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Shenzhen KUKI Elect. Co., Ltd.
深圳市久喜电子有限公司



Shenzhen KUKI Elect. Co., Ltd.

Shenzhen KUKI Elect. Company Limited, located in Shenzhen, was founded in 1994. We are a manufacturer specialized in producing NTC and temperature sensor, having workers around 800 and occupied production area around 20000 square meters. We are the Chinese exclusive agent of Shibaaura who is the leading producer of NTC element in the world.

KUKI devotes itself to being professional and efficient, is ISO9001 & IATF16949 certified and owns automated production lines. For over 20 years, we supplied various sensors for temp. control and measuring widely in consuming and commercial application. We provide ONE-STOP customized services from design to production and keep providing high performance product to market.

深圳市久喜电子有限公司，成立于1994年，工厂位于深圳，拥有厂房面积20000平方米，员工800多人，专业从事热敏电阻和温度传感器制造。是NTC热敏电阻行业领袖日本芝浦电子株式会社中国总代理。久喜致力追求“专业，高效”，通过ISO9001/IATF16949质量管理体系认证，拥有多条自动化生产线。20多年来，我们为温度控制和温度测量的大范围消费用品和商业用品应用，提供多样化的温度传感器，为客户提供从设计到生产的一站式个性化服务，为市场持续提供高性能优质产品。



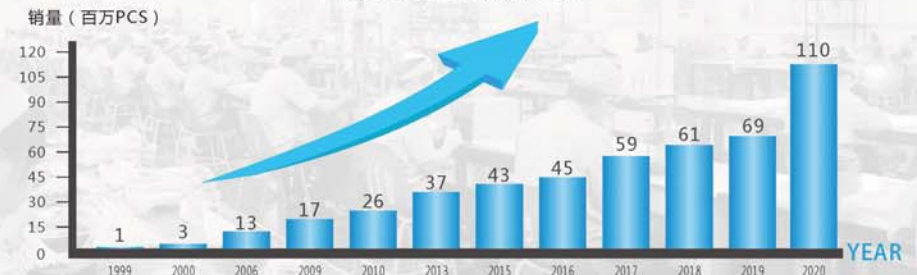
Our Development

久喜历程



KUKI NTC & temperature sensor yearly sales QTY.

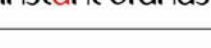
KUKI NTC & 温度传感器年销售量



2020年，与日本芝浦SHIBAURA NTC热敏电阻贸易总量超过1亿只，成为SHIBAURA全球最大数量的销售与应用商。 In 2020, the total trade volume with SHIBAURA NTC thermistors more than 100 million, making SHIBAURA the largest sales and application provider in the world.

1994—2020
Our Parters

久喜伙伴

		B/S/H/	 
		MOBICOOL Our Name is our Mission	
			
			
			
			
			
			
			

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Automated Production

自动化生产

Professional & Efficient 专一制造，高效服务

KUKI dedicates in temperature sensor's design and manufacture and has rich producing experience. We produced over 200 kinds of temperature sensors that applied to more than 50 industries. Customers we served are around 2000 and we supplied 150 thousands piece daily to market. For over 20 years, we keep providing high quality and stable performance product to market, by which we built up our good reputation well known as "KUKI-made" in market.

久喜专注于温度传感器的设计和制造拥有超过20年丰富的生产经验。目前已生产制造传感器品种超过200个，服务客户数量超过2000家，产品供应行业超过50个，每天产能近15万个。多年来，一直为市场提供稳定优质的产品并在行业中建立了“久喜制造”的品牌式信誉。

Automated Production 自动化生产

Owning advanced production technology, is the secret KUKI welcomed by customer and made excellent performance in supplying. To make further improvement on production efficiency and product quality, KUKI invested heavily to develop its own automated production line. At present, KUKI has Auto-soldering SCARA, Auto-potting SCARA, Auto-coating machine, Auto-chip soldering machine, Auto-NTC classified machine and so on. The automated production lines we inputted bring 60% improvement in daily production ability and made us be leading in the assembly industry. 拥有先进的生产工艺，是久喜赢得客户青睐保持优良供应的秘诀。为了追求更高的生产效率，更优的产品品质，久喜大力投资研发自动化生产线。目前拥有自动焊接机，自动上胶机，自动灌胶机，自动电阻整形机，自动芯片焊接机，自动电阻精度分选机，小型自动化加工生产线等多种自动化设备。投入多条自动化生产线后带来日产能提高近60%，处于行业领先水平。



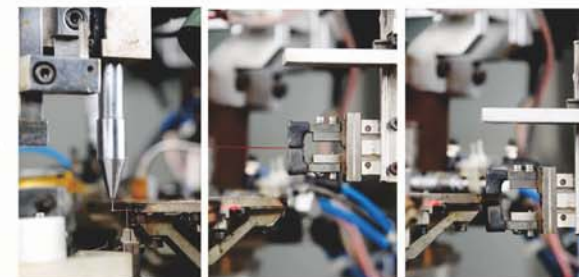
Strict Quality Control 严格品控

Quality foremost, is the fundamental of KUKI. Besides improving the production technology, KUKI conduct as ISO9001/TS16949 regulated. We established our traceable quality management system and monitored product quality from daily production. We are able to make stable quality supply for our customer by executing our strict and multi-layer quality control system. 品质为先，是久喜立业的根本。除了不断改进生产工艺，久喜还严格执行ISO9001/TS16949质量管理体系，建立可追踪的质量管理系统，监察每日生产品质，层层管控，为客户保证持续稳定的品质供应。

Auto-soldering/
Potting SCARA
自动焊接机/灌胶机



Chip Auto-soldering
machine
自动芯片焊接机



Auto-coating machine
自动上胶机



Expert Discussion on Resistance of Thermistor
热敏电阻专家谈

What is a thermistor? 什么是热敏电阻？



King of Negative Temperature Coefficient Temperature Sensors 负温度系数温度传感器之王

Thermistor is a thermal sensor of fine ceramic semiconductor
热敏电阻是精细陶瓷半导体的感热元件

Thermistor is a semiconductor with significant change of resistance value with temperature. When the general material temperature rises, the resistance value increases gradually. As the temperature rises, the resistance value of the NTC thermistor is reduced significantly. Negative temperature coefficient (NTC)
Below instructions are limited to NTC thermistors. Thermistor is a kind of heat sensing element of fine ceramic semiconductor sintered from Mn (manganese), Ni (nickel), Co (cobalt) and many kinds of metal oxides.
The operating temperature is between $-50 \sim +500^{\circ}\text{C}$, covering the temperature range required for daily temperature control. Because of its small size, good stability and high responsiveness, thermistors are widely used in temperature sensors or temperature compensation components of household appliances and industrial instruments.

热敏电阻是对热敏感的电阻体，其阻值随温度变化而发生显著变化的半导体。一般的物质温度上升时，电阻值渐增。芝浦电子制NTC热敏电阻的电阻值随温度上升而显著减少。

※负温度系数(英文名称: Negative Temperature Coefficient; 英文缩写: NTC)

以下说明仅限于NTC热敏电阻。热敏电阻是一种由Mn(锰), Ni(镍), Co(钴)为主多种金属氧化物为原料烧结而成的精细陶瓷半导体的感热元件。

工作温度在 $-50 \sim +500^{\circ}\text{C}$ 之间，涵盖了日常温度控制所需的温度范围。

由于热敏电阻体积小，又稳定性好且响应性高，因而大量被使用在家用电器和工业仪器的温度传感器或温度补偿元件等用途上。

Physical properties of thermistors 热敏电阻的物理性质

4 constants to determine thermistor properties.
4个常数来决定热敏电阻特性

Thermistor characteristics. : These four constants are basically determined by
热敏电阻特性，基本上是以[电阻值 R]-[B值 B]-[耗散常数 δ]-[热时间常数 τ]这4个常数来决定。



Basically, these four constants are used, and sometimes are represented by [current-voltage characteristics] and [resistance temperature coefficients].

基本上用这4个常数，另外有时候以「电流-电压特性」和「电阻温度系数」为补助表示。

The following page begins to describe the above physical properties. 下页开始说明以上物理性质。

Resistance
电阻值

The resistance value of the thermistor is specified in the JIS C 5602 as follows.
Japanese Industrial Standards (JIS) 日本工业标准

[At specified ambient temperatures, the resistance value of the resistor is changed by the heat of the detected current itself relative to the DC resistance of the thermistor measured by the inspection power with negligible total detection error]
The resistance value of thermistor is measured in SHIBAUURA Electronics with standardized detection current value and ultra-high precision constant temperature slot designed in the company. Chip electronic thermistor is called NTC [thermistor with negative temperature coefficient], and its resistance value decreases with the increase of temperature.
The relationship between [resistance R] and [absolute temperature T] of thermistors can be approximately expressed by the following formula.

热敏电阻的电阻值在JIS C 5602被规定如下。

※日本工业标准 (英文名称: Japanese Industrial Standards; 英文缩写: JIS)

「在规定的环境温度下, 电阻体受检测电流自身发热引起的电阻值变化相对于总的检测误差可以忽略不计的检测电功率测得的热敏电阻的直流电阻值。」

在芝浦电子以标准化的检测电流值和公司内设计的超高精度恒温槽检测热敏电阻的电阻值。

芝浦电子制的热敏电阻通称NTC「负温度系数的热敏电阻」, 具备随温度上升而其电阻值减少的特点。

热敏电阻的[电阻值R]和[绝对温度T]的关系可近似地用下式表示。

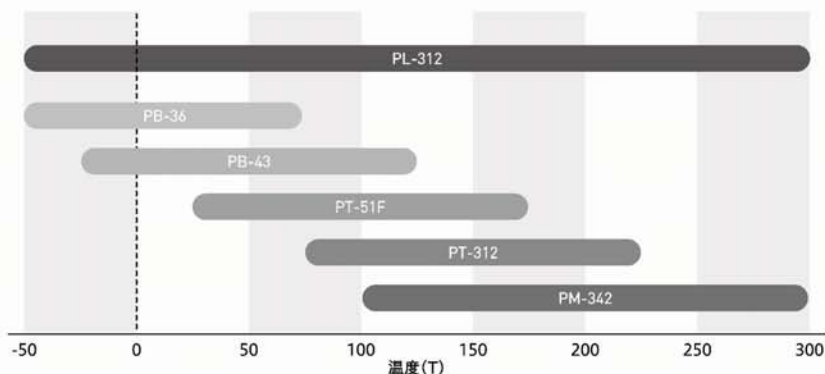
$$R_1 = R_2 \exp B \left(\frac{1}{T_1} - \frac{1}{T_2} \right)$$

R1: Resistance (Ω) at absolute temperature T1 (K)
在绝对温度T1 (K) 时的电阻值 (Ω)
R2: Resistance (Ω) at absolute temperature T2 (K)
在绝对温度T2 (K) 时的电阻值 (Ω)
B: B constant (K)
B值 (K)

Since the ideal thermistor characteristic in circuit design is the change of resistance value in working temperature range of 100Ω~400 kΩ, this resistance value can be used as reference value when selecting suitable specifications from various characteristics. From the rich electronic characteristics of SHIBAUURA, please select the corresponding thermistor specifications according to the working temperature range.

因为电路设计上理想的热敏电阻特性是工作温度范围内的电阻值变化100Ω~100kΩ, 所以从各种各样的特性选择适合的规格时, 此电阻值能作为参考值。

从丰富的芝浦电子特性一览, 按照工作温度范围请选择相应的热敏电阻规格。



Change the size of thermistor chip before glass package. The resistance value will be adjusted.
SHIBAUURA electronic standard specifications, customer requirements specifications can also be customized corresponding.

玻璃封装前的热敏电阻芯片尺寸改变, 就会调整电阻值。

芝浦电子标准品规格以外, 客户要求的规格也可以定制对应。

B constant
B值

B constant is the physical property value representing the sensitivity of the thermistor to the temperature change.
NTC thermistor is characterized by the decrease of its resistance value with the increase of temperature.
and its resistance value change rate is expressed as B constant.
The inclination rate on the online graph can also represent the rate of change, and its inclination is large (i.e., the B constant is large), that is, the sensitivity to temperature change is high.

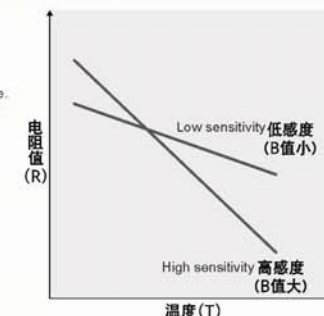
B值是表示对温度变化的热敏电阻感度的物性值。

NTC热敏电阻的特点是随着温度升高而其电阻值减少的。

其电阻值变化率以B值来表示。

在线圈上的倾斜度也能表示变化率。

其倾斜度大(即B值大), 也就是说对温度变化的感度高。



B constant representing the rate of change is a change in the resistance between two ambient temperatures.

表示变化率的B值是两个环境温度之间的电阻值变化来计算出。

$$B = \frac{\ln R_1 - \ln R_2}{\frac{1}{T_1} - \frac{1}{T_2}} = \frac{2.3026 (\log R_1 - \log R_2)}{\frac{1}{T_1} - \frac{1}{T_2}}$$

B constant (K)
B: B值(K)

Resistance (Ω) at absolute temperature T1 (K)

R1: 在绝对温度T1(K)的电阻值(Ω)

Resistance (Ω) at absolute temperature T2 (K)

R2: 在绝对温度T2(K)的电阻值(Ω)

B constant and resistance value are different, the thermistor chip size change will not adjust the B constant specifications.

Thermistor chip material composition to determine B constant specifications.

Moreover, B thermistor with large value is also high resistance value, so it can not freely combine resistance value and B constant.

For example, although the resistance value is very high, but the B constant of the thermistor is very difficult to develop.

Chip electronic thermistor specification type with resistance and B constant of a variety of combinations, the directory can not record the full specification. If you need to customize B special value, please consult us.

B值和电阻值不同, 把热敏电阻芯片尺寸改变也不会调整B值的规格。

热敏电阻芯片的材料组成来决定B值规格。

而且B值大的热敏电阻是电阻值也高, 所以不能自由组合电阻值和B值。

比如, 虽然电阻值非常高, 但是B值极小的热敏电阻是开发难度特别得高。

芝浦电子的热敏电阻规格类型具备电阻值和B值的多种组合, 目录上无法记载全规格。

如果需要定制特殊B值的话, 请咨询我们。

B constant 0°C/100°C calculation example.

B值0°C/100°C的计算例。

$$B = \frac{\ln R_1 - \ln R_2}{\frac{1}{T_1} - \frac{1}{T_2}} = \frac{\ln 162.2 - \ln 3.3}{\frac{1}{273.15} - \frac{1}{373.15}} = 3969.9 \approx 3970$$

R1: 在0°C的电阻值=162.2 kΩ

R2: 在100°C的电阻值=3.3 kΩ

T1: 0°C + 273.15 = 273.15 K

T2: 100°C + 273.15 = 373.15 K

Thermal dissipation constant 耗散常数

Thermal dissipation constant δ is the electric power (mW/°C) required when the heating of the electrothermal sensitive resistance increases by 1°C in the static air environment. When the ambient temperature T_a the applied power W , the thermistor's own heating finally reaches the temperature T , and the following relationship is established.

