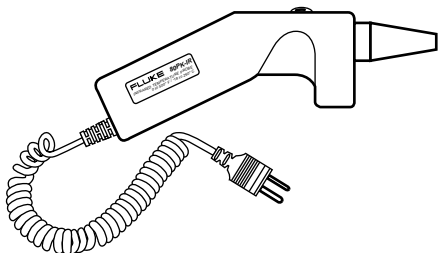


80PK-IR

Infrared Thermocouple Probe

Instruction Sheet

FLUKE®



INTRODUCTION

The Fluke 80PK-IR Infrared Thermocouple Probe (the probe) is a noncontact temperature measurement accessory for use with a digital Type K thermometer. The probe has a temperature range of -18°C to 260°C (0°F to 500°F), with a basic accuracy of 3% of reading, and a Type K miniature thermocouple connector.

Temperature is measured by pointing the probe at the surface to be measured and reading the temperature on the thermometer display.

Box Contents

Thermocouple Probe, Battery, Instruction Sheet, Quick Reference Card and Warranty Card.

SAFETY INFORMATION

The 80PK-IR complies with IEC Publication 1010-1-1990 including Amendment 1, CSA C22.2 No. 231, ANSI/ISA-S82.01 and .03 Safety Standards.

WARNING

IF TARGET EMISSIVITY IS LESS THAN 0.95, THE PROBE CAN INDICATE A TEMPERATURE LOWER THAN THE ACTUAL TARGET TEMPERATURE. AVOID TOUCHING THE TARGET; THERMAL BURNS COULD RESULT.

CAUTION

- **Do not place the probe on or around hot objects ($\geq 70^{\circ}\text{C}$ / 158°F). Heat may cause damage to the probe case.**
- **If the probe is exposed to significant changes in ambient temperature (hot to cold or cold to hot), allow 20 minutes for temperature stabilization before taking measurements.**
- **Do not operate the probe near large electrical or magnetic fields, such as arc welders and induction heaters. These fields can cause measurement errors.**
- **Condensation may form on the lens when going from a cold to hot environment. Wait 10 minutes for condensation to dissipate before taking measurements.**
- **Connectors must only be plugged into miniature Type K input jacks of a digital thermometer.**
- **Do not touch or hold by the front cone. Temperature readings can be affected by heat from the hand.**
- **Equipment use not specified by the manufacturer may impair safety.**

COMPATIBILITY

The probe is compatible with all digital thermometers that accept standard miniature Type K polarized thermocouple plugs with flat, in-line blades spaced 7.9 mm (0.312 in.) center-to-center.

OPERATION

To take a measurement, perform the following steps:

1. Plug the yellow connector into the miniature Type K jack on the thermometer.
2. Turn on the thermometer.
3. Slide the probe switch to "ON".
4. Point the tip of the probe at the object to be measured.
5. Read the thermometer display. (Refer to Table 1 for error conditions.)

NOTE

After 10 minutes of use, the probe automatically shifts to Sleep mode (the display shows ambient temperature). Restart the probe by sliding the switch to "OFF" and then to "ON" (see Table 1). Sleep mode extends battery life. However, for maximum battery life, switch the probe to the "OFF" position.

Measurement Considerations

- For small target surfaces (13 mm (1/2 in.) or less), hold the probe as close as possible without touching the surface (no more than 50 mm (2 in.) away).
- If the surface to be measured is covered by frost or other material, clean it to expose the surface.

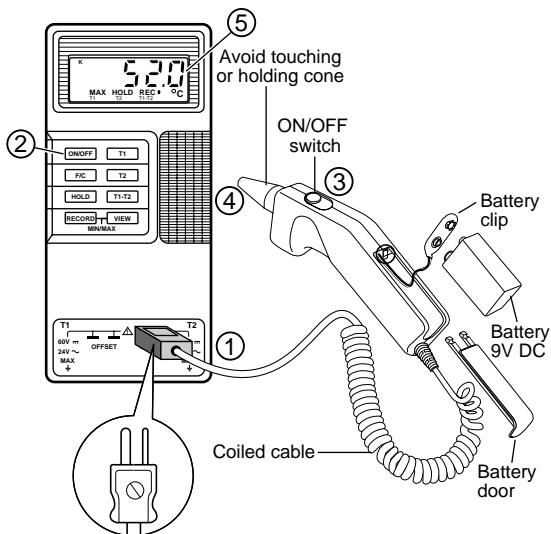


Figure 1.

- If target emissivity is less than 0.95, wait until the target is at a safe temperature, then apply a high emissivity coating to the surface (such as flat black paint or masking tape.)
- If the probe seems to be giving incorrect readings, check the front of the probe. There may be condensation or debris obstructing the sensor; clean per "Front Window Cleaning" instructions.

Display Codes

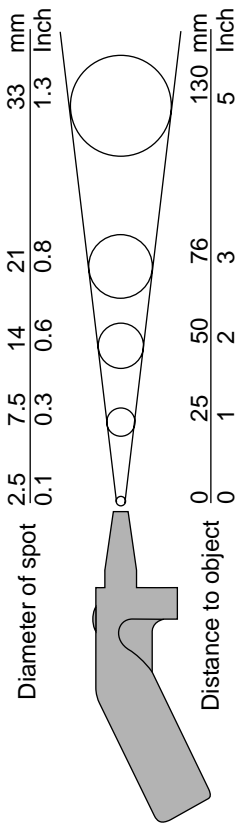
Under the conditions shown in Table 1, the thermometer will alternate between displaying a reading and a Display Code.

