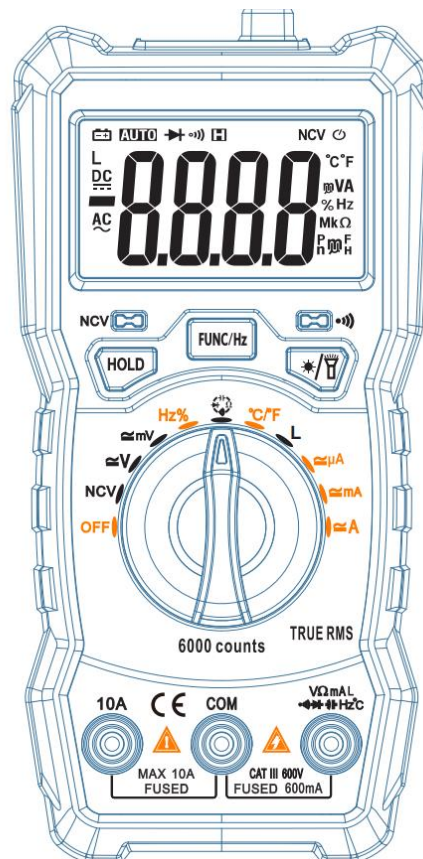


LCR Meter

Auto-ranging Digital Multimeter with TRUE RMS



Contents:

- Introduction
- Panel diagram
- Monitor Symbols Explanation
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- Safety Signs
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- Maintenance
- Technical indicators
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Introduction

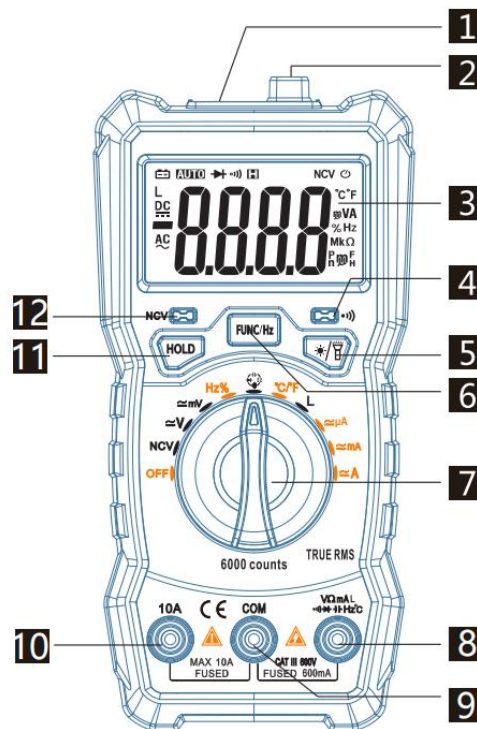
This meter is a multi-purpose instrument with high measurement accuracy, fast response speed and high safety level. It is embedded with a special chip with up to 6000 counts. This chip is composed of high-precision AD and high-speed digital processor. It has accurate measurement, high resolution, fast calculation speed, and can achieve high-speed true effective value calculation of AC 1KHz. The whole machine is software calibrated, and the accuracy remains unchanged for long-term use.

The appearance design of the entire instrument is aesthetically pleasing and suitable for various industrial applications, and the circuit design is safe and reliable. The entire instrument has many measurement functions and a friendly human-machine interface, which can meet the needs of various application groups such as professional engineers and maintenance engineers.

This meter can be used to measure DC and AC voltage, DC and AC current, resistance, capacitance, inductance, temperature, diode, and circuit continuity testing.

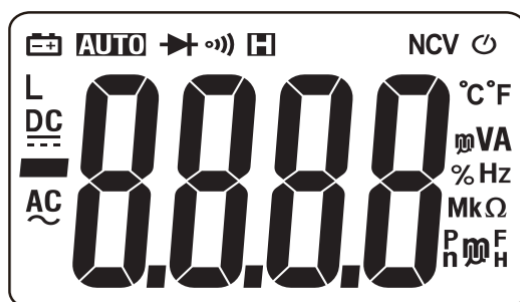
This instrument is equipped with a backlight and an illumination lamp to facilitate users to read the measurement display value in a dark place.

