

[1] SAFETY PRECAUTIONS —Be sure to read the following before use.

1-1 Explanation of Safety Symbols and Keywords

The following markings are printed on the product and in this manual to alert the user to important information.

	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
	Indicates information considered important, but not hazard-related (e.g., messages relating to property damage).

	Electrical hazard. Electrocutation, electric shock, burns, fire, and/or equipment damage could result.
	Indicates something that you must do (mandatory).
	Indicates something that you must not do (prohibited).

1-2 Safety Precautions

Be sure to observe the following precautions when using this instrument.

DANGER

	Be sure to observe the following; otherwise, there is a risk of electric shock. <ul style="list-style-type: none">Be sure to inspect this instrument before use. Follow the procedure in “5-1. Pre-operation Check” to confirm that the instrument is functioning properly.Do not use the instrument when it is wet or when your hand is wet.When using the instrument near a live component, do not touch any place where voltage is applied.When using the instrument, wear protective safety gear.Do not apply a strong impact to the instrument. If it is subjected to a strong impact, perform operation checks before using. Do not use the instrument if you suspect there is a malfunction.
	Do not store the instrument where it may be exposed to direct sunlight, high temperature or humidity or where there is condensation. If you do store the unit under these conditions, be sure to perform operation checks before using it. Do not use the instrument if you suspect there is a malfunction.

Cleaning and storage:

- Since this instrument can be damaged by solvents, do not clean it with benzine, alcohol, or thinners. Wipe off stain with a soft cloth moistened with a small amount of water.
- Since the instrument is vulnerable to heat, do not leave it near an object that generates high temperature.
- Do not store the instrument in a place where there are constant vibrations or where there is risk that it could fall.
- Do not store the instrument in a place under direct sunlight or where temperature is high or low, humidity is high, and there is condensation.
- Be sure to remove the batteries when the instrument will not be used for a long period of time.
- Follow local regulations when disposing of the instrument and/or button batteries.

[2] APPLICATION AND FEATURES

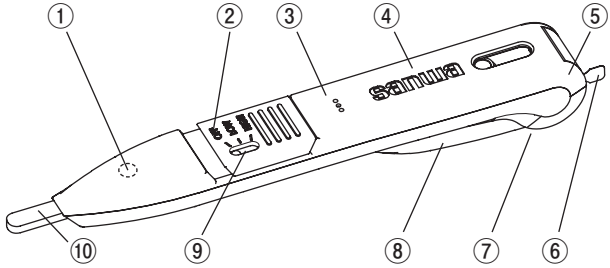
2-1 Application

This instrument is a pen-shaped voltage detector that can check jacketed electrical wires and bare wires that use AC voltage in live wire conditions.

2-2 Features

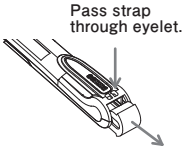
- Slim, easy-to-hold pen-shaped design
- Detection with a loud beep and blinking LED
- Sensitivity switchable between LOW and HIGH
- Safety design equipped with a power LED

[3] NAMES OF PARTS



No.	Name	Functions
①	Red detector LED	Blinks when voltage is detected.
②	Power/sensitivity switch	Turns the power ON and OFF and switches the sensitivity between LOW and HIGH when this sliding switch is moved.
③	Beep emitter	Beeps when voltage is detected.
④	Grip	Stabilizes detection sensitivity when gripped firmly (see “5-2. Detection Procedures”).
⑤	Battery compartment cover	Open this when replacing the batteries (see “[6] BATTERY REPLACEMENT”).
⑥	Insulation tab	Pull this out before use (see “[5] USING THE INSTRUMENT”).
⑦	Strap eyelet*	Accommodates a hand strap.
⑧	Clip	Holds the edge of cloth when the instrument is stored in a pocket.
⑨	Green power LED	Lights or blinks when the power is ON. Blinks when voltage is detected.
⑩	Sensor	Detects voltage when contacting a jacketed electrical wire or bare wire.

* A strap is not provided. Use a strap that is the right size. Open the battery compartment cover before passing the strap through the eyelet.



