



# 规格书

# SPECIFICATION

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**MODEL**

**K-EC310-K400-35**

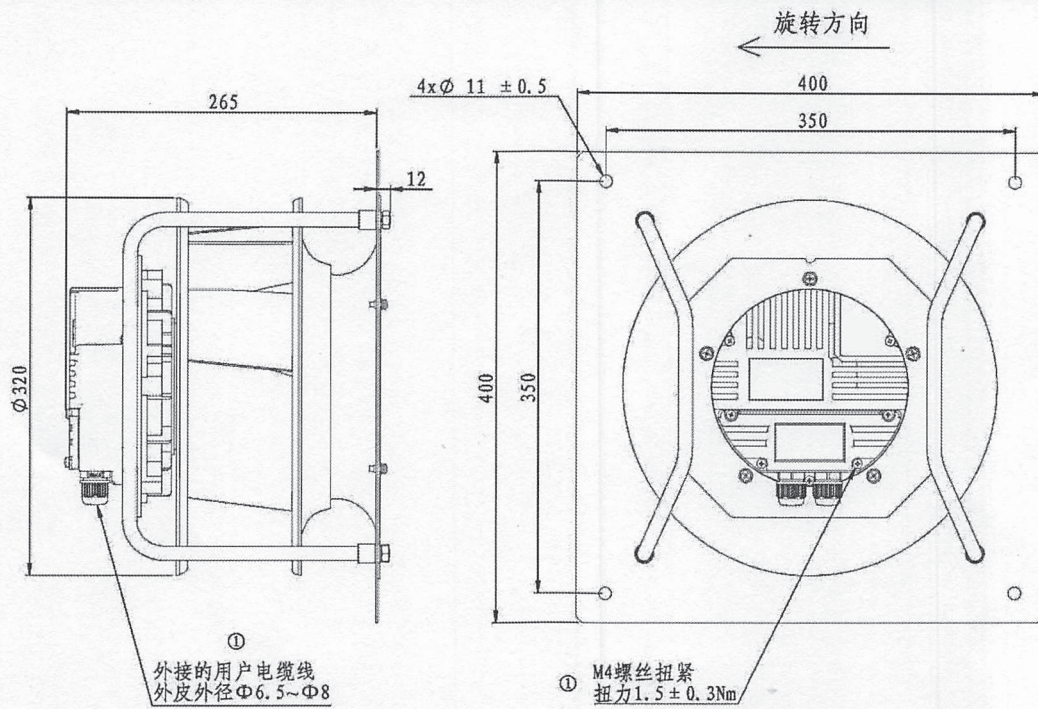
**产品设计标准和安规要求/ Engineering standard and safety regulations**

- ◆ 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/T10563-2006《一般用途离心通风机通用技术条件》/JB/T10563-2006 Technical specification for general purposes 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
- ◆ 本产品全部材料符合 RoHS 要求。/All materials accord with RoHS.

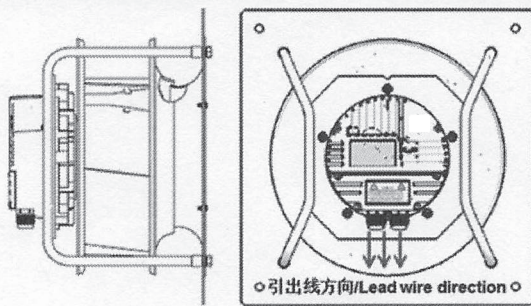
**使用环境 / Operating environment requirements**

- ◆ 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/Storing temperature :  $-40^{\circ}\text{C} \sim +70^{\circ}\text{C}$
- ◆ 贮存湿度/Storing humidity: 5%~95% RH
- ◆ 海拔高度/Altitude:  $\leq 1000\text{m}$

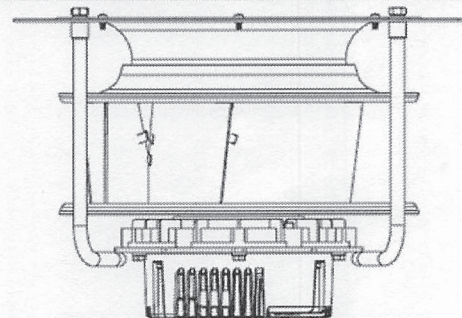
产品图 / Dimension drawing



安装方向 / Installation direction description:



