BM91B Digital Multimeter Operating Instruction

Ⅰ.General introduction

Welcome to use this product!

This product is one kind of 3 6/7 portable multipurpose automatic measuring range instrument, may measure the AC/ DC voltage, the AC/ DC current, resistance, frequency, capacitance, Continuity test, diode. The measuring appliance is loaded with guards against the surge electric discharge, protect the appliance to be more effective. This measuring appliance structure is exquisite, the operation is easy, it is your ideal test service tool!

Ⅱ.Safety Rules and Notes

The design of this measuring appliance conforms to the safety standard of EN61010 CATII 1000V , Please read this handbook carefully before use.

2.1 notes on security mark

⚠ Warning, be careful!

⚠ Danger of being hit by high-pressured electric!

Dual insulation protection.

2.2 when measure, do not surpass the greatest stipulated input value.

2.2 do not surpass 10V voltage to the input end, except the voltage grade

2.4 In the process of measuring, do not turn switch to change the measuring range at random, in case to destroy the measuring appliance.

2.5The measuring appliance can display the mark while the voltage is bigger than DC60V and AC30V, remind the user that the measured voltage has surpassed the safety voltage, please operate carefully.

2.6measuring appliances should avoid the straight sunlight, the high temperature, and moisture.

2.7after use, must release the power switch to turn off the power

2.8 if it doesn't use for a long time, should take out the battery, in case the battery leaks to damage the parts.

Ⅲ. Features

3.1General Features

3.1.1 take the CMOS big scale integrated circuit as the core, in AC / DC voltage, the AC/DC electric current, the resistance, the frequency and the electric capacity measure it can automatically transform the measuring range, making it more convenient.

3.1.2 greatest display: 6000 Counts or 9999 Counts o

3.1.3 has the function of back light, data hold, the maximum/ minimum value hold measure.

3.1.4 automatic cathode display: Displays " - "

3.1.5 batteries insufficient display: Displays "− +".

3.1.6 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 any button to wake up the instrument. If you don't need the automatic sleep mode, you should hold down the SELECT button to turn on the instrument, and then the symbol"⏻" will not be display on the LCD.

3.1.7 working condition：0℃~40℃，75%RH（max）

3.1.8 storage environment：-10℃~60℃，80%RH（max）

3.1.9 battery：AA1.5V×2

3.1.10 external dimensions ： 178(L）85(W）35（H）mm

3.1.11 weight：approximately 280g（contain battery）

3．2 technical index

3．2．1 DCV

Range	Accuracy	Resolution
6V	±(0.5%+5d)	
60V		1mV
600V		10mV
1000V	±(0.8%+5d)	1V

Input resistance：about 10MΩ。

Overload protection :DC/AC peak value1000V。

3．2．2 ACV

Range	Accuracy	Resolution
6V	±(1.2%+5d)	1mV
60V		10mV
600V		100mV
700V	±(1.5%+5d)	1V

Input resistance ： about10MΩ。

Frequency：10Hz~1kHz。

display：TRUE RMS(sinusoidal waveform RMS calibration)。

Overload protection: DC1000V or peak value AC1000V。

3.2.3 DCA

range	Accuracy	Resolution
600μA	±(1%+5d)	0.1μA
6000μA		1μA
60mA	±(1.5%+5d)	0.01mA
600mA		0.1mA
6A	±(2%+5d)	1mA
10A		10mA

Overload protection ：μA/mA:F1 A/250V with fuse ，10A： F10 A/250V with fuse。

⚠greatest input current：10A（less than 10 seconds）。

voltage drop measure：full measure range is 600mV。

3.2.4 ACA

range	Accuracy	Resolution
600μA	±(1%+5d)	0.1μA
6000μA		1μA
60mA	±(1.8%+5d)	0.01mA
600mA		0.1mA
6A	±(3%+5d)	1mA
10A		10mA

Overload protection：μA/mA:F1 A/250V with fuse，10A F1 0A/250V fuse。

Voltage drop measure：full measure range is 600mV(10A is 100mV)。

Frequency：10Hz~1kHz (Warning：Frequency for square wave accuracy is specified from 10Hz to 400Hz)。

display：TRUE RMS(sinusoidal waveform RMS calibration)。

⚠ greatest input electric current：10A（less than 10 seconds）。

3.2.5 resistance Ω

range	Accuracy	Resolution
600Ω	±(0.8%+5d)	0．1Ω
6KΩ		1Ω
60KΩ		10Ω
600KΩ		100Ω
6MΩ		1KΩ
60MΩ	±(2%+5d)	10KΩ

Overload protection ： 250Vvirtual value.