[4] DESCRIPTION OF FUNCTIONS

4-1 Auto Power Off

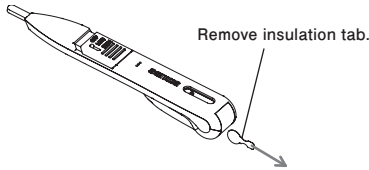
The instrument beeps three times intermittently about 5 minutes after the power is turned ON or since voltage was last detected and then beeps continuously for 2 seconds. The green power LED goes out and voltage detection is interrupted. To turn the power ON again, slide the power/sensitivity switch to OFF and then move it to the desired position.

4-2 Battery Low Warning

When battery voltage drops below about 2.4 V, the instrument beeps continuously for about 2 seconds and the power turns OFF automatically. If this happens, both batteries should be replaced with new ones.

[5] USING THE INSTRUMENT

Remove the battery insulation tab before using the instrument for the first time.



5-1 Pre-operation Check

To ensure safety, be sure to check the following before operation.

- External appearance: Check that there are no external abnormalities or signs of damage such as might be caused if the instrument were dropped.
- Battery exhaustion: Check that the beep sounds once, the red detector LED blinks, and the green power LED lights when the power/sensitivity switch is set to LOW or HIGH.
- Voltage detection function: Check that the beep sounds and the red detector LED blinks when the sensor contacts a known voltage supply with about 100 V or 200 V.

5-2 Detection Procedures

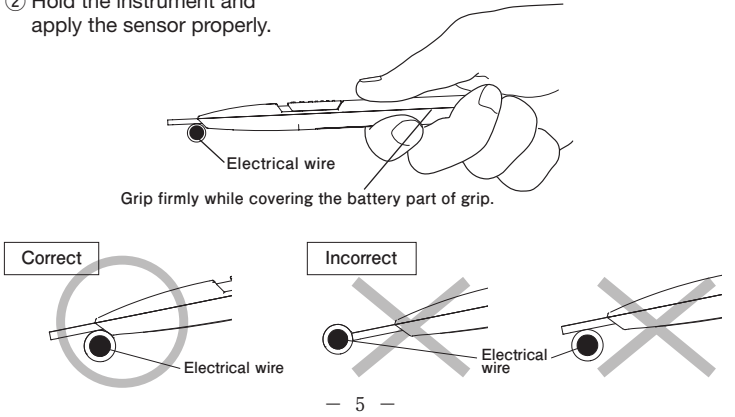
- ① Set the power/sensitivity switch to LOW or HIGH.

LOW: For bare live parts and bare wires

HIGH: For jacketed electrical wires

When the switch is set to LOW, the instrument beeps once, the red detector LED blinks once, and the green power LED lights continuously. When the switch is set to HIGH, the instrument beeps twice, the red detector LED blinks twice, and the green power LED lights continuously.

- ② Hold the instrument and apply the sensor properly.



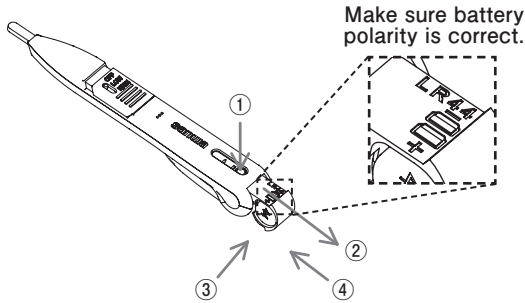
- ③ When voltage is detected, the instrument starts beeping intermittently and the red and green LEDs start blinking.

■ Correct detection may not be possible in the following cases.

- This instrument is designed exclusively for detection of commercially supplied AC voltage. It may not be able to detect electric circuits with other frequencies such as the voltage generated by an inverter's secondary side.
- This instrument may not be able to detect live electricity depending on how it is held, where the sensor is applied, and conditions in the surrounding environment.
- If the human body is in contact with the target hot-line cable, detection sensitivity deteriorates.
- This instrument cannot be used for shielded electrical wires.

[6] BATTERY REPLACEMENT

After confirming that the power is OFF, replace the batteries as shown below.



