

G9309 Operating Manual



Multifunction Installation Tester

I. Overview

G9309 is a multifunction digital safety testing instrument, designed with combination of large-scale integrated analog & digital circuits and micro-processor chip. It mainly measures RCD, line loop impedance, continuity, insulation resistance, DC and AC voltage, phase sequence, etc. The instrument is widely used to measure RCD, insulation and earth connections for various equipments, and an ideal tool for testing, inspection and maintenance badly needed for various electric devices and RCDs.

II. Safety Information

This Tester is designed, manufactured and tested according to IEC61010 safety standards. The manual includes safety information related to safe use of the Tester. Please strictly follow the safety items and read the following instructions before use.

⚠ Warning

- Please read and understand the manual before using the Tester.
- Use the Tester as specified in the manual and keep it for future reference.
- Please note that misuse during tests might cause personal injury or damage to the Tester.
- ⚠ On the Tester alerts users to use the Tester properly, please refer to the manual for details.

⚠ Danger	Specifies conditions and actions that may cause severe or fatal hazards.
⚠ Warning	Alerts users to avoid electric shock.
⚠ Caution	Specifies conditions and actions that may damage the Tester or affect accurate measurement.

⚠ Danger

- Do not operate around any inflammables, sparks may cause potential explosion.
- Do not measure the Tester if its surface is wet or the operator's hands are wet.
- Do not touch conductive part of test leads during measurement.
- Do not measure with the battery cover opened.
- Do not touch the circuits under test when measuring insulation resistance and RCD.

⚠ Warning

- Stop using the Tester if any anomaly happens. E.g., the Tester is damaged or shows exposed metal.
- Take extreme caution when working with voltages higher than 33Vrms, 46.7acrms or 70Vdc, for it may pose electric shock.
- The electric storage present in tested circuits must be released after finishing high-voltage tests.
- Do not remove the battery cover until the Tester is under test status.
- Make sure all test leads are firmly secured to input terminals of the Tester.
- Turn off the Tester before opening the battery cover.

⚠ Caution

- It is necessary to replace test leads or power adaptor, use only the same model with same electrical specifications.
- The Low Battery Indicator (LBI) shows, do not use the Tester. Take the battery out for use for a long time.
- Do not store or use the Tester around high-temperature, high humidity, flammables, explosives and electromagnetic environments.
- Clean the Tester's casing with soft cloth dampened with water or mild detergent. No abrasives or solvents are allowed.
- Dry the Tester before storing it if it is wet.

III. Electrical Symbols

⚠	Danger of possible electric shock
⚡	Double insulation or reinforced insulation
⎓	DC
~	AC
⊕	Grounding

VI. Technical Specifications

Accuracy: ±(a% of reading + b digits), calibration per year.

Ambient temperature: 23 ± 5 °C

Ambient humidity: 45~75% RH

1. RCD Test

Test Current	10 mA, 30mA, 100mA, 300mA, 500mA
Operational Voltage	Voltage: 230V/±15%~110%, Frequency: 45Hz~65Hz L/N, 2/1, L/N and 5/1, L/N, (0%~10%)
Test Current Accuracy	±(0.5%+5)
Tripping Time	1/2 L/N, ±10%~0%
Tripping Time Accuracy	±(5%+5)
Tripping Current Range	1/2 L/N, ±10%~10% (total 7 test points)
Tripping Current Accuracy	±10%

2. Loop Impedance Measurement

Operating Voltage (L-E)	Voltage: 230V/±15%~110%, Frequency: 45Hz~65Hz
Test Current	20A/20mA
Measuring Scope	0.050~2000Ω
Measuring Ranges	0.05 ~ 1.99
Accuracy	±(5%+5)
Resolution	20 ~ 2000
Prospective Fault Current	Minimum 1001 Ω
	0KΩ~26KΩ

3. Line Impedance Measurement

Operating Voltage (L-N)	Voltage: 230V/±15%~110%, Frequency: 45Hz~65Hz
Test Current	20A/20mA
Measuring Scope	0.050~2000Ω
Measuring Ranges	0.050~1.99 Ω
Accuracy	±(5%+5)
Resolution	20.0~2000.0
Prospective Short Current	Minimum 1001 Ω
	0KΩ~26KΩ

