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# FLUKE®

## 80K-6 High Voltage Probe

### Instruction Sheet

### Description

The 80K-6 is a high voltage probe designed to extend the voltage measuring capability of an ac/dc voltmeter to 6000 volts peak AC or DC Overvoltage Category I. This means the probe can only be used to make measurements on energy limited circuits within equipment. Examples include high voltage within televisions or photo copy machines. DO NOT use this probe to measure high voltages on power distribution systems. A 1000:1 voltage divider provides the probe with a high input impedance. The divider also provides high accuracy when used with a voltmeter having a 10 megohm input impedance. A molded plastic body houses the divider and protects the user from the voltage being measured.

### Specifications

The 80K-6 will achieve rated accuracy when it is used with an ac/dc voltmeter having 0.25% accuracy, or better, and an input impedance of 10 megohms  $\pm 10\%$ . Specifications for the probe are as follows:

**Voltage Range:** 0 to 6 kV, dc or peak ac  
**Input Impedance:** 75 megohms nominal  
**Division Ratio:** 1000:1

**Accuracy:**  
DC to 500 Hz:  $\pm 1\%$   
500 Hz to 1 kHz:  $\pm 2\%$   
Above 1 kHz: Output reading falls. Typically, -30% at 10 kHz.

**Temperature:**  
Storage: -20 to 60°C  
Operating: 0 to 50°C

**Temperature Coefficient:** 100 ppm/C  
**Relative Humidity:** 20 - 80%  
**Altitude:** 2000 m

**Shock and Vibration:**  
Shock: 1 m Drop  
Vibration: 5-55 Hz swept sine 3 g max.

**Dimensions:** 24.89 cm (9.8 in) (probe body), 5.10 cm (2.0 in) max. width  
12.7 g (45 oz)

**Weight:**  
**Safety:** CAN/CSA C22.2 No. 1010.2.031-94 & IEC 1010-2-031:1993, Type B, 6 kVDC or peak AC, 4.24 kV rms AC, Overvoltage Cat. I (Voltage derived from limited energy transformers).

### Measurement Considerations

Before attempting to use the 80K-6, the following paragraphs should be read and understood. Particular attention should be given to Operator Safety.

### Operator Safety



Indicates the operator must refer to an explanation in this manual.



Indicates terminals at which lethal voltages may exist.

### ⚠ Warning

- To avoid damage or electric shock, use within ratings and under dry (no condensation) conditions.
- To avoid electrical shock, the 80K-6 user should be familiar with, and exercise, all possible high-voltage safety practices. When handling the probe the following additional cautions must be taken:
  - When making a measurement, never make body contact with the probe tip or the red portion of the probe. Always hold the probe by its black handle.
  - Before making a measurement, make sure that the ground side of the output connector is connected to the voltmeter's common terminal.
  - The clip lead must be attached to earth ground.
  - Do not use the probe if it is damaged. Before using the probe, inspect it for cracks or missing plastic. Pay close attention to the probe body, tip and insulation surrounding the connectors.
  - Make sure the tip is firmly attached to the body.
  - When servicing, use only specified replacement parts.
  - Do not operate probe around explosive gas, vapor or dust.
  - Do not use the probe if it operates abnormally. Protection may be impaired. When in doubt have the probe serviced.

### Voltmeter Compatibility

The 80K-6 is compatible with any ac or dc voltmeter that has an input impedance of 10 megohms  $\pm 10\%$ . Voltmeters with higher input impedances require the use of an external shunt to obtain an accurate measurement.

Use the following formula to determine the value of an external shunt resistor:

$$R_s = \frac{R_m \times 10}{R_m - 10}$$

Where:  $R_s$  = Shunt Resistance in Megohms  
 $R_m$  = Voltmeter Input Impedance in Megohms (> 10 megohms)

### Circuit Loading

The 80K-6 represents a load of approximately 75 megohms to the circuit being measured (13  $\mu$ A per 1 kV). See Figure 1. To more accurately determine the load resistance, measure the resistance of the 80K-6 at its voltmeter connector and multiply the measured value by 1000.

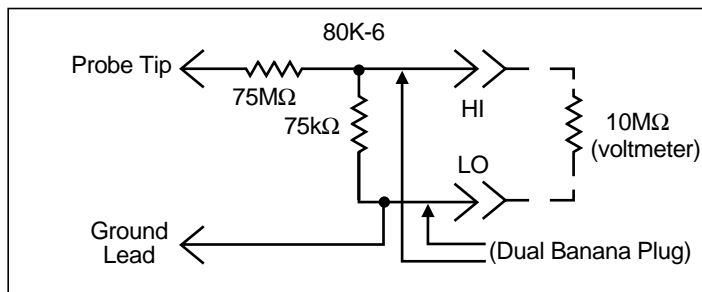


Figure 1. 80K-6 Schematic Diagram

### Operation

Use the following procedure to operate the 80K-6:

1. Inspect the probe. (Refer to the preceding Warning.)
2. Connect the probe cable to a compatible voltmeter. (Refer to the preceding Warning.) Use a shunt resistor if required.
3. Select an appropriate voltage range (1 volt reading per 1000 volt probe input).
4. Connect the ground lead of the probe to earth ground. (Refer to the preceding Warning.)
5. Hold the probe by the black handle and connect the probe tip to the circuit being measured. Observe the voltmeter reading.

### Maintenance

#### Performance Test

Verify the probe accuracy by measuring a 5 kV dc  $\pm 0.25\%$  voltage source. When used with a compatible dc voltmeter, the probe should accurately measure the source voltage to within  $\pm 1\%$ . No calibration adjustments are provided on the probe.

#### Cleaning

Use a soft cloth dampened with distilled water to clean the 80K-6. Never use solvents or abrasive cleaners.

#### Disassembly

Use the following procedure to disassemble the probe:

1. Unscrew the black handle from the probe, and slide the handle onto the cable.
2. Unscrew the metal tip one turn, and push in on the tip until the internal assembly snaps free of the housing. Remove the tip.
3. Withdraw the internal assembly from the probe by pulling the metal ring over the threads on the probe body.
4. Logically reverse this procedure to reassemble the probe.

### Caution

**To avoid probe damage after repair, measure and, if necessary, adjust the outside distance between the ring and the probe coupling on the internal assembly before reassembling the probe. The distance must be 4.910 $\pm$ 0.020 inches. Make the adjustment using the solder connection at the rear of the metal probe coupling.**

### Replaceable Parts

Description	Fluke Part No.
Tip, High Voltage	536946
Body, Probe	580621
Coupling, Probe	536961
Divider, High Voltage	632091
Sleeve	580605
Bus Wire, Probe	617290
Instruction Sheet	613224
Decal	587063
Alligator Clip	306753
Boot	217703