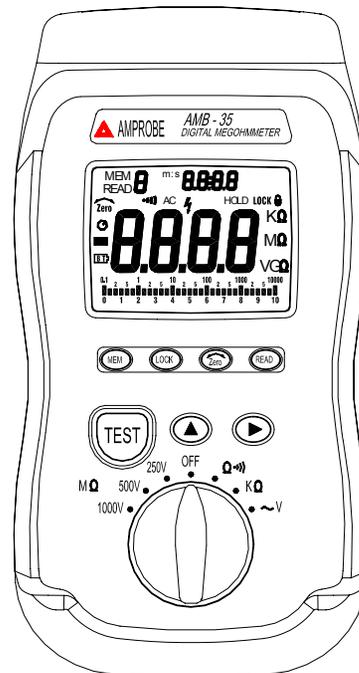




INSULATION TESTER

AMB-35

INSTRUCTION MANUAL



1. SAFETY INFORMATION

- The circuit under test must be de-energized and isolated before connections are made except for voltage measurements.
- Verify operation prior to measuring hazardous voltages (voltage above 30V AC rms, 42V AC peak and 60V DC).
- Do not touch the Circuit connections during a test.
- Disconnect the hot test lead before disconnecting the neutral test lead.
- After insulation tests, to protect against electric shock, capacitive circuits must be discharged.
- Do not use the meter if the low battery indicator (BT) is displayed.
- Test leads (including crocodile clips) must be in good order, clean with no breaks or cracks.
Do not use the meter if it looks damaged.
- Do not use the meter around explosive gases, vapors or dust.
- Do not push the test button before all connections and preparations are complete. The instrument must only be used by suitably trained and competent persons.
- Do not use the meter with any parts or cover removed.
- Do not use the meter in a wet environment.
- U.S. PAT. NO. 478,017
- JAPAN PAT. NO. 1180870
- CHINA PAT. NO. ZL02367250.1

Warnings and Safety symbols:



Caution refer to this manual before using the meter.



Dangerous voltages.



Meter is protected throughout by double insulation or reinforced insulation.



Comply with IEC1010-1

When servicing, use only specified replacement parts.

2. SPECIFICATIONS

2-1 General Information

Environment conditions:

- ① Installation Categories III 1000V
- ② Pollution Degree 2
- ③ Altitude up to 2000 meters
- ④ Indoor use only

Safety Meets of IEC61010-1 and IEC61557

Display : Dual display, 3-3/4 Digital readout with analog bar indication.

Sampling Rate : 2.5 sample/sec.

Manual data Memory and Read : Memory capacity 9 set.

Over Range Indicator : "OL" will be displayed.

Low Battery Indication :

The (BT) will be displayed when the battery voltage drop below the operating voltage.

Operating Temperature and Humidity :

0°C to 50°C (32°F to 122°F) below 80% RH (noncondensing).

Temperature Coefficient : 0.10 x (specified accuracy) / °C

Storage Temperature and Humidity :

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

Battery : 6 x 1.5V "AA" battery.

Fuse : 6mm x 32mm (0.25 x 1.25 inch), 0.5A 1000V, Fast Acting.

Dimensions : 235 (L) x 116 (W) x 54(H) mm ,
(9.3"L x 4.6"W x 2.1"H)

Weight : Approx. 520g (1.15 LB), including batteries

Accessories : Test leads, 6pcs battery, Holster, operation manual.

2-2 Electrical Specifications

Accuracies are specified as:

±(...% of reading + ...digits) at 23°C ±5°C, below 80% RH.

