# VOLT-OHM-METER S-831

## INSTRUCTIONS

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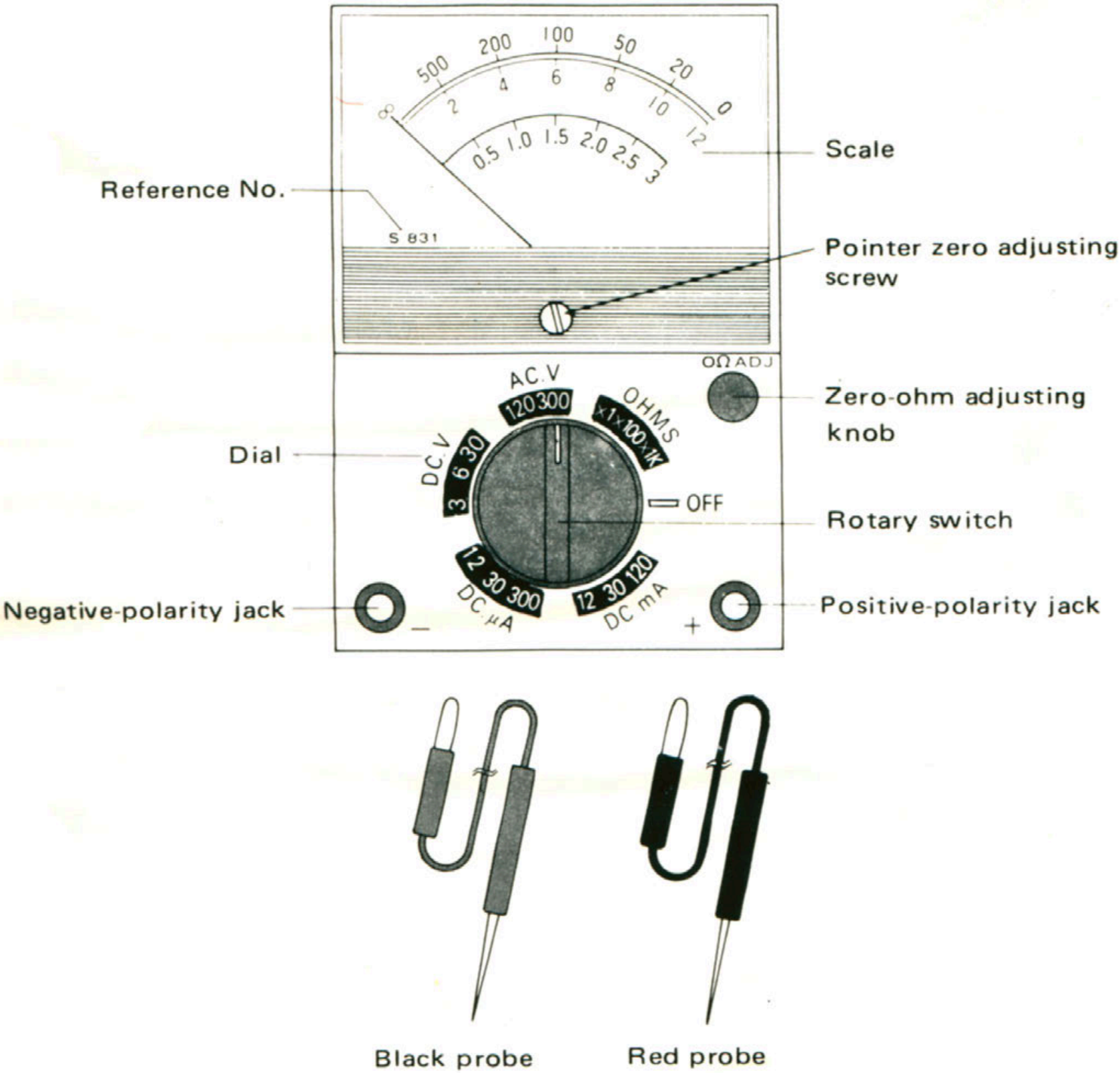
# 1. DESIGNATION

