

4-1/2 Digit High Resolution, High Speed And High Bandwidth!

- Direct 20,000 Counts Accuracies! 20kHz ACV Bandwidth!
AC+Hz Dual Display! nS Measurements!
- VFD V & Hz! BeepLit™ Continuity Tester! Record DC Min/Max Readings Updates 10/sec!
Captures Crest Extremes! Relative Zero! BeepJack™ Input Warning!



BM830 Series
Professional Multimeters

BRYMEN®

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

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● **BM839**



● **BM836**

839	836	FUNCTIONS & FEATURES
●	●	3-5/6 Digits & 4-1/2 Digits 20,000 Counts Max Large Easy-To-Read LCD Display
●	●	Nominal 5/Sec Fast Measurements; Fully Auto-Ranging
●	●	61 Segment Analog Bar-graph Updates 60/Sec
●	●	Paper-White Back-Lighted LCD Display
●	●	Dual Digital Display AC + Hz Readings
●	●	AC True RMS Conversion
●	●	Intelligent Auto Power Off
●	●	Data Hold
●	●	Relative Zero Mode
●	●	Crest (Peak Hold) Max/Min Readings
●	●	High-Update Record Max/Min Readings, Update Intervals DC's 100ms / AC's 120ms
●	●	BeepJack™ Input Warning Against Improper Plug In To μ Am/A Terminals
●	●	VFD-V & VFD-Hz Measures Fundamental V & Hz Of Most Variable Frequency Drives
●	●	AC/DC Voltage Ranges 200.00mV To 1000.0V
●	0.09%	Best Basic DCV accuracy upto 0.045%
●	5kHz	ACV Bandwidth Up To 20kHz
●	●	Ohms Ranges 200.00 Ω To 20.000M Ω
●	●	nS Range 60.00nS
●	●	BeepLit™ Continuity Tester. Features Audible Beep & Visible Backlight Effects
●	●	Diode Tester
●	●	Frequency Ranges 9.999Hz To 100.0kHz
●	●	AC/DC μ A, mA & A Ranges 200.00 μ A To 10.000A
●	●	Capacitance Ranges 20.00nF To 20.00mF
●	●	Type-K Temperature -40.0°C To 1090.0°C; Selectable °F Readings
●	●	Optional Purchase Magnetic Hanger
●	●	Rugged Fire Retarded Casing With Battery And Fuse Access Door
●	●	Replaceable Protective Holster With Probe-Holders & Tilt-Stand
●	●	HBC 1kV Fuses Protected On μ Am/A Terminals
●	●	Transient Protection Up To 8kV 1.2/50 μ s Lightning Surge
●	●	LVD Meets EN61010-1/-2-030/-2-033 to Measurement CAT III 1000V & CAT IV 600V
●	●	EMC EN61326-1:2013

GENERAL SPECIFICATION

Display: 3-5/6 digits 6,000 counts & 4-1/2 digits 20,000 counts max

Polarity: Automatic

3-5/6 digits Update Rate: 5 per second nominal

4-1/2 digits Update Rate: 5 per second nominal

61 Segments Bar graph Update Rate: 40 per second max

Operating Temperature: -10°C to 50°C

Relative Humidity: Maximum relative humidity 90% for temperature up to 28°C decreasing linearly to 50% relative humidity at 50°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 0.1 x (specified accuracy)/ °C @ (-10°C ~ 18°C or 28°C ~ 50°C), or otherwise specified

Sensing: AC True RMS

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,

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 < 1.8:1 at full scale & < 3.6:1 at half scale, and with frequency components fall within the specified frequency bandwidth for non-sinusoidal waveforms.

AC Voltage (6000-count mode)

RANGE	Accuracy	
	BM839	BM836
50Hz ~ 60Hz		
600.0mV, 6.000V, 60.00V, 600.0V, 1000V	0.7% + 3d	0.5% + 3d
40Hz ~ 1kHz		
600.0mV, 6.000V, 60.00V, 600.0V, 1000V	1% + 3d	
1000V	2% + 3d	
1kHz ~ 5kHz		
600.0mV, 6.000V, 60.00V, 600.0V	1.8% + 4d ¹⁾	2% + 4d ¹⁾
1000V	Unspecified	
5kHz ~ 20kHz ²⁾		
600.0mV, 6.000V, 60.00V	2% + 20d ²⁾	Unspecified
600.0V, 1000V	Unspecified	

