

# LCB2000/2 and LCB2500/2

## Premium Loop & Circuit Breaker Testers



- n **Non-trip loop tests to 0.01**
- n **PSCC + Contact Voltage**
- n **Single + 3 phase loop tests**
- n **Tests a wide variety of RCDs**
- n **Ramp and auto sequence tests**
- n **Phase rotation**
- n **Waterproof and dustproof to IP54**
- n **Storage and download (2500/2)**

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### DESCRIPTION

The Megger® LCB2000/2, and LCB2500/2 series of Loop and Circuit Breaker testers utilise advanced microprocessor technology to provide a host of new features not normally associated with standard testers.

The instruments utilise a large custom LCD display with a power saving LED backlight. The display is mounted behind a highly resilient polycarbonate window where it provides outstanding clarity and viewing angle.

Both the LCB2000/2 and the LCB2500/2 are designed to perform all the live system tests required for an electrical installation meet in full the requirements of the 16th Edition Wiring Regulations, (BS 7671). By providing a range of both basic and advanced features, all of which are simple to use, the LCB2000/2 and LCB2500/2 are designed for maximum user convenience and time saving. As an example the auto-sequence RCD test enables the instrument to perform and record all the necessary tests on an RCD in sequence whilst the user stays at the distribution board to reset the trip.

In the event that the installed system has a fault or does not test as expected a host of diagnostic features such as ramp RCD tests are on hand to pinpoint the problem.

The LCB2500/2 provides the ultimate in technology offering the ideal mix of features for the busy electrical contractor combined with speed of operation, live display of R1 + R2 values and efficiency provided by the downloading of data. When combined with software

certification the system provides a highly professional image for the contractor combined with the ever increasing requirement for tracability of test results.

The LCB2500/2 offers comprehensive data storage options with individual test results being quickly stored with relevant connection details against user selectable distribution board and circuit references. Data storage is contained within non-volatile memory, (NVM), ensuring that test results are not lost in the event of battery failure or removal.

Once stored, results may be recalled to the display, printed to an external serial printer or downloaded to suitable software. Download Manager™ for Windows is included enabling the simple download of stored data from the instrument into files on a PC. These files can be maintained as a record, used for manually completing certificates or exported to other applications such as spreadsheets and word processor documents. Instrument setups and printer language may also be changed.

Where creation of certificates of test is required both instruments are fully compatible with PowerSuite for Windows, PowerSuite XPress and NICEone (for the creation of N.I.C.E.I.C. Certification alone).

## APPLICATIONS

### ELECTRICAL CONTRACTORS FEATURES AND APPLICATIONS

The LCB2000/2 and LCB2500/2 are designed to provide the electrical contractor with highly professional tools for testing and commissioning fixed installations to both the British and International Wiring Regulations. The LCB2000/2 provides a comprehensive set of features to cater for almost all Loop and RCD testing needs. The LCB2500/2 adds to these the ability to store and print results on site and to view R1 + R2 loop values during a live test. The on-board storage facilities enable each test result to be assigned to particular distribution board and circuit references. Data may be later recalled to the display for manual completion of certificates of test or for maximum performance downloaded to certification software such as PowerSuite for Windows, PowerSuite XPress or NICEone to create a seamless recording system with the tracability necessary for safety critical applications. Some of the key features of the LCB2000/2 and LCB2500/2 are:

#### n Intelligent Power saving backlight

The inclusion of an intelligent backlight ensures that the display can be clearly seen even where the distribution board is located in a dark cupboard but without ruining battery life.

#### n A choice of Non Tripping loop tests

A three wire 15 mA non tripping loop test provides a fast response with 0,01 . A two wire 15mA non-tripping loop test is also included and provides 0.1 resolution. Both tests guarantee not to trip RCDs rated at 15 mA or more.

#### n No neutral needed for Line - Earth Testing

This useful feature enables tests to be performed on lighting and three phase delta configurations where no neutral is available.

