

DIGITAL CLAMP METER DCM 2000

INSTRUCTION MANUAL

This manual describes the clamp meter DCM2000, a digital clamp meter for low voltage circuits.

Prior to using your new meter, please read this manual thoroughly to ensure safe use.

Please keep this manual together with the meter.

sanwa
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Printed in Japan.

[1] SPECIFICATIONS

Measuring ACA : AC clamp CT.

Measuring method : Integral method.

Display : 3.5 digits, max. display [1999], with a unit sign.

Max. conductor diameter to clamp : $\phi 55\text{mm}$

Input over indication : Most significant digit "1" flicker (except for 600V range).

Date hold : "DH" mark lights and the display held.

Battery voltage display : "B" mark lights when approx. 1.2V less.

Sampling rate : Twice/sec.

Working circuit voltage : 600 VAC max.

Applicable standard : IEC1010-2 CAT. III-2

Withstand voltage : 5550 VAC/80 sec. (Iron core~rear case)

Applicable height : Up to 2000m (above sea level)

Working temperature and humidity : 0~40°C, 80%RH max.

Storage temperature and humidity : -10~60°C, 70%RH max.

Power supply : RO 3 (1.5V) \times 2

Power consumption : Approx. 5mW. (continuously 500 hours)

Dimensions : 240(H) \times 85(W) \times 34(D)mm

Weight : Approx. 350 g

Accessories : Carrying (soft) case \times 1, instruction manual \times 1



CAUTION--GENERAL PRECAUTIONS FOR HANDLING

- ① Vibration and shock : It is a cause of failure.
- ② Environment : DO not keep the meter for long hours in places under direct sunlight or hot (over 60°C) or humid (over 85%) places or places where condensation will occur.
- ③ Battery replacement : Setting the battery with their polarities (\oplus , \ominus) reversed may damage the circuit components in the meter.
- ④ When the meter is not used for measurement, be sure to keep the power switch at OFF.


[2] BATTERY REPLACEMENT

⚠ WARNING

Hazard of electrical shock.

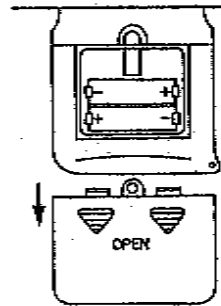
- ① Do not attempt to replace the batteries while the meter is clamping a wire or measuring a voltage.
- ② Do not use the meter with the battery case removed.

⚠ CAUTION

- ① If the batteries are consumed and drop below the operating voltage, the symbol  lights in the display. Immediately replace the batteries with new ones.
- ② Do not use a new battery and an used battery together or different types of batteries together.
- ③ If the meter is not used for a long time, remove the batteries and keep them in a safe place.
If they are left in the meter, the liquid may leak to damage the meter.

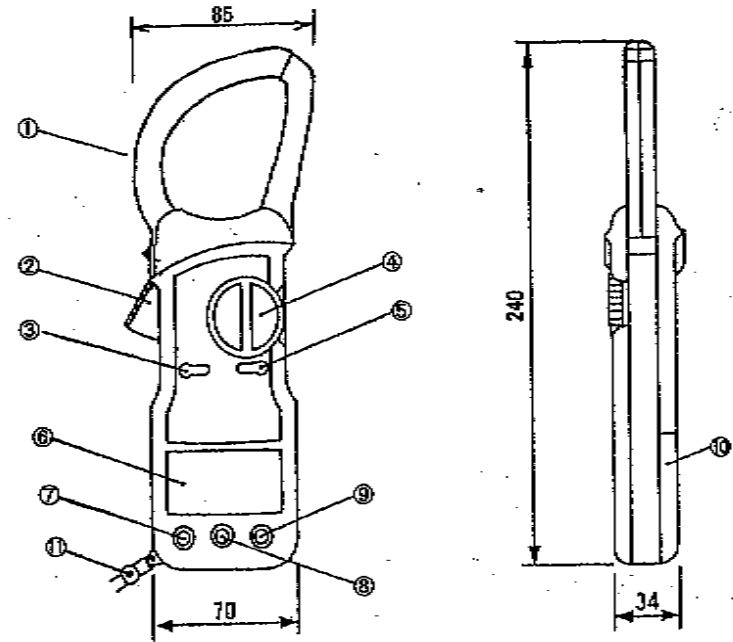
How to replace

- ① Using a screwdriver, remove the screw fixing the battery case located at the bottom on the back of the meter and slide to remove the battery case in the arrow direction.
- ② Take out the two consumed batteries.
- ③ Set new batteries with their polarities facing the correct directions.
- ④ Attach the battery case and fix it with the screw.



