

# BT51

## Low Resistance Ohmmeter



- High test current
- Four terminal measurement
- Two measuring ranges (2000 m $\Omega$  and 20,00 m $\Omega$ ) and maximum resolution of 0,01 m $\Omega$
- Protected against inadvertent connection to the mains supply

### DESCRIPTION

The DUCTER® BT51 Low Resistance Ohmmeter makes measurements by passing a current through the conductor under test and also monitoring the voltage across it. The test current is limited by a simple current limiting circuit and is measured by monitoring the voltage across a resistor. The test current is maintained at a nominal 2 A, and as the measurement is ratiometric, the reading is unaffected by any current variations.

The instrument has a 3½ digit LED display to facilitate use in low light levels. Two LED's on the front panel indicate battery condition and whether test current is flowing when a measurement is being made. A neon lamp indicates the presence of a dangerous voltage if the test spikes are accidentally placed across a live circuit. This warning takes place whether or not the instrument has been switched on.

The ohmmeter is protected up to 240 V a.c. by a relay circuit that keeps the instrument in a safe mode isolated from the mains supply. Again, this safeguard is effective whether or not the instrument has been switched on.

Operation of the instrument is simple, there being only one range switch to set. Power is supplied by internal rechargeable cells and the charger unit is incorporated into the case. Duplex hand spike test leads are supplied and other types of leads are available.

The instrument is built into a robust, portable case that is weatherproof and shockproof and has a hinged, detachable lid.

### APPLICATIONS

Instruments that measure low resistance accurately and give the result directly are invaluable in many applications. The BT51 is a stable, accurate, reliable, low resistance ohmmeter equally suited to precision laboratory applications and to applications in the field.

#### Example Uses

- Commissioning and maintenance of substation equipment, where measurements can be made on such things as busbar joints, switch and circuit breaker contact resistance, fuse resistance, cold lap welded joints in aluminium earthing strip and earth bonding
- Maintenance of overhead transmission lines, where "hot" joints can be tested before and after their remaking or recompression
- 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
- Electronic equipment, where measurements can be made on such things as resistors, track resistance of printed circuit boards (quality control of plating thickness), resistance of plated-through holes on printed circuit boards, contact resistance of relays, resistance of shunts, thick film circuits, etc.
- Domestic and industrial wiring installations, where ring

main continuity and circuit protective conductor continuity can be measured and the integrity of earth bonding checked in compliance with the 16th Edition IEE Wiring Regulations

PRINCIPLE OF OPERATION

The BT51 uses the four-terminal method of measurement. The main advantage of this method is that the resistance of the test leads is not included in the measurement. This is an important factor when the value of the measured resistance is very low. In the diagram, resistance RX is measured only between points A and B; other resistances in the current loop either side of A and B are ignored.

Good connections to the item whose resistance is being measured are very important. Test leads for the instrument may take the form of duplex hand spikes, which enable connections to such things as busbars and aircraft frames to be made easily. Crocodile-type clip leads are used where a more rigid connection is necessary (e.g., when varying contact resistance tends to introduce errors). Sometimes the current connections are made with crocodile clips and the potential connections with spikes. This may be the case, for example, where multiple measurements have to be made.

FEATURES AND BENEFITS

- High test current – 2 a.c. (e.g., for aircraft bond testing)
- Four terminal measurement
- Two measuring ranges (2000 m and 20,00 mW) and maximum resolution of 0,01 m
- 3½-digit LED display, which is helpful in a poorly lit environment
- Protection against 240 V a.c. and warning lights for added safety
- Robust, shockproof, weatherproof, portable case
- Can use very long test leads

SPECIFICATIONS

Ranges

2000 m , resolution 1 m  
20,00 m , resolution 0,01 m

Test Current

2 A nominal, with up to 2 across the C terminals

Accuracy (0 to 50° C)

±1% of reading ±2 digits

Display

3½-digit LED display

Temperature Range

Operating: 0 to 50° C (32 to 122°F)

Storage: -20 to +50° C (-4 to 122°F)

Protection

Relay protection for up to 240 V mains supply applied from C1/P1 to C2/P2

100 mA (T) fuse, 20 x 5 mm, ceramic (for charging circuit)

Power Supply

4 Ah capacity NiCad rechargeable cells with internal charging unit

Normal charging time of 10 hours on 240 V, 50 Hz mains supply

Safety

The instrument meets the requirements for IEC 10101-1 (1992), EN61010-1 (1993).

The instrument is intended for use with non powered circuits only.

EMC

In Accordance with IEC61326 including Amendment No. 1.

Dimensions

245 H x 344 W x 158 D mm  
(9,6 H x 13,5 W x 6,25 D in. approx)

Weight

45 kg (10 lb approx)

Power Supply

6 X 1,5 V cells IEC LR6 type. Nickel Cadmium rechargeable cells may be used.

Battery Life:

Typically more than 2000 tests each of 5 second duration.

Weight

530 gm. (1,16 lbs approx.)

Dimensions

195 x 98 x 40 mm.  
(5 in x 2,4 in x 1 in approx.)

ORDERING INFORMATION

Item (Qty)	Order Code
Low Resistance Ohmmeter (240 V operation)	BT51
Low Resistance Ohmmeter (120 V operation)	BT51/120
Included Accessories	
Supply lead for battery charger	25424-860
Duplex handspikes with 2,5 m (8 ft.) test leads	6111-022
Operating instruction book	6170-921
Optional Accessories	
Test leads with duplex hand spikes	,
6,0 m [20 ft]	6111-023
9,1 m [30 ft]	6111-024
Four terminal lead set with clip connectors	6110-220
Test lead with single hand spikes, 1,8 m [6 ft]	6130-516
Accessory pouch, leather	6430-193
NATO Stock No. 6625-99-763-2517	