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ТЕРМОПРЕОБРАЗОВАТЕЛИ

Технические характеристики на

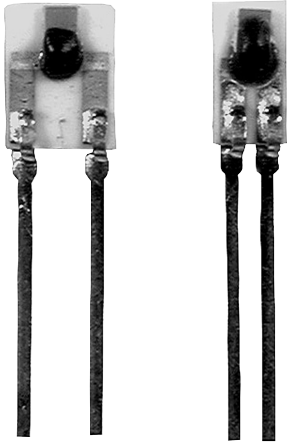
HEL 775



Temperature Sensors

Platinum RTDs

HEL-775 Series



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

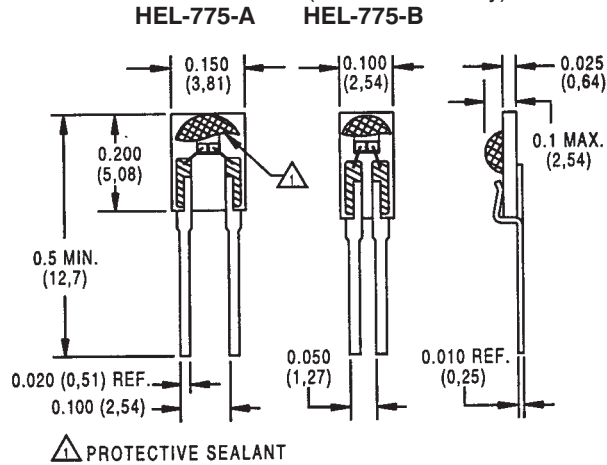
HEL-775 platinum RTDs are designed to measure temperatures from -55°C to $+150^{\circ}\text{C}$ (-67°F to 302°F) in printed circuit boards, temperature probes, or other lower temperature applications. Solderable leads in 0.050" or 0.100" spacing provide strong connections for wires or printed circuits.

The 1000 Ω , 375 alpha version, provides 10x greater sensitivity and signal-to-noise. The 0.050" lead space models are ideal for probes.

ORDER GUIDE

| | |
|------------------|---|
| HEL-775-A | Ceramic SIP pkg. 0.100" lead spacing |
| HEL-775-B | Ceramic SIP pkg. 0.050" lead spacing |
| -U | 1000 Ω , 0.00375 $\Omega/\Omega/^{\circ}\text{C}$ |
| -T | 100 Ω , 0.00385 $\Omega/\Omega/^{\circ}\text{C}$, DIN specification |
| -0 | $\pm 0.2\%$ Resistance Trim (Standard) |
| -1 | $\pm 0.1\%$ Resistance Trim (Optional) |

MOUNTING DIMENSIONS (for reference only) mm/in.



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.

Fig. 1: Wheatstone Bridge 2-Wire Interface

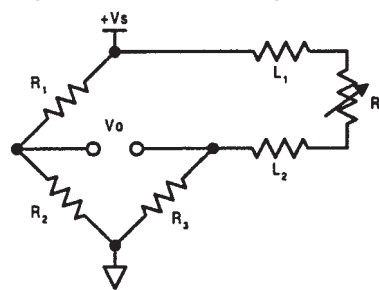


Fig. 2: Linear Output Voltage

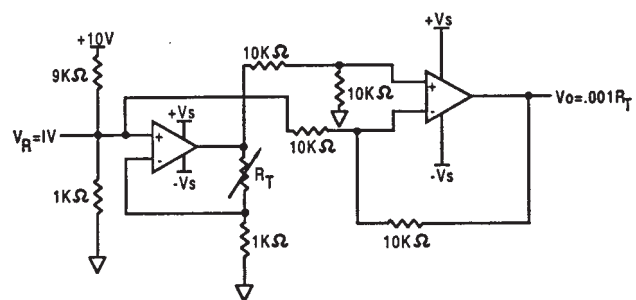
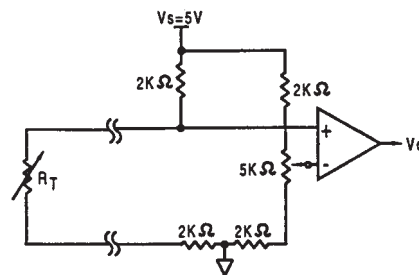


