

# Multitalented and Compact; Loaded with Nice Up-to-date Features!

AutoHold Real-Read™, BeepPass™ Diode, BeepLit™ Continuity, BeepJack™ InEr, LoZ AutoV, Hi/Lo EF, VFD, REC MaxMinAvg, CREST MaxMin, REL, HOLD, i-APO, PC-Comm!

# BM2250 Series

Versatile  
Professional  
Multimeters



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Bright People's Choice

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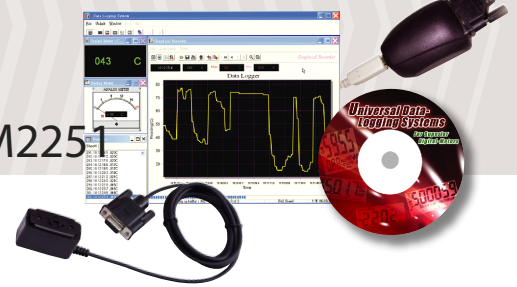


BM2257



BM2251

**BRUA-20X Interface Kit (Optional Purchase)**



2257	2251	FUNCTIONS & FEATURES
•		AutoV Automatic Selection of ACV or DCV
•		LoZ Ghost-voltage-buster AutoV to Drain Ghost Voltages for Hard Signals
•		Capacitance; 7 Ranges @ 20.00nF to 10.00mF
•		Type-K Temperature from -40.0°C to 1000°C or -40.0°F to 1832°F; °C/°F Selectable
•	•	3-5/6 Digits 6,000 Counts Large LCD Display
•	•	5/Sec Nominal Data Update; Fast Auto-Ranging & Measurements
•	•	60 Segment High-Resolution Analog Bar-graph Updates 40/Sec
•	•	Amber LED Warm Backlight LCD Display
•	•	AutoHold with Real-Read™ to Avoid "Blind" Measurements
•	•	Relative Zero for Readings Comparison & Offset
•	•	CREST Max/Min >5ms Peaks; Automatic iAPO Disable
•	•	REC Max/Min/Avg; Auto-ranging; Automatic iAPO Disable
•	•	Display HOLD Freezes the Displaying Reading for Later Viewing
•	•	AC True RMS on Voltage and Current Functions
•	•	DCV Best Accuracy 0.2% + 3d; 3 Ranges @ 6.000V to 600V
•	•	ACV; 3 Ranges @ 6.000V to 600V
•	•	VFD_ACV with LPF; Range @ 600.0V
•	•	High-Resolution AC/DC mV; 2 Ranges @ 60.00mV to 600.0mV
•	•	AC/DC mA, mA, & A; 6 Ranges 600.0µA to 10.00A
•	•	Resistance; 6 Ranges @ 600.0Ω To 60.00MΩ
•	•	AC Line-level Hz via Test leads; 10Hz to 50kHz
•	•	Logic Level Hz from 10.00Hz to 200.0kHz
•	•	Fast BeepLit™ Continuity with Beep + Backlight Effects; Response Time <15ms
•	•	Diode with BeepLit™ (Continuity) & BeepPass™ (Short Beep) Features
•	•	EF-Detection for Identifying Live Lines; Selectable Hi/Lo Sensitivities
•	•	BeepJack™ Guards Against Improper Amp Terminals Plug-in
•	•	Auto Power Off (iAPO) Stays ON While in Measurements
•	•	PC-Comm Interface Capability; Optional Purchase USB Cable & PC Software Set
•	•	600V General Input Protection on All Functions and Ranges
•	•	High Breaking Capacity HBC Fuses Protected on µmA & A Terminals
•	•	Transient Protection to 6kV 1.2/50µs + 8/20µs Combo Surges
•	•	Fire-retarded Housing with Battery Access Door
•	•	Protective Holster with Probe-Holders & Tilt-Stand; Washable & Replaceable
•	•	Rugged & Durable; Robust Enclosure and Premium Plated Low Leakage PCB
•	•	EMC Certified; Superior Immunity to Interferences
•	•	LVD with cULus Listed to CAT III 600V; UL, CSA, CE, and UKCA Compliance

