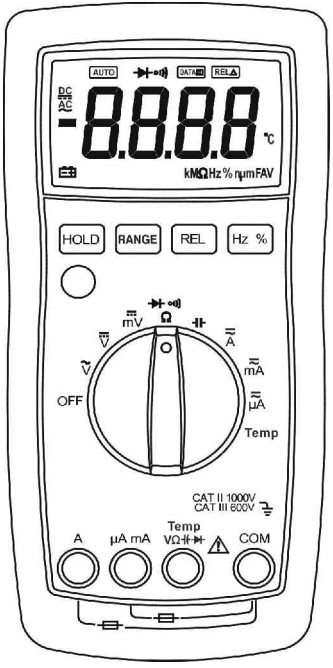
DIGITAL MULTIMETER

USER'S Manual



CAT II 1000V

CAT III 600V

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1.General Instructions

This instrument complies with IEC 1010-1 (61010-1@ IEC: 2001), CAT II 1000V and CAT III 600V overvoltage standards. See Specifications.
To get the best service from this instrument, read carefully this user's manual and respect the detailed safety precautions.
International symbols used on the Meter and in this manual are explained in chapter 1.1.3

1.1Precautions safety measures

1.1.1 Preliminary

- MEASUREMENT CATEGORY III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.
  NOTE: Examples are measurements on distribution boards, circuit-breakers, wiring, including cables, bus-bars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industrial use and some other equipment, for example, stationary motors with permanent connection to the fixed installation.
- MEASUREMENT CATEGORY II is applicable to test and measuring circuits connected directly to utilization points (socket outlets and similar points) of the low-voltage MAINS installation.
  NOTE: Examples are measurements on household appliances, portable tools and similar equipment.
- Measurement category I is for measurements performed on circuits not directly connected to MAINS.
  NOTE: Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS derived circuits. In the latter case, transient

stresses are variable; for that reason, requires that the transient withstand capability of the equipment is made known to the user.
- When using this Multimeter, the user must observe all normal safety rules concerning:
  - protection against the dangers of electric current.
  - protection of the Multimeter against misuse.
- For your own safety, only use the test probes supplied with the instrument. Before use, check that they are in good condition.

1.1.2 During use

- If the meter is used near noise generating equipment, be aware that display may become unstable or indicate large errors.
- Do not use the meter or test leads if they look damaged.
- Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.
- Use extreme caution when working around bare conductors or bus bars.
- Do not operate the meter around explosive gas, vapor, or dust.
- Verify a Meter's operation by measuring a known voltage. Do not use the Meter if it operates abnormally. Protection may be impaired. When in doubt, have the Meter serviced.
- Uses the proper terminals, function, and range for your measurements.
- When the range of the value to be measured is unknown, check that the range initially set on the multimeter is the highest possible or, wherever possible, choose the autoranging mode.
- To avoid damages to the instrument, do not exceed the

maximum limits of the input values shown in the technical specification tables.
- When the multimeter is linked to measurement circuits, do not touch unused terminals.
- Caution when working with voltages above 60Vdc or 30Vac rms. Such voltages pose a shock hazard.
- When using the probes, keep your fingers behind the finger guards.
- When making connections, connect the common test lead before connecting the live test lead; when disconnecting, disconnect the live test lead before disconnecting the common test lead.
- Before changing functions, disconnect the test leads from the circuit under test.
- For all dc functions, including manual or auto-ranging, to avoid the risk of shock due to possible improper reading, verify the presence of any ac voltages by first using the ac function. Then select a dc voltage range equal to or greater than the ac range.
- Disconnect circuits power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.
- Never perform resistance or continuity measurements on live circuits.
- Before measuring current, check the meter's fuse and turn off power to the circuit before connecting the meter to the circuit.
- In TV repair work, or when carrying out measurements on power switching circuits, remember that high amplitude voltage pulses at the test points can damage the multimeter. Use of a TV filter will attenuate any such pulses.
- Use only three AAA batteries, properly installed in the Meter's battery case, to power the Meter.

- Replace the battery as soon as the battery indicator appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- Do not measure voltages above 600V in CAT III, or 1000V in CAT II installations.
- When in REL mode the **REL** △ symbol is displayed. Caution must be used because hazardous voltage may be present.
- Do not operate the Meter with the case (or part of the case) removed.

