

# For 55mm Large Conductor Size And Ultimate Safety For 2000A Areas!

VFD V/Hz, Ghost-Voltage-Buster,  
True-rms & PC-Comm Interface  
for Advanced Users!



CE

**BM190 SERIES**  
CAT IV 1kV Clamp-on DMMs

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





**BM197**

**BM195**



**BRUA-19X PC Interface Kit  
(Optional Purchase)**

197	195	FUNCTIONS & FEATURES
●	●	VFD-V & Hz for fundamental V/Hz of most Variable-Frequency-Drives
●	●	Fully auto-ranging for ease of use; Fast measurement updates 5/sec
●	●	Large ACA/DCA Hall-effect jaws up to 55mm conductor size
●	●	3-5/6 digits, 6,000 counts + 1,999 counts dual display
●	●	2000A DC & AC Clamp-on + Multimeter ranges
●	●	1000VAC/DC input protection on all functions
●	●	Ultimate safety up to CAT IV 1000VAC/DC
●	●	Dual Display ACA+Hz and ACV+Hz
●	●	High 0.5% DCV accuracy
●	●	Soft carrying pouch
●	●	Auto Power Off
●	●	Data HOLD
●	●	Relative Zero mode
●	●	Non-Contact EF-Detection (NCV)
●	●	Fast 5ms Crest-MAX mode to capture in-rush currents
●	●	Probe-Contact EF-Detection for more precise indication of live
●	●	AutoCheck™ feature (Automatic DCV, ACV & Ohms selection)
●	●	Lo-Z volts to drain ghost voltages (AutoCheck™ feature)
●	●	AC, AC+DC True RMS voltage and current functions
●	●	Back-lighted easy-to-read LCD display
●	●	Type-K temperature -50°C to 1000 °C or -58°F to 1832°F selectable
●	●	DCV 4 ranges 6.000V to 1000V
●	●	ACV 4 ranges 6.000V to 1000V
●	●	DCA 2 ranges 200.0A to 2000A
●	●	ACA 2 ranges 200.0A to 2000A
●	●	Ohm 6 ranges 600.0Ω to 40.00MΩ
●	●	Diode test; Fast audible Continuity
●	●	Line-level ACV Frequency 10Hz to 1999Hz
●	●	Non-invasive ACA Frequency via clamp jaws 20Hz to 400Hz
●	●	Cx 6 ranges 60.00nF to 2000μF for start & run motor capacitors
●	●	Optional purchase USB cable set & software for Win98/2k/xp/Vista/Win7
●	●	Rugged fire retarded casing with battery access door
●	●	Transient protection 12kV 1.2/50μs lightning surge
●	●	LVD EN61010-2-032 & EN61010-1 CAT IV 1000V
●	●	EMC EN61326-1:2006 (EN55022, EN61000-3-2/-3 & EN61000-4-2/-3/-4/-5/-6/-8/-11)