# Powerful and Handy; High-Performance Full Functions for Daily Use!

Speedy Hi-res Bar-graph, VFD-V/Hz, Logic/Line Hz, Wide-range Cx, °C/°F, Speeded MΩ, Hi-res 60.00mV, AC True-RMS, CAT III 600V cUL<sub>US</sub> Listed

## 3-5/6 Digits LCD Display

6,000 Counts Nominal;  
19mm Height Large Digit

## Relative Zero Mode

Convenient Readings  
Comparison & Offset

## Capacitance

Measures Small to Large Motor Capacitors;  
7 Ranges @ 20.00nF to 10.00mF

## Fast Measurements

5/Sec Nominal Data Update;  
Fast Auto-Ranging & Measurements

## DCV Best Accuracy 0.2% + 3d

Measures DCV; 3 Ranges @ 6.000V to 600V

## Fast Analog Bar-graph

60 Segment High-Resolution  
Analog Bar-graph Updates 40/Sec

## PC-Comm Interface Capability

Optional Purchase USB  
Cable & PC Software Set

## Warm Amber Backlight

Amber LED Warm  
Backlight LCD Display

## REC Max/Min/Avg Auto-ranging

Records Max, Min, and Calculates  
Average Readings Over Time;  
Auto-ranging; Automatic iAPO Disable

## VFD\_ACV with LPF

For Noisy Electrical and  
VFD Signals; Range @ 600.0V

## AutoV

Automatic Selection of ACV or  
DCV Whichever Higher in Magnitude

## LoZ Ghost-voltage-buster AutoV

Low Ramp-up Input Impedance to  
Drain Ghost Voltages Leaving Meter  
Readings on Hard Signals

## BeepJack™ Input Warning

Guards Against Improper Amp Terminals  
Plug-in for Voltage Measurements

## Detachable Protective Holster

Features Probe-Holders & Tilt-Stand;  
Washable & Replaceable

## Auto Power Off (iAPO)

Stays ON While in Measurements;  
Intelligently Turns OFF to Extend Battery Life;  
Power-up Disable option

