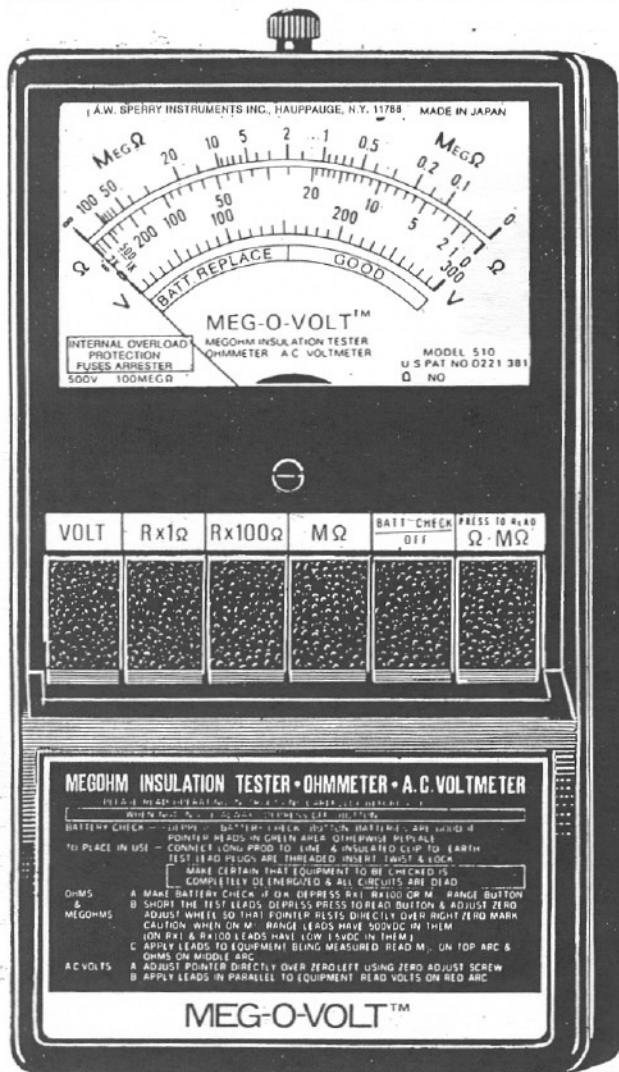


# OPERATING INSTRUCTIONS MEG-O-VOLT™ SERIES

• MEGOHM INSULATION TESTER • OHMMETER • A.C. VOLTMETER



Models  
510  
520  
530

MODEL 510  
Shown Approx  
3/4 Size

U.S. Patent No. D221,381

## CAUTION

Please read this Manual thoroughly and completely before putting instrument into use. Failure to do so might result in injury and/or damage to equipment. Observe all standard industry safety rules.

## A.W. SPERRY INSTRUMENTS INC.

245 MARCUS BLVD., HAUPPAUGE, N.Y. 11788 • TOLL FREE  
800-645-5398 • N.Y., HAWAII, ALASKA CALL COLLECT 516-231-7050

Printed In U.S.A.

Page 3	Front Panel Controls Terminal & Battery Compartment
Page 4, 5, 8	To Place MEG-O-VOLT™ In Operation
Page 7	How to Read Scaleplate
Page 8, 9	How To Measure Insulation Resistance

Page 11	How To Make Continuity Checks
Page 12	How To Measure A.C. Volts General Maintenance
Page 12	Carrying Case Return For Repairs

NOTE: ILLUSTRATIONS ARE ALL MODEL 510.

Ranges		MODEL 510 SERIES 1.	MODEL 520 SERIES 2.	MODEL 530 SERIES 1.
Megohms		0-100	0-1000	0-2000
R × 1Ω		0-2KΩ 25Ω Mid-scale		
R × 100Ω		0-200KΩ 2.5KΩ Mid-scale		
A.C. Volts		0-300	0-600	
D.C. Test Volts	MEGΩ Range at	500 Volts D.C.		1000 Volts D.C.
	All Ω Ranges at	1.5 Volts D.C.		
Accuracy:				
MEGΩ	Within ±5% of ind. value	1 to 50	1 to 500	2 to 1000
	Within ±10% of ind. value	51 to 100	501 to 1000	1001 to 2000
R × 1Ω		Within ±3% of SL		
R × 100Ω		Within ±3% of SL		
A.C. Volts		Within ±3% of FS		

#### SPECIFICATIONS:

MOVEMENT	Taut Band
POWER SUPPLY	(Self-contained) 8—1.5V AA batteries in series—Type B-1
FUSES, LINE, ALL RANGES	1/4 Amp., 600V AC Rated, Bussmann Type KTK, 3/16" x 1 1/16", or equal. Fuse F-6 from A.W. Sperry Authorized Wholesalers. Fuse is located inside the threaded handle of MEG-PROBE, see Page 3.
FUSE, MEGOHMS RANGES	1/50 Amp. (20ma), 250V AC Rated, Fast Acting Glass Fuse, Bussmann AGC-1/50, 1 1/4" x 1/4", or equal. Fuse F-4 from A.W. Sperry Authorized Wholesalers. Fuse is located inside housing, see Page 4.
WEIGHT:	28 oz. with batteries
DIMENSIONS:	8 1/2" H x 4 1/16" W x 2 7/16" T
SL=SCALE LENGTH FS=FULL SCALE IV=INDICATED VALUE	

#### PACKAGING:

Comes complete with TL-55 test leads, F-4 and F-6 Fuses, 8 B-1 batteries, carrying case C-24, operating instructions, warranty card.

