RTD100 Wire Type Platinum Resistor

Certification

CE

Application Scenarios

Semiconductor photovoltaics | Machinery manufacturing | HVAC | Food Hygiene | Medical equipment | New energy

Product Features

Range	Accuracy	Various materials of wires	Lead wire method
-196…600℃	1/10B level AA level (1/3B) A-level B-level	Tetrafluoro silver plated shielding wire PTFE wrapped wire High temperature shielding wire, etc	2-wire, 3-wire, 4-wire

Product Description

Platinum resistance, as the main method of thermal resistance, is one of the components that uses the resistance value of a conductor or semiconductor to measure temperature as it changes with temperature.

PT100 refers to a thermal resistance with a nominal resistance R0 at 0 ℃ and a resistance value of 100 Ω, while PT1000 refers to the resistance value of the nominal resistance R0 at 0 ℃

A thermal resistance of 1000 Ω.

Platinum resistors are widely used in mechanical manufacturing, HVAC, and other fields due to their high accuracy, good temperature measurement stability, no need for reference points, and compatibility with various structures in various fields such as temperature control equipment, food hygiene, medical devices, and new energy.

Technical Parameter

The tolerance levels and tolerances for thermal resistance are shown in the table below:

Tolerance	Temperature range			Allowable difference
1/10B	(0~100) ℃			± (0.03℃+0.0005|t|)
AA (1/3B)	(-70~500) ℃	(-50~400) ℃		± (0.1℃+0.0017|t|)
A	(-70~500) ℃	(-50~400) ℃		± (0.15℃+0.002|t|)
B	(-196~150) ℃	(-70~500) ℃	(-50~400) ℃	± (0.3℃+0.005|t|)

Note: | t | in the table represents the absolute value of temperature in degrees Celsius; The allowable deviation above grade A is not applicable to platinum resistors using a two wire system.

The resistance temperature relationship of platinum thermistors (Industrial standard thermoelectric resistance IEC751):

The resistance temperature relationship of platinum thermistors applicable to this standard is as follows:
(1) For the temperature range of -200~0 ℃: Rt=R0 [1+At+Bt2+C (t-100 ℃) t3]
(2) For the temperature range of 0~850 ℃: Rt=R0 (1+At+Bt2)
(3) For commonly used industrial platinum thermistors, the constant values in the above two equations are:
A=3.90802 × 10-3 ℃ -1;
B=-5.802 × 10-7 ℃ -2;
C=-4.27350 × 10-12 ℃ -4
The temperature coefficient of the platinum thermistor that satisfies the above relationship is:
α= 0.003850 Ω· Ω -1 ·℃ -1（ α Defined as: α= (R100-R0)/100 × R0 ΩΩ -1 ·℃ -1)

In the above relationship, R100 represents the resistance value at 100 ℃ and R0 represents the resistance value at 0 ℃.

The difference between PT100 and PT1000

(1) Sensitivity varies. The reaction sensitivity of PT1000 is higher than that of PT100. With a temperature change of one degree, the resistance value increases or decreases by about 3.8 ohms.
The temperature changes by one degree, and the resistance value increases or decreases by about 0.38 ohms.

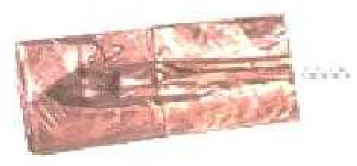
(2) The measurement temperature range is different. PT1000 is suitable for measuring small range temperature measurement, while PT100 is suitable for measuring slightly larger range temperature measurement. Its industrial principle is:
When PT1000 is at 0 degrees Celsius, its resistance value is 1000 ohms, and its resistance will increase uniformly with the temperature. PT1000 is platinum thermal resistance, its resistance value is proportional to the change in temperature. The relationship between the resistance value of PT1000 and temperature change is: when the temperature of PT1000 is 0 ℃, its resistance value is 1000 ohms, its resistance value is about 1385 ohms at 100 ℃.

(3) The temperature range is different, PT100 is -200 to 850 degrees, and PT1000 is -50 to 300 degrees.

(4) PT1000 has a 10 times larger scale than PT100, resulting in higher measurement accuracy.

