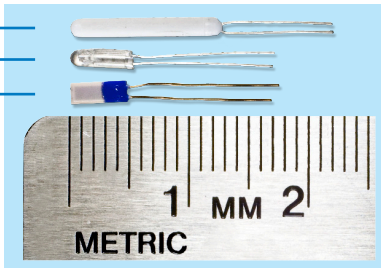


General Description

Platinum RTDs are the 'sensor of choice' over a very wide temperature range. They are used by the National Institute of Standards and Technology (NIST) as a primary sensor from 14K (the triple point of hydrogen) to 1235K (the triple point of Silver).

Devices have good sensitivity and interchangeability down to about 30K. Below that, they require individual calibration.

CP-100
GP-100
XP-100
XP-1K

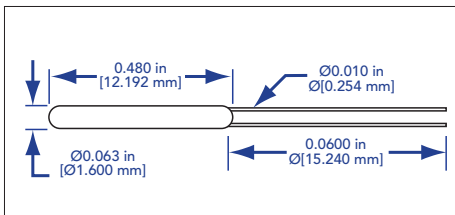


Features

- **Interchangeability:** Conforms to DIN43760 and IEC751 Class B standards. 100Ω Resistance at 0°C.
- **Wide temperature range:** 14K to 873K.
- **Extremely stable:** Minimum long-term drift.
- **High Repeatability:** ±5mK at 77K.
- Low magnetic field dependence.
- Low-susceptibility to ionizing radiation.
- Cryogenically conditioned for operation between 14K and 500K. Operation at higher temperatures may cause a repeatable calibration shift.

Packaging

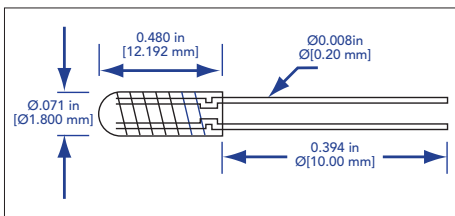
CP-100



The **CP-100** is a wire-wound ceramic sensor that is fabricated by winding Platinum wire into a coil. The coil is then inserted into the ceramic body and packed with Alumina powder to prevent shorting and provide vibration resistance. The result is a strain-free mounting that minimizes hysteresis over the widest possible temperature range. There is no internal atmosphere.

Exposure to temperatures above +250°C will result in increasing the 0°C resistance value by about 0.01Ω, or 0.025K. Cryogenic conditioning to 77K will reverse this shift.

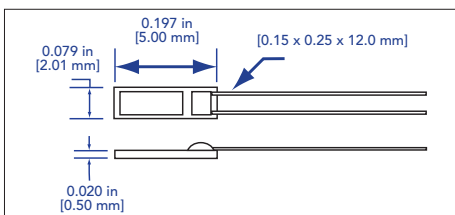
GP-100



The **GP-100** is fabricated as a platinum band wound onto a glass tube and protected from the environment by a layer of glaze. The expansion-coefficient of the glass is adjusted to the platinum and is further stabilized through an aging process. The result is an excellent thermal coupling between the package and sensor element.

Compared to the CP-100, features are low self-heating and rapid thermal response. Temperature hysteresis similar to the CP-100.

XP-100 and XP-1K



The **XP-100** and **XP-1K** are thin film sensors. They are manufactured by depositing a thin layer of platinum on a ceramic substrate. The metal is deposited in a specific pattern and trimmed to the final resistance. The elements are then coated with glass for moisture resistance.

Primary features are ease of installation and rapid thermal response.

Cryogenic conditioning results in a shift of the DIN standard curve downward by about 0.3Ω, or 0.75K. If the sensor is exposed to temperatures above +150°C, it will require re-conditioning to restore low-temperature accuracy.

Ordering Information

	Ceramic Wire-wound Platinum RTD	Glass Platinum RTD	Thin-film RTD	Thin-film RTD
Uncalibrated	CP-100	GP-100	XP-100	XP-1K

Specifications

Useful Temperature Range:

CP-100: 14K to 873K, 100Ω @ 0°C
 GP-100: 14K to 673K, 100Ω @ 0°C
 XP-100: 30K to 673K, 100Ω @ 0°C
 XP-1K: 30K to 673K, 1,000Ω @ 0°C

Standard Curve: DIN43760 and IEC751

Excitation Current:

CP-100, GP-100, XP-100: 1.0mA Typical
 XP-1K: 100μA Typical
 Maximum, all devices: 0.5W

Stability

±0.05% max shift at 0°C following 1,000 hours at 400°C.

