

BM822AA/8235A

DigitalClampMeterOperating Instruction

I. Introduction

Welcome to use this product.

This series digital clamp meter altogether has two models, BM822A is AC clamp meter, BM823A is AC/DC clamp meter.

This series digital clamp meter, as portable digital clip-on meter, can be used for measuring AC/DC, AC/DC voltage, resistance, frequency, on/off test, temperature, positive pressure loss of diode and so on. The meter is workmanlike in structure, easy to use, and convenient to be taken, and is ideal for electricity measurement. It is especially suitable for the measurement of refrigerating equipment, electricity maintenance and large current application.

II. Safety standard

The meter in structure complies with the safety requirements of ICE1010-1. Read the instruction carefully as follows before you use the meter:

1. When measuring voltage, no AC or DC voltage should be more than the peak voltage (AC 600V or DC 600V) of the meter.
2. Voltage of less than 36V is safety voltage. When voltage of more than DC 51V or AC36V, the leads should be checked. The meter pens should be connected correctly and their insulating property should be under excellent status against electric shock.
3. When change of functional measuring range, the meter pens should be away from test point.
4. Correct functions and measuring range should be selected against fault operation. 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!

 Dangerously because of high pressure and electric shock!

 Double insulation protection.

III. Features

3.1 General

3.1.1 The 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: 30mm.

3.1.5 Memory of data: Press "DH" key to memory current displaying data, and release the key to cancel memory function.

3.1.6 Auto negative polarity indication: Displaying "-".

3.1.7 Lack of battery power: Displaying "".

3.1.8 Work environment: 0°C-40°C, 70%RH.

3.1.9 Storage environment: -10°C-60°C, 80%RH.

3.1.10 Auto power off: The meter shall automatically be switched off to save energy without range changed within 10

minutes after switching on.

3.1.11 External dimensions: 165 (L) × 68 (W) × 28 (H) mm

3.1.12 Weight: About 180g (including battery's weight)

3. Technical specifications

Accuracy: $\pm(\% \text{ reading} + \text{digit})$; calibration term is one year.

Ambient temperature: 23°C \pm 5°C; Ambient humidity: $\leq 70\%RH$

3.2.1 DCV

Measuring range	Accuracy	Resolution
400mV	$\pm(1\%+3d)$	0.1mV
4V		1mV
40V		10mV
400V		100mV
600V	$\pm(1\%+3d)$	1V

Input impedance: 10M Ω , mV Range: >100M Ω

3.2.2-1 ACV

Measuring range	Accuracy	Resolution
4V	$\pm(1.5\%+5d)$	1mV
40V		10mV
400V		100mV
600V		1V

Input impedance: 10M Ω

Frequency: 50~400Hz

AC conversion type: sine-wave input, average response, and corrective reading are conforming to valid value concerned.

3.2.2-2 ACV Positive PEAK HOLD(225A)

Measuring range	Accuracy	Resolution
4V	$\pm(4\%+9d)$	1mV
40V		10mV
400V		100mV
600V		1V

Input impedance: 10M Ω Frequency: 50~60Hz

Attention: The peak value test can only use the manual measuring range pattern, before the test, like not to know that was measured the voltage peak value the size, please manual adjust 600V to press the PH key to enter the peak value test again

3.2.3 ACA

ACA(BM822A)

range	Accuracy	Resolution
4A	$\pm(2\%+10d)$	1mA
40A		10mA
400A		100mA

ACA(BM823A)

range	Accuracy	Resolution
400/600A	$\pm(2\%+5d)$	1A

AC conversion type: sine-wave input, average response, and corrective reading are conforming to valid value concerned.

Frequency: 50~60Hz

ACA Positive PEAK HOLD(BM822A)

Measuring range	Accuracy	Resolution
4A	$\pm(4\%+9d)$	1mV
40A		10mV
400A		100mV

Attention: The peak value test can only use the manual measuring range pattern, before the test, like not to know that was measured the current peak value the size, please manual adjust 400A to press the PH key to enter the peak

value test again

Frequency: 50~60Hz

3.2.4 Measurement of DCA(BM823A)

range	Accuracy	Resolution
400/600A	$\pm(2\%+5d)$	1A

3.2.5 Resistance Ω

range	Accuracy	Resolution
400 Ω	$\pm(1\%+3d)$	0.1 Ω
4k Ω		1 Ω
40k Ω		10 Ω
400k Ω		100 Ω
4M Ω	$\pm(1.2\%+5d)$	1k Ω
40M Ω		10k Ω

