

sanwa

INSULATION RESISTANCE TESTER

DM-1527 DM-5257

DM-5017

INSTRUCTION MANUAL

Contents

	Page
1. Features	1
2. Measuring Range and Performance	2
3. Front View and Name of Each Part	3
4. For the Safety Use	4
5. Precaution Before the Measurement	4
6. Measuring Method of AC Voltage (ACV)	5
7. Measuring Method of Insulation Resistance (M Ω)	5
8. When the Tester Does Not Function Correctly	8
9. Preventive Maintenance	8

Battery-Driven Insulation Resistance Tester

DM-1527, DM-5257, DM-5017

We thank you for your purchasing our product, the battery-driven insulation resistance tester.

This is a DC resistance tester developed under the principle to provide new and unique design and function for the measurement of insulation resistance of each kind of electric equipments. Since this tester generates high voltage, we recommend that you read this Instruction Manual thoroughly, and treat the tester correctly and safely.

1. Features

1. Variable Rated Voltage

For each model, it is possible to change the rated voltage by a switch.

2. Discharge Function (DM-1527 and DM-5257)

When high voltage is charged to the measuring object, it is indicated on the indicator, and can be discharged by the function switch. Therefore, it is possible to prevent an electric shock after measurement caused by the voltage charged with the measuring object.

3. High Voltage Indicator

This tester has LED pilot lamp which indicates the operational status after the impression of high voltage for measurement.

4. AC Voltage Checking Function

As the tester is provided with measuring range for AC voltage (0-600V), it is possible to check the impression or otherwise of AC voltage on the measuring object.

5. Soft Touch Dual Step Switch

Soft touch type has been employed for the measuring switch. Since this switch is dual step change over type, it can be easily locked at the selected position by the way of depressing.

6. One-touch Disconnection Prevention Terminal

As the measuring terminals are provided with lead plug disconnection prevention mechanism on one-touch type, it is safe because the lead plug will never be disconnected from the tester during the measurement.

2. Measuring Range and Performance

Model	Rated V Rated R	Scale range (bold letters show the primary effective scale)	ACV	Remarks
DM-1527	1000V 2000MΩ	0—2— 1000 —2000MΩ	0—600V	Rated voltage 1000V—500V—250V Change over type
	500V 1000MΩ	0—1— 500 —1000MΩ		
	250V 500MΩ	0—0.5— 200 —500MΩ		
DM-5257	500V 1000MΩ	0—1— 500 —1000MΩ	0—600V	Rated voltage 500V—250V—100V Change over type
	250V 500MΩ	0—0.5— 200 —500MΩ		
	100V 200MΩ	0—0.2— 100 —200MΩ		
DM-5017	500V 1000MΩ	0—1— 500 —1000MΩ	0—600V	Rated voltage 500V—15V Change over type
	15V 20MΩ	0—0.1— 10 —20MΩ		

1. Allowance

Measurement of insulation resistance (MΩ)

Within ±5% of indicated value on primary effective scale range

Within ±2% of scale length on other scale range

Measurement of AC voltage (ACV)

Within ±5% of maximum scale value

2. Terminal-to-terminal voltage

At ∞ scale: ±10% of rated voltage

At the center of scale: approx. 90% of rated voltage

3. Ambient temperature: 0°C~40°C

4. Ambient humidity: 80% or less (with no condensation)

5. Battery used: R6 or SUM-3 X 6

6. Accessories: Measuring lead set (TL-507)

Carrying case (C-06)

Instruction manual; 1 copy

7. Size and weight: 175 X 118 X 55 mm; approx. 520 g

3. Front View and Name of Each Part

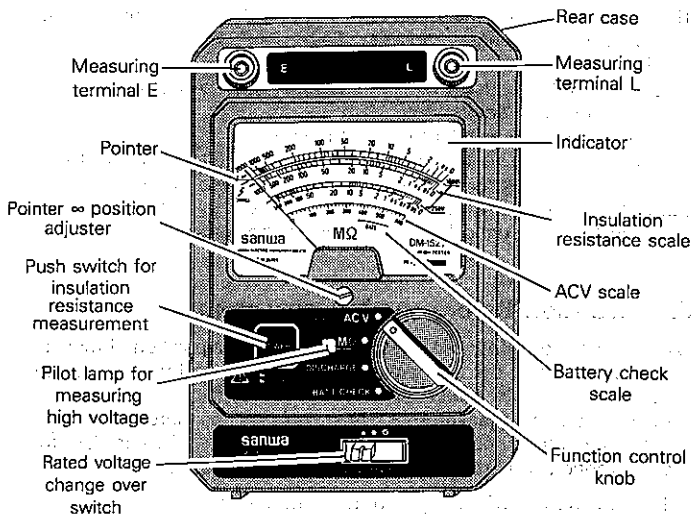


Fig. 1 Front view of tester

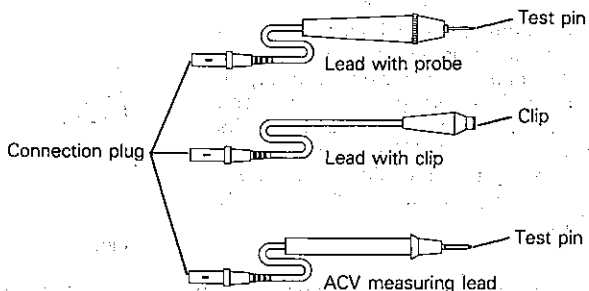


Fig. 2 Measuring leads (TL-507)

