

1TLO 系列三相异步电动机
1TLO THREE-PHASE ASYNCHRONOUS MOTOR

产品说明书
INSTRUCTIONS

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1 概述 General instructions

1TL0 系列电动机为一般用途、全封闭鼠笼式、自扇冷三相异步电动机。

1TL0 motor is a totally enclosed self-ventilation induction motor for general purpose application.

1TL0 系列电动机机座号 FS080-355，额定功率 0.55-315kW，防护等级 IP55，可选配 IP56。

1TL0 motor frame size ranges FS080-355, rating output 0.55-315kW, protection class is IP55, and optional protection class is IP56.

本系列电机符合 GB18613-2020《中小型三相异步电动机能效限定值及能效等级》标准，具体规格的能效标准如下：1TL0003/1TL0303是3级能效，1TL0004/1TL0304是2级能效，或者具体规格的能耗指标参见铭牌，其中选项 F70、选项 F90、频率 60Hz 及船用电机不在 GB18613 标准范围内，电机铭牌上不标注能效信息。

1TL0 motors comply with GB18613 “Minimum allowable values of energy efficiency and the energy efficiency grades for small and medium three-phase asynchronous motors”, the efficiency standard version number and the value of energy efficiency are : 1TL0003/1TL0303 series motors are grade 3, 1TL0004/1TL0304 series motors are grade 2, and the value of energy efficiency are shown on rating plate, except F70,F90,60Hz and marine motor in standard GB18613, the nameplate without efficiency information.

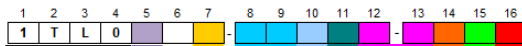
1TL0 系列电动机可用于拖动转速及其它性能无特殊要求的机械，如金属切削机床、水泵、鼓风机、矿山机械、农业机械等。由于电动机有较好的起动性能，也适用于需要较大起动转矩的机械，如压缩机、搅拌机、粉碎机等。

1TL0 motor is suitable for driving machines which have no special requirements, such as machine tools, pumps, blowers, mining machines, agricultural machines etc. As this series of motor has good starting characteristics, it is also suitable for machines which need high starting torque such as compressors, mixers, miller etc.

2 技术条件 Technical information

- | | |
|---|--|
| (1) 额定电压：200 ~ 660V | Rated voltage: 200 ~ 660V |
| (2) 额定频率：50Hz，可选 60Hz | Rated frequency: 50Hz, optional 60Hz |
| (3) 工作方式：连续 S1 | Working condition: S1 (continuous) |
| (4) 接法：△或 Y | Connection: △ or Y |
| (5) 绝缘等级：155 (F) | Insulation class: 155 (F) |
| (6) 工作条件：环境温度-15°C ~ +40°C，海拔不超过 1000 米 | Ambient temperature: -15°C ~ +40°C, altitude not over 1,000 meters |

3 型号含义 Motor type designation



低压系列电动机 Low-voltage motor series

0=铸铁壳, 3=铝壳

3 = IE3, 中国能效等级3级 China Energy Efficiency Grade3

4 = IE4, 中国能效等级2级 China Energy Efficiency Grade2

机座号编号 Code of frame size

0D=80/0E=90/1A=100/1B=112/1C=132

1E = 180/ 2A = 200 / 2B = 225 / 2C = 250 / 2D = 280/3A = 315 / 3B = 355

极数编号 Code of poles

A = 2 / B = 4 / C = 6 / D = 8

铁心长度编号 Code of frame length

0 or 1 = S (短机座) / 2 or 3 or 4 = M (中机座) / 4 or 5 or 6 or 7 = L (长机座)