耗散常数 δ 是在静止空气中依通电热敏电阻自身发热升高1°C时需要的电功率(mW/°C)。在周围温度 T_a 外加电功率 W 时,热敏电阻自身发热终于到温度 T 的话,成立如下关系。

$$\delta = \frac{W}{T - T_a} = \frac{I^2 R}{T - T_a}$$

δ : Thermal dissipation constant (mW/°C)

W : Electrical power consumed by thermistors (mW)

T : Temperature at which heat is raised to equilibrium (°C)

T_a : Ambient temperature (°C)

I : The temperature T , current value through thermistor (mA)

R : The temperature T , the electric resistance of the thermistor Ω (k)

δ : 耗散常数(mW/°C)

W : 热敏电阻消耗的电功率(mW)

T : 升高到热平衡时的温度(°C)

T_a : 外界周围环境温度(°C)

I : 温度 T 时,通过热敏电阻的电流值(mA)

R : 温度 T 时,热敏电阻的电阻值(k Ω)

Thermal dissipation constant is equivalent to the electric power of the thermistor whose temperature increases by 1°C. However, the error between this temperature and the ambient temperature is also reflected in the detection data.

Therefore, when designing the circuit, the external power should be controlled to suppress its own heating.

Because the Thermal dissipation constant is δ determined by the balance of "self-heating" and "exothermic", it changes significantly according to the surrounding environment of thermosensitive electrolyte.

If the material with high thermal conductivity is used around the thermistor, it will promote exothermic heat, and the Thermal dissipation constant δ will also increase.

Conversely, the Thermal dissipation constant δ of low exothermic structures may be small, so the selection of assembly materials is particularly important.

After assembly, in the actual working environment (air, water, oil, hot plate contact, etc.), the actual detection of Thermal dissipation constant δ the actual work of the data.

耗散常数相当就热敏电阻自身温度升高1°C的电功率。但是此温度和周围环境温度的误差也被反映到检测数据。

因此,设计电路时,不妨碍检测的范围内应该以控制外加电功率抑制自身发热。

因为耗散常数 δ 是「自身发热」和「放热」的平衡来决定,所以根据热敏电阻周围的环境,显著变化。

如果热传导率高的材料用在热敏电阻周围,就会助长放热,结果耗散常数 δ 也会增大。

反过来低放热性结构时的耗散常数 δ 可能会较小,因此装配材料的选择是特别重要。

装配后,在实际工作环境(空气,水,油,热板的接触等)中,由实际检测耗散常数 δ 获得实际工作符合的数据。

Thermal time constant 热时间常数

The thermal time constant is the degree of responsiveness of the thermistor to the change of surrounding temperature. When the ambient temperature of thermistor changes from T_1 to T_2 , the following relationship between time t (sec.) and thermistor temperature T is established.

热时间常数是表示热敏电阻追随周围温度变化的响应性程度。

热敏电阻周围环境温度从 T_1 变化到 T_2 时,经过时间 t (sec)和热敏电阻温度 T 之间成立以下关系。

$$T = (T_2 - T_1) (1 - \exp(-t / \tau)) + T_1$$

τ (sec.) in the relation is the thermal time constant.

$t = \tau$, can be expressed as follows.

关系式中的 τ (sec.)就是热时间常数。

$t = \tau$ 的话,可以表示如下。

$$T = (T_2 - T_1) (1 - e^{-1}) + T_1$$

$$\frac{T - T_1}{T_2 - T_1} = 1 - e^{-1} = 1 - \frac{1}{2.718} = 0.632$$

For this thermistor temperature change to 63.2% of the initial temperature difference, the time required is defined as the thermal time constant τ (sec.). With only a time defined as a thermal time constant, the thermistor temperature does not reach the ambient temperature.

If the thermal time constant τ (sec.) n times, the temperature change rate is as follows. A thermistor temperature about 7 times the thermal time constant (sec.) will reach the ambient temperature.

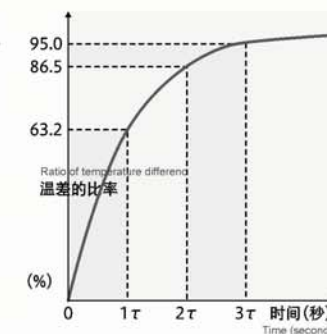
$\tau = 63.2\%$ $2\tau = 86.5\%$ $3\tau = 95.0\%$... $7\tau \approx 100\%$

就此热敏电阻的温度变化到初期温差的63.2%所需要的时间定义为热时间常数 τ (sec.)。

单有被定义为热时间常数的时间,热敏电阻温度不会到达周围环境温度。

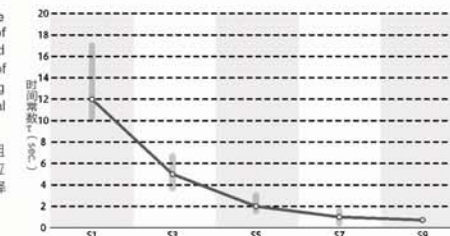
热时间常数 τ (sec.) n 倍时的温度变化率如下。用热时间常数 τ (sec.)的约7倍就热敏电阻温度会到达周围环境温度。

$\tau = 63.2\%$ $2\tau = 86.5\%$ $3\tau = 95.0\%$... $7\tau \approx 100\%$



Because the smaller the thermistor volume, the faster the response speed, the smaller the thermal time constant of the small thermistor will τ be. In addition, the response speed will change significantly due to the assembly structure of thermistor, so we should pay close attention to the working environment and choose the material with high thermal conductivity.

因为热敏电阻体积越小响应速度快,所以小型热敏电阻的热时间常数 τ 会较小。另外由于热敏电阻装配结构,响应速度会显著变化,因此应该十分留意工作环境,还要选择热传导率高的材料。



Current-voltage characteristics (I-V characteristics) 电流-电压特性(I-V特性)

Current and voltage characteristics (I-V characteristics) are represented by the voltage changes when the thermistor is electrified. The current-voltage characteristic (I-V characteristic) of NTC thermistor is characterized by the linear increase of voltage value with the increase of current value.

But the voltage value begins to decrease after reaching the current value.

电流-电压特性(I-V特性)是热敏电阻通电时的电压变化表示在线图上的。

NTC热敏电阻的电流-电压特性(I-V特性)的特点是随着电流值增大,电压值也线性地增大。但是到达有的电流值后电压值开始减少。

After electrification, the thermistor starts to heat itself, as the current increases, the calorific value also continues to increase; Because of the heat release of the conductor and the heat release on the surface of the thermistor (according to radiation), the heat release of the conductor is larger than that of the thermistor. Therefore, the thermistor does not change because of its own heating temperature, and the resistance value will not be affected. According to Ohm's law, current and voltage are proportional.

通电后热敏电阻开始自身发热,随着电流值增大,发热量也继续增大。

由于导线的放热及热敏电阻表面的放热(依辐射),自身发热量较小时的放热量比发热量较大。因此热敏电阻因自身发热的温度变化不发生,而电阻值也不会受影响。依照欧姆定律,电流和电压是比例关系。

However, if the calorific value exceeds the heat release, the temperature of the thermistor will increase because of its own heating, and the resistance value will decrease and the proportional relationship between the current and the voltage will disappear. Therefore, the voltage value decreases gradually after crossing the boundary value.

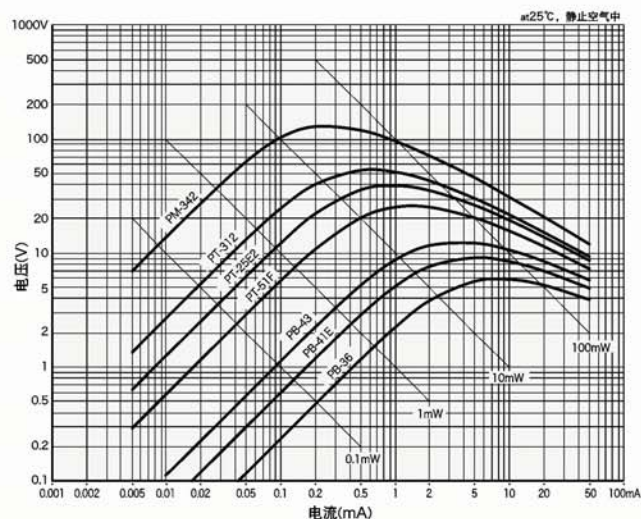
但是发热量超过放热量的话,因自身发热而热敏电阻温度会升高,受此影响地电阻值也减少就电流和电压的比例关系会消失。为此越过境界值后电压值逐渐减少的。

The current-voltage characteristics of the thermistor element are represented in the following line diagram. The thermistor's own heating affects the change of resistance value in a small range (in the field represented by a straight line on the line diagram) and should be usually used.

热敏电阻元件的电流-电压特性表示在以下线图。热敏电阻自身发热给电阻值变化的影响微小的范围内(线图上用直线表示的领域内),应该通常使用。

And when the applied voltage exceeds the vertex of the graph, the thermistor enters [out of control mode (repeated between the reduction of resistance value and its own heating)], which may be hot and damaged in a short period of time. Special attention should be paid to it.

而且超过线图顶点的外加电压使用时,热敏电阻进入「失控模式(电阻值减少和自身发热之间不断地重复)」,经短时间有可能会发热破损,应该特别注意。



Resistance temperature coefficient α 电阻温度系数 α

Resistance temperature coefficient is the change rate of resistance per 1°C of thermistor, unit is %/°C.

He resistance temperature coefficient is $\alpha = \frac{1}{R} \cdot \frac{dR}{dT}$ (substituted into the R formula : which has been mentioned in the resistance value term), and the differential temperature can be expressed as follows T the calculation of the differential temperature.

电阻温度系数是表示热敏电阻每1°C的电阻值变化率。单位是%/°C。

电阻温度系数 $\alpha = \frac{1}{R} \cdot \frac{dR}{dT}$ (代入R式:在电阻值项已提的),微分温度T求 α ,就可以表示如下。

$$\alpha = \frac{1}{R} \cdot \frac{dR}{dT} \times 100 = -\frac{B}{T^2} \times 100$$

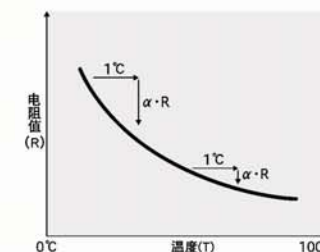
α : Resistance temperature coefficient

电阻温度系数 (%/°C)

R: Resistance value (Ω) T (K) at absolute temperature
在绝对温度T(K)的电阻值(Ω)

B: B constant(K)

B值(K)



A symbol (-) a the resistance temperature coefficient indicates that the thermistor resistance will be reduced by increasing the accompanying temperature. B constant is 3400 K; the resistance temperature coefficient near 20°C is calculated

电阻温度系数 α 的符号(-)表示随着温度升高热敏电阻电阻值会减少的。
B值是3400K,求20°C附近的电阻温度系数的话

$$\alpha = \frac{-3400}{(273.15 + 20)^2} \times 100$$

$$\alpha \approx -4\%/^{\circ}\text{C}$$

Resistance temperature coefficient $\alpha \approx -4\%/^{\circ}\text{C}$.

电阻温度系数 $\alpha \approx -4\%/^{\circ}\text{C}$ 。

The resistance of general metals and alloys increases with the increase of temperature. For the temperature change of 1°C, the temperature coefficient is 0.4%(gold) 0.39%(platinum), and the larger is 0.66%(iron) and 0.67%(nickel) degree. But the resistance temperature coefficient of the thermistor is about -4. In other words, the resistance of thermistors to small temperature changes will also change significantly. It can be said that thermistor sensors are suitable for precision temperature detection and small temperature difference control.

一般金属及合金随着温度升高电阻值会增大。对1°C的温度变化,其温度系数是0.4%(金),0.39%(铂),较大的也0.66%(铁),0.67%(镍)程度。但热敏电阻的电阻温度系数是约-4%。换言之,对微小温度变化也,热敏电阻的电阻值会显著变化。可以说热敏电阻传感器适用精密温度检测和微小温差控制。

Insulation resistance 绝缘电阻

Insulation resistance of thermistor elements is the insulation between conductors $\longleftrightarrow$ glass.

To ensure durability, very insulation is very important. The insulation resistance of the whole product is detected in SHIBAURA Electronics in addition to N (PSB, RB1) and KG shapes.

The method of detecting insulation resistance is shown in the following figure.

A metal container is filled with conductive insulation testing liquid, impregnating the thermistor to the glass head (NS shape, between glass and ceramics).

The anode (+) of the insulation resistance tester is first connected to the thermistor wire, and the cathode (-) of the insulation resistance tester is connected to the metal container, and then the insulation between the "wire $\longleftrightarrow$ glass" is detected.

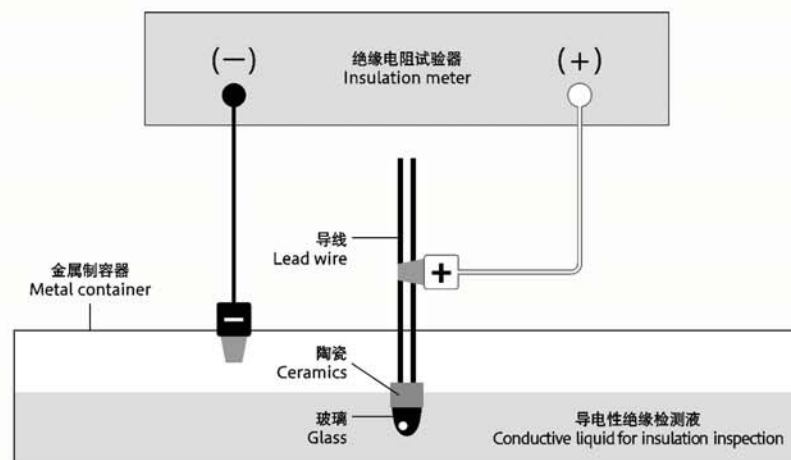
热敏电阻元件的绝缘电阻是「导线 $\longleftrightarrow$ 玻璃」之间的绝缘性。

确保耐久性能上，充分的绝缘性很重要。在芝浦电子，除了N形(PSB, RB1)和KG形以外，对全制品进行全数检测绝缘电阻。

检测绝缘电阻办法表示在下面。

金属制容器里充填导电性的绝缘检测液，将热敏电阻浸渍至玻璃头部(NS形的话，浸渍至玻璃和陶瓷之间)。

首先将绝缘电阻试验器的阳极(+)连接热敏电阻导线，其次将绝缘电阻试验器的阴极(-)连接金属制容器，然后检测「导线 $\longleftrightarrow$ 玻璃」之间的绝缘性。



Market share of leading standard products list
市场占有率领先的电子标准制品一览

Thermistor element 热敏电阻元件



※没有特别记载时，热时间常数及耗散常数是静止空气中的检测结果。

PSB thermistors PSB PSB热敏电阻

They are the best Thermistors that they having obtained patents in 8 countries in the world.
在世界8个国家获得过专利的实体具备的热敏电阻最佳品

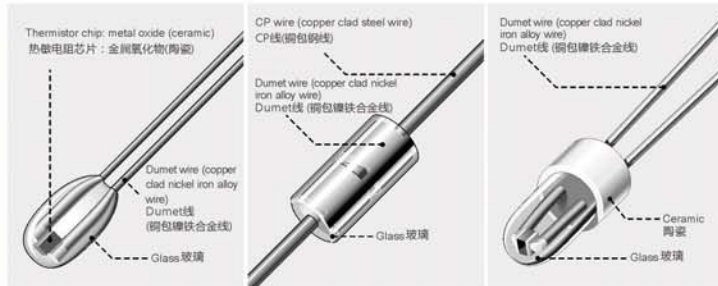
PSB thermistor is a patented product developed by our company in 8 major countries in the world (Japan, the United States, Canada, France, the United Kingdom, Germany, Italy, Switzerland). To detect thermistors and temperature compensation thermistors are the most used thermistors.