## HBC Fuses Protected

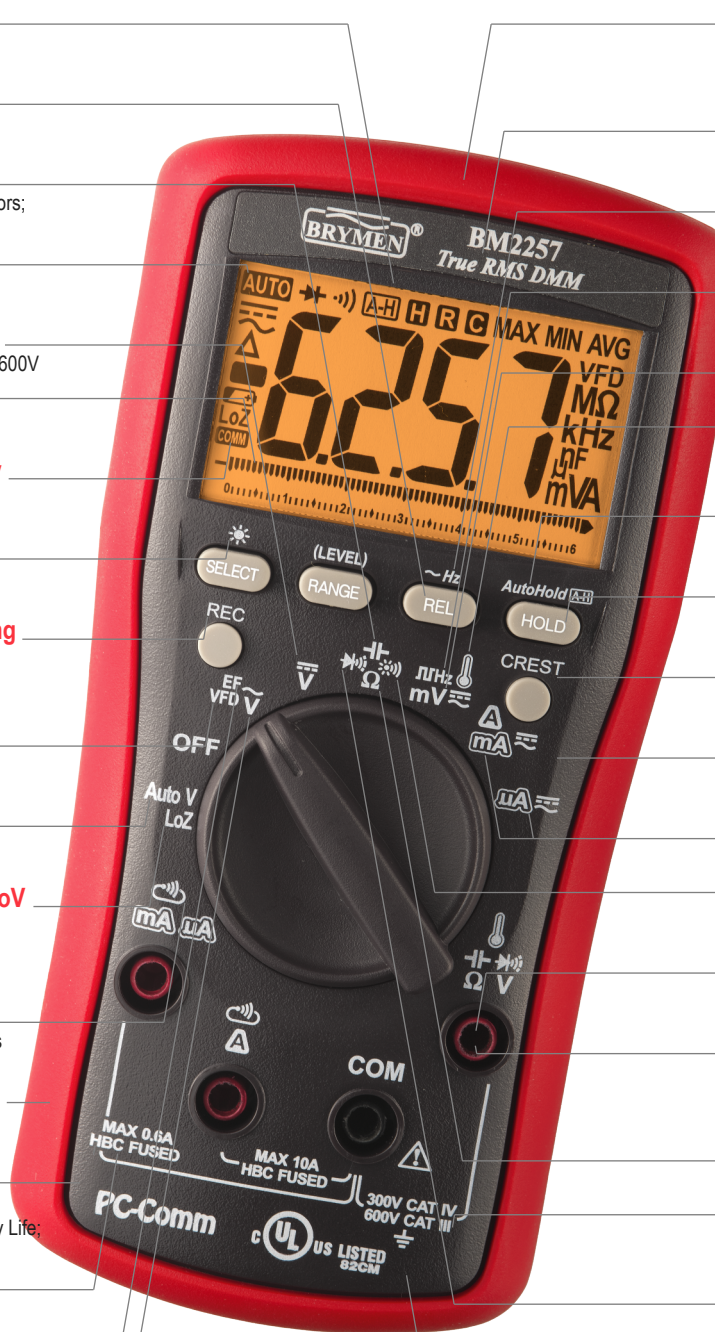
High Breaking Capacity Fuses  
Protected on μA mA & A Terminals

## EF-Detection with Hi/Lo Sensitivities

Features Non-Contact (NCV) &  
Single-Pole Contact Voltage Detections;  
Selectable Hi/Lo Sensitivities

## ACV

Measures ACV;  
3 Ranges @ 6.000V to 600V



## EMC Certified

Superior Immunity to Interferences;  
Reliable Operations and Readings;  
EN61326-1 Certified

## AC True RMS

Ideal for Non-sinusoidal & Complex Waveforms  
on Voltage and Current Functions

## AC Line-level Hz

Measures Noisy High Voltage Frequency  
via Test leads; 10Hz to 50kHz

## Logic Level Hz

Measures Digital Logic Level Frequencies  
from 10.00Hz to 200.0kHz

## High-Resolution AC/DC mV

2 Ranges @ 60.00mV to 600.0mV

## Type-K Temperature

Measures from -40.0°C to 1000°C or -40.0°F  
to 1832°F; °C/°F Selectable

## AutoHold with Real-Read™

Shows Real-time Readings and Automatically  
Latches the Last Stable Reading for Later Viewing

## Display HOLD

Freezes the Displaying  
Reading for Later Viewing

## CREST Max/Min >5ms Peaks

Fast Captures +/- Peak Extremes at  
Durations > 5ms; Automatic iAPO Disable

## Rugged & Durable

Robust Enclosure, Premium Plated Low  
Leakage PCB, and Reliable Rotary Switch

## AC/DC μA, mA, & A

6 Ranges @ 600.0μA to 10.00A

## Fast BeepLit™ Continuity

Fast Captures +/- Peak Extremes at  
Durations > 5ms; Automatic iAPO Disable

## 600V General Input Protection

Superb Protection for Misinput on All  
Functions and Ranges

## Transient Protection to 6kV

1.2/50μs + 8/20μs Combo Surges;  
Fully Certified by Independent Test Lab;  
Years of Credibility for Serious Users

## Resistance

6 Ranges @ 600.0Ω To 60.00MΩ

## LVD with cUL<sub>US</sub>

Listed to CAT III 600V; UL, CSA, CE,  
and UKCA Compliance

## Diode with BeepLit™ & BeepPass™

Continuous Beep + Backlight  
Effects on Shorted Diodes;  
Short-Beep Alerts on Good Diodes