#### ONE YEAR LIMITED WARRANTY

A.W. Sperry Instruments Inc., warrants that this AWS Instrument has been carefully tested, inspected, and warranted for one (1) year from the date of purchase by the original end user against defects in material or workmanship. This warranty covers only the original end user purchaser provided the completed warranty card is returned within ten (10) days after purchase and the instrument has not been misused, damaged due to negligence, neglect or unauthorized repair, abused or used contrary to the operating instructions. Instruments must be returned to A.W. Sperry Instruments Inc., Attention: Customer Service Center, 245 Marcus Boulevard, Hauppauge, New York 11788, postage prepaid for examination and verification of manufacturing defect under warranty. A.W. Sperry Instruments Inc. shall be the sole judge of the existence of such defect. The liability of A.W. Sperry Instruments Inc., shall be limited to the repair or replacement at its sole option of any defective product.

THIS WARRANTY AND THE OBLIGATIONS AND LIABILITIES OF SELLER THEREUNDER ARE EXCLUSIVE AND IN LIEU OF AND BUYER HEREBY WAIVES ALL OTHER REMEDIES, EXPRESS WARRANTIES, GUARANTEES OR LIABILITIES, OF AND FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR WHETHER OR NOT OCCASIONED BY SELLER'S NEGLIGENCE. THIS WARRANTY SHALL NOT BE EXTENDED, ALTERED OR VARIED EXCEPT BY A WRITTEN INSTRUMENT SIGNED BY SELLER AND BUYER. SOME STATES ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIED LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

instrument and are installed. Remove back Battery Cover, lift battery pack out and check to make sure that batteries are firmly in position and in correct polarity. The polarity mark (+) will be found molded in the battery well, with the (-) negative side touching the coil spring. See Fig. 3.

- For replacement, use B-1 Batteries, 1.5V, "AA", Novel UM-3, Eveready 915 or equal. For easy installation, first insert negative (-) side against coil spring and then snap the positive (+) end of the battery into position. Observe polarity carefully.
- If the instrument is taken out of service for any length of time, remove all eight (8) batteries and store separately.

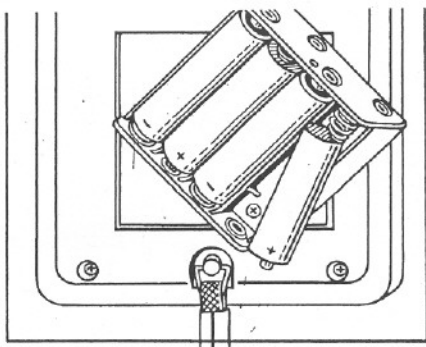


FIG. 3

#### B. FUSES (see Fig. 4A & 4B)

Two (2) removable Fuses are furnished with each instrument, installed in their holders.

- FUSE F-4, located inside the instrument, adjacent to the battery holder. For accessibility, remove the back cover by unscrewing the four corner screws to lift cover off. For replacement, use F-4, 1/50 Amp. (20ma), 250V AC Rated, Fast Acting Glass Fuse, 1 1/4" x 1/4", Bussmann AGC-1/50, or equal.
- FUSE F-6, located in the threaded handle of the MEG-PROBE Prod. For replacement, use F-6, 1/4 Amp., 600V AC Rated, Bussmann KTK, or equal. Check both Fuses before putting instrument into operation.

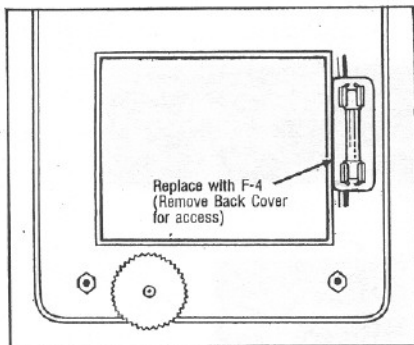


FIG. 4A

#### C. "LEFT" ZERO ADJUSTMENT (METER)

- Before use, and for greatest accuracy, make certain that the pointer is set exactly on the "left" zero line; at the extreme left of the arc.
- If not on Zero, rotate the Zero Adjust Screw, at middle bottom of window, see Fig. 1, until pointer is directly over the zero line.
- It is a good practice to check the left zero adjustment daily, since changes in atmospheric conditions cause it to drift.

**Note:** "Right" Zero Adjustment is used on the  $\Omega$  Ranges, RX10, RX100 $\Omega$  & MEG $\Omega$ . See Page 5.

#### D. TEST LEADS (See Fig. 5)

- One (1) Set, Model TL-55, is furnished with each instrument, consisting of

**Red Lead**—55" long, heavy duty, well insulated, one side with 6 1/4" Barrier Type Heavy Prod Handle, threaded so the two halves separate to hold Fuse F-6, the other side with a threaded insulated connector for positive lock into the instrument. Red Lead is always connected to the LINE TERMINAL.