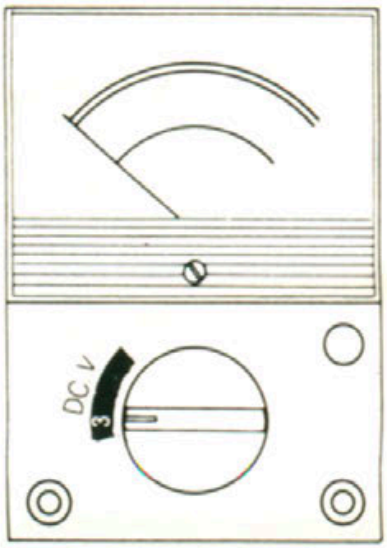


## 2. HOW TO USE

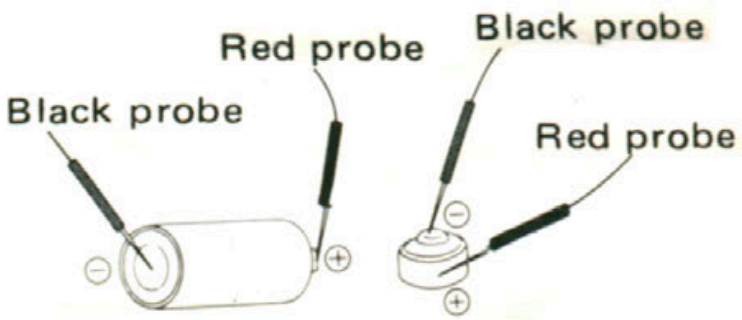
### (1) Measurement of DC voltage (DC V) . . . Measusrement of battery voltage, etc.

*Ex.* Voltage measurement of a dry cell for watch or clock.

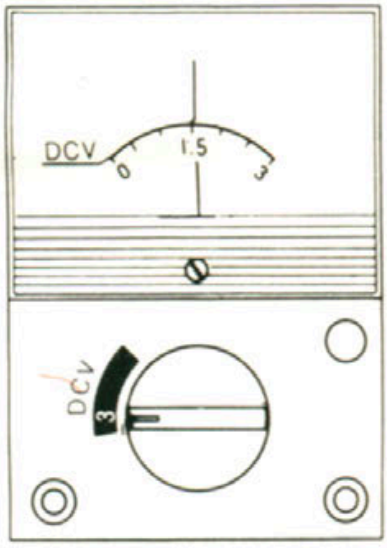
1) Adjust the rotary switch at 3 on DC V (red zone). With this, up to 3 V (volts) will be measured.




2) Apply the negative-polarity probe (black) to the negative electrode surface of the cell, and the positive-polarity probe (red) to the positive electrode surface.

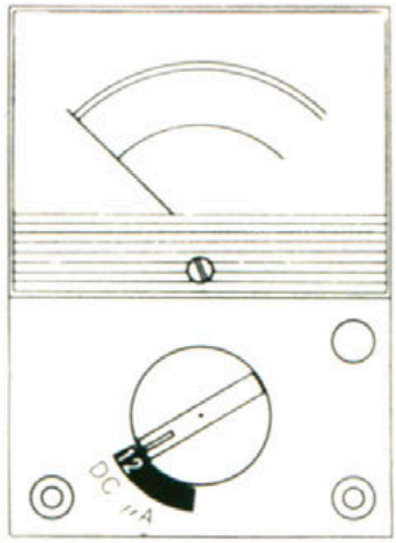



3) Read the value indicated by the pointer. Since the rotary switch has been set at 3 on DC V zone (red zone), the reading must be taken from the DC V 0-to-3 line (red) on the scale. In the illustration on the right, the reading is 1.5 V (volts).



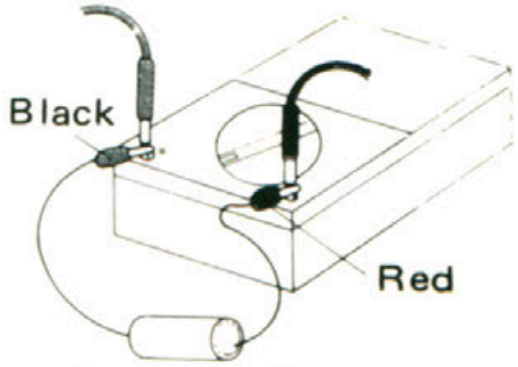
## (2) Measurement of DC current (DC μA, DC mA) . . . Measurement of current consumption, etc.

