sanwa

CP-7D

MULTITESTER

INSTRUCTION MANUAL

CONTENTS

[1] INTRODUCTION

You are kindly requested to read this Instruction Manual carefully before starting to use Multitester CP-7D so as to ensure its safety.

Keep this manual together with the meter not to lose it.

[2] APPLICATION AND FEATURE

Application:

This instrument is portable multitester designed for measurement of weak current circuits. The tester is suitable for measuring small type communication equipment, electrical home appliance, lighting voltage and batteries of various types

Feature:

This tester is only 23mm thick even with the test lead attached. It is 119mm high and 82mm wide, so it fits well into a palm.

[3] SAFETY INFORMATION

Following description is intended to protect operators from such injury as burn and electric shock. Be sure always to observe it at the time of using this instrument.

⚠ DANGER

1. **Do not use the tester for the measurement of electric circuits of a large capacity. The fuse contained in the tester is rated as 250V (breaking capacity 500A). Avoid measuring such circuits as there may be some problem that jeopardizes safety measurement due to a possible error in setting range.**
2. **Be sure to use a fuse of the specified rating and type (0.5A/250V, ϕ5mm, 20mm long). Never use a substitute or short the circuit.**

⚠ WARNING

1. Never operate the tester with wet hands, at places with high humidity or much moisture. You may get electric shock.
2. Do not touch the test pins during measurement.
3. There is a danger of electric shock. Exercise special care when measuring voltage above 60V DC or 25 Vrms AC.
4. The repair and redesign works call for our service man.
5. Do not make a measurement with the rear case or the meter cover removed.
6. Each time you make a measurement, be sure to check ranges. Measurement with erroneous range setting or beyond the measuring range is hazardous.
7. Make sure that the coating of the cord of the test lead is not damaged or conductor is not exposed. If they are damaged or exposed, do not use the tester.
8. Take care not to cause an overloaded state when measuring voltage or current containing pulsating currents of pulses.
9. Indoor use.

⚠ CAUTION

1. Make sure that the case is not damaged by dropping. If it is damaged or displaced, do not use the tester.
2. It is highly recommended that the tester be calibrated and inspected at least every 6 months or a year to maintain the accuracy and ensure safety.

[4] HOW TO MEASURE

4-1 Meter 0 Correction

The meter-0 corrector is turned to the right and left and the meter pointer is adjusted to stay exactly on zero of the scale left.

4-2 Range Selection

The range being used is selected by turning the range selector knob in either direction. The range is classified into DC voltage (DCV), DC current (DCmA), AC voltage (ACV), resistance (Ω) and ⊣1.5V⊢ for checking the battery power.

4-3 Connections of Test Leads

The test leads paired are inserted in the jacks with their polarity to agree with that of the jacks. Insert them well down in the jacks, and they would hardly come off. Make a point of using the test leads (TL-84) attached: none others available on the market would fit in.

4-4 Fuse Continuity Test

The fuse contained, if blown out, misjudges the presence of power on the meter: the operator can be in danger of getting an electric shock. A simple way of checking the fuse continuity is to short together the test leads on an ohm range and see if the pointer deflects. If it does, the fuse is OK. The fuse blown should be replaced with a 0.5A miniature fuse.

4-5 Measuring DCV

1. Set the range selector knob to an appropriate DCV range.
2. Apply the black test lead to the minus potential of the measured circuit and the red one to the plus potential of the circuit.
3. Read out the swing of the pointer.

4-6 Measuring ACV

1. Set the range selector knob to an appropriate ACV range.
2. Apply the test leads to the measured circuit.
3. Read out the swing of the pointer.

4-7 Measuring DCA

1. Set the range selector knob to an appropriate DCmA range.
2. Measure current by connecting the meter in series with the load. Apply the black test lead to the minus potential side of the measured circuit and the red one to the plus potential side.
3. Read out the swing of the pointer.

4-8 Measuring Ω

1. Set the range selector knob to an appropriate Ω range.
2. Short the red and black test leads and turn the 0Ω adjuster knob until the pointer points to 0Ω. Replace the built-in battery with a fresh one when the pointer fails to swing to 0Ω even after having turned the 0Ω adjuster knob clockwise fully.
3. Apply the test leads to the measured resistance.
4. Read out the swing of the pointer on the Ω scale.

Caution **When the Ω range is used, polarity turns reverse to the indicated polarity of the measuring terminals. Take care when semiconductors are measured.**

4-9 Measuring Battery Load Voltage (1.5V)

The tester can determine the exhaustion level of manganese batteries (SUM-1/R20, SUM-2/R14, SUM-3/R6) and alkaline batteries (LR20, LR14, LR6) by measuring their voltage when the load is 10Ω. (Use the DC 2.5V range for measuring button batteries and other small current batteries.)

1. Set the range selector knob to 1.5V.
2. Apply the test leads to the measured battery.
3. Read out the scale 0.9–1.5V directly in 1.5V .

4-10 Measuring Load Current (LI)

It is necessary to know load current (LI) well when measuring the resistance of thermistors or extremely fine wire coils because their resistance may vary when they are heated by measuring current. How to measure load current is to take readings of the pointer swing on LI scale in Ω range.

In Ω x 1 range, read out measured value on 0–7.4 in mA unit after multiplying it by 10. Accordingly, the measuring range is 0–74mA. In Ω x 10 range, read out measured value on 0–7.4 in mA unit directly. In kΩ range, read out measured value on 0–150 in μA unit directly.

4-11 Measuring Low Frequency Output (dB)

1. Measuring method is same as that in ACV.
2. The dB scale corresponds to AC10V scale and is graduated as 0 dB = 0.775V. So the output of 600Ω impedance circuit alone can be obtained as dB value, as 0 dB = 1 mW.

[5] SPECIFICATIONS

Fuse	0.5A • 250V φ5 x 20mm
Battery	R6 (IEC) or UM-3 1.5V
Frequency characteristic range	30Hz~100kHz (10VAC range)
Operating temperature humidity range	23±20°C 80% RH max. No condensation
Dimensions & weight	119 x 82 x 23 mm 140g
Accessories	A set of test leads (TL-84 type), one copy of instruction manual

Measuring Range

DCV	0.25-2.5-10-50-250-500 (Input impedance: 4kΩ/V)
DCmA	0.25-25-500 Voltage drop: 250mV (Fuse resistance not included)
ACV	10-50-250-500 (Input impedance: 4kΩ/V)
Ω Load current (LI)	x1-x10-kΩ 0-74mA-7.4mA-150μA
Battery load voltage	0.9~1.5V
dB	−20~36

Allowance

DCV• mA	Within ±3% fs
ACV	Within ±4% fs
Ω	Within ±3% of arc

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⑦ 02.05 Ⓜ