



## AVO® 840

### TRMS 1000 V AC/DC Digital Multimeter with Low-Z

*User Guide*

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## 1. Introduction

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The AVO®840 multimeter is for professional electricians, technicians, service personnel and engineers that require high reliability, build quality, and performance in a compact, tough case. Suitable for applications where more than the basic functions are needed.

The AVO840 digital multimeter provides a comprehensive feature set including Bluetooth® and mobile app on your Android™ or iOS smart device, allowing you to share live measurements, monitor readings from safe distances, and get your job done easier than ever before. The low impedance (Low-Z) feature presents a low impedance input to the circuit under test. This reduces the possibility of false readings due to ghost voltages and improves accuracy when testing to determine absence or presence of voltage frequency, diode, capacitance, and a Type K thermocouple input for temperature measurement.

This multimeter combines a range of features, precise measurements, and quality construction into a tool of exceptional value. Easy to use and built to last, the AVO840 offers long-term stability for everyday use.

The meter meets CAT III and CAT IV IEC 61010-2-033 standards. The IEC 61010-2-033 safety standard defines three measurement categories (CAT II to IV) based on the magnitude of danger from transient impulses. See below for further information.

Read the ensuing safety regulations attentively before using this device.

### 1.1 Company web site

Occasionally an information bulletin may be issued via the Megger web site. This may concern 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](http://www.megger.com)

## 2. Safety warnings and standards

National 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 danger and risk of injury such as inadvertent short circuits. Where assessments show that the risk is significant then the use of fused test leads may be appropriate.

Warnings and precautions must be read and understood before an instrument is used. They must be observed during operation of the instrument.

### 2.1 Warnings, cautions and notes

This user guide follows the internationally recognised definition. 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.

### 2.2 Safety warnings

The following safety information must be observed to ensure maximum personal safety during the operation of this meter:

- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- The instrument is intended for use in a pollution degree 2 environment. Keep the instrument clean and dry; do not use the instrument in wet conditions.
- The instrument is not intrinsically safe. Do not use the instrument in an explosive atmosphere.
- Check the equipment before use. Do not operate the instrument or connect it to any external system if it shows visible signs of damage or if it has been stored for prolonged time in an environment outside its specification.
- Test leads and probes must be in good order, and free from defects e.g. broken or cracked insulation.
- When using test leads or probes, keep fingers behind the finger guards.
- Do not apply or remove test leads on or around uninsulated hazardous live conductors where a potential to cause electric shock, electrical burns or arc flash exists.
- Measurements beyond the maximum selected range must not be attempted.
- Extreme care must be taken when measuring above 50 V, especially on live exposed contacts.
- The circuit under test must be switched off, de-energized, securely isolated, and proved dead before carrying out continuity (buzzer), resistance, capacitance or diode tests.
- Remove test connections before turning the rotary selector switch.
- To avoid false readings that could lead to electric shock and injury, replace the battery as soon as the low battery indicator appears.



- Disconnect test leads whenever the battery cover is removed.
- Never operate the meter unless the back cover and the battery-and-fuse cover is correctly in place and fastened securely with the manufacturer-supplied fastener .
- Replacement fuses must be of the correct type and rating.
- Check for correct instrument operation by testing a known voltage before and after use. Do not use it if misleading results are obtained.
- Personal protective equipment should be used if there are accessible hazardous live parts in the installation where measurement is to be carried out.

### 2.2.1 Installation category definitions:

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

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

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







CAT I - Measurement category I: The circuits are not connected to mains.

Measurement equipment may be safely connected to circuits at the marked rating or lower.








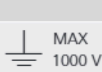

The connection rating is that of the lowest rated component in the measurement circuit.

### 2.3 Safety, hazard and warning symbols on the instrument

Disconnect the test leads from the test points before changing the position of the function rotary switch. Never connect a source of voltage with the function rotary switch in  $\Omega$ ,  $-(-)$ , or  $\text{⏏}$  position. Do not expose meter to extremes of temperature or high humidity.

Icon	Description
	Warning: High Voltage, risk of electric shock
	Caution: Refer to user guide
	UK conformity. This equipment complies with current UK legislation
	EU conformity. Equipment complies with current EU directives
	Conforms to relevant Australian Safety and EMC standards
	AC measurement

## Safety warnings and standards

	DC measurement
	Direct and alternating current
	Equipment protected by double or reinforced insulation
	Battery
	Earth
	Fuse
	Application around and removal from hazardous live conductors is permitted
	The terminal(s) must not be connected to a circuit point at which the voltage with respect to earth ground exceeds (in this case) 1000 V AC or V DC
	Do not dispose of via landfill, sewage system or by fire

Do not expose the batteries to excessive heat; to do so may cause an explosion. Do not use any metallic objects to short circuit the positive and negative ends of the battery. Do not mix with the solid waste stream. Spent batteries should be disposed of by a qualified recycler or hazardous materials handler per local regulations. Contact your authorized Megger Service Center for recycling information. Keep batteries away from children.

## 2.4 Input protection limits

NEVER apply voltage or current to the instrument that exceeds the specified maximum:

Function	Maximum Input
V DC	1000 V DC RMS
V AC	1000 V AC RMS
Low-Z	600 V AC RMS / 600 V DC
mA AC/DC	800 mA 1000 V fast acting fuse
A AC/DC	10 A 1000 V fast acting fuse
Frequency, resistance, capacitance, duty cycle, diode test, continuity	600 V DC / AC RMS
Temperature	1000 V DC / AC RMS
Surge protection	8 kV peak per IEC 61010

### Unsafe voltage

**WARNING** : When the multimeter detects a potentially hazardous voltage,  $\leq 30$  V or a voltage overload (OL) in V mode, the symbol is displayed.

