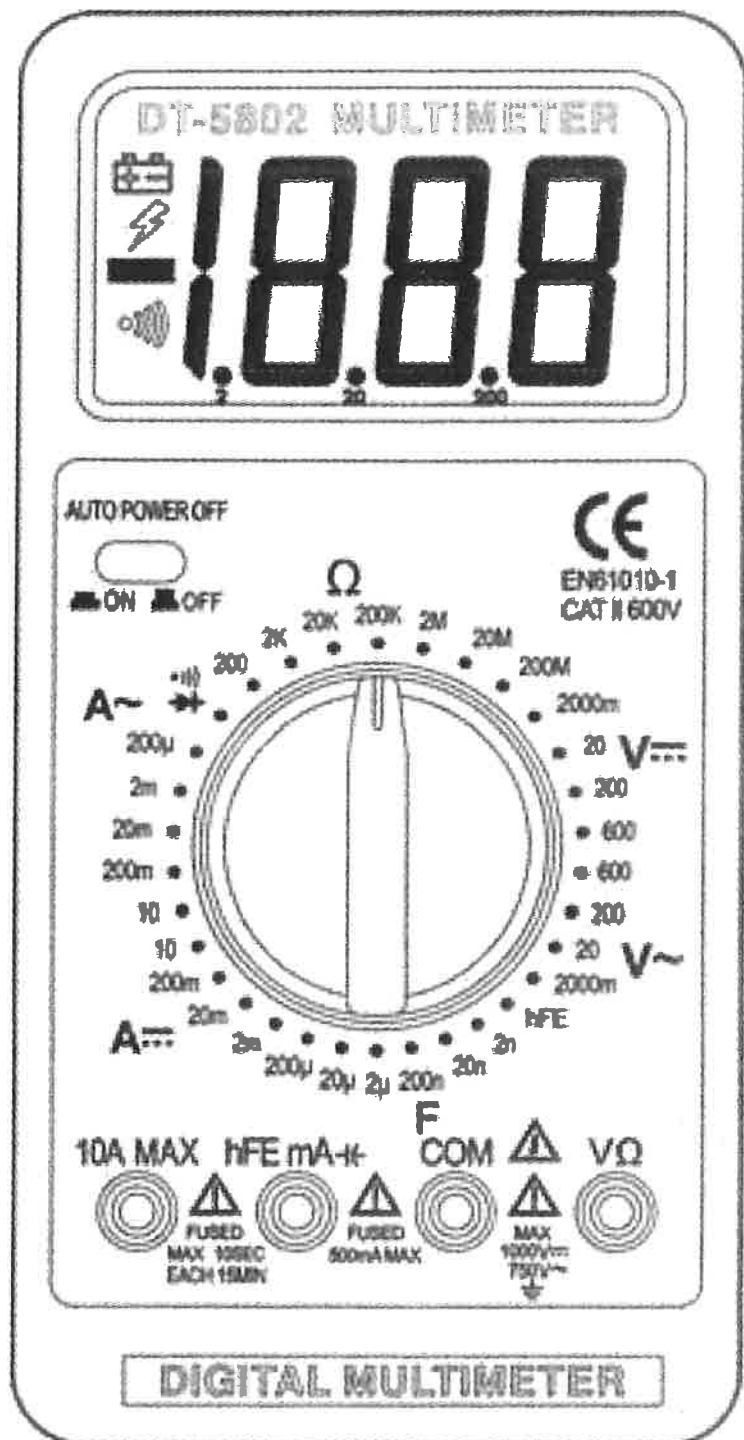


OPERATOR'S INSTRUCTION MANUAL

DIGITAL MULTIMETER

MODEL:

- DT5801
- DT5802
- DT5807
- DT5808



WARNING

READ AND UNDERSTAND THIS MANUAL
BEFORE USING THE INSTRUMENT.

1. INTRODUCTION

This manual provides all safety information, operation instruction, specifications and maintenance for the meter, which is compact, handheld, and battery operated.

This instrument performs AC/DC voltage, AC/DC Current, Resistance, Audible Continuity, Diode, hFE and Temperature measurements; it is a 3 1/2 digits, 1999 counts digital multimeter.

DT580 series digital multimeter has been designed according to EN61010-1 oncoming electronic measuring instruments with an over voltage category (CAT II 600V) and Pollution degree 2.

Over voltage installation categories per IEC 61010-1, 2000: The Meter is designed to protect against transients in these categories:

CAT I: From high-voltage low-energy sources, e.g., electronic circuits or a copy machine.