# CAT IV 1kV! 2000A DC+AC TRMS! Dual-Display VFD Convenience!

## Start & Run Motor Cx, In-rush Crest, EF-Detection, 'C/'F and Auto-Check™ Features!



**LARGE HALL-EFFECT CLAMP JAWS**  
FOR LARGE CONDUCTORS UP TO 55mm  
WITH DC & AC 2000A CAPABILITY

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

**RUGGED & DURABLE**  
HIGH-IMPACT FIRE-RETARDED  
ENCLOSURE WITH BATTERY  
COMPARTMENT & ACCESS DOOR

**LVD CAT IV 1000V SAFETY**  
MEETS EN61010-2-032, EN61010-1  
& UL STANDARDS ON CAT IV 1000V

**DIODE TEST**  
FOR TESTING DIODES & RECTIFIERS

**RESISTANCE**  
6 AUTO-RANGES UP TO 40MΩ

**CAPACITANCE**  
6 AUTO-RANGES UP TO 2000μF  
TO MEASURE MOTOR CAPACITORS

**AC+DC TRUE RMS MEASUREMENTS  
(BM197 ONLY)**  
FOR NON-SINUSOIDAL & COMPLEX  
WAVEFORMS OF VOLTAGES & CURRENTS

**TYPE-K TEMPERATURE  
(BM197 ONLY)**  
SELECTABLE °C AND °F READINGS;  
COMES WITH BKP60 BEAD PROBE

**ERGONOMIC & STREAMLINE BODY**  
ALSO COMES WITH A SOFT POUCH  
FOR EASY CARRYING & PROTECTION

**AUTO-POWER-OFF**  
EXTENDS BATTERY LIFE

**VFD V & Hz FEATURE**  
MEASURES FUNDAMENTAL  
VOLTAGE & FREQUENCY OF MOST  
VARIABLE FREQUENCY DRIVES

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

**AUTOCHECK™ FEATURE**  
AUTOMATIC SELECTION OF  
LoZ DCV, LoZ ACV & OHMS

**5ms CREST-MAX**  
CAPTURES IN-RUSH PEAK SIGNALS OF ACA  
OR ACV AS SHORT AS 5ms IN DURATION

**FULLY AUTO-RANGING DMM**  
SHORTENS THE TIME TO MEASURE  
AND INCREASES THE EASE OF USE

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

**GHOST-VOLTAGE-BUSTER**  
LoZ DRAINS GHOST/ STRAY VOLTAGES  
LEAVING ONLY HARD SIGNALS  
ON METER READINGS

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

**BACKLIGHTED LCD DISPLAY  
(BM197 ONLY)**  
FOR EASY VIEWING IN THE DARK

**0.5% DCV BASIC ACCURACY**  
DCV 4 AUTO-RANGES TO 1000V;  
ACV 4 AUTO-RANGES TO 1000V

**EMC**  
MEETS EN61326-1:2006 (EN55022,  
EN61000-3-2/3 & EN61000-4-2/3/4/5/6/8/11)

**EF-DETECTION**  
BOTH NON-CONTACT (NCV) &  
SINGLE-PROBE VOLTAGE DETECTION  
FOR IDENTIFYING LIVE LINES

**PC-COMM INTERFACE CAPABILITY**  
OPTIONAL PURCHASE RS232C+USB CABLES  
WITH DATA RECORDING PC SOFTWARE  
FOR WIN98/NT4/2K/XP/VISTA/WIN7

**TRANSIENT PROTECTION**  
UP TO 12kV 1.2/50μs LIGHTNING SURGE;  
MORE CONFIDENCE FOR SERIOUS USERS

**RELATIVE ZERO MODE**  
FOR CONVENIENT READINGS  
COMPARISON & OFFSET



## 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 BM195; True RMS for BM197  
**Safety:** Double insulation per IEC/EN61010-1 2nd Ed., UL61010-1 2nd Ed. & CAN/CSA C22.2 No.

## Electrical Specifications

Accuracy is ±(% reading digits + number of digits) or otherwise specified, at 23°C ± 5°C & less than 75% relative humidity. True RMS BM197 voltage accuracies are specified from 5% to 100% of range or otherwise specified. Maximum Crest Factor < 1.4 : 1 at full scale & < 2.8 : 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 & 1000V	0.5%+5d

Input Impedance: 10MΩ, 50 pF nominal

## AutoCheck™ DCV

RANGE	Accuracy
6.000V, 60.00V, 600.0V & 1000V	1.3%+5d

AutoCheck™ Lo-Z DCV Threshold:

> +1.5VDC & < -1.5VDC nominal

AutoCheck™ Lo-Z DCV Input Impedance:

Initially approx. 2.5kΩ, 600pF 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:

10kΩ @100V  
 60kΩ @300V  
 200kΩ @600V  
 420kΩ @1000V

## AC Voltage

RANGE	Accuracy
50Hz ~ 400Hz	
6.000V, 60.00V, 600.0V & 1000V	1.2%+5d

Input Impedance: 10MΩ, 50 pF nominal

## AC+DC Voltage (Model 197 Only)

RANGE	Accuracy
DC, 50Hz ~ 400Hz	
6.000V, 60.00V, 600.0V & 1000V	1.4%+7d

Input Impedance: 10MΩ, 50 pF nominal

## AutoCheck™ ACV

RANGE	Accuracy <sup>1)</sup>
50Hz ~ 60Hz	
6.000V, 60.00V, 600.0V & 1000V	1.5%+5d

AutoCheck™ Lo-Z ACV Threshold:

> 1.5V(50/60Hz) nominal

AutoCheck™ Lo-Z ACV Input Impedance:

Initially approx. 2.5kΩ, 600pF 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:

10kΩ @100V  
 60kΩ @300V  
 200kΩ @600V  
 420kΩ @1000V

## CREST-MAX Capture Mode

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

61010.1-0.92 to CAT IV 1000V AC & DC  
**Transient Protection:** 12kV (1.2/50μs surge)

## Overload Protections:

Clamp-on jaws: 2000A rms continuous  
 \* + \* & COM Terminals (all other functions):  
 1000V 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 + 200 digits

