

BM186 & BM189 GENERAL SPECIFICATIONS

Display: 3-5/6 digits 6000 counts & 3-1/2 digits 1,999 counts for Hz

Polarity: Automatic

Update Rate: 5 per second nominal

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

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 -- 40°C), or otherwise specified

Sensing: Average sensing for BM186; True RMS for BM189

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 CAT III 600V and CAT IV

300V AC & DC

Transient Protection: 6.0kV (1.2/50µs surge)

Overload Protections:

ACA Clamp-on jaws: AC 600A rms continuous

" + " & COM Terminals (all other functions):

660VDC/VAC rms

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 + 150 digits

Performance above 3V/m is not specified

Power Supply: 1.5V AAA Size (NEDA 24A or IEC LR03) battery x 2

Power Consumption: Typical 13mA for Current functions, and 5.2mA for others

Low Battery: Below approx. 2.4V

APO Timing: Idle for 34 minutes

APO Consumption: 10µA typical

Dimension: L190mm X W63mm X H32mm

Weight: 227 gm

Jaw opening & Conductor diameter : 30mm max

Accessories: Test leads (pair), user's manual, Bkp60 banana plug K-type thermocouple x 1 (BM189 only)

Optional purchase accessories: USB interface kit BRUA-13X; BKB32 banana plug to type-K socket plug adaptor (BM189 only)

Special Features: AutoCheck™ V&Ω; VFD-V & VFD-Hz; Backlighted LCD (BM189 only); 5ms CREST-MAX Capture mode (Peak Hold); Auto-ranging Relative-Zero mode; Display Hold; EF-Detection (NCV); Interface capabilities with PC computers

Electrical Specifications

Accuracy is ±(% reading digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 75% relative humidity.

True RMS model 189 voltage accuracies are specified from 5% to 100% of range or otherwise specified. Maximum Crest Factor < 1.65 : 1 at full scale & < 3.3 : 1 at half scale, and with frequency components within the specified frequency bandwidth for non-sinusoidal waveforms.

DC Voltage

RANGE	Accuracy
6.000V, 60.00V, 600.0V & 600V ¹⁾	0.5%+5d

¹⁾Added range to indicate instantaneous over-range voltage values

Input Impedance: 10MΩ, 50 pF nominal

AutoCheck™ DCV

RANGE	Accuracy
6.000V, 60.00V, 600.0V & 600V ¹⁾	1.3% + 5d

¹⁾Added range to indicate instantaneous over-range voltage values

AutoCheck™ Lo-Z DCV Threshold:

> +1.5VDC & < -1.5VDC nominal

AutoCheck™ Lo-Z DCV Input Impedance:

Initially approx. 2.5kΩ, 650pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances vs display voltages typically are:

15kΩ	@100V
100kΩ	@300V
250kΩ	@600V

AC Voltage

RANGE	Accuracy
50Hz ~ 400Hz	
6.000V, 60.00V, 600.0V & 600V ¹⁾	1.2% + 5d

¹⁾Added range to indicate instantaneous over-range voltage values

Input Impedance: 10MΩ, 50 pF nominal

AC+DC Voltage (BM189 Only)

RANGE	Accuracy
DC, 50Hz ~ 400Hz	
6.000V, 60.00V, 600.0V & 600V ¹⁾	1.4% + 7d

¹⁾Added range to indicate instantaneous over-range voltage values

Input Impedance: 10MΩ, 50 pF nominal

AutoCheck™ ACV (with Low Pass Filter)

RANGE	Accuracy ¹⁾
5Hz ~ 20Hz	
6.000V, 60.00V, 600.0V & 600V ²⁾	3.5%+80d
20Hz ~ 200Hz	
6.000V, 60.00V, 600.0V & 600V ²⁾	2.0%+60d
200Hz ~ 400Hz ³⁾	
6.000V, 60.00V, 600.0V & 600V ²⁾	7%+80d

¹⁾Not specified for fundamental frequency > 400Hz

²⁾Added range to indicate instantaneous over-range voltage values

³⁾Accuracy linearly decreases from 2% + 50d @

200Hz to 7% + 80d @ 400Hz

AutoCheck™ Lo-Z ACV Threshold:

> 1.5V(50/60Hz) nominal

AutoCheck™ Lo-Z ACV Input Impedance:

Initially approx. 2.5kΩ, 650pF nominal; Impedance increases abruptly within a fraction of a second as display voltage is above 50V (typical). Ended up impedances vs display voltages typically are:

15kΩ	@100V
------	-------

100kΩ	@300V
250kΩ	@600V

CREST-MAX Capture Mode

Accuracy: Specified accuracy plus 250 digits for changes > 5ms in duration

AutoCheck™ Ohm

RANGE ¹⁾	Accuracy
600.0Ω, 6.000KΩ, 60.00KΩ	0.5%+5d
600.0KΩ	0.8%+5d
6.000MΩ	1.2%+5d
40.00MΩ	2.3%+5d

Open Circuit Voltage: 0.45VDC typical

¹⁾AutoCheck™ Ohm Threshold:

< 10.00MΩ nominal

Audible Continuity Tester

Audible Threshold: Between 10Ω and 200Ω

Response time: 32ms approx.

