User-Selectable Sensitivities To Work On Real-World Car Signals!



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Automotive Multimeter

BRIGHT PEOPLES CHOICE

http://www.brymen.com



319	315	FUNCTIONS & FEATURES	
•	•	3-5/6 Digits 6,000 Counts Large Easy-To-Read LCD Display	
•	•	Fast Measurements, 5/Sec; Fully Auto-Ranging	
•	•	24 Segment Analog Bar-graph Updates 40/Sec	
•		Display Backlight	
•	•	Beep-Jack™ Input Warning Guard Against Improper Amps-Terminal Plug In	
•		Auto Power Off	
		Data Hold	
•	•	DCV 0.01mV To 1000V	
	•	ACV 0.01mV To 1000V	
	•	Ohms 0.1Ω To $60M\Omega$	
•	•	DCA 0.001A To 10A (6A continuous, 10A for 30sec per 5 minutes cool down interval)	
		ACA 0.001A To 10A (6A continuous, 10A for 30sec per 5 minutes cool down interval)	
•		DCμA/mA 0.1μA To 600mA	
•		ACμA/mA 0.1μA To 600mA	
		Capacitance 6.000μF Το 2000μF	
•		Type-K Temperature Readings -50°C To 1000°C / -58°F To 1832°F	
•		Line-Level Frequency 10Hz To 50kHz	
	•	Diode Tester	
	•	Continuity Beeper	
		Dwell-Angle Function	
•	•	%-Duty Function	
•	•	ms-Fuel Injection Detector (Injection on-time) Function	
•	•	IG-RPM Function (Primary-Signal via Test Leads)	
	•	IP-RPM Function (Secondary-Signal via Inductive Pickup Clip)	
	Optional	Inductive pickup clip, Accessory for IP-RPM Function	
•	•	Selectable 4-Stroke, 4-Stroke-DIS / 2-Stroke or 2-Stroke-DIS for RPM Functions	
•	•	Selectable 1, 2, 3, 4, 5, 6, 8, 10 or 12 Cylinders for Dwell and IG-RPM Functions	
		4 Selectable Trigger-Levels for IP-RPM, IG-RPM, Dwell, %-Duty and ms Functions	
	•	Selectable Positive (+) or Negative (-) Trigger for %-Duty and ms Functions	
	•	Rugged Fire-Retarded Casing	
•	•	Replaceable Protective-Holster with Probe-Holders & Tilt-Stand	
•	•	Batteries And Fuses Access Door	
•	•	Optional Purchase Magnetic Hanger	
•	•	600V General (Ohm, Capacitance etc.) Input Protection	
•	•	Transient Protection Up To 6kV 1.2/50μs Lightning Surge	
•	•	LVD Meets EN61010-1 2nd Edition CAT II 1kV	
•	•	EMC EN61326-1:2006 (EN55022, EN61000-3-2/-3 & EN61000-4-2/-3/-4/-5/-6/-8/-11)	

Professional Choice Of Size & Functions For Automotive Industry!

Both IP (inductive) & IG (contact) RPM; ms Fuel-injection on-time; % Duty-cycle; Dwell-angle; Line-Level Hz; Temperature; Capacitance; Diode... Full-Functions! Stream-line Ergonomic, Magnetic Hanger, Protective Holster, Probe Holders, Till stand, Batteries & Fuses Access Cover... User-Friendly!

