Earth Leakage and Load Current Meter (EL&LC Meter)

User Manual
Issue 1.1

DESIGNED AND MANUFACTURED IN THE UK

LIFETIME WARRANTY

TERMS AND CONDITIONS APPLY

CONTENTS

SAFETY

Please read this manual carefully to make yourself familiar with the capabilities and functions of the EL&LC Meter before attempting to use it.

1. This manual contains all the information necessary to use the above test instrument. Please make sure that you read this fully before using it.

2. The unit is designed to be powered from a 230V mains socket. This can supply a maximum of 10 Amps.

3. To isolate the unit from the mains, either switch off at the mains socket or disconnect the IEC lead.

4. There are no user serviceable parts in this unit. Under no circumstances should the user attempt to open the unit. If opened, the warranty will be invalidated.

5. The EL&LC Meter is guaranteed for one year from the date of purchase. Please keep your invoice as proof of purchase. Should the unit require a service, repair or calibration, please return it to the address at the back of this user manual. See inside back cover for our Lifetime Warranty.

   When returning the unit, please contact the Sales Department to receive a Returns Number. The owner will be advised of any costs prior to work commencing.

GETTING STARTED

Before using the EL&LC Meter please check that the following items have been included in the shipment:

- EL&LC Meter
- Test lead
- IEC power lead
- User manual

Check for any damage in transit. If there is any sign of damage, please report it to your supplier and do not attempt to repair the unit.

INTRODUCTION

When carrying out Portable Appliance Testing, the Insulation Resistance test can be carried out in one of 2 ways. The popular way is to apply 500V to the Live and neutral wires of the appliance and check for any leakage current to the earth pin on the plug (Class 1) or any user touchable metal part on the appliance (Class 2). This leakage current is then used to work out the Insulation Resistance.

Another way is to supply mains voltage to the appliance and look for any leakage current on the Earth pin (Class 1) or from any user touchable metal part (Class 2). When testing Class 1 appliances this is referred to as the Earth Leakage test and for Class 2 appliances is referred to as the Touch Current test.

Both these tests look for any breakdown of the insulation. The Leakage Current test has some advantages over the 500V test.

1. The appliance must be switched ON for this test to be carried out. For appliances that need mains voltage (like a PC) to be properly ON, this is a better test than the 500V insulation test.

2. Any surge protection devices fitted to the appliances will not interfere with this test as it is in its normal operating state.

3. On some older appliances the IET Code of Practice claims that there is a possibility of damage with the 500V test. For this reason the Leakage Current test is referred to as a “soft test” as there is no risk of damage.

The Load Current test is useful as a higher than normal current draw can indicate a faulty appliance. This is advisable specially after an appliance has been repaired.

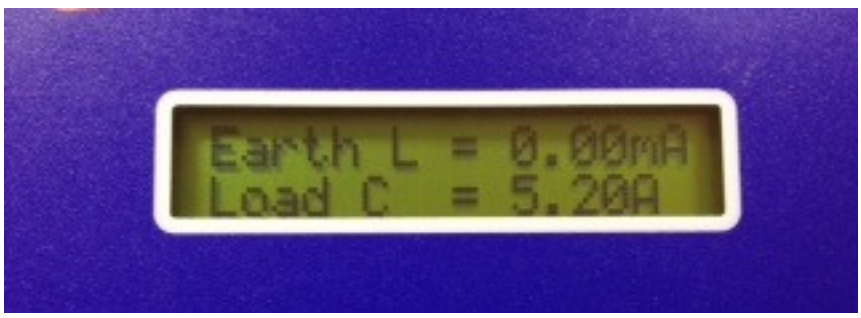
Before any testing is carried out, it is very important to inspect the appliance. Many faults, e.g. a wrong value fuse or a wrongly wired plug, can only be found by careful inspection.

OPERATION

This instrument is very easy to use. Simply plug into 230V mains using the IEC power lead that is supplied. Plug the appliance under test into the 13 Amp socket on the front panel.

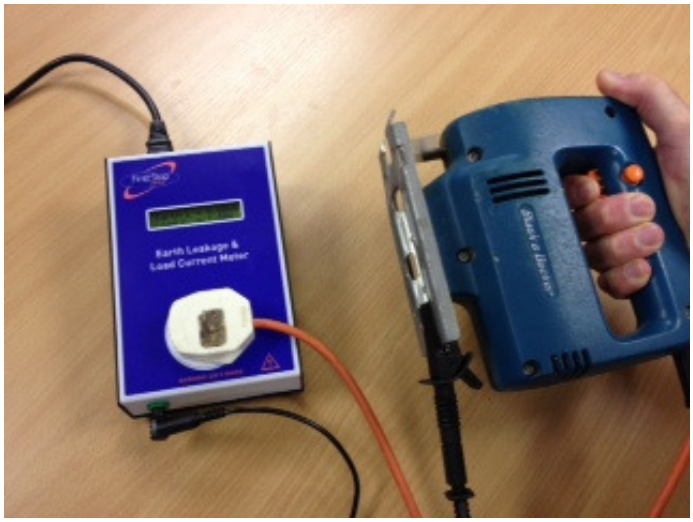
Switch the appliance ON taking any necessary precautions. For example if this is a kettle, make sure that there is some water in it. If a power tool then it will start to work. The image above shows an electric fire plugged into the meter and switched ON.

The EL&LC meter will immediately start to show the Load Current taken by the appliance under test. For Class 1 appliances it will also show the Earth Leakage Current.



For Class 2 appliances, connect the clip of the test probe to a user connected metal part. For example, on a drill it will be the chuck. On a charger it will be the connector. The image below shows the test probe clipped on the metal part of a jig saw during the test.