Panel diagram



- | | |
|----------------------------------|-------------------------------|
| 1. Illumination | 2. NCV sensing area |
| 3. LED display | 4. Buzzer |
| 5. Backlight/illumination button | 6. "FUNC/HZ" selection button |
| 7. Gear rotary switch | 8. HzVΩMALF input socket |
| 9. COM input socket | 10. 10A input socket |
| 11. Lock keys | 12. NCV indicator |

Monitor Symbols Explanation



Symbol	Description
	Battery low voltage display
	Auto power off
	Negative polarity input indication
AC	Alternative input indication
DC	Direct input indication
	In continuity test mode
	In diode test mode
L	Inductance measurement
AUTO	Auto ranging mode
	Data hold mode
°C、 °F	Temperature
%	Duty cycle
NCV	Non-contact voltage detection mode
V、 mV	Volt, unit of Voltage
A、 mA、 μA	Ampere, unit of current
Ω、 kΩ、 MΩ	Ohm, unit of resistor
Hz、 KHz、 MHz	Hz, hertz, unit of frequency
mF、 μF、 nF、 pF	Farah, unit of capacitance
H、 mH、 μH	Inductance unit

Security Information

Safety Instructions








*When using this meter, the user must comply with all the standard safety regulations in the following two aspects

A: Protection against electric shocks

B: Preventing the misuse of the instrument's safety procedures

*To ensure your personal safety, please use the test pen provided with the meter, check before use, and make sure they are intact.


Safety Signs

	Warning
	AC (alternative current)
	DC (direct current)
	Ground
	Double insulation
	European union standard
	High voltage warning
CAT II	II category overvoltage protection

Precaution for use:

- The use of meter instruments near devices with large electromagnetic disturbances will be unstable and may even cause large errors.
- Do not use when the appearance of the meter or the test pen is broken.
- If the meter is not used correctly, the safety functions provided by the meter may fail.
- Care must be taken when working around bare conductors or buses.
- Do not use this instrument near explosive gas vapor or dust.
- The correct input function must be used to measure the range.
- **Do not switch gears while measuring voltage or current.**
- The input value must not exceed the limit of the input value specified for each range to prevent damage to the instrument.
- Do not touch the unused input when the instrument is connected to the circuit under test.
- When the measured voltage exceeds 60 VDC or 30 VAC, use caution to prevent electric shock.
- When measuring with a test pen, place your finger behind the guard ring of the test.
- Before converting the range, it must be ensured that the test pens have left the circuit under test.
- Before carrying out a resistance, diode, capacitance measurement or continuity test, the circuit under test must be powered off and all high-voltage capacitors in the circuit under test should be discharged.
- Do not measure the resistance on a live circuit or perform buzzer test.
- Before conducting the current measurement, the fuse of the meter should be checked. Before connecting the meter to the circuit under test, the power of the circuit under test should be turned off.
- When performing TV repairs or measuring power conversion circuits, care must be taken in the high-amplitude voltage pulses in the circuit under test to avoid damage to the meter.
- The instrument uses three pieces AAA 1.5V batteries as the power supply. The battery must

be properly installed in the battery compartment of the meter.

- When the battery with low voltage symbol “” appears, replace the battery immediately. Insufficient battery power can make the meter read incorrectly, which may result in electric shock or personal injury.
- When measuring voltages, do not exceed 600V. Do not use the instrument when the instrument's housing or part of the housing is removed.

Maintenance:

- When opening the instrument case or removing the battery cover, pull out the test pen first.
- The specified replacement parts must be used to service the meter.
- Before opening the meter, all relevant power must be disconnected. At the same time, you must ensure that you do not have static electricity to avoid damage to the meter.
- Instrument components, instrument calibration and maintenance operation instructions are operated by professionals.
- When opening the instrument housing, some capacitance in the instrument must be noticed. Even after the instrument is turned off, dangerous voltages are kept.
- If the instrument is observed any abnormality, the table should be immediately stopped and sent for repair, and to ensure that it can not be used before inspection qualified.
- When not in use for a long time, please remove the battery, and avoid storing in high temperature and humidity.

Input protection measures

- The limit voltage is 600V when the voltage is measuring.
- The limit voltage is 250 ACV or the equivalent RMS voltage when the capacitance or the diode is measuring.
- When measuring μA current and mA current, it is protected by a fuse (600mA/250V)。

General maintenance:

To avoid electric shock or damage to the meter, do not get the inside of the meter wet. Before opening the case or battery cover, turn off the power and check that the test pen is disconnected from the circuit under test.