PSB热敏电阻是本公司独自开发,在世界主要8个国家(日本,美国,加拿大,法国,英国,德国,意大利,瑞士)获得过专利的产品,以检测用热敏电阻及温度补偿用热敏电阻为主,是被使用最多的热敏电阻。

Many advantages 不少的优点

- Gold electrode for wire and thermistor chip (PSB-S, NS shape).
导线和热敏电阻芯片用金电极接合(PSB-S, NS形).
- Because of the dense fine ceramic thermistor chip, it has high stability.
由于致密的精细陶瓷热敏电阻芯片,具备高稳定的特性.
- Due to glass packaging, excellent heat resistance and weathering resistance.
由于玻璃封装,具备卓越的耐热性及耐候性.
- Due to consistent automatic production, shape and characteristics are stable and uniform.
由于一贯性自动化生产,形状及特性稳定均一.
- Can make thermal response excellent small thermistors.
可以制造热响应性优秀的微小热敏电阻.
- As a result of mass production, can stabilize the supply of high quality products.
由于批量生产,可以稳定供应高品质产品.

Structure 结构



Property value of components of thermistor 热敏电阻构成部件物性值

项目 Project	热敏电阻芯片 Thermistor chip	玻璃外层 Glass case	导线 Wire	陶瓷 Ceramic
材质 Material	Mn(锰), Ni(镍), Co(钴)的氧化物	玻璃	Dumet线 (铜包镍铁合金线)	MgO · SiO ₂ (滑石系)
(杨氏模量)[GPa] Young's modulus	150	50	150	150
(泊松比) Poisson's ratio	0.25	0.26	0.33	0.24
热膨胀系数[25~400℃] Thermal expansion coefficient	90 × 10 ⁻⁷	91 × 10 ⁻⁷	88 × 10 ⁻⁷	97 × 10 ⁻⁷
热传导率[W/m·K] Thermal conductivity	10	0.7	150	5.0
比热[J/kg·K] Specific heat	200	900	400	800
密度[g/cm ³] Density	5.0	4.3	8.5	3.0

※数值是代表性的例子

Resistance-Temperature Characteristic Table 电阻-温度特性表

The resistance value of a standard thermistor can be directly confirmed when developing the required temperature.
可以直接确认在开发要求温度时的标准热敏电阻电阻值

Standard resistance - temperature characteristics of PSB thermistors are summarized in the following table. The values in each resistance value () in the table are nominal resistance values of the reference temperature.

PSB热敏电阻标准电阻-温度特性归纳如下表。表中的各电阻值()内的数值为基准温度的公称电阻值。

PSB thermistors standard resistance - temperature characteristics table

PSB热敏电阻标准电阻-温度特性表

单位: kΩ

Spec.规格	POC-35G	POC-36	POC-42H	POC-43	POC-51F	POC-25E2	POC-312	POC-342	POC-312
电阻25℃/R25℃	3529K	3420K	3435K	3480K	3992K	4066K	4240K	4557K	2240K
℃	3500K ⁽¹⁾	3390K ⁽¹⁾	3406K ⁽¹⁾	3450K ⁽¹⁾	3970K ⁽¹⁾	4300K ⁽¹⁾	4537K ⁽¹⁾	5133K ⁽¹⁾	2240K ⁽¹⁾
-50	81.20	77.58	364.0	408.0					205.0
-45	59.66	57.69	269.8	301.4					165.5
-40	44.31	43.34	202.2	225.1					134.8
-35	33.24	32.87	153.0	169.8					110.7
-30	25.18	25.17	116.8	129.3					91.60
-25	19.25	19.43	90.05	99.32	657.4	1317			76.37
-20	14.85	15.13	69.99	76.96	487.4	980.5			64.12
-15	11.55	11.88	54.84	60.13	365.0	736.8			54.18
-10	9.051	9.392	43.30	47.34	276.1	558.6			46.07
-5	7.149	7.481	34.44	37.55	210.7	427.2			39.40
0	5.688	(6.000)	27.59	(30.00)	162.2	329.4	806.5		33.88
5	4.557	4.844	22.25	24.13	125.8	255.0	618.9		29.29
10	3.675	3.935	18.05	19.53	98.32	198.9	478.8		25.44
15	2.982	3.217	14.74	15.91	77.45	156.3	373.1		22.20
20	2.435	2.644	12.11	13.03	61.47	123.8	292.9		19.46
25	(2.000)	2.186	(10.00)	10.74	49.12	98.63	231.4	1388	17.13
30	1.652	1.817	8.304	8.896	39.52	79.13	184.1	1085	15.14
35	1.372	1.518	6.931	7.409	32.00	63.87	147.4	853.9	13.43
40	1.145	1.274	5.814	6.201	26.06	51.87	118.7	696.5	11.96
45	0.9602	1.075	4.900	5.215	21.36	42.36	96.13	539.3	10.69
50	0.8092	0.9106	4.149	4.406	17.60	34.79	78.29	432.5	9.582
55	0.6851	0.7749	3.529	3.739	14.58	28.72	64.10	348.9	8.617
60	0.5826	0.6622	3.014	3.186	12.14	23.83	52.76	283.0	7.772
65	0.4976	0.5683	2.584	2.727	10.16	19.87	43.63	230.8	7.031
70	0.4267	0.4895	2.235	2.343	8.541	16.64	36.26	189.2	6.377
75	0.3673	0.4233	1.923	2.021	7.214	14.00	30.27	155.9	5.800
80	0.3175	0.3674	1.667	1.749	6.120	11.83	25.38	129.0	5.288
85	0.2754	0.3200	1.451	1.520	5.213	10.04	21.37	107.3	4.834
90	0.2397	0.2796	1.268	1.325	4.459	8.556	18.06	89.57	4.428
95	0.2094	0.2452	1.111	1.159	3.829	7.318	15.33	75.12	4.066
100	0.1835	0.2156	0.9763	1.017	(1.000)	6.282	13.06	63.26	3.741
105	0.1613	0.1902	0.8608	0.8947	2.854	5.412	11.17	53.48	3.449
110	0.1423	0.1683	0.7612	0.7898	2.478	4.679	9.585	45.38	3.186
115	0.1259	0.1494	0.6751	0.6992	2.158	4.059	8.254	38.65	2.949
120	0.1117	0.1330	0.6004	0.6208	1.886	3.532	7.131	33.04	2.735
125	0.0994	0.1186	0.5354	0.5527	1.653	3.083	6.181	28.34	2.540
130	0.0886	0.1061	0.4787	0.4933	1.453	2.700	5.374	24.39	2.364
135	0.0793	0.0952	0.4290	0.4414	1.281	2.371	4.686	21.05	2.203
140	0.0711	0.0856	0.3855	0.3960	1.133	2.088	4.098	18.23	2.057
145	0.0639	0.0772	0.3472	0.3561	1.004	1.844	3.594	15.84	1.923
150	0.0576	0.0697	0.3134	0.3209	0.8928	1.632	3.161	13.80	1.800
155	0.0520	0.0631	0.2836	0.2899	0.7957	1.449	2.787	12.05	1.688
160	0.0471	0.0573	0.2571	0.2625	0.7109	1.289	2.464	10.56	1.585
165	0.0427	0.0521	0.2336	0.2381	0.6367	1.150	2.184	9.272	1.490
170	0.0389	0.0475	0.2127	0.2165	0.5716	1.028	1.940	8.164	1.402
175	0.0354	0.0433	0.1940	0.1972	0.5142	0.9217	1.728	7.207	1.322
180	0.0323	0.0396	0.1774	0.1800	0.4637	0.8278	1.542	6.377	1.247
185	0.0296	0.0363	0.1624	0.1646	0.4190	0.7451	1.379	5.656	1.178
190	0.0271	0.0334	0.1490	0.1508	0.3793	0.6720	1.237	5.028	1.114
195	0.0249	0.0307	0.1369	0.1384	0.3442	0.6074	1.111	4.480	1.055
200	0.0229	0.0283	0.1261	0.1272	0.3128	(0.5500)	(1.000)	(4.000)	(1.000)
205					0.2849	0.4990	0.9020	3.579	0.9488
210					0.2600	0.4536	0.8151	3.209	0.9010
215					0.2376	0.4130	0.7380	2.882	0.8565
220					0.2176	0.3768	0.6694	2.594	0.8150
225					0.1995	0.3443	0.6083	2.340	0.7762
230					0.1833	0.3151	0.5537	2.114	0.7398
235					0.1686	0.2889	0.5049	1.913	0.7058
240					0.1554	0.2653	0.4611	1.734	0.6739
245					0.1434	0.2440	0.4218	1.575	0.6439
250					0.1326	0.2247	0.3865	1.432	0.6158
255					0.1227	0.2072	0.3547	1.305	0.5893
260					0.1137	0.1914	0.3259	1.191	0.5644
265					0.1056	0.1771	0.3000	1.088	0.5410
270					0.0981	0.1640	0.2765	0.9958	0.5188
275					0.0913	0.1521	0.2552	0.9127	0.4979
280					0.0851	0.1413	0.2358	0.8377	0.4782
285					0.0793	0.1313	0.2182	0.7700	0.4596
290					0.0741	0.1223	0.2022	0.7086	0.4419
295					0.0693	0.1140	0.1876	0.6531	0.4252
300					0.0649	0.1064	0.1743	0.6026	0.4094

※B值的检测温度 (1) 0℃/100℃ (2) 100℃/200℃ (3) 200℃/300℃ (4) 25℃/50℃

请参照 P.16 「电阻-温度特性表」的概念

The concept of resistance-temperature characteristic table 「电阻-温度特性表」的概念

The resistance of the thermistor varies with the temperature and is not a straight line on the drawing line. With the increase of temperature, the resistance value describes the decrease of the curve.

The SHIBAURA thermistor calculates the "resistance-temperature characteristic table" according to the following formula.

随温度变化热敏电阻的电阻值变化，在图线上不是直线。随着温度升高，电阻值描述曲线地减少下去。

芝浦热敏电阻根据以下公式计算「电阻-温度特性表」。

$$R=R_0 \exp \left[B \left(\frac{1}{T} - \frac{1}{T_0} \right) + C \ln \frac{T_0}{T} + D \left(\ln \frac{T_0}{T} \right)^2 \right]$$

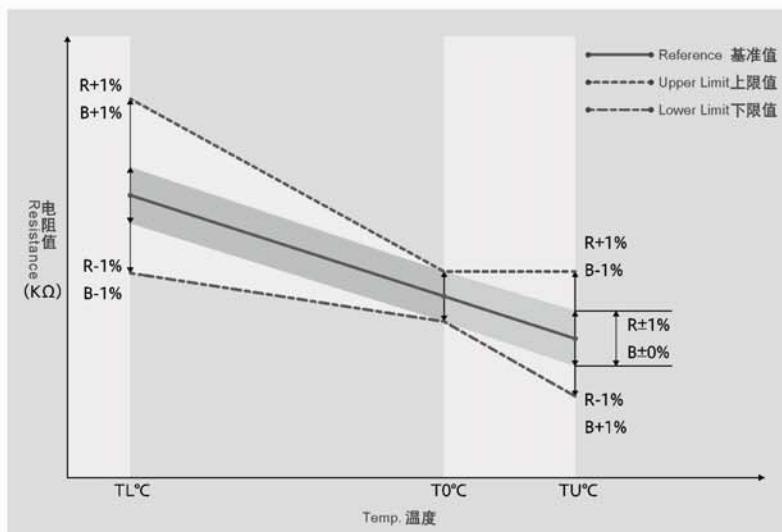
R_0 : Reference value 基准电阻值(kΩ) T_0 : Reference temperature 基准温度(K) B, C, D: Thermistor constant for each characteristic 热敏电阻每个特性的常数

The reference resistance value R_0 and the B constant have tolerances. Because the range of resistance value distribution will be affected by the tolerance of B constant, the wider the distribution from the reference temperature.

The downline diagram is a pattern diagram with a wider distribution range of resistance values and B tolerance $\pm 1\%$ (at $T_0^\circ\text{C}$) when the resistance value is changed.

基准电阻值 R_0 和B值都有公差。因为电阻值分布范围会受B值公差的影响，所以从基准温度越离开越分布变宽。

下线图是电阻值及B值公差 $\pm 1\%$ (在 $T_0^\circ\text{C}$)时的电阻值分布范围变宽的模式图。



Value upper limit value lower limit value resistance temperature
芝浦电子的「电阻-温度特性表」是按照以上概念作成的。

Durability specifications 耐久性规格

PSB thermistors of SHIBAURA Electronics meet the following durability specifications regardless of shape and characteristics.
芝浦电子的PSB形热敏电阻不管形状及特性满足以下的耐久性规格。

1 Temperature cycle test

温度循环试验

Record conditions, resistance values and initial values after 500 cycles, Value deviation $\pm$ less than 2.0%, appearance and shape are not abnormal.

在图上记载条件，500次循环试验后的电阻值和初始值的偏差 $\pm 2.0\%$ 以内，外观和形状没异常。

2 Thermal shock test

热冲击试验

Record condition on the diagram, resistance value and initial value after 5 cycles test. Deviation $\pm$ less than 1.0%, appearance and shape are not abnormal.

在图上记载条件，5次循环测试后的电阻值和初始值的偏差 $\pm 1.0\%$ 以内，外观和形状没异常。

3 High temperature storage test

高温保管试验

150°C $\pm 5^\circ\text{C}$ environment after 1000 hours, normal temperature Deviation of resistance value and initial value for 1 hour $\pm 2.0\%$ 150°C $\pm 5^\circ\text{C}$ 的环境中1000个小时放置后，常温状态下放置1个小时的电阻值和初始值的偏差 $\pm 2.0\%$ 以内。

4 High temperature and high humidity storage test

高温·高湿保管试验

80°C $\pm 2^\circ\text{C}$, relative humidity 90~95% environment 1000 hours After setting, place the resistance value and initial value for 2 hours at room temperature. Deviation $\pm$ less than 1.0%.

80°C $\pm 2^\circ\text{C}$, 相对湿度90~95%的环境中1000个小时放置后，常温状态下放置2个小时的电阻值和初始值的偏差 $\pm 1.0\%$ 以内。

5 High temperature load test

高温负荷试验

Place a thermistor of 50μA electrified $^\circ\text{C} \pm 5^\circ\text{C}$ environment After 1000 hours, place 1 hour resistance value and deviation of initial value $\pm$ within 2.0%.

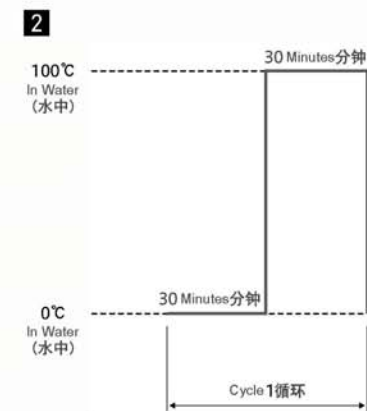
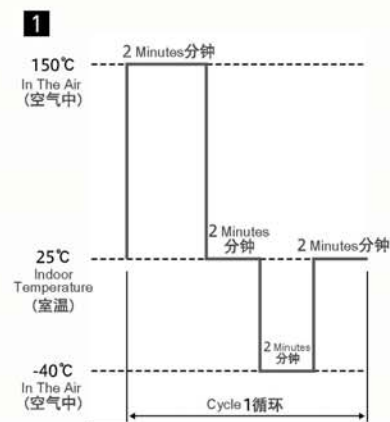
150°C $\pm 5^\circ\text{C}$ 的环境中，通电50μA的热敏电阻放置1000个小时后，常温状态下放置1个小时的电阻值和初始值的偏差 $\pm 2.0\%$ 以内。

6 Low temperature storage test

低温保管试验

-40°C $\pm 2^\circ\text{C}$ environment, 1000 hours after placement, normal temperature. For 1 hour, the deviation between the resistance value and the initial value $\pm 1.0\%$ to Inside, the appearance and shape are not abnormal.

