



# PM7a DIGITAL MULTIMETER

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## [1] SAFETY PRECAUTIONS

This instruction manual explains how to use your new digital multimeter PM7a safely. Before use, please read this manual thoroughly. After reading it, keep it together with the product for reference to it when necessary. The instruction manual given under the heading of must be followed to prevent accidental burn or electrical shock.

### 1-1 Explanation of Warning Symbols

The meaning of the symbols used in this manual and attached to the product is as follows.

**⚠** :Very important instruction for safe use.

The **WARNING** message are intended to prevent accidents to operating personnel such as burn and electrical shock.

The **CAUTION** message are intended to prevent damage to the instrument.

- ~ Alternating current (AC)
- ⚡ Buzzer
- +
- ⚡ Direct current (DC)
- ➡ Diode
- Minus
- Ω Resistor

### 1-2 Warning instruction for Safe Use

#### ⚠ WARNING

To ensure the meter is used safely, be sure to observe the instruction when using the instrument.

- Never use meter on an electric circuits that exceeds 1kVA.
- Pay special attention when measuring the voltage of AC33Vrms(46.7V peak) or DC70V or more to avoid injury.
- Never apply an input signal exceeding the maximum rating input value.
- Never use meter for measuring the line connected with

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equipment (i.e.motors) that generates induced or surge voltage since it may exceed the maximum allowable voltage.

- Never use meter if the meter or test leads are damaged or broken.
- Never use uncased meter.
- Be sure to disconnect the test pins from the circuit when changing the function.
- Before starting measurement, make sure that the function and range are properly set in accordance with the measurement.
- Never use the meter with wet hands or in a damp environment.
- Be sure to use test leads of the specified type.
- Never open tester case except when replacing batteries. Do not attempt any alteration of original specifications.
- Never use the meter near place where there are strong electromagnetic Waves.
- To ensure safety and maintain accuracy, calibration and check the tester at least once a year.
- Indoor use only.

### 1-3 Overload protection

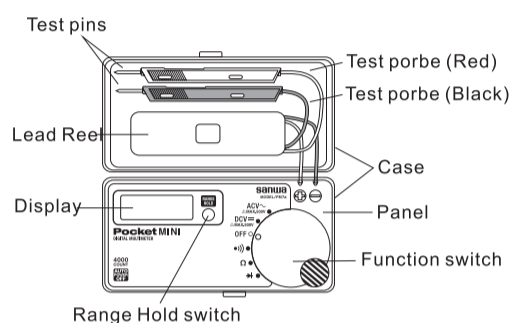
| Function | Input Terminals | Max. Rating input value | Max. Overload protection input |
|----------|-----------------|-------------------------|--------------------------------|
| DCV      |                 | DC500V                  | DC500V, AC500V                 |
| ACV      | +, -            | AC500V                  | or Peak Max.700V               |
| ⚡ Ω ➡    |                 | Never apply voltage     | AC/DC450V                      |

\*AC voltage is regulated by rms of sine wave.

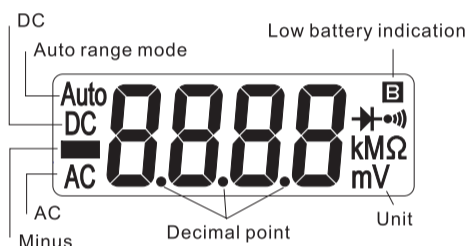
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## [3] NAME OF COMPONENT UNITS

### 3-1 Multimeter



### 3-2 Display



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## [4] DESCRIPTION OF FUNCTIONS

### Function switch

Turn this switch, to turn on and off the power and to select the functions of ACV, DCV, ⚡, Ω, ➡.

### Low battery indication

Mark is indicated when low battery.

### Over display

OL indication when input is over maximum rating input value except ACV and DCV functions.

### RANGE HOLD switch

Pressing this switch once sets the manual mode and the range is fixed. AUTO on the display disappears.

Once the manual mode is set, the range moves each time this switch is pressed. Checking the unit on the display and the place of the decimal point, select a desired range. To return to the auto mode, keep pressing this switch and AUTO on the display appears.

