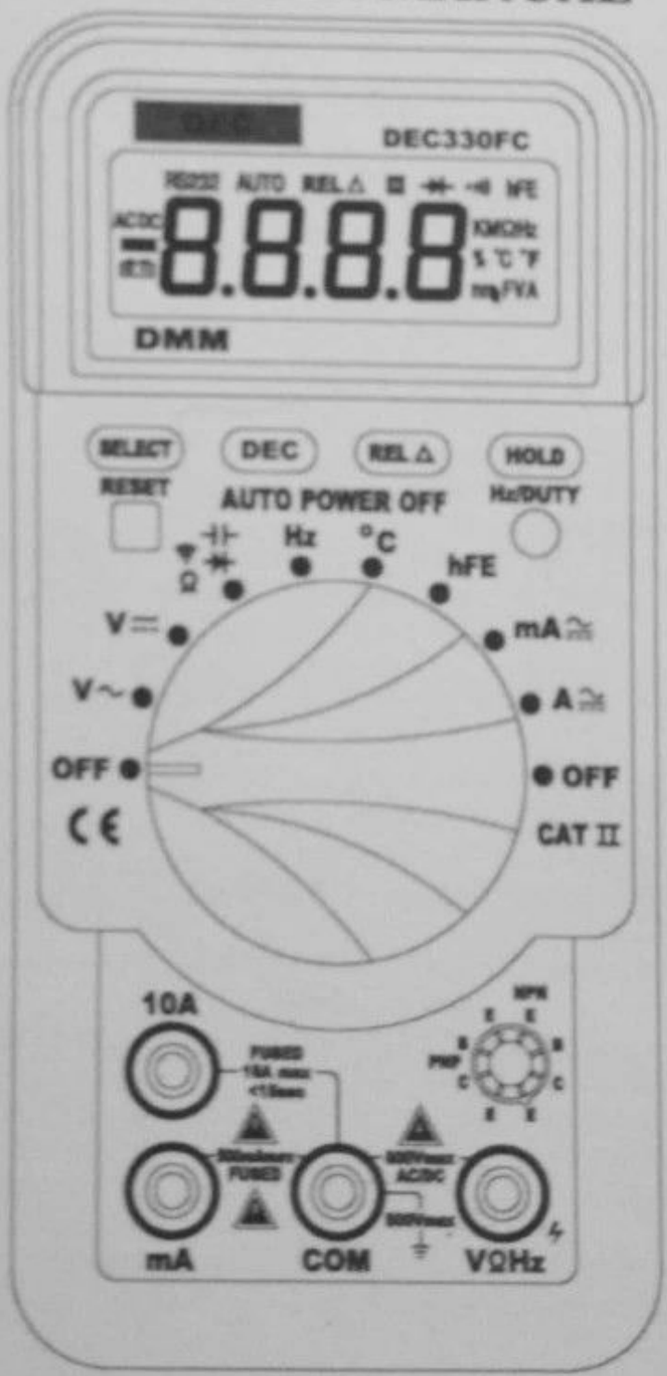
DEC

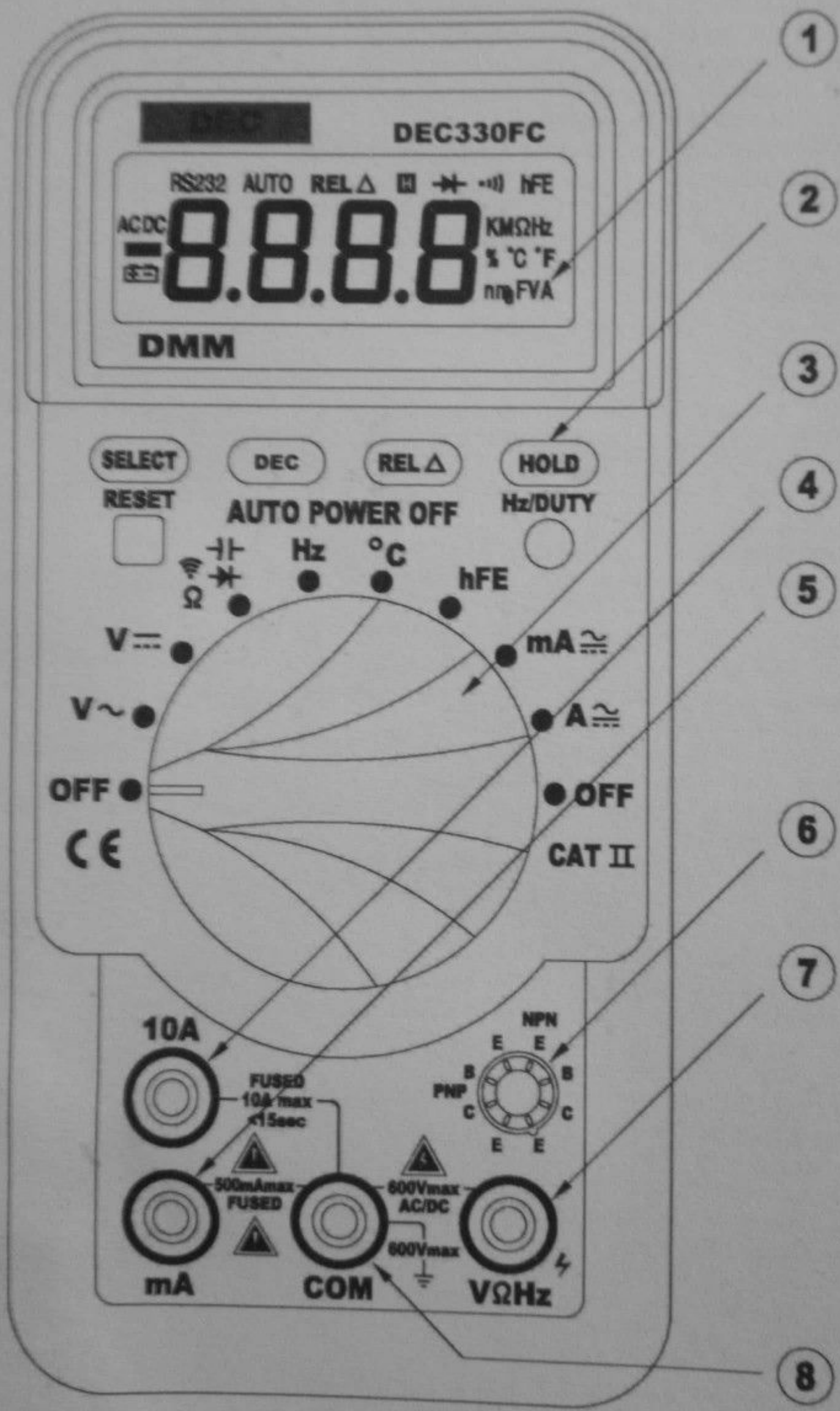
DEC330FC

4000 COUNTS AUTO-RANGE DIGITAL MULTIMETER

OPERATION MANUAL



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DEC330FC
RS232 AUTO REL Δ hFE
AC DC
KMΩHz
% °C °F
nmFVA
DMM
SELECT
RESET
DEC
REL Δ
HOLD
Hz/DUTY
AUTO POWER OFF
Hz
°C
hFE
Ω
V
mA
V~
A
OFF
OFF
CAT II
10A
FUSED
10A max
<15sec
500mAmax
FUSED
600Vmax
AC/DC
600Vmax
NPN
PNP
E
B
C
mA
COM
VΩHz
1
2
3
4
5
6
7
8

PANEL DESCRIPTION

① LCD display window
② Function key
③ Function selector switch
④ 10A terminal
⑤ mA and ℃ terminal
⑥ Transistor test hole
⑦ VΩHz terminal
⑧ COM terminal

1. ATIONSAFETY INFORM

SAFETY SYMBOLS

⚠ **Warning!** Dangerous Voltage (Risk of electric shock).
⚠ **Caution!** Refer to the user's manual before using this Meter.
⧈ **Double Insulation** (Protection Class Ⅱ).
~ Alternating Current (**AC**).
⎓ Direct Current (**DC**).
≂ Either **DC** or **AC**.
⏚ **Ground** (maximum permitted voltage between terminal and ground).