-40°C $\pm 2^\circ\text{C}$ 的环境中，1000个小时放置后，常温状态下放置1个小时的电阻值和初始值的偏差 $\pm 1.0\%$ 以内，外观和形状没异常。



Model and Thermistor Elements 型号和热敏电阻元件一览

PSB product name representation feature PSB的产品名称表示特性

PSB thermistors have models classified by shape and product names classified by characteristics.
The model is obtained from the product name.

PSB形热敏电阻有按形状分类的型号及按特性分类的产品名称。
由产品名称得出型号。

Thermistor elements in general 热敏电阻元件一览

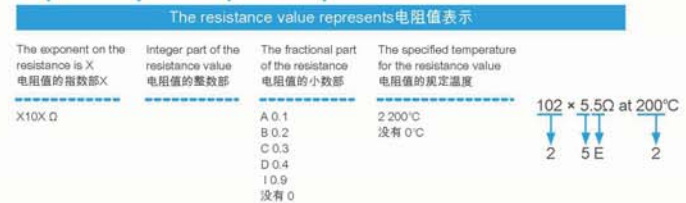
单位: mm

Category name 分类名称	STANDARD				COMPACT			ADVANCED			PL			RB1			KG	
Model 型号	PSB-S1形	PSB-S2形	PSB-S3形	PSB-N形	PSB-S5形	PSB-S7形	PSB-S9形	NSII-E1形	NSII-E3形	NSIII-U1形	PL形	PL2形	PL3形	S1形	S3形	N形	KG2形	KG3形
Operating temperature range 工作温度范围	-50~+300°C				-50~+250°C			-			-50~+300°C			-50~+120°C			-50~+200°C	
Maximum operating temperature 最高工作温度	-				-			300°C		500°C	-			-			-	
Thermal time constant 热时间常数	约12秒种	约9秒种	约5秒种	约12秒种	约2秒种	约1秒种	约0.6秒种	约18秒种	约10秒种	约18秒种	约12秒种	约8秒种	约5秒种	约12秒种	约5秒种	约12秒种	约5秒种	约10秒种
Thermal dissipation constant 耗散常数	约1.3mW/C	约1.0mW/C	约0.75mW/C	约2.3mW/C	约0.4mW/C	约0.25mW/C	约0.15mW/C	约1.5mW/C	约1.2mW/C	约1.5mW/C	约1.3mW/C	约0.9mW/C	约0.75mW/C	约1.3mW/C	约0.75mW/C	约2.3mW/C	约1.3mW/C	约1.4mW/C
Insulation resistance 绝缘电阻	DC500V 50MΩ	DC50V 10MΩ		DC500V 100MΩ	DC50V 10MΩ			DC500V 100MΩ	DC50V 10MΩ	DC500V 100MΩ	DC500V 50MΩ	DC50V 10MΩ		DC500V 50MΩ	DC50V 10MΩ	DC500V 100MΩ	-	
Glass site size 玻璃部位尺寸	φ2.3±0.2 L4.1±0.5	φ1.6±0.2 L2.7±0.4	φ1.3±0.2 L2.2±0.4	φ1.8±0.2 L3.7±0.4	φ0.8±0.1 L1.4±0.4	φ0.55±0.1 L1.1±0.3	φ0.43±0.1 L0.8±0.3	φ2.1±0.2 L4.0±0.3	φ1.2±0.2 L2.0±0.3	φ2.3±0.3 L2.8±0.3	φ2.3±0.2 L4.1±0.5	φ1.6±0.2 L2.7±0.4	φ1.3±0.2 L2.2±0.4	φ2.3±0.2 L4.1±0.5	φ1.3±0.2 L2.2±0.4	φ1.8±0.2 L3.7±0.4	□1.2±0.1 L1.4±0.1	□1.65±0.1 L2.3±0.1
Wire diameter dimensions 导线径尺寸	0.30	0.25	0.20	0.50	0.15	0.10	0.07	0.35	0.20	0.35	0.30	0.25	0.20	0.30	0.20	0.50	-	
Ceramic site size 陶瓷部位尺寸	-				-			φ2.2±0.2 L1.5±0.2	φ1.5±0.2 L3.0±0.2	φ2.2±0.2 L1.5±0.2	-			-			-	

PSB thermistor Product Name
Structure PSB
PSB形热敏电阻的产品名称结构

Product Name Example:
产品名称例

P T 7 - 2 5 E 2



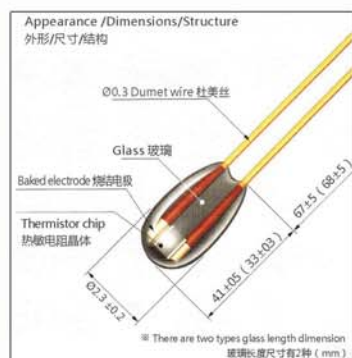
PSB-S1 THERMISTOR

PSB-S1型 热敏电阻

— Standard product of PSB thermistors
PSB热敏电阻的标准品

The PSB-S1 is a standard product of PSB thermistors. The diameter of the glass part is $\varnothing 2.35\text{mm}$ or under $\varnothing 2.5\text{mm}$. This thermistor can be used as a temperature detection element in all fields with a temperature range of $-50^{\circ}\text{C}\sim 300^{\circ}\text{C}$.

PSB型热敏电阻的标准品。玻封部的直径为 $\varnothing 2.35\text{mm}$ 最大也在 $\varnothing 2.5\text{mm}$ 以下。作为温度检测元件可使用于 $-50^{\circ}\text{C}\sim 300^{\circ}\text{C}$ 的温度范围。



Features 特长

- This is a glass-sealed thermistor, so it is heat resistance and has a higher level of stability.
- Mass production is automated from chip soldering to sealing, as well as in all measure test during the process.
- Patented in eight countries mainly. (J.P., the U.S., the U.K., West Germany, France, Canada, Italy and Switzerland)
- 玻璃封装的球形设计，高耐热性和高稳定性。
- 使用片形热敏电阻晶体，从晶体、玻璃封装到各项测试全部自动化生产。质量稳定并能批量供应。
- 日本、美国、加拿大、法国、英国、德国、意大利、瑞士等世界8个国家获得专利。

Applications 用途

For following equipment, please use in device that require high reliability and control in temperature.
除以下领域外，也可以使用于温度检测，要求高的设备上。

- Air conditioning equipment
- Hot water boilers
- Cellphones
- Refrigerators
- Car air conditioners
- Industrial temperature control equipment

- 空调
- 热水泵
- 手机
- 冰箱
- 汽车空调
- 工业用温度控制器

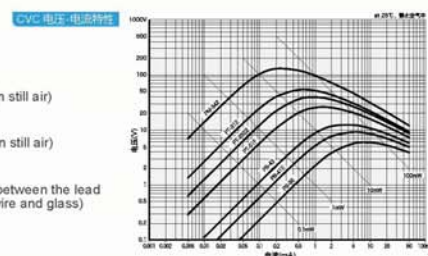
Rated Values 规格

Operating temperature range: $-50^{\circ}\text{C}\sim 300^{\circ}\text{C}$
使用温度范围

Thermal time constant τ : 12 sec. (10-17 sec) (in still air)
热时间常数 τ (静止空气中)

Dissipation constant δ : 1.3mW/ $^{\circ}\text{C}$ (1.1-1.6mW/ $^{\circ}\text{C}$) (in still air)
耗散常数 δ (静止空气中)

Soldering heat resistance: Min. 50M Ω (500V d.c.) (between the lead wire and glass)
绝缘电阻 (引线 and 玻璃之间)



PSB-S3 THERMISTOR

PSB-S3型热敏电阻

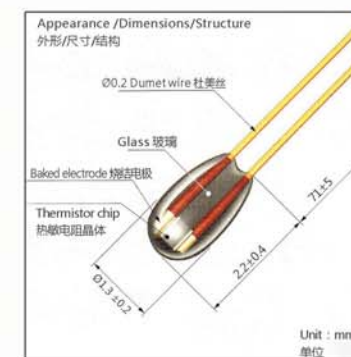
— For those that require fast response
对应要求高响应速度的用户

The PSB-S3 is a thermistor element developed in response for requirements of getting even faster thermal response than that of PSB-S1. In a medium size at $\varnothing 1.32\text{mm}$, this thermistor has high speed response, meanwhile, mechanically strong.

针对比PSB-S1形热敏电阻更快响应速度的要求而开发的热敏电阻元件。直径 $\varnothing 1.32\text{mm}$ 中型尺寸，响应性快、机械性好。

Features 特长

- The thermistor has high speed response and can be used in $-50^{\circ}\text{C}\sim 300^{\circ}\text{C}$
- Resistance value of PSB-S3 is very stable out of glass-sealed process.
- The thermal element is supplied with conformance and stable quality under automated mass production.
- Patented in eight countries mainly. (J.P., the U.S., the U.K., West Germany, France, Canada, Italy and Switzerland)
- 响应性快，适用于 $-50\sim 300^{\circ}\text{C}$
- 由于是玻璃封装，能够长时间稳定工作。
- 使用片形热敏电阻元件，采用一贯性自动化生产，特性稳定均一并能批量供应。
- 日本、美国、加拿大、法国、英国、德国、意大利、瑞士等世界8个国家获得专利。



Applications 用途

Please use for equipment that require a high speed response. Like the machines below.
也可以使用于快速响应要求高的设备上。

- Temperature control of tone fixing drum of photocopying machines.
- Temperature control of thermal heads in fax machines.
- Water and wind temperature control in bidet toilets.
- Electronic medical thermometers, etc.

- 复印机的墨粉卷筒的温度控制
- 传真机的压头的温度控制
- 温水便座的水温、风温控制
- 电子体温计等

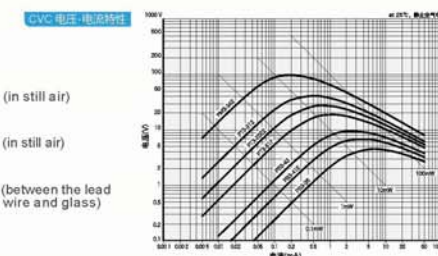
Rated Values 规格

Operating temperature range: $-50^{\circ}\text{C}\sim 300^{\circ}\text{C}$
使用温度范围

Thermal time constant τ : 5 sec. (3.5-6.5 sec) (in still air)
热时间常数 τ (静止空气中)

Dissipation constant δ : 0.75mW/ $^{\circ}\text{C}$ (0.7-0.9mW/ $^{\circ}\text{C}$) (in still air)
耗散常数 δ (静止空气中)

Soldering heat resistance: Min. 10M Ω (50V d.c.) (between the lead wire and glass)
绝缘电阻 (引线 and 玻璃之间)



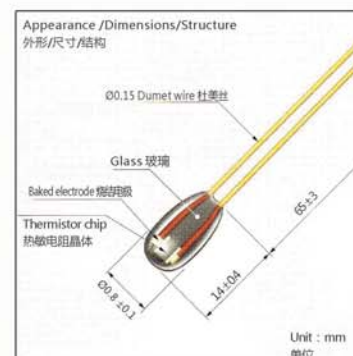
PSB-S5 THERMISTOR

PSB-S5型 热敏电阻

— For those that require fast response
对应要求高速响应的用户

This is a thermistor element developed for the requirements of getting even faster thermal response than PSB-S3. With a diameter in $\varnothing 0.8\text{mm}$ and thermal time constant at 2sec., PSB-S5 is super small in size and is suitable for temperature control required high speed response. Diameter of PSB-S5's lead wire is $\varnothing 1.5\text{mm}$, it's very thin but strong in mechanically strength.

针对比PSB-S3形热敏电阻更快响应速度要求而开发的热敏电阻元件。超小型尺寸实现自动批量生产。直径 $\varnothing 0.8\text{mm}$ ，只有半粒芝麻大小，热时间常数 $\tau=2\text{秒}$ ，响应速度快，最适用于高速反应要求的设备使用 $\varnothing 0.15\text{mm}$ 的引线，机械性较好，可以用在微弱振动处。



Features 特长

- The thermal response of PSB-S5 is about 6 times faster than that of regular products, and although it's small in size, it is mechanically strong.

PSB-S1 PSB-S5

- Thermal time constant: $\tau=2\text{ sec}$ $\tau=2\text{ sec}$ (in still air)
- The thermistor chip is glass-sealed, so it is heat resistance and also has a high level of stability.
- The thermal element is supplied with conformance and stable quality under automated mass production.
- Patented in eight countries mainly. (J.P., the U.S., the U.K., West Germany, France, Canada, Italy and Switzerland)

- 响应性比旧产品快大约6倍。尺寸小、机械性好。

PSB-S1 PSB-S5

- 热时间常数: $\tau=12\text{秒}$ $\tau=2\text{秒}$ (静止空气中)
- 热敏电阻晶体采用玻璃封装，耐热、稳定性高。
- 采用一贯性自动化生产，提供形状、特性均一的热敏电阻。
- 日本、美国、加拿大、法国、英国、德国、意大利、瑞士等世界8个国家获得专利。

Applications 用途

Please use in the following equipment that required high speed response or for temperature measure set in narrow space. 也可以使用于高速响应要求设备或狭窄空间处。

- Temperature control of tone fixing drum of photocopying machines.
- Temperature control of a thermal head in printer.
- Temperature control in water heaters.
- Luminance control in printer, etc.
- Water temperature control in bidet toilets.

- 复印机的墨粉卷筒的温度控制
- 打印机压头的温度控制
- 热水器的温度控制
- 打印机的光源亮度控制等
- 温水便座的水温控制

Rated Values 规格

Operating temperature range: $-50^{\circ}\text{C}\sim 250^{\circ}\text{C}$

使用温度范围

Thermal time constant τ : 2 sec. (1.7-2.9sec) (in still air)

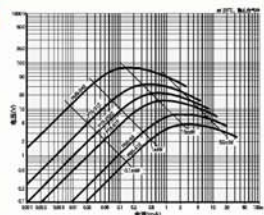
热时间常数 τ (静止空气中)

Dissipation constant δ : 0.4mW/ $^{\circ}\text{C}$ (0.35-0.55mW/ $^{\circ}\text{C}$) (in still air)

耗散常数 δ (静止空气中)

Soldering heat resistance: Min. 10MQ (50V d.c.) (between the lead wire and glass)

CVC 电压-电流特性



PSB-S7 THERMISTOR

PSB-S7型热敏电阻

— This is the ultimate thermistor with high speed response and microscopic size
高速响应、微型热敏电阻

The PSB-S7 is a thermistor developed for temperature sensors that require a microscopic shape and for equipment that requires an extremely fast thermal response.

If we look it on a photograph or a drawing, it may appear large, but the real thing is very small and can be expressed as "a thermistor attached to the end of two strands of hair."

针对如需要安装在细小的针头上或粘贴在薄膜上等微小形状的温度传感器，以及响应性非常快的设备而开发的热敏电阻。图像是被放大的，实际物体如2根头发上安装热敏电阻一样微小。

Features 特长

- The PSB-S7 is in size of $\varnothing 0.53\text{mm}$ with thermal response speed 12 times faster than regular product.