Overload protection: effective value 220V

3.2.6 Capacitance

range	Accuracy	Resolution
40nF	$\pm(3\%+10d)$	0.01nF
400nF		0.1nF
4 μ F		1nF
40 μ F		10nF
100 μ F		100nF

Overload protection: effective value 220V

3.2.7 Frequency

Measuring	Accuracy	Resolution
40Hz	$\pm(0.5\%+3d)$	0.01Hz
400Hz		0.1 Hz
4 kHz		1 Hz
40kHz		10 Hz
400kHz		100 Hz
4MHz		1k Hz

Overload protection: effective value 220V

The Measurement frequency is divided the voltage frequency measurement and the normal frequency measurement two kind of functions, the voltage frequency measurement scope is 10Hz~40kHz, the voltage frequency measurement suits the test to be bigger than the 50V above frequency, the low pressure supply oscillator output signal possibly cannot test. The normal frequency measurement function please do not measure that is bigger than 50V the frequency.

3.2.8 Positive pressure loss of diode \rightarrow

Displaying approximate direct voltage values of diode. Test condition: forward direct current is 0.5mA; opposite DC voltage is about 1.5V.

3.2.9 Continuity Test \rightarrow

In the case that the resistance between two inspected points is less than about $220\Omega \pm 40\Omega$, the buzzer will bring up sound. Open-circuit voltage is about 0.5V.

3.2.10 Measurement of temperature

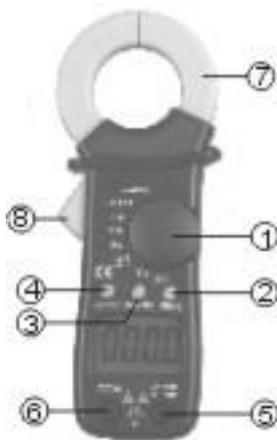
range	Resolution	Accuracy
-20~300 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 1\% \pm 5$
300~750 $^{\circ}$ C	1 $^{\circ}$ C	$\pm 1.9\% \pm 15$
-10~500 $^{\circ}$ F	1 $^{\circ}$ F	$\pm 1.2\% \pm 6$
500~1382 $^{\circ}$ F	1 $^{\circ}$ F	$\pm 1.9\% \pm 25$

Temperature sensor: K WRNM-010 bare contact thermojunction

IV. Operation

4. 1 Instruction for control panel

- (1) Rotary switch: used for selecting functions and measuring ranges of current, voltage, resistance, capacity, temperature, frequency, positive pressure loss of diode, and on/off test.
- (2) FUNC key: When press the key continuously, change of all function for a range can be decided.
- (3) RANGE key: Press the key to select fixed range. Range can be selected from small value to large value.
- (4) DH key: It is a holding key. Press the key to hold current reading; at the same time, the screen display "DH". Press the key again to cancel the holding function and the symbol "DH" disappears.
- (5) "V/ Ω /Hz/ $^{\circ}$ C/CAP": Input jack of voltage—resistance—frequency—temperature—capacity—diode
- (6) "COM" common input end (input position)
- (7) Clamp mouth
- (8) Trigger



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. connect the meter pens with the two ends of the circuit and then directly read the reading on the LCD display
- (2) 3999 AC clamp meter measures the alternating voltage peak value: In measured that the alternating voltage function, presses the RANGE key to move the voltage was measured the alternating voltage peak value measuring range, then holds down PH key for 2 seconds, after waiting the measuring appliance to demonstrate the PH mark, lets go. Will leads joining-up to measure the electric circuit, may read on the liquid crystal display monitor's reading directly;

Please note: 1. The peak value test can only use the manual measuring range pattern, before the test, like not to know that was measured the voltage peak value the size, please manual adjust 600V to press the PH key to enter again measures the peak value function.

2. when the 4V. measuring range enters measures the peak value function, if the input end is hanging, the measuring appliance can hold the input the disturbing voltage to cause not to be able to demonstrate that zero, this is the normal phenomenon.

3. the measuring appliance when measures the voltage, shows the value to be bigger than 660V display OL.

4. Presses the FUNC key in the ACV function to cut the frequency measurement pattern, may measure that is bigger than 50V the alternating voltage frequency and the dutyfactor.

