PRTD10-1K-FG-SS316L Thin Film Platinum RTD

1,000 Ω Pt RTD in a Ø0.118 in SS316L stainless steel housing · fiberglass leads · -75 to 540 °C



PT1000 ALPHA 0.00375 -75 TO 540 °C

FEATURES

- -75 to 540 °C operating temperature
- 1,000 Ω platinum RTD at 0 °C, α = 0.00375 Ω/Ω/°C
- ±0.1% resistance trim: 1,000 ±1 Ω at 0 °C
- ±0.3 °C or 0.6% of temperature, whichever is greater
- ±0.1% FS linearity from -40 to 125 °C
- Laser-trimmed thin-film platinum on alumina substrate
- Ø0.118 × 0.25 in SS316L housing (3.00 × 6.35 mm)
- 28 AWG fiberglass-insulated leads, 2-wire, 12 in
- Low self-heating at 1 mA recommended excitation
- Fully assembled — no fragile splices to extension leads

DESCRIPTION

The PRTD10-1K-FG-SS316L is a thin-film platinum RTD for monitoring and controlling critical temperatures in industrial equipment. Its resistance rises linearly with temperature, combining high linearity, stability and accuracy with a wide temperature range in a small, fast-responding package.

The sensing chip is a thin platinum film deposited on an alumina substrate and laser trimmed to ±0.1% (±0.3 °C at 0 °C). The element is packaged in an SS316L stainless steel housing. We ship it fully assembled with fiberglass-insulated leads, ready to build into your probe assembly.

APPLICATIONS

- Ovens and kilns
- HVAC equipment
- Autoclaves
- Process control
- Environmental chambers

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	**-75 to 540 °C · -103-1004 °F**	Sensing Element	**Pt RTD, 1,000 Ω at 0 °C**
Storage Temperature	**-75 to 540 °C · -103-1004 °F**	Housing	**SS316L stainless steel**

Operational characteristics

R_0 = 1,000 Ω at 0 °C unless noted

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
Nominal resistance	0 °C	999	1,000	1,001	Ω
Resistance tolerance (trim)	0 °C	−0.1	—	+0.1	%
Temperature coefficient α	0 °C	—	0.00375	—	Ω/Ω/°C
Temperature accuracy (note 1)	0 °C	−0.3	—	+0.3	°C
Linearity	−40 to 125 °C	−0.1	—	+0.1	%FS
Linearity	−75 to 540 °C	−2.0	—	+2.0	%FS
Operating temperature	—	−75	—	540	°C
Storage temperature	—	−75	—	540	°C
Operating current (note 2)	—	—	1	2	mA
Stability	occupied environments	<0.25 °C/year; 0.05 °C/5 years			—
Insulation resistance	50 VDC, 25 °C	>50	—	—	MΩ

NOTES

1) Over temperature, accuracy is ±0.3 °C or 0.6% of the measured temperature, whichever is greater; see the accuracy table on page 4. 2) 1 mA is recommended; 2 mA maximum keeps self-heating error to about 1 °C.

Electrical connections

LEAD	CONNECTION
Lead 1	RTD element
Lead 2	RTD element

A 2-wire RTD is not polarized. In a 2-wire circuit the lead resistance adds to the reading, so keep runs short or compensate for the leads in your measurement.

Construction

Sensing element	Thin-film platinum on alumina substrate, laser trimmed, glassed
Housing	SS316L stainless steel
Lead wire	28 AWG nickel-coated stranded copper, fiberglass insulated
Lead configuration	2-wire

Application information

Package

The element sits in a Ø0.118 × 0.25 in SS316L stainless steel housing, compatible with a range of media. The compact size and low thermal mass give a fast response.

Sensing element

A thin platinum film on an alumina substrate, laser trimmed to 1,000 Ω ±0.1% at 0 °C with α = 0.00375 Ω/Ω/°C. Resistance rises nearly linearly with temperature.

Leads

Two 28 AWG nickel-coated stranded copper leads with fiberglass insulation, 12.25 in overall with 0.25 in stripped ends. The element is fully assembled, so you avoid fragile splices to extension leads.

Excitation

Drive the RTD with 1 mA (recommended) and no more than 2 mA. Higher current raises self-heating error.

Accuracy

±0.3 °C at 0 °C, widening to ±0.3 °C or 0.6% of temperature, whichever is greater. The accuracy table on page 4 gives values across the range.

Stability

Less than 0.25 °C drift per year in occupied environments.

Temperature range

−75 to 540 °C operating and storage.

Integration

Build the element into your probe assembly or housing. Contact us for custom lead lengths, terminations and probe assemblies.

