



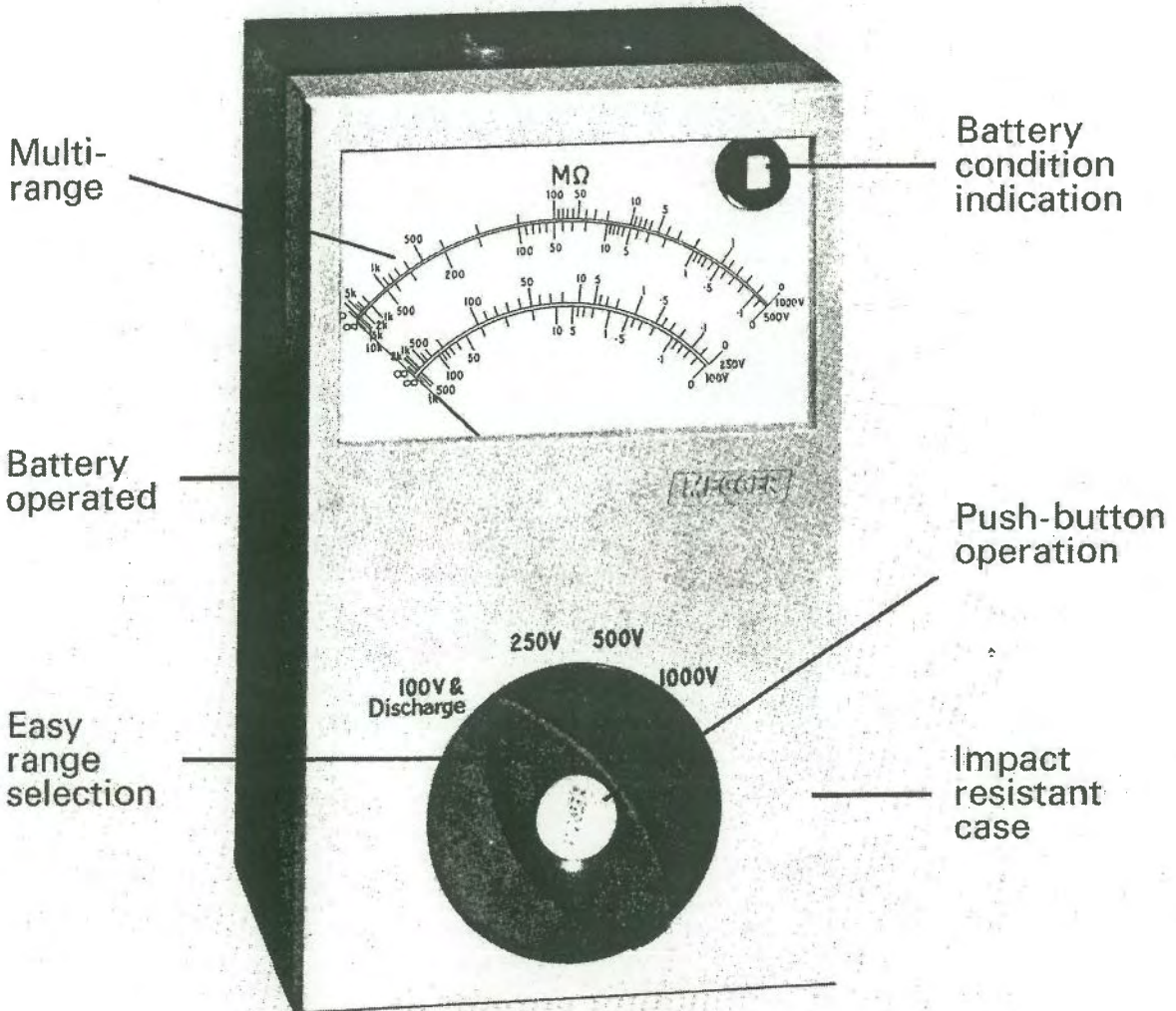
Model **BM 8**

Testing Instruments

Catalogue No 40060

# Multi-Voltage Insulation Tester (Battery Operated)

Intended for use where high values of insulation resistance may be met—such as in high-voltage cables and where tests can be of long duration. There are four testing voltages, selected by a rotary switch. At 1000V the range is 0-10 000 megohms and an indicator continuously monitors the condition of the internal dry batteries.





# Testing Instruments BM8 Battery 'Megger' Tester

## Specification

Ranges:—0-1000 megohms and infinity at 100V. d.c.

0-2000 megohms and infinity at 250V. d.c.