电压、连接方式和频率编号 Code of voltage, connection and frequency

21 = 220VD/380VY 50Hz

22 = 230VD/400VY 50Hz

04 = 400VD 50Hz

23 = 240VD/415VY 50Hz

35 = 415VD 50Hz

33 = 380VD/660VY 50Hz

34 = 400VD/690VY 50Hz

90= 特殊电压与频率

结构和安装方式编号 Code of Construction and mounting type

T^(3/4)= IM B6

A= IM B3

U^(3/4)= IM B7

W^(3/5)= IM V15

M^(2/4/5)= IM V18

J= IM B35

V^(3/4)= IM B8

Y⁽³⁾ = IM V35

L^(2/4) = IM V19

F= IM B5

C^(3/4/5)= IM V5

G⁽³⁾= IM V1

N⁽²⁾=IM B34

K^(2/4)= IM B14

D^(3/4)= IM V6

H⁽³⁾= IM V3

绕组保护编号 Code of winding protection

A = 无绕组保护 without winding protection

B = 绕组带一组二芯串联的PTC热敏电阻用于跳闸 3 PTC thermistors for tripping

C = 绕组带两组二芯串联的PTC热敏电阻用于报警和跳闸 3 PTC thermistors for tripping

H = 绕组带3个Pt100测温元件 3 resistance thermometers pt100

J = 绕组带6个Pt100测温元件 6 resistance thermometers pt100

Z = 其他绕组保护 Other temperature for winding protection

接线盒位置编号 (从驱动端看)

4 = 顶端出线 on top / 5 = 右端出线 on RHS / 6 = 左端出线 on LHS

附注:

- 1) 用电压编号 90 及相应选件号来定制其它电压
- 2) 只适用于 FS80 ~ 112
- 3) 只适用于 FS80 ~ 160
- 4) 当订购附带排水孔 (选件号 H03) 时, 必须要说明结构型式
- 5) 电动机标配无防雨罩, 如需要加带防雨罩请用订购选件号 H00
- 6) 只适用于 FS160 ~ 355
- 7) 只适用于 FS200 ~ 355

Note:

- 1) Other voltages and frequencies use code 90
- 2) Only for FS080 -112
- 3) Only for FS080 -160
- 4) When ordering condensation drainage holes (code H03), must specify construction type
- 5) For protective cover with canopy, please use option code H00
- 6) Only for FS160 ~ 355
- 7) Only for FS200 ~ 355

4 结构型式 Construction types

有三种基本结构形式：

B3 型 - 机座带底脚，端盖无凸缘的结构形式

B5 型 - 机座不带底脚，端盖上带大于机座的凸缘的结构型式

B35 型 - 机座带底脚，端盖上带大于机座的凸缘的结构型式

















There are three basic construction types:

B3 - with feet but no flange

B5 - with flange but no feet

B35 - with feet and flange

表 1 Table 1

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)					
安装型式 Mounting type	IM B3 FS ³⁾ 80 ~ 355	IM B6 FS 80 ~ 160	IM B7 FS80 ~ 160	IM B8 FS 80 ~ 160	IM V5 ¹⁾ FS 80 ~ 160	IM V6 ²⁾ FS 80 ~ 160
示意图 Diagram						
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)		
安装型式 Mounting type	IM B5 FS 80 ~ 280	IM V1 ¹⁾ FS 80 ~ 355	IM V3 ²⁾ FS 80 ~ 160	IM B35 FS 80 ~ 355	IM V15 ¹⁾ FS 80 ~ 160	IM V35 ²⁾ FS 80 ~ 160
示意图 Diagram						
结构型式 Construction type	机座不带底脚，端盖有标准小法兰 Without feet and with C-flange on the end-shield (DE)			机座带底脚，端盖有标准小法兰 With feet and with C-flange on the end-shield (DE)		
安装型式 Mounting type	IM B14 FS 80 ~ 112	IM V18 ¹⁾ FS 80 ~ 112	IM V19 ²⁾ FS 80 ~ 112	IM B34 FS80 ~ 112		
示意图 Diagram						

附注：

- ¹⁾ 室外使用时推荐使用护罩（选件号 H00）
- ²⁾ 当户外安装时，建议对电动机采取防护措施，避免水直接喷射到电动机轴上或积存在电机外壳上

Note:

- ¹⁾ For outdoor application, protective cover (option code H00) is recommended
- ²⁾ At outdoor application, please take measures to prevent water splitting to shaft, or remaining on motor housing

5 运输与贮存 Transportation and storage

5.1 在运输电机时，必须使用所有吊环进行吊装搬运。在搬运电机之前，请确保所有吊环安装正确且牢固，但切勿使用电机轴和风扇罩来搬运电机。另外，电机升降时必须注意避免摇晃和震动，以防造成轴承受损。

When lifting the motors, always use all the lifting eyes provided. Prior to lifting the motor shaft and fan coving. In addition, care must be taken during lifting and lowering of the motor to avoid any shocks or vibrations which can result in bearing damages.