## 2.5 Features

- Safety rated CAT III 1000 V, CAT IV 600 V
- Accurate true RMS AC current and voltage
- Measure frequency up to 10 kHz
- Low-Z V range 1000 V
- Resistance, continuity, and diode measurements
- 6000  $\mu$ F capacitance range
- Bright backlight display
- High resolution 6000 counts LCD
- Current measurement to 10 A
- Built in torch
- Analogue bar graph
- IP44 (dust and water resistance) rating
- Designed and tested to withstand a 2 m (6 ft 7 in) drop
- Bluetooth interface and Megger app

### 3. Instrument overview

#### 3.1 Unpacking and inspection

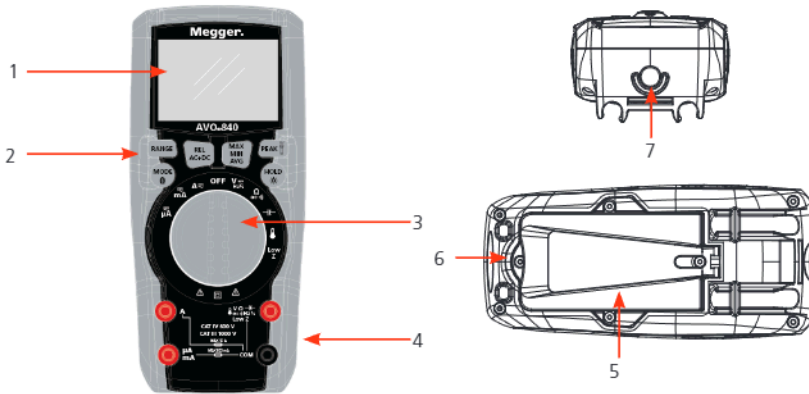
Upon removing your new multimeter from its packing, you should have the following items:

- AVO840 Multimeter
- 1 m 4 mm non-fused, right angle test leads\* (x2)
- 4 mm exposed metal probes\* (x2)
- Exposed tip probes for CAT II probing (x2)
- Red + Black crocodile clips\*
- K-type multimeter adapter
- K-type thermocouple lead
- Soft case
- 4 mm cap plugs (x2)
- Quick start guide
- 4x AAA Alkaline batteries



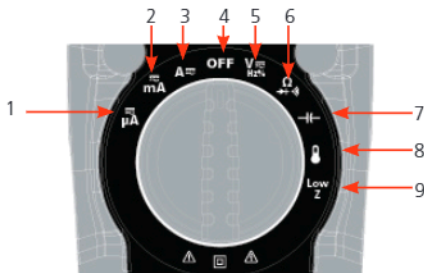
\*Ratings: Double insulated, CAT III 1000 V, CAT IV 600 V, 10 A max

#### 3.2 Instrument layout



Item	Description	Item	Description
1.	6000 count LCD	5.	Tilt stand
2.	Softkeys	6.	Fuse and battery cover
3.	Function switch	7.	Torch
4.	Terminals		

### 3.3 Rotary switch

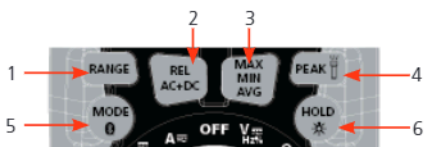


Turn the rotary switch to select a measurement function.

Item	Function Switch	Function
1.	µA AC/DC	AC, DC micro-amps measurements
2.	mA AC/DC	AC, DC milli-amps measurements
3.	A AC/DC	AC, DC amps measurements
4.	OFF	
5.	V AC/DC Hz	AC+DC voltage measurements, frequency measurements
6.	Ohms Diode Continuity	Resistance, diode test and continuity measurements
7.	Capacitance	Capacitance measurements
8.	Temperature	Temperature measurements
9.	Low-Z	Low impedance measurements

### 3.4 Softkeys

The softkeys on the front of the instrument activate features within each function selected from the rotary switch, navigate menus or control power to instrument circuits.



Item	Softkey	Item	Softkey
1.	RANGE	4.	PEAK
2.	REL AC + DC	5.	MODE
3.	MAX MIN AVG	6.	HOLD

## Instrument overview

The AVO840 has six push buttons on the front of the Meter to activate features that extend the function selected using the rotary switch.

### 3.4.1 Range

The AUTO range mode automatically selects the proper range for the measurement being made and is generally the best mode for most applications. When the meter is turned off/on it will default to AUTO range mode.

Default mode is AUTO. For measurements that require a range be manually selected, perform the following:

1. Press the RANGE button, The AUTO indicator will no longer be shown on the LCD.
2. Press the RANGE button to step through the available ranges until the desired range is selected.
3. To exit the manual mode, press and hold the RANGE button until the AUTO indicator reappears.

**NOTE :** The range button does not work on Frequency, duty cycle, capacitance or temperatures modes.

### 3.4.2 MODE / Bluetooth® button

#### MODE

Press the MODE button to select the mode within a test

- Voltage AC, DC, frequency or duty cycle,
- Resistance, continuity or diode test
- Temp °C or °F.
- Low-Z AC or DC
- Current AC or DC

#### Bluetooth®

Bluetooth allows readings to be displayed and stored on mobile devices.

To activate Bluetooth:

1. Press and hold the Bluetooth button until the Bluetooth symbol appears on the LCD.
2. Bluetooth should be disabled when not connected to a mobile device to conserve battery power.
3. To turn off Bluetooth, press and hold the Bluetooth button until the Bluetooth symbol no longer appears on the display.

### 3.4.3 REL/AC+DC button

The Relative function (REL) zeros out the reading on the display and stores it as a reference. Subsequent readings will be displayed as the relative difference between the actual measurement and the stored reference value.

To activate,

1. Press the REL/AC+DC button,  
The REL indicator will appear on the LCD along with the relative reading.
2. Press the REL/AC+DC button again to return to normal operation.

**NOTE :** The meter does not Auto range when the Relative mode is active.

The display will read OL if the difference exceeds the range.

When this occurs, exit REL and use the RANGE Button to select a higher range.

**NOTE :** REL does not work on frequency, duty cycle, Low-Z or temperature.

- The AC+DC function measures both the AC and DC components to derive the effective RMS (AC+DC) value.
- The AC+DC mode is typically used when measuring voltage on unfiltered rectifier circuits.
- To activate. Press and hold the REL/AC+DC Button until AC+DC appears on the LCD.

**NOTE :** AC+DC can only be accessed when the meter is set to AC or DC voltage.

### 3.4.4 MAX/MIN/AVG button

Cycle through the modes of the MAX/MIN/AVG mode to select the relevant reading. As a default setting the MAX/MIN/AVG is turned off.

