GAZELLE®

G9306

Operating Manual



Digital RCD (ELCB) Tester

1. Safety Instructions

This operation manual includes the user guidance and safety instru -ction when using the tester, please read it before using.

⚠ *Caution*

- *Before using the tester, please read and understand the operating manual.*
- *Keep the operating manual properly, and let it easy to get it for reference during the process of testing.*
- *When using the tester, user must follow the testing procedure as mentioned in the operating manual.*
- *Carefully read the operating manual regarding the safety information.*
- *Strictly follow all the related safety instructions, otherwise it may cause accidents or damage the tester.*

Safety sign " ⚠ " has three meaning in this manual, user has to pay the attention to this sign " ⚠ " for operation.

⚠ *Danger-----identifies conditions and actions that most likely pose severe or fatal hazard(s)*

⚠ *Warning---identifies conditions and actions that may pose severe or fatal hazard(s)*

⚠ *Caution---identifies conditions and actions that may cause minor injury or damage to the Tester.*

⚠ *Danger*

- *This test instrument is suitable for using under single phase 230V+10%-15%.(Operational Voltage Scope: 195 – 253 V)*
- *To avoid possible electric shock or personal inquiry, do not use the test t instrument or test leads if they appear damaged or metal part is exposed, or if test instrument is not operating properly. If in doubt, please have the instrument serviced.*

- *Do not use your finger to touch on any testing cable during the testing ..*
- *Remove the test leads away from the power after the testing completes. Do not keep the test leads connected to the power for a long time after the testing*

⚠ *Warning*

- *Do not open or disassemble the tester randomly during the measurement, for the high voltage present into the unit may endanger the user. If it needs service repairing, please contact our after-sales services or our agents.*
- *If the test instrument appear abnormal (for example, no completed display, incorrect calculation, housing damage, noise issue during the measurement etc….). please contact our after-sales services or our agents.*
- *Do not use the tester if your hands are in wet.*

⚠ *Caution*

- *Ensure the test lead probe (use only the specified test leads) insert into the corresponding port in order to provide a safe before measurement. It is recommended not to use third arties test plead probe on our tester.*
- *Do not expose the tester in extreme temperature and wet environment.*
- *Soft cloth and mild detergent should be used to clean the surface of he tester. No abrasive and solvent should be used when servicing.*
- *Dry the tester before storing if it is wet.*

Warnings:

1. If a possible voltage between the protective conductor and earth will influence the measurements.
2. It needs to test the connection between the neutral point of the distribution system and earth before the test is started. A possible voltage between the N-conductor and the earth may influence the measurements.
3. The leakage currents in the circuit following the residual current protection device may influence the measurements.
4. When the fault voltage is over 50V, "Uf Hi" will be displayed and the test will stop. The voltage relates to the residual operating current of the protective device.
5. The earth electrode resistance of the measuring circuit probe cannot surpass 5Ω.
6. The potential fields of other earthing installations may influence the measurement.
7. Special conditions in residual current protective devices of a particular shall be taken into consideration.
8. Equipment is connected downstream of a residual current protective device may cause a considerable extension of the operating time.

This Tester has the follow signs,please pay attention to the content when using

⚠	danger, warning, caution
⧈	double or reinforced insulation
⏚	Grounding
CE	CE conforms to Standards of European Union

Working principle:

The measuring equipment is applied to testing of the effectiveness of protective measures by regular disconnections of Residual Current protective Device (RCD) in TT, TN and TI systems. It calibrates based on closed-loop control system, the output current as a feedback. When the actual output current is different from the rated current, the device will adjust accordingly. AC current between live and ground line can be outputted accurately. And its trip time quickly captured by a MCU.

