

Section 1 Introduction

Receiving Instructions

Check the equipment received against the packing list to ensure that all materials are present. Notify AVO International of any shortage. Telephone (215) 646-9200. Examine the instrument for damage received in transit. If any damage is discovered, file a claim with the carrier at once and notify AVO International or its nearest authorized sales representative, giving a detailed description of the damage.

The instrument has been thoroughly tested and inspected to meet rigid specifications before being shipped. It is ready for use when set up as indicated in this manual. Before attempting to use the DLRO, be sure to read and understand the safety requirements and operating procedures in this manual.

General Information

The Digital Low Resistance Ohmmeter (DLRO®) is a microprocessor-based, general purpose ohmmeter intended for field testing. It is powered by a removable battery pack. A battery charger is supplied with the instrument. A nylon pouch that contains the test leads snaps onto the lid of the instrument.

There are seven ranges for measuring resistance in various applications. Readings are displayed on a four-digit liquid crystal display (LCD). The DLRO stores 250 readings of test data. An RS-232 communications port is provided for transferring stored data to a personal computer.

The instrument has automatic and manual modes of operation. The automatic mode is the default setting requiring no switch selection. After the TEST button is pressed, 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. The result is displayed and held/stored until the TEST button is pressed again. The manual mode operates with the test current flowing continuously. Manual mode has hold/store functions but no averaging capability.

Section 3 Specifications

Electrical

Read and understand the Safety section before operating the instrument.

DLRO

Table 1 delineates the ranges, resolution, and accuracy of the DLRO.

Table 1: Ranges, Resolution, and Accuracy

Range	dc Test Current Regulated $\pm 10\%$	Accuracy of Reading (1 year, 15 to 35°C)*	Resolution
200 Ω	100 μA	$\pm(0.25\% + 1 \text{ LSD})$	0.1 Ω
20 Ω	1.0 mA	$\pm(0.25\% + 1 \text{ LSD})$	0.01 Ω
2 Ω	10.0 mA	$\pm(0.25\% + 1 \text{ LSD})$	0.001 Ω
200 m Ω	100 mA	$\pm(0.25\% + 1 \text{ LSD})$	0.1 m Ω
20 m Ω	1 A	$\pm(0.25\% + 1 \text{ LSD})$	0.010 m Ω
2 m Ω	10 A	$\pm(0.25\% + 1 \text{ LSD})$	0.001 m Ω
200 $\mu\Omega$	10 A	$\pm(0.30\% + 2 \text{ LSD})$	0.1 $\mu\Omega$

* Accuracy of reading (1 year, 0 to 50°C) $\pm (0.5\% + 1 \text{ LSD})$

Allowable test lead resistance: 40 to 160 m Ω total

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 10 A 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

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.

Fuses: output circuits: F1: 1 A T, Slo Blo, 5 x 20 mm
F2: 3.15 A T, Slo Blo, 5 x 20 mm
power supply: F1: 2 A fast acting, 5 x 20 mm or 2AG pigtail

Caution
Only use AVO Biddle Battery Pack P/N 33642.

Safety Classification

DLRO

Equipment: IEC 1010-1/ANSI/ISA-S82.01 Class III
Measurement circuit: IEC 1010-1/ANSI/ISA-S82.01 Class II,
Installation Category I, Pollution Degree 2

Battery Charger

IEC 1010-1/ANSI/ISA-S82.01 Class I, Installation Category II,
Pollution Degree 2

Mechanical

DLRO

Dimensions: 11 x 7.5 x 8.2 in. (280 x 190 x 210 mm)
Weight: 10.5 lb (4.8 kg)
Case: Rugged, molded case has carrying handle and removable, hinged lid.

Battery Charger

Dimensions: Charger: 3.5 x 6.5 x 3 in. (89 x 165 x 76 mm)
Receptacle: 3 x 3 x 2 in. (76 x 76 x 51 mm)
Weight: 2.2 lb (1.0 kg)

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

Accessories

Accessories supplied with the DLRO are listed in Table 2. Optional accessories are listed in Table 3.

Table 2: Accessories Supplied

Description	Part No.
10 ft (3 m) Current and potential duplex test lead set	33896
Battery charger, 100/240 V ac, 50/60 Hz with a line cord having a three-pronged, molded plug, identified as "North American" type, designated for 120 V ac, 60 Hz, U.S.A. receptacles. For other voltages, use a suitable grounded plug.	33650
Snap-on nylon pouch with Velcro closure to contain leads	25613-21
Instruction Manual	AVTM247701J
Data Transfer Software	34393
Soft pack carrying case	218746

Table 3: Optional Accessories

Description	Cat. No. or Part No.
Spare battery pack for use with existing battery charger	33642
Spare 100/240 V ac, 50/60 Hz battery charger to charge spare battery pack when another battery pack is charging with supplied charger	33650
10 ft (3 m) Current and potential duplex lead set with remote test switch	242703-10
10 ft (3 m) Kelvin clip, light duty, duplex lead set with remote test switch	242705-10
20 ft (6 m) Kelvin clip, heavy duty, duplex lead set with remote test switch	242706-20
10 ft (3 m) and spikes helical spring point lead set with remote test switch	242711-10
Adapter block (for use with existing C/N 2420XX-XX test leads)	247710
Field test shunt, 10 Ω \pm 0.25%, 0.001 A	249000
Field test shunt, 1.0 Ω \pm 0.25%, 0.01 A	249001
Field test shunt, 0.10 Ω \pm 0.25%, 1 A	249002
Field test shunt, 0.010 Ω \pm 0.25%, 10 A	249003
Field test shunt, 0.001 Ω \pm 0.25%, 100 A	249004
Field test shunt, 0.0001 Ω \pm 0.25%, 500 A	249005
Certificate of Calibration, NIST	CERT-NIST