From default:

- Press the MAX/MIN/AVG button once to view the highest reading.  
"MAX" will appear on the LCD and the meter will display and hold the highest reading.  
The meter will update the reading when a higher max reading occurs.
- Press the MAX/MIN/AVG Button twice to view the lowest reading.  
"MIN" will appear on the LCD and the meter will display and hold the lowest reading.  
The meter will update the reading when a lower min reading occurs.
- Press the MAX/MIN/AVG button 3 times to view the average reading, "AVG" will appear on the LCD and the meter will display the running average. The meter will update the reading when the average value changes.
- Press and hold the MAX/MIN/AVG Button to end MAX/MIN/Average and return to normal operation.

## Instrument overview

**NOTE :** \*The meter does not auto range when the MAX/MIN/AVG mode is active. The display will read "OL" if the range is exceeded. When this occurs, exit MAX/MIN/AVG and use the RANGE button to select a higher range.

**NOTE :** \*\*MAX/MIN/AVG does not work on Frequency, Duty Cycle or Temperature.

### 3.4.5 HOLD/Backlight button

The HOLD/backlight button has 2 functions.

1. To freeze the reading on the LCD, press the HOLD / backlight button. The "HOLD" indicator will be displayed while the reading is being held.
2. Press the HOLD / backlight button again to exit HOLD and return to normal operation.
3. To turn the backlight on, press and hold the HOLD / backlight button until the backlight turns on.
4. To turn the backlight off, press and hold the HOLD / backlight button until the backlight turns off.

**NOTE :** The backlight will automatically turn on when in lowlight. This cannot be overridden by holding the HOLD / backlight button.

### 3.4.6 PEAK/Torch button

The Peak/Torch button has 2 functions. The peak reading at highest or lowest point, and turning on or off the flash light.

The PEAK function is accessible when measuring AC Voltage or Current. It captures and displays the highest positive peak and the highest negative peak of the AC waveform.

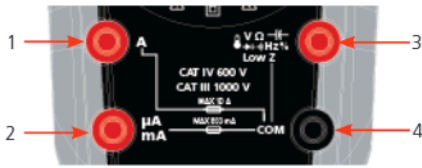
1. Press the PEAK/Torch button to view the highest positive peak.  
Peak MAX will appear on the LCD and meter will display and hold the highest reading.  
The meter will update the reading when a higher positive peak occurs.
2. Press the PEAK/Torch button a second time to view the lowest negative peak.  
Peak MIN will appear on the LCD and the meter will display and hold the highest reading.  
The meter will update the reading when a lowest negative peak occurs.
3. Press the PEAK/Torch Button again to exit PEAK and return to normal operation.

The flash light function turns on the light on the top of the multimeter.

1. Press and hold the PEAK/Torch button until the Torch turns on.
2. Press and hold the PEAK/Torch Button until the Torch turns off.



### 3.5 Terminals



All functions except current use the VΩ and COM input terminals. The two current input terminals.

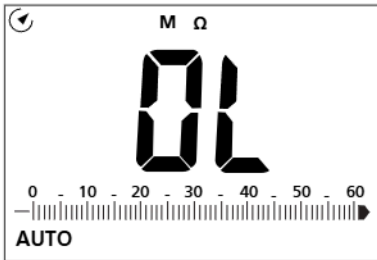
Item	Description	Item	Description
1.	10 A Input terminal. Input for 0 A to 10.00 A current.	3.	Positive input terminal. Input for voltage, continuity, resistance, diode test, capacitance, frequency and temperature
2.	μA mA Input terminal. Input for 0 A to 800 mA current.	4.	Common input terminal. Return terminal for all measurements.



## 4. Operation

**WARNING : Risk of electrocution. High-voltage circuits, both AC and DC, are very dangerous and should be measured with great care.**

- ALWAYS turn the rotary switch to the OFF when the meter is not in use.
- 'OL' appears in the display when a measurement value exceeds the range you have selected. Change to a higher range.



For user safety it is important to:

- Always connect the common (COM) probe first and then connect the live probe to the circuit or the instrument.
- Always remove the live probe first and then remove the common (COM) probe.

### 4.1 Current measurements

**WARNING : To prevent possible electrical shock, fire, or personal injury:**

- Never attempt to make an in-circuit current measurement when the open-circuit potential to earth is >1000 V.
- Check the instrument fuses before testing. ([Consult chapter 6. Battery and fuse replacement on page 33.](#))
- Use the proper terminals, switch position, and range for your measurement.
- Never place the probes in parallel with a circuit or component when the leads are plugged into the current terminals.

#### 4.1.1 DC current measurements

**CAUTION : Do not make current measurements greater than 10 A.**

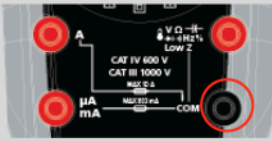


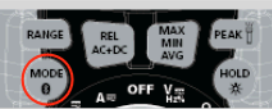
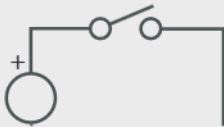
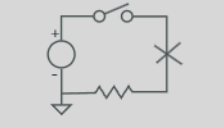
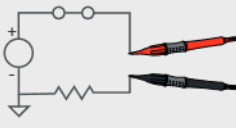
1. Set the function switch.

For current measurements up to:

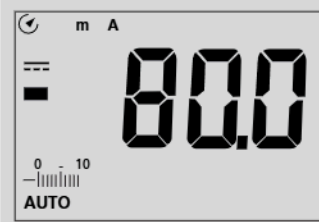
- 1.1. 6000  $\mu$ A DC, set function switch to  $\mu$ A.
- 1.2. 600 mA DC set function switch to mA.
- 1.3. 10 A Set function switch to A.



