Megger. *210170*

Insulation & Low Resistance Tester

User Guide

SAFETY WARNINGS

- **Safety Warnings** and **Precautions** must be **read and understood** before the instrument is used. They must be **observed** during use.
- The circuit under test **must** be switched off, de - energized and isolated **before** Insulation or Continuity tests are made.
- Circuit connections **must not** be touched during a test.
- The test button **must not** be pressed while connecting the test leads or while changing ranges.
- The '**Test**' button must **not** be pressed when making a voltage test.
- The **Default Voltmeter**, and **Automatic discharge** are additional safety features and **should not** be regarded as a substitute for normal safe working practice.
- The ***210170*** is protected for connection to Power distribution systems up to 300 V **Line** - **Ground**, and 500 V **Line** - **Line** for Installation Category III*.
- It is recommended that fused test leads are used when measuring voltage on high energy systems.
- After insulation tests, capacitive circuits **must** be allowed to discharge **before** disconnecting the test leads.
- Test leads, prods and alligator clips **must be** in good order; clean, and with no broken or cracked insulation.
- Replacement fuses **must be** of the correct size, type and rating.

NOTE

THE INSTRUMENT MUST ONLY BE USED BY SUITABLY TRAINED AND COMPETENT PERSONS.

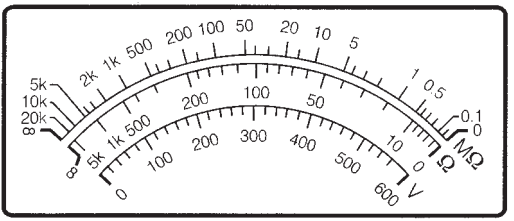
Symbols used on the instrument

Caution: risk of electric shock

Caution: refer to accompanying notes

Equipment protected throughout by Double Insulation (Class II)

MEASUREMENT SCALES



OPERATION

⚠ **Refer to Safety Warnings before using the instrument**

Default Voltage measurement

The ***210170*** will act as a default voltmeter (0 to 600 V a.c.) with any of the Insulation test positions selected. The '**Test**' push **must not** be pressed when making a voltage test. **Note:-** The ***210170*** is internally fuse protected to 500 V. For fuse protection with supplies above 500 V, use Fuse Probe Kit **FPK5**.

1. Select any Insulation test position with the rotary selector switch.
2. Carefully connect the test leads to the circuit under test. **Do not press the** '**Test**' **push**.
3. Read the voltage measurement from the voltmeter scale.
4. Carefully disconnect the test leads.

Low Resistance measurement (Ω)

1. Select Ω with the rotary selector switch.
2. Ensure that all test leads are clean and in good condition, and connect them to the **isolated** circuit under test.
3. ⚠ Any pointer deflection indicates a live circuit, and testing should be **aborted**.
4. Press the '**Test**' push, and keep it pressed while turning the generator handle.
5. Read the measurement from the **k**Ω scale.
6. Disconnect the test leads.

Insulation Testing (MΩ)

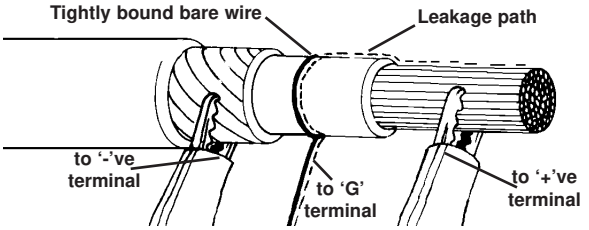
Automatic circuit discharge is effective when the test button is released, and decaying voltage is indicated by the scale needle until the circuit is discharged.

1. Select **M**Ω with the rotary selector switch.
2. Ensure that all test leads are clean and in good condition, and connect them to the **isolated** circuit under test.
3. ⚠ Any pointer deflection indicates a live circuit, and testing should be **aborted**.
4. Press the '**Test'** button, and keep it pressed while turning the generator handle.
5. Read the measurement from the **M**Ω scale.
6. Release the '**Test**' push and monitor any scale needle movement to confirm when any discharging voltage decays to zero.
7. When the circuit has discharged, disconnect the test leads.

Using the Guard Terminal

For basic insulation tests and where there is little possibility of surface leakage affecting the measurement, it is unnecessary to use the guard terminal.

In cable testing, there may be surface leakage paths across the insulation between the bare cable and the external sheathing due to the presence of moisture or dirt. Where it is required to remove the effect of this leakage, particularly at high testing voltages, a bare wire may be bound tightly around the insulation and connected via the third test lead to the guard terminal '**G**'.



The guard terminal is at the same potential as the negative terminal. Since the leakage resistance is effectively in parallel with the resistance to be measured, the use of the guard causes the current flowing through surface leakage to be diverted from the measuring circuit. The instrument therefore reads the leakage of the insulator, ignoring leakage across its surface.

