Temperature Sensors

Platinum RTDs

HRTS Series



FEATURES

- Resistance interchangeable
- Accurate
- Linear
- Fast Laser trimmed •
- Bolt, cement-on or strap-on models

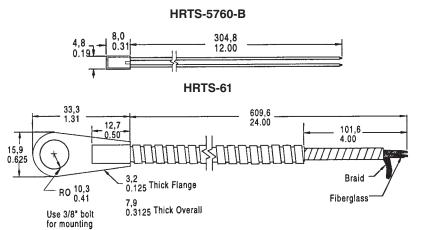
TYPICAL APPLICATIONS

- HVAC room, duct and refrigerant equipment
- **OEM** assemblies •
- Electronic assemblies semiconductor protection, temperature compensation
- Process control temperature regulation

ORDER GUIDE

ONDER GUIDE					
HRTS-5760-B	Miniature, ceramic body, 28 ga TFE Teflon insulated leads (2-wire only)				
HRTS-61	Bolt-on, nickel plated copper alloy body, 24 ga fiberglass insulated leads, SST braid, TFE overwrap, spiral armor				
	-T	100 Ω , 0.00385 $\Omega/\Omega/^{\circ}$ C, 3-wire leads, DIN specification			
	-U	1000 Ω , 0.00375 $\Omega/\Omega/^{\circ}$ C, 2-wire leads			
		-0 ±0.2% Resistance Trim (Standard)			
		-1 ±0.1% Resistance Trim (Optional)			
			-12	Standard length, HRTS-5760-B	
			-24	Standard length, HRTS-61	
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MOUNTING DIMENSIONS (for reference only)



The HRTS is designed to measure surface temperatures from -200° to +480°C (-320° to +900°F) in printed circuit, temperature probe, or other applications.

HRTS surface temperature sensors are fully assembled elements, ready to use, without the need for fragile splices to extension leads.

A thin layer of platinum is deposited on an alumina substrate and laser trimmed to a resistance interchangeability of ±0.2% with $\pm 0.5^{\circ}$ C accuracy or $\pm 0.1\%$ with $\pm 0.3^{\circ}$ C accuracy. The sensor chip is then glassed, wired and potted or ceramic fired to result in a cylindrical alumina package with either Teflon or fiber glass insulated lead wires.

Fig. 1: Wheatstone Bridge 2-Wire Interface

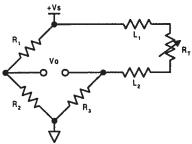


Fig. 2: Linear Output Voltage

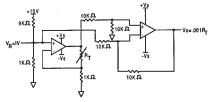
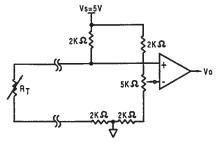


Fig. 3: Adjustable Point (Comparator) Interface



Femperature

Temperature Sensors Platinum RTDs

FUNCTIONAL BEHAVIOR

C)
$C_{T<0} = -\alpha \beta$
100 ⁴

CONSTANTS

Alpha, α (°C ⁻¹)	0.00375 ±0.000029	0.003850 ±0.000010	
Delta, δ (°C)	1.605 ± 0.009	1.4999 ± 0.007	
Beta, β (°C)	0.16	0.10863	
A (°C ⁻¹)	3.81×10 ⁻³	3.908×10 ^{-₃}	
B (°C ⁻²)	-6.02×10 ⁻⁷	-5.775×10 ⁻⁷	
C (°C-4)	-6.0×10 ⁻¹²	-4.183×10 ⁻¹²	

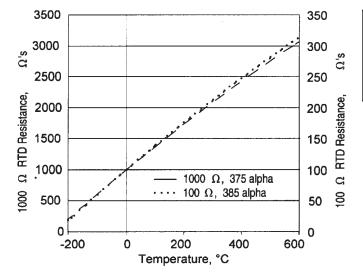
ACCURACY VS TEMPERATURE

HRTS platinum RTDs are available in two base resistance trim tolerances: $\pm 0.2\%$ or $\pm 0.1\%$. The corresponding resistance interchangeability and temperature accuracy for these tolerances are:

Tolerance	Standard ±0.2%		Optional ±0.1%	
Temperature (°C)	$\pm \Delta R^*$ (Ω)	±ΔT (°C)	$\pm \Delta R^*$ (Ω)	±ΔT (°C)
-200	6.8	1.6	5.1	1.2
-100	2.9	0.8	2.4	0.6
0	2.0	0.5	1.0	0.3
100	2.9	0.8	2.2	0.6
200	5.6	1.6	4.3	1.2
300	8.2	2.4	6.2	1.8
400	11.0	3.2	8.3	2.5
500	12.5	4.0	9.6	3.0
600	15.1	4.8	10.4	3.3

Both $\beta = 0$ and C = 0 for T>0°C

RESISTANCE VS TEMPERATURE CURVE



*1000 Ω RTD. Divide ΔR by 10 for 100 Ω RTD.

CAUTION PRODUCT DAMAGE

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation, take normal ESD precautions when handling this product.

SPECIFICATIONS

of Eon IoAnono		
Sensor Type	Thin film platinum RTD: $R_o = 1000 \Omega @ 0^{\circ}C$; alpha = 0.00375 $\Omega/\Omega/^{\circ}C$ $R_o = 100 \Omega @ 0^{\circ}C$; alpha = 0.00385 $\Omega/\Omega/^{\circ}C$	
Temperature Range	HRTS-5760-B: -200° to +260°C (-320° to +500°F) HRTS-61: -75° to +425°C (-100° to +800°F)	
Temperature Accuracy	±0.5°C or 0.8% of temperature @ 0.2% R₀ Trim ±0.3°C or 0.6% of temperature @ 0.1% R₀ Trim Optional	
Time Constant, 1/e	HRTS-5760-B: Typically 0.6 sec. on metal surfaces HRTS-61: Typically 20 sec. On metal surfaces	
Operating Current	2 mA max. for self-heating errors of 1°C 1 mA recommended	
Self-Heating	0.3 mW/°C	
Lead Material	Nickel coated stranded copper, Teflon or Fiberglass insulated	