

## 80PK-3A

### Type K Thermocouple Surface Probe

### Instruction Sheet

#### WARNING

**TO AVOID ELECTRICAL SHOCK, DO NOT USE THIS PROBE WHEN VOLTAGES EXCEEDING 24V AC RMS OR 60 V 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):  $\pm 2.2^{\circ}\text{C}$  (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  $\mu\text{V} / ^{\circ}\text{C}$

**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

September 1989 Rev. 4, 4/02

©1993-2002 Fluke Corporation. All rights reserved. Printed in U.S.A.

All product names are trademarks of their respective companies

**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 owners 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:

$$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$$

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

$$(^{\circ}\text{F} - 32) \times 0.5556 = ^{\circ}\text{C}$$

## WARRANTY

Fluke Corporation (Fluke) warrants this product to be free from defects in material and workmanship under normal use and service for a period of 1 year from date of shipment. Software is warranted to operate in accordance with its programmed instructions on appropriate Fluke products. It is not warranted to be error free. This warranty extends only to the original purchaser and shall not apply to fuses computer media, batteries or any product which, in Flukes sole opinion, has been subject to misuse, alteration, abuse or abnormal conditions of operation or handling.

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.

THE FOREGOING WARRANTY IS PURCHASER'S SOLE AN EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, OR USE. FLUKE SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR LOSS WHETHER IN CONTRACT, TORT, OR OTHERWISE.

## CLAIMS

Immediately upon arrival, purchaser shall check the packaging container against the enclosed packing list and shall, within thirty (30) days of arrival, give Fluke notice of shortages or any nonconformity with the terms of the order. If purchaser fails to give notice, the delivery shall be deemed to conform with the terms of the order.

The purchaser assumes all risk of loss or damage to products upon delivery by Fluke to the carrier. If a product is damaged in transit, PURCHASER MUST FILE ALL CLAIMS FOR DAMAGE WITH THE CARRIER to obtain compensation. Upon request by purchaser, Fluke will submit an estimate of cost to repair shipment damage.

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.

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



205 Westwood Ave  
Long Branch, NJ 07740  
1-877-742-TEST (8378)  
Fax: (732) 222-7088  
salesteam@Equipment.NET