

产 品 规 格 书

PRODUCT SPECIFICATION

产品系列 Product Series: EC 离心风机 EC centrifugal fan

产品型号 Model: SC310E5-AGT-04

配置代号 Configuration code: 101



泛仕达机电股份有限公司
FANS-TECH ELECTRIC CO.,LTD.

换版记录/Records of revision

版本号 Vision no.	换版原因 Reason for revision	修订内容 Revised Contents	姓名 Revised by	日期 Date
A/0	/	/	邓世俊	2021/08/12

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客户确认(Customer Confirmation):  21-08-16

日 期(Date):

产品设计标准和安规要求/ Engineering standard and safety regulations

- ◆ GB14711《中小型旋转电机安全通用要求》/GB14711 Safety requirements of small and medium size rotating electrical machines
- ◆ JB/T10563《一般用途离心通风机技术条件》/JB/T10563 Technical requirement for general purposes centrifugal fan.
- ◆ EN60335-1《家用和类似用途电器的安全》/EN60335-1 Safety of household and similar electrical appliances

◆ 本产品通过以下认证/ Certification

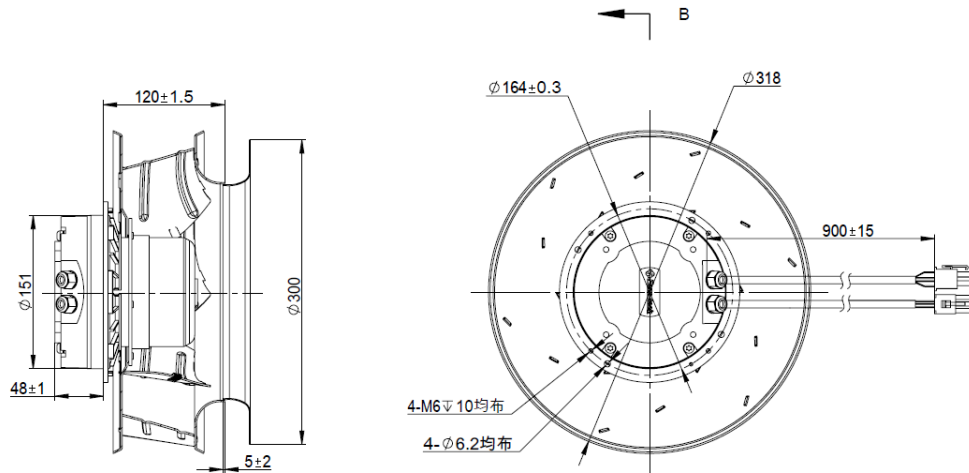
- | | | |
|------------------------------------|---------------------------------|-------------------------------------|
| ☐ UL+cUL | ☐ CE-LVD | ☐ CE-LVD+EMC |
| ☐ CE-EMC | ☐ TUV | ☐ CCC |
| ☐ 其他 Others | | |

- ◆ 本产品全部材料符合 RoHS 或 REACH 要求。/All materials accord with RoHS or REACH.

使用环境 / Operating environment requirements

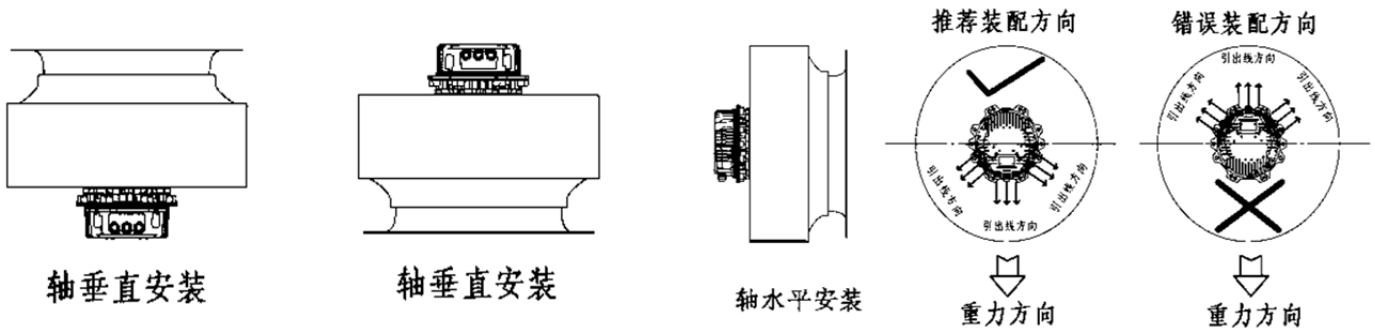
- ◆ 工作温度/Operating temperature: $-25^{\circ}\text{C} \sim +60^{\circ}\text{C}$
- ◆ 工作湿度/Operating humidity: 5%~95% RH
- ◆ 贮存温度/Storaging temperature : $-25^{\circ}\text{C} \sim +60^{\circ}\text{C}$
- ◆ 贮存湿度/Storaging humidity: 5%~95% RH

