

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!



BM190 SERIES

CAT IV 1kV Clamp-on DMMs



BRIGHT PEOPLE'S CHOICE



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!



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

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

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.

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

AP0 Timing: Idle for 34 minutes
AP0 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

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

AutoCheckTM Lo-Z DCV Threshold:

> +1.5VDC & < -1.5VDC nominal

AutoCheckTM 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 ¹⁾
50Hz ~ 60Hz	
6.000V, 60.00V, 600.0V & 1000V	1.5%+5d

AutoCheckTM Lo-Z ACV Threshold:

> 1.5V(50/60Hz) nominal

AutoCheckTM 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

VFD_ACV (with Low Pass Filter)

RANGE	Accuracy ¹⁾
10Hz ~ 20Hz	
6.000V, 60.00V, 600.0V & 1000V	4%+80d
20Hz ~ 200Hz	
6.000V, 60.00V, 600.0V & 1000V	2%+60d
200Hz ~ 400Hz ²⁾	
6.000V, 60.00V, 600.0V & 1000V	7%+80d

¹⁾Not specified for fundamental frequency > 400Hz

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

Ohm & AutoCheck™_Ohm¹⁾

RANGE	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⁾AutoCheckTM 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, 600.0uF	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)}
200.0A	2.0%+5d
0~500A	2.0%+5d
500~2000A	3.0%+5d

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

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

ACA Current (Clamp on)

RANGE	Accuracy ¹⁾
50Hz ~ 60Hz	
200.0A	2.0%+5d
0~500A	2.5%+5d
500~2000A	3.0%+5d
40Hz ~ 50Hz & 60Hz ~ 400Hz	
200.0A	2.5%+5d
0~500A	3.0%+5d
500~1000A	3.5%+5d
1000~2000A	unspecified

True RMS Crest Factor (BM197 only):

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

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

DC+ACA Current (Clamp on) (BM197 Only)

RANGE	Accuracy ^{1) 2)}
DC, 50Hz ~ 60Hz	
200.0A, 2000A	3.0%+8d
40Hz ~ 50Hz & 60Hz ~ 400Hz	
200.0A	3.5%+8d
0~1000A	3.5%+8d
1000~2000A	unspecified

True RMS Crest Factor:

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

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

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

Temperature (BM197 only)

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

K-type thermocouple range & accuracy not included

