

## 电机用热电阻传感器

### Thermal resistance sensor for motor

#### 概述 Summary

铂热电阻具有示值稳定，测温准确度高和有一定程度的抗振动冲击的性能。产品分为小型电机用铂热电阻传感器、大型电机用铂热电阻传感器、高压电机用铂热电阻传感器与轴承用铂热电阻传感器。产品安装简便，与KLB智能型温度控制仪配合使用可直接显示电机的线圈及轴承的实际工作温度。

The platinum thermal resistor has such good performances as stable value indication, accurate temperature measuring and good anti-vibration and anti-shock. It has different types such as platinum thermal resistance sensor for small motor, platinum thermal resistance sensor for big motor, platinum thermal resistance sensor for high voltage motor and platinum thermal resistance motor for bearing. It can be easily installed. When used together with KLB intelligent temperature control meter, it can directly show the actual working temperature of the motor coil and the bearing.

#### 主要性能 Main performances

##### ◆稳定性 Reliability

在200℃时恒温状态下，工作300小时后，0℃时的误差为0.008 Ω (0.02℃)之内。

Under the constant temperature of 200℃ and after working 300 hours, the deviation is within 0.008 Ω, (0.02℃) when at 0℃.

##### ◆自热测试 Self-heating test

将Pt100传感器放在冰水混合物中，同时使Pt100通过1mA电流，此时阻值增量：1mA时为0.02 Ω（约0.05℃）。

Put the Pt100 sensor into the mixture of ice and water, and meanwhile let 1mA current go through Pt100, the resistance value at this time is increment: when at 1mA, it is 0.02 Ω (about 0.05℃).

##### ◆使用电流 Use the current

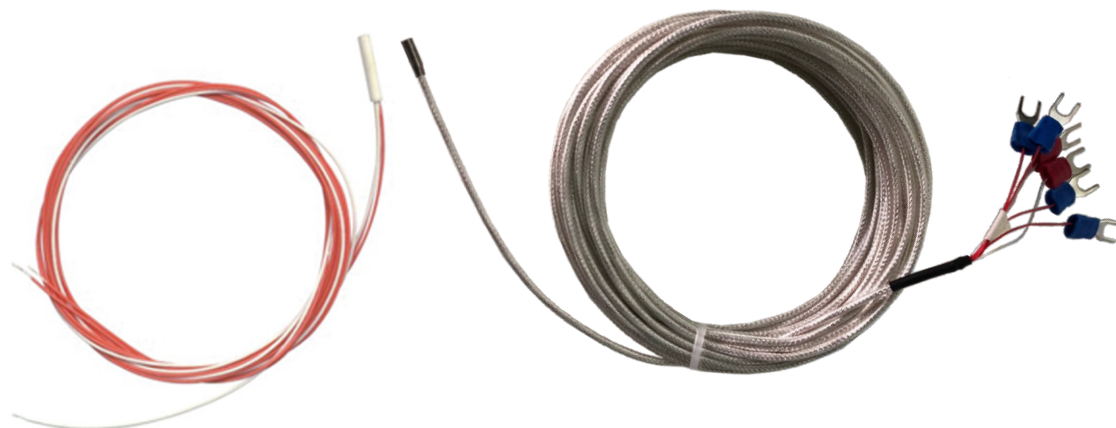
WZP-a × b-H允许通过的最大电流为5mA，因此产生的温差不大于0.3℃。

The maximum current allowed for WZP-a × b-H is 5mA. So the temperature difference is no more than 0.3℃.

##### ◆等级允差 Grade tolerance

温 度 Temperature	阻 值 Resistance value	A 级 A Class		B 级 B Class	
		℃	Ω	℃	Ω
-100	60.25	± 0.35	± 0.14	± 0.8	± 0.32
0	100	± 0.15	± 0.06	± 0.3	± 0.12
100	138.51	± 0.35	± 0.14	± 0.8	± 0.30
200	175.86	± 0.55	± 0.20	± 1.3	± 0.48
250	194.10	± 0.695	± 0.23	± 1.58	± 0.55
300	212.05	± 0.75	± 0.27	± 1.8	± 0.64

#### 小型电机用铂热电阻传感器 Platinum thermal resistance sensor for small motor



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## ◆特点 Characteristics

该类传感器体积小（常规传感体尺寸为 $3 \times 16\text{mm}$ 、 $4 \times 32\text{mm}$ ），安装简单，适用于机座号H355以下的电机。

This type of sensor has small space volume ( the common sensor dimensions are  $3 \times 16\text{mm}$ 、 $4 \times 32\text{mm}$ ) and can be easily installed. It is suitable for the motor below the base no.H355.