Plough voltage approximately 0.5V

3.2.6 CAP

Range	Accuracy	Resolution
9.999nF	±（3%+20d）	0.001nF
99.99nF	±（3%+5d）	0.01nF
999.9nF		0.1nF
9.999uF		1 nF
99.99uF		10nF
999.90uF		100nF
9.999mF	±（5%+5d）	1uF

Overload protection ： 250Vvirtual value.

3.2.7 **FREQ**

Range	Accuracy	Resolution
99.99Hz	±(0.5%+3d)	0.01Hz
999.9Hz		0.1 Hz
9.999kHz		1 Hz
99.99kHz		10 Hz
999.9kHz		100 Hz
9.999MHz		1k Hz

Overload protection ： 250Vvirtual value, input delicacy:1V。

Caution：if the measured frequency is above 30V, please press "Hz/DUTY" key at AC electric voltage measuring range to get to the frequency function, then carry on measure。

3．2．8 **Diode positive voltage**

Display of similar diode positive voltage. Measuring condition：positive DC electric current 2mA，reverse DC voltage approximate 3.2V。

3．2．9 **Continuity Test**

When the transited resistance is smaller than about 50Ω,the buzzer beeps. Test condition:Open-circuit voltage is about 0.5V.

Ⅳ．Application method

4.1.1 RANGE button

RANGE button for the automatic / manual measuring range button , in the trigger movement way, before start the device it is at the automatic measuring range. It changes to manual measuring range when press it. At manual measuring range it goes upward one gear with one push, after it reaches the top gear, it goes downward to the lower-gear gradually with continuous press, and it takes turns. If press this key over 2 seconds, it changes back to the automatic measuring range condition.

4.1.2 DH/LIGHT button

The DH/LIGHT button is maintenance / the back light control button for the reading.

A.DH reading maintenance

in the trigger movement way, when touches the button lightly, display value is locked and maintained invariably, and shows " DH "on the monitor; When presses again, the fixed condition is relieved, enters into the usual measure condition.

B.LIGHT: back light controls

press LIGHT button more than 2 seconds to open the back light control signal, opens after the back light signal presses more than 2 seconds again switches off the back light control signal. After opening the back light, if don't press the LIGHT button for more than 2 seconds, it will shut off automatically after 10 seconds

4.1.3 SELECT button

The SELECT button: function choice button, in the trigger movement way. may select the pattern: Chooses AC or DC under the DCorAC current; Chooses under the temperature measure condition it needs . in the DC/AC Condition choose, in temperature measure condition choose ℃or ℉.in the Diode/Beeper condition choose Diode or Beeper, in the Ohm/Cap/ Diode/ Beeper condition choose Ohm, Diode or Beeper。

4.1.4 Hz/DUTY button

Hz/DUTY is a choose button of frequency / duty ratio, worked as the way of triggering. Under the pattern of frequency survey, pressing the button can choose the pattern of

frequency or duty ratio. Under the pattern of AC voltage pressing the button can choose the survey pattern of voltage/frequency/duty ratio.

4.1.5 MAX/MIN value hold button

1)Pressing the MAX/MIN button namely enters the MAX pattern, which always maintains the maximum value of measurement.; And the second pressing of the key namely enters the MIN pattern, Press this button again to enter the normal measurement mode.duplicates above circulates.

After entering the pattern of MAX/MIN will automatically enters the manual measuring range. Need to press RANGE key to select suitable range.

4.2 DC/AC voltage measure

turn the Range switch to V and this time the measuring appliance is set as the DC voltage measuring range of automatic shift gears. Insert the black lead into COM jack, and the red lead into V/Ω/Hz jack.

For example, the measuring of DC voltage is to merge the table pen at the beginnings and ends of the measured electric circuit, which can directly read the number on the liquid crystal display monitor.

If one wants to measure the alternating voltage, press SELECT to the pattern of alternating voltage, and then merge the table pen with the measured electric circuit to read the showed number.

If manually choose measuring scope is needed, press RANGE key to choose.

4.3 Measurement of alternating/DC electric current

turn the Range switch to the range of electric current, this time the measuring appliance is set as the direct current automatic shift gears in advance. Insert the black lead into COM jack, and the red lead into 10A orμA/mA jack.

If one wants to measure DC, one can concatenate the table pen with the measured electric circuit, which can directly read the number on the liquid crystal display monitor; If one wants to measure alternating current, press SELECT key to alternating current measuring range, then concatenate the table pen with the measured electric circuit to read the showed number.

