

P/N 947776  
5/98

OPERATING INSTRUCTIONS  
for  
**AMPROBE**



Insulation Tester  
Model AMB-5D



**AMPROBE**  
A United Dominion Company

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## LIMITED WARRANTY

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

Your AMPROBE® instrument has a limited warranty against defective materials and/or workmanship for one year from the date of purchase provided the seal is unbroken or, in the opinion of the factory, the instrument has not been opened, tampered with, or taken apart.

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

**IMPORTANT:** For your protection, please use the instrument as soon as possible. If damaged, or should the need arise to return your instrument, place it in a shipping carton packed with sufficient packing material. It must be securely wrapped. Amprobe is not responsible for damage in transit. Be sure to include a packing slip (indicating model and manufacturer number) along with a brief description of the problem. Make certain your name and address appears on the box as well as packing slip.

Ship prepaid via Air Parcel Post insured or U.P.S. (where available) to:

Service Division  
AMPROBE®  
630 Merrick Road (use for U.P.S.)  
P.O. BOX 329 (use for Parcel Post)  
Lynbrook, NY 11563-0329

Outside the U.S.A the local Amprobe representative will assist you. Above limited warranty covers repair and replacement only and no other obligation is stated or implied.

## SAFETY INFORMATION

The circuit under test must be de-energized and isolated before connections are made, except for voltage measurements.

Circuit connections must not be touched during test.

After insulation tests, capacitive circuits must be allowed to be discharged.

Test leads (including two crocodile clips), must be in good order, clean and have no broken, or cracked insulation.

Do not push test button before all connection and preparation is done. The instrument must only be used by suitably trained and competent persons.

## WARNINGS AND SAFETY SYMBOLS



Caution - refer to this manual before using meter.



Dangerous voltages.



Meter is protected throughout by double insulation or reinforced insulation.



Instrument complies with IEC1010-1.

**When servicing, use only specified replacements parts.**

## PARTS AND CONTROLS

- A. Storage compartment
- B. LCD Display
- C. Mega Ohm TEST button
- D. Data hold button
- E. Mega Ohm TEST power LOCK button
- F. Back light button Auto power OFF (wake.up)
- G. Function Selector
- H. Hi measuring terminal
- I. Lo measuring terminal

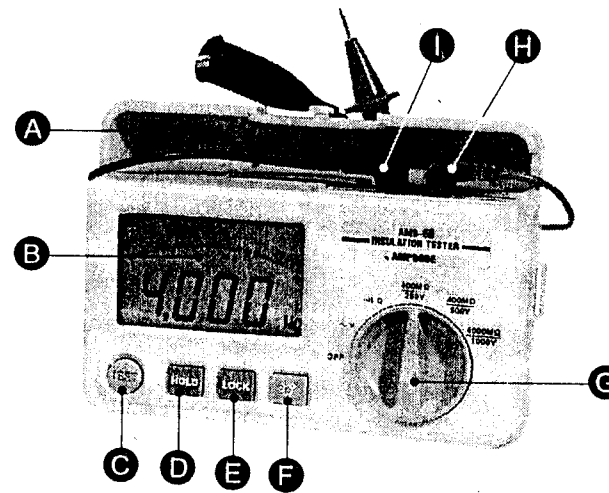



Fig. 1

## BEFORE OPERATION

### How to connect test leads:

Connect the red test lead into the "Hi" terminal and the black lead into the "Lo" terminal.

### Battery Check & Replacement:

1. If battery power is not sufficient, the LCD will display "  ". Replace all eight batteries, with 1.5 Volt, size "AA", Alkaline.
2. Use a screw driver to unscrew the screws on the battery cover. Remove the used batteries and replace with 8 new batteries.
3. Replace the battery cover and secure the screws.

### Test Leads Check:

Set the range select switch to the 400 $\Omega$  range. Connect the crocodile clip to the test lead tip. The indicator should read <0.5 $\Omega$ . When the leads are not connected the display will read infinity indicated by "-OL-". This will ensure that test leads are in working condition.

### Fuse Replacement:

1. Turn instrument over and remove the four screws (4) phillips head screws.
2. Remove top cover & test leads/crocodile clips from storage area.
3. Separate instrument from back case.
4. Replace fuse. Note: Use only recommended replacement fuse for continued protection.
5. Reassemble front of instrument into back case.
6. Reinstall the four phillip headscrews.
7. Instrument is now ready for use.



## AC VOLTAGE MEASUREMENTS

1. Set the range switch to "~V" position.
2. Connect red test lead to "Hi" terminal and black test lead to "Lo" terminal.
3. Connect test leads IN PARALLEL to the circuit being measured.
4. Read the voltage value on LCD.