5.2 如果电机配有转子固定装置，则在运输电机时始终应使用该装置。在整个运输期间它都必须保持固定，不能发生移动。如果客户已经加装了一些零件，例如联轴器或者带轮，则轴承在运输过程中可能会有损坏。在这种情况下需要客户自行准备转子固定装置。If the machine is fitted with a rotor shipping brace, this should always be used when transporting the machine. The rotor shipping brace must be attached during the transport. If the customer already has mounted parts, such as a coupling or belt pulley, the bearings can be damaged during transport. In this case, make sure that the customer uses a rotor shipping brace.

5.3 存储要求 Storage

电动机存放时不允许堆码。对于有包装箱的电机，按照包装上的标识操作。

Do not stack motors during storage. For motors with packages, follow the instructions and markings on the package.

5.3.1 室外存放 Storing outdoors

选择水平、不会摇晃且干燥的存放位置。如果按照存放要求是必要的，请在存放前修复损坏的包装。将电机、设备和包装箱放置在底架、大方木料或基座上，以防止地面湿气。防止电机陷入地下。

Choose a dry storage location which is safe from flooding and free from vibration. Repair any damage to the packaging before putting the equipment into storage if this is necessary to ensure proper storage conditions. In order to ensure protection against ground moisture, locate machines, equipment and crates on pallets, wooden beams or foundations. Prevent equipment from sinking into the ground. Do not impede air circulation under the stored items.

防潮用的盖布或防雨布不得与所存放物品的表面接触。放置间隔板垫，以确保足够的空气循环。

Covers or tarpaulins used to protect the equipment against the weather must not come into contact with the surfaces of the equipment. Use wooden spacer elements to ensure that air can circulate freely around the equipment.

5.3.2 室内存放 Storing indoors

应防止受极端天气的影响，储藏室应保持干燥、通风良好并且防尘、防冻、防撞、抗震。

The storage rooms must provide protection against extreme weather conditions. They must be dry, free from dust, frost and vibration and well ventilated.

5.3.3 金属裸露表面 Bare metal surfaces

考虑到运输已对裸露部分（如轴端、法兰表面、中心边缘）进行了临时的防腐处理（<6个月）。长期存放时，须采取适当的防腐措施。

电机已根据订货时要求的温度范围采用了最佳的材料，指定的温度范围请见铭牌。

For transport, the bare surfaces (shaft ends, flange surfaces, centering edges) should be coated with an anti-corrosion agent which will last for a limited amount of time (<6 months). Apply suitable anti-corrosion measures for longer storage times.

The materials used are specially designed for the temperature range required by the customer. The relevant temperature limits are specified on the rating plate.

如果电机没有采取任何保护措施而在室外使用或存放，会导致电机损坏。

- 避免电机受强烈阳光照射、雨雪、冰雹或灰尘的侵蚀。
- 在户外或湿度大的环境中存储电机可能导致电机零部件生锈。
- 必要时请咨询服务中心或者遵循户外使用电机的技术条件。



The motor can be damaged if you use it or store it unprotected outdoors.

- Protect the motor against intensive solar radiation, rain, snow, ice and dust.
 - Storing the motor outdoors or in a high humidity environment may cause the motor parts to rust.
 - If required, contact the service center, or technically coordinate outdoors use.
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5.3.4 存放温度

允许的温度范围：— 20 °C 到 + 50 °C

Permissible temperature range: -20 ° C to +50 ° C

允许的最大空气湿度： 60 %

Maximum permissible air humidity: 60%

对于因环境温度而对运行状态或海拔有特殊规定的电机，其存放温度需要遵守其他条件。此时请参照电机铭牌上的环境温度和海拔说明。

For machines that have a special design regarding the ambient temperature in the operating state or the installation altitude, other conditions could apply regarding the storage temperature. In this case, refer to the machine rating plate for data on the ambient temperature and installation altitude.

5.3.5 存放时间 Storage time

每半年必须至少旋转一次电机轴，避免振蚀。长期存放会降低轴承的润滑使用寿命。

Turn the shaft once every year to avoid bearing brinelling. Prolonged storage periods reduce the useful life of the bearing grease (aging).

5.3.6 开放型轴承 Open bearings

- 存放超过 12 个月时，应对开放型轴承的润滑脂进行检查。
- For open bearings, e.g. 1Z, check the status of the grease when stored for longer than 12 months.
- 如果检查时发现润滑脂耗尽或受污染，必须立即更换润滑脂。冷凝水渗入会改变润滑脂粘稠度。
- Replace the grease if it is identified that the grease has lost its lubricating properties or is polluted. The consistency of the grease will change if condensation is allowed to enter.