If one needs to choose measuring scope manually, press RANGE.

If one does not know the measured electric current scope before survey, one should set the range key to the highest measuring range and adjust downward by the files.

When the display monitor only displays OL, that is to say, the measured electric current has surpassed the measuring range and the switch of measuring range needs to move the high one grade.

μA/mA jack represents that the maximum input current is 600mA. The overload inputs can burn the internal installation fuse out and should be replaced immediately.

10A jack, without a fuse, the time of measuring should be less than 10 seconds to avoid the heating of lines, which would influence accuracy.

4.4 Resistances

1) turn the Range switch to the range to Ω position, and this time the measuring appliance will be set for the resistance measuring range.
2) Insert red lead into the V/Ω/Hz jacks, black lead into " COM " jack.
3) Connect the pen with the beginnings and ends of the test circuit to read the resistance value.
4) If the manual choice measuring range scope is needed, press RANGE to choose.
   When the leads is overloaded input, display monitor can display " OL ".

4．5 Measurement of forward voltage of diode

（1）turn the Range switch to “Ω/ /▶┤” position. press “SELECT”to ▶┤ measuring range

（2）insert the red lead to “V/Ω/Hz”jack，insert the black lead to “COM”jack.（red pen “+”）

（3）connect the test leads to the two ends of the measured to read positive voltage.

(4) when the diode is reverse connected or the input end leads the way, the display monitor can display " OL ".

(5) the diode does not have the simulation strip display.

4．6 Continuity Testing

（1）) Turn the Range switch to “Ω/ /▶┤” position, press“SELECT”key to measuring range.

（2）Insert red lead to “V/Ω/Hz”jack，insert black lead to“COM”jack.

(3)If the measured resistance is less than about 50Ω，the buzzer will beep. This is continuity testing..

⚠Caution：

a. when the input end leads the way, it displays “OL”。

b. the measured circuit should be measured under the off-power condition ，because any overload signal would make the buzzer beep, thus cause wrong measure.

4. 7 Capacitance measure

> ⚠**Warning！** When measure the electric capacity, must guarantee the measured capacitor has sent the electricity out, if the big electric capacity contains the oversized non- electric capacity ingredient, possibly affects the measuring accuracy.

（1）t）turn the Range switch to “┤├”position . General type press“SELECT” to CAP measuring range.

（2）insert the red lead to “V/Ω/Hz”jack，insert black lead to“COM”jack.

（3）connect the test leads to the two ends of the measured capacitor，could get the capacity value.

（4）capacity position can not set the measuring range manually, no simulation strip display. when the capacity value is big, the measure may need about 10 seconds .

4．8 frequency/DUTY measure

（1）) turn the Range switch to Hz measuring range.

（2）insert red lead to“V/Ω/Hz/CAP”jack，insert black lead to “COM”jack.

（3）connect the test lead to the measured circuit ，get the frequency value. press Hz/DUTY”key，it displays“Hz”,change it to “%”to get the ratio.

⚠ Caution: (1)Frequency grade can not set measuring range manually, no simulation strip display.

(2)If the measured frequency is above 30V, please press “Hz/DUTY” key at “ACV” measuring range to frequency function for measure. By this method, it can bear 700V voltage，in case the voltage is too high to damage the meter . it can reduce the voltage to the best range IC is able to deal.

4.9 NON CONTACT VOLTAGE TESTING

Turn the Rotary switch to the “NCV” function, then the LCD display “EF”, plug red test lead in the “VΩ” terminal and black lead without being used,place the red test lead near the electric line, switch,or socket,the phase metal terminal ,When the AC voltage is detected, the meter displays "----". When the sensed voltage is higher, the number of "-" is displayed, the denser the sound accompanying the buzzer sounds.

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

4.10 output frequency

turn the Range switch to the range to“ OUT ” position, At this time, the output frequency is 50Hz. use other frequency, press the SELECT button. , Connect the probe to the desired circuit.

⚠Note: It is not allowed to input voltage in square wave output range.

Ⅴ．Maintenance

> ⚠**warning！** before open the cover or the battery cover, cut off the power source and test pen and any input signal, in case electric shock.

5．1 when the meter displays “ ”，must replace the battery. Open the battery cover, replace with the same type new battery to keep it work well.

5．2 keep the meter and test pen clean, dry and not damaged, could use the clean cloth or cleanser to clean the cover，do not use abrasive or solvent.

5．3 avoid damage, shake, shock，avoid high temperature and strong magnetic field.

5．4 should be corrected at least once per year

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