## ◆安装与使用 Installation and use

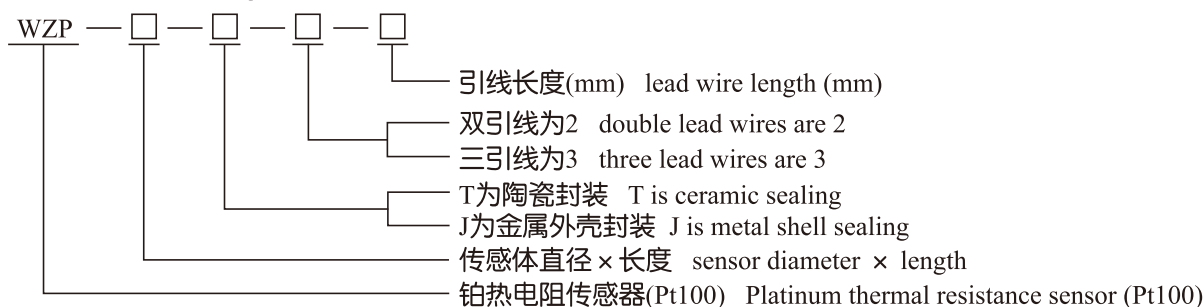
将传感器嵌在电机的绕组内部，压紧绑扎后同线圈一同浸漆，引线沿壳体引出，并固定在接线盒内。

使用时，接专用的Pt100测温仪表。

Insert the sensor into the winding of the motor. After pressing and binding it tightly, soak it in paint together with the coil, and the lead wire comes out along the shell and is fixed inside the wiring case.

When using it, please connect to the special Pt100 thermometer.

## ◆型号命名 Model designation



注：三引线(3时)有两根同色线，常规线色为两红一白，其中任意一根红线都可作为补偿线。

Notes: the three lead wires (when 3) have two wires of same color. Commonly, the colors of the lead wires are two reds and one white, and any of the two red wires could be the compensating wire.

## ◆技术指标 Technical index

型 号 Model	测温范围(°C) Temperature test range (°C)	分度号 Graduation mark	允差等级 Tolerance grade	探头材料 Probe material	外形尺寸 (mm) Outer dimensions	0°C时的阻值(Ω) Resistance value when at 0°C (Ω)	热响应时间 $\tau$ 0.5(秒) thermal response time $\tau$ 0.5 (seconds)	绝缘电阻 (500V ± 5V) Dialectric resitance (500V ± 5V)
WZP-3 × 16-T	-40~200°C	Pt100	A级 Class	陶 瓷 Ceramic	$\phi 3 \times 16$	$100 \pm 0.06$	< 1	$\geq 100\text{M}\Omega$
			B级 Class			$100 \pm 0.12$		
WZP-3 × 16-B	-40~200°C	Pt100	B级 Class	金 属 Metal	$\phi 3 \times 16$	$100 \pm 0.12$	< 2	$\geq 100\text{M}\Omega$
WZP-4 × 32-T	-40~200°C	Pt100	A级 Class	陶 瓷 Ceramics	$\phi 4 \times 32$	$100 \pm 0.06$	< 2	$\geq 100\text{M}\Omega$
			B级 Class			$100 \pm 0.12$		
WZP-4 × 32-B	-40~200°C	Pt100	B级 Class	金 属 Metal	$\phi 4 \times 32$	$100 \pm 0.12$	< 3	$\geq 100\text{M}\Omega$

注：热响应时间：在温度出现阶跃变化时，热电阻的阻值变化至相当于该阶跃变化的50%所需要的时间，称为热响应时间，用T0.5单位为秒。

Notes: thermal response time: when the temperature has step change, the time which the resistance value of the thermal resistor takes to change to 50% of that step change is the thermal response time. The unit for it is T0.5 Second.

## 大型电机用埋置式热电阻传感器 Embedded thermal resistance sensor for big motor

### ◆特点与应用 Characteristics/Applications

电机用埋置式热电阻是电动机、发电机绕组的测温元件。该产品具有测量精度高，长期使用性能稳定，高抗震能力强等特点。其感温元件和引出线焊点处于全封闭状态，特别适用于F级无溶剂漆的相容性要求（它适用于H400以上的电机线圈测温）。

The embedded thermal resistor is the temperature measuring component for the winding of the motor and generator. It has such characteristics as high precision, long-term stable use, good anti-vibration. Its sensing component and weld point of the lead wire are fully sealed. So in particular, it is suitable for the consistence requirements of F grade non-solvent paint ( it is suitable for temperature measuring of the motor coil over H400).

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## ◆ 引用标准 Reference standard

JB/T10500.1-2005电机用埋置式热电阻 第1部分：一般规定、测量方法和检验规则。

JB/T10500.2-2005电机用埋置式热电阻 第2部分：铂热电阻技术要求。

JB/T10500.1-2005 embedded thermal resistor for motor Section 1: general rules, measuring methods and inspection rules.

