Let's Create
New Concepts of Instrumens
MULTI

ANALOG INSULATION
INSULATION RESISTANCE TESTER

Model MIS-1A/2A/3A/4A

INSTRUCTION MANUAL

Thank you very much for selecting our analog insulation resistance tester. This model is complex instrument and employs a very reliable mechanical/ electronic design.

Before use the instrument, read this instruction manual completely and familiarize yourself thoroughly with all functions.

Keep this instruction manual carefully to take out whenever you need.

MULTI MEASURING INSTRUMENTS CO., LTD

Akihabara Murai Bldg. 7F, 1-26 Kanda Sakuma-cho,

Chiyoda-ku, Tokyo, Japan, 101-0025

TEL : +81-3-3251-7016 FAX : +81-3-3253-4278

Home Page: http://www.multimic.com/

E-mail: multi@multimic. com

1. FEATURES

- MIS series are 3 ranges insulation resistance tester designed for testing of electrical installations and equipment in accordance with IEC international standard.
- Battery operation and heavy duty rugged case is used for high performance insulation testing.
- The signal and fluorescent scale indicator for 3 range insulation measurements enabled easy observation. Especially, useful when working in dark place.
- Hand free and continuous measurements with custom made MΩ test switch.
- Safe design with built-in automatic discharging function for any capacitor present in the circuit.
- The voltage in the circuit can be pre-checked without any switch operation for safe insulation measurements.
- Ultra compact, light weight.

2. SAFETY SUMMARY

- The CAUTIONs and WARNINGs which appear on the following pages must be followed to ensure operator safety and to retain the operating conditions of the instrument.

  Safety Symbols:

   indicates the operator must refer to an explanation in this manual.

   indicates terminals at which dangerous voltages may exist.

⚠ **WARNING**

- To avoid electrical shock, use CAUTION when working with more than 60V DC or 25V rms.AC since the danger of electric shock exist.
  In addition, check that the test leads are normal condition.
- POSSIBLE ELECTRICALSHOCK:
  Do not make measurements if the case is damaged.
  Make sure that the terminals and the connecting cables are in a good condition and that the proper measuring function has been selected.
- POSSIBLE ELECTRICAL SHOCK or FIRE HAZARD:
  Do not expose this instrument to rain or moisture.
  Do not operate the instrument in the presence of flammable gasses or fumes.
- This instrument must be used only by professionals. Any adjustment, maintenance and repair of the opened apparatus under voltage shall be carried out only by a skilled person who is aware of the hazard involved.

⚠ **CAUTION**

Where it is likely that the protection has been impaired, the instrument shall be made inoperative and be secured against any unintended operation. The protection is likely to be impaired if the instrument:

- shows visible damage.
- fails to perform the intended measurements.
- has been subjected to prolonged storage under unfavourable conditions.
- has been subjected to severe transport stresses.

3. SPECIFICATIONS

Function: Insulation resistance, AC voltage, battery check

Meter movement: 100 μ A, 870 Ω, taut band meter

Safety standard: IEC 61010-1, CAT. II 600V phase to earth

EMC standard: EN 61326

Constructional standard: IEC 61557-2

Insulation resistance: DC 500V-50M Ω or more (MIS-1A, MIS-2A)

DC 1000V-50M Ω or more (MIS-3A, MIS-4A)

Withstanding voltage: AC 3700V/1minute, between input terminal and outer case

Battery check: DC 6.3V ~ 9.5V

Low battery limit: DC 6.3V

Temperature characteristics (0~40℃): ±5%rdg of specified accuracy

Overload protection: 120% of the highest nominal output voltage (10 sec.)

