500,000 Counts High Performance!
Innovative Features! User-Oriented!

5-4/5d DCV At 1µV Best Resolution, DC & AC in Dual Display, 100kHz DC+AC TRMS, Cat IV 1kV Safety…
USB PC-Comm, Paper-White Backlit, Bar-graph, BeepJack™, Crest (Peak), Rec (Min Max Avg), Relative…
Measures VFD V & Hz, X-Speed Large Cx, nS Conductance, 4-20mA, T1-T2, Line Level Hz, Duty %, dBm…
Ergonomic, Large LCD, Battery Access Cover, Magnetic Hanger, Holster, Probe Holders, Tilt stand Hanger…

BM860s SERIES

Professional
Multimeters

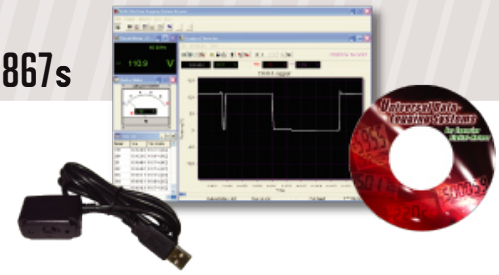
www.brymen.com

BRYMEN®
Bright People's Choice

BM869s

BM867s

BU-86X Interface Kit (Optional Purchase)



869s	867s	FUNCTIONS & FEATURES
●	0.03%	0.02% High Basic DCV Accuracy
●		100kHz AC, AC+DC Voltage Bandwidth
●		VFD-V & VFD-Hz Measures Fundamental V & Hz Of Most Variable Frequency Drives
●		T1-T2 Dual Type-K Temperature –50°C To 1000°C; Selectable °F Readings
●	●	5-4/5 Digits 500,000 Counts Large Easy To Read LCD Display
●	●	Fast Measurements, 5/Sec; Fully Auto-Ranging
●	●	Dual Digital Display
●	●	41 Segment Analog Bar-graph Updates 60/Sec
●	●	Optional Purchase USB Cable & Software
●	●	Intelligent Auto Power Off (I-APO) Resets On Significant Operation & Readings
●	●	Data Hold
●	●	Relative Zero Mode
●	●	Audible & Visible BeepJack™ Input Warning Against Improper Plug In
●	●	AC, AC+DC True RMS Conversion;
●	●	Record Max/Min Readings; Calculates Average Reading over time; Auto-Ranging
●	●	Crest (Instantaneous Peak Hold) Max/Min Readings, Auto-Ranging
●	●	Paper-White Back-Lighted Large Easy To Read LCD Display
●	●	dBm Readings, 20 Selectable Impedance Values
●	●	DCV 0.001mV To 1000V
●	●	ACV 0.01mV To 1000V
●	●	AC+DCV 0.01mV To 1000V
●	●	DCA 0.01μA To 10A; 20A For 30 Seconds Per 5 Minutes Cooling
●	●	ACA 0.01μA To 10A; 20A For 30 Seconds Per 5 Minutes Cooling
●	●	AC+DCA 0.01μA To 10A; 20A For 30 Seconds Per 5 Minutes Cooling
●	●	Ohms 0.01Ω To 50MΩ
●	●	Conductance 0.01nS To 99.99nS
●	●	X-Speed Capacitance 50.00nF To 25mF
●	●	Line Level Frequency 10Hz To 200kHz
●	●	Logic Level Frequency 5Hz To 1MHz
●	●	Logic Level Duty Cycle Readings 0.1% To 99.99%
●	●	Diode Tester
●	●	Rugged Fire Retarded Casing With Battery Access Door
●	●	Replaceable Protective Holster With Probe-Holders & Tilt-Stand
●	●	Optional Purchase Magnetic Hanger
●	●	1000V General (Ohm, Capacitance … etc.) Input Protection
●	●	1000V High Breaking Capacity Fuses Protected On Current Inputs
●	●	Transient Protection Up To 12kV 1.2/50μs Lightning Surge
●	●	LVD Meets EN61010-1/-2-033 to CAT IV 1000V
●	●	EMC EN61326-1

The Ultimate Choice Of Resolution, Performance, Safety & Features!

Unbeatable 5-4/5d DCV Resolution, 100kHz DC+AC Performance, Cat IV 1kV Safety & New VFD Features!

