

产 品 规 格 书

PR ODUCT S PECIFICATION

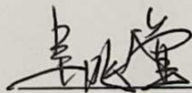
名 称 (NAME): 离心风机 centrifugal fan

型 号 (MODEL): SC500F5-AKT-00

软件型号 (SOFTWARE): EICEC000000ZL0

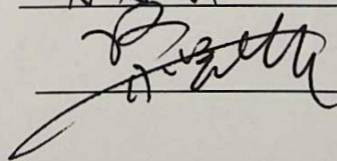
配置代码 (CONFIGURATION CODE): 002(不带导风圈)

版 本 号 (VERSION NUMBER): A/1

编 制 (MAKE): 

校 对 (EDITED): 黄观敏 李少钊

审 核 (CHECKED): 肖利歌

批 准 (APPROVED): 

客户确认 (CUSTOMER APPROVE):

日 期 (DATE):

换版记录/ Change record

版本号 Revision	换版原因 Reason for revise	修订内容 Description for revise	姓名 Make by	日期 Date
A/0	/	原版	吴兆堂	2016-3-9
A/1	更新部分内容	1、更新公司名称 2、更新功能描述 3、更新总装图 4、增加安装方向描述 5、增加软件型号和描述； 6、增加规格书编号	吴兆堂	2018-10-10

1.0 概述/ Introduction

本规格书主要描述了产品标准、使用环境、技术要求等。

This specification describes the standard, operation environment and technic requirements of the product.

2.0 本产品符合的标准 / The product satisfy requirements

2.1 本产品符合的标准 / Engineering standard

2.1.1 GB14711 《中小型旋转电机安全通用要求》

GB14711 《General requirements for safety of small and medium size rotating electrical machines》

2.1.2 JB/T10563 《一般用途离心通风机技术条件》

JB/T10563 《Technical specification for general purposes centrifugal fans》

2.2 本产品电机通过 CQC认证

The motor of the fan has CQC safety regulations certificate.

2.3 本产品全部材料符合RoHS要求.

All material accord with RoHS.

3.0 使用环境/ Operating environment requirements

3.1 工作温度和湿度/ Operating temperature and humidity

工作温度范围: $-25^{\circ}\text{C} \sim +60^{\circ}\text{C}$, 工作湿度范围: 5%~95% RH。

Operating temperatures range $-25^{\circ}\text{C} \sim +60^{\circ}\text{C}$, operating humidity from 5% to 95% RH.

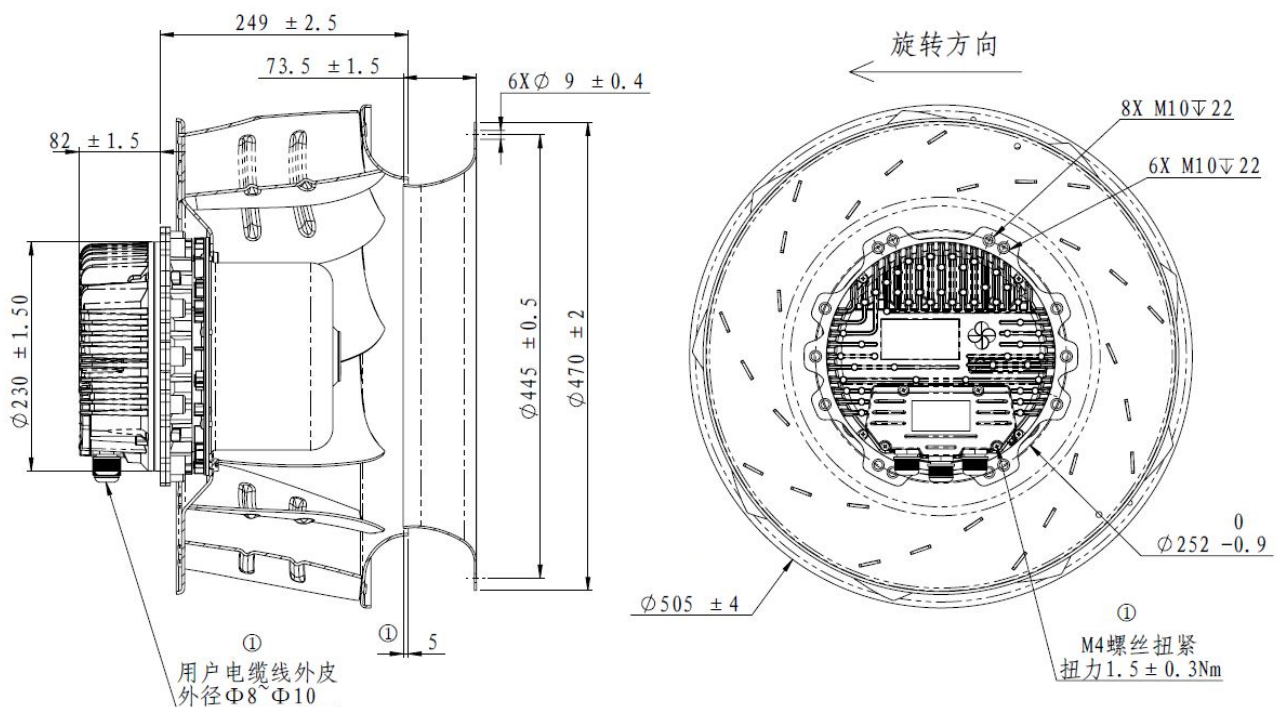
3.2 贮存温度和湿度/Storage temperature range and humidity