产品图 / Dimension drawing



安装方向/ Installation direction description:

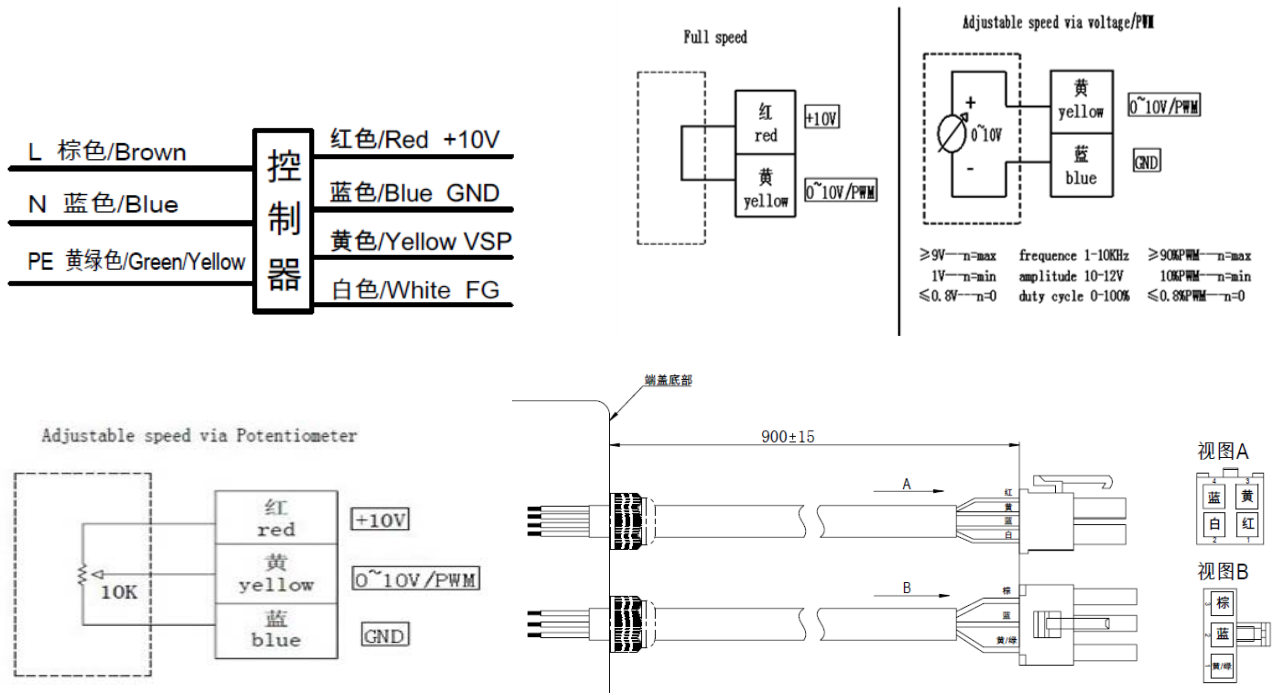
可以进行轴水平和轴垂直安装/Shaft level and axis vertical mounting



