

# INSULATION TESTER

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## INSTRUCTION MANUAL

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## 1. Introduction

### **NOTE**

This meter has been designed and tested according to IEC publication 348, safety requirements for electronic measuring apparatus, IEC-1010 (EN 61010) and other safety standards. Follow all warnings to ensure safe operation.

### **WARNING**

**READ "SAFETY NOTES" ( NEXT PAGE ) BEFORE USING THE METER.**

- CAT IV - Is for measurements performed at the source of the low-voltage installation.
- CAT III - Is for measurements performed in the building installation.
- CAT II - Is for measurements performed on circuits directly connected to the low-voltage installation.
- CAT I - Is for measurements performed on circuits not directly connected to Mains.

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## 2. Safety Notes

- Read the following safety information carefully before attempting to operate or service the meter.
- Use the meter only as specified in this manual ; otherwise the protection provided by the meter may be Impaired.
- Rated environmental conditions :
  - (1). Indoor use.
  - (2). Installation CAT III 600V.
  - (3). Pollution Degree 2.
  - (4). Altitude up to 2000 Meter.
  - (5). Relative Humidity 80% Max.
  - (6). Ambient Temperature 0~40°C.
- Observe the international electrical symbols listed below.



Meter is protected throughout by double Insulation or reinforced insulation.



Warning ! Risk of electric shock .



Caution ! Refer to this manual before using the meter.



Alternating current.

## 3. Features

- Battery operated.
- Solid state circuitry.
- Battery check feature.
- Automatic circuit discharge.
- Color coded scale.
- Three megohm voltages.
- Alternating voltage measurement.
- Fuse protected.
- One year limited warranty.

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## 4. Specifications

- **Insulation Resistance**

Megohm :

0-100M $\Omega$  &  $\infty$  (250 DCV  $\pm$ 10%)

0-200M $\Omega$  &  $\infty$  (500 DCV  $\pm$ 10%)

0-400M $\Omega$  &  $\infty$  (1000 DCV  $\pm$ 10%)

SALE MULTIPLIER
250V x 1/2
500V x 1
1000V x 2

Accuracy :  $\pm$ 5% of indicated value (approximately)

Short circuit terminal current :

0-100M $\Omega$  : 2 mA      0-200M $\Omega$  : 2 mA      0-400M $\Omega$  : 2 mA

Power consumption : Max. consumption current  
approximately 190mA

- **AC Voltage**

Range : 0- 600V

Accuracy : 2.5% of full scale

Line frequency range : 40 - 1k Hz.

- **Continuity**

Ohm range : 0-50 $\Omega$  &  $\infty$

Accuracy :  $\pm$ 5% of indicated value (approximately)

Open circuit terminal voltage : 600 DCmV (approx.)

Short circuit terminal current : 240 DCmA (approx.)

Power consumption : Max. consumption current  
approximately 120mA

- **Withstand Voltage** : Meet IEC-1010 safety

- **Dimension** : 170 x 165 x 92 mm (6.7 x 6.5 x 3.6 inch)  
With housing front cover

- **Weight** : 970 g (Batteries included)

- **Standard Accessories** :