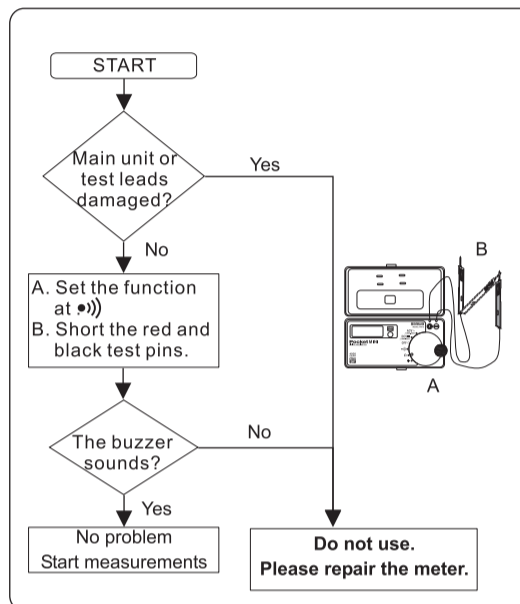
## [5] MEASUREMENT PROCEDURE

### 5-1 Start-up Inspection

#### ⚠ WARNING

- Be sure to pre-check the meter before use.
- Do not use a damaged meter and test leads.
- Check continuity of test leads.
- When a battery exhaust mark appears in the display, replace the battery with a new one.

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#### ⚠ WARNING

- Never apply an input signal exceeding the maximum rating input value.
- Be sure to disconnect the test pins from the circuit

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## [2] APPLICATION AND FEATURES

### 2-1 Applications

This instrument is portable digital multimeter designed for measurement of weak current circuits.

### 2-2 Features

- Auto Power off function (15 mins)
- Shell type pocket size multimeter.

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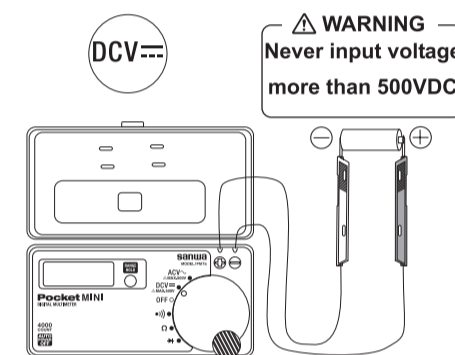
when changing the function.  
3.Always keep your fingers away from test pins when making measurements.

### 5-2 Voltage measurement

**5-2-1 DCV measurement:** Maximum rating input value DC500V

Range: 400.0mV, 4.000V, 40.00V, 400.0V, 500V

- The reading does not become 0 when the input terminal is shorted. But this does not bring about the influence to measurement.
- "-" indication appears when applying test pins reversed.



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**5-2-2 ACV measurement:** Maximum rating input value AC500V

Range: 4.000V, 40.00V, 400.0V, 500V

- Accuracy is guaranteed in the case of sine wave (Bandwidth 40Hz ~ 400Hz)
- In the AC4V range, the reading does not become 0 when no input signal. But this does not bring about the influence to measurement.

**5-3 Resistance measurement:** Max. rating input value 40M ohm

Range: 400.0 ohm, 4.000k ohm, 40.00k ohm, 400.0k ohm, 4.000M ohm, 40.00M ohm

- Open voltage is approx. DC 0.4V.
- If a finger touches a test pin during measurement, the reading will be influenced by the resistance in the human body.

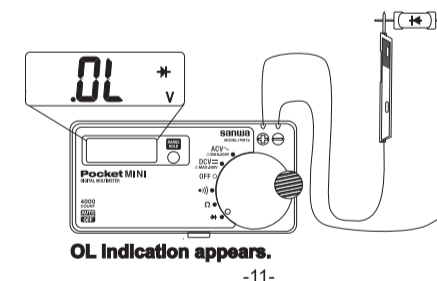
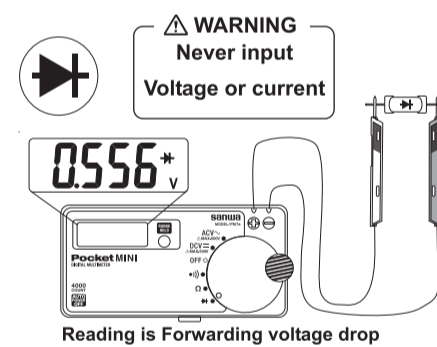
### 5-4 Checking Continuity (⚡)

- Open voltage is approx. DC 0.4V.
- Threshold: approx. 10 ohm to 120 ohm.

### 5-5 Testing Diode (➡)

Diodes is good when following readings appear.

- Open voltage is approx. DC 1.5V.



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## [6] MAINTENANCE

### 6-1 Maintenance and inspection

- Appearance: Is the appearance not damaged by falling?
- Test leads: Is the cord of the test leads not damaged? Or is the core wire not exposed at any place of the test leads? If your meter fails in any of the above items, do not use it and have it repaired or replace it with a new one.

