

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 (1.2/50µs 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): 10µA
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 only)

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 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

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 (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 | |
| 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 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 | | |
| 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 BM319 only

²⁾ 6A continuous, >6A to 10A 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 (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

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