

USER GUIDE

EVT100

Electric Vehicle Tester

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1. Safety Warnings

The safety instructions given in this document are indicative of safe practice and are not be considered exhaustive. Additionally, they are not intended to replace local safety procedures in the region where the instrument is used. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

1.1 Warnings, Cautions and Notes

This user guide follows the internationally recognized definition of warnings, cautions and s. These instructions must be adhered to at all times.

Description
WARNING : Indicates a potentially dangerous situation which, if ignored, could lead to death, serious injury or health problems.
CAUTION : Indicates a situation which could lead to damage of the equipment or environment
NOTE : Indicates important instructions to be followed to perform the relevant process safely and efficiently.

1.2 Safety warnings

These safety warnings must be read and understood before the instrument is used. Retain for future reference.

WARNING : This instrument must be operated only by suitably trained and competent people. Protection provided by the instrument may be impaired if it is not used in a manner specified by the manufacturer.

- Local Health and Safety Legislation requires users of this equipment and their employers to carry out valid risk assessments of all electrical work to identify potential sources of electrical danger and risk of electrical injury such as inadvertent short circuits. Where the assessments show that the risk is significant then the use of fused test leads may be appropriate.
- The voltage indicator and automatic discharge features must be regarded as additional safety features and not a substitute for normal safe working practice which MUST be followed.
- The circuit under test must be switched off, de-energized, securely isolated and proved dead before test connections are made.
- Circuit connections, exposed conductive parts and other metalwork of an installation or equipment under test must not be touched during testing.
- When inductive loads are measured it is essential that the current carrying leads are securely clamped to the item being tested and that they are not removed before any stored charge has been discharged at the end of the test. Failure to comply with these instructions might result in an arc being produced, which might be dangerous for the instrument and the operator.
- The Voltmeter function will operate only if the instrument is switched on and working correctly.
- After an insulation test, the instrument must be left connected until the circuit has been discharged to a safe voltage.
- The instrument must not be used if any part of it is damaged or if the terminal shutter is missing.
- All test leads, probes and crocodile clips must be in good order, clean and with no broken or cracked insulation.
- Verify the integrity of the test leads before use. Only “Megger” approved test leads must be used with this product.
- The safe maximum limit of a measurement connection is that of the lowest rated component in the measurement circuit formed by the instrument, test leads and any accessory.

- Ensure that hands remain behind finger guards of probes/clips.
- Replacement fuses must be of the correct type and rating. Failure to fit the correctly rated fuse will result in fire and burns hazards and cause damage to the instrument in the event of an overload.
- All covers must be in place whilst conducting tests.
- This product is not intrinsically safe. Do not use in an explosive atmosphere.
- Ensure every cell in the battery compartment is of identical type. Never mix rechargeable and non-chargeable cells.

1.2.1 Test lead safety warnings

- The circuit under test must be switched off, de-energized, isolated and checked to be safe before insulation test connections are made. Make sure the circuit is not re-energized while the instrument is connected.
- Test leads, including crocodile clips, must be in good condition, clean, dry and free of broken or cracked insulation. The lead set or its components must not be used if any part of it is damaged.
- The safe maximum limit of a measurement connection is that of the lowest rated component in the measurement circuit formed by the instrument, test leads and any accessories.
- The CAT III 600 V rated thermocouple probe tip and protective ring are conductive. Care must be taken when using the probe on live systems not to short-circuit to adjacent conductors.

1.3 Product Safety Category - Measurement Connection

Only Megger supplied test leads designed for this instrument provide the full safety rating.

Voltage

The rated measurement connection voltage is the maximum line to earth voltage at which it is safe to connect.

CAT IV – Measurement category IV: Equipment connected between the origin of the low-voltage Mains Power supply and the distribution panel.

CAT III – Measurement category III: Equipment connected between the distribution panel and the electrical outlets.

CAT II – Measurement category II: Equipment connected between the electrical outlets and the User's equipment.

Measurement equipment may be safely connected to circuits at the marked rating or lower. The connection rating is that of the lowest rated component in the measurement circuit.

1.4 Safety, Hazard and Warning Symbols on the Instrument

This section details the various safety and hazard icons on the instruments outer case.

Icon	Description
	High Voltage, risk of electric shock.
	Refer to User Guide.
	Equipment complies with current UK legislation.
	Equipment complies with current EU directives.
	Complies with RCM standards or use in Australia and New Zealand.
	Do not dispose of batteries in landfill, sewage systems or by fire.
	Equipment protected throughout by double insulation.
	Fuse.
	CAT rating 600 V AC RMS maximum between terminals and between terminal and earth.
	DC
	Do not use in distribution systems with voltages higher than 1100 V.
IP54	IP rating.

1.4.1 Warning Icons

This section details the warning icons that can show on the display.

Icon	Warning	Description
	External Voltage Warning	<p>If an external voltage is applied between the terminals and the instrument is set to On, the High Voltage warning will flash on the display. This is a warning that the item under test is live and might be dangerous and testing is disabled. The High Voltage warning message will flash if more than 50 V potential difference is applied between the Voltage terminals and the Current terminals. This warning will not show if all terminals are at the same high voltage.</p> <p>The warning will not operate if the instrument is set to Off.</p>
	Internal Error Warning	Internal Error Warning switch off and back on. Contact Megger if not cleared.
	Read the User Guide	Refer to the user guide if this message shows.

2. Introduction

2.1 Product Description

This user guide details the operational and functional details of the Megger EVT100 Industrial Multi Tester. Please read this user guide fully before attempting to use the EVT100. The EVT100 instrument is designed to perform a number of tests that are typical for photovoltaic systems, electric vehicles and a number of industrial applications. These tests include

- Insulation resistance
- Voltage measurement
- Continuity
- DLRO, digital low resistance ohmmeter - 4 wire kelvin mΩ
- Temperature

The EVT100 is powered by rechargeable NiMH AA cells, and is supplied with an external power supply and adaptor to charge the batteries whilst in the instrument. As an option, the instrument can be powered by six AA alkaline cells, or Lithium primary (not Lithium Ion) cells can also be used.

For personal safety and to get the maximum benefit from this instrument, make sure that the safety warnings and instructions are read and understood before the instrument is used, see *Refer to 1. Safety Warnings on page 8*. This user guide must be thoroughly read before attempting to operate the EVT100.

NOTE : This manual includes instructions for all EVT100 variants. Some facilities may not be available on your model of this equipment.

The EVT100 takes the test abilities of Megger's proven hand held insulation testers adding: DLRO four wire tests to provide a versatile multi tester, all packaged in a robust hand held instrument, which up to now has simply not been available.

In addition the EVT100 also incorporates temperature measurement and compensation (for Insulation Resistance and DLRO tests).

All these new test abilities go together to make the EVT100 a real world, versatile, hand held test instrument for photovoltaic installations, electric vehicles and industrial applications.

The EVT100 also comes in an over-moulded case, providing increased protection, robustness and achieving an IP54 rating against moisture and dust ingress.

Refer to the image at *Refer to 2.6 Instrument Controls on page 13* for detail of the EVT100 layout.

For the safety of all personnel and to get the maximum benefit from this instrument, ensure the safety instructions of *Refer to 1. Safety Warnings on page 8* are read and thoroughly understood before the EVT100 is used.

Tests and connections detailed in this user guide are not exhaustive. Refer to the application notes, booklets and guides published by Megger to reveal the best benefits of this advanced instrument.

2.2 Applications

Typical applications include but are not limited to:

- Photovoltaic installations: domestic, industrial, and utility scale
- Electric vehicles: manufacturing and workshops
- Power generation: infrastructure maintenance
- Rotating machinery, motors, and generators: manufacture and workshops
- Electrical installations: Domestic, Industrial, and production lines

2.3 Features

- Guard Terminal to eliminate any surface leakage current.
- Detachable insulation resistance test leads with interchangeable clips and probes for different applications.
- Stores test results for up to 256 test results, which can be downloaded to a USB drive.
- Rotary dial control and full graphic display - simple and easy to use.
- Sealed to IP54, providing protection against moisture and dust ingress, including the battery and fuse compartments.
- Tough housing: A 'rubber over moulding' combines a tough shock absorbing outer protection with excellent grip, on a strong modified ABS housing, providing an almost indestructible case.
- Rechargeable batteries with mains charger kit option.

2.4 Company web site.

Occasionally an information bulletin may be issued via the Megger web site. This may be new accessories, new usage instructions or a software update. Please occasionally check on the Megger web site for anything applicable to your Megger instruments.

www.megger.com

2.5 In the box

Unpack the carton contents carefully. There are important documents that you should read and keep for future reference. Please read the Safety Warning and User Guide before operating the instrument.

In the Box	
■ EVT100	
■ Quick start guide	
■ Battery charger kit	
■ Kelvin probe pins	
■ Long reach test probe CAT III	
■ Long reach test probe CAT IV	
■ Grabber clip leadset	
■ Temperature probe	
■ Hook strap and magnetic strap	
■ Kelvin probe lead set	
■ Kelvin clip lead set	
■ SP5 remote probe	
■ Multi-purpose carry case	

2.6 Instrument Controls



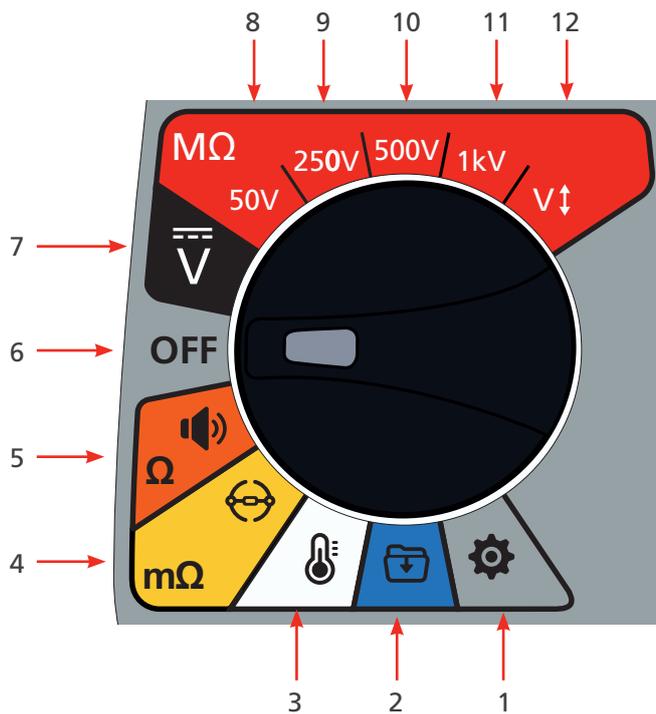
Item	Description	Item	Description
1	External electrical connections	6	Save
2	Display	7	Test
3	Soft keys (multifunction)	8	Information / Lock / OK
4	Buzzer control	9	Rotary selection switch
5	Backlight control		

2.7 Instrument Display



Item	Description	Item	Description
1	Status / Mode	5	Soft key functions
2	Battery indicator	6	Secondary field
3	Primary field	7	Time
4	Status symbols		

2.8 Instrument Controls



Item	Description	Item	Description
Rotary switch positions			
1	Settings (Grey)	8	Insulation Resistance Test, 50 V (Red)
2	Data management (Blue)	9	Insulation Resistance Test, 250 V (Red)
3	Temperature (White)	10	Insulation Resistance Test, 500 V (Red)
4	Digital Low Resistance Ohmmeter (Yellow)	11	Insulation Resistance Test, 1 kV (Red)
5	Continuity and diode test (Orange)	12	Insulation Resistance Test, user selectable voltage (Red)
6	Off (Grey)		
7	DC voltmeter		

2.9 Instrument Connections and Leads

2.9.1 View on top of EVT100

Slider to front

Slider to back



Item	Description	Item	Description
1	Rear attachment point for strap	4	Slider in rear position
2	Battery charger connection / switch probe	5	USB port
3	Slider in front position	6	Front

The external connections are all situated on top of the EVT100. A sliding cover is installed to prevent any other connection being made at the same time as the USB port. Connection to the USB port can only be made when the sliding cover is pushed completely to the back of the instrument.

For charging or connection to any test leads the sliding cover must be in the forward position.

The charger connection is designed so that no other lead can be connected while the battery is being charged in the instrument.

