

KL-60C-4 内藏式电主轴
KL-60C-4 Ball Bearing Spindle

操作说明书
Operating Instruction

 **东莞市科隆电机有限公司**

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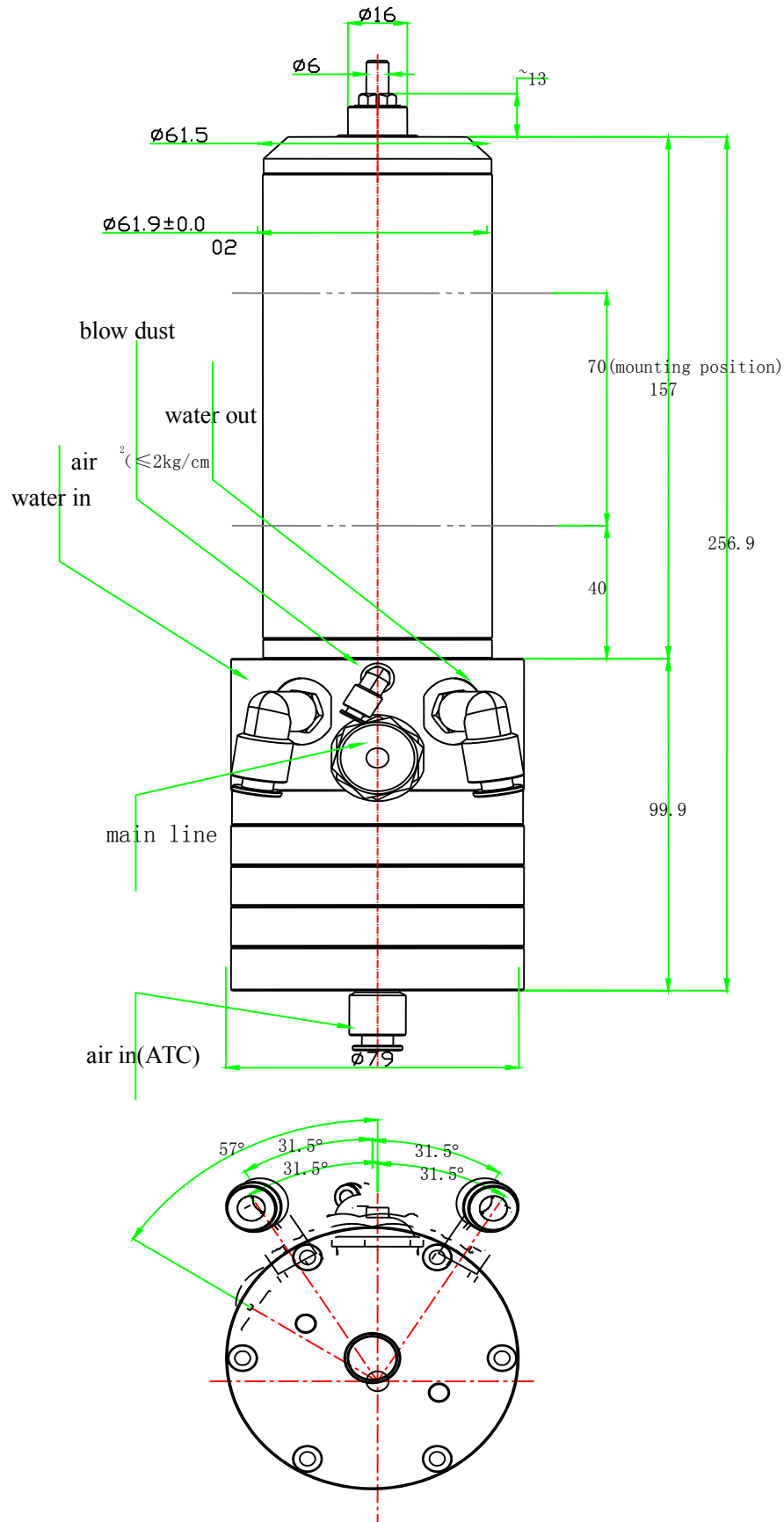
Web: <http://www.klkjgroup.com>

<http://www.cnchighspeedspindle.com>

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KL-60C-4 结构示意图 outline drawing



