

S220186 ESCC Temperature Sensor

High Performance RTD Sensors for Space Applications

For decades, Minco has designed and manufactured rugged, reliable temperature sensors and heaters for the harshest space applications. We pioneered the development of Thermofoil™ heaters, now a standard in modern instrumentation, and continue to meet industry demands for smaller, lighter, faster products. Minco builds components using materials ideally suited to the temperature range, mounting requirements and size restrictions of these challenging applications. Supporting over 60 space programs with tens of thousands of heaters and temperature sensors, Minco can improve product life, increase reliability, and help minimize costs.

Product Overview

Space is a challenging environment in which the failure of any component can be enormously costly. Maintenance and repair are often not options making performance and reliability critical. Minco offers heating and temperature sensing products that can operate at temperatures approaching absolute zero and up to 400°C. They can withstand repeated thermal shock and significant vibration. They have a wide compatibility range and a high degree of moisture resistance along with a range of other features making them ideal for use in harsh environments.

Certifications

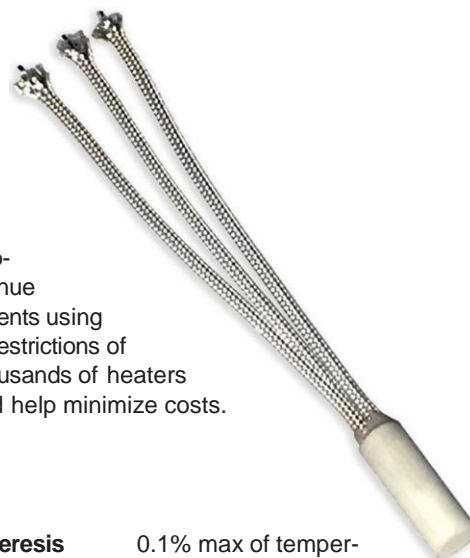
- ISO 9001:2000/AS9100
- ISO 9001:2008 / AS/EN/SJAC9100 (Registrar: TÜV)
- UL / C-UL Component Recognition
- TÜV component recognition
- Nadcap accreditation for Flex
- ESCC QPL

Industry Certifications

- ESCC Detail Specification No. 4006
- NASA certification since 1994
- ESA certification since 2013

General Specifications

Temperature	-269°C to +400°C
Resistance (0°C)	100 ohms to 1000 ohms
Nominal Alpha	0.003851Ω/Ω/°C from 0°C to 100°C
Insulation Resistance	10 megohms min. with 100 VDC applied



Thermal Hysteresis	0.1% max of temperature span encountered between readings
Time Constant	0.8 seconds in water flowing at 3 fps
Repeatability	≤0.2°C at 0°C when exposed to 20 temperature shocks from liquid helium to +25°C air
Self-Heating	TBD
Vibration	MIL-STD-202G, Method 204, Condition E (50G max from 2 to 2000 Hz)
Compatibility	Suitable for use in any non-conductive fluid or environment that is compatible with platinum and a metal oxide ceramic
Humidity	Not susceptible to moisture absorption in moderate humidity atmospheres if the leads are suitably protected
Sensor Weight	0.57g with two 2" leads

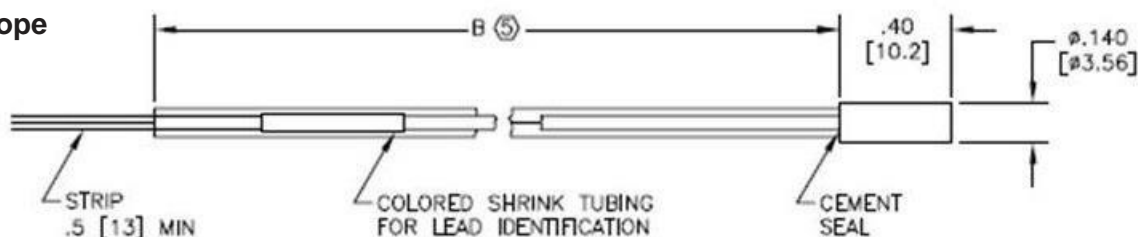
R₀ Interchangeability

0°C Resistance Tolerance		
	%	0°C Error
Standard	±1.0%	±2.56°C
Optional	±0.25%	±0.64°C
Optional	±0.12%	±0.30°C

Specifications subject to change

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Product Envelope



Resistance-Temperature Relationship and Table

Temperature (°C)	Resistance Ω
-260	0.20
-240	2.50
-220	9.80
-200	18.52
-180	27.10
-160	35.54
-140	43.88
-120	52.11
-100	60.26
-80	68.33
-60	76.33
-40	84.27
-20	92.16
0	100.00
20	107.79
40	115.54
60	123.24
80	130.90
100	138.51
120	146.07
140	153.58
160	161.05
180	168.48
200	175.86
220	183.19
240	190.47
260	197.71
280	204.90
300	212.05
320	219.15
340	226.21
360	233.21
380	240.18
400	247.09

S220186 ESCC Temperature Sensor Configuration Guide

S220186 Series		Assembly Series
	100 Ohm (consult factory for other R_0 values)	Resistance (0°C)
	$\pm 1.0\%$	R_0 Interchangeability
	$\pm 0.25\%$	
	$\pm 0.12\%$	
	ESCC 4006, Charts F2 and F3	Screening Option
	ESCC 4006, Charts F2, F3 and Chart F4 Endurance (includes 20 test units)	
	ESCC 4006, Charts F2, F3 and Chart F4 Environmental/Mechanical (includes 35 test units)	
	ESCC 4006, Charts F2, F3 and Chart F4 (Endurance, Environmental/Mechanical (includes 56 test units)	
	2 Wire	Leadwire Options
	3 Wire	
	4 Wire	
	2 (minimum), 12, 24, 40 (max)	Length Options (inches)
	Calibration Points (°C)	[R vs. T Table (°C)]
	-269, -196, 0, 100, 260	[-260 to 400]
	-50, 0, 50	[-50 to 50]
	-196, 0, 100	[-196 to 200]

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ISO9001:2008/AS9100C
Data Sheet S220186
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