

# Duo-core Dual Measurements A + V, VFD, HVAC, RST, AmpTip™ & Much More !

Convenient Measurements Of Amps + A DMM Function!  
Large Ohms, DC  $\mu$ A & Temperature For HVAC!  
Patented AmpTip™ Jaws For Thin Conductors!  
Patented 3-Terminal RST For Power & Motors!  
EF-Detection (NCV) With Hi/Lo Sensitivities!  
+Visible Continuity For Noisy Environments!  
Measures VFD V/Hz With Low Pass Filter!  
Peak-RMS To Capture In-rush Currents!



World-wide Patented:

- I442059
- D148257
- 1996509
- D678091S
- 402011006274.7
- M438628
- 2755507
- 13486915
- 202012102140.4
- M429871
- 2359464
- 202011052429.9



## BM170D Series

### Convenient Clamp DMM Duo



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





● **BM176D**



● **BM175D**



● **BM173D**

176D	175D	173D	Functions & Features
●	●	●	VFD-V & Hz For Fundamental V/Hz Of Most Variable-Frequency-Drives
●	●	●	Fast Measurement Updates 5/Sec
●	●	●	Dual 3-5/6 Digits 6,000 Counts Large LCD Display
●	●	●	Duo-Core To Simultaneously Measure Clamp-On Amps + A DMM Function
●	●	●	30mm Conductor Size Ultra-Slim 600A AC Jaws
●	●	●	AmpTip™ Low-Current-Range Calibrated At Jaw-Tip For Slim-Conductors
●	●	●	AC True RMS Voltage And Current Functions
●	●	●	Intelligent Auto Power Off
●	●	●	Data HOLD
●	●	●	Fast 80ms PEAK-RMS Mode To Capture In-Rush Currents
●	●	●	Back-Lighted Easy-To-Read LCD Display
●	●	●	Non-Contact EF-Detection (NCV), Selectable Hi/Lo Sensitivities
●	●	●	Probe-Contact EF-Detection For More Precise Indication Of Live
●			Ⓡ 3Φ-Rotation-R For Supply Systems (Probe-Contact)
●			Ⓜ 3Φ-Rotation-M (Hi-Sensitivity Mode) For Motors (Probe-Contact)
●	●		Type-K Temperature -10.0°C To 400°C Or 14.0°F To 752°F Selectable
●	●		DCμA Ranges 200.0μA To 2000μA (Via Leads) For HVAC Flame Sensors
●	●	●	ACA Ranges 60.00A To 600.0A + AmpTip™ ACA 60.00A Range
●	●	●	DCV Range 600.0V
●	●	●	ACV Range 600.0V
●	●	●	Ohm Ranges 600.0Ω To 6000kΩ
●	●	●	Cx Ranges 200.0μF To 2500μF For Start & Run Motor Capacitors
●	●	●	Diode Test
●	●	●	Fast Audible+Visible Continuity
●	●	●	Line-Level ACV Frequency 10.00Hz To 999.9Hz
●	●	●	Soft Carrying Pouch
●	●	●	Rugged Fire Retarded Casing With Battery Access Door
●	●	●	Transient Protection 6kV 1.2/50μS Lightning Surge
●	●	●	LVD EN61010-2-032 & EN61010-1 CAT III 600V & CAT IV 300V
●	●	●	EMC EN61326-1:2013



# Convenient Duo-core Meter Customized For Electrical Professionals!

Duo-core A+V, VFD V/Hz, AmpTip™ Jaws, In-rush Peak-RMS, °C/°F, DCμA, Ohms 6000kΩ, Motor RST, +Visible Continuity, Hi/Lo EF-Detection

**TYPE-K TEMPERATURE (BM176D & 175D ONLY)**  
 Selectable °C And °F Readings;  
 Comes With Bkp60 Bead Probe

**Hi/Lo EF-DETECTION**  
 Both Non-Contact (NCV) &  
 Single-Probe Voltage Detection  
 For Identifying Live Lines;  
 Selectable Hi/Lo Sensitivities

**LVD CAT III 600V & CAT IV 300V**  
 Certified EN61010-2-032, EN61010-2-033,  
 EN61010-1 & Relevant UL Standards On  
 CAT III 600V & CAT IV 300V

