DLRO10HD
10 Amp Digital Low Resistance



- **NEW interchangeable test lead terminations**
- **High or low output power selection for condition diagnosis**
- **Rechargeable battery or line power supply, continuous operation, even with dead battery**
- **10 A for 60 seconds, less time waiting to cool**
- **Protected to 600 V without blowing a fuse, test lead live voltage warning light**
- **Heavy duty case: IP 65 lid closed, IP54 battery operation**
- **Simple rotary switch selection of five test modes, including auto start on connection**

DESCRIPTION

Augmenting Megger's DLRO10 and 10X range the DLRO10HD combines ultimate simplicity of operation with a rugged IP65 case designed for stable ground and bench operation.

The unit is powered from either its rechargeable battery or line power making it suitable for continuous testing in production line/repetitive use environments.

Rotary switch controls are simple and easy to operate in all weather conditions and with gloved hands. A large, clear, backlit LCD display is easy to read from a distance. The DLRO10HD provides significantly enhanced compliance and is capable of delivering 10 A into measurements up to 250 mΩ and 1 A into measurements up to 2.5 Ω. The duration of each test may be up to 60 seconds.

The DLRO10HD is rated CATIII 300 V provided the optional terminal cover is fitted to the instrument. Details of which can be found in the ordering information panel of this data sheet.

The DLRO10HD provides five test modes each of which is selected through a simple rotary control.

History of 'Ducter' testing

For over 100 years the 'Ducter test' has been used to describe a simple test for measuring very low contact resistances and "Ducter", which is still used as a trade mark, was the name originally given to the low resistance ohmmeter manufactured by Megger. The name Ducter was registered by Megger in June 1908 and 'Ducter' has since become the industry standard.

ADDITONAL FEATURES AND BENEFITS

- Rugged case well suited to transportation with shoulder strap and lead set pouch
- Removable lid facilitates easy test lead connection
- Operational ingress protection is IP 54 (battery power only) ensuring protection from the elements
- 7Ah lead acid battery provides extended operation and can be charged whilst operating from line power
- Rotary mode switch with bidirectional (current reversal with averaging cancels thermal EMFs), unidirectional, automatic, continuous and inductive modes
- Large, clear LCD display with backlight and contrast adjustment
- Auto power off function conserves battery

APPLICATIONS

The DLRO10HD measures low resistance values in applications ranging from railways and aircraft to resistance of components in industry.

Any metallic joint can be measured but users must be aware of measurement limitations depending on application. For example, if a cable manufacturer plans to make resistive measurements on a thin wire, a low test current should be selected to prevent heating the wire thereby changing its resistance

Measurements on electric motors and generators will be inductive and require the user to understand the inductive mode and charging process before a correct result is achieved.

The DLRO10HD is well suited to measuring thick conductors, bonds and quality of welding because of its 10 A range for resistance values up to 250 mΩ.

Electromagnetic noise induced into the leads can interfere with a reading. A noise symbol alerts the user and prevents a measurement when the instrument detects noise above its threshold.

When dissimilar metals are joined a thermocouple effect is created. Users should select a bidirectional mode to ensure cancellation of this effect. The instrument measures with current flowing in both directions and averages the result.

Normal mode is initiated by pressing the 'Test' button after connecting the test leads to the unit under test. Continuity of all four connections is checked. Current is applied in both forward and reverse direction following which measurement is displayed.

Automatic mode is started as soon as the probes make contact. Forward and reverse current measurements are made and the average value is displayed. This mode is ideal when working with handspikes. Each time the probes are removed and reconnected to the load a new test will be performed without the need to press the test button.

TEST modes

Automatic unidirectional mode applies current in one direction only to speed up the measurement process.

However thermal EMF resulting from dissimilar metal bonds can cause lower accuracy. Test starts automatically when probes are connected.

Continuous mode allows repeated measurements to be made on the same sample. Simply connect the test leads and press the test button. The measurement is updated every three seconds until the circuit is broken.

