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Read First: Safety Information

- Never use the meter if the meter or test leads look damaged.
- Be sure the test leads and switch are in the correct position for the desired measurement.
- Never measure resistance or testing acoustic continuity in a circuit when power is applied.
- Never connect the probe to a voltage source when the test leads are plugged into the 10 A input jack .
- Never connect the probe to a voltage source when the function are in uA or mA range.
- Never apply more than rated voltage between any input jack and earth ground.
- Be careful when working with voltages above 60 V dc or 30 V ac rms. Such voltages pose a shock hazard.
- Keep your fingers behind the finger guards on the test probes when making measurements.
- To avoid false readings, replace the battery immediately, When  symbol appears.

Symbols:



Read Safety Information First



Dangerous Voltage May Be Present



Meter is protected throughout by double insulation or reinforced insulation.

When servicing, use only specified replacement parts.

1. SPECIFICATIONS

1-1 General information

Display:

- Digital: 4000 counts
- Analog: 42 segments

Maintenance & Clearing:

- Repairs or servicing not covered in this manual should only be by qualified personal.
- Periodically wipe the case with a dry cloth and detergent. Do not use abrasives or solvents on this instruments.

Display Symbol Definition:



Sampling Rate:

Digital: 2 times/sec

Analog: 20times/sec for Bargraph indication.

Over Range Indication: LCD will show "OL".

Low Battery Indication:

The **B** is displayed when the battery voltage drop below the proper operating range.

Battery type: 1.5V.SIZE AAA Batter

Battery Life: 500hrs typical (alkaline Battery)

Polarity: " " Indicates negative input.

Auto Power Off Time: 30 minutes

Operating Temperature and Humidity:

0°Cto 40°C(32°F to 104°F) below80%RH

Storage Temperature and Humidity:

-10°Cto 60°C(14°F to 140°F) below70%RH

Weight: Approx.220g(7.76oz)

Dimensions(LxWxH):

150mm×72mm×35mm (5.9"×2.83"×1.38")

Accessories:

Test leads, Spare fuse (0.5A/250V),Batteries and Instruction manual.

1-2 Electrical Specifications

Accuracy specification: \pm ([... % of reading]+ [...number of least significant digits]) at 18°C to 28°C (64°F to 82°F) \leq 80%RH

Diode Tester

Range	Resolution	Accuracy	Test Current	Test Voltage	Overload protection
→	1mV	1%+2	<1mA	<3.2V	600Vrms

Continuity beeper

Range	Active Range	Test Voltage	Overload protection
→	under40Ω	<1.5V	600Vrms

DC Voltage (Auto Range)

Range	Resolution	Accuracy	Input Impedance	Overload	Protection
400mV	0.1mV	0.5%+2	200 MΩ	1100Vpeak	
4V	1mV	0.5%+2	11MΩ	1100Vpeak	
40V	10mV	0.5%+2	10MΩ	1100Vpeak	
400V	100mV	0.5%+2	10MΩ	1100Vpeak	
1000V	1V	0.8%+2	10MΩ	1100Vpeak	

AC Voltage (Auto Range)

Range	Resolution	Accuracy		Input Impedance	Overload Protection
		45Hz~400Hz	400Hz~1KHz		
400mV	0.1mV	1%+5 (45Hz~100Hz)		200 MΩ	1100Vpeak
4V	1mV	1%+4	1.5%+4	11MΩ	1100Vpeak
40V	10mV	1%+4	1.2%+4	10MΩ	1100Vpeak
400V	100mV	1%+4	1.2%+4	10MΩ	1100Vpeak

750V	1V	1%+4	1.2%+4	10MΩ	1100Vpeak
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DC Current (uA,mA,Auto Range)

Range	Resolution	Accuracy	Burden Voltage	Overload	Protection
400uA	0.1uA	1%+2	<0.25V	0.5A / 250V Fast Blow Fuse	
4000uA	1uA	1%+2	<1V	0.5A / 250V Fast Blow Fuse	
40mA	10uA	1%+2	<0.25V	0.5A / 250V Fast Blow Fuse	
400mA	100uA	1%+2	<1.5V	0.5A / 250V Fast Blow Fuse	
10A	10mA	1.2%+2	0.35V	10A / 250V Fast Blow Fuse	

AC Current(uA,mA,Auto Range)