4. Non-Trip Loop Impedance Measurement

Operating Voltage (L-E)	Voltage: 230V/±15%~110%, Frequency: 45Hz~65Hz
Test Current	20A/20mA
Measuring Scope	0.010~2000Ω
Measuring Ranges	1.000~1.990
Accuracy	±(5%+5)
Resolution	20.0~2000.0
Prospective Fault Current	Minimum 1001 Ω
	0KΩ~26KΩ

5. Continuity Test

Rated Voltage	About 5.0V
Measuring Scope	0.010 ~ 2000
Test Current	0.00~2.00 ~ 200mA
Accuracy	0.010~2000.0 ±(2%+5)

6. Insulation Resistance Measurement

Rated Voltage	250V
Measuring Ranges	50V Range: 0.05~2000MΩ 500V Range: 0.05~2000MΩ 1000V Range: 0.05~2000MΩ
Open Circuit Voltage	DC 250V ±10%, DC 500V ±10%, DC 1000V ±10%
Rated Test Current	At 250 Vd: At 500 Vd: At 1000 Vd:
Short-Circuit Current	1mA~1.1mA 1mA~1.1mA 1mA~1.1mA
Accuracy	±(5%+5)

7. Voltage Measurement

Measuring Range	DC voltage: 2.0V ~ 400V AC voltage: 10V~400V(45Hz~65Hz) < 10V, for reference only.
Special Function	Automatic identification for AC voltage and DC voltage
Resolution	1V
Accuracy	±(0.5%+3)

8. Frequency Measurement

Measuring Range	1Hz~100Hz
Resolution	1Hz
Accuracy	Only for reference

9. Phase Rotation Test

Operating Voltage	Three-phase AC voltage: 100V~400V, frequency: 45Hz~65Hz
Test Result	Phase sequence: L1→L2→L3 forward rotation L1→L2→L3 reversed rotation
Detect Open Phase	Any open phase among L1, L2, L3 will be displayed on LCD

- Display: LCD, display count: 9999
- Low Battery Indication: display V_{bat}
- Over-Load Indication: > over-limited value (e.g. →500M)
- Auto Changing
- On-Display: Press the arrow key to display function and electrical units symbols
- On-Display: Press the arrow key to display function and electrical units symbols
- Safety: (Auto) Automatically
- Working Conditions: 0°C~40°C / Humidity: $\leq 85\%$
- Storage Conditions: -20°C~60°C / Humidity: $\leq 90\%$
- Current Consumption: around 50mA (at Max. 1000V output voltage) (normally status at 10mA)
- Safety: CAT III 300V, Pollution Degree 2 as per IEC61010
- Dimensions: 210mm(L)×175mm(W)×90mm(D)
- Weight: 1kg (including battery)
- Power: 10W (including battery)
- Accessories: Test leads, alkaline battery 1.5V (AA) ×8pcs, operating manual, carrying bag

V. Tester Description (See Figure 1&2)

1. LCD Display
2. Function Buttons F1, F2, F3, F4
3. TEST Button
4. Power
5. Input Terminal to Test Lead (Black)
6. Input Terminal to Test Lead (Red)
7. Input Terminal to Test Lead (Green)
8. Or to specified test lead

1. Phase Rotation: Direct Phase sequence
2. Auto: Automatic RCD Test Time at ×1/2 Rated Current
3. 250V: Measure Insulation Resistance
4. 500V: Measure Insulation Resistance
5. 1000V: Measure Insulation Resistance
6. Continuity with Test Current up to 200mA
7. OFF
8. Loop/PSC/Ze: Measure Loop/Line Impedance, Prospective Fault current, Prospective Short Current.
9. Auto: Automatic RCD Test Time at ×1/2 Rated Current
10. ×1: Measure RCD Trip Time at ×1 Rated Current
11. ×2: Measure RCD Trip Time at ×2 Rated Current
12. ×5: Measure RCD Trip Time at ×5 Rated Current
13. ×5: Measure RCD Trip Time at ×5 Rated Current
14. Ramp: Measure RCD Trip Current

VI. Rotary Switch

1. Phase Rotation: Direct Phase sequence
2. Auto: Automatic RCD Test Time at ×1/2 Rated Current
3. 250V: Measure Insulation Resistance
4. 500V: Measure Insulation Resistance
5. 1000V: Measure Insulation Resistance
6. Continuity with Test Current up to 200mA
7. OFF
8. Loop/PSC/Ze: Measure Loop/Line Impedance, Prospective Fault current, Prospective Short Current.
9. Auto: Automatic RCD Test Time at ×1/2 Rated Current
10. ×1: Measure RCD Trip Time at ×1 Rated Current
11. ×2: Measure RCD Trip Time at ×2 Rated Current
12. ×5: Measure RCD Trip Time at ×5 Rated Current
13. ×5: Measure RCD Trip Time at ×5 Rated Current
14. Ramp: Measure RCD Trip Current