RPM-4, RPM-2, RPM-2M

USER-SELECTABLE READINGS ON 4-STROKE, 4-STROKE-DIS / 2-STROKE, 2-STROKE-DIS ENGINES CYLINDER

SELECTION OF 1 TO 12 CYLINDERS FOR DWELL & IG-RPM READINGS

CAPACITANCE

BM319/ AUTOMOTIVE DMM

±TRIGGER

Temp

A MA

RPM

Temp+ Ω**V-II**-

UA≅

UP TO 2000μF WITH 600V PROTECTION; AUTO-RANGING

LARGE 6000 COUNTS LCD DISPLAY

5/SEC FAST NOMINAL UPDATE RATE

+/-TRIGGER

+/-TRIGGER POLARITY FOR USER-ACCUSTOMED READINGS

DATA HOLD

FREEZES THE DISPLAYING READING FOR LATER VIEW

ANALOG BAR-GRAPH

FAST UPDATE RATE 40/SEC

TRIGGER LEVEL

4 SENSITIVITIES FOR MORE VARIETY OF ENGINE SIGNALS

AUTO & MANUAL-RANGING

AUTO-RANGING WITH MANUAL-RANGING OVERRIDE

TYPE-K TEMPERATURE

SELECTABLE °C & °F READINGS

mV FUNCTIONS

0.01mV X-HIGH RESOLUTION
TO COPE BETTER WITH MOST SENSORS

иA/mA/A FUNCTIONS

CHECKS LEAKAGE CURRENT OR LOOP CURRENT CONSUMPTION

ERGONOMIC STREAMLINE DESIGN

FITS COMFORTABLY IN ONE'S HAND

TRANSIENT PROTECTION

UP TO 6kV 1.2/50μs LIGHTNING SURGE; SUPERB PROTECTION FOR SERIOUS USERS

LVD SAFETY

MEETS EN61010-1 2ND EDITION CAT II 1kV

AUTO-POWER-OFF

TO EXTEND BATTERY LIFE

RUGGED & DURABLE

HIGH-IMPACT FIRE-RETARDED ENCLOSURE FOR REINFORCED SAFETY & DURABILITY

DISPLAY BACKLIGHT

FOR EASY VIEWING IN THE DARK

FUNCTION SELECTION

TOGGLE CONVENIENTLY BETWEEN PRIMARY & SECONDARY FUNCTIONS

IP-RPM READINGS

INDUCTIVE PICKUP RPM TEST ON SPARK-PLUG IGNITION HV WIRES

DWELL-ANGLE & %-DUTY

TESTS CONVENTIONAL ENGINES; USER-SELECTABLE SENSITIVITIES

ms-FUEL INJECTION DETECTOR

TESTS BOTH TBI & PFI ENGINES; USER-SELECTABLE SENSITIVITIES

IG-RPM READINGS

DIRECT RPM TEST ON FUEL-INJECTOR, DWELL OR MCU RPM SIGNALS VIA TEST LEADS

Hz OF LINE LEVEL VOLTAGE

MEASURES NOISY HIGH VOLTAGE ACV FREQUENCIES

HIGH IMPEDANCE VOLTAGE

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

DIODE TEST

FOR CHECKING DIODES AND RECTIFIERS

FAST AUDIBLE CONTINUITY

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

RESISTANCE

BEST RESOLUTION 0.1Ω ; AUTO-RANGING; UP TO $60M\Omega$ WITH 600V PROTECTION:

BEEP-JACK[™] AUDIBLE WARNING

BEEPS AGAINST IMPROPER AMPS-TERMINAL PLUG IN. DECREASES RISKS OF DAMAGE

BATTERIES & FUSES ACCESS DOOR

OF

(JACK)

MA MA

JACK!

FOR EASY BATTERIES & FUSES CHECKING AND REPLACEMENT

PROTECTIVE HOLSTER

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

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BM319 & BM315 GENERAL SPECIFICATION

Display: 3-5/6 digits 6,000 counts Update Rate: 5 per second nominal 24 Segments Bar graph: 40 per second max Operating Temperature: 0°C to 40°C

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

relative humidity at 40°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 @ (0°C ~ 18°C or 28°C ~ 40°C), or

otherwise specified Sensing: Average sensing Pollution Degree: 2

Safety: Double insulation per IEC61010-1 2nd Ed., EN61010-1 2nd Ed., UL61010-1 2nd Ed. & CAN/CSA C22.2 No. 61010.1-0.92 to Category II 1000V AC & DC

Transient Protection: 6kV (1.2/50 µs surge) Terminals (to COM) Measurement Category: V : Category II 1000V AC & DC

A & mAµA: Category II 450V AC & DC 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:

Capacitance function is not specified

Other function ranges:

Total Accuracy = Specified Accuracy + 100 digits

Performance above 3V/m is not specified

Overload Protection:

μA & mA: 0.63A, IR 50kA@500Vac &

1.5kA@450Vdc

A: 6.3A, IR 50kA@500Vac & 1.5kA@450Vdc

V: 1050 Vrms, 1450 Vpeak mV, OHM & others: 600 Vrms Low Battery: Below approx. 2.3V Power Supply: 1.5V AAA Size battery X 2 Power Consumption (typical): 4.3mA APO Consumption (typical): 10μΑ APO Timing: Idle for 34 minutes

Dimension: 161*80*50mm L*W*H (With Holster) Weight: Approx. 340 gm (With Holster)

Accessories: Test lead pair; batteries installed; user's manual; BKP60 banana plug type-K thermocouple

(BM319 only); BP300 Inductive pickup clip (BM319

Optional purchase accessories: Magnetic hanger BMH-01; BKB32 banana plug to type-K socket plug adaptor (BM319 only); BP300 Inductive pickup clip

(BM315 only) Special Features:

Backlighted LCD (BM319 only)

±Trigger: Selectable positive & negative trigger

Cylinder: 9 Selectable number of cylinders (1, 2, 3, 4, 5, 6, 8, 10 & 12) in Dwell and IG-RPM functions Hold: Freezes the display data for later view Range: Manual & Auto-ranging selection RPM (4): For RPM of traditional 4-stroke engines which have 1 ignition on every 4 engine strokes RPM (2): For RPM of DIS & traditional 2-stroke engines which have 1 ignition on every 2 engine strokes

RPM (2)M : For RPM of 2-stroke waste ignition (on-board) engines which have 1 ignition on every

single engine stroke

Electrical Specification

Accuracy is given as +/- (% of reading digits + number of digits) or otherwise specified @ 23°C +/- 5°C and less than 75% R.H.

