

# A Handy Yet Most Complete Slim-Jaws PowerClamp™!

Full Power Functions Plus kWhr Recording  
& 3~Unbalanced-Load Power For Advanced Applications!



CE

**BM350 Series**  
**Compact PowerClamp™**

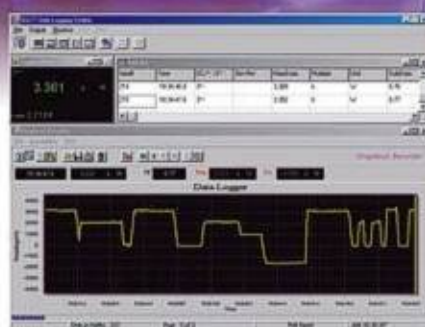
**BRYMEN**  
BRIGHT PEOPLE'S CHOICE  
<http://www.brymen.com>



**BM357**



**BM351**



**BRUA-13X PC Interface Kit  
(Optional Purchase)**

357	351	FUNCTIONS & FEATURES
●	●	Ultra-slim jaws to access tight places; 26mm conductor size
●	●	600A AC Clamp-on + Multimeter ranges
●	●	600VAC/DC input protection on all functions
●	●	AC True RMS voltage and current functions
●	●	Balanced-Load 3-phase /1-phase Power W, VA & VAR measurements
●	●	+ Dual display Power Factor (PF) & A-Lags-V Phase-Shift indication
●		Unbalanced-Load 3-phase 3-wire/4-wire Power W (with memory recall)
●		kWhr Kilo-Watt-Hour Recording function (with memory recall)
●		Back lighted LCD display
●	●	Automatic selection of DCV, ACV & ACA measurements (Auto V.A)
●	●	Fast PEAK-rms Hold (65ms to 90%) for In-rush ACA & ACV readings
●	●	PC-Comm (Optical isolated PC interface capability)
●	●	Software kit for Win 95/98/ME/2000/XP/VISTA (Optional purchase)
●	●	Data HOLD
●	●	Measure line-level ACV Frequency via test leads
●	●	Measure non-invasive ACA Frequency via clamp jaws
●	●	DCV & ACV 0.1V to 600.0V
●	●	ACA 0.01A to 600A non-invasive current measurements
●	●	Ohm 0.1Ω to 999.9Ω
●	●	Fast Audible Continuity
●	●	Battery cover with Probe holders
●	●	Rugged Fire-retarded casing; Soft carrying pouch
●	●	Transient protection 6kV 1.2/50μs lightning surge
●	●	LVD EN61010-1 & EN61010-2-032 CAT III 600V
●	●	EMC EN61326-1:2006 (EN55011, EN61000-3-2/-3 & EN61000-4-2/-3/-4/-5/-6/-8/-11)

# Small Power Jaws For Better Portability & Access To Tighter Places!

Superior Technology That Saves Costs, Size And Weight!

**SMALL & ULTRA-SLIM CLAMP JAWS**  
FOR EASY ACCESS TO TIGHT PLACES  
WITH AC 600A CAPABILITY

**RUGGED & DURABLE**

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

**LVD CAT III 600V SAFETY**

MEETS EN61010-1 & EN61010-2-032  
2ND EDITION CAT III 600V

**PC-COMM INTERFACE CAPABILITIES**

BUILT-IN OPTICAL ISOLATED DATA  
OUTPUT PORT. OPTIONAL PURCHASE  
INTERFACE KIT FOR PC CONNECTION

**TRUE RMS MEASUREMENTS**

FOR NON-SINUSOIDAL WAVEFORMS  
OF AC VOLTAGES & AC CURRENTS

**0.5% DCV & ACV BASIC ACCURACY**

UP TO 600 VOLTS, 0.1V RESOLUTION

**DISPLAY BACKLIGHT**

FOR EASY VIEWING IN THE DARK

**AutoVA™ FEATURE**

SOPHISTICATED MCU CONTROLLED  
AUTO-SELECTION OF ACA, ACV OR DCV  
SHORTENS THE TIME TO MEASURE  
AND INCREASES THE EASE OF USE