### 6-2 Calibration

The manufacturer may conduct the calibration and inspection. For more information, please contact the dealers.

### 6-3 Storage

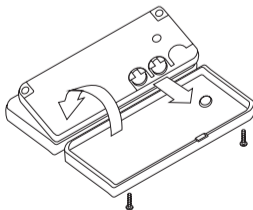
#### ⚠ CAUTION

- The meter are not resistant to volatile solvent and must not be cleaned with thinner or alcohol. For cleaning, use dry, soft cloth and wipe it lightly.
- The meter are not resistant to heat. Do not place the instrument near heat-generating devices (such as a soldering iron).
- Do not store the instrument, in a place where it may be subjected to vibration or from where it may fall.
- For storing the instrument, avoid hot, cold or humid places, under direct sunlight or where condensation is anticipated.

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### 6-4 Battery replacement

Replace battery when low battery indication appears. Battery: LR44 x 2 pcs.



## [7] AFTER-SALES SERVICE

### 7-1 Repair

If the meter fails during use, check the following items before sending it for repair.

- Is the battery not exhausted?
- Is the fuse not blown?

We repair defective product(s) at cost. When sending it to us for repair, please use appropriate packing material.

### 7-2 For information or Enquiries

If you need information regarding purchase of repair parts or if you have any other sales related questions, please contact the dealer, selling agent, or manufacturer.

### 7-3 SANWA web site

http://www.sanwa-meter.co.jp  
email: exp\_sales@sanwa-meter.co.jp

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## [8] SPECIFICATIONS

### 8-1 General Specification

- Measuring method:  $\Delta \Sigma$  method
- Display: 3 3/4 digit, 4000 counts
- Range Selection: Auto and Manual ranges
- Over indication: "OL" indication (except AC/DC500V ranges)
- Polarity indication: Automatic Selection "-" indication
- Low battery indication: Below approx. 2.4V, "B" indication appears.
- Sampling rate: Approx. 3 times/sec.
- AC sensing: Average sensing
- Environmental condition: Operation altitude < 2000m / Pollution degree II
- Operating temperature/humidity: 5°C~40°C, Max RH. 80% RH for temperatures up to 31°C decreasing linearly to 50% RH at 40°C
- Storage temperature/humidity: -10°C ~50°C, 70%RH max. No condensation. (Remove batteries)
- Power supply: LR44 (1.5V) x 2 pcs.
- Auto power off: 15 min after no operation
- Power consumption: Approx. 5mW at DCV
- Size.Weight: 115(H) x 57(W) x 18(D)mm, Approx 85g
- Accessory: Battery x 2 pcs, Instruction manual

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### 8-2 Measurement Range and Accuracy

Accuracy assurance range: 23±5°C, 80%RH max. No condensation.

| Function | Range   | Accuracy(±)     | Input Impedance | Remarks  |
|----------|---------|-----------------|-----------------|--|
| DCV      | 400.0mV | (0.7%rdg+3dgt)  | ≥100MΩ          |  |
|          | 4.000V  |                 | Approx.11MΩ     |  |
|          | 40.00V  |                 |                 |  |
|          | 400.0V  | (1.3%rdg+3dgt)  | Approx.10MΩ     |  |
|          | 500V    |                 |                 |  |
| ACV      | 4.000V  | (2.3%rdg+10dgt) | Approx.11MΩ     | Accuracy in the case of sine wave. Bandwidth: 40~400Hz   |
|          | 40.00V  |                 |                 |  |
|          | 400.0V  | (2.3%rdg+5dgt)  | Approx.10MΩ     |  |
|          | 500V    |                 |                 |  |
|          |         |                 |                 |  |
| Ω        | 400.0Ω  |                 |                 | Open voltage: Approx DC0.4V<br>The measuring current changes according to the resistance of the resistor to measure. |
|          | 4.000kΩ | (2.0%rdg+5dgt)  |                 |  |
|          | 40.00kΩ |                 |                 |  |
|          | 400.0kΩ |                 |                 |  |
|          | 4.000MΩ | (5.0%rdg+5dgt)  |                 |  |
| ⚡)       |         |                 |                 | Buzzer sounds at less than 10~120Ω   |
|          |         |                 |                 |  |
| ➡        |         |                 |                 | Open voltage: Approx. 1.5V   |

Specifications and external appearance of the product described above may be revised for modification without prior notice.

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