## Operation

<p>2. Insert the black test lead 4 mm plug into the COM terminal.</p>	
<p>3. For current measurements.</p> <p>3.1. up to 6000 <math>\mu</math>A DC, 3.2. up to 600 mA DC.</p> <p>Insert the red test lead 4 mm plug into the <math>\mu</math>A/mA terminal.</p>	
<p>4. For current measurements</p> <p>4.1. up to 10 A DC.</p> <p>Insert the red test lead 4 mm plug into the A terminal.</p>	
<p>5. Press the MODE button to cycle through setting until the display shows the DC current icon (<math>\rightarrow</math>).</p>	
<p>6. Turn off the power.</p>	
<p>7. Break the circuit.</p>	
<p>8. Insert the meter probes in series with the circuit.</p>	

9. Turn on the power.
10. The results will be displayed.

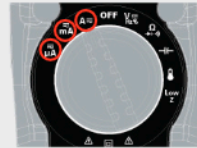


### 4.1.2 AC current measurements

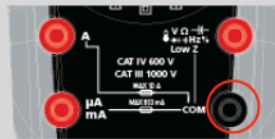
**CAUTION : Do not make current measurements greater than 10 A.**

**Exceeding this current for grater than 30 seconds may cause damage to the meter and/or the test leads.**

1. Set the function switch to the mA position.  
For current measurements up to:
  - 1.1. 6000  $\mu$ A AC, set function switch to  $\mu$ A.
  - 1.2. 600 mA AC set function switch to mA.
  - 1.3. 10 A Set function switch to A.

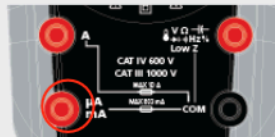


2. Insert the black test lead 4 mm plug into the COM terminal.



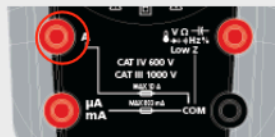
3. For current measurements.
  - 3.1. up to 6000  $\mu$ A AC,
  - 3.2. up to 600 mA AC.

Insert the red test lead 4 mm plug into the  $\mu$ A/mA terminal.



4. For current measurements.
  - 4.1. up to 10 A AC.

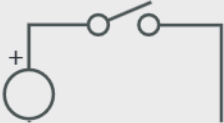
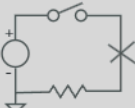
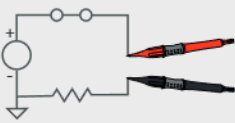
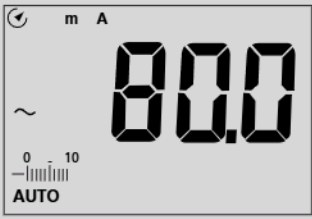
Insert the red test lead 4 mm plug into the A terminal.



5. Press the MODE button to cycle through setting until the display shows the AC current icon (~).



## Operation

6. Turn off the power.	
7. Break the circuit.	
8. Insert the meter probes in series with the circuit.	
9. Turn on the power. 10. The results will be displayed.	

## 4.2 Voltage measurement

The instrument features true RMS measurement, which gives accurate readings for distorted sine waves and other waveforms such as square waves, triangle waves, and staircase waves.

### 4.2.1 V AC or DC voltage measurements

**WARNING : Risk of Electrocution.**


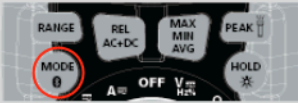
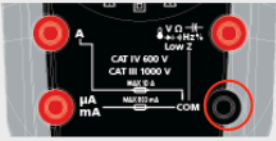




**The probe tips may not be long enough to contact the live parts inside some 240 V outlets as the contacts are recessed deep in the outlets.**

**This may result in the reading showing 0 V when the outlet has voltage on it.**

**Make sure the probe tips are touching the metal contacts inside the outlet before assuming that no voltage is present.**

- Never attempt to make an in-circuit current measurement when the open circuit potential to earth is >1000 V.
- Check the Meter's fuse before testing. ([Consult chapter 6.1.1 Test the fuses on page 34](#))
- Use the proper terminals, switch position, and range for your measurement.
- Never place the probes in parallel with a circuit or component when the leads are plugged into the A (Amps) terminal.


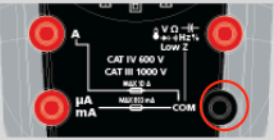





**CAUTION : Do not measure AC or DC voltages if a motor on the circuit is being switched ON or OFF, large voltage surges may occur that can damage the meter.**

<p>1. Set the switch to the V DC position.</p>	
<p>2. Press the MODE button to switch between AC and DC. They AC/DC symbol with appear on the screen.</p>	
<p>3. Insert the black test lead 4 mm plug into the COM terminal.</p>	
<p>4. Insert the red test lead 4 mm plug into the V terminal.</p>	
<p>5. Touch the black test probe tip to the negative side of the circuit.</p>	
<p>6. Touch the red test probe tip to the positive side of the circuit.</p>	
<p>7. The results will be displayed.</p>	

## Operation

### 4.2.2 Frequency and % Duty cycle measurements

**WARNING : Observe all safety precautions when working on live voltages. Do not measure frequency or duty cycle on circuits that exceed 600 V.**





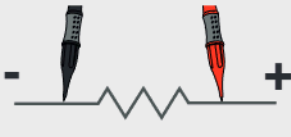
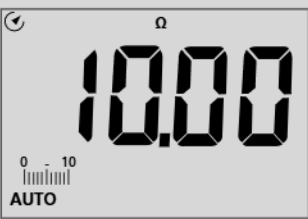
1. Set the switch to the V DC Hz% position.	
2. Insert the black test lead 4 mm plug into the COM terminal.	
3. Insert the red test lead 4 mm plug into the positive V terminal.	
4. Press the MODE button until the Hz or % symbol appears on the LCD.	
5. Touch the black test probe tip to the negative side of the circuit.	
6. Touch the red test probe tip to the positive side of the circuit.	
7. The results will be displayed.	