Clean the instrument case regularly with a damp cloth and a small amount of detergent. Do not use abrasives or chemical solvents. Dirty or damp input sockets can cause oxidation of the metal surface, which may affect readings.

Technical indicators:

Comprehensive indicators

*Operating conditions:

600V CAT II Pollution grade: 2

Height: under 2000m

Working temperature: 0-40℃ (<80%RH)

Storage temperature: -10-60℃ (<70%RH, take off battery)

*Test or calibrate surrounding temperature: 25±2℃

*The biggest voltage between measurement end and ground: 600V

*Fuse protection: "μA/mA" fuse 600mA/250V; "A" fuse 10A/250V

*Conversion rate: about 3s/second

*Display:6000 counts LED display

*Overload: 'OL' displayed

*Low voltage display of battery: "⎓" displayed when the working voltage is low

*Input polarity indicator: "-" shown automatically

*Battery:3 X1.5V AAA

*Size: 147mm (L)*71mm (W)*45mm (H)

*Weight: about 220g (battery excluded)

Accuracy index

Accuracy:± (%reading+digit) ,one year warranty from the manufacture date

Conditions: surroundings temperature from 18℃ to 28℃, <80%RH

Direct current of voltage(DCV)

Range	Resolution	Accuracy
60mV	0.01mV	± (0.5%Readings+5digits)
600mV	0.1mV	
6V	0.001V	
60V	0.01V	
600V	0.1V	

Input resistance: 10MΩ

Maximum input voltage: 600VDC

Alternative current of voltage (TRMS)

Range	Resolution	Accuracy
60mV	0.01mV	± (1%Readings+4digits)
600mV	0.1mV	
6V	0.001V	
60V	0.01V	
600V	0.1V	

Input resistance: 10MΩ

Maximum input voltage: AC600V

Frequency response: 40HZ to 1KHZ true RMS



Resistance

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

Overload protection: 250V DC/AC

Open circuit voltage: 0.52V

Diode and Buzzer

Function	Testing condition	open-circuit voltage
	The display shows the approximate value of the forward voltage of the diode	3.2V
	When the internal resistance is lower than 600Ω, the buzzer sounds and the red indicator light lights up	1V

Overload protection: 250V DC/AC

Direct current

Range	Resolution	Accuracy
600μA	0.1μA	± (1.2%Readings+5digits)
6000μA	1μA	
60mA	0.01mA	
600mA	0.1mA	
6A	0.001A	± (3%Readings+5digits)
10A	0.01A	

Overload protection: μA/mA range fuse (600mA/250V); 10A range fuse (10A/250V).

When the measurement current is greater than 10A, the continuous measurement time cannot be longer than 10 seconds, otherwise the solder joint may be melted due to high temperature. After the measurement, the current measurement must be stopped for more than 1 minute before measuring again.

Alternative current

Range	Resolution	Accuracy
600μA	0.1μA	± (1.2%Readings+5digits)
6100μA	1μA	
60mA	0.01mA	
600mA	0.1mA	
6A	0.001A	± (3%Readings+5digits)
10A	0.01A	

Overload protection: μA/mA range fuse (600mA/250V); 10A range fuse (10A/250V).

Maximum input current: mA level: 600mA AC effective value; 10A level: 10A AC effective value.
 When the measurement current is greater than 10A, the continuous measurement time cannot be longer than 10 seconds, otherwise the solder joint may be melted due to high temperature. The current measurement must be stopped for 1 minute after the measurement.