⚠**The RESPONSIBLE BODY shall be made aware that, if the instrument is used in a manner not specified by the manufacturer, the protection provided by the instrument may be impaired.**

⚠**The finger or any part of your body shall not be beyond the barrier of the test probe when measuring.**

The following safety information must be observed to insure maximum personal safety during the operation at this meter.

- Do not operate the meter if the body of meter or the test lead look broken. Check the main function dial and make sure it is at the correct position before each measurement.
- When making current measurements ensure that the circuit not "live" before opening it in order to connect the test leads.
- Do not perform resistance, capacitance, temperature, transistor, diode and continuity test on a live power system.
- Do not apply voltage between the test terminals and test terminal to ground that exceed the maximum limit record in this manual.
- Exercise extreme caution when measuring live system with voltage greater than 60V DC or 30V AC.
- Change the battery when the "🔋" symbol appears to avoid incorrect data.
- Use the DMM indoor, altitude up to 2000m and temperature 5℃ to 40℃. Maximum relative humidity 80% for temperatures up to 31℃, decreasing linearly to 50% relative humidity at 40℃. Pollution Degree 2.

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2. SPECIFICATIONS

2.1 GENERAL SPECIFICATIONS

Display: LCD with a max. reading of 4000.
Dec control: Auto dec & Manual range control
Polarity: Automatic negative polarity indication.
Zero adjustment: Automatic.
Over dec indication: The "OL" or "-OL" display.
Low battery indication: Display "" sign.
Data hold: Display "H" sign.
Relative measurement: Display "**REL**△" sign.
Auto Power Off: When measurement exceeds 30 minutes without switching mode and pressing key, the meter will switch to standby mode. Press any key or switch selector switch to exit standby mode. When restart the system, press and hold **SELECT** key to disable auto power off.
Safety standards: CE **EMC/LVD. CAT Ⅱ 600V.**
The meter is up to the standards of IEC1010 Double Insulation, Pollution Degree 2, Overvoltage Category Ⅱ.
Operating environment: Temperature 32 to104°F (0°C to 40°C).
Humidity ≤ 80% RH.
Storage environment: Temperature -4 to140°F (-20°C to 60°C).
Humidity ≤ 90% RH.
Power supply: 2×1.5V "AA" batteries.
Dimension: 150(H) x 70(W) x 33(D) mm
Weight: Approx. 180g (including battery).

2.2 ELECTRICAL SPECIFICATIONS

Accuracies are ± (% of reading + number in last digit) at 23 ± 5°C,≤75% RH.

2.2.1 DC Voltage

Dec	Accuracy	Resolution
4V	± (0.5%+2)	1mV
40V		10mV
400V		100mV
600V	± (0.8%+3)	1V

Overload protection: 600V DC or AC rms
Impedance: 10M□

2.2.2 AC Voltage

Dec	Accuracy	Resolution
400mV	± (1.5%+3)	0.1mV
4V	± (1.0%+2)	1mV
40V		10mV
400V		100mV
600V	± (1.5%+3)	1V

The 400mV dec be selected by press "**DEC**" key only
Average sensing, calibrated to rms of sine wave
Frequency: 40～400Hz
Overload protection: 600V DC or AC rms
Impedance: 10M□ , More than 100M□ on 400mV dec

2.2.3 DC Current

Dec	Accuracy	Resolution
40mA	± (1.2%+3)	10μ A
400mA		100μ A
4A	± (2.0%+5)	1mA
10A		10mA