Inductive mode is selected when measuring resistance on, for example, motors and generators. When measuring inductive loads it is necessary to wait for the voltage to stabilise as the inductive element is charged. Test leads are firmly connected to the device under test and the 'Test' button pressed. The instrument will pass the selected current through the sample continuously in one direction only and take repetitive readings that will gradually decrease to the true value as the voltage stabilises. The operator decides when the result is stable and presses the 'Test' button to terminate the test

ELECTRICAL SPECIFICATIONS

Resistance/Current Ranges

The green resistance ranges on the keypad indicate low output power (<0.25 W) outputs. Red ranges indicate higher 2.5 W (1 A) and 25 W (10 A) power outputs.

Resolution and Accuracy

Test current accuracy ±10%

Voltmeter input impedance >200 kΩ

Maximum lead resistance at 10 A <100 mΩ

Test current	Resistance range	Resolution (as displayed)	Basic accuracy*	Full scale voltage	Max. power output
100 µA	0 - 2.5 kΩ	0.1 Ω	±0.2% ±200 mΩ	25 mV	25 µW
100 µA	0 - 250 Ω	0.01 Ω	±0.2% ±20 mΩ	25 mV	2.5 µW
1 mA	0 - 25 Ω	1 mΩ	±0.2% ±2 mΩ	25 mV	25 µW
10 mA	0 - 2.5 Ω	0.1 mΩ	±0.2% ±200 µΩ	25mV	250 µW
100 mA	0 - 250 mΩ	0.01 mΩ	±0.2% ±20 µΩ	25 mV	2.5 mW
1 A	0 - 25 mΩ	1 µΩ	±0.2% ±2 µΩ	25 mV	25 mW
10 A	0 - 2.5 mΩ	0.1 µΩ	±0.2% ±0.2 µΩ	25 mV	0.25 W
1 A**	0 - 2.5 Ω	0.1 mΩ	±0.2% ±200 µΩ	2.5 V	2.5 W
10 A **	0 - 250 mΩ	0.01 mΩ	±0.2% ±50 µΩ	2.5 V	25 W

* Basic accuracy stated assumes forward and reverse measurements.

** Higher 2.5 W (1 A) and 25 W (10 A) power outputs (G shows).

Inductive mode or undirectional mode will introduce an undefined error if an external EMF is present.

Basic accuracy at reference conditions.

GENERAL SPECIFICATIONS

Temperature coefficient	< 0.01% per °C, from 5 °C to 40 °C
Maximum altitude	2000 m (6562 ft) to full safety specifications
Display size/type	Main 5 digit + 2 x 5 digit secondary displays
Battery type	6 V, 7Ah sealed lead acid
Voltage input range	100 - 240 V 50 / 60 Hz 90 VA
Charge time	8 hours
Backlight	LED backlight
Battery life	>1000 Auto (3 sec) tests
Auto power down	300s
Mode selection	Rotary switch
Range selection	Rotary switch
Weight	6.7 kg
Case dimensions	L315 mm x W285 mm x H181 mm
Pouch for test leads	Yes (lid mounted)
Test leads	DH4C lead set
IP rating	IP65 case closed, IP54 battery operation

Safety rating
In accordance with IEC61010-1, CATIII 300V when used with optional terminal cover (details in ordering information)

Operating temperature and humidity
-10 °C to +50 °C

(14 °F to 122 °F) <90% RH

Reference conditions 20 °C ±3 °C

Storage temperature and humidity
-25 °C to +60 °C, <90% RH

EMC
In accordance with IEC61326-1 (Heavy industrial)

Noise rejection
Less than 1% ±20 digits additional error with 100 mV peak 50/60 Hz. on the potential leads. Warning will show if hum or noise exceeds this level.

Maximum lead resistance
100 mΩ total for 10 A operation irrespective of battery condition.