Input impedance: 10M Ω , 110pF nominal

¹⁾Add 0.5% @ bandwidth >4kHz ~ 5kHz

²⁾Add 20d @ reading >80% of range

³⁾Unspecified for < 5% of range

AC Voltage (20000-count mode)

RANGE	Accuracy	
	BM839	BM836
50Hz ~ 60Hz		
199.99mV, 1.9999V, 19.999V, 199.99V, 1000.0V	0.7% + 30d	0.5% + 30d
40Hz ~ 1kHz		
199.99mV, 1.9999V, 19.999V, 199.99V	1% + 30d	
1000.0V	2% + 30d	
1kHz ~ 5kHz		
199.99mV, 1.9999V, 19.999V, 199.99V	1.8% + 40d	2% + 40d ¹⁾
1000.0V	Unspecified	
5kHz ~ 20kHz ²⁾		
199.99mV, 1.9999V, 19.999V, 199.99V	2% + 40d	Unspecified
1000.0V	Unspecified	

Input impedance: 10M Ω , 110pF nominal

¹⁾Add 0.5% @ bandwidth >4kHz ~ 5kHz

²⁾Unspecified for < 5% of range

VFD AC Voltage

RANGE	Accuracy ¹⁾	
	BM839	BM836
10Hz ~ 45Hz		
600.0V, 1000V	4% + 5d	
45Hz ~ 200Hz		
600.0V, 1000V	2.5% + 5d	
200Hz ~ 440Hz		
600.0V, 1000V	9% + 5d ²⁾	

Input impedance: 10M Ω , 110pF nominal

¹⁾Unspecified for fundamental frequency > 440Hz

²⁾Accuracy linearly decreases from 2.5% + 5d @200Hz to 9.0% + 5d @440Hz

DC Voltage (6000-count mode)

RANGE	Accuracy	
	BM839	BM836
600.0mV	0.09% + 1d	0.18% + 1d
6.000V, 60.00V	0.045% + 1d	0.09% + 1d
600.0V, 1000V	0.09% + 1d	0.18% + 1d

Input impedance: 10M Ω , 110pF nominal

DC Voltage (20000-count mode)

RANGE	Accuracy	
	BM839	BM836
199.99mV	0.09% + 6d	0.18% + 6d
1.9999V, 19.999V, 199.99V	0.045% + 6d	0.09% + 6d
1000.0V	0.09% + 6d	0.18% + 6d

Input impedance: 10M Ω , 110pF nominal

Ohms (6000-count mode)

RANGE ¹⁾	Accuracy	
	BM839	BM836
600.0 Ω	0.15% + 3d	0.3% + 3d
6.000k Ω , 80.00k Ω	0.15% + 1d	0.3% + 1d
600.0k Ω	0.3% + 1d	0.6% + 1d
6.000M Ω ²⁾	0.5% + 1d	0.7% + 1d
60.00M Ω ³⁾	1.5% + 3d ⁴⁾ ⁶⁾	2% + 3d ⁴⁾ ⁶⁾
60.00S ³⁾	2.0% + 10d ⁵⁾ ⁹⁾	

¹⁾Open Circuit Voltage: 1.7VDC typical

²⁾Constant Test Current: 0.2 μ A Typical

³⁾Constant Test Current: 0.02 μ A Typical

⁴⁾Add 1% @ >20M Ω

⁵⁾Add 30d @ < 20% of range

IEC/UL/EN61010-031 Ed. 1.1 and the corresponding CAN/CSA-C22.2 regulations to Measurement CAT III 1000 V AC & DC and Category IV 600V AC & DC

Overload Protections:

μ A & mA: 0.4A/1kV DC/AC rms, IR 30kA, F Fuse; or better

A: 11A/1kV DC/AC rms, IR 20kA, F Fuse; or better

V: 1100V DC/AC rms

mV, Ω & Others: 1000 V DC/AC rms

Transient Protection: 8kV (1.2/50 μ s surge)

E.M.C.: Meets EN61326-1:2013

ACV of Model 836, in an RF field of 1V/m:

Total Accuracy = Specified Accuracy + 30 digits

Performance above 1V/m is not specified

All Other Functions, in an RF field of 3V/m:

Total Accuracy = Specified Accuracy + 150 digits

Performance above 3V/m is not specified

Power Supply: Four Alkaline AA batteries (IEC LR6)

⁹⁾Add 2% @ operation temperature >35°C

Ohms (20000-count mode)

RANGE ¹⁾	Accuracy	
	BM839	BM836
199.99 Ω ²⁾	0.15% + 20d	0.3% + 20d
1.9999k Ω , 19.999k Ω	0.15% + 6d	0.3% + 6d
199.99M Ω	0.3% + 6d	0.6% + 6d
1.9999M Ω ³⁾	0.5% + 6d	0.7% + 6d
19.999M Ω ⁴⁾	1.5% + 30d ⁵⁾	2% + 30d ⁵⁾

¹⁾Open Circuit Voltage: 1.7VDC typical

²⁾Specified with input lead resistance been offset by REL $\blacktriangle$ or Shrt (short)

feature

³⁾Constant Test Current: 0.2 μ A Typical

⁴⁾Constant Test Current: 0.02 μ A Typical

⁵⁾Add 2% @ operation temperature >35°C

BeepLit™ Continuity Tester

Continuity Threshold: Between 20 Ω and 350 Ω

Response time: < 30ms

Audible Response: Beep sound

Visible Response: LCD Backlight

Diode Tester

Range	Accuracy	Test Current (Typical)	Open Circuit Voltage
2.700V	1.5% + 4d	0.4mA	< 2.8VDC

Capacitance

RANGE	Accuracy ¹⁾
20.0nF	1% + 8d
200.0nF, 2.000 μ F, 20.00 μ F, 200.0 μ F, 2000 μ F	1% + 2d
20.00mF	2% + 2d

¹⁾Accuracies with film capacitor or better

Temperature (BM839 only)

RANGE	Accuracy ¹⁾ ²⁾
-40.0°C ~ 0.0°C	1% + 2.0°C
0.0°C ~ 50.0°C	1% + 1.0°C
50.0°C ~ 1090.0°C	1% + 1.5°C
-40.0°F ~ 32.0°F	1% + 3.6°F
32.0°F ~ 122.0°F	1% + 1.8°F
122.0°F ~ 1994.0°F	1% + 2.7°F

¹⁾Accuracies assume meter interior has the same temperature of the ambient (isothermal stage) for a correct junction voltage compensation. Allow enough time to reach the isothermal stage for a significant change of ambient temperature. It can take up to an hour for changes > 5°C.

²⁾Type-K thermocouple range & accuracy not included

DC current (6000-count mode)

RANGE	Accuracy		Burden Voltage
	BM839	BM836	
600.0 μ A ¹⁾	0.18% + 4d	0.36% + 4d	0.2mV/ μ A
6000 μ A ¹⁾	0.18% + 2d	0.36% + 2d	0.2mV/ μ A
60.00mA ¹⁾	0.18% + 4d	0.36% + 4d	3.0mV/mA
600.0mA ¹⁾ ²⁾	0.3% + 3d	0.5% + 3d	3.0mV/mA
6.000A	0.5% + 4d	0.6% + 4d	30mV/A
10.00A ³⁾	0.7% + 2d	0.8% + 2d	30mV/A

¹⁾ μ A/mA DC accuracies will be affected by extreme interior temperatures of the meter. For rated accuracies, allow 6 to 20 minutes cool down interval after measuring A-currents of 3 to 10A continuously.

²⁾ $\leq$ 400mA continuous; >400mA for <1.1 hours on per >20 minutes off

³⁾10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

DC current (20000-count mode)

RANGE	Accuracy		Burden Voltage
	BM839	BM836	
199.99 μ A ¹⁾	0.18% + 40d	0.36% + 40d	0.2mV/ μ A
1999.9 μ A ¹⁾	0.18% + 20d	0.36% + 20d	0.2mV/ μ A
19.999mA ¹⁾	0.18% + 40d	0.36% + 40d	3.0mV/mA
199.99mA ¹⁾	0.18% + 30d	0.36% + 30d	3.0mV/mA
1.9999A	0.5% + 40d	0.6% + 40d	30mV/A
10.000A ²⁾	0.7% + 20d	0.8% + 20d	30mV/A

¹⁾ μ A/mA DC accuracies will be affected by extreme interior temperatures of the meter. For rated accuracies, allow 6 to 20 minutes cool down interval after measuring A-currents of 3 to 10A continuously.