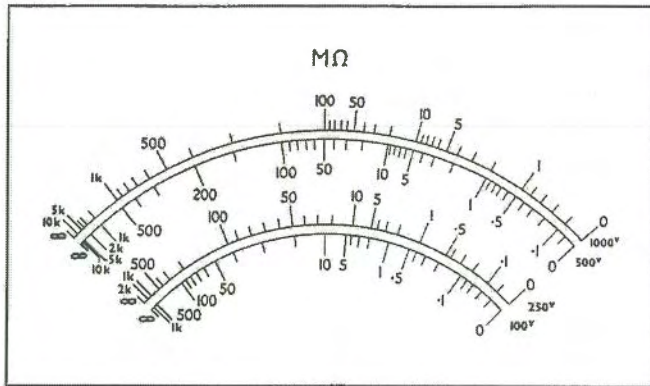
0-10 000 megohms and infinity at 500V. d.c.

0-10 000 megohms and infinity at 1000V. d.c.

Short-circuit Current: 1.0 milliamp (all ranges).

Maximum Battery Drain: 200 milliamps.

Catalogue No. 40060



**Accuracy:**  $\pm 1.27$  mm (0.050 in.) from any marked position on the scale when measured against standard resistors.

**Battery Check:** Red and white band on separate indicator gives battery indication under load for entire duration of any test.

**Power Source:** Six dry cells of 1.5V. each (Ever Ready U7 or equivalent).

**Range Selection:** Click-stop rotary switch with four positions: 100V. & Discharge, 250V., 500V., and 1000V.

**Movement:** Robust taut band suspension permanent magnet moving-coil type.

**Terminals:** 4 mm sockets to accept "banana" plugs.

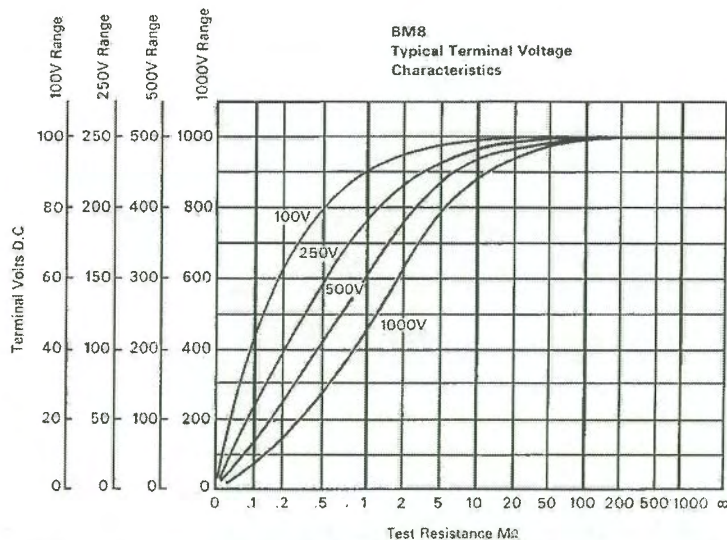
**Discharge:** Capacitive circuits can be discharged by setting instrument to 100V. position and releasing button.

**Dimensions (instrument)**  
153 × 59 × 95 mm ( $6 \times 2\frac{3}{8} \times 3\frac{3}{8}$  in.)  
**Dimensions (total including case)**  
160 × 61 × 117 mm ( $6\frac{1}{4} \times 2\frac{3}{8} \times 4\frac{3}{8}$  in.)