**Black Lead**—55" long, heavy duty, well insulated, one side with Mueller type insulated clip with brass contact TIP, the other side with a threaded insulated connector. Black Lead is always connected to the EARTH TERMINAL.

**Note:** For best performance and safety, only use the Test Leads furnished with the instrument.

#### E. BATTERY CHECK (See Fig. 6)

- This is done ONLY when measuring  $\Omega$  and MEG $\Omega$ .
- Touch the "BATT. CHECK" button, second from right and note position of pointer.
- If pointer is in GOOD area, proceed with  $\Omega$  or MEG $\Omega$  measurements.
- If pointer is in BATT. REPLACE area, replace all 8 batteries.

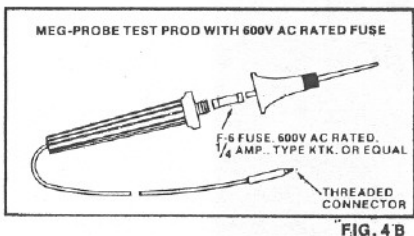


FIG. 4B

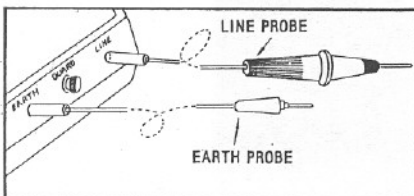


FIG. 5

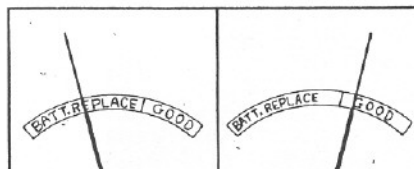


FIG. 6

# TO PLACE MEG-O-VOLT™ IN OPERATION

## F. "RIGHT" ZERO ADJUSTMENT (ON $\Omega$ & MEG $\Omega$ RANGES ONLY)

**NOTE:** On all three  $\Omega$  Ranges, RX1 $\Omega$ , RX100 $\Omega$  & MEG $\Omega$ , the Zero "0" Position is at the extreme right of the scale and reads right to left deflection. See Fig. 7.

### 1. ON MEG $\Omega$ RANGE (Follow sequence shown)

- Connect the Test Leads to the instrument, Red to the Line Terminal, Black to the Earth Terminal.
- Short the Test Leads. See Fig. 8.
- Press MEG $\Omega$  Range Button.
- Touch Press To Read Button and note if pointer is directly over the "0" Position at the extreme right of the MEG $\Omega$  scale.
- If not, turn Right Zero Adjust Wheel on lower middle side, see Fig. 1, until it is on "0".
- Touch "OFF" Button disconnecting the MEG $\Omega$  Range.
- Disconnect Test Leads from the instrument.

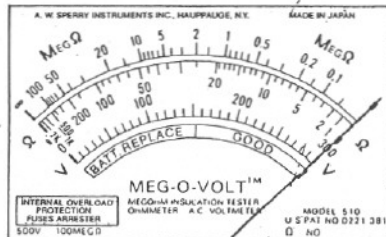


FIG. 7

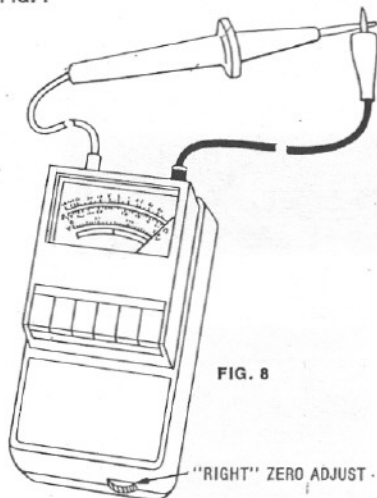


FIG. 8

### CAUTION

There is 500 Volts DC testing voltage in Models 510 and 520, 1,000 Volts DC testing voltage in Model 530, between LINE and EARTH, when the MEG  $\Omega$  Range is ON. Be careful not to touch the probe tips of both leads when making this adjustment.

## 2. ON RX1 $\Omega$ & RX100 $\Omega$ RANGES

**NOTE:** Both these ranges are at approximately 1.5 Volts D.C. This very low voltage will not cause any shock if the probe tips of both leads are touched.

- Connect the Test Leads to the instrument, Red to the Line Terminal and Black to the Earth Terminal.
- Short the Test Leads. See Fig. 8.
- Press RX1 $\Omega$  or RX100 $\Omega$  Range Button.
- Touch Press To Read Button and note if pointer is directly over the "0" Position at the extreme right of the  $\Omega$  scale.
- If not, turn Right Zero Adjust Wheel on lower middle side, see Fig. 1, until it is on "0".
- Touch the "OFF" button disconnecting the range from the instrument.
- Disconnect Test Leads from instrument.