贮存温度范围: $-25^{\circ}\text{C} \sim +60^{\circ}\text{C}$, 贮存湿度范围: 5%~95% RH。

Storage temperatures range $-25^{\circ}\text{C} \sim +60^{\circ}\text{C}$, storing humidity from 5% to 95% RH.

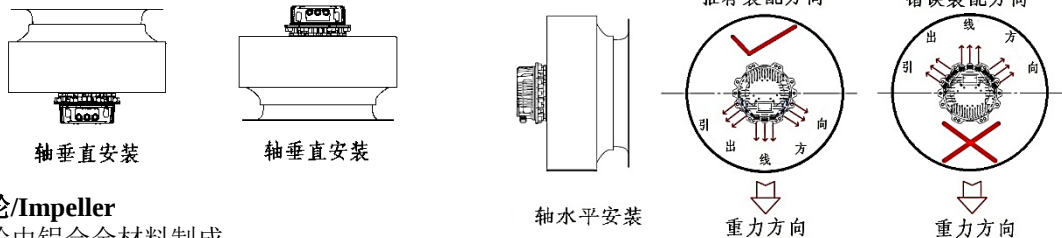
4.0 机械要求/ Mechanical requirements

4.1 外形图/Dimension drawing



4.2 整机装配方向/Machine assembly direction

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



4.3 叶轮/Impeller

叶轮由铝合金材料制成。

Impeller made of aluminum.

4.4 电机/Motor

外转子可调速永磁同步电动机。

External rotor, adjustable-speed permanent magnet synchronous motor.

4.5 软件/software

本产品内嵌风机电机驱动软件,软件为EICEC00000ZL0。

This product is embedded with fan motor driver software, the software is EICEC00000ZL0.

4.6 平衡/ Balancing

风机在全速运转时, 每个端面动平衡精度不低于 G6.3, 符合标准 JB/T9101。

When the fan is running at full speed, the residual unbalance of the fan not less than G6.3 (balancing precision grade) in each plane, according with JB/T9101.

4.7 振动/Vibration of the fan

风机振动速度有效值按照JB/T 8689标准规定。

Vibration speed virtual value of fan accord with JB/T 8689.

4.8 跳动/ Runout of impeller

风轮轴向、径向跳动 $\leq 1.5\text{mm}$ 。

Runout of impeller in axial and radial direction $\leq 1.5\text{mm}$.

4.9 防护等级/ Protection grade

电机的防护等级为 IP54。

Protection grade is IP54.

4.10 寿命/Life time

风机寿命估算值40000小时, (在额定电压、环境温度为40℃、风机全速运转时)。

The fan life is expectant 40000 hours, at nominal voltage, running at full speed, and environment temperature at 40 °C.