**FULL POWER PARAMETERS**

DUAL DISPLAY MEASUREMENTS OF  
"W + PF", "VA + PF", OR "VAR + PF" ON  
3~ BALANCED-LOAD & 1~ POWER

**TOTAL POWER FACTOR**

$PF = W / VA$  IS USED FOR NOWADAYS  
POWER-SYSTEMS WITH HARMONICS

**3~ UNBALANCED-LOAD POWER W**

MEASURES UNBALANCED-LOAD POWER  
THRU DISCRETE MEASUREMENTS BY ONLY  
ONE SINGLE PAIR OF JAWS FOR LOWER COST  
OF OWNERSHIP & BETTER PORTABILITY

**LIGHT WEIGHT & STYLISH**  
ALSO COMES WITH A SOFT POUCH  
FOR EASY CARRYING & PROTECTION

**65ms PEAK-RMS HOLD**  
CAPTURES IN-RUSH RMS VALUES  
OF ACA OR ACV AS SHORT AS  
65ms IN DURATION

**DATA HOLD**  
FREEZES THE DISPLAYING  
READING FOR LATER VIEW

**PROBE HOLDERS**  
BUILT-IN PROBE STORAGE HOLDERS

**BATTERY COMPARTMENT**  
WITH ACCESS DOOR FOR  
EASY BATTERY REPLACEMENT

**kWhr RECORDING**  
RECORDS BOTH 3~ BALANCED-LOAD  
& 1~ KILO-WATT-HOUR READINGS  
WITH LAST MEMORY RECALL

**A-lags-V INDICATION**  
UNAMBIGUOUS INDICATIONS OF CURRENT  
LAGS VOLTAGE IN INDUCTIVE CIRCUITS

**HIGH CURRENT ACA Hz**  
MEASURES NON-INVASIVE  
ACA FREQUENCY VIA CLAMP JAWS

**HIGH VOLTAGE ACV Hz**  
MEASURES NOISY HIGH VOLTAGE  
ACV FREQUENCY VIA TEST LEADS

**250µs FAST AUDIBLE CONTINUITY**  
FOR QUICK OPEN-SHORT TESTS  
ON SWITCHES, FUSES, AND WIRES

**EMC**  
MEETS EN61326-1:2006  
(EN55011, EN61000-3-2/3 &  
EN61010-4-2/3/4/5/6/11)

**TRANSIENT PROTECTION**  
UP TO 6kV 1.2/50µs LIGHTNING SURGE;  
MORE CONFIDENCE FOR SERIOUS USERS

**RESISTANCE**  
UP TO 999.9 OHMS, 0.1 OHM  
RESOLUTION WITH 600V PROTECTION



## BM351 & BM357 GENERAL SPECIFICATION

### Display :

Voltage functions: 6000 counts LCD display  
Power, Ohm & Hz functions: 9999 counts LCD display  
ACA clamp-on function: 4000 counts LCD display

### Update Rate :

Power function: 2 per second nominal  
Voltage, ACA clamp-on & Ohm functions: 2 per second nominal

Hz function: 1 per second nominal

**Polarity :** Automatic

**Low Battery :** Below approx. 2.4V

**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 to 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

**Safety :** Meets IEC61010-1 2nd Ed., EN61010-1 2nd Ed., UL61010-1 2nd Ed., IEC61010-2-032, EN61010-2-032, UL61010B-2-032

Measurement Category : III 600 Volts ac & dc

**Transient protection :** 6.5kV (1.2/50µs surge)

**Pollution degree :** 2

**E.M.C. :** Meets 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:

Total Accuracy = Specified Accuracy + 50 digits

Performance above 3V/m is not specified

**Overload Protections :**

ACA Clamp-on jaws : AC 600A rms continuous

+ & COM terminals (all functions) : 600VDC/VAC rms

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

**Power Consumption :**

Voltage, ACA, Hz & Power functions: 11mA typical  
Ohm function: 5.5mA typical

**APO Timing :** Idle for 30 minutes

**APO Consumption :** 4µA typical

**Dimension :** L189 X W78 X H40 mm

**Weight :** 192 gm approx

**Jaw opening & Conductor diameter :** 26 mm max

**Special features :** Backlighted display (BM357 only); AutoVA™ (Auto Selection on ACV, DCV or ACA functions); selectable Power parameters of W, VAR & VA with Total Power Factor in dual-display; kWhr Recording (BM357 only); Display Hold; PEAK-rms HOLD; PC-Comm computer interface capabilities

**Accessories :** Test leads (pair), batteries installed, user's manual & soft carrying pouch

**Optional accessories :** BRUA13X PC interface kit (including BUA-2303 USB-to-Serial adaptor, BA-1XX optical adapter back, BC-100R cable & Bs software CD)

## ELECTRICAL SPECIFICATION

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

True RMS ACV & ACA clamp-on accuracies are specified from 0% to 100% of range or otherwise specified. Maximum Crest Factor 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 and 60Hz.

