

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: SC400F5-112-003

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

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A/0	原版	/	陈宏基	2021/11/9

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日 期(Date): _____

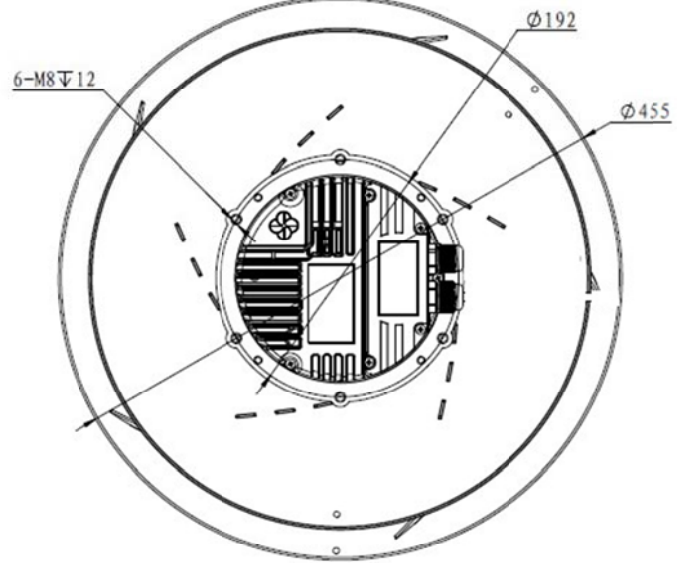
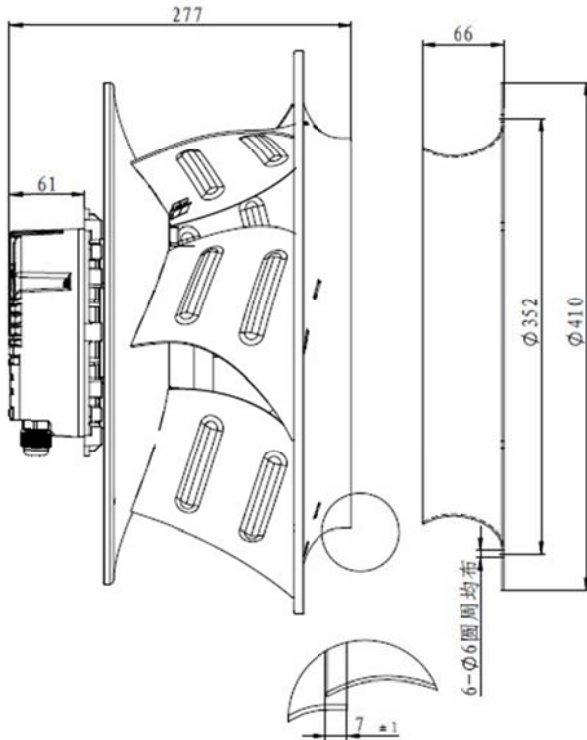
产品设计标准和安规要求/ Engineering standard and safety regulations

- ◆ 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/T10562-2006 《一般用途离心通风机通用技术条件》/JB/T10563-2006 Technical specification for general centrifugal fan
- ◆ 风机振动速度有效值, 按照 JB/T6411-1992 标准规定/The fan vibration speed virtual value according to JB/T6411-1992 standard
- ◆ 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/All materials accord with RoHS.

使用环境 / Operating environment requirements

- ◆ 工作温度/Operating temperature: $-25^{\circ}\text{C} \sim +40^{\circ}\text{C}$
- ◆ 工作湿度/Operating humidity: 5%~95% RH
- ◆ 贮存温度/Storing temperature : $-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$
- ◆ 贮存湿度/Storing humidity: 5%~95% RH
- ◆ 海拔高度/Altitude: $\leq 1000\text{m}$

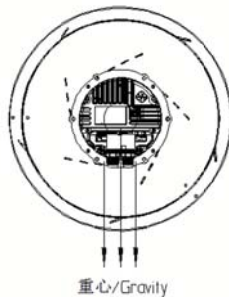
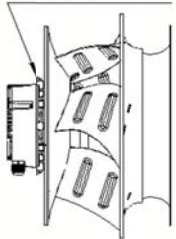
产品图 / Dimension drawing