Operation temperature: 0℃ to 40℃, less than 80% RH without condensation

Storage temperature: -10℃ to 60℃, less than 80% RH without condensation

Power supply: 1.5V (AA size, R-6) x 6

Dimension: 170(W) x 105(H) x 54(D)mm, approx. 330g (without batteries)

Accessories: Line test lead 1

Earth test lead 1

Batteries 6

Test leads case 1

Belt 1

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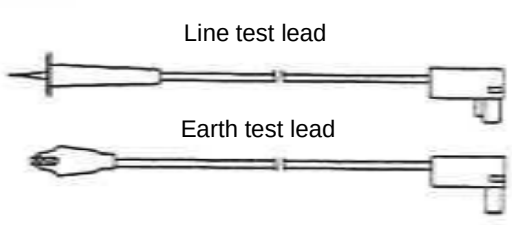


Optional accessory: Test lead with remote switch

4. MEASURING RANGES AND TECHNICAL DATA

● Insulation resistance measurement

Model	MIS-1A	MIS-2A	MIS-3A	MIS-4A
Rated voltage & effective measuring range	50V-10MΩ 125V-20MΩ 250V-50MΩ	125V-20MΩ 250V-50MΩ 500V-100MΩ	125V-20MΩ 250V-50MΩ 1000V-2000MΩ	250V-50MΩ 500V-100MΩ 1000V-2000MΩ
Center scale	0.2MΩ 0.5MΩ 1MΩ	0.5MΩ 1MΩ 2MΩ	0.5MΩ 1MΩ 50MΩ	1MΩ 2MΩ 50MΩ
Min. measurable resistance at rated voltage	0.05MΩ 0.125MΩ 0.25MΩ	0.125MΩ 0.25MΩ 0.5MΩ	0.125MΩ 0.25MΩ 1MΩ	0.25MΩ 0.5MΩ 1MΩ
Rated current	1mA+20% -0%			
Max. no-load voltage	Rated voltge+30% -0%			
Short circuit current	<2mA			

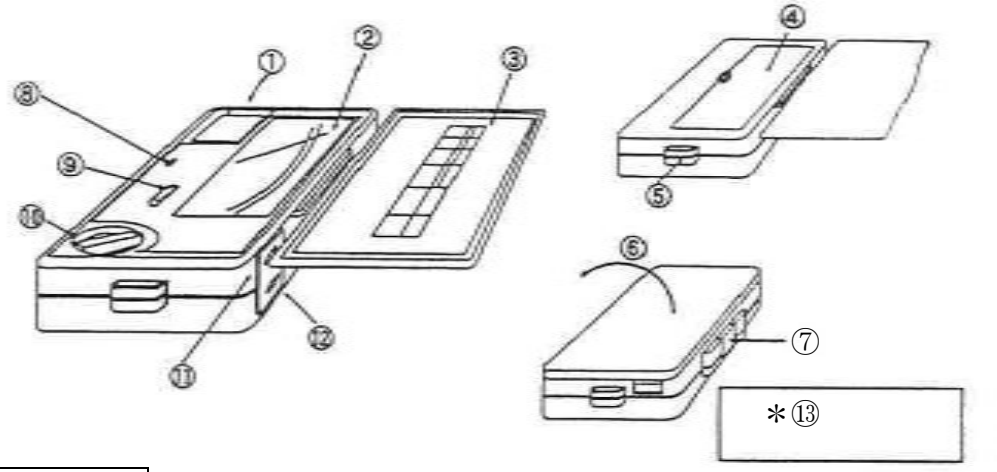
● Accuracy

Rated Voltage	DC50V	DC125V	DC250V	DC500V	DC1000V
First effective range	0.01~5MΩ ±5%rdg	0.02~10MΩ ±5%rdg	0.05~20MΩ ±5%rdg	0.1~50MΩ ±5%rdg	2~1000MΩ ±5%rdg
Second effective range	0.005~0.01MΩ 5~10MΩ ±10%rdg	0.01~0.02MΩ 10~20MΩ ±10%rdg	0.02~0.05MΩ 20~50MΩ ±10%rdg	0.05~0.1MΩ 50~100MΩ ±10%rdg	1~2MΩ 1000~2000MΩ ±10%rdg
	10~50MΩ ±30%rdg	20~100MΩ ±30%rdg	50~100MΩ ±30%rdg		