1. LCD Display
2. Function Buttons F1, F2, F3, F4
3. TEST Button
4. Power
5. Input Terminal to Test Lead (Black)
6. Input Terminal to Test Lead (Red)
7. Input Terminal to Test Lead (Green)
8. Or to specified test lead

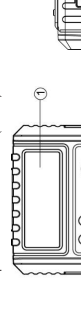


Figure 1

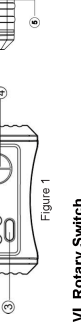


Figure 2

VII. Preparing before Measurement

1. Discharge totally the tested circuits and keep them completely separated from the power supply before test.
2. Insert red lead or specific TEST-marked test lead into red input terminal and black test lead to black terminal.
3. Connect red and black alligators or test probes to the circuit under test.
4. Turn the rotary switch to "Insulation" position and select proper test voltage, then press TEST button to start.

1. Phase rotation: Direct Phase sequence
2. Auto: Automatic RCD Test Time at ×1/2 Rated Current
3. 250V: Measure Insulation Resistance
4. 500V: Measure Insulation Resistance
5. 1000V: Measure Insulation Resistance
6. Continuity with Test Current up to 200mA
7. OFF
8. Loop/PSC/Ze: Measure Loop/Line Impedance, Prospective Fault current, Prospective Short Current.
9. Auto: Automatic RCD Test Time at ×1/2 Rated Current
10. ×1: Measure RCD Trip Time at ×1 Rated Current
11. ×2: Measure RCD Trip Time at ×2 Rated Current
12. ×5: Measure RCD Trip Time at ×5 Rated Current
13. ×5: Measure RCD Trip Time at ×5 Rated Current
14. Ramp: Measure RCD Trip Current

VIII. Testing for Continuity (See Figure 3)

1. Discharge totally the tested circuits and keep them completely separated from the power supply before test.
2. Insert red lead or specific TEST-marked test lead into red input terminal and black test lead to black alligators or test probes to the circuit under test.
3. Connect red and black alligators or test probes to the circuit under test.
4. Turn the rotary switch to "Insulation" position, then press TEST button to begin. Refer to Figure 3 for details.

Low Battery Indicator	Battery Voltage
⚡	$\leq 7V$



Figure 3

IX. Measuring Insulation Resistance (See Figure 4)

1. Discharge totally the tested circuits and keep them completely separated from the power supply before test.
2. Insert red lead or specific TEST-marked test lead into red input terminal and black test lead to black terminal.
3. Connect red and black alligators or test probes to the circuit under test.
4. Turn the rotary switch to "Insulation" position and select proper test voltage, then press TEST button to start.



Figure 4

X. Measuring Voltage/Frequency (See Figure 5)

1. Discharge totally the tested circuits and keep them completely separated from the power supply before test.
2. Insert red lead or specific TEST-marked test lead into red input terminal and black test lead to black alligators or test probes to the circuit under test.
3. Connect red and black alligators or test probes to the circuit under test.
4. Turn the rotary switch to "Voltage" position, then press TEST button to begin. Refer to Figure 5 for details.

Figure 5

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Buzzer and backlight	Test Lock	ZERO	Invalid

1. Long press F1 for about 2 seconds to turn on/off the backlight; short press to turn on/off 20 compare function and LCD will show buzzer indicator, the buzzer will alarm if the measured TEST-LOCKED function. When it is necessary to take a long measurement, press F2 to enable the function. Lock indicator shows on LCD, when you just need to press TEST down once, release it and the Tester will take measurements continuously.
2. Press TEST again to stop the measurements. To disable the function, press F2 again or turn the rotary switch to other functions.
3. Press to zero the test leads. First short-circuit two test leads, and then long press F3 to reset the display to 0.00. "ZERO" will show on LCD, indicating the operation completes.

- ⚠ Caution:
 - Do not ensure an accurate test, please perform the zeroing beforehand.
 - Before the test starts, the Tester will automatically display the voltage between two input terminals if this voltage is > 30V, and TEST button will be inhibited.

