Welectron.

Handy Electrical DMM + 3Φ Rotation Meter!

System & Motor 3Φ Rotation, Audible + Visible BeepLit™ Continuity, AutoV + Ghost Voltage Buster, VFD V & Hz Fundamentals, Hi & Lo EF-Detection, No Amps & 10 Amps Models, Records Min/Max/Average!

CE

BM230R Series
Electricial Multimeter

BRYMEN®
BRIGHT PEOPLE'S CHOICE
http://www.brymen.com

An Electrical DMM Engineered For Professionals!

LoZ AutoV, VFD V/Hz, 3Wire RST, °C/°F, µA/10A, BeepLit™ Continuity, Hi/Lo EF-Detection, BeepJack™ Warning

White Display Backlight
For Easy Viewing In The Dark

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

True Rms Measurements
For Non-sinusoidal Waveforms Of AC Voltages & AC Currents

Large 6000 Counts LCD Display
5/sec Fast Nominal Update Rate

Function Selection
Toggle Conveniently Between Primary & Secondary Functions

Max Min Avg Record
Record Max/Min And Calculates Average Readings Over Time

Hz Of Line Level Voltage
Measures Noisy High Voltage ACV Frequencies

Relative Zero Mode
For Convenient Readings Comparison & Offset

VFD V & Hz Feature
Measures Fundamental Voltage & Frequency Of Most Variable-Frequency-Drives

Data Hold
Freezes The Displaying Reading For Later View

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

Hi/Lo Senses EF-Detection
Both Non-contact (NCV) & Single-probe Voltage Detection For Identifying Live Lines

AutoV LoZ Feature
Automatic Selection Of LoZ DCV And LoZ ACV

RST Phase Rotation
Dual Sensitivity Modes For Both Motors And Supply Systems

Ghost-voltage-buster
AutoV Loz Drains Ghost/ Stray Voltages Leaving Only Hard Signals On Meter Readings

BeepLit™ Continuity
Quick Open-short Tests. Beep and Backlight Effects For Noisy Environments

Beep-jack™ Audible Warning
Beeps Against Improper A-terminal Plug In. Decreases Risks Of Damage

Type-k Temperature
Selectable °C & °F Readings

Intelligent Auto-power-off
To Extend Battery Life

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

Transient Protection
Up To 6kV 1.2/50µs Lightning Surge; Superb Protection For Serious Users

EMC
Meets EN61326-1:2013

LVD Safety
Meets EN61010-1/-2-030/-2-033 CAT II 1kV & CAT III 600V

BM239R

BM237R

BM236R

239R	237R	236R	FUNCTIONS & FEATURES
●	●	●	3-5/6 Digits 6,000 Counts Large Easy To Read LCD Display
●	●	●	Fast Measurements, 5/Sec; Fully Auto-Ranging
●	●	●	Intelligent Auto Power Off
●	●	●	True RMS AC Conversion
●	●	●	Data Hold
●	●	●	Records Max/Min Readings & Calculates Avg Readings Over Time
●	●	●	VFD V & Hz Fundamental Readings Of Most Variable-Frequency-Drives
●	●	●	Paper white Back-Lighted LCD Display
●	●	●	BeepLit™ Continuity. Features Audible Beep & Visible Backlight Effects
●	●	●	Relative Zero Mode
●	●		Non-Contact EF-Detection (NCV) With Hi/Lo Selectable Sensitivities
●	●		Probe-Contact EF-Detection For More Precise Indication Of Live
●	●	●	Ⓡ 3Φ-Rotation-R (Regular-sensitivity mode) for Supply Systems (Probe-contact)
●	●	●	Ⓜ 3Φ-Rotation-M (Hi-sensitivity mode) for Motors (Probe-contact)
●	●	●	AutoV LoZ Feature. Automatic DC & AC 1000V Selection With Low Initial Impedance To Drain Ghost Voltages
●	●	●	DC/AC V Ranges 600.0mV To 1000V
●	●	●	Ohms Ranges 600.0Ω To 60.00MΩ
●	●		Cx Ranges 2000nF to 10.00mF For Start & Run Motor Capacitors
●	●		Line Level Frequency Ranges 99.99Hz To 50.00kHz
●	●		DC/AC A Ranges 6.000A To 10.00A (20A for 30s / 5 mins cool down)
●			DC/AC µA Ranges 200.0µA To 2000µA
●			Type-K Temperature Readings -40°C To 400°C or -40°F To 752°F
●	●		Beep-Jack™ Input Warning Against Improper A-Terminal Plug In
●	●	●	Diode Tester
●	●	●	Rugged Fire Retarded Housing
●	●	●	Replaceable Protective Holster With Probe-Holders & Tilt-Stand
●	●	●	Optional Purchase Magnetic Hanger
●	●	●	Batteries And Fuses Access Door
●	●	●	Transient Protection Up To 6kV 1.2/50µs Lightning Surge
●	●	●	LVD: EN61010-1/-2-030/-2-033 CAT-II 1kV, CAT-III 600V & CAT-IV 300V
●	●	●	EMC: EN61326-1:2013

