



## INSTRUCTION MANUAL

**MT560**

**DIGITAL  
INSULATION TESTER**





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## 1. SAFETY INFORMATION

- Read the following safety information carefully before attempting to operate or service the meter.
- To avoid damages to the instrument do not apply the signals which exceed the maximum limits shown in the technical specifications tables.
- Do not use the meter or test leads if they look damaged. Use extreme caution when working around bare conductors or bus bars.
- Accidental contact with the conductor could result in electric shock.
- Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.
- Read the operating instructions before use and follow all safety Information.
- Caution when working with voltages above 60V DC or 30V AC RMS. Such voltages pose a shock hazard.
- Before taking resistance measurements or testing acoustic continuity, disconnect circuit from main power supply and all loads from the circuit.

## 2. SAFETY SYMBOLS



Caution refer to this manual before using the meter.  
Dangerous voltages.



Meter is protected throughout by double insulation or reinforced insulation.



When servicing, use only specified replacement parts.  
CE Comply with EN-61010-1

## 3. SPECIFICATIONS


### 3.1. General Information

#### Environment conditions:

1. Installation Categories III
2. Pollution Degree 2
3. Altitude up to 2000 meters
4. Indoor use only
5. Relatively humidity 80% max.
6. Operation Ambient 0~40°C

#### Maintenance & Cleaning:

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 instruments.

Function	Range
Display	Large LCD with dual display
Measurement Range	4000M $\Omega$ /125V, 4000M $\Omega$ /250V, 4000M $\Omega$ /500V, 4000M $\Omega$ /1000V, 400 $\Omega$ /BZ, to 500V, decreasing linearly to $\leq 1.5$ at 1000V, 1000V/DCV, 750V/ACV
Sampling Rate	2.5 times per second.
Zero Adjustment	Automatic adjustment.
Over Range Indicator	"OL" of highest digit is displayed.
Low Battery Indication	The  is displayed when the battery Voltage drops below the operating voltage.
Operating Temperature	0°C to 40°C (32°F to 104°F) and Humidity below 80% RH
Storage Temperature	-10°C to 60°C (14°F to 140°F) and Humidity below 70% RH
Batteries	6 x AA
Dimensions	200(L) x 92(W) x 50(H) mm
Weight	Approx. 700g including battery
Accessories	Test Leads, 6 Batteries, Carrying Case, Manual.

### 3.2. Electrical Specifications


Accuracies are specified in the way:

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

#### OHMS

Range	Resolution	Accuracy	Max. open Circuit Voltage	Overload Protection
40.00 $\Omega$	0.01 $\Omega$	$\pm(1.2\%+3)$	5.8V	250Vrms
400.0 $\Omega$	0.1 $\Omega$		5.8V	

#### Continuity Beeper

Range	Resolution	Accuracy	Max. open Circuit Voltage	Overload Protection
	0.01 $\Omega$	Resistance $\leq 35\Omega$	5.8V	250Vrms
Short circuit current		$\geq 200$ mA		

**DC Voltage**

Range	Resolution	Accuracy	Input Impedance	Overload Protection
1000V	1V	$\pm(0.8\%+3)$	10M $\Omega$	1000Vrms

**AC Voltage (40Hz~400Hz)**

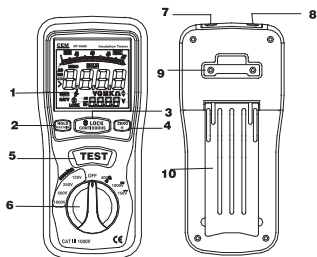
Range	Resolution	Accuracy	Input Impedance	Overload Protection
750V	1V	$\pm(1.2\%+10)$	10M $\Omega$	750Vrms