● AC voltage measurement (50Hz/60Hz)

Range	Accuracy	Input impedance	Max. input voltage
AC 600V	±2.5% of full scale	approx. 1.5MΩ	AC 600V rms

5. PANEL FUNCTION



① MEASURE MΩ test switch
② Meter movement
③ Unit cover
④ Battery compartment cover
⑤ Belt connecting hole
⑥ Opening direction
⑦ To open the unit cover, depress the yellow button of the front
⑧ Zero Ω adjustor
⑨ B.CHECK Battery check switch
⑩ Range selector switch
⑪ Line terminal
⑫ Earth terminal
⑬ The unit cover can be settled on the bottom of the unit

* Note: The custom made MΩ test switch is used for hand free and continuous measurements. When the switch knob is pulled up, the switch is locked at continuous “ON” position. Thus, the continuous measurements are enabled without any switch operation.

6. METHOD OF MEASUREMENT

6-1. Precautions for Use

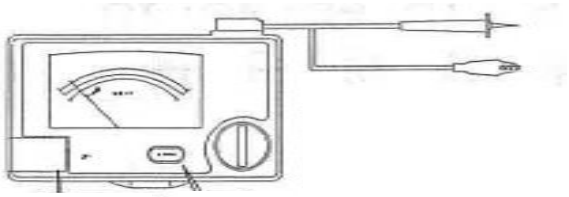
- Always check to make sure that the range selector switch is set to the proper position.
- Before making measurements, make sure that the terminals and test leads are in a good condition.
- Before making any measurement, make sure that the pointer of the instrument correspond to exactly to the zero at the beginning of the scale.
- When MEASURE MΩ test switch is set to “ON” position, a high voltage is being generated between line and earth terminals.
  Do not touch any live parts in the circuit during the measurements.
- When making MΩ test, make sure all power is disconnected in the circuit to be measured.

6-2. Battery Check

① Verify MEASURE MΩ test switch is set to “OFF” position.

② To verify the battery charge, press B.CHECK switch.
The pointer of the instrument should move to the “B◢” section. Make this test at the shortest time, as the consuming of the battery power is large.

③ If the pointer moves to the left side of “B◢” section, replace the all batteries with new ones as quickly as possible.



①Set OFF ②Push

⚠WARNING

- Before making battery check, always make sure MEASURE MΩ test switch is set to “OFF” position.
- To avoid electrical shock or damage, never press B.CHECK switch, when MEASURE MΩ test switch is set to “ON” position.

6-3. Measurement of AC Voltage

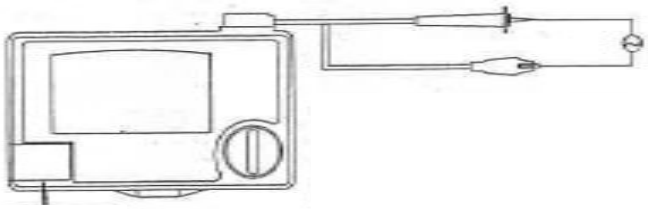
① Verify the MEASURE MΩ test switch is set to “OFF” position.

② Connect the plug of line test lead into the line terminal.
Connect the plug of earth test lead into the earth terminal.

③ Set the range selector switch to any position. If MEASURE MΩ test switch is set to “OFF” position, this tester works as AC voltage measurement tester.

④ Connect the test leads to the circuit under test.

⑤ Read the voltage value in the display after display stabilized.



Set to OFF

⚠WARNING

- POSSIBLE ELECTRICAL SHOCK or FIRE HAZARD.
  Do not expose the instrument to rain or moisture. Do not operation the instrument in the presence of flammable gases or fumes.
- To avoid damage to the instrument, disconnect test leads before changing function.
- Never fail to keep the max. 600V AC input to avoid electrical shock or damage.
- To avoid electrical shock or damage, do not apply any voltage to the instrument when MEASURE MΩ test switch is set to “ON” position.

