

# FLUKE®

## 80PK-7

*Type K Thermocouple Heavy Duty  
Surface Probe*

*Instruction Sheet*

### WARNING

To avoid electrical shock, do not use this probe when voltages exceeding 24V AC RMS or 60V DC are present. The probe is electrically connected to the output terminals.

### ATTENTION

Pour éviter les risques d'électrocution, ne pas utiliser cette sonde quand la tension est supérieure à 24 V efficaces en courant alternatif ou 60 V en courant continu. La pointe de la sonde est reliée électriquement aux bornes de sorties.

### WARNUNG

Um Elektroschock zu vermeiden, dürfen Sie den Meßstift nicht in der Anwesenheit von Spannungen über 24V Wechselstrom oder 60V Gleichstrom verwenden. Die Spitze des Meßstifts ist mit den Ausgangsanschlüssen elektrisch verbunden.

### ADVERTENCIA

Para evitar descargas eléctricas, no use esta sonda cuando se apliquen voltajes que sobrepasen 24 V ca rcm o 60 V cc. La punta de la sonda está conectada eléctricamente a las terminales de salida.

### Introduction

The 80PK-7 Type K Thermocouple Heavy Duty Surface Probe is designed for reliably measuring temperatures to 600°C (1112°F) on flat or slightly convex surfaces, while retaining a long service life.

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## SPECIFICATIONS

**Type:** K (Chromel vs Alumel)

**Measurement Range:** -127°C to 600°C  
(-196.6°F to 1112°F)

**Junction Accuracy:** -127°C to 0°C  $\pm 4.4^\circ\text{C}$   
(-196.6°F to 32°F  $\pm 7.92^\circ\text{F}$ )  
0°C to 225°C  $\pm 2.7^\circ\text{C}$   
(32°F to 437°F  $\pm 4.86^\circ\text{F}$ )  
225°C to 600°C  $\pm 1.2\%$  of reading  
in °C (437°F to 1112°F  $\pm <1.2\%$  of  
reading in °F)

**Output:** 25°C (77°F) = 1.00 mV (Reference junction at 0°C)

**Seebeck Coefficient:** 25°C (77°F) = 40.50  $\mu\text{V}/^\circ\text{C}$

**Measurement Time (Time Constant):** 1 time constant equals 330 ms; 5 time constants equal final reading. See "Application Information" below.

**Maximum Voltage Rating at Probe Tip:** 24V ac rms, or 60V dc

**Probe Tip:** Maximum Temperature: 600°C (1112°F)  
Material: 303 stainless steel

**Sheath Material:** 303 stainless steel

**Cable Length:** 1.2 meters (4 ft)

**Cable Isulation:** Material: PVC  
Maximum Temperature: 105°C  
(220°F)  
Minimum Temperature: -20°F

**Conductors:** Type: K  
Size: AWG #24 stranded (7 strands of #32)  
Length: 1.2 meters nominal (4 ft)

**Handle:** Material: Hytrel  
Maximum Temperature: 125°C (257°F)  
Minimum Temperature: -20°F

**Connector:**  
Type: yellow mini-thermocouple connector with 0.792 mm (0.312 in) pin spacing  
Material: Hytrel  
Maximum Temperature: 125°C (275°F)

**Dimensions:**  
Diameter: 22.9 mm (0.9 in)  
Length: 322.6 mm (12.75 in)

## **MEASUREMENT CONSIDERATIONS**

### **Instrument compatibility**

The 80PK-7 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 must be considered along with the 80PK-7 accuracy specifications in order to determine the overall accuracy of the combination.

### **Temperature Limitations:**

The probe tip has continuous temperature rating of 600°C. However the rest of the assembly is rated for a lower temperature. See the specifications for further information.

### **Media Limitations:**

Media must be compatible with Chromel, Alumel, and 303 stainless steel.