4. For the Safety Use

The symbols used on this tester and in this instruction manual denote the following meanings:

- ⚡** Be careful as the high voltage is impressed.
- ⚠** Be careful because there is a possibility of bodily injury or the destruction of equipment.
- ⚠ 1.** To prevent the accident of electric shock
Never use the tester to high power, high voltage circuit. Never use it with wet hand or in the moisture environment.
- ⚠ 2.** For the sake of safety measurement, never use the wires other than the measuring leads attached to the tester.

5. Precaution Before the Measurement

- ⚠** For the sake of safety use, be sure to confirm the position of function control knob and the connection of measuring lead with the tester before starting the measurement.

Also, when the measurement is completed, be sure to turn the function control knob to the position of POWER OFF to prevent the consumption of batteries incorporated in the tester:

1. Confirmation of zero position of indicator

If the pointer is not on the $\infty M\Omega$ position at the leftmost of ∞ scale, adjust it to the $\infty M\Omega$ position by rotating the pointer position adjuster by screw driver, etc.

2. Confirmation of internal batteries (Fig. 3)

Since this tester is driven by batteries, be sure to confirm the residual capacity of batteries before starting the measurement. Turn the function control knob to the position of BATT CHECK. As the pointer will move rightward, confirm that it stops within the range of lowest part of the scale (BATT).



Fig. 3

If the pointer is located left of the range, it means the exhaustion of batteries. In this case, replace the batteries with new ones according to the procedures described in Section 9.

6. Measuring Method of AC Voltage (ACV)

△ Do not impress AC 600V or high voltage. It is DANGEROUS!
After the preparations described in Section 5 are completed, proceed to the following procedures.

- △ 1. Connection of measuring leads
Insert the plug of lead with probe to measuring terminal L and the plug of ACV measuring lead to terminal E, respectively. After inserting the leads, turn them to right direction. It will prevent the inadvertent slipping off.
2. Turn the function control knob to the position of ACV (POWER OFF).
- △ 3. Attach the measuring lead to the measuring object.
4. The pointer will move rightward, then read the value of ACV scale indicated by the pointer. This is the value of voltage measured.
5. After the completion of measurement, detach the measuring lead from the measuring object.

7. Measuring Method of Insulation Resistance (MΩ)

- △ There is a possibility of causing an accident of electric shock. After the measurement of insulation resistance is completed, be sure to discharge the high voltage charged in the measuring object.
 - △ There is a risk of electric shock during the measurement. Be careful not to touch the measuring terminal and measuring object during the measurement.
 - △ When the circuit is activated, make measurement after disconnecting the power source.
 - △ Make measurement within the insulation resistance measuring range, and never impress voltage from outside, or the tester will be destroyed.
 - In case of insulation resistance measurement, there should occur an indication error if there is AC voltage component in the measured circuit. Therefore, be sure to make measurement after confirming that there is no AC voltage component in the measured circuit.
 - After completing the preparation as described in Section 5, proceed to the following procedures.
- △ 1. Connection of measuring lead
Insert the plug of lead with probe to measuring terminal L, and the plug of lead with clip to measuring terminal E, respectively. After the insertion, turn the leads to the right direction, then an advertent slipping off will be prevented.

2. Set the rated voltage change-over switch to the appropriate range according to the voltage of measuring object.
3. Connect the clip of lead to the other side of measuring object.
4. Turn the function control knob from POWER OFF to $M\Omega$ position. In case of model DM-5017, turn the function control knob to the $M\Omega$ range which corresponds with the voltage set by the rated voltage change-over switch.
- △5. While keeping the test pin of lead with probe contacting with the another part of measuring object, turn on the power by lightly depressing the $M\Omega$ measuring push switch (POWER ON/OFF). When this switch is pushed lightly, the power is turned on while the switch is depressed, and is turned off when the switch is released. If the switch is pushed strongly, the switch is kept at the depressed position, and the power is not turned off even if the finger is removed from the switch. Push the switch strongly once more to turn the power off.
When the power is turned on, measuring high voltage is generated, measurement is started, and LED at the center of panel will start blinking.
6. When the measuring switch is turned on, the pointer will move rightward. Then read the value indicated by the pointer on the voltage scale which corresponds with the voltage value set by the rated voltage change-over switch. This is the value of insulation resistance measured.
7. If the high voltage indicator lamp at the center of the panel is blinking at this time, it means that the tester is working correctly and correct voltage has been impressed on the measuring object. This lamp does not blink when the batteries have been exhausted or the contact of batteries is not proper.
8. Turn the measuring push switch to POWER OFF position when the measurement is completed.
- △9. Discharge the high voltage charged to the measuring object. (Refer to the Section describing the discharge range.)
10. Disconnect the measuring lead from the measuring object.
11. Return the function control knob to the POWER OFF position.