*Ex. 1.* Measurement of quartz watch current consumption
For details, refer to "TECHNICAL GUIDE" for the corresponding calibre.



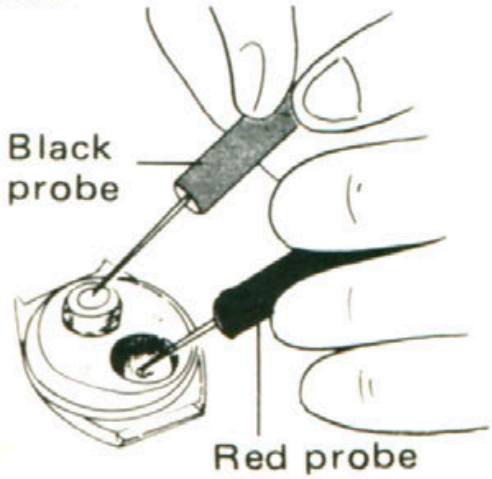

1) Set the rotary switch at 12 on DC μA zone (blue zone), and up to 12 μA (micro amperes) can be measured.

2) For the measurement of analogue quartz watches, attach the jacks with a capacitor of 200 to 500 μF (micro farad) as illustrated on the right.
(Unless the capacitor kit is attached as illustrated, the pointer will swing over a wide range, making it hard to take the reading.)



Capacitor kit

3) Then, apply the probes as instructed below.
**In case of analogue quartz watches:—**
**Current consumption is measured with the battery mounted on the caseback**
Apply the probes as illustrated below.

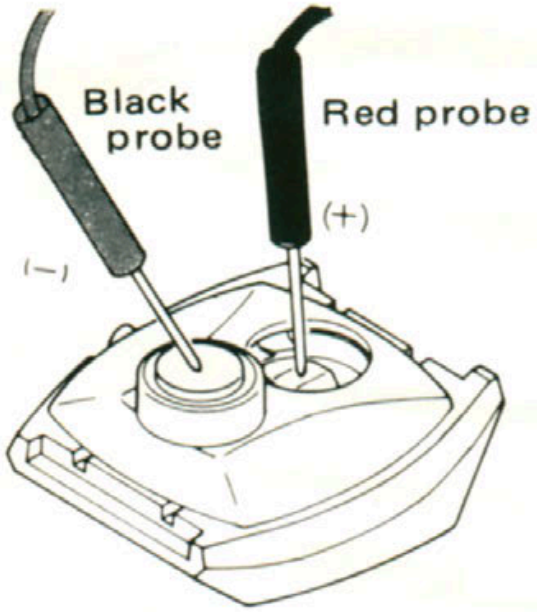



**Current consumption is measured with the caseback removed**
The measuring method varies depending on calibre. For details, refer to "TECHNICAL GUIDE" for the corresponding calibre.

**In case of digital quartz watches:—**

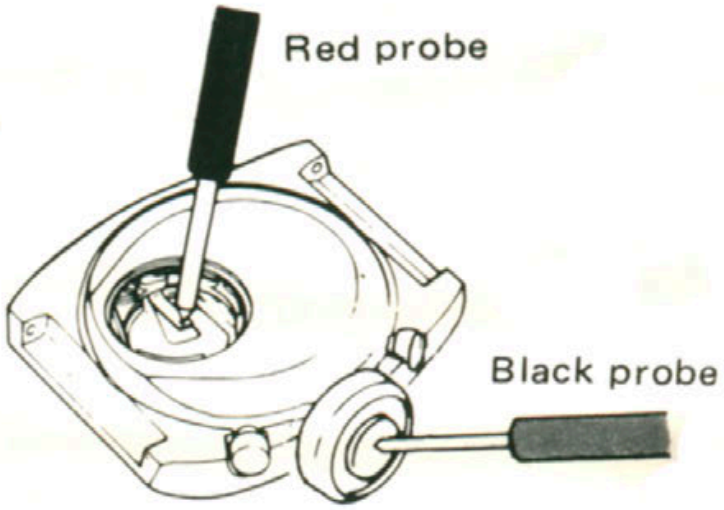
**Current consumption is measured with the battery mounted on the caseback**

Apply the probes as illustrated below.

