DC/AC True RMS Clamp Meter

Model:BM803A+



Specifications:

- 33/4 Digit , Maximum Display:3999
- Over Load Protection
- Auto Range
- Measured frequency AC voltage profile
- Inrush Current
- Auto power off
- Battery power is insufficient
- DCA Automatic Zero
- MAX expand of the pincers:52mm
- DC Voltage: 400m/4/40/400V±0.8%±2,1000V±1%±3
- AC Voltage: 400m/4/40/400V±1.2%±5, 700V±1.5%±3
- DC Current: 400/1000A±2%±10
- AC Current: 400/1000A±2%±10
- Resistance: 400/4k/40k/400k/4MΩ±0.8%±5；40MΩ±1.5%±5
- Capacitance：10n/100n/1u/10 u/100u/1000uF±3%±5, 10mF±5%±5
- Frequency: 10 /100 /1k /10k/100k/1M/10M/30MHz±0.5%±3
- Duty Test：1%~99.9%±0.5%±3
- Temperature：-50∽400℃±1.2%±4, 400∽1000℃±1.9%±15
  -58∽400oF ±1.2%±6, 400∽1832oF ±1.9%±25
- Continuity Test: BUZZER , DIODE , NCV
- Power Supply: 9V×1 6F22
- Size：249×89×38mm



Made in China

BM802A/BM803A+ Digital Clamp Meter
Operating Instruction

Ⅰ. Introduction

Welcome to use this product.

The updated BM802A, BM803A+ adopts high-performance MCU processor,it is Great Value as has high reliability,security, automatically setting range funcition,hand-held clamp meter etc.. the product has a large digital display, full range overload protection, data-hold function, undervoltage indication, auto shut off function,it has TRUE RMS measurement function which can accurately measure frequency voltage, non-sinusoidal voltage and inrush current measurement function which can measure inrush current about 80mS RMS, it also has temperature measurement function which can accurately measured -50~1000 ℃, the instrument is suitable for frequency-converting power supply, air conditioning, refrigeration equipment such as refrigerators, motor performance test, BM803A+ has the function to measure DC current range up to DC 400A, 1000A , which is widely used in electroplating, DC welding machine, motor vehical test and all kinds of DC 500mA current measurement. It is more excellent for a new generation of practical electrical measuring instrument .

This product is ideal instrument for test, maintenance and repais in college, smelting, communications, manufacturing, petroleum, electric power, national defense,electronic, electric power equipment .

Ⅱ. Safety standard

The meter in structure complies with the safety requirements of ICE61010-1. Read the instruction carefully as follows before you use the meter:

1. When measuring voltage, AC or DC voltage should not be more than the peak voltage (DC / AC 1000V) of the meter.
2. Voltage of less than 36V is safety voltage. When the voltage is more than DC 51V or AC36V, the leads should be checked. The test lead should be connected correctly and their insulating property should be under excellent status against electric shock.
3. When change of functional measuring range, the test lead should be away from test point.
4.It is suggested that for safety the functions and range should be selected correctly although protective function for the full measuring range exists.
5.When measurement of current, the input current shouldn't be more than the maximum current labeled on input end.
6. Safety symbols:


Warning!


risk of high voltage and electric shock!


Double insulated.

Ⅲ. Features

3.1 General

3.1.1The meter is based on CMOS large scale IC and can automatically changed measuring range for measurement of AC/DC voltage, AC, resistance, frequency and capacity, which makes the meter easy to be used.
3.1.2 Display mode: Display by LCD.
3.1.3 Maximum display: 3999
3.1.4 Maximum span of jaw: 52mm.
3.1.5 Auto negative polarity indication: Displaying "-".
3.1.6 Lack of battery power: Displaying "".
3.1.7 Auto power OFF

After turning on the instrument and without turning the function switch or pressing any button, the instrument will automatically enter into sleep mode after 10 minutes,to save battery power.when it is in the sleep mode you can press the SELECT key to wake up the instrument. If you don't need the automatic sleep mode, you should hold down the DH key to turn on the instrument, and then the symbol"" will not be display on the LCD.