2. Features

- **Suitable for Use** on 230V/50Hz single-phase line (operating voltage: 195~253V);
- **Adopts Micro-Processor Chip** to maintain high accuracy, reliability and stability;
- **Wiring Check:** three –LED indication
  When P-E and P-N green LED are on and red LED is off, the wiring is correct; otherwise it indicates wrong wiring(reverse P and N or bad grounding);
- **Phase Angle Selection:** The tests can be performed at positive 0 or negative 180 phase angle.
- **Over-Load Indication:** "OL mS" shows when trip time exceeds Max. test time
- **Auto Data Hold:** The test results will be maintained for a while after the tests finishes.
- When the upper limit is surpassed in trip time measurement, "> The Max test time" displays, and when in trip current measurement, "> The Max test current" displays in AUTO RAMP stall.
- **Auto Ramp Test:** Test trip current and trip time simultaneously;
- **Power-Off Warning Indication:** The buzzer alarms after operating for 3minutes;
- **Power Save and Environment-Friendly:** Powered directly by tested circuit (Power 230V/50Hz) , no need to use battery;
- **Fused Protection**
- **Double or Reinforced Insulation for safe design.**
- **When the fault voltage is up to 50V, LCD will display "Uf Hi" and the test stops.**

3. Technical Specifications

3.1 Measuring Range & Accuracy. (Temperature: 23±5℃; Humidity: 45%~75% RH; Altitude ≤2000m)

Functions	Voltage(AC)	Trip Current(I△n)	Trip Time (MAX)	Accuracy	
				Trip Current	Trip Time
X 1/2	230V (Tolerance: -15%~+10%) Frequency: 50Hz	10 / 20 / 30 /100 / 300 / 500mA	2000mS	Tolerance: -10%~0%	±(2%+2)
X 1		10 / 20 / 30 /100 / 300 mA	1000mS	Tolerance: 0%~+ 10%	
		500mA	300mS		
X 5		10 / 20 / 30mA	40mS		
AUTO RAMP TEST		10 / 20 / 30 /100 / 300 / 500mA	(RAMP increase to 10%) I△n from 20%~110% 300*10 mS	Tolerance: -10%~+10%	

Factors that might affect the measurement results:

No.	Designation code	Variable descriptions	Note
1	A	Intrinsic uncertainty	
2	E1	Reference position ±90°	
3	E2	Voltage supply at the limits stated by the manufacturer	
4	E3	0℃ and 35℃ temperature	
5	E5	Resistance of the probes within the limits stated by the manufacturer	
6	E8	85% to 110% of the nominal system volta	

3.2 Measuring Range (Functions)

×1/2----------Non-trip test, check RCD sensitivity
×1----------Measure trip time
×5----------Measure fast trip time at I△n×5 trip current
AUTO RAMP Test---- Measure trip current

3.3 Application Standard:
IEC 61010-1 CAT III 300V,IEC 61326-1 IEC 61326-2-2 .
IEC 61557-1,6
IEC 61010-2-030
Enclosure protection class IP40