铭牌标识/Nameplate drawing

风机用交流输入永磁同步电动机			
型号/MODEL: SC310E5-AGT-04	额定转速/RATED SPEED: 2600r/min	L 棕色/Brown N 蓝色/Blue PE 黄绿色/Green/Yellow 控制器 红色/Red +10V 蓝色/Blue GND 黄色/Yellow VSP 白色/White FG	
额定电压/RATED VOLTAGE: 230V	绝缘等级/INS.CL: F		
频率/RATED FREQUENCY: 50/60Hz	防护等级/IP CLASS: IP44		
额定电流/RATED CURRENT: 2.3A	工作制/WORKING SYSTEM: S1		
输入功率/INPUT POWER: 360W	泛仕达机电股份有限公司		
		Made in China	

接线示意图/ View lead connection



Lead Wire1 (引线1)		
Color (颜色)	Sign (标记)	Performance (功能)
Brown (棕)	L	Single Phase 230VAC 50/60Hz Line (单相 230VAC 50/60Hz 电源线火线)
Blue (蓝)	N	Single Phase 230VAC 50/60Hz Neutral (单相 230VAC 50/60Hz 电源线零线)
Yellow/Green (黄/绿)	PE	Protective Earth 接地保护线
Lead Wire2 (引线2)		
Color (颜色)	Sign (标记)	Performance (功能)
Red (红)	+10V	+10VDC 辅助电源输出; Fixed voltage output 10VDC(±1V max. 1.1mA); power supply for ext.devices(e.g.potentiometer)
Yellow (黄)	VSP	Control input PWM or 0-10VDC, electrically isolated. 0-10VDC 调速输入
Blue (蓝)	GND	Public Side(GND):connection for control interface, electrically isolated. 控制信号参考端
White (白)	FG	速度/故障输出反馈; Speed signal Feedback/Fault Feedback

性能参数/Nominal data		机械参数/Mechanical data	
额定电压/Nominal voltage	230VAC	电机/Motor	DE088F5-00005-001
额定电压范围/Nominal voltage range	207~253VAC	叶轮/Impeller	叶轮由铝合金材料制成/Impeller made of aluminum
频率/Frequency	50/60Hz	重量/Weight	4 Kg
电流/Current draw(±10%)	2.3A	电机防护等级/motor degree of protection	IP44
输入功率/Power input(±10%)	360W	轴承/Bearing	滚动轴承/Ball Bearing
转速/Speed(±10%)	2600r/min	振动/Vibration	≤2.8mm/s
风量/Air flow(±10%)	2650m ³ /h	平衡/Balancing	在额定转速运转时,每个端面动平衡精度不低于平衡品质等级 6.3。 /When the fan is running at rated speed, the dynamic balance accuracy of each end side is not lower than the balance quality grade G6.3.
噪音/Noise(-7/+3)	78dB(A)		
测试状态/ Method of obtaining data	放空状态/ Free air		