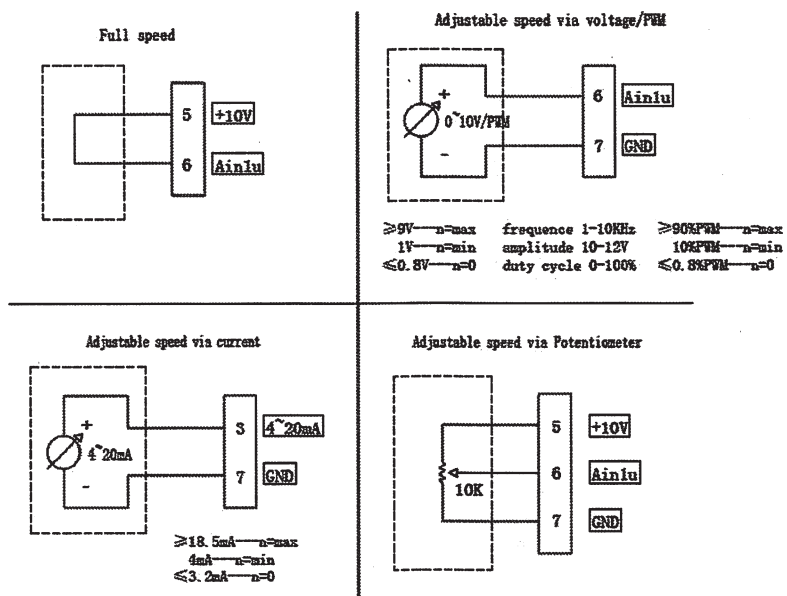
轴水平安装 / Shaft horizontal installation style



轴垂直安装 / Shaft vertical installation style



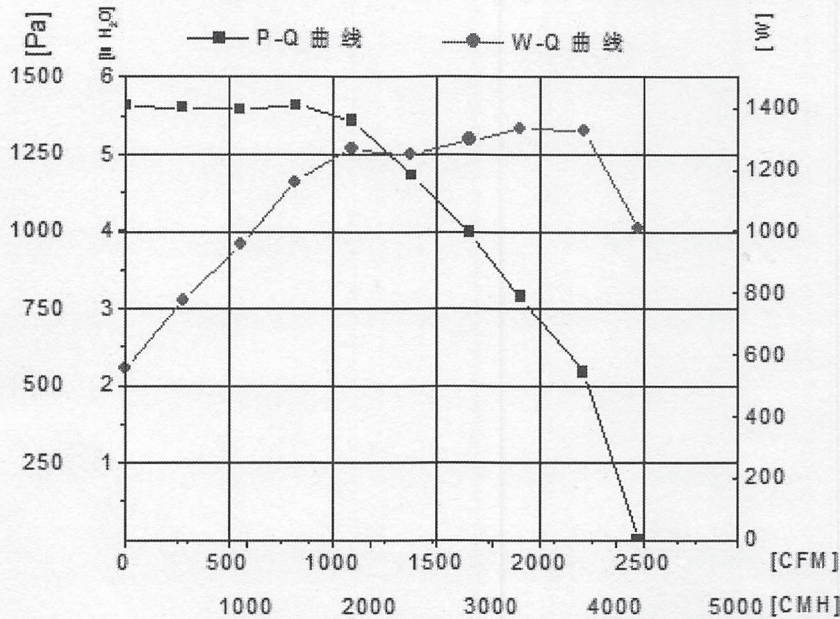
序号 NO.	脚位 Pin	标记 Signal	定义/功能 Assignment/Function	15
KL1	1	RSA	RS485 接口 RSA; Bus connection RS485; RSA;MODBUS RTU	
	2	RSB	RS485 接口 RSB; Bus connection RS485; RSB;MODBUS RTU	
	3	4~20mA	4~20mA 电流调速输入; Analogue control input 4~20mA; Only usable as alternative to input 0-10V/PWM	
	4	+20V	+20VDC 辅助电源输出; Fixed voltage output 18~30VDC, max.20mA; power supply for ext. devices (e.g. potentiometer)	
	5	+10V	+10VDC 辅助电源输出; Fixed voltage output 10±10%VDC, max.10mA; power supply for ext. devices (e.g. potentiometer)	
	6	Ain1U	0-10VDC/PWM 调速输入; Control input 0-10VDC/PWM only usable as alternative to input 4~20mA	
	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	XXX	程序烧录串口, 仅供厂家使用 Programed serial ports are only used by fan manufacturers	
	10			
	11			
KL3	12	L1	主电源输入端,电压 3[PH]400VAC;50/60Hz; (注意: 外接电源需客户端配 5~10A 的空气开关或者慢断型保险丝) Mains supply connection, supply voltage 3[PH]400VAC;50/60Hz (Note: The power supply needs 5~10A specification air switch or slow break type fuse)	
	13	L2		
	14	L3		
PE	15		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[PH]400VAC	电机/Motor	
额定电压范围/Nominal voltage range	320~528VAC	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	12 Kg
电流/Current draw(±10%)	1.7A	电机防护等级/motor degree of protection	IP54
输入功率/Power input(±10%)	1010W	控制器防护等级/PCB degree of protection	IP54
转速/Speed(±10%)	3500r/min	轴承/Bearing	滚动轴承/Ball Bearing
风量/Air flow(±10%)	4150m <sup>3</sup> /h	振动/Vibration	≤3.5mm/s
噪音/Noise(-7/+3)	LpA:83dB(A)	平衡/Balancing	在 3500±10%/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 3500±10%/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	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	1182Pa	绝缘等级/Insulation class	F
输入功率/Power input	1247W	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	2332m <sup>3</sup> /h	接触电流/ touch current	≤ 3.5mA (标准 EN60335-1)
转速/Speed	3418r/min		
最大电流点参数 (供参考) Parameters at maximum current point (For reference)			
额定电压/Rated voltage	3[PH]400VAC	最大电流/Current draw	2.32A
频率/Frequency	50Hz	输入功率/Power input	1413W
电容/Capacitor	/	转速/Speed	3500r/min
静压/Pst	847Pa	风量/Air flow	3190m <sup>3</sup> /h