3.1.8 Work environment: 0°C-40°C, 75%RH.
3.1.9 Storage environment: -10°C-60°C, 85%RH.
3.1.10 battery : BM802A: 3V (AA1.5V×2)
BM803A+: 9V (IEC6F22, NEDA1604, JIS006P and similar type)
3.1.11External dimensions: 249 (L) ×89 (W) ×38 (H) mm
3.1.12Weight: About 360g (including battery's weight)

3.2 Technical specifications

Accuracy: ±(% reading + digit); calibration term is one year.
Ambient temperature: 23℃±5℃; Ambient humidity: ≤70%RH

3.2.1 DCV

Range	Accuracy	Resolution	Input impendance
400mV	±(0.8%+2d)	0.1mV	About 10MΩ
4V		1mV	About 10MΩ
40V		10mV	About 10MΩ
400V		100mV	About 10MΩ
1000V	±(1%+3d)	1V	About 10MΩ

3.2.2 ACV

Range	Accuracy	Resolution	Input impendance
400mV	±(1.2%+5d)	0.1mV	About 10MΩ
4V		1mV	About 10MΩ
40V		10mV	About 10MΩ
400V		100mV	About 10MΩ
700V	±(1.5%+5d)	1V	About 10MΩ

Frequency: 10Hz~1kHz (Warning: Frequency for square wave accuracy is specified from 10Hz to 400Hz), display: TRUE RMS(sinusoidal waveform RMS calibration)。
Overload protection:250V at mV range,DC1000V or peak value AC1000V at V range

3.2.3 DCA (BM803A+ ONLY)

Range	Accuracy	Resolution
400A	±(2%+5d)	100mA
1000A		1A

3.2.4 ACA

Range	Accuracy		Resolution
	BM802A	Bm803A+	
4A	±(2%+10d)	-	1mA
40A			10mA
400A		±(2%+5d)	100mA
1000A			1A

AC Conversion Type: TRUE RMS responding, calibrated readings consistent with sinusoidal waveform RMS. Frequency Range:50~60Hz。

3.2.5 Resistance Ω

Range	Accuracy	Resolution
400Ω	±(1%+3d)	0.1Ω
4kΩ		1Ω
40kΩ		10Ω
400kΩ		100Ω
4MΩ		1kΩ
40MΩ	±(1.5%+5d)	10kΩ

Overload protection: effective value 220V

3.2.6 Capacitance

Range	Accuracy	Resolution
10nF	± (3%+20d)	0.001nF
100nF	± (3%+5d)	0.01nF
1uF		0.1nF
10uF		1nF
100uF		10nF
1000uF		100nF
10mF	± (5%+5d)	1uF

Overload protection: effective value 250V
warning: There is about 20pF dead zone in the 10nF,capacitance below 20pF can not be measured

3.2.7 Frequency

Range	Accuracy	Resolution
100Hz		0.01Hz
1kHz		0.1Hz
10kHz		1Hz
100kHz		10Hz
1MHz		100Hz
10MHz		1kHz
40 MHz		10kHz

Overload protection: effective value 250V. Input sensitivity RMS: effective value 1V.
NOTE:If the voltage of the frequency being measured is above 30V,set the rotary function switch to the ACV measured function and press "Hz/DUTY" key to enter voltage frequency measured function,in order to avoid demage the instrument.

3.2.8 DUTY

Rrange	Accuracy	Resolution
1%~99%	± (0.5%+3d)	0.1%

Overload protection: effective value 250V.
input sensitivity RMS: 1V

3.2.9 Temperature

Range	Resolution	Accuracy
-50～300℃	1℃	±1%±5
301～1000℃	1℃	±1.9%±5
-58～600 ℉	1 ℉	±1.2%±6
601～1832 ℉	1 ℉	±1.9%±6

Temperature sensor: K WRNM- 010 bare contact thermojunction
Overload protection: effective value 250V.