PSB-S1 PSB-S7

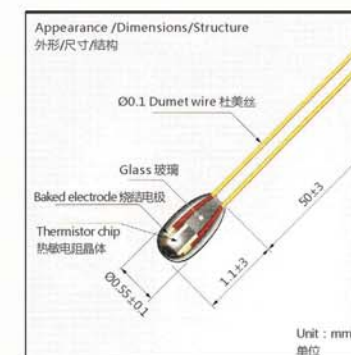
- Thermal time constant: $\tau=12\text{ sec}$ $\tau=1\text{ sec}$ (in still air)

- The PSB-S7 is glass-sealed, so it is heat resistance and has high level of stability.
- Patented in eight countries mainly. (J.P., the U.S., the U.K., West Germany, France, Canada, Italy and Switzerland)

- 直径为 $\varnothing 0.53\text{mm}$ ，响应速度比常规产品快12倍

PSB-S1 PSB-S7

- 热时间常数: $\tau=12\text{秒}$ $\tau=1\text{秒}$ (静止空气中)
- 采用玻璃封装，耐热、稳定性高。
- 日本、美国、加拿大、法国、英国、德国、意大利、瑞士等世界8个国家获得专利



Applications 用途

The PSB-S7 is suitable for the following equipment and superfine tubes that require fast response or for temperature measurement set in narrow space.

适用于以下要求高速响应的设备或极细套管以及狭小处。

- Pinhole sensors
- Luminance control in printer.
- Temperature control of thermal head in printer.
- For medical equipment, etc.

- 针孔传感器
- 打印机的光源亮度控制
- 打印机压头的温度控制
- 医疗器械等

Rated Values 规格

Operating temperature range: $-50^{\circ}\text{C}\sim 250^{\circ}\text{C}$

使用温度范围

Thermal time constant τ : 1 sec. (0.6-1.5sec) (in still air)

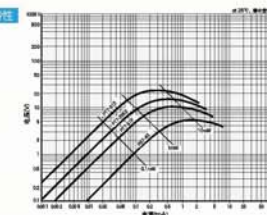
热时间常数 τ (静止空气中)

Dissipation constant δ : 0.25mW/ $^{\circ}\text{C}$ (0.2-0.3mW/ $^{\circ}\text{C}$) (in still air)

耗散常数 δ (静止空气中)

Soldering heat resistance: Min. 10MQ (50V d.c.) (between the lead wire and glass)

CVC 电压-电流特性



PSB-S9 THERMISTOR

PSB-S9型 热敏电阻

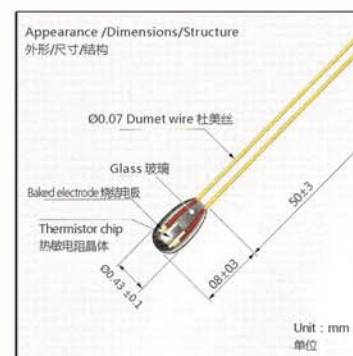
— For those that desire the smallest size and ultra high speed response
— 针对要求外形极小、超高速响应的用户

The PSB-S9 with size of $\varnothing 0.43\text{mm}$ which is half size of S7, is the smallest glass-sealed thermistors in the world, mass-produced. The thermal response speed is twice faster than that of S7.

The PSB-S9 is developed for sensors that require high speed response, smaller size and higher reliability (for example, temperature sensor for medical equipment which require extremely small size) and for application of contactless sensors, medical equipment and office equipment, such as printers and photocopying machines, which demand a high speed response.

外形尺寸 $\varnothing 0.43\text{mm}$ 并可以批量生产，在玻璃封装热敏电阻中是世界上最小的。比高速响应、微小热敏电阻PSB-S7的体积小50%，响应速度快2倍实现了外形极小和超高速响应。

对应于高速响应的打印机，复印机等办公设备以及非接触式传感器的应用，对外形要求非常小的医疗器械等、超高速响应、体积小且信赖性要求高的传感器领域而开发的产品。



Features 特长

- Microminiaturization (50% of the volume compare to regular products)
- A small size element with a high speed response. High precision and high stability.
- Excellent cost performance.
- 超小型（常规型号体积的50%）
- 高速响应、高精度、高稳定性的小型芯片
- 性价比高

Applications 用途

The PSB-S9 is suitable for the following equipment and superfine tubes that require a high speed response or for temperature measurement set in narrow space.

适用于以下要求高速响应的设备及极细套管和狭小处。

- Catheters.
- Temperature control of tone fixing drum of photocopying machines.
- Contactless sensors.
- Superfine metal protective casing.

- 医疗用导管
- 复印机、打印机等墨粉快速定影传感器
- 非接触式传感器
- 极细金属保护管

Rated Values 规格

Operating temperature range: $-50^{\circ}\text{C} \sim 250^{\circ}\text{C}$

使用温度范围

Thermal time constant τ : 0.6 sec.(0.6sec) (in still air)

热时间常数 τ （静止空气中）

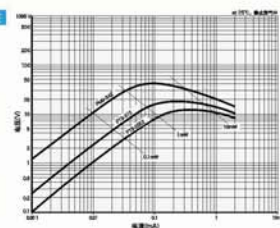
Dissipation constant δ : 0.15mW/ $^{\circ}\text{C}$ (in still air)

耗散常数 δ （静止空气中）

Soldering heat resistance: Min. 10MQ (50V d.c.) (between the lead wire and glass)

绝缘电阻（引线及玻璃之间）

CVC 电压-电流特性



PSB - N/N3 THERMISTOR

PSB-N/N3型热敏电阻

— Double heat sink diode (DHD)
— DHD（二极管型）

There is a thermistor sealed in DHD, using a chip of PSB-S type.

Lead wires come out from both ends of the thermistor element. They are glass-sealed and are heat resistance.

Short circuit is less likely happen with construction like this, so the PSB-N/N3 can be used in oil smoky/dusty/humid or other tough environment.

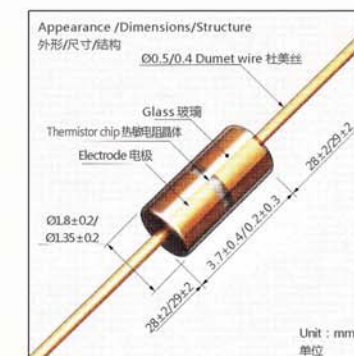
使用PSB-S形热敏电阻晶体，封装在DHD内的热敏电阻。

从热敏电阻晶体两端引出引线，有玻璃薄膜保护，耐热性好。

引线间间隔大，不易引起误差，适用于多油烟、多粉尘、高温度等各种恶劣的环境。

Features 特长

- High stability.
- Outstanding performance in dusty/smoky/humid/ or other though working environment.
- Small and durable in construction. Can be easily mounted on circuit board.
- 稳定性强。
- 引线之间间隔大，能在烤箱等温度大、容易产生油烟等恶劣环境下工作。
- 尺寸小且结构牢固，可适用于自动装填在电路板上。



Applications 用途

For temperature sensors applied in the following equipment.

适用于以下需要两端引线型的温度传感器。

- Microwave oven meat probes
- Temperature control in convection microwave ovens
- Temperature detection in induction cookers
- Temperature control in laser beam printer photosensitive drums, etc.

- 微波炉的温度探头
- 烤箱的温度控制
- 电磁炉的温度检测
- 激光打印机感光卷筒的温度控制等

Rated Values 规格

Operating temperature range: $-50^{\circ}\text{C} \sim 300^{\circ}\text{C}$

使用温度范围

Thermal time constant τ : 12 sec.(10-15sec) 6 sec.(5-8 sec) (in still air)

热时间常数 τ （静止空气中）

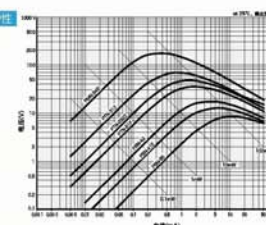
Dissipation constant δ : 2.3mW/ $^{\circ}\text{C}$ (1.9-3.0mW/ $^{\circ}\text{C}$) 1.3mW/ $^{\circ}\text{C}$ (1.9-3.0mW/ $^{\circ}\text{C}$) (in still air)

耗散常数 δ （静止空气中）

Soldering heat resistance: Min. 100MQ (500V d.c.) Min. 100MQ (500V d.c.)

绝缘电阻（引线及玻璃之间）（between the lead wire and glass）

CVC 电压-电流特性



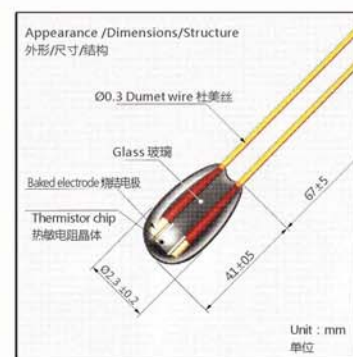
PMH THERMISTOR

PMH型 热敏电阻

— Thermistors used in high temperature environment.
高温热敏电阻

The PMH is a thermistor developed for equipment that required to work long hours under high temperature environment. The highest continuous operating temperature of PMH is 350°C. PMH can also work under 400°C for less than 100h if needed. Please be aware that the lead wire will be oxidized by the heating and risk of burn-out will increase if over-used.

要求在高温下长时间使用的设备而开发的热敏电阻。可持续工作的最高使用温度为350°C。连续工作100小时之内最高使用可达到400°C。超过以上温度，高温会使引线氧化，造成断线的危险。使用了耐热性杜美线（Ø0.3mm）。



Features 特长

- Good performance in heat resistance. Highest operating temperature of 350°C. (400°C X 100 hours is permitted)
- The thermal element is supplied with conformance and stable quality under automated mass production.
- Patented in eight countries mainly. (J.P., the U.S., the U.K., West Germany, France, Canada, Italy and Switzerland)
- 具有耐热性，最高使用温度达350°C（400°C×100h）。
- 使用片形热敏电阻晶体，采用一贯性自动化生产，特性稳定均一并能大批量供应。
- 日本、美国、加拿大、法国、英国、德国、意大利、瑞士等世界8个国家获得专利。

Applications 用途

Please use PMH thermistor in the following equipment working in high temperatures environment and required heat resistance. 适用于以下高温环境、耐热性要求高的设备。

- Kerosene vaporizers
- Temperature control in oven and microwaves
- Temperature detection in car engines, etc.
- 石油汽化器
- 烤箱的温度控制
- 汽车引擎的温度检测等

Rated Values 规格

Operating temperature range: 100°C~350°C (400°C x 100h is permitted)
使用温度范围

Thermal time constant τ : 12 sec.(11-16sec)

热时间常数 τ （静止空气中）

Dissipation constant δ : 1.3mW/°C(1.1-1.6mW/°C)

耗散常数 δ （静止空气中）

Soldering heat resistance: Min. 50MQ (500V d.c.)

绝缘电阻（引线及玻璃之间）

(in still air)

(in still air)

(between the lead wire and glass)

RB1 THERMISTOR

RB1型热敏电阻

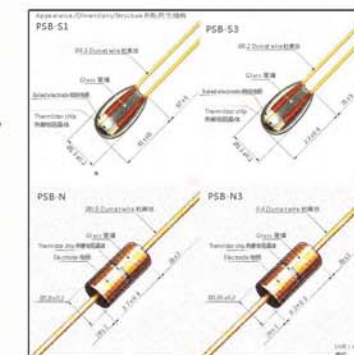
— High precision of $\pm 1\%$ tolerance in both resistant value and B constant
电阻值精度、B值精度 $\pm 1\%$ 的热敏电阻

Rb1 is a thermistor that suitable for temperature sensor required high precise equipment. It is glass-sealed and perform stably.

适用于设备的高性能化、高精度化的热敏电阻。玻璃封装稳定性高，设备性能维持优越。

Features 特长

- Glass-sealed. High stability. Be durable in soldering/resin seal/molding processing.
- Various shape available for option.
- 玻璃封装稳定性高，对于引线上锡、树脂封装或注塑等高温处理，有良好的适用性。
- 形状品种丰富，根据用途可任意选择热敏电阻。



Applications 用途

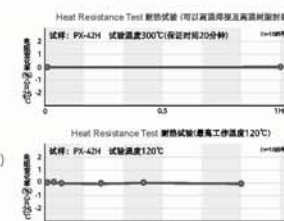
The RB1 is suitable for the following devices that required temperature detection of high performance and high precision. 适用于以下需要高性能、高精度的检测设备。

- For charging control of battery packs and battery chargers, as well as for temperature compensation for crystal oscillators in mobile communication devices
- For office equipment, cooking devices, home appliance such as water heaters, driving force in automobiles, as well as temperature measurement and control in industrial measuring equipment.
- 电池组、充电器的充控制、移动通信器材的水晶振荡器的温度补偿。
- 办公设备、烹饪设备、热水器等家用电器、汽车驱动、工业用测量器材等的温度检测及温度控制。

Rated Values 规格

	S1	S3	N	N3
Operating temperature range: -50°C~120°C 使用温度范围	-50°C~120°C	-50°C~120°C	-50°C~120°C	-50°C~120°C
Thermal time constant τ : 12 sec.(10-17sec) 热时间常数 τ	12 sec.(10-17sec)	5 sec.(3.5-6.5sec)	12 sec.(10-15sec)	6 sec.(5-8sec)
Dissipation constant δ : 1.3mW/°C 耗散常数 δ	1.3mW/°C (1.1-1.6mW/°C)	0.75mW/°C (0.7-0.9mW/°C)	2.3mW/°C (1.9-3.0mW/°C)	1.3mW/°C (1.0-1.6mW/°C)
Soldering heat resistance: Min. 50MQ 绝缘电阻	Min. 50MQ (500V d.c.)	Min. 10MQ (50V d.c.)	Min. 100MQ (500V d.c.)	Min. 100MQ (500V d.c.)

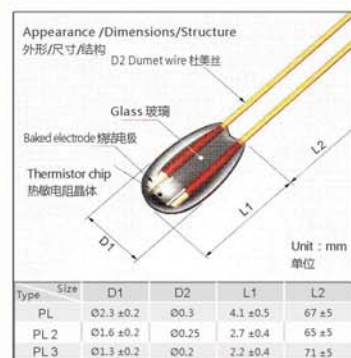
Reliability Data 可靠性数据



PL Series SHIBAURA WIDE TEMPERATURE RANGE THERMISTOR

PL系列 芝浦宽温域传感器

— Thermistors that can give high precision measurement in a wide range of temperature. 温度范围广、高精度测量的热敏电阻



Features 特长

- These thermistors can be used in a wide temperature range, because high resistance value and low B constant (2240K).
- The PL Series are glass sealed, which operating temperature range is wide like PSB-S models at -50°C~300°C while giving about 1.5 times wider temperature control range under same resistance value range.
- PL Series thermistors are available in three types of sizes of applications, so processing into various sensor shapes is possible.
- 具有过去热敏电阻不具备的高阻值低B值 (2240K)。可使用在广泛温度范围的热敏电阻。
- 玻璃封装热敏电阻。和PSB-S相同。使用温度范围为-50°C~+300°C。对于同样的阻值范围，PL热敏电阻可覆盖的温度范围为原有的1.5倍。
- 根据用途备有3种尺寸。可加工成各种传感器。

Applications 用途

In addition to the following equipment, please use in device that require high reliability in temperature measurements and control. 除以下领域之外，也可以使用于温度检测，温度控制等要求高的设备。

- Home appliances, like microwaves, rice cookers and IH cooking appliances.
- White goods, like refrigerators and air conditioners.
- Industrial equipment using platinum or thermocouples
- 微波炉、电饭煲、IH电磁炉等家电产品
- 有冷暖切换功能的冰箱、空调等白色家电
- 使用铂电阻、热电偶的产业设备。

Rated Values 规格

	PL	PL2	PL3	
Operating temperature range: 使用温度范围	-50°C~300°C	-50°C~300°C	-50°C~300°C	
Thermal time constant τ : 热时间常数 τ	12 sec.(10-17sec)	8sec.(6.5-10sec)	5sec.(3.5-6.5sec)	(in still air)
Dissipation constant δ : 耗散常数 δ	1.3mW/°C (1.1-1.6mW/°C)	0.9mW/°C (0.8-1.1mW/°C)	0.75mW/°C (0.7-1.0mW/°C)	(in still air)
Soldering heat resistance: 绝缘电阻	Min. 50M Ω (500V d.c.)	Min. 10M Ω (50V d.c.)	Min. 10M Ω (50V d.c.)	(between the lead wire and glass)

NS II THERMISTOR

NSII型热敏电阻

— A thermistor for temperature measurements in humid environment 水温测量用热敏电阻

The NSII is a glass-sealed thermistor that has outlet of lead wire mechanically reinforced with ceramic tube, which remarkably enhanced the electrical insulation and mechanical strength.

