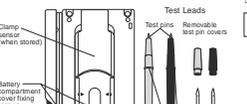


SAFETY PRECAUTIONS Explain how to be following safety precautions. This instruction manual explains how to safely use your new PM333a digital multimeter with clamp sensor. Before use, please read this manual thoroughly. After reading it, keep it together with the product so you can refer to it when necessary. Using this product in ways not specified in this manual may damage the product function and void the warranty. Instructions given under the "WARNING" and "CAUTION" headings must be followed to prevent accidental burns or electrical shock.

1. Explaination of Warning Symbols
2. The meanings of the symbols used in this manual and on the product are as follows.
3. Very important instruction for safe use.
4. The warning messages are intended to prevent accidents and protect personal health and safety.
5. The caution messages are intended to prevent damage to the instrument.
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and the clamp sensor barrier when making measurements.
 9. Be sure to disconnect the test pins from the circuit when changing the function.
 10. Before starting measurement, make sure that the function and range are properly set in accordance with the measurement that you are going to perform.
 11. Never use meter with wet hands or in a damp environment.
 12. Never open the instrument case except when replacing batteries and when necessary for alteration of original specifications.
 13. To use safely and maintain accuracy, calibrate and check the instrument at least once a year.
 14. The instrument is for indoor use only.

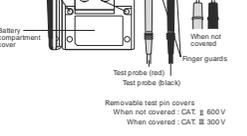


additional function equipment, enabling measurement of small type communication equipment, electrical home appliances, lighting voltage and batteries of various types.
 A current clamp sensor is also provided that can measure up to 100 A DC/AC, allowing measurement of the electric consumption of equipment that uses an automobile battery or AC power supply. This can be done by simply clamping a single line of electrical wiring in the device being measured.

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1. Correct measurement may not be possible in areas exposed to strong magnetic fields generated by electrical equipment such as a transformer or large current path, electromagnetic waves generated by wireless equipment, or areas where electrostatic charges are generated.
 2. This instrument may malfunction or give erroneous results when used in areas where measurement with special waveforms such as those provided by an inverter circuit.

2-2 Features
 • The instrument is compact and lightweight and has been designed in accordance with the standard EN 61010-1.
 • Provided with a current clamp sensor that can measure up to 100 A DC/AC.
 • The clamp sensor has a thin U-shaped sensor design that is 7 mm thick. Also because the inclination angle of the sensor is variable between 0° and 180°, the display section of the main unit can be adjusted to see into and view a range.
 • Provided with RANGE hold, MAX/MIN hold, REL/ZERO and DATA HOLD functions that are convenient for measurement.
 • The HOLD function is a special function used during the activation of the ACV/ACA function, the frequency and duty of the signals that are being measured can be tested.
 • The stable accuracy of the test leads and test probes use an elastomeric material that is easy to wind and store.

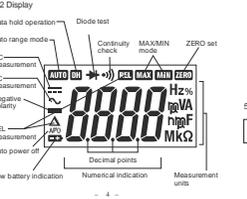


3-2 Display
 Data hold operation: Diode test
 Auto range mode: Continuity check
 DC measurement: MAX/MIN hold
 AC measurement: REL/ZERO set
 Negative polarity: REL measurement
 REL measurement: Auto power off
 Low battery indication: Numerical indication
 Measurement units

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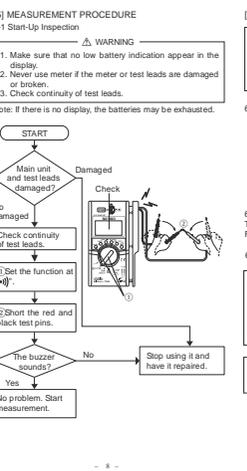


3-1 Multimeter
 Winding directions of test leads
 MAX/MIN RANGE button
 REL/ZERO button
 DATA HOLD button
 SELECT button
 Power switch
 Switch cover

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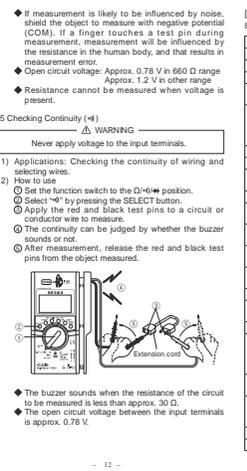


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5-8 Testing Diodes **WARNING**
 Never apply voltage to the input terminals.