²⁾10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

Power Consumption: 8mA typical for VFD ACV $\pm$ Hz; 6.5mA typical for other functions

Low Battery: approx. 4.8V

APO Timing: Idle for 20 minutes

APO Consumption: 20 μ A typical

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

Weight: 635 gm with holster

Accessories: Test probe pair, Holster, User's manual, Bkp60 banana plug type-K thermocouple (Model 839 only)

Optional Accessories: BKB32 banana plug to type-K socket plug adaptor (Model 839 only), BMH-01 magnetic hanger; BMP-86x soft carrying pouch

Special Features: VFD; Dual display $\pm$ Hz Readings; Selectable 6,000 & 20,000 Counts Resolution; High-Update Record MAX/MIN readings; Crest MAX/MIN readings; Relative Zero; Display Hold; LCD Backlight; BeepLit™ Continuity Tester, BeepJack™ audible & visible input warning

AC current (6000-count mode)

RANGE	Accuracy		Burden Voltage
	BM839	BM836	
40Hz ~ 3kHz			
600.0μA, 6000μA	1% + 2d	1.2% + 2d	0.2mV/μA
60.00mA, 600.0mA ¹⁾			3mV/mA
6.000A, 10.00A ²⁾	1% + 4d	1.2% + 4d	30mV/A
3kHz ~ 5kHz			
600.0μA, 6000μA	2% + 2d	Unspecified	0.2mV/μA
60.00mA, 600.0mA ¹⁾			3mV/mA
6.000A, 10.00A ²⁾	Unspecified		30mV/A

¹⁾ $\leq$ 400mA continuous; >400mA for <1.1 hours on per >20 minutes off

²⁾10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

AC current (20000-count mode)

RANGE	Accuracy		Burden Voltage
	Model 839	Model 836	
40Hz ~ 3kHz			
199.99μA, 1999.9μA	1% + 20d	1.2% + 20d	0.2mV/μA
19.999mA, 199.99mA			3mV/mA
1.9999A, 10.000A ¹⁾	1% + 40d	1.2% + 40d	30mV/A
3kHz ~ 5kHz			
199.99μA, 1999.9μA	2% + 20d	Unspecified	0.2mV/μA
19.999mA, 199.99mA			3mV/mA
1.9999A, 10.000A ¹⁾	Unspecified		30mV/A

¹⁾10A continuous up to ambient 35°C; <15 mins on per >5 mins off @ 35°C ~ 50°C. >10A to 20A for <30 seconds on per >5 mins off

~ Hz Line Level Frequency

Function RANGE	Sensitivity (Sine RMS)	Range
199.99mV, 600.0mV	40mV	6Hz ~ 100kHz
1.9999V, 6.000V	0.4V	10Hz ~ 50kHz
19.999V, 60.00V	4V	10Hz ~ 30kHz
199.99V, 600.0V	40V	10Hz ~ 5kHz
1000.0V, 1000V	400V	10Hz ~ 440Hz
VFD 600.0V	40V	10Hz ~ 440Hz
VFD 1000V	400V	10Hz ~ 440Hz
199.99 μ A, 600.0 μ A	40 μ A	10Hz ~ 5kHz
1999.9 μ A, 6000 μ A	400 μ A	
19.999mA, 60.00mA	4mA	
199.99mA, 600.0mA	40mA	10Hz ~ 3kHz
1.9999A, 6.000A	0.6A	
10.000A, 10.000A	6A	

Accuracy: 0.01%+4d

High-Update Record mode

DC functions update interval 100ms, nominal response to 85%;

For changes > 200ms in duration:

6000-count mode: Specified accuracy $\pm$ 12 counts

20000-count mode: Specified accuracy $\pm$ 120 counts

AC functions update interval 120ms, nominal response to 85%;

For changes > 350ms in duration and input >5% of range:

6000-count mode: Specified accuracy $\pm$ 30 counts

20000-count mode: Specified accuracy $\pm$ 300 counts

Crest mode

DC/AC functions

For changes > 5ms in duration:

6000-count mode only: Specified accuracy $\pm$ 150 counts