

sanwa

DG-501M

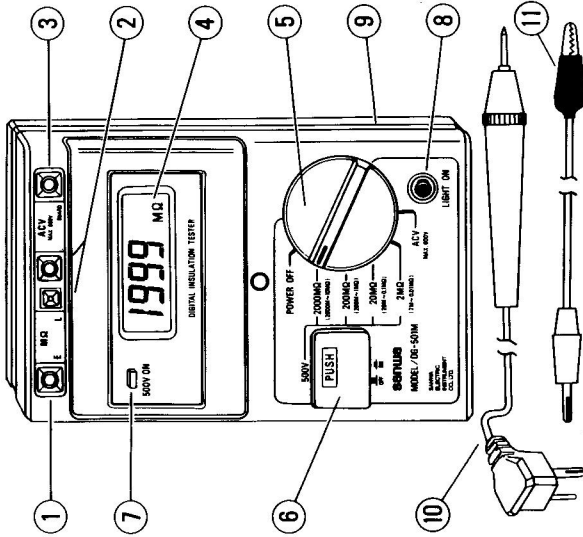
DIGITAL INSULATION TESTER

sanwa
SANWA ELECTRIC
INSTRUMENT CO.,LTD

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

INSTRUCTION MANUAL

Instrument Components



- (1) Insulation resistance measurement terminal (earth)
- (2) Insulation resistance measurement terminal (line)
- (3) AC voltage measurement terminal/guard terminal
- (4) Display
- (5) Range selection switch
- (6) Measurement pushbutton switch
- (7) 500V on pilot LED
- (8) Lamp pushbutton
- (9) Rear cover
- (10) Line probe lead
- (11) Earth clip lead

Dimensions: 163 × 100 × 47mm
 Weight: Approx. 470g

Accessories: 1 probe lead, 1 clip lead
 1 instruction manual
 6 type AA cells
 Carrying case (sold separately)

DIGITAL INSULATION TESTER MODEL DG-501M

Introduction

The DG-501M makes use of a high-performance, low power CMOS A/D converter to combine the functions of a 3.5 digit AC voltmeter with a high-megohm meter in one small package. In addition, the functions of a 500V/100MΩ and a 500V/1000MΩ insulation resistance tester have been provided.

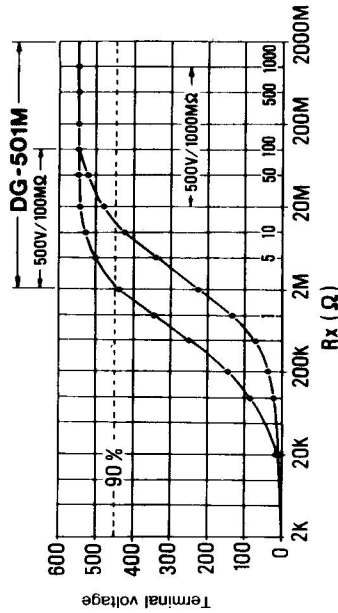
Features

1. Easy to use, compact design.
2. All four ranges are controlled by one switch. Wide range resistance measurements from 0.01MΩ to 2000MΩ.
3. Guarded probe for elimination of errors caused by external leakage and induction to enable stable, accurate readings.
4. Illuminated for easy reading in dark places.
5. Power switch is provided with a convenient lock to override the normal push on/push off mechanism.
6. Battery alarm and 500V on LED display. Worn batteries are indicated by a "B" mark and high voltage power supply status is flagged by a 500V on LED, keeping you constantly informed of instrument status.
7. Wide range of test voltage. As shown in the graph the

Specifications

DG-501M conforms to JIS standard C1302 for 500V/100M Ω and 500V/1000M Ω insulation resistance meters, making it useful for a wide range of insulation resistance measurement applications. Since the megohm measurement function is not related to the 500V DC-DC converter circuit, normal megohm measurements can be made even if the battery alarm has been lighted.

Insulation resistance measurement terminal voltage



Range	Effective measurement range	Display accuracy	Remarks
2000M Ω	1999M Ω ~ 10M Ω	$\pm 4\% \pm 2$ dgt	For 500M Ω and below, others $\pm 5\% \pm 2$ dgt
200M Ω	199.9M Ω ~ 1M Ω	$\pm 2\% \pm 2$ dgt	
20M Ω	19.99M Ω ~ 0.1M Ω	$\pm 2\% \pm 2$ dgt	
2M Ω	1.999M Ω ~ 0.01M Ω	$\pm 2\% \pm 2$ dgt	
ACV	MAX 600V	$\pm 1\%$ rdg $\pm 1\%$ fs	40Hz ~ 2kHz 10M Ω input

- **Insulation resistance measurement terminal voltage:**
Rated 500V $\pm 10\%$ (see graph)
- **Sampling rate:** 2.5/second
- **Measurement method:** Integration type
- **Measurement time:** Approx. 3 seconds max.
- **Display:** Maximum 1999 3.5 digit LCD
- **Display overflow indicator:** Most significant digit (1) only is lighted
- **Units annunciation:** M Ω , AC, V
- **Battery check:** "B" mark and 500V on LED lamp
- **Operating temperature:** 0 ~ 40°C, 85% RH max.
- **Guaranteed accuracy operating range:** 15 ~ 28°C, 80% RH max.
- **Temperature characteristics:** $\pm 1\%$ of reading

Operation 1 Internal Battery Check (Terminals open)

1. Set the range switch to any megohm range.
2. Depress the pushbutton switch.
3. The 500V on LED should light and the display should be as shown, indicating normal operation from internal batteries.



