DM-BM4070, Digital LCR Meter Manual

I. Overview

This is an inductance, capacitance and resistance measuring meter, it is a special digital instrument which is easy to operate, the reading accuracy degree is higher with liquid crystal display 3 1/2. It adopted double integral A/D converter core and a large-scale integrated circuit; these make the meter an excellent performance instrument for the users.

II. Safety Information

Please read the safety note before use:

1. **Do not input either AC or DC voltage**
2. **When measuring capacitance, the capacitor should be fully discharged, to avoid electric shock or damaging the instrument**
3. **When changing switching function, the test lead should be removed from the test points**
4. **Make sure you have selected the right function, to avoid misoperation.**

III. Features

3.1 General

1. Display: LCD
2. Biggest display value 1999 (3 1/2)
3. Measuring method: Double integral A/D conversion
4. Sampling rate: 3 times per second
5. Overrange display: "1" at the highest digital place
6. Instruction for low voltage of battery:
    - Showing "  "
7. Auto power off and Data Hold Function
8. Working temperature: 0 ℃ to 40 ℃
9. Storage temperature: -10 ℃ to 50 ℃
10. Power: A 9V laminated battery (6F22)
11. Accessory list:
    - 1x Instruction manual
    - 1x pair of alligator clips
    - 1x 9V battery

3.2 Technical Specifications

Key aspects:

Accuracy ± (%reading + digits)
Quality Guarantee: 1 year
Environment temperature: 23 ℃ ± 5 ℃
Relative humidity: <75%

3.2.1 Capacitance

Range	Accuracy	Resolution
200 pF	± (2.5%+5)	0.1 pF
2 nF		1 pF
20 nF		10 pF
200 nF		100 pF
2 μF		1 nF
20 μF		10 nF
200 μF		100 nF
2000 μF	± (5%+5)	1 μF

3.2.2 Inductance

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

3.2.3 Resistance

Range	Accuracy	Resolution
200 Ω	± (0.8%+2)	0.1 Ω
2 kΩ		1 Ω
20 kΩ		10 Ω
200 kΩ		100 Ω
20 MΩ	± (1.5%+5)	10 kΩ

3.2.4 Forward voltage drops of diode

Range	Instruction	Testing condition
—▶⊢	Display forward voltage approximation of diode	Forward voltage of DC: Approx. 1 mA Reverse voltage of DC: Approx. 3V

IV. Operation

4.1 Testing note

1. Do not apply voltage to the input socket, to avoid damaging the instrument
2. Inductors, capacitors meter is used for measuring the inductance of inductors and capacitance of capacitor, it cannot be used to measure quality factor of wattless part, when measuring the inductance or capacitance which contains a component of resistance, it may get the wrong reading.
3. When measuring the parameters of the component in the circuit, the power should be cut off and remove incentives before connecting test lead.
4. For every measurement, you have inserted the black test lead into negative (-) terminal and red test lead into the positive (+) terminal.
5. It is prohibited to short the circuit of input terminal when measuring inductance and capacitance, short-circuit for a long time may rapidly consume the battery power and may cause internal burning.

4.2 Capacitance measurement

1. The capacitor should be fully discharged
2. Set the range switch to the proper capacitance range. Insert the black test lead of the alligator clip into negative (-) end and red test lead to positive (+) end, connect the capacitor pin to the relative input terminal
3. If the display shows "1", it indicates that the measurement is overrange, in other words you should choose the higher range. If the display shows one or more zero before the displaying value, you should choose a lower range to increase resolution to get higher accuracy.

4.2.1 Note:

1. When it is not showing zero, please adjust the zero-knob until it shows zero.
2. When using the test wire, a stray capacitance value is introduced, the measurement value should subtract the value.
3. When measuring small capacitance, you should particularly use short wire to prevent stray capacitance.
4. If the measuring value shows zero for all range when measuring an open-circuit capacitor, or shows an unstable value when it is at the large capacitance range, then there are two possible outcomes: one there is a

serious leakage or two, use another instrument that measures the capacitance to confirm.

4.3 Inductance measurement

1. Set the range switch to the proper inductance range. Connect alligator clip to both terminals of the inductor.
2. If the display shows "1", it indicates that the measurement is surpassing the measuring range, you should select a higher range, if the display shows one or more zero before the displaying value, you should choose a lower range to increase resolution to get a higher accuracy.

4.3.1 Note:

1. If the value of inductance is not accurately displayed on the LCD display, keep increasing the range gradually through the knob from 200 uH until the overload signal is no more and displays normal value.
2. When 2 mH range is under use, the test wire should be short-circuited firstly to get the inductance value, the final measurement of the inductor will be deducted from the value of the test wire.
3. This instrument cannot be used to measure the quality factor of inductors, the measuring inductance is varied when there is different impedance in the same inductor, you may get the wrong value if you are measuring the inductance of the resistance.

4.4 Resistance measurement

1. Set the range switch to the desired resistance range position. Connect alligator clips across the resistance
2. If the display shows "1", it indicates that the measurement is surpassing the measuring range, you should select a higher range, if the display shows one or more zeros on the displaying value, you should choose a lower range to increase resolution to get a higher accurate result.

4.4.1 Note:

1. When measuring resistance below 200 Ω, you should short the circuit of the alligator clip and get the resistance value of the alligator clip. The final measurement will be deducted from the value of the alligator clip.

4.5 Diode measurement

1. Connect the black test wire of the alligator clip to the negative (-) terminal and the red to the positive (+) terminal.
2. Set the range switch at the —▶⊢ symbol of the LCR tester, connect the alligator clips respectively across the diode.

4.5.1 Note:

1. If the input is an open circuit, the instrument will display an overrange value of "1" at the left most digit.
2. The display value is forward voltage drop value, should the diode be reversely connected, it will display overrange value of "1" at the left most digit.

V. Maintenance:

1. The meter is of highly accurate electronic apparatus, do not change the internal circuit.
2. Don't use the meter when the back cover doesn't cover the meter well.
3. Pay attention to the situation of the 9V battery, if it is lacking power, low battery "  " signal will be showed on the LCD. Change the same type of battery quickly.