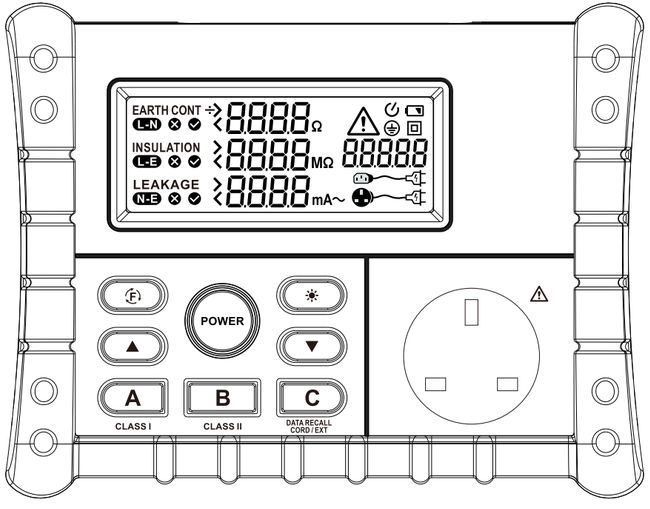
USER'S MANUAL



CAT II
300 V

CE

Contents

Contents

1. Introduction of Instrument

The meter is a handheld safety tester which is mainly used for safety performance tests of household appliances and industrial equipment(otherwise know as a Portable Appliance Tester),

Main functions are as follows:

Safety CLASS I test;
Safety CLASS II test;
Cord/Polarity test;
230V/110V Sub-Leakage test functionality
12V battery-powered and mains powered using 12VDC adaptor, with automatic power-off function so that it will automatically shut down if there is no operation within 5 minutes.
It has backlight display function and will be automatically shut down within 30s.

⚠ Warning

Read this manual carefully before use and follow the relevant procedures during the operation.

2. This kit includes:

- Safety tester 1pcs
- CORD Main test cord 1pcs
- Alligator clip test cord (including a removable alligator clip) 1pcs
- Probe 1pcs
- AA(LR6) battery 1.5V 8pcs
- Instructions 1pcs
- Rugged padded carrying case 1pcs

3. Safety instructions

Warnings - Please be aware of the following warnings.

- Before using the unit and test leads inspect both items. Do not use the unit and test leads if they are damaged or the case is broken or damaged as this could result in electrical shock.
- Replace the battery as soon as the battery indicator "🔋"appears. Low battery levels may produce inaccurate readings.
- Do not use or store the unit in high temperature, humid, flammable or electromagnetic environments as damage and incorrect readings may result.
- If the tester requires repair or replacement please contact your local service center.

Declaration of Conformity
This product and declares that this product conforms to thefollowing standards:
BS EN 61326
Electrical equipment for measurement, control and laboratory use
BS EN 61010-1
Safety Requirements for electrical equipment for measurement, control, and laboratory use.

3.1 Warranty

The meter is warranted to be free from defects in material and workmanship under normat use and service. The warranty period one year and begins on the date of shipment Part. This warranty does not apply to fuses, disposable batterise.

3.2 Safety Symbols

⚠	Note-Important safety information, refer to the instruction manual.
⚠	Caution, possibility of electric shock
⧈	Equipment protected throughout by double insulation or reinforced insulation.
CE	Complies with European (EU) safety standards

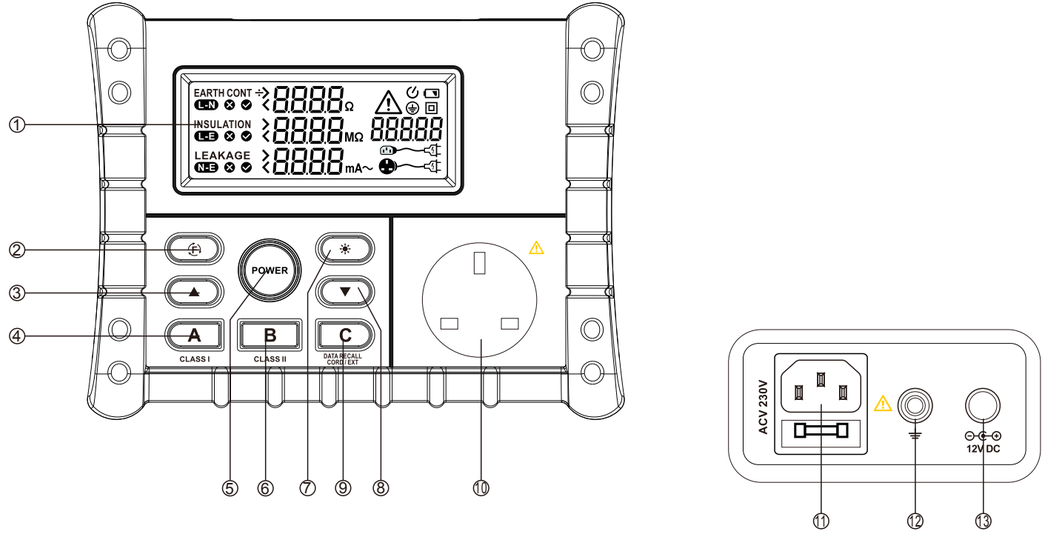
⏚	Earth (ground) TERMINAL
⎓	Direct current
~	Alternating current

