Honeywell

Interactive Catalog Replaces Catalog Pages

Honeywell Sensing and Control has replaced the PDF product catalog with the new Interactive Catalog. The Interactive Catalog is a power search tool that makes it easier to find product information. It includes more installation, application, and technical information than ever before.



Click this icon to try the new Interactive Catalog.

Sensing and Control

Honeywell Inc. 11 West Spring Street Freeport, Illinois 61032

Temperature Sensors

Platinum RTDs



FEATURES

- Linear resistance vs temperature
- Accurate and Interchangeable
- Excellent stability
- Small size
- Printed circuit mountable
- Ceramic SIP package

TYPICAL APPLICATIONS

- HVAC room, duct and refrigerant equipment
- Instrument and probe assemblies
- Electronic assemblies temperature compensation
- Process control temperature regulation

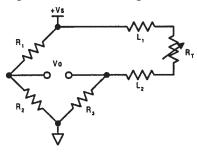
HEL-776 and HEL-777 platinum RTDs are designed to measure temperatures from -55° to $+150^{\circ}$ C (-67° to 302° F) in printed circuit boards, temperature probes, or other lower temperature applications. Solderable leads in 0.050" or 0.100" spacing provide strong connections for wires or printed circuits.

The 1000Ω , 375 alpha version, provides 10x greater sensitivity and signal-tonoise. Both are ideal for air temperature sensing.

ORDER GUIDE

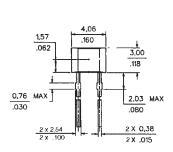
HEL-776-A	Molded SIP pkg. 0.100" lead spacing		
HEL-777-A	Molded SIP pkg. 0.100" lead spacing		
	-U	1000Ω, 0.00375 Ω/Ω/°C	
	-T	100Ω, 0.00385 Ω/Ω/°C	
		-0	±0.2% Resistance Trim (Standard)
		-1	±0.1% Resistance Trim (Optional)

Fig. 1: Wheatstone Bridge 2-Wire Interface



MOUNTING DIMENSIONS (for reference only) mm/in. **HEL-776-A**

2X 4/°30 2.54



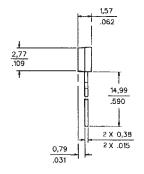


Fig. 2: Linear Output Voltage

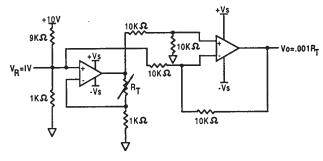
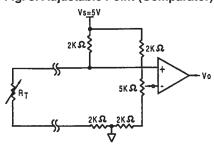
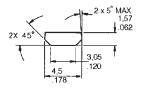


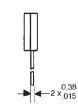
Fig. 3: Adjustable Point (Comparator) Interface



HEL-777-A







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.

Temperature Sensors

Platinum RTDs

FUNCTIONAL BEHAVIOR

 $\begin{array}{l} R_{\scriptscriptstyle T} = R_{\scriptscriptstyle 0} (1 + AT + BT^2 - 100CT^3 + CT^4) \\ RT = Resistance \; (\Omega) \; at \; temperature \; T \; (^{\circ}C) \end{array}$

 $R_0 = \text{Resistance} (\Omega)$ at 0°C

T = Temperature in °C

$$A = \alpha + \frac{\alpha \delta}{100} \qquad B = \frac{-\alpha \delta}{100^2}$$

$$C_{\scriptscriptstyle T<0} = \frac{-\alpha \, \beta}{100^4}$$

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}	

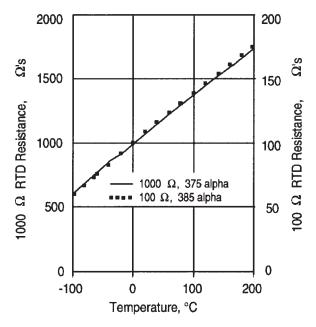
Both $\beta = 0$ and C = 0 for T > 0°C

ACCURACY VS TEMPERATURE

Tolerance	Standard ±0.2%		Optional ±0.1%	
Temperature (°C)	$\pm \Delta R^{\star}$ (Ω)	±ΔT (°C)	$\pm \Delta R^{\star}$ (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

^{* 1000} Ω RTD. Divide ΔR by 10 for 100 Ω RTD.

RESISTANCE VS TEMPERATURE CURVE



SPECIFICATIONS

Sensor Type	Thin film platinum RTD: $R_0 = 1000~\Omega~@~0^{\circ}\text{C}$; alpha = $0.00375~\Omega/\Omega/^{\circ}\text{C}$ $R_0 = 100~\Omega~@~0^{\circ}\text{C}$; alpha = $0.00385~\Omega/\Omega/^{\circ}\text{C}$		
Temperature Range	TFE Teflon: -200° to +260°C (-320° to +500°F) Fiberglass: -75° to +540°C (-100° to +1000°F)		
Temperature Accuracy	$\pm 0.5^{\circ}$ C or 0.8% of temperature °C (R _o $\pm 0.2\%$ trim), whichever is greater $\pm 0.3^{\circ}$ C or 0.6% of temperature °C (R _o $\pm 0.1\%$ trim), whichever is greater (optional)		
Base Resistance and Interchangeability, $R_0 \pm \Delta R_0$	$1000 \pm 2 \Omega \ (\pm 0.2\%) \ @ \ 0^{\circ}\text{C} \text{ or } 100 \pm 0.2 \ \Omega \ (\pm 0.2\%) \ @ \ 0^{\circ}\text{C}$ $1000 \pm 1 \ \Omega \ (\pm 0.1\%) \ @ \ 0^{\circ}\text{C} \text{ or } 100 \pm 0.2 \ \Omega \ (\pm 0.2\%) \ @ \ 0^{\circ}\text{C} \text{ (optional)}$		
Linearity	$\pm 0.1\%$ of full scale for temperatures spanning -40° to 125° C $\pm 2.0\%$ of full scale for temperatures spanning -75° to 540° C		
Time Constant	<0.5 sec, 0.85 inch O.D. in water at 3 ft/sec; <1.0 sec, 0.85 inch O.D. in still water		
Operating Current	2 mA maximum for self heating errors of <1°C; 1 mA recommended		
Stability	<0.25°C/year; 0.05°C per 5 years in occupied environments		
Self Heating	<15mW/°C for 0.85 O.D. typical		
Insulation Resistance	>50 MΩ @ 50 VDC @ 25°C		
Construction	Alumina case; Epoxy potting (Teflon leads); Ceramic potting (fiberglass leads)		
Lead Material	Nickel coated stranded copper, Teflon or Fiberglass insulated		