

# LOW RESISTANCE OHMMETERS

## DLRO

Megger has been manufacturing low resistance ohmmeters for many decades. In fact the first low resistance ohmmeter was launched in 1908. The first low resistance ohmmeter used a cross-coils meter movement.

Today, Megger has a comprehensive range of Low Resistance Ohmmeters, providing accurate and reliable measurements with test currents ranging from a few  $\mu\text{A}$  to 600 A suitable for many applications.

### DLRO100 SERIES

The new Megger DLRO100 series offers a unique range of 100 A digital low resistance testers. Never before has CATIV 600 V safety, operational IP54 ingress protection for dust and water, and lightweight, fast charge (2.5 hr), Li-ion battery technology been available on a continuous 100 A low resistance tester.

Providing low resistance measurements across a multitude of applications, including areas without access to line power, the DLRO100 is extremely flexible.

Applications include:

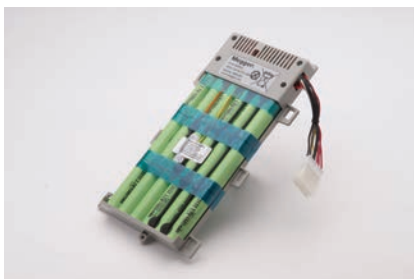
- Switchgear
- Wire and cable resistance
- Circuit breaker
- Lightning conductor bonding
- Contact resistance
- Welded joints
- Bus bar and cable joints
- Ground connections and joints

Megger has taken a no compromise approach when designing the new DLRO100 series. The range offers a unique combination of features with everything including DualGround™ testing, adjustable current ramping, high noise immunity, high power 100 A continuous testing and even remote control, yet still manages to be small and lightweight.

There are three models in the series, all three models can be line powered, are rated CAT IV 600 V and can test with currents from 10 to 110 A. B in the model name indicates the battery powered option (in addition to AC power).

- **DLRO100 E or EB** - The base model. B in the model name indicates the battery powered option.
- **DLRO100 X or XB** - This model includes all features in the basic model, with added data storage and DualGround™ testing capability.
- **DLRO100 H or HB** - The top-of-the-line model includes features in the E and X models, with asset tagging (enter unique asset ID's using the DLRO100 Asset Tag Windows app), Bluetooth® download and USB remote operation.

**NOTE: The DLRO100 Units are not supplied with leads included.**



A user replaceable high power lightweight Li-ion battery provides, from a single charge, 200 Manual/Auto 100 A tests or up to two 10 minutes continuous 100 A tests and takes 2.5 hours to charge when fully discharged.



A new terminal adapter has been designed to enable the use of user's own test leads.



A new tough adjustable clamp has been designed to ensure flexibility in many applications and provides a good connection with the test piece.

# LOW RESISTANCE OHMMETERS



## 10 Amp models

### DLRO-10 AND DLRO-10X



The DLRO-10 and DLRO-10X are built into a strong, lightweight case that is equally suitable in the field or in the laboratory. Light enough to be worn around the neck, they are small enough to be taken into areas which were previously too small to access. The DLRO-10 uses a large, bright 4½-digit LED display while the DLRO-10X has a large, backlit LCD.

The DLRO-10 displays the average of measurements achieved using forward and reverse current, while the DLRO-10X displays both individual measurements and the average. The DLRO-10X uses a menu system controlled by a two-axis paddle to allow the user to manually select the test current. The unit also adds real-time download of results and on-board storage for later download to a PC.

*See ordering information on pages 22-23.*

**See page 20 for a convenient accessory for the DLRO10 and DLRO10X.**



### DLRO10HD



Common with the DLRO10 series, the DLRO10HD features output power limiting to 0.25 W so as not to heat the test piece. However, the DLRO10HD has the additional benefit of combining this with two high power\*, high compliance ranges. Benefits include the ability to use much longer test leads if required, the ability to heat and, therefore, identify circuit weakness. In addition, with the ability to maintain 10 A for at least a minute, this allows for improved testing of inductive loads.

The DLRO10HD is designed to operate in the harshest of conditions, surviving knocks, drops, dusty and wet conditions. It can be used in the rain, and with the lid closed is sealed to IP65. There is no need to worry about inadvertent connection to live supplies. High input protection shrugs it off without even blowing a fuse.

