NEW

BIDDLE® DLRO®

- **Kelvin-type, four-wire measurement of low resistance circuits**
- **Automatic lead continuity and over voltage pretest**
- **Data storage of 250 measurements with RS 232 port for data extraction**
- **Removable battery pack**
- **Supplied complete with test leads and battery charger**

General Purpose 10 Amp Microprocessor based DLRO

DESCRIPTION

The General Purpose 10 Amp Microprocessor Based Digital Low Resistance Ohmmeter (DLRO®) is a highly accurate instrument for measuring the resistance of a wide variety of low resistance circuits. Designed for field testing and incorporating data storage and RS-232 downloading capability, the DLRO is powered by a removable battery pack and is supplied complete with test leads and battery charger.

This microprocessor-based instrument operates on the well-known, four-wire measuring principle to eliminate errors caused by lead and contact resistances for its basic accuracy of 0.25% from 0.1 μΩ to 200.0 Ω full scale with seven (7) discrete ranges. Readings are displayed on a four-digit liquid crystal display (LCD). The DLRO stores a maximum of 250 readings of test data which can be transferred to a personal computer using the RS-232 communications port. The number of stored readings is displayed and during the data transfer process, the display counts down the number of stored readings to 000. An included accessory is the DLRO Data Transfer Software, 3½ inch diskette format for operation within the Windows® 3.1 and Windows® 95 operating systems permitting the transfer of data from the DLRO to Microsoft Word®, Excel® and Notepad® application programs.

The DLRO has automatic and manual modes of operation. The automatic mode is the default setting and only requires the setting of range and data options. After the test leads are connected to the specimen under test, the test button is pressed and the instrument checks for lead continuity and overvoltage condition before proceeding with the measurement. The microprocessor computes the average of a forward and reverse reading and the result is displayed and held/stored until the test button is pressed again. The manual mode operates with the test current flowing continuously and has hold/store functions but no automatic averaging capability.

The removable battery pack, which is supplied with a 100 to 240 V ac, 50/60 Hz battery charger fits snugly into the front panel. The maximum continuous (manual mode) operating time at 10 A test current is 30 minutes with the battery at 100% capacity, while at lower test currents, the operating time is 7 to 8 hours. Use of a spare battery pack (optional accessory) will further extend the testing time.

The supplied leads are 10 ft (3m) current and potential duplex leads with insulated alligator clamps. Optional Kelvin clip and Helical Spring Point Leads are available and there is also an adapter block option (including mounting hardware) that allows the instrument to be used with existing DLRO test leads for connection to four wing-nut terminals. Calibration can be performed easily at the front without removing the instrument from its case. Including the removable battery charger this rugged and compact instrument only weighs a bit more than 10 lbs.

APPLICATIONS

Typical applications include, but are not limited to, measuring the dc resistance of:

- Switch and circuit breaker contacts
- Small transformer and motor windings
- Busbar joints and cable splice connections
- Aircraft frame bonds and static control circuits i.e. wick bonding to skin
- Metal alloys, spot weld uniformity and fuse links
- Copper, Aluminum and other metal cables
- Graphite electrodes and other composite materials
- Intercell strap connections on floating and grounded battery systems (maximum 300 volts dc to ground)
- The DLRO is suitable for use in maintenance and manufacturing operations.

FEATURES AND BENEFITS

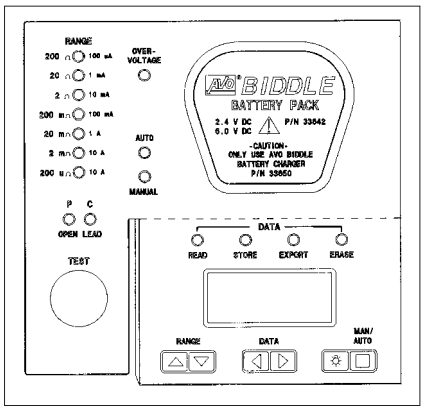
- Protection up to 50 V dc and 35 V ac with no damage to the instrument
- Resolution to 0.1 μΩ
- Standard accuracy of ±(0.25% of reading + 1 lsd)
- LED indication of open lead condition