SPECIFICATION

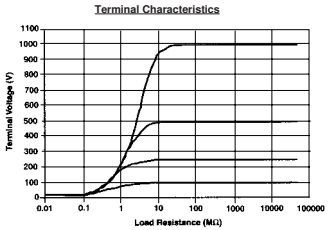
Insulation Ranges

Measuring Ranges: 0 - 20,000 MΩ at all test voltages

Test Voltages (d.c.): 100 V; 250 V; 500 V; 1kV on open circuit

Test V. Accuracy: ±5%

Short Cct. Current: 220 µA nominal on all ranges



Accuracy: ±3% of scale length on a 3.08 inch arc length

Low resistance Range

Measuring Range: 0 - 5000 Ω
Open Cct. Voltage: 3 V ± 5%
Short Cct. Current: 30 mA ± 10%
Accuracy: ±3% of scale length on a 3.08 inch arc length

Default Voltage measurement

Range: 0 - 600 V a.c.
Accuracy: ±2.5% of scale length

General Specifications

Overload rating: The ***210170*** is protected for connection to Power distribution systems up to 300 V **Line** - **Ground**, and 500 V **Line** - **Line** for Installation Category III*.

Temp. Range:

Operating: 14°F to 122°F
Storage: 4°F to 158°F

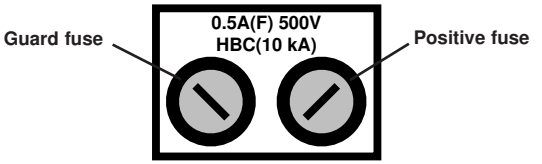
Humidity:

Operating: 70% RH at 68°F, 50% RH at 104°F
Storage: 95% RH at 95°F

Automatic Discharge: Capacitive circuits are automatically discharged when the '**Test**' push is released following an insulation test.

Power Supply: Low voltage brushless a.c. generator

Fuses: 2 x 500 mA (F) 500 V H.B.C. 10 kA min 1¼" x ¼"
To check these fuses, short all three test leads together and set the rotary selector switch on any Insulation test position. Press the '**Test**' push and keep it pressed while turning the generator handle. The needle should register approximately **2 M**Ω. A zero reading indicates that the '**G**' fuse has ruptured. An Infinity reading indicates that the **+ve** fuse has ruptured.



Fuse Replacement: Held in a screw type holder located in the base of the instrument. Use a flat blade screwdriver to release the center part of the holder, and remove the ruptured fuse. Replace with fuse(s) of the correct type, size and rating.

Weight: 2.2 lb

Dimensions: 8¼" (including generator handle) x 5" x 5"

Cleaning: Wipe disconnected instrument with a clean cloth dampened with soapy water or Isopropyl Alcohol IPA)

*Relates to transient overvoltage likely to be found in fixed installation wiring.

ACCESSORIES

Supplied	**Part Number**
User Guide	6172-382
Test lead set comprising:- 1 black, 1 red, 1 green test lead, with alligator clips	6220-436
Test Record Card (5 supplied)	6172-111
Optional	
Carrying case	217740
Fuses (500mA) x 5	6121-289
Fused probe kit **FPK8**	6111-287
Test lead set	6220-436
Test Record cards (Pack of 20)	6111-216
Publication - 'A Stitch in Time'	AVTM21-P8B

REPAIR AND WARRANTY

The instrument contains static sensitive devices, and care must be taken in handling the printed circuit board. If an instrument's protection has been impaired it should not be used, but sent for repair by suitably trained and qualified personnel. The protection is likely to be impaired if for example; it shows visible damage; fails to perform the intended measurements; has been subjected to prolonged storage under unfavourable conditions, or has been subjected to severe transport stresses.

NEW INSTRUMENTS ARE GUARANTEED FOR 1 YEAR FROM THE DATE OF PURCHASE BY THE USER.

Note: Any unauthorized prior repair or adjustment will automatically invalidate the Warranty.

INSTRUMENT REPAIR AND SPARE PARTS

For service requirements for Megger Instruments contact :-

Megger **or**
Valley Forge Corporate Center
2621 Van Buren Avenue
Norristown, PA 19403
U.S.A.

Tel: +1 (610) 676-8579
Fax: +1 (610) 676-8625
or an approved repair company.

Megger Limited
Archcliffe Road
Dover
Kent, CT17 9EN
England

Tel: +44 (0) 1304 502243
Fax: +44 (0) 1304 207342

Approved Repair Companies.

A number of independent instrument repair companies have been authorised for repair work on most Megger instruments, using genuine Megger spare parts. Consult the Appointed Distributor / Agent regarding spare parts, repair facilities, and advice on the best course of action to take.

Returning an Instrument for Repair

If returning an instrument to the manufacturer for repair, it should be sent freight pre-paid to the appropriate address. A copy of the invoice and of the packing note should be sent simultaneously by airmail to expedite clearance through Customs. A repair estimate showing freight return and other charges will be submitted to the sender, if required, before work on the instrument commences.

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