GENERAL SPECIFICATION

Display: 3-5/6 digits 6,000 counts
Update Rate: 5 per second nominal
Operating Temperature: -10°C to 45°C
Relative Humidity: Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 45°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 ~ 45°C), or otherwise specified
Sensing: True RMS sensing
Pollution Degree: 2
Safety: Double insulation per IEC/UL/EN61010-1 Ed. 3.0, IEC/UL/EN61010-2-030 Ed. 1.0, IEC/UL/EN61010-2-033 Ed. 1.0, IEC/UL/EN61010-031 Ed. 1.1 and the corresponding CAN/CSA-C22.2 regulations to Measurement CAT II 1000V, CAT III 600V and CAT IV 300V AC & DC
Transient Protection: 6.0kV (1.2/50µs surge)
Terminals (to COM) Measurement Category:
V / mAµA / A / L3: Category II 1000V, CAT III 600V and CAT IV 300V AC & DC.
E.M.C. : Meets EN61326-1:2013
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:
A: 11A/1000V DC/AC rms, IR 20kA, F Fuse; or better
V, Auto V & L3: 1100V DC/AC rms
mV, Ohm & others: 1000V DC/AC rms
Low Battery: Below approx. 2.5V
Power Supply: 1.5V AAA Size battery X 2
Power Consumption (typical): 3.2mA
APO Consumption (typical): 10µA
APO Timing: Idle for 30 minutes
Dimension: 161*80*50mm L*W*H (With Holster)
Weight: Approx. 334 gm (With Holster)
Special Features: AutoV (LoZ); 3-Phase Rotation detection; VFD; BeepLit™ Continuity Tester; Auto-ranging MAX/MIN/AVG Record; Backlighted LCD; Auto-ranging Relative Zero mode; Display Hold; EF-Detection (NCV) (BM237R & BM239R only); BeepJack™ on A terminal (BM237R & BM239R only)
Accessories: Test lead set; Alligator clip set; Batteries installed; User's manual; BKP60 banana plug type-K thermocouple (BM239R only)
Optional Purchase Accessories: BKB32 banana plug to type-K socket plug adaptor (BM239R only); BMH-01 magnetic hanger; BMP-25x soft carrying pouch

Electrical Specification

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 components fall within the meter specified frequency bandwidth for non-sinusoidal waveforms

AC Voltage

RANGE	Accuracy
50Hz ~ 60Hz	
6.000V, 60.00V, 600.0V, 1000V	0.7% + 3d
45Hz ~ 440Hz	
6.000V, 60.00V, 600.0V, 1000V	2.0% + 3d
10Hz ~ 500Hz	
60.00mV, 600.0mV	1.0% + 3d
500Hz ~ 800Hz	
60.00mV, 600.0mV	2.0% + 3d

Input Impedance: 10MΩ, 54pF nominal

VFD_ACV (with Low Pass Filter)

