

AP33 MULTITESTER

INSTRUCTION MANUAL

使用说明书

SANWA ELECTRIC INSTRUMENT CO., LTD.

三和电气株式会社

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[1] Safety Information – Prior to use, read the following precautions carefully. Thank you for selecting a SANWA Analog Multitester AP33. Prior to use, please read this instruction manual thoroughly to ensure correct and safe use. After reading it, please keep it together with the tester in a safe place for future reference. Be sure to observe instructions marked with WARNING and CAUTION to avoid accidents involving “shock hazards”, “injuries and damages.”

1-1 Description of Warning Symbols

Symbols and their meaning used on product and Instruction Manual.

⚠ :Indicates very important instructions for safe use.

⚠ :WARNING identifies instructions to CAUTION identifies information to avoid unsafe operation that may result in damages to the equipment.

~ :AC Ω :Resistance
+ :Positive - :Negative
☐ :Double insulation or reinforced insulation



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1-2 Warning Instructions for Safe Use

⚠ WARNING

Observe the instructions listed below in operating this equipment to avoid a fatal accident that may result in “electric shock” and “injuries.”

- Do not use the tester in a power line exceeding 3.6 kVA.
- Pay special attention when measuring the voltage of AC 33 V(46.7peak), DC 70 V or more to avoid injury.
- Do not input signals that exceed the maximum rated input value.
- Do not measure lines (such as motor lines) where inductive voltages and surge voltages will occur as they may exceed the maximum overload input value.
- Do not operate the meter when the main body or test lead is damaged or broken.
- Do not use the tester with its case removed.
- Do not change function during measurement.
- Confirm the function every time when making measurement.
- Do not use the tester with wet hand.
- Be sure to use the designated test leads.
- Do not attempt repair or modification, except for replacement of the built-in battery.
- Be sure to carry out startup checks and inspections at least once a year.
- This tester is for indoor use.

1-3 Maximum Overload Protective Input

Function(Range)	Input Terminal	*1 Max. Overload Protective Input
DCV	500 V	AC-DC 550 V or peak max770 V
	250 V/50 V	AC-DC 500 V or peak max700 V
	10 V	AC-DC 250 V or peak max350 V
ACV	500 V	AC-DC 550 V or peak max770 V
	250 V/50 V	AC-DC 500 V or peak max700 V
	250 mA	AC-DC 10 V or peak max14 V
DCA	25 mA	AC-DC 3 V or peak max4.2 V
	Ω	AC-DC 135 V or peak max189 V
Ω	×1 k	AC-DC 15 V or peak max21 V
	×10	AC-DC 35 V or peak max49 V
BATT.	9 V/1.5 V	AC-DC 35 V or peak max49 V

*1 (Tested by applying load 9 times for 0.5 sec. and once for 5 sec. every about one minute.)

1-4 General Handling Precautions

- Vibration:**
Do not place the tester on vehicles such as motorcycles as it is exposed to frequent vibration that causes a tester failure.
- Environment:**
Do not store the tester for long hours in places where it is exposed to direct sunlight, high temperature (over 60 °C), high humidity (over 85 %) or where condensation occurs.
- Electrification:**
The tester cover has been treated by antistatic coating. Do not rub it with cloth strongly.
- Maintenance:**
When servicing the tester, wipe off dust and dirt lightly with a brush or cloth. Do not use a solvent such as thinner and alcohol.
- Caution:**
Do not use the tester near places where strong electromagnetic waves are generated or charged substances are present.

[2] Application and Features

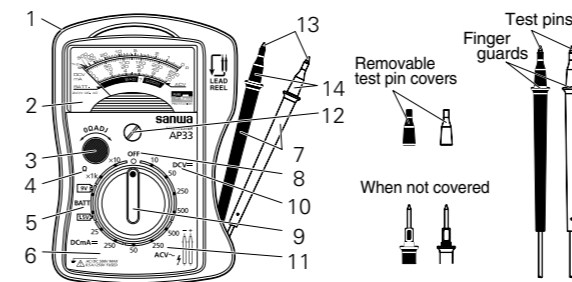
2-1 Application

This is a pocket type portable analog multitester designed for measuring small-capacity power lines. This tester is suitable for measuring voltages and testing continuity of household appliances and measuring voltages of electric light circuits, batteries, etc.

2-2 Features

- A pocket size AMT with a built-in shock absorbing rubber.