Table 1.

Display Codes*	Condition	Action
270°C (518°F) or -30°C (-22°F)	Target temperature is over or under range.	Select target within probe's specified temperature range.
280°C (536°F) or -45°C (-49°F)	The temperature of the probe is near either the high or low ambient operating range limit.**	Ensure that the probe is within the specified ambient operating range.
-60°C (-76°F)	Battery power is low.	Replace the battery.
Ambient Temperature	Sleep mode or battery is dead.	Restart the probe by sliding switch to "OFF" and then to "ON", or replace battery.
<p>* Values may vary ± 7 °F (4 °C) depending on system accuracy.</p> <p>** Although a display code may be present, the displayed reading is valid if the probe is within the specified ambient operating range.</p>		

Emissivity

All objects emit invisible infrared energy. This ability, called emissivity, is based upon the material that the object is made of and its surface finish. Emissivity values typically range from 0.10 for a very reflective object to 1.00 for a black body. The probe senses this energy assuming that the target has an emissivity value of 0.95. This value is factory set in the probe. If the actual target emissivity is less than 0.95, the indicated temperature could be less than the actual target surface temperature. To correct for this, safely coat the target with a substance with emissivity ≥ 0.95 or thermally bond a "target" with emissivity ≥ 0.95 to the surface to be measured.



Spot size increases with distance from the probe tip, as shown

Figure 2.

Distance to Spot Size Ratio

Distance to Spot Size Ratio (or Field of View) refers to the diameter of the spot that the probe is sensing at a given distance. The closer you are to the object (or target), the smaller the area (or spot) the probe is sensing. For example when the probe is held at a 200 mm (8 in.) distance from the target, the spot size is approximately 50 mm (2 in.); at 100 mm (4 in.) the spot size is approximately 25 mm (1 in.), and with the probe held at a 50 mm (2 in.) distance from the target, the spot size is approximately 13 mm (1/2 in.). Hot spots can be missed if too large an area is included in the field of view, so get as close as possible without touching! (See Figure 2.)

Operational Check

For an operating test of the probe, point it directly at ice immersed in water (slush). The meter should read, within specifications limits, 0°C (32°F) (see Accuracy specifications).

SPECIFICATIONS

Temperature Range: -18 to 260°C (0 to 500°F)

Ambient Operating Range: 0 to 63°C (32 to 145°F)

Accuracy (for 1 year): ±3% of reading or ±3°C (±5°F), whichever is greater, @ 22 to 32°C (72 to 90°F) ambient operating temperature

Temperature Coefficient: ±0.2% of reading or ±0.2°C (±0.3°F), whichever is greater, change in accuracy per °C change in ambient operating temperature above 32°C (90°F) or below 22°C (72°F).

Response Time: 1 second

Optical Resolution:	4 to 1 distance to spot size ratio
Spectral Response:	8 to 14 microns nominal
Target Emissivity:	Probe calibrated for 0.95
Output:	Type K thermocouple voltage characteristics
Relative Humidity:	95% or less @ 30°C (86°F) noncondensing, Temp. Coef. applies
Storage Temperature:	-25 to 70°C (-13 to 158°F) without battery
Power:	9V battery; (NEDA 1604A, 6F22, 006P)
Battery life (Alkaline):	50 hours typical, @ 23°C (73°F) 33% duty cycle
Dimensions:	(L x W x H) 180 mm x 30 mm x 50 mm (7.1 in.) x (1.2 in.) x (2 in.)
Weight:	180 gm (6.4 oz)

MAINTENANCE

Battery Replacement

Remove battery door (See Figure 1.) and replace with a 9V Alkaline battery (ANSI/NEDA 1604A, IEC 6LR61).

Front-Window Cleaning (as necessary)

1. Blow off loose particles using clean compressed air.
2. Gently brush remaining debris away with a camel hair brush or cotton swab.
3. Carefully wipe the surface with a moist cotton swab. The swab may be moistened with water or a water-based glass cleaner. Allow to air dry. (Do not use solvents to clean the window.)

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.

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Fluke's warranty obligation is limited, at Fluke's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a Fluke authorized 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).

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Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this Warranty is held invalid or unenforceable by a court of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

Case Cleaning

To clean the exterior housing, simply use soap and water or a mild commercial cleaner. Wipe with a damp sponge or soft rag.

Service

To order parts or for service information in the U.S.A., call 1-800-825-9810. Outside the U.S.A., contact the nearest Fluke Service Center.

Calibration

Fluke recommends that the user return the probe annually to a Fluke Service Center for calibration, starting one year after purchase.

Replacement Part

Battery (Alkaline) - PN 614487

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

800-443-5853 (800-44-FLUKE) in the U.S.A. and Canada

(31 40) 723220 in Europe

206-356-5500 from other countries

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