CAT II: 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.

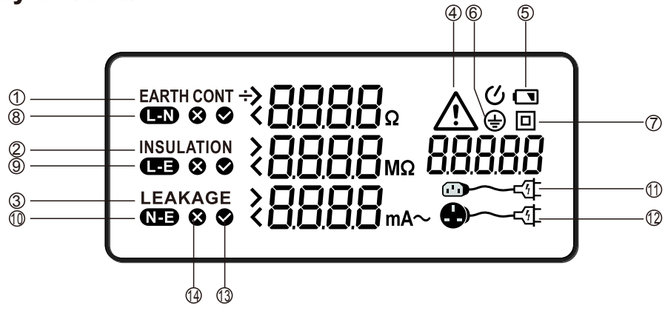
4. Description

4.1 Introduction of functions of each part

1	**LCD**	Display the test content and data
2	**F**	A function key. Complete the combined function in conjunction with other keys
3	**▲**	UP key. Turn pages when viewing the test results
4	**A**	Start the CLASS I test
5	**POWER**	Turn on/off the machine
6	**B**	Start the CLASS II test
7	☀	Turn on/off the backlight
8	**▼**	DOWN key. Turn pages when viewing the test results
9	**C**	Start the CORD test
10	**Output socket**	For the output of the test voltage during CLASS I, CLASS II and CORD tests
11	**Input socket**	For input of the test voltage during CORD and out-phase tests
12	**Input Earth Bond Lead terminal**	A conductor for connecting external earth points on Class I appliances
13	**12VDC power connector**	A power connector when an external 12VDC power is applied



4.2 Display Screen



	Indicator	Description
1	EARTHCONT	Ground Resistance Test / Reading result
2	INSULATION	Insulation Resistance Test / Reading result
3	LEAKAGE	Leakage Current Test / Reading result
4	⚠	The warning of DC voltage output
5		Low Battery Symbol
6	⏚	Earth-leakage protection/ class I Test
7	⧈	Double Insulated / Class II Test

8	L-N	Live - Neutral
9	L-E	Live - Earth
10	N-E	Neutral - Earth
11		CORD test
12		Power socket test
13	√	Pass Symbol
14	×	Fail Symbol

5. Features

- Auto Switch Off
  The unit will automatically switch off after approximately 5 minutes if no buttons are pressed.
- It has backlight display function and will be automatically shut down within 30s.
- Power: AA 1.5V*8 or 12VDC adapter
- Low voltage detection: ≤ 9.5V
- Data: Logging 300 groups
- APO: Auto Power Off
- LBD: Low Battery Display
- Product Size: 204mm×155mm×76mm
- Product Weight: 1270g

6. Operation of instrument

6.1 Turn on / off

Press POWER to turn on/off the machine;
The instrument will be automatically shut down if there is no operation within 5 minutes;
Note: When the instrument displays , this indicates the lack of power and it is necessary to replace the battery. Or to use the 12V DC Power Adapter

6.2 Calibration

When using the test leads for the 1st time or replacing the test leads, including the IEC lead (used when testing extension cables / C Type functionality) or Earth Bond leads these functions require recalibration of the meter before use. (This calibration will compensate for the lead resistance during testing)

- Calibrate the CLASS I test grounding resistance.
  Insert the Earth bond lead main into the output socket (12) with the probe supplied, insert the probe into the earth thermal and the input socket (10). Press and hold the F (2) and A (4) function key together until the calibration interface is enabled.
  Press the A (4) key this will then perform the lead calibration/ adjustment, Press the F (2) to exit the calibration process.
- Calibrate the CORD/IEC test grounding resistance.
  Insert the CORD/IEC main test cord into the output socket (10) and the other end into input socket (11). Press the POWER key to turn on the instrument, and press and hold the combination key F + A until entering the calibration interface. Press the C key to calibrate the CORD test grounding resistance; after the calibration is completed, the resistance of the current test cord (line) will be displayed. Press the F key to exit.