5.3.7 密封型轴承 Closed bearings

- 密封型轴承存放超过 24 个月时，应更换驱动端和非驱动端轴承。
- For closed bearings, replace the DE and NDE bearings after a storage time of 24 months.

如果电机在灰尘及湿度较大环境下存储时间超过 2 年，电机的使用寿命将会降低。对于这种情况，必要时在电机安装和启动前，对其绝缘系统进行检测，从而保证其可以正常稳定的运行。

The service life of the motor can be considerably reduced if the storage period extends beyond 2 years in environments with high moisture and dirt .If necessary, the insulation resistance of the winding could be measured determine the health of the motor prior to installation and start-up.

电机加工表面（法兰表面、轴端表面等）已在工厂进行防腐蚀处理，但是在储存时仍需做必要的防腐蚀措施。建议经常转动一下电机轴，使轴承润滑脂分布均匀，同时避免产生静态压痕。

Machined surfaces (flange, DE rotor shaft) are treated at the factory with anti-corrosive agent to prevent rusting. However, these surfaces should be retreated during storage as deemed necessary. It is recommended to rotate motor's shaft regularly to ensure grease distribution, and to prevent static impression on bearing rings.

6 安装前的准备 Preparation before installation

6.1 电动机开箱前应检查包装是否完整无损，有无受潮迹象，电动机开箱后应仔细清除电机上的灰尘和杂物。

Before unpacking, check to ensure the package is not damaged. After unpacking, clean dusts on the motor.

6.2 核对电动机的铭牌数据，确保与要求一致。

Check the parameters on nameplate. Make sure they are the same as required.

6.3 仔细检查电动机在运输过程中有无变形或损坏，紧固件有无松动或脱落，用手转动转子，不应有定转子相擦等现象。

Check whether there is any damage or deformation after transportation; whether fasteners loosening or missing. Rotate the shaft by hand; there shall be no any abrasion.

6.4 用 500 伏兆欧表测量绝缘电阻，其值不应低于 1 兆欧，否则应对定子绕组进行干燥处理，干燥处理温度不超过 120°C。

Check winding insulation resistance with 500VMΩ Avometer. The measured value be at least 1MΩ, otherwise measures shall be taken to dry the stator winding. Temperature for drying should not exceed 120°C.

6.5 良好的基础与正确的安装是将来电机长期可靠运行的基本条件。基础不良或者安装不当，会造成异常的电机振动和噪音。

A fine foundation and correct installation is the basic for long-time reliable operation. Inappropriate foundation or installation may cause abnormal vibration and noise.

6.5.1 基础要求 Requirements for foundation

电机安装的基础可以是金属底座，也可以是混凝土结构的平台，无论是何种结构，基础都应有足够的强度与刚性支撑电机。

The foundation for installation can be a metal base or a concrete platform, whatever it is, the foundation must have enough strength and rigidity to support the motor.

基础的设计可以参考 DIN4024。

The design of foundation can refer to DIN4024.

支撑电机的基础表面必须是平面，常用电机支撑平面的平面度：

The supporting surface for the motor must be flat. The flatness is shown below:

机座号 Frame size	平面度 Flatness mm
≤ 132	0.10
160	0.15
≥ 180	0.20

6.5.2 安装要求 Requirements for installation

由于机械部件制造公差及累积误差的存在，电机底脚安装平面与基础安装的接触平面之间，可能存在间隙。

Because of manufacturing tolerances and accumulate differentials, clearances may exist between motor feet and the foundation.

安装时，应仔细用塞尺测量此间隙值。对于>0.05mm 的间隙，应插入合适的填隙片。填隙片的尺寸根据实际间隙配做。

When installing, the clearance size must be measured carefully by feeler gauge. For the clearance >0.05mm, shim with proper thickness should be inserted. The shim can be made according to the actual size of clearance.

7 安装 Installation



警告

所有工作都必须由熟练工人进行操作。对电机进行任何作业前，确保电机与主线及辅助电路断开，并且确保电源不被意外接通。

Work can only be carried out by skilled workers. Before start any work, the main power supply and auxiliary circuits must be disconnected. And make sure they will not be connected coincidentally.