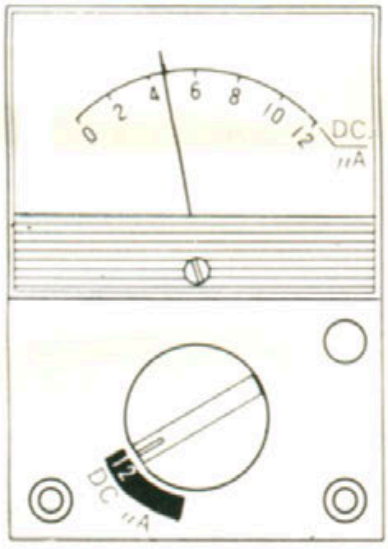



**Current consumption is measured with the battery pressed against the button**

Apply the probes as illustrated below.




4) Read the value indicated by the pointer. Take the reading on the 0-12 scale for DC μA (blue zone), because the rotary switch is adjusted to 12 on the DC μA zone (blue zone). In the illustration on the right, the reading is 4.8 μA (micro amperes)

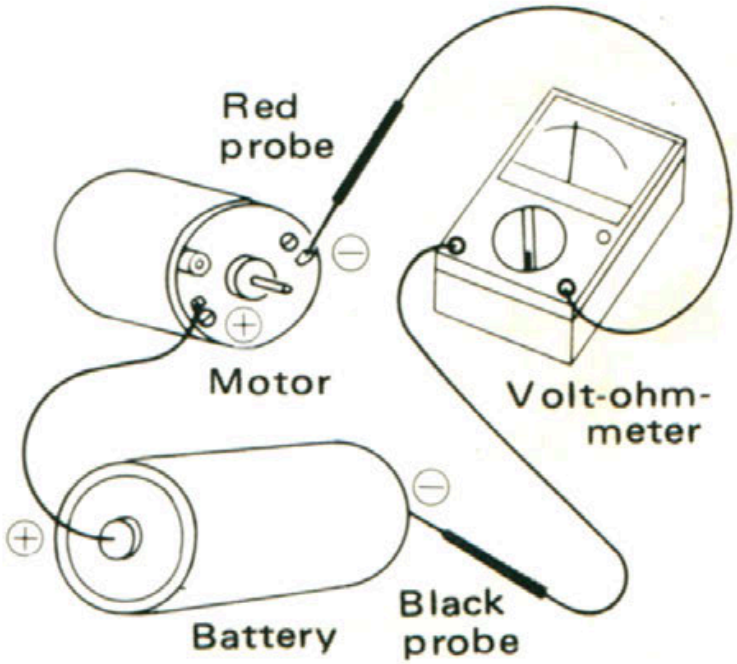



***Note***: The pointer of the Volt-ohm-meter may run over the maximum value when the current consumption is measured with the rotary switch set at 12 on the DC μA zone. When this happens, set the rotary switch at 30 or 300 on the DC μA zone while keeping the probes applied as instructed above, wait 2 to 3 sec., and then turn the rotary switch back at 12 on the DC μA zone for measurement.