Insulation Resistance

Range	Resolution	Accuracy	Test Voltages
4MΩ/40MΩ/400MΩ/ 1000MΩ/250V	4MΩ: 1 KΩ	3%+5 (<1000M)	250V+20% ~ -0%
4MΩ/40MΩ/400MΩ/ 2000MΩ/500V	40MΩ: 10 KΩ 400MΩ: 100 KΩ	5%+5 (>1000M)	500V+20% ~ -0%
4MΩ/40MΩ/400MΩ/ 4000MΩ/1000V	4000MΩ: 10MΩ		1000V+20% ~ -0%
Analog Bar Graph	0 to 4000MΩ		
Nominal Current	≥ 1mA		
Circuit Protection	Test inhibited if input ≥ 30V AC or DC		

LoΩ

Display Range	40.00Ω
Measurement Range	0.10Ω to 40.00Ω
Accuracy	2%+2
Resolution	0.01Ω
Analog Bar Graph	40.00Ω
Open Circuit Voltage	6V typical
Short Circuit Current	200mA minimum, (0.2 to 2.0Ω)
Circuit Protection	Test inhibited if input ≥ 30V AC or DC.

AC Voltage (40Hz~500Hz)

Range	Resolution	Accuracy	Input Impedance	Overload Protection
1000V	1V	2%+1	2.5MΩ	1000Vrms

Sensitivity : 2V

❑ **DC Voltage**

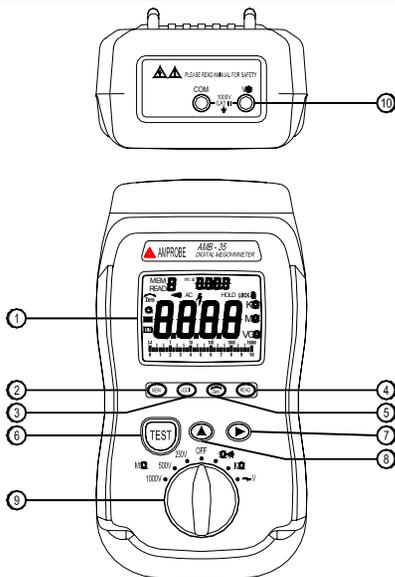
Range	Resolution	Accuracy	Input Impedance	Overload Protection
1000V	1V	1%+1	2.5MΩ	1000Vrms
-1000V				

Sensitivity : 2V

❑ **Resistance & Continuity**

Range	Resolution	Accuracy	Max. open Circuit Voltage	Overload Protection
9999Ω	1Ω	1%+2	3V	1000Vrms

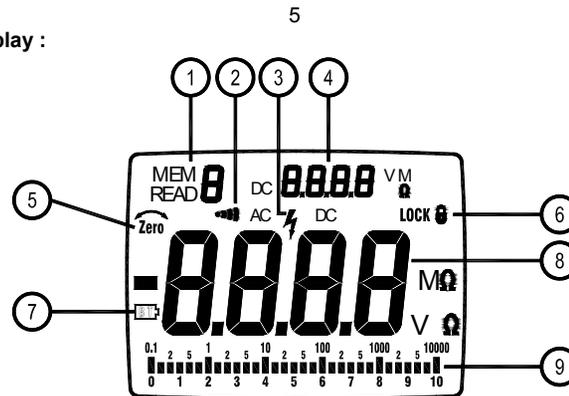
3. PARTS & CONTROLS



- ① LCD display.
- ② MEM key: Manual data memory control key.
- ③ LOCK key: Locks the Insulation test Resistance (MΩ) and Low resistance (LoΩ) functions.
 - a). Press and hold down TEST key, then press LOCK key, the “LOCK” icon appears on the display.
 - b). In MΩ mode continuously applies the test voltage to the circuit to be tested. The beeper sounds every 2 seconds to remind you that you are in the LOCK mode.
 - c). In LoΩ mode continuously applied the test current to the circuit to be tested.
 - d). Press Lock or TEST key again to exit the mode.
- ④ READ key: Manual memory data reading control key.
- ⑤ **Zero** key: In the LoΩ function, turns the test lead resistance compensation ON.