1.1.3 Symbols:

Symbols used in this manual and on the instrument:

⚠	**Caution:** refer to the instruction manual. Incorrect use may result in damage to the device or its components.
~	AC (Alternating Current)
⎓	DC (Direct Current)
≂	AC or DC
⏚	Earth ground
⧈	Double insulated
—▭—	Fuse

1.1.4 Instructions

- Remove test leads from the Meter before opening the Meter case or battery cover.
- When servicing the Meter, use only specified replacement parts.
- Before opening up the instrument, always disconnect from all sources of electric current and make sure you are not charged with static electricity, which may destroy internal components.
- Any adjustment, maintenance or repair work carried out on the meter while it is live should be carried out only by appropriately qualified personnel, after having taken into account the instructions in this present manual.
- A "qualified person" is someone who is familiar with the installation, construction and operation of the equipment and the hazards involved. He is trained and authorized to energize and de-energize circuits and equipment in accordance with established practices.
- When the instrument is opened up, remember that some internal capacitors can retain a dangerous potential even after the instrument is switched off.
- If any faults or abnormalities are observed, take the instrument out of service and ensure that it cannot be used until it has been checked out.
- If the meter is not going to be used for a long time, take out the battery and do not store the meter in high temperature or high humidity environment.

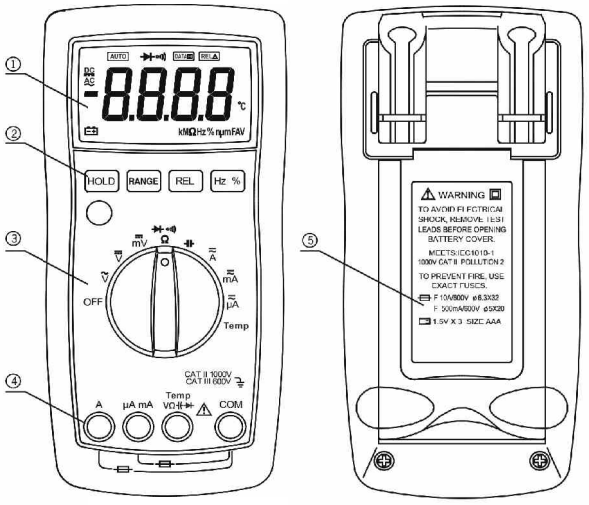
1.2 Protection mechanisms

This instrument is fitted with various protection mechanisms:

- Varistor protection for limiting transients of over 1000V at the VΩ terminal.
- A PTC (positive temperature coefficient) resistor protects against permanent overvoltages of up to 1000V during resistance, capacitance, temperature, continuity and diode test measurements.
- Selected function or range isn't suitable for the inserted red test lead terminal. Pull out the red test lead and then select the function or range

2. DESCRIPTION

2.1 Instrument Familiarization



1.LCD display
2.Keypad
3.Rotary switch
4.Terminals
5.Battery cover

2.2 LCD Display

See Table 1 indicated for information about the LCD display.

Table 1. Display Symbols

Number	Symbol	Meaning
1		The battery is low. ⚠ **Warning:** To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.
2	−	Indicates negative readings.

3	AC		Indicator for ac voltage or current. AC voltage and current are displayed as the average of the absolute value of the input, calibrated to indicate the equivalent rms value of a sine wave.
4	DC		Indicator for dc voltage or current.
5	AUTO		The Meter is in the Autorange mode in which the meter automatically selects the range with the best resolution.
6	⊣◀		The Meter is in the Diode Test mode
7	)))		The Meter is in the Continuity Check mode.
8	DATA-H		The Meter is in the Data Hold mode
9	RELΔ		The Meter is in the Relative measurement mode
10	°C		°C:Celsius scale. The unit of temperature.
11	V, mV	V: mV:	Volts. The unit of voltage. Millivolt. $1x10^{-3}$ or 0.001 volts.
	A, mA, μA	A: mA: μA:	Amperes (amps). The unit of current. Milliamp. $1x10^{-3}$ or 0.001 amperes. Microamp. $1x10^{-6}$ or 0.000001 amperes
	Ω,kΩ, MΩ	Ω: kΩ: MΩ:	Ohm. The unit of resistance. Kilohm. $1x10^{3}$ or 1000 ohms. Megohm. $1x10^{6}$ or 1,000,000 ohms.

