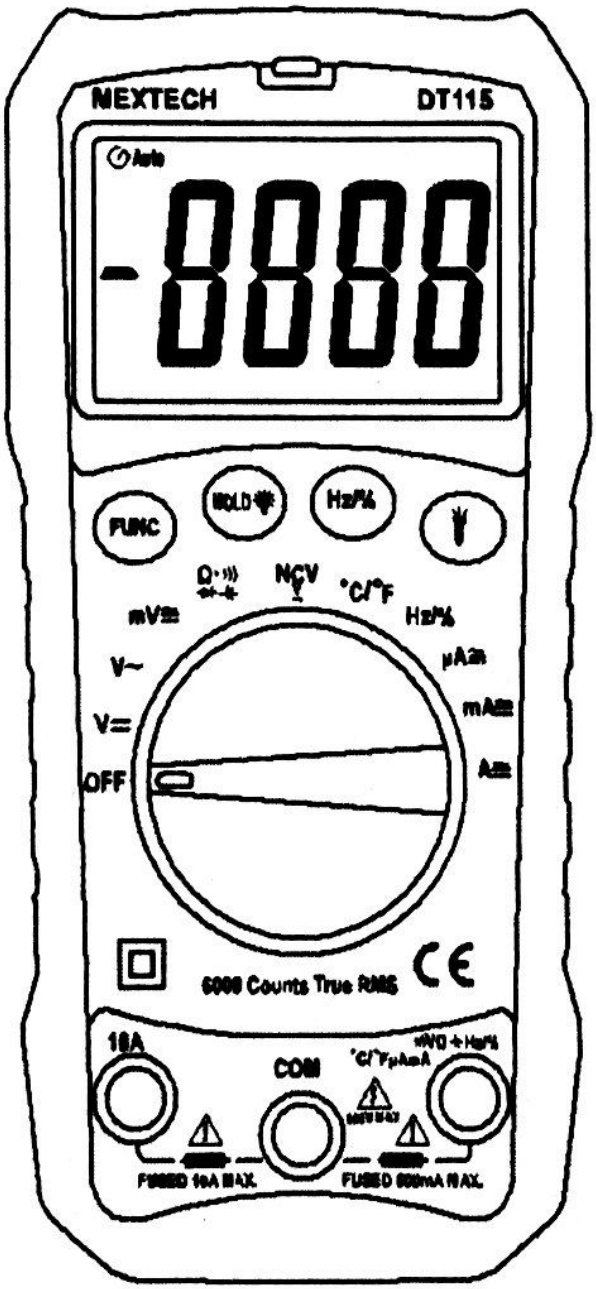
MEXTECH

Digital Multimeter



MODEL: DT 115

Please read the user manual carefully and follow its guidance.

Safety precautions

⚠ Warning

To reduce the risks of electric shock, product damage and personal injury, please read the safety precautions and instructions of this manual and follow its guidance.

This tool meets the GB/T 13978-92 standards for digital multimeter general technical requirement, the GB4793.1-1995 standards for digital testing equipment safety requirement and the the standards in a pollution degree 2 environment. Safety rating: CAT Ⅱ 600V. For longer product lifetime and better product performance, please use it with caution and maintain it properly.

Before operation

1. Follow basic safety rules, such as protect yourself against electric shock and avoid operation mistakes.
2. Make sure that the product is not damaged in transportation.
3. Test lead needs to be in a good condition. Check to make sure that the insulating part of test lead is not damaged and that the metal fuse inside the cable is not revealed.
4. For safety concerns, please use the original test lead. If the original test lead needs to be replaced, choose a test lead with the same specs as the original one (1000V 10A).