Range	Resolution	Accuracy		Burden Voltage	Overload Protection
		45Hz~500Hz	500Hz~1KHz		
400uA	0.1uA	1.3%+5	1.6%+5	<0.25Vrms	0.5A / 250 Vfast Blow Fuse
4000uA	1uA	1.3%+5	1.6%+5	<1Vrms	0.5A / 250 VFast Blow Fuse
40mA	10uA	1.3%+5	1.6%+5	<0.25Vrms	0.5A / 250 VFast Blow Fuse
400mA	100uA	1.3%+5	1.6%+5	<1.5Vrms	0.5A / 250 VFast Blow Fuse
10A	10mA	1.5%+5	1.8%+5	<0.35Vrms	10A / 250V Fast Blow Fuse

Ohms (Auto Range)

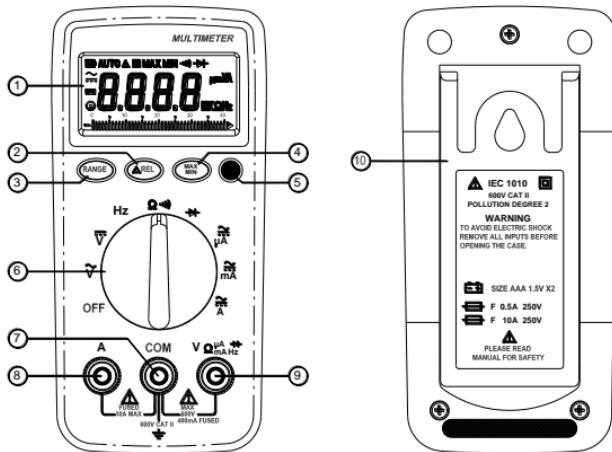
Range	Resolution	Accuracy	Test Voltage	Overload Protection
400Ω	0.1Ω	0.75%+2	<1.5VDC	600Vrms
4KΩ	1Ω	0.75%+2	<1.5VDC	600Vrms
40KΩ	10Ω	0.75%+2	<1.5VDC	600Vrms
400KΩ	100Ω	0.75%+2	<1.5VDC	600Vrms
4MΩ	1KΩ	0.75%+2	<1.5VDC	600Vrms
40MΩ	10KΩ	1.2%+3	<1.5VDC	600Vrms

Frequency (Auto Range)

Range	Resolution	Accuracy	Sensitivity	Overload Protection
4 KHz	1Hz	0.1%+1	<300mVpp	600V rms
40KHz	10Hz	0.1%+1	<300mVpp	600V rms
400KHz	100Hz	0.1%+1	<300mVpp	600V rms
4MHz	1KHz	0.1%+1	<3Vpp	600V rms
40MHz	10KHz	0.1%+1	<3Vpp	600V rms

2.PARTS & CONTROLS

2-1 Name of Parts and Position:



← LCD Display:

Measured values, unit, function and decimal points symbols are displayed.

↑ Relative Button:

Press button to enter the relative mode. The Display is zeroed , and the reading is stored as reference value for subsequent measurements. Press it again, the "Δ" annunciator blinking and stored relative value will display . Press and hold down button for 1 second to exit the relative mode.

→ Auto-range & Manual Range Button:

- Press to select the Manual Range mode and the annunciator turn on and The meter remains in the same range it



was .

- In the Manual Range mode, each time you press  button , the range (and the input range annunciate) increases , and a new value is displayed.
- If the meter is in the highest range, the next range is change to the lowest range. To exit the Manual Range mode and return to Auto Range mode, Press and hold down  for 1 seconds, the AUTO annunciate turns back on.

↓  **MAX/MIN recording button:**

Press  button to enter the maximum and minimum recording mode, select the proper range before using MAX/MIN to ensure that reading value will not exceed the measurement range. Press the button once to select MAX value.

Press it again to select MIN value, and press again to select current value with " MAX.MIN " annunciator blinking. Press and hold down  button for 1 second to exit the MAX MIN mode.

◦  /  **AC/DC Current Select and Ω Select Button:**

- To select function AC or DC in current Ampere range.
- To select continuity measurements or Resistance measurement at  range.

± **Function Selector Switch:**

For power OFF and selection of desired Function Range.

" **COM Measuring Connector:**

To connect negative lead (black test lead) for voltage, frequency, current, resistance, diode and continuity measurement.

