

OPERATING INSTRUCTIONS FOR AMPROBE® MODEL AM-5 DIGITAL MULTI•PROBE TESTER



See PRECAUTIONS FOR
PERSONAL AND INSTRUMENT
PROTECTION on page 4

LIMITED WARRANTY

Congratulations! You are now the owner of an AMPROBE® instrument. It has been quality crafted according to quality standards and contains quality components and workmanship. This instrument has been inspected for proper operation of all of its functions. It has been tested by qualified factory technicians according to the long-established standards of AMPROBE INSTRUMENT.

Your AMPROBE instrument has a limited warranty against defective materials and/or workmanship for 90 days from the date of purchase provided, in the opinion of the factory, the instrument has not been tampered with or taken apart.

Should your instrument fail due to defective materials, and/or workmanship during the 90-day warranty period return it along with a copy of your dated bill of sale which must identify instrument by model number and serial number.

For your protection, please use the instrument as soon as possible. If damaged, or should the need arise to return your instrument, it must be securely wrapped (to prevent damage in transit) and sent prepaid via Air Parcel Post insured or UPS where available to:

Service Division
AMPROBE INSTRUMENT
P.O. BOX 329 (Use for P.P.)
630 Merrick Rd. (Use for U.P.S.)
Lynbrook, N.Y. 11563

Outside of the U.S.A. the local Amprobe representative will assist you.

Above limited warranty covers repair and replacement of instrument only and no other obligation is stated or implied.

SPECIFICATIONS

Voltage Ranges

0-199.9/1000VAC/DC* Input Impedance - 1 Megohm
15KV AC/DC - See Note 1 on page 4

*Do not use above 1000 volts

Millivolt Ranges

0-1999mV AC/DC Input Impedance - 1 Megohm

Resistance Ranges

0-199.9/1999 Ohms

0-19.99K ohms

Open Circuit Voltage - 0.55 volts

Current Ranges

0-199.9/1999uA AC/DC at 400mV

0-19.99mA AC/DC at 400mV

Leakage

0-1.999mA AC (120 or 230 VAC Appliances). See Note 2 on page 4.

Drop Proof Test: Will withstand a 5 foot drop.

Accuracy * (64°F-82°F/18°C-28°C)

DC Volts, uA and mA: $\pm 1\%$ of reading + 1 digit

AC Volts, uA and mA: $\pm 2\%$ of reading + 4 digits

Resistance: 0-199.9 ohms $\pm 2\%$ of reading + 4 digits

0-1999 ohms and 0-19.99K ohms $\pm 2\%$ of reading
+ 2 digits.

*AC is based on sinusoidal waveform 40-400 Hz

Case Voltage Breakdown

3000VAC

Sampling Rate

2.5 per second

Response Time

DC Volts, uA and mA 2.5 seconds

AC Volts, uA and mA 3.5 seconds

Resistance 2.5 seconds

Power Supply

Uses one 9V Alkaline Battery (Cat. No. MN1604) not supplied

Circuit Protection

Resistance and current ranges are fuse protected with an 8AG-361 0.1 Amp 250VAC fuse.

Do not use substitute fuses as blow time can vary, see page 13.

All voltage ranges are overload protected up to 1500 VAC or 2000VDC.

Millivolt range is overload protected up to 240VAC/DC.

**Note 1 This range capability is available through the use of an accessory High Voltage Probe Model HV-5 and resistor, Model HVR-5, Resistor is not supplied with probe.

**Note 2 This testing capability is available through the use of an accessory AC Leakage Detector, Model ACL-5.

**Accessory is not supplied with the basic AM-5 instrument.

IMPORTANT: Use of instrument and/or accessories on circuits with higher voltages and/or currents than the indicated overload limits may result in personal injury and/or damage to the instrument and/or accessories.

PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION

- 1) Read these instructions thoroughly and follow them carefully.
- 2) In many instances you will be working with dangerous levels of voltage and/or current, therefore, it is important that you avoid direct contact with any uninsulated, current-carrying surfaces. Appropriate insulating gloves and clothing should be worn.
- 3) Before connecting or disconnecting the meter to or from the circuit to be tested, turn off all power to the circuit.
- 4) Before applying test leads to circuit under test, make certain:
 - a) Test leads are plugged into proper instrument jacks and
 - b) Selector function switches are set to proper range and function.
- 5) Before using any electrical instrument or tester for actual testing, the unit should be checked on a known live line to make certain it is operating properly.