#### n Automatic Test Start

When using probes to make the connections both hands are needed making it almost impossible to press the test button. The LCB2000/2 and LCB2500/2 include a "Test start on voltage detection" feature. Once armed the instrument will wait until the probes are connected or voltage is turned on then automatically start a test .

#### n Three Phase Test Capability

Phase-Phase measurements (up to 440 V), Phase-Neutral and Phase-Earth tests are all possible.

#### n A variety of Test leads Supplied as standard

LCB2000/2 and LCB2500/2 are supplied with a pre-wired plug for making connections via the standard socket outlets and a three wire leadset with probes and clips. This enables connection to be made easily to a wide variety of systems.

#### n Selectable RCD Types

The LCB2000/2 and LCB2500/2 may be easily set to test General purpose, Selective or dc sensitive RCDs.

#### n Tests Programmable RCD's

The Megger LCB2000/2 and LCB2500/2 cater for programmable RCDs by allowing the test current to be precisely defined up to 1000 mA. This advanced feature enables the instruments to be used in a wide range of specialist installations, (e.g. medical), or where a programmable device is encountered.

#### n Contact Voltage Indication

Megger LCB2000/2 and LCB2500/2 indicate the Contact Voltage, (potential that bonded metalwork would actually rise to in the event of a fault) and the loop impedance during and RCD test.

#### n Auto-Sequence RCD tests

RCD testing requires a number of tests to be performed sequentially, many of which will trip the RCD which then has to be reset each time. In many cases the tester is some distance away from the RCD requiring the operator to make repeated journeys to reset the trip. LCB2500/2 includes an unique Auto-Sequence RCD enabling the operator to remain with the RCD in order to reset it whilst the instrument automatically cycles through the necessary tests and records the results ready for when the operator returns.

#### n RCD Ramp Test - Indicates the actual tripping current

There are numerous situations when it is useful to know the current at which a particular RCD actually trips. For instance in cases of nuisance tripping it is necessary to establish whether the RCD is over sensitive. LCB2000/2 and LCB500/2 include a Ramp Test feature which automatically increases the test current until the RCD trips. At this point the actual tripping current is displayed.

#### n Phase Rotation Display

LCB2000/2 and LCB2500/2 include a special phase rotation symbol within the LCD display. When connected to a three phase supply the symbol automatically indicates the phase rotational sequence.

#### n Warranty

In addition to the electrical features above the rugged design of the LCB2000/2 and LCB2500/2 range ensures that they can withstand the everyday handling, transportation and storage with other tools in the contractor's toolbox. Both products are supplied with a three year manufacturer's warranty.

**SPECIFICATION**

**SUPPLY VOLTAGE**

Instruments are designed to work on supplies of 110 - 440 V, 50/60 Hz overvoltage Category III with a maximum voltage to Earth of 300 V

**Supply Voltage Measurement:**

25 - 500 V

**Intrinsic accuracy:**  
±2% ±2 digits

**Supply Frequency Measurement:**

16 - 460 Hz

**Intrinsic accuracy:**  
±0,1% ±1 digit

**LINE-EARTH LOOP RESISTANCE MEASUREMENT**

(to EN 61557-3)

**Displayed Range:**  
0,01 to 3,00 k

**Supply Range:**  
100 - 280 V

**Nominal Supply:**  
230 V, 50 Hz

**EN61557 Operating Range:**  
0,25 to 3,00 k

**Intrinsic accuracy:**  
0,01 - 9,99 ±4% ±0,03  
10,0 - 89,9 ±5% ±0,5  
90 - 899 ±5% ±5  
900 - 3,00 k ±5% ±20

**LINE - LINE (Phase/Phase) LOOP RESISTANCE MEASUREMENT (to EN 61557-3)**

**Displayed Range:**  
0,01 to 19,99

**Supply Range:**  
100-440V Phase to Phase

**Nominal Supply:**  
230 V, 50 Hz

**EN61557 Operating Range:**  
0,25 to 19,99

**Intrinsic accuracy:**  
±5% ±0,03

**PROSPECTIVE FAULT CURRENT**

**Prospective fault current =**  
Nominal voltage  
Loop resistance

Prospective Fault Current is calculated from the respective loop resistance. Ranges and accuracy's are therefore derived from the previous section.