During operation

1. Make sure you are using the product in the correct way. Make sure not to exceed the maximum range.
2. Do not touch the metal tip of the test lead when the meter is measuring circuits.
3. If the tested voltage is over 60V DC or 30V AC (RMS), please keep your finders behind the protection ring of the test lead.
4. When the voltage of the measuring terminal is over 600V DC or 600V AC, you should not test voltage with this tool.
5. Before turning the rotary switch to switch measuring mode, you need to move the test lead away from circuits under test.
6. Make sure no current is running through the circuit when you are testing resistance, capacitance, diode or continuity.
7. Do not use or store this meter in a highly humid and hot environment. Do not expose this product to direct sunlight.
8. Do not connect this device to a voltage source when measuring current, resistance, capacitance, diode or continuity. Doing so may damage the meter.
9. Power off the circuit and discharge capacitors before testing capacitance.
10. Keep this product away from explosive gas, vapor or dust.
11. If you notice anything abnormal or faulty, please stop using this product at once.
12. Make sure that the battery cover is safely secured.

Marks

⚠ Attention (Contains important safety information. Refer to the user manual)

⚠ Can be used on dangerous charged conductor

Double insulation (Class II)

CAT II This is a voltage category rating, established on IEC-61010-1 standards. This rating defines the instrument's ability to withstand voltage spikes applied through a specified level of resistance. The tool meets the standards in a pollution degree 2 environment.

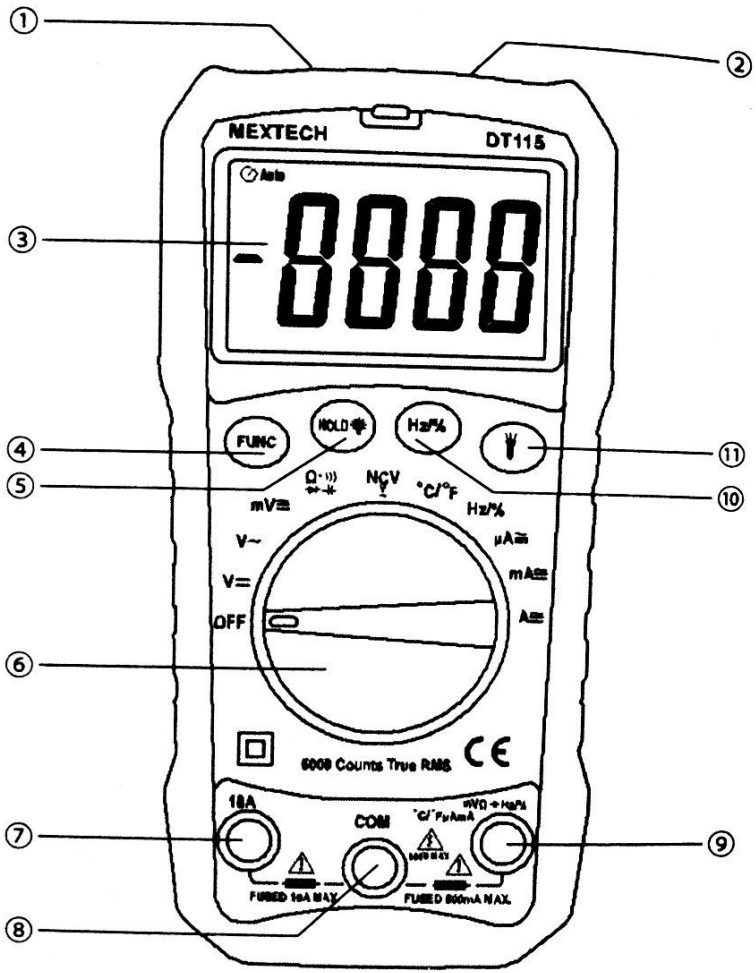
CE Comply with EU regulatory requirements

⏚ Grounding

Maintenance

1. Please do not disassemble the product or try to fix the product by yourself. Only professional mechanics with thorough understanding of multimeter and with awareness of electric shock hazard are allowed to do so.
2. Remove the test lead away from the circuit before you open the battery cover or the circuit.
3. When the meter shows 🔋 icon, please replace battery in time to avoid wrong readings or electric shock.
4. Clean this product with damp cloth and mild detergent, do not use solvents or abrasives to clean it.
5. If you are not going to use this product for a long time, turn the rotary switch to OFF and then take out the battery.