Touch the probe tips together, then press **Zero** key, the **Zero** icon appears on the display and the main display indicates 0.00Ω.
- ⑥ TEST key:
 - a). Used for MΩ and LoΩ test functions.
 - b). Press and hold TEST key until the main display reading is stable.
- ⑦ ⑧ ▼▲ keys : In READ mode, select the memory data location for direct reading the data from the display.
- ⑨ Rotary switch: To select a measurement function.
- ⑩ Input terminals.

Display :



- ① Manual data memory and read location indicator.
- ② Beeper symbol shows if beeper turned on in $\Omega \cdot \text{b}$ function.
- ③ High voltage warning symbol flashes, if voltage $\geq 30V$ is present on the probes.
- ④ Voltage applied to the probes in $M\Omega$ function, Resistance reading held from the last measurement in $M\Omega$ and $Lo\Omega$ functions and DC Voltage reading in $\sim V$ function.
- ⑤ Zero symbol is on if test leads are zeroed out.
- ⑥ Lock symbol is on if the TEST mode is locked in $M\Omega$ or $Lo\Omega$ functions.
- ⑦ Low battery symbol.
- ⑧ Main display reading for all functions.
- ⑨ Analog bar graph displays resistance on a logarithmic scale and voltage on a linear scale. The value always tracks the main display.

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4. BEFORE OPERATION



Warning

- To avoid electrical shock remove the test leads before opening the case or battery cover. Do not operate with battery cover open.
- To avoid electrical shock when performing resistance tests, remove all power from the circuit to be measured.
- To avoid electrical shock, first connect the test leads to the meter inputs before you make connection to the circuit under test.
- To avoid electrical shock, do not touch the test lead tips, test points or terminals when pressing TEST.

4-1 How to connect test leads.

Connect the red test lead into the " $V\Omega$ " jack and the black lead into the "COM" jack.

4-2 Battery Check & Replacement

- 1). If battery power is not sufficient, The LCD will display " BT ". Replacement of 6 ea. new batteries, type 1.5V size "AA" is required.
- 2). Use a screw drive to unscrew the screw secured on battery cover. Take out the used batteries and replace 6 pcs new batteries.
- 3). Place back the battery cover and secure the screw.

4-3 Auto-Power-Off

- 1). The meter automatically turns off after 15 minutes of non-use. In the $Lo\Omega$ mode the meter turns off after 5 minutes of non-use.
- 2). To turn the meter back on, turn the rotary switch to OFF, then to the desired function.

4-4 Test Leads Check

Set the range select switch to the " $\Omega \cdot \text{b}$ " range. Connect the alligator clips to the test leads. Connect the alligator clips together. 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 under working condition.

4-5 Data Memory Storage and Read Modes:

- 1). Clearing the memorized data
 - ① Set the function switch to the OFF position.
 - ② Press and hold the "MEM" key, and rotate the function switch to one of its operating modes. The "dEL" symbol will appear on the LCD indicating the memorized data has been erased.
- 2). Storing Manual data
 - ① Press the "MEM" key each time, one set of data will be stored into the memory. At this moment, the LCD will show the "MEM" mark and the memory address location. The total memory size is 9 sets.
 - ② When the memory is full, the LCD will display the number "9", the last memory address location.
- 3). Read Manual memory data
 - ① Press the "READ" key to enter the memory storage mode. The LCD will display the "READ" symbol along with the memory address number.
 - ② Press the "▲" or "▼" key to select the desired memory address location.
 - ③ Press the "READ" key again to exit this mode.

5. $\overline{\sim}$ V VOLTAGE MEASUREMENTS

- 1). Set the function switch to $\overline{\sim}$ V position.
- 2). Connect red test lead to the "V Ω " jack and the black test lead to the "COM" terminal.
- 3). Connect the probe IN PARALLEL with the circuit to be measured.
- 4). Read the voltage value from the display. The meter indicates DC voltage on the upper right of the display and the AC voltage on the main display.

