

# 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>



# 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

**High Accuracy**  
0.2% Basic DCV Accuracy

**Ergonomic Streamline Design**  
Fits Comfortably In One's Hand

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

**Data Hold**  
Freezes The Displaying  
Reading For Later View

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

**mA & Hz**  
Measures Currents &  
Frequencies In Dual Display

**Earth Continuity Test**  
Test Currents:  
>200mA @ 2.000  $\Omega$  Range  
And >90mA @ 20.00  $\Omega$  Range

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

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

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

**Resistance Function**  
Autoranging 600.0  $\Omega$  To 60.00M  $\Omega$

**Transient Protection**  
Up To 8kV 1.2/50 $\mu$ s Lightning Surge;  
Superb Protection For Serious Users

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

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

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

**Smooth Mode**  
Smooth Out Unstable Insulation  
Resistance Readings

**Function Selection**  
Toggle Conveniently Between  
Primary & Secondary Functions

**Paper-white Display Backlight**  
For Easy Viewing In The Dark

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

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

**Diode Test**  
For Checking Diodes  
And Rectifiers

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

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

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

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

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

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

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

**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







● **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 ● <b>INS.</b> /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 <sub>N</sub> 50V, 100V, 250V, 500V & 1000V
●	●	●	↔ Earth Continuity; I <sub>N</sub> ≥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 ● <b>INS.</b> (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 (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<sup>Hz</sup> & VFD ACV<sup>Hz</sup>: 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; Backlight LCD; VFD V & Hz readings; Lock-Test mode for Insulation resistance & Earth Continuity Test (BM878 & BM877 only); BeepJack™ audible & visible input warning; PI/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 <sup>1)</sup>
10Hz ~ 45Hz	
600.0V	4% + 5d
45Hz ~ 200Hz	
600.0V	2% + 5d
200Hz ~ 440Hz	
600.0V	7% + 5d <sup>2)</sup>

<sup>1)</sup>Unspecified for fundamental frequency > 440Hz

<sup>2)</sup>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 <sup>1)</sup>
3.000µF <sup>2)</sup> , 30.00µF, 300.0µF, 3000µF	1.5% + 5d
30.00mF	10% + 5d

<sup>1)</sup>Accuracies with film capacitor or better

<sup>2)</sup>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 <sup>1)</sup>
-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% + 8°F
32.0°F ~ 122.0°F	4.4°F
122.0°F ~ 999.0°F	2% + 4°F

<sup>1)</sup>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	50Hz ~ 1KHz	
	1.5% + 3d	3.0mV/mA

### Earth Continuity Test (BM878 & BM877 only)

RANGE	Test Current	Accuracy	Measuring Range <sup>1)</sup>
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.

<sup>1)</sup>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 <sup>1)</sup>	6mV	10Hz ~ 50kHz
600mV <sup>1)</sup>	60mV	10Hz ~ 100kHz
6V	0.6V	10Hz ~ 20kHz
60V	6V	10Hz ~ 20kHz
600V	60V	10Hz ~ 3kHz
1000V	600V	10Hz ~ 3kHz
VFD 600V	60V ~ 240V <sup>2)</sup>	10Hz ~ 440Hz
60mA <sup>1)</sup>	6mA	10Hz ~ 5kHz
600mA <sup>1)</sup>	60mA	10Hz ~ 5kHz

Accuracy: 0.02%+4d

<sup>1)</sup>Model 878 Only

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

### Insulation Resistance

Test Voltage <sup>1)</sup>	Range	Test Current	Accuracy	
50V	3.000MΩ, 30.00MΩ, 55.0MΩ	1mA @50kΩ	1.5%+5d	
	3.000MΩ, 30.00MΩ, 110.0MΩ	1mA @100kΩ		
250V	3.000MΩ, 30.00MΩ, 275.0MΩ	1mA @250kΩ		
	3.000MΩ, 30.00MΩ, 300.0MΩ, 550.0MΩ	1mA @500kΩ		
1000V	3.000MΩ, 30.00MΩ, 300.0MΩ	1mA @1MΩ		1.5%+5d
	3000MΩ, 25.0GΩ			2.0%+5d 10%+5d

<sup>1)</sup>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

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