11	%	%	Percent. The unit of Duty cycle.
	Hz, kHz, MHz	Hz: Khz: MHZ:	Hertz. The unit of frequency in cycles/second. Kilohertz. $1x10^{3}$ or 1000 hertz. Meghertz. $1x10^{6}$ or 1,000,000 hertz.
	μF, nF	F: μF: nF:	Farad. The unit of capacitance. Microfarad. $1x10^{-6}$ or 0.000001 farads. Nanofarad. $1x10^{-9}$ or 0.000000001 farads.
12	OL		The input is too large for the selected range.

2.3 Keypad

See Table 2 indicated for information about the keypad operations.

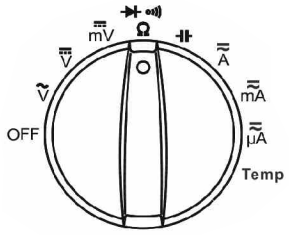
Key	Function	Operation performed
O (YELLOW)	Ω ⊣◀))) A mA μA Power-up Option	Switches between Resistance measurement, Diode Test and Continuity check. Switches between dc and ac current. Disables automatic power-off feature.
HOLD	Any switch position	Press **HOLD** to enter and exit the Data Hold mode

RANGE	**V~ V⎓ Ω A, mA and µA**	1.Press **RANGE** to enter the manual ranging mode. 2.Press **RANGE** to step through the ranges available for the selected function. 3.Press and hold **RANGE** for 2 seconds to return to autoranging.
REL	**Any switch position**	Press **REL** to enter and exit the Relative measurement mode.
Hz %	**V~, A, mA and µA**	1 Press to start the frequency counter. 2 Press again to enter duty cycle (duty factor) mode. 3 Press again to exit the frequency counter mode.

2.4 Rotary switch

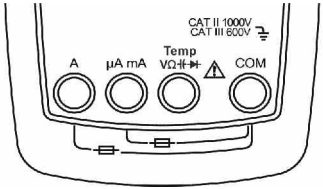
See Table 3 indicated for information about the rotary switch positions.

Table 3. Rotary Switch Positions



V~	AC Voltage measurement
V⎓	DC Voltage measurement
mV⎓	DC milliVolt measurement
Ω →|| ◦))	Resistance measurement / Diode Test / Continuity Check
⊣⊢	Capacitance measurement
A≂	DC or AC Current measurement from 0.01A to 10.00A.
mA≂	DC or AC current measurements from 0.01mA to 400mA.
µA≂	DC or AC current measurements from 0.1µA to 4000µA.
Temp	Temperature measurement

2.5 Terminals
See Table 4 indicated for information about the terminals.



Terminal	Description
COM	Terminal receiving the black test lead as a common reference.
Temp VΩ⊣⊢⊣◀	Terminal receiving the red test lead for voltage, resistance, capacitance, frequency, Temperature, diode and continuity measurements.
μA/mA	Terminal receiving the red test lead for ,μ mA and frequency measurements.
A	Terminal receiving the red test lead for 4A, 10A and frequency measurements.

3. FUNCTION DESCRIPTION

3.1 General Functions

3.1.1 DATA HOLD mode

Data Hold mode makes the meter stop updating the display. Enabling Data Hold function in autorange mode makes the meter switch to Manual ranging mode, but the full-scale range remains the same. Data Hold function can be cancelled by changing the measurement mode, pressing **RANGE** key, or push **HOLD** key again.
To enter and exit the Data Hold mode:
1. Press **HOLD** key (short press). Fixes the display on the current value, **DATA-H** is displayed.
2. A second short press returns the meter to normal mode.

3.1.2 Manual ranging and Autorange mode

The Meter has both manual ranging and autorange options.
- In the autorange mode, the Meter selects the best range for the input detected. This allows you to switch test points without having to reset the range.
- In the manual ranging mode, you select the range. This allows you to override autorange and lock the meter in a specific range.
- The Meter defaults to the autorange mode in measurement functions that have more than one range. When the Meter is in the autorange mode, **AUTO** is displayed.

To enter and exit the manual range mode:
1. Press **RANGE** key. The Meter enters the manual ranging mode. **AUTO** turns off. Each presses of **RANGE** key increments the range. When the highest range is reached, the Meter wraps to the lowest range.

NOTE:
If you manually change the measurement range after entering the Data Hold modes, the Meter exits this mode.
2. To exit the manual ranging mode, press and hold down **RANGE** key for two seconds. The Meter returns to the autorange mode and **AUTO** is displayed.