### DC Voltage

RANGE	Accuracy
600.0V	0.5% + 5d

NMRR : >50dB @ 50/60Hz

CMRR : >120dB @ DC, 50/60Hz, Rs=1kΩ

Input Impedance: 2MΩ, 30pF nominal

DCV AutoVA™ Threshold: 2.4VDC nominal

### 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: >60dB @ DC to 60Hz, Rs=1kΩ

Input Impedance: 2MΩ, 30pF nominal

Crest Factor: < 2 : 1 at full scale & < 4 : 1 at half scale

ACV AutoVA™ Threshold: 30VAC (40Hz ~ 500Hz only) nominal

### ACA Current (Clamp-on)

RANGE	Accuracy <sup>1)2)</sup>
50Hz / 60Hz	
40.00A, 400.0A, 600A	1.0% + 5d
45Hz ~ 500Hz	
40.00A, 400.0A	2.0% + 5d
600A	2.5% + 5d
500Hz ~ 3.1kHz	
40.00A, 400.0A	2.5% + 5d
600A	3.0% + 5d

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

Crest Factor:

< 3 : 1 at full scale & < 6 : 1 at half scale

<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 jaw marking lines (away from jaw opening)

Add 4% to specified accuracy for measurements made BEYOND jaw marking lines (toward jaws opening)

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

Response: 65ms to >90%

### Frequency

RANGE	Accuracy
5Hz ~ 500Hz	0.5% + 4d

Sensitivity (Sine RMS)

40A range: > 4A

400A range: > 40A

600A range: > 400A

600V range: > 30V

### 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

### Single-Phase & 3-Phase Balanced-Load Power

RANGE	Accuracy <sup>1)2)3)</sup>		
	F ~ 10th	11th ~ 45th	46th ~ 51st
0 ~ 360.0kVA @ PF = 0.99 ~ 0.1	2.0%+6d	3.5%+6d	5.5%+6d
RANGE	Accuracy <sup>1)2)4)</sup>		
	F ~ 10th	11th ~ 25th	26th ~ 45th
0 ~ 360.0kW / kVAR @ PF = 0.98 ~ 0.70	2.0%+6d	3.5%+6d	4.5%+6d
@ PF = 0.70 ~ 0.50	3.0%+6d		
@ PF = 0.50 ~ 0.30	4.5%+6d		10%+6d
@ PF = 0.30 ~ 0.20	10%+6d		

<sup>1)</sup>Specified accuracy is for 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 jaw marking lines (away from jaw opening)

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

<sup>2)</sup>Add 4d to specified accuracy for 3-Phase Balanced-Load Power measurements.

<sup>3)</sup>Add 1% to specified accuracy @ ACA fundamental < 6A or ACV fundamental < 90V. Accuracy is not specified @ ACA fundamental < 1A or ACV fundamental < 30V

<sup>4)</sup>Add 1% to specified accuracy @ ACA fundamental < 6A or ACV fundamental < 90V. Accuracy is not specified @ ACA fundamental < 2A or ACV fundamental < 50V

### Total Power Factor (PF)

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

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

### A-lags-V Indication:

LCD annunciator (A-lags-V) turns on to indicate an inductive circuit, or Current A lags Voltage V (i.e., phase-shift angle  $\theta$  is  $\neq 0$ ).

A-lags-V Indication is specified at 50/60Hz fundamental without the presence of harmonics, and at ACV > 90V, ACA > 9A and PF < 0.95

### kWhr (kilo-Watt-Hour Energy) (BM357 only)

Time base accuracy: < 30ppm

Non-volatile memory: Separately stores one 3-Phase-Balanced-Load and one Single-Phase result

### 3-Phase Unbalanced-Load Power (BM357 only)

This 3-Phase Unbalanced-Load Power measurement is achieved thru the calculation of discrete single-phase measurements that are taken one at a time manually. Since it is not real-time on all 3 phases simultaneously, it is intended only for stable power conditions without significant power fluctuations over the time of measurements. Result accuracy is hence the accumulated accuracy of the discrete single-phase measurements plus the associated fluctuations.

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