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- 6) If the instrument should indicate that voltage is not present in circuit, or give a reading which does not appear to be correct, do not touch circuit until you have checked to see that all instrument switches are in proper position and instrument has been checked on a known live line.
- 7) Make certain no voltage is present in circuit, before connecting ohmmeter to circuit.
- 8) Do not use the range positions marked with a "—" as incorrect readings will be obtained.

IMPORTANT: Plug in only one accessory probe or set of test leads at any one time except as directed.

IMPORTANT: Failing to follow these instructions and/or to observe the above precautions may result in personal injury and/or damage to the instrument and/or accessories.

GENERAL

To install the battery (9 Volt Alkaline, Cat. No. MN1604) turn instrument over and remove battery cover by sliding out (Fig. 1). Snap battery into connector, place battery in battery compartment and replace cover. To turn on the AM-5, push in the ON/OFF switch (see Fig. 2) until it locks in and the digital display appears in the window. The "ON/OFF" must be in the "ON" position for all tests and measurements covered by these instructions.

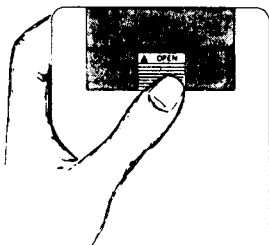


Fig. 1

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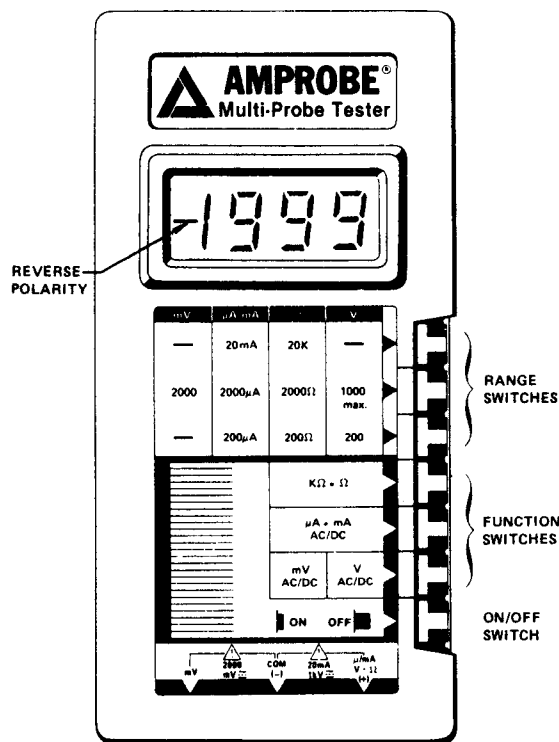


Fig. 2

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The front panel of the AM-5 is designed, labeled and color-coded to simplify the operation and to minimize the possibility of error. To further help reduce the possibility of error, the three Range Push Buttons and three Function Push Buttons are self-cancelling. To activate a particular range (or function) push in the switch until it locks in the "ON" position. This action will also release (cancel) any other Range Button (Function Button) that was previously locked in.

NOTE: An erratic reading, a reading below the expected level or a zero reading, may be an indication that the wrong range and/or function is being used.

LOW BATTERY INDICATION

When either an arrow "←" or the word "Batt" appears to the left of the display, replace the battery.

OVER RANGE INDICATION

Over-range (an input which is too large for the selected range) is indicated when "1", without any other numbers, appears in the Most Significant Digit position (the first digit on the left of the display). A decimal may or may not appear with the "1" depending on the selected range.

When measuring AC or DC volts, do not exceed 1000 volts on the 1999 range. AM-5 does not indicate overrange if more than 1000 volts is applied.

REVERSE POLARITY INDICATION

If the test leads are not connected to the circuit "+" to "+" and "-" to "-" when measuring DC, a "-" symbol will appear to the left of the digital display.

Connecting Test Leads

The AM-5 features safety twist-lock connectors on the test leads. To connect these to the AM-5,

- 1) Align the two projections on one connector with the "COM" keyway slot in the bottom end of the AM-5.

- 2) Insert the connector into the keyway slot.
- 3) Push in slightly and turn clockwise 1/4 turn, to lock in position.
- 4) Repeat with the other test lead, using the correct jack for the measurement to be made.
- 5) To remove, reverse the above steps.

