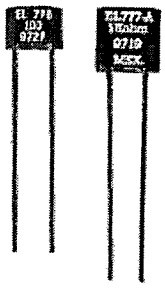
Temperature Sensors
Platinum RTDs

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° to +150°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.

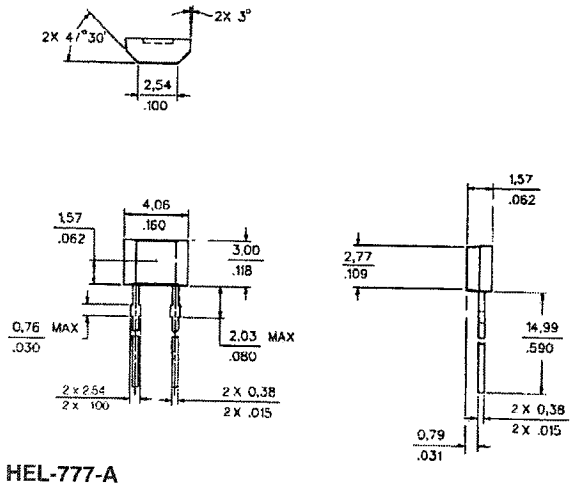
The 1000Ω, 375 alpha version, provides 10x greater sensitivity and signal-to-noise. Both are ideal for air temperature sensing.

ORDER GUIDE

HEL-776-A	Molded SIP pkg. 0.100″ lead spacing	
HEL-777-A	Molded SIP pkg. 0.100″ lead spacing	
	-U	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)

MOUNTING DIMENSIONS (for reference only) mm/in.

HEL-776-A



HEL-777-A

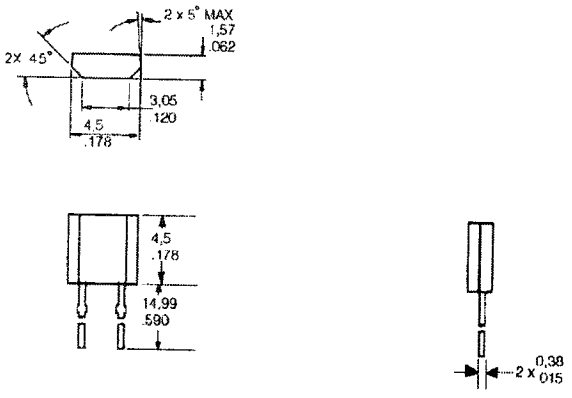


Fig. 1: Wheatstone Bridge 2-Wire Interface

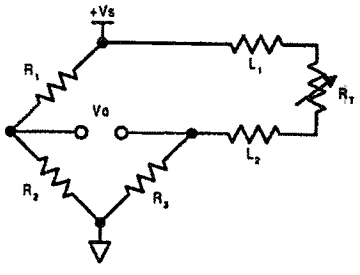


Fig. 2: Linear Output Voltage

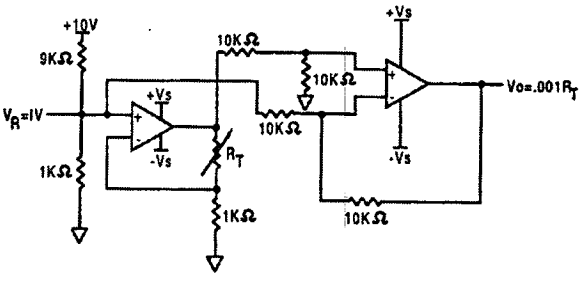
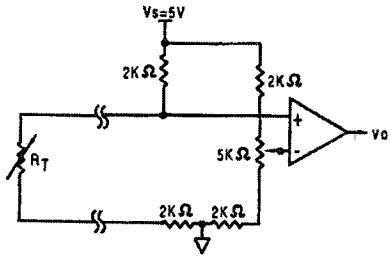


Fig. 3: Adjustable Point (Comparator) Interface



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 Sensors
Platinum RTDs

HEL-776/HEL-777

FUNCTIONAL BEHAVIOR

$R_T = R_0(1+AT+BT^2-100CT^3+CT^4)$
RT = Resistance (Ω) at temperature T (°C)
R_0 = Resistance (Ω) at 0°C
T = Temperature in °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 (°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}