$\geq 10A$ **Measuring Connector:**

To connect positive lead (red test lead)for current measurement below 10A.

$\times V\Omega, \mu A, mA, Hz, \rightarrow$ **Measuring Connector:**

To connect positive lead (red test lead) for voltage, diode, frequency, micro ampere, milliampere and continuity measurement.

Note:

To avoid blowing an input fuse, use the 10 A jack until you

are sure that the current is less than 400mA. When Doing Current Measurement.

∞ Tilt stand

2-2 Operating Instruction

2-2-1 Ranging

The meter defaults to autorange mode when you turn on the Meter. Manual ranging is available in $V\sim$, $V\equiv$, ohms, $A\sim$, $A\equiv$, frequency.

To return to autorange, press  for 1 second or turn the rotary switch.

2-2-2 DC Voltage Measurements

WARNING!

Maximum Input Voltage is 1000V DC, 750V AC. Do not attempt to Take any voltage measurement that may exceed to avoid Electrical shock hazard and/or damage to this instrument

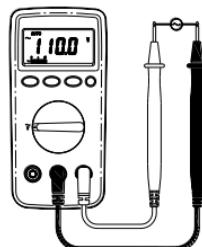


- ⇒ Connect red test lead to "V" jack and black test lead to "COM" jack.
- Set Range Switch to $V\equiv$ range.
- Connect the test leads IN PARALLEL to the circuit being measured.
- ⇒ Read the Voltage value on LCD.

2-2-3 AC Voltage Measurements

WARNING!

Maximum Input Voltage is 1000V DC, 750V AC. Do not attempt to Take any voltage measurement that may exceed to avoid Electrical shock hazard and/or damage to this instrument.



- ⇒ Connect red test lead to "V" jack and black test lead to "COM" jack.
- Set Range Switch to $V\sim$ range.

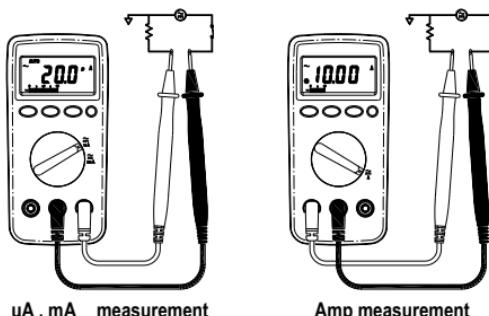
- Connect the test leads IN PARALLEL to the circuit being measured.
- Read the Voltage value on LCD.

2-2-4 AC/DC Current Measurements

WARNING!

To avoid injury, do not attempt a current measurement if the open circuit voltage exceeds the rate voltage of the meter.

- Connect red test lead to the "mA / uA "jack for Current measurements up to 400mA.(For measuring Current between 400mA to 10A , Connect red test lead to " 10 A " jack) Connect black test lead to " COM " jack.
- Set Range selector Switch to desired A range and press DC/AC button to select AC/DC function.
- Cut the power to the circuit to be tested and Connect the instrument IN SERIES with the circuit with the black test lead on the negative " - " side and the red lead on the positive " + " side being measured.
- Apply power and read the ampere value on LCD.



2-2-5 Diode Tests

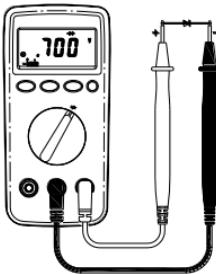
WARNING!

Before taking any in-circuit measurement ,remove power from the circuit being tested and discharge all capacitors in the

circuit.

- Connect red test lead to "  " jack and black test lead to " COM " jack.

- Set Range selector Switch to "  " range.



▫ Connect the red test lead to the anode side and black test lead to the cathode side of the diode being tested.

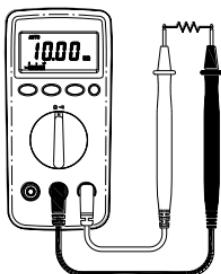
▫ Read forward Voltage(V_f) value on LCD.

▫ If the polarity of test leads are reversed with diode polarity ▫, the digital reading show " OL ". This can be used for distinguishing anode and cathode terminal of a diode.

2-2-6 Resistance Measurements

WARNING!

Before taking any in-circuit measurement , remove power from the circuit being tested and discharge all capacitors in the circuit.