3.2.10 Forward voltage drop of diode 

Displaying approximate forward voltage values of diode. Measuring condition: forward direct current is 1.5mA; opposite DC voltage is about 3 V.

3.2.11 Continuity Test 

In the case that the resistance between two tested points is less than about 90Ω±20Ω,the buzzer will bring up sound. Test condition:Open-circuit voltage is about 0.5V.

Ⅳ. Operation

4.1 Instruction for control panel

（1） jaws

（2） Trigger

（3） Rotary switch： This switch is used to select functions such as current.voltage,capacitance.resistance,temperature,frequency,forward voltage drop of diode,continuity and turn on/off the meter.

（4） “SELECT” button: When press the key continuously, change the range of all function for a proper range you need.

（5）“RANGE” button: One may change the measuring range by pressing this button, press this key to cycle from small to large range of each function

（6）INRUSH:measuring Inrush voltage, current key,in AC measuring function press the key,it will measure the Inrush value, and show the "INR" symbol in the LCD, INRUSH function can measure current or voltage with the minimum period up to valid values80mS,in the inrush mode, instrument automatically enter the manual range function, if the measurement range is unknowed , press RANGE key to the maximum range first . press the INRUSH button again inrush measurement will be resumed, and the "INR" symbol disappear.

ZERO:zero key of DC current function, when measuring DC current and it is not display zero without measuring,press ZERO key to make it display zero before measure.

（7）“DH” button: The user may hold the present reading and keep it on the display by pressing the “DH” button. Press the button again to concel the data-hold function

（8）LCD display

（9）“VΩ”jack: This is positive input terminal for voltage,resistance frequency,temperature,capacity and diode.

（10）“COM”jack:This is negative(ground)input terminal

(11) Barrier



4.2 Measurement of AC/DC voltage

(1) Turn the Rotary switch to “V”. Then plug black lead in “COM” socket, and plug red lead in “V/Ω” socket. For BM803A+ when measuring AC voltage you need to press SELECT to switch to the ACV function, connect the test lead with the two ends of the circuit and then directly read the reading on the LCD display

NOTE: 1. The inrush measuring funciton can only be change range manually, before the test,if the voltage is unknown, manually set the measuring range to 700V and then press the PH key to enter the INRUSH measuring function.

2. Don't measure the peak voltage more than 1000V, otherwise it might damage the instrument ,if the screen only displays OL, it means that the tested voltage is higher than DC1000V or AC700V.

3. Presse the SRLECT key in the ACV function to enter the voltage frequency measurement mode, it can measure the the frequency range from 10Hz to 100KHz with voltage higher than AC 30V~700V.

4.3 AC/DC current measurement

4.3.1 DC current measurement

Turn rotary switch to “DCA” range, if it isn’t displaying zero ,press “ZERO” button until zero displayed on the LCD.

(1) Press the trigger, opens the mouth of the clamp, and hold a wire (put the wire in the clamp center), read the reading directly.

4.3.2 AC current measurement

Turn rotary switch to “~A” range. Press the trigger, opens the mouth of the clamp, and hold wire (put the wire in the clamp center), read the reading directly

Note:1.INRUSH measuring can only be manually setting range. when the current value being measuring is unknow, turn the rotary switch to 1000A and press INRUSH key to entry INRUSH measuring funciton.

2. When measuring current ,the clamp might hold only one wire,it is null to catch one more another wire

4.4 Measurement of resistance,continuity and forward Voltage drop of diode

Warning! When measurement of resistance or continuity, make sure that no voltage is with the circuit and components.

（1）Turn the Rotary switch to the range of Ω/))/⊣◀. At this time, the meter is reserved at resistance range.

（2）Plug red lead in “V/Ω” socket, and plug black lead in “COM” socket

（3）Connect the leads with the two ends of the circuit or component, and then read the value of resistance.

（4）Press SELECT key to change the range of))). When the resistance measured is less than about 90Ω±20Ω, the buzzer sounds. This is continuity testing.

（5）When the test lead is under open-circuit or input-overload status, the display will display “OL”.