CAT II: From equipment supplied from the fixed installation, e.g., TVs, PCs, portable tools and household appliances.

CAT III: From equipment in fixed equipment installations, e.g., installation panels, feeders and short branch circuits, and lighting systems in large buildings.

Warning


To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic. Pay attention to the insulation around the connectors.









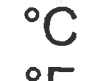


- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and grounding.
- The rotary switch should be placed in the right position and no any changeover of range shall be made during measurement is conducted to prevent damage of the Meter.
- When the Meter working at an effective voltage over 60V in DC or 30V rms in AC, special care should be taken for there is danger of electric shock.
- Use the proper terminals, function, and range for your measurements.
- Do not use or store the Meter in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after dampened.
- When using the test leads, keep your fingers behind the finger guards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes or hFE.
- 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.
- Remove the connection between the testing leads and the circuit being tested, and turn the Meter power off before opening the Meter case.
- When servicing the Meter, use only the same model number or identical electrical specifications replacement parts.
- The internal circuit of the Meter shall not be altered at

- will to avoid damage of the Meter and any accident.
- Soft cloth and mild detergent should be used to clean the surface of the Meter when servicing. No abrasive and solvent should be used to prevent the surface of the Meter from corrosion, damage and accident.
- The Meter is suitable for indoor use.
- Turn the Meter power off when it is not in use and take out the battery when not using for a long time. Constantly check the battery as it may leak when it has been using for some time, replace the battery as soon as leaking appears. A leaking battery will damage the Meter.