Product Overview



① Flashlight
② NCV (Non-contact voltage) Sensing Area
③ LCD Screen
④ **'FUNC'** Button
⑤ **'HOLD/ 💡 '** Button
⑥ Rotary switch
⑦ **'10A'** Terminal
⑧ **'COM'** Terminal
⑨ **'V/Ω/µA/mA/⊣⊢/•))/⊣(/Hz/℃ °F'** terminal
⑩ **'HZ%'** Button
⑪ **' 🔦 '** Flashlight Button

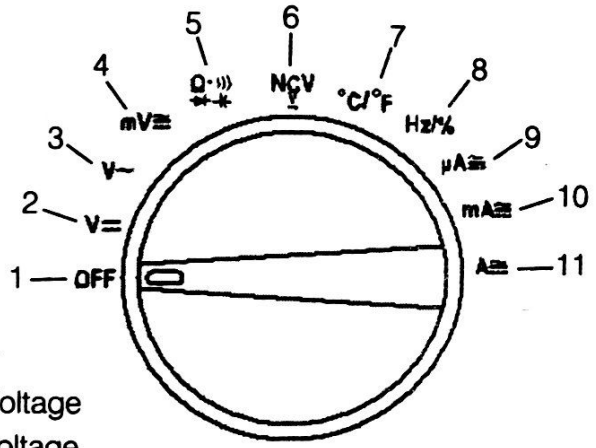
Description

Buttons and terminals

1. **'FUNC'** Button
   Press **'FUNC'** button to select measuring modes.
2. **'HOLD/ 💡 '** Button
   - Short press the button to hold the present reading. Short press the button again to resume normal operation.
   - Long press the button for more than 2 seconds to turn on backlight. Long press the button again to turn off backlight.
3. **'COM'** terminal
   Always connect the black banana plug to the 'COM' terminal.
4. **'V/Ω/µA/mA/⊣⊢/•))/⊣(/Hz/℃ °F'** terminal
   The terminal for testing voltage, electric resistance, current (µA, mA), frequency, duty cycle, diode, continuity, capacitance and temperature.

5. **'HZ%'** Button
   Switch between measuring frequency and measuring duty cycle.
6. **'10A'** Terminal
   When you are measuring DC/AC current (600mA~10A), connect the red banana plug to the 10A terminal.
7. ' 🔦 ' Flashlight Button
   Turn on/off the flashlight

Rotary switch

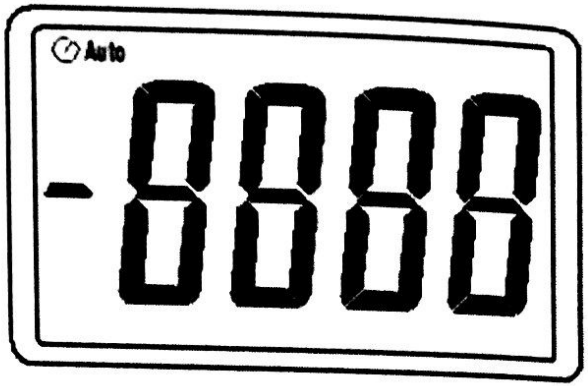


1. **OFF** : Turn off power
2. **V⎓** : Measure DC Voltage
3. **V~** : Measure AC Voltage
   Hz/% : Measure frequency and duty cycle
4. **mV⎓**: Measure AC Voltage (Units: mV); Measure DC Voltage (Units: mV)
   Hz/% : Measure frequency and duty cycle
5. **Ω** : Resistance
   : Continuity test (Beeps)
   : Test diodes
   : Measure capacitance