（6） When measuring diode,press the SELECT key to the function of ⊣◀.

（7）Connect the test lead with the two ends of the diode, and then read the value of forward voltage drop value.

（8）When the test lead is under reverse connection or open-circuit status, the display will display “OL”.

Note：a、When the resistance measured is above 1MΩ, it needs several seconds for the reading to be stable, it is normal when measuring high resistance.

b、When measuring high resistance, insert the resistance pin directly into the VΩ and COM jack, so as to avoid interference

c、When measuring resistance in a circuit make sure the power to the circuit is turned off and all capcitors are discharged,

4.5 Measurement of capacitance

⚠Warning! When measurement of capacity, the measured capacitor should be completely discharged.

（1）Turn the Rotary switch to “CAP” function. Plug red lead in “V/Ω” socket, and plug black lead in “COM” socket.

Warning:The range for capacitor can’t be set manually. When the capacity value is large, the time for measurement may be a little longer.

a. ⚠ Do not take an external voltage or charged capacitor (especially a large capacitor) connected to the test terminal

b. When a large capacitor is serious leakage or breakdown, the measurement value may be instability

4.6 Measurement of frequency / DUTY Ratio

（1）Turn the Rotary switch to “Hz” function.if you want to measure DUTY Ratio,Press SELECT key to switch

（2）Plug red test lead in “V/Ω” terminal and plug black lead in “COM” terminal.

（3）Connect the leads with measured circuit and then read the reading.

（4）when the voltage exceeding 30V, please enter the Voltage frequency measurement mode by pressing the SELECT key in the “ACV” measurement function.

4.7 Measurement of temperature

Turn the Rotary switch to the function of temperature, then plug the cold end (plug end) of temperature sensor to the V/Ωand COM socket(black end for COM socket and red end for V/Ω socket). Place the working end (temperature end) of the sensor on or in the measured object. Then read the temperature value (in ℃) on the display. If you need to measure that “^{O}F”, presses the SELECT key to switch.

⚠**Caution:** When the cold terminal of the sensor isn’t inserted into the meter, the meter might display approximate environmental temperature. K WRNM- 010 bare contact thermojunction has a limiting temperature of 250℃ (300℃ for short time).

4.8 NON CONTACT VOLTAGE TESTING

Turn the Rotary switch to the “ϟ” function, then the LCD display NCV and ~ symble, plug red test lead in the “V/Ω” terminal and black lead without being used,place the red test lead near the electric line, switch,or socket,the phase metal terminal need not to be connected,when the detected voltage is above AC RMS 110V,a reverse C will be displayed on the LCD,the higer the testing voltage is ,the more reverse C will be display,with buzzer alarm sounds more intensive.

⚠Caution:

1.even if there is no indication, voltage may still exist. Do not judge the wire whether threre is voltage absolutely throught the non contact voltage testing,the testing may be effected by many factors such as the socket design,the insulation thickness and types etc.

2.when a voltage is input to the input termimal of the meter,due to the existence of induction voltage,the voltage indicated light may also be bright.

3.Interference source of external environment,such as flash,motor etc,may false triggle the non contect voltage testing.

Ⅴ. Maintenance of meter

⚠ Warning! Switch off the power, remove the test lead and any of input signals to prevent electric shock before opening the cover of meter or the cover of battery.

5.1 When the meter displays the symbol of “+−”, the battery should be changed. Open the battery cover, and then change the used battery with new battery to ensure the normal operation of the meter.

5.2 Keep the meter and the pens clean, dry and non-destructive. Clean cloth or detergent may be used for cleaning the cover of the meter. No grinding agent or organic solvent can be used for the same cleaning purpose.

5.3 The meter should be protected against damage, vibration and impact. It shouldn’t be placed where high temperature or intense magnetic field exists.

5.4 Calibrating of the meter is done on a yearly basis.

Ⅵ. Accessories

6.1 Test lead: 1 set

6.2 users manual: 1 piece

6.3 Temperature sensors: 1 set

6.4 cloth bag: 1piece

