LOW RESISTANCE OHMETERS

DUCTER®
D7001

- True four-terminal, low-resistance measurement at high accuracy
- Internal rechargeable cells, 10 Ah total capacity, with built-in charger unit and battery condition indication
- Test current up to 10 A for repeatable results

Low Resistance Ohmmeter

DESCRIPTION

The DUCTER® D7001 Low Resistance Ohmmeter is a portable test set suitable for measurements down to 1 \( \mu \Omega \) at 10 A d.c. It uses the four-terminal measurement principle; test leads with duplex hand spikes are provided, although alternative types of test leads are available.

The instrument will measure from 1 \( \mu \Omega \) to 59.99 \( \Omega \) in five ranges, each of which is selected by a rotary switch. Simple controls make the ohmmeter easy to operate. The readings are given directly in ohms with the decimal point correctly positioned.

The 3 \( \frac{3}{4} \) -digit L.E.D. display has 12 mm (1/2 in.) high characters and is easy to read in poor lighting conditions.

The ON/OFF/LOCK switch has two “on” positions: a LOCK position for continuous operation and a momentary spring-held ON position that helps conserve battery power when taking a series of readings on the high-current ranges.

Variations in test current or battery condition will not result in loss of accuracy. A switch is used to reverse the connections to the potential terminals so that differences in reading caused by a suspected zero offset can be eliminated from a measurement. The condition of the digital display and the measuring circuit batteries is shown on a separate analogue panel meter.

The D7001 is completely self-contained in a strong plastic case fitted with a detachable protective cover. The unit incorporates rechargeable battery cells and the charging circuit within the casing.

APPLICATIONS

The DUCTER® D7001 Low Resistance Ohmmeter is a stable, accurate and reliable instrument, yet tough and robust, and is well suited for use in the workshop, in installation and commissioning and in field servicing.

Example Uses

- Commissioning and maintenance of substation equipment (e.g., busbar joints and earth bonding, switch and circuit breaker contact resistance, fuse resistance and cold lap-welded joints in aluminum earthing strip)
- Testing transformer and motor windings
- Maintenance of overhead transmission lines (e.g., in testing joints)
- Bond testing aircraft frames, including the bonding of electronic dischargers and fuel tanks
- Testing earth bonds in mines
- Rail bond testing, where a rail is used as part of a communication system or for power transmission
- Testing the integrity of lightning conductors

Other Models

Different measuring ranges and test currents can be provided on other DUCTER® and BIDDLE™ instruments, namely BT51, D007, D203 and DLRO® Low Resistance Ohmmeters, with test currents ranging from 1 to 100 A. The following DLRO instruments will be of particular interest:

For high resolution DLRO 247002-47
Same as D7001 but able to measure down to 0.1 \( \mu \Omega \)

For 100 A test current DLRO 247001-3-47
Same as D7001 but with an adaptor for a separate 100 A power supply (100 A testing is often required for switchgear testing to IEC 694.)

DLRO 247120-47
100 A power supply unit (operated from the mains supply)

For UPS battery testing DLRO 247001-11-47
Same as D7001 but includes input voltage protection (for testing battery strap resistances in UPS systems, etc.)

DLRO 247002-11-47
Same as DLRO 247002-47 but includes input voltage protection Tests carried out with the D7001 conform to the U.K. Mines and Quarries Act 1954 Conductance Tests. (The instrument is not suitable for use in explosive atmospheres.)
### SPECIFICATIONS

#### Ranges

<table>
<thead>
<tr>
<th>Resistance Range</th>
<th>Lowest Reading</th>
<th>Test Current (±20%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5,999 mΩ</td>
<td>1 μΩ</td>
<td>10 A</td>
</tr>
<tr>
<td>0 to 59.99 mΩ</td>
<td>10 μΩ</td>
<td>1 A</td>
</tr>
<tr>
<td>0 to 599.9 mΩ</td>
<td>100 μΩ</td>
<td>0.1 A</td>
</tr>
<tr>
<td>0 to 5,999 Ω</td>
<td>1 mΩ</td>
<td>0.01 A</td>
</tr>
<tr>
<td>0 to 59.99 Ω</td>
<td>10 mΩ</td>
<td>0.001 Ω</td>
</tr>
</tbody>
</table>