ASIC TECHNOLOGY
MORE FUNCTIONS & FEATURES
AT AFFORDABLE PRICES

LARGE 500,000 COUNTS LCD DISPLAY
5/SEC FAST NOMINAL UPDATE RATE

ANALOG BAR-GRAPH
FAST UPDATE RATE 60/SEC

HIGH ACCURACY
0.02% BASIC DCV ACCURACY;
1µVDC BEST RESOLUTION

AUTO & MANUAL-RANGING
AUTO-RANGING WITH
MANUAL-RANGING OVERRIDE

PAPER-WHITE DISPLAY BACKLIGHT
FOR EASY VIEWING IN THE DARK

FUNCTION SELECTION
TOGGLE CONVENIENTLY BETWEEN
PRIMARY & SECONDARY FUNCTIONS

CREST (PEAK HOLD)
CAPTURES INSTANTANEOUS
+PEAK & -PEAK, AUTO-RANGING

LOGIC LEVEL DUTY%
MEASURES DIGITAL LOGIC LEVEL
DUTY CYCLE % READINGS

LOGIC LEVEL Hz
MEASURES DIGITAL LOGIC LEVEL
FREQUENCIES UP TO 1MHz

HIGH IMPEDANCE VOLTAGE
1000VAC/DC MEASURING CAPABILITIES;
HIGH INPUT IMPEDANCE FOR
LOAD SENSITIVE CIRCUITS

Hz OF LINE LEVEL VOLTAGE
MEASURES NOISY HIGH VOLTAGE
ACV FREQUENCIES UP TO 200kHz
IN DUAL DISPLAY

PC INTERFACE CAPABILITY
OPTIONAL PURCHASE USB CABLE
WITH DATA RECORDING PC SOFTWARE

VFD V & Hz FEATURE
MEASURES FUNDAMENTAL
VOLTAGE & FREQUENCY OF MOST
VARIABLE FREQUENCY DRIVES

dBm FUNCTION
WITH 20 SELECTABLE
REFERENCE IMPEDANCE VALUES

BEEP-JACK™ AUDIBLE & VISIBLE WARNING
GUARDS AGAINST IMPROPER A-TERMINAL
PLUG IN. DECREASES RISKS OF DAMAGE

INTELLIGENT AUTO-POWER-OFF
TO EXTEND BATTERY LIFE; AWAKE RESETS ON
SIGNIFICANT OPERATION & MEASUREMENTS

AC, AC+DC 100kHz TRUE RMS
FOR NON-SINUSOIDAL WAVEFORMS
OF COMPLEX VOLTAGE OR CURRENT SIGNALS

T1-T2 TYPE-K TEMPERATURE
2 CHANNEL MEASUREMENTS,
SELECTABLE °C & °F READINGS

DUAL DIGITAL DISPLAY
SIMULTANEOUSLY VIEW RELEVANT
PARAMETERS IN COMPLEMENTARY DISPLAY

X-SPEED CAPACITANCE
X-SPEED MEASURES UP TO 25mF
ONLY IN A FEW SECONDS; 1kV PROTECTION

DIODE TEST
FOR CHECKING DIODES
AND RECTIFIERS

nS CONDUCTANCE
nS=1/GΩ VIRTUALLY EXTENDS
RESISTANCE MEASUREMENT TO
THE ORDER OF GΩ. IT IS USEFUL
FOR LEAKAGE MEASUREMENTS