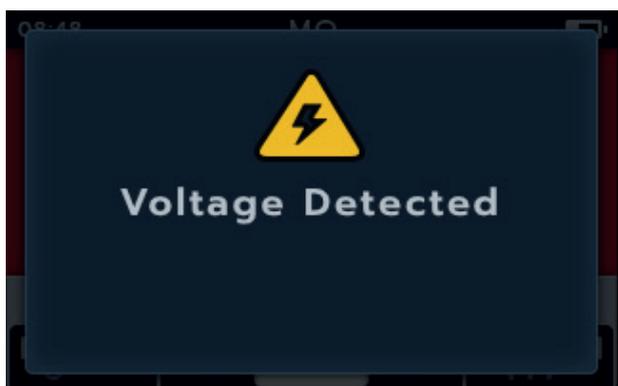
3. Instrument Set up

Before each use of the instrument, visually inspect the instrument case, test leads and connectors to confirm their condition is good, with no damaged or broken insulation

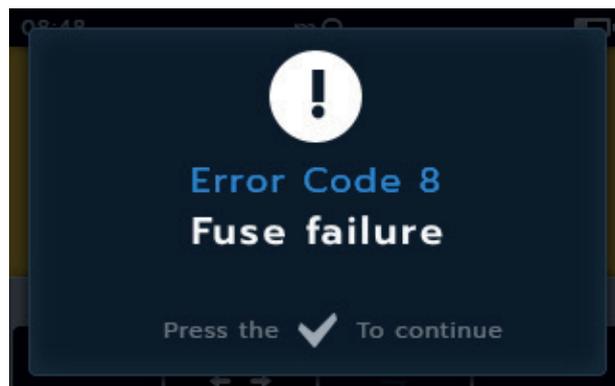
3.1 Warnings and exception conditions

There are two types of alerts that interrupt the standard process, they are the warnings for an external condition alert and the exception condition for an internal fault alert. The alert message is overlaid on the display screen with the fault message. The images below are examples illustrating the two types of alerts:

Alert for dangerous external fault.



Alert for internal fault.



3.2 Power

3.2.1 First use

NOTE : Before the EVT100 can be turned on the battery isolation tab must be removed.

1. Remove the battery cover.
2. Pull the battery isolation tab clear of the battery cells.
3. Replace cover.

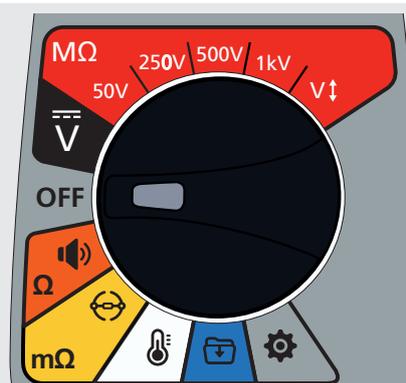
For further details on accessing the battery panel, *Refer to 13.4 Battery and Fuse Replacement on page 72.*

For initial date and time set up, *Refer to 12.4.3 Date on page 67 and Refer to 12.4.7 Time on page 68.*

NOTE : If the EVT100 should lose the date and time setting, (for example if the batteries have been replaced and the instrument has been without them for more than 3 minutes) the instrument will display a prompt screen when turned on to enter the date and time details - this can appear anytime after first set up.

3.2.2 Turn the instrument on and off

1. Turn the instrument ON by turning the rotary switch away from the OFF position to Activate the instrument.

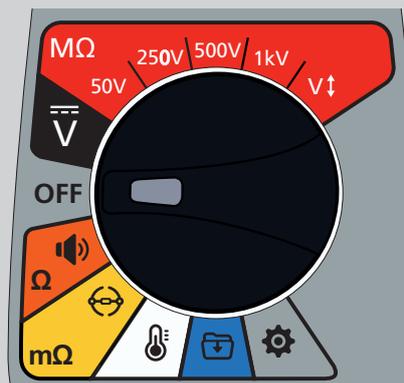


Instrument Set up

2. Turn the instrument OFF by turning the rotary switch to the OFF position to deactivate the instrument.

NOTE : The EVT100 switches off after a period of inactivity, which is user adjustable, Refer to 12. Settings on page 64.

To start the instrument again rotate the mode switch to Off and then select a mode or press the TEST button to wake the instrument up.



3.2.3 Power options

CAUTION : Do not attempt to recharge alkaline or Lithium cells, this action is a high potential fire hazard.

The EVT100 is powered by Internal batteries,

- These cells may be used:
 - 6 x LR6 1.5 V Alkaline (AA)
 - 6 x IEC HR6 1.2V NiMH
 - 6 x IEC FR6 1.5 V Lithium (LiFeS2).

The instrument charges using the DC adapter (NiMH cells only), which will work at voltages between 100 and 240 V AC. Charging will only occur if the battery type is set to NiMH.

WARNING : Charge NiMH cells only between 0 °C and +40 °C ambient.

The battery cell type is selected from the settings menu, Refer to 12. Settings on page 64. It will not charge Alkaline or LiFeS2 cells.

To charge the cells in the instrument, it has to have the mains charger kit plugged into the terminal connections. Testing or access the USB is not possible while the instrument is being charged.

See also Refer to 14. Specifications on page 74

3.3 Initial test set up

1. Turn on the EVT100 by rotating the range dial to the test type required.
2. Select the required test mode.



3. Connect the test leads to the EVT100.
 - 3.1. Press the Information (i) button to view the lead set up diagram.

NOTE : When the diagram is displayed a test cannot be performed. Press Information (i) button to return to the test screen

This test can also be performed with just the red and the black lead.



4. Connect the test leads to the unit under test.

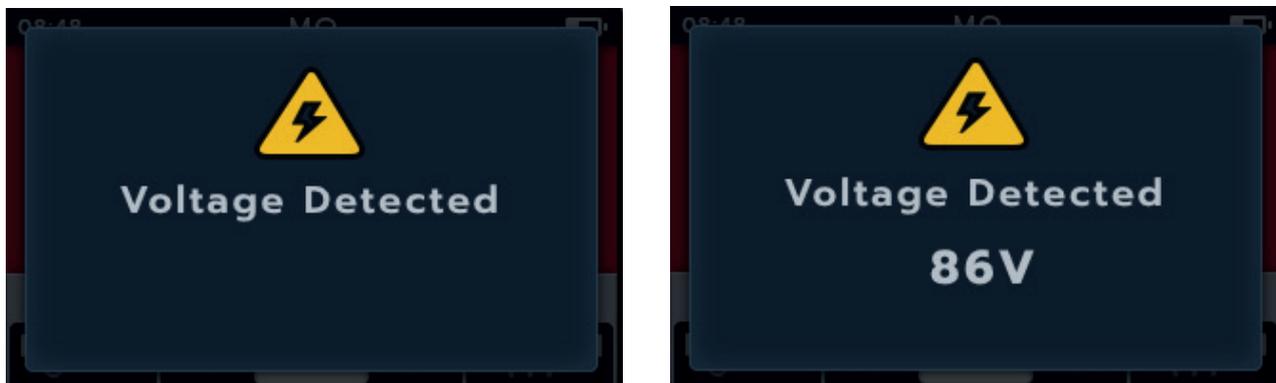
3.3.1 Test Lead connections

Switch the range dial to the required test mode and press the Information (i) button.
Screen shows leads connected to terminal panel for the test.

Test Mode	Test sub-mode	Lead connections
 Insulation Resistance	Insulation resistance 3 pole/phase Polarisation index Timed Dielectric absorption ratio Variable voltage	
 Voltmeter	DC	
 Continuity	Uni-directional Bi-directional Diode	
 DLRO Low Resistance Ohmmeter	Single direction (auto and manual) Bi-direction (auto and manual) 3 pole/phase	
 Temperature measurement	Thermocouple temperature Manual temperature	

3.4 Lockout Voltage

Before testing, the measurement board will carry out a short a pre-test voltage check. If the lockout voltage is exceeded, the user will see an overlay menu showing the current voltage measured. The overlay will disappear if the voltage is lowered below the lockout voltage threshold.



The lockout voltage is active on all test modes. It is hard-coded to Activate at 20 V. The only exception is the insulation resistance tests, where the lockout voltage can be set in the settings (as 20 V, 30 V, 50 V or 75 V).

3.5 Temperature compensation

Temperature compensation is available in a selection of test range sub-modes:

- Insulation resistance
 - IR tests
 - 3 pole/phase test
 - Timed test
- DLRO Low Resistance Ohmmeter
 - Uni-directional
 - Bi-directional
 - 3 pole/phase

Temperature compensation is **OFF** by default.

3.5.1 Example for using Temperature compensation

Turn the temperature compensation on and off by pressing soft key 4

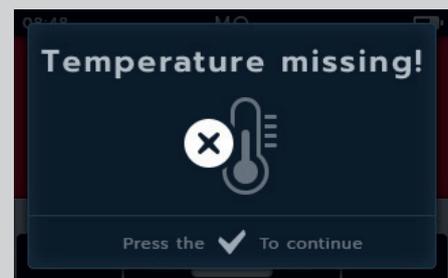
NOTE : Before a test can be carried out with temperature compensation enabled, the temperature of the unit under test must be established.

For this procedure Refer to 12.2.4 Temperature compensation on page 65



If a temperature measurement hasn't been made, the right of the secondary field will show -- °C.

If a test is attempted with temperature compensation enabled the unit will display a Temperature missing pop-up window.



If the temperature reading is more than 30 minutes old, a red time stamp will be displayed in the secondary field above the temperature reading.



4. Insulation Resistance Tests

WARNING : Hazardous voltages are emitted throughout the insulation resistance tests. Do not touch the test leads while testing is in progress (after test button has been pressed). The warning triangle will flash on the display during these tests.

Insulation resistance tests can be carried out at the following settings 50 V, 250 V, 500 V, 1 kV and variable voltage (). These are all coloured red and are positioned across the top of the rotary switch.

The test method for each voltage setting is identical.

Variable voltage is user selectable, Refer to 12. Settings on page 64. The variable voltage setting is configurable between 10 V to 999 V.

4.1 Insulation test options

Icon	Description
IR:	Insulation resistance.
PI:	Polarization Index is the ratio between insulation resistance values recorded at 1 minute (assigned t1) and 10 minutes (assigned t2).
DAR:	Dielectric Absorption Ratio, it is the ratio between the insulation resistance values at 15 or 30 seconds (assigned t1) and at 60 second interval (assigned t2). i.e. after 30 seconds and 60 seconds. $DAR = 15 \text{ or } 30 \text{ (default) second value} / 60 \text{ second value}$.
T(s):	Time IR = Selectable from 1 minute to 10 minutes, in 1 minute increments.
3P	3 Phase. To test insulation resistance phase to phase.

WARNING :  This warning triangle flashes when any voltage is being output in the insulation resistance test process.

4.2 Two Terminal and Guard

The EVT100 is fitted with a guard terminal. The guard terminal is used to conduct leakage currents away from the measured circuit to reduce errors.

The guard terminal is only used for insulation testing and as an additional connection in 3-phase testing. The lead is coloured blue.



The guard lead (G) is optional. When used, it should be connected to the guard conductor, screen, steel wire armoured conductor, or "user added" conductive wire or wrapper, such as foil.

For further information refer to **application guides** published by Megger.