6. **NCV** : Non-contact voltage detection (for testing AC voltage only)
7. **°C/°F** : Measure temperature
8. **Hz/%** : Measure frequency and duty cycle
9. **μA⎓** : Measure AC/DC current (unit: μA),
   Hz/% : Measure frequency and duty cycle
10. **mA⎓** : Measure AC/DC current (unit: mA)
    Hz/% : Measure frequency and duty cycle
11. **A⎓** : Measure AC/DC current (unit: A)
    Hz/% : Measure frequency and duty cycle

Note: Some switching positions may contain more than one mode. In this case, after you have turned the rotary switch to the correct position, press **'FUNC'** button to switch modes.
mV~, V~ , μA~ , mA~ , A~ modes are always positioned together with HZ% mode. In other words, AC modes are placed in together with frequency mode.

LCD Display



AC	Alternating Current
DC	Direct Current
⊳|	Diode
•))	Continuity test (Beeps)
AUTO	Auto-ranging
⏻	Auto power-off status
	Low battery
%	Duty cycle (Percentage)
Hz , kHz , MHz	Hertz, kilohertz, megahertz (Frequency)
mV , V	Millivolt, volt (Voltage)
μA , mA , A	Microamp, milliamp, amp (Current)
nF , μF , mF	Nanofarads, microfarads, megafarads (Capacitance)
Ω , kΩ , MΩ	Ohms, Kiloohms, Megohms (Resistance)
(EF) NCV	Non-contact voltage mode
H	Data hold

Specifications

General specifications

1. Auto-ranging
2. Overload protection
3. Maximum voltage: 600V DC or 600V AC (RMS)
4. Operating altitude: <2000m
5. Display: LCD
6. Max LCD display: 5999
7. Polarity indication: '-' indicate that the red probe detected negative polarity.
8. Over-range display: '0L' or '-0L'
9. Sampling frequency: Once every 0.4 seconds
10. Auto power-off time: 15 mins
11. Power source: 3*AAA battery, 1.5V, 180mAh, 0.27W
12. Low voltage indication: icon indicates low voltage
13. Temperature coefficient: <0.1×Accuracy/℃
14. Working temperature and humidity: 0～40℃/32～104°F/ 45%-80%RH
15. Storage temperature and humidity: -20～60℃/-4～140°F/ 45%-80%RH
16. Dimensions: 148×69×44mm
17. Weight (without battery): around 190g

Technical specifications

True RMS & ZIR (zero input response) feature

1. When it comes to measuring non-sine wave, it is more accurate to use true RMS responding measurement than average-responding measurement.
2. When the rotary switch is turned to an AC mode and the input terminal received no signal (e.g. Turned to AC voltage mode and input terminal short-circuited), some figures (within 1 to 50) may be displayed on screen. Please be aware that this is normal. As long as the tested AC circuit didn't exceed the specified measuring range, the multimeter can still provide an accurate reading despite of the initial deviations.

DC voltage

Accuracy: ± (a%readings+digits), operating temperature: 23 ± 5℃, operating humidity: <75%

Range	Resolution	Accuracy
60mV*	0.01mV	±(1.0% reading + 3 digits)
600mV*	0.1mV	±(1.0% reading + 3 digits)
6V	0.001V	±(0.5% reading + 5 digits)
60V	0.01V	
600V	0.1V	

- Input impedance: 10MΩ

* The readings displayed on screen would be unstable when the circuit is open. The readings would be stable (≤1 digit) when loads are connected to the circuit.

- Max input voltage: 600V DC

AC Voltage

Range	Resolution	Accuracy
60mV*	0.01mV	±(1.2% reading + 3 digits)
600mV*	0.1mV	±(1.2% reading + 3 digits)
6V	0.001V	±(1.2% reading + 5 digits)
60V	0.01V	±(1.2% reading + 5 digits)
600V	0.1V	±(1.5% reading + 5 digits)

- Input impedance: 10MΩ

* The readings displayed on screen would be unstable when the circuit is open. The readings would be stable (≤1 digit) when loads are connected to the circuit.

