

High Voltage Probes

By G8MNY

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(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

Although you can buy a commercial probe, here is one that you can make for either an oscilloscope or a DMM. It is designed to fit an old plastic single piece clear pen tube. For general high voltage work there is no need for great accuracy, just safety & kit protection.

Specifications

240V - 10kV MAX

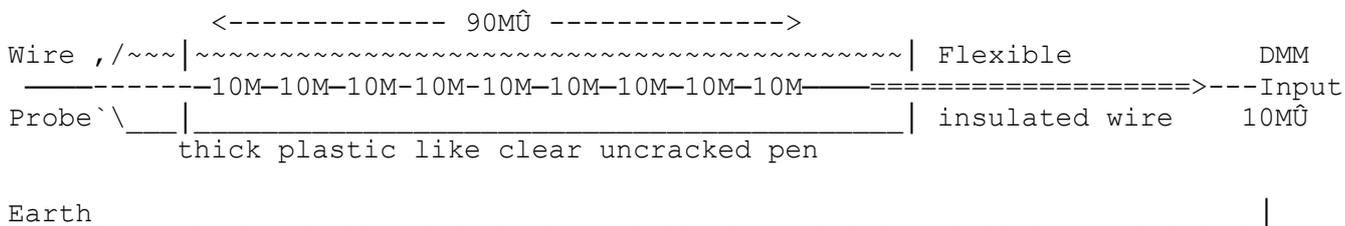
DC to 50Hz only. Not for LOPTY AC stages!

100MΩ input load.

Use 1kV rated Rs!

10:1 DIGITAL VOLTMETER PROBE

This assumes the DMM is 10MΩ input.



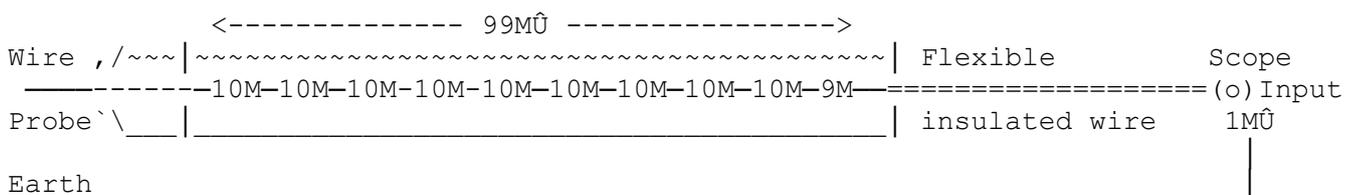
CALIBRATION

DMM

Apply mains to DMM & note reading. Add the series probe & the reading should have gone down to 1/10. If too high add more Rs to suit, if too low replace an R with a low value to suit.

100:1 SCOPE PROBE 100

This assumes the scope is 1MΩ input.



The 9MΩ is just a low value 10MΩ selected on test. Or you could just use the same DMM probe for both & recalibrate the scope to suit when used.

CALIBRATION

SCOPE

If scope has 100V/cm range, apply 240V mains at 350V peak 700V peak-peak & measure with scope directly, it should give about 7cm p-p. Now with probe in series adjust the scope's Y front panel gain for the same 7cm P-P display on the 1V/cm range. Or you can adjust the R values as in DMM calibration.

MEASURING HIGH VOLTAGES

With all power off, & any HV point safely dumped to earth, connect the wire probe. Ensure the meter/scope is safely connected to the same circuit as needed.

With hands clear power up the HV & take readings etc.

For B/W TV/MON/SCOPES EHT be aware that 10kV will easily track any slightly dirty/damp surface! Plastic sprays like "Damp Start" can be useful, but be aware of non connection to surfaces coated with it!

SAFETY

If the testgear end gets disconnected power down the HV unit & make sure any HT is safely discharged before working on the loose testgear end of the probe.

This longitudinal resistor design should not flashover, but is extra testgear protection is needed put a wire ended NEON tube across the DMM/SCOPE input. That should limit the DMM or SCOPE to see only 80V (e.g. probe can only measure up to 800V on DMM or 8kV on SCOPE).

See my Tech Buls "Scope Probes" & "Scope & DMM Calibrator"

Why Don't U send an interesting bul?

73 de John G8MNY @ GB7CIP