

[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 23 mm thick even with the test lead attached. It is 119 mm high and 82 mm 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 250 V (breaking capacity 500 A). 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 (0.5 A/250 V, ϕ 5 mm, 20 mm long). Never use a substitute or short the circuit.

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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 $\Omega \times 1$ range, read out measured value on 0-7.4 in mA unit after multiplying it by 10. Accordingly, the measuring range is 0-74 mA. In $\Omega \times 10$ range, read out measured value on 0-7.4 in mA unit directly. In $k\Omega$ range, read out measured value on 0-150 in μ A unit directly.

4-11 Measuring Low Frequency Output (dB)

1. Measuring method is same as that in ACV.
2. The dB scale corresponds to AC 10 V scale and is graduated as 0 dB = 0.775 V. So the output of 600 Ω impedance circuit alone can be obtained as dB value, as 0 dB = 1 mW.

[5] WARRANTY AND PROVISION

Sanwa offers comprehensive warranty services to its end-users and to its product resellers. Under Sanwa's general warranty policy, each instrument is warranted to be free from defects in workmanship or material under normal use for the period of one (1) year from the date of purchase.

This warranty policy is valid within the country of purchase only, and applied only to the product purchased from Sanwa authorized agent or distributor.

Sanwa reserves the right to inspect all warranty claims to determine the extent to which the warranty policy shall apply. This warranty shall not apply to fuses, batteries and test leads.

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⚠ WARNING

To ensure that the meter is used safely, follow all safety and operating instructions.

1. Never use meter on the electric circuit that exceed 6 kVA.
2. Pay special attention when measuring the voltage of AC 30 Vrms (42.4 V peak) or DC 60 V or more to avoid injury.
3. Never apply an input signals exceeding the maximum rating input value.
4. Never use meter for measuring the line connected with equipment (i.e. motors) that generates induced or surge voltage since it may exceed the maximum allowable voltage.
5. Never use meter if the meter or test leads are damaged or broken.
6. Never use uncased meter.
7. Be sure to use a fuse of the specified rating or type. Never use a substitute of the fuse or never make a short circuit of the fuse.
8. Always keep your fingers behind the finger guards on the probe when making measurements.
9. Be sure to disconnect the test pins from the circuit when changing the function or range.
10. Before starting measurement, make sure that the function and range are properly set in accordance with the measurement.
11. Never use meter with wet hands or in a damp environment.
12. Never use test leads other than the specified test leads.
13. Never open tester case except when replacing batteries or fuses. Do not attempt any alteration of original specifications.
14. To ensure safety and maintain accuracy, calibrate and check the meter at least once a year.
15. Indoor use.

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[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 $\sqrt{15V}$ 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 0.5 A 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.

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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 0 Ω adjuster knob until the pointer points to 0 Ω . Replace the built-in battery with a fresh one when the pointer fails to swing to 0 Ω even after having turned the 0 Ω 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 ($\sqrt{15V}$)

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 10 Ω . (Use the DC 2.5 V range for measuring button batteries and other small current batteries.)

1. Set the range selector knob to $\sqrt{15V}$.
2. Apply the test leads to the measured battery.
3. Read out the scale 0.9-1.5 V directly in $\sqrt{15V}$.

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[6] SPECIFICATIONS

Fuse	0.5 A · 250 V ϕ 5 x 20 mm Fast fuse
Battery	R6 (IEC) or UM-3 1.5 V
Frequency characteristic range	30 Hz~100 kHz (10VAC rang) \pm 3 % F.S.
Operating temperature humidity range	0~43 °C 80 % RH max. No condensation
Dimensions & mass	119 x 82 x 23 mm 140 g
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: 4 k Ω /V)
DCmA	0.25-25-500 Voltage drop: 250 mV (Fuse resistance not included)
ACV	10-50-250-500 (Input impedance: 4 k Ω /V)
Ω Load current (LI)	2 k(x1)/20 k(x10)/1 M(k Ω) 0-74 mA-7.4 mA-150 μ A
Battery load voltage	0.9~1.5 V
dB	~20~36

Allowance (23 \pm 2 °C, 75 % RH max. no condensation)

DCV· mA	Within \pm 3 % fs
ACV	Within \pm 4 % fs
Ω	Within \pm 3 % or arc

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MEMO

sanwa.

保証書	
ご氏名	型名 CP-7D
ご住所	製造No.
□□□-□□□□	この製品は厳密なる品質管理を経てお届けするものです。 本保証書は所定項目をご記入の上保管していただき、アフターサービスの際ご提出ください。 ※本保証書は再発行はいたしませんので大切に保管してください。
TEL	三和電気計器株式会社
保証期間	本社=東京都千代田区外神田2-4-4 電波ビル 郵番号=010-0021 電話=東京(03)3253-4871(FX)
ご購入日	年 月より3年間

保証規定

保証期間中に正常な使用状態のもとで、万一故障が発生した場合には無償で修理いたします。ただし下記事項に該当する場合は無償修理の対象から除外いたします。

記

1. 取扱説明書と異なる不適当な取扱いまたは使用による故障
2. 当社サービスマン以外による不当な修理や改造に起因する故障
3. 火災水害などの天災を始め故障の原因が本計器以外の事由による故障
4. 電池の消耗による不動作
5. お買上げ後の輸送、移動、落下などによる故障および損傷
6. 本保証書は日本国内において有効です。
This warranty is valid only within Japan.

年 月 日	修理内容をご記入ください。

※無償の認定は当社において行わせていただきます。