IX. Measuring Insulation Resistance (See Figure 4)

1. Discharge totally the tested circuits and keep them completely separated from the power supply before test.
2. Insert red lead or specific TEST-marked test lead into red input terminal and black test lead to black terminal.
3. Connect red and black alligators or test probes to the circuit under test.
4. Turn the rotary switch to "Insulation" position and select proper test voltage, then press TEST button to start.



Figure 4

To measure insulation resistance:

1. Discharge totally the tested circuits and keep them completely separated from the power supply before test.
2. Insert red lead or specific TEST-marked test lead into red input terminal and black test lead to black terminal.
3. Connect red and black alligators or test probes to the circuit under test.
4. Turn the rotary switch to "Insulation" position and select proper test voltage, then press TEST button to start.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Buzzer and backlight	Test lock	Invalid	Invalid

1. Long press F1 for about 2 seconds to turn on/off the backlight; short press to turn on/off 20 M compare function. The buzzer will alarm if the measured resistance is <math>< 2M</math>.
2. Press to zero the test leads. First short-circuit two test leads, and then long press F3 to reset the display to 0.00. "ZERO" will show on LCD, indicating the operation completes.

- ⚠ Caution:
 - Do not ensure an accurate test, please perform the zeroing beforehand.
 - Before the test starts, the Tester will automatically display the voltage between two input terminals if this voltage is > 30V, and TEST button will be inhibited.
 - Do not measure with the battery cover opened.
 - Do not short-circuit two test leads under high-voltage output status or measure insulation resistance after the high-voltage has already been output.

X. Measuring Voltage/Frequency (See Figure 5)

1. Discharge totally the tested circuits and keep them completely separated from the power supply before test.
2. Insert red lead or specific TEST-marked test lead into red input terminal and black test lead to black alligators or test probes to the circuit under test.
3. Connect red and black alligators or test probes to the circuit under test.
4. Turn the rotary switch to "Voltage" position, then press TEST button to begin. Refer to Figure 5 for details.

Figure 5

To measure voltage/frequency:

1. Set the rotary switch to Volts
2. Connect as shown in Figure 5:

2) Insert red test lead into "Red" input terminal and black test lead into "Black" terminal.
 3) Connect red & black alligator clips or probes firmly to tested circuits. The Tester will automatically identify AC/DC voltage and show measured voltage and frequency readings on the LCD.
 Or connect as shown in Figure 7:
 1) Insert three connectors of specified one-plug test leads to three input terminals of the Tester (red to red, green to green, black to black).
 2) Press TEST button to start. When tested circuits, the Tester will automatically identify AC/DC voltage and show measured voltage and frequency readings on the LCD.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	Invalid	Invalid	Invalid

F1: Long press F1 for 2 seconds to turn on/off the backlight.
 F2, F3, F4: all are invalid.

Caution

- Please make sure domestic 220V in the power socket is normally supplied. If the socket is unable to be powered normally or de-energized, L-PE and L-N icons on lower left part of LCD will flash simultaneously.
- Ensure the socket is properly grounded. If the socket has backgrounding or isn't grounded, L-PE and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure the neutral terminal of the socket is firmly connected if the neutral terminal is badly or not connected, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure live and neutral terminals of the power socket are not reversely connected when measuring loop impedance/prospective fault current, otherwise L-PE, L-N and high-voltage status.

XI. Detecting Phase Sequence(See Figure 6)

To measure Loop Impedance/Prospective Short Current:
 (1) Turn the rotary switch to "NO-RSP" position.
 (2) Insert three connectors of one-plug test leads to three separate test leads into three input terminals of the Tester (red to red, green to green, black to black). (Refer to Figure 6 for details). After that, the Tester will indicate the phase sequence and open phase result on LCD.
 (3) Press TEST button to start.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	Invalid	Invalid	Invalid

F1: Long press F1 for 2 seconds to turn on/off the backlight.
 F2, F3, F4: all are invalid.

Caution

- Do not input voltage higher than 440V or 440Vrms. It may be possible to display the voltage value, but it may pose hazard to the Tester.
- To avoid electric shock, please take extreme caution when working with high voltage.
- Remove the test leads away from tested circuits and disconnect them from the input terminals of the Tester after completing the measurements.
- Do not measure with the battery cover opened.