4.3 Automatic discharge

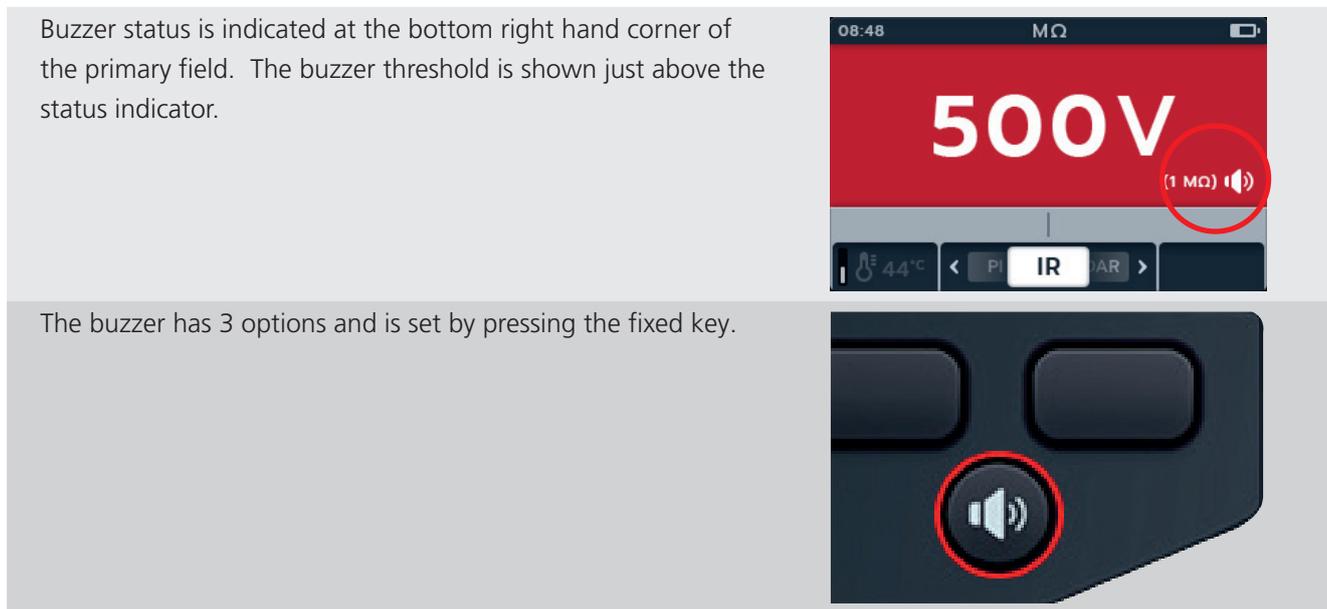
Following any insulation test, when the TEST button is released, the discharge loop begins to discharge the test piece. The automatic discharge loop will discharge the unit under test, removing any hazardous voltage introduced by the insulation test.

During the automatic discharge loop, the lightning symbol will flash and the falling voltage displayed on the left of the secondary field.

After the automatic discharge loop has finished, the secondary result is displayed in the secondary field again and the buzzer sounds for one second.

4.4 IR Buzzer settings

Set the buzzer to the preferred option before starting an Insulation resistance test.



The options are OFF (default), ON and Optical. Press and release the buzzer key until the desired function is reached.

Visual indicator	Description
	Buzzer off No indication given.
	Buzzer on - loud mode Sound icon will appear on screen and buzzer will sound.
	Buzzer on - optical / silent mode Eye icon will appear on screen.

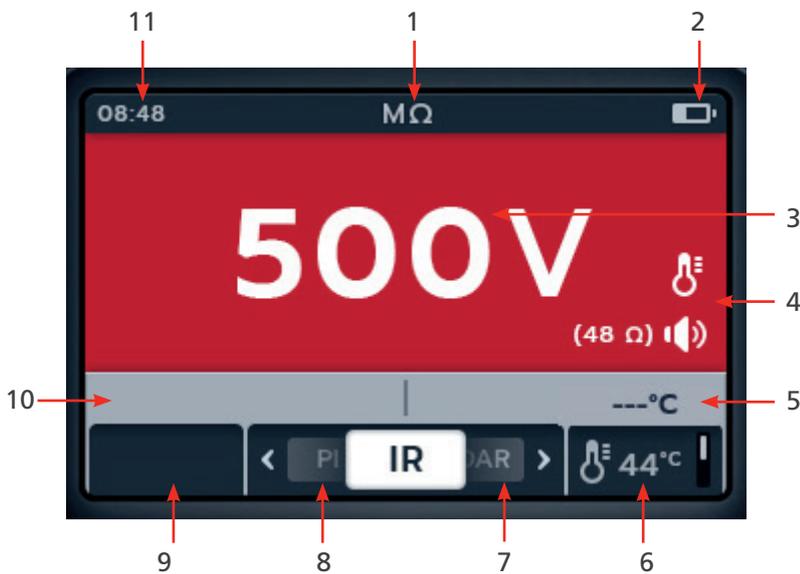
Insulation Resistance Tests

When running an IR test, buzzer is active, but will not sound unless the limit is achieved or passed. When passed the audio will sound and the background will flash. A pass band is shown in the analogue scale and is highlighted in green.



The insulation threshold buzzer rate can be adjusted in the settings. Refer to 12.2.2 Insulation threshold on page 65

4.5 Insulation Resistance test display



Item	Description	Item	Description
1	Insulation resistance mode	6	Soft key 4 - Temp compensation
2	Battery indicator	7	Soft key 3 - carousel sub mode right
3	Test measurement / results	8	Soft key 2 - carousel sub mode left
4	Buzzer setting details	9	Soft key 1 - not used
5	Secondary field - Temp compensation settings	10	Secondary field - voltage and amps
		11	Time

4.6 IR Test sequence

1. The display will show the selected voltage, in this case 500 V.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes. IR is default, scroll through to 3P, PI, T(s) DAR.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



3. If required, press soft key 4 to toggle between temperature compensation on and off.

NOTE : This is available in IR, 3 Phase and Timed test mode. To adjust the temperature compensation, Refer to 12.2.4 Temperature compensation on page 65



4. If required, Turn the buzzer OFF, ON-loud or ON-visual only as required by pressing buzzer button. Refer to 4.4 IR Buzzer settings on page 23

NOTE : This is only available in IR, Timed and 3 pole/phase test mode. To adjust the insulation threshold, Refer to 12. Settings on page 64



5. Start the test by pressing and holding down the TEST button. The buzzer will sound on test initiation.

- 5.1. To hold the test voltage, press the LOCK button while the TEST button is held. Once the lock symbol is displayed and the buzzer has sounded, the TEST button can be released. This test will continue until the TEST button or the LOCK button is pressed to stop the test. To enable this Refer to 12.2.3 Lock on page 65

NOTE : As the test starts the Soft Key Function field disappears, secondary and function fields drop to the bottom of the screen. Sub-mode initials separate the secondary fields.



Insulation Resistance Tests

6. During the tests,

- Test results in the primary field show the IR value.
- Status symbols will appear in the bottom right-hand corner of the primary field.
- The secondary field shows the actual voltage and current.



7. The test may be stopped at any time by pressing or releasing the TEST button again

8. When the test has completed the primary field displays the test results.

The secondary field displays actual voltage output and the current measured.



9. To save the test result press the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.

10. To restart the test press the TEST button again.

NOTE : To set up an asset ID Refer to 12. Settings on page 64



4.7 3 Pole/Phase (3P)

1. The display will show the selected voltage, in this case 500 V.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to 3P (3 pole).

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.

3. If required, press soft key 4 to toggle between temperature compensation on and off.

NOTE : This is available in IR, 3 pole and Timed test mode. To adjust the temperature compensation, Refer to 12.2.4 Temperature compensation on page 65

4. To start the test press the TEST button.

A warning triangle will flash on screen.

NOTE : The test can be stopped at any time by pressing the TEST button.



5. During the tests:

- The primary field displays a countdown time in seconds, warning triangle and completed pole to pole tests in the three pole sequence. Each phase icon will flash during each test.
- The secondary field displays actual voltage output and the current measured.



6. When the test has completed:

- The primary field displays the test results and also the actual voltage output and the current measured.
- The secondary field shows the % difference and Temperature compensation



7. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.

NOTE : If the test was stopped before completion, it cannot be saved.

8. To restart the test press the TEST button again.



4.8 Polarization Index (PI)

1. The display will show the selected voltage, in this case 500 V.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to PI (Polarization Index).

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



Insulation Resistance Tests

3. To start the test press the TEST button.

The test will start and the clock will appear in the bottom left of the primary screen. The test will continue for 10 minutes. The clock will countdown the test. An interval result will appear after 1 minute.

A warning triangle will flash on screen.

NOTE : The test can be stopped at any time by pressing the TEST button.



4. During the tests,

- The primary field displays the test results.
- The secondary field displays actual voltage output and the current measured.



5. When the test has completed,

- The primary field displays the test results.



6. The result can be saved by pressing the SAVE button.
A message will inform you the data was saved and which asset ID it was saved to.

NOTE : If the test was stopped before completion, it cannot be saved.

7. To restart the test pressing the TEST button again.



4.9 Timed (T(s)) Test

1. The display will show the selected voltage, in this case 500 V.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to T(s) (Timed Test).

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.

3. If required, press soft key 4 to toggle between temperature compensation on and off.

NOTE : This is available in IR, 3 Phase and Timed test mode. To adjust the temperature compensation, Refer to on page 25



4. To start the test press the TEST button.

The clock will appear in the bottom left corner of the primary field. The Timed test is user configurable and can run for 1,2,3,4,5,6,7,8,9, or 10 minutes Refer to 12.2.6 Timed Insulation on page 66



A warning triangle will flash on screen.

NOTE : The test can be stopped at any time by pressing the TEST button.

5. During the tests,
 - The primary field displays the test results.
 - The secondary field displays actual voltage output and the current measured.



6. When the test has completed,
 - The primary field displays the test results.
 - The secondary field displays actual voltage output and the current measured.



7. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.
8. To restart the test pressing the TEST button again.



4.10 Dielectric Absorption Ratio (DAR)

1. The display will show the selected voltage, in this case 500 V.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to DAR (Dielectric Absorption Ratio).

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



3. To start the test press the TEST button.

The clock will appear in the bottom left corner of the primary field as the DAR test runs for one minute.

A warning triangle will flash on screen.

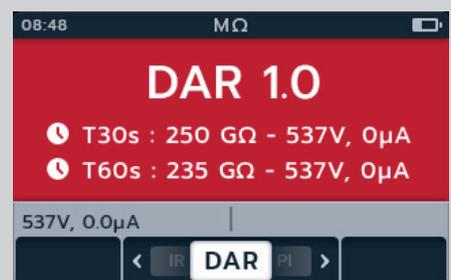
NOTE : The test can be stopped at any time by pressing the TEST button.



4. During the tests,
 - The primary field displays the test results.
 - The secondary field displays actual voltage output and the current measured.



5. When the test has completed,
 - The primary field displays the test results.
 - The secondary field displays actual voltage output and the current measured.



6. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.

NOTE : If the test was stopped before completion, it cannot be saved.

7. To restart the test pressing the TEST button again.



4.11 Variable voltage

1. Turn rotary switch to select variable voltage position.

NOTE : Set the voltage required under the variable voltage test setting. Refer to 12.2.7 Variable Voltage on page 66

2. The display will show the selected voltage, in this case 10 V.



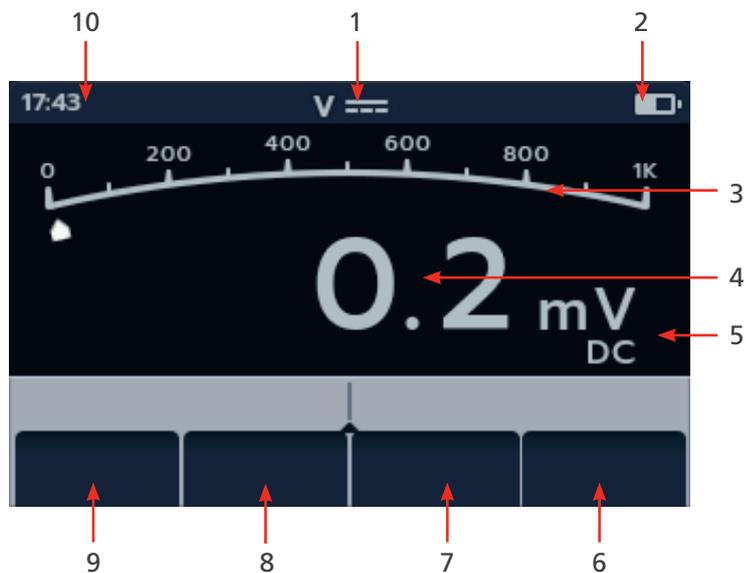
3. Press soft keys 2 and 3 to move the carousel left or right through sub-modes. IR is default, scroll through to 3P, PI, T(s) DAR.



4. Run the chosen test as described in the previous sections.

5. Voltmeter

5.1 Voltage test display



Item	Description	Item	Description
1	Voltage mode	6	Soft key 4 - unused
2	Battery indicator	7	Soft key 3 - unused
3	Analogue test measurement / results	8	Soft key 2 - unused
4	Digital test measurement / results	9	Soft key 1 - unused
5	Result units and setting	10	Time

5.2 DC

1. Turn rotary switch to select the Voltmeter (V) position.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



2. The DC tests start automatically.
3. During the DC tests,
 - The primary field displays the measured voltage.



4. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.



