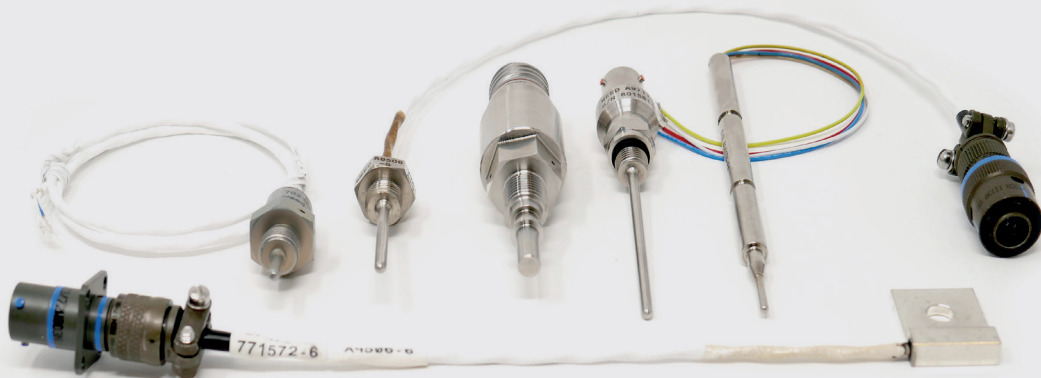


# ULTRA



## Temperature Sensors - Aerospace Ambient Air and Gas

Measuring the temperature of air  
and gas in an open environment

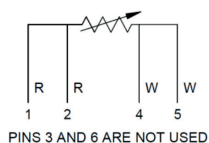


### Key features

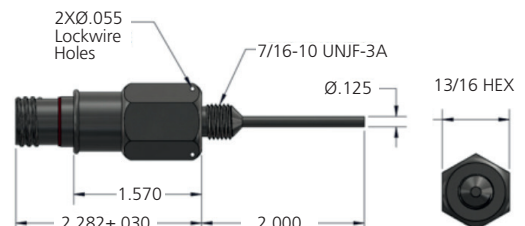
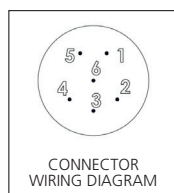
- Fast time response
- Variety of temperature ranges available
- Probe length, connector, and thread can be altered to fit application

### Overview

Ultra's ambient air and gas sensors measure the temperature of air and gas in an open environment such as a wind tunnel, jet engine test cell, or a housing for sensitive electronics. Our products are customizable to meet your application requirements. A unique feature of our ambient air and gas sensors is their very fast response time.



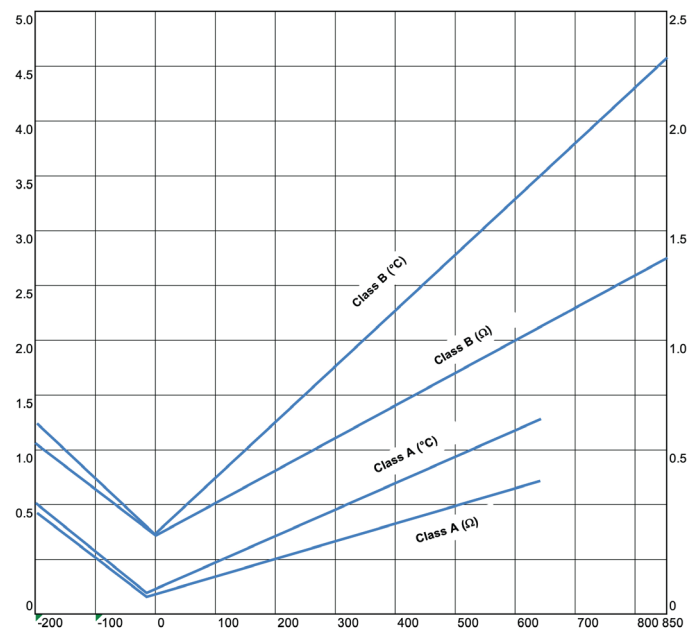
Wiring Diagram



Model	Features	Temperature Range	Size	Sensing Element	Typical Applications
A9511	High Accuracy, high emissivity coating to minimize radiation error; very fast response time	-50° to 400°C	Length of 4.85" maximum housing diameter to .72"	100, 200, 500 ohm available	Jet engine test cell applications requiring accurate measurement of rapid changing gas temperatures
A9528	Fast response; sensing element in perforated sheath for maximum protection; moisture sealed	-65° to 100°C	Length of 1.875" maximum housing diameter of .343"	100, 200, 500 ohm available	Measurement of cooling air in environmental control systems for aircraft, missiles and spacecraft

## Tolerances for 100 Ω RTD

Temperature (°C)	Tolerance			
	Class A		Class B	
	(± °C)	(± Ω)	(± °C)	(± Ω)
-200	0.55	0.25	1.30	0.56
-100	0.35	0.14	0.80	0.32
0	0.15	0.06	0.30	0.12
100	0.35	0.13	0.80	0.30
200	0.55	0.20	1.30	0.48
300	0.75	0.27	1.80	0.64
400	0.95	0.33	2.30	0.79
500	1.15	0.38	2.80	0.93
600	1.35	0.43	3.30	1.06
650	1.45	0.46	3.60	1.13
700	-	-	3.80	1.17
800	-	-	4.30	1.28
850	-	-	4.60	1.34



## Thermocouple, Temperatures and Tolerances

Wire Type	Temp Range	Standard Tolerance	Special Tolerance
J	32 to 1400 °F	+/-4 °F or 0.75%	+/-2 °F or 0.4%
K	32 to 2300 °F	+/-4 °F or 0.75%	+/-2 °F or 0.4%
N	32 to 2300 °F	+/-4 °F or 0.75%	+/-2 °F or 0.4%
R	32 to 2700 °F	+/-2.7 °F or 0.25%	+/-1.1 °F or 0.1%
S	32 to 2700 °F	+/-2.7 °F or 0.25%	+/-1.1 °F or 0.1%
B	1472 to 3092 °F	+/-0.5%	+/-0.25%
C	800 to 4200 °F	+/-1%	+/-1%
E	-328 to -274 °F	+/-1%	Not established
	-273 to 32 °F	+/-3.1 °F	Not established
	33 to 644 °F	+/-3.1 °F	+/-1.8 °F
F	645 to 1652 °F	+/-0.5%	0.4%
	-328 to -89 °F	+/-1.5%	Not established
	-90 to 32 °F	+/-1.8%	Not established
	33 to 271 °F	+/-1.8%	0.9 °F
	271 to 700 °F	+/-0.75%	0.4%



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