**Meg OHMS**

Terminal Voltage	Range	Resolution	Accuracy	Test Current	Short Circuit Current
125V (0%~+10%)	0.125~4.000M $\Omega$	0.001M $\Omega$	$\pm(2\%+10)$	1mA	$\leq 1\text{mA}$
	4.001~40.00M $\Omega$	0.01M $\Omega$	$\pm(2\%+10)$	@load	
	40.01~400.0M $\Omega$	0.1M $\Omega$	$\pm(4\%+5)$	125k $\Omega$	
	400.1~4000M $\Omega$	1M $\Omega$	$\pm(5\%+5)$		
250V (0%~+10%)	0.250~4.000M $\Omega$	0.001M $\Omega$	$\pm(2\%+10)$	1mA	$\leq 1\text{mA}$
	4.001~40.00M $\Omega$	0.01M $\Omega$	$\pm(2\%+10)$	@load	
	40.01~400.0M $\Omega$	0.1M $\Omega$	$\pm(3\%+5)$	250k $\Omega$	
	400.1~4000M $\Omega$	1M $\Omega$	$\pm(4\%+5)$		
500V (0%~+10%)	0.500~4.000M $\Omega$	0.001M $\Omega$	$\pm(2\%+10)$	1mA	$\leq 1\text{mA}$
	4.001~40.00M $\Omega$	0.01M $\Omega$	$\pm(2\%+10)$	@load	
	40.01~400.0M $\Omega$	0.1M $\Omega$	$\pm(2\%+5)$	500k $\Omega$	
	400.1~4000M $\Omega$	1M $\Omega$	$\pm(4\%+5)$		
1000V (0%~+10%)	1.000~4.000M $\Omega$	0.001M $\Omega$	$\pm(3\%+10)$	1mA	$\leq 1\text{mA}$
	4.001~40.00M $\Omega$	0.01M $\Omega$	$\pm(2\%+10)$	@load	
	40.01~400.0M $\Omega$	0.1M $\Omega$	$\pm(2\%+5)$	1M $\Omega$	
	400.1~4000M $\Omega$	1M $\Omega$	$\pm(4\%+5)$		

#### 4. PARTS & CONTROLS


1. Digital Display
2. Data Hold Button; MAX/MIN
3. Lock Button
4. Backlight Button; ZERO
5. Test Button
6. Rotary Function switch
7. V $\Omega$  Jack
8. COM input jack
9. Pothook
10. Battery Cover



##### 4.1. How to connect test leads.

On M $\Omega$  Range, and 400 $\Omega$ /BZ, ACV, DCV, Connect the red test lead into the "V $\Omega$ " terminal and the black lead into the "COM" terminal.

##### 4.2. Battery Check-UP & Replacement

- a) As battery power is not sufficient. LCD will display . Replacement of 6 pcs new batteries, type 1.5V size "AA" is required.
- b) Place back the battery cover and four the screws.

##### 4.3. Test leads check

Set the range select switch to the 400 $\Omega$  range. With the tip and alligator clip of the test leads connected. The indicator should read 00.0 $\Omega$ . When the leads are not connected the display will read infinity indicated by "OL". This will ensure that test lead are under working condition.

##### 4.4. Rotary Switch positions

Turn the Tester on by selecting any measurement  
Lift < 1000V, 500V, 250V, 125V (4000M $\Omega$ )  
OFF 400 $\Omega$ /•), 1000VDC, 750VAC > Right

##### 4.5. Buttons and a display Indicators

###### a) Button

**HOLD/MAX.MIN:** Press the "HOLD" button to ensure the current values are held on the primary display. Once held on the display, hold down the button for 2 seconds for the display to read the "MAX" value. Click again to view the "MIN" value. Hold down the button for 2 seconds to exit.

**LOCK:** In the insulation resistance testing function, press the "LOCK" button, and then push down the "TEST" key, it will allow hands free operation to inject the high-voltage and enter the insulation resistance testing status. Press the "TEST" button once more, it will shut off the high-voltage and exit from the insulation resistance testing status.

**TEST:** In the insulation resistance testing function, pressing and holding the "TEST" button, the meter will inject high-voltage, and enter into the insulation resistance testing, release the "TEST" button and it will cut off the high-voltage and exit from the insulation resistance testing.

**ZERO/LIGHT:** Press the "ZERO/LIGHT" button, the current values in the primary display will be set to zero, (mainly used for  $400\Omega$ , the low resistance testing), it will return if the button is pressed for 2 seconds, it will enter directly into the "LIGHT" status, and the LCD backlight light up. After 15 seconds, the backlight is shut off automatically, the same as pressing for 2 seconds within 15s.

#### **b) Display Indicators**

**The Primary Display:** Indicates the current function testing values

**The Secondary Display:** It shows the output DCV while you test the insulation resistance, and the battery voltage while the ACV

**The Analog Bar:** Indicates the current function testing value in synchronous with the primary display.

⚡ : While testing the insulation resistance, the symbol "⚡" flashes frequently if the voltage is over 30V.

••••• : While testing the insulation resistance, the symbol "•••••" flashes frequently and the buzzer warns continually if the outside voltage is over 30V. the symbol "•••••" is indicated while  $LO\Omega \leq 35\Omega$  and the buzzer warns continuously.