6. Continuity

6.1 Continuity test display



Item	Description	Item	Description
1	Voltage mode	7	Soft key 4 - buzzer (Uni-direction only)
2	Battery indicator	8	Soft key 3 - carousel sub mode right
3	Analogue test measurement / results	9	Soft key 2 - carousel sub mode left
4	Digital test measurement / results	10	Soft key 1 - test current 20 mA / 200 mA
5	Buzzer setting when used	11	Secondary field - present current measured
6	Secondary field left - forward reverse measurement (Bi-direction only)	12	Timed reading
		13	Time

NOTE : Results of measurements can be adversely affected by impedances of additional operating circuits connected in parallel or by transient current.

NOTE :



Null symbol will show when the leads have been nulled to zero.



Crossed null symbol will show when the leads have not been nulled to zero

NULL the test leads by touching the two test probe ends. Press the TEST button until the NULL (symbol) appears on the screen. The ohmic value on the primary screen will read 0 Ω.

6.2 Uni-direction

1. Turn rotary switch to select the Continuity position.
2. If required, turn the buzzer off, on loud or on visual only as required by pressing buzzer button.

NOTE : This is only available in uni-direction mode.



3. To adjust the continuity buzzer threshold press soft key 4.

NOTE : The buzzer mode bypasses the continuity detection and voltage pretesting.



4. A new screen will open where the threshold can be adjusted pressing soft keys 2 and 3.
5. Press soft key 4 to save and return to the original screen.
OR
Press soft key 1 to cancel and return to the original screen.



6. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to uni-direction

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



Continuity

7. The test current can be toggled between 200 mA and 20 mA pressing soft key 1.



8. NULL the test leads by touching the two test probe ends. Press the TEST button until the NULL (symbol) appears on the screen. The ohmic value on the primary screen will read 0 Ω.



9. Connect the test leads to the unit under test.

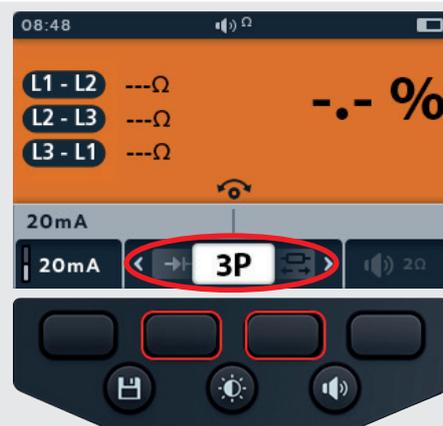
10. This test starts automatically when the test leads are connected to the unit under test.
11. During the tests,
- The primary field displays the result of the true resistance of the unit under test.
 - The secondary field displays test current and the previous resistance value in Uni direction.



6.3 3 Pole / Phase Continuity

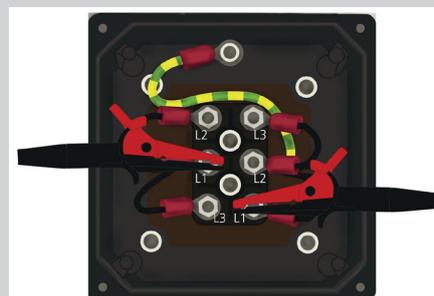
1. Turn rotary switch to select the DLRO (m Ω) position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to 3 pole.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.

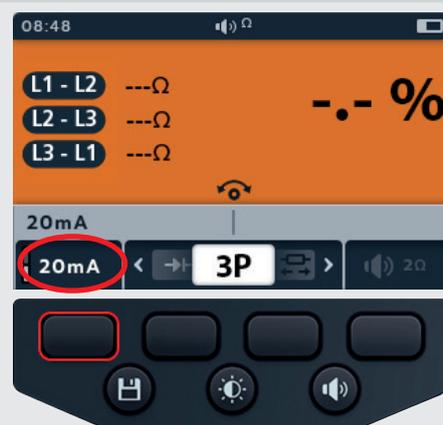


3. Connect the test leads to the unit under test.

NOTE : The connection is for illustrative purposes only showing winding resistance across phase 1.



4. The test current can be toggled between 200 mA and 20 mA pressing soft key 1.



5. Press test



6. Press soft key 1 to assign reading to a phase (or press test before assigning to retest)
7. Move the probes to the next phase
8. Press test

NOTE : A result can be assigned to any phase and there is a possibility to change the phase if required.



Continuity

9. Press soft key 2 to assign reading to a phase (or press test before assigning to retest)
10. Move the probes to the next phase
11. Press test



12. Press soft key 3 to assign reading to a phase

NOTE : The percentage difference is calculated from the largest deviation between test readings



13. When the test has completed,

- The primary field displays the result for percentage difference.

NOTE : The percentage difference is calculated from the largest deviation between test readings



14. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.

NOTE : Results can be saved at any point during the 3 Phase test sequence. One, two or three test values can be saved.

15. To restart the test, press soft key 4 then repeat the steps for 3 Phase testing.



6.4 Bi-direction

1. Turn rotary switch to select the Continuity position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to bi-direction

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



3. The test current can be toggled between 200 mA and 20 mA pressing soft key 1.



4. NULL the test leads by touching the two test probe ends. Press the TEST button until the NULL (symbol) appears on the screen. The ohmic value on the primary screen will read 0 Ω.



5. Connect the test leads to the unit under test.

6. This test starts automatically.
7. During the tests,
 - The primary field displays the result of the true resistance of the unit under test
 - The secondary field displays the test current and the resistance values in both directions - highest value shown in Primary.
 - The test in bi-direction mode runs continually



6.5 Diode test

1. Turn rotary switch to select the Continuity position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to Diode test.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



3. This test starts automatically.
4. During the tests, the primary field displays the voltage drop as it is measured.



- A good forward-biased diode displays a voltage drop ranging from 0.5 to 0.8 V for the most commonly used silicon diodes. Some germanium diodes have a voltage drop ranging from 0.2 to 0.3 V. The voltage drop is also dependent on the test current.
- The meter displays O/C when a good diode is reverse-biased. The O/C reading indicates the diode is functioning as an open switch.
- A bad (open circuit) diode does not allow current to flow in either direction. The meter will display O/C in both directions when the diode is opened.
- A short circuited diode has zero voltage drop reading in both directions.
- If a voltage between 0 V and 3 V is detected, the buzzer will sound and background flash /or background flash depending on what buzzer mode is activated.
- If a voltage above 3 V is detected, the buzzer will NOT sound and the background will not flash, the display will show "OL".

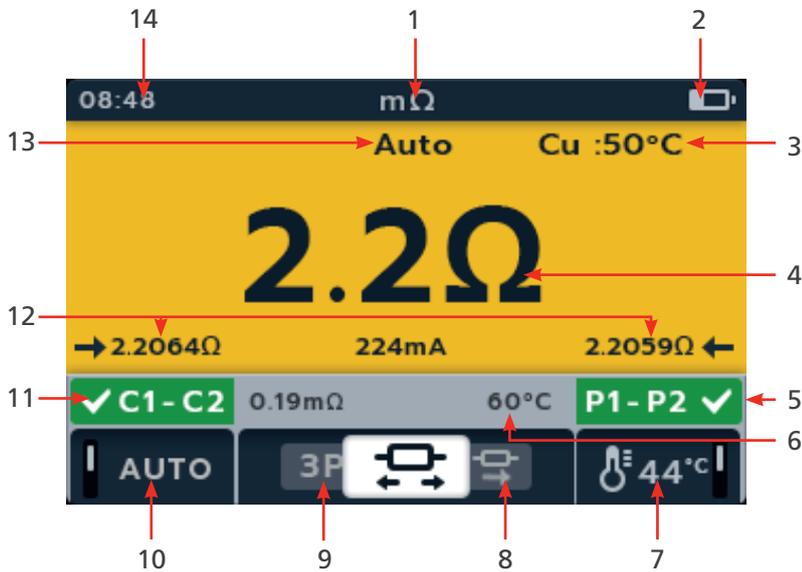


NOTE : The user is responsible for connecting test probes across the diode under test. There is no information displayed in the secondary field at this point. The only information to display is the diode drop voltage if the instrument senses a voltage across the device. If no current flows the main display will show "O/C".

7. DLRO Digital Low Resistance Ohmmeter

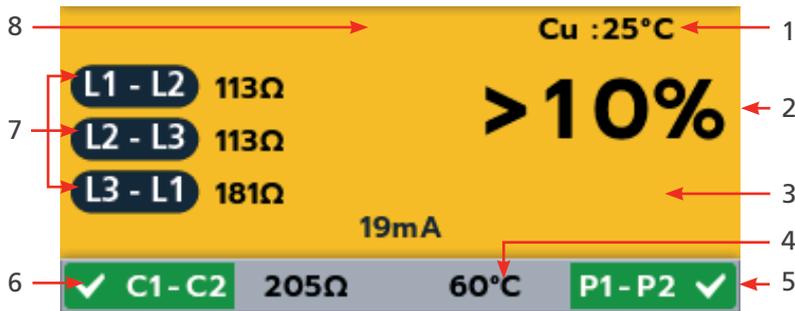
7.1 DLRO display

7.1.1 Uni/Bi-direction test display



Item	Description	Item	Description
1	DLRO mode	8	Soft key 3 - carousel sub mode right
2	Battery indicator	9	Soft key 2 - carousel sub mode left
3	Cable material (temperature compensation)	10	Soft key 1 - Auto test on/off
4	Digital test measurement / results	11	Secondary field - C1-C2 connection status
5	Secondary field left - P1-P2 connection status	12	Forward reverse readings (Bi directional only)
6	Secondary field left - previous temperature compensation measurement	13	Auto on
7	Soft key 4 - Temperature compensation	14	Time

7.1.2 3 Pole/Phase test display



Item	Description	Item	Description
1	Cable material (temperature compensation)	5	Secondary field - P1-P2 connection status
2	Digital test measurement / results	6	Secondary field - C1-C2 connection status
3	Percentage difference	7	3 Phase readings
4	Secondary field left - last recorded temperature of test subject	8	Auto on

7.2 Manual single direction test

1. Turn rotary switch to select the DLRO (mΩ) position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to uni-directional.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



3. Connect the test leads to the unit under test.

4. If there is a continuity reading detected for C and P connections the secondary fields will display with a tick and background will be green.



5. To start the test press the TEST button.
6. The test runs for a few seconds, then automatically stops.



7. During the tests,
 - The primary field displays the result with the actual current being delivered. As the resistance gets higher the current will get lower.
 - The secondary field displays the continuity on the Current (C1-C2) and potential (P1-P2) circuits.



8. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.
9. To restart the test, press the TEST button again.



7.3 Auto Single direction test

1. Turn rotary switch to select the DLRO (mΩ) position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to uni-directional

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.



3. Connect the test leads to the unit under test.

4. Press soft key 1 to enable auto mode.
5. If there is a continuity reading detected for C and P connections the secondary fields will display with a tick and background will be green.

If all the leads are connected correctly, test will start immediately.

6. The test runs for a few seconds then automatically stop



7. During the tests,
 - The primary field displays the result with the actual current being delivered. As the resistance gets higher the current will get lower.
 - The secondary field displays the continuity on the Current (C1-C2) and potential (P1-P2) circuits.



8. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.
9. To restart the test, re-connect to a new test piece and the test will start automatically.



7.4 Manual bi-direction test

1. Turn rotary switch to select the DLRO (m Ω) position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes bi-directional.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.

3. Connect the test leads to the unit under test.



4. If there is a continuity reading detected for C and P connections the secondary fields will display with a tick and background will be green.



5. To start the test press the TEST button.
6. The test runs for a few seconds, then automatically stop.



7. During the tests,
 - The primary field displays a rotating circle to show a test is underway.
 - The secondary field displays the continuity on the Current (C1-C2) and potential (P1-P2) circuits.



8. When the test has completed,
 - The primary field displays the result for current and resistance in each direction and an average of the two.
 - The secondary field displays the continuity on the Current (C1-C2) and potential (P1-P2) circuits.



DLRO Digital Low Resistance Ohmmeter

9. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.
10. To restart the test, press the TEST button again.



7.5 Auto Bi direction test

1. Turn rotary switch to select the DLRO (mΩ) position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to bi-directional.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.

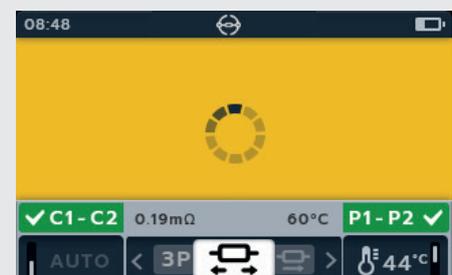
3. Connect the test leads to the unit under test.