OPTIONAL TERMINAL COVER



The CATIII 300 V rating on the DLRO10HD is only valid when the instrument is fitted with the optional terminal cover to provide the required creepage and clearances at the instrument terminals. Although the terminal cover may be used with any test leads, only the Megger DH4, DH5 and DP1-C duplex handspikes, and KC2-C insulated kelvin clips have suitable probe insulation to comply with the requirements of IEC61010-1 and the CATIII 300 V rating.





SUPPLIED LEADSET OPTIONS



DLRO10HD



+ DH4-C probe 1.5 m leads



+ KC1 Kelvin clip 3 m leads

+ No test leads supplied

ORDERING INFORMATION

Item (Qty)	Order No.
DLRO10HD + DH4-C probe 1,5m leads	1006-603
DLRO10HD + KC1 kelvin clip 3m leads	1006-604
DLRO10HD without test leads supplied	1006-657

Standard included accessories

DLRO10HD user guide CD	1000-869
Warranty book.	6170618

Test leads supplied with instruments

1006-603 DLRO10HD = DH4-C probe 1,5m leads	1006-444
1006-604 DLRO10HD = KC1 kelvin clip 3m leads	1006-462
1006-657 DLRO10HD = No test leads supplied	1006-657

Optional Accessories at extra cost

Calibration Shunt,10 Ω, current rating 1 mA.	249000
Calibration Shunt, 1 Ω, current rating 10 mA.	249001
Calibration Shunt, 100 mΩ current rating 1A.	249002
Calibration Shunt, 10 mΩ current rating 10 A.	249003
Certificate of Calibration for Shunts, NIST	CERT-NIST
Replacement tips for DH4 and DH5 handspikes. Needle point	1008-024
Replacement tips for DH4 and DH5 handspikes. Serrated end	1010-924

Optional Test Leads at extra cost
Normal test leads not fitted with in-line connector:

Industrial application kit	1011-376
Terminal cover (use in conjunction with DH4 test leads supplied as standard, or optional DH5 test leads for CATIII 300 V compliance)	1002-390
Duplex Handspikes (2) with spring loaded helical contacts. 2m/7ft	242011-7
DH1 5.5m/18ft	242011-18
DH2 9m/30ft (only 1 lead supplied)	242011-30
Straight Duplex Handspikes (2) Heavy Duty with fixed contacts. 2m/7ft	242002-7
Straight Duplex Handspikes (2) Heavy Duty with fixed contacts 5.5m/18ft	242002-18
Straight Duplex Handspikes (2) Heavy Duty with fixed contacts 9m/30ft	242002-30
Duplex Heavy Duty 5cm (2") C-Clamps. (2) 2m/7ft	242004-7
Duplex Heavy Duty 5cm (2") C-Clamps. (2) 5.5m/18ft	242004-18
Duplex Heavy Duty 5cm (2") C-Clamps. (2) 9m/30ft	242004-30
Duplex handspikes with replaceable Needle Points 2m/7ft	242003-7
Duplex 1.27 cm (1/2 ") Kelvin Clips. (2) gold plated 2m/7ft	241005-7
Duplex 1.27 cm (1/2 ") Kelvin Clips. (2) silver plated 2m/7ft	242005-7
Duplex 3.8 cm (11/2") Kelvin Clips. (2) 2m/7ft	242006-7
Duplex 3.8 cm (11/2") Kelvin Clips. (2) 5.5m/18ft	242006-18
Duplex 3.8 cm (11/2") Kelvin Clips. (2) 9m/30ft	242006-30
Single handspike (1) for potential measurement. 2m/7ft	242021-7
Single handspike (1) for potential measurement. 5.5m/18ft	242021-18
Single handspike (1) for potential measurement. 9m/30ft	242021-30
Current clip (1) for current connections. 2m/7ft	242041-7
Current clip (1) for current connections 5.5m/18ft	242041-18
Current clip (1) for current connections 9m/30ft	242041-30

Note: For more details of optional leadsets see separate test lead datasheet DLROTest Leads_DS_V##.pdf

For detailed information on connecting lead accessories refer to the supplied "accessory important information sheet" (DLROTestLeads--2007-431_UG_EN-DE-FR-ES-IT_V##)

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