• **About the Terminals E and L**

The measuring terminals are named E and L respectively, and + of measuring high voltage generates on E side, and - on L side.

⚠ DISCHARGE Range

There is a case where the high voltage impressed to the measuring object during the measurement of insulation resistance may remain in the object even after the completion of measurement. Especially in case of the objects which have capacity such as capacitors and wires, the impressed high voltage will remain in the object without fail.

If this voltage is left undischarged, it is extremely dangerous as it will cause the electric shock and destruction of equipments.

Therefore, it should be discharged completely according to the following procedures.

(This discharge function is not provided with the model DM-5017, so the voltage should be discharged by other method.)

1. Keep the test pin contacting with the measuring object even after the completion of measurement, and then turn only the measuring push switch to OFF position.

In this case, if the pointer moves to adverse direction up to the red line at the left of ∞ of $M\Omega$ scale as shown in Fig. 4, it means that the high voltage is still remaining in the measuring object.

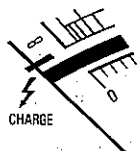


Fig. 4

2. If it is found that the high voltage is still charged in the measuring object, remove the test pin from the measuring object, and turn the function control knob to the position of DISCHARGE.
- ⚠ 3. Attach the test pin again to the measuring object. The high voltage in the measuring object is discharged with the internal resistance by this procedure, so keep this situation for a while. When the discharge is completed, the pointer will move from red line to ∞ position.
4. After confirming that the pointer has returned to the ∞ position, detach the test pin from the measuring object.
5. Turn the function control knob to the POWER OFF position. The high voltage charged in the measuring object is discharged by the above procedures. These procedures should be carried out without fail every when measurement is completed for the sake of safety.

8. When the Tester Does Not Function Correctly

If the tester does not work correctly in spite that it has been treated properly according to this Instruction Manual, confirm the following points.

1. Whether the internal batteries have enough power; whether the mounting direction of batteries' polarity is correct.
2. Whether there is any breakage of measuring leads. If the tester does not work due to the reasons other than above, send the tester to our company.

9. Preventive Maintenance

•How to Replace Batteries (Fig. 5 and 6)

The batteries should be replaced with new ones according to the following procedures, if the pointer stays left of the BATT scale range when the function control knob is turned to BATT CHECK position.

1. Stop all the measurement, and disconnect measuring lead from the object.
2. Turn the function control knob to POWER OFF position.
3. Disconnect the measuring leads from the tester.
4. Remove the cover of battery case at the rear side of the tester.
5. Replace the batteries with 6 pieces of new R6 or SUM-3 batteries (be careful for the mounting position (polarity) of batteries).
6. Place the battery holder plate to original position.

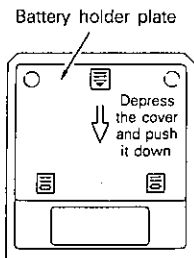


Fig. 5

How to open
the battery holder plate

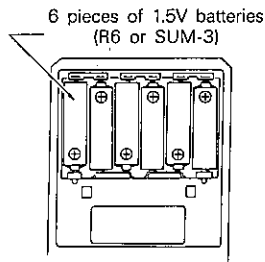


Fig. 6

Configuration of batteries

When to replace the batteries, depress the square marked portion at the upper center of battery holder cover at the rear side of tester (Fig. 5), and push it downward; then the cover will be removed. Mount the new batteries correctly as shown in Fig. 6. In this case, be careful for the polarity (+/-) of batteries.

After confirming the battery position, insert the battery holder cover to the rear case as it was before.

• General Cautions

- ⚠ 7. There is a possibility of leakage of battery liquid. Therefore, remove the batteries from the tester when the tester is not used for a long time.
- ⚠ 8. Do not leave the tester for a long time at the place where there are shocks and vibrations, or the place of high temperature (60°C or more), high humidity (85% or more), or where there is a possibility of condensation, as it will cause a trouble to the tester.
- ⚠ 9. When to clean the tester, wipe it with soft brush or cloth, and do not use thinner or alcohol; otherwise, the surface of the tester will be deformed.
- ⚠ 10. Do not wipe the meter cover strongly with dry cloth, because it may degrade the electric charge prevention effect.
If the meter cover may have become to easily have electric charge after a long time use, apply neutral detergent on the surface of it as an emergency measure.

We will not take any responsibility on the troubles caused by the use, maintenance, adjustment or remodeling which are not expressly stated in this instruction manual.

sanwa

**SANWA ELECTRIC
INSTRUMENT CO., LTD.**

Dempa Bldg., Sotokanda 2-Chome
Chiyoda-Ku, Tokyo, Japan