6. Ω \rightarrow RESISTANCE AND CONTINUITY MEASUREMENTS

- 1). Set the function switch to Ω \rightarrow position.
- 2). Connect the red test lead to "V Ω " terminal and the black test lead to "COM" terminal.
- 3). Connect the probes to the circuit to be measured. Measure the voltage first to ensure that no hazardous voltage is present, then switch to ohms.
- 4). Read the resistance value on the display. If the resistance is approximately 40 Ω or less, the meter will beep.

7. LO Ω LOW RESISTANCE MEASUREMENTS**7-1 Measuring Low Resistance**

- 1). Set the function switch to Lo Ω position.
- 2). Connect the red test lead to "V Ω " terminal and the black test lead to "COM" terminal.
- 3). Zero out the test lead resistance (see Zero key).
- 4). Connect the probes to the circuit to be measured, if there is voltage on the probes, the voltage will be displayed. A repetitive beep will sound and the flashing high voltage symbol " $\overline{\sim}$ " will be displayed to warn the user when the voltage is more than 30V.

Please remove the voltage from the circuit under test before proceeding with the next step.

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- 5). Press and hold the TEST key until a stable reading is displayed on the main display.
- 6). Release the TEST button. The upper right display holds the resistance reading until a new test is started or a different function is selected.
- 7). Exchange the red (+) and black (-) probes on the circuit and repeat steps 5 and 6 to reverse the polarity of the test current. The reading should be the same as the previous. This test is useful to detect corroded connections, which can cause different reading for both polarities.

7-2 Using the LOCK Function to Measure Resistance

The LOCK function is used to continuously supply the test current to the circuit to be tested. This is useful for making several measurements in succession, don't need to push and hold the TEST key for each measurement.

- 1). Press and hold the TEST button, then press the LOCK key to enter LOCK mode.
- 2). Connect the probes to the desired test location in succession.
- 3). Press LOCK or TEST to disable the lock function.
- 4). The meter cannot indicate if the circuit is live in this mode. Ensure that the circuit is deenergized before connecting the test probes or the fuse may blow.

8. MΩ INSULATION RESISTANCE MEASUREMENTS

8-1 Measuring Insulation Resistance

Measuring insulation resistance requires the application of potentially dangerous voltages to the circuit. This may include exposed metal surfaces.

Before proceeding, ensure that the installation is correctly wired and no personnel are endangered by any test.

- 1). Set the function switch to the desired MΩ test voltage position.

- 2). Connect the red test lead to "VΩ" jack and black test lead to "COM" jack.

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- 3). Connect the probes to the circuit to be measured, if there is a voltage measured by the probes, the voltage will be displayed. A repetitive beep and the flashing high voltage symbol  on the LCD will be present to warn the user when the voltage is over 30V. Please remove the voltage from the circuit under test before preceding the next step.
- 4). The display will show "-----" until the TEST button is pressed. Press and hold the TEST key. The upper right display shows the test voltage applied to the circuit under test. The main display shows the resistance until a stable resistance reading is displayed on the main display.
- 5). After releasing the TEST key the upper right display shows the measured resistance and the circuit discharges through the meter. The main display indicates the decreasing voltage. Assure the probes remain in contact with the circuit until it is completely discharged and "-----" again appears on the main display. The upper right display holds the resistance reading until a new test is performed or a different function is selected.

8-2 Using the LOCK Function to Measure Insulation Resistance

For long duration tests use the LOCK mode. This eliminates the need to hold the TEST button for long periods.

- 1). Press and hold the TEST button, then press the LOCK key to enter LOCK mode. In this mode, a potentially dangerous voltage is continuously applied to the probes. In this mode, if the probes are disconnected from the circuit, the meter cannot discharge any potentially dangerous capacitive voltages left on the circuit. In this mode the meter cannot indicate whether or not there is a voltage present. Ensure that the circuit is de-energized before connecting the test probes.
- 2). Press the LOCK or TEST key again to disable the Lock mode.