4. Press soft key 1 to enable auto mode.
5. If there is a continuity reading detected for C and P connections the secondary fields will display with a tick and background will be green.
6. If all the leads are connected correctly, test will start immediately, runs for a few seconds and then automatically stop.



7. During the tests,
 - The primary field displays a rotating circle to show a test is underway
 - The secondary field displays the continuity on the Current (C1-C2) and potential (P1-P2) circuits



8. When the test has completed,
 - The primary field displays the result for current and resistance in each direction and an average of the two.
 - The secondary field displays the continuity on the Current (C1-C2) and potential (P1-P2) circuits.



9. The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.
10. To restart the test, re-connect to a new test piece and the test will start automatically.



7.6 DLRO 3 Pole/Phase

1. Turn rotary switch to select the DLRO (mΩ) position.
2. Press soft keys 2 and 3 to move the carousel left or right through sub-modes to 3 Phase.

NOTE : The full title text of the sub-mode will appear in the secondary field for a few seconds.

3. Connect the test leads to the unit under test.



4. Press soft key 1 to enable auto mode.
5. If there is a continuity reading detected for C and P connections the secondary fields will display with a tick and background will be green.
6. If all the leads are connected correctly, test will start immediately, runs for a few seconds and then automatically stop.



7. Press test



DLRO Digital Low Resistance Ohmmeter

8. Press soft key 1 to assign reading to a phase (or press test before assigning to retest)
9. Move the probes to the next phase
10. Press test

NOTE : A result can be assigned to any phase and there is a possibility to change the phase if required.



11. Press soft key 2 to assign reading to a phase (or press test before assigning to retest)
12. Move the probes to the next phase
13. Press test



14. Press soft key 3 to assign reading to a phase

NOTE : The percentage difference is calculated from the largest deviation between test readings



15. When the test has completed,

- The primary field displays the result for percentage difference.

NOTE : The percentage difference is calculated from the largest deviation between test readings



16. The result can be saved by pressing the SAVE button.
A message will inform you the data was saved and which asset ID it was saved to.

NOTE : Results can be saved at any point during the 3 Phase test sequence. One, two or three test values can be saved.

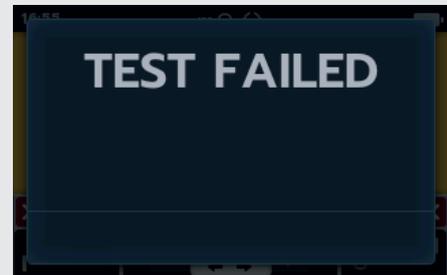
17. To restart the test, press soft key 4 then repeat the steps for 3 Phase testing.



7.7 Test failure

7.7.1 Lost connection

Should the connection be lost during the test the EVT100 will notify the user. The user can re-make the connection then restart the test after a few seconds by pressing the test button or by reconnecting to a test piece.



8. Temperature measurement

Thermocouple connected, type “T” is set as default, the EVT100 can also be configured for “J” and “K” type thermocouples.

Before an insulation resistance test can be carried out with temperature compensation enabled a temperature measurement must be carried out to establish the temperature of the unit under test.

1. Temperature measurement screen will display O/C when the thermocouple is not detected and there is not a previous temperature measurement reordered.



2. Two options are displayed:
 - 2.1. Connect the thermocouple for an accurate temperature measurement.
 - 2.2. Press soft key 4 for a manual temperature measurement.

8.1 Thermocouple temperature measurement

1. Turn rotary switch to select the Thermometer position.
2. Connect the thermocouple test leads to the EVT100.
 - 2.1. Press the Information (i) button to view the lead set up diagram.

NOTE : When the diagram is displayed a test cannot be performed. Press Information (i) button to return to the test screen.

NOTE : The thermocouples are sensitive to polarity.



3. Press soft keys 2 and 3 to move the carousel left or right to choose thermocouple type T, K or J.

A thermocouple symbol appears in the bottom left of the primary screen, alongside the type of thermocouple selected.

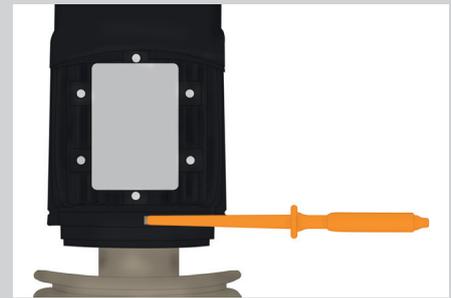


- Press soft key 1 to toggle between °C (Centigrade) or °F (Fahrenheit).

NOTE : This will change the temperature units of measure for all temperature reading within the EVT100 test and measurement results.



- Place the thermocouple against the test piece and allow the thermocouple to rise to a stable temperature.
- The unit starts measuring the temperature as soon as it detects the probe is connected.



- During the test the primary field displays the measured temperature.

NOTE : If the thermocouple is not connected or is damaged the primary field will display "O/C"

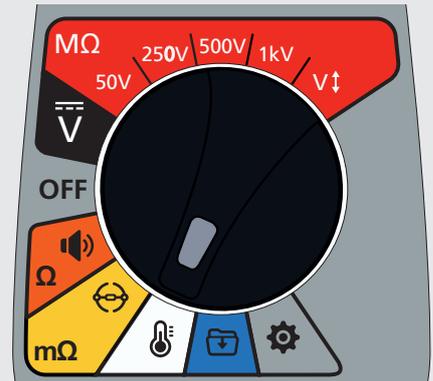


- The result can be saved by pressing the SAVE button. A message will inform you the data was saved and which asset ID it was saved to.



8.2 Manual Temperature measurement

1. Turn rotary switch to select the Thermometer position.



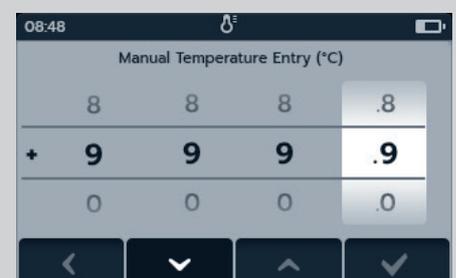
2. Press soft key 4.



3. Press soft keys 2 and 3 to select a positive or negative temperature.
4. Press soft key 4 to confirm or soft key 1 to cancel.



5. Press soft key 2 and 3 to scroll through the digits.
6. Press soft key 4 to accept the first digit and move to the next.
7. Press soft key 2 and 3 to scroll through the digits.
8. Press soft key 4 to accept the second digit and move to the next.
9. Press soft key 2 and 3 to scroll through the digits.
10. Press soft key 4 to accept the third digit and move to the next.
11. Press soft key 2 and 3 to scroll through the digits.
12. Press soft key 4 to accept the temperature value.
13. Press soft key 1 to cancel and return to the previous menu at any point.



14. The new temperature will be displayed.
The result can be saved by pressing the SAVE button.
A message will inform you the data was saved and which asset ID it was saved to.



9. Data management

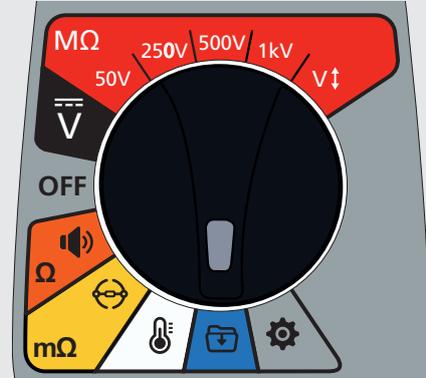
Use data management mode to view saved test results and transfer saved test results to USB drive or PC.

9.1 Creating a new asset ID

1. Turn rotary switch to select the data management position.

The primary field shows list of Assets stored on the EVT100.

The secondary field shows the amount of entries, the total storage available are shown in the left hand field and the number of entries under the selected asset are shown in the right hand field.



2. Press soft keys 2 and 3 to scroll up and down through the asset list.

NOTE : Assets are save and sorted in an ascending order. The chosen asset for saved information is held at the top of the display while scrolling through the list.



3. Press soft key 1 to type in a new asset. The relevant language keyboard screen will appear.



4. Press soft keys 1, 2, 3 and 4 to navigate the keyboard
5. Press the tick button (✓) to type the selected character into the title space in secondary field.
 - Upper case can be selected via the shift key.
 - Select the 123 key for numbers and other symbols.
6. Press the save button to create the asset
or
To cancel the entry select back character (↶) and press the tick button (✓).

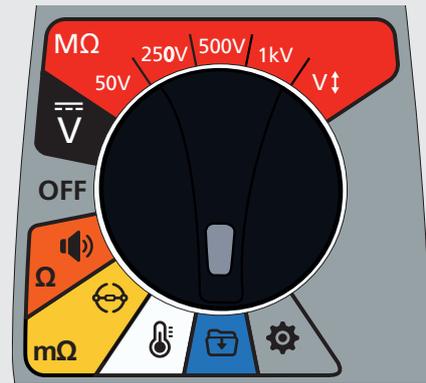


9.2 Using an existing asset ID

1. Turn rotary switch to select the data management position.

The primary field shows list of assets stored on the EVT100.

The secondary field shows the amount of entries, the total storage available are shown in the left hand field and the number of entries under the selected asset are shown in the right hand field.



2. Press soft keys 2 and 3 to scroll up and down through the asset list



3. Press the SAVE button to assign the next measurements to this asset.

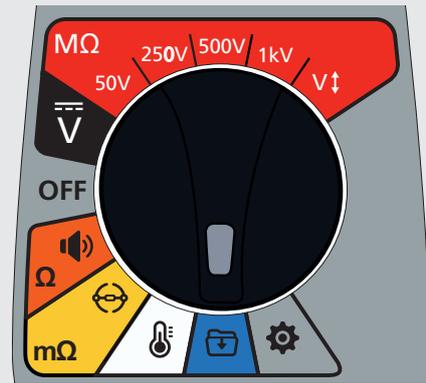


9.3 Deleting an asset

1. Turn rotary switch to select the data management position.

The primary field shows list of Assets stored on the EVT100.

The secondary field shows the amount of entries, the total storage available are shown in the left hand field and the number of entries under the selected asset are shown in the right hand field.



2. Press soft keys 2 and 3 to scroll up and down through the asset list.



3. Press soft key 4 to delete chosen asset and all its entries.



4. Press soft key 4 to confirm
or
Soft key 1 to cancel.

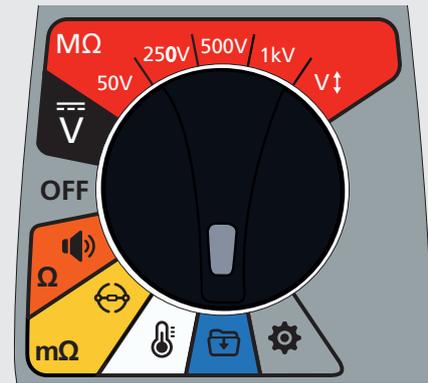


9.4 Deleting items from within an asset

1. Turn rotary switch to select the data management position.

The primary field shows list of Assets stored on the EVT100.

The secondary field shows the amount of entries, the total storage available are shown in the left hand field and the number of entries under the selected asset are shown in the right hand field.



2. Press soft keys 2 and 3 to scroll up and down through the asset list.



3. Press the tick button (✓) to open the chosen asset and all its entries.



4. Press soft keys 2 and 3 to scroll up and down through the list.
5. Press soft key 4 to delete chosen date and all its entries.



6. Press soft key 4 to confirm
or
Soft key 1 to cancel.

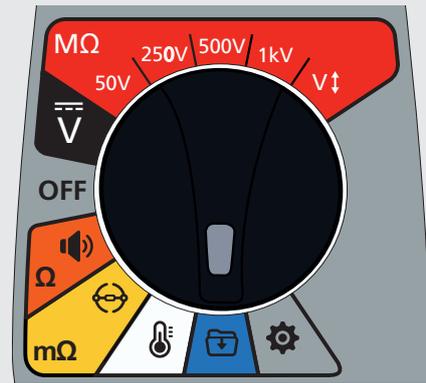


9.5 Deleting a single test

1. Turn rotary switch to select the data management position.

The primary field shows list of assets stored on the EVT100.

The secondary field shows the amount of entries, the total storage available are shown in the left hand field and the number of entries under the selected asset are shown in the right hand field.