## 4.3 Resistance, continuity and diode testing







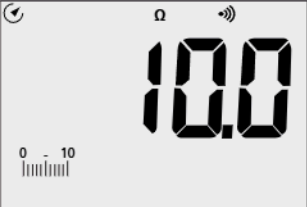
### 4.3.1 Resistance measurements

**WARNING :** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.




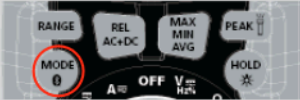
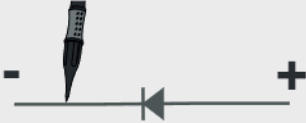
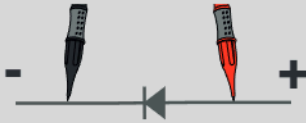
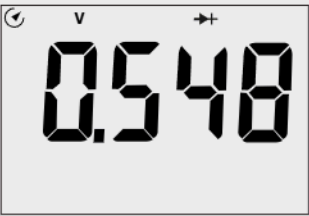
1. Set the function switch to the $\Omega$ position.	
2. Insert the black test lead 4 mm plug into the COM terminal.	
3. Insert the red test lead 4 mm plug into the positive $\Omega$ terminal.	
4. Touch the black test probe tip to the negative side of the circuit.	
5. Touch the red test probe tip to the positive side of the circuit.	
6. The results will be displayed.	

### 4.3.2 Continuity check

**WARNING :** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any continuity checks. Remove the batteries and unplug the line cords.





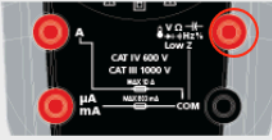

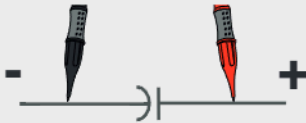
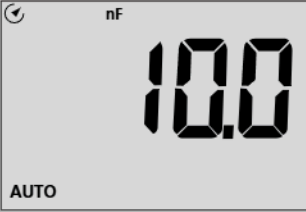
<p>1. Set the function switch to the continuity <math>\Omega</math> position</p>	
<p>2. Insert the black test lead 4 mm plug into the COM terminal.</p>	
<p>3. Insert the red test lead 4 mm plug into the positive continuity <math>\Omega</math> terminal .</p>	
<p>4. Press the MODE button to cycle through setting until the display shows conductance mode (<math>\Omega</math>) in top right hand side.</p>	
<p>5. Touch the black test probe tip to the negative side of the circuit.</p>	
<p>6. Touch the red test probe tip to the positive side of the circuit.</p>	
<p>7. The results will be displayed.</p> <p><b>NOTE :</b> If the resistance is less than approximately 250, the audible signal will sound. If the circuit is open, the display will indicate "OL".</p>	

### 4.3.3 Diode test

<p>1. Set the function switch to the Diode <math>\rightarrow +</math> position.</p>	
<p>2. Insert the black test lead 4 mm plug into the COM terminal.</p>	
<p>3. Insert the red test lead 4 mm plug into the positive Diode (<math>\rightarrow +</math>) terminal.</p>	
<p>4. Press MODE button to cycle through setting until the display shows the Diode icon (<math>\rightarrow +</math>) in top right hand side.</p>	
<p>5. Touch the black test probe tip to the negative side of the circuit.</p>	
<p>6. Touch the red test probe tip to the positive side of the circuit.</p>	
<p>7. The results will be displayed.</p> <p><b>NOTE :</b> Forward voltage will indicate 0.4 to 0.7 on the main display</p> <p><b>NOTE :</b> The voltage will typically indicate 0.400 to 3.200 V.</p> <p><b>NOTE :</b> A reverse voltage will indicate "OL".</p> <p><b>NOTE :</b> Shorted devices will indicate near "OV"</p> <p><b>NOTE :</b> An open device will indicate "OL" in both polarities.</p>	




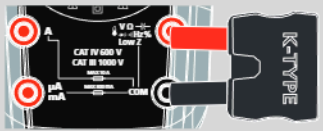




## 4.4 Capacitance measurements

**WARNING :** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

<p>1. Set the function switch to the Capacitance (  ) position.</p>	
<p>2. Insert the black test lead 4 mm plug into the COM terminal.</p>	
<p>3. Insert the red test lead 4 mm plug into the positive Capacitance (  ) terminal.</p>	
<p>4. Touch the black test probe tip to the negative side of the circuit.</p>	
<p>5. Touch the red test probe tip to the positive side of the circuit.</p>	
<p>6. The results will be displayed.</p>	

## 4.5 Temperature measurements



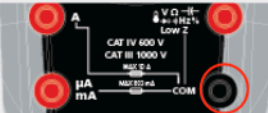




**WARNING : Do not connect K-type lead to live circuits.**

<p>1. Set the function switch to the Temperature  position.</p>	
<p>2. Insert the K-type adapter into the COM and Temp terminal.</p> <p><b>NOTE :</b> Check the black goes to COM and red TEMP </p>	
<p>3. Connect the wire probe to the K-type adapter check making sure to observe the correct polarity + to + and - to -.</p>	
<p>4. Press the MODE button to change the temperature units (°C or °F), displayed in top right hand side.</p>	
<p>5. Place probe tip at heat source to be measured.</p>	
<p>6. The results will be displayed.</p>	

## 4.6 Low-Z voltage measurements

**WARNING : Observe all safety precautions when working on live voltages. Do not connect to circuits that exceed 600 V AC/DC when the meter is set to Low-Z.**

Low-Z is used to check for ghost voltage, Ghost voltages are present when non-powered wires are near wires powered wires. Capacitive coupling between wires make it appear that non-powered wires are connected to a real source of voltage.

<p>1. Set the function switch to the Low-Z position.</p>	
<p>2. Press the MODE button to cycle through setting to choose AC or DC current icon (~ or →).</p>	
<p>3. Insert the black test lead 4 mm plug into the COM terminal.</p>	
<p>4. Insert the red test lead 4 mm plug into the positive Low-Z terminal.</p>	
<p>5. Touch the black test probe tip to the negative side of the circuit.</p>	
<p>6. Touch the red test probe tip to the positive side of the circuit.</p>	
<p>7. The results will be displayed.</p>	

## 5. Maintenance

---

**NOTE :** There are no user replaceable parts within this product, other than the rechargeable battery and the fuses.

### 5.1 General maintenance

Ensure the unit is kept clean and dry after use.

Close all covers when not in use.

Test leads and adaptors should be checked before use for damage and continuity.

### 5.2 Cleaning

Disconnect from mains power / charger.

Switch off and remove battery cells.