- ① Press down using a pointed object such as the tip of a ballpoint pen.
② Slide the battery compartment cover in the direction of the arrow to open the cover, while keeping ① depressed.
③ Replace the batteries with 2 new LR44 button batteries. Be sure the batteries are aligned correctly according to polarity.
④ Replace the battery compartment cover in the original position.

Note:

Although the battery compartment is designed to keep the batteries from falling out, the batteries may still fall out if the instrument is subjected to strong vibrations and shocks. If the batteries are placed in the compartment incorrectly, they may be difficult to remove.

[7] AFTER-SALE SERVICE

7-1 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.

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 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.

7-2 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

Please contact Sanwa authorized agent, distributor, or service provider, listed in our website, in your country with above information. An instrument sent to Sanwa agent or distributor without those information will be returned to the customer.

Note:

- 1) Prior to requesting repair, please check the following:

- Capacity and installation polarity of the batteries.
- Continuity of the test leads.

- 2) Repair during the warranty period:

The failed instrument will be repaired in accordance with the conditions stipulated in “7-1 Warranty and Provision”.

- 3) 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 or service provider

in advance. The minimum retention period of service functional parts is six (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.

- 4) 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.

7-3 SANWA Website

http://www.sanwa-meter.co.jp

E-mail: exp_sales@sanwa-meter.co.jp

[8] SPECIFICATIONS

Detectable voltage range	80 to 600 V AC, 50/60 Hz LOW: Works with bare live part HIGH: Works with IV2 mm jacketed electrical wire or equivalent
Detection indicator	Red and green LEDs blinks; beep sound
Volume	50 dB or more at 50 cm distance from beep emitter
Light intensity	Visible at 50 cm distance from light emitting section with light intensity of 8,000 lux
Dielectric strength	1 min. at 2000 V AC, from sensor to grip
Low battery warning	Beep sounds for 2 sec. when voltage falls below approx. 2.4 V and then power is turned OFF
Operating temperature/ humidity range	Temperature: -10 °C to 45 °C; humidity: 80 % RH or less (no condensation)
Storage temperature/ humidity range	Temperature: -20 °C to 60 °C; humidity: 80 % RH or less (no condensation)
Power supply	LR44 (alkaline button battery), 1.5 V x 2
Battery life	Approx. 9 hours of continuous operation (approx. 7 mA during detection, approx. 1.5 mA during standby) or 3 years in Auto Power Off or OFF mode
Auto Power Off mode	Approx. 5 min. since last detection, 2 μA TYP
Dimensions/weight	134 (H) x 20 (W) x 18 (D) mm, approx. 20 g (including batteries)
Accessories	LR44 (alkaline button battery) x 2; Instruction manual

The product specifications described in this manual and its appearance are subject to change without notice for improvement or other reasons.

WARNING

	Be sure to observe the following; otherwise, there is a risk of electric shock. <ul style="list-style-type: none">Do not use this instrument for any purpose or operate it in any manner other than described in this manual.Do not use the instrument if it is damaged or broken.Do not use the instrument if the case or battery compartment cover has been removed.When the battery power is low, replace the batteries with new ones.This instrument does not detect voltage unless the power is ON. Be sure to check that the green power LED lights or blinks when operating it.Do not make any repairs or modifications other than battery replacement.Do not apply strong force to or get the sensor dirty.
	Be sure to observe the following; otherwise, the instrument may not function properly and/or an accident may occur. <ul style="list-style-type: none">Use the instrument indoors.Do not connect the instrument to an electric circuit exceeding 600 V.
	To avoid accidental swallowing, keep the button batteries out of the reach of children.

CAUTION

	Do not use this instrument near a strong magnetic field (for example, near a transformer and large current path) or charged object. This could cause the instrument to execute unnecessary operations.
	Do not use the instrument in environments exposed to dust or water.

NOTICE

- Avoid subjecting this instrument to strong vibrations and be careful not to drop it.

Replacing the batteries:

- Do not forcibly pull or twist the battery compartment cover. Doing so could damage the instrument.
- Although the instrument has been designed to prevent the button batteries from falling out, strong vibrations may cause the batteries to fall out.
- Due to the button battery fall prevention design, incorrect battery insertion may make the batteries difficult to remove.