

# DET3/2

## Digital Earth Tester



- n **Three- or four-terminal measurement selected by a switch**
- n **50 volt maximum output voltage for safety and convenience**
- n **Direct-reading 3 1/2-digit L.C.D.**
- n **Four ranges covering measurements from 0,01 to 19,99 k**

### DESCRIPTION

The Megger® DET3/2 Digital Earth Tester is a compact instrument designed to measure earth electrode resistance and soil resistivity. The instrument uses the four-terminal method of measurement, in which the resistance of the current circuit does not affect the reading. The instrument circuit has been designed so the resistance of the potential circuit also does not affect the measurement. Pressing a latching button converts the instrument from its four-terminal measurement mode to a three-terminal one. The reversing d.c. test current has a frequency of 128 Hz, which avoids possible interference from other 50 and 60 Hz stray currents in the vicinity of the earth electrode under test. In the interests of safety, the maximum test voltage has been limited to 50 V.

There are four measuring ranges (20 and 200  $\Omega$  and 2 and 20 k  $\Omega$ ) selected by a rotary switch that incorporates an OFF position. The instrument is simple to use and there is no test button to hold down. The readings are displayed quickly, directly and accurately on the 3 1/2-digit L.C.D. Annunciators on the display indicate if:

- n Noise interference in the soil passing the test current is excessive
- n Current test spike resistance is too high
- n Potential test spike resistance is too high
- n Generator is being cranked too slowly

The potential spike resistance is checked by pressing a separate button. The direct indication of these factors

speeds the testing procedure and gives assurance of valid measurements. The low service error and the wide operating temperature range enable accurate results to be achieved in real on-site conditions.

Powered by an easy-to-turn, hand-cranked generator, the DET3/2 instrument power is always available and very convenient for work in remote locations.

Each instrument is built into a small, lightweight, yet robust plastic case with a fold-down carrying handle. Four recessed terminals, marked C1, P1, P2 and C2, are mounted at the top of the case. Right-angled terminal connectors are supplied, enabling test leads with spade, hook or 4 mm plug connectors to be used.

### APPLICATIONS

The DET3/2 Digital Earth Tester is a reliable instrument, able to measure the earth resistance of both simple and complex electrode systems. They may be used to test in accordance with BS 7430 (1991), BS7671, the IEE wiring regulations, NFC15-100, IEC364 and German specification VDE 0413 Part 7 (1982). The instrument is 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. It is also suitable for performing archeological and geological investigations.

The direct indication of excessive noise and high spike

resistances avoids measurement errors, lengthy separate testing of these parameters and the need for high resistance ranges on the instruments. The direct, digital reading is unambiguous, avoids errors and assists in faster, more economic testing.

Earth testing kits, which include suitable test spikes and test leads, are available separately. Also available is the detailed publication "A Simple Guide to Earth Testing" which describes the various methods of earth testing.

**FEATURES AND BENEFITS**

- n Direct indication of noise and high spike resistance (current and potential)
- n Comply with the testing requirements of British and VDE specifications
- n Powered by a hand-cranked generator for field independence

**SPECIFICATIONS**

**Earth Resistance Ranges**

- 0,01 to 19,99
- 0,1 to 199,9
- 1,0 to 1,999 k
- 10 to 19,99 k

**Accuracy (23° C ±2° C)**

±2% of reading ±3 digits

**Total Service Error:**

±5% of reading ±3 digits

**Comply With Standards**

BS 7430

VDE 0413 Part 7 (1982)

**Test Frequency**

128 Hz ±0,5 Hz

**Test Current**

**20-Ohm Range:**  
10 mA a.c. rms

**200-Ohm Range:**

1 mA a.c. rms

**2- and 20-k Ranges:**

100 µA a.c. rms

Test current (= short-circuit current) is constant throughout the range.

**Interference**

Interference voltages of 20 V ±5% peak-to-peak, 50 Hz in the potential circuit will have a maximum effect of ±1% on the reading obtained for the 20 to 2 k ranges. For the 20 k range, this interference voltage is reduced to 16 V ±1,0 V peak-to-peak at full-scale deflection.

**Maximum Current Spike Resistance**

The spike resistance that will introduce an additional 1% error is:

- 20 range 4 k ±0,5 k
- 200 range 25 k ±3 k

2 and 20 k ranges 50 k ±5 k

**Maximum Potential Spike Resistance**

The spike resistance that will introduce an additional 1% error is:

- 20 range 10 k ±1 k
- 200 range 25 k ±3 k

2 and 20 k ranges 100 k ±10 k

(The current and potential spike resistances are loop values; therefore, the resistance under test must be subtracted from these figures.)

**Maximum Output Voltage**

50 V

**Display**

31/2-digit L.C.D., max. reading 1999

**Temperature Effect**

< ±0,2% per °C over the temperature range -15 to + 55°C

**Temperature Range**

**Operating:** -15 to +55°C

**Storage:** -40 to +70°C

**Humidity**

**Operating:** 95% RH max. at 40°C

**Storage:** 93% RH max. at 55°C

**Flash Test**

3 kV a.c.

**Voltage Withstand**

In the event of a system fault, the instrument will withstand 240 V a.c. applied between any two terminals.

**Safety**

The instrument meets the requirements of the IEC 1010-1 (1992) specification.

**EMC**

In accordance with IEC61326 including Amendment No.1.

**Dimensions**

128 H x 210 W x 125 D mm

(5 H x 8,25 W x 5 D in. approx)

**Weight**

1 kg (2,25 lb approx)

**Power Supply**

Internal, hand-cranked a.c. generator (minimum cranking speed 160 rpm)

**ORDERING INFORMATION**

Item	Order Code.
Digital Earth Tester	DET3/2
Included Accessories	
Operating instruction book	6171-524
<b>Optional Accessories</b>	
Carrying case, for instrument only	6420-043
Three terminal Earth testing kit	6210-160
Comprising carrying bag containing; Three push-in galvanised steel spikes 10 mm round section, 450 mm long 3m, 15 m and 30 m of cable on a winder	
Earth testing kit	6310-755
Comprising carrying case and pouch containing: Four galvanised steel spikes 10 mm dia. (0.4 in. dia. approx) x 350 mm (14 in. approx) long 30 m (98,5 ft approx) of cable on a winder 50 m (164 ft approx) of cable on a winder Two 3 m leads complete with connectors and clips	
Four terminal 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 Reel of cable (50 m long)	
<b>Publications</b>	
'Getting Down to Earth'	AVTM25-TA