

PT100 / PT1000 thin film resistance temperature sensor M222 platinum thermal resistance

Performance and parameters

1. Temperature coefficient TCR of platinum resistance element

$$TCR = \frac{R_{100} - R_0}{R_0 \times 100}$$

in

Resistance value of R100 at 100°C

Resistance of R0 at 0°C

We provide platinum resistance elements with TCR=0.003851 that meet the IEC751 standard. In addition, we can also provide customers with platinum resistance elements with other temperature coefficients, such as TCR=0.003750.

2. Temperature-resistance characteristics of platinum resistance elements

$$R_T = R_0 [1 + aT + bT^2 + cT^3 (T - 100)]$$

R_T resistance value at temperature T

Resistance of R0 at zero

a b c coefficient

Coefficient when TCR=0.003851

temperature	a	b	c
$T < 0$	3.90802×10^{-3}	5.80195×10^{-7}	4.27351×10^{-12}
$T \geq 0$	3.90802×10^{-3}	5.80195×10^{-7}	0

3. Error of platinum resistance element

grade	Resistance error at zero degree (%)	Temperature error (°C)	Temperature coefficient TCR error (ohm/ohm/°C)
1/3DIN	±0.04	±(0.10+0.0017 T)	0.003851±0.000004
A	±0.06	±(0.15+0.002 T)	0.003851±0.000005
B	±0.12	±(0.30+0.005 T)	0.003851±0.000012
2B	±0.25	±(0.60+0.01 T)	0.003851±0.000024

4. Stability of platinum resistance element

Platinum resistance elements have good long-term stability. For example, CRZ-1632 lasts for 300 hours at 400°C, and the large temperature drift at 0°C is only 0.02°C.

5. Thermal response time of platinum resistance element

part No.	Thermal response time $T_{0.9}$ (seconds)		
	air		water
	V=1.0m/s	V=3.0m/s	
CRZ-1632	10	7	0.3
CRZ-2005	16	11	0.3

6. Self-heating and test current of platinum resistance element

The test current of the platinum resistance element should not exceed the allowable value. For example, the CRZ-1632 element is installed in a $\phi 8\text{mm}$ protective tube without any filling and immersed in stirring water at 0°C . When the test current is 1mA, the self-heating temperature rises to 0.05°C ; When the test current is 5mA, the self-heating temperature rises to 2.2°C .

7. Self-heating coefficient of platinum resistance element

part No.	Self-heating coefficient ($\text{mW}/^{\circ}\text{C}$)		
	air		static water
	V=1.0m/s	static	
CRZ-1632-100	2	1	12
CRZ-2005-100	4	2	20
CRZ-2005-1000	4	2	20

8. Temperature-resistance table

Nominal resistance (Ω)	100	500	1000
TCR ($10^{-6}/K$)	3851		
temperature ($^{\circ}C$)	resistance (Ω)		
-50	80.31	401.53	803.07
0	100	500	1000
50	119.4	596.98	1193.95
100	138.51	692.5	1385
150	157.33	786.57	1573.15
200	175.86	879.2	1758.4
250	194.1	970.37	1940.74
300	212.05	1060.09	2120.19
350	229.72	1148.37	2296.73
400	247.09	1235.19	2470.38
450	264.18	1320.56	2641.12
500	280.98	1404.48	2808.96
550	297.49	1486.95	2973.9
600	313.71	1567.97	3135.94
650	329.64	1647.54	3295.08