### WARNING

**DO NOT proceed with resistance test until indicated voltage is removed.**

## LOW RESISTANCE (CONTINUITY) MEASUREMENTS

1. Set the range to  $\rightarrow \Omega$  position.
2. Connect red test lead to "Hi" terminal and black test lead to "Lo" terminal.
3. Connect the tips of the test leads to both ends of the circuit under test. Reading is displayed on the LCD.
4. When the impedance of the circuit is below 40 $\Omega$ , it will be indicated by a continuous beeper tone.
5. Press the  button to hold data.
6. Press the  again to release data hold operation.

### WARNING

**Max test voltage=12V, 200mA  
Do not use this range to do diode test.  
Do not proceed with test unless the ACV reading is zero.**

## INSULATION RESISTANCE MEASUREMENTS

### Manual Testing Mode:

1. Set the selector switch to the test voltage, required. Connect the test lead, first to the instrument, and then to the isolated item under test.
2. Press the test button to activate the test voltage. The reading will be displayed on the display and high voltage warnings beeps will sound.
3. When the test button is released the test voltage will be deactivated and the test result will be held automatically.

### 3 Minutes Test Power Lock Mode:

1. Set the selector switch to the test voltage required. Connect the test lead, first to the instrument, and then to the isolated item under test.
2. Press the LOCK button to set the testing mode to 3 min. Lock Mode. "Lock" symbol will be displayed on the LCD.
3. Press the "Test" button once to begin the 3 min. test period and activate the test voltage. The reading will be shown on the LCD display.
4. Press the Test button again to deactivate the test voltage before the 3 minutes is up. The reading will be held automatically.

If the testing process is not interrupted within 3 min., the test voltage will turn off when 3 minutes is reached.

The analog display bar can indicate range up to  $10G\Omega$ , when the reading is between  $4G\Omega$  to  $10G\Omega$ , the LCD will show "-HI-", when the resistance is higher than  $10G\Omega$ , the LCD will show "-OL-".

Note: The charge stored in the tester will be discharged automatically when the testing process is finished.

**WARNING**  
**DO NOT proceed with this test unless ACV reading is zero.**

### AUTO POWER OFF

The tester will turn itself off if there is no switch or button operations after 30 min.

Note: Auto power off has a small power consumption and it is recommended that the instrument be switched to OFF when not in use. This is particularly important at the end of the working day, since no battery is used in the OFF position.

## POWER TOOLS AND SMALL APPLIANCES

This test would also apply to other similar equipment that has a line cord. For double insulated power tools, the megohmmeter lead shown connected to the housing would be connected to some metal part of the tool (e.g. chuck, blade).

Note: The switch of the device must be in the "ON" position and the main power should be disconnected.

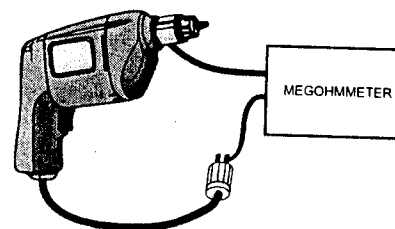


Fig. 2

### Motors

AC Motors - Disconnect the motor from the line by disconnecting the wires at the motor terminals or by opening the main switch. If the main switch is used and the motor also has a starter then the starter must be held, by some means, in the "ON" position. In the latter case, the measured resistance will include the resistance of the motor, wire and all other components between the motor and the main switch. If a weakness is indicated, the motor and other components should be checked individually.

If the motor is disconnected at the motor terminals, connect one megohmmeter lead to the grounded motor housing and the other lead to one of the motor leads.

DC Motors - Disconnect the motor from the line. To test the brush rigging, field coils and armature connect one megohmmeter lead to be grounded motor housing and the other lead to the brush on the commutator. If the resistance measurement indicates a weakness, raise the brushes off the commutator and separately test the armature, field coils and brush rigging by connecting one megohmmeter lead to each of them individually, leaving the other applies connected to the grounded motor housing. The above also applies to DC Generators.

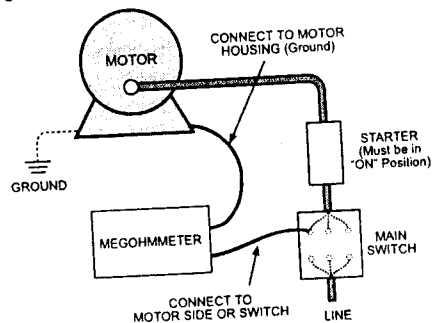


Fig. 3

#### Cables

Disconnect the cable from the line. Also disconnect opposite ends to avoid errors due to leakage from other equipment. Check each conductor to ground and/or lead sheath by connecting one megohmmeter lead each of the conductors in turn. Check insulation resistance between conductors by connecting megohmmeter leads to conductors in pairs.