## G. RANGE SELECTION & READING

1. On RX1 $\Omega$ , RX100 $\Omega$  and MEG $\Omega$  Ranges, measurement is accomplished by First, pressing the desired Range button, and Second, touching the "Press To Read" button.
2. On A.C. VOLT Range, only the Volt Range button, on extreme left of panel, need be pressed. The instrument is then ready to be used as an A.C. Voltmeter.

## H. "QUICK" INSTRUCTION PLATE

1. This is on the front panel for "quick" reference, once you are thoroughly familiar with the MEG-O-VOLT™ operation.
2. Refer to the proper section of this manual for all detailed and complete procedures.

## I. SAFETY FEATURES

Before taking any measurements, please read this manual thoroughly and completely, and remember, the MEG-O-VOLT™ is for use on completely de-energized, "dead" circuits when measuring Insulation Resistance (MEG $\Omega$ ) and Testing Continuity ( $\Omega$ ).

The A.C. VOLT Range is included *primarily* to determine if any live voltage is present in the de-energized circuit being checked, before pressing the MEG $\Omega$  or  $\Omega$  Range buttons. It can however, be used to check A.C. Volts following standard procedures for this function.

# I. SAFETY FEATURES—continued

## 1. Safety Fusing.

A ¼ Amp., 600V AC Rated Fuse is located in one side of the line (in handle of Meg-Probe) to prevent damage when live voltage is accidentally impressed across the terminals.

A 1/50 Amp. (20ma), 250V AC Rated Fuse is located in the Meg Ω Range circuit to prevent damage when live voltage is accidentally impressed across the terminals.

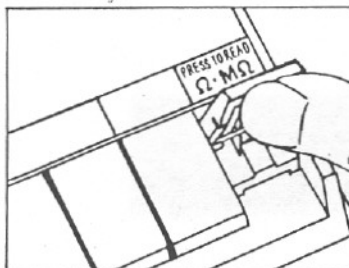
## 2. Voltage Arrestor.

This safety device is incorporated to shunt excessive live voltage from the instrument circuitry when accidentally impressed across the terminals.

## 3. "OFF" Button is located on the front panel to prevent excessive battery drain. After measurements are made on Ω & MEGΩ, the "OFF" Button should be pressed to disconnect ranges from the circuitry and to conserve the battery strength.

## 4. "PRESS TO READ" BUTTON when touched is a momentary contact. Reading will disconnect and return to zero when finger is removed from button.

To maintain contact, lift the button up. Finger can then be removed and reading will be maintained. Please remember to restore button to normal position after reading, since the battery will continue to drain if left in maintained position. See Fig. 9.

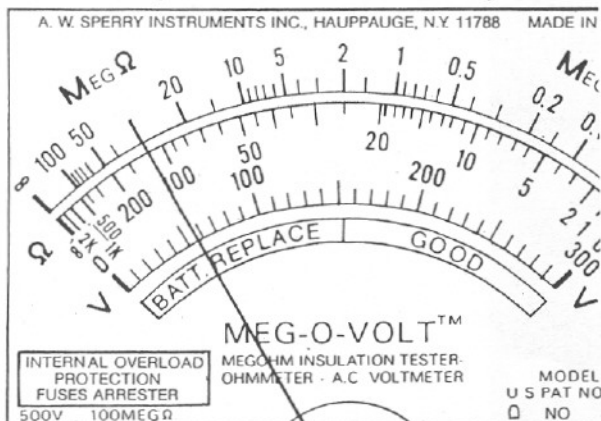


# J. HOW TO READ THE SCALEPLATE (ALL ILLUSTRATIONS MODEL 510)

## 1. MEGΩ Range

Read Megohms on the top black arc. Pointer is shown on 30 Megohms in Fig. 10.

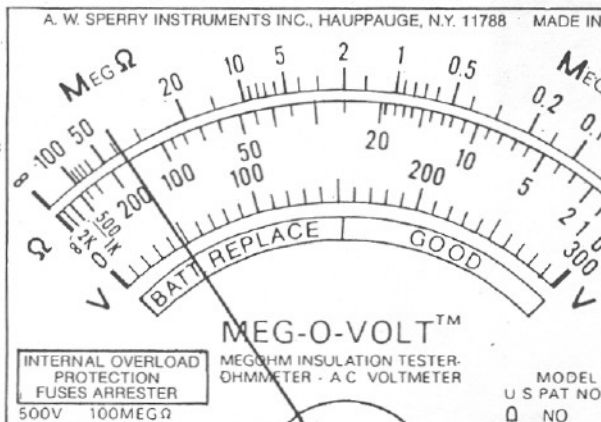
FIG. 10



## 2. RX1Ω Range RX100Ω Range

Read Ω (ohms) on the second black arc down from the top. Pointer is shown at 150Ω for RX1Ω and would be 15,000Ω for RX100Ω in Fig. 11.

