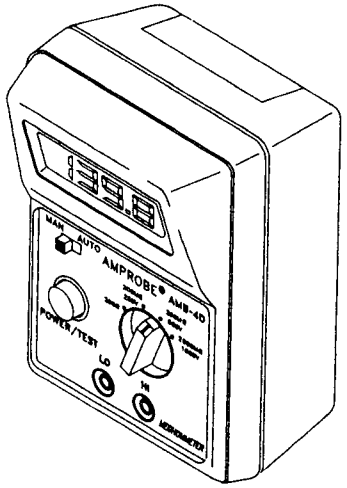
Pt. No. 947763
5/90

OPERATING INSTRUCTIONS
for
AMPROBE®
MEGOHMMETER
MODEL AMB-4D



AMPROBE INSTRUMENT®
DIVISION OF CORE INDUSTRIES INC., LYNBROOK, NEW YORK 11563

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 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 the one-year 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
630 Merrick Road (For U.P.S.)
P.O. Box 329 (For P.P.)
Lynbrook, NY 11563-0329

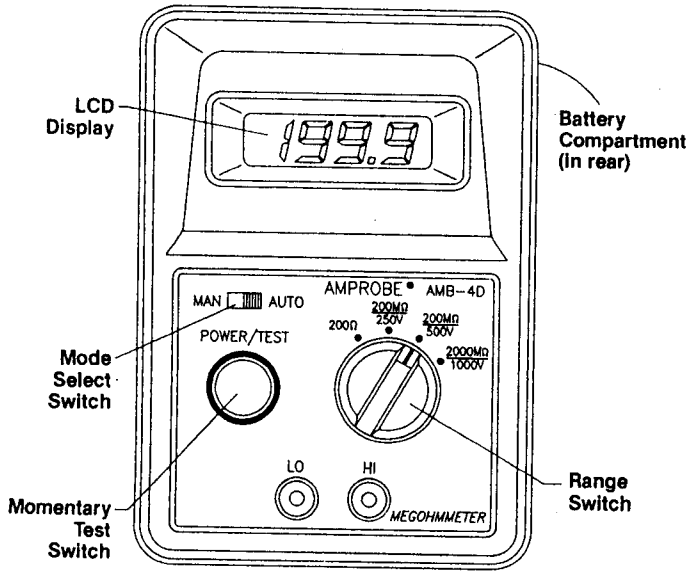
Outside the U.S.A. the local Amprobe representative will assist you. Above limited warranty covers repair and replacement of instrument only and no other obligation is stated or implied.

PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION

Although there is high voltage at the tips of the test leads when the AMB-4D is used as a Megohmmeter, low current flow reduces any danger to relatively safe levels.

WARNING
Under no circumstance is voltage to be applied to this instrument. This instrument is not protected for misapplication of voltage. Be sure that the equipment to be tested is disconnected from any voltage source or has no voltage present as a result of a stored charge. If the equipment to be tested was used up to the time of testing, it will probably have a capacitive charge built up. This charge must be removed before using this instrument.

When the AMB-4D is not used for long periods of time, remove the batteries to avoid possible instrument damage due to a leaking battery.



THEORY OF OPERATION

MANUAL

The AMB-4D has two modes of operation, MANUAL and AUTO. In the Manual mode, the POWER/TEST button must be held down during the measurement of either Ohms or Megohms. Once the test button is released, the measuring process has stopped. To restart, press and hold button down.

AUTO

The function of this instrument in the Auto mode is mainly for doing the Dielectric Absorption Ratio Test. Move rotary switch to Megohm position. Press POWER/TEST button and release. The instrument is now in the measuring mode and will be for the next 30 seconds. At the end of this period, the data in the display is held for the 15 seconds. For the next 15 seconds, the data is updated. At the end of 60 seconds from start the data in the display is held again for 15 seconds. After this 15 second period, the instrument is back in the measuring mode. If it is not shut off before three minutes from when it was initiated, it will automatically shut off. See timing diagram for more details.

BACKGROUND

Good insulation is defined as a material which, when placed between conductors at different potentials, permits only a small or negligible current in phase with the applied voltage to flow through it. Unless there is accidental damage of some sort, insulation failure is generally gradual rather than sudden. This gradual failure is due to repeated heating and cooling, the related expansion and contraction, dirt, physical abrasion, vibration, moisture, chemicals, etc. When insulation starts to fail, its resistance decreases allowing more current to flow through the insulation. If the resistance continues to decrease, the condition of the insulation may reach a point where it may permit a relatively large current to flow through the insulation. This could cause:

1) a simple blowing of a fuse
2) equipment damage
3) even fatal shock

An Insulation Resistance Testing Program helps reveal deteriorating insulation before it becomes a serious problem. Such a testing program consists of periodic insulation resistance tests on critical equipment and systems.

There are several insulation measurement techniques in practice today. The most common Megohmmeter measurement on insulation resistance involves taking a reading after 30 seconds and another one after 60 seconds. The 60 second reading divided by the 30 second reading is known as the Dielectric Absorption Ratio. Periodic comparisons of absorption ratios may prove more useful than comparing one minute readings. The AMB-4D is designed to automatically facilitate easy determination of absorption ratio. See page 8 for more information on instrument operation.

