

## BM151, BM152 & BM155 GENERAL SPECIFICATION

**Display:**  
 Voltage functions: 6000 counts  
 Power, Ohm & Hz functions: 9999 counts  
 ACA clamp-on function: 4000 counts  
**Update Rate:**  
 Voltage, ACA clamp-on, Ohm, Hz & Temperature functions:  
 4 per second nominal  
 Power function: 1 per second nominal  
**Polarity:** Automatic  
**Operating Temperature:** 0°C ~ 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:** True RMS sensing for all models

**Pollution Degree:** 2  
**Safety:** Meets IEC61010-2-032 (1994), EN61010-2-032 (1996), UL3111-2-032 (1999)  
**Measurement Category:** CAT III 600V ac & dc  
**Transient Protection:**  
 6.5kV (1.2/50µs surge) for all models  
**E.M.C.:**  
 Meets EN61326 (1997, 1998/A1), EN61000-4-2 (1995), & EN61000-4-3 (1996)  
 In an RF Field of 3V/m:  
 Total accuracy = Specified accuracy + 45 digits  
 Performance above 3V/m is not specified  
**Overload Protection:**  
 ACA Clamp-on jaws: AC 1000A rms continuous + & COM terminals (all functions): 600VDC/VAC rms  
**Jaws Opening & Conductor Diameter:**  
 45mm max  
**Power Supply:** standard 1.5V AAA Size (NEDA 24A or IEC LR03) battery x 2  
**Low Battery:** Below approx. 2.4V

**APO Timing:** Idle for 17 minutes  
**APO Consumption:** 10µA typical  
**Power Consumption (typical):**  
 Voltage, ACA, Hz & Power functions: 10mA typical  
 Ohm & Temperature functions: 4mA typical  
**Dimension:** L224mm x W78mm x H40mm  
**Weight:** approx. 224 gm  
**Special Features:** Backlight display (BM152 & BM155 only); AutoVA™ (Auto Selection on ACA, ACV or DCV functions); Power measurement of selectable W, VAR & VA with dual-display Total Power Factor features; Total harmonic distortion THD%-F (BM155 only); PEAK-rms HOLD  
**Accessories:** Test leads (pair), batteries installed, user's manual, soft carrying pouch, & BKP60 banana plug type-K thermocouple (BM152 & BM155 only)  
**Optional Accessories:** BR15X PC interface kit (including BA-1XX optical adaptor back, BC-100R cable + Bs15x RS232 software CD), BKB32 banana plug to type-K socket plug adaptor (BM152 & BM155 only)

## BM151, BM152 & BM155 ELECTRICAL SPECIFICATION

Accuracy is ± (% of reading digits + number of digits) or otherwise specified, at 23°C ± 5°C and less than 75% R.H.  
 True RMS (all models) ACV & ACA clamp-on accuracies are specified from 0% to 100% of range or otherwise specified. Maximum Crest Factors are as specified below, and with frequency spectrums, besides fundamentals, fall within the meter specified AC bandwidth for non-sinusoidal waveforms. Fundamentals are specified at 50Hz or 60Hz.

### AC Voltage

RANGE	Accuracy
50Hz / 60Hz	
600.0V	0.5%+5d
45Hz ~ 500Hz	
600.0V	1.5%+5d
500Hz ~ 3.1kHz	
600.0V	2.5%+5d

CMRR: > 80dB @ DC to 60Hz, R<sub>s</sub>=1kΩ  
 Input Impedance: 2MΩ, 30pF nominal  
 Crest Factor: < 2.3 : 1 at full scale & < 4.6 : 1 at half scale  
 ACV AutoVA™ Threshold: 30 VAC (40Hz ~ 500Hz only) nominal

### DC Voltage

RANGE	Accuracy
600.0V	0.5%+5d

NMRR: > 50dB @ 50Hz/60Hz;  
 CMRR: > 120dB @ DC, 50Hz/60Hz; R<sub>s</sub>=1kΩ  
 Input Impedance: 2MΩ, 30pF nominal  
 DCV AutoVA™ Threshold: 2.4 VDC nominal

### ACA Current (Clamp-On)

RANGE	Accuracy <sup>1) 2)</sup>
50Hz / 60Hz	
40.00A, 400.0A, 1000A	1.0%+5d
45Hz ~ 500Hz	
40.00A, 400.0A	2.0%+5d
1000A	2.5%+5d
500Hz ~ 3.1kHz	
40.00A, 400.0A	2.5%+5d
1000A	3.0%+5d

ACA AutoVA™ Threshold: 1A AC (40Hz ~ 500Hz only) nominal  
 Crest Factor:

