

Aerospace Temperature Probes



Models 44, 54, and 56

Scientific Instruments offer a wide variety of Aerospace Temperature Probes. Those include the Series 44, and the Series 56 and their associated models. Our temperature probes are constructed of stainless steel and are hermetically sealed units allowing for installation into hazardous environments. The series 54D & 56D have a silicon diode sensing element in a closed well housing, while the 44 B & C have pure annealed, strain-free Platinum resistance possess a sensing element supported and contained in a closed well housing.

These units are designed to permit interchangeability of units with the same number and are capable of repeating test parameter results under identical test conditions, within $\pm 0.1K$ ($\pm 5mVDC$) at the boiling point of liquid helium and within $\pm 0.5K$ ($1.2 mVDC$) from 25K to 400K.

Units will operate in the following gaseous or liquid media where compatible with the sheath-housing material and within the temperature range of the unit:

- | | |
|--|--|
| Alcohol | Neon |
| Ammonia (NH ₃) | Nitrogen (N ₂) |
| Helium (He) | Nitrogen Teroxide (N ₂ O ₄) |
| Hydrogen (H ₂) | Oxygen (O ₂) |
| Hydrazine (N ₂ H ₄) | Unsymmetrical dimethylhydrazine (UDMH) |
| Monomethylhydrazine (MMH) | Water (H ₂ O) |



Part Number	Accuracy Range	External Environmental Temperature Capability
44B-XXX	Individually Calibrated	233.15K (40°C) to 473.15K (200°C)
44C-XXX	Individually Calibrated	77.15K (196°C) to 398.15K (125°C)
54D-XXX	$\pm 0.25K$ ($\pm 12.8 mVDC$) from 1.5K to 25K and within $\pm 0.5K$ ($1.2 mVDC$) from 25K to 400K)	1.5K (-271.66°C) to 400K (196.85°C)
56D-XXX	$\pm 0.25K$ ($\pm 12.8 mVDC$) from 1.5K to 25K and within $\pm 0.5K$ ($1.2 mVDC$) from 25K to 400K)	1.5K (-271.66°C) to 400K (196.85°C)

Aerospace Probes

The aerospace probes possess a temperature self-heating error, with the following temperature range as follows:



Unit	Temperature Error	I^2
44B	± 1.1K Maximum	0.065 watts
44C	± 3K Maximum	0.2 watts
54D	± 0.01K Maximum	0.2 milliwatts
56D	± 0.01K Maximum	0.2 milliwatts
56DX	± 0.10K Maximum	2.0 milliwatts

Calibration Points

44 B/C

With constant current of 1.0 mA plus or minus 0.001mA, the units are calibrated as follows using the following set points:

Boiling point of Nitrogen -198.8C (320.5F)
 Triple point of water 0.0C (32.0F)
 Boiling point of water 100C (212F)

54D

With a constant current of 10uA +/- 0.1 uA for 54D, the units are calibrated using the following set points:

Boiling point of helium 4.22K (-268.93C)
 Boiling point of nitrogen 77.35K (-195.8C)
 Triple point of water 273.15K (0.0C)

56D / 56DX

With a constant current of 10uA +/- 0.1 uA for 56D or 100uA +/- 1.0uA for a 56DX, the units are calibrated using the following set points:

Boiling point of helium 4.22K (-268.93C)
 Boiling point of nitrogen 77.35K (195.8C)
 Triple point of water 273.15K (0.0C)

Pressure Seal

44B/C & 54D: Probes shall operate with no leakage or degradation to a maximum pressure of 35 megapascals [5076 pounds per square inch, gauge (psig)]

56D/DX: The probes shall show no leakage at operating pressures listed below (Depending on the safety factor required for the application:

Pressure	1.5X Applications	1.2X Applications
MEOP	2000 psi	2500 psi
Proof	3000 psi	3000 psi
Burst	4000 psi	4000 psi