The DLRO10HD is battery powered, and is equally convenient at home running on a line supply, even while charging the battery. This means the instrument is at home in manufacturing environments, never having to wait for the battery to charge. The DLRO10HD is always ready to test.

\*25W

# LOW RESISTANCE OHMMETERS

## OPTIONAL ACCESSORY

### DLRO10LPU LINE POWER UNIT



The DLRO10 and DLRO10X can now be powered from a mains / line power supply.

The DLRO10LPU unit is simply fitted to the instrument in place of the standard battery pack.

When in use a red LED is illuminated when the instrument is powered from a mains/line power supply.

*\*This option also works with the BITE3. See page 32.*



### ORDERING INFORMATION FOR LINE POWER UNIT

Item	Cat. No
DLRO10LPU-US Mains power attachment - US plug	1003-171

### DLRO200 AND DLRO200-115



- Small and weighs less than 15 kg.
- Test currents from 10 A to 200 A dc.
- 0.1  $\mu\Omega$  best resolution.
- On board memory for up to 300 test results and notes.
- RS232 port to download stored results or for real time output to a printer.
- Supplied complete with 5m test leads and download software.

*See ordering information on pages 22-23.*



DLRO200

# LOW RESISTANCE OHMMETERS



## GENERAL PURPOSE DLROS (247000 SERIES)



Three models designed for general purpose testing applications. All units in this family feature digital readout, offer a resolution to 1  $\mu\Omega$  or better, and have a basic accuracy of  $\pm 0.25\%$ .

### Dual-Pak DLRO (Cat. No. 247000)

- Separate measuring and charging modules.
- Weighs less than 8 lbs (3.6 kg).
- Rechargeable battery with separate charger for hours of testing.

### Single-Pak DLRO (Cat. No. 247001)

- Measuring circuits, rechargeable batteries, and charger in one self-contained unit.
- Housed in a tough case with hinged, removable lid and carrying handle.
- Includes captive wing nuts.

### Single-Pak/Low-Range DLRO (Cat.No. 247002)

- Features a current-reversing switch to average out voltage offset.
- Includes captive wing nuts.
- Adds an extra decimal of resolution.



General Purpose Model (247001)

See ordering information on pages 22-23.

## MOM2 HANDHELD MICRO-OHMMETER (DLRO)



- Up to 240 A.
- Battery powered.
- Lightweight – 1 kg.
- Safe test – DualGround™.
- Auto range: 1  $\mu\Omega$  to 1000 m $\Omega$ .
- Bluetooth® PC communication.
- Complies with IEEE and IEC standards.

The NEW, revolutionary, MOM2 Micro-ohmmeter is designed to measure the resistance of circuit breaker contacts, bus-bar joints and other high-current links. This product is designed with safety, ease of use and versatility in mind.

The MOM2 uses an ultra capacitor to generate the high output current. The ultra capacitor is able to store a huge amount of energy compared to conventional capacitors and can deliver very high current during the discharge thanks to its very low internal resistance. The micro-ohmmeter can be used anywhere to measure a low resistance value with high accuracy.

With MOM2 it is possible to make measurements according to the DualGround™ method. This means that the test object will be grounded on both sides throughout the test giving a safer, faster and easier workflow