Overload protection: 0.5A/250V, 10A/250V fuse

2.2.4 AC Current

Dec	Accuracy	Resolution
40mA	± (1.5%+3)	10μ A
400mA		100μ A
4A	± (2.5%+5)	1mA
10A		10mA

Average sensing, calibrated to rms of sine wave
Frequency: 40~400Hz
Overload protection: 0.5A/250V, 10A/250V fuse

2.2.5 Resistance

Dec	Accuracy	Resolution
400□	± (1.0%+2)	0.1□
4k□		1□
40k□		10□
400k□		100□
4M□		1k□
40M□	± (2.0%+3)	10k□

Overload protection: 250V DC or AC rms

2.2.6 Capacitance

Dec	Accuracy	Resolution
40nF	± (3.0%+10)	10pF
400nF	± (2.5%+5)	100pF
4μF		1nF
40μF	± (5.0%+10)	10nF
100μF		100nF

Overload protection: 250V DC or AC rms

2.2.7 Diode and Audible continuity test

Dec	Description	Test condition
	Display read Approximately forward voltage of diode	Forward DC current approx. 0.4mA Reversed DC voltage approx.1.5V
	Built-in buzzer sounds if resistance is less than 100□	Open circuit voltage approx. 0.5V

Overload protection: 250V DC or AC rms

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2.2.8 Frequency

Dec	Accuracy	Resolution
10Hz	± (0.1%+5)	0.01Hz
100Hz		0.1Hz
1000Hz		1Hz
10kHz		10Hz
100kHz		100Hz
1000kHz		1kHz
10MHz		10kHz

Sensitivity: sine wave 0.6V rms (10MHz: 1.5V rms)
Overload protection: 250V DC or AC rms

2.2.9 Duty cycle

0.1%～99.9%: ± (2.0%+2) Frequency lower than 10kHz
Sensitivity: sine wave 0.6V rms
Overload protection: 250V DC or AC rms

2.2.10 Temperature

Dec	Accuracy		Resolution
℃	-50~150℃	± (3℃+1)	1℃
	150~800℃	± (3%+1)	

NiCr-NiSi sensor
Overload protection: 0.5A/250V fuse

2.2.11 Transistor hFE test

Test dec: 0-1000
Ib=10μA, Vce=2.5V Approx.

3. OPERATION

3.1 DC and AC Voltage Measurement

1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
2) Set the selector switch to desired "**V⎓**" or "**V～**" position.
3) Measure the voltage by touch the test lead tips to the test circuit where the value of voltage is needed.
4) Read the result from the LCD panel.

3.2 DC and AC Current Measurement

1) Connect the black test lead to "**COM**" socket. For measurement up to 400mA, connect the red test lead to the "**mA**" socket; for measurement from 400mA to 10A, connect the red test lead to the "**10A**" socket.
2) Set the selector switch to desired "**mA⎓**" or "**A⎓**" position.
3) Press "**SELECT**" key to choose "**DC**" or "**AC**" measurement.
4) Remove power from the circuit under test and open the normal circuit path where the measurement is to be taken. Connect the meter in series with the circuit.
5) Read the result from the LCD panel.

3.3 Resistance Measurement

1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
2) Set the selector switch to desired "**Ω⊣◀⊣⊢**" position.
3) Connect tip of the test leads to the points where the value of the resistance

is needed.
4) Read the result from the LCD panel.

Note: When take resistance value from a circuit system, make sure the power is cut off and all capacitors need to be discharged.

3.4 Capacitance Measurement

1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
2) Set the selector switch to desired "Ω⊣◁)⊣⊢" position.
3) Press "**SELECT**" key to choose **Capacitance** measurement.
4) Connect tip of the test leads to the points where the value of the capacitance is needed.
5) Read the result from the LCD panel.