- True RMS frequency response: 45Hz~1KHz.
- When short-circuited, there may still be figures (<10 digits) displayed on screen. When the tested voltage reach full value, the crest factor is 3.0>. (However, when the tested voltage is around 600V, the crest factor is 1.5)
- Max output voltage: 600V AC (RMS)

Electric resistance

Range	Resolution	Accuracy
600Ω	0.1Ω	±(0.8% reading + 5 digits)
6kΩ	0.001kΩ	
60kΩ	0.01kΩ	
600kΩ	0.1kΩ	
6MΩ	0.001MkΩ	
60MΩ	0.1MΩ	±(1.5% reading + 5 digits)

- Open-circuit voltage: around 0.4 V
- Overload protection: 250V DC or AC (RMS)

Capacitance

Range	Resolution	Accuracy
9.999nF	0.001nF	For reference only
99.99nF	0.01nF	±(3.0% reading + 3 digits)
999.9nF	0.1nF	
9.999μF	0.001μF	
99.99μF	0.01μF	
999.9μF	0.1μF	
9.999mF	0.001mF	±(4.0% reading + 5 digits)
99.99mF	0.01mF	

- Overload protection: 250V DC or AC (RMS)

Diode

Range	Resolution	Function
⯈|	0.001V	Shows the approximation of diode forward voltage.

- Forward DC current is around 1mA
- Reverse DC current is around 3V
- Overload protection: 250V DC or AC (RMS)

Continuity test

Range	Resolution	Function
•))	0. 1Ω	If the resistance of tested circuit is lower than 30Ω, the built-in buzzer would beep.

- Open-circuit voltage: 1.2 V
- Overload protection: 250V DC or AC (RMS)

Frequency

AC current or AC voltage mode

Note: This chart refers to the specifications of frequency mode that positioned together with the AC current/voltage modes.

Range	Resolution	Accuracy
60Hz	0.01Hz	±(2.0% reading + 5 digits)
600Hz	0.1Hz	
6kHz	0.001kHz	
10kHz	0.01kHz	

- Measuring range: 10Hz ~ 10KHz
- Input voltage range: ≥ 0.2V AC (RMS) (Input voltage increases along with the increase of tested frequency.)

Frequency mode

Range	Resolution	Accuracy
99Hz	0.01Hz	±(2.0% reading + 5 digits)
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
99.99kHz	0.01kHz	
999.9kHz	0.1kHz	
9.999MHz	1kHz	
99.99MHz	10kHz	

- Overload protection: 250V DC or AC (RMS)
- Measuring signal: Vpp3V AC signal

Duty cycle

Range	Resolution	Accuracy
10 - 95%	0.1%	±2.0%

- Input voltage range: ≥1V AC (RMS)

DC current

Range	Resolution	Accuracy
600μA	0.1μA	±(1.0% reading + 5 digits)
6000μA	1μA	
60mA	10μA	
600mA	100μA	
10A	10mA	±(2.0% reading + 5 digits)

- Overload protection:
  μA and mA mode: fuse FF600mA
  A mode: fuse F10A
- When the measuring current is above 5A, the continuous measuring time should not be longer than 10 seconds. After that, you need to stop measuring current for 1 minutes.

AC Current

Range	Resolution	Accuracy
600μA	0.1μA	±(1.5% reading + 5 digits)
6000μA	1μA	
60mA	10μA	
600mA	100μA	
10A	10mA	±(3.0% reading + 5 digits)

- Overload protection:
  μA and mA mode: fuse FF600mA
  A mode: fuse F10A
- Frequency range: 50 ~ 60Hz
- When the measuring current is above 5A, the continuous measuring time should not be longer than 10 seconds. After that, you need to stop measuring current for 1 minutes.