7.1 电动机允许用联轴器、正齿轮及皮带轮传动。但对 4 千瓦以上的 2 极电动机和 30 千瓦以上的 4 极电动机不建议采用皮带传动。

Transmission can be done through couplings, gears or belts. It is not recommended to use belts and pulleys for 2-pole motors over 4kW, or 4-pole motors over 30kW.

7.2 联轴器安装一般采用热套的方式。若采用冷压的方式，应避免用力敲击，以免造成轴承损坏。

Coupling is usually assembled by using heating. If the coupling is pressed onto shaft, hitting should be avoided in order to prevent bearing damage.

7.3 采用皮带传动时，电机轴中心线与负载轴中心线平行，且要求皮带中心线与轴中心线垂直；采用联轴器传动时，电机轴中心线与负载轴中心线重合。

With belt transmission, the center line of the motor shaft should be parallel with center line of the driven shaft; center line of the belt should be perpendicular to the center line of the shaft. With coupling transmission, the center line of the motor should be aligned with the center line of driven shaft.

7.4 对于立式安装的电机，轴伸上除皮带轮或相当于皮带轮的负载外，不建议带任何其它轴向负载装置。

For vertically installed motor, it is recommended to avoid any additional axial load on shaft.

7.5 电动机应安装在通风的位置，后方至墙壁的距离至少为风罩进风口直径的 1/4。

The motor should be installed in a well-ventilated location. The distance from motor fan cover to wall should be at least 1/4 of air inlet diameter.

8 运行 Operation

8.1 接线盒内有接地装置，应妥善接地。

Terminal box has grounding terminals inside, it should be grounded correctly.

8.2 接线盒内接线板上有 6 个接线柱对应机内绕组引出线，接电源线对应相序如下：

There are six terminals on terminal board. The identifications are as follows:

表 2 Table 2

相序 Phase sequence	A	B	C
头 Head of phase winding	U1	V1	W1

尾 Tail of phase winding	U2	V2	W2
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8.3 关于接线端子的拧紧力矩，请参照表 3 中接线端子拧紧力矩大小以及方向。

Please refer to Table 3 for tightening torque and direction for electrical terminals.

表 3 Table 3

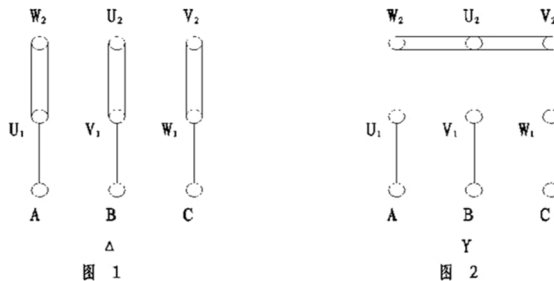


尺寸 Size	M4	M5	M6	M8	M10	M12	M16
转矩 Torque (Nm)	1.2	2.5	4.0	8.0	13	20	40

注：拧紧力矩（Nm，公差：±10%） Note: Tightening torque (Nm, tolerance: ±10%)

8.4 按电动机铭牌规定接法，接成△或 Y 型。按图中相序接线时，从轴伸端视之，电动机的转向为顺时针，任意调换三相电源中两相的相序，电动机则逆时针旋转。

According to the nameplate, the connection of stator winding should be delta or star. When phase sequence A.B.C of the power supply is accord with winding sequence U1, V1, W1, motor turn direction is clockwise as viewed from the shaft extension end. With any of the two phase of the power line changed, the motor turns in the opposition direction.