KL-60C-4内藏式主轴技术参数表

主轴型号Spindle Model	KL-60C-4	转速范围 (rpm) Speed Range	10,000-60,000
电压范围 (V) Voltage	33-182	频率范围 (Hz) Frequency	167-1000
最大电流 (A) Max. Current	5	额定功率 (Kw) Rated power	1.5
轴承类型 Bearing Type	Ball Bearing	主轴重量 Spindle Weight (kg)	4.6

序号 No.	技术参数 Technical Parameters		
1	静态偏摆 Static Runout (μm)	≤ 2.0	
2	动态偏摆 Dynamic Runout (μm)	≤ 10.0	
3	振动 Vibration (mm/s)	≤ 1.0	
4	夹头扭矩 Collet torque (N.cm)	≥ 210 ($\varnothing 3.176$)	≥ 382 ($\varnothing 6$)
5	电机绕组耐压测试 Winding withstand voltage test	1500V/1min 耐电压试验	
6	冷却水温 Cooling water temperature ($^{\circ}\text{C}$)	20 ± 2	
7	冷却水流量 Cooling water flow (l/min)	≥ 1.2	
8	夹头锁定方式 Collet Type	可拆卸式	
9	主轴吹尘气压 Spindle Air Pressure (kg/cm^2)	≥ 2.0	
10	主轴开刀气压 Spindle release Pressure (kg/cm^2)	≥ 5.0	
11	主轴吹尘气流量 Spindle Air Flow (l/min)	50	

主轴引出线接线说明: Power lines

颜色 Color	功能 Function
棕色 Brown	PTC (可选)
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红色 Red	U
蓝色 Blue	V
黑色 Black	W
黄绿相间 Yellow and green	接地 Ground

测速接线：（可选）Speed testing lines

输入/输出 In/Out	颜色 Color	功能 Function
输入 In put		+ 5V
输入 In put		- 0V
输出 Out put		信号 Signal

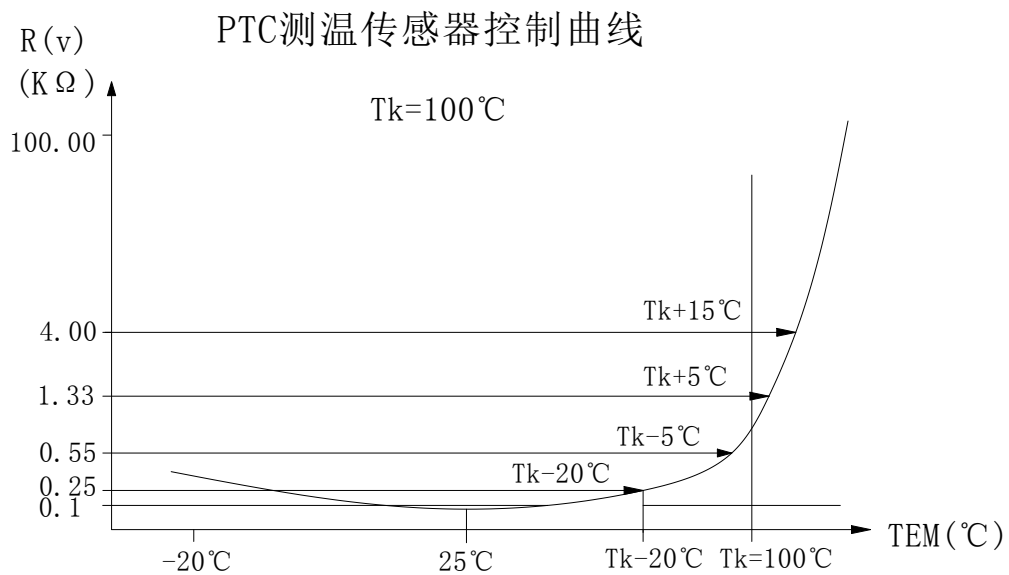
测温传感器技术参数（可选）Temperature Sensor technical parameters (Optional)