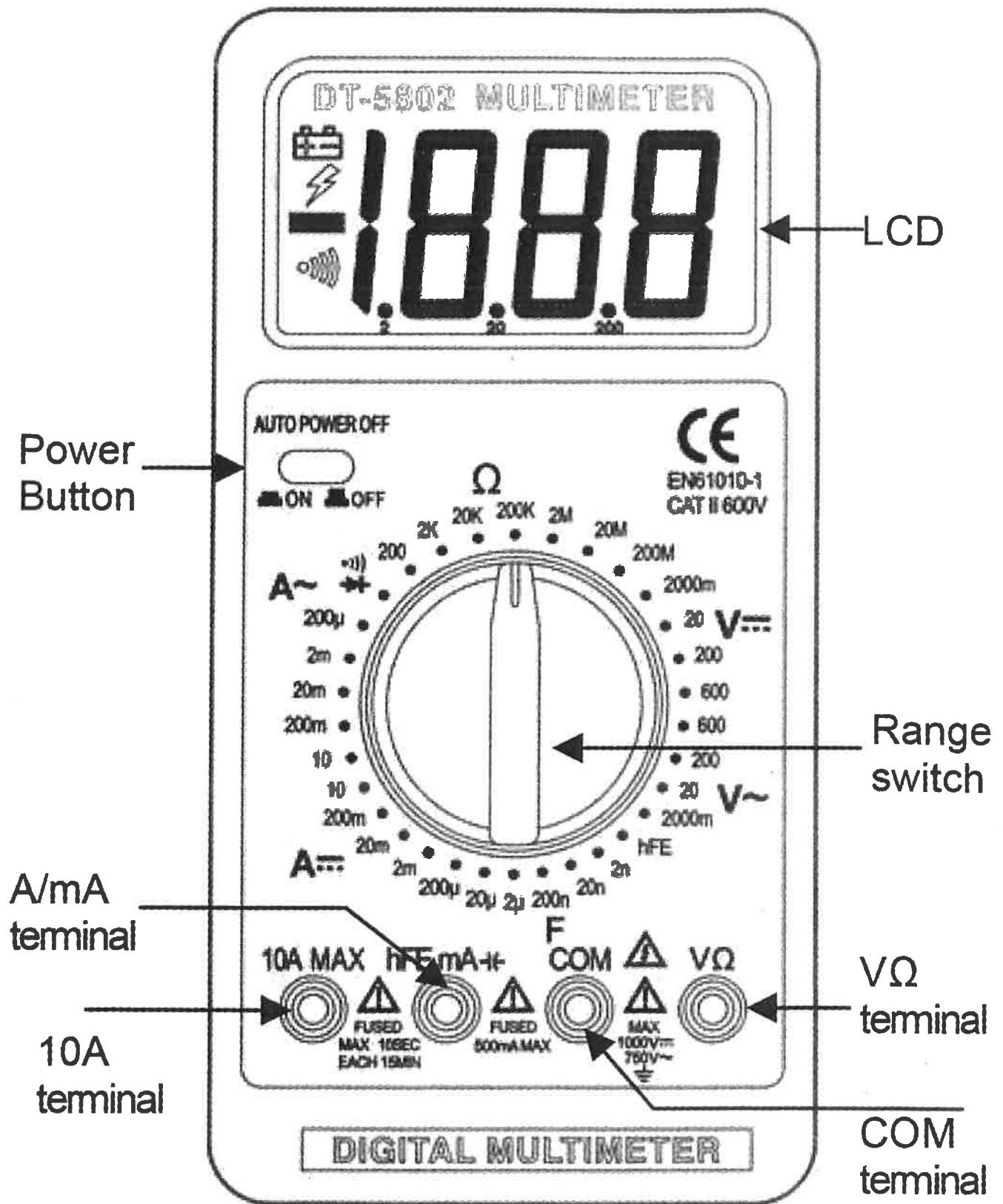
2. GENERAL CHARACTERISTICS

Display	: LCD, 1999 counts updates 2/sec
LCD size	: 66 x 34mm
Polarity Indication	: “-” displayed automatically
Over-range Indication	: “1” displayed
Low Battery Indication	: “  ” displayed
Range select	: Manual
Operation Temperature	: 0°C to 40°C, less than 80%RH
Storage Temperature	: -10°C to 50°C, less than 85%RH
Battery Type	: 9V battery IEC 6F22, NEDA 1604
Dimension (H×W×D)	: 193 x 90 x 37mm
Weight	: Approx 251g



3. ELECTRICAL SYMBOLS

	DC (Direct Current)
	AC (Alternating Current)
	DC or AC
	Important safety information. Refer to the manual
	Dangerous voltage may be present
	Earth ground
	Low battery
	Fuse
	Diode
	Continuity test
°C	Centigrade
°F	Fahrenheit
CE	Conforms to European Union directive
	Double insulated

4. PANEL DESCRIPTION



Series Multimeters Function Table

Model	DCV	ACV	DCA	ACA	Ω			hFE	CAP	Hz	$^{\circ}\text{C}$
DT5801	✓	✓	✓	✓	✓	✓	✓	✓			
DT5802	✓	✓	✓	✓	✓	✓	✓	✓	✓		
DT5807	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
DT5808	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

5. SPECIFICATIONS

Accuracy is guaranteed for 1 year $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ less than 80%RH

5-1. DC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(0.5\%$ of rdg + 3dgt)
2V	1mV	$\pm(0.8\%$ of rdg + 5dgt)
20V	10mV	
200V	100mV	
600V	1V	$\pm(1.0\%$ of rdg + 5dgt)

Input Impedance: $10\text{M}\Omega$

Overload Protection: 600V DC AC rms

Max. Input voltage: 600V DC

5-2. AC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(1.2\%$ of rdg + 5dgt)
2V	1mV	$\pm(1.0\%$ of rdg + 5dgt)
20V	10mV	
200V	100mV	
600V	1V	$\pm(1.2\%$ of rdg + 5dgt)

Input Impedance: $10\text{M}\Omega$

Frequency Range: 40Hz ~ 400Hz

Overload Protection: 600V DC AC rms

Response: Average, calibrated in rms of sine wave

Max. Input voltage: 600V AC rms

5-3. TEMPERATURE

Range	Resolution	Accuracy
-40 ~ 1370°C	1°C	-40°C~150°C:±(1.0% + 4)
		150°C~1370°C:±(1.5% + 15)

Overload Protection: 250V DC/AC rms

5-4. DC CURRENT

Range	Resolution	Accuracy
20μA	10nA	±(1.8% of rdg + 2dgts)
200μA	100nA	
2000μA	1μA	
20mA	10μA	
200mA	100μA	±(2.0% of rdg + 2dgts)
2A	1mA	±(2.0% of rdg + 10dgts)
10A	10mA	

Overload Protection:

mA: F0.5A/600V fuse (DT5802,DT5807,DT5808)

A : F2A/600V fuse (DT5801)

10A: F10A/600V fuse

Voltage Drop: 200mV

5-5. AC CURRENT

Range	Resolution	Accuracy
20μA	10nA	±(2.0% of rdg + 5dgts)
200μA	100A	±(2.0% of rdg + 3dgts)
2mA	1μA	
20mA	10μA	
200mA	100μA	±(2.0% of rdg + 5dgts)
2A	1mA	±(2.5% of rdg + 10dgts)
10A	10mA	

Overload Protection:

mA: F0.5A/600V fuse (DT5802,DT5807,DT5808)

A : F2A/600V fuse (DT5801)

