

## OPERATION MANUAL OF DIGITAL LCR METER

### 1. GENERAL DESCRIPTION

This 3 1/2 digital LCR meter with highly stable performance and unit symbol display function is driven by 9V battery. It has wide measurement ranges for measuring inductance, resistance, and capacitance. It's widely applied in labs, production line, maintenance locations and schools. It holds low resistance range, especially adapted to the measurement of electric heating components. It's also an ideal tool for testing SMD type components. In addition, the meter offers advanced features, such as capacitor self-discharge function. It can discharge the capacitor automatically, and protect the meter from the damage caused by voltage. But if the voltage carried by the capacitor is higher than 250V, please discharge the capacitor manually.

This operating manual covers information on safety and cautions. Please read the relevant information carefully and observe all the cautions and notes strictly. Please read this operation manual carefully before your operation!

### 2. CHARACTERISTICS

#### 2-1. General characteristics

Display: LCD Max. display: 1999

Inductance measurement: 0.1uH~20H

Capacitance measurement: 0.1pF~2000uF

Resistance measurement: 0.01Ω~20MΩ

Zero adjustment: To obtain accurate measuring values, perform zero adjustment before measuring capacitance under 20nF

Over range: display "1"

Low battery indicator: "⚡" symbol appears

Sampling rate: 0-5 seconds

Working temperature: 0~40℃

Relative humidity: less than 80%

Meter size: 185mm×93mm×35mm (length × width × height)

Weight: Approx.290g (including 9V battery)

Power source: one 9V battery (6F22 or equivalent)

Battery life: alkaline battery lasts 150 hours

Standard accessories: test leads, operation manual

#### 2-2. Electric characteristic

Accuracy: ± (a% of reading+ digits) at 23 ± 5℃, relative humidity<75%. One year guarantee since production date.

##### 2-2-1. Capacitance

Range	Accuracy	Resolution
200pF	±(2.0%+5)	0.1pF
2nF		1pF
20nF		10pF
200nF		100pF
2μF		1000pF
20μF		0.01μF

200μF		0.1μF
2000μF	±(5.0%+5)	1μF

##### 2-2-2. Inductance

Range	Accuracy	Resolution
200uH	±(3.0%+5)	0.1uH
2mH		1uH
20mH		10uH
200mH	±(2.0%+5)	100uH
2H		1mH
20H		10mH

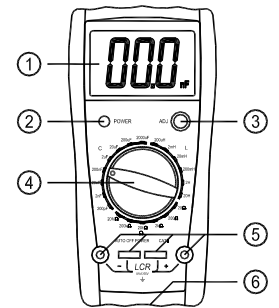
##### 2-2-3. Resistance

Range	Accuracy	Resolution
20Ω	±(1.0%+5)	0.01Ω
200Ω		0.1Ω
2kΩ		1Ω
20kΩ	±(0.8%+2)	10Ω
200kΩ		100Ω
20MΩ		10kΩ

### 3. OPERATION INSTRUCTION

#### 3-1. Panel description (SEE PIC.1)

- 1) LCD display: LCD displays measuring value, unit and "⚡" symbol.
- 2) Power on/off button: turn on/off the meter.
- 3) Zero adjustment knob/ "ADJ" knob: To obtain accurate measuring values, perform zero adjustment before measuring capacitance under 20nF.
- 4) Function knob: Selects the range for the desired measurement.
- 5) Slot and jack: input terminal.
- 6) Battery case.



#### 3-2. Cautions before measurement

- To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.
- Disconnect all the measuring components before switching the function knob.
- To avoid damage to the meter or to the equipment under test, disconnect circuit power and discharge all high-voltage (higher than 250V) capacitors before measurement. DO NOT connect the test terminal with voltage source, and do not measure the capacitor in circuit. Even if it can get readings, it will cause the big error and damage the meter (when the circuit is not powered off or there exists voltage, or the capacitor isn't discharged completely).
- Capacitance measurement can't be used to check the quality of the capacitor. It may get a false reading when it measures the capacitance value of a resistor.
- Be sure to observe the proper polarity if the capacitor is a polarized type. Use the red test clip to clip the capacitor's positive and the black test clip to clip the capacitor's negative when the capacitor has polarity.
- Do not short the test leads, otherwise it will cause dissipation of large current, and make over range display in all ranges.
- It may fail to zero adjust ranges under 20nF when SMD test clip is used (the clip's capacitance is bigger than 20pF).
- Inductance measurement can't be used to check the quality of inductor. It may get a false reading when it measures the inductance value of a resistor.

- Do not measure the capacitor in circuit. Even if it can get readings, it will cause the big error and damage the meter (when the circuit is not powered off or there exists voltage.)

