DET5/4D & DET5/4R
Digital Earth Tester

- **Simple, fully automatic operation**
- **Choice of three or four terminal measurement**
- **Autoranging from 10 mΩ to 20 kΩ**
- **Tests to BS7671, BS7430, BS6651 and VDE 0413**
- **High tolerance to spike resistance helps testing in urban areas**
- **Noise rejection to 40 V**

DESCRIPTION

The Megger® DET5/4D and DET5/4R are fully automatic, four terminal instruments built into a rugged, water resistant case giving protection for outdoor use. The instrument is suitable for the testing of earth electrodes and measuring earth resistivity.

Operation is started by pushing one of two buttons on the front panel; one for three terminal measurement and one for four terminal testing. All other functions of the instrument are completely automatic. The instrument checks for conditions that may cause an invalid reading during a test. The low service error and wide operating temperature range enable accurate results to be achieved in real on-site conditions.

There are four ranges covering measurements from 10 mΩ to 20 kΩ. The earth resistance reading is displayed quickly, accurately and directly on a large, clear 3½ digit liquid crystal display. The display indicates when there is a high test spike resistance and also when the noise interference is too high to take a valid reading. If the batteries need replacing or recharging this will also be shown on the display.

Six 1,5 V AA dry cells provide power for the DET5/4D allowing 600 typical 15 second tests. The DET5/4R is powered by an internal rechargeable, lead acid battery. This instrument has a built in battery charger that can operate from a wide range of mains voltages. The capacity of the lead acid battery enables 600 typical 15 s tests to be made from one charge.

Each instrument is built into a small, lightweight case with a handle that has been designed for outdoor use and has IP54 protection. Four large terminals allow either spade or hook connectors, 4 mm plugs or bare ended wire to be used for the test leads. Terminal Shorting bars are provided for continuity testing or measurement using the 'dead earth' method. A removable cover allows access to the battery compartment in the DET5/4D or to the charger socket in the DET5/4R.

APPLICATIONS

The DET5/4D and DET5/4R digital earth testers are reliable instruments able to measure the earth resistance of both simple and complex electrode systems. They may be used to test in accordance with BS7430 (1991), BS6651 (1992) BS7671 (the 16th Edition of the IEE wiring regulations), NFC15-100, IEC364 and VDE 0413 part 7 (1982). The instruments are suitable for soil resistivity measurements which are used to establish the optimum earth electrode system design and location, to avoid expensive reworking of electrical installations. They are also suitable for performing archeological and geological investigations.

The direct indication of excessive noise and high spike resistances avoids measurement errors and lengthy testing of these parameters. The direct digital reading is unambiguous, avoids errors and assists in faster, more economic testing.

Earth testing kits including test spikes and leads, and a

book describing several testing techniques are also available.

FEATURES AND BENEFITS

- Simple to use, one touch operation
- Auto switch off to save battery power
- Rugged, weatherproof case
- Large, clear L.C.D.
- Noise rejection to 40 V
- Indicators show if reading may be invalid
- Terminal shorting bars supplied
- Earth testing kits available
- Optional carrying case and harness

SPECIFICATIONS

Earth Resistance Ranges (Autoranging)

20 Ω Range:
0,01 Ω to 19,99 Ω

200 Ω Range:
0,1 Ω to 199,9 Ω

2 kΩ Range:
0,001 kΩ to 1,999 kΩ

20 kΩ Range:
0,01 kΩ to 19,99 kΩ

Accuracy (at 23°C)
±7.5% ±3 digits (±10% at >0.5 ohms and ±0.05 ohm at <0.5 ohms for KEMA K85B requirements.

Maximum service error
±7.5% ±3 digits (±10% at >0.5 ohms and ±0.05 ohm at <0.5 ohms for KEMA K85B requirements.

Display
3½ digit L.C.D. with Ω, kΩ and low battery voltage indicators. LEDs for high noise, high voltage probe resistance and high current loop resistance.