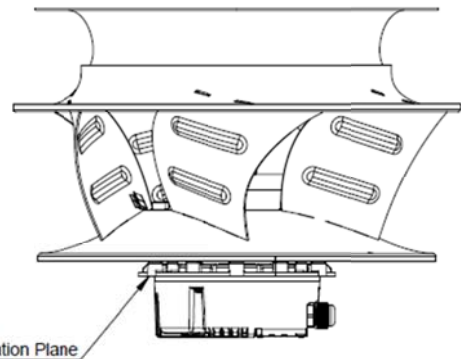
使用建议: 安装导风圈的开口尺寸建议为 $\Phi 342\text{mm}$

安装方向/ Installation direction

安装面/Installation Plane



轴水平安装/ Shaft Horizontal installation style



安装面/ Installation Plane

轴垂直安装/ Shaft vertical installation style

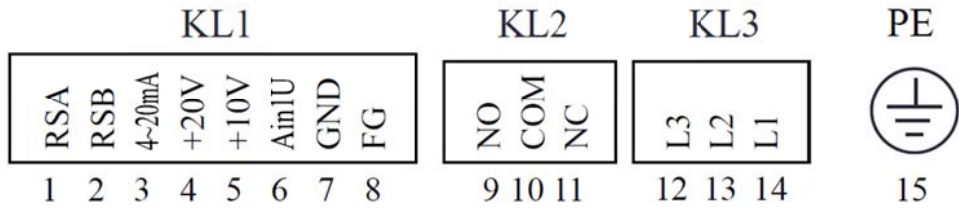
铭牌标识/Nameplate drawing



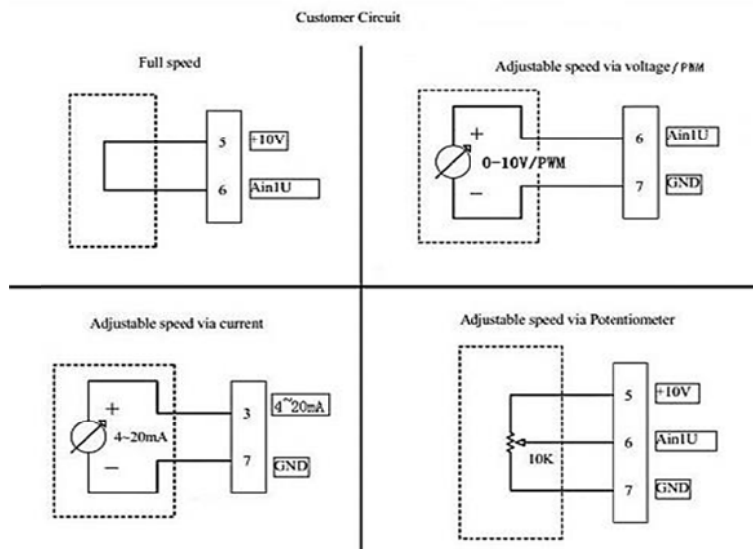
备注: 铭牌上的额定电流及额定功率参数是风机带导风圈在 0Pa 状态下运行的参数。

Note: The rated current and rated power parameters on the nameplate are the parameters of the fan with the air guide ring operating at 0Pa.

接线示意图/ View lead connection



序号 NO.	脚位 Pin	标记 Signal	定义/功能 Assignment/Function
KL1	1	RSA	RS485 接口RSA; Bus connection RS485; RSA;MODBUS RTU
	2	RSB	RS485 接口RSB; Bus connection RS485; RSB;MODBUS RTU
	3	4~20mA	4~20mA 电流调速输入; Analogue control input 4~20mA; Only usable as alternative to input 0-10V/PWM
	4	+20V	+20VDC 辅助电源输出: Fixed voltage output 20VDC (± 2 max.20mA); power supply for ext. devices (e.g. potentiometer)
	5	+10V	+10VDC 辅助电源输出: Fixed voltage output 10 $\pm$ 1VDC, max.5mA; power supply for ext. devices (e.g. potentiometer)
	6	Ain1U	0-10VDC/PWM 调速输入; Control input 0-10VDC/PWM
	7	GND	控制信号参考端; Signal ground for control interface KL1
	8	FG	速度/故障输出反馈 Speed Signal Feedback/Fault feedback
KL2	9	NO	报警继电器常开端 Status relay, floating status contact; normally open; close with error
	10	COM	报警继电器公共端 Status relay, common connection; contact rating 250VAC/2A(AC1)
	11	NC	报警继电器常闭端 Status relay, break with error
KL3	12	L3	主电源输入端,电压
	13	L2	3~380 $\pm$ 20%VAC;50/60Hz;需要客户配空气开关或慢断保险管 5A~10A
	14	L1	Mains supply connection, supply voltage 3~380 $\pm$ 20%VAC;50/60Hz.Need customer equip air switch or time-lag fuse 5A~10A.
PE	15	PE	大地接口; Earth connection, PE connection