## Battery Access Door

Fire-retarded Housing with  
Battery Access Door

## GENERAL SPECIFICATIONS

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

**Update Rate:**

3-5/6 digits: Max 5 per second nominal

60 Segment Bar-graph: 40 per second max

**Operating Temperature:** -10°C to 50°C continuous operating (except on A function, see Electrical Specifications below for more details)

**Relative Humidity:** Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 50°C

**Altitude:** Operating below 2000m

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

**Temperature Coefficient:** Nominal 0.15 x (specified accuracy)/°C @ (-10°C ~ 18°C or 28°C ~ 50°C), or otherwise specified

**Sensing:** True RMS sensing

**Ingress Protection:** IP40

**Pollution Degree:** 2

**Safety:** Certified per IEC/UL/EN/BSEN 61010-1 Ed. 3.1, IEC/UL/EN/BSEN 61010-2-033 Ed. 2.0, IEC/UL/EN/BSEN 61010-031 Ed. 2.0 and the corresponding CAN/CSA-C22.2

regulations to Measurement Categories:

CAT III 600V and CAT IV 300V AC & DC

**Transient Protection:** 6.0kV (1.2/50µs surge)

**E.M.C.:** Meets EN61326-1

In an RF field of 3V/m:

Temperature function is not specified

Ohm function:

Total Accuracy = Specified Accuracy + 15 digits

Other functions:

Total Accuracy = Specified Accuracy

Performance above 3V/m is not specified

**Overload Protection:**

**µA & mA:** 0.63A/1000V DC/AC rms, IR 30kA, F fuse; or better

**A:** 12A/600V, IR 50kA for Vdc & 100kA for Vac, F fuse; or 11A/1000V DC/AC rms, IR 30kA, F fuse; or better

**V & AutoV:** 1100V AC rms & 660V DC mV, Ohm & others: 600V DC/AC rms

**Low Battery:** Below approx. 2.5V

**Power Supply:** 1.5V AAA size battery X 2

**Power Consumption (typical):** 4.0mA

**iAPO Consumption (typical):** 20µA

**iAPO Timing:** Idle for 30 minutes

**Dimension:** 161\*80\*50mm L\*W\*H (With Holster)

**Weight:** Approx. 334 gm (With Holster)

**Special Features:** AutoHold; AutoV (LoZ); VFD-ACV & VFD-Hz; Hi/Lo EF-Detection (NCV & Single pole);

BeepLit™ Diode w/BeepPass™ indication; BeepLit™

Continuity; Auto-ranging REC MAX/MIN/AVG; Auto-ranging CREST (Instantaneous Peak) MAX/MIN;

Backlighted LCD; Auto-ranging Relative-zero; Display Hold; BeepJack™ audible & visible input warning

**Accessories:** Test lead pair; Batteries; User's manual; BKP60 banana plug type-K thermocouple

**Optional Purchase Accessories:** BKB32 banana plug to type-K socket plug adaptor; BMH-01 magnetic hanger; USB interface kit BRUA-20X

## ELECTRICAL SPECIFICATIONS

Accuracy is given as ±( % of reading digits + number of digits ) or otherwise specified @ 23°C ± 5°C  
ACV & ACA accuracies are specified from 1 % to 100 % of range or otherwise specified; Maximum Crest Factor <2.1 at full scale & <4:1 at half scale, and with frequency spectrum limited to the specified bandwidth of the AC functions for non-sinusoidal waveforms

### ACV

RANGE	Accuracy
50Hz ~ 60Hz	
6.000V, 60.00V, 600.0V	0.7% + 3d
45Hz ~ 500Hz	
6.000V, 60.00V, 600.0V	1.0% + 5d

Input Impedance: 10MΩ, 54pF nominal  
Overload protection: 1100Vrms for AC; 660V for DC