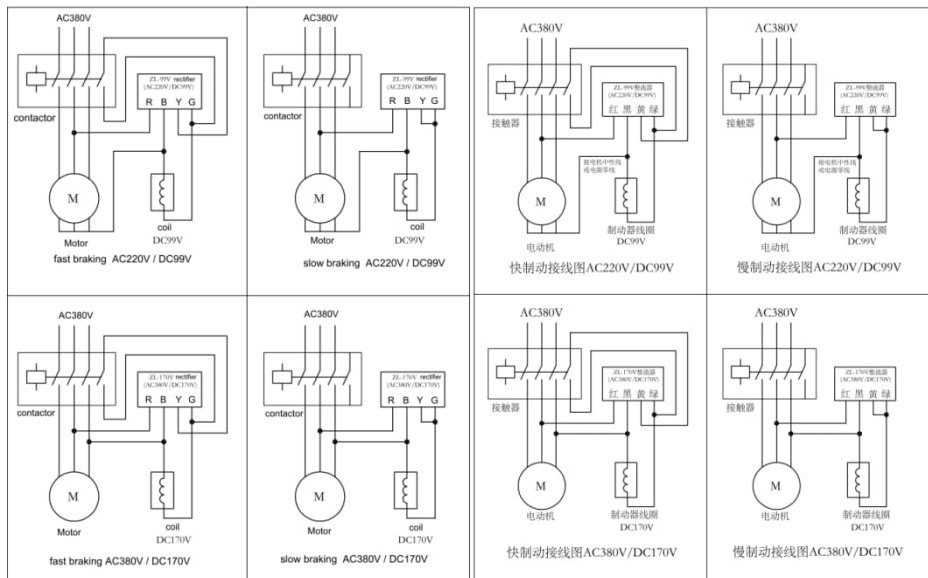
8.5 若电机安装电磁制动器（选件号 F01），接线图如图 3。图中 Ac380 伏，Dc170 伏接线图适用于 FS112 及以上规格电机；图中 Ac220 伏、Dc99 伏接线图适用于 FS112 以下规格电机。整流装置需配合快速制动整流装置需配合快速制动时，将“黄、绿”两接线接到接触器的常开触点；当制动电机允许以较慢的速度制动时，将“黄、绿”两接线直接短接。

If the motor installed electromagnetic brake (option code F01) and wiring diagram as shown in figure 3. Ac380V, Dc170V wiring diagram is applicable to the Fs112 and above the specifications, Ac220 V, Dc99V wiring diagram is applicable to the Fs112 following specifications, the rectifier devices need to meet rapid braking, "yellow, green," received two

connection with the contacts and make it clear that when the brake motor allowed to slow the speed brake, "yellow, green," two direct wiring shorted.

制动器根据需要可接成慢制动或快制动。

Brakes can be accessed as needed into slow or fast braking.



注：R-红，B-黑，Y-黄，G-绿

Note: R-red, B-black, Y-yellow, -green

图 3 Figure 3

8.6 建议使用过热保护装置和电流保护装置，并应根据铭牌电流设定保护装置的额定值。

It is recommended to use winding protecting device and current protection device. Set the protection device according to the rated current values on rating plate.

8.7 绕组保护 Winding protection

1TL0 电机有不同形式的绕组保护（电机编号的第 15 位字母）

1TL0 motors have different types of electrical protection as options:

- PTC 热敏电阻 - 用于报警（145°C）或跳闸保护（155°C）

PTC - used for temperature alarming (145°C) or tripping function (155°C)

- PT100 测温电阻 - 用于测定轴承或绕组温度

PT100 - used for monitoring temperature of bearing or stator windings.

表 4 Table 4

PTC		2PTC			PT100						2PT100						选项号Option code												
PTC 155°C		PTC 155°C		PTC 145°C		U		V		W		U		V		W		Q72	Q04										
																		轴承测温元件 2PT100resistan ce thermo meter for bearing	防潮加 热带 Heater										
2TP1	2TP2	2TP1	2TP2	1TP1	1TP2	1R1	1R2	2R1	2R2	3R1	3R2	1R1	1R2	2R1	2R2	3R1	3R2	4R1	4R2	5R1	5R2	6R1	6R2	10R1	10R2	11R1	11R2	1HE1	1HE2

附注:

Foot note:

对于使用 2 个 PT100 的，端子 1TP1、1TP2 用于报警，2TP1、2TP2 用于跳闸。


For usage of 2 PTC, terminal 1TP1 and 1TP2 are used for alarming, 2TP1 and 2TP2 are used for tripping.

8.8 温度是电机运行时的重要参考指标，得到电机各重要部位的实时温度，对掌握电机的运行状态、有效预防电机故障、保证电机可靠运行十分重要。

Temperature is an important index of motor running. It is essential for prevent faults and ensure normal operation by monitoring real-time temperature, and motor's working status.

电机温度受冷却介质和环境温度的影响。对电机绕组温升的测量，通常是预埋测温元件（如 PT100），测温元件通过引出线连接控制系统，对电机进行测温，或者使用高精度的电阻法进行推算。如需测量电机机壳表面温度，应采用专门的仪器（如红外测温仪）进行测量，测量位置一般在电机吊环孔位置或电机中间位置。

The motor temperature is influenced by cooling medium and environmental temperature. Measurement of motor winding temperature rise, usually embedded temperature measuring device (such as PT100), temperature measuring element through the lead wire connection control system, the motor temperature, or using the high precision of resistance method is founded. For measuring surface temperature of motor, should use special instruments such as infrared thermometer to measure, measure position generally in the middle position of the motor or eyebolt position.