**ACA 30mm AmpTip™ CLAMP JAWS**  
 For Large & Small Conductors With  
 AC TRMS 600A Capability

**DIODE TEST**  
 For Testing Diodes & Rectifiers

**DCμA (BM176D & 175D ONLY)**  
 For HVAC Flame Sensors  
 Testing Via Test Probes

**AUDIBLE + VISIBLE CONTINUITY**  
 For Quick Open-short Tests  
 On Switches, Fuses, And Wires;  
 Visible Flashing Icons

**PHASE ROTATION (BM176D ONLY)**  
 Two Sensitivity RST Modes For  
 Both Supply Systems And Motors

**AUTO-POWER-OFF**  
 Extends Battery Life

**CAPACITANCE**  
 2 Auto-ranges Up To 2500μF  
 To Measure Motor Capacitors

**FULLY AUTO-RANGING DMM**  
 Shortens The Time To Measure  
 And Increases The Ease Of Use

**6000kΩ RESISTANCE**  
 5 Auto-ranges Up To 6000kΩ  
 Best Resolution 0.1Ω At 600Ω Range

**VFD V & Hz FEATURE**  
 Measures Fundamental  
 Voltage & Frequency Of Most  
 Variable Frequency Drives

**ERGONOMIC & STREAMLINE BODY**  
 Also Comes With A Soft Pouch  
 For Easy Carrying & Protection

**IN-RUSH PEAK-RMS**  
 Captures In-rush Peak RMS Readings  
 At Durations As Short As 80ms

**DUO-CORE MEASUREMENTS**  
 To Conveniently Measure Amps +  
 Volts Or Another DMM Function

**AmpTip™ LOW-CURRENTS**  
 Calibrated To Measure At Jaw Tip For  
 Small-sized Conductors Up To 60 Amps

**DATA HOLD**  
 Freezes The Displaying  
 Reading For Later View

**REGULAR CURRENT**  
 Measures At Jaw Center For  
 Regular Conductors Up To 600 Amps

**RUGGED & DURABLE**  
 High-impact Fire-retarded  
 Enclosure With Battery  
 Compartment & Access Door

**BACKLIGHTED LCD DISPLAY**  
 For Easy Viewing In The Dark

**EMC**  
 Meets EN61326-1:2013

**TRANSIENT PROTECTION**  
 Up To 6kV 1.2/50μs Lightning Surge;  
 More Confidence For Serious Users

**1.0% DCV BASIC ACCURACY**  
 DCV Up To 600V;  
 ACV Up To 600V



## GENERAL SPECIFICATIONS

**Display:** 3-5/6 digits 6000 counts; dual display

**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:** True RMS

**Safety:** Double insulation per UL/IEC/EN61010-1

Ed. 3.0, CAN/CSA C22.2 No. 61010-1 Ed. 3.0,

UL/IEC/EN61010-2-032 Ed. 3.0,

UL/IEC/EN61010-2-033 Ed. 1.0 to CAT III 600V

and CAT IV 300V AC & DC

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

**Overload Protections:**

Clamp-on jaws: 600A rms continuous

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

600VDC/VAC rms

**E.M.C.:** Meets EN61326-1:2013

Temperature function at 80MHz ~ 150MHz:

In an RF field of 1V/m:

Total Accuracy = Specified Accuracy + 25 digits

Other functions:

In an RF field of 3V/m:

Total Accuracy = Specified Accuracy + 20 digits

**Power Supply:** 1.5V AAA Size battery X 2

**Power Consumption:** 6.2mA typical

**Low Battery Indication:**

Below approx. 2.85V for Capacitance & Hz

Below approx. 2.5V for other functions

**APO Timing:** Idle for 32 minutes approx.

**APO Consumption:** 5µA typical

**Dimension (LxWxH):** 217 x 76 x 37mm

**Weight:** 186gm

**Jaw opening & Conductor diameter:**

30mm max

**Accessories:** Test lead set, User's manual, Soft

carrying pouch, Bkp60 banana plug K-type

thermocouple (BM175D & BM176D only), Alligator

Clip set (BM176D only)

**Optional purchase accessories:** BKB32 banana

plug to type-K socket plug adaptor (BM175D &

BM176D only)

**Special Features:** AmpTip™ low-current range;

Display Hold; EF-Detection (NCV); Backlighted

LCD; 80ms Peak-RMS mode for inrush current;

3-Phase Rotation detection (BM176D only)

## Electrical Specifications

Accuracy is ±(% reading digits + number of digits) or otherwise specified, at 23°C ± 5°C.

