830L+ Digital Multimeter Operation Manual

It's very helpful that reading the operation manual to familiar with how to operate and maintenance the device before operation.

1. Appearance Introduction

1-1. Display

3½ LCD with 20mm high figure display.

1-2. Function Keys

SELECT: select ➔ or ·))) function under ➔·))) status. The device goes to sleep when stopping the operation for 15 minutes, and re-powers on when press the function key or toggle the function switch.

HOLD/☀:
(1) Data hold: press this key for a short time, the current measuring value of the device will be hold on the LCD and "H" symbol will be displayed. Press it again can exit the HOLD mode.
(2) Backlight: press this key for more than 2 seconds to turn on the LCD backlight. The LCD backlight will be turned off automatically after 15 seconds, or turned off by press this key again for more than 2 seconds.

1-3. Range rotary switch

This device is adapting rotary type switch, it combines function selection, range selection and power switch into one role. To extend the battery life, the rotary switch should be turned to "OFF" position if the device is not be used.

1-4. Input Terminal

"VΩmA": Input terminal for Voltage, Resistance and less than 200mA current.
"COM": Input terminal for common GND.
"10A": Input terminal for more than 200mA current.
"NPN/PNP": Input terminal for triode measurement.

1-5. The top of the LCD is non-contact voltage (NCV) detector area.

1-6. Holster and battery door.

2. General Features

Display: 3½ LCD, Max. display 1999.
Polarity: Automatic polarity display.
Over-range display: Display "1".
Working environment: (0~40)℃, relative humidity <75%.
Storage environment: (-15~50) ℃.
Battery: 2pcs 1.5V battery ("AAA" 7# battery).
Battery life: About 200 hours for alkaline battery, and 100 hours for carbon battery.
Dimension&Weight: 140mm(L) x 72mm(W) x 37mm(H), N.W: 195g
Low battery indication: LCD displays "🔋"

3. Technical Features

Environment condition: Temperature: 23℃±5℃, Relative humidity: <75%. Accuracy: ± (a% × reading data + digits), one year guarantee since production date.

3-1. DCV

Range	Resolution	Accuracy
200mV	100uV	
2000mV	1mV	
20V	10mV	±(0.5% reading + 4)
200V	100mV	
600V	1V	

Input impedance: 200mV range >40MΩ, other ranges is 10MΩ.
Overload protection: 600V DC/AC RMS.

3-2. DCA

Range	Resolution	Accuracy
20uA	10nA	
2mA	10uA	±(1.0% reading + 5)
200mA	100uA	
10A	10mA	±(2.0% readomg + 5)

Overload protection: 0.2A/250V fuse, 10A/250V fuse.

3-3. ACV

Range	Resolution	Accuracy
200V	100mV	±(1.0% reading + 6)
600V	1V	

Frequency response: 40-400Hz.
Overload protection: 600V DC RMS or AC RMS.
Displaying: True RMS response (calibration based on sine wave RMS).

3-4. Resistance

Range	Resolution	Accuracy
200Ω	0.1Ω	±(0.8% reading + 5)
2kΩ	1Ω	
20kΩ	10Ω	±(0.8% reading + 1)
2MΩ	1kΩ	
200MΩ	100kΩ	±(1.2% reading + 5)

Open circuit voltage: ＞500mV
Overload protection: 250V DC/AC peak value.

3-5. Transistor (hFE)

Measurement	Range	Test conditions
hFE NPN or PNP	0～1000	Base current is approx 15µA, Vce is about 1.2V

3-6. Diode and Continuity Test

Measurement	Range	Test conditions
➔·)))	Diode forward voltage drop	Forward DC current: 0.8mA, open circuit voltage: 2.2V.
	When the resistance under test is less than 50Ω, buzzer sounds continuously.	Open circuit voltage: 2V

Overload protection: 250V DC/AC peak value.
WARNING: Do not input any voltage at this range!
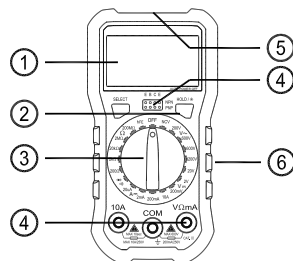
4. OPERATION

4-1. DCV measurement

A. Insert the red test lead into "VΩmA" terminal, and the black one into "COM" terminal;

B. Turn the rotary switch to DCV position and select the proper range, if users not sure about the range, then select the highest range;

C. Connect the red and the black test leads to the tested circuit.

4-2. DCA measurement

A. Insert the black test lead into "COM" terminal and the red one into "VΩmA" terminal (less than 200mA) or into "10A" terminal (more than 200mA);

B. Turn the rotary switch to the proper DCA range position;

C. Connect the red and the black test leads to the tested circuit.

4-3. ACV measurement (TRMS)

A. Insert the red test lead into "VΩmA" terminal, and the black one into "COM" terminal;

B.   Turn the rotary switch to the proper ACV range position;

C.   Connect the red and the black test leads to the tested circuit.

4-4. Resistance measurement

A.   Insert the red test lead into "VΩmA" terminal, and the black one into "COM" terminal;

B.   Turn the rotary switch to the proper resistance range position;

C.   Connect the test leads to two points of the tested resistor.

4-5. Transistor hFE measurement

A.   Switch the rotary to hFE range;

B.   Define the transistor is NPN or PNP type, then insert the emitter, base and collector separately in the relative
   hole.

4-6. Diode and Continuity test

A.   Insert the red test lead into "VΩmA" terminal, and the black one into "COM" terminal;

B.   Switch the rotary to Diode range. Forward measurement: LCD will display the approx. value of forward voltage
       drop; Backward measurement LCD will display "OL".

C.   Connect red and black test leads to two points of tested circuir, if the resistance is less than about 400Ω, the
       buzzer sounds.

4-7. Non-contact voltage detector

WARNING: This function could be affected by different external interference sources, and then the alarm is activated
by wrong signal. Even if there is no voltage indication, there may be voltage on the circuit. NCV detector is not the
only way to detect if there is voltage. The Measurement result is for reference only.

Turn the rotary function switch to "NCV" position. When the testing circuit is placed above the meter and when the
meter sensor detects voltage, the indicator lights on and the buzzer alarms.

5.   Replace the Battery and the Fuse
When "⸬" symbol is displaying, you should replace the battery in time;
If there is no current input when testing the mA current, you should check if the fuse is damaged. if it's damaged,
please replace the fuse with same type and specification. When replacing the fuse, screw off the fixing screws and
remove the back cover before replacement.