Temperature

Range	Resolution	Accuracy
-30~0℃ (-22~32°F)	1℃/1°F	±(5.0% reading + 3 digits)
0~400℃ (32~752°F)		±(1.0% reading + 3 digits)
400~1000℃ (752~1832°F)		±(2.0% reading + 2 digits)

* This chart only refers to the range, resolution and accuracy of the multimeter. The influence posed by the type K thermocouple is not taken into consideration.

Operation Guidance

Data hold

1. You can press the 'HOLD' button to lock the displayed data on screen.
2. Press 'HOLD' button again to unlock the displayed data on screen.

Measurements

⚠Warning

1. When measuring circuit or object with unknown current/voltage, turn the rotary switch to 'V' mode or 'A' mode first instead of 'mV', 'mA' or 'μA' mode. This way you get the maximum range.
2. Connect the red probe to the positive terminal and the black test lead to the negative terminal. '-' indicate that the red probe detected negative polarity.

NCV detection

1.Turn the rotary switch to NCV position.
2. Move the NCV Sensing Area close to the conductor.
3. When the tested voltage is over 110Vac (RMS), the built-in buzzer would beep.

Note:

Do not rely on NCV mode to test the presence or absence of voltage:

1. The built-in buzzer may not beep when the voltage is present. The detection could be impeded by design of socket, thickness of insulation and other factors.
2. The built-in buzzer may beeps when the voltage is absent. This happened because of the existence of induced voltage, which originates from the input terminal of this tool or other outside influences (such as motor or flashlights).

Measure DC voltage

1. Turn the rotary switch to V⎓ or mV⎓ position to measure DC voltage.
2. Remove the protective caps. Connect the black banana plug to COM terminal and connect the red banana plug to the 'V' terminal.
3. Remove the protective caps. Measure voltage by touching the probe tips to the correct test point of the circuit.
4. The measured voltage would be displayed on screen. When measuring DC voltage, the electrical polarity tested by the red probe would be displayed on screen at the same time. '-' indicates that the red probe detected negative polarity.

Measure AC voltage

1. Turn the rotary switch to V~ position. Or, turn the rotary switch to mV~ position and press **'FUNC'** button to switch to AC voltage mode (unit: mV).
2. Remove the protective caps. Connect the black banana plug to COM terminal and the red banana plug to 'V' terminal.
3. Remove the protective caps. Touch the probe tips to the correct test point of the circuit to measure AC voltage.
4. Read the measured voltage on LCD screen.

Measure resistance

1. Turn the rotary switch to Ω position.
2. Remove the protective caps. Connect the black banana plug to 'COM' terminal and connect the red banana plug to the 'Ω' terminal. The LCD screen would display 'MΩ' by default.
3. Remove the protective caps. Measure resistance by touching the probe tips to the correct test point of the circuit.
4. Read the resistance value displayed on LCD screen.

Test Diode

1. Turn the rotary switch to Ω position. Press the **'FUNC'** button to switch to ⊣◀ diode measuring mode.
2. Remove the protective caps. Connect the black banana plug to COM terminal and connect the red banana plug to the'Ω'terminal.
3. Remove the protective caps. Connect the red probe to the positive side of the diode and the black test lead to the negative side of the diode.
4. Read the forward bias voltage value on the display screen.
5. If the test leads is reversely connected to the diode, the display reading shows 'OL'.

Measure Capacitance

1. Turn the rotary switch to Ω position. Press the **'FUNC'** button to switch to ⊣⊢ capacitance measuring mode. The LCD screen would display 'nF' by default.
2. Remove the protective caps. Connect the black banana plug to COM terminal and connect the red banana plug to ⊣⊢ terminal.

3. Remove the protective caps. Touch the probe tips to the correct test point.
4. Let the reading stabilize (wait for around 2 seconds).
5. Read the capacitance value displayed on screen.