Note:

a) Before testing, discharge the capacitor by shorting its leads together. Use caution in handing capacitors because they may have a charge on them of considerable power before discharging.
b) Before testing, press "**REL△**" key to eliminate the zero error.
c) When testing 100μF capacitor, note that there will be approx. 15 seconds time lag.

3.5 Diode and Audible continuity Test

1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
2) Set the selector switch to desired "Ω⊣◁)⊣⊢" position.
3) Press "**SELECT**" key to choose **Diode** or **Audible continuity** measurement.
4) Connect the test leads across the diode under measurement, display shows the approx. forward voltage of this diode.
5) Connect the test leads to two point of circuit, if the resistance is lower than approx. 100□ , the buzzer sounds.

Note: Make sure the power is cut off and all capacitors need to be discharged under this measurement.

3.6 Frequency and Duty cycle measurement

1) Connect the black test lead to "**COM**" socket and red test lead to the "**VΩHz**" socket.
2) Set the selector switch to desired "**Hz**" position.
3) Press "**Hz/DUTY**" key to choose **Frequency** or **Duty cycle** measurement.
4) Connect the probe across the source or load under measurement.
5) Read the result from the LCD panel.

3.7 Temperature Measurement

1) Connect the black banana plug of the sensor to "**COM**" socket and red banana plug to the "**mA**" socket.
2) Set the selector switch to desired "**°C**" position.
3) Put the sensor probe into the temperature field under measurement.
4) Read the result from the LCD panel.

3.8 Transistor hFE Test

1) Set the selector switch to the hFE position.
2) Determine whether the transistor is NPN or PNP and locate the Emitter, Base and Collector leads. Insert the leads into the proper holes in the socket on the front panel.
3) The display will read the approximate hFE value.

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3.9 Data Hold

On any dec, press the "**HOLD**" key to lock display value, and the "**H**" sign will appear on the display, press it again to exit.

3.10 Relative measurement

Press the "**REL△**" key, you can measure the relative value and "**REL△**" sign will appears on the display, the auto dec mode be changed to manual dec mode. Press it again to exit relative measurement and "**REL△**" sign disappears, but you can not go back to auto dec mode. This function is non effective on **Hz/DUTY** measurement.

3.11 Auto/Manual dec

The auto dec mode is a convenient function, but it might be faster to manually set the dec when you measure values that you know to be within a certain dec.

To select manual dec, repeatedly press "**DEC**" key until the display shows the desired dec. The dec steps upward as you press "**DEC**" key. The meter will go back to auto dec mode when you press "**DEC**" key for more than 2 seconds. It can not select manual dec mode on **Hz/DUTY, capacitance** and **hFE** dec.

Caution: while using the manual dec mode, if "**OL**" sign appears on the display, immediately set dec to a higher.

4. Battery replacement

1) When the battery voltage drop below proper operation range, the " " symbol will appear on the LCD display and the battery need to changed.
2) Before changing the batteries, set the selector switch to "**OFF**" position. Open the cover of the battery cabinet by a screwdriver.
3) Replace the old batteries with the same type battery.
4) Close the battery cabinet cover and fasten the screw.

5. Fuse replacement

1) This meter is provided with a 0.5A/250V fuse to protect the current measuring circuits which measure up to 400mA, with a 10A/250V fuse to protect the 10A dec.
2) Ensure the instrument is not connected to any external circuit, set the selector switch to "**OFF**" position and remove the test leads from the terminals.
3) Remove the two screws on the bottom case and lift the bottom case. Replace the old fuse with the same type and rating: 5×20mm 0.5A/250V or 5×20mm 10A/250V European standard fuse.
4) Close the bottom case and fasten the screws.

6. MAINTENANCE

1) Before open the battery cover, disconnect both test lead and never uses the meter before the battery cover is closed.
2) To avoid contamination or static damage, do not touch the circuit board without proper static protection.
3) 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.
4) Repairs or servicing not covered in this manual should only by qualified personal.
5) Periodically wipe the case with a dry cloth and detergent. Do not use abrasives or solvents on the meter.

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