Thermal Response Time

CP-100: 1.7S @ 77K, 12.5S @ 273K
 GP-100: 2.5S @ 77K, 20.0S @ 273K
 XP-100, XP-1K: 0.07S @ 273K

Self Heating

CP-100: 7.0 K/mW
 GP-100: 0.36 K/mW
 XP-100: 6.0 K/mW
 XP-1K: 0.6 K/mW

Measured in 273K air moving at 1.0 meters per second.

Use in Radiation: Recommended for use in ionizing radiation environments.

Maximum Storage Temperature

CP-100, GP-100: +250°C
 XP-100, XP-1K: +150°C

Note: If the sensors are exposed to temperatures above those listed above, they will require cryogenic conditioning to restore low-temperature accuracy.

Leads

CP-100: 0.59" (15mm), Diameter: 0.001" (0.25mm)
 Material: Pt 95% Rh 5%, Uninsulated.

Caution - Leads are brittle.

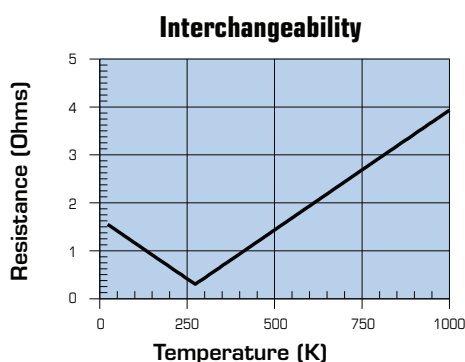
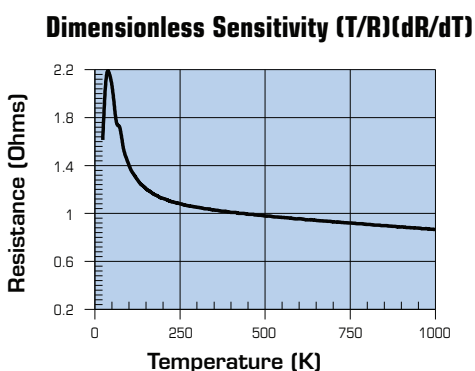
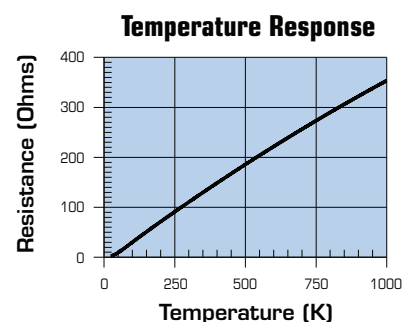
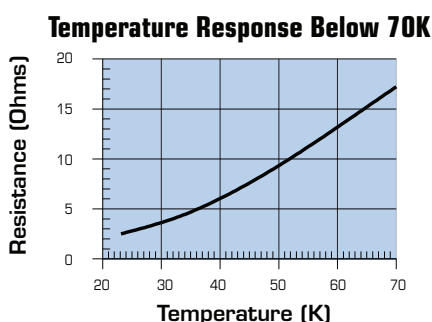
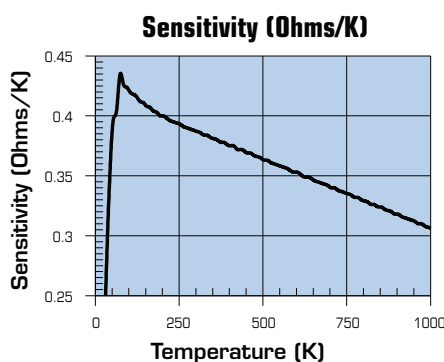
GP-100: 0.394" (10mm), Diameter: 0.008" (0.20mm)
 Material: Platinum coated nickel.

XP-100, XP-1K: 0.59" (15mm), Diameter: 0.001" (0.25mm)
 Material: Palladium coated Gold.

Recommended Connection

Four-wire for accuracy below 100K.

Typical Performance Charts



Typical Temperature Response

T(K)	R(Ω)	S(Ω/K)
20	2.2913	0.085
50	9.3865	0.360
77	20.380	0.423
150	50.788	0.409
300	110.354	0.387
600	221.535	0.372
800	289.789	0.360



Cryogenic Control Systems, Inc.

PO Box 7012, Rancho Santa Fe, CA 92067

Tel: (858) 756-3900

Fax: (858) 759-3515

E-mail: sales@cryocon.com

Web: www.cryocon.com