玻璃封装热敏电阻的引线出口处用高强度陶瓷加固，进一步提高了电气的绝缘性和机械强度。适用于多湿的环境。

Features 特长

- Distance between two lead wires is enlarged after having ceramic tube. Good humidity-resistance.
- Strengthen outlet of the lead wire and made glass-sealed body be more durable in processing.
- 引线之间的距离用陶瓷管加大。耐湿性出色。
- 加强了引线出口的强度，使在组装传感器或注塑时，热敏电阻的玻璃球体不易被破碎或裂开。



Applications 用途

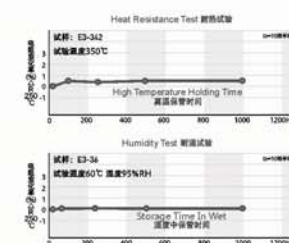
The NSII is suitable for temperature detection in the following equipment that used in humid environment. 适用于以下高湿度环境下的设备。

- Temperature control in oil and gas boilers.
- Temperature sensors that require humidity-resistance, and mechanical strength in water heaters, dish dryers, clothes dryers, bidets, automobile coolants and engine oils.
- 石油、气泵的温度控制
- 热水器、洗碗干燥机、衣类烘干机、温水便座、汽车冷却水系统、发动机机油等耐湿度或机械性强度要求高的温度传感器。

Rated Values 规格

	E1	E3
Operating temperature range: 使用温度范围	300°C	300°C
Thermal time constant τ : 热时间常数 τ	Approx. 18sec	Approx. 10sec
Dissipation constant δ : 耗散常数 δ	Approx. 1.5mW/°C	Approx. 1.2mW/°C
Soldering heat resistance: 绝缘电阻	min. 100M Ω (500V d.c.)	min. 10M Ω (50V d.c.)

Reliability Data 可靠性数据



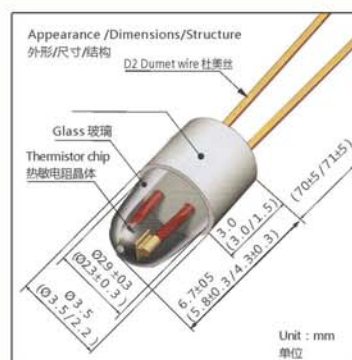
NS III THERMISTOR

NS III 型热敏电阻

— 500 °C Heat resistance
实现耐高温500 °C

The NSIII is a thermistor given a significantly wider operating temperature range after having glass-sealed and ceramic reinforced process.

把热敏电阻封装入耐热性玻璃中，再用陶瓷加固，大幅度提高了热敏电阻的温度使用范围。



Features 特长

- Using heat-resistance thermistor chip. Suitable for applying under high temperature environment.
- Good humidity-resistance and strong mechanical strength.
- 采用耐热性热敏电阻晶体，适用于高温等恶劣的环境下。
- 耐热性玻璃和陶瓷的配套使用，提高了耐温度及热敏电阻引出线的机械强度。

Applications 用途

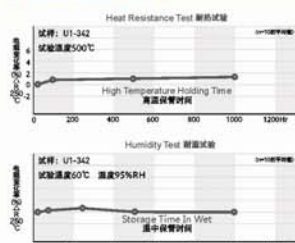
The NSIII is suitable for temperature sensors applied in the equipment required high temperature detection. 适用于如下高温检测设备。

- Temperature sensors used in kerosene vaporizers, automotive exhaust, ovens, gas stove, etc.
- 石油气化、汽车排气温度、火灾报警器、烤箱、煤气炉等高温恶劣环境下使用的温度传感器。

Rated Values 规格

	U0	U1
Operating temperature range: 使用温度范围	500°C	500°C
Thermal time constant τ : 热时间常数 τ	Approx. 20sec	Approx. 20sec
Dissipation constant δ : 耗散常数 δ	Approx. 1.5mW/°C	Approx. 1.2mW/°C
Soldering heat resistance: 绝缘电阻	Approx. 2.0mW/°C	Approx. 2.0mW/°C

Reliability Data 可靠性数据



KG2, KG3 THERMISTOR

KG2、KG3 热敏电阻

— High reliable and for SMT device
可靠性高，对应SMT设备

The KG is a chip thermistor that developed for demanding of high reliability thermistor. Using square glass and metal electrode, which made it very durable in use and simple in soldering and mounting.

KG是根据高可靠性的需求而研发的贴片型热敏电阻。由于使用方形玻璃和金属电极，经年老化小，且便于焊接安装。

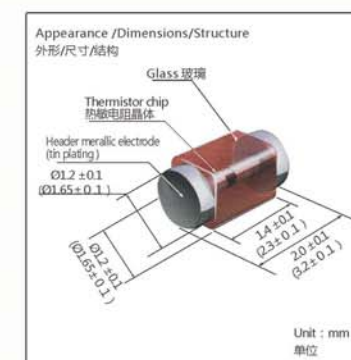
Features 特长

- Two types for option. KG3(3216) and KG2(2012)
- The electrode is not film, and metal body is solder plating, so there will be no solder leaching or electrode peeling.
- No mounting defect will be found for square glass is used.
- 有KG3(3216)、KG2(2012)两种类型，可根据使用目的进行选择。
- 由于不是膜型电极，且金属体有电镀处理，不会发生焊锡溶化或电极脱落现象。
- 由于使用方形玻璃，不会发生实际安装时的移位、脱落等落固定不良的情况。

Applications 用途

KG thermistors are suitable for the following temperature measurements with SMT. 适合如下SMT测温。

- Temperature compensation in electronic components, such as crystal oscillators, hybrid integrated circuits and transistors
- Surface-mounted temperature compensation for general electronic circuit components
- Temperature control in printers and thermal heads etc.
- Over-charging prevention in mobile communication batteries
- Over-charging prevention in audiovisual equipment batteries
- Brightness adjustment and voltage control for LCD
- Temperature sensors for measurement and control devices and precision equipment
- 晶体振荡器、混合IC、晶体管等电子元器件的温度补偿
- 普通电子电路元件表面安装的温度补偿
- 打印机压头等的温度调节
- 防止移动通信电池的过度充电
- 防止视听设备的过度充电
- 液晶显示屏幕的亮度调整和电压控制
- 测量控制仪表、精密设备的温度传感器



Rated Values 规格

	KG3	KG2
Operating temperature range: 使用温度范围	-50°C~200°C	-50°C~200°C
Thermal time constant τ : 热时间常数 τ	Approx. 10sec	Approx. 5sec
Dissipation constant δ : 耗散常数 δ	Approx. 1.4mW/°C	Approx. 1.3mW/°C
Soldering heat resistance: 绝缘电阻	3 sec. at 350°C	3 sec. at 350°C

Reliability Data 可靠性数据



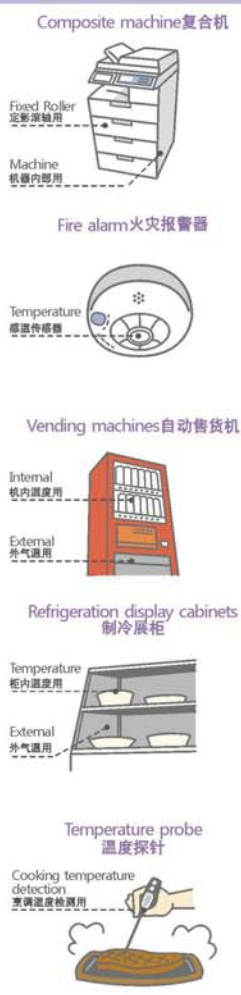
* (1) 电阻公差: ±2%, ±1%



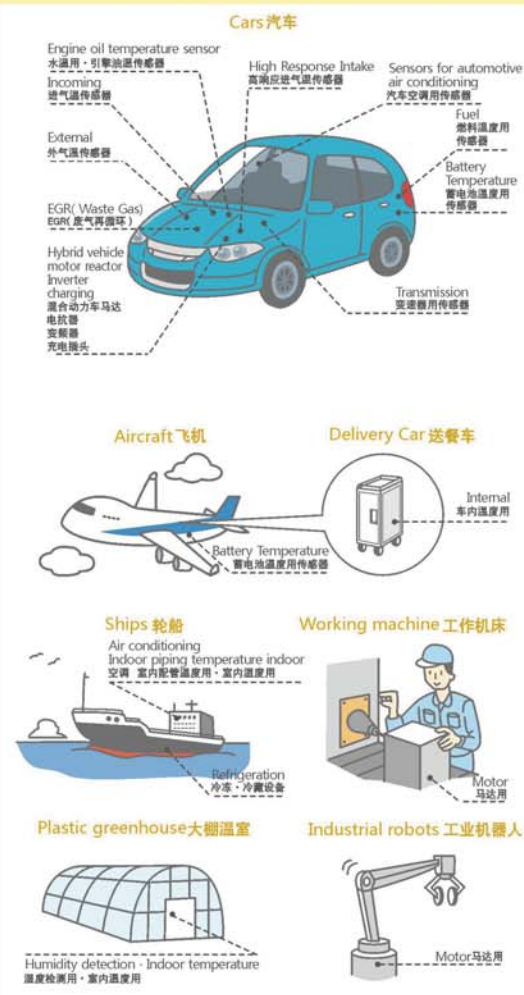
Home 家居



Office 办公室



Transport-Agriculture · Industry 交通工具·农业·工业



Medical 医疗



Industrial Experience

行业经验

Rice cooker series

电饭煲系列（食品加工设备和烹饪设备）



Type: JXW-060

Features:
Fast response and stable performance in temp. measurement.

Applications:
IH rice cooker, IH high pressure cooker.

Temperature Range:
-40°C ~ 200°C

Thermal time constant:
Less than 10sec. (on hot plate)

类型: JXW-060

特点:
快速响应型, 测温一致性好。

用途:
IH智能电饭煲, IH电压力锅。

使用温度范围:
-40°C ~ 200°C

热时间常数:
< 10秒 (热平板)



Type: JXW-061

Features:
Temp. sensor with built-in thermal fuse.

Applications:
IH cookers.

Temperature Range:
-40°C ~ 200°C

Thermal time constant:
Less than 20sec. (on hot plate)

类型: JXW-061

特点:
内置温度保险丝的复合温度传感器。

用途:
IH料理器及电饭煲等用。

使用温度范围:
-40°C ~ 200°C

热时间常数:
小于20秒 (热平板)



Type: JXW-062

Features:
Temp. sensor with built-in thermal fuse.

Applications:
IH cookers.

Temperature Range:
-40°C ~ 200°C

Thermal time constant:
Less than 10sec. (on hot plate)

类型: JXW-062

特点:
内置温度保险丝的复合温度传感器。

用途:
IH料理器及电饭煲等用。

使用温度范围:
-40°C ~ 200°C

热时间常数:
小于10秒 (热平板)



Type: JXW-063

Features:
Stainless steel encapsulated sensor with epoxy sealed. Available for earth wire assembling.

Applications:
IH cookers.

Temperature Range:
-10°C ~ 200°C

Thermal time constant:
Less than 8sec. (in steam)

类型: JXW-063

特点:
不锈钢结构的温度传感器, 环氧树脂封装, 可安装接地线。

用途:
IH料理器及电饭煲顶部温度传感器。

使用温度范围:
-10°C ~ 200°C

热时间常数:
小于8秒 (蒸汽中)



Type: JXW-064

Features:
Temp. sensor with movable probe head.

Applications:
Food processor or bread maker.

Temperature Range:
-10°C ~ 200°C

Thermal time constant:
Less than 3sec. (in steam)

类型: JXW-064

特点:
头部可自由伸缩的温度传感器。

用途:
料理器及面包机等用。

使用温度范围:
-10°C ~ 200°C

热时间常数:
≤ 3秒 (蒸汽中)



Type: JXW-065

Features:
Temp. sensor with stainless steel tube encapsulated. Available for earth wire assembling.

Applications:
IH high pressure cooker.

Temperature Range:
-10°C ~ 200°C

Thermal time constant:
Less than 8sec. (in steam)

类型: JXW-065

特点:
不锈钢保护管封装的温度传感器, 可安装接地线。

用途:
IH电压力电饭煲顶部温度传感器。

使用温度范围:
-10°C ~ 200°C

热时间常数:
小于8秒 (蒸汽中)

Industrial Experience

行业经验

Microwave oven, Toaster oven series (home appliances)

微波炉、电烤箱系列（家用电器）



Type: JXW-074

Features:

Temp. sensor with stainless steel probe encapsulated and stereo plug. All materials are FDA approval.

Applications:

Microwave oven, Toaster oven, Electric hot plate etc.

Temperature Range:

0°C ~ 250°C

Thermal time constant:
Approx. 4sec. (in food)

类型: JXW-074

特点:

不锈钢针管的温度传感器。硅胶手柄, 硅胶屏蔽护套线和音频插头, 所有材料符合FDA。

用途:

微波炉, 电烤箱, 电烤盘。

使用温度范围:

0°C ~ 250°C

热时间常数:
约4秒 (在食物内)



Type: JXW-075

Features:

Applied PSB type NTC and sealed with high temp. resist material for specially working under high temp. environment.

Applications:

Microwave oven, Toaster oven etc.

Temperature Range:

-20°C ~ 200°C

Thermal time constant:
Approx. 6sec. (on hot plate)

类型: JXW-075

特点:

采用PSB型热敏电阻和耐热密封材料, 可用于加热高温环境。

用途:

微波炉, 电烤箱等。

使用温度范围:

-20°C ~ 200°C

热时间常数:
约6秒 (热平板)



Type: JXW-076

Features:

Applied NSI type NTC and specially working under high temp. environment.

Applications:

Toaster oven, Food waste disposer and Dishwasher etc.

Temperature Range:

-40°C ~ 500°C (probe head only)

Thermal time constant:
Approx. 20sec. (in air)

类型: JXW-076

特点:

使用NSI系列元件, 应用在超高温环境中。

用途:

电烤箱, 烤箱, 洗碗机等。

使用温度范围:

-40°C ~ 500°C (仅感温头部)

热时间常数:
约20秒 (大气中)

Microwave oven, Toaster oven series (home appliances)

微波炉、电烤箱系列（家用电器）



Type: JXW-077

Features:

Quick response detection with exposed PSB type element. Encapsulated in the stainless steel casing.