6.3 Test Voltage selection

In addition to selecting the output voltage (250V/500V) of the test insulation resistance in the CLASS I/II test, you can select the working voltage (110V/230V) of the equipment to be tested according to the working voltage of the equipment under test. The setting of the working voltage (110V/230V) of the equipment to be tested will affect the leakage current test results and the out-phase detection function.

- Setting of the output voltage of the insulation resistance test voltage.
  Press the POWER key to turn on the instrument, press and hold the combination key F + B until entering the voltage setting interface. Set the insulation resistance test voltage by pressing ▲ or ▼ key. Switch to INSULATION, press the POWER key to select the voltage, and switch 250V/500V through ▲ and ▼ keys. Press the POWER key to confirm and exit.
- Setting of the working voltage of the equipment to be tested.
  Press the POWER key to turn on the instrument, and press and hold the combination key F + B until entering the voltage setting interface. Set the insulation resistance test voltage or the working voltage of the equipment to be tested by pressing ▲ or ▼ key. Switch to LEAKAGE, press the POWER key to select the voltage, and switch 110V/230V through ▲ and ▼ keys. Press the POWER key to confirm and exit.

6.4 CLASS I test

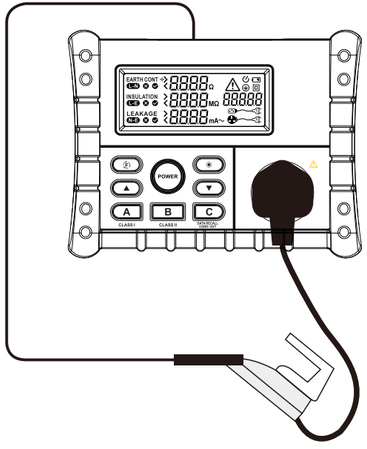
Connect the equipment to be tested to the meter with the mains test cord supplied with the appliance to the meter output socket and the other end to the power connector of the equipment to be tested.
Connect the Earth bond lead to the meter (Terminal 12) then connect the other end to a metal conductive part of the CLASS1 appliance (connected to the protective conductor of the equipment).
After correct connection, press the A key to start the CLASS I test. Ensure that the equipment to be tested is powered on during the test. After the test is started, the meter will light the ⏚ symbol at the right hand side of the LCD screen to indicate that the CLASS I test is being performed currently. The test will be done automatically according to the following steps:

- **Grounding Test**

  Test the resistance between the conductive part of the equipment to be tested and the protected area.

  If the measured resistance is greater than 25Ω, the buzzer and the grounding icon flash to indicate the grounding fault. After 5 seconds, exit and return to the main interface;

  If the measured resistance is less than 25Ω, compare with the set resistance, display the resistance and "√" or "×", and then conduct the next test.



- **Insulation Resistance Test**

  If the power switch of the equipment to be tested is off, the instrument may display LO LOAD to indicate that the equipment to be tested has an insufficient load capacity. Press the A key or turn on the power switch of the equipment to be tested to continue the insulation resistance test. Press any other key to exit and return to the main interface.

  After the test is completed, the insulation resistance is displayed. Compare it with the set value and display the comparison result "√" or "×".

- **Leakage current test**

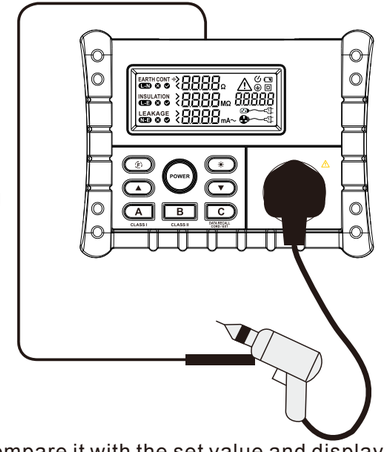
  After the test is completed, the leakage current value is displayed. Compare it with the set value and display the comparison result "√" or "×".

- **Final Result**

  Make a final judgment based on the test results obtained in the three steps above, display PASS or FAIL, and save the test results.

  Press any key to or automatically exit and return to the main interface after about 10 seconds.

6.5 CLASS II test



Connect the equipment to be tested to the meter with the mains test cord: connect one end of the mains test cord to the meter output socket(10) and the other end to the power interface of the equipment to be tested.