Frequency response: 40Hz-1KHz, true RMS

Frequency

Range	Resolution	Accuracy
9.999Hz	0.001Hz	± (1.5%Readings+5digits)
99.99Hz	0.01Hz	
999.9Hz	0.1Hz	
9.999KHz	0.001KHz	
99.99KHz	0.01KHz	
999.9KHz	0.1KHz	
9.999MHz	0.001MHz	

Input voltage range: 200mV-10V AC RMS

Overload protection:250V DC/AC

Capacitance

Range	Resolution	Accuracy
6000pF	1pF	± (4.0%Readings+5digits)
60nF	0.01nF	
600nF	0.1nF	
6μF	0.001μF	
60μF	0.01μF	
600μF	0.1μF	
6mF	0.001mF	
60mF	0.01mF	
100mF	0.1mF	

Overload protection:250V DC/AC

Temperature

Range	Resolution		Accuracy
°C	1°C	-20°C~1000°C	± (1.0%+3) Readings
°F	1°F	-4°F~1832°F	± (1.0%+3) Readings

Overload protection:250V DC/AC

Inductance

Range	Resolution	Accuracy
600μH	0.1μH	± (4.0%Readings+5digits)
6mH	0.001mH	
60mH	0.01mH	
600mH	0.1mH	
6H	0.001H	
60H	0.01H	

Overload protection:250V DC/AC

Button function description

"HOLD" key: data hold key.

1. During the measurement process, short press the HOLD key to keep the current measurement value display of voltage, current, resistance, capacitance, and inductance unchanged. Short press the HOLD key again or rotate the gear switch to cancel this mode.
2. Press and hold the HOLD button to turn on the phone, and three beeps of "di-di-di" will cancel the automatic shutdown function. The device restarts and restores the automatic shutdown function.

"FUNC/Hz" key: function selection key

1. AC/DC voltage and AC/DC current measurement can be switched between current and voltage levels. Under AC voltage and AC current measurement, long press "FUNC/Hz" to switch the frequency measurement of 0~1KHz signals with voltage lower than 250V. (Reference voltage, current measurement)
2. In the "→/←)/Ω / ← " range, short press "FUNC/Hz" to cycle through resistance, capacitance, on-off, Diode measurement mode.

Backlight and lighting functions

1. Short press the "☀/☹" key to turn on the backlight, and short press again to turn off the backlight. If there is no operation for 30 seconds, the backlight will be turned off automatically.
2. Long press the "☀/☹" button to turn on the lighting, and the backlight will also light up at the same time. Short press again to turn off the lighting and backlight. If there is no operation for 30 seconds, the lighting and backlight will automatically turn off.
3. When the backlight is on, long pressing this button for 2 seconds can also turn on the lighting. If there is no operation for 30 seconds, the backlight and lighting will be turned off at the same time.

Operation instruction

On/off operation:

Turn the gear switch on automatically. If there is no operation for about 15 minutes after powering on, the instrument will make a beep sound to indicate that it has entered sleep mode. Press any button or rotate the gear switch in automatic shutdown mode to restart.

ACV and DCV measurement

⚠ Do not measure any voltage greater than AC600V or DC600V to prevent electric shock or damage to the instrument.

1. Turn the rotary switch to the " $\approx mV$ " or " $\approx V$ " position, and press the "FUNC/Hz" key to select DC or AC.
2. Connect the black test lead and red test lead to the COM input socket and V input socket respectively.
3. Use the other two ends of the test pen to measure the voltage value of the circuit under test. (Connected in parallel with the circuit under test)
4. The display shows the measured voltage value. When measuring DC voltage, if the red test lead touches the negative pole of the voltage being measured, the display will display the "-" polarity symbol.

Notice:

- ① In the DC or AC 600mV and 6V ranges, even if no test pen is input or connected, the meter will have several displays. In this case, short-circuit the "V- Ω " and "COM" terminals to return the meter display to zero. The instrument is normal.
- ② Under the AC voltage function, long press the "FUNC/Hz" key to measure the frequency of the AC voltage source. Please refer to Measuring Frequency.
- ③ The AC voltage value measured by this meter is the true effective value (root mean square). For sine waves and other waveforms (without DC offset), such as square waves, triangle waves, and step waves, these measurements are accurate.

Resistance measurement

⚠ To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring resistance, and all high-voltage capacitors should be fully discharged.

Turn the rotary switch to the " $\rightarrow \text{V}/\Omega / \text{Hz}$ " position and press the "FUNC/Hz" key to select the " Ω " range.

2. Connect the black test pen and the red test pen to the "COM" input socket and the "V/ Ω " input socket respectively.
3. Use the other two ends of the test pen to measure the resistance of the circuit under test.
4. The display shows the measured resistance value.