Applications:

Microwave oven, Electronic oven.

Temperature Range:

-40°C ~ 250°C

Thermal time constant:
Approx. 60sec. (in the wind)

类型: JXW-077

特点:

PSB型通过露出头部, 提高感热敏度, 封装在不锈钢外壳内的温度传感器。

用途:

电烤箱, 微波炉温度检测。

使用温度范围:

-40°C ~ 250°C

热时间常数:
约60秒 (有风状态)



Type: JXW-078

Features:

Using PSB type element. Good performance in heat resistance and stability. Length of protection tube is changeable.

Applications:

Microwave oven, Electronic oven.

Temperature Range:

-40°C ~ 300°C (probe head only)

Thermal time constant:
Approx. 90sec. (in air)

类型: JXW-078

特点:

采用PSB型热敏电阻, 耐高温, 稳定性强, 可以变更保护管长度。

用途:

电烤箱, 微波炉等。

使用温度范围:
-40°C ~ 300°C (仅限传感器头部)

热时间常数:
约90秒 (大气中)



Type: JXW-079

Features:

Using PSB type element. Good performance in heat resistance and stability. Length of protection tube is changeable.

Applications:

Microwave oven, Electronic oven.

Temperature Range:

-40°C ~ 300°C (probe head only)

Thermal time constant:
Approx. 90sec. (in air)

类型: JXW-079

特点:

采用PSB型热敏电阻, 耐高温, 稳定性强, 可以变更保护管长度。

用途:

电烤箱, 微波炉等。

使用温度范围:
-40°C ~ 300°C (仅限传感器头部)

热时间常数:
约90秒 (大气中)

Industrial Experience

行业经验

Fire alarm series (fire control and safety equipment)

火灾报警器系列 (消防和安全设备)



Type: JXW-047

Features:
Temp. sensor encapsulated by threaded stainless steel. Fast response and durable sensor for fire alarm.

Applications:
To measure temp. around fire alarm control unit and PCB board.

Temperature Range:
-30°C ~ 200°C

Thermal time constant:
20~40sec. (in air)

类型: JXW-047

特点:
带螺纹不锈钢外壳的温度传感器。高响应高耐久性火灾报警传感器。

用途:
检测电气火灾报警系统控制单元及线路的周围温度等。

使用温度范围:
-30°C ~ 200°C

热时间常数:
20~40秒(大气中)



Type: JXW-048

Features:
Temp. sensor encapsulated by threaded stainless steel. Fast response and durable sensor for fire alarm.

Applications:
To measure temp. around fire alarm control unit and PCB board.

Temperature Range:
-30°C ~ 200°C

Thermal time constant:
9~21sec. (in air)

类型: JXW-048

特点:
带螺纹不锈钢外壳的温度传感器。高响应高耐久性火灾安全系统报警传感器。

用途:
检测电气火灾报警系统控制单元及线路的周围温度等。

使用温度范围:
-30°C ~ 200°C

热时间常数:
9~21秒(大气中)



Type: JXW-049

Features:
Applied PSB-S3 type NTC, simply shape directly soldered on substrate and epoxy sealed.

Applications:
To measure temp. around PCB board.

Temperature Range:
-30°C ~ 100°C

Thermal time constant:
9~21sec. (in air)

类型: JXW-049

特点:
环氧树脂绝缘处理。直接焊接在基板上,形状简单。能使用PSB-S3型元件。

用途:
检测火灾报警器,基板的周围温度等。

使用温度范围:
-30°C ~ 100°C

热时间常数:
9~21秒(大气中)

Coffee machine series (home appliances)

咖啡机系列 (家用电器)



Type: JXW-023

Features:
Encapsulated with aluminum cap. Fast response and high temp. resist. Ceramic cap type with fast response is also available.

Applications:
IH cookers, Electric hot-water pot and IH rice cookers etc.

Temperature Range:
-20°C ~ 300°C

Thermal time constant:
Approx. 5sec. (oh hot plate)

类型: JXW-023

特点:
保护管采用铝制保护管,响应速度快,耐热性强且易于安装。也有陶瓷保护管的高响应类型。

用途:
IH调理器,咖啡壶,电热水瓶及IH电饭煲等。

使用温度范围:
-20°C ~ 300°C

热时间常数:
约5秒(热平板)



Type: JXW-024

Features:
Screw & water proof type sensor.

Applications:
Coffee machines and solar systems etc.

Temperature Range:
-20°C ~ 120°C

Thermal time constant:
approx. 5sec. (in liquid)

类型: JXW-024

特点:
螺纹式防水型传感器。

用途:
咖啡机以及太阳能系统等。

使用温度范围:
-20°C ~ 120°C

热时间常数:
约5秒(液体中)



Type: JXW-025

Features:
Applied PSB-S3 type NTC. Fast response. Encapsulated with stainless steel housing. Good performance in water proof.

Applications:
Gas water heater, heat pumps, coffee machines, toilet seat heating, floor heating and cogeneration systems etc.

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Less than 2sec. (in water)

类型: JXW-025

特点:
使用PSB-S3型元件的高响应的温度传感器,不锈钢外壳防水封装。

用途:
燃气热水器,热泵,咖啡机,温水便座,地暖和热电联产系统等。

使用温度范围:
-40°C ~ 120°C

热时间常数:
小于2秒(水中)

Industrial Experience

行业经验

Wall-hung boilers and water heater series (water treatment equipment)

壁挂炉热水器系列（水处理设备）



Type: JXW-020

Features:
Applied PSB-3 type NTC. Fast response. Encapsulated with stainless steel housing. Good performance in water proof.

Applications:
Gas water heater, heat pumps, coffee machines, toilet seat heating, floor heating and cogeneration systems etc.

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Less than 2sec. (in water)

类型: JXW-020

特点:
使用PSB-3型元件的高响应的温度传感器, 不锈钢外壳防水封装。

用途:
燃气热水器、热泵、咖啡机、温水便座、地暖和热电联产系统等。

使用温度范围:
-40°C ~ 120°C

热时间常数:
小于2秒 (在水中)



Type: JXW-030

Features:
Screw & water proof type sensor.

Applications:
Hot water supplier (Water heater, Wall-hung boilers)

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 5sec. (in warm water)

类型: JXW-030

特点:
螺纹式防水型传感器。

用途:
热水供应 (热水器、壁挂炉)。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约5秒 (在温水中)



Type: JXW-031

Features:
Durable temp. sensor applied PSB type NTC. Screw & water proof construction design.

Applications:
Cogeneration system equipment and water storage tanks for solar systems etc.

Temperature Range:
-20°C ~ 120°C

Thermal time constant:
Less than 5sec. (in warm water)

类型: JXW-031

特点:
是使用PSB型电阻的高耐久性水温传感器, 螺旋式防水型结构。

用途:
热电联产设备以及太阳能热水储水设备等。

使用温度范围:
-20°C ~ 120°C

热时间常数:
小于5秒 (在温水中)

Wall-hung boilers and water heater series (water treatment equipment)

壁挂炉热水器系列（水处理设备）



Type: JXW-032

Features:
Clip sensor in injected molding type. Size available for pipe size from Ø12 ~ Ø20mm.

Applications:
Hot water supplier, (Wall-hung boilers, dual-use boiler, etc)

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 3sec. (on hot plate)

类型: JXW-032

特点:
注塑成型结构夹臂式温度传感器。可用于Ø12mm~Ø20mm的水管上。

用途:
热水供应 (壁挂炉、两用锅炉等)。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约3秒 (热平板)



Type: JXW-033

Features:
Clip sensor. Size available for pipe size from Ø12 ~ Ø20mm.

Applications:
Hot water supplier, (Wall-hung boilers, dual-use boiler, etc)

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 3.5~5sec. (on hot plate)

类型: JXW-033

特点:
夹臂式温度传感器。可用于Ø12mm~Ø20mm的水管上。

用途:
热水供应 (壁挂炉、两用锅炉等)。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约3.5~5秒 (热平板)



Type: JXW-034

Features:
Temp. protection given by this temp. limiter. Size available for pipe size from Ø12 ~ Ø20mm.

Applications:
Hot water supplier, (Wall-hung boilers, dual-use boiler, etc)

Temperature Range:
80°C ~ 100°C

Thermal time constant:
Less than 5sec. (on hot plate)

类型: JXW-034

特点:
限温器开关起到保护作用。可用于Ø12mm~Ø20mm的水管上。

用途:
热水供应 (壁挂炉、两用锅炉等)。

使用温度范围:
80°C ~ 100°C

热时间常数:
小于5秒 (热平板)

Industrial Experience

行业经验

Wall-hung boilers and water heater series (water treatment equipment)

壁挂炉热水器系列（水处理设备）



Type: JXW-035

Features:
Clip sensor with connector assembled for easy using. Size available for pipe size from $\varnothing 12$ ~ $\varnothing 20$ mm.

Applications:
Hot water supplier, (Wall-hung boilers, dual-use boiler, etc)

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 3.5~5sec. (on hot plate)

类型: JXW-035

特点:
夹簧式温度传感器, 可安装在 $\varnothing 12$ mm~ $\varnothing 20$ mm的管道, 尾部采用连接器插接, 易于安装。

用途:
热水供应（壁挂炉, 两用锅炉等）。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约3.5~5秒 (热平板)



Type: JXW-036

Features:
Clip sensor with wire assembled. Size available for pipe size from $\varnothing 12$ ~ $\varnothing 20$ mm.

Applications:
Hot water supplier, (Wall-hung boilers, dual-use boiler, etc)

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 5sec. (on hot plate)

类型: JXW-036

特点:
夹簧式温度传感器, 可安装在 $\varnothing 12$ mm~ $\varnothing 20$ mm的管道, 可定制。

用途:
热水供应（壁挂炉, 两用锅炉等）。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约5秒 (热平板)



Type: JXW-037

Features:
Temp. sensor with threaded stainless steel housing encapsulated. Easy assembly.

Applications:
Hot water supplier, (Wall-hung boilers, dual-use boiler, etc)

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 3.5~5sec. (in warm water)

类型: JXW-037

特点:
不锈钢外壳螺纹式的温度传感器, 易安装。

用途:
热水供应（壁挂炉, 两用锅炉等）。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约3.5~5秒 (在温水中)

Intelligent toilet series (water treatment equipment)

智能马桶系列（水处理设备）



Type: JXW-080

Features:
Applied PSB-53 type element and encapsulated by designed stainless steel tube. Extremely fast response. Good humidity resist.

Applications:
IH toilet, water treatment equipment.

Temperature Range:
-20°C ~ 100°C

Thermal time constant:
Approx. 0.3sec. (in warm water)

类型: JXW-080

特点:
极速反应型, 异形不锈钢拉伸管结构的温度传感器。使用PSB-53型热敏电阻, 高响应速度, 防潮性强。

用途:
智能马桶, 水处理设备。

使用温度范围:
-20°C ~ 100°C

热时间常数:
约0.3秒 (在温水里)



Type: JXW-081

Features:
Applied PSB-53 type element and encapsulated by designed stainless steel tube sealed with epoxy. Good in response and humidity resist. Custom design for the mounting bracket is acceptable.

Applications:
IH toilet, water treatment equipment.

Temperature Range:
-40°C ~ 100°C

Thermal time constant:
Less than 1sec. (in warm water)

类型: JXW-081

特点:
PSB-53型热敏电阻和环氧树脂封装的不锈钢保护管结构。反应速度快, 耐湿性强, 安装片可根据要求更改。

用途:
智能马桶, 水处理设备及各种管道等。

使用温度范围:
-40°C ~ 100°C

热时间常数:
小于1秒 (在温水里)



Type: JXW-082

Features:
Applied PSB-53 type element and encapsulated by designed stainless steel tube sealed with epoxy. Good in response and humidity resist. Custom design for the mounting bracket is acceptable.

Applications:
IH toilet, water treatment equipment.

Temperature Range:
-40°C ~ 100°C

Thermal time constant:
Less than 1sec. (in warm water)

类型: JXW-082

特点:
PSB-53型热敏电阻和环氧树脂封装的不锈钢保护管结构。反应速度快, 耐湿性强, 安装片可根据要求更改。

用途:
智能马桶, 水处理设备及各种管道等。

使用温度范围:
-40°C ~ 100°C

热时间常数:
小于1秒 (在温水里)

Industrial Experience

行业经验

Frozen, refrigerated series (refrigeration equipment)

冷冻冷藏系列（制冷设备）



Type: JXW-001

Features:
Epoxy sealed type temp.sensor. Good performance in humidity resist.

Applications:
Air conditioning, Refrigerator, automobile air-con system.

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 10sec. (in air)

类型: JXW-001

特点:
环氧树脂封装水滴型温度传感器, 防潮性强。

用途:
空调、冰箱及汽车空调系统。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约10秒 (在空气中)



Type: JXW-002

Features:
Copper tube encapsulated. Good performance in humidity resist.

Applications:
Air conditioning, Refrigerator.

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 20sec. (in air)

类型: JXW-002

特点:
紫铜管类型的温度传感器, 防潮性强。

用途:
空调、冰箱。

使用温度范围:
-40°C ~ 120°C

热时间常数:
约20秒 (在空气中)



Type: JXW-003

Features:
Encapsulated by cooper tube with mounting hole for easy assembly. Good humidity resist.

Applications:
Air conditioning, Refrigerator.

Temperature Range:
-30°C ~ 120°C

Thermal time constant:
Approx. 10sec. (on hot plate)

类型: JXW-003

特点:
带安装孔的紫铜管类型的温度传感器, 防潮性强, 易安装。

用途:
空调、冰箱。

使用温度范围:
-30°C ~ 120°C

热时间常数:
约10秒 (热平板)



Type: JXW-004

Features:
TPE overmolding type sensor. Good in anti-seepage.

Applications:
Refrigerating controlling equipment. Thermostat.

Temperature Range:
-50°C ~ 120°C

Thermal time constant:
Approx. 15sec. (in humidity)

类型: JXW-004

特点:
防渗透型TPE材料 (不含卤素) 注塑型的温度传感器。

用途:
冷冻冷藏控制设备, 恒温器等。

使用温度范围:
-50°C ~ 120°C

热时间常数:
约15秒 (在空气中)



Type: JXW-005

Features:
Temp. sensor encapsulated by stainless steel tube and plastic overmolding. Good in anti-seepage.

Applications:
Refrigerating controlling equipment. Thermostat.

Temperature Range:
-50°C ~ 120°C

Thermal time constant:
Approx. 20sec. (in humidity)

类型: JXW-005

特点:
防渗透, 不锈钢管注塑型的温度传感器。

用途:
冷冻冷藏控制设备, 恒温器等。

使用温度范围:
-50°C ~ 120°C

热时间常数:
约20秒 (在空气中)



Type: JXW-006

Features:
Temp. sensor encapsulated by stainless steel tube and plastic overmolding. Good in anti-seepage.

Applications:
Refrigerating controlling equipment. Thermostat.

Temperature Range:
-50°C ~ 120°C

Thermal time constant:
Approx. 20sec. (in humidity)

类型: JXW-006

特点:
不锈钢管防渗透型的温度传感器。

用途:
冷冻冷藏控制设备, 恒温器等。

使用温度范围:
-50°C ~ 120°C

热时间常数:
约20秒 (在空气中)

Industrial Experience

行业经验

Frozen, refrigerated series (refrigeration equipment)
冷冻冷藏系列 (制冷设备)



Type: JXW-010

Features:
Encapsulated with ABS tube. Special apply for low temperature environment.