Test Frequency
128 Hz ±0,5 Hz

Test voltage
Maximum 50 V peak

Test Current (constant current within a range)

20 Ω Range:
10 mA a.c. r.m.s.

200 Ω Range:
1 mA a.c. r.m.s.

2 kΩ, 20 kΩ Range:

100 μA a.c. r.m.s.

Potential Circuit Interference
Voltages of 40 V pk to pk at 50 Hz, 60 Hz, 200 Hz or 162⅔ Hz in the potential circuit will have a maximum effect of typically 1% on the reading in the 20 Ω to 2 kΩ ranges. If the 'NOISE' LED is not showing, the maximum error due to noise on these ranges will not exceed 2%. In the 20 kΩ range this is reduced to 32 V pk to pk.

Current Loop Interference
Voltages of 60 V pk to pk, 50 Hz, 60 Hz, 200 Hz or 162⅔ Hz in the current loop will have a maximum effect of 1% on the reading with minimal current loop resistance.

Maximum Current Loop Resistance
An additional error of typically 1% may be introduced for current loop resistances of:-

20 Ω Range: 4 kΩ

200 Ω Range: 40 kΩ

2 kΩ, 20 kΩ Range: 400 kΩ

Note: with minimal current loop interference.

If the 'Rc' LED is not showing the maximum error will not exceed 2%.

Maximum Voltage Probe Resistance
An additional error of typically 1% will be introduced for voltage probe resistance of 75 kΩ. If the 'Rp' LED is not showing the maximum error will not exceed 2%.

Power Supply
DET5/4D; 6 x 1,5 V (AA) IEC LR6 cells giving 600 typical 15 s tests at 20°C (68°F).

DET5/4R; Rechargeable version (12 V, 0,8 Ah) from 110/120 V or 220/240 V (user selectable) 50/60 Hz supplies giving 600 typical 15 s.

Instrument Protection
IP54

Safety
The instruments meet the requirements of IEC1010-1.

EMC
In accordance with IEC61326 including amendment No. 1.

Flash Test
Tested to 2,3 kV r.m.s.

Voltage Withstand
250 V a.c. between any two terminals.

Dimensions
243 mm x 161 mm x 70 mm
(9,4 in x 6 in x 2,75 in approx.)

Weight
DET5/4D
0,82 kg (1,5 lb approx.)

DET5/4R
1,27 kg (2,8 lb approx.)

Temperature Range
Operating:
-20°C to +45°C (-4 to113°F)

Storage:
-40°C to +70°C (-40 to 158°F) (DET5/4D, without batteries)

Temperature Coefficient
±0,1% per °C over the temperature range -15°C to +45°C

±0,05% per °F over 5°F to 113°F

Humidity
Operating:
90% RH max. at 45°C (113°F)

Storage:
70% RH max. at 55°C (113°F)

ORDERING INFORMATION

Item	Order Code.
Battery powered digital earth tester	DET5/4D
Rechargeable digital earth tester	DET5/4R
Included Accessories	
Terminal Shorting bars (2)	
Operating Instructions	6171-996
Mains supply lead for charging (DET5/4R)	
Optional Accessories	
Carrying Case	6420-103
Instrument Carrying Harness	6220-537
Three terminal Compact Earth testing kit	6210-160
Comprising carrying bag containing; Three push-in galvanised steel spikes 10 mm round section, 450 mm long 3 m, 15 m and 30 m of cable on a winder	

Item	Order Code.
Four terminal Compact Earth testing kit	6210-161
Comprising carrying bag containing: Four push-in galvanised steel spikes 10 mm round section, 450 mm long 3 m, 15 m, 30 m and 50 m of cable on a winder	
Four terminal Earth testing kit	6310-755
Comprising carrying bag containing: Four spikes, hammer 2 x 3 m, 30 m, 50 m on winders with connectors & clips.	
Reel of cable, 50 m (16 ft. approx.)	6121-119
Publication	
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