FLUKE®

80PK-24

SureGrip™ Air Temperature Probe

Instruction Sheet

⚠⚠Warning

To avoid electrical shock, do not use this probe when voltages exceeding 24 V ac rms or 60 V dc are present. The probe tip is electronically connected to the output terminals.

Introduction

The 80PK-24 SureGripTM Air Temperature Probe is designed for measuring the temperature of air or gases. The measuring bead of the probe is protected by a perforated 304 Stainless Steel baffle to prevent accidental damage. The sheath material is 300 Stainless Steel. The 38-inch (1 meter) cable is terminated with a Type K miniature thermocouple connector with 0.792-mm (.312-in) pin spacing. The 80PK-24 can be used with any temperature-measuring instrument that is designed to accept Type K thermocouples and has a miniature connector input.

Specifications

Type

K Standard Grade Ni-Cr vs Ni-Al (Chromel vs Alumel)

Measurement Range

-40 °C to 816 °C (-40 °F to 1500 °F)

Accuracy

(With respect to ANSI MC96.1-1982-Standard Limits of Error):

Note

All error calculations should be done in °C*, then scaled to* °F*.*

Range	Accuracy (% of reading)
-40 °C to 293 °C (-40 °F to 559.4 °F)	±2.2 °C
293 °C to 816 °C (559.4 °F to 1500 °F)	±0.75 %

November 2004 Rev.2, 9/09
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Output

@ 25 °C (77 °F) =1.00 mV (reference junction @ 0 °C)

Seebeck Coefficient

@ 25°C (77°F) =40.50 µV / °C

Measurement Time (Time Constant)

3.0 seconds in 100 °C air moving at 3.33 meters/second (10.9 feet/ second) at sea level pressure (5 time constants = 1 complete step change, i.e., 15 seconds).

Maximum Voltage: 24 V ac rms or 60 V dc

Maximum Temperature of Tip: 816 °C (1500 °F)

Baffle

Material: 304 Stainless Steel Dimensions

Diameter: 3.81 mm (0.150 in)

Length: 3.3 cm (1.3 in)

Sheath

Material: 304 Stainless Steel Dimensions

Diameter: 3.175 mm (0.125 in)

Length: 215.9 mm (8.5 in) from handle body to end of baffle

Grounding

Junction welded to sheath.

Cable

Length: 38 inches (1 meter)

Insulation

Material: PVC

Maximum Temperature: 105 °C (220 °F)

Jacket Color: Gray

Conductors

Type: K

Size: AWG #24 stranded (7 strands of #32)

Handle

Material: Hytrel

Maximum Temperature: 125 °C (257 °F)

Connector

Type: Mini-thermocouple connector with .792 mm (0.312 in) pin spacing

Material: Yellow Hytrel

Maximum Temperature: 125 °C (257 °F)

Overall Length

31.9 cm (12.55 in) from baffle tip to end of cable strain relief.

Protection

Class 3. Relates solely to insulation and grounding properties defined in IEC 348.

Measurement Considerations

Instrument Compatibility

The 80PK-24 is compatible with any temperature-measuring instrument that accepts Type K thermocouples, has a miniature thermocouple connector, and has cold reference junction compensation. Accuracy of the temperature-measuring instrument must be considered along with the 80PK-24 accuracy specification to determine the overall accuracy of the combination.

Temperature Limitations

The baffle tip of the 80PK-24 has a continuous temperature rating of 816 °C (1500 °F). However, the opposite end of the sheath nearest the handle should not be subjected to temperatures greater than 125 °C (257 °F). This is the maximum temperature limitation of the handle.

Media Limitations

The stainless steel baffle and sheath should not be exposed to halides or sulfides. Even though the sheath to junction transition is sealed, it is not recommended to immerse the probe in liquid or saturated vapor. The 80PK-24 should not be used in reducing atmospheres or in a vacuum.

Operation

Use the 80PK-24 as follows:

1. Use the miniature (0.312-inch spacing) thermocouple connector to connect the 80PK-24 to a compatible Type K temperature-measuring instrument.
2. Turn on the measuring instrument, and select the appropriate range and scale.
3. Check the read out on the measuring instrument. With no heat or cold source applied to the tip of the probe, the measuring instrument should display the ambient (room) temperature. If the instrument does not read out properly, refer to “Troubleshooting”.

Minimizing Thermal Shunting

The 80PK-24 Air Probe should be inserted at least 6.35 cm (2.5 in) into the environment to be measured to minimize the shunting effect of the sheath.

Troubleshooting

With no heat or cold applied to the probe, the measuring instrument should display the ambient temperature. If the measuring instrument does not read out properly, try the following:

1. Verify that the temperature-measuring instrument is designed to be used with Type K thermocouples. The temperature-measuring instrument should have a yellow input connector and / or be marked with a “K”.
2. Check for an open circuit indicator on the measuring instrument. Some temperature measuring instruments have a built-in circuit to indicate if the connected probe is open. (All Fluke Temperature-measuring instruments have this feature.) Refer to the owners manual accompanying the measuring instrument to see if this feature is available.

   Short the two input pins of the measuring instrument with a piece of wire. If the instrument is functioning, it should indicate the ambient temperature.
3. If you suspect a broken connection, use an ordinary ohmmeter to read the continuity of the probe from pin to pin. The ohmmeter should read 20 ohms or less if there is continuity.

Scale Conversions

Use the following equation to convert °C to °F:

(°C x 1.8) + 32 = °F

Use the following equation to convert °F to °C:

(°F –32) x 0.5556 = °C

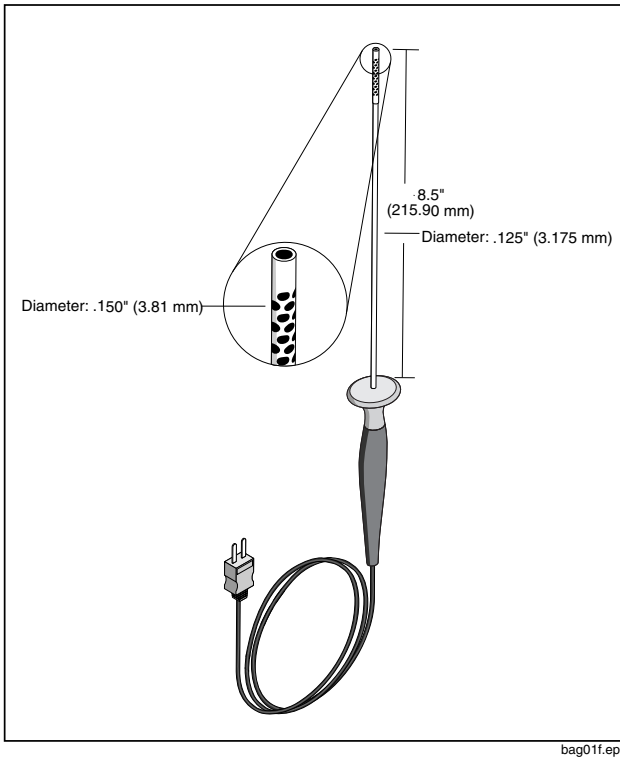


Figure 2. 80PK-24

Contacting Fluke

For application or operation assistance, or information on Fluke products, call:
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