

sanwa

AP31

MULTITESTER

INSTRUCTION MANUAL

Thank you for purchasing a SANWA tester Model AP31 You are kindly requested to thoroughly read this manual before use for safety.

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1.0 SAFETY RULES

- This meter is designed and tested in accordance with IEC publication 1010, pollution degree II and installation category (overvoltage category) II .
- This meter has been tested according to the following EC Directives:-
 - 89/336/EEC (EMC, Electromagnetic Compatibility) EN55022, EN50082-1
 - 73/23/EEC (Product safety law, Low Voltage Directive) EN61010-1
- This meter is designed to be indoor use at temperature 5°C to 40°C and altitude up to 2,000m.
- To ensure that the meter is used safely, follow all safety and operating instructions in this manual. If the meter is not used as described in this manual, the safety features of the meter might be impaired.

2.0 INTERNATIONAL SYMBOLS


 Important Information see manual

 High Voltage

 AC

 Ground

 DC

 Double Insulation

3.0 SPECIFICATIONS

3.1 General Specifications

Display	: Analog Display.
Switching range	: Manual Operation.
Operating temperature and humidity	: 5°C to 40°C, max. 75%RH.
Power source	: IEC R03 Single 1.5Volt AAA size battery
Fuse	: 5X20mm 250V/500mA Fast Acting

Dimensions	: 120 (H) ×85 (W) ×30 (D) mm.
Weight	: Approx. 150g (including battery and test leads)
Packing	: Complete with Operation Manual

3.2 Electrical Specifications

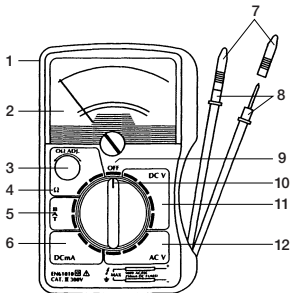
Measuring range and Accuracy (23°C ±5°C, max. 75% RH, no condensation)

DC Voltage	Range	10/50/250/500V
	Accuracy	±5% against full scale
	Sensitivity	2KΩ/V
AC Voltage	Range	50/250/500V
	Accuracy	±5% against full scale
	Sensitivity	2KΩ/V
DC Current	Range	25/250mA
	Accuracy	±5% against full scale
Resistance	Range	R×10,×1K(measurement up to 500kΩ)
	Accuracy	±3% of arc
Decibel	Range	+4 to 56 (0dB 1mW 600Ω)
Battery Test	1.5V	110mA
	Accuracy	±10%
	9.0V	21.5mA
	Accuracy	±10%

Meter Resistance : 2kΩ/V

4.0 PANEL DESCRIPTION

- 1 .Case with protective bumper
- 2 .Analog display
- 3 .Resistance zero adjustment knob
- 4 .Resistance range
- 5 .Battery test range
- 6 .DC current range
- 7 .Pin cover
- 8 .Attachable test leads with probes
- 9 .Power off
- 10 .Range switch
- 11 .DC voltage range
- 12 .AC voltage range



5.0 FITTING AND REPLACING THE BATTERY AND FUSE

- 1) Ensure that the instrument is not connected to any external circuit, set the selector switch to OFF position and remove the test leads from any live source.
- 2) Remove the screws on the bottom case, and lift bottom case.
- 3) Replace the battery (Single 1.5V Size: AAA battery) or fuse (Fast Acting: 500mA/250V 5mm×20mm) with the same type and rating.
- 4) Reinststate the bottom case, tighten the securing screws.

6.0 OPERATION

WARNING

- 1) When measuring voltage ensure that the instrument is not connected or switched to a current or resistance range. Always ensure that the correct terminals are used for the type of measurement to be made.
- 2) Use extreme care when measuring voltage above 50V, especially from sources where high energy exists.
- 3) Avoid making connections to "live" circuits whenever possible.
- 4) When making current measurements ensure that the circuit is not "live" before opening it in order to connect the test leads.
- 5) Before making resistance measurements, ensure that the circuit under test is de-energized.
- 6) Always ensure that the correct function and range is selected. If in doubt about the correct range, start with the highest and work downwards.
- 7) Extreme care should be taken when using the instrument to conjunction with a current transformer connected to the terminals. High voltage may be produced at the terminals if an open circuit occurs.
- 8) Ensure that the test leads and prods are in good condition with no damage to the insulation.
- 9) Take care not to exceed the over-load limits as given in the specifications.
- 10) Fuse for replacement must be of the correct type and rating.
- 11) Before opening the case of the instrument to replace the battery or fuse, disconnect the test leads from any external circuit, set the selector switch to "OFF" position.

6.1 DC Voltage Measurements

Set the Range switch to desired "DC V" range and connect the test leads across the sources or load under measurement. If the voltage range is not known beforehand, set the range switch to the highest range and work down. Read the DC voltage reading on the "DC V" scale (Black color)

6.2 AC Voltage Measurements

Set the Range switch to desired "AC V" range and connect the test leads across the source or load under measurement. If the voltage range is not known beforehand, set the range switch to the highest range and work down. Read the AC Voltage on the "AC V" scale (Red color).

6.3 Resistance Measurements

Set the Range to the desired " Ω " (OHM) range, Short two probes together and adjust the "0 Ω ADJ" knob to set the pointer to "0" next to the resistance scale. If the pointer cannot be set to "0", replace the battery by a new one and set the pointer again. If the resistance being measured is connected to a circuit, turn off power and discharge all capacitors before applying test prods. Connect the test leads across the source or load under measurement. Read the resistance reading on the "OHMS" scale (Green Color), use proper multiply to get the correct value ($R \times 10$, $R \times 1K$), depending on the resistance range.

6.4 DC Current Measurements

Set the Range switch to the desired "DC mA" range, connect test leads IN SERIES with the load in which current is to be measured. If the current range is not known beforehand, set the range switch to the highest range and work down. Read the DC current reading on the "mA" scale (Black color).

6.5 Decibel Measurements

Set the Range switch to the desired "AC V" range, connect the test leads across the sources or load under measurement. For "50V AC" Range read dB reading on the dB scale directly, but for other ranges, calculate the reading with the following table:-

dB Range	4 to 36	18 to 50	24 to 56
AC Range	50V	250V	500V
Add Value	0	14	20

Note: For Absolute dB measurement, circuit impedance must be $0\ \Omega$, $0\text{dB} = 1\text{mW}$ dissipated in a $600\ \Omega$ load.

For the signal with DC component. Connect a capacitor with capacity $> 0.1\ \mu\text{F}$ between test probes and circuit under test.

6.6 Battery Check for 9.0V and 1.5V

Set the Range switch to the desired "BATT" Range connect the test leads across the battery under test. Read the reading on the "BATT." scales ("RED" color for bad, "Green" color for Good)



WARNING

BEFORE ATTEMPTING BATTERY AND FUSE REMOVAL OR REPLACEMENT, DISCONNECT TEST LEADS FROM ANY ENERGISED CIRCUITS TO AVOID SHOCK HAZARD.