Wipe the instrument with a clean cloth dampened with either water or isopropyl alcohol (IPA).

### 5.3 Battery

**WARNING :** Always set the instrument to OFF 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.

Battery (and fuses) are user-accessible using a screwdriver to remove access covers to the left of the grip (and to the right of the barrel respectively).

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

Remove battery cells if the instrument is not going to be used for a long period.

Store batteries in a cool, dry place. Batteries can be damaged when exposed to heat.

#### 5.3.1 Battery status

**WARNING :** Do not recharge Alkaline batteries.

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

## 5.4 Maintenance

**WARNING :** To prevent possible electrical shock, fire, personal injury, or damage to the Product:

- Repair the instrument before use if the battery leaks.
- Do not operate the instrument with covers removed or the case open. Hazardous voltage exposure is possible.
- Remove the input test leads before you clean the instrument.
- Use only specified replacement parts.
- Have an approved technician repair the instrument.
- Use only specified replacement fuses.
- Replace a blown fuse with exact replacement only for continued protection against arc flash.
- Keep the meter dry. If it gets wet, dry it with a clean cloth.

## Maintenance

- Use and store the meter in normal temperatures. Temperature extremes can shorten the life of the electronic parts and distort or melt plastic parts.
- Handle the meter gently and carefully, dropping it can damage the electronic parts or the case.
- Keep the meter clean, Wipe the case occasionally with a damp cloth,
- Do not use chemicals, cleaning solvents, or detergents.
- Use only fresh batteries of the recommended size and type, remove old or weak batteries so they do not leak and damage the unit.
- If the meter is to be stored for a long period of time, the batteries should be removed to prevent damage to the unit.



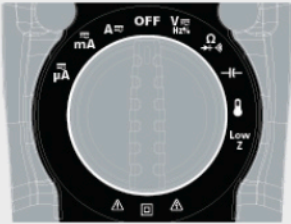
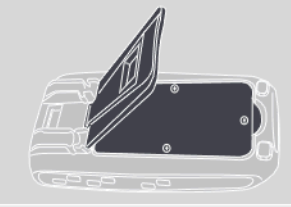

## 6. Battery and fuse replacement

**WARNING :** Switch off the instrument and remove any connection before removing the battery cover.


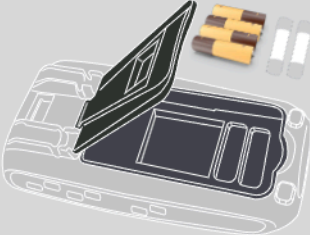

**CAUTION :** Batteries should not be left in the instrument if remaining unused for an extended period.

The batteries are user-accessible using a screwdriver to undo the latch then open the access cover. Fuses are user-accessible using a screwdriver to undo the latch then open the access cover.

### 6.1 Replacing the battery and fuses

Description	Model Number
10 A 1000 V 30 kA Fast acting ultra rapid ceramic fuse	50 199 06/10A
800 mA 1000 V 30 kA Fast acting ultra rapid ceramic fuse	70-172-40/0.8A
1. Turn the multimeter off and remove the test leads from the terminals.	
2. Extend the tilt stand to expose the battery door.	
3. Open the rear battery cover by removing the four screws using a Phillips head screwdriver.	

## Battery and fuse replacement

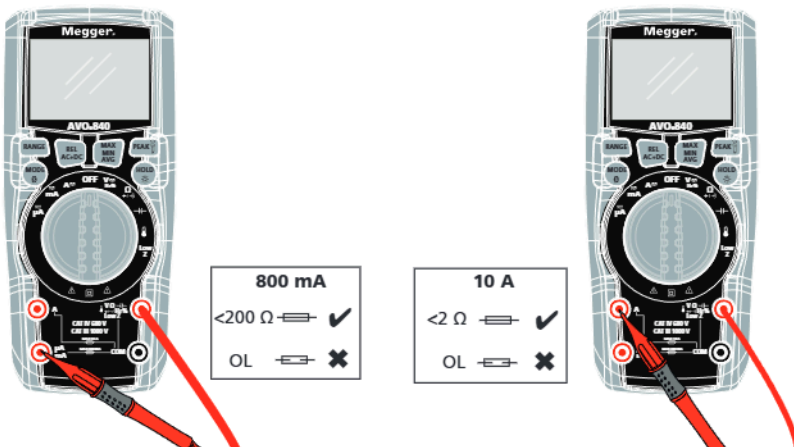
4. Lift the battery cover off of the instrument.	
5. Remove the remove the batteries and fuses.  <b>NOTE :</b> Use correct tool to avoid damaging components inside.	
6. Replace the batteries	
6.1. Insert the battery into battery holder, observing the correct polarity!	
7. Replacing the fuses	
<b>NOTE :</b> Use ONLY fuses with the amperage, interrupt, voltage, and speed rating specified.	
8. Fit the fuse/battery cover back on.	
9. Secure with the screw.	

**CAUTION :** Do not over tighten the screws as this could damage the thread

### 6.1.1 Test the fuses

Test fuses as shown below.

800 mA fuse	10 A fuses
800 mA <200 Ω = OK	10 A < 2 Ω = OK
800 mA OL = Fuse not OK	10 A OL = Fuse not OK




## 7. Specifications

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity less than 70 %. Accuracy specifications take the form of:  $\pm$ (% of Reading) + [Counts]