**LOCK:** Push down the "LOCK" button while you test the insulation resistance and the symbol "🔒" is indicated.

**LOBAT:** The display shows "LOBAT" when the voltage drops below 7.5V

**MAX/MIN:** Stand for the maximum or the minimum.

**ZERO:** Digital zero adjusting.

**HOLD:** The digital holding function for the primary display.


**AC, DC:** The indicator for the voltage property.

**V, M $\Omega$ ,  $\Omega$ :** The measured dimension units.

#### **5. INSULATION RESISTANCE MEASUREMENTS**



- Turn the function switch from the "OFF" position to the left (4000M $\Omega$ /1000V, 4000M $\Omega$ /500V, 4000M $\Omega$ /250V, 1000M $\Omega$ /125V) and choose one of the voltage-block (there are 4 ranges namely, 4M $\Omega$ , 40M $\Omega$ , 400M $\Omega$  and 4000M $\Omega$  can be switched automatically for every voltage-block.)
- Connect two testing lines to the tested;
- Push down and hold the "TEST" button /or press the "LOCK" keystroke first and then the "TEST" button, if the object under test is live and its voltage (AC/DC) is over 30V, it will refuse to work and no high-voltage testing occurs, simultaneously, it shows ">30V" on the LCD, the symbol "⚡" flashes, and the buzzer warns frequently. If the object under test



or its voltage is lower than 30V, it will enter into the formal testing process and inject the high-voltage on the primary display, the insulation resistance in  $M\Omega$  is indicated in-phase with analog bar; on the secondary display, the tested insulation voltage in V (DC) is indicated, the symbol "" flashes and the buzzer warns frequently

- d) Hands free operation "TEST" button or pushing down the "TEST" button in the "LOCK" status can exit from the "LOCK" status and shutoff the high-voltage, synchronously, the resistance values is indicated in the primary display will be held, and the secondary display still be in the status of monitoring the insulation voltage for the tested.
- e) Subsequently, discharge the balance insulation voltage of the tested through the inner switch of the meter. Turning the function switch can exit automatically from testing status during the process.

#### **6. LOW RESISTANCE (CONTINUITY) MEASUREMENTS**

- a) Set the range switch to  $400\Omega$  () Position
- b) Connect the red test lead to the  $V\Omega$  terminal and black to the COM terminal.
- c) Connect the tips of the test leads to both ends of the circuit under test, read resistance in  $\Omega$  on the LCD. The two ranges ( $40.00/400.0\Omega$ ) can be switched automatically; the primary display of the resistance in  $\Omega$ , flashes in synchronous with the analog bar.
- d) When the impedance on circuit is below approximately  $\leq 35\Omega$ . It will indicate by a continuous beeper.
- e) The current is from 200 to 220mA while the tested resistance is  $0\Omega$
- f) The high voltage symbol "" flashes along with a primary display of ">30V" and the buzzer warns frequently if the voltage (AC/DC) is more than 30V.

#### **7. AC/DC VOLTAGE MEASUREMENTS**

- a) Set the range switch to ACV or DCV position
- b) Connect red test lead to " $V\Omega$ " terminal and black test lead to terminal "COM".
- c) Connect test prods of test leads IN PARALLEL to the circuit being measured.
- d) Read the voltage value on LCD.

#### **8. BATTERY SAVER (SLEEP MODE)**

The meter will automatically enter the "sleep mode" if there is no function change or button press for 10 minutes, but it works as soon as you turn the rotary function switch or push down any button.

#### **9. POWER TOOLS AND SMALL APPLIANCES**

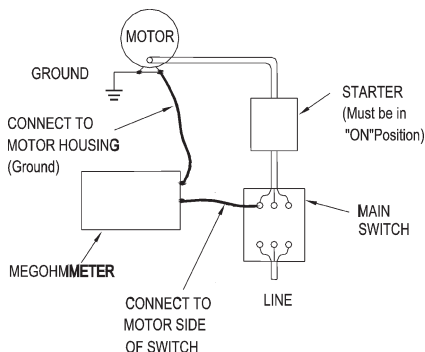
This test would also apply to other similar equipment that has a line cord. For double insulated power tools, the megohmmeter lead shown

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.

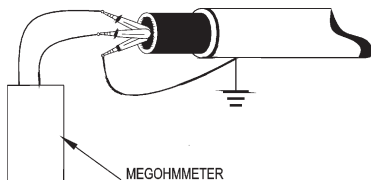
### MOTORS

**AC-**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 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 one of the motor leads. **DC-**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 the line. Also disconnect opposite end to avoid errors due to leakage from other equipment. Check each conductor to ground and /or lead sheath by connecting one megohmmeter lead to a ground and /or lead sheath and the other megohmmeter lead to each of the conductors in turn. Check insulation resistance between conductors by connecting megohmmeter leads to conductors in pairs.





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