See MOM2 ordering information on page 23







# LOW RESISTANCE OHMMETERS



## SELECTION GUIDE FOR DIGITAL LOW RESISTANCE OHMMETERS (CONT.)

		Cat. No											
		DLRO100E	DLRO100X	DLRO100H	DLRO10HD (1000-348)	DLRO-10 (6111-428)	DLRO-10X (6111-429)	247000	247001	247002	DLRO200-EN	DLRO200-115	BT51
Resolution	0.1 $\mu\Omega$	■	■	■	■	■	■			■	■	■	
	1 $\mu\Omega$				■	■	■	■	■	■			
	10 $\mu\Omega$				■	■	■	■	■	■			■
	100 $\mu\Omega$				■	■	■	■	■	■			
	1 m $\Omega$				■	■	■	■	■	■			■
	10 m $\Omega$				■	■	■	■	■	■			
	100 m $\Omega$				■	■	■						
Accuracy	0.25% + 1 lsd							■	■				
	0.3% + 2 lsd								■				
	1.00%									■	■		
	0.2% + 0.2 $\mu\Omega$	■	■	■	■	■	■						
	0.2% + 2 $\mu\Omega$				■	■	■						
	0.2% + 20 $\mu\Omega$				■	■	■						
	0.2% + 200 $\mu\Omega$				■	■	■						
	0.2% + 2 m $\Omega$				■	■	■						
	0.2% + 20 m $\Omega$				■	■	■						
0.2% + 200 m $\Omega$				■	■	■							
Power Source	Rechargeable battery	■	■	■	■	■	■	■	■	■			■
	Line power	■	■	■	■					■	■		
Warranty	2 year warranty				■	■	■			■	■		■

## SELECTION GUIDE FOR MOM2

	Cat. No.	MOM2 + Clamps (BD-59092)	MOM2 + Probes (BD-59090)
Output Current	240 ampt	■	■
Resistance Range	0 to 999 $\mu\Omega$	■	■
	1.0 to 9.99 m $\Omega$	■	■
	10.0 to 99.9 m $\Omega$	■	■
	100 to 1000 m $\Omega$	■	■
Resolution	1 $\mu\Omega$	■	■
	10 $\mu\Omega$	■	■
	100 $\mu\Omega$	■	■
	1 m $\Omega$	■	■
Accuracy	1.00%	■	■
Power Source	Rechargeable battery	■	■

† Configurable current output: 10 A to 200 A

# DLRO LEADS

Megger DLROs require test leads, two potential and two current, to make low-resistance measurements. In addition to individual current and potential lead sets, duplex leads that combine current and potential connections in one set are offered. A variety of C-clamps, Kelvin clips, fixed point, and helical spring-point leads are available in various lengths.



## Helical Spring Points

Tips rotate and compress into the probe's body to ensure accurate measurement. • Cat. No. 242011-7, 242011-18, 242011-30, 242009-18



## Heavy Duty Fixed Points

Economical, light weight and durable. • Cat. No. 242002-7, 242002-18, 242002-30



## Heavy Duty C-Clamps

Current passes through the C-Clamp and screw thread; potential passes through a four-point anvil insulated from the clamp metal. • Cat. No. 242004-7, 242004-18, 242004-30



## Kelvin Clips

Feature spade lugs on outboard end and alligator clips with insulated, silver or gold plated jaws. • Cat. No. 241005-7, 242005-7, 242006-7, 242006-18, 242006-30



## Hand Spikes, DH Series

Feature indicator lights in one of the probes which duplicate warning and signal lights on the instruments. • Cat. No. EV6111-503 (DH4), EV6111-517 (DH5).



## Wind Turbine Lightning Protection Test Lead Set

Specially designed for measuring resistance of lightning protection circuit between wind turbine blade tip to ground. • Cat. No. 1000-809

## DUPLEX TEST LEADS

Cat. No.	EMC	Termination	Length	Current
242011-7	■	Helical hand spikes with spring points	7 ft. (2 m)	10 A
6111-022			8 ft. (2.5 m)	10 A
242011-18	■		18 ft. (5.5 m)	10 A
6111-023			20 ft. (6 m)	10 A
242011-30	■		30 ft. (9 m)	10 A
6111-503*		Duplex hand spikes	4 ft. (1.2 m)	10 A
6111-517*		Duplex hand spikes	8 ft. (2.5 m)	10 A
6111-518*		Duplex hand spikes	4 ft. (1.2 m)	10 A
242009-18	■	Helical hand spikes w/ spring points and current push-button switch	18 ft. (5.5 m)	10 A
242002-7	■	heavy-duty, fixed-point hand spikes	7 ft. (2 m)	10 A
242002-18	■		18 ft. (5.5 m)	10 A
242002-30	■		30 ft. (9 m)	10 A
242003-7	■	Replaceable needle points	7 ft. (2 m)	10 A
242104-2-16	■	Heavy-duty C-clamps	16 ft. (5 m)	100 A
242104-2-26	■		26 ft. (8 m)	100 A
242004-7	■		7 ft. (2 m)	10 A
242004-18	■		18 ft. (5.5 m)	10 A
242004-30	■		30 ft. (9 m)	10 A
241005-7**	■		0.5 in. (1.3 cm) Kelvin clips	7 ft. (2 m)
242005-7***	■	7 ft. (2 m)		10 A
242006-7	■	1.5 in. (4 cm) Kelvin clips	7 ft. (2 m)	10 A
242006-18	■		18 ft. (5.5 m)	10 A
242006-30	■		30 ft. (9 m)	10 A
6220-755		Current lead with HD clips and separate potential leads with clips	16 ft. (5 m)	600 A
6220-756			33 ft. (10 m)	600 A
6220-757			49 ft. (15 m)	600 A
6220-787			16 ft. (5 m)	200 A
1000-809*		Kelvin clip and hook ends on HD cable reel with friction brake	328 ft. (100 m)	10 A
		DH2 lead with duplex hand spikes and hook end	16 ft. (5 m)	