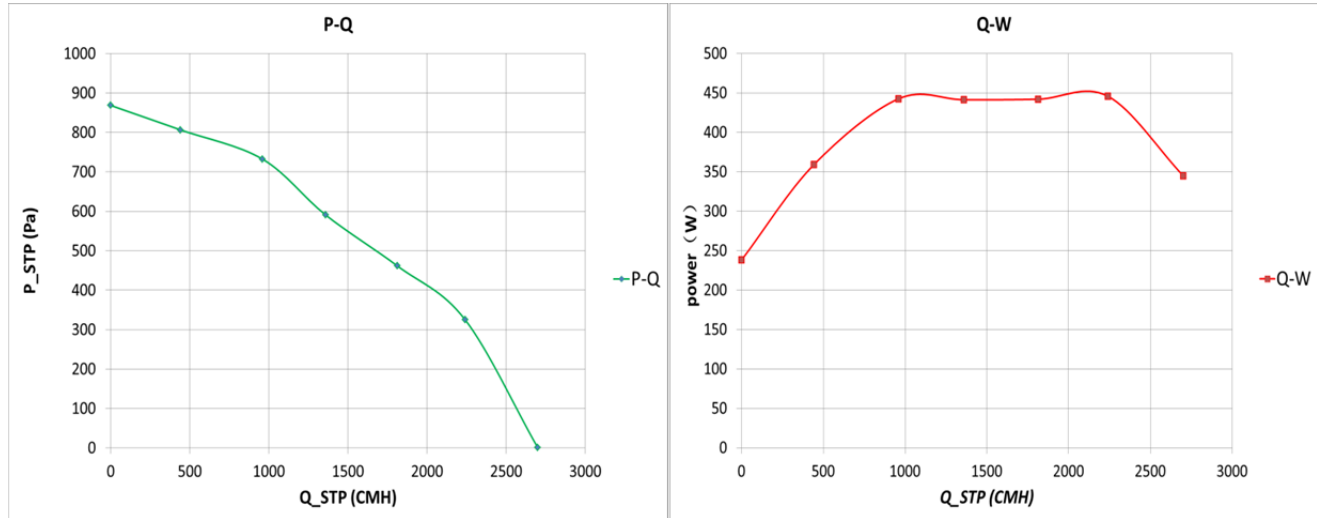
最高效率点参数/Parameters at maximum efficiency point		电气参数/Electrical description	
静压/Pst	461Pa	绝缘等级/Insulation class	F
输入功率/Power input	442 W	器具等级/Protection class	I 类 / Protection class I
风量/Air flow	1812 m ³ /h	接触电流/ touch current	≤ 3.5 mA (标准 GB4706.32-2012)
转速/Speed	2450 r/min		
效率等级/Efficiency grade N	52.2		

最大电流点参数（供参考）Parameters at maximum current point (For reference)			
额定电压/Rated voltage	230VAC	最大电流/Current draw	2.86 A
频率/Frequency	50/60Hz	输入功率/Power input	445.9 W
静压/Pst	325 Pa	转速/Speed	2537 r/min
		风量/Air flow	2240 m ³ /h

特性曲线 /Performance curve

流量-压力/P-Q

流量-功率/Q-W



调速	电压 U	频率 f	输入电流 I	输入功率 P	转速 n	静压 Pts	流量 QV	静压 Pts	流量 QV
VSP	VAC	Hz	A	W	r/min	Pa	CMH	inH2O	CFM
10VDC	230	50/60	1.51	238.33	2598	868.8	0.00	3.475	0
10VDC	230	50/60	2.30	359.1	2576	806.6	441.55	3.226	260.04
10VDC	230	50/60	2.85	442.7	2548	732.7	959.15	2.931	564.87
10VDC	230	50/60	2.84	441.54	2437	590.7	1359.64	2.363	800.73
10VDC	230	50/60	2.85	442.2	2452	461.5	1812.92	1.846	1067.68
10VDC	230	50/60	2.86	445.9	2537	325.42	2240.35	1.301	1319.41
10VDC	230	50/60	2.25	349.6	2591	0.49	2700.26	0.002	1590.26

寿命/Life expectance

在额定电压、环境温度 40 °C、风机全速连续运转时，预期寿命为 40,000 小时（根据应用产品实际工况，预期寿命会有不同。）/The life expectancy is 40,000 hours at rated voltage, ambient temperature of 40 °C, and continuous operation of the fan at full speed. (According to the actual working conditions of the product, the life expectancy will be different).保质期以双方约定的协议为准。/The warranty period is subject to the agreement agreed by both parties.

备注/Note:

测试环境: 在室温为 25°C，相对湿度为 85%RH 时测试/Tested at room temperature of 25 °C and relative temperature of 85% RH. **风量:** 根据 ISO5801 安装类别 A 标准进行测试; /Air volume is tested according to ISO 5801 installation category A standard; **噪音:** 进行声压级测试，根据按 GB/T2888 《风机和罗茨鼓风机噪声测量方法》进行测试，轴水平放置风机，离风机进风口 1 米处测试。给定的值在上述条件下有效，并且可能根据实际安装情况而有所不同。/noise is tested for sound pressure level, according to GB/T 2888 Fan and Roots Blower Noise Measurement Method, the axis is placed horizontally and the fan is tested 1 meter away from the air inlet of the fan . The given value is valid under the above conditions and may vary according to the actual installation situation.Measurement Method, the axis is placed horizontally and the fan is tested 1 meter away from the air inlet of the fan . The given value is valid under the above conditions and may vary according to the actual installation situation.