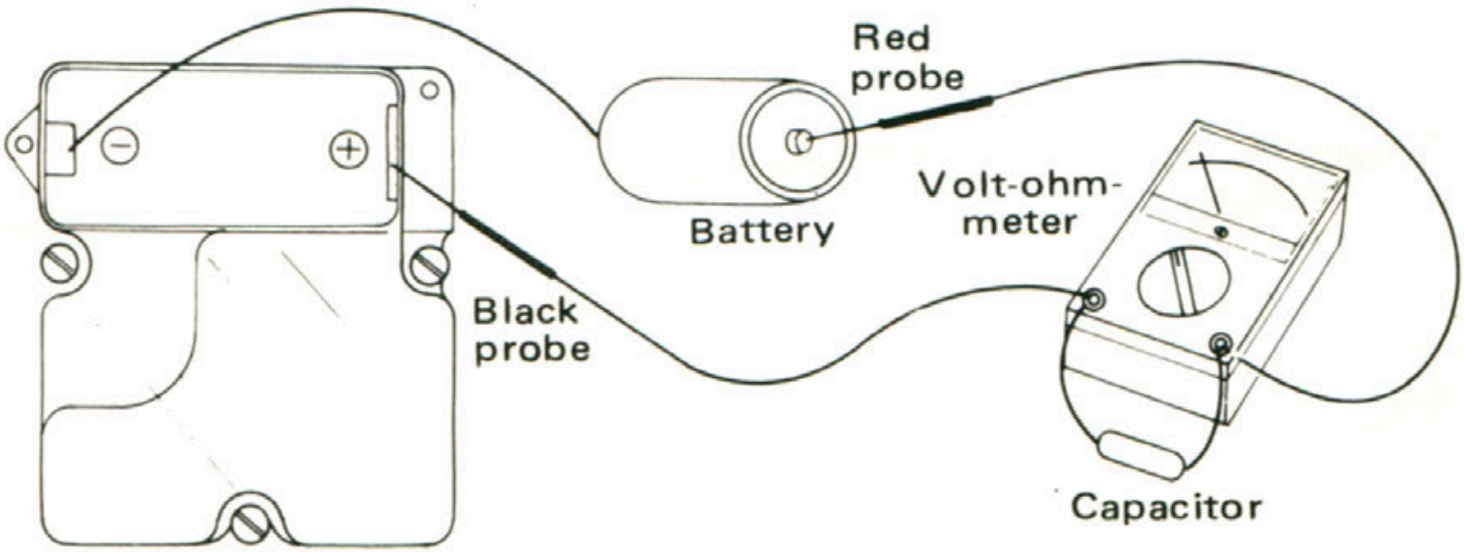
*Ex. 2.* Measurement of clock current consumption

For details, refer to "TECHNICAL GUIDE" for the corresponding calibre.

- When measuring the current consumption of the motor alone, apply the probes as illustrated on the right.



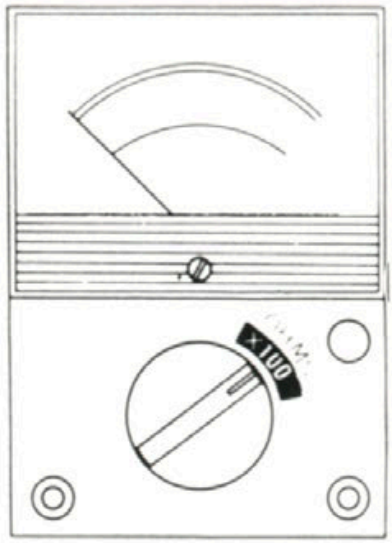

- For the measurement of clock current consumption, connect a capacitor (6.3V, 1,000$\mu$F) as illustrated below.



## (3) Measurement of resistance (ohms) . . . Measurement of resistance and checking of conductivity

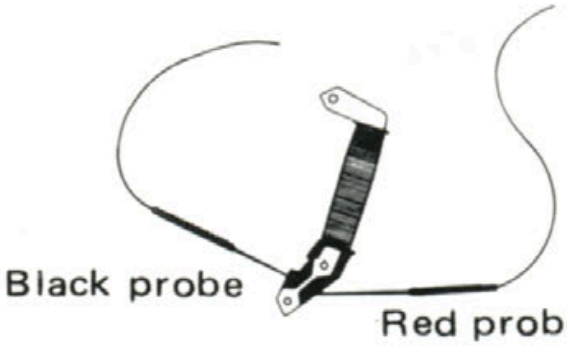
*Ex. 1.* To check the coil of the quartz watch

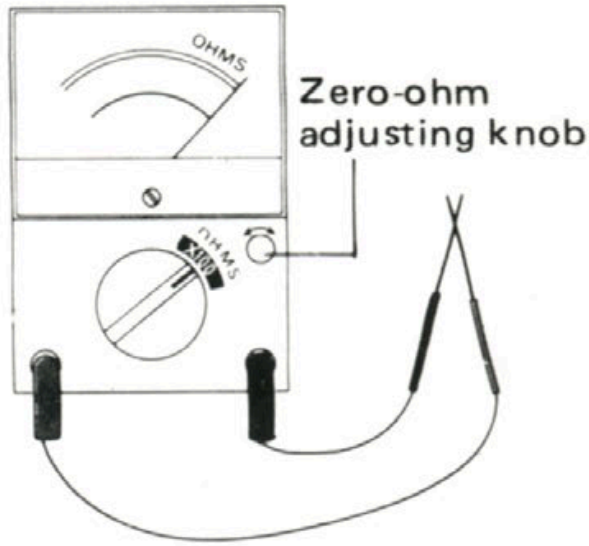
1) Set the rotary switch at **X100** on the OHMS (green zone) zone.