2. Press soft keys 2 and 3 to scroll up and down through the asset list.



3. Press the tick button (✓) to open the chosen asset and all its entries.



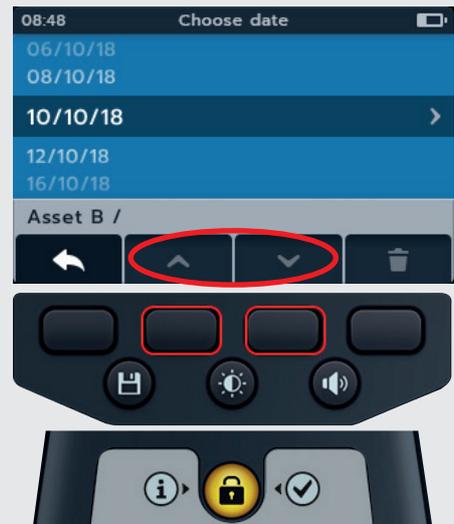
4. Press soft keys 2 and 3 to scroll up and down through the list.
5. Press the tick button (✓) to open the chosen date and all its entries.

The date opens out into colour - coded text (these are the same colours in use on the EVT100 rotary switch).

A number, in parenthesis, to the right hand side of the text line shows the number of results of that type of test saved to that asset, on that date. If no number is present, there are no results saved against this test type.



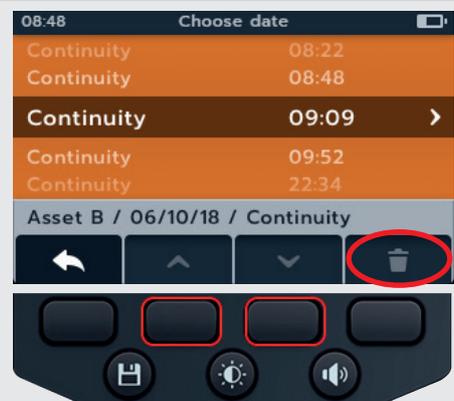
6. Press soft keys 2 and 3 to scroll up and down through the list.
7. Press the tick button (✓) to open to select the test type required.



8. Press soft keys 2 and 3 to scroll up and down through the list of test types.



9. Press soft keys 2 and 3 to scroll up and down through the individual test list.
10. Press soft key 4 to delete the entry.



11. Press soft key 4 to confirm
or
Soft key 1 to cancel.

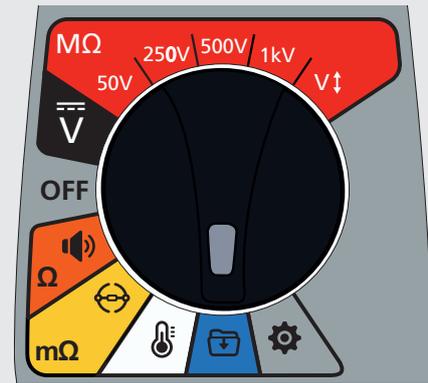


9.6 Exporting entries to USB

1. Turn rotary switch to select the data management position.

The primary field shows list of assets stored on the EVT100.

The secondary field shows the amount of entries and the total storage available are shown in the left hand field and the number of entries under the selected asset are shown in the right hand field.



2. Connect a USB Memory stick to the EVT100.

A USB type A socket is provided on the top of the EVT100 for transferring test results. The position is clearly marked with a USB symbol, the slider must be in the backward position.

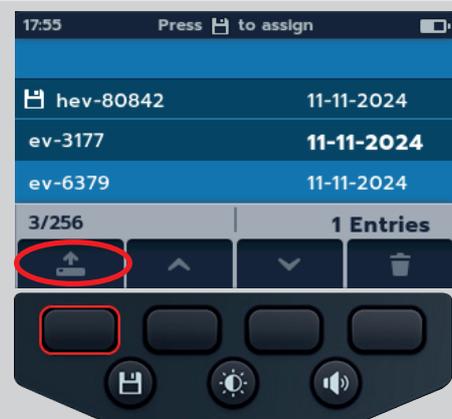
NOTE : When a USB memory stick is recognised, the icon for soft key 1 will change from a plus (+) to the download symbol (↓).



3. Use soft keys 2 and 3 to scroll up and down through the asset list.



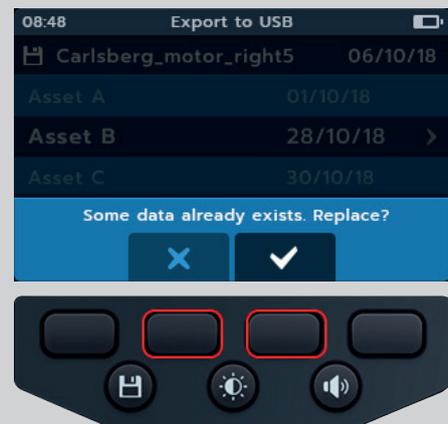
4. Press soft key 1 to begin upload.



5. Press soft key 2 to upload the single asset ID and its measurement entries
or
Press soft key 3 to upload all saved assets and measurements
or
Press soft key 1 to cancel.



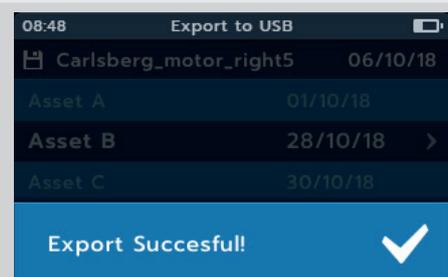
6. If matching names already exist in the storage device the user is asked if the EVT100 should overwrite them.



7. As the data is uploading, a message appears and blocks navigation in the secondary field. No other work can be carried out while uploading is in progress.



8. When the export is successful the EVT100 will notify the user.



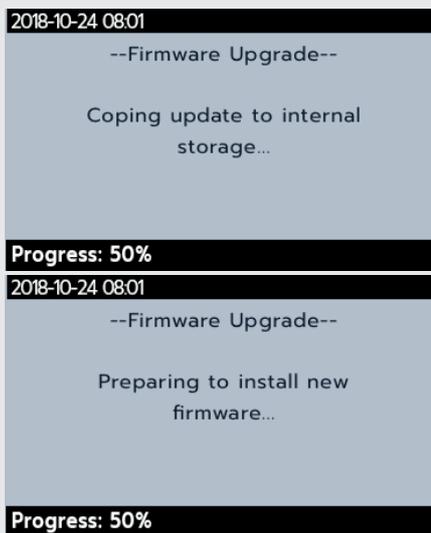
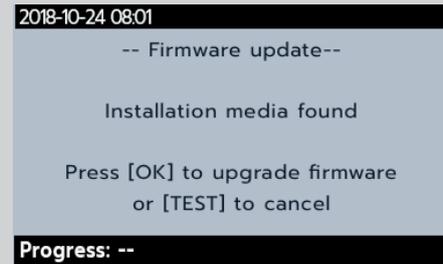
10. Firmware update

Connect a USB flash drive to the EVT100 with the firmware update file in the root directory. The EVT100 will start the update process when the instrument is turned on if a firmware update is available.



1. Ensure the rotary switch is in the off position.
2. Plug the USB pen drive in to the USB slot at the top of the instrument.

3. The boot loader screen will be displayed when the instrument starts up.
4. Press [OK] to upgrade firmware or [TEST] to cancel.
5. The will progress through various stages.



6. When complete, return the range dial to off position.
7. Remove the USB.
8. Restart the EVT100 by turning the rotary switch to any test position.



9. The firmware update screen will display while the update in progress.
10. "Date and time is not set. Remind me later message" will appear. Press soft key 4 to continue.
11. The instrument will reboot after the update is complete.

NOTE : Steps 10 and 11 will only appear if the update file contains an update for the measurement processor, otherwise it will be skipped.



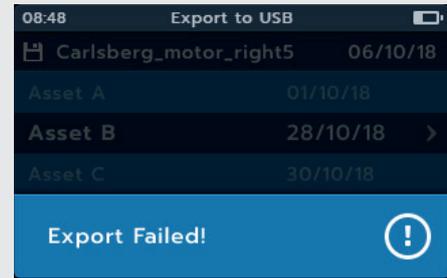
NOTE : If "Date and time is not set. Remind me later message" is received, Refer to 12.4.3 Date on page 67 and Refer to 12.4.7 Time on page 68 to update

11. Error and Warning Conditions

If an error code appears on the display follow the on screen instructions.

11.1 Failed export

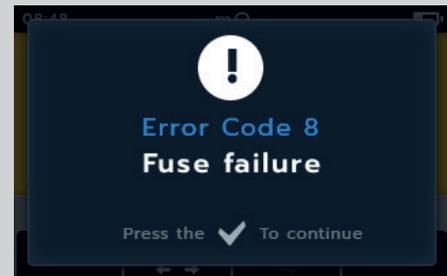
1. If the export fails, the EVT100 will notify the user.
This may be because the receiving USB device is faulty, is disconnected, full or in some other way fails.
2. The EVT100 will return to its previous screen.



11.2 Fuse Failure

If a fuse fails, no measurements can be carried out. A message will appear each time the user tries to run a test. Close the message by pressing tick button (✓). Refer to 13.4 Battery and Fuse Replacement on page 72

NOTE : A fuse failure warning could indicate a very low insulation resistance, check the leads connection and try again.



11.3 Battery Low

The battery is too low to perform a test.



If the error code number is 1000 or higher the instruction on screen will suggest rebooting the instrument and if the problem persists, contact Megger.

For Megger contact details Refer to 16. Calibration, Repair and Warranty on page 78.

12. Settings

Various user settings can be adjusted, serial and software version numbers can be accessed in this section.

IR Test Settings	Continuity	General Settings	Language settings
DAR	Temperature compensation	Back-light timer	English
Insulation threshold		Battery technology	French
Lock		Date	Dutch
Temperature compensation		Instrument information	Spanish
Terminal lockout voltage		Key press notification	
Time insulation		Sleep timer	
Variable voltage		Time	
		Restore factory settings	
		Screen shots	
		Calibration	

12.1 Test settings navigation

All settings are available as listed in the chart above. The set up procedures are all similar to one-another.

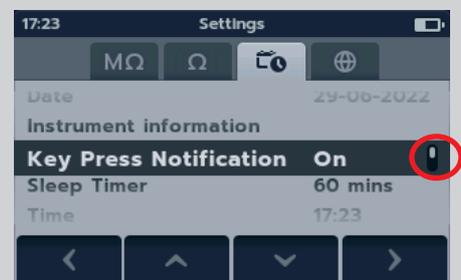
1. Rotate the switch to the settings position.
2. Use Soft keys 1 and 4 to navigate between the top level setting categories.



1. Scroll through the individual settings under each top level using soft keys 2 and 3.
2. Use the tick button (✓) to select a setting.
 - 2.1. This will toggle between the two options where a toggle key is displayed to the right hand side.

or

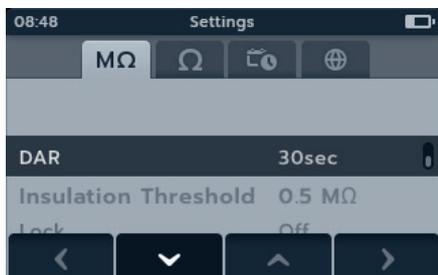
- 2.1. This will enter a sub menu if more than two options are available.



12.2 IR test settings

12.2.1 DAR Settings

There are two options available for DAR. Press the tick button (✓) to toggle between 15 seconds and 30 seconds.



12.2.2 Insulation threshold

There are a number of options available for Insulation threshold.

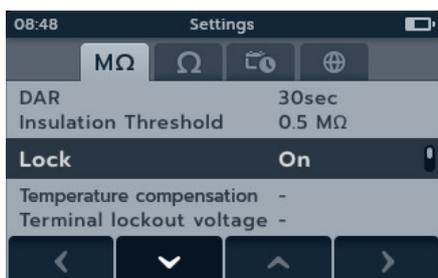
1. Select Insulation Threshold, press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected setting.
4. Press soft key 1 to cancel and return to the previous menu.



12.2.3 Lock

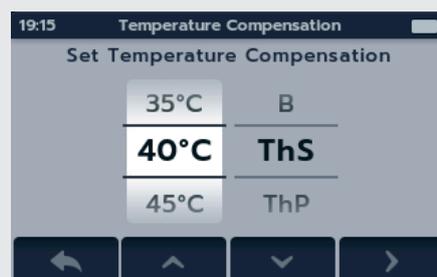
The lock setting enables the lock button for IR tests.

There are two options available for Lock. Press the tick button (✓) to toggle between on and off.