6-4. Insulation Resistance Test

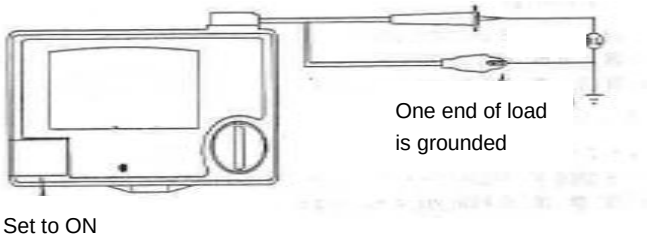
① Set the range selector switch to a desired range appropriate to the circuit to be measured. (Refer to the section 4. “Insulation resistance measurement”).

② Connect the test leads to line and earth terminals.

③ Connect the tip of line test lead to the alligator clip of earth test lead and press MEASURE MΩ test switch. Verify the pointer to indicate zero ohm on the scale.

④ Connect the test leads to the circuit under test.

⑤ Press MEASURE MΩ test switch and read the insulation resistance value in the display.



Note: When MEASURE MΩ test switch is pressed at the open condition of the terminals, the pointer moves to 0 MΩ direction momentary, however, this is not abnormal.

⚠WARNING

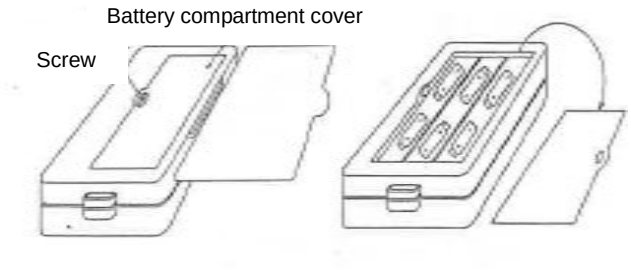
- When MEASURE MΩ test switch is set to “ON” position, a high voltage is being generated between line and earth terminals. Do not touch any live parts in the circuit during the measurements.
- When making MΩ test, make sure all power is disconnected in the circuit to be measured.

6-5. Discharging of Capacitors in The Circuit

After the MΩ test has been done, keep to connect the test leads to the circuit under test and turn off the MEASURE MΩ test switch. The generation of voltage output is stopped and the discharging circuit is activated, thus, the charged electric power in the circuit will be discharged. To verify the discharging condition, observe the pointer to indicate ∞ position (no voltage condition) on the scale.

7. REPLACEMENT OF BATTERIES

Before changing batteries, remove all electrical input. To replace batteries, remove the battery cover located on the unit back. Loosen a screw on the battery cover by flat blade screw driver or coin. Then, slowly remove the battery cover.
Replace the six batteries (AA size or R6) with new ones observing polarity.
Use high-quality batteries which are guaranteed against leakage. If the instrument is left unused for long periods of time, to prevent damage from leakage, remove the batteries.



6. REPAIR SERVICE

When requesting for repair service, Please bring the instrument directly to the dealer where you bought.
When mailing the instrument, always pack it in its original or equivalent packing materials to avoid any damage during the transportation and also put together with documents showing your name, address, phone number and defect point.

7. WARRANTY

This instrument is sent out from our factory after the sufficient internal inspections but if you find any defect due to the fault in our workmanship or the original parts, please contact the dealer where you bought the instrument.

The warranty period is 12 months from the date of purchase and the instrument shall be repaired at free of charge, provided that we judge the cause of defect is obviously resulted from our responsibility.

GUARANTEE REGULATIONS

1. This instrument is warranted for the operation under normal use for 12 months from the date of purchase.
2. This warranty does not cover the following defects:
   a. Defect caused from the improper use and operation.
   b. Defect caused from the use, operation and storage beyond the original specifications, designs and conditions.
   c. Defect caused from the renovations or repairs done by someone else than us or our representatives.
   d. Defect not caused from our responsibilities.