\* Used with DLRO10 and DLRO10X only \*\* Gold plated \*\*\* Silver plated

## DLRO100 TEST LEADS

Cat. No.	EMC	Termination	Length	Current
1004-448	■	DLRO100 CAT IV Lead Set	16 ft. (5 m)	100 A
1004-449	■		33 ft. (10 m)	100 A
1004-450	■		49 ft. (15 m)	100 A
1005-634	■	DLRO100 CAT IV Kelvin Lead Set	16 ft. (5 m)	100 A
1005-635	■		33 ft. (10 m)	100 A
1005-636	■		49 ft. (15 m)	100 A
1005-555	■	DLRO100 Terminal adapters (x2)	N/A	N/A

## INDIVIDUAL TEST LEADS

Cat. No.	EMC	Type	Termination	Length	Current
242021-7	■	Potential	Hand Spikes	7 ft. (2 m)	N/A
242021-18	■			18 ft. (5.5 m)	
242021-30	■			30 ft. (9 m)	
242041-7	■	Current	Terminal Clips	7 ft. (2 m)	10 A
242041-18	■			18 ft. (5.5 m)	
242041-30	■			30 ft. (9 m)	
242144-16		Current	Clamps	16 ft. (5 m)	100 A



## PVM

Initially, the PVM210 may be used as an aid to select the most appropriate site for placing the solar panels. Once the installation is complete the PVM210 will be used to verify the stated short circuit current, as marked on each panel, in conjunction with either a suitable multimeter or clampmeter.



### MEGGER PVM210 IRRADIANCE METER

The Megger PVM210 has been designed to provide the solar / photovoltaic engineer a compact, pocket size instrument that is easy to use. Single-handed operation is possible due to the solar detector and meter being housed in one neat unit. This feature is ideal when using the instrument on a sloping roof or when working at the top of a ladder.

The easy-to-read display and measurement hold feature allows fast accurate readings of solar power.

The PVM210 has a 3¾ digit LCD display with a measurement range up to 1999 W/m².

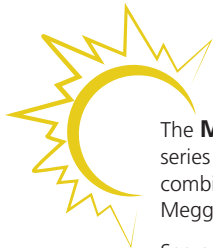
In addition to W/m² measurements, a selectable BTU (British Thermal Unit) measurement range up to 634 BTU / (ft 2\*h) is also featured. The unit features a data hold function that freezes the display to allow easy reading of measurements. Range selection is featured on the PVM210.

A universal camera screw thread on the rear of the instrument allows accurate positioning if required when using a camera stand.

- Optimal incident angle and positioning of solar panels.
- Measurement of solar power for panel short circuit calculation.
- 3-3/4 digit LCD display with 1999 W/m² range.
- Single handed use.
- Pocket sized for easy carrying.
- Standard camera mount fixing for accurate placement.
- 1 year warranty

#### ORDERING INFORMATION FOR PVM

Cat. No.	Description
1002-548	PVM210 Irradiance meter; 1999 W/m²



The **MIT400/2 series** has been proven to perform in the “renewable energy” industry. The MIT400/2 series has been used successfully in both wind and solar applications. From generators and cables to combiner boxes. Find pinched wires and leakage problems before they become dangerous with the Megger line of MIT400/2 series Insulation testers.

See page 8 for more details.