FIG. 11

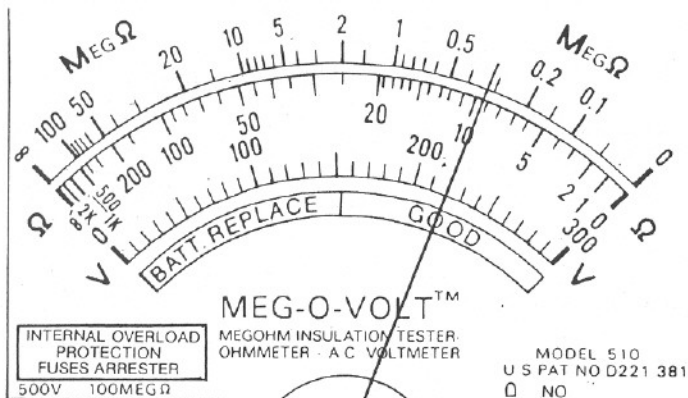


### 3. A.C. VOLTS

Read A.C. Volts on red arc, third down from the top.

Pointer is shown at 220V, in Fig. 12.

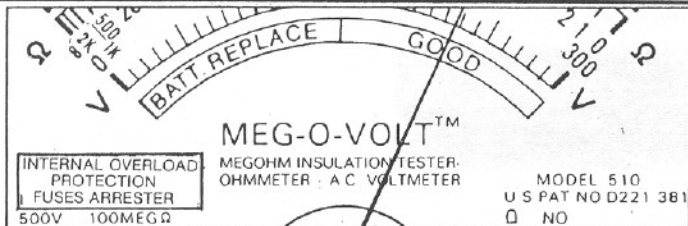
FIG. 12



### 4. Battery Check

Pointer is shown in GOOD area, signaling O.K. to proceed with  $\Omega$  and MEG $\Omega$  measurements.

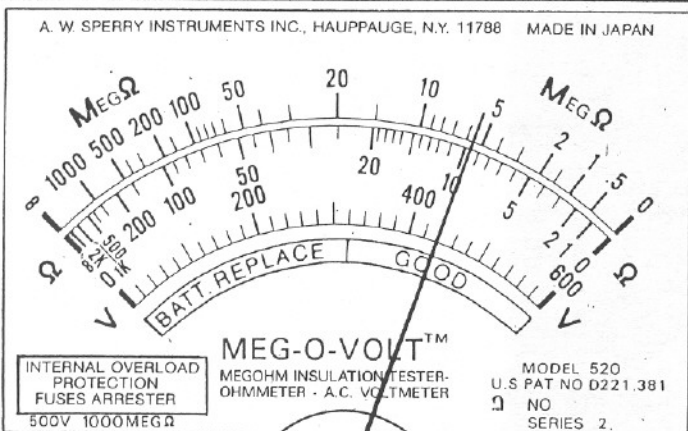
FIG. 13A



### 5. SCALE PLATE

Model 520 illustrated

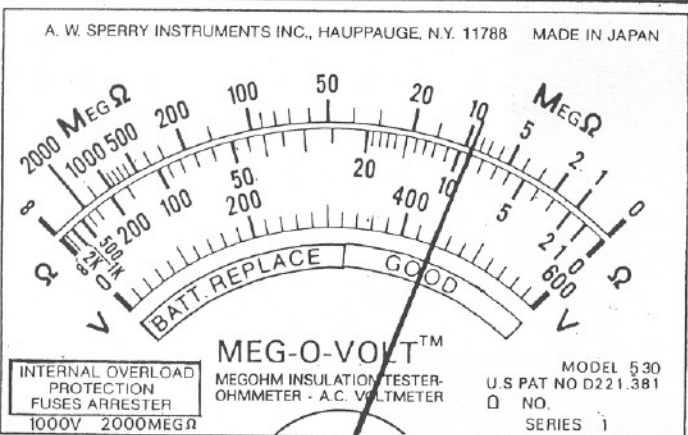
FIG. 13B



### 6. SCALE PLATE

Model 530 illustrated

FIG. 13C



**CAUTION****MEASUREMENT PROCEDURE****CAUTION**

To eliminate the possibility of injury to the operator and damage to the instrument and equipment, the procedure outlined in this manual is recommended. Exercise care and caution in preparing equipment for test and measurement, making sure that all  $\Omega$  & MEG $\Omega$  measurements are on completely de-energized circuits. Mis-use, abuse and carelessness cannot be prevented by any written word and is clearly the operator's responsibility. This instrument is not approved for use in an explosive atmosphere, dust or vapor.

## HOW TO MEASURE INSULATION RESISTANCE

### L. MEG $\Omega$ RANGE

1. On the MEG $\Omega$  Range, the testing voltage is 500VDC for Models 510 and 520, and 1,000VDC for Model 530. Do not use this test voltage on equipment which cannot safely accept this voltage.
2. On the MEG $\Omega$  Range, handle the test leads with care. Remember Models 510 & 520 have a 500VDC test voltage across the test leads while Model 530 has a 1000VDC test voltage across the test leads.