After correct connection, press the B key to start the CLASS II test. Ensure that the equipment to be tested is powered on during the test. After the test is started, the meter will light the ⧈ marking at the right side of the LCD screen to indicate that the CLASS II test is being performed currently. If the insulation resistance test voltage used is 500V, the ⚠ marking will also be lit. The test will be done automatically according to the following steps:

- **Insulation Resistance Test.**

  If the power switch of the equipment to be tested is off, the instrument may display LO LOAD to indicate that the equipment to be tested has an insufficient load capacity. Press the A key or turn on the power switch of the equipment to be tested to continue the insulation resistance test.

  Press any other key to exit and return to the main interface.

  After the test is completed, the insulation resistance is displayed. Compare it with the set value and display the comparison result "√" or "×".

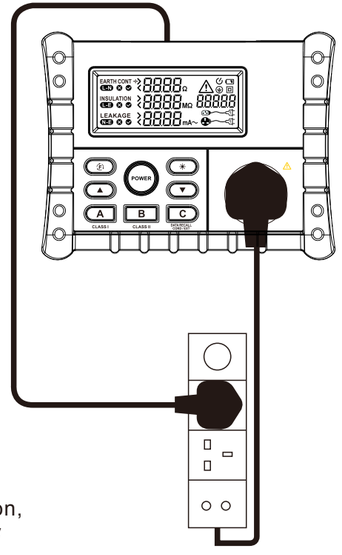
- **Leakage current test**

  After the test is completed, the leakage current value is displayed. Compare it with the set value and display the comparison result "√" or "×".

- **Final Result**

  Make a final judgment based on the test results obtained in the two steps above, display PASS or FAIL, and save the test results. Press any key to or automatically exit and return to the main interface after about 10 seconds.

Note: The CLASS II insulation resistance test voltage is defaulted as 500VDC and can be set to 250VDC. The specific operation is shown in 6.3.



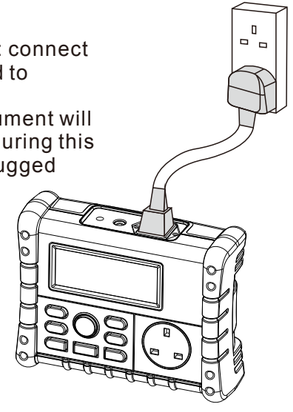
6.6 CORD test

Connect the CORD cable to be tested to the meter: Connect one end of the CORD cable to the meter output socket(10) and the other end to the meter IEC input socket(11).
After the correct connection, press the C key to start the CORD test.
After the test is started, the meter will lighten the marking at the right hand side of the LCD screen to indicate that the CORD test is being performed currently.

- **Grounding Test**
  Detect the connectivity of the Earth terminal of the CORD cable.
  If the connectivity is poor or it is not connected, the buzzer and the grounding icon flash to indicate the grounding fault, provide an initial error prompt after the polarity analysis, and exit and return to the main interface after 5 seconds;
  If the connectivity is good, compare it with the set resistance, display the resistance and "√" or "×", and conduct the next test.
- **Insulation Resistance Test**
  After the test is completed, the insulation resistance is displayed. Compare it with the set value and display the comparison result "√" or "×".
- **Polarity Test**
  Test whether there is an open circuit, short circuit and reverse connection, display test results with PASS/OPEN/SHOR/CORS/FAIL to respectively indicate the correct connection, open circuit, short circuit, reverse connection and concurrence of many errors.

- **Final Result**
  Make a final judgment based on the test results obtained in the three steps above, display GOOD or ERROR, and save the test results. Press any key to or automatically exit and return to the main interface after about 10 seconds.

6.7 Power socket test



Connect the socket to be tested to the meter with the CORD main test cord: connect one end of the IEC test cord to the meter input socket(11) and the other end to the socket to be tested.
After correct connection, if the socket to be tested is powered on, the instrument will automatically perform the out-phase test. Other operations will be invalid during this period until the socket to be tested is powered off or the power cord is unplugged from the socket.
After entering the test interface, the meter will lighten the marking at the right hand side of the LCD screen to indicate that the instrument is under the instrument is performing the out-phase test.
Note: This test result is affected by the setting of the working voltage of the equipment under test. The setting operation is shown in 6.3.
Test result:
If it is normal, display LN "√", LE "√", NE "√";
If the Zero line is out of phase, display LN "×", LE"√" and NE"×";
If the ground line is out of phaset, display LN "√", LE"×" and NE"×";

6.8 Reading test date

When the instrument is in the standby mode, press the ▲ key or the ▼ key to view the test results, where a maximum of last 300 test results can be viewed. the meter only saves the results of the CLASS I test, the CLASS II test and the CORD test, the results will be saved only when the test is completed successfully.
For the test results, ⏚, ⧈ and respectively indicate the test type corresponding to the data displayed currently as CLASS I, CLASS II and CORD.