9. POWER TOOLS AND SMALL APPLIANCES

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

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



MOTORS

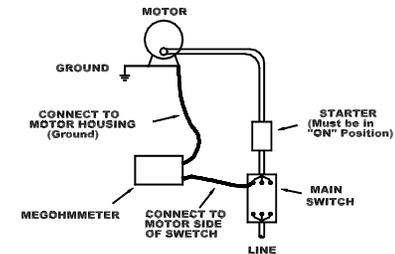
Disconnect the motor from the line by disconnecting the wires at the motor terminals or by opening the main switch. If a main switch is used and the motor has a starter contactor then the starter contacts must be held closed by some means, possible by energizing the coil. In the latter case, the measured resistance will include the resistance of the motor, wire and all other components between the motor and the main switch. If a problem 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 hot motor lead.

Disconnect the motor from the line. To test the brush rigging, field coils and armature connect one megohmmeter lead to the grounded motor housing and the other lead to the brush on the commutator.

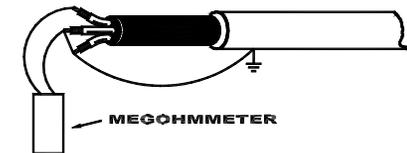
If the resistance measurement indicates a problem, raise the brushes off the commutator and separately test the armature, field coils and brush rigging by connecting one megohmmeter lead to each of them

individually, leaving the other connected to the grounded motor housing. The above also applies to DC Generators.



CABLES

Disconnect the cable from power. Also, disconnect the opposite end of the cable to avoid any leakage due to the load. Check each conductor to ground and/or lead source by connecting one megohmmeter lead to ground and/or lead source and the other megohmmeter lead to each of the conductors. Check insulation resistance between conductors by connecting megohmmeter leads to conductors in pairs.



10. FUSE CHECK & REPLACEMENT

10-1 Testing the Fuse

- 1). Set the function switch to Lo Ω position.
- 2). Connect the test leads to the input terminals and short them together.

- 3). Press TEST key, the display should indicate approximately 0.5Ω , if the display reads OL, replace the fuse as described next and test again.

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10-2 Replace the Fuse

Warning

To avoid electric shock, personal injury or damage to the meter, use only the specified fuse.

- 1). Set the function switch to OFF position.
- 2). Disconnect test leads from any power source.
- 3). Place the meter face down on a nonabrasive surface and loosen the four screws.
- 4). Take off the bottom cover.
- 5). Remove the fuse, replace with a new fuse.
- 6). Place the bottom cover on and secure the four screws.
- 7). Test the fuse (refer 10-1 Testing the Fuse).

11. BATTERY REPLACEMENT

- 1). Set the function switch to OFF position.
- 2). Disconnect test leads from any power source.
- 3). Place the meter face down on a nonabrasive surface and loosen the two screws.
- 4). Take off the battery cover.
- 5). Remove the battery, replace with six new batteries.
- 6). Place the battery cover on and secure the two screws.

12. MAINTENANCE & CLEANING

Maintenance & Clearing :

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

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WARRANTY

Congratulations! Your new instrument has been quality crafted according to quality standards and contains quality components and workmanship. It has been inspected for proper operation of all of its functions and tested by qualified factory technicians according to the long-established standards of our company.

Your instrument has a limited warranty against defective materials and/or workmanship for one year from the date of purchase provided that, 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 this one-year period, a no charge repair or replacement will be made to the original purchaser. Please have your dated bill of sale, which must identify the instrument model number and serial number and call the number listed below:

Repair Department

ATP – Amprobe, TIF, Promax

Miramar, FL

Phone: 954-499-5400

800-327-5060

Fax: 954-499-5454

Website: www.Amprobe.com

Please obtain an RMA number before returning product for repair.

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



Miramar, FL

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