3.1.3 Battery Saver
- The Meter enters the "sleep mode" and blanks the display if the Meter is on but not used for 30 minutes.
- Press the **HOLD** key or rotate the rotary switch to wake the meter up.
- To disable the Sleep mode, hold down the yellow key while turning the meter on.

3.1.4 Relative measurement mode
The Meter will display relative measurement in all functions except frequency.
To enter and exit the relative measurement mode:
1. With the Meter in the desired function, touch the test leads to the circuit on which you want future measurement to be based.
2. Press **REL** key to store the measured value and activate the relative measurement mode. The difference between the reference value and subsequent reading is displayed.
3. Press **REL** key for more than 2 seconds to return the Meter to normal operation.

3.2 Measurement Functions

3.2.1 AC and DC Voltage measurement

⚠Warning

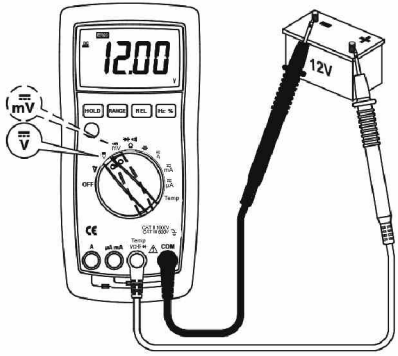
To avoid electrical shock and/or damage to the instrument, do not attempt to take any voltage measurement that might exceeds 1000Vdc or 1000Vac rms.
To avoid electrical shock and/or damage to the instrument, do not apply more than 1000Vdc or 1000Vac rms between the common terminal and the earth ground.

Voltage is the difference in electrical potential between two points. The polarity of ac (alternating current) voltage varies over time; the polarity of dc (direct current) voltage is constant.
The Meter's voltage ranges are 400.0mV, 4.000V, 40.00V, 400.0V and 1000V. (AC 400.0mV range only exists in manual ranging mode).

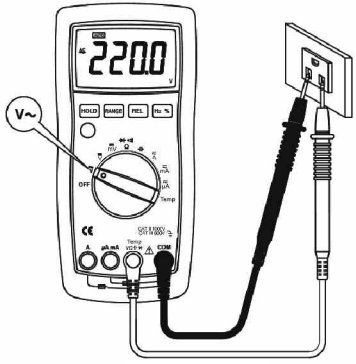
To measure ac or dc voltage (set up and connect the Meter as shown in Figure 2):
1. Set rotary switch to the DCV, ACV or DCmV range.
2. Connect the black and red test leads to the COM and V terminals respectively.
3. Connect the test leads to the circuit being measured
4. Read the displayed value. The polarity of red test lead connection will be indicated when making a DCV measurement.

NOTE:

- Unstable display may occur especially at 400mV range, even though you do not put test leads into input terminals, in this case, if an erroneous reading is suspected, short the V terminal and the COM terminal, and make sure the zero display.
- For better accuracy when measuring the dc offset of an ac voltage, measure the ac voltage first. Note the ac voltage range, then manually select a dc voltage range equal to or higher than the ac range. This improves the accuracy of the dc measurement by ensuring that the input protection circuits are not activated.



DC Voltage



AC Voltage

3.2.2 Resistance measurement

⚠Warning

To avoid electrical shock and/or damage to the instrument, disconnect circuit power and discharge all high-voltage capacitors before measuring resistance.

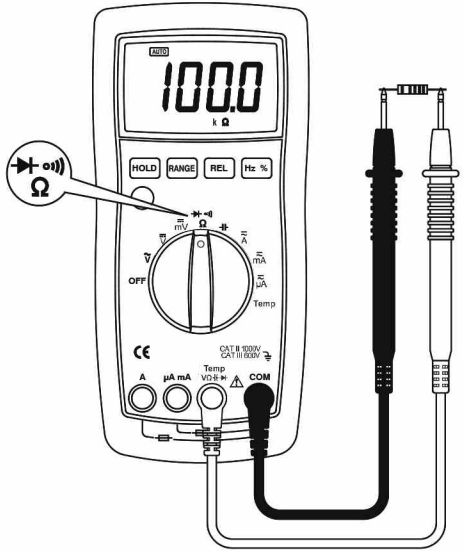
Resistance is an opposition to current flow.
The unit of resistance is the ohm (Ω). The Meter measures resistance by sending a small current through the circuit. Because this current flows through all possible paths between the probes, an in-circuit resistance reading represents the total resistance of all paths between the probes.
The Meter's resistance ranges are 400.0Ω, 4.000kΩ, 40.00kΩ, 400.0kΩ, 4.000MΩ and 40.00MΩ.
To measure resistance (set up the Meter as shown in figure 3):

1. Set the rotary switch to Ω range.
2. Connect the black and red test leads to the COM and VΩ terminals respectively.
3. Connect the test leads to the circuit being measured and read the displayed value.

