

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

HEL-776/HEL-777



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°C to $+150^{\circ}\text{C}$ (-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 1000 Ω , 375 alpha version, provides 10x greater sensitivity and signal-to-noise. 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 | 1000 Ω , 0.00375 $\Omega/\Omega/^{\circ}\text{C}$ |
| -T | 100 Ω , 0.00385 $\Omega/\Omega/^{\circ}\text{C}$ |
| -0 | $\pm 0.2\%$ Resistance Trim (Standard) |
| -1 | $\pm 0.1\%$ Resistance Trim (Optional) |

MOUNTING DIMENSIONS (for reference only) mm/in.

HEL-776-A



HEL-777-A



Fig. 1: Wheatstone Bridge 2-Wire Interface

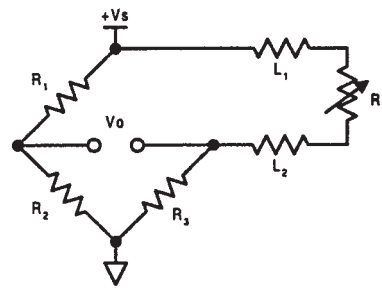


Fig. 2: Linear Output Voltage

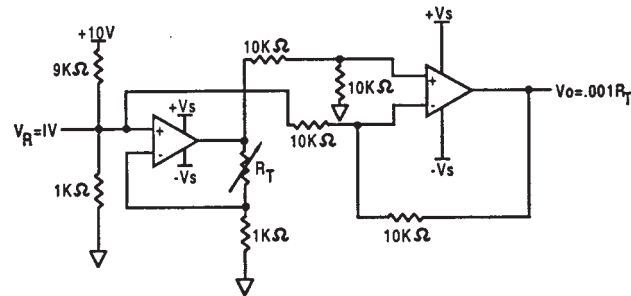


Fig. 3: Adjustable Point (Comparator) Interface



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

Temperature Sensors

HEL-776/HEL-777

Platinum RTDs

FUNCTIONAL BEHAVIOR

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

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

R₀ = Resistance (Ω) at 0 $^{\circ}\text{C}$

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

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

CONSTANTS

| | | |
|--|---------------------------|----------------------------|
| 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 | TFE Teflon: -200° to $+260^{\circ}\text{C}$ (-320° to $+500^{\circ}\text{F}$) Fiberglass: -75° to $+540^{\circ}\text{C}$ (-100° to $+1000^{\circ}\text{F}$) |
| 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 | $\pm 0.1\%$ 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 $< 1^{\circ}\text{C}$; 1 mA recommended |
| Stability | $< 0.25^{\circ}\text{C}/\text{year}$; 0.05°C per 5 years in occupied environments |
| Self Heating | $< 15\text{mW}/^{\circ}\text{C}$ for 0.85 O.D. typical |
| Insulation Resistance | $> 50 \text{M}\Omega @ 50 \text{VDC} @ 25^{\circ}\text{C}$ |
| Construction | Alumina case; Epoxy potting (Teflon leads); Ceramic potting (fiberglass leads) |
| Lead Material | Nickel coated stranded copper, Teflon or Fiberglass insulated |



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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