

5 Test Voltages 50V To 1kV for Insulation!

200mA High Test Current for Earth Continuity!

Helps To Determine The State Of Insulation Material And Earth Continuity For Preventive Maintenance!



BM870 Series

Insulation Multimeter



BRIGHT PEOPLE'S CHOICE
<http://www.brymen.com>



● **BM878**



● **BM877**



● **BM876**

| 878 | 877 | 876 | FUNCTIONS & FEATURES |
|-----|--------|----------|---|
| ● | ● | ● | 3-5/6 Digits 6,000 Counts Large Easy-To-Read LCD Display |
| ● | ● | ● | Fast Measurements, 5/Sec; Fully Auto-Ranging |
| ● | ● | ● | 61 Segment Analog Bar-graph Updates 60/Sec |
| ● | ● | ● | AC True RMS Conversion |
| ● | ● | ● | Dual Digital Display |
| ● | ● | ● | Data Hold |
| ● | ● | ● | Auto Power Off (APO) |
| ● | ● | ● | Paper-White Back-Lighted Display |
| ● | ● | ● | Record Max/Min Readings; Auto-Ranging |
| ● | ● | ● | BeepJack™ Input Warning Against Improper Plug-In To ● INS. /mA Terminal |
| ● | ● | ● | VFD-V & VFD-Hz Measures Fundamental V & Hz Of Most Variable Frequency Drives |
| ● | 6.000V | 6.000V | AC/DC Voltage Ranges 60.00mV To 1000V |
| ● | ● | ● | Ohms Ranges 600.0Ω To 60.00MΩ |
| ● | ● | ● | Fast Audible Continuity Tester |
| ● | ● | ● | Hz Line Level Frequency |
| ● | ● | ● | Diode Tester |
| ● | | | X-Speed Capacitance Ranges 3.000μF To 30.00mF |
| ● | | | Type-K Temperature -50.0°C To 537.0°C; Selectable °F Readings |
| ● | | | AC/DC Current Ranges 60.00mA To 600.0mA; HBC 1kV Fuse Protected |
| ● | ● | ● | Insulation Resistance; Selectable V _N 50V, 100V, 250V, 500V & 1000V |
| ● | ● | ● | ↔ Earth Continuity; I _N ≥200mA @ 2.000Ω Range and ≥90mA @ 20.00Ω Range |
| | ● | ● | PI (Polarization Index) & DAR (Dielectric Absorption Ratios) Features |
| | ● | ● | PASS/FAIL Insulation Resistance Compare Feature; 12 Selectable Preset Values |
| ● | ● | Optional | Remote Probe (For Insulation Resistance & Earth Continuity Test) |
| ● | ● | ● | Optional Purchase Magnetic Hanger |
| ● | ● | ● | Rugged Fire Retarded Casing With Battery/Fuse Access Door |
| ● | ● | ● | Replaceable Protective Holster With Probe-Holders & Tilt-Stand |
| ● | ● | ● | 1kV General (Ohm, Capacitance, Diode ... etc.) Input Protection |
| ● | ● | ● | HBC 1kV Fuse Protected On ↔ (To COM) Against Extraneous Overvoltages |
| ● | ● | ● | HBC 1kV Fuse Protected On ● INS. (To COM) Against Extraneous Overvoltages |
| ● | ● | ● | Transient Protection Up To 8kV 1.2/50μs Lightning Surge |
| ● | ● | ● | LVD Meets EN61010-1/-2-030/-2-033 to Measurement CAT III 1000V & CAT IV 600V |
| ● | ● | ● | LVD Also Meets EN61557-1/-2 (Insulation Resistance)/-4 (Earth Continuity) |
| ● | ● | ● | EMC EN61326-1 (EN5022, EN61000-3-2/-3 & EN61000-4-2/-3/-4/-5/-6/-8/-11) |

Ultimate 3 In 1!

Superior DMM + Insulation Tester + Earth-Continuity Tester!

Convenient Remote Probe. Test Inhibits On Live Circuits.
Lock Feature For Continuous Testing.

Analog Bar-graph
Fast Update Rate 60/sec

6,000 Counts Wide-view LCD Display
5/sec Fast Nominal Update Rate

Dual Digital Display
Simultaneously View Relevant
Parameters In Complementary Display

ASIC Technology
Allows More Functions &
Features At Affordable Prices

Auto & Manual-ranging
Auto-ranging With
Manual-ranging Override

Smooth Mode
Smooth Out Unstable Insulation
Resistance Readings

High Accuracy
0.2% Basic DCV Accuracy

Function Selection
Toggle Conveniently Between
Primary & Secondary Functions

Ergonomic Streamline Design
Fits Comfortably In One's Hand

Paper-white Display Backlight
For Easy Viewing In The Dark

LOCK Feature
For Two Handed Continuous
Testing Without The Need
To Press The TEST Button

