

DLRO10HDX

10 Amp Digital Low Resistance



- **NEW** Onboard memory storage for test results up to 200 records (HDX only)
- Download to PowerDB
- **NEW** interchangeable test lead terminations
- High or low output power selection for condition diagnosis
- Operates from battery or AC mains supply
- Protected to 600 V without blowing a fuse, test lead live voltage warning light
- Heavy duty case: IP 65 lid closed, IP54 operational
- Simple rotary switch selection of five test modes, including auto start on connection

DESCRIPTION

Augmenting Megger's DLRO10 and 10X range the DLRO10HDX combines ultimate simplicity of operation with a rugged IP65 case designed for stable ground and bench operation and provides memory storage.

These units are powered from either rechargeable battery or mains 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 DLRO10HDX 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 DLRO10HDX is rated CAT III 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 DLRO10HDX provides five test modes each of which is selected through a simple rotary control on the Mode selection rotary switch. All memory functions, delete, download to PowerDB and recalling test results are also accessible via the Range Selection rotary switch.

A simple control panel enables easy navigation for configuration settings.

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.

ADDITIONAL 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 DLRO10HDX 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 DLRO10HDX 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 $\pm 10\%$

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	$\pm 0.2\%$ ± 200 mΩ	25 mV	25 μW
100 μA	0 - 250 Ω	0.01 Ω	$\pm 0.2\%$ ± 20 mΩ	25 mV	2.5 μW
1 mA	0 - 25 Ω	1 mΩ	$\pm 0.2\%$ ± 2 mΩ	25 mV	25 μW
10 mA	0 - 2.5 Ω	0.1 mΩ	$\pm 0.2\%$ ± 200 μΩ	25 mV	250 μW
100 mA	0 - 250 mΩ	0.01 mΩ	$\pm 0.2\%$ ± 20 μΩ	25 mV	2.5 mW
1 A	0 - 25 mΩ	1 μΩ	$\pm 0.2\%$ ± 2 μΩ	25 mV	25 mW
10 A	0 - 2.5 mΩ	0.1 μΩ	$\pm 0.2\%$ ± 0.2 μΩ	25 mV	0.25 W
1 A **	0 - 2.5 Ω	0.1 mΩ	$\pm 0.2\%$ ± 200 μΩ	2.5 V	2.5 W
10 A **	0 - 250 mΩ	0.01 mΩ	$\pm 0.2\%$ ± 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.

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

Basic accuracy at reference conditions.

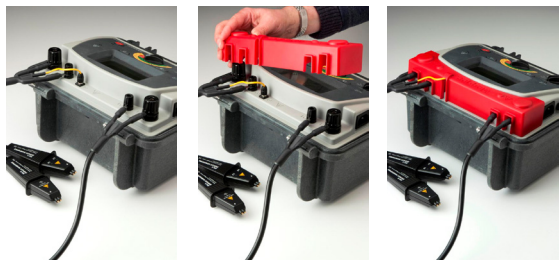
GENERAL SPECIFICATIONS

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
Memory features 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	included depending on chosen option: DH4C lead set KC1 Kelvin Clip lead set
IP rating	IP65 case closed, IP54 battery operation
Record storage	200 test records
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 CAT III 300 V rating on the DLRO10HDX 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



DLRO10HDX



+ DH4-C probe 1.5 m leads



+ KC1 Kelvin clip 3 m leads

+ No test leads supplied



Model name

Language

Plug/Mains lead

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SELECT A LEADSET

NLS (No Leadset)

DH4C (DH4-C probe 1.5 m leads)

KC1-TL3-C (KC1 Kelvin clip 3 m leads)

SELECT A LANGUAGE AND PLUG

Please note only some plug types are available for certain languages - the language you need will determine the mains leads available

LANGUAGE		PLUG TYPES AVAILABLE							
3 DIGIT CODE	LANGUAGE INCLUDED	 UK	 EU	 US	 CH	 AUS	 IT	 IN	 UK + US
LG1	EN, DE, FR, NL	P1	P2	-	P4	P5	-	-	-
LG2	EN, ES, PT, IT	P1	P2	P3	-	-	P6	-	-
LG3	EN, AR, TR, FR	P1	P2	P3	-	-	-	P7	-
LG4	EN, CZ, SK, PL	P1	P2	-	-	-	-	-	-
LG5	EN, CN, JA, KO	P1	P2	P3	-	-	-	-	P8
LG6	EN, RU, HU, RO	-	P2	-	-	-	-	-	-
LG7	EN, NO, SV, FI	-	P2	-	-	-	-	-	-

ORDERING INFORMATION

Item (Qty)	Order No.	Item (Qty)	Order No.
DLRO10HDX	Configured*	Straight Duplex Handspikes (2) Heavy Duty with fixed contacts 9m/30ft	242002-30
* See ordering configuration on previous page			
Standard included accessories			
DLRO10HDX user guide CD		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
Optional Accessories at extra cost		Duplex handspikes with replaceable Needle Points 2m/7ft	242003-7
Calibration Shunt, 10 Ω , current rating 1 mA.	249000	Duplex 1.27 cm (1/2 ") Kelvin Clips. (2) gold plated 2m/7ft	241005-7
Calibration Shunt, 1 Ω , current rating 10 mA.	249001	Duplex 1.27 cm (1/2 ") Kelvin Clips. (2) silver plated 2m/7ft	242005-7
Calibration Shunt, 100 m Ω current rating 1A.	249002		
Calibration Shunt, 10 m Ω current rating 10 A.	249003	Duplex 3.8 cm (1 1/2 ") Kelvin Clips. (2) 2m/7ft	242006-7
Certificate of Calibration for Shunts, NIST	CERT-NIST	Duplex 3.8 cm (1 1/2 ") Kelvin Clips. (2) 5.5m/18ft	242006-18
Replacement tips for DH4 and DH5 handspikes. Needle point	1008-024	Duplex 3.8 cm (1 1/2 ") Kelvin Clips. (2) 9m/30ft	242006-30
Replacement tips for DH4 and DH5 handspikes. Serrated end	1010-929	Single handspike (1) for potential measurement. 2m/7ft	242021-7
Transport case	1009-744	Single handspike (1) for potential measurement. 5.5m/18ft	242021-18
Optional Test Leads at extra cost		Single handspike (1) for potential measurement. 9m/30ft	242021-30
Normal test leads not fitted with in-line connector:		Current clip (1) for current connections. 2m/7ft	242041-7
Industrial application kit	1011-376	Current clip (1) for current connections 5.5m/18ft	242041-18
Terminal cover (use in conjunction with DH4 test leads supplied as standard, or optional DH5 test leads for CATIII 300 V compliance)	1002-390	Current clip (1) for current connections 9m/30ft	242041-30
Duplex Handspikes (2) with spring loaded helical contacts. 2m/7ft	242011-7	Note: For more details of optional leadsets see separate test lead datasheet DLRO_TL_DS_V###.pdf	
DH1 2.5m/8ft	1006-442	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###)	
DH1 5.5m/18ft	242011-18		
DH2 6m/20ft (only 1 lead supplied)	1006-443		
DH2 9m/30ft (only 1 lead supplied)	242011-30		
6m ext	1006-460		
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		
Test lead pouch (lid mounted)	1005-623		