

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 IEC/UL/EN61010-1 Ed. 3.0, IEC/EN61010-2-030 Ed. 1.0, IEC/EN61010-2-033 Ed. 1.0, IEC/UL/EN61010-031 Ed. 1.1 and CAN/CSA-C22.2 No. 61010-1-12 Ed. 3.0 to Category II 1000V, CAT III 600V and CAT IV 300V AC & DC
Transient Protection: 6kV (1.2/50µs surge)
Terminals (to COM) Measurement Category:

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: 10MΩ, 50 pF nominal

AC Voltage

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

Input Impedance: 10MΩ, 50 pF nominal

Ohm

RANGE	Accuracy
600.0Ω,	0.5%+6d
6.000KΩ, 60.00KΩ	0.5%+3d
600.0KΩ	0.8%+4d
6.000MΩ	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 (BM319s 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	
60.00mA ¹⁾	0.7%+3d	2.5 mV/mA
600.0mA ¹⁾	0.5%+3d	
6.000A	0.7%+3d	0.03V/A
10.00A ²⁾	0.5%+3d	

¹⁾ Ranges for BM319s only

²⁾ 10A continuous, >10A to 20A for 30 sec. max with 5 minutes cool down interval

V / mAµA / A: CAT 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:

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 : 0.4A/1000V DC/AC rms, IR 30kA, F fuse

A : 11A/1000V DC/AC rms, IR 20kA, F fuse

V : 1100V DC/AC rms

mV, Ohm & others : 1000V DC/AC rms

Low Battery: Below approx. 2.3V

Power Supply: 1.5V AAA Size battery X 2

Power Consumption (typical): 4.3mA

APO Consumption (typical): 10µA

APO Timing: Idle for 34 minutes

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

Weight: Approx. 340 gm (With Holster)

Special Features:

Backlight LCD (BM319s only)

AC Current

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

¹⁾ Ranges for BM319s only

²⁾ 10A continuous, >10A to 20A for 30 sec. max with 5 minutes cool down interval

Diode Tester

RANGE	Accuracy
1.000V	1.0% + 3d

Test Current: 0.50mA typically

Open Circuit Voltage: < 1.6VDC typically

Temperature (BM319s 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 ¹⁾ (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

¹⁾Measurements via inductive pickup clip (optional purchase for Model 315s)

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 ¹⁾ (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

¹⁾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

±Trigger: Selectable positive & negative trigger slopes

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

Accessories: Test lead pair; batteries installed; user's manual; BKP60 banana plug type-K thermocouple (BM319s only); BP300 Inductive pickup clip (BM319s only; not certified by UL)

Optional purchase accessories: Magnetic hanger BMH-01; BKB32 banana plug to type-K socket plug adaptor (BM319s only); BP300 Inductive pickup clip (BM315s only; not certified by UL)

Level 2: 1.85V typically

Level 3: 3.75V typically

Level 4: 6V typically

DWELL

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

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

¹⁾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 ¹⁾	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

¹⁾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

BRYMEN TECHNOLOGY CORPORATION

http://www.brymen.com

TEL: +886 2 2226 3396 (rep)

FAX: +886 2 2225 0025

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Specifications subject to change without notice

Patents pending



Printed in Taiwan

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



Selectable 4-stroke, 4-DIS/ 2-stroke, & 2-DIS engine RPM;
Selectable Trig(+)/Trig- on % & ms readings;
Selectable Sensitivity-Levels on RPM, Dwell, % & ms readings,
Bar-graph indication, BeepJack warning, Backlit display,
Display Hold... Full-Features!

New BM310s Series Automotive Multimeter



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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, Tilt stand, Batteries & Fuses Access Cover... User-Friendly!



BM319s



BM315s

319s	315s	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 60MΩ
●	●	DCA 0.001A To 10A (10A continuous, 20A for 30sec per 5 minutes cool down interval)
●	●	ACA 0.001A To 10A (10A continuous, 20A for 30sec per 5 minutes cool down interval)
●	●	DCμA/mA 0.1μA To 600mA
●	●	ACμA/mA 0.1μA To 600mA
●	●	Capacitance 6.000μF To 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
●	●	1000V General (Ohm, Capacitance ... etc.) Input Protection
●	●	Transient Protection Up To 6kV 1.2/50μs Lightning Surge
●	●	LVD Meets EN61010-1/61010-2-030/61010-2-033 CAT II 1kV
●	●	EMC Meets EN61326-1

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
UP TO 2000μF WITH 1000V 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

μA/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 3RD EDITION CAT II 1kV

AUTO-POWER-OFF
TO EXTEND BATTERY LIFE

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

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

BATTERIES & FUSES ACCESS DOOR
FOR EASY BATTERIES & FUSES CHECKING AND REPLACEMENT

RESISTANCE
BEST RESOLUTION 0.1Ω; AUTO-RANGING; UP TO 60MΩ WITH 1000V PROTECTION

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

DIODE TEST
FOR CHECKING DIODES AND RECTIFIERS

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

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

ms-FUEL INJECTION DETECTOR
TESTS BOTH TBI & PFI ENGINES; USER-SELECTABLE SENSITIVITIES

DWELL-ANGLE & %-DUTY
TESTS CONVENTIONAL ENGINES; USER-SELECTABLE SENSITIVITIES

IP-RPM READINGS
INDUCTIVE PICKUP RPM TEST ON SPARK-PLUG IGNITION HV WIRES

FUNCTION SELECTION
TOGGLE CONVENIENTLY BETWEEN PRIMARY & SECONDARY FUNCTIONS

DISPLAY BACKLIGHT
FOR EASY VIEWING IN THE DARK