### ACmV

RANGE	Accuracy
40Hz ~ 500Hz	
60.00mV <sup>1)</sup> , 600.0mV <sup>2)</sup>	1.0% + 3d
500Hz ~ 1kHz	
60.00mV <sup>1)</sup> , 600.0mV <sup>2)</sup>	2.0% + 3d

Input Impedance: 10MΩ, 54pF nominal

<sup>1)</sup>Signal peak absolute values, including DC bias, less than 130mV<sub>peak</sub>

<sup>2)</sup>Signal peak absolute values, including DC bias, less than 1300mV<sub>peak</sub>

### VFD\_ACV (with Low Pass Filter)

RANGE	Accuracy <sup>1)</sup>
10Hz ~ 100Hz	
600.0V	1.0% + 3d
100Hz ~ 400Hz	
600.0V	10% + 3d <sup>2)</sup>

Overload protection: 1100Vrms for AC; 660V for DC

<sup>1)</sup>Not specified for fundamental frequency > 400Hz

<sup>2)</sup>Accuracy linearly decreases from 1% + 3d @ 100Hz to 10% + 3d @ 400Hz

### AutoV\_ACV (Model 2257 only)

RANGE	Accuracy <sup>1)</sup>
50Hz ~ 60Hz	
6.000V, 60.00V, 600.0V	1.0% + 5d

Overload protection: 1100Vrms for AC; 660V for DC

<sup>1)</sup>Not specified at <1.5VAC

Threshold: > 1.5VAC nominal

Input Impedance:

Initially approx. 2.1kΩ, 164pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical).

Ended-up impedances vs display voltages typically are:

12kΩ @ 100V  
100kΩ @ 300V  
240kΩ @ 600V

### DCV

RANGE	Accuracy
6.000V	0.3% + 4d
60.00V	0.4% + 3d
600.0V	0.2% + 3d

Overload protection: 1100Vrms for AC; 660V for DC

Input Impedance: 10MΩ, 54pF nominal

### DCmV

RANGE	Accuracy
60.00mV, 600.0mV	0.3% + 4d

Input Impedance: 10MΩ, 54pF nominal

### AutoV\_DCV (Models 2257 only)

RANGE	Accuracy <sup>1)</sup>
6.000V, 60.00V, 600.0V	1.0% + 4d

Overload protection: 1100Vrms for AC; 660V for DC

<sup>1)</sup>Not specified at <1.5VDC

Threshold: > +1.5VDC or < -1.5VDC nominal

Input Impedance:

Initially approx. 2.1kΩ, 164pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical).

Ended-up impedances vs display voltages typically are:

12kΩ @ 100V  
100kΩ @ 300V  
240kΩ @ 600V

### CREST mode (Instantaneous Peak Hold)

Accuracy: Specified accuracy ± 250 digits for changes > 5ms in duration

Availability: Voltage and Current functions

Resolution: 6000 counts

### AutoHold Real-Read™

Accuracy: Specified accuracy ± 50 digits

Availability: Resistance, Continuity, LoZ AutoV, VFD Volts, Voltage and Current functions

### Ohm

RANGE <sup>1)</sup>	Accuracy
600.0Ω, 6.000kΩ, 60.00kΩ, 600.0kΩ	0.5% + 4d
6.000MΩ <sup>2)</sup>	0.7% + 4d
60.00MΩ <sup>3)</sup>	2.0% + 4d <sup>4)</sup>

<sup>1)</sup>Open Circuit Voltage: 1.6VDC typical

<sup>2)</sup>Constant Test Current: 0.2µA Typical

<sup>3)</sup>Constant Test Current: 0.02µA Typical

<sup>4)</sup>5%+20d @ >30MΩ

### BeepLit™ Continuity Tester

Continuity Threshold: Between 30Ω and 480Ω

Continuity ON Response Time: <15ms

Audible Indication: Beep sound

Visible Indication: LCD Backlight

### Capacitance (Models 2257 only)

RANGE	Accuracy
20.00nF, 200.0nF	1.5% + 8d
2000nF, 20.00µF, 200.0µF, 2000µF	1.5% + 2d
10.00mF	4.5% + 10d