The image below shows the jig saw being kept on during this test.



TEST LIMITS

Leakage Current Test

The following limits are from the IET Code of Practice, Edition 4. It should be noted that in some cases manufacturers may well specify Leakage currents which may be less than this. If in doubt, please check the manufacturer's recommendations.

Class 1

Portable or hand-held appliances	<0.75 mA
Heating appliances 1kW	<0.75 mA
Heating appliances 2kW	<1.5 mA
Heating appliances 3 kW	<2.25 mA
Other appliances	<3.5 mA

Class 2

All appliances	<0.25 mA

Example

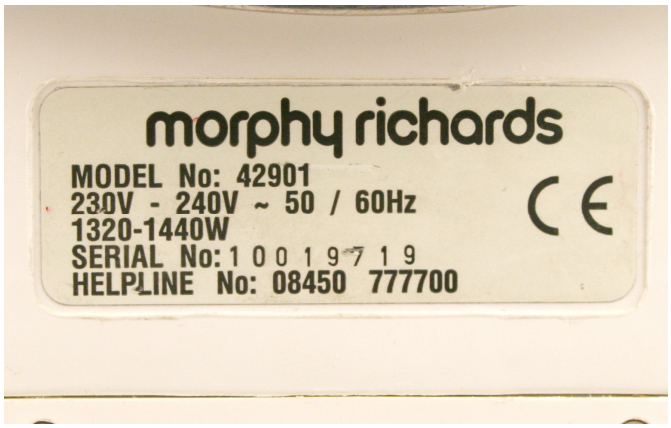
The image below shows a test on a Class 1 drill. The Load Current is 0.9 Amp but the leakage Current is 14.9 mA. This appliance is unsafe and needs to be discarded.

Load Current Test

The maximum current taken by the appliance during operation can be worked out by looking at the power rating shown on its rating plate. This is normally marked in Watts. Dividing this figure by 230 will give the maximum current in Amps.

Example

The rating plate on this iron shows the power consumption as 1440 Watts. The maximum current drawn by the appliance will be 1440 divided by 230 which is 6.3 Amps.



If during operation, the Load Current displayed on the meter is higher than this, then the appliance has to be investigated by a competent person.

PROTECTION

To prevent damage to internal circuits and cables the EL&LC meter has a built-in trip.

If the Load Current exceeded 10 Amps for 100mS, the power to the appliance under test will be removed. If the Leakage Current exceeds 10 mA for 100mS then the power to the appliance under test will be removed.

A warning message is displayed to the user.

If this happens the only way to reset the EL&LC meter is to remove power to it and then reconnect it.

SPECIFICATION

EARTH LEAKAGE CURRENT

RANGE	0 to 10 mA
TOLERANCE	+/- 5% + 1 digit
RESOLUTION	0.1 mA

LOAD CURRENT

RANGE	0 to 10 Amps
TOLERANCE	+/- 5% + 1 digit
RESOLUTION	0.1 Amp

DIMENSIONS

HEIGHT	45mm (front) /65 mm (back)
WIDTH	120 mm
DEPTH	177 mm
WEIGHT	1.0 Kg

CARING FOR YOUR EL&LC Meter

Annual calibration

Your EL&LC Meter is an accurate instrument and it is important to make sure that it is continuing to measure correctly. A faulty tester could fail to pick up any faults with electrical appliances and result in passing them. To prevent this and ensure the accuracy of your EL&LC Meter, we recommend that calibration is carried out annually. We will send you an annual reminder by e-mail or letter.

When you return the EL&LC meter to us we check it out thoroughly and:

Calibrate it with traceability back to National Standards.
Refurbish the unit and upgrade it if required.
Carry out a PAT test on the tester.
Issue a Calibration Certificate.

Collection & Delivery Service

We can arrange for the EL&LC Meter to be collected for calibration and delivered back to you. The turnaround is 5 working days from receipt of the tester. All you have to do is to order on-line or send us a completed order form.

Lifetime Warranty

As long as your EL&LC Meter is calibrated annually by First Stop Safety we provide a Lifetime Warranty. Should the EL&LC Meter fail for any reason between annual calibrations please give us a call. We will repair it and ship it back to you free of charge. By calibrating your tester annually your Lifetime Warranty will cover your EL&LC Meter for many years.

Booking a calibration

This couldn't be easier. You can request your calibration in a number of ways.

Download a booking form from our website www.firststopsafety.co.uk
Send us an e-mail to calibrations@firststopsafety.co.uk
Ring us on 01904 791050

Remember: All you have to do is to send us the order.
We will do everything else.

Lifetime Warranty Conditions

First Stop Safety have complete confidence in our EL&LC Meters enabling us to provide a lifetime warranty free of charge.

To retain the validity of the Lifetime Warranty the unit must be returned to First Stop Safety annually for a recalibration

Note: If the calibration is allowed to expire, the Lifetime Warranty is invalidated.

We have a one month grace period with regards to your calibration date. This means that you have one calendar month after the calibration expiry date in which to book your tester in for calibration.

The Lifetime Warranty covers the EL&LC unit only not accessories.

If your unit develops a fault we repair it free of charge as long as your unit is still within Warranty.

What is not covered by the lifetime warranty

- If mains power has been applied to the tester.
- If the unit has been water damaged.
- If the unit has been physically damaged beyond fair wear and tear.
- If the unit has not been returned for its annual calibration repairs are chargeable.

First Stop Safety
11 Glaisdale Road
Northminster Business Park
York YO26 6QT
t: 01904 791050
f: 01904 352225
e: info@firststopsafety.co.uk
w: www.firststopsafety.co.uk