Temperature measurement form

Common



Chip

Lead forms: two wire, three wire, and four wire systems

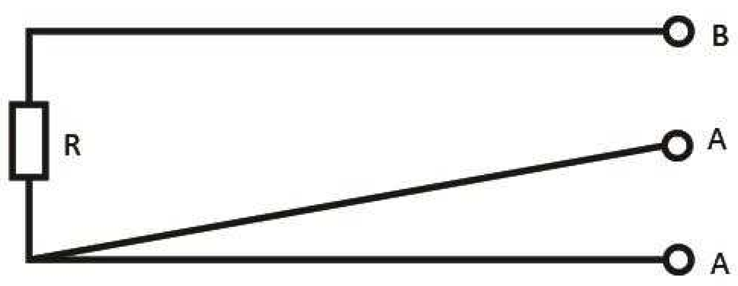
Two wire system: a lead form in which one lead is connected to each end of the temperature sensing element. This form of structure is simple and cost-effective, but it requires the addition of lead resistance. Due to the added error, it is not suitable for Class A and above, and the lead length should not be too long.

Three wire system: Connect two leads to one end of the temperature sensing element and one lead to the other end, forming a three wire system. This form can eliminate internal lead resistance. Due to its impact and higher accuracy, the use of a three wire system is the most widely used.

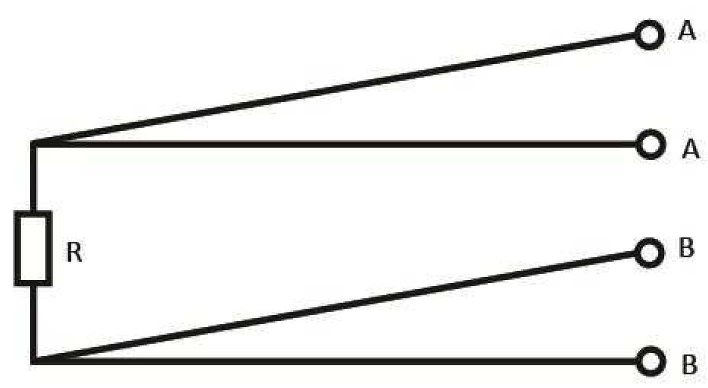
Four wire system: a lead form in which two leads are connected to each end of the temperature sensing element. When measuring with high precision, a four wire system should be used, which can not only eliminate the internal lead electricity

The influence of resistance can be eliminated when the resistance values of the connecting wires are the same.

Two wire system



Three wire system

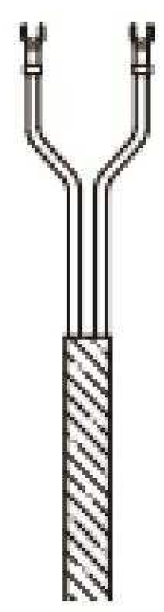


Four wire system

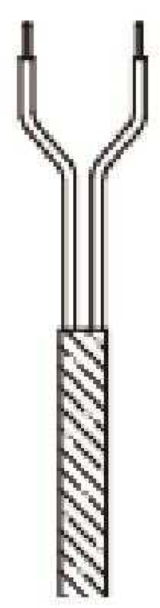
Temperature resistance table for each material

Material	Temp Range	Waterproof
PFA Tetrafluoro silver plated shielding wire	(-50~200)	Yes
PTFE Wrapping wire	(-200~260)	Yes
Glass fiber high-temperature shielding wire	UP TO480	No

Terminal structure



U-shaped terminal



Bare wire type

Type
- PT100
- PT1000
- Y– Other

Tolerance level
- B10– 1/10B level
- AA– AA level（1/3B）
- A– A level
- B– B level

Temp measurement form
- A– Common
- B– Chip
- Y– Customized

Lead length

______mm

Lead form
- 2– 2–wire
- 3– 3–wire
- 4– 4–wire

Lead material
- F– Tetrafluoro silver plated shielding wire
- P– PTFE Wrapping wire
- H– High temperature shielded wire
- Y– Other

Terminal structure
- B–Bare wire type
- U– U–shaped terminal
- Y– Customized

Special requirements
- XX–Customized

10 20 30 40 50 60 70 80 90

RTD100 Wire type platinum resistor

Selection rules:

Requirement: PT100, Class A, conventional, 2-meter lead, three wire system, temperature measurement 0-200 ℃

Model selection: RTD100-PT100A-A2000-3FB