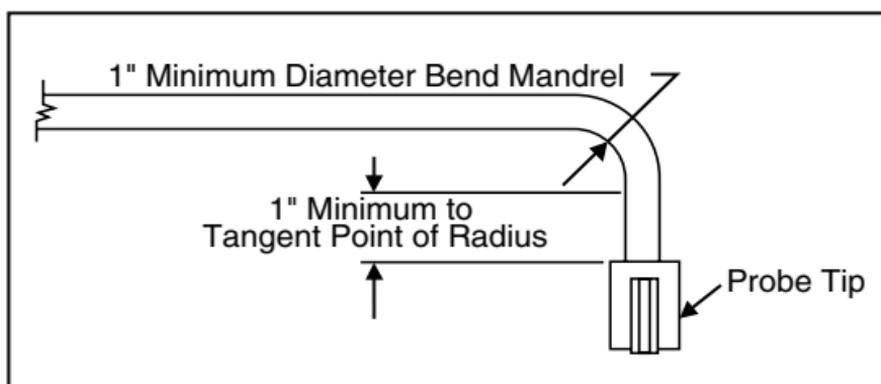
### **Application Information**

At high temperatures, a surface temperature probe removes a small amount of heat from the measured surface. At 600°C on a polished metal surface, the temperature at a contact point will be lowered, typically not more than 2°C. A lowering of the temperature at the contact point is less likely (and contact response time is quicker) on clean, polished, thermally conductive surfaces than on materials with low thermal conductivity, such as plastic or rough, contaminated surfaces. To obtain the best thermal contact and performance, the stainless steel ring must make full and firm contact with the measurement surface.

### **Bending the Probe Shaft**

This probe may be bent into a shape more appropriate to your application. Use the following guidelines and refer to Figure 1.

- Use a commercial pipe bender for 7.9 mm (5/16") to avoid collapsing the probe shaft.
- Do not bend the probe shaft into a radius of less than 1".
- Do not begin or end the bend closer to the probe head than 1".



**Figure 1. Bending Probe Shaft**

Bending the probe shaft in accordance with the above instructions will not result in loss of Fluke's standard product warranty protection. However, if the probe shaft is improperly bent, Fluke will not be liable for any damage to the probe itself or for any loss of function or fitness for its use. Bending the probe shaft is entirely at owner's risk.

## **OPERATION**

Use the 80PK-7 as follows:

1. Using the miniature thermocouple connector, connect the 80PK-7 to a compatible Type K temperature measuring instrument.
2. Turn on the measuring instrument and select the appropriate range and scale.
3. Read the temperature on the measuring instrument. When no heat or cold is applied to the sensing ribbon, the measuring instrument should display the ambient (room) temperature. If the instrument does not readout properly, refer to "TROUBLESHOOTING".

## **MEASURING TECHNIQUE**

To improve 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

When no heat or cold applied to the probe, the measuring instrument should display the ambient temperature. If the measuring instrument does not do so, try the following:

1. Verify that the temperature measuring instrument is designed for 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 instrument's owner's manual to see if this feature is available.

If you suspect a broken connection, use an ohmmeter to check probe continuity from pin to pin. If 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.

## CLEANING

Dip ¼" of the probe tip in the water. Do not dip the entire probe tip! Brush *lightly* with a toothbrush. *Excessive or abrasive brushing can damage the probe and void the warranty.* If necessary you can dip the brush, but not the probe, into rubbing alcohol. To dry the probe, bake it for a minimum of two hours at 150-200°F (66-93°C). Baking at temperatures above 200°F (93°C) can damage the cord and void the warranty.

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

**USA: 1-888-99-FLUKE (1-888-993-5853)**

**Canada: 1-800-36-FLUKE (1-800-363-5853)**

**Europe: +31 402-678-200**

**Japan: +81-3-3434-0181**

**Singapore: +65-738-5655**

**Anywhere in the world: +1-425-446-5500**

**Or, visit Fluke's Web site at [www.fluke.com](http://www.fluke.com).**

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## **LIMITED WARRANTY & LIMITATION OF LIABILITY**

Each Fluke product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 1 year and begins on the date of shipment. Parts, product repairs and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a Fluke authorized reseller, and does not apply to fuses, disposable batteries or to any product which, in Fluke's opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation or handling. Fluke warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. Fluke does not warrant that software will be error free or operate without interruption.

Fluke authorized resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Fluke.

Fluke's warranty obligation is limited, at Fluke's option, to refund of the purchase price, or free of charge repair, or replacement of a defective product which is returned to an Authorized Fluke Service Center within the warranty period.

To obtain warranty service, contact your nearest Fluke Authorized Service Center or send the product, with a description of the difficulty, postage and insurance prepaid (FOB Destination), to the nearest Fluke Authorized Service Center. Fluke assumes no risk for damage in transit.

Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If Fluke determines that the failure was caused by misuse, alteration, accident or abnormal condition of operation or handling, Fluke will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

Local warranty service is available only if product is purchased through a Fluke authorized sales outlet in the country of use or Buyer has paid the applicable Fluke international price. Product transported from the country of purchase for which the applicable Fluke international price was not paid must be returned to the country of purchase for warranty service at the shipment expense and risk of Buyer. Fluke reserves the right to invoice Buyer for importation costs of repair/replacement parts when product purchased in one country is submitted for repair in another country.

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