XII. Measuring Line Impedance/Prospective Short Current (See Figure 7, 8)

To measure Line Impedance/Prospective Short Current:
 (1) Turn the rotary switch to "NO-RSP" position.
 (2) Insert three connectors of one-plug test leads, or three separate test leads, into three input terminals of the Tester (red to red, green to green, black to black). (Refer to Figure 6, 7, 8).
 (3) Plug the plug into domestic 220V socket or connect the test probes to the tested lines.
 (4) Press TEST button to start.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	Invalid	Invalid	Invalid

F1: Long press F1 for 2 seconds to turn on/off the backlight; short press to switch between L-N and L-PE measurements.
 F2, F3, F4: all are invalid.

Caution

- Please make sure domestic 220V in the power socket is normally supplied. If the socket is unable to be powered normally or de-energized, L-PE and L-N icons on lower left part of LCD will flash simultaneously.
- Ensure the socket is properly grounded. If the socket has bad grounding or isn't grounded, L-PE and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure the neutral terminal of the socket is firmly connected if the neutral terminal is badly or not connected, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure live and neutral terminals of the power socket are not reversely connected when measuring line impedance/prospective short current, otherwise L-PE, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Please take extreme caution when making the measurement, for it is performed under high-voltage status.

XIV. Taking Auto RCD Tests (See Figure 7)

To Test RCD Automatically:
 (1) Turn the rotary switch to "TO" position.
 (2) Insert three connectors of one-plug test leads into three input terminals of the Tester (red to red, green to green, black to black). (Refer to Figure 7).
 (3) Plug the plug into domestic 220V socket.
 (4) Press TEST button to start.

Tip:

Auto RCD Test is designed to measure trip times in one time just by pressing one button down. The Tester will complete all RCD measurements before proceeding into next test. All these data will be saved in the Tester; pressing F3 can review all the data, RCD measurements are taken in following order:
 G8309: 1, 1Z1, 1, n/0°
 2, 1Z1, 1, n/180°
 4, 11, 1, n/180°
 5, 21, 1, n/0°
 6, 21, 1, n/0°
 7, 51, 1, n/0°
 8, 51, 1, n/180°

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	AC/DC/Time	RCL	L-N

F1: Long press for 2 seconds to turn on/off the backlight.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to toggle between RCD types and Timer mode.
 F4: Press to select RCD rated leakage test current, refer to rated options in following order, from 30s to 0s before enabling RCD test.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	AC/DC/Time	Not used	L-N

F1: Long press for 2 seconds to turn on/off the backlight; short press to toggle between RCD types and Timer mode.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to select RCD rated leakage test current, refer to rated options in following order, from 30s to 0s before enabling RCD test.

Caution

- Please make sure domestic 220V in the power socket is normally supplied. If the socket is unable to be powered normally or de-energized, L-PE and L-N icons on lower left part of LCD will flash simultaneously.
- Ensure the socket is properly grounded. If the socket has backgrounding or isn't grounded, L-PE and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure the neutral terminal of the socket is firmly connected if the neutral terminal is badly or not connected, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure live and neutral terminals of the power socket are not reversely connected when testing RCD, otherwise L-PE, L-N and N-PE icons on the lower left part of LCD will flash simultaneously.
- Please take extreme caution when taking regular RCD tests, for it is performed under high-voltage status.

XVI. Measuring RCD Trip Current (See Figure 7)

To measure trip current:
 (1) Turn the rotary switch to "▲ Ramp position.
 (2) Insert three connectors of one-plug test leads into three input terminals of the Tester (red to red, green to green, black to black). (Refer to Figure 7).
 (3) Plug the plug into domestic 220V socket.
 (4) Press TEST button to start.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	AC/DC/Time	Not used	L-N

F1: Long press for 2 seconds to turn on/off the backlight; short press to toggle between RCD types and Timer mode.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to select RCD rated leakage test current, refer to rated options in following order, from 30s to 0s before enabling RCD test.

Tip:

The leakage current will be different depending on the selected waveform. Refer to the following table for detailed relationship.

Full wave	10mA	30mA	100mA	300mA	500mA
Half wave					

Caution

- Please make sure domestic 220V in the power socket is normally supplied. If the socket is unable to be powered normally or de-energized, L-PE and L-N icons on lower left part of LCD will flash simultaneously.
- Ensure the socket is properly grounded. If the socket has backgrounding or isn't grounded, L-PE and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure the neutral terminal of the socket is firmly connected if the neutral terminal is badly or not connected, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure live and neutral terminals of the power socket are not reversely connected when testing RCD trip current, otherwise L-PE, L-N and N-PE icons on the lower left part of LCD will flash simultaneously.
- Please take extreme caution when testing RCD trip current, for it is performed under high-voltage status.

