LTW 300 series
2 Wire Loop impedance testers



- **2 Wire Non-tripping loop tester**
- **50 V to 440 V operation**
- **110 V centre-tap loop testing**
- **CATIV installation testing**
- **AUTO start - operation**
- **0.001 Ω resolution (LTW425)**

DESCRIPTION

The new Megger two wire earth loop testers verify the loop impedance of a live electrical circuit, ie without the need to disconnect the electrical supply. The new LTW300 series instruments offer a 2 wire loop testing solution that does not trip 30 mA RCDs and can be used on a wide range of voltages.

The new LTW300's offer a range of features to make earth loop testing safer and easier.
The range consists of:

- LTW315 - 2 Wire loop impedance measurement
- LTW325 - 2 wire + maxZ + (R1+R2)
- LTW335 - 2 wire + maxZ + (R1+R2) + Download
- LTW425 - 2 wire + maxZ + (R1+R2) + 0.001 Ω

2 Wire testing

A loop test is performed with only 2 test leads. This can be either:

- Phase to Earth
- Phase to Neutral
- Phase to Phase

Testing is simple, as there is no need for a 3rd wire to be connected, which can cause confusion when trying to identify which part of the circuit is being tested.

Test results are displayed to a resolution of 0.01 Ω.

Non-trip loop testing

The LTW300 series are guaranteed not to trip working RCDs of ≥30 mA, using the No-trip loop test.

3 Phase circuits with RCD protection can also be tested, as all test modes operate on single and three phase systems.

The loop test runs for approximately 10 seconds, with an additional 10 seconds if the instrument detects electrical noise on the supply that could otherwise cause errors on the test result.

High current loop testing

For supplies that do not have an RCD fitted the high current test should be used, as there is no risk of tripping and RCD.

Noise detection (only applies to No-trip tests)

The LTW uses sophisticated noise detection circuitry which continually monitors the supply whilst performing a loop test to ensure the accuracy of the result has not been compromised by the effects of electrical noise from plant and services.

Two operational modes are available:

a) 10 second test:
Always performs a 10s test and if noise is detected displays a warning at the end of the test

b) Auto test extension
Automatically extends a test up to a further 10 seconds if noise is detected, to improve the accuracy of the test.

AUTO START
An auto-start function will start the loop test running as soon as the test leads are connected. No need to press the test button means much safer testing.

Operating voltage
The instruments will operate on a wide range of electrical voltages (see table below) from 50 V a.c to 300 V a.c single phase supplies and up to 440 V a.c on 3 phase installations. These include centre tapped 110 V a.c circuits, with 55 V phase to earth.

LTW315 is limited between 100 V – 280 V.

High resolution test
The LTW425 offers a high current high resolution loop test to three decimal places. This is ideal for establishing the correct Ze on an incoming supply, especially on PME installations. Results of this test can also be used to calculate higher PFC results.

PFC Display
All instruments can calculate up to 20 KA.
The LTW425 can calculate up to 40 KA using the 0.001 Ω high current, resolution test range.The calculation uses the measured loop impedance and the measured line voltage to calculate the appropriate PFC.

Standards
All the Megger LTW300 series Loop testers meet or exceed the UK and International Wiring Regulations, including requirements of BS7671 and VDE 0413 parts 1 and 4, HD 384, IEC 364, NFC15-100, and NEN3140 and EN 61557.
In addition the range meets the requirements of BSEN 61010-1 for safe connection to Category IV supplies (300 V Phase to Earth).

All LTW300 series instruments are warranted for a period of 3 years.

Calibration Certificate
All LTW300 series instruments are supplied with a Megger calibration certificate, produced at the time of manufacture.

APPLICATIONS RADIAL CIRCUITS
Measurement of impedance of a 'live' electrical circuit cannot be made using a continuity tester. Thus an earth loop tester must be used.

Earth loop testers measure circuit loop IMPEDANCE.

Single and 3 Phase supplies with RCD protection
Radial circuits can now be tested as easily as a wall socket or distribution panel using the 2 wire tester, where it can be impractical, very difficult or even impossible to connect a 3 wire tester.

NON-RCD PROTECTED ELECTRICAL CIRCUITS
Any single or three phase supply not exceeding 300 V phase to earth or 440 V phase to phase can safely be tested.

RADIAL CIRCUITS
Radial circuits where the circuit does not return to the origin are as easy to test as ring circuits, using the 2 wire tester, even where only a phase and neutral contacts are available.

110 V INSTALLATIONS
110 V a.c systems including 110 V Centre tap to earth (55 V phase to earth) can be tested on the secondary winding, either at 110 V or 55 V on the centre tap to earth.

AUTOMOTIVE ELECTRICAL DISTRIBUTION SYSTEMS
Typically consisting of 230 V, 415 V and 110 V (centre taped) distributed supplies, driving an auxiliary generator off the engine. Automotive supplies can present particulary difficult with variable voltages depending on engine RPM and voltage specifications that may exceed standard utility voltages.