Logic Level Hz
Measures Digital Logic Level
Frequencies Up To 100kHz

Data Hold
Freezes The Displaying
Reading For Later View

60.00mV AC/DC Ranges
0.01mV High Resolution To
Test Small Signal Changes

Max Min Avg Record
Record Max, Min & Avg
Readings; Auto-ranging

Diode Test
For Checking Diodes
And Rectifiers

mA & Hz
Measures Currents &
Frequencies In Dual Display

Fast Audible Continuity
For Quick Open-short Tests
On Switches, Fuses And Wires

Earth Continuity Test
Test Currents:
>200mA @ 2.000Ω Range
And >90mA @ 20.00Ω Range

High Impedance Voltages
1000VAC/DC Measuring Capabilities;
High Input Impedance For
Load Sensitive Circuits

Insulation Resistance Test
5 Test Voltages:
50V, 100V, 250V, 500V & 1000V.
It Is Useful For Determining
The State Of Insulation Material.

Hz Of Line Level Voltage
Measures Noisy High Voltage
ACV Frequencies In Dual Display

Type-k Temperature
Measurements -50.0°C To 537.0°C,
Selectable °C & °F Readings

VFD V & Hz Feature
Measures Fundamental
Voltage & Frequency Of Most
Variable Frequency Drives
In Dual Display

X-speed Capacitance
X-speed Measures Up To 30mF
In Only A Few Seconds; 1kV Protection

Accepts Remote Probe
Convenient Activation For Insulation
& Earth Continuity Tests. Full Silicone
Leads To Minimize Insulation Test Error

Resistance Function
Autoranging 600.0Ω To 60.00MΩ

Beep-jack™ Audible & Visible Warning
Guards Against Improper "-INS. mA" Terminal
Plug In. Decreases Risks Of Damage

Transient Protection
Up To 8kV 1.2/50μs Lightning Surge;
Superb Protection For Serious Users

Intelligent Auto-power-off
To Extend Battery Life; Awake Resets On
Significant Operation & Measurements

LVD Safety
Meets EN61557-1/-2/-4,
& EN61010-1/-2-030/-2-033
CAT III 1kV & CAT IV 600V

AC True Rms
For Non-sinusoidal Waveforms
Of Complex Voltage Or Current Signals

Protective Holster
With Holders For Probe Storage
And "third Hand" Feature,
Replaceable & Washable

EMC
Meets EN61326-1:2006
(En55022, EN61000-3-2/-3 &
EN61000-4-2/-3/-4/-5/-6/-8/-11)



GENERAL SPECIFICATION

Display: 3-5/6 digits 6,000 counts

Polarity: Automatic

Update Rate: 5 per second nominal

61 Segments Bar graph: 40 per second max

Operating Temperature: -10°C to 40°C

Relative Humidity: Maximum relative humidity 90% for temperature up to 28°C decreasing linearly to 50% relative humidity at 40°C

Pollution Degree: 2

IP Rating: IP40

Storage Temperature: -20°C to 60°C, < 80% R.H. (with battery removed)

Altitude: Operating below 2000m

Temperature Coefficient: nominal 0.15 x (specified accuracy) / °C @ (-10°C ~ 18°C or 28°C ~ 40°C), or otherwise specified

Sensing: AC, True RMS

Safety: Double insulation per IEC/UL/EN61010-1 Ed. 3.0, IEC/EN61010-2-030 Ed. 1.0, IEC/EN61010-2-033 Ed. 1.0, IEC/UL/EN61010-031 Ed. 1.1 and CAN/CSA-C22.2 No. 61010-1-12 Ed. 3.0 to Category III 1000 V AC & DC and Category IV 600V AC & DC

Compliance to IEC/EN61557:2007 (Per CE requirements, not certified by UL or ETL): IEC/EN61557-1, IEC/EN61557-2 & IEC/EN61557-4 where applicable

Overload Protections:

Insulation Resistance & mA (BM878 only): 0.4A/1KV, IR 30kA or better

Earth Continuity Test (BM878 & BM877 only): 0.25A/1KV, IR 30kA or better

V: 1100Vrms

mV, Ω & Others: 1000 Vrms

Transient Protection: 8kV (1.2/50µs surge)

E.M.C.: Meets EN61326-1:2006 (EN55022, EN61000-3-2, EN61000-3-3, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11)

In an RF field of 3V/m:

Total Accuracy = Specified Accuracy + 25 digits

Performance above 3V/m is not specified

Power Supply: Four Alkaline AA batteries (IEC LR6)

Power Consumption: 4.5mA typical except the followings:

ACV ^{Hz} & VFD ACV ^{Hz}:

7.0mA

Earth Continuity Test:

110mA @20Ω Range

220mA @2.0Ω Range

Tester can perform at least 3000 Earth Continuity Test measurements with new alkaline batteries at room temperature. These are standard tests of 1 Ω with a duty cycle of 5 seconds on and 25 seconds off.