10A: F10A/600V fuse

Voltage Drop: 200mV

Frequency Range: 40Hz ~ 400Hz

Response: Average, calibrated in rms of sine wave

5-6. Transistor hFE Test

Range	hFE	Test Current	Test Voltage
PNP & NPN	0~1000	$I_b \approx 10\mu\text{A}$	$V_{ce} \approx 2.8\text{V}$



5-7. RESISTANCE

Range	Resolution	Accuracy
200 Ω	0.1 Ω	$\pm(1.0\% \text{ of rdg} + 10\text{dgts})$
2K Ω	1 Ω	$\pm(1.0\% \text{ of rdg} + 4\text{dgts})$
20K Ω	10 Ω	
200K Ω	100 Ω	
2M Ω	1K Ω	
20M Ω	10K Ω	$\pm(1.0\% \text{ of rdg} + 10\text{dgts})$
200M Ω	100K Ω	$\pm[5\%*(\text{rdg}-10) + 10\text{dgts}]$

Open Circuit Voltage: about 3V

Overload Protection: 250V DC/AC rms

5-8. Diode and Continuity

Range	Introduction	Remark
	The approximate forward voltage drop will be displayed	Open circuit voltage: about 2.8V
	The built-in buzzer will sound if the resistance is less than about $30 \pm 20\Omega$.	Open circuit voltage: about 2.8V

Overload Protection: 250V DC/AC rms

5-9. Capacitance

Range	Resolution	Accuracy
2nF	1pF	$\pm(4\% \text{ of rdg} + 5\text{dgts})$
20nF	10pF	
200nF	100pF	
2uF	1nF	
20uF	10nF	

Overload Protection: F0.5A/600V fuse

Over-load protect: 250V DC/AC rms

5-10. Frequency

Range	Resolution	Accuracy
2KHz	1Hz	$\pm(3\% \text{ of rdg} + 5\text{dgts})$
20KHz	10Hz	

Over-load protect: 250V DC/AC rms

6. OPERATION INSTRUCTION

6-1. Measuring Voltage

- 1) Connect the BLACK test lead to the "COM" jack and the RED to the "V Ω " jack.
- 2) Set the function switch to desired V \sim or V $\overline{\text{---}}$ range.
- 3) If the voltage magnitude to be measured is unknown beforehand, select the highest range.
- 4) Connect the test leads across the source or load to be measured.
- 5) Read LCD display. The polarity of the RED lead connection will be indicated when making a DC measurement.

Note:

- a. In small range, the meter may display an unstable reading when the test leads have not been connected to the load to be measured. It is normal and will not affect the measurements.

- b. When the meter shows the over range symbol "1", a higher range must to be selected.
- c. To avoid damage to the meter, don't measure a voltage which exceeds 600Vdc (for DC voltage measurement) or 600Vac (for AC voltage measurement).

6-2. Measuring Current

- 1) Connect the BLACK test lead to the "COM" jack. If the current to be measured is less than 200mA(2A for DT5801), connect the red test lead to the "mA"/"A" jack. If the current is between 200mA/2A and 10A, connect the red test lead to the "10A" jack instead.
- 2) Set the function switch to desire $A\sim$ or $A\overline{\sim}$ range. If the current magnitude to be measured is not known beforehand, set the ranges switch to the highest range position and then reduce it range by range until satisfactory resolution is obtained.
- 3) If the current magnitude to be measured is not known beforehand, select the highest range.
- 4) Connect test leads in series with the circuit to be measured.
- 5) Read the reading on the display. For DC current measurement, the polarity of the red test lead connection will be indicated as well.

Note: When the display shows the over range symbol "1", a higher range must be selected.

6-3. Measure Resistance

- 1) Connect the BLACK test lead to the "COM" jack and the RED to the "V Ω " jack (Note: The polarity of the red test lead is positive "+").
- 2) Set the range switch to desire Ω range
- 3) If the current magnitude to be measured is not known


beforehand, select the highest range.

- 4) Connect the test leads across the load to be measured.
- 5) Read the reading on the display.


Note:

- a. For resistance measurements $>1\text{M}\Omega$, the meter may take a few seconds to stabilize reading. This is normal for high-resistance measurement.
- b. When the input is not connected, i.e. at open circuit, the symbol "1" will be displayed as an over range indicator.
- c. Before measuring in-circuit resistance, be sure that the circuit under test has all power removed and all capacitors are fully discharged.

6-4. Continuity Test

- 1) Connect the BLACK test lead to the "COM" jack and the RED to the " $\text{V}\Omega$ " jack (Note: The polarity of the red test lead is positive "+").
- 2) Set the range switch to  range
- 3) Connect the test leads across the load to be measured.
- 4) If the circuit resistance is lower than about $30\pm 20\Omega$, the built-in buzzer will sound.