Specification	Detail
Maximum voltage between any terminal and earth ground	1000 V
F1 Fuse protection for A inputs	10 A, 1000 V, 30 kA
F2 Fuse protection for mA input	800 mA, 1000 V, 30 kA
Battery	Four "AAA" 1.5 V cells
Display	6000 LCD
Operating altitude	2000 m maximum.
Operating temperature	0 °C to +40 °C (+32 to +104 °F)
Storage temperature	-10 °C to +60 °C (+14 to +140 °F)
Operating humidity	Max 70% up to 31 °C (88 °F) decreasing linearly to 50% at 40 °C (104 °F).
Storage humidity	80% at 40 °C (104 °F)
Size (H x W x D)	170 mm x 74 mm x 45 mm
Weight	370 g with battery 417 g
Safety	IEC 61010-1: Pollution Degree 2 IEC 61010-2-033: CAT IV 600 V, CAT III 1000 V
EMC	IEC 61326-1: Portable Electromagnetic Environment, CISPR 11: Group 1, Class A, IEC 61326-2-2
Enclosure	Double moulded, IP44 (dust and water resistance) rating
Shock (drop test)	2 meters (6 feet 7 inches)
Continuity check	Audible signal will sound if the resistance is less than <50 Ω (approx.), test current <0.35 mA
PEAK	Captures peaks > 1 ms
Temperature sensor	Requires type K thermocouple
Input impedance	> 10 MΩ V DC and >9 MΩ V AC
AC response	True RMS
AC True RMS	The term stands for "Root-Mean-Square," which represents the method of calculation of the voltage or current value. Average responding multimeters are calibrated to read correctly only on sine waves, and they will read inaccurately on non-sine wave or distorted signals. True rms meters read accurately on either type of signal
ACV bandwidth	50 Hz to 1000 Hz

## Specifications

Overrange indication	OL is displayed
Measurement rate	3 readings per second
Auto power OFF	Turn off after approximately 15 minutes (fixed)
Low-Z	Approximately 3 kΩ input impedance
Transducer current	Max 3000 A
Polarity	Automatic (no indication for positive); Minus (-) sign for negative
Low battery indication	 " " is displayed if battery voltage drops below working voltage.

## 7.1 Electrical specifications

### 7.1.1 AC voltage

Range	Resolution	Accuracy
6.000 V	1 mV	± (0.8% + 8 digits)
60.00 V	10 mV	
600.0 V	0.1 V	
1000 V	1 V	±(1.0% + 3 digits)

**Input protection:** 1000 V AC RMS or 1000 V DC; Input impedance: 10 MΩ.

**AC voltage bandwidth:** 50 to 1000 Hz.

All AC voltage ranges are specified from 5% of range to 100% of range.

### 7.1.2 DC voltage

Range	Resolution	Accuracy
6000.0 mV	0.1 mV	±(0.5% + 8 digits)
6.000 V	1 mV	±(0.5% + 5 digits)
60.00 V	10 mV	
600.0 V	0.1 V	
1000 V	1 V	±(0.8% + 3 digits)

**Input protection :** 1000 VAC RMS or 1000 V DC; Input impedance: 10 MΩ.

### 7.1.3 (AC+DC)

Range	Resolution	Accuracy
6.000 V	1 mV	±(1.5% + 20 digits)
60.00 V	10 mV	
600.0 V	0.1 V	
1000 V	1 V	±(1.5% + 5 digits)

**Input protection:** 1000 V AC RMS or 1000 V DC;

**Input impedance:** 10 MΩ.

**AC voltage bandwidth:** 50 to 400 Hz.

### 7.1.4 AC/DC voltage (Low-Z)

Range	Resolution	Accuracy
6.000 V	1 mV	(3.0% + 40 digits)
60.00 V	10 mV	
600.0 V	0.1 V	

**Input protection:** 600 V AC RMS or 600 V DC;

**Input impedance:** Approx. 3 kΩ.

**AC voltage bandwidth:** 50 to 400 Hz.

All AC voltage ranges are specified from 5% of range to 100% of range.

### 7.1.5 AC current

Range	Resolution	Accuracy
600.0 μA	0.1 μA	± (1.5% + 3 digits)
6000 μA	1 μA	
60.00 mA	10 μA	
600.0 mA	0.1 mA	
10.00 A	10 mA	±(2.0% + 5 digits)

**Overload protection:**

**μA/mA ranges:** 800 mA / 1000 V fuse;

**10 A range:** 10 A / 1000 V fuse.

**AC current bandwidth:** 45 to 500 Hz

All AC current ranges are specified from 5% of range to 100% of range

Amps input burden voltage (typical): mA input ~3.8 mV/A, A input ~30 mV/A.

## Specifications

### 7.1.6 DC current

Range	Resolution	Accuracy
600.0 $\mu$ A	0.1 $\mu$ A	$\pm$ (1.0% + 3 digits)
6000 $\mu$ A	1 $\mu$ A	
60.00 mA	10 $\mu$ A	
600.0 mA	0.1 mA	
10.00 A	10 mA	$\pm$ (1.5% + 3 digits)

#### Overload protection:

**$\mu$ A/mA ranges:** 800 mA / 1000 V Fuse;  
**10 A range:** 10 A / 1000 V fuse

### 7.1.7 Frequency

Range	Resolution	Accuracy
9.999 Hz	0.001 Hz	$\pm$ (1.0% + 5 digits)
99.99 Hz	0.01 Hz	
999.9 Hz	0.1 Hz	
9.999 kHz	1 Hz	

**Input protection:** 600 V AC RMS or 600 V DC;

**Sensitivity:** 8 V RMS.

### 7.1.8 Duty cycle

Range	Resolution	Accuracy
20 to 80%	0.1%	$\pm$ (1.2% + 5 digits)

**Input protection :** 600 V DC or 600 V AC RMS;

**Pulse width:** 0.1 to 100 mS.

**Frequency range:** 5 Hz to 1 kHz;

**Sensitivity:** 8 V RMS.

### 7.1.9 Resistance

Range	Resolution	Accuracy
600.0 $\Omega$	0.1 $\Omega$	$\pm$ (1.0% + 5 digits)
6.000 k $\Omega$	1 $\Omega$	
60.00 k $\Omega$	10 $\Omega$	
600.0 k $\Omega$	100 $\Omega$	
6.000 M $\Omega$	1 k $\Omega$	$\pm$ (2.0% + 10 digits)
60.00 M $\Omega$	10 k $\Omega$	

**Input Protection:** 600 V DC or 600 V AC RMS.

### 7.1.10 Capacitance

Range	Resolution	Accuracy
60.00 nF	10 pF	± (5.0% + 35 digits)
600.0 nF	100 pF	± (3.0% + 5 digits)
6.000 µF	0.001 µF	
60.00 µF	0.01 µF	
600.0 µF	0.1 µF	
6000 µF	1 µF	± (5.0% + 5 digits)

**Input Protection** 600 V AC RMS or 600 V DC.

### 7.1.11 Temperature

Range	Resolution	Accuracy
-20 to 760°C	0.1 °C	± (1.0% + 5 °C)
-4 to 1400°F	0.1 °F	± (1.0% + 9 °F)

**Input Protection** 600 V AC RMS or 600 V DC.

## 7.2 Safety

This instrument is intended for origin of installation use and is protected by double insulation per 61010-1:2010 +A1:2019 Safety requirements for electrical equipment for measurement, control, and laboratory use to Measurement connection: CAT III 1000 V and CAT IV 600 V; Pollution Degree 2. The instrument also meets EN (IEC) 61010-2-033:2021 +A11:2021, particular requirements for hand-held multimeters and other meters, 61010-031:2015, Safety requirements for hand-held probe assemblies for electrical measurement and test, EN 62479: 2010 Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz); and EN 50663: 2017 Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10 MHz - 300 GHz).