Some tips for measuring resistance:

- The measured value of a resistor in a circuit is often different from the resistor's rated value. This is because the Meter's test current flows through all possible paths between the probe tips.
- In order to ensure the best accuracy in measurement of low resistance, short the test leads before measurement and memory the test probe resistance in mind. This necessary to subtract for the resistance of the test leads.

- The resistance function can produce enough voltage to forward-bias silicon diode or transistor junctions, causing them to conduct. To avoid this, do not use the 40MΩ range for in-circuit resistance measurements.
- On 40MΩ range, the meter may take a few seconds to stabilize reading. This is normal for high resistance measuring.
- When the input is not connected, i.e. at open circuit, the figure "OL" will be displayed for the overrange condition.



3.2.3 Diode Test

> ⚠**Warning**
>
> **To avoid electrical shock and/or damage to the instrument, disconnect circuit power and discharge all high-voltage capacitors before testing diodes.**

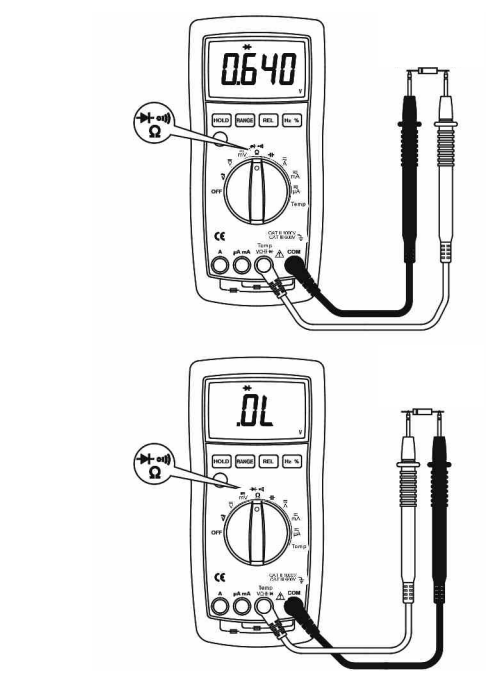
Use the diode test to check diodes, transistors, and other semiconductor devices. The diode test sends a current through the semiconductor junction, then measures the voltage drop across the junction, A good silicon junction drops between 0.5V and 0.8V.

The Meter's resistance ranges are 400.0Ω, 4.000kΩ, 40.00kΩ, 400.0kΩ, 4.000MΩ and 40.00MΩ.

To test a diode out of a circuit (set up the Meter as shown in Figure 4):

1. Set the rotary switch to Ω range.
2. Press the yellow key once to activate Diode Test.
3. Connect the black and red test leads to the COM and VΩ terminals respectively.
4. For forward-bias readings on any semiconductor component, place the red test lead on the component's anode and place the black test lead on the component's cathode.
5. The meter will show the approx. forward voltage of the diode.

In a circuit, a good diode should still produce a forward bias reading of 0.5V to 0.8V; however, the reverse-bias reading can vary depending on the resistance of other pathways between the probe tips.



3.2.4 Continuity Check

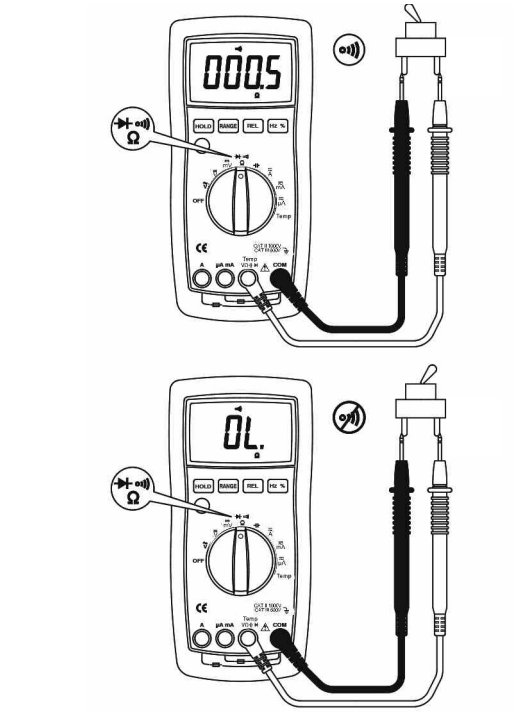
> ⚠**Warning**
>
> **To avoid electrical shock and/or damage to the instrument, disconnect circuit power and discharge all high-voltage capacitors before testing for Continuity.**

Continuity is a complete path for current flow.
The beeper sounds if a circuit is complete. These brief contacts cause the Meter to emit a short beep.