### M. PREPARING THE EQUIPMENT TO BE MEASURED

1. Select the equipment, component, apparatus, or circuitry whose insulation resistance is to be measured.
2. Completely disconnect this equipment from the line or its feeding live voltage source. Open switches or breakers. Disconnect from other equipment or circuitry, and from neutral and ground connections. See Fig. 14.
3. Isolate equipment to be tested so that your measurements do not include other apparatus or circuitry. Check for lines going out of the equipment and disconnect these as well. Discharge capacitance in the equipment by short circuiting or grounding it.
4. Check if the equipment is close to an energized line, since current may leak over and give inaccurate readings. Disconnect this energized line during time measurements are being made.

The equipment should now be completely de-energized, "dead" and isolated for your test and measurement. To make sure, use the built-in voltmeter in the MEG-O-VOLT™ to see if live voltage is present.

### N. TAKING THE INSULATION RESISTANCE MEASUREMENT

1. Make Battery Check.
2. Connect Test Leads. Red to Line Terminal, Black to Earth Terminal.
3. Check and adjust "Right" Zero.
4. Connect Mueller type insulated clip to ground (earth) side of the equipment being measured. Touch the long prod handle probe to the line side. See Fig. 15 and 16.
5. Press MEG $\Omega$  Range button. Small red light in upper right corner will glow, signifying that MEG $\Omega$  range is ON.
6. Touch PRESS TO READ Button and note reading on top black arc.
7. Remove finger from Press To Read button and press the "OFF" Button, disconnecting the MEG $\Omega$  Range.
8. Disconnect Test Leads from equipment and instrument.



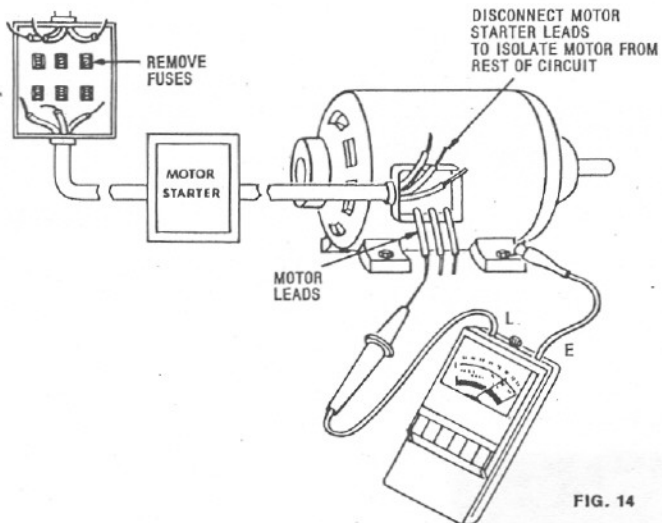


FIG. 14

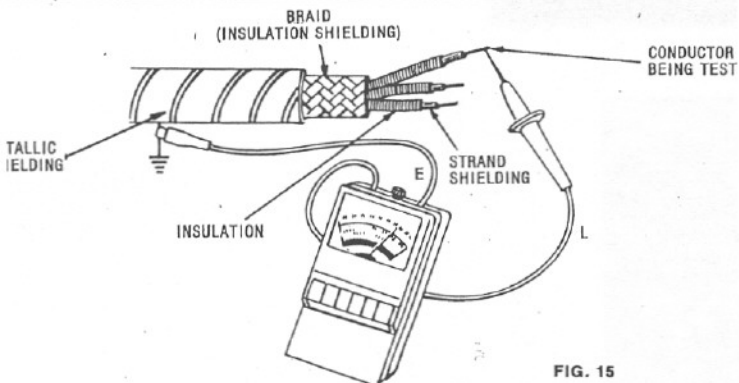


FIG. 15

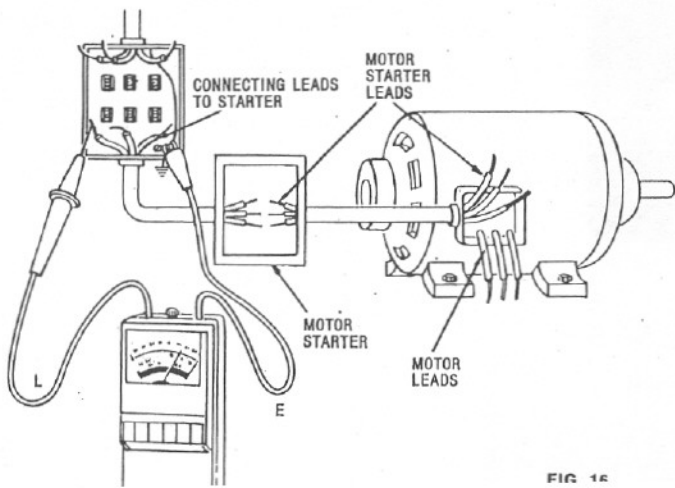


FIG. 16



## O. USE OF THE GUARD TERMINAL

1. In checking the insulation resistance of all electrical equipment, we find that there are two possible conducting paths, one through the insulation itself, and the second, over the insulation surfaces.
2. To obtain an accurate reading of the insulation itself, without interference of the surface leakage current, it is necessary to prevent the leakage current from passing through the meter.
3. This is accomplished by adding a third terminal, GUARD TERMINAL, on your MEG-O-VOLT™, to the circuit, connected as shown in Fig. 17.