12.2.4 Temperature compensation

1. Select temperature compensation press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected temperature setting and move to the insulation class setting.
4. Press soft key 2 and 3 to scroll through the options.
5. Press soft key 4 to accept the insulation class setting.
6. Press soft key 1 to cancel and return to the previous menu.



NOTE : C and F units can be changed by pressing soft key 1 in the Temperature test mode. Refer to 8. Temperature measurement on page 50

Settings

12.2.5 Terminal lock out

1. Select Terminal lockout press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected setting.
4. Press soft key 1 to cancel and return to the previous menu.



12.2.6 Timed Insulation

1. Select Timed insulation press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected setting.
4. Press soft key 1 to cancel and return to the previous menu.



12.2.7 Variable Voltage

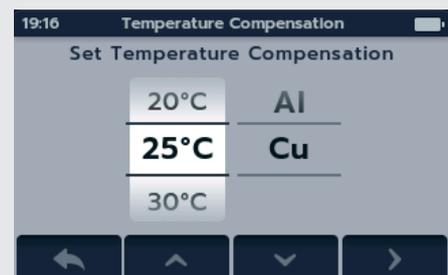
1. Select Variable voltage press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the digits.
3. Press soft key 4 to accept the first digit and move to the next.
4. Press soft key 2 and 3 to scroll through the digits.
5. Press soft key 4 to accept the second digit and move to the next.
6. Press soft key 2 and 3 to scroll through the digits.
7. Press soft key 4 to accept the third digit and save the setting.
8. Press soft key 1 to cancel and return to the previous menu at any point.



12.3 Continuity Settings

12.3.1 Continuity temperature compensation

1. Select Temperature compensation press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected temperature setting and move to the winding material setting.
4. Press soft key 2 and 3 to scroll through the options.
5. Press soft key 4 to accept the winding material setting.
6. Press soft key 1 to cancel and return to the previous menu.

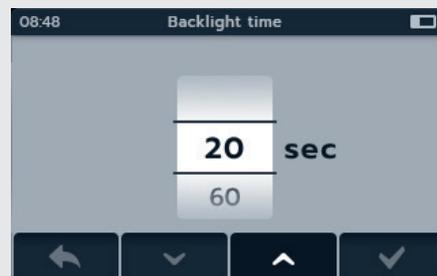


NOTE : C and F units can be changed by pressing soft key 1 in the Temperature test mode. Refer to 8. Temperature measurement on page 50.

12.4 General Settings

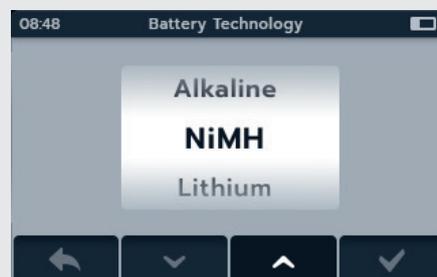
12.4.1 Back-light timer

1. Select back-light timer press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected setting.
4. Press soft key 1 to cancel and return to the previous menu.



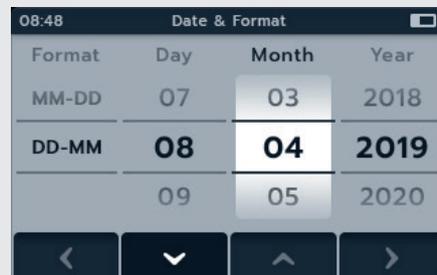
12.4.2 Battery Technology

1. Select Battery technology press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected setting.
4. Press soft key 1 to cancel and return to the previous menu.



12.4.3 Date

1. Select Date press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the date format.
3. Press soft key 4 to accept the format and move to the day.
4. Press soft key 2 and 3 to scroll through the day.
5. Press soft key 4 to accept the day and move to the month.
6. Press soft key 2 and 3 to scroll through the months.
7. Press soft key 4 to accept the month and move to the year.
8. Press soft key 2 and 3 to scroll through the year.
9. Press soft key 4 to accept and save the date.
10. Press soft key 1 to cancel and return to the previous menu at any point.



12.4.4 Instrument information

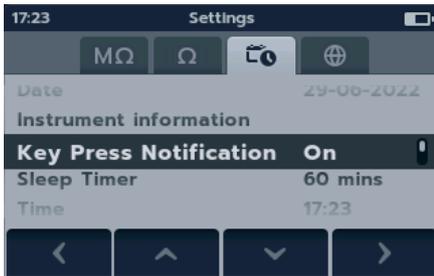
1. Select instrument information press the tick button (✓).
2. The instrument information will display.
3. Press soft key 1 to return to the previous menu.



Settings

12.4.5 Key Press Notification

There are two options available for Key Press Notification. Press the tick button (✓) to toggle between ON and OFF.



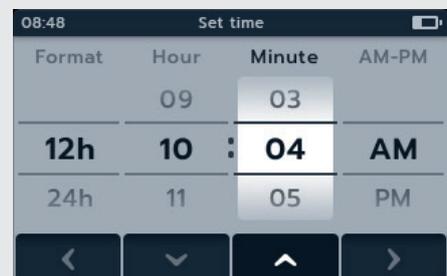
12.4.6 Sleep timer

1. Select Sleep timer press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the options.
3. Press soft key 4 to accept the selected setting.
4. Press soft key 1 to cancel and return to the previous menu.



12.4.7 Time

1. Select Time press the tick button (✓).
2. Press soft key 2 and 3 to scroll through the date format.
3. Press soft key 4 to accept the format and move to the hour.
4. Press soft key 2 and 3 to scroll through the hour.
5. Press soft key 4 to accept the hour and move to the minute.
6. Press soft key 2 and 3 to scroll through the minute.
7. Press soft key 4 to accept and save the time.
8. Press soft key 1 to cancel and return to the previous menu at any point.



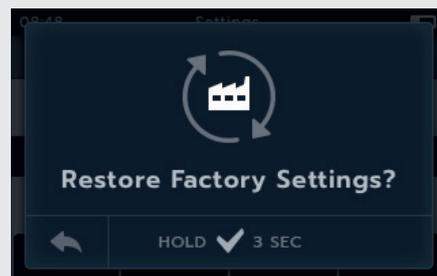
12.4.8 Restore factory settings

When the restore factory settings option is selected a pop screen will appear.

1. Press and hold the tick button (✓) to store the factory settings. This will restore settings and remove any saved data.
or
2. Press soft key 1 to return to the previous menu. This will restore settings and keep any saved data.

After the EVT100 has restored factory setting:

3. Navigate through IR settings and check defaults.
4. Navigate through Continuity settings and check defaults.
5. Navigate to the date and time settings under the General settings tab *Refer to 12.4.3 Date on page 67 and Refer to 12.4.3 Date on page 67*
6. Navigate to Instrument Information and check information is correct



12.4.9 Screen shot

There are two options available for Key Press Notification. Press the tick button (✓) to toggle between ON and OFF.

12.4.10 To take a screen shot

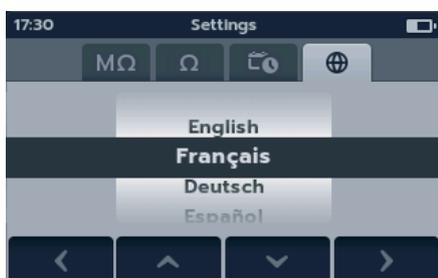
1. Plug a pen drive / USB into top EVT100.
2. Toggle on screen shots in the setting.
3. Press brightness button at any point during use of the EVT100 to take screen shot. These are automatically saved to the attached pen drive.
4. To access the images, open the pen drive on a computer. 2 folders will display on the pen drive, a folder for results and a folder for screen shots. Open the screen shots folder to access the images.

NOTE : Screen shot settings will resets every time instrument is turned off



12.5 Language settings

The languages set in the EVT100 are English, French, German and Spanish. From the settings menu screen select the Language sub-menu using soft keys 2 and 3. Select the required language using soft keys 2 and 3, the language changes immediately.



13. Maintenance

13.1 General Maintenance

- Test leads should be checked before use for damage and continuity.
- Ensure the unit is kept clean and dry after use.
- Close all covers when not in use.

13.2 Cleaning

1. Disconnect from mains power.
2. Wipe the instrument with a clean cloth dampened with either water or isopropyl alcohol (IPA).

13.3 Battery

WARNING : Always set the instrument to Off and remove test leads before battery cells are removed or installed.

CAUTION : Old batteries must be disposed of in accordance with local regulations.

CAUTION : Only use approved batteries as defined below.

Replacement battery types are: 6 x LR6 1.5 V Alkaline (AA), IEC HR6 1.2V NiMH or IEC FR6 1.5 V Lithium (LiFeS₂), Refer to 14. Specifications on page 74.

Battery technology (battery type) can be selected between alkaline, NiMH or Lithium. When changing between battery types always ensure the correct type is selected in the settings menu, if this isn't done the battery reading will be incorrect.

To help maintain the health, reliability and longevity of the installed battery:

- Ensure if using rechargeable batteries they are fully charged before use.
- Store batteries in a cool, dry place. Battery cells can be damaged when exposed to heat.

13.3.1 Battery status

WARNING : Do not recharge Alkaline or Lithium battery cells.

The battery condition icon is positioned at the top right hand corner of display. This icon is displayed at all times when the EVT100 is switched on. When running on battery, the icon will indicate state of charge, the icon will be filled in proportion to the state of charge.

When the battery is in a good state of charge the battery icon will be white and in a low state of charge the battery icon will flash.

When the battery is very low a large red battery icon will appear in the primary field with the message "**Battery low please charge or replace to continue**". No tests will be able to be performed but changes to settings and data handling can be carried out. The battery must be replaced (Alkaline/Lithium) or recharged (NiMH) before the EVT100 can be used.

When the battery is charging, it will show an animation of the battery from empty to full, then repeats. Once the battery is full, the animation stops.

The maximum charging time for NiMH batteries is 6 hours, normal charging time is approximately 4 hours.

13.3.2 12 V supply

When charging NiMH rechargeable battery cells, only use the power supply provided by Megger as an optional extra. Other power supplies will not function with the EVT100. The Megger power supply is designed to preserve the functions and accuracy of the EVT100.

13.3.3 Battery Charging

WARNING : ONLY NiMH battery cells are rechargeable.

When charging the EVT100 while the instrument is OFF, an animated battery will display across the screen to show charging is taking place. Once the battery is fully charged the screen will display a solid green battery.



Battery charging



Battery fully charged

When charging the EVT100 while the instrument is OFF, an animated battery will display in the top right hand corner of the screen. While the EVT100 is charging a test can not be performed. If the test button is pressed the buzzer will sound. However the Data Management and Settings are fully accessible while the instrument is charging.

13.3.4 Battery error screens

Battery Low

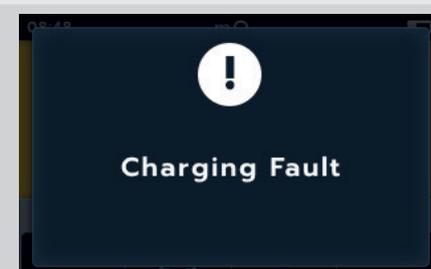
The battery is too low to perform a test.



Charging Fault

A generic charging fault warning screen.

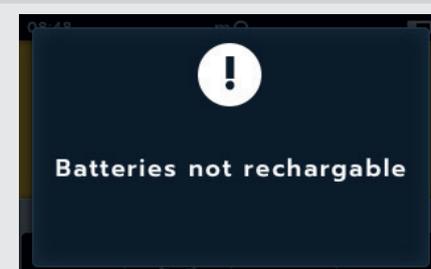
Turn off and disconnect the charger. Then reconnect and try again.



Battery not chargeable

The battery settings are not correct to allow battery charging.