3.4 Operational Voltage: 230VAC/50Hz (Voltage Range: 195 – 253 V)

3.5 Working Environment: Temperature: 0℃ ~40℃
Relative Humidity: ≤80%RH
Altitude: ≤2000 meter Pollution Degree : 2

3.6 Storage Condition:
Temperature: -20℃ ~60℃
Relative Humidity: ≤75%RH

3.7 Product Size: 160mmx70.5mmx100mm

3.8 Product Net Weight: About 500g

3.9 Standard Accessories:

Test Leads(1.5 meter)	1 pc
English Mnaual	1 pc
Carrying Case	1 set

4. Tester Description (See Figure 1, 2, 3)

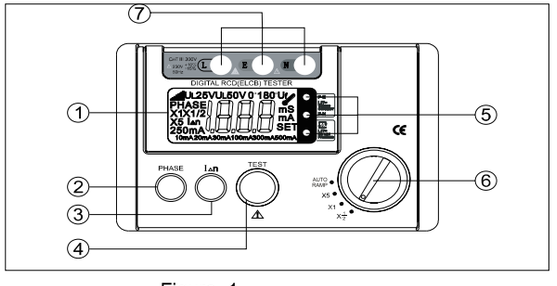


Figure 1

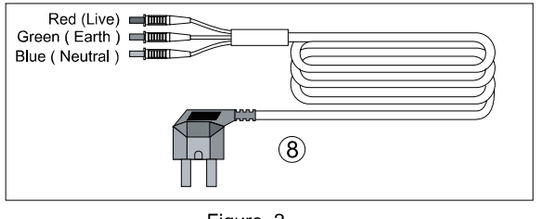


Figure 2

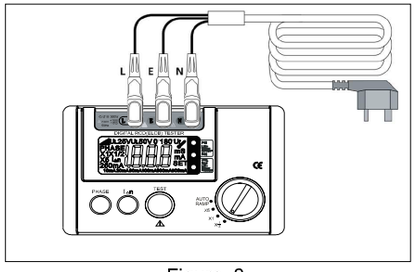


Figure 3

① LCD Display
② PHASE Button
③ I△n Button
④ TEST Button
⑤ Wiring LED Indicators
⑥ Rotary Switch
⑦ Test Terminals
⑧ Test Leads

5. Making Measurements

(1) Test Lead Connections

Insert three connectors of test leads respectively into three termi -nals of the Tester: Red to L, Green to E, Blue to N, and then connect another end of test leads to tested circuit (power socket 230V/50Hz).

(2) Wiring Check

Check the wiring status by identifying three LEDs. If P-E and P-N green LEDs are on and red LED is off, it indicates the wiring is correct, otherwise wiring is wrong due to reverse connection between L and N terminals or bad grounding. Please unplug the test leads, check and correct the relative circuits until right wiring indication is obtained.

⚠ **Caution:** Reverse connection between L and N terminals during wiring check may cause RCD to trip, so please check and correct the circuits until the wiring indication is obtained and before you proceed into next operation.

⚠ *Danger*
Do not proceed into next operation (press TEST button) if the wiring is incorrect, otherwise it may cause error to the result or other hazards.

(3) Press I△n button to adjust the trip current(I△n) the same as the rated trip current marked on RCD. The set trip current will show on lower part of LCD.
Default value: I△n---------- 30mA
0°/180°---------- 0°

(4) Taking RCD Tests

4.1 Set the rotary switch to test parameters

- Non-Tripping ----------×1/2: Max. trip time up to 2000ms;
- Tripping ----------×1: Max. trip time up to 1000ms (Except 500mA);
- Tripping ----------×1(500mA): Max. trip time up to 300ms ;
- Fast Tripping---------- ×5(only 10, 20, 30mA): Max. trip time up to 40ms;
- AUTO RAMP Test: 20%~110% of rated trip current (I△n), Max. trip time up to 300ms.

4.2 Press TEST button

- Non-Tripping Test -------The RCD should not trip.
- Tripping ----------The RCD should trip.
- ×5 Fast Tripping: ---------- The RCD should trip.
- AUTO Ramp Test: ---------- The RCD should trip, and trip time and trip current are displayed simultaneously.

4.3 Press PHASE (0°/180°) button to set the phase angle and repeat 4.2 to determine the fastest trip time.

4.4 Press to change the phase angle and repeat 4.2

4.5 When the tests finish, disconnect the test lead from the tested circuit immediately.

⚠ *Danger*

- *Do not touch any exposed metal or conductor during these test operations.*
- *Relative components in the Tester may get hot during the operation, if the Tester continues to work for a long time, it may cause damage to the unit or other hazards. Therefore the Tester is recommended not to use for a long-time and continuous tests on production lines in RCD factories .It is only suitable for sampling precision tests.*
- *The time interval between each test with trip current 300mA /500mA(large current trip test) should be ensured up to 5 minutes.*

6. Maintenance & Repair

6.1 Cleaning the Casing:

Clean the surface of the Tester with dry soft cloth; No alcoholic and solvent is allowed, for it may cause corrosive damage to the LCD; Protect the Tester from any moisture.

6.2 Repair

Please contact our after-sale service center or agents if following issues happen:

A. The Tester casing is broken or the components are damaged;
B. LCD display works abnormally;
C. Unexpected data occur under normal use;
D. The buttons don't function normally;
E. Noise happen during tests.

6.3 Warning:

If insulation on probe is damaged, replace it. If the test leads need to be replaced, you must use a new one which should meet EN 61010-031 standard, rated CAT III 300V, 500mA or better.

** END **

This operating manual is subject to change without notice.