XVII. Replacing the Battery

- To avoid electric shock, remove away all test leads from the Tester before replacing the battery.
- Do not measure with the battery cover opened.
- Do not mix old and new batteries for use.
- When low battery indicator shows on LCD, please replace the battery timely.

To replace the battery, follow steps as below:

- Open the battery cover (test the rotary switch to OFF) and remove away the test leads.
- Remove the old batteries from the battery cover, remove the battery cover and replace the batteries with new batteries.
- Screw up the battery and lighten up the screws.

XVIII. Maintenance & Repair

Cleaning the Casing:

- Clean up the Tester with soft cloth or sponge dampened with little water.
- Do not immerse the Tester into water.
- Do not submerge it into the water.
- Dry the Tester before storing it if it is wet.

Repair:

- When it becomes necessary to calibrate or repair the Tester, please have it serviced by qualified professional personnel or designated service center.

The manual information is subject to changes without prior notice.

END

F3: Press to recall all saved data from the whole test.
 F4: Press to select RCD test current.

Caution

- Please make sure domestic 220V in the power socket is normally supplied. If the socket is unable to be powered normally or de-energized, L-PE and L-N icons on lower left part of LCD will flash simultaneously.
- Ensure the socket is properly grounded. If the socket has backgrounding or isn't grounded, L-PE and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure the neutral terminal of the socket is firmly connected if the neutral terminal is badly or not connected, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure live and neutral terminals of the power socket are not reversely connected when testing RCD, otherwise L-PE, L-N and N-PE icons on the lower left part of LCD will flash simultaneously.
- Please take extreme caution when taking auto RCD tests, for it is performed under high-voltage status.

XV. Taking Regular RCD Tests (See Figure 7)

To take regular RCD test:
 (1) Turn the rotary switch to 1Z1, 1, n, 11, 1, n, 21, 1, n or 51, 1, n position;
 (2) Insert three connectors of one-plug test leads into three input terminals of the Tester (red to red, green to green, black to black). (Refer to Figure 7).
 (3) Plug the plug into domestic 220V socket.
 (4) Press TEST button to start.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	AC/DC/Time	Not used	L-N

F1: Long press for 2 seconds to turn on/off the backlight; short press to toggle between RCD types and Timer mode.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to select RCD rated leakage test current, refer to rated options in following order, from 30s to 0s before enabling RCD test.
 F4: Press to select RCD rated test current, refer to rated options in following order:
 10mA → 30mA → 100mA → 300mA → 500mA

Tip:

The leakage current will be different depending on the selected current multiplier. Refer to the following table for detailed relationship.

1Z1, 1, n	10mA	30mA	100mA	300mA	500mA
11, 1, n					
21, 1, n					
51, 1, n					

Caution

- Please make sure domestic 220V in the power socket is normally supplied. If the socket is unable to be powered normally or de-energized, L-PE and L-N icons on lower left part of LCD will flash simultaneously.
- Ensure the socket is properly grounded. If the socket has backgrounding or isn't grounded, L-PE and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure the neutral terminal of the socket is firmly connected if the neutral terminal is badly or not connected, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure live and neutral terminals of the power socket are not reversely connected when testing RCD, otherwise L-PE, L-N and N-PE icons on the lower left part of LCD will flash simultaneously.
- Please take extreme caution when taking regular RCD tests, for it is performed under high-voltage status.

XVI. Measuring RCD Trip Current (See Figure 7)

To measure trip current:
 (1) Turn the rotary switch to "▲ Ramp position.
 (2) Insert three connectors of one-plug test leads into three input terminals of the Tester (red to red, green to green, black to black). (Refer to Figure 7).
 (3) Plug the plug into domestic 220V socket.
 (4) Press TEST button to start.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	AC/DC/Time	Not used	L-N

F1: Long press for 2 seconds to turn on/off the backlight; short press to toggle between RCD types and Timer mode.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to select RCD rated leakage test current, refer to rated options in following order, from 30s to 0s before enabling RCD test.
 F4: Press to select RCD rated test current, refer to rated options in following order:
 10mA → 30mA → 100mA → 300mA → 500mA

Caution

- Please make sure domestic 220V in the power socket is normally supplied. If the socket is unable to be powered normally or de-energized, L-PE and L-N icons on lower left part of LCD will flash simultaneously.
- Ensure the socket is properly grounded. If the socket has backgrounding or isn't grounded, L-PE and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure the neutral terminal of the socket is firmly connected if the neutral terminal is badly or not connected, L-N and N-PE icons on lower left part of LCD will flash simultaneously.
- Ensure live and neutral terminals of the power socket are not reversely connected when testing RCD, otherwise L-PE, L-N and N-PE icons on the lower left part of LCD will flash simultaneously.
- Please take extreme caution when taking regular RCD tests, for it is performed under high-voltage status.