Applications:
Air conditioning, Refrigerator Chamber air temperature etc.

Temperature Range:
-40°C ~ 100°C

Thermal time constant:
Approx. 15sec. (in humidity)

类型: JXW-010

特点:
是使用ABS树脂保护管, 适用于低温环境测量的温度传感器。

用途:
测量冰箱、冰柜库内温度等。

使用温度范围:
-40°C ~ 100°C

热时间常数:
小于15秒 (在湿气中)



Type: JXW-011

Features:
Temperature sensor encapsulated with copper tube. Screw type. Good humidity resistance.

Applications:
Air conditioning, Refrigerator.

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 10sec. (in liquid)

类型: JXW-011

特点:
螺旋式黄铜管结构的传感器。防潮性强。

用途:
空调、冰箱。

使用温度范围:
-40°C ~ 120°C

热时间常数:
小于10秒 (液体内)



Type: JXW-012

Features:
Temperature sensor encapsulated with lengthened copper tube. Screw type. Good humidity resistance.

Applications:
Air conditioning, Refrigerator.

Temperature Range:
-40°C ~ 120°C

Thermal time constant:
Approx. 15sec. (in liquid)

类型: JXW-012

特点:
螺旋式加长黄铜管结构的传感器。防潮性强。

用途:
空调、冰箱。

使用温度范围:
-40°C ~ 120°C

热时间常数:
小于15秒 (液体内)

Automobiles series
汽车系列



Type: JXW-007

Features:
Terminal type temperature sensor.

Applications:
Battery temp, measurement of EV cars.

Temperature Range:
-40°C ~ 100°C

Thermal time constant:
Approx. 10sec. (on hot plate)

类型: JXW-007

特点:
端子型温度传感器。

用途:
新能源汽车动力电池温度检测。

使用温度范围:
-40°C ~ 100°C

热时间常数:
约10秒 (热平板)



Type: JXW-008

Features:
PSB-S3 small element applied. Good for fixing in narrow space.

Applications:
Battery temp, measurement of EV cars.

Temperature Range:
-20°C ~ 200°C

Thermal time constant:
Approx. 10sec. (on hot plate)

类型: JXW-008

特点:
使用小型的PSB-S3型热敏电阻。可以安装在空间狭小位置。

用途:
新能源汽车动力电池温度检测。

使用温度范围:
-20°C ~ 200°C

热时间常数:
约10秒 (热平板)



Type: JXW-009

Features:
Terminal type temperature sensor.

Applications:
Battery temp, measurement of EV cars.

Temperature Range:
-20°C ~ 120°C

Thermal time constant:
Approx. 10sec. (on hot plate)

类型: JXW-009

特点:
端子型温度传感器。

用途:
新能源汽车动力电池温度检测。

使用温度范围:
-20°C ~ 120°C

热时间常数:
约10秒 (热平板)

Industrial Experience

行业经验

Automobiles series

汽车系列



Type: JXW-090

Features:
Temperature sensor molded with nylon fiber. Good in anti-corrosion.

Applications:
Oil pump, Automobile fuel temperature.

Temperature Range:
-40°C ~ 100°C

Thermal time constant:
Approx. 8sec. (in liquid)

类型: JXW-090

特点:
尼龙加纤材料注塑成型的温度传感器。具有耐腐蚀性。

用途:
油泵、汽车燃料温度。

使用温度范围:
-40°C ~ 100°C

热时间常数:
约8秒 (液体内)



Type: JXW-091

Features:
Temperature sensor encapsulated with brass tube. Screw type. Quick response. Very durable. Suitable for mid-temperature range.

Applications:
Water, Oil and engine temperature for motorcycles or multi-purpose engines etc.

Temperature Range:
-40°C ~ 150°C

Thermal time constant:
Approx. 3sec. (in liquid)

类型: JXW-091

特点:
螺旋式黄铜结构的温度传感器。响应速度快。超强耐久性。适用于中温区。

用途:
检测摩托车和常用引擎的水温、油温以及引擎温度等。

使用温度范围:
-40°C ~ 150°C

热时间常数:
约3秒 (液体内)



Type: JXW-092

Features:
High speed response. Heat resistance.

Applications:
Automobile heater, water, oil and engine temperature or multi-purpose engines etc.

Temperature Range:
-40°C ~ 200°C (300°C in short time)

Thermal time constant:
Approx. 3sec. (in liquid)

类型: JXW-092

特点:
高响应时间, 高耐温型传感器。

用途:
检测汽车加热器和常用引擎的水温、油温以及引擎温度等。

使用温度范围:
-40°C ~ 200°C (短时间300°C)

热时间常数:
约3秒 (液体内)



Type: JXW-093

Features:
High speed response. Heat resistance.

Applications:
To measure surface temperature of automobile heater combustion chamber shell.

Temperature Range:
-40°C ~ 400°C (on sensor surface)

Thermal time constant:
Approx. 4sec. (hot plate surface)

类型: JXW-093

特点:
高响应时间, 高耐温型传感器组件。

用途:
检测汽车加热器燃烧室外壳表面温度。

使用温度范围:
-40°C ~ 400°C (传感器表面)

热时间常数:
约4秒 (热平板表面)



Type: JXW-094

Features:
Assembling good for air ventilation in the heater.

Applications:
Air temperature of automobile heater combustion chamber shell.

Temperature Range:
-40°C ~ 300°C (probe head only)

Thermal time constant:
Approx. 10sec. (in air)

类型: JXW-094

特点:
便于加热器空气流通安装。

用途:
检测汽车加热器燃烧室外壳空气温度。

使用温度范围:
-40°C ~ 300°C (限于传感器头部分)

热时间常数:
约10秒 (空气中)



Type: JXW-095

Features:
High stability. Using PSB type element.

Applications:
Automobile heater.

Temperature Range:
-40°C ~ 120°C (150°C in short time)

Thermal time constant:
Approx. 8sec. (in liquid)

类型: JXW-095

特点:
高稳定性。采用PSB系列电阻。

用途:
汽车加热器。

使用温度范围:
-40°C ~ 120°C (短时间150°C)

热时间常数:
约8秒 (液体内)

Industrial Experience

行业经验

Automobiles series 汽车系列



Type: JXW-013

Features:
Temperature sensor molded with nylon fiber. Good in anti-corrosion.

Applications:
Power battery of EV cars.

Temperature Range:
-40°C ~ 100°C

Thermal time constant:
Approx. 8sec. (on hot plate)

类型: JXW-013

特点:
尼龙加纤胶料注塑成型的温度传感器。具有耐腐蚀性。

用途:
新电源电动汽车动力电池。

使用温度范围:
-40°C ~ 100°C

热时间常数:
约8秒 (热平板)



Type: JXW-014

Features:
Pt resistance applied. Good performance in water proof, oil-resis, anti-corrosion and high temp-resis.

Applications:
Temp. protection for engin of EV cars, highvolt elect-plug, charging pile.

Temperature Range:
-50°C ~ 200°C

Thermal time constant:
Approx. 10sec. (in liquid)

类型: JXW-014

特点:
使用PT铂金电阻, 高防水, 防油, 防腐蚀, 高耐温型温度传感器。

用途:
电动汽车电机, 高压电充电插头和充电桩的温度保护。

使用温度范围:
-50°C ~ 200°C

热时间常数:
约10秒 (液体内)



Type: JXW-015

Features:
PSB type NTC applied. Good performance in water proof, oil-resis, anti-corrosion and temp-resis.

Applications:
Temp. protection for engin of EV cars, highvolt elect-plug, charging pile.

Temperature Range:
-50°C ~ 200°C

Thermal time constant:
Approx. 10sec. (in liquid)

类型: JXW-015

特点:
使用PSB系列热敏电阻, 高防水, 防油, 防腐蚀, 高耐温型温度传感器。

用途:
电动汽车电机, 高压电充电插头和充电桩的温度保护。

使用温度范围:
-50°C ~ 200°C

热时间常数:
约10秒 (液体内)



Type: JXW-016

Features:
Temperature sensor molded with nylon fiber. Corrosion proof.

Applications:
Temp measurement of automobile's air-con heater.

Temperature Range:
-40°C ~ 100°C

Thermal time constant:
Approx. 10sec. (in humidity)

类型: JXW-016

特点:
尼龙加纤胶料注塑成型的温度传感器。具有耐腐蚀性。

用途:
检测汽车空调发热器温度。

使用温度范围:
-40°C ~ 100°C

热时间常数:
约10秒 (在湿气中)



Type: JXW-017

Features:
High stability. Using PSB type element.

Applications:
Engine's water temp. measurement.

Temperature Range:
-40°C ~ 150°C (200°C in short time)

Thermal time constant:
Approx. 15sec. (in liquid)

类型: JXW-017

特点:
高稳定性。采用PSB系列电阻。

用途:
发动机水温检测。

使用温度范围:
-40°C ~ 150°C (短时间200°C)

热时间常数:
约15秒 (液体内)



Type: JXW-018

Features:
Temperature sensor encapsulated with brass tube. Screw type. Quick response. Very durable. Suitable for mid-temperature range.

Applications:
Temp measurement of automobile's air-con heater.

Temperature Range:
-40°C ~ 150°C

Thermal time constant:
Approx. 10sec. (in humidity)

类型: JXW-018

特点:
螺纹式黄铜结构的温度传感器。响应速度快。超强耐久性。适用于中温区

用途:
检测汽车空调发热器温度。

使用温度范围:
-40°C ~ 150°C

热时间常数:
约10秒 (在湿气中)

Industrial Experience

行业经验

Iron series

电烫斗系列



Type: JXW-100

Features:
Temperature sensor encapsulated with aluminum plate, suitable for working under high temperature environment. High sensitivity.

Applications:
Iron, hair straighten etc.

Temperature Range:
-40°C ~ 250°C

Thermal time constant:
Approx. 5sec. (on hot plate)

类型: JXW-100

特点:
铝安装片的温度传感器。灵敏度高。可以在高温环境下工作。

用途:
电烫斗, 直发器等。

使用温度范围:
-40°C ~ 250°C

热时间常数:
约5秒 (热平板)



Type: JXW-101

Features:
PSB-N type element is simply connected to teflon high temperature wire and protected by Glass fiber tube with brass fixed plate.

Applications:
Iron, hair straighten etc.

Temperature Range:
-40°C ~ 250°C

Thermal time constant:
Approx. 20sec. (on hot plate)

类型: JXW-101

特点:
保护套管与导线相连的PSB-N型元件的简单结构, 带黄铜固定片。

用途:
电烫斗, 直发器等。

使用温度范围:
-40°C ~ 250°C

热时间常数:
约20秒 (热平板)



Type: JXW-102

Features:
PSB-N type element is simply connected to teflon high temperature wire and protected by polyimide tube.

Applications:
Iron, hair straighten etc.

Temperature Range:
-20°C ~ 250°C

Thermal time constant:
Approx. 10sec. (on hot plate)

类型: JXW-102

特点:
PSB-N型元件与铁氟龙高温导线相连接, 采用聚酰亚胺胶带保护元件。

用途:
电烫斗, 直发器等。

使用温度范围:
-20°C ~ 250°C

热时间常数:
约10秒 (热平板)



Type: JXW-103

Features:
Temperature sensor epoxy encapsulated with aluminum component.

Applications:
Food cooking machine.

Temperature Range:
-30°C ~ 125°C

Thermal time constant:
Approx. 5sec. (on hot plate)

类型: JXW-103

特点:
异形铝外壳结构环氧树脂封装温度传感器。

用途:
食物料理机。

使用温度范围:
-30°C ~ 125°C (传感器表面)

热时间常数:
约5秒 (热平板)



Type: JXW-104

Features:
Temperature sensor epoxy encapsulated with stainless steel housing.

Applications:
Food cooking machine.

Temperature Range:
-30°C ~ 125°C

Thermal time constant:
Approx. 3sec. (in liquid)

类型: JXW-104

特点:
异形不锈钢结构环氧树脂封装温度传感器。

用途:
食物料理机。

使用温度范围:
-30°C ~ 125°C

热时间常数:
约3秒 (液体内)



Type: JXW-105

Features:
Temperature sensor composed by screw type aluminum tube and screw type plastic clip. Good sealing. Water proof and good sensitivity.

Applications:
Food cooking machine.

Temperature Range:
-30°C ~ 150°C

Thermal time constant:
Approx. 3sec. (on the surface)

类型: JXW-105

特点:
螺纹式铝管与螺纹式塑料扣相结合的温度传感器。密封性好, 防水。反应灵敏。

用途:
食物料理机。

使用温度范围:
-30°C ~ 150°C

热时间常数:
约3秒 (发热体表面)

Industrial Experience

行业经验

Electric hot plate, Induction cooker series

电烤盘、电磁炉系列



Type: JXW-070

Features:
PSB-N type element is simply connected with teflon high temperature wire and have glass fiber protection tube.

Applications:
Electric hot plate, Induction cooker.

Temperature Range:
-40°C ~ 200°C

Thermal time constant:
Less than 60sec. (in air)

类型: JXW-070

特点:
保护套管和铁氟龙高温导线连接的 PSB-N型元件的简单结构。

用途:
电烤盘、电磁炉等。

使用温度范围:
-40°C ~ 200°C

热时间常数:
小于60秒 (大气中)



Type: JXW-071

Features:
Temperature sensor encapsulated with ceramic tube. Using PSB type element. High sensitivity. Good heat resistance.

Applications:
IH cooker.

Temperature Range:
-40°C ~ 250°C

Thermal time constant:
Approx. 5sec. (on hot plate)

类型: JXW-071

特点:
内部为陶瓷结构的温度传感器。采用 PSB型热敏电阻。灵敏度高。耐高温。

用途:
IH料理器等用。

使用温度范围:
-40°C ~ 250°C

热时间常数:
约5秒 (热平板)



Type: JXW-072

Features:
Encapsulated by ceramic cap. Good performance in insulation and can be assembled easily. Aluminum cap type with fast response is also available.

Applications:
Induction cooker, Coffee maker.

Temperature Range:
-50°C ~ 300°C

Thermal time constant:
Approx. 5 sec. (on hot plate)

类型: JXW-072

特点:
保护管采用陶瓷。绝缘性高且易于安装。也有铝制保护管的高响应类型。

用途:
电磁炉、咖啡机等用。

使用温度范围:
-50°C ~ 300°C

热时间常数:
约5秒 (热平板)

SI Sensor 燃气灶应用系列



Type: SI Sensor (JXW-106)

Features:
Good & stable performance in dry-fire protection and high temp. resistance with fast response.

Applications:
Gas stove.

Temperature Range:
-50°C ~ 300°C (350°C in short time)

Thermal time constant:
About 4 sec. (on the surface)

类型: SI Sensor (JXW-106)

特点:
防干烧, 耐高温, 反应灵敏, 控温一致性强。

用途:
燃气灶。

使用温度范围:
-50°C ~ 300°C (短时间可耐350°C)

热时间常数:
约4秒 (在发热体表面)



Type: SI Sensor (JXW-107)

Features:
Good & stable performance in dry-fire protection and high temp. resistance with fast response.

Applications:
Gas stove.

Temperature Range:
-50°C ~ 300°C (350°C in short time)

Thermal time constant:
About 4 sec. (on the surface)

类型: SI Sensor (JXW-107)

特点:
防干烧, 耐高温, 反应灵敏, 控温一致性强。

用途:
燃气灶。

使用温度范围:
-50°C ~ 300°C (短时间可耐350°C)

热时间常数:
约4秒 (在发热体表面)