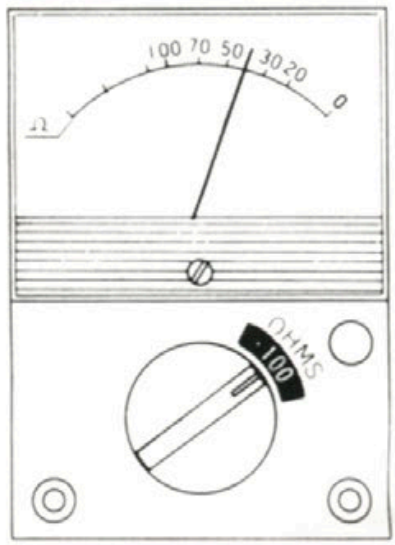

2) Touch the black probe to the red probe, and turn the zero-ohm adjusting knob so that the pointer indicates 0 Ω (ohm).

3) Apply the probes to the coil terminals.



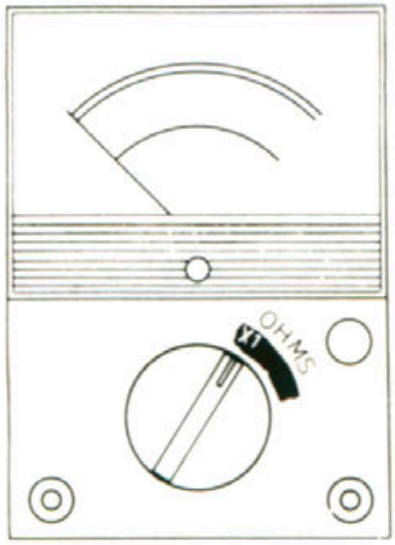




4) Read the value indicated by the pointer. Since the rotary switch is set at **X100** on the OHMS (green) zone, take the reading on the green zone on the OHMS scale. In the illustration on the right, the rotary switch is set at **X100**, and the reading is 40. Then, the resistance is calculated as 40 X 100 = 4,000 Ω (OHMS) or 4 kΩ (kilo ohms).

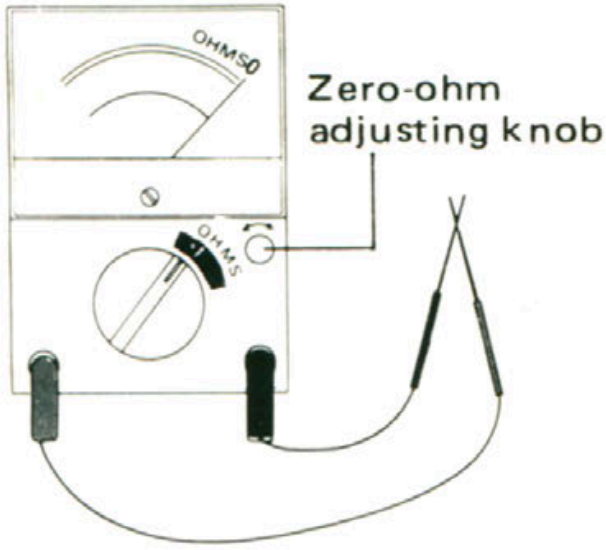


*Ex. 2.* To check conductivity of the movement of a quartz watch

1) Set the rotary switch at **X1** on the OHMS (green) zone.




2) Touch the black probe to the red probe as illustrated on the right, and turn the zero-ohm adjusting knob so that the pointer indicates 0 Ω (ohm).




3) Then, apply the probes to the terminals of a movement whose conductivity is to be checked. (Refer to "TECHNICAL GUIDE" for the corresponding calibre.)

