Megger

LT300 High current loop tester

User guide

⚠ SAFETY WARNINGS

- **Safety Warnings and Precautions** must be read and understood before the instrument is used. They **must** be observed during use.
- The earth loop impedance test creates a temporary low resistance path between live and earth for the duration of the test. This is particularly hazardous with both an instrument and an installation fault.

  Working practices and hazard avoidance must take care of this risk
- Continuity of protective conductors and earthed equipotential bonding of new or modified installations **must** be verified **before** carrying out an earth fault loop impedance tests.
- Circuit connections and exposed metalwork of an installation or equipment under test **must** not be touched in case of the presence of hazardous touch voltages
- Do not leave the instrument connected to the mains supply when **not** in use.
- Ensure that hands remain behind guards of probes/clips when testing.
- The instrument should not be used if any part of it is damaged.
- Test leads, probes and crocodile clips **must** be in good order, clean and with no broken or cracked insulation.
- The battery cover **must** be in place whilst conducting tests.
- Some national safety authorities recommend fused leads for voltage measurement on high energy systems. If RCD or Loop tests are made it may cause the fuse to rupture, and so they must be used with caution on voltage testing.

NOTE
THE INSTRUMENT MUST ONLY BE USED BY SUITABLY TRAINED AND COMPETENT PERSONS.

Users of this equipment and/or their employers are reminded that Health and Safety Legislation requires them to carry out valid risk assessments of all electrical work so as to identify potential sources of electrical danger and risk of electrical injury such as inadvertent short circuits

Symbols used on the instrument:

⚠ Caution: risk of electric shock

⚠ Caution: refer to accompanying notes

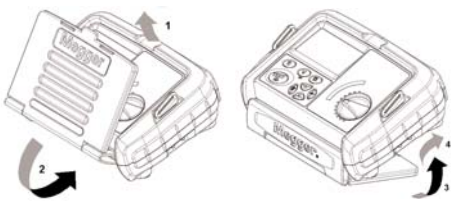
⧈ Equipment protected throughout by Double Insulation (Class II)

CE Equipment complies with relevant EU Directives

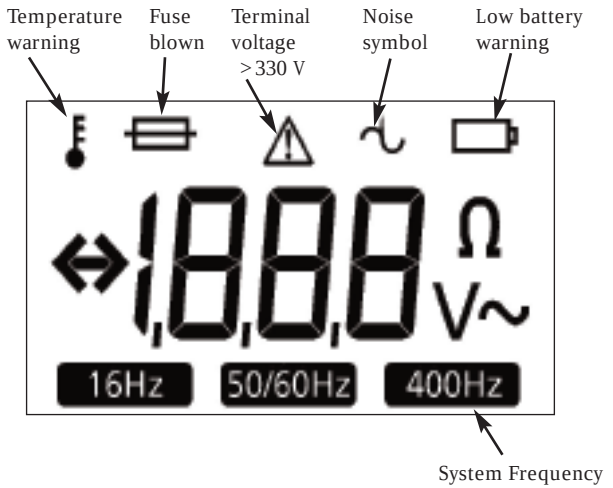
N1337
✔ Equipment complies with 'C tick' requirements

Lid open/closure

1. Open lid by lifting up front panel tab (1).
2. Fold-away underneath instrument (2 & 3) and click into retaining slot (4).



Digital Display Layout



Operation

Important:

Operational voltage range of the LT300 is:

50 V to 550 V.

Operational frequencies of the LT300 are:

16 Hz, 33 Hz, 50 Hz/60 Hz, 125 Hz and 400 Hz (400 V @ 16 Hz).

Auto-Power down:

The instrument will switch off automatically after 4 minutes of no use. To switch on again press the TEST button or change range.

Test lead check:

Only use the specified test leads. The test leads supplied have an internal resistance of 0.06 Ω. The LT300 allows for this so accurate measurements are obtained at the probe tips.

Before each use of the instrument, inspect the test leads, prods and crocodile clips to confirm that their condition is good, with no damaged or broken insulation.