RANGE	Accuracy 1)
10Hz ~ 440Hz (fundamental)	
600.0V,1000V	2.0%+3d

1)Not specified for fundamental frequency > 440Hz

AutoV_ACV

RANGE	Accuracy 1)
45Hz ~ 440Hz	
600.0V,1000V	2.0% + 3d

1)Not specified at <1VAC
Threshold: > 1VAC 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
580kΩ @1000V

DC Voltage

RANGE	Accuracy
60.00mV, 600.0mV, 6.000V, 60.00V, 600.0V, 1000V	0.3% + 2d

Input Impedance: 10MΩ, 54pF nominal

AutoV_DCV

RANGE	Accuracy 1)
600.0V, 1000V	2.0% + 3d

1)Not specified at <1VDC
Threshold: > +1.0VDC or < -1.0VDC 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
580kΩ @1000V

Ohm

RANGE 1)	Accuracy
600.0Ω, 6.000KΩ	0.3% + 3d
60.00KΩ, 600.0KΩ	0.5% + 3d
6.000MΩ 2), 60.00MΩ 3)	0.9% + 3d 4)

1)Open Circuit Voltage: 1.6VDC typical
2)Constant Test Current: 0.2µA Typical
3)Constant Test Current: 0.02µA Typical
4)5%+20d @ >30MΩ

BeepLit™ Continuity Tester

Continuity Threshold: Between 30Ω and 480Ω
Response time: 64ms
Latch time: 128ms
Audible Response: Beep sound
Visible Response: LCD Backlight

Capacitance (BM237R & BM239R only)

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

Accuracies with film capacitor or better

DCµA & ACµA (BM239R only)

RANGE	Accuracy	Burden Voltage
DCµA		
200.0µA, 2000µA	0.7% + 3d	2.5mV/µA
ACµA (50Hz ~ 400Hz)		
200.0µA, 2000µA	1.0% + 3d	2.5mV/µA

Overload protection type: PTC protective impedance combination

DCA & ACA (BM237R & BM239R only)

RANGE	Accuracy	Burden Voltage
DCA		
6.000A, 10.00A 1)	0.7% + 3d	0.04V/A
ACA (50Hz ~ 400Hz)		
6.000A, 10.00A 1)	1.0% + 3d	0.04V/A

1)10A continuous, >10A to 20A for 30 seconds max with 5 minutes cool down interval
Overload protection type: HBC fuse

Temperature (BM239R only)

RANGE	Accuracy
-40.0 °C ~ 99.9°C	1% + 1 °C
100 °C ~ 400°C	
-40.0 °F ~ 99.9 °F	1% + 2 °F
100 °F ~ 752 °F	

Type-K thermocouple range & accuracy not included

Diode Tester

RANGE	Accuracy
3.000V	0.9% + 2d

Test Current: 0.3mA typical
Open Circuit Voltage: < 3.2VDC typical

Line Frequency (BM237R & BM239R only)

Function	Sensitivity (Sine RMS)	Range
60mV, 600mV	50mV	10Hz - 50kHz
6V	3V	10Hz - 50kHz
60V	5V	10Hz - 50kHz
600V	50V	10Hz - 1kHz
1000V	500V	10Hz - 1kHz
VFD 600V	50V	10Hz - 1kHz
VFD 1000V	500V	10Hz - 1kHz
200µA 1), 2000µA 1)	500µA	10Hz - 5kHz
6A, 10A	8A	50Hz - 1kHz

1)Available for Model 239R only
Accuracy: 0.03% + 2d

Non-Contact EF-Detection (BM237R & BM239R only)

Bar-Graph 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: Bar-graph segments & audible beep tones proportional to the field strength
Detection Frequency: 50/60Hz
Detection Antenna: Top left end of the meter
Probe-Contact EF-Detection: For more precise indication 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.

Ⓡ&Ⓗ 3-Phase Rotation function

Hi-sensitivity mode Ⓗ
Voltage range: 0.4V ~ 1000V
Frequency range: 3Hz ~ 400Hz
Regular-sensitivity mode Ⓡ
Voltage range: 65V ~ 1000V
Frequency range: 35Hz ~ 400Hz

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