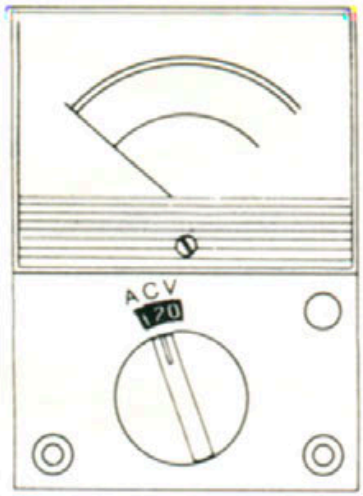
4) Read the value indicated by the pointer. If the pointer indicates 0 Ω (ohm) on the OHMS scale, the terminal conducts.

*Note*: For the resistance measurement and conductivity check of the clock, refer to "TECHNICAL GUIDE" for the corresponding calibre.

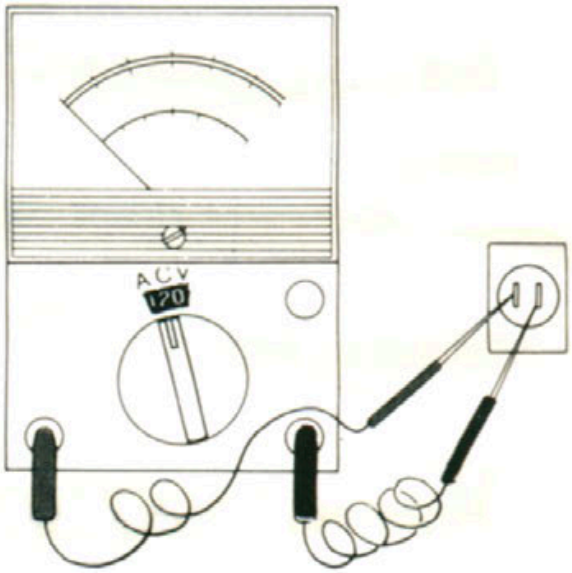
**(4) AC voltage measurement . . . For checking household power supply and household appliances, etc.**

*Ex.* To check voltage of household power supply

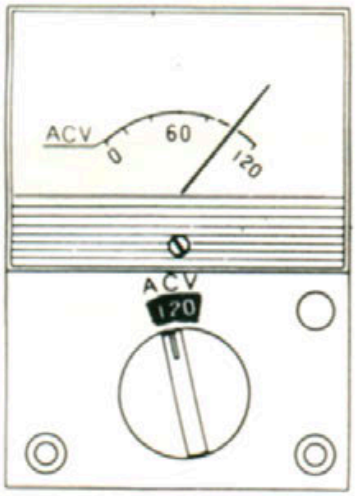
1) Set the rotary switch at 120 on the AC V zone (red zone), and up to 120 V (volts) will be measured.




2) Apply the probes to the terminals of a subject to measure the voltage. Irrespective of probe color (polarity), apply one probe to either of the two terminals and the other probe to the remaining terminal.




3) Read the value indicated by the pointer. Since the rotary switch has been set at 120 on the AC V zone (red zone), take the reading on the 0-120 zone on the AC V (red) scale. In the illustration on the right, the reading is 100 V (volts).




***Note***: Some household appliances have high-tension parts in them. Be careful to avoid electric shock hazards and burnout failure of the Volt-ohm-meter.

# 3. SPECIFICATIONS

Measuring ranges, internal resistances, and tolerances

| | DC voltage (DC V) | DC current (DC μA, mA) | AC voltage (AC V) | Resistance (OHMS) |
|---|---|---|---|---|
| Measuring range | 3V, 6V, 30V | 12 μA, 30 μA, 300 μA 1.2 mA, 30 mA, 120 mA | 120V, 300\ | R X 1, R X 100, R X 1 K |
| Internal resistance | 50 kΩ/V | (Voltage drop, 100 mV) | 12.5 kΩ/V | — |
| Tolerance | within ±3% f.s. | within ±3% f.s. | within ±3% f.s. | within ±3% of deflection |