主要功能/Technical features

软启动/Soft start

电机以低转速启动, 大约 25 秒到达全速, 以减少对电源的电流冲击/The motor starts at low speed and reaches full speed after 25 seconds' running for reducing power supply current surge.

过流保护/Over-current protection function

风机具有电流过流保护功能/The fan has overcurrent protection

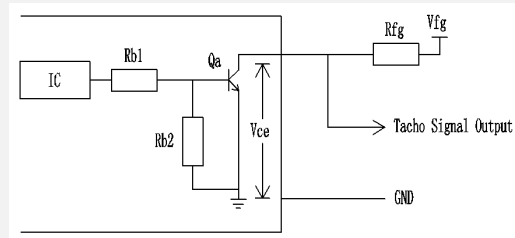
IPM 过温保护功能/ IPM over-temperature protection features;

当IPM的功率模块温度超过一定温度, 风机停止运转, 当其温度恢复时, 自动启动。When the power module temperature of IPM exceeds a certain temperature,the fan stops,and starts Automatically when its temperature recovers.

转速反馈/Feedback function of rotary speed

风机具有速度输出信号, 输出信号波形图见下图, VFG 和上拉电阻为客户外接部份, $VFG=(5-30)VDC$, $R \geq 1000 * (VFG) \Omega$ 。

The fan provides a speed output signal signal drawing see under annex. VFG and pull up resistor are out connected by customer. $VFG=(5-30)VDC$, $R \geq 1000 * (VFG) \Omega$ 。



当风机待机时, 速度反馈输出低电平; 当风机故障时, 速度反馈输出高电平; 当风机动转时, 速度反馈输出占空比为 50%的方波, 频率与电机输入电流的频率一致, 根据公式 $n=60f/p$, 其中 n 为转速, f 为电机输入电流的频率, p 为极对数。本型号电机的极对数为 5, 每转输出 5 个方波。

When the fan is in the standby mode, the signal of speed outputs low voltage; when the fan is in the error mode, the signal of speed outputs high voltage; when the fan is in normal operation, the signal of speed generates square waves of 50% duty cycle the frequency of square waves is equal to the one of phase current. Base on the formula $n=60f/p$, n is speed, f is frequency, p is polar couples number. The motor has 5 polar couples, the fan outputs 5 pulses revolution.

欠电压与过电压保护功能/Under-voltage and over-voltage protection features.

当电源电压超出允许的范围时, 风机停转; 停转后电压恢复到允许的范围, 电机恢复运行/When the power supply voltage exceeds the permitted value, the motor stop; When the power supply voltage recover to permitted value, the motor restarts automatically.

堵转保护/Locked-rotor protecting function

当风机堵转时, 风机停止运行。每次停止后, 会继续尝试启动。需要手动切断电源, 并排除堵转故障。

When the fan is blocked, the fan will stop running; It will try to start up after each stop. The operator needs to power off the fan and solve the problem.

辅助电源输出/Auxiliary power output

输出 $10 \pm 1\text{VDC}$, 最大 1.1mA /The output $10 \pm 1\text{VDC}$, Max 1.1mA ;

速度控制/Speed control

1、线性电压: $0 \sim 10\text{VDC}$ /Linear voltage: $0 \sim 10\text{VDC}$

最低控制电压有效值为 $1.0 \pm 0.2\text{V}$ 时, 电机开始运转; 低于最低控制电压 0.2V 时, 风机停转; 当控制电压有效值在 $9\text{V} \sim 10\text{V}$ 时, 电机全速运转; 输入的最大控制电压应小于 12V , 以免损坏控制器。

