

# BM11D and BM21

## 5-kV Insulation Resistance Testers



Model BM21  
Cat. No. 218621

Model BM11D  
Cat. No. 218651

- Analog/digital display
- Multiple test voltages
- Integral timer
- Automatic discharge of equipment under test

### DESCRIPTION

The Megger BM11D and BM21 5-kV Insulation Resistance Testers are portable, battery-powered, high-voltage instruments that use the latest electronic design and technology. The instruments have user-friendly keypads with push-buttons to select test voltages of 500, 1000, 2500, and 5000 V dc. In addition to the standard test voltages, a variable voltage feature on the BM21 selects test voltages between 25 and 5000 V dc in 25-V steps.

An integral timer automatically controls the duration test and stops the output voltage when the preset time has expired.

Analog/digital displays offer practicality and precision. The analog/digital LCD on the BM11D displays from 100 k $\Omega$  to 1 T $\Omega$  in all test voltages. On the BM21, the analog/digital LCD displays readings of insulation resistance to 5 T $\Omega$ , leakage current to below 1 nA, and capacitance to 10  $\mu$ F. The analog scale rapidly identifies insulation condition and monitors variable measurements. The digital display complements the analog scale by simultaneously displaying an easy-to-read, precise measurement.

As a safety feature, these testers act as an ac/dc safety voltmeter, indicating the level of applied voltage before a test and monitoring discharge voltage after a test. For added safety, an alarm warns the operator if the circuit under test has not been de-energized.

Both testers incorporate a guard terminal to eliminate the effects of surface leakage in the item under test, thus ensuring accurate measurements.

### APPLICATIONS

The BM11D and BM21 test the insulation resistance of:

- High-voltage power cables
- Large motor/generator windings
- Line and substation transformers
- High-voltage buses

Both instruments perform spot tests, step-voltage tests, and dielectric absorption tests for the following applications:

- Acceptance testing at installation to check conformance to specifications.
- Routine preventative/predictive maintenance testing after installation.
- Quality assurance testing as part of the manufacturing process.
- Diagnostic testing to isolate faulty components for repair.

The BM11D and BM21 detect high- or low-resistance grounds and short circuits in apparatus, cables, wiring, caused by moisture, oil, dirt, corrosion, damage to insulation or natural deterioration. The units determine the presence of moisture, solvents and semiconducting foreign materials in wires, cables and other conductors, and in built-up insulation systems such as those found in motor windings.

A series of measurements taken over time and recorded on test record cards show the gradual decline in the integrity of the insulation during its operational life. The maintenance engineer or technician uses this information to anticipate future performance and to plan for repairs. These recorded measurements also show improvements in the insulation of motor, transformer, and generator windings that result from drying-out procedures after exposure to excessive humidity or water.

**FEATURES AND BENEFITS**

- Simple, push-button operation is user-friendly and easy to use.
- Analog/digital LCD enables direct reading in all ranges.
- Lock-down TEST button and integral timer are useful for extended tests such as polarization index.
- Rechargeable, battery-powered instrument is useful anywhere because of its portability.
- Automatic discharge of capacitive test sample charge promotes user safety.
- Guard terminal eliminates surface leakage current from the measurement.

**SPECIFICATIONS**

**Nominal Test Voltage (dc)**

**BM11D** 500, 1000, 2500, 5000 V  
**BM21** 500, 1000, 2500, 5000 V; plus 25 - 5000 V in 25-V steps

**Accuracy at 68°F (20°C)**

±5% on 100 mΩ load

**Insulation Resistance Range**

**BM11D**  
 Digital 10 kΩ to 50 GΩ @ 500 V  
 10 kΩ to 100 GΩ @ 1000 V  
 10 kΩ to 250 GΩ @ 2500 V  
 10 kΩ to 500 GΩ @ 5 kV  
 Analog 100 kΩ to 1 TΩ @ all voltages  
**BM21**  
 Digital 10 kΩ to 500 GΩ @ 500 V  
 10 kΩ to 1 TΩ @ 1000 V  
 10 kΩ to 2.5 TΩ @ 2500 V  
 10 kΩ to 5 TΩ @ 5 kV  
 Analog 100 kΩ to 1 TΩ @ all voltages

**Accuracy at 68°F (20°C)**

**BM11D**  
 ±5% of reading 1 MΩ to 100 GΩ @ 5 kV  
**BM21**  
 ±5% of reading 1 MΩ to 1 TΩ @ 5 kV

**Voltage Range**

**BM11D** 50 to 1000 V dc or ac  
**BM21** 50 to 1000 V dc or ac  
 (0 to 5000 V dc when testing)

**Accuracy at 68°F (20°C)**

±2%, ±1 V

**Leakage Current Measurement**

**BM11D** None  
**BM21** 0.01 nA to 999 mA; Accuracy ±5% ±0.2 nA

**Capacitance Measurement**

**BM11D** None  
**BM21** 0.01 to 10.0 μF

**Timer**

**BM11D** Automatic; 0 to 60 minutes  
**BM21** User selectable; 0 to 90 minutes

**Short Circuit Current**

2 mA nominal

**Display**

Analog/digital

**Interference Rejection**

1 mA r.m.s. per kV to a maximum 2 mA

**Temperature Range**

**Operating:** -4 to +122°F (-20 to +50°C)  
**Storage:** -13 to +149°F (-25 to +65°C)

**Humidity Range**

90% RH @ 104°F (40°C)

**Power Supply**

Two rechargeable, sealed lead-acid batteries (12 V, 2 Ah)

**Battery Life**

Typically 8 hours continuous, built-in charger operating from 95 to 265 V ac  
 50/60 Hz

**Charging Time**

16 hours

**Low Battery Indication**

Comprehensive battery state indicator

**Dimensions**

6 H x 10 W x 14 D in.  
 (152 H x 250 W x 350 D mm)

**Weight**

13 lb (5.6 kg) approximate

**ORDERING INFORMATION**

Item (Qty)	Cat. No.
BM11D 5 kV Insulation Resistance Tester	218651
BM21 5 kV Insulation Resistance Tester	218621
<b>Included Accessories</b>	
Three test leads, 10 ft (3 m)	210968
Test record cards, universal	210954
Charging cord	17032
Instruction manual	AVTMBM11D
<b>Optional Accessory</b>	
Carrying case	218748

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 Registered to ISO 9001:1994 Reg no. Q 09250  
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