Fig. 3: Adjustable Point (Comparator) Interface



Temperature Sensors

HEL-775 Series

Platinum RTDs

FUNCTIONAL BEHAVIOR

$$R_T = R_0(1 + AT + BT^2 - 100CT^3 + CT^4)$$

R_T = Resistance (Ω) at temperature T ($^{\circ}\text{C}$)

R_0 = Resistance (Ω) at 0°C

T = Temperature in $^{\circ}\text{C}$

$$A = \alpha + \frac{\alpha \delta}{100} \quad B = \frac{-\alpha \delta}{100^2} \quad C_{T < 0} = \frac{-\alpha \beta}{100^4}$$

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

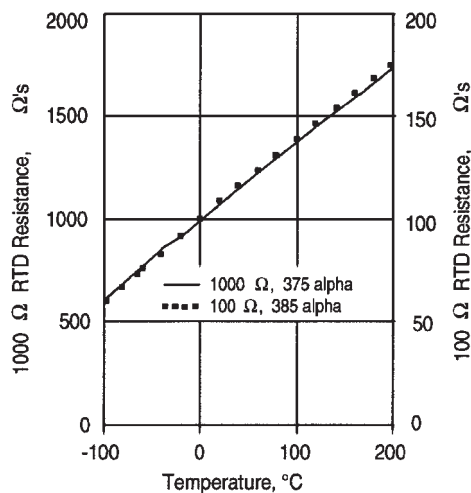
Both $\beta = 0$ and $C = 0$ for $T > 0^{\circ}\text{C}$

ACCURACY VS TEMPERATURE

| Temperature ($^{\circ}\text{C}$) | Standard $\pm 0.2\%$ | | Optional $\pm 0.1\%$ | |
|---------------------------------------|----------------------------------|--|----------------------------------|--|
| | $\pm \Delta R^*$ (Ω) | $\pm \Delta T$ ($^{\circ}\text{C}$) | $\pm \Delta R^*$ (Ω) | $\pm \Delta T$ ($^{\circ}\text{C}$) |
| -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 | -55° to $+150^{\circ}\text{C}$ (-67° to $+302^{\circ}\text{F}$) |
| Temperature Accuracy | $\pm 0.5^{\circ}\text{C}$ or 0.8% of temperature, $^{\circ}\text{C}$ ($R_0 \pm 0.2\%$ trim), whichever is greater $\pm 0.3^{\circ}\text{C}$ or 0.6% of temperature, $^{\circ}\text{C}$ ($R_0 \pm 0.1\%$ trim), whichever is greater (optional) |
| Base Resistance and Interchangeability, $R_0 \pm \Delta R_0$ | $1000 \pm 2 \Omega$ ($\pm 0.2\%$) @ 0°C or $100 \pm 0.2 \Omega$ ($\pm 0.2\%$) @ 0°C $1000 \pm 1 \Omega$ ($\pm 0.1\%$) @ 0°C or $100 \pm 0.2 \Omega$ ($\pm 0.2\%$) @ 0°C (optional) |
| Linearity | $\pm 0.15\%$ of full scale for temperatures spanning -55° to 150°C |
| Time Constant | < 10 sec. in air at 10 ft./sec. |
| Operating Current | 1 mA maximum in still air for $< 0.3^{\circ}\text{C}$ (0.5°F) self heating |
| Stability | < 0.05°C per 5 years in occupied environments |
| Self Heating | HEL-775-A: 9.7mW/ $^{\circ}\text{C}$ nominal in air at 10ft/sec, 4.3mW/ $^{\circ}\text{C}$ nominal in enclosed still air HEL-775-B: 6.8mW/ $^{\circ}\text{C}$ nominal in air at 10ft/sec, 3.0mW/ $^{\circ}\text{C}$ nominal in enclosed still air |
| Insulation Resistance | > 50 M Ω @ 50 VDC @ 25°C |
| Construction | Alumina substrate with epoxy protection |
| Lead Material | Phosphor bronze with bright tin lead 60/40 plating |
| Lead Configuration | 2-wire |

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