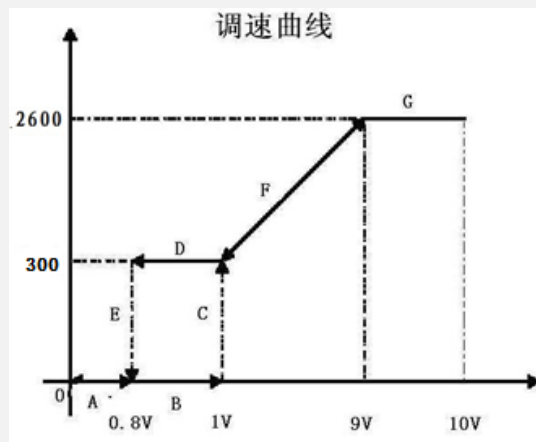
The motor starts running when the minimum input control voltage ranges from $1.0 \pm 0.2\text{V}$ and will stop with the input control voltage below 0.2V . The motor runs at full speed when inputting with $9\text{V} \sim 10\text{V}$. To avoid damaging the controller, the maximum input control voltage should be less than 12V ;

2、PWM控制信号/ PWM control signal

PWM信号电压幅值为: $10\text{V} \sim 10.5\text{V}$; 频率范围为: $1 \sim 10\text{KHz}$; 最低占空比有效值在 $10\% \pm 2\%$, 电机开始运转; 低于启动占空比数值 2% 时, 风机停转; 当占空比有效值在 $90\% \sim 100\%$ 时, 电机全速运转; 输入的电压幅值应小于 12V , 以免损坏控制器。

The PWM signal voltage amplitude is: $10\text{V} \sim 10.5\text{V}$; the frequency range is: $1 \sim 10\text{KHz}$; the minimum duty cycle effective value is $10\% \pm 2\%$, and the motor starts to run; when the value of the starting duty ratio is lower than 2% , the fan stops; when the effective value of the duty cycle is between $90\% \sim 100\%$, the motor runs at full speed; the input voltage amplitude should be less than 12V to avoid damage to the controller.

3、调速曲线/Regulate speed curve



配附件/Other requirements on accessory

导风圈/Inlet cones

■ 带/Yes, □ 不带/No, 型号为/model: TDFQ320000JS0

连接器组件/Connector assembly

■ 带/ Yes, □ 不带/No, 型号为/model: 20Y0DE08854800700

■ 电缆线/Cable, □ 组合线 外露长度/The leakage Lang: 900mm
型号为/model: ①三芯电缆 3*20AWG 棕、蓝、黄/绿 (电源线)
②四芯电缆 4*20AWG红、黄、蓝、白 (信号线)

连接器/linker ■ 有/Yes, □ 没有/No 型号为/model: HX42000-4R
HX42000-3R

端子/terminal ■ 有/Yes, □ 没有/No 型号为/model: HX42000-RT

其他/Other

警示语 /Warning:

在使用产品之前, 请仔细阅读以下说明, 遵守以下警告, 以防止发生故障或对人员造成危险。/ Read these instructions carefully before starting work on the device. Observe the following warnings to prevent malfunctions or danger to persons.

**危险/ DANGER:**

表示在紧急的情况下, 如不采用指定的措施, 会导致死亡和重伤, 必须遵守说明。/ Indicates an imminently hazardous situation which will result in death or serious injury if the specified actions are not taken. Compliance with the instructions is imperative.

1) 没有防护, 在操作过程中, 手、衣物、长头发可能会卡在设备中, 从而导致严重伤害。/ Without protection hands, clothing, and long hair may get stuck in the device, resulting in serious injury during operation.

2) 风机请安装在儿童不能接触到扇叶和带电部件的地方, 也不允许儿童单独使用本产品。/ The fan should keep away from the children especially the blade and electric parts. And the children are not allowed to operate the fan alone.

警告/ WARNING:

表示潜在的危险情况下, 可能导致死亡或严重伤害, 工作格外小心。/ Indicates a potentially hazardous situation which can result in death or serious injury if the specified actions are not taken. Exercise extreme caution while working.