1,000 Ω	±0.1%	0.00375	540 °C
R_0 at 0 °C	Resistance trim	α, Ω/Ω/°C	Max operating temp

Resistance and accuracy vs. temperature

Nominal resistance, R_0 = 1,000 Ω, α = 0.00375

TEMP (°C)	R (Ω)	TEMP (°C)	R (Ω)
-75	710.4	250	1,914.9
-50	807.9	275	2,002.2
-25	904.4	300	2,088.8
0	1,000.0	325	2,174.7
25	1,094.9	350	2,259.8
50	1,189.0	375	2,344.1
75	1,282.4	400	2,427.7
100	1,375.0	425	2,510.5
125	1,466.8	450	2,592.6
150	1,558.0	475	2,673.9
175	1,648.3	500	2,754.5
200	1,737.9	525	2,834.3
225	1,826.8	540	2,881.9

Calculated with the Callendar–Van Dusen equation and the coefficients below.

CALLENDAR-VAN DUSEN

$R_T = R_0[1 + A \cdot T + B \cdot T^2 + C \cdot (T - 100) \cdot T^3]$

$A = 3.81 \times 10^{-3}\ °C^{-1}$ · $B = -6.02 \times 10^{-7}\ °C^{-2}$

$C = -6.0 \times 10^{-12}\ °C^{-4}$ for $T < 0$ °C; $C = 0$ for $T \geq 0$ °C

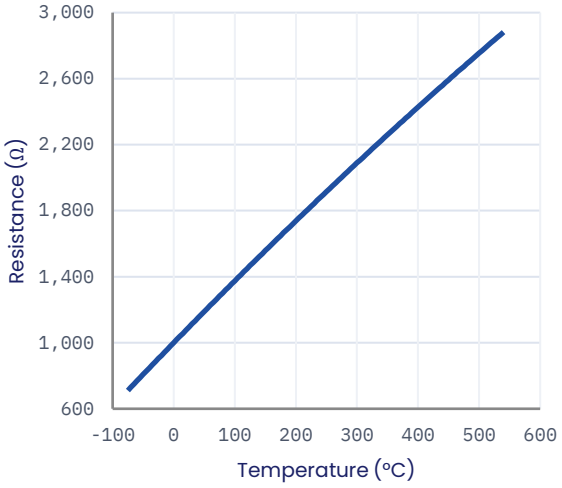


Fig. 1 — Nominal resistance vs. temperature.

Accuracy vs. temperature

TEMP (°C)	±ΔR (Ω)	±ΔT (°C)
-100	2.4	0.6
0	1.0	0.3
100	2.2	0.6
200	4.3	1.2
300	6.2	1.8
400	8.5	2.3
500	9.6	3.0
600	10.4	3.3

±0.1% trim. Points from −100 to 600 °C are shown for interpolation; the rated range is −75 to 540 °C.

Mechanical dimensions — inches

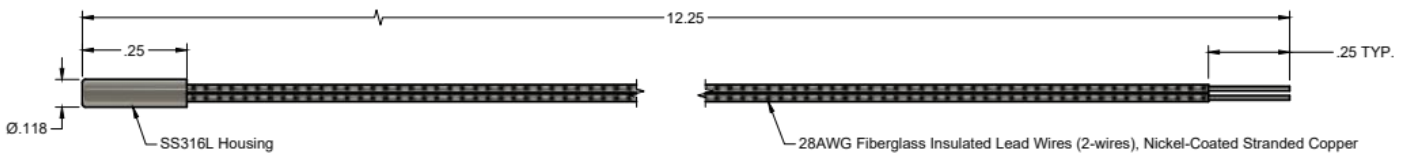


Fig. 2 — PRTD10-1K-FG-SS316L, drawing Rev 1.3.

Key dimensions

FEATURE	INCHES
Housing diameter	Ø 0.118
Housing length	0.25
Overall length	12.25 (11.75–12.75)
Lead strip length	0.25 typ.
Lead wire	28 AWG, 2-wire

Construction

Housing	SS316L stainless steel
Sensing element	Pt RTD, 1,000 Ω at 0 °C, 0.00375 Ω/Ω/°C
Lead wire	Fiberglass-insulated, nickel-coated stranded copper

TOLERANCES (INCHES)
X ± 0.5 · X.X ± 0.15
X.XX ± 0.010 · X.XXX ± 0.005

Ordering information — part-number configuration

PRTD10 – **1K** – **FG** – **SS316L**

MODEL · R_0 AT 0 °C · WIRE TYPE · PROBE MATERIAL

Code fields

FIELD	CODE
Model	PRTD10
Resistance at 0 °C	100 = 100 Ω · 1K = 1,000 Ω
Wire type	FG = Fiberglass
Probe material	SS316L = Stainless steel 316L

EXAMPLE

PRTD10-1K-FG-SS316L → 1,000 Ω Pt RTD · fiberglass leads · SS316L probe · 12 in leads

Configure your PRTD10

Custom lead lengths, terminations and probe assemblies are available for OEM volumes. Talk to an engineer to spec your part.

REQUEST A QUOTE
sales@phoenixsensors.com
(480) 462-1810

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