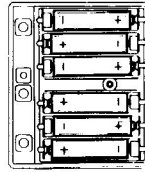
4. If the 500V on lamp does not light or the display does not light as shown:
 - Batteries are completely worn or
 - Batteries are not installed in the meter.

Since either of the conditions are possible, remove the rear cover and insert a new set of batteries (six type AA cells).

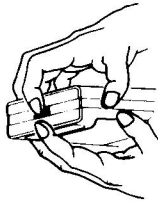
5. If the 500V on LED lights but weakly, but the display "B" mark appears, the batteries are nearing the end of their life, and should be immediately replaced with new cells.



6. To remove the rear cover, remove the centrally located screw as shown in the diagram, applying pressure firmly to the top of the case, and pulling away the rear cover.



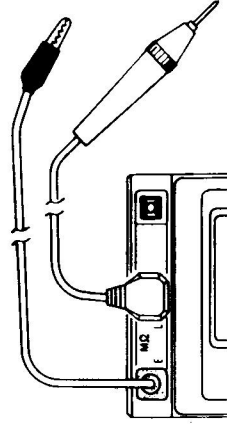
Battery location



7. After checking batteries, return the range switch to the power off position.

Operation 11 Insulation Resistance Measurements

1. Connect the probe lead to the L terminal and the clip lead to the E terminal.
2. Connect the clip to one end of the circuit under measurement and the probe to the other end.



3. Set the range switch to the 2000MΩ range and depress the pushbutton.
4. The 500V pilot LED should light, and the resistance value can be read from the display.
5. If the measurement terminals are left open, the display will show a "1" only.
6. If the measured value in the 2000MΩ range is below 10MΩ, error will be large. Switch to the 20MΩ range.
7. Set the range switch so that the measured value is within the effective range as indicated within brackets for each range.
8. After completion of measurements, set the pushbutton

switch to off and the range switch to the power off position.

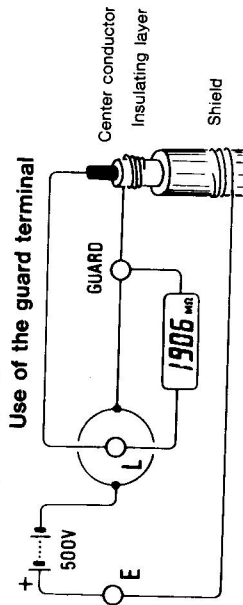
Precautions

1. E and L terminals

If one side of the circuit to be measured is connected to ground, connect this part of the circuit to the E terminal. This is a safety precaution. In general, however, either lead can be connected to the — side of the circuit.

2. Use of the guard terminal.

The extreme right side terminal is a guard terminal (used also for AC voltage measurements as the — side terminal) and is used to eliminate the effect of surface leakage on measured values. For example, when measuring the insulation resistance of a cable, a bare wire can be wrapped around the insulating layer and connected to the guard terminal, causing the leakage current to flow into the meter's — terminal, eliminating this cause of error, and leaving only the true resistance value to be measured and displayed. (see figure)

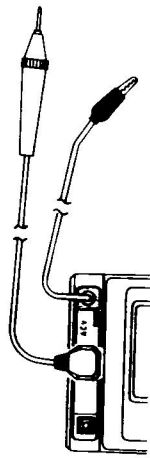


3. The battery alarm

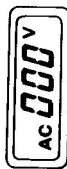
The battery alarm "B" mark may light when measuring very low values of resistance (below 500kΩ). This is due to the large power consumed when measuring such small resistances. When subsequent resistance measurements of high values result in the "B" mark disappearing, the meter batteries should be assumed to be normal.

4. When the 500V on LED is lighted, 500V is present between the E and L terminals. Please be cautious when handling the instrument in this condition.

Operation III AC Voltage Measurements

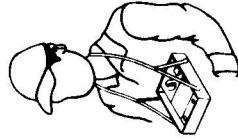
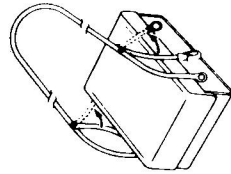


1. Connect the probe lead to the L terminal, and the clip lead or other test lead to the right hand AC voltage terminal marked ACV.
2. Set the range switch to the ACV position.
3. The display should be as shown to the right. The pushbutton switch is not used.
4. Measurements to 600V may be made. Connect the test leads to the AC circuit to be measured and read the voltage off of the display.
5. When measurements are completed, set the range switch to the power off position.



Precautions II

1. When making measurements in dark places, depress the light ON switch to turn the panel light on for easy reading.
2. When not using this instrument, set the range switch to the power off position.
3. While the display section is protected, avoid applying excessive pressure to it.
4. Avoid subjecting the instrument to excessively high temperatures, humidities, or direct sunlight.
5. If the instrument is to be left unused for a long period, be sure to remove the batteries first to prevent battery leakage damage to the meter.
6. Avoid cleaning the surface of the meter with thinners or other solvents. Use only soapy water for this purpose.
7. If you have questions concerning this instrument, feel free to contact your sales representative.
8. The carry case (sold separately) is used as shown in the figure.



Inspections

To maintain accurate measurements, this instrument should be recalibrated at least once a year. While calibrations, adjustments, inspections and repairs are normally done at the factory, consult your local representative for calibration assistance.

We reserve the right to make changes in the specifications of this instrument without prior notice.

PROTECTION FUSE

There is built-in fuse inside of the instrument.

In case the built-in fuse is blown, the instrument ceases to function needing replacement of the fuse with a new one. (See 6. of P5)

Specifications of fuse

- 250V/0.2A~0.5A
size: 5.2φ×20mm