▫ Connect red test lead to " Ω "jack and black test lead to " COM "jack.

▫ Set Range Switch to "  " range and press  button to " Ω "function.

▫ Connect test lead to the circuit being measured and read the resistance value on LCD.

2-2-7 Continuity Measurements

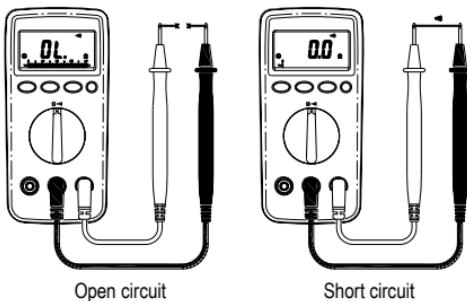
WARNING!

Before taking any in-circuit measurement ,remove power from

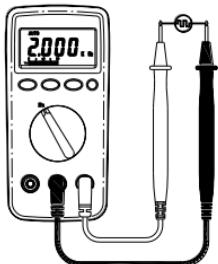
the circuit being tested and discharge all capacitors in the circuit.

- ⇒ Connect red test lead to “ Ω ” jack and black test lead to “COM” jack.
- Set Range Switch to “ Ω ” range , by pressing button.
- Remove power from the circuit being tested and discharge all capacitors.
- Connect test lead to the circuit being measured.
- When the impedance between the test jack is lower than $40\ \Omega$,it will activate a continuous beeper (2KHz).

Note: Continuity Test is available to check open/short of the circuit .



2-2-8 Frequency Measurements



- ⇒ Connect red test lead to “Hz” jack and black test lead to “COM” jack.
- Set Range Switch to “Hz” range .
- Connect the test lead IN PARALLEL to the circuit being measured.
- Read the frequency value on LCD.

3.BATTERY & FUSE REPLACEMENT

WARNING!

To prevent electrical hazard or shock , turn off multimeter and disconnect test leads before removing back cover.

3-1 Battery Check & Replacement

1. As battery power is not sufficient, LCD will display “ **B** ” .
Replacement of two new batteries type AAA 1.5V is Required.
2. Set Range Switch to “ OFF ” position .Use a screwdriver to remove the rear cover. Take out the battery and replace them with two new batteries of type AAA1.5V.
3. Place back the rear cover and secure it with the original screw.

3-2 FUSE Replacement

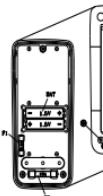
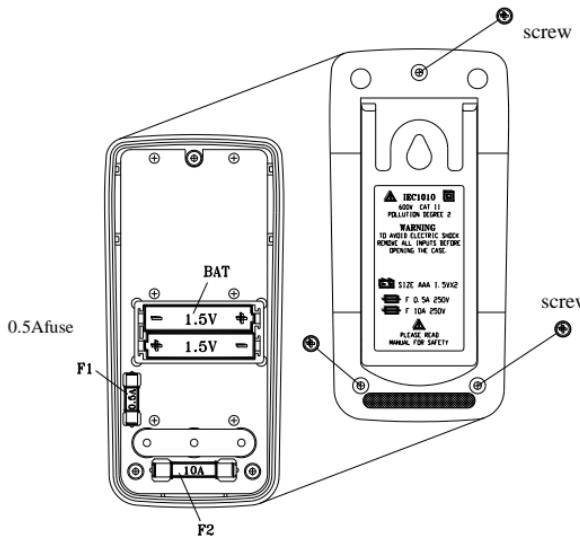
1. Set Range Switch to “ OFF ” position. Use a screwdrive to remove the rear cover. Take out the malfunction fuse and replace it with a new fuse rated 0.5A / 250A (or 10A / 250V) of fast blow type.
2. Place back the rear cover and secure it with the original screw.

WARNING!

For safety , use exact replacement .

Fuse 1 : F0.5A / 250V 5 ϕ \times 20 mm Fast blow type

Fuse 2 : F10A / 250V 6.3 ϕ \times 32 mm Fast blow type



4. MAINTENANCE

WARNING!

To avoid electric shock, remove the test leads before opening the case, and close the case before using the meter.

To prevent fire and possible arc-flash, use fuses with ratings shown on the back of the meter.

Caution!

To avoid contamination or static damage, do not touch the circuit board without proper static protection.



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