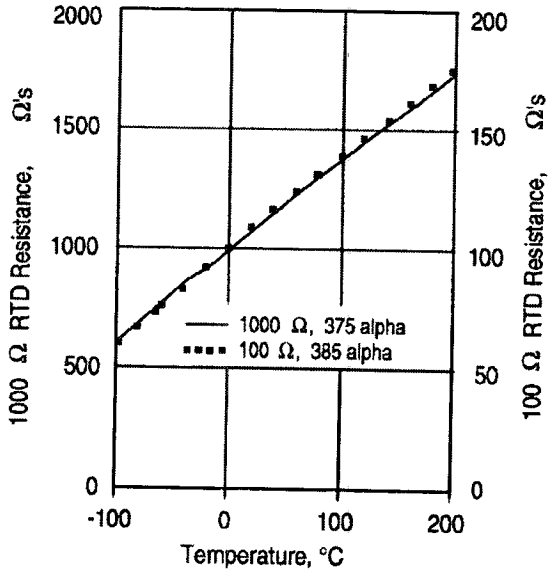
Both β = 0 and C = 0 for T>0°C

ACCURACY VS TEMPERATURE

Tolerance	Standard ±0.2%		Optional ±0.1%	
Temperature (°C)	±ΔR* (Ω)	±ΔT (°C)	±ΔR* (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

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

RESISTANCE VS TEMPERATURE CURVE



SPECIFICATIONS

Sensor Type	Thin film platinum RTD: R_0 = 1000 Ω @ 0°C; alpha = 0.00375 Ω/Ω/°C R_0 = 100 Ω @ 0°C; alpha = 0.00385 Ω/Ω/°C
Temperature Range	TFE Teflon: −200° to +260°C (−320° to +500°F) Fiberglass: −75° to +540°C (−100° to +1000°F)
Temperature Accuracy	±0.5°C or 0.8% of temperature °C (R_0 ±0.2% trim), whichever is greater ±0.3°C or 0.6% of temperature °C (R_0 ±0.1% trim), whichever is greater (optional)
Base Resistance and Interchangeability, $R_0 \pm \Delta R_0$	1000 ± 2 Ω (±0.2%) @ 0°C or 100 ± 0.2 Ω (±0.2%) @ 0°C 1000 ± 1 Ω (±0.1%) @ 0°C or 100 ± 0.2 Ω (±0.2%) @ 0°C (optional)
Linearity	±0.1% of full scale for temperatures spanning −40° to 125°C ±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

欢迎索取免费详细资料、设计选型指南和光盘、样品；产品繁多未能尽录，欢迎来电查询。

中国传感器科技信息网：HTTP：//WWW.SENSOR-IC.COM/
工控安防网：HTTP：//WWW.PC-PS.NET/
消费电子专用电路网：HTTP://WWW.SUNSTARE.COM/
E-MAIL： xjr5@163.com szss20@163.com
MSN: suns8888@hotmail.com
QQ: 195847376
地址： 深圳市福田区福华路福庆街鸿图大厦 1602 **室**
电话：0755-83376549 83376489 83387030 83387016
传真：0755-83376182 83338339 **邮编：**518033 **手机：**(0)13902971329
深圳展销部：深圳华强北路赛格电子市场 2583 **号** TEL/FAX：0755-83665529 25059422
北京分公司：北京海淀区知春路 132 **号中发电子大厦** 3097 **号**
TEL：010-81159046 82615020 13501189838 FAX：010-82613476
上海分公司：上海市北京东路 668 **号上海赛格电子市场** 2B35 **号**
TEL：021-28311762 56703037 13701955389 FAX：021-56703037
西安分公司：西安高新开发区 20 **所(中国电子科技集团导航技术研究所)**
西安劳动南路 88 **号电子商城二楼** D23 **号**
TEL：029-81022619 13072977981 FAX:029-88789382
成都：TEL:(0)13717066236
技术支持：0755-83394033 13501568376