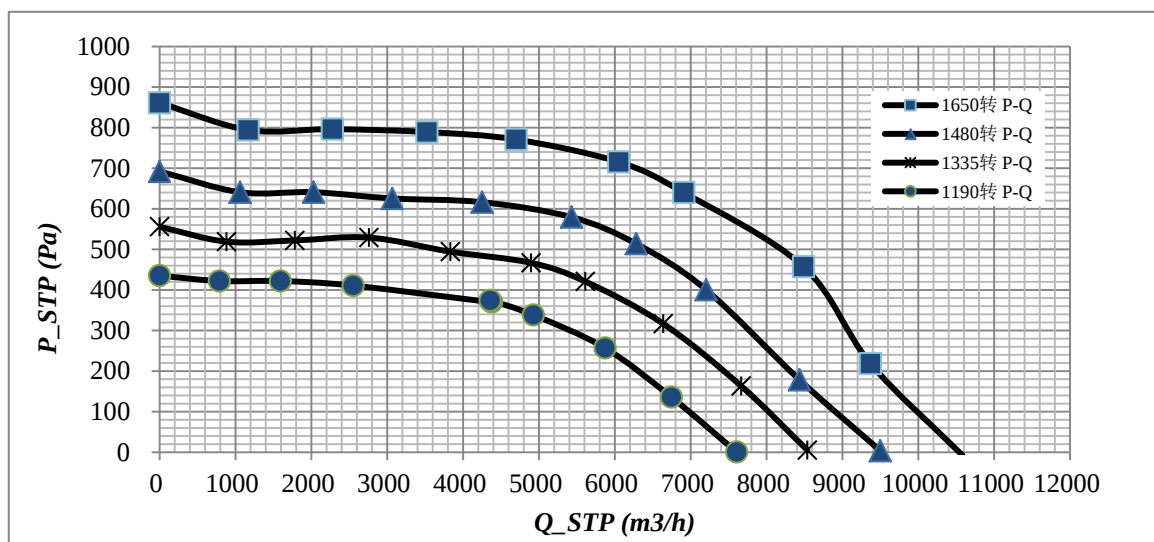
5.0 风机性能/Fan performance

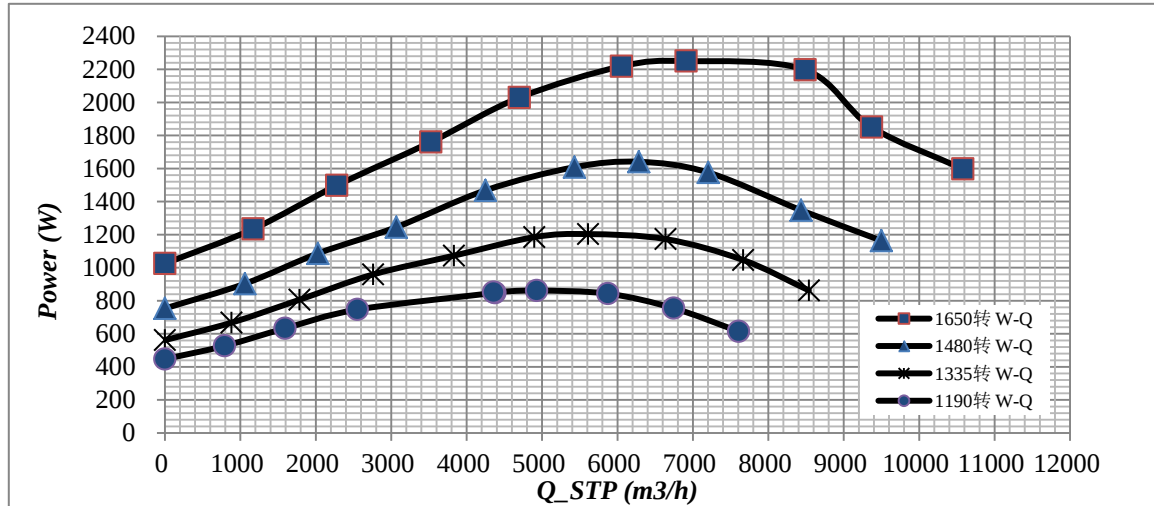
5.1 放空参数/ Data

输入电压 Input voltage [VAC]	频率 Frequency [Hz]	输入电流 Input current [A] [±10%]	输入功率 Input Power [W] [±10%]	转速 Speed[r/min] [±5%]	风量[0Pa] Air flow [m³/h] [±10%]	* 噪音 Noise level [dB(A)]LP (+3/-7)	绝缘等级 Insulation class
3~380	50/60	2.2	1350	1650	10500	85	F