DATA HOLD
FREEZES THE DISPLAYING
READING FOR LATER VIEW

MAX MIN AVG RECORD
RECORD MAX, MIN & AVG
READINGS; AUTO-RANGING

%4-20mA LOOP CURRENT
FOR PROCESS CONTROL

CURRENT & Hz
MEASURES CURRENT & FREQUENCIES,
AC & DC IN DUAL DISPLAY

FAST AUDIBLE CONTINUITY
FOR QUICK OPEN-SHORT TESTS
ON SWITCHES, FUSES, AND WIRES

ERGONOMIC STREAMLINE DESIGN
FITS COMFORTABLY IN ONE'S HAND

TRANSIENT PROTECTION
UP TO 12kV 1.2/50µs LIGHTNING SURGE;
SUPERB PROTECTION FOR SERIOUS USERS

EMC
MEETS EN61326-1

LVD SAFETY
MEETS EN61010-1/-2-033
CAT IV 1kV

PROTECTIVE HOLSTER
WITH HOLDERS FOR PROBE STORAGE
AND "THIRD HAND" FEATURE,
REPLACEABLE & WASHABLE

GENERAL SPECIFICATIONS

Display: 4-4/5 digits 50,000 counts fast mode. Selectable stable mode 5-4/5 digits 500,000 counts for DC Voltage & 5 digits 99,999 counts for Hz
Polarity: Automatic
Update Rate:
4-4/5 digits fast mode: 5 per second nominal;
5-4/5 digits stable mode: 1.25 per second nominal;
41 Segments Bar graph: 60 per second max
Operating Temperature: 0°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
Pollution degree: 2
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 @(0°C ~ 18°C or 28°C ~ 45°C), or otherwise specified
Sensing: AC, AC+DC True RMS
Safety: Certified per IEC/UL/EN61010-1 Ed. 3.1, IEC/UL/EN61010-2-033 Ed. 2.0, IEC/UL/EN61010-031 Ed. 2.0 and the corresponding CAN/CSA-C22.2 regulations to Measurement Category CAT IV 1000V AC & DC
Overload Protections:
μA & mA : 0.44A/1000V DC/AC rms, IR 10kA, F fuse
A : 11A/1000V DC/AC rms, IR 20kA, F fuse
V : 1100V DC/AC rms
mV, Ω & Others : 1000V DC/AC rms
Transient protection: 12kV (1.2/50μs surge)
E.M.C.: Meets EN61326-1
In an RF field of 3V/m:
Capacitance function is not specified
Other function ranges:
Total Accuracy = Specified Accuracy + 1000 digits
Performance above 3V/m is not specified
Power Supply: Single Alkaline 9V battery; NEDA1604A, JIS6AM6 or IEC6LF22
Power Consumption: 6.5mA typical; 8mA for VFD ranges (Model 869s only)
Low Battery: Below approx. 7V
APO Timing: Idle for 17 minutes
APO Consumption: 70μA typical .
Dimension: L208mm X W103mm X H64.5mm with holster
Weight: 635 gm with holster
Accessories: Test leads (pair), holster, battery installed, user's manual, Bkp60 banana plug K-type thermocouple x 1 (Model 869s only)
Optional Accessories: BU-86X PC interface kit, Bkb32 banana pins to K-type socket plug adapter (Model 869s only), BMH-01 Magnetic Hanger
Special Features: Record MAX, MIN & AVG readings; Crest (Instantaneous Peak hold) MAX & MIN readings; Relative zero mode; 500,000 counts stable DCV mode; Paper-White Backlit display; dBm readings; %4-20mA loop current readings; Data Hold; BeepJack™ Audible & visible input warning; T1-T2 differential temperature readings (Model 869s only); VFD V & Hz readings (Model 869s only)

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BRYMEN TECHNOLOGY CORPORATION
www.brymen.eu

ELECTRICAL SPECIFICATIONS

Accuracy is ±(% reading digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 75% relative humidity.
True RMS voltage & current accuracies are specified from 5 % to 100 % of range or otherwise specified. Maximum Crest Factor < 2.1:1 at full scale & < 4.2:1 at half scale, and with frequency components within the specified frequency bandwidth for non-sinusoidal waveforms.

DC Voltage

RANGE	869s	867s
	Accuracy	
500.00mV [1], 5.0000V,	0.02% + 2d	0.03% + 2d
50.000V	0.03% + 2d	0.04% + 2d
500.00V	0.04% + 2d	0.05% + 2d
1000.0V	0.15% + 2d	0.15% + 2d

[1]Signal peak absolute values, including DC bias, less than 1000mVpeak
Input Impedance: 10MΩ, 60pF nominal (80pF nominal for 500mV range)

Ohms

RANGE	869s	867s
	Accuracy	
500.00Ω	0.07%+10d	0.1%+10d
5.0000kΩ	0.07%+2d	0.1%+6d
50.000kΩ	0.1%+2d	0.1%+6d
500.00kΩ	0.1%+2d	0.1%+6d
5.0000MΩ	0.3%+6d	0.4%+6d
50.000MΩ	2.0%+6d	2.0%+6d
99.99nS [1]	2.0%+10d	2.0%+10d

Open Circuit Voltage: < 1.3VDC (< 3VDC for 500Ω range)
[1]From 0% to 10% of range: Specified accuracy + 30d

Audible Continuity Tester

Audible threshold: between 20Ω and 200Ω
Response time < 100μs

Crest mode (Instantaneous Peak Hold)

Resolution: 5000 counts
Accuracy: Specified accuracy ± 100 digits for changes > 0.8ms in duration