## 特性曲线 / Performance curve

### 流量-压力/P-Q & 流量-功率/W-Q



调速电压U	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
VDC	VAC	Hz	A	W	r/min	Pa	CMH	inH <sub>2</sub> O	CFM
10	400	50	1.07	592.4	3511	1409	0	5.64	0
10	400	50	1.94	1179	3507	1424	1370	5.7	807
10	400	50	2.29	1399	3476	1017	2805	4.07	1652
10	400	50	1.7	1010	3500	0	4156	0	2463

### 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 humidity 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, 轴垂直放置风机, 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 vertically 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/overcurrent protection.
被动式 PFC 电路/ Passive PFC	全速运行时功率因素 ≥ 0.75 / Power factor at full speed ≥ 0.75.

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转速分一次降低. 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 speed is reduced in one step. When the drive module overheats, the fan stops running.

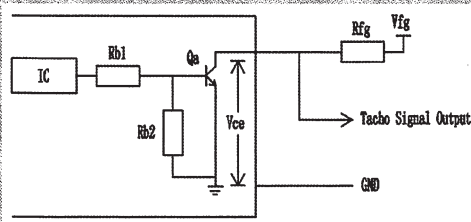
风机刹车功能  
Fan brake function

当输入主电源, 未输入调速电源时, 风机刹住。外力不能使风机转动/  
When only connect the main power supply and not connect the speed control power, the fan brake, External forces cannot make the fan rotate.

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.

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 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 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

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.

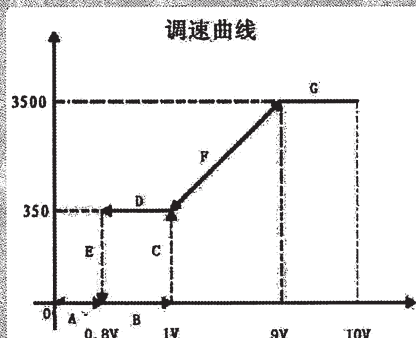
联机通信/On-line communication function

RS485 通讯功能/RS485 communication function.

辅助电源输出/Auxiliary power output

输出  $10 \pm 10\% VDC$ , 最大 10mA /The output  $10 \pm 10\% VDC$ , Max 10mA;  
输出 20VDC (18~30VDC), 最大 20mA /The output 18~30VDC, Max 20mA;

速度控制/Speed control



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

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  $5\text{mA} \pm 1\text{mA}$  时，电机开始运转；低于最低控制电流  $1\text{mA}$  时，风机停转；当控制电流有效值在  $18.5\sim 20\text{mA}$  时，电机全速运转；输入的最大控制电流应小于  $25\text{mA}$ ，以免损坏控制器。When the RMS of the minimum control current is  $5\text{mA} \pm 1\text{mA}$ , the motor starts to run; when the current is lower than the minimum control current of  $1\text{mA}$ , the fan stops; when the effective value of the control current is  $18.5\sim 20\text{mA}$ , the motor runs at full speed; the maximum control current input should be less than  $25\text{mA}$  to avoid damage to the controller.