LTW SUMMARY CHART

	LTW315	LTW325	LTW335	LTW425
Loop testing				
2 wire non-tripping Loop testing	■	■	■	■
2 wire fast test (high current)	■	■	■	■
110 V to 280 V applications	■	■	■	■
50 V to 440 V applications		■	■	■
Phase to Phase testing		■	■	■
20 KA PFC range	■	■	■	■
40 KA PFC range				■
0.01 Ω resolution	■	■	■	■
0.001 Ω resolution				■
AUTO noise detection	■	■	■	■
AUTO Start loop test	■	■	■	■
Voltage measurement	■	■	■	■
Frequency measurement	■	■	■	■
Max Zs display		■	■	■
R1+R2 display		■	■	■

	LTW315	LTW325	LTW335	LTW425
Features				
Backlit display (White light)	■	■	■	■
Built-in front cover (Foldaway)	■	■	■	■
IP54 Weatherproof case	■	■	■	■
Accepts rechargeable batteries	■	■	■	■
Test result storage			■	
Downloading test results			■	
Test lead set with crocs	■	■	■	■
Mains socket test lead	■	■	■	■
Full Calibration Certificate	■	■	■	■
IEC61010-1 300V CATIV	■	■	■	■
EN61557	■	■	■	■

Specification

General Specification

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

Accuracy

All accuracy statements are based on:

Ambient temperature: 23° ± 2°C

Nominal source voltage: 230 V a.c ± 1%

Voltage measurement

(ac only) 50V to 440 V

Accuracy: ±2% ±1V

Frequency measurement

Range: 25Hz to 99.99Hz

Accuracy: ±0.1Hz

A warning will be shown if applied voltage exceeds 440 V.

Damage will occur if applied voltage exceeds 600 √ rms.

Loop testing

Accuracy

+/-5% +/-0.03 ohms @ 230 V a.c.

+/-10% +/-0.03 ohms @ 100 V a.c. and 300 V a.c. (LTW325 & LTW335)

+/-10% +/-0.03 ohms @ 100 V a.c. and 280V (LTW315)

+/-10% +/-0.02 ohms (LTW425)

+/-15% +/-0.03 ohms @ 50 V a.c. (LTW325 & LTW335)

+/-15% +/- 0.03 ohms @ 50 V a.c. (LTW425)

NO-TRIP Loop and High current Loop test

Source voltage:

LTW315 100V to 280V (50Hz)

LTW325,335 & 425 50V to 440V (50Hz)

Display range: 0.01 Ω to 2000 Ω

Accuracy: ±5% ±0.03 Ω

Nominal test current:

No-Trip loop test 15 mA (at nominal 230 V a.c supply)

High current loop test 4 A (at nominal 230 V a.c supply)

EN61557

Operational range: 0.30 Ω to 1000 Ω

High resolution loop test (LTW425 only)

Source voltage: 50 V to 440 V (50Hz)

Display range: 0.001 Ω to 2000 Ω

Accuracy: ±5% ±0.01 Ω

Nominal test current: 4 A at nominal 230 V supply

EN61557

Operational range: 0.30 Ω to 1000 Ω

Prospective Fault Current (PFC)

Prospective fault current = Measured Source Voltage / Loop r esistance

Maximum range: 40 kA

Accuracy is derived from loop test and voltage measurement.

Environmental

Temperature and humidity

Operating Range: -10°C to +50°C

Operating Humidity: 90% R.H. non-condensing at +40°C max.

Storage Range: -25°C to +70°C

Maximum altitude: 2000m to full safety specification

Dust and water ingress: IP54

Safety

EN61010

Designed to EN61010-1 ed2 2001-02

Designed for 300 volts to Earth Category IV, with Phase to Phase voltages to 440 Volts.

Fuse protected to 600 volts rms ac.

EN61557

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

Part1-General Requirements

Part3-Loop resistance

E.M.C

In accordance with IEC61326 including amendment No.1

Power supply

Battery: 8 x 1,5 V cells IEC LR6 type (AA alkaline).

Rechargeable: 8 x 1.2VNiCd or NiMH cells

Battery life: 2000 consecutive tests

Mechanical

Weight:	1000g ±10% excluding test leads
Dimensions:	203 x 148 x 78 mm

Patents

The loop testing technologies used in these instruments are subject to the following patent applications:
UK Patent no. 0518089.9
European Patent no. 06119110.2
US and Canadian patent application.

ORDERING INFORMATION

Item	Order Code
2 Wire loop tester	LTW315-EU-BS LTW315-EU-SC LTW315-EU-AU
2 Wire loop tester +maxZ and (R1+R2)	LTW325-EU-BS LTW325-EU-SC LTW325-EU-AU
2 Wire loop tester +maxZ and (R1+R2) +Result store and download	LTW335-EU-BS LTW335-EU-SC LTW335-EU-AU
High resolution 2 wire loop tester (0.001 Ω)	LTW425-EU-BS LTW425-EU-SC LTW425-EU-AU

Item	Order Code
Optional Accessories	
2 wire test lead set (fused) 10 A with croc clips	6220-827
Included Accessories	
BS1363 to 3 x 4 mm socket leadset	6220-810
2 wire leadset with croc clips	6220-784
Schuko plug test lead –EU-SC	6220-832
AU/NZ plug test lead –EU-AU	6220-828
Hard carry case	5410-409
User CD	6172-978

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