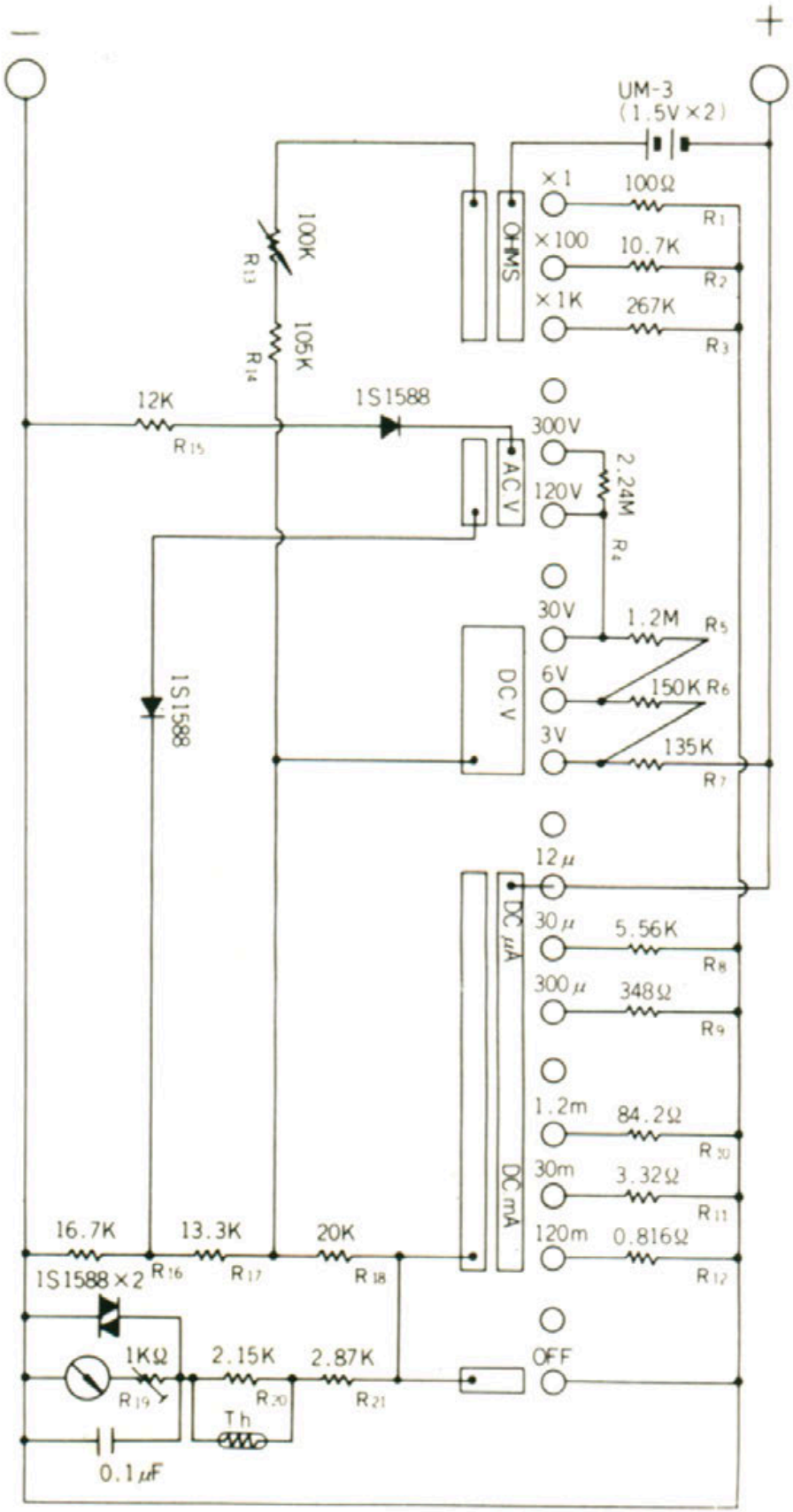
**Battery power:** Dry cell IEC "R6" or ANSI "AA" (1.5 V) X 2 units (capable of delivering an output voltage of 3 Vdc.)

**Protection:** A protective circuit using 2 units of silicon diode

**Accessory:** Probes X 1 set

**Dimensions:** 90 X 130 X 53 mm

# 4. CIRCUIT DIAGRAM FOR VOLT-OHM-METER
## Model S-831



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