DC Loop Current %4~20mA

4mA = 0% (zero); 20mA = 100% (span)
Resolution: 0.01% Accuracy: ± 25d

AC Voltage

RANGE	869s	867s
	Accuracy [1]	
	20Hz ~ 45Hz	
500.00mV [2], 5.0000V, 50.000V	1.5%+40d	Unspec'd
500.00V, 1000.0V	Unspec'd	
	45Hz ~ 300Hz	
500.00mV [2]	0.3% + 20d	Unspec'd
5.0000V, 50.000V	0.4% + 30d	
500.00V, 1000.0V	0.5% + 40d	
	300Hz ~ 5kHz	300Hz ~ 1kHz
500.00mV [2]	0.4% + 20d	0.8%+40d
5.0000V, 50.000V, 500.00V	0.4% + 40d	2.0%+60d
1000.0V	0.8% + 40d [3]	1.0%+40d
	5kHz ~ 20kHz	1kHz ~ 20kHz
500.00mV [2]	0.6%+40d	1dB [4]
5.0000V, 50.000V	0.7%+40d	2dB [4]
500.00V	0.5%+40d	3dB [4]
1000.0V	Unspec'd	Unspec'd
	20kHz ~ 100kHz	
500.00mV [2]	4.0%+40d	Unspec'd
5.0000V, 50.000V	4.0%+40d [4]	
500.00V	Unspec'd	
1000.0V		

[1]From 5% to 20% of range: Specified accuracy + 80d
[2]Signal peak absolute values, including DC bias, less than 1000mVpeak
[3]Specified bandwidth 300Hz ~ 1kHz
[4]From 5% to 20% of range: Specified accuracy + 200d
[4]From 20% to 50% of range: Specified accuracy + 150d
Input Impedance: 10MΩ, 60pF nominal
(80pF nominal for 500mV range)
Residual reading less than 50 digits with test leads shorted.

dBm

Range and accuracy are subjected to ACmV, ACV, and reference impedance selected. Typical 600Ω reference impedance ranges:
At ACmV : -29.83dBm to –03.80dBm
At ACV : -01.09dBm to 62.22dBm
Input Impedance: 10MΩ, 60pF nominal
Selectable reference impedance of 4, 8, 16, 32, 50, 75, 93, 110, 125, 135, 150, 200, 250, 300, 500, 600, 800, 900, 1000 & 1200Ω

DC [AC] & AC+DC [AC] Voltage

RANGE	869s	867s
	Accuracy [1]	
	20Hz ~ 45Hz	
500.00mV [2], 5.0000V, 50.000V	1.5% + 40d	Unspec'd
500.00V, 1000.0V	Unspec'd	
	DC, 45Hz ~ 300Hz	
500.00mV [2]	0.45% + 40d	0.8%+60d
5.0000V, 50.000V	0.7% + 80d	
500.00V, 1000.0V	0.7% + 40d	
	300Hz ~ 5kHz	300Hz ~ 1kHz
500.00mV [2]	0.8% + 40d	0.8%+40d
5.0000V, 50.000V, 500.00V	0.8% + 40d	2.0%+60d
1000.0V	1.0% + 40d [3]	1.0%+40d
	5kHz ~ 20kHz	1kHz ~ 20kHz
500.00mV [2]	1.0%+40d	1dB [4]
5.0000V, 50.000V	1.5%+40d	2dB [4]
500.00V	1.5%+40d	3dB [4]
1000.0V	Unspec'd	Unspec'd
	20kHz ~ 40kHz	
500.00mV [2]	3.5%+40d	Unspec'd
5.0000V, 50.000V	4.0%+40d [4]	
500.00V	Unspec'd	
1000.0V		

[1]From 5% to 20% of range: Specified accuracy + 80d
[2]Signal peak absolute values, including DC bias, less than 1000mVpeak
[3]Specified bandwidth 300Hz ~ 1kHz
[4]From 5% to 20% of range: Specified accuracy + 200d
[4]From 20% to 50% of range: Specified accuracy + 150d
Input Impedance: 10MΩ, 60pF nominal
(80pF nominal for 500mV range)
Residual reading less than 50 digits with test leads shorted.