Accuracies with film capacitor or better

### BeepLit™ Diode Tester

RANGE	Accuracy	Test Current (Typical)	Open Circuit Voltage
3.0000V	1.0% + 3d	0.3mA	< 3.2 VDC

BeepPass™ Indication (Short-beep): Drop Across 0.850V

BeepLit™ Indication (Continuity) Threshold: < 0.100V

Audible Indication: Beep Sound

Visible Indication: LCD Backlight

### DC Current

RANGE	Accuracy	Burden Voltage
600.0µA, 6000µA	0.5% + 5d	0.1mV/µA
60.00mA, 600.0mA		1.9mV/mA
6.000A, 10.00A <sup>1)</sup>		0.04V/A

<sup>1)</sup>10A continuous up to ambient 40°C only, and is <3 mins on per >15 mins off @ 40°C ~ 55°C; >10A to 20A for <30 seconds on per >15 mins off

### AC Current

RANGE	Accuracy	Burden Voltage
50Hz ~ 400Hz		
600.0µA, 6000µA	1.0% + 5d	0.1mV/µA
60.00mA, 600.0mA		1.9mV/mA
6.000A, 10.00A <sup>1)</sup>		0.04V/A

<sup>1)</sup>10A continuous up to ambient 40°C only, and is <3 mins on per >15 mins off @ 40°C ~ 55°C; >10A to 20A for <30 seconds on per >15 mins off

### Temperature (Models 2257 only)

RANGE	Accuracy <sup>1) 2)</sup>
-40.0°C ~ 99.9°C	1.0% + 1°C
100°C ~ 1000°C	0.3%+3°C
-40.0°F ~ 99.9°F	1.0% + 2°F
100°F ~ 1832°F	0.3%+6°F

<sup>1)</sup>Accuracies assume the meter interior and the ambient have reached the same temperature (isothermal stage) for a correct junction voltage compensation. Allow enough settling time for a significant change in ambient temperature. It can take up to an hour for changes > 5°C.

<sup>2)</sup>Type-K thermocouple range & accuracy not included

### Logic Level Hz (DCmV Function)

RANGE	Sensitivity (Square wave)
10.00 Hz ~ 200.0 kHz	3V <sub>peak</sub>

Accuracy: 0.03% + 3d

### Line Frequency

Available Function	Trigger Level	Sensitivity (Sine RMS)	Range
ACV/DCV	0	1V	10Hz - 50kHz
	1	4V	
	2	40V	
VFD-ACV	3	400V	10Hz - 1kHz
	2	40V	
	3	400V	
µA	0	40µA	10Hz - 5kHz
	1	400µA	
mA	0	4mA	50Hz - 1kHz
	1	40mA	
A	0	0.6A	50Hz - 1kHz
	1	6A	

Accuracy: 0.03% + 3d

### Non-Contact EF-Detection

Bar-segment Indication	EF-H (Hi Sensitivity)	EF-L (Lo Sensitivity)
	Typical Voltage (Tolerance)	
-	10V (3V ~ 19V)	40V (16V ~ 71V)
--	20V (10V ~ 38V)	80V (32V ~ 142V)
---	40V (21V ~ 79V)	160V (63V ~ 285V)
----	80V (40V ~ 156V)	300V (105V ~ 608V)
-----	160V (>80V)	500V (>300V)

Indication: Display bar-segments, backlight flashing, & beep tones in proportion to the field strength

Detection Frequency: 50/60Hz

Detection Antenna: Top-right end of the meter

Probe-Contact EF-Detection: For more precise indications of live wires, such as distinguishing between live and ground connections, use direct contact testing with one single test-probe via the input terminal COM or V. The COM terminal (Black) has the best sensitivity.



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