## 8. Calibration, Repair and Warranty

### 8.1 Limited warranty

This Megger product will be free from defects in material and workmanship for three years from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling.

### 8.2 Repair and warranty

The instrument contains static sensitive devices, and care must be taken in handling the printed circuit board. If an instrument's protection has been impaired, it should not be used but sent for repair by suitably trained and qualified personnel. The protection is likely to be impaired if for example, it shows visible damage; fails to perform the intended measurements; has been subjected to prolonged storage under unfavourable conditions or has been subjected to severe transport stresses.

**NOTE :** Any unauthorised prior repair or adjustment will automatically invalidate the warranty.

### 8.3 Instrument repair and spare parts

For service requirements contact Megger instruments or an approved repair company.

**Megger Limited**

Archcliffe Road

Dover

Kent

CT17 9EN

**U.K.**

Tel: +44 (0) 1304 502 243

Fax: +44 (0) 1304 207 342

### 8.4 Returning an instrument for repair

**WARNING :** Remove the battery cells before shipping this instrument.

If it is necessary to return an instrument for repair, a Returns Authorisation number must first be obtained by contacting one of the addresses shown. You will be asked to provide key information, such as the instrument serial number and fault reported when the number is issued. This will enable the Service Department to prepare in advance for the receipt of your instrument, and to provide the best possible service to you. The Returns Authorisation number should be clearly marked on the outside of the product packaging, and on any related correspondence. The instrument should be sent, freight paid to the appropriate address. If appropriate a copies of the original purchase invoice and of the packing note, should be sent simultaneously by airmail to expedite clearance through customs. For instruments requiring repair outside the warranty period a repair estimate will be submitted to the sender, if required, before work on the instrument commences. Approved Repair Companies A number of independent instrument repair companies have been authorised for repair work on most Megger instruments, using genuine Megger spare parts. A list of approved companies is available from the UK address shown.



## 8.5 Calibration, service and spare parts

For service requirements for Megger Instruments contact **Megger** or your local distributor or authorised repair centre.

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

See the **last page** of this User Guide for Megger contact details.

To find your local Authorised Service Centre email Megger on **ukrepairs@megger.com** and give details of your location.

## 8.6 Approved repair companies

A number of independent instrument repair companies have been approved to do repair work on most Megger instruments, complete with genuine Megger spare parts.

Consult the Appointed Distributor / Agent about spare parts, repair facilities and advice.

## 9. Decommissioning

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### 9.1 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.

### 9.2 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.

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](http://www.megger.com)

## 10. Worldwide Sales Offices

Sales Office	Telephone	Email
UK	T. +44 (0)1 304 502101	E. UKsales@megger.com
USA – Dallas	T. +1 214 333 3201	E. USsales@megger.com
USA – Valley Forge	T. +1 214 333 3201	E. USsales@megger.com
USA – Dallas	T. +1 214 333 3201	E. USsales@megger.com
DEUTSCHLAND – Aachen	T. +49 (0) 241 91380 500	E. info@megger.de
SVERIGE	T. +46 08 510 195 00	E. seinfo@megger.com
中国	T. +86 512 6556 7262	E. meggerchina@megger.com
中国 - 香港	T. +852 26189964	E. meggerchina@megger.com
ČESKÁ REPUBLIKA	T. +420 222 520 508	E. info.cz@megger.com
América Latina	T. +1 214 330 3293	E. csasales@megger.com
ESPAÑA	T. +34 916 16 54 96	E. info.es@megger.com
SUOMI	T. +358 08 510 195 00	E. seinfo@megger.com
LA FRANCE	T. +01 30 16 08 90	E. infos@megger.com
ΕΛΛΑΔΑ	T. +49 (0) 9544 68 0	E. sales@sebakmt.com
Magyarország	T. +36 1 214-2512	E. info@megger.hu
ITALIA	T. +49 (0) 9544 68 0	E. sales@sebakmt.com
日本	T. +44 (0)1 304 502101	E. UKsales@megger.com
한국	T. +1-800-723-2861	E. sales@megger.com
صاير ليا ءى عرب ال	T. +966 55 111 6836	E. MESales@megger.com
نبرح لبا ءك ءم م	T. +973 17440620	E. MESales@megger.com
NEDERLAND	T. +46 08 510 195 00	E. seinfo@megger.com
NORGE	T. +46 08 510 195 00	E. seinfo@megger.com
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PORTUGAL	T. +34 916 16 54 96	E. info.es@megger.com
România	T. +40 21 2309138	E. info.ro@megger.com
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SLOVENSKO	T. +421 2 554 23 958	E. info.sk@megger.com
Türkiye	T. +46 08 510 195 00	E. seinfo@megger.com

## Local Sales office

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Kent  
CT17 9EN  
ENGLAND  
T. +44 (0)1 304 502101  
F. +44 (0)1 304 207342

## Manufacturing sites

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**Megger Limited**  
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**Megger AB**  
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E. [seinfo@megger.com](mailto:seinfo@megger.com)

**Megger Valley Forge**  
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E. [USsales@megger.com](mailto:USsales@megger.com)

**Megger USA - Dallas**  
Dallas, TX USA  
T. +1 214 333 3201  
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**Megger Germany GmbH**  
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This instrument is manufactured in China.

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

Megger is a registered trademark

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