



## MEGGER® BM21

- Analog/digital display
- Multiple test voltages
- Integral timer controls test duration
- Automatic discharge of equipment under test
- High sensitivity - tests to 5 TΩ

# 5 kV Insulation Resistance Tester

## DESCRIPTION

The Megger® BM21 5 kV Insulation Resistance Tester is a portable, battery-powered, high-voltage insulation tester that uses the latest electronic design and technology. The instrument's user-friendly keypad with pushbuttons, allows the user to select test voltages of 500, 1000, 2500, and 5000 Vdc. In addition to the standard test voltages, a variable voltage feature selects test voltages between 25 and 5000 Vdc 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 shows readings of insulation resistance to 5 TΩ, leakage current to below 1 nA, and capacitance to 10 μF. 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, the BM21 acts 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 when the circuit under test has not been de-energized.

The BM21 incorporates a guard terminal to eliminate the effects of surface leakage in the item under test, thus ensuring accurate measurements.

## APPLICATIONS

The BM21 tests the insulation resistance of:

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

The instrument performs spot tests, step-voltage tests, and dielectric absorption tests for the following applications:

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

The instrument detects high- or low-resistance grounds and short circuits in apparatus, cables and wiring, caused by moisture, oil, dirt, corrosion, damage to insulation or natural deterioration.

The BM21 determines the presence of moisture, solvents and semiconduct-

ing 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 and recorded over time show the gradual decline in insulation integrity 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, pushbutton operation is user-friendly and easy to use.
- Analog/digital LCD enables direct reading in all ranges.
- Lockdown TEST button and integral timer are useful for extended tests such as polarization index.
- Rechargeable, battery-powered instrument is portable anywhere.
- Automatic discharge of capacitive test sample charge promotes user safety.
- Guard terminal eliminates surface leakage current from the measurement.

**SPECIFICATIONS****Nominal Test Voltage (dc)**

500, 1000, 2500, 5000 V; plus 25 to 5000 V in 25-V steps

**Accuracy at 68° F (20° C)**

±5% on 100 mΩ load

**Insulation Resistance Range**

Digital 10 kΩ to 500 GΩ at 500 V  
10 kΩ to 1 TΩ at 1000 V  
10 kΩ to 2.5 TΩ at 2500 V  
10 kΩ to 5 TΩ at 5 kV  
Analog 100 kΩ to 1 TΩ at all voltages

**Accuracy at 68° F (20° C)**

±5% of reading 1 MΩ to 1 TΩ at 5 kV

**Voltage Range Accuracy**

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**

0.01 nA to 999 μA  
Accuracy ±5% ±0.2 nA

**Capacitance Measurement**

0.01 to 10.0 μF (Test Voltage>200V)

**Timer**

User selectable, 0 to 90 min

**Short Circuit Current**

2 mA maximum

**Display**

Analog/digital

**Interference Rejection**

1 mA rms 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 at 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 Vac 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

**Optional CB101 Calibration Box**

Nominal resistance values: 10MΩ, 100MΩ, 1GΩ, 10GΩ.

High quality resistors, rated to high voltage, suitable for calibration checks on insulation testers up to 5 kV dc. Voltage coefficient is less than 1 part per million per volt.

A calibration certificate is provided with each CB101 showing the actual value of each check point.

**CB101 Specification**

Calibration accuracy	1%
Voltage coefficient	1ppm/V
Calibration temperature	68°F (20° C)
Temperature coefficient	250ppm/C
Shelf stability, typically	0.5% per year

**ORDERING INFORMATION**

Item	Cat. No.	Item	Cat. No.
BM21 5 kV Insulation Resistance Tester .....	218621	<b>Optional Accessories</b>	
<b>Included Accessories</b>		Carrying case .....	218748
Three test leads, 10 ft (3 m) .....	210968	"A Stitch in Time" manual .....	AVTM21-P8B
Test record cards, universal .....	210954	High voltage test lead, 25 ft (8m) long .....	6220-543
Charging cord		High voltage test lead, 50 ft (16m) long .....	6220-588
Instruction manual .....	AVTMBM21D	Shielded lead set, 50 ft (16m) long .....	6311-080
		CB101, 5 kV calibration box .....	6311-077
		Test record cards [pack of 20] .....	6111-217
		Charging lead, 12 V dc with automotive cigarette lighter plug, 10 ft (3m) long .....	6231-584