Insulation Resistance @1mA test current:

50V output voltage: 25mA

100V output voltage: 45mA

250V output voltage: 85mA

500V output voltage: 170mA

1000V output voltage: 440mA

Tester can perform at least 950 insulation tests with new alkaline batteries at room temperature. These are standard tests of 1000 V into 1 MΩ with a duty cycle of 5 seconds on and 25 seconds off.

Low Battery: approx. 4.6V

APO Timing: Idle for 20 minutes

APO Consumption: 50µA typical

Dimension: L208mm X W103mm X H64.5mm with holster

Weight: 635 gm with holster

Accessories: Test probe pair, Alligator clip pair, BRP21S2-C Remote probe (BM878 & BM877 only), Holster, User's manual, Bkp60 banana plug K-type thermocouple (BM878 only)

Optional Accessories: BRP21S2-C Remote probe (BM876 only), BKB32 banana plug to type-K socket plug adaptor (BM878 only), BMH-01 magnetic hanger

Special Features: Record MAX/MIN readings; Display Hold; Backlighted LCD; VFD V & Hz readings; Lock-Test mode for Insulation resistance & Earth Continuity Test (BM878 & BM877 only); Beep/Jack™ audible & visible input warning; P/DAR mode (BM877 & BM876 only); Compare mode (BM877 & BM876 only)

Electrical Specifications

Accuracy is ±(% reading digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 80% relative humidity.

True RMS voltage & current accuracies are specified from 1% to 100% of range or otherwise specified. Maximum Crest Factor < 1.70:1 at full scale & < 3.4:1 at half scale, and with frequency components fall within the specified frequency bandwidth for non-sinusoidal waveforms.

AC Voltage

| RANGE | Accuracy |
|-------------------------------|-------------|
| 50Hz ~ 60Hz | |
| 6.000V, 60.00V, 600.0V, 1000V | 1% + 3d |
| 60Hz ~ 1kHz | |
| 6.000V, 60.00V, 600.0V, 1000V | 2% + 3d |
| 1kHz ~ 3kHz | |
| 6.000V, 60.00V | 2% + 3d |
| 600.0V, 1000V | Unspecified |
| 3kHz ~ 5kHz | |
| 6.000V, 60.00V | 4% + 5d |
| 600.0V, 1000V | Unspecified |

Input impedance: 10MΩ, 110pF nominal

VFD AC Voltage

| RANGE | Accuracy ¹⁾ |
|---------------|------------------------|
| 10Hz ~ 45Hz | |
| 600.0V | 4% + 5d |
| 45Hz ~ 200Hz | |
| 600.0V | 2% + 5d |
| 200Hz ~ 440Hz | |
| 600.0V | 7% + 5d ²⁾ |

¹⁾Unspecified for fundamental frequency > 440Hz

²⁾Accuracy linearly decreases from 2% + 5d @200Hz to 7% + 5d @440Hz

Input impedance: 10MΩ, 110pF nominal

DC Voltage

| RANGE | Accuracy |
|------------------------|-----------|
| 6.000V, 60.00V, 600.0V | 0.2% + 3d |
| 1000V | 0.3% + 3d |

Input impedance: 10MΩ, 110pF nominal

Ohms

| RANGE | Accuracy |
|---------------------------|-----------|
| 600.0Ω | 0.9% + 5d |
| 6.000kΩ, 60.00kΩ, 600.0kΩ | 0.9% + 2d |
| 6.000MΩ | 1.2% + 3d |
| 60.00MΩ | 3.0% + 6d |

Open Circuit Voltage: < 1.5VDC typical

Audible Continuity Tester

Audible threshold: between 20Ω and 200Ω

Response time < 30ms

Diode Tester

| Range | Accuracy | Test Current (Typical) | Open Circuit Voltage |
|--------|-----------|------------------------|----------------------|
| 2.000V | 1.5% + 4d | 0.5mA | < 2.8 VDC |

Capacitance (BM878 only)

| RANGE | Accuracy ¹⁾ |
|--|------------------------|
| 3.000µF ²⁾ , 30.00µF, 300.0µF, 3000µF | 1.5% + 5d |
| 30.00mF | 10% + 5d |

¹⁾Accuracies with film capacitor or better

²⁾Readings not available below 200nF

DCmV (BM878 only)

| RANGE | Accuracy |
|---------|-----------|
| 60.00mV | 0.5% + 3d |
| 600.0mV | 0.1% + 3d |