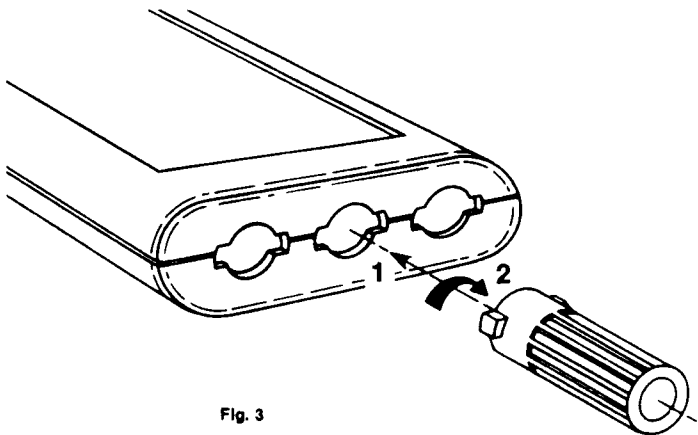


Fig. 3

To Use The AM-5 As A VOLTAGE TESTER

The AM-5 test leads may be used in two ways:

- 1) As a regular set of test leads where the AM-5 can be rested on a flat non-metallic surface.
- 2) As a voltage tester, with one of the test probes fastened into one of the slots in the top of the AM-5.

To set the AM-5 for use as a voltage tester:

- 1) Connect test leads into the "COM" and " μmA " $\text{V} \cdot \Omega$ jacks.
- 2) Slide the appropriate latch on top of the AM-5 toward the center of the case.

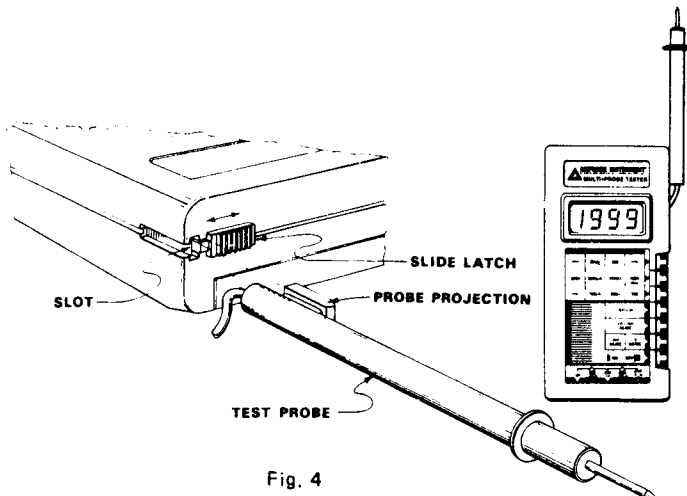


Fig. 4

- 3) Align the probe projection on the test probe (Fig. 4) with the appropriate slot in the top of the AM-5.
- 4) Insert probe projection into slot.
- 5) Push the slide latch over toward the test probe so it locks the probe projection in position. If slide latch does not move, gently push down on the test probe so the probe projection is fully inserted.

DC/AC VOLTAGE RANGES

All voltage measurements are read directly from the digital display except when using the 15KV AC/DC Probe in which case an appropriate multiplying factor must be applied. See page 10-11.

AC/DC Voltage Measurement (See Operating Precautions on page 4-5.)

- 1a) Push in the " $\frac{V}{AC/DC}$ " push button.
- 1b) Push in the push button for the appropriate voltage range (red

band on front panel). When voltage is unknown, use the highest voltage range (1000V).

- 2) Plug the Black test lead into the "-" or "COM" jack.
- 3) Plug the red test lead into the "+" or " μ/mA " jack.
- 4) Place one test prod on each side of the circuit under test. If "-" sign appears to left of reading when measuring DC, reverse Red and Black test prods.
- 5) If meter reading falls within a lower range, push in the push button for the lower range.

For 15KVAC/DC see Note 1 on page 4 and instructions on page 10-11.

AC/DC Millivolt Measurement (See Operating Precautions on page 4-5.)

- 1a) Push in the " $\frac{mV}{AC/DC}$ " push button.
- 1b) Push in the push button for the 2000 millivolt range.
- 2) Plug the Black test lead into the "-" or "COM" jack.
- 3) Plug the Red test lead into the "mV" jack.
- 4) Place one test prod on each side of the circuit under test. If "-" sign appears to left of reading when measuring DC, reverse Red and Black test prods.

High Voltage Probe 15 KV (See Operating Precautions on page 4-5.)

- 1) To use accessory High Voltage Probe Model HV-5 with the AM-5, unscrew handle from main probe and insert resistor, Model HVR-5 (not supplied with probe) with the spring on the resistor toward the handle.
- 2) Screw handle back onto probe.
- 3) Push in the 200V Range Push Button.
- 4) Push in the " $\frac{V}{AC/DC}$ " Function Push Button.
- 5) Plug instrument's Black voltage test lead into "-" jack on AM-5 and fasten the other end of the lead to "ground" of circuit being tested.
- 6) Plug HV-5 Probe (with resistor installed) into "+" jack.