The test results viewed indicate data groups with 001 – 300 to distinguish which data belongs to which test result. The last test result is classified as 001; the greater the number, the earlier the test time. Press the POWER key to view the determined final test result of the current test result and display it in the group position.
Press the F key to exit the view page and return to the main interface.

7. Technical Specifications

Test Conditions:

Function	Range	Accuracy	Technical parameters
Grounding performance test	0Ω~20Ω	±5%+3	Test current>200mA (R < 2Ω)
			If 0.01~0.1Ω passed, display "√" If 0.1~0.5Ω passed, display "√" and flash If 0.51~19.9 failed, display"×"
			Test voltage 5VDC, test time 5S
Insulation resistance test	Test voltage 500VDC		Test current> 1mA (R = 500KΩ) Test time 5S
	0.2MΩ~19.99MΩ	±5%+3	
	Test voltage 250VDC		Test current> 2mA (R = 1KΩ), test time 5S
	0.2MΩ~19.99MΩ	±5%+3	
	CLASS I		If ≥1MΩ passed, display "√"
	CLASS II		If ≥2MΩ passed, display "√"
	CORD		If ≥1MΩ passed, display "√"

Leakage current test	0.10mA~10mA	±5%+3	Test voltage 50V rms, frequency 50Hz Test time 5S
	CLASS I		If 0.1~0.75mA passed, display "√" If 0.75~3.5mA passed, display "√" and flash If 3.5~10.50mA failed, display "×"
	CLASS II		If 0.1~0.25mA passed, display "√" If 0.25~10.50mA failed, display "×"
Polarity test	Correct	Display "√PASS"	
	L open	"LN ×, LE ×, NE √, OPEN"	
	N open	"LN ×, LE √, NE×, OPEN"	
	G open	"LN √, LE ×, NE ×, OPEN"	
	L_N short	"LN ×, LE √, NE √, SHOR"	
	L_G short	"LN √, LE ×, NE √, SHOR"	
	N_G short	"LN √, LE √, NE ×, SHOR"	
	L_N reverse	"LN ×, LE √, NE √, CORS"	
	L_E reverse	"LN √, LE ×, NE √, CORS"	
	N_E reverse	"LN √, LE √, NE ×, CORS"	
	Multiple errors	"LN ×, LE ×, NE ×, FAIL"	
Power socket test	Correct	Display "LN √, LE√, NE√"	230VAC±15% 110VAC±15%
	Open Neutral	Display "LN ×, LE√, NE×"	
	Open ground	Display "LN √, LE×, NE×"	

7.1 CLASS I TEST:

Grounding performance test	Insulation resistance test	Leakage current test	Final test result
“√”	“√”	“√”	“PASS”
“√” flash	“√”	“√”	“PASS” flash
“×”	“√”	“√”	“FAIL”
“√”	“×”	“√”	“FAIL”
“√”	“√”	“√” flash	“PASS” flash
“√”	“√”	“×”	“FAIL”
“√” flash	“√”	“√” flash	“PASS” flash

7.2 CLASS II TEST:

Insulation resistance test	Leakage current test	Final test result
“√”	“√”	“PASS”
“×”	“√”	“FAIL”
“√”	“×”	“FAIL”

7.3 CORD TEST:

Grounding performance test	Insulation resistance test	Power socket test	Final test result
“√”	“√”	“√”	“GOOD”
“×”	“√”	“√”	“ERROR”
“√”	“×”	“√”	“ERROR”
“√”	“√”	“×”	“ERROR”

8. Maintenance of instrument

8.1Maintenance

Battery Replacement

When the low battery symbol ” ▭ ”appears, replace the batteries by:
1) Disconnecting all test leads before battery replacement.
2) Power off the unit.
3) Unscrew the battery cover.
4) AA(LR6) battery 1.5V.
5) Ensure the polarity of the batteries is correct.
6) Re-attach the battery cover.

8.2 Cleaning

Clean only with a dry cloth; do not use solvents.
Before use, ensure unit is clean and dry; visually inspect all leads, connectors, and case. Any damage or wear must be rectified to preserve user safety.

8.3 Maintenance & Service

This unit should be calibrated and repaired by an authorized service center. To ensure the accuracy of the device it must be calibrated annually.
There are no user serviceable parts.
Environmental rating
Operating temperature range 0°C to 40°C,
Do not expose to moisture or condensation as incorrect or non-genuine readings may result.
Storage temperature range -25° C to 65°C.

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