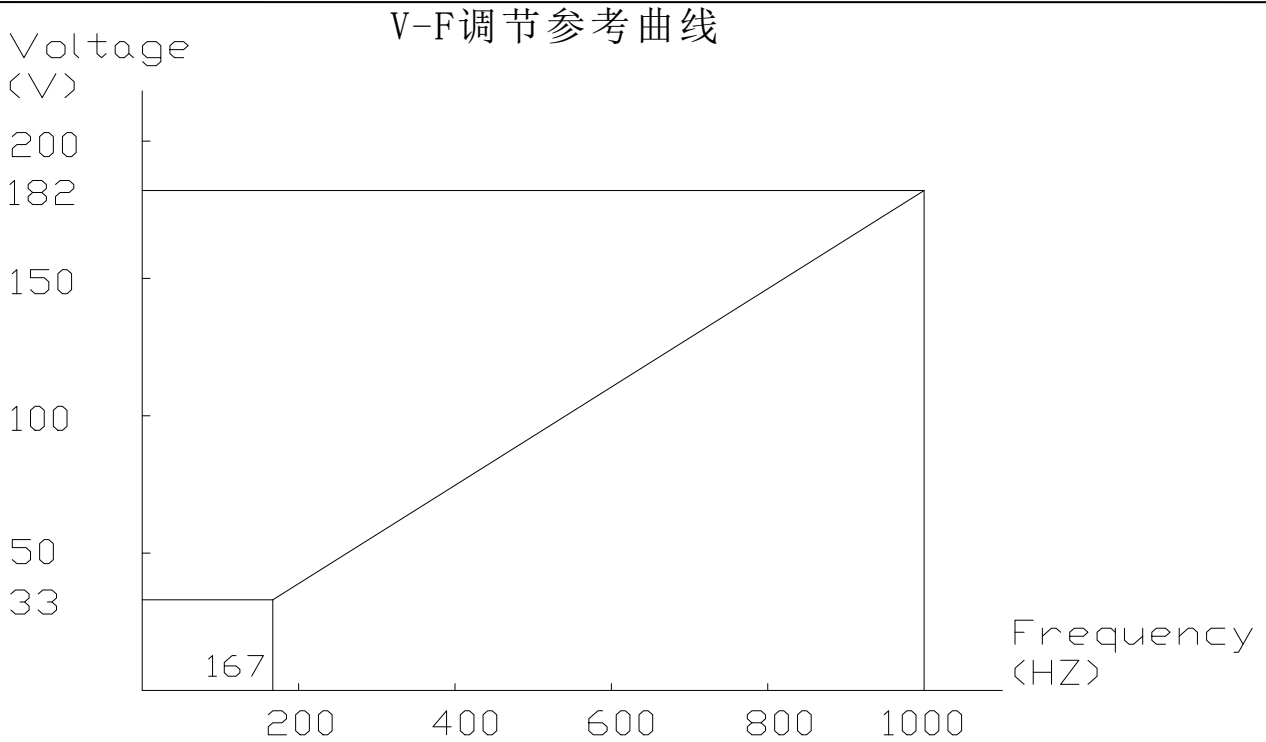
1、测温传感器相关技术参数见下表 Temperature Sensor parameters as below:

PTC热敏电阻技术数据 PTC thermistor technical data		单芯热敏电阻 Single chip	单位 unit
最大工作电压Max. work voltage	U _{max}	25	V
额定动作电压Rated work voltage	T _k	60-180	°C
T _k 的公差 Tolerance of T _k	T _k =100°C	±5	°C
T _k 的重复性Repeatability of T _k	ΔT	±0.5	°C
常温阻值T=25°C (U≤2.5V) Normal Temperature	R ₂₅	≤100	Ω
PTC电阻 (U≤2.5V) 在某一温度时 Resistance (U≤2.5V) at certain temperature	T _k -5°C	≤550	Ω
PTC电阻 (U≤2.5V) 在某一温度时 Resistance (U≤2.5V) at certain temperature	T _k +5°C	≥1330	Ω
PTC电阻 (U≤2.5V) 在某一温度时 Resistance (U≤2.5V) at certain temperature	T _k +15°C	≥4.00	K Ω
T _k 的动作时间T _k action time	TD	<5.0	s
绝缘强度 Insulation strength	UIS	2.5	KV
最高允许存放温度Max. allow store	TL _{max}	160	°C
最低允许存放温度Min. allow store	TL _{min}	-25	°C

- 2、 主轴正常工作状态下，线圈温度的容许值：T 线圈≤100°C
 Normally, the stator can permit work at temperature : T≤100°C
 主轴正常工作状态下，测温传感器的温控点位温度：T_k=100°C
 Normally ,the PTC control temperature point :T_k=100°C
- 3、 测温传感器温阻曲线图如下：PTC control curve