Continuity Test

1. Turn the rotary switch to Ω position. Press the **'FUNC'** button to switch to •)) continuity test. and Ω icon would be displayed on screen.
2. Remove the protective caps. Connect the black banana plug to COM terminal and connect the red banana plug to Ω terminal.
3. Remove the protective caps. Touch the probe tips to the correct test point of the circuit to measure the electrical resistance of circuit.
4. If the resistance is less than 50, the buzzer would beep continuously, indicating a short circuit. If the product reads "0L", the circuit is open.

Measure Frequency and Duty Cycle

To measure frequency:

1. Turn the rotary switch to Hz/% position.
2. Remove the protective caps. Connect the black banana plug to 'COM' terminal and connect the red banana plug to 'Hz' terminal.
3. Remove the protective caps. Measure frequency by touching the probes tips to the correct test points of the circuit.
4. Read the frequency displayed on screen.

To measure duty cycle:

1. Turn the rotary switch to Hz/% position. Single press the 'Hz/%' button. '%' would be displayed on screen.
2. Remove the protective caps. Connect the black banana plug to 'COM' terminal and connect the red banana plug to 'Hz' terminal.
3. Remove the protective caps. Measure frequency by touching the probes tips to the correct test points of the circuit.
4. Read the duty cycle displayed on screen.

AC/DC Current Measurement

> **⚠ Warning**
> Please make sure: a) All power to the circuit is OFF and b) Discharge the capacitor if voltage is present in the circuit.

1. Turn the rotary switch to μA Hz/% mA Hz/% or A Hz/% position. Press the **'FUNC'** button to switch among AC/DC current measuring modes.
2. Remove the protective caps. Connect the black banana plug to COM terminal. If the tested current is less than 600mA, connect the red banana plug to the mA terminal. If the tested current falls within 600mA~10A, connect red banana plug to the 10A terminal.
3. Remove the protective caps. Connect the black probe to the the one end of the open circuit (with lower voltage). Connect the red probe to the other end of the open circuit (with higher voltage).
4. The measuring result would be displayed on screen. If the current of the circuit exceeds measuring range, '0L' would be displayed on screen. You need to turn the rotary switch to another position (turn from uA to mA or from mA to A) to get a higher measuring range.

Measure Temperature

1. Turn the rotary switch to ℃/℉ position.
2. You need to test temperature with Type K thermocouple. Connect its black banana plug to COM terminal and its red banana plug to the '℃/℉' terminal.
3. Place the tip of the Type K thermocouple on the surface of a tested object or in the environment under test.
4. The measured result would be displayed on screen.
5. Press **'FUNC'** button to convert between ℃ and ℉.

Flashlight

Power on the multimeter. Press button to turn on the flashlight. Press the button again to turn off the flashlight.

Backlight

Long press the ' HOLD ' button for no less than 2 seconds to turn on the backlight. The backlight will not remain turned on for more than 30 secs. You can also turn off the black light manually by long pressing the ' HOLD ' button again.

Auto power-off function

1. After 15 minutes of inactivity, the tool would enter into sleep mode to save power.
2. Press any button to activate the device and return to work mode.
3. To cancel the auto power-off button, turn on the product and press 'FUNC' button. The buzzer would beep 3 times as an indication. To restore the auto power-off function, restart this product.

Maintenance

Replace batteries

> **⚠ Warning**
> Before opening the battery cover, you need to remove the test lead away from the circuit to avoid electric shock.

1. When the icon displays on screen, it means that the battery needs to be replaced.
2. Remove the screw on the battery cover.
3. Replace the old batteries with the new ones and close the battery cover.

Note: Do not install the battery with the polarity reversed.

Replace test lead

> **⚠ Warning**
> If the original test lead needs to be replaced, choose a test lead with the same specs (1000V 10A) as the original one. The replacement test lead should be in good condition.

If the insulating part of this test lead is damaged, the test lead needs to be replaced.