**LINE - EARTH LOOP RESISTANCE MEASUREMENT AT15 mA (to EN 61557-2)**

**Loop L-PE 0.1**  
**Displayed Range:**  
0,1 to 2,00 k

**Nominal Supply:**  
230 V 50 Hz

**EN61557 Operating Range:**  
5,0 to 2,00 k

**Intrinsic accuracy:**  
up to 200 ±3%  
±0,3 over 200 ±5% ±5

**Noise Immunity:**  
1 of reading within 0,3 on a normal domestic supply.

**LOOP L-PE 0.01**  
**Displayed Range:**  
0,01 to 10,00

**EN61557 Operating Range:**  
0.5 to 10,00

**Nominal Supply:**  
230 V 50 Hz

**Intrinsic accuracy:**  
±5% ±0,05

**Noise Immunity:**  
1 of reading within 0,05 on a normal domestic supply

**RCD TESTING (to EN61557-6 up to 500 mA)**

**Selectable Ranges:**  
30, 100, 300, 500, 1000 mA

**Variable Range:**  
10 mA to 1000 mA

**Test Facilities:**  
Contact voltage tests at  $1\frac{1}{2} I_n$   
Loop resistance tests at  $\frac{1}{2} I_n$

No Trip tests at  $\frac{1}{2} I_n$

Trip tests at  $I_n$ ,  $5I_n$

Fast Trip test at 150 mA

Ramp tests

**RCD Types:**

General purpose, delayed (Selective) and d.c. Sensitive

**Nominal Supply:**  
230 V, 50 Hz

**Supply Range:**  
100 - 280 V, 45 - 65 Hz

**$\frac{1}{2} I_n$  TEST CONTACT VOLTAGE**

**Displayed range:**  
0 V to 90 V

**Measurement range:**  
5 V to 90 V

**LOOP RESISTANCE (measured at  $\frac{1}{2} I_n$ )**

$I_{\Delta n}$	RESOLUTION
10	0,5 k to 9 k
30	170 to 3 k
100	50 to 900
300	17 to 300
500	10 to 180
1000	5 to 90

**2 SECOND NO TRIP TEST at  $\frac{1}{2} I_n$  (optional)**

**Test current duration:**  
2 seconds

**Intrinsic Test Current accuracy:**  
-8% to -2%

**TRIP TESTS**

$I_n$  Trip Test Automatic  $\frac{1}{2} I_n$  test, followed by a 30 second delay (Selective type only) then a Trip test.

**General purpose Test:**  
 $I_n$  test for up to 300 ms

**Selective Test:**  
 $I_n$  test for up to 2000 ms

**D.C. Sensitive Trip (For RCDs up to 300 mA)**

As the  $I_n$  Trip Test above, but test current is a half wave rectified a.c.with an r.m.s. value of  $2 I_n$ .

**$5I_n$  Trip Test (for RCDs up to 100 mA)**

Test follows the same sequence of  $\frac{1}{2} I_n$  test, 30 second delay (Selective type only) as the  $I_n$  test.

**General purpose test**  
 $5I_n$  test for up to 40 ms

**Selective test**  
 $5I_n$  test for up to 150 ms

**TIMED TRIP TESTS**

**Trip time displayed Range:**  
0,1 ms to test time limit

**Intrinsic Trip time accuracy:**  
± 1% ± 1 ms

**Intrinsic Test Current accuracy:** 2% to +8%

**Ramp Test (Trip current measurement)**

Automatic  $\frac{1}{2} I_n$  test followed by a 30 second delay (Selective type RCD only) then an incremental ramp test.