To test for continuity (set up the Meter as shown in Figure 5):

1. Set the rotary switch to Ω ⊣◀ ◦)) range.
2. Press the yellow key twice to activate Continuity Check.
3. Connect the black and red test leads to the COM and terminals respectively.
4. Connect the test leads to the resistance in the circuit being measured.
5. When the test lead to the circuit is below 75Ω, a continuous beeping will indicate it.

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



3.2.5 Capacitance measurement

⚠Warning

To avoid electrical shock and/or damage to the instrument, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. Use the dc voltage function to confirm that the capacitor is discharged.

Capacitance is the ability of a component to store an electrical charge.The unit of capacitance is the farad (F). Most capacitors are in the nanofarad to microfarad range. The Meter measures capacitance by charging the capacitor with a known current for a known period of time, measuring the resulting voltage, then calculating the capacitance. The measurement takes about 1 second per range.

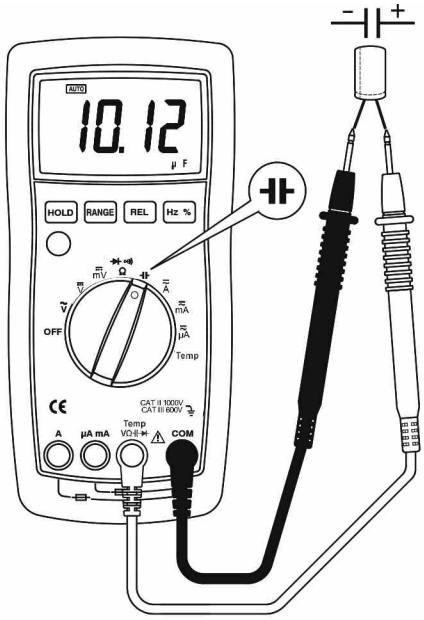
The Meter's capacitance ranges are 50.00nF, 500.0nF, 5.000μF, 50.00μF and 100.0μF.

To measure capacitance (set up the Meter as shown in Figure 6):

1. Set the rotary switch to ⊣⊢ range.
2. Connect the black and red test leads to the COM and ⊣⊢ terminals respectively (or you can measure the capacitance by using Multi Function Socket).
3. Connect the test leads to the capacitor being measured and read the displayed value.

Note:

- The meter may take a few seconds to stabilize reading. This is normal for high capacitance measuring.
- To improve the accuracy of measurements less than 50nF, subtract the residual capacitance of the Meter and leads.
- Below 500pF, the accuracy of measurements is unspecified.



3.2.6 Frequency and Duty Cycle measurement

⚠Warning

Do not measure Frequency on high voltage (>1000V) to avoid electrical shock hazard and/or damage to the instrument.

Frequency is the number of cycles a voltage or current signal completes each second.
The Meter can measure Frequency or Duty Cycle while making either an AC Voltage or AC Current measurement.

To measure frequency or Duty Cycle:
1. With the meter in the desired function (AC Voltage or AC Current), press the **Hz %** key.
2. Read the frequency of the AC signal on the display.
3. To make a duty cycle measurement, press the **Hz %** key again.
4. Read the percent of duty cycle on the display.

Note:
In noisy environment, it is preferable to use shield cable for measuring small signal.

3.2.7 Temperature measurement

⚠Warning

To avoid electrical shock and/or damage to the instrument, do not apply more than 1000V DC or 1000V AC rms between the Temp terminal and the COM terminal.
To avoid electrical shock, do not use this instrument when voltages at the measurement surface exceed 60V dc or 24V rms. AC.
To avoid damage or burns. Do not make temperature measurements in microwave ovens.

To measure temperature:
1. Set the rotary switch to **Temp** range and the LCD will show the current environment temperature.
2. Insert “K” type thermocouples into the COM terminal and **Temp** terminal (or you can insert it by using Multi Function Socket),Takings care to observe the correct polarity.
3. Touch the object with the thermocouple probe for measurement.
4. Read the stable reading from LCD.