XVII. Replacing the Battery

- To avoid electric shock, remove away all test leads from the Tester before replacing the battery.
- Do not measure with the battery cover opened.
- Do not mix old and new batteries for use.
- When low battery indicator shows on LCD, please replace the battery timely.

To replace the battery, follow steps as below:

- Open the battery cover (test the rotary switch to OFF) and remove away the test leads.
- Remove the old batteries from the battery cover, remove the battery cover and replace the batteries with new batteries.
- Screw up the battery and lighten up the screws.

XVIII. Maintenance & Repair

Cleaning the Casing:

- Clean up the Tester with soft cloth or sponge dampened with little water.
- Do not immerse the Tester into water.
- Do not submerge it into the water.
- Dry the Tester before storing it if it is wet.

Repair:

- When it becomes necessary to calibrate or repair the Tester, please have it serviced by qualified professional personnel or designated service center.

The manual information is subject to changes without prior notice.

END

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 Manufactured by an ISO certified Company

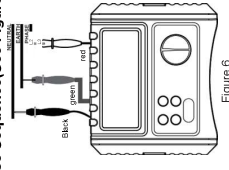


Figure 6

To Detect Phase Sequence:

- Turn the rotary switch to Phase Rotation position.
- Insert three connectors of three test leads into input terminals of the Tester (red to red, green to green, black to black).
- Then connect three test leads into three-phase AC system (black to L1, green to L2, red to L3, refer to Figure 6 for details). After that, the Tester will indicate the phase sequence and open phase result on LCD.

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	Invalid	Invalid	Invalid

F1: Long press for 2 seconds to turn on/off the backlight.
 F2, F3, F4: all are invalid; TEST button is invalid too.

Caution

- Do not input voltage higher than 440V or 440Vrms. It may be possible to display the voltage value, but it may pose hazard to the Tester.
- To avoid electric shock, please take extreme caution when working with high voltage.
- Remove the test leads away from tested circuits and disconnect them from the input terminals of the Tester after completing the measurements.
- Do not measure with the battery cover opened.

XI. Measuring Loop Impedance/Prospective Fault Current (See Figure 7, 8)

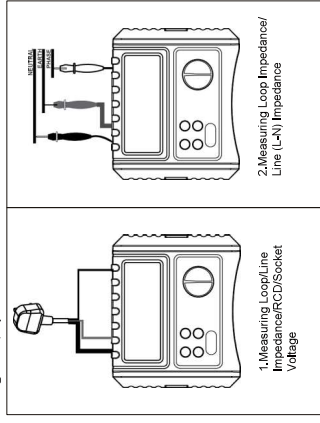


Figure 7

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	Invalid	Invalid	Invalid

F1: Long press for 2 seconds to turn on/off the backlight.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to toggle between RCD types and Timer mode.
 F4: Press to select RCD/Socket Voltage

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	AC/DC/Time	RCL	L-N

F1: Long press for 2 seconds to turn on/off the backlight.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to toggle between RCD types and Timer mode.
 F4: Press to select RCD/Socket Voltage

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	Invalid	Invalid	Invalid

F1: Long press for 2 seconds to turn on/off the backlight.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to toggle between RCD types and Timer mode.
 F4: Press to select RCD/Socket Voltage

Understanding F1-F4 Buttons:

F1	F2	F3	F4
Backlight	AC/DC/Time	Not used	L-N

F1: Long press for 2 seconds to turn on/off the backlight; short press to toggle between RCD types and Timer mode.
 F2: Press to toggle between RCD types and Timer mode.
 F3: Press to select RCD rated leakage test current, refer to rated options in following order, from 30s to 0s before enabling RCD test.
 F4: Press to select RCD rated leakage test current, refer to rated options in following order, from 30s to 0s before enabling RCD test.

Figure 8