[3] COMPONENT DEVICES OF THE METER

- ① Clamp type CT : Clamp type current detect sensor.
- ② Open lever : When this is pushed inward, the clamp opens.



- ③ Power switch : When a switch is pressed, the power is turned on and the indicator lamp lights. When it is pressed again, the power is turned off.
The auto power off function turns off the power in about 10 minutes after the power was turned on.
- ④ Range select knob
- ⑤ Data hold switch : When this switch is pressed on, the measured value is maintained.
When the switch is pressed again, the data hold is reset.
- ⑥ Display : An LCD to show measurements in digits and battery status.
- ⑦~⑨ Measuring terminals
- ⑩ Battery cover : A cover on the battery compartment. Remove the cover to set and replace the batteries.
- ⑪ Hand strap

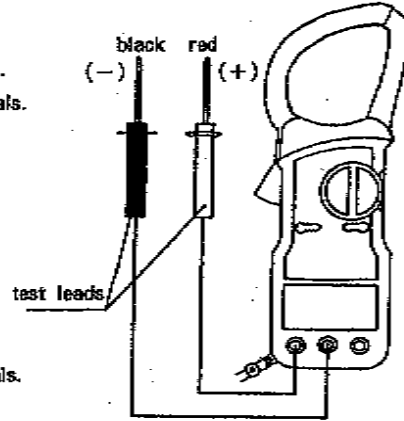
[4] MEASUREMENT PROCEDURE

NOTE

- If "DH" is shown in the display, press the DATA HOLD switch to reset the data hold. (The "DH" mark disappears.)
- If input is exceeding the range, only the most significant digit "1" is flickering.

4-1 Measuring ACV (\sim V)

- ① Press the power switch to on.
- ② Set the range select knob to an ACV position.
- ③ Plug the test lead pins into measuring terminals.
- ④ Apply the test lead tips to measured target.
- ⑤ Read an indicated value.



4-2 Measuring DCV ($\overline{\text{V}}$)

- ① Press the power switch to on.
- ② Set the range select knob to a DCV position.
- ③ Plug the test lead tips into measuring terminals.
- ④ Apply the test lead tips to measured target.
- ⑤ Read an indicated value.

(Note) 「-」 is indicated before measured value when the polarity of input is reverse to that of measuring terminals.

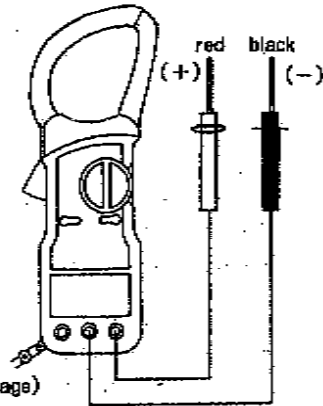
4-3 Testing Diode ∇

- ① Press the power switch to on.
- ② Set the range switch to a ∇ range.
- ③ (forward voltage)

Apply the black test pin to the cathode of the diode and the red test pin to the anode.
Normal diodes are measured in a range of 0.4V to 0.7V.

- ④ (revers voltage)

Apply the red test pin to the cathode of the diode and the black test pin to the anode.
Normal diodes revers voltage: approx. 1.5V (Battery voltage)

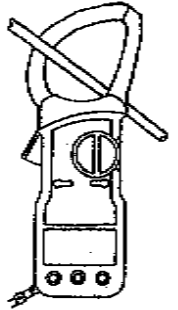


4-4 Measuring ACA (\sim A)

WARNING

- Be sure to disconnect the test lead from the measuring terminals for preventing electric shock.
- If an excessively large current is applied to the meter during current measurement, it will be heated and may be damaged. Do not use the meter for measurement of current above 2000A.