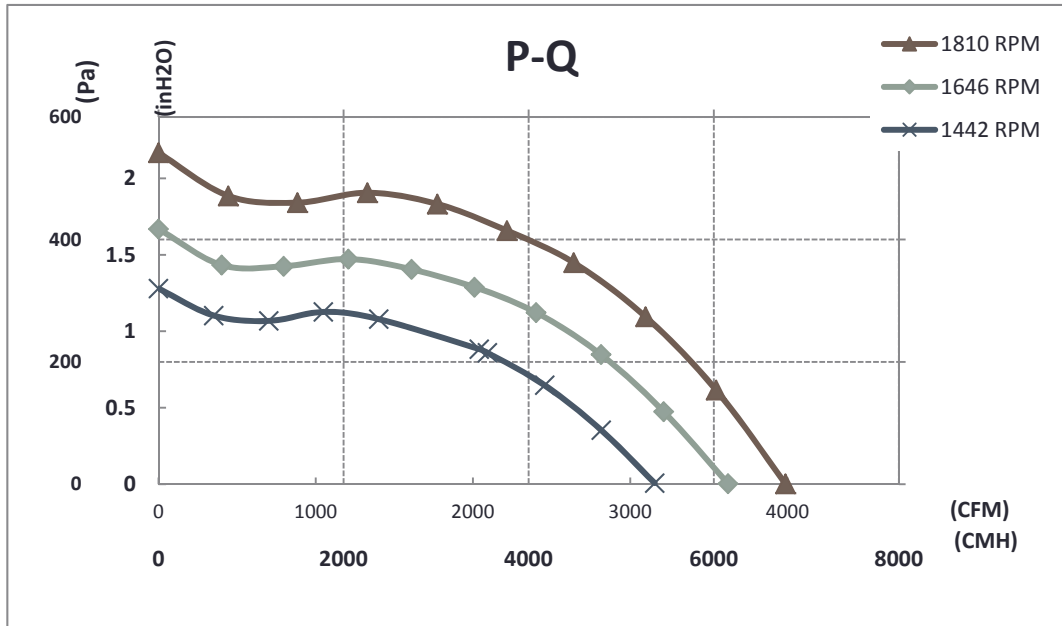
性能参数/Nominal data		机械参数/Mechanical data	
额定电压/Nominal voltage	3~380VAC	电机/Motor	DE112F5-00007-001
额定电压范围/Nominal voltage range	380~480VAC	叶轮/Impeller	铝合金，原色/sheet aluminum, primitive color.
频率/Frequency	50/60Hz	蜗壳/Scroll housing	/
电容/Capacitor(±5%)	/	重量/Weight	9.5Kg
电流/Current draw(±10%)	1.0A	控制器防护等级/PCB degree of protection	IP54
输入功率/Power input(±10%)	562W		
转速/Speed(±10%)	1800r/min	轴承/Bearing	滚动轴承/Ball Bearing
风量/Air flow(±10%)	6775m³/h	振动/Vibration	≤4.6mm/s
噪音/Noise(-7/+3)	LpA: 77dB(A)	平衡/Balancing	在 1800±10%r/min 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 1810±10%r/min, the dynamic balance accuracy of each end side is not lower than the balance quality grade G6.3.
测试状态/ Method of obtaining data	额定电流及额定功率参数是风机带导风圈在 0Pa 状态下运行参数。风量按我司风洞测量值；噪音是在噪音房里，轴水平放置风机, 离风机进风口 1 米处测试。/The rated current and rated power are the parameters of the fan with the guiding ring running at 0Pa. The airflow is measured in the wind tunnel, the noise is tested in a horizontal position in the noise testroom, with 1m distance to the air inlet of the fan.		