Notice:

- ① The resistance value measured on the circuit is usually different from the rated value of the resistor. (Influence of parallel resistance and capacitance)
- ② When measuring low resistance, in order to measure accurately, please short-circuit the two test leads first and read the resistance value of the short-circuit test leads. After measuring the resistance under test, you need to subtract the resistance value.
- ③ If the display displays "OL" during measurement, it means that the measured value exceeds the range. Please change to the corresponding higher range measurement.

④ When the meter is open circuit, the display will show "OL".





Diode measurement

⚠ **To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring diode, and all high-voltage capacitors should be fully discharged.**

1. Turn the rotary switch to the "/Ω / 
" position, and press the "FUNC/Hz" key to select the "/Ω / " range.2. Connect the black test lead and red test lead to the COM input socket and V/Ω input socket respectively.
3. Connect the black test pen and red test pen to the cathode and anode of the diode under test respectively.
4. The meter will display the forward conduction voltage value of the diode under test. If the polarity of the test pen is reversed, the meter will display "OL".






Buzzer test

⚠ **To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring on-off of the circuit and all high-voltage capacitors should be fully discharged.**

1. Turn the rotary switch to the "/Ω / 
" position and press the "FUNC/Hz" key to select the "/Ω / " range.2. Connect the black test lead and red test lead to the COM input socket and V/Ω input socket respectively.
3. Use the other two ends of the test pen to measure the resistance of the circuit under test. If the resistance of the circuit under test is less than 600Ω, the indicator light will light up, the buzzer will sound continuously, and the display will display the measured resistance value.

Capacitance measurement

⚠ **To avoid damage to the meter or device under test, all power to the circuit under test should be cut off before measuring capacitance. All high-voltage capacitors should be fully discharged.**

1. Turn the rotary switch to the "/Ω / 
" position and press the "FUNC/Hz" key to select the "/Ω / " range.2. Connect the black test pen and red test pen to the "COM" input socket and the "
" input socket respectively.3. Touch the two terminal pins of the capacitor with a test pen, and the display will display the measured value of the capacitor.

Notice:

- ① When measuring large capacitance, it takes some time for the reading to stabilize.
- ② When measuring polarized capacitance, pay attention to the corresponding polarity to avoid damaging the instrument and ensure measurement accuracy.

Frequency measurement

⚠ Do not test any voltage higher than 250V to prevent electric shock or damage to the instrument.

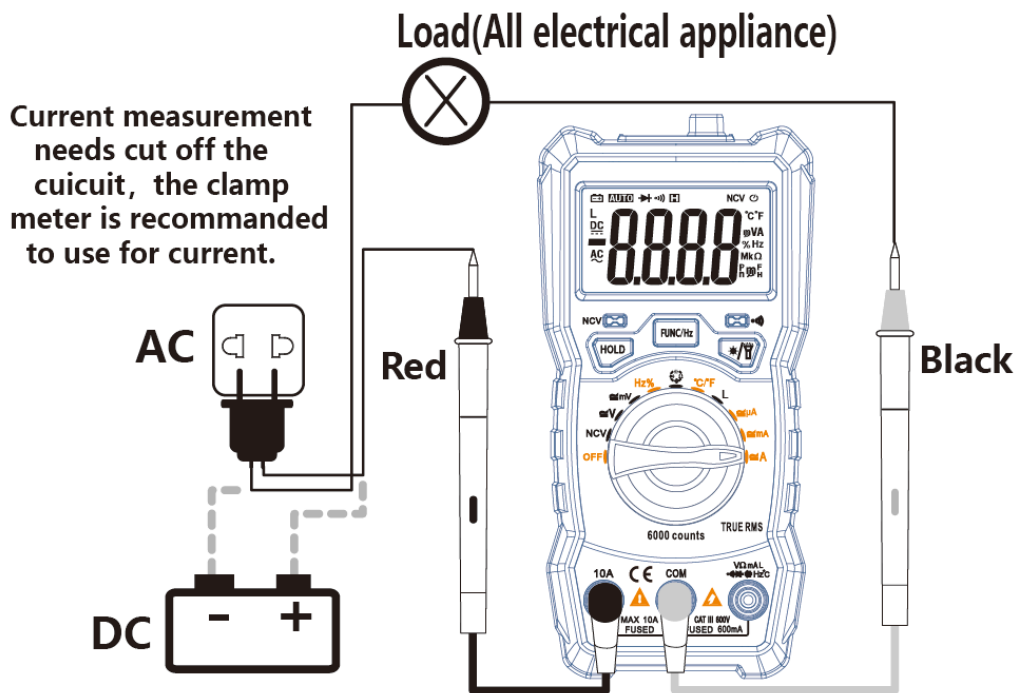
1. Turn the rotary switch to the "Hz%" position.
2. Connect the black test pen and red test pen to the "COM" input socket and the "Hz" input socket respectively.
3. Use the other two ends of the test pen to measure the frequency value of the circuit under test.
4. Press the "FUNC/Hz" key to display frequency and duty cycle respectively.