3.2.8 Current measurement

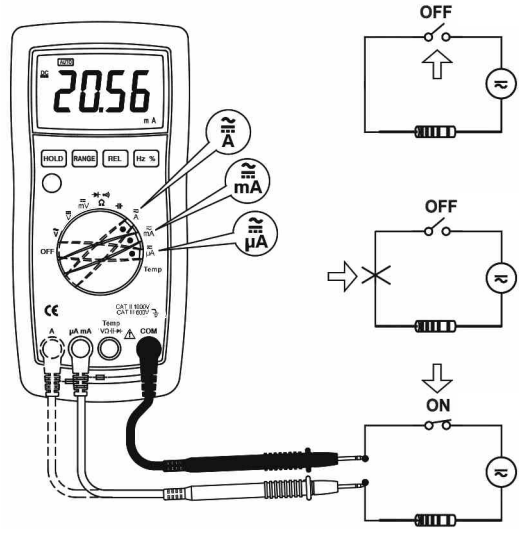
⚠Warning

To avoid damage to the Meter or injury if the fuse blows, never attempt an in-circuit current measurement where the open-circuit potential to earth is greater than 250V.
To avoid damage to the meter, check the meter's fuse before proceeding. Use the proper terminals, function, and range for your measurement. Never place the probes in parallel with a circuit or component when the leads are plugged into the current terminals.

Current is the flow of electrons through a conductor.
The Meter's current ranges are 400.0μA, 4000μA, 40.00mA, 400.0mA, 4.000A and 10.00A.

To measure current (set up the Meter as shown in Figure 7):

1. Turn off power to the circuit. Discharge all high voltage capacitors.
2. Set the rotary switch to the μA, mA or A range.
3. Press the yellow key to select DCA or ACA measuring mode.
4. Connect the black test lead to the COM terminal and the red test leads to the mA terminal for a maximum of 400mA. For a maximum of 10A, move the red test lead to the A terminal.
5. Break the circuit path to be tested.Touch the black probe to the more negative side of the break; touch the red probe to the more positive side of the break. (Reversing the leads will give a negative reading, but will not damage the Meter.)
6. Turn on power to the circuit; then read the display. Be sure to note the measurement units at the right side of the display (μA, mA or A). When only the figure "OL" displayed, it indicates overrange situation and the higher range has to be selected.
7. Turn off power to the circuit and discharge all high voltage capacitors. Remove the Meter and restore the circuit to normal operation.



4 TECHNICAL SPECIFICATIONS

4.1 General specifications

- Environment conditions:
  1000V CAT II and 600V CAT III
  Pollution degree: 2
  Altitude < 2000m
  Operating temperature: 0~40°C, 32°F~122°F(<80% RH, <10°C non-condensing)
  Storage temperature: -10~60°C, 14°F~140°F(<70% RH, battery removed)
- Temperature Coefficient: 0.1(specified accuracy) /°C (<18°C or >28°C)
- MAX. Voltage between terminals and earth ground: 1000V AC rms or 1000V DC.
- Fuse Protection: μA and mA: F 500mA/250V Ø5x20; A: F 10A/250V Ø6.3x32.
- Sample Rate: 3 times/sec for digital data.
- Display: 3 3/4 digits LCD display. Automatic indication of functions and symbols.
- Range selection: automatic and manual.
- Over Range indication: LCD will display "OL".
- Low Battery Indication:The is displayed when the battery is under the proper operation range.
- Polarity indication: "-" displayed automatically.
- Power source: 4.5V⎓
- Battery type: AAA 1.5V.
- Dimensions: 185(L)87(W)53(H) mm.
- Weight: 360g. Approx. (battery included).

4.2 Measurement specifications

Accuracy is specified for one year after calibration, at operating temperatures of 18°C to 28°C, with relative humidity at 0% to 75%.
Accuracy specifications take the form of: ±(% of Reading + Number of Least Significant Digits)

4.2.1 DC Voltage

Measuring Range	Resolution	Accuracy
400mV	0.1mV	±(1.0% reading + 10dgt)
4V	1mV	±(0.5% reading + 3dgt)
40V	10mV	
400V	100mV	
1000V	1V	

- Overload protection: 1000V DC or AC rms
- Frequency Range: 40Hz~500Hz
- Manual Range only