最高效率点参数/Parameters at maximum efficiency point		电气参数/Electrical description	
静压/Pst	362Pa	绝缘等级/Insulation class	F
输入功率/Power input	696W	器具等级/Protection class	接地保护, 客户端连接 I (with customer connection of ground protection)
风量/Air flow	4485m ³ /h	接触电流/ touch current	≤ 5mA
转速/Speed	1810r/min		
ErP 指令/ErP Directive	ErP2020		
效率等级/Efficiency grade N	83.2		

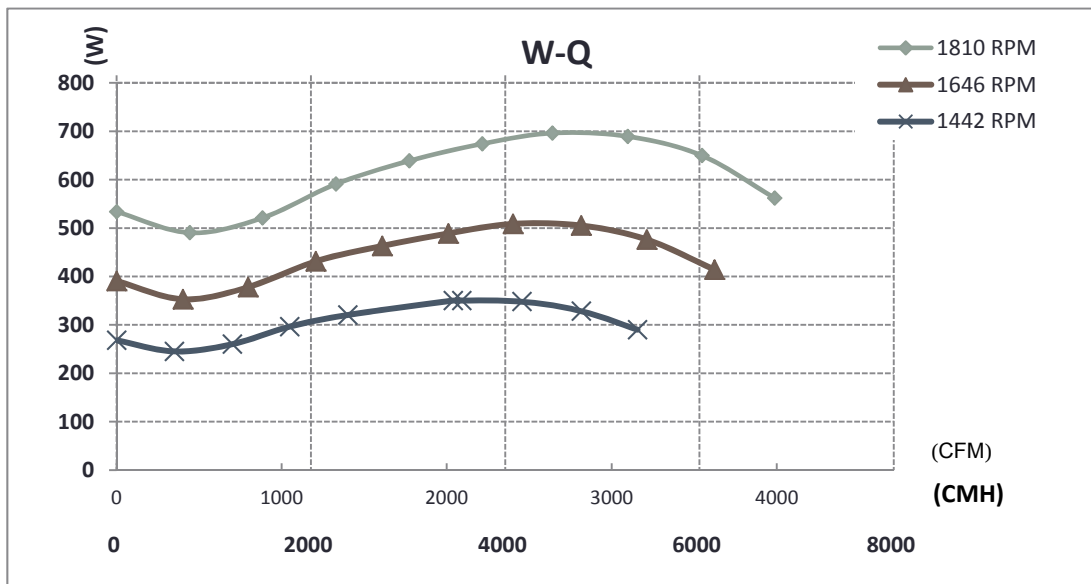
最大电流点参数 (供参考) Parameters at maximum current point (For reference)			
额定电压/Rated voltage	3~380VAC	最大电流/Current draw	1.2A
频率/Frequency	50Hz	输入功率/Power input	696W
电容/Capacitor	/	转速/Speed	1810r/min
静压/Pst	362Pa	风量/Air flow	4485m ³ /h

特性曲线 / Performance curve

流量-压力/P-Q



流量-功率/Q-W



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
VAC	Hz	A	W	r/min	Pa	CMH	inH2O	CFM
380	50	1.2	696.2	1810	362.2	4485.88	1.4	2641.9
380	50	1.2	689.3	1810	273.8	5262.70	1.1	3099.4
380	50	1.1	649.7	1810	154.0	6026.22	0.6	3549.0
380	50	1.0	561.9	1810	0.7	6774.81	0.0	3989.9

寿命/Life expectanc

在额定电压、环境温度40℃、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)..

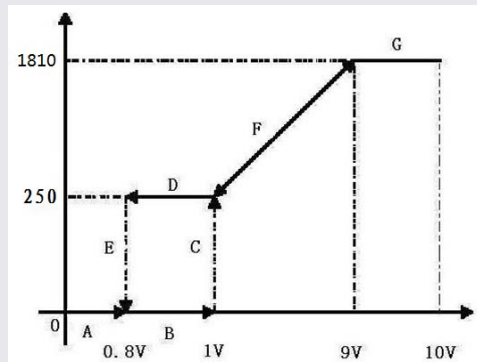
备注/Note:

测试环境: 在室温为 25℃，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 30 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 30 seconds' running for reducing power supply current surge.
过流保护/Over-current protection function	电流过流保护功能。/Over-current protection.
升温减额运行，驱动模块过温保护/Driving module over-temperature protection function when operates under rising temperature	驱动模块温度升到达到一定的程度时，最高转速降低为全速 80%，当驱动模块过热时风机停止运行。/When the temperature of the drive module rises to a certain extent, the highest speed is reduced to 80% of full speed. When the drive module overheats, the fan stops running.
电源缺相保护/Power phase loss protection function	电源缺相时，停止驱动输出。Power phase loss, stop driving output.
继电器报警输出/Alarm output of relay	当输入电压过压、欠压、驱动模块过温、电源缺相故障时，继电器公共接点由常闭触点接到常开触点。/ Under the situation of input voltage exceeds limit, under-voltage, driving module over-temperature, the common contact of relay is turned from normally close contact to normally open contact.
转速反馈/Feedback function of rotary speed	VFG 和上拉电阻为客户外接部分，$VFG = (5-30) VDC$，$R \geq 1000 * (VFG) \Omega$。/ VFG and pull up resistor are out connected by customer. $VFG = (5-30) VDC$，$R \geq 1000 * (VFG) \Omega$. 当风机运转时，FG 速度反馈输出占空比为 50% 的方波，电机每旋转一周，输出 5 个完整周期的方波。/When the fan is in the error mode, the signal of speed outputs high voltage; When the motor is running, the FG terminal outputs a duty cycle of 50% square wave signal. Each revolution of the motor outputs 5 complete outputs of the square wave of the cycle. FG 信号电路的外接电源，需要保证稳定性，不允许输入超过规格的电源电压，电源无明显的尖峰与浪涌冲击。外接电阻选型需要符合规格书要求。FG 端口需要注意防静电损伤。/The power supply of FG signal circuit needs to be stable, input power supply voltage is not allowed exceeding specification and surge pulse. External resistance needs to accord with specification. FG port needs to prevent electrostatic damage.
堵转保护/Locked-rotor protecting function	将负载风机堵住，输入额定的电压(3~380VAC)及调速电压，输入电流小于规定值。/Lock the loaded fan, and input rated voltage (3~380VAC) and speed control voltage, and input current is less than the rated value.
联机通信/On-line communication function	RS485 通讯功能。/RS485 communication function
辅助电源输出/Auxiliary power output	输出 10±1VDC,负载电流≤5mA。 Output 10±1VDC, load current≤5mA.

速度控制/Speed control



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.

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.

3、线性电流/ Linear current: 4~20mA

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.

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.

安规/Safety

1、动态接触电流: 风机在 10% 、 25% 、 50% 、 75% 和 100% 全速下, 输入测试电压 $3 \sim 380Vac$ (相电压 $220Vac$) 和 $3 \sim 440Vac$ (相电压 $254Vac$) 测试风机动态接触电流值, 接触电流 $\leq 5mA$ 。/Dynamic contact current: the fan at 10% , 25% , 50% , 75% and 100% full speed, input test voltage $3 \sim 380VAC$ (phase voltage: $220VAC$) and $3 \sim 440VAC$ (phase voltage: $254VAC$), contact current $\leq 5mA$

2、静态接触电流: 风机在 $3 \sim 509Vac$ (相电压: $294Vac$) 下, 测试风机静态接触电流, 接触电流 $\leq 10mA$ 。/Static contact current: the fan at $3 \sim 509VAC$ (phase voltage: $294VAC$), the fan static contact $\leq 10mA$

3、绝缘电阻: $500Vdc/60s \geq 50M\Omega$ /Insulation resistance: $500Vdc/60s \geq 50M\Omega$

4、普通绝缘: /Ordinary insulation:

取消气体放电管情况下: /When the air discharge tube is cancelled:

相线对大地: $1250Vac/60s \leq 10mA$; /(L1-PE,L2-PE,L3-PE): $1250Vac/60s \leq 10mA$;

相线对大地: $1500Vac/60s \leq 10mA$; /(L1-PE,L2-PE,L3-PE): $1500Vac/60s \leq 10mA$;

相线对大地: $1800Vac/60s \leq 10mA$; /(L1-PE,L2-PE,L3-PE): $1800Vac/60s \leq 10mA$;

不取消气体放电管情况下: /When the air discharge tube is not cancelled:

相线对大地: $2500Vdc/60s \leq 10mA$; /(L1-PE,L2-PE,L3-PE): $2500Vdc/60s \leq 10mA$;

5、加强绝缘: /Strengthen insulation:

相线对信号线: $3000Vac/60s \leq 10mA$; /(L1-TH,L2-TH,L3-TH) : $3000Vac/60s \leq 10mA$;

相线对信号线: $4242Vdc/60s \leq 10mA$ 。/(L1-TH,L2-TH,L3-TH) : $4242Vdc/60s \leq 10mA$.

配附件/Other requirements on accessory

导风圈/Inlet cones

金属

标志/ Logo

FANS-TECH

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.