Maximum Crest Factor < 2.5 : 1 at full scale & < 5 : 1 at half scale or otherwise specified, and with frequency components within the specified frequency bandwidth for non-sinusoidal waveforms.

### DC Voltage

RANGE	Accuracy
600.0V	1.0% + 5d

Input Impedance: 10MΩ, 100 pF nominal

### AC Voltage (with Digital Low Pass Filter)

RANGE	Accuracy
50Hz ~ 60Hz	
600.0V	1.0% + 5d

Input Impedance: 10MΩ, 100 pF nominal

### Hz Line Level Frequency

Function	Sensitivity <sup>1)</sup> (Sine RMS)	Range
600V	50V	5.00Hz ~ 999.9Hz

Accuracy: 1% + 5d

<sup>1)</sup>DC-bias, if any, not more than 50% of Sine RMS

### Audible Continuity Tester

Audible Threshold: Between 10Ω and 250Ω

Response time: 32ms approx.

### Ohm

RANGE	Accuracy
600.0Ω, 6.000KΩ, 60.00KΩ	1.0% + 5d
600.0KΩ <sup>1)</sup> , 6000KΩ <sup>2)</sup>	1.2% + 5d

Open Circuit Voltage: 1.7VDC typical

<sup>1)</sup>Test Current: 2µA typical

<sup>2)</sup>Test Current: 0.2µA typical

### Capacitance

RANGE	Accuracy <sup>1)</sup>
200.0µF, 2500µF	2.0% + 4d

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

### Diode Tester

RANGE	Accuracy
3.000V	1.5% + 5d

Test Current: 0.3mA typical

Open Circuit Voltage: < 3.5VDC typical

### DCµA (BM175D & BM176D only)

RANGE	Accuracy	Burden Voltage
200.0µA, 2000µA	1.0% + 5d	3.5mV/µA

### Temperature (BM175D & BM176D only)

RANGE	Accuracy
-40.0°C ~ 99.9°C	1.0% + 0.8°C
100°C ~ 400°C	1.0% + 1°C
-40.0°F ~ 99.9°F	1.0% + 1.5°F
100°F ~ 752°F	1.0% + 2°F

K-type thermocouple range & accuracy not included

### AmpTip™ Clamp-on ACA

RANGE	Accuracy <sup>1) 2) 3) 4)</sup>
50Hz ~ 60Hz	
60.00A	1.5% + 5d

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

<sup>2)</sup>Induced error from ACV measurement < 0.60A

/kV @50/60Hz

<sup>3)</sup>Add 10d to the specified accuracy @ < 6A

<sup>4)</sup>Unspecified @ < 0.2A while Rotary-switch

function is Continuity or Non-Contact EF-Detection

### Regular Clamp-on ACA

RANGE	Accuracy <sup>1) 2) 3) 4)</sup>
50Hz ~ 100Hz	
60.00A <sup>5)</sup> , 600.0A	1.8% + 5d
100Hz ~ 400Hz	
60.00A <sup>5)</sup> , 600.0A	2.0% + 5d

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

<sup>2)</sup> Induced error from ACV measurement < 0.60A

/kV @50/60Hz

<sup>3)</sup>Specified accuracy is for measurements made at

the jaw center. When the conductor is not

positioned at the jaw center, add 2% to specified accuracy for position errors

<sup>4)</sup>Unspecified @ < 0.2A while Rotary-switch

function is Continuity or Non-Contact EF-Detection

<sup>5)</sup> Add 10d to specified accuracy @ < 6A

### 80ms PEAK-RMS for Clamp-on ACA functions

Response: 80ms to > 90%

Accuracy: share clamp-on ACA function

specifications except unspecified for < 2% of

range

### Non-Contact EF-Detection

Bar-Graph Indication	EF-H (High Sensitivity)	EF-L (Low Sensitivity)
	Typical Voltage (Tolerance)	
-	10V ( 5V ~ 25V)	40V (32V ~ 70V)
--	25V (20V ~ 66V)	110V (55V ~ 165V)
---	55V (50V ~ 125V)	220V (130V ~ 265V)
----	110V ( 90V ~ 200V)	400V (250V ~ 500V)
-----	220V (>180V)	550V (>430V)

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 direct

contact testing with one single test-probe via an

input terminal. The COM terminal (Black) has the

best sensitivity.

