
[4] The direction of rotation of the terminal box is viewed directly above the terminal box cover.
[5] Not applicable for 500kW-4P(3BB5) and 400kW-6P(3BC4).
[6] Insulated bearing locate at NDE side for horizontal mounting; insulated bearing locate at DE side for vertical mounting.
[7] Not possible in combination with canopy or separately driven fan. The second standard shaft extension dimension is not same with DE shaft.
[8] Not possible in combination with Option code L05.
[9] When the separately driven fan is mounted, the length of the motor increase by ΔL. For an explanation of the additional dimension and technical data see from page 9. Not applicable for 500kW-4P(3BB5) and 400kW-6P(3BC4).
[10] Without fan and fan cover, the length of the motor is decrease. The correct motor cooling is in responsibility of customer. Missing or wrong cooling reduce the life time or damaged the motor.

外形尺寸 Dimension drawings

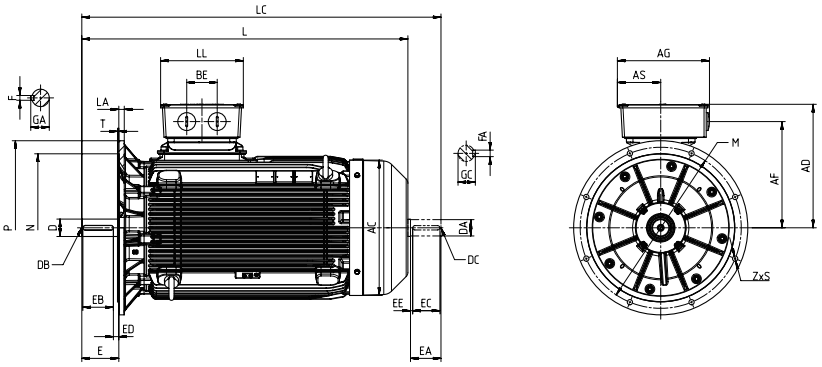
INNOMOTICS 1LE8 系列电机
机座号 315-355 Frame size 315-355

IM B3 安装结构方式 Type of constructions IM B3



INNOMOTICS 1LE8 系列电机
机座号 315-355 Frame size 315-355

IM B5 安装结构方式 Type of constructions IM B5



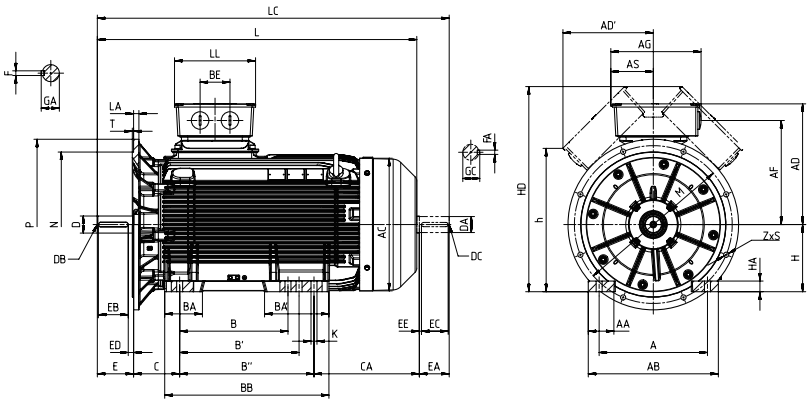
机座号 Frame size	型号 Type	极数 Poles	尺寸及公差 Dimension and tolerance																	
			A	AA	AB	AC	AD[1]	AD '[1]	AF	AG	AS	B	B '	B ''	BA	BA '	BB	BE	C		CA
																			基本尺寸 Dimension	极限偏差 Tolerance	
315	3AA	2P	508	120	610	622	570	430	488	423	199	508	560	630	177	302	770	140	216	±4	494
	3AB, 3AC, 3AD	4~8P	508	120	610	622	570	430	488	423	199	508	560	630	177	302	770	140	216	±4	494
355	3BA	2P	610	150	780	699	625	510	538	505	196	630	710	800	195	322	998	2×130[2]	254	±4	415
	3BB, 3BC, 3BD	4~8P	610	150	780	699	625	510	538	505	196	630	710	800	195	322	998	2×130[2]	254	±4	415

[1] 该尺寸为整机外形尺寸，为圆整后的数值。
[2] 机座号 355 电机接线盒有三个进线孔，相邻两孔间距 130 mm。

外形尺寸 Dimension drawings

INNOMOTICS 1LE8 系列电机
机座号 315-355 Frame size 315-355

IM B35 安装结构方式 Type of constructions IM B35



机座号 Frame size	型号 Type	极数 Poles	尺寸及公差 Dimension and tolerance												
			D			DB	E		EB		ED	F		GA
			基本尺寸 Dimension	极限偏差 Tolerance			基本尺寸 Dimension	极限偏差 Tolerance	基本尺寸 Dimension	极限偏差 Tolerance		基本尺寸 Dimension	极限偏差 Tolerance	
315	3AA	2P	Φ65	m6	+0.030 +0.011	M20×42	140	0 -0.4	125	+0.5 0	10	18	0 -0.043	69
	3AB, 3AC, 3AD	4~8P	Φ80	m6	+0.030 +0.011	M20×42	170	0 -0.4	140	+0.5 0	25	22	0 -0.052	85
355	3BA	2P	Φ75	m6	+0.030 +0.011	M20×42	140	0 -0.4	125	+0.5 0	10	20	0 -0.052	79.5
	3BB, 3BC, 3BD	4~8P	Φ95	m6	+0.035 +0.013	M24×50	170	0 -0.4	140	+0.5 0	25	25	0 -0.052	100