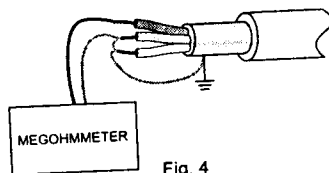


Fig. 4

## SPECIFICATIONS

### Environment conditions

- Installation Category: II
- Pollution Degree: 2
- Altitude: up to 2000 meters
- Indoor use only
- Relatively humidity: 80% max.
- Operating Temperature Range: 32°F-104°F (0°C-40°C)

### Maintenance & Cleaning

- Repairs or servicing not covered in this manual should only be performed by qualified personnel.
- Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on this instrument.

### Display

- 3.15 x 1.97 inch LCD Display (80mm x 50mm)
- 3 3/4" Digital readout with analog bar indication

### Back Light Operation

- Pressing the back light button will turn on the LCD back light for 30 sec. Pushing it again will turn off the back light.

### Measurement Range

- 600V/ACV, 400Ω, 4000M Ω/250V, 4000M Ω/500V, 4000M Ω/1000V

### Sampling Rate

- 2.5 samples/sec for digital
- 10 samples/sec for analog indication

### Over Range Indicator

- "-OL-" will be displayed.

### Low Battery Indication

- The "⊕ -" is displayed when the battery voltage drops below the required operating voltage.

### Voltage Protection

- Up to 600V (Ohms & Continuity functions)

### Operating Temperature and Humidity

- 32°F to 104°F (0°C to 40°C) below 80% RH (noncondensing)

### Storage Temperature and humidity

- 14°F to 140°F (-10°C to 60°C) below 70% RH (noncondensing)

### Power Source

- DC12V (8 x 1.5V Size "AA" batteries or equivalent)

### Power Consumption

- Approx. 90mA (4000MΩ/1000V range) (Output open circuit)
- Approx. 60mA (4000MΩ/500V range) (Output open circuit)
- Approx. 45mA (4000MΩ/250V range) (Output open circuit)
- Approx. 20mA (ACV Ohms range)

### Dimensions

- 7.5 (L) x 5.5 (W) x 3 (H) inch (190 x 140 x 77 mm)

### Weight

- Approx. 2 Lb. (900g.), includes battery

### Accessories

- Test leads, 8 AA Batteries, Carrying Case, Operating manual, 2 Crocodile clips

## ELECTRICAL SPECIFICATIONS

Accuracies are specified as:  
±(...% of reading + ...digits) at 23°C ± 5°C, below 80% RH.

### OHMS & Continuity Beeper

| Range | Resolution | Accuracy | Max. Open Circuit Voltage | Max. Short Circuit Current | Overload Protection |
|-------|------------|----------|---------------------------|----------------------------|---------------------|
| 400Ω  | 0.1Ω       | 1% +5    | 12.8V                     | 280mA                      | 600Vrms             |

| Range | Resolution | Beeper Active    | Max. Open Circuit Voltage | Overload Protection |
|-------|------------|------------------|---------------------------|---------------------|
| ⎓     | 0.1Ω       | Resistance < 40Ω | 12.8V                     | 600Vrms             |

### AC Voltage (40Hz~500Hz)

| Range | Resolution | Input Impedance | Accuracy (above 1V) | Overload Circuit |
|-------|------------|-----------------|---------------------|------------------|
| 600V  | 0.1V       | 4.5MΩ           | 1.5% +3             | 750Vrms          |

### Meg OHMS (Auto Range)

| Range                           | Resolution            | Accuracy         | Terminal Voltage |
|---------------------------------|-----------------------|------------------|------------------|
| 4MΩ/40MΩ/400MΩ<br>/4000MΩ/250V  | 1K, 10K<br>100K, 1Meg | 3%+5<br>(<2000M) | 250V +20%~-0%    |
| 4MΩ/40MΩ/400MΩ<br>/4000MΩ/500V  |                       |                  | 500V +20%~-0%    |
| 4MΩ/40MΩ/400MΩ<br>/4000MΩ/1000V |                       | 5%+5<br>(<2000M) | 1000V +10%~-0%   |

| Range        | Test Current | Short Circuit Current |                            |
|--------------|--------------|-----------------------|----------------------------|
| 4000MΩ/250V  | 1mA          | ≤ 1.5mA               |                            |
| 4000MΩ/500V  |              |                       | 250KΩ (load)               |
| 4000MΩ/1000V |              |                       | 500KΩ (load)<br>1MΩ (load) |