1) 产品在安装、拆卸过程中可能打滑、掉落, 可能会导致致命或严重的伤害以及财产损失, 设备严重损坏。/ The product may slip and fall during installation and disassembly, which may result in fatal or serious injury, property damage, and serious damage to the equipment.

2) 噪音可能超过 $L_p: 70\text{dB(A)}$ 时, 有引起听力损失的风险。/ the sound pressure level may exceed 70dB(A) . Risk of noise-induced hearing loss.

警戒/ CAUTION:

表示潜在的危险情况下, 如果不采取指定的措施, 可能会导致轻度或中度伤害或财产损失。/ Indicates a potentially hazardous situation which can result in minor or moderate injury or damage to property if the specified actions are not taken.

1) 从包装中取出风扇时有割伤和压伤的危险。/ Cutting and crushing hazard when removing fan from packaging.

注意/ NOTE:

可能会发生潜在的有害情况, 如果不避免, 可能会导致财产损失。/ A potentially harmful situation can occur and, if not avoided, can lead to property damage.

1) 包装运输仅以原始包装运输。在原始包装中, 清洁的环境中保护其不受天气影响, 并且不受振影响。/ Transport the device in its original packaging only. protected against the weather and free from vibration, in the original packaging in a clean environment.

2) 在客户端进行安装时须满足可能出现的机械、温度及使用寿命相关的应力要求。/ When installing at the client, it must meet the mechanical, temperature and service life-related stress requirements that may occur

3) 在接入设备前, 请检查数据连接、输入的电压是否与铭牌相匹配。/ Before connecting to the device, check whether the information on the nameplate matches the connection data, and make sure the power supply matches the device voltage.

4) 在移动产品的时候, 不得以风机扇叶为受力点搬运产品, 否则会造成扇叶变形而使风机震动过大。/ Be careful when moving the fan and do not take the blades as a handle because it will cause the distortion and chatter.

5) 使用的安装螺丝不得超过要求长度, 否则会造成风机损坏。/ The length of the mounting screws shall not exceed the requirement, otherwise the fan will be damaged.

6) 请不要自主拆装风机, 否则将影响动扇叶平衡、防水等效果, 严重的将引起安全问题。/ Do not disassemble the fan arbitrarily. It may hurt the capacity of watertightness and dynamic balance or cause other serious problems.

7) 带导风圈的风机需按照推荐尺寸设计和安装, 否则将影响产品性能。/ The fan with inlet ring should be installed follow the requirements or it will affect the performance.

8) 对于未带电缆线之风机, 客户所接电缆线的外径需在要求的范围内, 否则将影响防水效果。/ Users should use the standard cable when install the fan otherwise it will affect the watertightness.

**危险/ DANGER:**

表示带电设备, 触电危险。/ Electrically charged device, Risk of electric shock

警告/ WARNIN: 设备关闭, 重新启动, 有触电的危险。/ Live terminals and connections even with device switched off, Electric shock

警戒/ CAUTION: 发生故障时, 给电机或风机通电或者在停电后, 如果设备设置有控制电压或者存储速度值, 电机将自动重启, 有受伤的风险。/ When a fault occurs, power on the motor or fan or after a power failure, if the device is set with a control voltage or stored speed value, the motor will automatically restart, there is a risk of injury.

**警戒/ CAUTION:**

表示外壳表面高温, 有烫伤危险和着火危险。/ High temperature on electronics housing Risk of burns

1) 电机接线必须按接线图的指示, 有接地线要求的产品请务必接上地线, 不建议客户使用延长线, 所有不按指示接线都可能造成电机烧坏。/ Wiring depends on the wiring diagram and please connect the earth ground if required. we don't suggest to use the extension cord. Any wrong connection may cause the damage of the fan.

2) 对于有接温控器要求的风机, 请务必接上带温控器的引线, 否则有可能造成电机内部温度过高而损坏。/ Connect the thermostat if required otherwise it would damage the motor because of the over temperature.

3) 风机的电气连接必须有合适的过流保护器以防止电流过大对产品造成损坏。/ The overcurrent protector is necessary in case the damage from the overcurrent.