< 2.5 : 1 at full scale & < 5.0 : 1 at half scale for 40.00A & 400.0A ranges  
 < 1.4 : 1 at full scale & < 2.8 : 1 at half scale for 1000A range

<sup>1)</sup>Induced error from adjacent current-carrying conductor: < 0.06A/A

<sup>2)</sup>Specified accuracy is from 1% to 100% of range and for measurements made at the jaw center. When the conductor is not positioned at the jaw center, position errors introduced are:

- Add 1% to specified accuracy for measurements made WITHIN jaws marking lines (away from jaws opening)
- Add 4% to specified accuracy for measurements made BEYOND jaws marking lines (toward jaws opening)

### PEAK-rms HOLD (ACA & ACV only)

Response: 65ms to 90%

### Ohms

RANGE	Accuracy
999.9Ω	1.0%+6d

Open Circuit Voltage: 0.4VDC typical

### Audible Continuity Tester

Audible Threshold: between 10Ω and 300Ω  
 Response time: 250µs

### Temperature (BM152 & BM155 only)

RANGE	Accuracy
-50°C ~ 300°C	2.0%+3°C
-58°F ~ 572°F	2.0%+6°F

Type-K thermocouple range & accuracy not included  
 Add 3°C (6°F) to specified accuracy @ -20°C ~ -50°C (or @ -4°F ~ -58°F)

### FREQUENCY

RANGE	Accuracy
5.00Hz ~ 500.0Hz	0.5%+4d

Sensitivity (Sine RMS):  
 40A range: > 4A  
 400A range: > 40A  
 1000A range: > 400A  
 600V range: > 30V

### Power

RANGE	Accuracy <sup>1) 2)</sup>		
	F ~ 10th	11th ~ 46th	47th ~ 51st
0 ~ 600.0kVA			
@ PF = 0.99 ~ 0.1	2.0%+6d	3.5%+6d	5.5%+6d

RANGE	Accuracy <sup>1) 2)</sup>			
	F ~ 10th	11th ~ 25th	26th ~ 46th	47th ~ 51st
0 ~ 600.0kW / kVAR				
@ PF = 0.99 ~ 0.70	2.0%+6d	3.5%+6d	4.5%+6d	10%+6d
@ PF = 0.70 ~ 0.50	3.0%+6d			
@ PF = 0.50 ~ 0.30	4.5%+6d			15%+6d
@ PF = 0.30 ~ 0.20	10%+6d			

<sup>1)</sup>Specified accuracy is for the ACA clamp measurement at the center of jaws. When the conductor is not positioned at the jaw center, position errors introduced are:

Add 1% to specified accuracy for ACA measurements made WITHIN jaws marking lines (away from jaws opening)

Accuracy is not specified for ACA measurements made BEYOND jaws marking lines (toward jaws opening)

<sup>2)</sup>Add 1% to specified accuracy @ ACA Fundamental < 5A or ACV Fundamental < 90V; Accuracy is not specified @ ACA Fundamental < 1A or ACV Fundamental < 30V

<sup>3)</sup>Add 1% to specified accuracy @ ACA Fundamental < 5A or ACV Fundamental < 90V; Accuracy is not specified @ ACA Fundamental < 2A or ACV Fundamental < 50V

### THD%-F <sup>1)</sup> (BM155 only)

RANGE	Harmonic order	Accuracy <sup>2)</sup>
0.0%~99.9% <sup>3)</sup>	Fundamental	1.5% of Reading + 6d
	2nd ~ 3rd	5.0% of Reading + 6d
	4th ~ 16th	2.5% of Reading + 6d
	17th ~ 46th	3.0% of Reading + 6d
	47th ~ 51st	4.5% of Reading + 6d

<sup>1)</sup>THD%-F is defined as: (Total Harmonic RMS / Fundamental RMS) x 100%

<sup>2)</sup>Range for Dual Display mode: 0% ~ 99%

<sup>3)</sup>Specified accuracy @ ACA Fundamental > 5A; ACV Fundamental > 50V

### Total Power Factor (PF)

RANGE	Accuracy <sup>1)</sup>	
0.10 ~ 0.99	F ~ 21st	22nd ~ 51st
	3d	5d

<sup>1)</sup>Specified accuracy @ ACA Fundamental > 2A; ACV Fundamental > 50V

### A-lags <sup>1)</sup> indication:

"A-lags" LCD annunciator turns on to indicate an inductive circuit, or Current A lags Voltage V (i.e., phase-shift angle θ is > 0°).

<sup>1)</sup>A-lags indication is specified at 50/60Hz fundamental without harmonics, and at ACV > 90V, ACA > 9A, & PF < 0.95

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