Measuring current (no load short-circuit measurement of mains power supply is prohibited)

⚠ Never attempt to make current measurements on a circuit when the open circuit voltage to ground exceeds 250V. If the fuse is blown during measurement, the meter may be damaged or you may be injured. To avoid damage to the meter or the equipment under test, please check the fuse of the meter before measuring current.

When measuring, the correct input socket, function range and range should be used. When the test pen is plugged into the current input socket (μA , mA, A), do not connect the two test pens in parallel to any circuit, otherwise there is a risk of burning out the instrument or getting an electric shock.

1. Turn the rotary switch to the " " or " " or " μA " position, and press "FUNC/Hz" to select AC or DC.
2. Connect the black test lead to the COM input socket. If the measured current is less than 600mA, connect the red test pen to the V Ω mA input socket; if the measured current is between 600mA and 10A, connect the red test pen to the 10A input socket.
3. Disconnect the circuit to be tested. Connect the black test lead to the end of the disconnected circuit (lower voltage) and the red test lead to the end of the disconnected circuit (higher voltage).
4. Connect power to the circuit and read the display. If the display only shows "OL", it means that the input exceeds the selected range. After powering off, turn the rotary switch to a higher range.
5. In the ACA measurement state, long press the "FUNC/Hz" key to display the frequency of the AC signal 0~1KHz.



NCV test (non-contact voltage detection)

Rotate the rotary switch to the "NCV" position and place the top of the meter (NCV sensing area) close to the conductor. If the meter detects AC voltage, the meter lights up the indicator light based on the detected signal strength, and at the same time the buzzer emits different frequencies of alarm sound.

Notice:

1. Voltage may still be present even when not indicated. Do not rely on non-contact voltage detectors to determine whether voltage is present on a wire. Detection operations may be affected by factors such as socket design, insulation thickness and type.
2. When voltage is input to the input terminal of the meter, the voltage sensor indicator light may also light up due to the existence of induced voltage.
3. Interference sources in the external environment (such as flashlights, motors, etc.) may mistakenly trigger non-contact voltage detection.

Temperature measurement

1. Turn the rotary switch to the "°C/°F" position, and the instrument will display the ambient temperature.
2. Remove the test leads and insert the thermocouple to the "COM" and "VΩmA" input terminals according to the correct polarity.
3. At this time, the meter displays the approximate temperature value transmitted from the thermocouple.

Inductance measurement

1. Turn the rotary switch to the "L" position.
2. Connect the black test pen and red test pen to the "COM" and "VΩmAL" input terminals respectively.
3. Use the test pen to touch both ends of the inductance device, and the display will display the measured inductance value.

Replace batteries, fuses, and accessories

To avoid erroneous readings that could result in electric shock or personal injury, when the "



" symbol appears, the battery should be replaced immediately.

Only use designated fuses (600mA/250V, 10A/250V fast-blow fuses).

To avoid electric shock or personal injury, turn off the phone before opening the battery cover to replace a new battery. And check that the test lead is disconnected from the circuit being measured.

Please follow the steps below to replace the battery:

1. Turn off the power of the instrument
2. Pull all the test pens out of the input socket,
3. Use a screwdriver to loosen the screws fixing the battery.
4. Remove the battery cover
5. Remove the old battery or the damaged fuse
6. Replace the new 3×1.5V AAA batteries or a new fuse (the spare fuse is under the battery cover)
7. Install batteries cover and close the screws.

Accessories

1. One instruction manual
2. One pair of test pen
3. One thermocouple
4. 3 x 1.5V AAA AA batteries