机座号 Frame size	型号 Type	极数 Poles	尺寸及公差 Dimension and tolerance										
			DA			DC	EA		EC		EE	FA	
			基本尺寸 Dimension	极限偏差 Tolerance			基本尺寸 Dimension	极限偏差 Tolerance	基本尺寸 Dimension	极限偏差 Tolerance		基本尺寸 Dimension	极限偏差 Tolerance
315	3AA	2P	Φ65	m6	+0.030 +0.011	M20×42	140	0 -0.4	125	+0.5 0	10	18	0 -0.043
	3AB, 3AC, 3AD	4~8P	Φ75	m6	+0.030 +0.011	M20×42	140	0 -0.4	125	+0.5 0	10	20	0 -0.052
355	3BA	2P	Φ65	m6	+0.030 +0.011	M20×42	140	0 -0.4	125	+0.5 0	10	18	0 -0.043
	3BB, 3BC, 3BD	4~8P	Φ80	m6	+0.030 +0.011	M20×42	170	0 -0.4	140	+0.5 0	25	22	0 -0.052

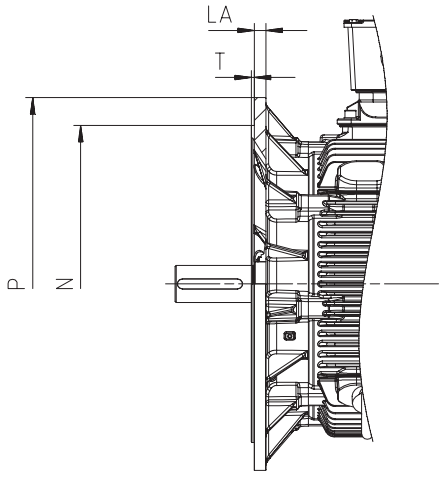
机座号 Frame size	型号 Type	极数 Poles	尺寸及公差 Dimension and tolerance												
			GC	H		HA	HD[1]	h[1]	K			L[1]	LC	LL
				基本尺寸 Dimension	极限偏差 Tolerance				基本尺寸 Dimension	极限偏差 Tolerance				
315	3AA	2P	69	315	0 -1	50	965	675	Φ28	H14	+0.52 0	1475	1620	380
	3AB, 3AC, 3AD	4~8P	79.5	315	0 -1	50	965	675	Φ28	H14	+0.52 0	1505	1650	380
355	3BA	2P	69	355	0 -1	49	1045	700	Φ28	H14	+0.52 0	1600	1749	423
	3BB, 3BC, 3BD	4~8P	85	355	0 -1	35	1045	700	Φ28	H14	+0.52 0	1630	1809	423

[1] 该尺寸为整机外形尺寸，为圆整后的数值。
[2] 机座号 355 电机接线盒有三个进线孔，相邻两孔间距 130 mm。

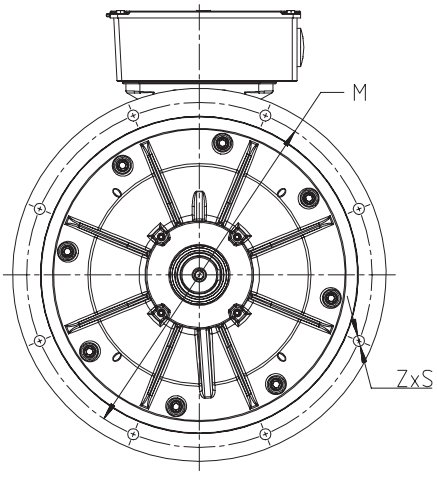
外形尺寸 Dimension drawings

法兰尺寸 Flange dimension

IM V1、IM B35、IM V15、IM V35 安装结构型式
Type of construction IM V1、IM B35、IM V15、IM V35



IM V1、IM B35、IM V15、IM V35 安装结构型式
Type of construction IM V1、IM B35、IM V15、IM V35



机座号 Frame size	型号 Type	极数 Poles	法兰带通孔 Flange with holes FF/A	法兰尺寸及公差 Flange dimension and tolerance									
			DIN / EN 50347	P	N			LA	T			M	ZxS
					基本尺寸 Dimension	极限偏差 Tolerance			基本尺寸 Dimension	极限偏差 Tolerance			
315	3AA	2P	FF740	Φ800	Φ680	js6	+0.025 -0.025	25	6	h12	0 -0.12	Φ740	8xΦ24
315	3AB, 3AC, 3AD	4~8P	FF740	Φ800	Φ680	js6	+0.025 -0.025	25	6	h12	0 -0.12	Φ740	8xΦ24
355	3BA	2P	FF740	Φ800	Φ680	js6	+0.025 -0.025	25	6	h12	0 -0.12	Φ740	8xΦ24
355	3BB, 3BC, 3BD	4~8P	FF740	Φ800	Φ680	js6	+0.025 -0.025	25	6	h12	0 -0.12	Φ740	8xΦ24

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