DC Voltage

RANGE	Accuracy	
60.00mV	0.4%+3d	
600.0mV	0.3%+3d	
6.000V, 60.00V, 600.0V	0.4%+3d	
1000V	0.7%+3d	

Input Impedance: $10M\Omega$, 50 pF nominal

AC Voltage

RANGE	Accuracy	
50Hz ~ 500Hz		
60.00mV, 600.0mV	2.0% + 5d	
6.000V, 60.00V, 600.0V,	2.0 % + 30	
1000V	2.2% + 5d	

Input Impedance: 10MΩ, 50 pF nominal

Ohm

RANGE	Accuracy
600.0Ω	0.5%+6d
6.000KΩ, 60.00 KΩ	0.5%+3d
600.0KΩ	0.8%+4d
6.000 M Ω	1.0%+5d
60.00MΩ	1.5%+5d

Open Circuit Voltage: 0.45VDC typical

Audible Continuity Tester

Audible Threshold: Between 10Ω and 200Ω

Response time: 32ms

Capacitance (BM319 only)

RANGE	Accuracy
6.000μF	2.0%+5d
60.00µF, 600.0µF	3.5%+5d
2000μF	4.0%+5d

Accuracies with film capacitor or better

DC Current

RANGE	Accuracy	Burden Voltage	
600.0μA ¹⁾	0.7%+3d	0.25 mV/uA	
6000μA ¹⁾	0.5%+3d	0.25 mv/uA	
60.00mA 1)	0.7%+3d	2.5 mV/mA	
600.0mA 1)	0.5%+3d	2.5 IIIV/IIIA	
6.000A	0.7%+3d	0.03V/A	
10.00A ²⁾	0.5%+3d	0.037/A	

¹⁾ Ranges for BM319 only

²⁾ 6A continuous, >6A to 10A for 30 sec. max with 5 minutes cool down interval

AC Current

RANGE	Accuracy	Burden Voltage	
50Hz ~ 500Hz	50Hz ~ 500Hz		
600.0μA ¹⁾	2.2%+5d	0.25 mV/uA	
6000μA ¹⁾	2.0%+5d	0.23 IIIV/uA	
60.00mA 1)	2.2%+5d	2.5 mV/mA	
600.0mA 1)	2.0%+5d	2.5 IIIV/IIIA	
6.000A	2.2%+5d	0.03V/A	
10.00A ²⁾	1.2%+5d	0,03V/A	

1) Ranges for BM319 only

Diode Tester

RANGE	Accuracy	
1.000V	1.0% + 3d	

Test Current: 0.50mA typically

Open Circuit Voltage: < 1.6VDC typically

Temperature (BM319 only)

RANGE	Accuracy
-50 °C ~ 1000 °C	0.5% + 3d
-58 °F ~ 1832 °F	0.5% + 6d

K type thermocouple range & accuracy not included

IP-RPM* (Inductive pickup type)

	RANGE	Accuracy
RPM 4	240 -20000 RPM	2 RPM
RPM 2	120 -10000 RPM	2 RPM
RPM 2M	60 -5000 RPM	2 RPM

^{*}Measurements via inductive pickup clip (optional purchase for BM315)

Four selectable trigger levels,

Sensitivity:

Level 1: 3.0V typically Level 2: 4.5V typically Level 3: 6.1V typically

Level 4: 8.1V typically IG-RPM* (Contact signal type)

	RANGE	Accuracy
RPM 4	60 -20000 RPM	2 RPM
RPM 2	30 -10000 RPM	2 RPM
RPM 2M	15 -5000 RPM	2 RPM

^{*}Measurements via test leads on Dwell, Fuel injection-ms and ignition primary signals

Nine selectable Cylinders: 1, 2, 3, 4, 5, 6, 8, 10 & 12

Four selectable trigger levels,

Sensitivity:

Level 1: 0.8V typically

Level 2: 1.85V typically Level 3: 3.75V typically Level 4: 6V typically

DWELL

RANGE	Accuracy
0.0° ~ 360.0° *	1.2° /krpm+1d
0.0%~100.0%	0.04%/krpm/cyl+2d

Specified ranges depend on engine rpm and number of Cylinders (cyl)

*Nine selectable Cylinders: 1, 2, 3, 4, 5, 6, 8, 10 & 12 Four selectable trigger levels, Sensitivity:

Level 1: 0.8V typically Level 2: 1.85V typically Level 3: 3.75V typically Level 4: 6V typically

Fuel injection-ms detector

RANGE *	Accuracy	
PFI / Multi Point Injection		
0.05ms ~ 250.0ms	0.05ms+1d	
0.0%~100.0%	0.04%/krpm +2d	
TBI / Single Point Injection		
0.05ms ~ 250.0ms	0.05ms+1d	
0.0%~100.0%	0.04%/krpm/cyl +2d	

*Specified range depends on engine rpm Selectable trigger slopes

Four selectable trigger levels,

Sensitivity: Level 1: 0.8V typically Level 2: 1.85V typically Level 3: 3.75V typically Level 4: 6V typically

Hz (Line-level) @ ACV & DCV

Function	Sensitivity (Sine RMS)	Range
6V	0.5V	10Hz - 10kHz
60V	5V	10Hz - 50kHz
600V	50V	10Hz - 50kHz
1000V	500V	45Hz - 1kHz

Accuracy: 0.1%+3d





^{2) 6}A continuous, >6A to 10A for 30 sec. max with 5 minutes cool down interval