



Tianjin ZINACA Intelligent Equipment Co., Ltd

ZNC - Industrial Assembly RTD

Product Overview

Industrial assembled RTDs are typically used in conjunction with display instruments and computers to directly measure the temperature of liquids, steam, gaseous media, and solid surfaces within the range of -200°C to $+500^{\circ}\text{C}$ during various industrial processes.

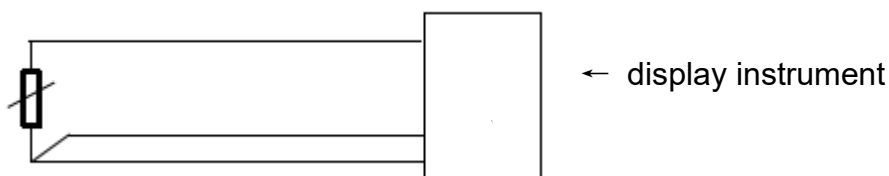
All RTDs produced by our company comply with IEC international standards and national standards. They are available in two main categories: platinum RTDs and copper RTDs.

Platinum RTDs include types with mica framework, ceramic framework, thick-film, and thin-film elements. Copper RTDs use a framework made of polycarbonate.

Platinum RTDs can be customized with index numbers Pt100, Pt1000, and Pt500, while copper RTDs are available with Cu50 and Cu100 index numbers.

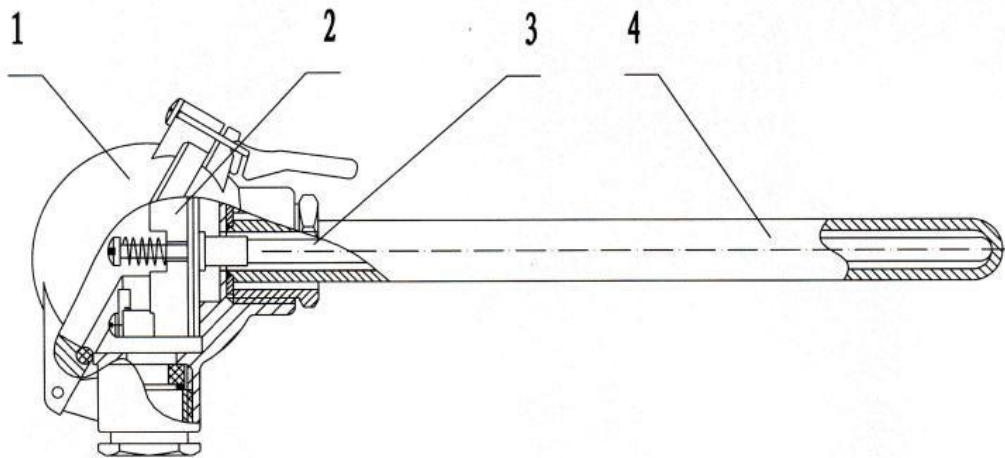
Working Principle

RTDs utilize the characteristic that the resistance value of a material (usually a pure metal) changes with temperature in a predictable functional relationship. When measuring temperature, the change in resistance is converted into an electrical signal and transmitted to the display instrument. Through the conversion circuit, the instrument displays the corresponding temperature value, thereby achieving accurate temperature measurement.



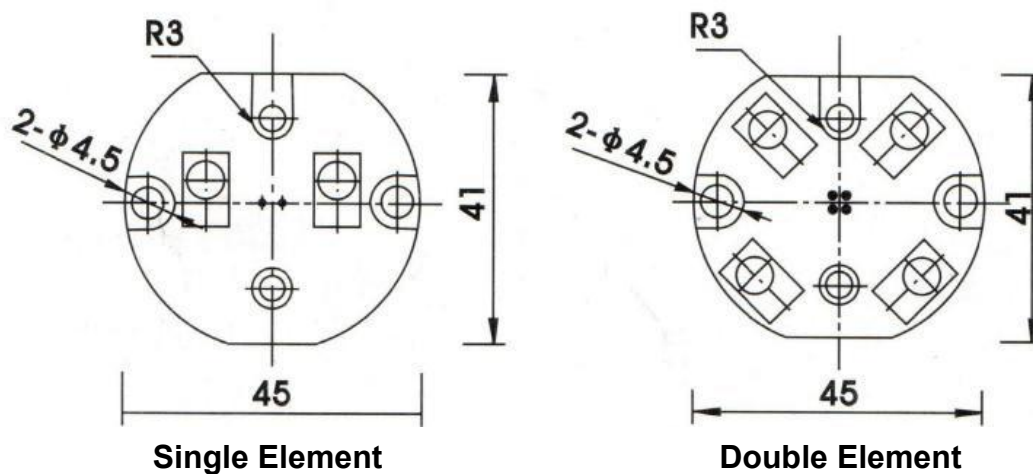
Basic Structure

Although the appearance of various RTDs differs significantly, their basic structure is generally the same. They usually consist of several main components: the sensing element, insulation tube, protective tube, terminal block, and terminal box.



① Junction Box ② Terminal Board ③ Core ④ Protective Tube

Wiring Type



RTD Tolerance

The tolerance class corresponds to the effective temperature range. Within the specified range, the maximum deviation between the temperature t calculated from the resistance value of the RTD (according to the reference table) and the true temperature shall not exceed the tolerance values given in **Table 1**.

Table 1 applies to any nominal resistance value of RTDs. For a specific RTD, if its effective temperature range is narrower than that specified in the table, this should be stated explicitly.

Table 1 – Tolerance Classes and Tolerance Values for RTDs

RTD Type	Tolerance Class	Effective Temperature Range (°C)		Tolerance Value
		Wire-wound element	Diaphragm element	
Industrial Platinum RTD (PRT)	AA	-50 ~ +250	0~+150	$\pm (0.100^{\circ}\text{C} + 0.0017 t)$ $\pm (0.150^{\circ}\text{C} + 0.002 t)$ $\pm (0.30^{\circ}\text{C} + 0.005 t)$ $\pm (0.6^{\circ}\text{C} + 0.010 t)$
	A	-100 ~ +450	-30~+300	
	B	-196 ~ +600	-50~+500	
	C	-196 ~ +600	-50~+600	
Industrial Copper RTD (CRT)	—	-50 ~ +150		$\pm (0.30^{\circ}\text{C} + 0.006 t)$

Notes:

1. The tolerance range from 600°C to 850°C shall be determined by the manufacturer in the technical specification.
2. |t| denotes the absolute value of temperature in °C.
3. If special tolerance classes different from Table 1 are required, the manufacturer must state them explicitly, including the corresponding effective temperature range.
4. Special tolerance grades for platinum RTDs are recommended as fractions or multiples of Class B (e.g., 1/10B, 1/5B, 3B).

Lead Configuration

All platinum resistance thermometers with a tolerance above Class B should use a **three-wire or four-wire lead configuration**.

Two wire	Three wire	Four wire
	