**Weight (instrument)**  
680 grams (1 lb. 8 oz.)  
**Weight (total including case and leads)**  
1 kg. (2 lb. 4 oz.)

**Supplied complete with testing leads.**  
Optional Extra: Leather case Cat. No. 40090

*All voltage and performance characteristics are typical.*



THE COMPANY RESERVE THE RIGHT AT ANY TIME TO ALTER THE SPECIFICATION OR DESIGN LISTED OR SHOWN, WITHOUT PRIOR NOTICE

## Evershed & Vignoles Limited

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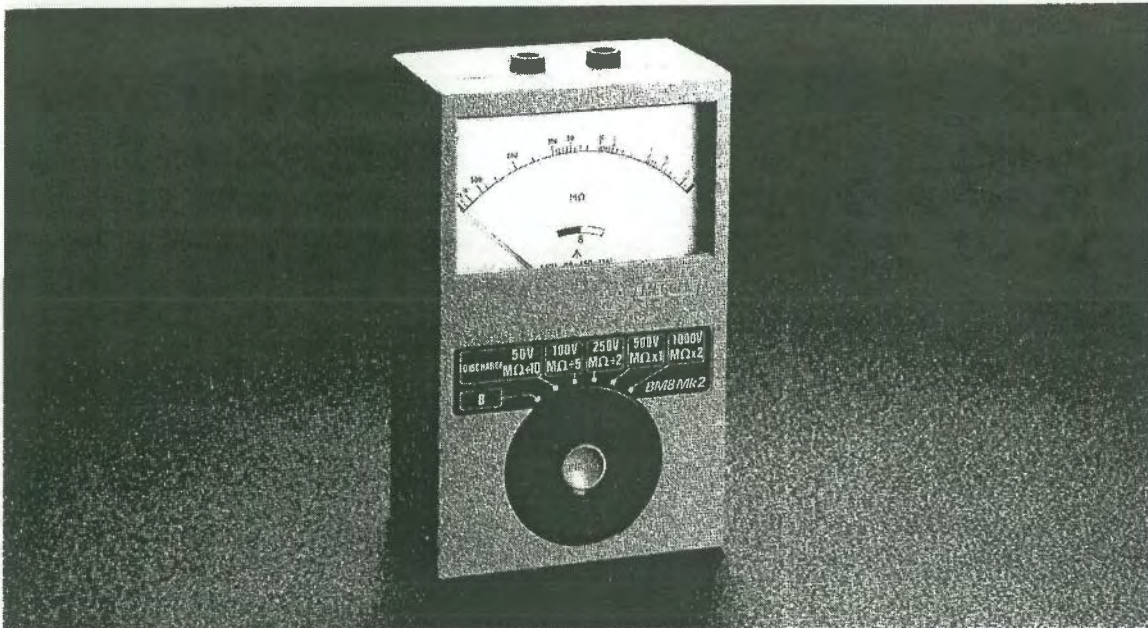


Thorn Measurement Control  
and Automation Division

A member of the Thorn Group



### A multi-voltage, hand-held, analogue insulation tester



**High sensitivity – to 20 000 MΩ.**

**Five d.c. test voltages from 50 V (for low voltage circuits) to 1000 V.**

**Battery powered, with built-in battery check.**

**Rugged taut band meter movement.**

**One hand operation.**

**Capacitive circuit discharge facility, selected by the range switch.**

The BM8/2 is an easy-to-use, battery powered insulation tester from which five d.c. test voltages are available i.e. 50 V, 100 V, 250 V, 500 V and 1000 V. The instrument can measure up to 20 000 MΩ at 1000 V d.c. and there is a single scale covering five decades of resistance. At 500 V measurement readings are direct and at the other test voltages multiplication factors are applied, as indicated on the range switch graphics label, to obtain the correct reading.

The BM8/2 is built into a rugged ABS plastic case and has a click-stop rotary switch to select the d.c. test voltage required. A test is executed when a push-button is pressed to energize the electronic circuit and apply the output voltage. The instrument uses a robust taut band meter movement with a clear easy-to-read scale from which accurate measurements are obtained. The output voltage is applied to the item under test via two 4 mm terminals fitted in the top of the case.

Power for the instrument is supplied from six 1.5 V battery cells fitted in a compartment at the rear of the case. The maximum battery current drain is 200 mA and a position on the range switch is selected in order to check the condition of the cells under load.

After making a test and before disconnecting the test leads, external circuit capacitance can be safely discharged through an internal resistor by turning the selector switch to the discharge position after releasing the test button. The test leads can be removed from the item tested in safety.

#### Applications

The BM8/2 instrument is suitable for installation, commissioning and maintenance work on many electrical systems including cables, switchgear, motors, generators etc. Also it may be used for testing the compliance of wiring installations with the IEE Wiring Regulations in respect of insulation tests.

It is an advantage that, in one instrument, the facilities are available to test at 1000 V d.c., where this requirement is specified, down to 50 V d.c. The 50 V range is useful for testing equipment liable to be damaged by higher voltages e.g. p.c.bs., components and computer peripheral devices. Normal 415 V/240 V a.c. systems can be tested at 500 V d.c. and 120 V a.c. systems at 240 V d.c. Telecommunications equipment would usually be tested at 100 V d.c. and the instrument has a range suitable for this.

A multi-voltage tester such as the BM8/2 can be employed to make measurements designed to show the gradual decline in insulation condition with time, also the improvements in the insulation of motor windings etc. which result from drying processes.