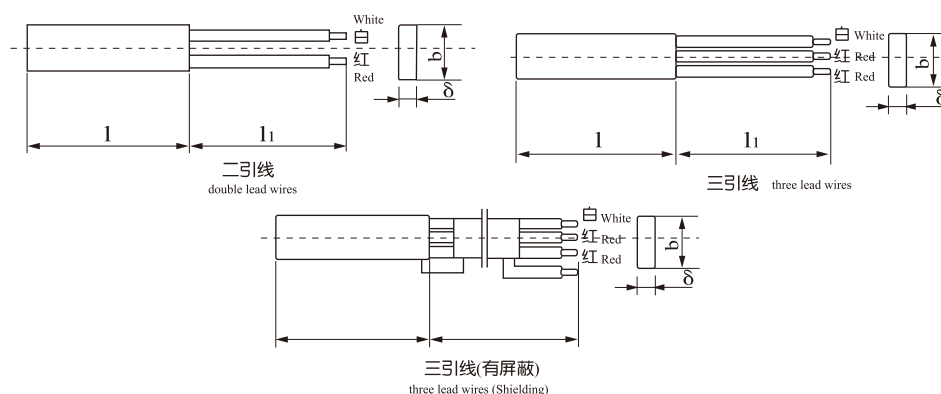
JB/T10500.2-2005 embedded thermal resistor for motor Section 2: technical requirements for platinum thermal resistor.

## ◆ 技术参数 Technical parameters

技术指标 Technical index

产品名称 Product name	分度号 Graduation mark	测温范围 Temperature test range	最大激励电流(温升 $\leq 0.3^{\circ}\text{C}$ ) Maximum exciting current (temperature increase $\leq 0.3^{\circ}\text{C}$ )	热响应时间 $\tau$ 0.5秒 Thermal response time $\tau$ 0.5 second.	允差 $\Delta t(^{\circ}\text{C})$ Tolerance $\Delta t(^{\circ}\text{C})$	耐电压50Hz,1分 Voltage withstanding 50Hz,1 minute	绝缘等级 Insulating grade
铂热电阻 Platinum thermal resistor	Pt100	-40~180 $^{\circ}\text{C}$	5mA	$\leq 6$ 秒second	$\pm (0.30+0.005t)$	1KV	F级 Class

外形尺寸 Outer dimensions



## ◆ 尺寸和允许偏差 Dimensions and tolerance

传感体厚度 $\delta$ sensor thickness $\delta$		传感体宽度 $b$ sensor width $b$		传感体长度 $L$ sensor length $L$		引线L1 lead wire L1		
基本尺寸 basic dimensions	允许偏差 Deviation allowed	基本尺寸 basic dimensions	允许偏差 Deviation allowed	基本尺寸 basic dimensions	允许偏差 Deviation allowed	长度(mm) Length (mm)	代号 Code	数量 Amount
2	0 -0.2	8	0 -0.2	60	+2 0	150	A	2根或3根 2 or 3 Root
				100		400	B	
				200		1000	C	3根 3 Root
				250		2000	D	
				500		3000	E	
						4000	F	
						5000	G	
		10	0 -0.2	60	+2 0	150	A	2根 2 Root
				100		400	B	或3根 or 3 Root
				200		1000	C	3根 3 Root
				250		2000	D	
				500		3000	E	
						4000	F	
						5000	G	
2 (屏蔽 Shielding)	+0.2 0	10	$\pm 1.5$	100	+2 0	1000	C	3根 3 Root
				200		2000	D	
				250		3000	E	
				300		5000	G	
2.5 (屏蔽双支 Shielding double pcs)	+0.2 0	12	$\pm 1.5$	100 200 250	+2 0	同上或根据用户需要设定。 Same as above or be determined according to the user's needs		6根 6 Root
3 (屏蔽双支 Shielding double pcs)	+0.2 0	8	$\pm 1.5$	100 200 250	+2 0	同上或根据用户需要设定。 Same as above or be determined according to the user's needs		6根 6 Root

注：屏蔽结构热电阻的接地线应可靠接地。

Notes: The grounding wire of the resistor with shielding structure shall be reliably grounded.

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## ◆引线 and 拉力 Lead wire and pull force

引线标称截面为 $0.2\text{mm}^2$ ，材料为FQ-2，FPFQ-2，聚四氟乙烯绝缘轻型电线电缆，镀银铜线芯。  
 引线 with 传感体连接纵向拉力10N，时间15秒。

The nominal section area of the lead wire is  $0.2\text{mm}^2$ , and the material is FQ-2, FPFQ-2, light-type of electric wire and cable with PTFE insulation, and the core wire is silver-plated copper wire.

The connection of the lead wire with the sensor shall sustain the pull force 10N for 15 seconds.

## ◆型号命名 Model designation