Input impedance: 10MΩ, 140pF nominal

ACmV (BM878 only)

| RANGE | Accuracy | |
|------------------|-------------|---------|
| 60.00mV, 600.0mV | 50Hz ~ 60Hz | 1% + 3d |
| | 60Hz ~ 3kHz | 2% + 3d |
| | 3kHz ~ 5kHz | 3% + 5d |

Input impedance: 10MΩ, 140pF nominal

Temperature (BM878 only)

| RANGE | Accuracy ¹⁾ |
|-------------------|------------------------|
| -50.0°C ~ 0.0°C | 2% + 3°C |
| 0.0°C ~ 50.0°C | 2.2°C |
| 50.0°C ~ 537.0°C | 2% + 2°C |
| -58.0°F ~ 32.0°F | 2% + 6°F |
| 32.0°F ~ 122.0°F | 4.4°F |
| 122.0°F ~ 999.0°F | 2% + 4°F |

¹⁾Type-K thermocouple range & accuracy not included

DCmA (BM878 only)

| RANGE | Accuracy | Burden Voltage |
|------------------|-----------|----------------|
| 60.00mA, 600.0mA | 0.5% + 3d | 3.0mV/mA |

ACmA (BM878 only)

| RANGE | Accuracy | Burden Voltage |
|------------------|-----------|----------------|
| 60.00mA, 600.0mA | 1.5% + 3d | 50Hz ~ 1kHz |
| | | 3.0mV/mA |

Earth Continuity Test (BM878 & BM877 only)

| RANGE | Test Current | Accuracy | Measuring Range ¹⁾ |
|--------|--------------|----------|-------------------------------|
| 2.000Ω | > 200mA | 1.5%+3d | 0.015Ω ~ 2.199Ω |
| 20.00Ω | > 90mA | | 0.15Ω ~ 21.99Ω |

Open Circuit Voltage: > 4VDC

Live Circuit Detector: Inhibit test if terminal voltage > 2V prior to initialization of test.

¹⁾Specified measuring range at percentage operating uncertainty B[%] ≤ ±30% per IEC/EN61557-4 requirements

~ Hz Line Level Frequency

| Function RANGE | Sensitivity (Sine RMS) | Range |
|---------------------|--------------------------|---------------|
| 60mV ¹⁾ | 6mV | 10Hz ~ 50kHz |
| 600mV ¹⁾ | 60mV | 10Hz ~ 100kHz |
| 6V | 0.6V | 10Hz ~ 20kHz |
| 60V | 6V | 10Hz ~ 20kHz |
| 600V | 60V | 10Hz ~ 3kHz |
| 1000V | 600V | 10Hz ~ 3kHz |
| VFD 600V | 60V ~ 240V ²⁾ | 10Hz ~ 440Hz |
| 60mA ¹⁾ | 6mA | 10Hz ~ 5kHz |
| 600mA ¹⁾ | 60mA | 10Hz ~ 5kHz |

Accuracy: 0.02%+4d

¹⁾Model 878 Only

²⁾VFD sensitivity linearly decreases from 10% F.S. @ 200Hz to 40% F.S. @ 440Hz

Insulation Resistance

| Test Voltage ¹⁾ | Range | Test Current | Accuracy |
|----------------------------|------------------------------------|--------------|----------|
| 50V | 3.000MΩ, 30.00MΩ, 55.0MΩ | 1mA @50kΩ | 1.5%+5d |
| | 3.000MΩ, 30.00MΩ, 110.0MΩ | 1mA @100kΩ | |
| 100V | 3.000MΩ, 30.00MΩ, 275.0MΩ | 1mA @250kΩ | 1.5%+5d |
| | 3.000MΩ, 30.00MΩ, 300.0MΩ | 1mA @500kΩ | |
| 500V | 3.000MΩ, 30.00MΩ, 300.0MΩ, 550.0MΩ | 1mA @1MΩ | 1.5%+5d |
| | 3000MΩ | | 2.0%+5d |
| | 25.0GΩ | | 10%+5d |

¹⁾Actual output voltage: 100% ~ 120% of Test Voltage

Live Circuit Detector: Inhibit test and display voltage reading instead if terminal voltage > 30V prior to initialization of test. Display voltage accuracies:

DCV: 1.5% + 5d

ACV: 3.0% + 5d @50Hz ~ 60Hz (for Models 877 & 876, unspecified @ > 600Vac)

Specified measuring range is 0.020MΩ ... 25.0GΩ for percentage operating uncertainty B[%] ≤ ±30% per IEC/EN61557-2 requirements

BRYMEN TECHNOLOGY CORPORATION

http://www.brymen.com

TEL: +886 2 2226 3396 (rep)

FAX: +886 2 2225 0025

Copyright © MMXIV B.T.C. All rights reserved

Specifications subject to change without notice

Patents pending. Printed in Taiwan