- 7) With your hand behind the protective discs on the handle of the probe, touch the probe tip to the circuit under test.
- 8) Take reading and multiply by 100.

CAUTION: DO NOT EXCEED 15,000 volts AC or DC.

NOTE: Tip of HV-5 Probe is replaceable.

AC/DC CURRENT MEASUREMENT (See Operating Precautions on page 4-5.)

A milliampere is one thousandth (1/1000) of an ampere and may be written as 1 mA or 0.001 ampere.

A microampere is one millionth (1/1,000,000) of an ampere and may be written as 1 μ A or 0.000001 ampere.

Meter must be connected in series with the circuit under test.

- 1a) Push in the " μ A•mA" push button.
AC/DC
- 1b) Push in the push button for the appropriate range. (Yellow band on front panel). When current is unknown use the highest current range.
- 2) Plug Black test lead into the "—" or "COM" jack.
- 3) Plug Red test lead into the " μ /mA" jack.
V• Ω
- 4) Using the Red and Black test leads connect the meter in series with the circuit under test.
- 5) If "—" sign appears to the left of the reading when measuring DC, reverse the Red and Black test leads.
- 6) If meter reading falls within a lower range, push in the push button for the lower range.

RESISTANCE MEASUREMENTS (See Operating Precautions on page 4-5.)

- 1) Push in the "K Ω • Ω " push button.
- 2) Push in the desired ohmmeter range push button. (Green band on front panel.)
- 3) Plug the Black test lead into the "COM" jack.
- 4) Plug the Red test lead into the " μ /mA" jack.
V• Ω

- 5) Connect test leads across the resistance to be measured.

Caution: Resistance to be measured must be disconnected from all power before applying ohmmeter test leads.

- 6) If meter reading falls within a lower range, push in the push button for the lower range. If meter indicates over range (1——) remove from circuit and reset selector switch to a higher range, if possible.

NOTE: When measuring low resistances, the test lead resistance must be subtracted from the measurement as the instrument measures its own test lead resistance as it measures the circuit or device resistance. To obtain the test lead resistance, connect as outlined above and short the test leads together (make certain a good electrical contact is made between the test points) and read the test lead resistance. Because of the sensitivity of the AM-5, even slight corrosion on the probe tips or test points may cause erroneous readings. To clean probe tips use fine steel wool.

AC LEAKAGE (See Operating Precautions on page 4-5.)

AC Leakage can be measured using the Model ACL-5 Leakage Detector available separately as an accessory. (For 120/230VAC Appliances).

- 1) Push in the " μ A•mA" Push Button.
AC/DC
- 2) Push in the 2000 μ A Range Push Button.
- 3) Plug the Black connector lead of the ACL-5 into the "COM" jack on the AM-5.
- 4) Plug the Red connector lead of the ACL-5 into the " μ /mA" jack on the AM-5.
V• Ω
- 5) Fasten the alligator clip test lead of the ACL-5 to an earth ground (metal cold water pipe, radiator, etc.) or to the power line ground or ground contact of a three-prong socket.

IMPORTANT: If the appliance to be checked has a 3-prong plug with a ground, the ground connection inside the appliance must be disconnected. Disconnect appliance from power while doing this.

- 6) If the appliance has been disconnected from the power supply,

reconnect it.

- 7) a) Using the test lead probe of the ACL-5, touch various parts (bare metal) inside and outside of the appliance. If appliance has a multiple-cycle switch and/or a multiple-level power switch, test the appliance with the switch(es) in each position.
- b) Refer to table below for levels of leakage which are considered acceptable according to ANSI.

Maximum Leakage Current Table*

Type of Appliance	Maximum Leakage Current milliamperere
Two-wire cord-connected appliance	0.50 (500 μ A)
Three-wire (including grounding conductor) cord-connected portable appliance	0.50 (500 μ A)
Three-wire (including grounding conductor) cord-connected stationery or fixed appliance	0.75 (750 μ A)

NOTE: Additional leakage-current requirements may be found in individual product standards.

*Reference ANSI Publication C'101.1-1973

FUSE REPLACEMENT

The fuse that protects the current and resistance ranges of the instrument is a 0.1 amp, 250VAC/DC fuse.

- 1) If the fuse is blown, remove battery cover by sliding out (Fig. #1)
- 2) The fuse is located in the bottom of the battery well. Replace it with an 8AG-361 0.1 amp 250VAC/DC fuse.