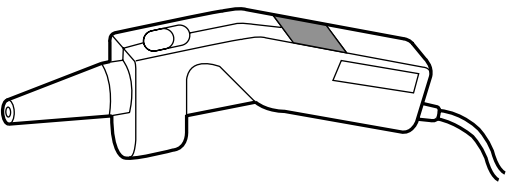
FLUKE®

80T-IR

Infrared Temperature Probe

Instruction Sheet



Introduction

The Fluke 80T-IR Infrared Temperature Probe (the probe) is a noncontact temperature measurement accessory for use with a test instrument capable of measuring DC volts in the millivolt range such as a digital multimeter (DMM). 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 an output of 1 mV dc per °C or °F.

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

Box Contents

Temperature Probe, Battery (installed), Instruction Sheet, Quick Reference Card and Warranty Card.

PN 935072 February 1993 Rev. 3, 9/97

Safety Information

The 80T-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 EMMISSIVITY 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 (70°C / 158°F). It will damage 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 voltage measurement input jacks of the test instruments.**
- **Do not touch or hold by the front cone. Temperature readings can be affected by heat from the hand.**
- **Equipment use not specified by manufacturer may impair safety.**

Compatibility

The probe is compatible with all DC millivolt measuring instruments that have a minimum of 1 MΩ input impedance and accept safety shrouded, standard diameter 0.16 in. (4 mm) banana plugs.

Operation

To take a measurement, perform the following steps:

1. Plug the red connector into the VΩ dc input jack and the black connector into the common or ground input jack on the test instrument.
2. Select mV dc on the test instrument.
3. Slide the probe switch forward to the "ON" position.
4. Point the tip of the probe as close as possible to the object being measured without touching the object.
5. Read the test instrument display.

Additional considerations are:

- After 10 minutes of use the probe will automatically shift to Sleep mode (the display will show 0°C or 0°F). It can be restarted 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.
- The temperature scale can be changed to °C or °F by removing the battery from the battery compartment and moving the internal °C/°F switch to the desired position. (see Figure 1).
- If the test instrument displays an overload condition, switch the DMM range from mV dc to V dc. Increasing the range to V dc moves the decimal position three places to the left (500°F displays as 0.500V).

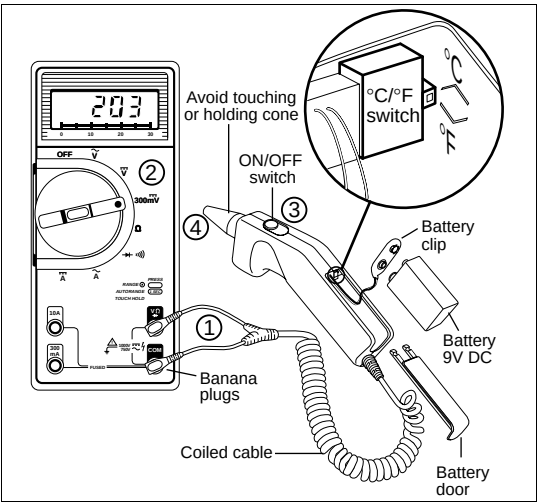


Figure 1.

Display Codes

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

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 0.98 for a near perfect 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, apply masking tape or a coat of matte paint to the target. The resulting target will have an emissivity of approximately 0.95.

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.
0°C (0°F)	Sleep mode or battery is dead.	Restart the probe by sliding switch to "OFF" and then to "ON", or replace battery.

* Values may vary ±5 degrees depending on DMM accuracy.

** Although a display code may be present, the displayed reading is valid if the probe is within the specified ambient operating range.

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! (See Figure 2.)

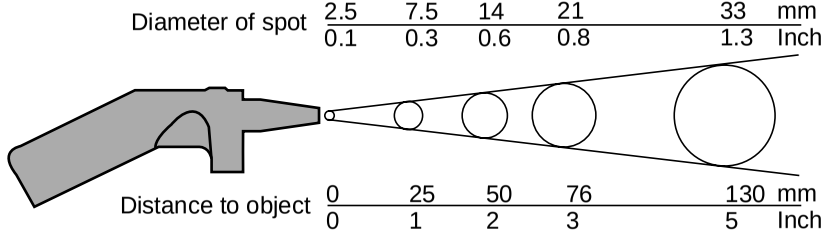


Figure 2.

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

Measurement Considerations

- If the surface to be measured is small (13 mm (1/2 in.) or less), hold the probe as close as possible to 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.
- If the surface to be measured is highly reflective such as polished metal, apply masking tape or a matte finish paint to the surface.
- 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 instructions in the maintenance section.

Quick Check

For a quick check 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, @ 18 to 28°C (64 to 82°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 28°C (82°F) or below 18°C (64°F).
Response Time:	1 second
Spectral Response:	8 to 14 microns nominal

Emissivity:	pre-set 0.95
Output:	1 mV/degree °C or °F
Relative Humidity:	95% RH 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 Q-tip.
3. Carefully wipe the surface with a moist Q-tip. 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.)

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

For service information in the U.S.A., call 1-800-526-4711. Outside the U.S.A., contact the nearest Fluke Service Center. To locate an authorized service center, visit us on the World Wide Web: www.fluke.com or call Fluke using the phone numbers listed below:

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

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

Calibration Procedures - PN 933234

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 one 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. Warranty support is available if product is purchased through a Fluke authorized sales outlet or Buyer has paid the applicable international price. 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.

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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