### 3-3. Capacitance measurement

- 1) Set the function knob to a proper capacitance range.
- 2) To obtain accurate measuring values, perform zero adjustment before measuring capacitance under 20nF. Slowly turn the “zero adjustment knob” to calibrate the display until the LCD shows “000”. (Please perform the zero adjustment with test leads or SMD test clip inserted in).
- 3) Insert the capacitor into the slot or clip the capacitor with test clip, the value will be displayed on LCD with the unit of the selected range. If LCD displays “1”, it means over range. If there is “1” or “00” before the digit, choose a lower range to increase the resolution and accuracy.

#### Note:

- 1) If the value of capacitor to be measured is unknown, choose the lowest range 200pF and increase the range step by step until a satisfactory reading is obtained and the over range symbol “1” is disappeared.
- 2) If capacitor is breakdown, LCD will display over range symbol “1” in all ranges. If capacitor has small leakage, LCD will display over range symbol “1” or a big capacitance value which is much bigger than the normal value. If capacitor is open-circuit, LCD will display “0” at all ranges.
- 3) When measuring the small (pF) capacitance, to minimize the effect of capacitance stored in the test clips, the test clips should be as short as possible and try to use the slot if it is possible. Keep the test clips close to the pins of capacitor under measuring, and then perform zero adjustment. Make sure the distance between test clips isn’t change when you measure the capacitor, thus can get a accurate value.
- 4) Some test leads may carry large capacitance, if it can’t be calibrated by “ADJ” knob, you should remember the capacitance value, and then deduct it from your test results.
- 5) Some capacitors especially the electrolytic capacitor will have large capacity. Don’t be surprised if the test result is much bigger than the nominal value. Usually the test result is rarely smaller than the nominal value.
- 6) To check the existence of leaky capacitor, switch the function knob to different capacitance ranges. If the test value has significant difference, it means there is a leaky capacitor. The difference increases proportionately with the capacitance of leaky capacitor.

### 3-4. Inductance measurement

- 1) Set the function knob to a proper inductance range.
- 2) Insert the inductor into the slot or clip the inductor with test clip, the value will be displayed on LCD with the unit of the selected range. If LCD displays “1”, it means over range. If there is “1” or “00” before the digit, choose a lower range to increase the resolution and accuracy.

#### Note:

- 1) If the value of inductor to be measured is unknown, choose the lowest range 200uH and increase the range step by step until a satisfactory reading is obtained and the over range symbol “1” is disappeared.
- 2) To avoid extra induction, use the test leads as short as possible when measuring small inductor.
- 3) Inductance measurement can’t be used to check the quality of inductor. It may get a false reading when it measures the inductance value of a resistor.

### 3-5. Resistance measurement

- 1) Set the function knob to a proper resistance range.
- 2) Insert the resistor into the slot or clip the resistor with test clip, the value will be displayed on LCD with the unit of the selected range. If LCD displays “1”, it means over range. If there is “1” or “00” before the digit, choose a lower range to increase the resolution and accuracy.

#### Note:

- 1) Before measuring the resistance under 200Ω, short the test leads first to get the wire resistance value, and then deduct it from the test results to obtain accurate measuring values.


### 4. AUTO POWER OFF

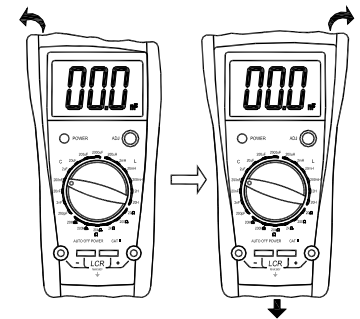
When there is no measurement in 20 minutes, the meter will auto power off and enter dormancy mode. Press power button will exit the dormancy mode. It won’t power off when LCD displays values bigger than 20% of the Max value at this range.

### 5. MAINTENANCE

The meter is a precise instrument. Random changes to the circuit are not allowed.

#### Note:

- 5.1 Keep the meter away from water, dust and shock.
- 5.2 Don’t expose the meter under high temperature, high humidity, combustible, explosive and strong magnetic place.
- 5.3 Wipe the case with a damp cloth and detergent. Do not use abrasives and alcohol to clean the meter.
- 5.4 To avoid leakage damage, remove the battery if the meter will not be used for a long time.
- 5.5 When  symbol is displayed, please replace the battery according to the following steps:
  - 5.5.1 Follow the picture, and remove the holster at first.
  - 5.5.2 Unlock the battery door and remove the cover.
  - 5.5.3 Replace the old battery with the new one. For longer using life, it's better to use alkaline battery.
  - 5.5.4 Fix the battery door.
  - 5.5.5 Follow the picture to put on the holster



- The specifications are subject to changes without prior notice.
- The content of this manual is regarded as correct. If users find out any mistakes or omissions, please kindly contact the manufacturer.
- The manufacturer will not be responsible for accidents and damage caused by improper operations. The functions described in this User Manual shall not be considered as the reason for any special usages.