#### Power Supply

- Internal rechargeable NiCad cells.
- Approximately 300 full charge/ discharge cycles

#### Battery Charger

- Full Charge Time: 14 hours for 240 V supply. Instrument may be used while charging takes place, but increased charging time is necessary. Charger operates from 220/240 V ±10%, 50/60 Hz.

#### Accuracy

- ±0.25% of reading ±1 digit (15 to 35°C)
- ±0.5% of reading ±1 digit (0 to 50°C)

#### Display

- Red 3½ digit L.E.D. display, 12 mm high characters, maximum reading 59.99, decimal point and negative sign, plus over-range indication

#### Zero Offset

- Typically 0 to 1 digit over 15 to 35°C; full accuracy can be achieved by using the REVERSE switch to average the readings.

#### On/Off

- Toggle switch that energizes all circuits; both momentary ON and LOCK positions

#### Response Time

- 2 seconds to final reading after ON/OFF/LOCK switch closed (plus inductive settling)

#### Input Protection

- 1-V peak may be applied between any two terminals.

#### Effect of Inductive Test Item

- Normally no damage caused by inductive kicks

#### Temperature Range

- Operating: 0 to 50°C
- Storage: -40 to +60°C (Batteries must be removed if instrument is stored at high temperatures.)

#### Test Lead Resistance Requirements

- 20 mΩ nominal for each current lead. Deviations affect test current, but do not affect accuracy unless the resistance is large compared with the top of the measuring range (e.g., 100 mΩ on the 6-mΩ range).

#### Fuse

- 160 mA ceramic HBC (T), 20 x 5 mm

#### Additional Specification for DLRO Instruments

**DLR0 247002-47**

As D7001 but with an additional range 0 to 599.9 μΩ, lowest reading 0.1 μΩ, test current 10 A ±20% and accuracy ±0.3% of reading ±2 digits

**DLR0 247001-3-47:**

As D7001 but with a 100 A adaptor plug

**DLR0 247120-47**

100 A current supply (requires separate 100 A rated leads)

### ORDERRING INFORMATION

<table>
<thead>
<tr>
<th>Item (Qty)</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Resistance Ohmmeter</td>
<td>D7001</td>
</tr>
</tbody>
</table>

#### Included Accessories

- Test leads with duplex hand spikes, 2.5 m [8 ft] (2 used) .......................................................6111-023
- Kelvin clip lead set, 1.5 m [5 ft] .......................................................249001
- Testing instruction book

#### Optional Accessories

- Test leads with single hand spikes, 1.8 m [6 ft] .......................................................6130-516
- Test leads with duplex hand spikes, 6 m [20 ft] (2 used) .......................................................6111-023
- Test leads with duplex hand spikes, 9 m [30 ft] (2 used) .......................................................6111-024

### E.M.C.

- The instrument meets EN 50081-1 and ENV50082-1 (1992).

### POWER SUPPLY

- 240 V, 50/60 Hz
- Dimensions: 254 H x 330 W x 200 D mm
- Weight: 9.3 kg (20 lb)

**DLR0 247001-11-47**

As D7001 but with additional input voltage protection

- Protection against accidental over-voltage up to 30 V using zener diode and fuse. Not suitable for testing inductive components

**DLR0 247002-11-47**

As D7001 but with an additional range and input voltage protection 0 to 599.9 μΩ, lowest reading 0.1 μΩ , test current 10 A ±20% and accuracy ±0.3% of reading ±2 digits

- Protection against accidental overvoltage up to 30 V using zener diode and fuse. Not suitable for testing inductive components