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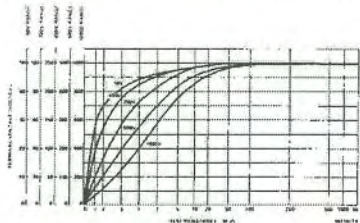
## SPECIFICATION

<b>Test Voltages/Insulation Resistance Ranges</b>	Test Voltages 50 V d.c. 100 V d.c. 250 V d.c. 500 V d.c. 1000 V d.c.	Resistance Ranges 0-1000 MΩ + ∞ 0-2000 MΩ + ∞ 0-5000 MΩ + ∞ 0-10000 MΩ + ∞ 0-20000 MΩ + ∞
<b>Short Circuit Current</b>	0,8 mA approximately (all ranges)	
<b>Range Selector</b>	Click-stop rotary switch with six positions: Battery check, 50 V / DISCHARGE, 100 V, 250 V, 500 V and 1000 V	
<b>Discharge</b>	Capacitive circuits are discharged by turning selector switch to DISCHARGE and releasing operating push-button	
<b>Movement</b>	Taut-band suspension permanent magnet moving coil	
<b>Accuracy</b>	± 1,27 mm (0,050 in) from any marked position on the scale when checked against standard resistors.	
<b>Power supply</b>	Six x 1,5 V cells IEC R6 type. Battery check: indicated on scale when button is pressed with battery test position selected. Battery drain: 200 mA max.	
<b>Terminals</b>	4 mm sockets to accept plugs	
<b>Dimensions</b>	153 mm x 95 mm x 59 mm (6 in x 3 7/8 in x 2 3/8 in) approx.	
<b>Weight</b>	680 g (1 1/2 lb) approx.	

Illustration of Typical Scale (not full size)



Typical Terminal Voltage Characteristics



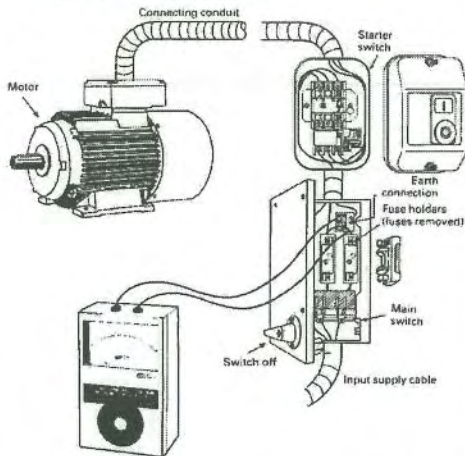
<b>Accessories</b> Supplied with the instrument	Test lead set including prods and shrouded crocodile clips Operating instruction book
Supplied as an optional extra	Test-and-Carry case, leather part no. 6320-054 Test-and-Carry case, imitation leather part no. 6320-069 A companion carrying case (leather covered) for the BM8/2 and one similar tester (e.g. a Loop Tester), plus all test leads part no. 6420-004

NATO Stock No. 6625-99-650-5337

## Routine Tests on Motors and Generators

The insulation tester will measure all parallel circuits connected to its terminals. These may include all parts of the equipment under test and all leakage paths.

The first step is always to open the main switch and remove the fuses; this isolates the entire motor (or generator) from the supply. Connect together the two terminals on the output (motor) side of the main switch and connect these to the 'L', '-' or black terminal of the insulation tester. Connect the 'E', '+' or red terminal to earth by using the motor frame, earth terminal or switch casing. See the illustration below.



Connections to test a motor and its switch gear

The insulation tester is operated and the resistance reading taken. The test performed in this way checks the whole system and if an unsatisfactory result is obtained the defective part must be identified.

The next step therefore is to disconnect the cable at the motor and re-test. If a satisfactory result is obtained the starter switch and cables are good and the fault lies in the motor itself. Further tests are then done on the motor to identify that part which is causing trouble. That is:-

- A test is done on the armature (or stator) and field windings connected together. This should give the unsatisfactory result found in the initial test.
- A test is done with the brushes lifted from the commutator. This is to separate the brush gear and field windings from the armature windings. An unsatisfactory result here narrows the problem to the brush gear or field windings. If the result is all right then:-
- Another test is done between the (now isolated) armature and frame, which should show the fault.

Further investigation in a similar manner will reveal in which part of the brush gear or windings the fault lies. Similarly, if after disconnecting the motor the test result was still unsatisfactory, the various parts of the starter, i.e. resistance coils, no-volt release coil, overload coil, or the connecting cable must be tested separately to locate the trouble spot.

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**MEGGER**

## Test with total confidence



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