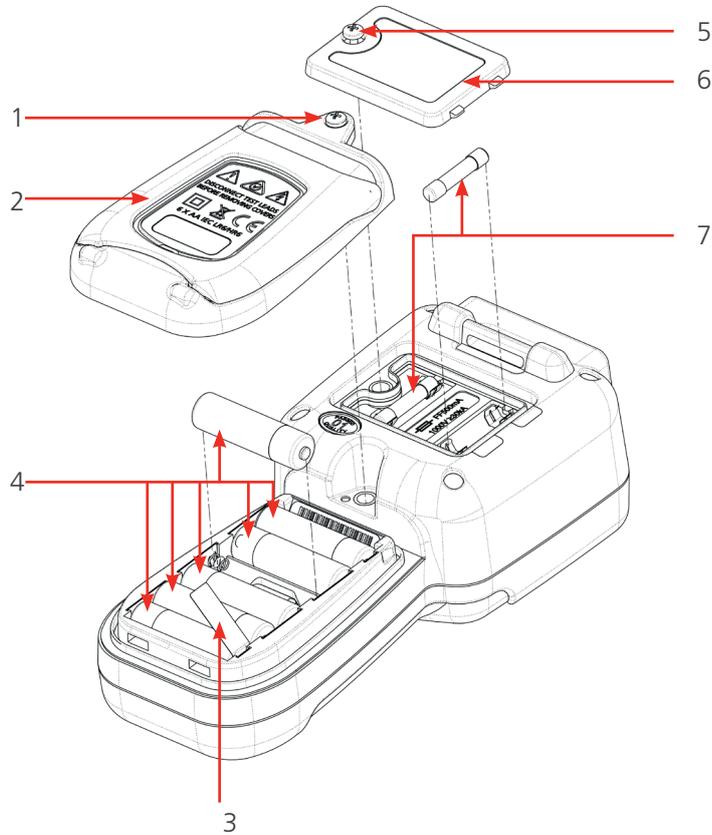
1. Check the correct battery type is in the instrument, Refer to 13.4 Battery and Fuse Replacement on page 72
2. Check the battery settings are NiMH, Refer to 12.4.2 Battery Technology on page 67



13.4 Battery and Fuse Replacement

WARNING : Remove all test leads before removing either the fuse or battery covers.

CAUTION : Battery cells should not be left in the instrument if remaining unused for an extended period.



No.	Description	Quantity
1	Screw, Captive	1
2	Cover, Battery	1
3	Battery isolation tab	1
4	Battery	6
5	Screw, Captive	1
6	Cover, Fuses	1
7	Fuses	2

13.4.1 Replace battery cells and remove isolation tab

The battery cells are housed in the lower section of the EVT100, behind the rotary switch. Looking at the back of the instrument, the lower (battery) cover incorporates a stand and has the replacement cell types written on it.

NOTE : When replacing the battery cells, there is an approximate 3 minute window in which the EVT100 will retain the settings for date and time. If left longer these settings will have to be re-made. If using the EVT100 for the first time remove and discard the battery isolation tab (3).

1. Remove the test leads and ensure the EVT100 is switched off.
2. Slacken one captive cross-point screw (1) which is centred at the top of the cover.
3. Battery cover (2) will now lift away from the top.
4. Ease out of lugs at the bottom of the cover.
5. The six battery cells (4) can now be lifted out of the compartment.

CAUTION : Ensure the new cells are replaced in the correct polarity as indicated on the cells and battery compartment.

CAUTION : Ensure all battery cells are of the same type, do not mix Alkaline, NiMH and Lithium.

6. Replace all six battery cells (4).
7. Replace the battery cover (2) in reverse order to above.
8. Re-secure with screw (1).

13.4.2 To replace the fuses

CAUTION : Glass fuses must not be used.

The fuses are housed in the upper section of the EVT100, behind the display. Looking at the back of the instrument, the upper cover has a fuse symbol on it.

1. Remove the test leads and ensure the EVT100 is switched off.
2. Slacken one captive cross-point screw (5) from the left hand side of the top cover (marked fuses).
3. Fuse cover (6) will now lift away from the left hand side.
4. Ease out of lugs at right hand of the fuse cover.
5. The two fuses (7) can now be accessed and removed.

CAUTION : Ensure correct replacement fuses are used, 500 mA (FF) H. B. C. 30 kA minutes 1000 V (32 mm x 6 mm) refer to *Refer to 14. Specifications on page 74.*

6. Replace fuses (7) as required.
7. Replace the fuse cover (6) in reverse order to above.
8. Re-secure with captive screw (5).

NOTE : Fuses on the P terminals are not user replaceable. If these fail the instrument must be returned to Megger for repair.

14. Specifications

Specification	Detail
Insulation resistance	
Accuracy	Volts Accuracy 50 V 10 GΩ ±2% ±2 digits ±4.0% per GΩ 100 V 20 GΩ ±2% ±2 digits ±2.0% per GΩ 250 V 50 GΩ ±2% ±2 digits ±0.8% per GΩ 500 V 100 GΩ ±2% ±2 digits ±0.4% per GΩ 1000 V 200 GΩ ±2% ±2 digits ±0.2% per GΩ Operational Uncertainty: IEC61557-2
Polarisation index (PI):	10 minute / 1 minute ratio
Dielectric absorption ratio (DAR):	User configurable 15 s or 30 s t1 start time with t2 fixed at 60 s
Guard terminal performance	<5% error at 500 kΩ parallel circuit resistance with 100 MΩ load
Resolution	0.1 kΩ
Short circuit / charge current	2 mA +0% -50% (IEC61557-2)
Terminal voltage accuracy	-0% +2% ±2 V
Test current	1 mA at min. pass value of insulation to a max. of 2 mA max
Operation range	0.10 MΩ to 1.0 GΩ (IEC61557-2)
Leakage current display	0.1 μA resolution 10% (±3 digits)
Voltage display	±3% ±2 digits ±0.5% of rated voltage
NOTE : Above specifications only apply when high quality silicone leads are being used - as supplied with the instrument.	
Continuity	
Measurement	0.01 Ω to 1 MΩ (0 to 1000 kΩ analogue scale)
Accuracy	±3 % ±2 digits (0 to 99.9 Ω) ±5% ± 2 digits (100 Ω - 500 kΩ)
Service Error:	IEC61557-4
Test current	200 mA (-0 mA +20 mA) (0.01 Ω - 4 Ω)
Polarity	Single polarity (Default) Dual polarity (configurable on setup)
Lead resistance	Null up to 9 Ω
Voltmeter	
Range	DC: 0 - 1000 V
Accuracy	DC: ±2% ±2 digits (0 - 1000 V), Operational Uncertainty: IEC61557-1
Diode test accuracy:	±2% ±2 digits 0.01 V to 3.00 V
Display range:	0.00 V to 3.00 V
Temperature measurement and compensation	
Thermocouple	Type T (Type K and Type J)
Thermocouple range	-20 °C to 200 °C (-4 °F - 392 °F)
Instrument range	-20 °C to 1000 °C (-4 °F - 1832 °F)
Instrument resolution	0.1 °C (0.18 °F)
Instrument accuracy	±1.0 °C ±20 digits (±1.8 °F)

Low resistance						
Test current	200 mA DC					
Range	1 mΩ to 10 Ω					
Resolution	0.01 mΩ					
Accuracy	±(0.25% rdg. ±10 digits)					
Results storage						
Storage capacity	256 test results (date / time stamped)					
Data download	USB Type A (USB Mass Storage Device)					
Power						
Battery	6 x AA cells LR6 1.5 V Alkaline FR6 1.5 V Lithium (LiFeS2) HR6 1.2V NiMH					
Battery life	IEC61557-2 - test cycle, 1200 insulation tests with duty cycle of 5 sec testing on 25 sec standby @ 500 V into 0.5 MΩ IEC61557-4 test cycle, 1200 continuity tests with duty cycle of 5 sec testing on 25 sec standby on 1 Ω resistance					
Battery charging	Mains battery charger kit or 12 - 15 V DC vehicle charger					
Safety protection	IEC61010 CAT III 600 V					
EMC	Industrial IEC61326					
Temperature coefficient	<0.1% per °C up to 1 GΩ					
Environment						
Operating temperature range	-10 °C to 50 °C (14 °F to 122 °F)					
Storage temperature range	-25 °C to 50 °C (-13 °F to 122 °F)					
Humidity	90% RH at 40 °C (104 °F) max.					
Calibration temperature	20 °C (68 °F)					
Maximum altitude	3000 m (9843 ft.)					
IP rating	IP 54					
Physical						
Display	Full LCD colour screen with user configurable back-light					
Dimensions	228 x 105 x 77 mm (8.98 x 4.13 x 3.35 in)					
Weight	0.93 kg (2.02 lbs)					
Fuse	x2 500 mA (FF) 1000 V 32 x 6 mm ceramic fuse, high break capacity HBC, 30 kA minimum Glass fuses must not be installed.					
Operational Uncertainty, IEC61557						
Insulation						
	Fiducial Value	A	E ₁	E ₂	E ₃	Operational Uncertainty
0.1 MΩ to 0.99 MΩ	0.1 MΩ	22 %	0	0	0	22 %
1 MΩ to 9.99 MΩ	1 MΩ	4 %	0	0	0	4 %
10 MΩ to 99.9 MΩ	10 MΩ	4 %	0	0	0	4 %
100 MΩ to 999 MΩ	950 MΩ	2.2 %	0	0	5.4 %	8.5 %

Specifications

Continuity						
	Fiducial Value	A	E ₁	E ₂	E ₃	Operational Uncertainty
0.1 Ω to 2 Ω	0.1 Ω	23 %	0	0	0	23 %
Key to table:		A: Intrinsic uncertainty E ₁ : Reference position ±90° E ₂ : Supply Voltage E ₃ : Temperature 0 °C to 30 °C IEC61557 -1, 61557-2 and 61557-4				

15. Accessories and Equipment

15.1 Optional Accessories

Item	Order No.
Mains charger kit	1007-464
Hook strap	1012-068
Soft pouch	1012-063
Multipurpose industrial carry case	1014-985
Kelvin probe lead set CAT III 600 V	1011-929
Kelvin probe pins (pack of 4)	1012-064
Kelvin clip lead set CAT III 600 V	1011-928
Grabber clip lead set CAT III 1000 V, CAT IV 600 V	1012-069
Test probe set, long reach CAT IV 600 V	1012-066
Test probe set, long reach, CAT II 1000 V	1012-065
Temperature probe, T type CAT III 600 V	1012-067
SP5 remote probe accessory	1007-157
Magnetic strap	1010-013

16. Calibration, Repair and Warranty

Megger operate fully traceable calibration and repair facilities to make sure your instrument continues to provide the high standard of performance and workmanship that is expected. These facilities are complemented by a worldwide network of approved repair and calibration companies, which offer excellent in-service care for your Megger products.

For service requirements for Megger instruments contact:

Megger Limited Archcliffe Road Dover Kent CT17 9EN U. K. Tel: +44 (0) 1304 502 243 Fax: +44 (0) 1304 207 342	OR	Megger 400 Opportunity Way Phoenixville PA 19460 USA Tel: +1 610 676 8579 Fax: +1 610 676 8625
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16.1 Return procedure

WARNING : Remove the battery cells before shipping this instrument.

UK and USA Service Centres

1. When an instrument requires recalibration, or in the event of a repair being necessary, a Returns Authorisation (RA) number must first be obtained from one of the addresses shown above. The following information is to be provided to enable the Service Department to prepare in advance for receipt of your instrument and to provide the best possible service to you:
 - Model (for example, EVT100).
 - Serial number (found on the display under settings, device information, or on the rear cover and by the batteries or on the calibration certificate).
 - Reason for return (for example, calibration required, or repair).
 - Details of the fault if the instrument is to be repaired.
2. Make a of the RA number. A returns label can be emailed or faxed to you if required.
3. Pack the instrument carefully to prevent damage in transit.
4. Before the instrument is sent to Megger, freight paid, make sure that the returns label is attached or that the RA number is clearly marked on the outside of the package and on any correspondence. Copies of the original purchase invoice and packing should be sent simultaneously by airmail to expedite clearance through customs. In the case of instruments which require repair outside the warranty period, an immediate quotation can be provided when obtaining the RA number.
5. Track the progress on line at www.megger.com.

17. Decommissioning

17.1 WEEE Directive

The crossed out wheeled bin symbol placed on Megger products is a reminder not to dispose of the product at the end of its life with general waste.



Megger is registered in the UK as a Producer of Electrical and Electronic Equipment. The Registration No is WEE/ HE0146QT.

For further information about disposal of the product consult your local Megger company or distributor or visit your local Megger website.

17.2 Battery disposal

The crossed out wheeled bin symbol placed on a battery is a reminder not to dispose of batteries with general waste when they reach the end of their usable life.



The battery, is located under the battery cover on the back of the instrument. To remove the battery follow the instructions in *Refer to 13.4 Battery and Fuse Replacement on page 72.*

For disposal of batteries in other parts of the EU contact your local Megger branch or distributor.

Megger is registered in the UK as a producer of batteries (registration No.: BPRN00142).

For further information see www.megger.com

18. Worldwide Sales Offices

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This instrument is manufactured in the United Kingdom.

The company reserves the right to change the specification or design without prior notice.

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