VFD AC Voltage (Model 869s only)

RANGE	Accuracy [1]
	10Hz ~ 20Hz
5.0000V, 50.000V, 500.00V, 1000.0V	5.5% + 80d
	20Hz ~ 200Hz
5.0000V, 50.000V, 500.00V, 1000.0V	2% + 50d
	200Hz ~ 440Hz
5.0000V, 50.000V, 500.00V, 1000.0V	6% + 80d [2]

[1]Not specified for fundamental frequency > 440Hz
[2]Accuracy linearly decreases from 2% + 50d @ 200Hz to 6% + 80d @ 440 Hz

Capacitance

RANGE	Accuracy [1]
50.00nF	0.8% + 3d
500.0nF	0.8% + 3d
5.000μF	1.5% + 3d
50.00μF	2.5% + 3d
500.0μF [2]	3.5% + 5d
5.000mF [2]	5.0% + 5d
25.00mF [2]	6.5% + 5d

[1]Accuracies with film capacitor or better
[2]In manual-ranging mode, measurements not specified below 45.0μF/ 0.450mF/4.50mF (450 counts) for 500.0μF/5.000mF/25.00mF ranges respectively

Diode Tester

RANGE	Accuracy	Test Current (Typical)	Open Circuit Voltage
2.0000V	1%+1d	0.4mA	< 3.5 VDC

Hz Logic Level Frequency

RANGE	Accuracy
5.000Hz ~ 1.0000MHz	0.002%+4d

Sensitivity: 2.5Vp square wave

DC Current

RANGE	Accuracy	Burden Voltage
500.00μA	0.15%+20d	0.15mV/μA
5000.0μA	0.1%+20d	0.15mV/μA
50.000mA	0.15%+20d	3.3mV/mA
500.00mA	0.15%+30d	3.3mV/mA
5.0000A	0.5%+20d	45mV/A
10.000A [1]	0.5%+20d	45mV/A

[1]10A continuous, >10A to 20A for 30 second max with 5 minutes cool down interval

AC, DC [AC] & AC+DC [AC] Current

RANGE	869s	867s	Burden Voltage
	Accuracy		
	DC, 50Hz ~ 60Hz		
500.00μA	0.5% + 50d	1.0% + 40d	0.15mV/μA
5000.0μA			0.15mV/μA
50.000mA			3.3mV/mA
500.00mA			3.3mV/mA
5.0000A [2]			45mV/A
10.000A [1] [2]			45mV/A
	40Hz ~ 1kHz		
500.00μA	0.7% + 50d	1.0% + 40d	0.15mV/μA
5000.0μA			0.15mV/μA
50.000mA			3.3mV/mA
500.00mA			3.3mV/mA
5.0000A [2]			45mV/A
10.000A [1] [2]			45mV/A
	1kHz ~ 20kHz		
500.00μA	2.0% + 50d	Unspec'd	0.15mV/μA
5000.0μA			0.15mV/μA
50.000mA			3.3mV/mA
500.00mA			3.3mV/mA
5.0000A 10.000A [1]	Unspec'd	Unspec'd	45mV/A
	20kHz ~ 100kHz		
500.00μA	5.0% + 50d	Unspec'd	0.15mV/μA
5000.0μA			0.15mV/μA
50.000mA			3.3mV/mA
500.00mA			3.3mV/mA
5.0000A 10.000A [1]	Unspec'd	Unspec'd	45mV/A

[1]10A continuous, >10A to 20A for 30 second max with 5 minutes cool down interval
[2]From 5% to 15% of range: Specified accuracy +50d,

~ Hz Line Level Frequency

AC Function RANGE	Sensitivity (Sine RMS)	Range
500mV	100mV	10Hz ~ 200kHz
5V	0.6V	10Hz ~ 100kHz
50V	6V	10Hz ~ 100kHz
500V	50V	10Hz ~ 100kHz
1000V	500V	10Hz ~ 10kHz
VFD 5V	0.5V ~ 2V [1]	10Hz ~ 440Hz
VFD 50V	5V ~ 20V [1]	10Hz ~ 440Hz
VFD 500V	50V ~ 200V [1]	10Hz ~ 440Hz
500μA	50μA	10Hz ~ 10kHz
5000μA	500μA	10Hz ~ 10kHz
50mA	5mA	10Hz ~ 10kHz
500mA	50mA	10Hz ~ 10kHz
5A	1A	10Hz ~ 3kHz
10A	10A	10Hz ~ 3kHz

Accuracy: 0.02%+4d
[1]VFD sensitivity linearly decreases from 10% F.S. @ 200Hz to 40% F.S. @ 440Hz

%Duty Cycle

RANGE	Accuracy
0.1% ~ 99.99%	3d/kHz+2d

Input Frequency: 5Hz -- 500 kHz, 5V Logic Family

T1-T2 Type-K Temperature (Model 869s only)

RANGE	Accuracy
-50.0°C to 1000.0°C	0.3%+1.5°C
-58.0°F to 1832.0°F	0.3%+3.0°F

Type-K thermocouple range & accuracy not included