For a fuller explanation of these ratios and safe values refer to IEEE standards 43-1961 and 62-1958. These standards may be ordered from:

IEEE
445 Hoes Lane
Piscataway, New Jersey 08854

SPECIFICATIONS

Ranges	Test Voltages	Range Accuracy
0-200Ω	3V	± 1% of rdg ± 2 LSD
0-200MΩ	250V ± 12.5V	± 3% of rdg ± 2 LSD
0-200MΩ	500V ± 25V	± 3% of rdg ± 2 LSD
0-2000MΩ	1000V ± 50V	0-1000MΩ ± 3% of rdg ± 2 LSD 1000MΩ-2000MΩ ± 3.5% of rdg ± 3 LSD

Power Supply: 6 AA batteries (not supplied)

Current Drain: 65mA max. on Megohm; 17mA max. on Ohm

LoBattery Indication: "BAT"

Display: 3½ LCD

Weight: 14.9 oz. (422gm) (without batteries)

Size: 4¼" × 6" × 3½" (10.79cm × 15cm × 8.89cm)

Operating Temperature and Humidity: 32°F (0°C) to 120°F (49°C) up to 80% RH

Storage Temperature and Humidity: 20°F (-6°C) to 140°F (60°C) at 80% RH

Visual Indication: Arrow pointing up in data hold mode

Audible Indication: 1 beep/second while instrument in data hold mode

Response Time: Less than 5 seconds

Sampling Rate: Minimum of 2 times per second

Resolution: 200Ω - 0.1Ω
200MΩ - 0.1MΩ
2000MΩ - 1.0MΩ

GENERAL

Open battery compartment in back case and install 6 AA alkaline batteries. Close battery compartment by sliding cover back into place.

Attach black lead to "LO" terminal and red lead to "HI" terminal. With no resistor connected, or if a higher value than the range selected is connected when the POWER/TEST button is pressed, the display will immediately go into the over-range mode and the display will show "1".

When the battery life has reached a critical point, a low battery indication "BAT" will appear in the lower left hand corner of the display. Fresh batteries should now be installed as soon as possible.

OHMS MEASUREMENT

1) Move rotary switch to 200Ω range.
2) Apply test leads to resistance to be measured.
3) Press MAN/AUTO switch to MAN position.
4) Press and hold POWER/TEST button.
5) Release POWER/TEST button when measurement is completed. The power supply will automatically be disconnected.

Note: If resistance to be measured is higher than 200Ω, an over-range indication will appear. It is not recommended that the AUTO mode be used for low ohms measurement.

MEGOHMS MEASUREMENT

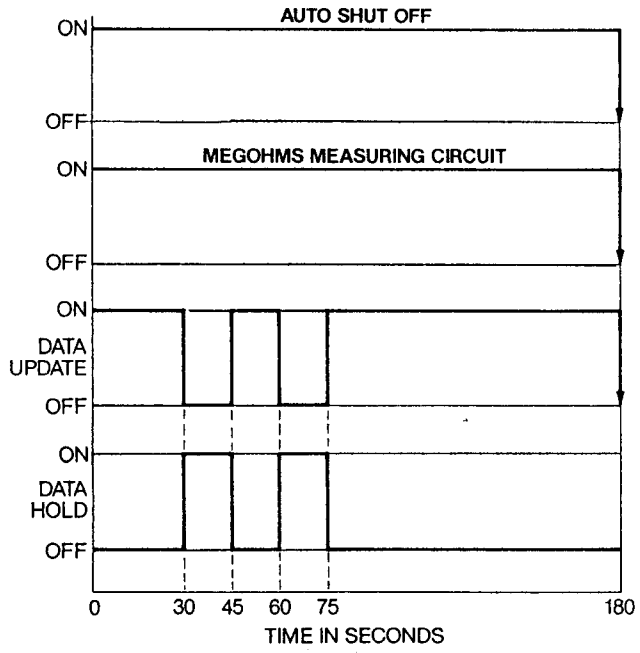
If the Absorption Ratio Test is not needed at this time, proceed as follows:
1) Move MAN/AUTO switch to MAN position.
2) Move rotary selector switch to appropriate Megohm range.
3) Connect leads of AMB-4D to resistance to be measured*.
4) Press and hold POWER/TEST button. If an over-range indication appears in the display, move rotary switch to a higher Megohm range.

5) Release POWER/TEST button when measurement is completed. The power supply will automatically be disconnected.

Insulation Resistance Measurement using the Absorption Ratio Test:
1) Move MAN/AUTO switch to AUTO position.
2) Move rotary selector switch to appropriate Megohm range.
3) Connect leads of AMB-4D to resistance to be measured*.
4) Press and release the POWER/TEST button. This action initiates the test and also connects the power supply.
5) After 30 seconds into the test, a visual and audible indication will be apparent for the next 15 seconds. Please record the reading that is now held in display. When the visual and audible indications have been removed, the instrument will now be updating its measurement for the next 15 seconds.
6) At the end of this 15 second period, 60 seconds from when the test was started, the reading is again held in the display for yet another 15 seconds with a visual and audible indication. Record this reading. See timing diagram for more clarity.
7) To compute the absorption ratio, divide the reading recorded in step 5 (60 second) by the reading recorded in step 4 (30 second). This number is called the Dielectric Absorption Ratio. See page 5 for more information.

NOTE: This test can be stopped at any time by simply pressing the POWER/TEST switch. This action disconnects the power supply and resets the master timer. To continue testing, simply follow step 3 thru 6. If during this mode of operation, the POWER/TEST button is not pressed to turn instrument off after ratio test is completed, the instrument will automatically turn itself off three minutes from when test was initiated.

** Spread test leads as far as possible to avoid any false reading as a result of lead insulation resistance.*



TIMING DIAGRAM
FOR ABSORPTION RATIO TEST

FACTORY SERVICE

Serial number is located on the back label of the instrument.

For factory service, package instrument and packing slip with sufficient cushioning material in a shipping carton; make certain your name and address also appear on box as well as packing slip; ship prepaid via U.P.S. (where available) or Air Parcel Post insured to:

Service Division
AMPROBE INSTRUMENT
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