**Intrinsic Ramp Test Current accuracy:**  
±3%

**$I_{\Delta n}$  RAMP RANGE INCREMENT**

10	5 - 15 mA	1 mA
30	15 - 50 mA	1 mA
100	50 - 150 mA	2 mA
300	50 - 300 mA	6 mA
500	250 - 500 mA	10 mA
1000	500 - 1020 mA	52 mA

**150 mA 40 ms Trip Test:**

Stand alone test at 150 mA for 40 ms

Displayed Range: 0,1 ms to 40 ms

**POWER SUPPLY**

6 x 1,5 V Alkaline cells type LR6 or 1,5V nickel cadmium rechargeable cells.

**FUSES**

Non replaceable 2 x 7 A (SIBA 70-065-63)

**TEMPERATURE RANGE**

**Operating:**  
-5°C to +40°C up to 90% RH

**Storage:**  
-25°C to +65°C up to 90% RH

**IEC 61557 / EN 61557**

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

Part 2 - Loop resistance

Part 3 - Residual current devices (RCDs)

Part 10 - Combined Measuring Equipment.

**Safety**

The LCB2000/2500/2 comply with the latest international directives concerning safety and electromagnetic compatibility.

The instruments meet the requirements for double insulation to IEC61010-1 (1995), EN61010-1 (1995) Safety Requirements for electrical equipment for measurement, control, and laboratory use. Category III\*\*, 300 Volts phase to earth (ground) and 440 Volts phase to phase, without the need for separately fused test leads. If required, fused test leads are available as an optional accessory.

\*\* Relates to the transient over-voltages likely to be met in fixed wiring installations.

**Electromagnetic Compatibility**

The LCB 2000/2500/2 series complies with IEC 61326-1

**Environmental Conditions**

**Operating range:** -5 to +40°C

**Operating humidity:** 90% RH at 40°C max.

**Storage temperature range:** -25 to +65°C

**Calibration Temperature:** +20°C

**Maximum altitude:** 2000 m

**Dust and water protection:** IP54

**Physical Specifications**

**Dimensions**

**Height:** 230 mm (9.1 inches)

**Width:** 114 mm (4.5 inches)

**Depth:** 62 mm (2.4 inches)

**Weight** 920 g (2.0lbs) (including batteries)

**Cleaning**

Wipe with a clean cloth dampened with soapy water or Isopropyl

**ORDERING INFORMATION**

Item (Qty)	Order Code	Item (Qty)	Order Code
Premium Loop/Circuit Breaker Tester	LCB2000/2		
Premium Loop/Circuit Breaker Tester	LCB2500/2		
With download, printing and storage			
<b>Included Accessories</b>			
User Guide	Depends on V Variant		
3-Wire Test Lead Set, 2Prods, 3 clips	6231-632		
Mains Plug Test Lead	Depends on variant		
Test and Carry Case	6420-122		
Download Manager Software on CD (LCB 2500/2 only)	6111-442		
<b>Optional Accessories</b>			
UK Mains Plug Test Lead	6231-633		
Euro Mains Plug Test Lead	6231-635		
2-Wire Test Lead Set With Prods and Clips (not for 0.01 non-trip loop tests)	6231-631		
2 Wire Test Lead 5m long (not for 0.01 non-trip loop tests)	6231-637		
Lead Set (Earth Bond) (5 Pin)	6231-634		
Switched Probe SP2	6231-636		
Fused Probe and Clip Set	6180-405		
Computer Serial Lead (LCB 2500 only)	25955-025		
Printer Serial lead (LCB 2500 only)	25955-026		
		<b>Optional Software</b>	
		PowerSuite for Windows (Comprehensive Electrical Testing Software)	See supplier
		NICEone (Certification software for producing NICEIC certificates)	6111-403
		PowerSuite XPress Certification Software	6111-519
		<b>Publications</b>	
		Testing Electrical Installations (Book)	6172-129
		'A Stitch in Time' (Video)	AVTM21-P8
		'Getting Down To Earth' (Book)	AVTB25-TA
		A practical manual on earth resistance testing	

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and The Kingdom of BAHRAIN.

**ISO STATEMENT**  
Registered to ISO 9001:1994 Reg no. Q 09250  
Registered to ISO 14001 Reg no. EMS 61597  
**LCB2000\_2\_2500\_2\_DS\_en\_V03**  
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