

DLRO10HD and DLRO10HDX 10 Amp Digital Low Resistance Ohmmeters

APPLICATIONS

The DLRO10HD and HDX measure 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: $>200\text{ k}\Omega$

Maximum lead resistance at 10 A $<100\text{ m}\Omega$

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