电压—频率调节参考曲线 Voltage –frequency regulation reference curve

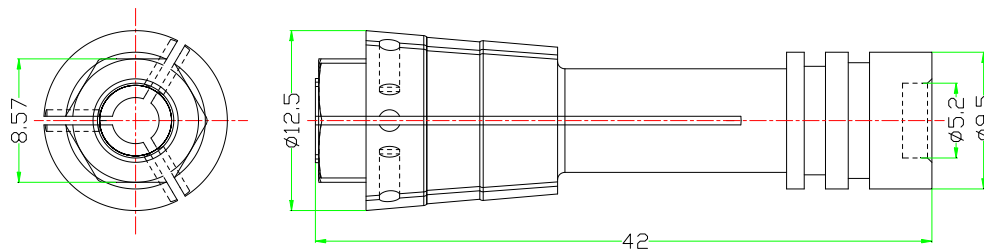




注：上图仅供主轴调试参考使用，现场需根据驱动设备的特性进行调试，如有疑问请联系厂商。

Above spindle V-F curve just for your reference when adjusting spindle, please adjust according to the actual characteristics of drive equipment ,please contact manufacturer if any question.

夹头示意图



主轴相关注意事项:

1. 主轴在运输及搬运及存放过程中需确保有相应的防潮、防震、防碰撞措施，并做到轻拿轻放。
Take measures to ensure the moisture-proof, shockproof, collision prevention of spindle during the transport, handling and storage process, make sure handle gently.
2. 主轴在运转前需确保 Before spindle running ,pls make sure everything is ok as below:
 - ①冷却水路畅通（需使用无腐蚀性的冷却液）。
Cooling waterways are clear(Need to use non-corrosive coolant)
 - ②正确锁紧夹头并夹有相应的刀柄（在任何情况下，夹头在闭合时均需夹有刀柄）。
In any case,Should be clip a handle when collet closed.
3. 工作状态下确保冷却水路不间断，且进出端的温差不超 5° C。（进水温度 18-22° C）
Ensure the spindle with uninterrupted cooling water flow under working conditions, and the temperature difference from inlet to outlet should be less than 5°C (inlet temperature 18-22°C)
4. 换刀时需确保主轴完全停止运转，并使夹头处于张开状态。
Ensure the spindle completely stop running when exchange the pin,and make the collet open
5. 使用前需认真阅读本说明书，并清楚相应的参数，调试需遵循相应的参数进行，若有疑问请及时与厂家取得联系。Reading the instructions carefully before operating, and be clear the corresponding parameters, adjusting follow the corresponding parameters. Please contact with the manufacturers if any question

主轴保养事项:

1. 每天均需对夹头的内孔进行清洗，用毛刷蘸少许酒精清洗夹头内孔，并用干净高压气吹干，确保无杂物而影响主轴精度，同时对各参数进行检测，以保证所加工产品的质量。

Every day, clean up the inner hole of collet, brush it with alcohol, and drying by high-pressure gas, to ensure no impurity to avoid affect the precision of the spindle. Also check each parameter of the spindle, to ensure the quality for production

2. 主轴每工作 100 小时须对夹头进行保养，采用专用的工具拆下夹头进行清洗，同时轴芯的内孔也必须确保清洁，Do maintenance for collet after every 100 hours of the spindle worked ,use special tool to remove the collet to clean, and also must clean the shaft inner hole.
3. 清洗好的夹头，在装配时需确保其尾部端面与轴霸小端面是完全帖紧的。

The collet ,which is cleaned up already ,please ensure the end surface of collet completely stick on the drawbar surface

4. 主轴静置数日后，需要在使用前进行**暖机**，暖机启动时间为 30 分钟，依次暖机转速及对应时间如下——①，20, 000rpm 10 分钟；②，30,000rpm 10 分钟；③，40, 000rpm 10 分钟。

If let Spindle stand for a few days later, before work need warm up spindle, the Warm-up start time is 30 minutes,the corresponding speed and time as following :

——①，20, 000rpm 10min. ②，30,000rpm 10min.；③，40, 000rpm 10min.。

6. 主轴在每使用一年后，需进行一次拆卸，并做全面的保养。

The spindle is needed disassemble to do a comprehensive maintenance one time ,after it is used everyone year .

非专业技术人员严禁运行主轴，未经本公司允许，请勿对主轴进行拆解。

Attention:Non-professional technical personnel it is strictly prohibited to running and disassemble spindle!