* 测试方法为: 距离风机进风口1米处测试

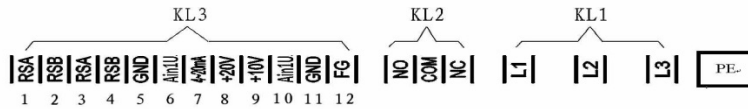
5.2 特性曲线/Performance curve



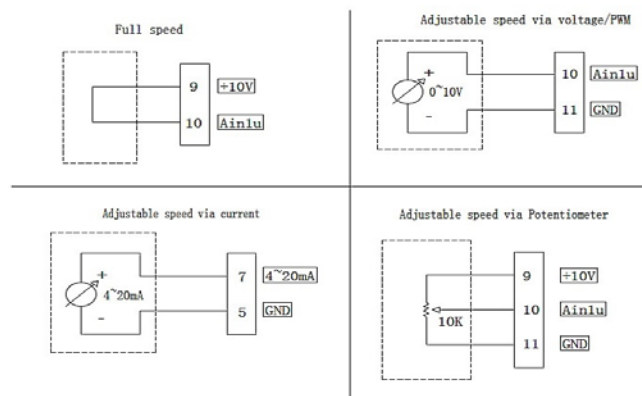


6.0 电气性能/Electrical performance

6.1 接线示意图/View lead connection



序号 NO.	脚位 Pin	标记 Signal	定义/功能 Assignment/Function	序号 NO.	脚位 Pin	标记 Signal	定义/功能 Assignment/Function
KL3	1/3	RSA	RS485接口RSA; Bus connection RS485; RSA; MODBUS RTU	KL2	1	NO	报警继电器常开端 Status relay, floating status contact; normally open; close with error
	2/4	RSB	RS485接口RSB; Bus connection RS485; RSB; MODBUS RTU		2	COM	报警继电器公共端 Status relay, common connection; contact rating 250VAC/2A(AC1)
	5/11	GND	控制信号参考端; Signal ground for control interface KL3		3	NC	报警继电器常闭端 Status relay, break with error
	6/10	Ain1U	0~10VDC/PWM调速输入; Control input 0~10VDC/PWM; only usable as alternative to input 4~20mA	KL1	1	L1	主电源输入端, 电压 3~380-480VAC; 50/60Hz; Mains supply connection, supply voltage 3~380-480VAC; 50/60Hz
	7	4~20mA	4~20mA电流调速输入; Analogue Control input 4~20mA; only usable as alternative to input 0~10V/PWM		2	L2	
	8	+20V	+20VDC辅助电源输出; Fixed voltage output 20VDC (+20% max. 50mA); power supply for ext. devices (e.g. potentiometer)		3	L3	
	9	+10V	+10VDC辅助电源输出; Fixed voltage output 10VDC (+10% max. 10mA); power supply for ext. devices (e.g. potentiometer)	PE		PE	大地接口; Earth connection, PE connection
	12	FG	速度/故障输出反馈 Speed Signal Feedback/ Fault Feedback				



6.2 电压范围/Voltage range

风机设计的额定运行电压为 3-380~480VAC，电压变化范围为 320~528VAC。

The fan is designed to operate at a nominal voltage of 3-380~480VAC, changing voltage from 320~528VAC.

6.3 速度控制/Speed control

6.3.1 单机模式/ Stand-alone mode

6.3.1.1 线性电压: 0~10VDC/Linear voltage:0~10VDC

最低控制电压有效值在 $1.0 \pm 0.2V$ 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 $9V \sim 10V$ 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。

When the RMS of the minimum control voltage is $1.0 \pm 0.2V$, the motor starts to run; when the voltage is lower than the minimum control voltage of $0.2V$, the fan stops; when the effective value of the control voltage is $9V \sim 10V$, the motor runs at full speed; the maximum control voltage input should be less than $12V$ to avoid damage to the controller.

6.3.1.2 PWM控制信号/ PWM control signal

PWM信号电压幅值为: $10V \sim 10.5V$; 频率范围为: $1 \sim 10KHz$; 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: $10V \sim 10.5V$; the frequency range is: $1 \sim 10KHz$; 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.