On test leads fitted with an outlet plug and flying leads, never connect test probes, clips, pins or other objects to the 3 lead plugs because of the danger of electrocution. These leads should only be used by a competent person.

Supply Category rating:

The LT300 is designed for use on 300 V CAT IV Phase to Earth and

550 V Phase to Phase applications (400 V @ 16 Hz).

Loop Testing

Select either the 20 Ω or 200 Ω measurement range depending on:

1. The required measurement resolution 0.01 Ω (20 Ω range) or 0.1 Ω (200 Ω range).
2. The anticipated loop resistance.
3. The required test current taken from the Voltage/Resistance table below.

Test current varies with supply voltage:

20 Ω range:	**200 Ω range:**
@ 550 V supply = 27 A	@ 550 V supply = 2.7 A
@ 230 V supply = 12 A	@ 230 V supply = 1.2 A
@ 115 V supply = 6.0 A	@ 115 V supply = 0.6 A
@ 50 V supply = 3 A	@ 50 V supply = 0.3 A

Phase-Earth loop measurement

This test is designed for non-RCD protected circuits.

The loop tester will operate over a supply voltage of: 50 V to 550 V (400 V @ 16 Hz).

1. Set the instrument to the 20 Ω range for 0.01 Ω resolution or the 200 Ω range for 0.1 Ω resolution. Display will show 000 V~
2. Connect the RED (PHASE) lead to the RED socket on the instrument and the GREEN (EARTH) lead to the GREEN/BLUE socket (alternatively use the Mains plug test lead Red and Green connections).
3. Connect the RED lead to Phase and the GREEN lead to Earth (or connect the mains plug to the wall socket).
4. The supply voltage is displayed and the appropriate system frequency indicator displayed.
5. Within 5 seconds the loop test starts automatically and the measured loop value is displayed.

The test can be repeated by pressing the [TEST] button.

Bonded Metalwork Testing

Repeat the above test but with the Green lead connected to the exposed metalwork.

Phase-Neutral loop measurement

1. Connect the RED (PHASE) lead to the RED socket on the

instrument and the GREEN (EARTH) lead to the GREEN/BLUE socket (alternatively use the mains plug test lead RED and BLUE connections).

2. Connect the RED lead to Phase and the GREEN lead to Neutral (or connect the mains plug to the wall socket).
3. The supply voltage is displayed and the appropriate system frequency indicator displayed.
4. Within 5 seconds the loop test starts automatically and the measured loop value is displayed.

The test can be repeated by pressing the [TEST] button.

Phase-Phase loop impedance

1. Connect the RED (PHASE) lead to the RED socket on the instrument and the GREEN (EARTH) lead to the GREEN/BLUE socket.
2. Connect the RED lead to Phase1 and the GREEN lead to Phase 2.
3. The supply voltage is displayed and the appropriate system frequency indicator displayed.
4. The results are displayed as per Phase - Neutral testing above.

Warning indicators

Over range

If the measured loop impedance exceeds the full scale value, the display will show "> 1." . This is displayed if:

1. Measurement > 19.99 Ω on the 20 Ω range or > 199.9 Ω on the 200 Ω range. OR
2. A dangerous voltage has been detected on the protective earthing conductors or bonded metalwork during test. This is normally due to poor or faulty earthing system.

Over-voltage

The warning triangle will FLASH if the input voltage exceeds 330 V. This is advisory.

If the voltage exceeds 550 V the warning triangle will be permanently displayed. Remove source of over-voltage immediately.

Overheating

The thermometer symbol will flash if the instrument is getting hot. Overheating is shown by a permanently displayed symbol.

Testing is inhibited when the temperature symbol indicator is on.

Voltage Measurement

The voltmeter is designed for AC applications only, up to 550 V (400 V @ 16 Hz)

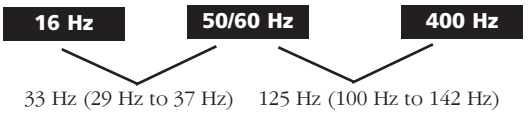
Frequency indicators

The frequency indicator shows the system frequency the circuit is using. It is intended as a guide only. For accurate frequency measurement a suitable test instrument should be used.