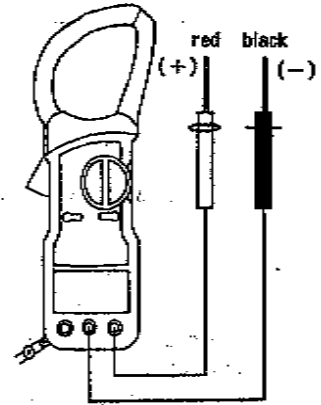
- ① Press the power switch to on.
- ② Set the range select knob to the proper ACA range according to the magnitude of the current to be measured.
- ③ Open the CT, clamp a cable to measure and close the clamp completely.
- ④ Read an indicated value. If a value is hard to read due for example to dark illumination, use the data hold function.



4-5 Measuring Ω , Testing Continuity $\ast\ast$)

- ① Press the power switch to on.
- ② Set the range selector knob to a Ω or $\ast\ast$) position.
- ③ Plug the test lead pins into measuring terminals.
- ④ Apply the test lead tips to measured target.
- ⑤ Ω : Read an indicated value.

$\ast\ast$): The continuity can be judged by whether the buzzer sounds (under 300 Ω) or not (over 300 Ω)



CAUTION

Hazard of damage

If a voltage is applied to the meter during resistance measurement and continuity test and diode test, the inside of the meter may be damaged.

Measuring range and Accuracy (23°C ± 5°C, 80%RH max.)

Function/Range		Accuracy	Max. overload protection input
~A (50/60Hz)	20A	±1.2%rdg±10dgt	AC2200A (3 sec.)
	200A	"	
	2000A	±1.2%rdg±8dgt	
~V (50/60Hz) ≡V	2V	±0.7%rdg±5dgt	AC/DC 600Vrms
	20V	±1.2%rdg±5dgt	
	200V	"	
	800V	"	
Ω (OHM)	200Ω	±1.2%rdg±5dgt	250Vrms (10 sec.)
	2K	"	
	20K	"	
	200K	"	
	2000K	"	
	20M	±3%rdg±10dgt	
•))	2KΩ	<approx. 300Ω	"
⚡	2V	±(10%rdg±3dgt)	"

rdg : reading, dgt : digit

~A : Place a conductor to measure in the center of the CT.

2000A. range : 1200~2000A / continuously 30 sec.

⚠ WARNING — PRECAUTIONS FOR SAFE MEASUREMENT

Prior to using the meter, please read this manual to prevent personal injury such as electrical shock.

- ① Use the meter in a cable run of low voltage (600V or below). Never try to measure cable runs exceeding 600V.
- ② Measure only coated cables. Never clamp bare cables.
- ③ Do not handle the meter with wet hands or in humid places.
- ④ If the body case is damaged or if the battery cover is removed, do not attempt to make measurement. Do not use damaged test leads.
- ⑤ Do not overhaul the meter.
- ⑥ For safety, never try to measure voltages in large capacity cable runs exceeding 250V. It is a very dangerous practice.
- ⑦ When replacing the batteries, disconnect the test leads from the measuring circuit. Otherwise, the meter may be damaged.
- ⑧ Never apply a voltage to the resistance measurement range or the diode test range. It is a cause of failure.

⚠ — PRECAUTIONS FOR MEASURING CURRENT

- ① Place a conductor to measure in the center of the CT.
- ② During measurement, close the ends of the CT (iron core) completely.
- ③ Use the meter in a frequency range from 50Hz to 60Hz.
- ④ An error will occur in display when measuring alternating current other than sine waves.
- ⑤ Direct current can not be measured.
- ⑥ Clamp only one conductor for measurement. Clamping 2 or more conductors leads to erroneous measurement.
- ⑦ If large current is applied, vibration noise may be heard from the CT. It is not a problem.

⚠ SYMBOL

The symbol **⚠** attached on the meter and used in the manual means the following.

- ① **⚠ WARNING** : May cause personal injury such as burn and electrical shock. Be sure to follow the instructions when handling the areas marked by this symbol.
- ② **⚠ CAUTION** : If the instructions are not followed, the meter may be damaged.