WARNING
TO AVOID ELECTRICAL SHOCK, DO NOT USE THIS PROBE WHEN VOLTAGES EXCEEDING 24V AC RMS OR 60V DC ARE PRESENT. THE PROBE TIP IS ELECTRONICALLY CONNECTED TO THE OUTPUT TERMINALS.

CAUTION
The thermocouple strip in the tip of the probe is designed to deflect only .030" in normal operation. Any action which bends or pulls the strip out further from the tip will CONSIDERABLY reduce the life of the probe.

INTRODUCTION
The 80PK-3A Type K Thermocouple Surface Probe is designed for measuring the temperature of flat or slightly convex surfaces, with an exposed junction to allow direct contact with the surface being measured. The 40-inch (1-meter) cable is terminated with a Type K miniature thermocouple connector with 0.792-mm (0.312 in) pin spacing. The probe 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 (Chromel vs Alumel)
Measurement Range: 0°C to 260°C (32°F to 500°F)
Junction Accuracy: (With respect to ANSI MC96.1): ±2.2°C (3.96°F) over the range of 0°C to 260°C (32°F to 500°F)
Restrictions: The 260°C continuous temperature rating is primarily determined by the Teflon support piece. The Teflon insulation should not be exposed to temperatures exceeding 260°C (500°F) nor to open flame, since this can cause release of toxic material.
Output: 25°C (77°F) = 1.00 mV (reference junction at 0°C)
Seebeck Coefficient: 25°C (77°F) = 40.50 µV / °C
Measurement Time: (Time Constant): 3 sec typical on metal surface; 15 sec max. for a 260°C change. See Applications Information below.
Maximum Voltage: 24V ac rms or 60V dc
Probe Tip:
  Maximum Temperature: 260°C (500°F)
  Material: White PTFE
Cable:
  Length: 40 inches (1 meter)
  Insulation:
    Material: PVC
    Maximum Temperature: 105°C (220°F)

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

Handle:
  Material: nylon
  Maximum Temperature: 105°C (220°F)

Connector:
  Type: Yellow mini-thermocouple connector with .792 mm (.0312 in) pin spacing
  Material: Hytrel 5556
  Maximum Temperature: 125°C (257°F)

Dimensions: 12.5 mm (1/2 inch) in diameter, 9.4 cm (3.75 inches) in length.

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

MEASUREMENT CONSIDERATIONS

Instrument Compatibility
The 80PK-3A is designed to be 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 could be considered along with the 80PK-3A accuracy specification in order to determine the overall accuracy of the combination.

Temperature Limitations
The probe tip has a continuous temperature rating of 260°C. However the rest of the assembly is rated for a lower temperature. See the specifications for further information.

Media Limitations
The Type K thermocouple junction is compatible with clean oxidizing atmospheres.

Applications information
At high temperatures, a surface temperature probe removes a small amount of heat from the measured surface. At 260°C on a polished metal surface, the temperature at a contact point will be lowered, typically not more than 2°C. Low temperatures at the contact point are less likely, and contact response time is quicker, on polished metal surfaces than on materials with low thermal conductivity, such as plastic and rough or contaminated surfaces. To obtain the best thermal contact and performance, the white supporting ring must make full and firm contact with the measurement surface.

OPERATION
Use the 80PK-3A as follows:
1. Connect the 80PK-3A to a compatible type K temperature measuring instrument using the miniature thermocouple connector.
2. Turn on the measuring instrument, and select the appropriate range and scale.
3. Check the readout on the measuring instrument. With no heat or cold source applied to the bead, the measuring instrument should display the ambient (room) temperature. If the instrument does not read out properly, refer to the TROUBLESHOOTING section below.
MEASURING TECHNIQUE
Here are some suggestions for improving the accuracy of your temperature measurements:

• When measuring higher than ambient temperatures, adjust the connection between the probe and the surface until you get the highest temperature reading.
• When measuring lower than ambient temperatures, adjust the connection between the probe and the surface until you get the lowest temperature reading.
• When measuring near ambient temperatures, make the reading when the thermometer readout is most stable.

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. It should have a yellow input connector and/or be marked “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 instruments have this feature.) Refer to the measuring instrument’s owner’s manual to see if this feature is available.
   If you suspect a broken connection, use an ordinary ohmmeter to check its continuity from pin to pin. The ohmmeter should read 10 ohms or less if there is continuity.
3. 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.

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

\[(°C \times 1.8) + 32 = °F\]

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

\[(°F - 32) \times 0.5556 = °C\]
WARRANTY

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Fluke’s obligation under this warranty is limited to repair or replacement of a product which is returned to an authorized service center within the warranty period and is determined, upon examination by Fluke, to be defective, if Fluke determines that the defect or malfunction has been caused by misuse, alteration, abuse, or abnormal conditions of operation or handling, Fluke will repair the product and bill the purchaser for the reasonable cost of repair. If the product is not covered by this warranty, Fluke will, if requested by purchaser, submit an estimate if repair costs before work is started.

To obtain repair service under this warranty purchaser must forward the product, (transportation prepaid) and a description of the malfunction to the nearest Fluke Service Center. The product shall be repaired at the Service Center or the factory, at Fluke’s option, and returned to purchaser, transportation prepaid. The product should be shipped in the original packing carton or a rigid container padded with at least four inches of shock absorbing material. FLUKE ASSUMES NO RISK FOR IN TRANSIT DAMAGE.

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Fluke will be happy to answer all questions to enhance the use of this product. Please address your requests or correspondence to: Fluke Corporation, P.O. Box 9090, Everett, WA 98206-9090, Attn: Sales Department, For European Customers: Fluke Europe B.V., P.O. Box 1186, 5602 B.D., Eindhoven, The Netherlands.

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