Nominal frequency bands are:

16 Hz	50/60 Hz	400 Hz
15 Hz to 18 Hz	40 Hz to 70 Hz	260 Hz to 490 Hz

Additional frequency Bands:



The appropriate indicator is displayed for the supply system frequency. Testing is only possible when one of the indicators is displayed.

Battery replacement

Low battery voltage is indicated by the  symbol in the display. When displayed, loop testing is still possible however the voltmeter accuracy may be affected.

To replace batteries switch off instrument and disconnect test leads from the circuit under test.

Remove the battery cover and replace the batteries. Use 8 x 1.5 V AA (LR6) Alkaline dry cells or NiMH rechargeable cells. Do not mix old and new batteries.

Warning: OBSERVE CORRECT POLARITY. Incorrect battery polarity could cause batteries to leak and damage the instrument.

Fuse replacement

A blown fuse is indicated by the  symbol in the display.
To replace the fuse remove battery cover and replace fuse with type:

7 A (F) HBC 50 kA 600 V.

Cleaning: Disconnect the instrument and wipe with a clean cloth dampened with soapy water or Isopropyl Alcohol (IPA).

SPECIFICATION

Only values with tolerances or limits are guaranteed data. Values without tolerances are for information only.

Service error is less than ±30% from 0.4 Ω to 200 Ω

Voltage measurement

Range: 0 V to 550 V (400 V @ 16 Hz)
Accuracy: ±5% ±2 V
Range: 16 Hz to 400 Hz

Loop Impedance measurement Phase to Earth

Supply: 50 V to 300 V (400 V @ 16 Hz)

Loop impedance measurement Phase to Phase

Supply: 50 V to 550 V (400 V @ 16 Hz)

When testing close to the source transformer, a system phase angle of 18° will cause an additional error of -5%. A system phase angle of 30° will cause an error of -16%.

Nominal test currents :

20 Ω range	**200 Ω range**
@ 550 V supply = 27 A	@ 550 V supply = 2.7 A
@ 230 V supply = 12 A	@ 230 V supply = 1.2 A
@ 115 V supply = 6.0 A	@ 115 V supply = 0.6 A
@ 50 V supply = 3 A	@ 50 V supply = 0.3 A

Loop accuracy 20 Ω range: 0 to 19.99 Ω ±5% ±0.03 Ω

Loop accuracy 200 Ω range: 0 to 199.9 Ω ±5% ±0.5 Ω

Frequency: 16 Hz, 33 Hz, 50/60 Hz, 125 Hz, 400 Hz

Loop ranges: in accordance with EN 61557-3

Environmental

Operating Range: -10°C to +60°C
Operating Humidity: 90% RH at +40°C max.
Storage Range: -25°C to +70°C
Environmental protection: IP54 weatherproof

Battery: 8 x 1,5 V cells IEC AA (LR6) alkaline or NiMH rechargeable
Battery Life: 60 hours

Fuse: 7A (F) 600 V, 32 x 6 mm HBC 50 kA minimum
Dimensions: 203 mm x 148 mm x 78 mm
Weight: 980 gms

Safety

Meets the requirements of EN61010-1, 300 V Cat IV phase to earth and 550 V Phase to Phase applications. Refer to safety warnings supplied.

E.M.C In accordance with IEC61326-1

Operational uncertainties: Refer to www.megger.com

Loop accuracy

Complies with the following parts of EN61557; Electrical safety in low voltage systems up to 1000 V a.c. and 1500 V d.c.- Equipment for testing, measuring or monitoring of protective measures:

Part1 - General Requirements Part3 - Loop resistance

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Megger products are distributed in 146 countries worldwide.

This instrument is manufactured in the United Kingdom.
The company reserves the right to change the specification or design without prior notice.

Part No. LT300_6172-969_UG_en_V03 1108
www.megger.com