6.3.1.3 线性电流: 4~20mA

Linear current: $4 \sim 20mA$.

最低控制电流有效值在 $5mA \pm 1mA$ 时, 电机开始运转; 低于最低控制电流 $1mA$ 时, 风机停转; 当控制电流有效值在 $18.5 \sim 20mA$ 时, 电机全速运转; 输入的最大控制电流应小于 $25mA$, 以免损坏控制器。

When the RMS of the minimum control current is $5mA \pm 1mA$, the motor starts to run; when the current is lower than the minimum control current of $1mA$, the fan stops; when the effective value of the control current is $18.5 \sim 20mA$, the motor runs at full speed; the maximum control current input should be less than $25mA$ to avoid damage to the controller.

6.3.2 联机模式/Online model

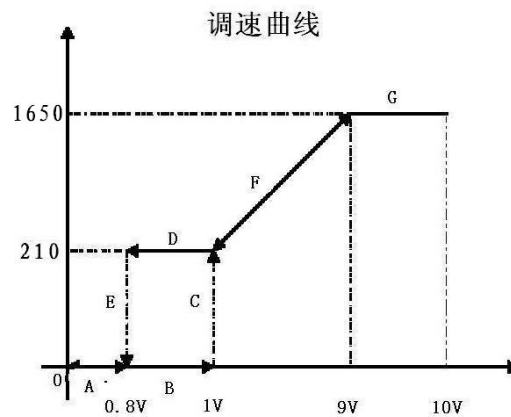
通过RS485通信, 使用MODBUS协议, 一台上位机可同时控制多台风机; 上位机可控制风机的启动、停止, 设置风机的最大转速; 同时风机向上位机反馈状态信息: 转速或故障状态。

By RS485 communications and using MODBUS protocol, one host computer can control multiple fans at the same time; the computer is able to control fan of start, stop, set the max speed of the fan, and feedback status information: speed or a failed state;

注: 风机默认状态为单机模式, 如要工作在联机控制模式, 必须由上位机设定。风机工作在联机控制模式时, 如掉电复位, 则变为单机模式, 如要工作在联机控制模式, 要由上位机重新设置。

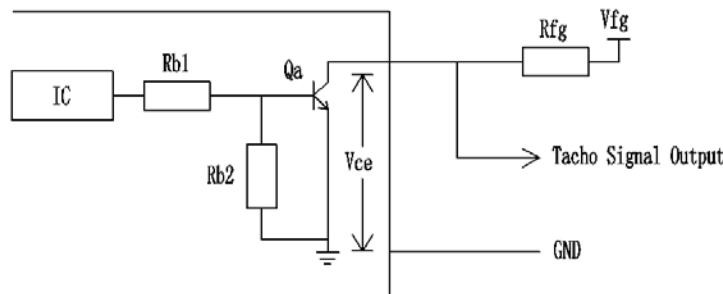
Notes: fan in the default state is stand-alone mode, if you want to work in online mode, you must set by the computer. fans work in online mode, such as the blackout reset, then becomes a stand-alone mode, if you want to work in online mode, to reset by the computer;

6.3.3 调速曲线(测试条件为: 线性电压: 0~10VDC)/ Regulate speed curve (Linear Voltage: 0~10VDC)



6.3.4 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分, $VFG = (5-30) VDC$, $R \geq 1000 * (VFG) \Omega$ 。

The fan provides a speed output signal, output 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, 速度反馈输出占空比为50%, 周期固定的方波; 当风机运转时, 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 50% duty cycle, square wave fixed period; 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 per revolution.

6.4 主要功能/Main features

6.4.1 限流保护功能/The feature of overcurrent protection;

6.4.2 软启动功能/ Soft-start function

软启动延时时间<30秒达到全速。

Soft-start time delay time less than 30S reached full speed;

6.4.3 被动式PFC电路/ Passive PFC

全速运行时功率因素 ≥ 0.8 / Power factor at full speed ≥ 0.8 .

6.4.4 线路板过温保护功能/ Circuit board over-temperature protection features

当IPM模块达到第一层限定温度时, 风机会降额运行;

当第一层保护没有能使IPM模块温度降低, IPM模块达到第二层限定温度时, 风机停止运行。

When the IPM module reaches the first layer of defined temperature, the fan deceleration runs.