- Kelvin-type, four-wire measurement eliminates errors caused by lead and contact resistances
- Automatic Mode to correct for errors due to stray dc currents flowing in the sample
- Data storage of 250 measurements with RS-232 port for data extraction
- In the READ mode, instantaneous measurement transfer when connected through the RS-232 to a PC
- Removable battery pack supplied with instrument along with 115/230 V ac, 50/60 Hz charger
- Wide selection of test leads
- Front panel calibration-removal of instrument from its case is not required

Main measuring unit:
IEC 1010-1 Class III, Installation Category I

Maximum 300 volts dc to ground

Allowable test lead resistance:
40 to 160 mΩ total



Control Panel View

SPECIFICATIONS

Electrical

Ranges, Resolution, and Accuracy:

Range	dc Test Current Regulated ±10%	Accuracy of Reading (1year, 15 to 35°C)*	Resolution
200 Ω	100 µA	±(0.25% + 1 LSD)	0.1 Ω
20 Ω	1 mA	±(0.25% + 1 LSD)	0.01 Ω
2 Ω	10.0 mA	±(0.25% + 1 LSD)	0.001 Ω
200 mΩ	100 mA	±(0.25% + 1 LSD)	0.1 mΩ
20 mΩ	1 A	±(0.25% + 1 LSD)	0.010 mΩ
2 mΩ	10 A	±(0.25% + 1 LSD)	0.001 mΩ
200 µΩ	10 A	±(0.30% + 2 LSD)	0.1µΩ

**Accuracy of reading (1 year, 0 to 50°C) ± (0.5% + 1 LSD)*

Power Supply:
Rechargeable battery pack with integral overload protection for each battery circuit. A 2.4 V circuit supplies the measure circuit and a 6.0 V circuit supplies the electronics.

Operating Time:
Depends on the mode of operation and the range selected. Maximum continuous (manual mode) operating time at 10A test current is 30 minutes with battery at 100% capacity. At lower test currents, the operating time is 7 to 8 hours with battery capacity at 100%.

Battery Life:
Up to 500 charge/discharge cycles

Battery Charger:
IEC 1010-1 Class I, Installation Category II Input: 100 to 240 V, 50/60 Hz, 70 VA maximum. Charger has 8 ft (2.4 m) power cord with 13 in. (33 cm) of cord between the charger and the charger receptacle.

Charges battery pack in 3 1/2 hours.

Mechanical

Dimensions:
11 H x 7.5 W x 8.2 D in.
280 H x 190 W x 210 D mm

Weight: 10.5 lb (4.8 kg)

Case:
Rugged, molded case has carrying handle and removable, hinged lid.

Environmental

Operating temperature range:
32 to 122° F (0 to 50° C)

Storage temperature range:-
-4 to 149° F (-20 to 65° C)

Humidity:
to 92% noncondensing

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ORDERING INFORMATION

Item	Cat. No.
Biddle General Purpose 10 Amp Microprocessor based DLRO	247701

Included Accessories

Item	Cat. No.
Duplex leads, 10 ft (3m), with insulated alligator clamps	33896
Battery charger, w/ line cord - supply for P/N33642 battery pack	33650
Soft pack carrying case	218746
Snap-on nylon pouch with velcro closure to contain leads	25613-21
Data transfer software	34393
Instruction manual	AVTM247701J

Optional Accessories

Item	Cat. No.
Duplex leads, 10 ft (3m), with insulated alligator clamps with remote push to test button.	242703-10
Kelvin clip, 10 ft (3m), light duty, with remote push to test button	242705-10
Kelvin clip, 10 ft (3m), heavy duty, with remote push to test button	242706-10
Kelvin clip, 20 ft (6m), heavy duty, with remote push to test button	242706-20
Helical spring point spikes, 10 ft (3m), with push to test button in handle	242711-10
Lead adapter block (for use with existing Cat. No. 2420XX-XX test leads)	247710
Battery pack	33642
Canvas carrying bag for optional leads	18313
Field test shunt, 10 Ω ±0.25%, 0.001A	249000
Field test shunt, 1.0 Ω ±0.25%, 0.01 A	249001
Field test shunt, 0.10 Ω ±0.25%,1 A	249002
Field test shunt, 0.010 Ω ±0.25%, 10 A	249003
Field test shunt, 0.001 Ω ±0.25%, 100 A	249004
Field test shunt, 0.0001 Ω ±0.25%, 500 A	249005
Certificate of Calibration, NIST	CERT-NIST