Capacitance

RANGE	Accuracy ¹⁾
60.00nF, 600.0nF, 6.000µF	2.0%+5d
60.00µF, 600.0µF	3.5%+5d ²⁾
2000µF	4.0%+5d ²⁾

¹⁾Accuracies with film capacitor or better

²⁾Temperature Coefficient: 0.25 x (specified accuracy) / °C @ (0°C -- 18°C or 28°C -- 40°C)

Diode Tester

RANGE	Accuracy
1.000V	1.0% + 3d

Test Current: 0.56mA typically

Open Circuit Voltage: < 1.8VDC typically

DCA Current (Clamp on)

RANGE	Accuracy ¹⁾²⁾
60.00A ³⁾	1.5%+8d
600.0A	1.5%+5d

¹⁾Induced error from adjacent current-carrying conductor: < 0.01A/A

²⁾Specified with Relative Zero mode applied to offset the non-zero residual readings, if any

³⁾Below 16% of range, add 10d to the specified accuracy

ACA Current (Clamp on)

RANGE	Accuracy ¹⁾
50Hz ~ 60Hz	
60.00A ²⁾ , 600.0A	1.5%+6d
40Hz ~ 400Hz	
60.00A ²⁾ , 600.0A	2%+6d

True RMS Crest Factor (Model 189 only):

< 1.7 : 1 at full scale & < 3.4 : 1 at half scale

¹⁾Induced error from adjacent current-carrying conductor: < 0.01A/A

²⁾Below 16% of range, add 10d to the specified accuracy

DC+ACA Current (Clamp on) (BM189 Only)

RANGE	Accuracy ¹⁾²⁾
DC, 40Hz ~ 400Hz	
60.00A ³⁾ , 600.0A	2.2%+10d

True RMS Crest Factor:

< 1.7 : 1 at full scale & < 3.4 : 1 at half scale

¹⁾Induced error from adjacent current-carrying conductor: < 0.01A/A

²⁾Specified with Relative Zero mode applied to offset the non-zero residual readings, if any

³⁾Below 16% of range, add 10d to the specified accuracy

Temperature (BM189 only)

RANGE	Accuracy
-50 °C ~ 1000 °C	0.3% + 4d
-58 °F ~ 1832 °F	0.3% + 6d

K-type thermocouple range & accuracy not included

Hz Line Level Frequency

Function	Sensitivity (Sine RMS)	Range
6V	1V	10Hz ~ 1999Hz
60V	10V	10Hz ~ 1999Hz
600V	60V	10Hz ~ 1999Hz
60A	6A	20Hz ~ 400Hz
600A	60A	20Hz ~ 400Hz
VFD 6V ¹⁾	1V~2V	10Hz ~ 400Hz
VFD 60V ¹⁾	6~20V	10Hz ~ 400Hz
VFD 600V ¹⁾	60V~200V	10Hz ~ 400Hz

Accuracy: 0.1%+4d

¹⁾VFD sensitivity linearly decreases from 10% F.S. @ 200Hz to 40% F.S. @ 400Hz

Non-Contact EF-Detection

Typical Voltage	Bar-Graph Indication
20V (tolerance: 10V ~ 36V)	-
55V (tolerance: 23V ~ 85V)	---
110V (tolerance: 59V ~ 600V)	-----

Indication: Bar-graph segments & audible beep tones proportional to the field strength

Detection Frequency: 50/60Hz

Detection Antenna: Top side of the stationary jaw

Probe-Contact EF-Detection: For more precise

indication of live wires, such as distinguishing

between live and ground connections, use the Red (+) test probe for direct contact measurement

BRYMEN TECHNOLOGY CORPORATION

http://www.brymen.com

TEL: +886 2 2226 3396 (rep)

FAX: +886 2 2225 0025

Copyright © MMXI B.T.C. All rights reserved

Specifications subject to change without notice

Patents pending. Printed in Taiwan