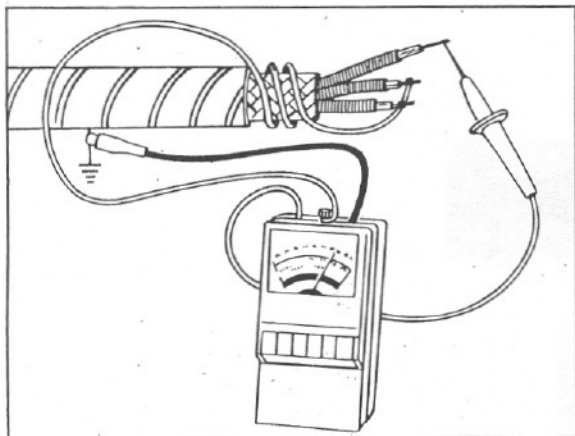


FIG. 17

## HOW TO MAKE CONTINUITY CHECKS

Continuity is checked and measured on the RX1 $\Omega$  and RX100 $\Omega$  Ranges. The equipment to be measured must be completely de-energized, "dead", and isolated for accurate check, before any continuity measurements can be taken. Follow same procedure as outlined on Page 8. M. Preparing the Equipment To Be Measured.

To make sure that there is no line voltage in the equipment being checked, use the built in volt range on the MEG-O-VOLT™ for this purpose.

### P. USING RX1 $\Omega$ Range

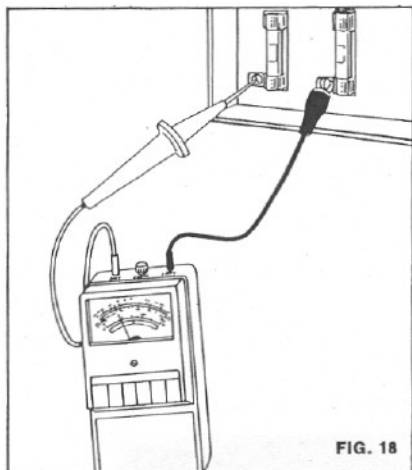
1. Make Battery Check.
2. Connect Test Leads. Red to Line Terminal, Black to Earth Terminal.
3. Check/adjust "Right" Zero.
4. Connect the Mueller type insulated clip to one side of the circuit or equipment and touch the other side with the long handle probe.
5. Press RX1 $\Omega$  Range-button.
6. Touch Press To Read button and note reading on the second black arc from the top.
7. Remove leads and press OFF button to disconnect range and conserve battery.

### Q. USING RX100 $\Omega$ RANGE

1. Follow all steps under Item P. above.
2. Read on the second Black arc down from the top and multiply by 100.

**NOTE:** The primary purpose for the inclusion of a built-in A.C. VOLT Range in the design of the MEG-O-VOLT™ was to incorporate a measuring range to make certain that live A.C. voltage was *NOT* present in equipment and circuitry when insulation resistance or continuity was being measured.

The A.C. Volt Range can however, be used separately to check and read A.C. Volts full scale, following standard measuring procedures for this type of function.



**FIG. 18**

To read and check A.C. Volts, see Fig. 18.

1. Check Mechanical Zero (Left Zero) and adjust if necessary
2. Connect Test Leads, Red to Line Terminal, Black to Earth Terminal.
3. Connect Mueller type insulated clip to one side of the line being measured.
4. Depress VOLT Range button. Touch other side of the line with the long handle probe.
5. Read on the red scale, third down from the top, with the letter "V" to the right and left.

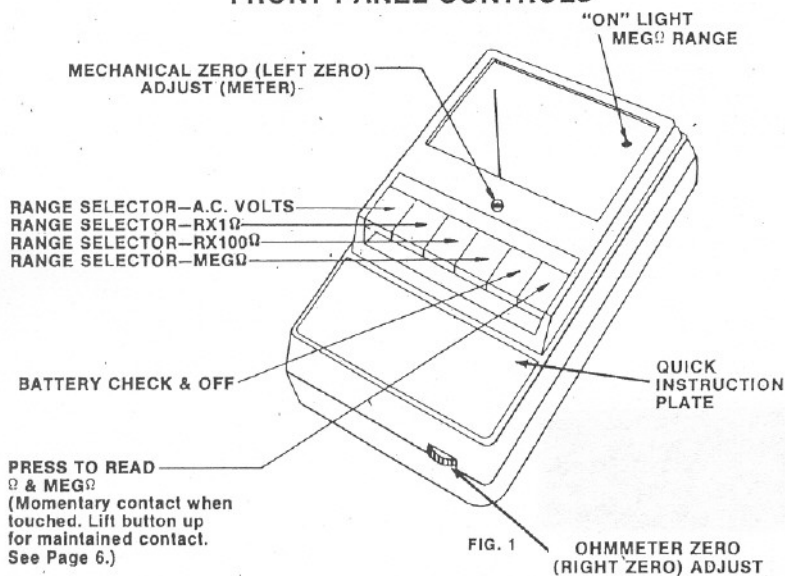
The above sequence is the safe recommended procedure for A.C. Volt measurement, providing one-hand operation, with the operator's other hand free and away from the circuit being checked.