4.3 AC/DC current measurement

4. 3. 1 AC current measurement

(1) Turn the knob to maximum measurement for AC current. Adjust the knob to needed measurement. Press down trigger; open the grip mouth to hold a wire. Pay attention to put the wire in the center of closed grip. Read the displayed value directly.

(2) When the value is comparatively small, may turn the knob to low measurement band.

(3) AC clamp meter measures the alternating current peak value: In measured that the alternating current function, presses the RANGE key to move the electric current was measured the alternating current peak value measuring range, then holds down PH key for 2 seconds, after waiting the meter to extol the PH mark, lets go. Press down trigger; open the grip mouth to hold a wire. Pay attention to put the wire in the center of closed grip. Read the displayed value directly.

(4) Please note: Measured that the peak value can only use the manual measuring range pattern, measured that before, like did not know was measured the electric current peak value the size, please allocate to 400A presses the PH key to enter the peak value survey function again.

attention: When measuring current can only grip a wire, will grip many will be unable with the wire to test or the measurement result does not have the significance.

4. 3. 2 Measure DC current with grip mouth

turn switch to "DCA", the measuring appliance demonstration can the automatic zero setting.

(1) Presses down the trigger, opens the mouth of the tongs, is caught in the pincers of a wire (to put in as far as possible wire closed mouth of the tongs center), reads the reading directly.

(2) If the use will later not return to zero, but long will press "DH/ZERO" the key 2 seconds to cause the demonstration reading to return zero or to allocate move set clock for the knob other functions to change to DCA also automatically to return again zero.

4. 4 Measurement of resistance, on/off test and positive pressure loss of diode

 Warning! When measurement of resistance or on/off tests, it is sure that no voltage is with the circuit and components.

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

(2) Plug red lead in "V/ Ω /Hz/ $^{\circ}$ C/CAP" 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 "FUNC" key to change to the range of . When the resistance measured is less than about $220\Omega \pm 40\Omega$, the buzzer sounds. This is on/off test.

(5) When the leads is under open-circuit or input-overload status, the display will display "OL".

(6) When measurement of diode, turn the "FUNC" key to the range of .

(7) Connect the leads with the two ends of the diode, and then read the value of positive pressure loss.

(8) When the leads is under reverse connection or open-circuit at input end, the display will display "OL".

4. 5 Measurement of capacity

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

(1) Turn the Rotary switch to the arrange of "CAP", or press "FUNC" key to turn to CAP range.

(2) Plug red lead in V/ Ω /Hz/ $^{\circ}$ C/CAP" socket, and plug black lead in "COM" socket.

(3) Connect the leads with the two ends of measured capacitor and then read the reading.

(4) The range for capacitor can't be set manually. When the capacity value is large, the time for measurement may be taken 10 seconds.

4. 6 Measurement of frequency

(1) Turn the Rotary switch to the range of Hz.

(2) Plug red meter pen in "V/ Ω /Hz/ $^{\circ}$ C/CAP" socket, and plug black meter pen in "COM" socket.

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

(4) Range for frequency can't be set manually.

(5) Sensitivity frequency range is 1V.

(6) In case of the frequency exceeding 50V, please enter the frequency function by pressing the "FUNC" key in the "ACV" range first before taking measurements. It can take high-voltage frequency measurements up to 600V against possible damaging by extra high voltage. It can automatically reduce the measured voltage to the extent of optimized IC function with outstanding interference guarding.

4.7 Measurement of temperature

Turn the Rotary switch to the range of temperature (AC/DC clamp meter presses FUNC key cut), then plug the cold end (plug end) of temperature sensor to the position between V/ Ω /Hz/ $^{\circ}$ C/CAP and COM (black end for COM plug and red end for V/ Ω /Hz/ $^{\circ}$ C/CAP plug). Place the working end (temperature end) of the sensor on or in the measured object. Then read the temperature value (in $^{\circ}$ C) on the display. if needs to measure that " $^{\circ}$ F", AC clamp meter presses the FUNC key cut, AC/DC clamp meter presses the RANGE key cut.

Caution:

When the cold end of the sensor isn't inserted into the meter, the meter can display approximate environmental temperature. K WRNM- 010 bare contact thermojunction has a limiting temperature of 250° C (300° C for short time).

V. Maintenance of meter

 Warning! Switch off the power, the meter pens 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 two new 1.5V batteries size 7(AAA) 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 A pair of meter pens

6.2 One instruction manual

6. 3 Temperature sensors: a pair of sensors (3999 clamp meter)