

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

BRYMEN[®]

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 (EN55022, 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

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 @ 2.000Ω Range
And ≥90mA @ 20.00Ω 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 600.0Ω To 60.00MΩ

Transient Protection
Up To 8kV 1.2/50μs 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)

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

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

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

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

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

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

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

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

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

Diode Test
For Checking Diodes
And Rectifiers

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

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

Paper-white Display Backlight
For Easy Viewing In The Dark

Function Selection
Toggle Conveniently Between
Primary & Secondary Functions

Smooth Mode
Smooth Out Unstable Insulation
Resistance Readings

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

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

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Freezes The Displaying Reading For Later View

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Record Max, Min & Avg Readings; Auto-ranging

mA & Hz
Measures Currents & Frequencies In Dual Display

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≥200mA @ 2.000Ω Range
And ≥90mA @ 20.00Ω Range

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Superb Protection For Serious Users

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& EN61010-1/-2-030/-2-033
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Smooth Out Unstable Insulation
Resistance Readings

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

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 (1.2/50 μ s 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 @20 Ω Range

220mA @2.0 Ω 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 M Ω 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: 50 μ A 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); Beep/Jack™ audible & visible input warning; P/DAR mode (BM877 & BM876 only); Compare mode (BM877 & BM876 only)

Electrical Specifications

Accuracy is $\pm$ (% reading digits + number of digits) or otherwise specified, at 23°C $\pm$ 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: 10M Ω , 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: 10M Ω , 110pF nominal

DC Voltage

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

Input impedance: 10M Ω , 110pF nominal

Ohms

RANGE	Accuracy
600.0 Ω	0.9% + 5d
6.000k Ω , 60.00k Ω , 600.0k Ω	0.9% + 2d
6.000M Ω	1.2% + 3d
60.00M Ω	3.0% + 6d

Open Circuit Voltage: < 1.5VDC typical

Audible Continuity Tester

Audible threshold: between 20 Ω and 200 Ω

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⁾
3.000 μ F ²⁾ , 30.00 μ F, 300.0 μ F, 3000 μ F	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: 10M Ω , 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: 10M Ω , 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	50Hz ~ 1kHz 1.5% + 3d	3.0mV/mA

Earth Continuity Test (BM878 & BM877 only)

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

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[%] $\leq \pm 30\%$ 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	3.000M Ω , 30.00M Ω , 55.0M Ω	1mA @50k Ω	1.5%+5d
100V	3.000M Ω , 30.00M Ω , 110.0M Ω	1mA @100k Ω	
250V	3.000M Ω , 30.00M Ω , 275.0M Ω	1mA @250k Ω	
500V	3.000M Ω , 30.00M Ω , 300.0M Ω , 550.0M Ω	1mA @500k Ω	
1000V	3.000M Ω , 30.00M Ω , 300.0M Ω	1mA @1M Ω	1.5%+5d
	3000M Ω , 25.0G Ω		2.0%+5d 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 0.020M Ω ... 25.0G Ω for percentage operating uncertainty B[%] $\leq \pm 30\%$ per IEC/EN61557-2 requirements

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