[3] Panel Description



- Protector
- Analog display
- 0 Ω adjuster
- Resistance range
- Battery test range
- DC current range
- Test leads
- (OFF)
- Range selector
- DC voltage range
- AC voltage range
- Meter 0-position adjuster
- Test pins
- Removable test pin covers

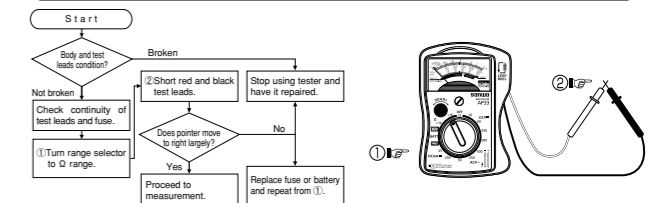
[4] Measuring Procedure

4-1 Startup Check

Turn the 0-position adjuster to align the pointer with the 0 position on the left end of the analog display.

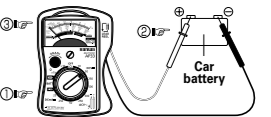
⚠ WARNING

- Do not use the tester when its body or test leads are damaged or broken.
- Make sure that the test leads are not cut.



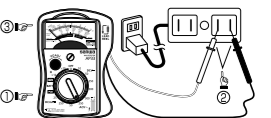
4-2 DC Voltage (DC V) Measurement

- Turn the range selector to a desired range of “DC V”.
- Connect the black test pin to “-” (negative, ground) of a circuit to measure and the red test pin to “+” (positive, measuring point).
● Connect the tester in parallel with the power supply (circuit).
- Read the measured value on the DC V scale (black).
● An example of measurement: Voltages of commercial dry cells, car batteries and button batteries.



4-3 AC Voltage (AC V) Measurement

- Turn the range selector to a desired range of “AC V”.
- Regardless of +/- polarity, connect the test pins to a circuit to measure.
● Connect the tester in parallel with the power supply.
- Read the measured value on the AC V scale (red).
● An example of measurement: Voltages of household outlets.

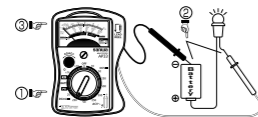


⚠ WARNING

A measurement error will become larger when a voltage of waveform other than sine wave AC is measured.

4-4 DC Current (DC mA) Measurement

- Turn the range selector to a desired range of “DC mA”.
- Turn off the power switch of a circuit to measure to isolate the object to be measured.
- Connect the black test pin to the negative side of the circuit to measure and the red test pin to the positive side.



⚠WARNING: Connect the tester in series with the circuit.
④Read the measured value on the mA scale (black).

⚠WARNING: Never apply voltage.

4-5 Resistance (Ω) Measurement

- Turn the range selector to a desired range of “Ω”. Short the red and black test pins and then adjust 0 Ω with the 0 Ω adjuster.
- Connect the test pins to a resistor or circuit to measure.
- Read the measured value on the OHMS scale (green).

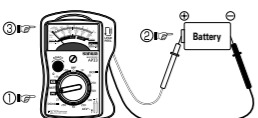


● An example of measurement: Check of wiring of resistors and cords.

⚠WARNING: Never attempt to measure resistance of lines with voltage.

4-6 Battery Load Voltage (BATT) Measurement

- A battery of 1.5 V and 9 V can be tested.
- Connect the red test pin to the ⊕ positive side of the battery and the black test pin to the ⊖ negative side.
- Judge the indication on the BAD? GOOD scale.



⚠CAUTION: The button battery cannot be measured.

⚠CAUTION: To prevent battery discharge, complete measurement quickly.

[5] Maintenance

⚠ WARNING

- This section is very important for safety. Read and understand the following instruction fully and maintain properly.
- The instrument must be calibrated and inspected once a year to maintain the safety and accuracy.

5-1 Maintenance and Inspection

- Check the appearance for any damage caused by a drop or for any other reason.
- Check the test lead for any damage or break. If the tester is in one of the above conditions, stop using it and have it repaired.

5-2 Calibration and Inspection

Contact the authorized agent of Sanwa Electric Instrument Co., Ltd. for calibration and inspection of the equipment.