-  警告 Warning

电机在运行时表面温度会上升，请勿用手直接触摸，以免烫伤。

Motor's surface temperature is rising during operation. Do not touch by hand, otherwise will be injured by heat.

9 维护 Maintenance

9.1 电动机应定期检查和清扫，并保持表面清洁。

Motor should be regular inspected and cleaned and keep the surface clean.

9.2 当电动机的热保护及短路保护连续发生动作时，应判别故障来自电动机，还是超负荷，或是保护装置设定值太低。清除故障后，才可继续运行。

If the winding protecting device or short-circuit protecting device comes to function continually, evaluation must be made to determine whether the motor is overloaded, or the protecting value is set too low. Only after the trouble is eliminated the motor is allowed to resume operation.

9.3 应保证电动机在运行过程中轴承有良好的润滑，一般运行 5000 小时左右，即应更换轴承或补充润滑脂。补充润滑脂的量具体见加油标签或铭牌。运行中若发现轴承过热或润滑脂变质时应及时更换润滑脂。更换润滑脂时，应清除旧的润滑脂，并洗净轴承盖的油槽，然后将润滑脂填充轴承内外圈之间空腔。对于废旧的润滑脂应妥善处理，以防污染环境。

Correct lubrication must be maintained during operation. Normally bearings should be replaced or bearing grease should be added after every 5000 hours operation. The quantity of re-grease is shown on oiling label or nameplate. Bearing grease should be replaced when deteriorates or when excessive heat of bearing occurs. Before new grease is used, clean old grease in bearing and grease chamber, and then fill with new lubricant. Wasted grease should be properly handled to avoid environmental pollution.

9.4 当轴承寿命终了时，电动机运行的振动及噪声将明显增大，检查轴承的径向游隙如达到表 5 数值时即应更换轴承。

When the bearing is on the wear limit, motor vibration and noise will increase significantly. Inspect bearing radial clearance and replace the bearing if the gap reaches the following values:

表 5 Table 5

Bearing inner diameter 轴承内径 (mm)	20-30	35-50	55-80	85-120
Max. clearance 极限磨损游隙 (mm)	0.10	0.15	0.20	0.30

关于端盖或法兰盘上螺栓的拧紧力，请参照表 6 中螺栓的拧紧力矩大小及方向，对于铝壳电机，请参照表 7。

Please refer to table 6 for tightening torques and direction for tightening. For aluminum motor, please refer to table 7.

表 6 Table 6



尺寸 Size	M4	M5	M6	M8	M10	M12	M16	M20
转矩 Torque (Nm)	2	3.5	6	16	28	46	110	225

注：拧紧力矩（Nm，公差：±10%） Note: Tightening torque (Nm, tolerance: ±10%)

表 7 Table 7

尺寸 Size	M5	M6	M8
转矩 Torque (Nm)	5	8.5	21

注：拧紧力矩（Nm，公差：±10%） Note: Tightening torque (Nm, tolerance: ±10%)

9.5 拆卸电动机时从轴伸端或非轴伸端取出转子都可以，如果没有必要卸下风扇则从非轴伸端取出转子较为便利。从定子中抽出转子时，注意避免损坏定子绕组或绝缘。

When dismantle the motor and draw-out the rotor, it can be drawn-out from either side of the motor. Usually it is more convenient to draw-out the rotor from fan side. Carefully hand to avoid damage the stator winding.

REACH 法规第 33 条的规定

该产品的一个或多个组成物中含有高关注物质候选清单中的以下物质超过 0.1%:

- CAS 编号 7439-92-1, 铅

基于现有信息，在规范化使用的条件下，包括废弃处理，该物质不会产生风险。

Information according to Article 33 of the REACH regulation

This product contains one or several subproducts in which the following substance – belonging to the "list of restrictions" – exists in a concentration exceeding 0.1 percent by weight.

- CAS No. 7439-92-1, lead

Based on currently available information, this substance does not represent any risk when correctly used, including its disposal.

贝得电机的服务范围仅限中国大陆地区

The service area of Beide motor is in China mainland

本公司产品服务由当前服务商或售后服务部负责

Product service is provided by current service agent or post-sale department

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如有变动，恕不事先通知

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