4.2.2 AC Voltage

Measuring Range	Resolution	Accuracy
400mV	0.1mV	±(3.0% reading + 3dgt)
4V	1mV	±(1.0% reading + 3dgt)
40V	10mV	
400V	100mV	
1000V	1V	

- Overload protection: 1000V DC or AC rms
- Frequency Range: 40Hz~500Hz
- Manual Range only

4.2.3 Frequency

Function	Resolution	Accuracy
50.00Hz	0.01Hz	±(0.1% reading + 3dgt)
500.0Hz	0.1Hz	
5.000kHz	0.001kHz	
50kHz	0.01kHz	
100kHz	0.1kHz	

- Overload protection: 1000V DC or AC rms

4.2.4 Resistance

Measuring Range	Resolution	Accuracy
400Ω	0.1Ω	±(0.5% reading + 3dgt)
4.000kΩ	1Ω	±(0.5% reading + 2dgt)
40.00kΩ	10Ω	
400.0kΩ	100Ω	
4.000MΩ	1kΩ	
40.00MΩ	10kΩ	±(1.5% reading + 3dgt)

- Overload protection: 1000V DC or AC rms

4.2.5 Diode test

Function	Resolution	Description
	0.001V	Displays approx. forward-biased voltage

- Overload protection: 1000V DC or AC rms

4.2.6 Continuity

Function	Description
	If measured resistance is less than 75Ω, buzzer will sound.

- Overload protection: 1000V DC or AC rms

4.2.7 Capacitance

Function	Resolution	Accuracy
50nF	10pF	±(3.0% reading + 10dgt)
500nF	100pF	±(3.0% reading + 5dgt)
5μF	1nF	
50μF	10nF	
100μF	100nF	

- Overload protection: 1000V DC or AC rms

4.2.8 Temperature

Function	Resolution	Accuracy
-55°C~0°C	0.1°C	±(9.0% of rdg + 2°C)
1°C~400°C		±(2.0% of rdg + 1°C)
400°C~1000°C	1°C	±2.0% of rdg

- Overload protection: 1000V DC or AC rms
- 1 Temperature specification do not include thermocouple errors.

4.2.9 DC Current

Measuring Range	Resolution	Accuracy
400μA	0.1μA	±(1.5% reading + 3dgt)
4000μA	1μA	
40mA	0.01mA	±(1.5% reading + 3dgt)
400mA	0.1mA	
4A	1mA	±(1.5% reading + 3dgt)
10A	10mA	

-Overload protection: F 10A H 250V fuse for A range.
F 500mA H 250V fuse for A and mA ranges.
-Maximum input current: 400mA dc or 400mA ac rms for A and mA ranges, 10A dc or 10A ac rms for A ranges. For measurements>5A, 4 minutes maximum ON to measure 10 minutes OFF; Above 10A unspecified.
-Frequency Range: 40Hz-200Hz
-Response: Average, calibrated in rms of sine wave

4.2.10 AC Current

Measuring Range	Resolution	Accuracy
400μA	0.1μA	±(1.5% reading + 3dgt)
4000μA	1μA	
40mA	0.01mA	±(1.5% reading + 3dgt)
400mA	0.1mA	
4A	1mA	±(1.5% reading + 3dgt)
10A	10mA	

-Overload protection: F 10A H 250V fuse for A range.
F 500mA H 250V fuse for A and mA ranges.
-Maximum input current: 400mA dc or 400mA ac rms for

A and mA ranges, 10A dc or 10A ac rms for A ranges. For measurements>5A, 4 minutes maximum ON to measure 10 minutes OFF; Above 10A unspecified.
-Frequency Range: 40Hz-200Hz
-Response: Average, calibrated in rms of sine wave

5. Maintenance

⚠Warning

To prevent electric shock and damage to the meter or personal injury, remove test lead before opening battery cover.

5.1 Replacing the Batteries

5.1.1 When the"[⊟+]"ymbol appears, it indicates the batteries need to be replaced.
5.1.2 Unscrew the battery cover and remove it from the meter.
5.1.3 Replace the used batteries with new AAA batteries.
5.1.4 Replace the battery cover and secure it to the meter.

5.2 Replacing the Test Lead (or alligator clip)

If insulation on leads is damaged, replace it.

⚠Warning

Replacement leads must be of the same rating or higher as the leads supplied with the meter: 600v 10a.

6. Accessories

1	User's manual	One piece
2	Test leads	One piece
3	"K"type bead thermocouple	One piece
4	Multi function socket	One piece

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