5-3 Storage

⚠ CAUTION

- The body is sensitive to volatile solvents. Do not wipe it with thinner and alcohol.
- The body is sensitive to heat. Do not place the tester near heat-generating sources.
- Do not keep the tester in places where the tester may be exposed to vibration or where there is a risk of falling down.
- Do not keep the tester in places where it is exposed to direct sunlight, high temperature, low temperature, high humidity or condensation.
- When the tester is not used for an extensive period of time, be sure to remove internal batteries from it.

5-4 Replacement of the Battery and Fuse

Factory-preinstalled built-in battery

A battery for monitoring is preinstalled before shipping, therefore it may run down sooner than the battery life specified in the instruction manual.

※The “battery for monitoring” is a battery to inspect the functions and specifications of the product.

- Unfasten two screws on the backside of the body using a screwdriver to remove the rear case.
- Remove the battery or fuse and replace it with new ones.
Battery: R03 (AAA battery) 1.5 V X 1
Fuse: φ5 X 20, 0.5 A/250 V
- Put the rear case and fasten the screws.

[6] After-Sales Service

6-1 Warranty and Provision

Sanwa offers comprehensive warranty services to its end-users and to its product resellers. Under Sanwa’s general warranty policy, each instrument is warranted to be free from defects in workmanship or material under normal use for the period of one (1) year from the date of purchase.

This warranty policy is valid within the country of purchase only, and applied only to the product purchased from Sanwa authorized agent or distributor.

Sanwa reserves the right to inspect all warranty claims to determine the extent to which the warranty policy shall apply. This warranty shall not apply to fuses, disposables batteries, or any product or parts, which have been subject to one of the following causes:

- A failure due to improper handling or use that deviates from the instruction manual.

- A failure due to inadequate repair or modification by people other than Sanwa service personnel.
- A failure due to causes not attributable to this product such as fire, flood and other natural disaster.
- Non-operation due to a discharged battery.
- A failure or damage due to transportation, relocation or dropping after the purchase.

6-2 Repair

Customers are asked to provide the following information when requesting services:

- Customer name, address, and contact information
- Description of problem
- Description of product configuration
- Model Number
- Product Serial Number
- Proof of Date-of-Purchase
- Where you purchased the product

- Prior to requesting repair, please check the following:
Capacity of the built-in battery, polarity of installation and discontinuity of the test leads.

- Repair during the warranty period:
The failed meter will be repaired in accordance with the conditions stipulated in 6-1 Warranty and Provision.

- Repair after the warranty period has expired:
In some cases, repair and transportation cost may become higher than the price of the product. Please contact Sanwa authorized agent / service provider in advance.
The minimum retention period of service functional parts is 6 years after the discontinuation of manufacture. This retention period is the repair warranty period. Please note, however, if such functional parts become unavailable for reasons of discontinuation of manufacture, etc., the retention period may become shorter accordingly.

- Precautions when sending the product to be repaired
To ensure the safety of the product during transportation, place the product in a box that is larger than the product 5 times or more in volume and fill cushion materials fully and then clearly mark “Repair Product Enclosed” on the box surface. The cost of sending and returning the product shall be borne by the customer.

6-3 SANWA web site

http://www.sanwa-meter.co.jp
E-mail: exp_sales@sanwa-meter.co.jp

[7] Specifications

Item	Specifications
Meter	Moving-coil, pivot type
Built-in fuse	0.5 A / 250 V, φ 5 × 20 mm fast acting fuse
Built-in battery	R03 (AAA battery) 1.5 V × 1
Operating temperature & humidity	5 - 40 °C, 80 % RH or below, no condensation. 80 % RH (max.) at 5 ~ 31 °C and linear decrease from 80 % RH to 50 % RH at over 31 °C and up to 40 °C.
Storage temperature & Humidity	-10 - 50 °C, 70 % RH MAX. No condensation.
Operating environment	Max. 2000 m, Pollution degree II, indoor use
Dimensions	126(H) × 87(W) × 30(D) mm
Mass	Approx. 185 g
Standard accessory	Instruction manual

Guaranteed accuracy range: 23 °C ± 2 °C, 75 % RH max.

	Measuring Range	Accuracy
DC voltage	10/50/250/500 V (2 kΩ/V)	± 5 % of full scale
AC voltage	50/250/500 V (2 kΩ/V)	
DC current	25 m/250 mA	± 3 % of scale length
Ω (OHMS)	×10 (10k) ----- ×1k (1M)	
BATT	1.5 V load approx 14 Ω 9 V load approx 420 Ω	—

⚠ The specifications are subject to change without notice.