Performance above 3V/m is not specified

**Power Supply:** 1.5V AA Size (IEC LR6) battery X 2

**Power Consumption:** Typical 14mA for Current

functions, and 5.2mA for others

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

**APC Timing:** Idle for 34 minutes

**APC Consumption:** 10μA typical

**Dimension:** L264mm X W97mm X H43mm

**Weight:** 608 gm

**Jaw opening & Conductor diameter:** 55mm max

**Accessories:** Test leads (pair), user's manual, Bkp60 banana plug K-type thermocouple x 1 (BM197 only)

**Optional purchase accessories:** USB interface kit BRUA-19X; BKB32 banana plug to type-K socket plug adaptor (BM197 only)

**Special Features:** AutoCheck™ V&Ω; VFD-V & VFD-Hz; Backlighted LCD (BM197 only); 5ms CREST-MAX Capture mode (Peak Hold); Auto-ranging Relative-Zero mode; Display Hold; EF-Detection (NCV); Optional Interface capabilities with PC computers

## VFD\_ACV (with Low Pass Filter)

RANGE	Accuracy <sup>1)</sup>
10Hz ~ 20Hz	
6.000V, 60.00V, 600.0V & 1000V	4%+80d

RANGE	Accuracy
20Hz ~ 200Hz	
6.000V, 60.00V, 600.0V & 1000V	2%+60d

RANGE	Accuracy
200Hz ~ 400Hz <sup>2)</sup>	
6.000V, 60.00V, 600.0V & 1000V	7%+80d

<sup>1)</sup>Not specified for fundamental frequency > 400Hz

<sup>2)</sup>Accuracy linearly decreases from 2% + 50d @ 200Hz to 7% + 80d @ 400Hz

## Ohm & AutoCheck™ Ohm <sup>1)</sup>

RANGE	Accuracy
600.0Ω, 6.000KΩ, 60.00KΩ	0.5%+5d

RANGE	Accuracy
600.0KΩ	0.8%+5d

RANGE	Accuracy
6.000MΩ	1.2%+5d

RANGE	Accuracy
40.00MΩ	2.3%+5d

Open Circuit Voltage: 0.45VDC typical

<sup>1)</sup>AutoCheck™ Ohm Threshold:

< 10.00MΩ nominal

## Capacitance

RANGE	Accuracy <sup>1)</sup>
60.00nF, 600.0nF, 6.000μF	2.0%+5d

RANGE	Accuracy
60.00μF, 600.0μF	3.5%+5d <sup>2)</sup>

RANGE	Accuracy
2000μF	4.0%+5d <sup>2)</sup>

<sup>1)</sup>Accuracies with film capacitor or better

<sup>2)</sup>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 <sup>1) 2)</sup>
200.0A	2.0%+5d

RANGE	Accuracy
0~500A	2.0%+5d

RANGE	Accuracy
500~2000A	3.0%+5d

<sup>1)</sup>Induced error from adjacent current-carrying

conductor: < 0.1A/A

<sup>2)</sup>Specified with Relative Zero Δ mode applied to offset the non-zero residual readings, if any

## ACA Current (Clamp on)

RANGE	Accuracy <sup>1)</sup>
50Hz ~ 60Hz	
200.0A	2.0%+5d

RANGE	Accuracy
0~500A	2.5%+5d

RANGE	Accuracy
500~2000A	3.0%+5d

RANGE	Accuracy
40Hz ~ 50Hz & 60Hz ~ 400Hz	
200.0A	2.5%+5d

RANGE	Accuracy
0~500A	3.0%+5d

RANGE	Accuracy
500~1000A	3.5%+5d

RANGE	Accuracy
1000~2000A	unspecified

True RMS Crest Factor (BM197 only):

< 1.4 : 1 at full scale & < 2.8 : 1 at half scale

<sup>1)</sup>Induced error from adjacent current-carrying conductor: < 0.1A/A

RANGE	Accuracy <sup>1) 2)</sup>
DC, 50Hz ~ 60Hz	
200.0A, 2000A	3.0%+8d

RANGE	Accuracy
40Hz ~ 50Hz & 60Hz ~ 400Hz	
200.0A	3.5%+8d

RANGE	Accuracy
0~1000A	3.5%+8d

RANGE	Accuracy
1000~2000A	unspecified

True RMS Crest Factor:

< 1.4 : 1 at full scale & < 2.8 : 1 at half scale

<sup>1)</sup>Induced error from adjacent current-carrying conductor: < 0.1A/A

<sup>2)</sup>Specified with Relative Zero Δ mode applied to offset the non-zero residual readings, if any

RANGE	Accuracy
-50 °C ~ 1000 °C	0.3%+4d

RANGE	Accuracy
-58 °F ~ 1832 °F	0.3%+6d

K-type thermocouple range & accuracy not included



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