Batteries 1.5V, size AA      8 pieces

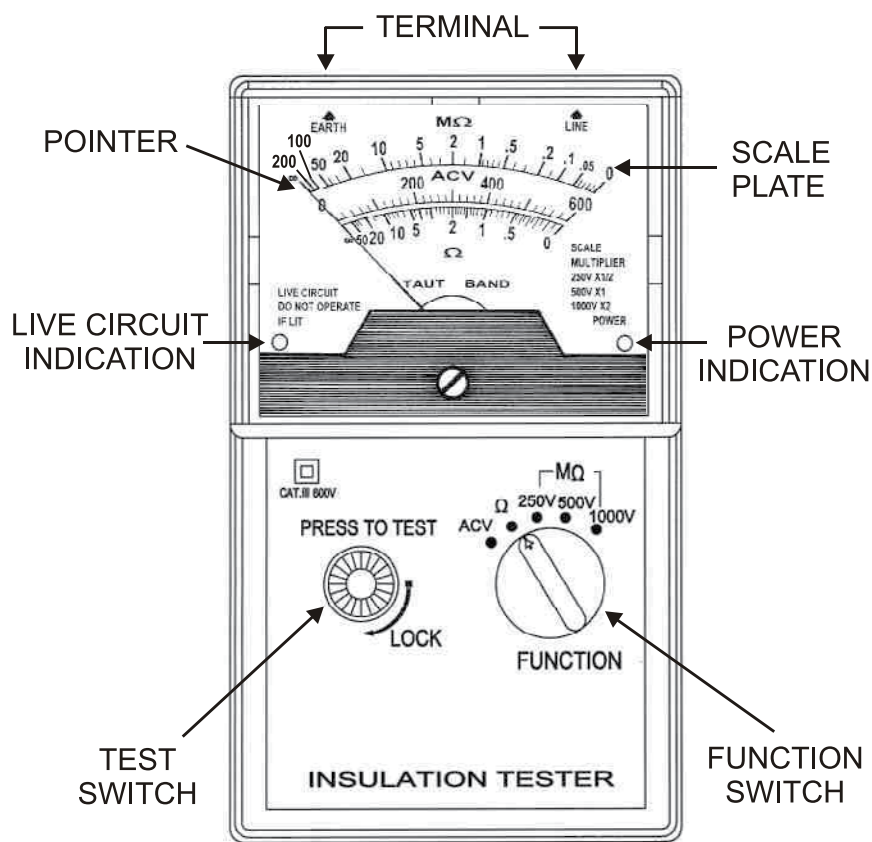
Test leads      1 pair

Fuse 1A 250V      1 piece

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## 5. Instrument layout



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## 6. Measuring Methods

### OPERATION CAUTION

Observe all safety precautions when the FUNCTION switch is set to either the 200M $\Omega$  (500V) or the 400M $\Omega$  (1000V) position. Connect the meter test leads to the circuit under test before operating the TEST switch. Do not touch the clip ends of the test leads when the TEST switch is pressed.

Some electrical equipment, especially cables, may retain an electrical charge when disconnected from the line. It is good practice to discharge such equipment with grounding straps, or other suitable devices, before touching or making connections. The meter automatically discharge the test Circuits when the spring loaded TEST switch is released.

### IMPORTANT

Remove all power to the circuit under test when making resistance measurements. If any voltage is present in the test circuit the red on the meter scale plate will light. Immediately disconnect test leads and turn off power to test circuit.

- Function switch :  
The FUNCTION switch is a five station rotary switch and is used to select the range, or function desired.
- Test switch :  
The TEST switch is normally OFF, spring loaded, momentary action switch which "turns on" the meter the momentary action is a safety feature. The test voltage generated by the meter is automatically discharged when the TEST switch is released.
- $\Omega$  measurement :  
This is the low resistance or "continuity" position. It is color coded green to correspond to the 0-50 $\Omega$  scale on the panel meter. The main purpose of this position on the FUNCTION Switch is to identify low resistance circuits such as motor run and start windings which may differ by only a few ohms. With a

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midscale reading of 2 ohms, the  $\Omega$  position can also be used to check relay contact resistance.

- Mechanical zero adjust :  
The pointer should indicate 0 on the green 50  $\Omega$  scale when the FUNCTION switch is in the  $\Omega$  position, the test leads are shorted together, and the TEST switch is pressed . If the pointer does not indicate 0, then adjust the white plastic mechanical zero adjust screw, located in the plastic panel meter lens cover as follows :
  1. Insert the test leads in the meter input jacks and short the free ends of the test leads together.
  2. Set the FUNCTION switch to  $\Omega$ .
  3. Push the TEST switch to the TEST position.
  4. Carefully adjust the zero screw until the pointer indicates zero.
- M $\Omega$  measurement :
  - 100M $\Omega$  (250V) : In this position approximately 250VDC is applied to the circuit under test when the TEST switch is pressed.
  - 200M $\Omega$  (500V) : In this position approximately 500VDC is applied to the circuit under test when the TEST switch is pressed. The 0-200M $\Omega$  range is used primarily to test insulation resistance which have begun to degrade.
  - 400M $\Omega$ (1000V) : In this position approximately 1000VDC is applied to the circuit under test when the TEST switch is pressed. This is the range which is normally used for preventive maintenance measurements on electrical equipment. Insulation resistance values in this application typically exceed 400M $\Omega$ .
- AC voltage measurement :  
Set the "FUNCTION" switch to ACV. Connect test leads to circuit being measured and read ACV directly.

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## 7. Maintenance

- Batteries replacement :  
The internal batteries supply the operating power for the meter. To test for defective or weak batteries :
  1. Press the TEST switch.
  2. The LED on the meter scale plate should flash.
  3. If the LED does not flash then replace the batteries
    - a. Remove the screw which secure the battery cover on the case back.
    - b. Remove the battery cover and replace the batteries.
    - c. Replace the battery cover and the screw.
- Fuse replacement :  
To test for an open fuse first assure that the batteries are not defective, then proceed as follows :
  1. Insert the test leads in the input jacks at the top of the meter and short the free ends of the test leads together.
  2. Set the FUNCTION switch to any one of resistance positions.
  3. Press the TEST switch.
  4. If the fuse is open the pointer will indicate an open circuit.  
That is, in the  $\Omega$  position of the FUNCTION switch the Pointer will remain at the left side of the meter scale plate.  
In the  $M\Omega$  position of the FUNCTION switch the pointer will remain at the left side of the meter scale plate.  
**NOTE : An open test lead will give the same indication as an open fuse.**
  5. If the fuse is determined to be open then remove the screw in the meter back.
  6. Replace the fuse which is located in the fuse holder inside the battery cover.
  7. Replace the battery cover.

- Cleaning and storage :  
Periodically wipe the case with a damp cloth and detergent  
; do not use abrasives or solvents.  
If the meter is not to be used for periods of longer than 60  
days, remove the batteries and store them separately.

#### WARNING

To avoid electrical shock or damage to the meter,  
do not get water inside the case.