## A LITTLE CARE GOES A LONG WAY

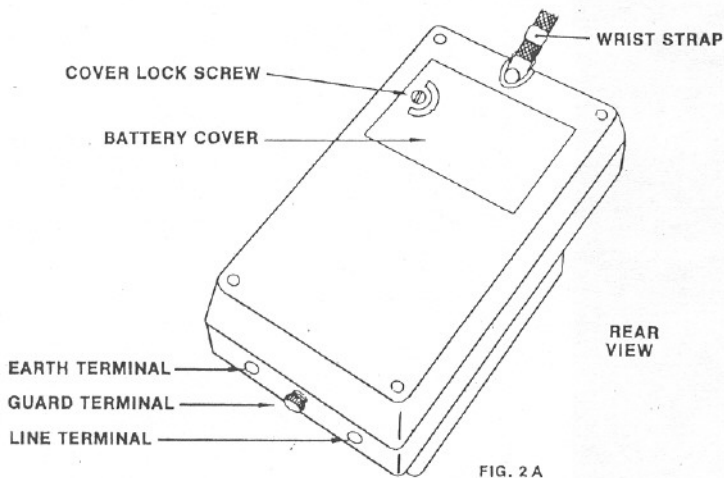
Remembering a few simple things will help get maximum service from your MEG-O-VOLT™.

1. Read operating instructions carefully and thoroughly.
2. Return Warranty Card immediately after purchase.
3. Apply basic rules of electric theory. Follow all standard safety procedures.
4. Never try to use the instrument beyond rated capacity or published function.
5. Check leads periodically for damage.
6. Do *NOT* try to take resistance measurements on a live circuit.
7. Make certain that instrument is properly adjusted before making measurements.
8. Check to make certain that batteries, fuses, etc. are good and in working order.
9. Make certain that scales are adequately lighted.
10. Do *NOT* polish instrument. Wipe gently with soft cloth.
11. Try to position eye so that it is in normal reading position relative to the scale.
12. Protect instrument from physical abuse; use a carrying case when not in use. Common sense and a little forethought will provide the maximum in service life and accuracy.

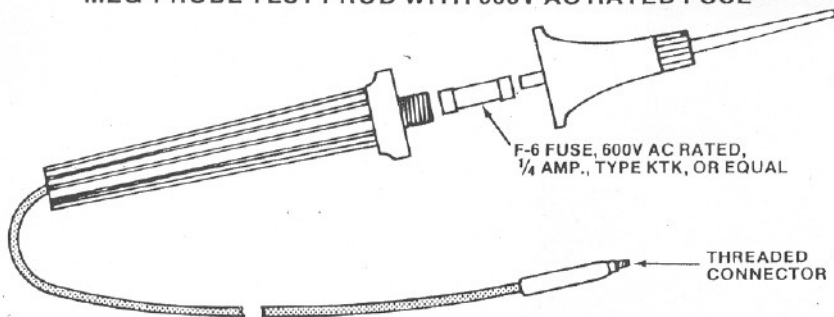
## FRONT PANEL CONTROLS



## TERMINALS & BATTERY COMPARTMENT



## MEG-PROBE TEST PROD WITH 600V AC RATED FUSE



## CARRYING CASE MODEL C-24

Your MEG-O-VOLT™ comes supplied with a roomy carrying case Model C-24 to assure long life and to protect the instrument from physical abuse.

Be sure to use the carrying case when instrument is not in use.

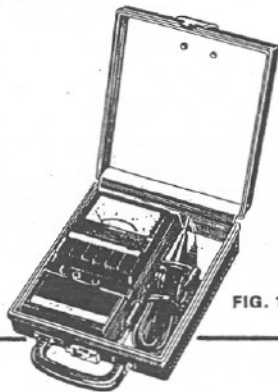


FIG. 19

## RETURN FOR REPAIRS

Before returning your MEG-O-VOLT™ for repair, please make sure that the failure to operate is NOT due to:

1. Weak Batteries. Check and replace if necessary.
2. Blown fuses. Check each fuse and replace if necessary.
3. Test Leads are in good condition. Check for loose connections, broken wire, intermittent continuity, broken clips, plugs or probes.

### IN WARRANTY

Send *Prepaid* to A. W. Sperry Instruments, Inc., 245 Marcus Blvd., Hauppauge, N.Y. 11788 and enclose a note indicating date purchased, wholesaler's name and address and nature of defect. Pack well, using the original packing materials and an outer corrugated carton.

Note: Your Warranty Card *must* be on file in our records for us to fulfill our Warranty obligation.

### OUT OF WARRANTY

Follow above procedure and enclose a note indicating what is wrong. Repair estimates will be furnished upon request without obligation.

**Replacement Fuses, Batteries, Fused Test Leads TL-55, Carrying Case C-24, all for the MEG-O-VOLT™ Series are in stock at your local Wholesaler.**