When the first layer of protection does not reduce the temperature of the IPM module and the IPM module reaches the second layer of defined temperature, the fan stops running.

6.4.5 电源缺相保护/Loss phase protection

当电源缺相时，风机停止运转；直到电源恢复正常，再重启运行。

When the power supply loss phase, the fan will stop; until the power returns to normal, restart the operation.

6.4.6 堵转保护/ The locked motor protection

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.

6.4.7 继电器报警输出/Relay alarm output

当风机出现母线电压过压、欠压、IPM过温、电源缺相故障时，继电器公共触点由常闭触点接至常开触点；

When fan bus overvoltage、under voltage、IPM over temperature、loss phase, the relay public contacts from close regular contact connect to open regular contact.

6.4.8 辅助电源输出/ Auxiliary power output

输出10V±5%，最大10mA /The output 10VDC, Max 10mA;

输出20V±10%，最大50mA /The output 20VDC, Max 50mA;

6.5 耐电压/ Withstand voltage

耐电压符合 GB/T21418 《永磁无刷电动机系统通用技术条件》规定

Withstand voltage in line with GB/T21418 《General specification for permanent magnet brushless motor system》.

6.6 接触电流/ Contact current

接触电流≤10mA（参照 GB4706.32-2012）

Contact current:≤10mA; (accord with GB4706.32-2012)

7.0 质量要求/Quality requests

质量要求符合企业标准/Quality requests accord with FANS-TECH standard.

8.0 产品标识/ Product marks

8.1 FANS-TECH标志/ Logo FANS-TECH

■要/ Yes, □取消/ No;

8.2 铭牌标识/Nameplate drawing

	SC500F5-AKT-00		
	3~380-480 VAC	50/60 Hz	1650 r/min
	1.35 kW	2.2 A	
	IP 54	CLASS F	
	DW150F5-AKT-01 Thermally Protected		
	3~380-480 VAC	50/60 Hz	max 2.4kV max 3.8A

	WARNING!	
1. Dangerous voltages! Capacitor discharge time 5 minutes!		
2. This product is solely intended as a built-in component. Rotor and impeller are only basic-insulated. Please assure that it is not possible to get in direct contact with rotor and impeller when the unit is built-in.		

9.0 包装和标识/ Packaging and marks

9.1 包装/Packaging

包装有确定的尺寸和合适的结构确保风机在运输过程中不会损坏。

The packaging has to be well dimension and structure, so that the fans for on normal transport could not be damaged.

9.2 标识/Marks

制造商名称、产品型号、重量、尺寸等。

Markings: mark of manufacturer, type of fan, date of manufacture, weight, size etc.

10.0附件/Other requirements on accessory

10.1 导风圈/ Inlet cones

□带/ Yes, ■不带/ No;

型号为/model:

10.2 引出线/Outing wire

□带/ Yes, ■不带/ No;

□电缆线/Cable, □组合线/Wire;

警示语 /Warning:

- 1、电机、风机必须在规定的温度和湿度范围内使用，否则可能造成不可预测的损坏。
The fan and motor must be used within the prescribed scope of temperature and humidity otherwise it will cause an unexpected damage.
- 2、请务必使用铭牌指示的正确电压接入产品，否则会造成风机损坏。
Provide the right voltage according to the nameplate otherwise it will damage the product.
- 3、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 .
- 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运转时震动过大。
Be careful when moving the fan and do not take the blades as a handle because it will cause the distortion and chatter.
- 5、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.
- 6、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.
- 7、请不要自主拆装风机，否则将影响扇叶平衡、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 water tightness and dynamic balance or cause other serious problems.
- 8、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 over current protector is necessary in case the damage from the over current.
- 9、请按风机的建议安装方向安装产品，任何不按产品的要求来安装将会影响风机的使用寿命。
Install the fan as required ,any other installing direction would affect the service life of the product.
- 10、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.
- 11、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 other wise it will affect the water tightness.
- 12、风机请安装在儿童不能接触到扇叶和带电部品的地方，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.

未按以上条例安装及使用风机，所造成的机器损坏或者事故，我公司均不承担任何责任。敬请知悉！

Please be informed that we are not responsible for any damage or accidents caused by violating above rules to install and operate the fan.