6-5. Diode Test

- 1) Connect the BLACK test lead to the "COM" jack and the RED to the " $\text{V}\Omega$ " jack (Note: The polarity of the red test lead is positive "+").
- 2) Set the range switch to  range
- 3) Connect the red test lead to the anode of the diode to be tested and the black test lead to the cathode.
- 4) The meter will show the approximate forward voltage of the diode. If the connections are reversed, "1" will

be shown on the display.

6-6. Transistor Test (W/multifunction adapter)

- 1) Set the range switch to hFE range.
- 2) Connect the adapter to the "COM" jack and the "hFE" jack. Don't reverse the connection.
- 3) Identify whether the transistor is NPN or PNP type and locate Emitter, Base and Collector lead. Insert the leads of the transistor to be tested into the proper holes of the transistor test socket of the adapter.
- 4) LCD display will show the approximate hFE value.

6-7. Measuring Temperature (W/multifunction adapter)

- 1) Set the range switch to °C range.
- 2) Connect the adapter to the "COM" jack and the "°C" jack. Don't reverse the connection.
- 3) Insert the black (or "-") plug of the K type thermocouple to the adapter "-" socket, and the red (or "+") plug to the adapter "+" socket.
- 4) Carefully touch the end of the thermocouple to the object to be measured.
- 5) Wait a while, read the reading on the display.

6-8. Capacitance Measuring

- 1) Connect the BLACK test lead to the COM jack and the RED to the mA jack.
- 2) Set the function switch at F position. (NOTE: The polarity of the RED lead is positive "+")
- 3) Connect test leads across the capacitor under measure and be sure the polarity of connection is observed.

Note: To avoid damage to the Meter, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance. The tested capacitor should be discharged before the testing procedure. Never apply

voltage to the input, or serious damage may result.

6-9. Frequency Measuring


- 1) Set the function range switch to the required "Hz" position.
- 2) Connect the BLACK test lead to the "COM" jack and the RED to the "V Ω " jack (Note: The polarity of the red test lead is positive "+").
- 3) Connect the test leads across the load to be measured.

Note: Do not apply more than 250V rms to the input. Indication is possible a voltage higher than 100V rms, but reading maybe out of specification.

7. Auto Power Off

If you don't operate the meter for about 15 minutes, it will turn off automatically. To turn on it again, just push the power button twice.

8. BATTERY REPLACEMENT

If the sign " appear on the display, it indicates battery should be replaced. Remove screws and open the back case, replace the exhausted battery with new battery (9V IED 6F22, NEDA 1604 or equivalent).

9. ACCESSORIES

Owners manual:	1 piece
Test leads:	1 pair
K type thermocouple (DT5807 & DT5808 only):	1 piece
Adapter:	1 piece

10. FUSE REPLACEMENT

- 1) Battery and fuse replacement should only be done after the test leads have been disconnected and power is off.

- 2) Loosen screws with suitable screwdriver and remove case bottom.
- 3) The meter is powered by a single 9V battery (IEC 6F22, NEDA 1604, JIS 006P). Snap the battery connector leads to the terminals of a new battery and reinsert the battery into the case top. Dress the battery leads so that they will not be pinched between the case bottom and case top.
- 4) The meter is protected by fuse:
 - a) mA: F0.5A/600V Fast, Breaking capacity is 10KA, dimensions is $\Phi 5 \times 20$ mm.
 - b) 10A: F10A/600V Fast, Breaking capacity is 10KA, dimensions is $\Phi 5 \times 20$ mm.
 - c) A(DT5801): F2A/600V Fast, Breaking capacity is 10KA, dimensions is $\Phi 5 \times 20$ mm.
- 5) Replace the case bottom and reinstall the three screws. Never operate the meter unless the case bottom is fully closed.

DISPOSAL OF THIS ARTICLE

Dear Customer,

If you at some point intend to dispose of this article, then please keep in mind that many of its components consist of valuable materials, which can be recycled. Please do not discharge it in the garbage bin, but check with your local council for recycling facilities in your area.



WARRANTY

This Instrument is warranted to be free from defects in material and workmanship for a period of one year. Any instrument found defective within one year from the delivery date and returned to the factory with transportation charges prepaid, will be repaired, adjusted, or replaced at no charge to the original purchaser. This warranty does not cover expandable items such as batteries & fuses. If the defect has been caused by a misuse or abnormal operating conditions, the repair will be billed at a nominal cost.