- 1) Applications: Testing the quality of diodes.
- 2) How to use
 - Set the function switch to the ∇ (Diode) position.
 - Select ∇ by pressing the SELECT button.
 - Apply the black test pins to the cathode of the diode and the red test pins to the anode.
 - Make sure that the display shows a diode forward voltage drop.
 - After replacing the red and black test pins, connect the red test pin to the cathode of the diode and connect the black test pin to the anode.
 - Make sure that the display shows the same as when the test is not connected (I.C. indication).
 - Note: Successful completion of steps ① and ② indicates that there is no problem with the diode.
- After measurement, release the red and black test pins from the object measured.

◆ When the 6.00V or 66.00V nF range is used, the REL mode is set to set the values that remain on the display to "0" (zeroed) before the measurement.
 ◆ Readings are unstable because of stray capacitance in test leads or noise.

5-9 Capacitance Measurement **WARNING**
 Never apply voltage to the input terminals.

- 1) Applications: Measuring the capacitance of low leakage capacitors such as film capacitors.
- 2) How to use
 - Set the function switch to the ∇ (Capacitance) position.
 - Apply the red and black test pins to a conductor to measure.
 - Read the value on the display.
 - After measurement, release the red and black test pins from the object measured.

◆ When the 6.00V or 66.00V nF range is used, the REL mode is set to set the values that remain on the display to "0" (zeroed) before the measurement.
 ◆ Readings are unstable because of stray capacitance in test leads or noise.

6-1 Maintenance and Inspection
 1) Appearance
 Has the appearance been damaged by falling?
 2) Test leads
 Is the test lead cord damaged?
 Is the cord wire exposed at any place on the test leads?
 If the built-in fuse is blown, current measurement is impossible. Make sure that the test leads are not cut, referring to the section 5-1.

6-2 Calibration
 The manufacturer may conduct calibration and inspection. For more information, please contact your dealer.

6-3 Battery Replacement **WARNING**
 1. To avoid electric shock, do not remove the battery compartment cover when input is applied to the measurement terminal (in the clamp sensor or when measurement is being performed).
 2. Be sure to confirm that the function switch is set to "OFF" before replacing the batteries.

6-4 Storage **CAUTION**
 1. The panel and the case are not resistant to volatile solvent and must not be cleaned with thinner or alcohol.
 2. The panel and the case are not resistant to heat. Do not place the instrument near heat-generating devices (such as a soldering iron).
 3. Do not store the instrument, in a place where it may be subjected to vibration or from where it may fall.
 4. For storing the instrument, avoid hot, cold or humid places or places under direct sunlight or where condensation is anticipated.
 5. When the instrument is not going to be used for extended time, be sure to remove the batteries.

8) SPECIFICATIONS
 8-1 General Specifications

Measurement	Double integral method
Display	Max. 6600 count
Over-ranging indication	OLC mark indication
Range selection	Auto and manual ranges
Polarity selection	Automatic selection (display only)
Low battery indication	When the built-in batteries are exhausted (to 2.3 V or less) with ∇ (I.C.) or ∇ (Capacitance) function in display
Sampling rate	Approx. 3 times/sec
Current measurement system	CT clamp
Measuring conductor diameter	10 mm
AC sensing	Average sensing
Environmental condition	Operating altitude <2000 m, indoor class pollution degree 2
Accuracy-guaranteed temperature range	23 ± 5 °C, <80 % RH (without condensation)
Operating temperature/humidity range	5 ~ 40 °C, <80 % RH (without condensation)
Storage temperature/humidity range	-10 ~ 50 °C, <80 % RH (without condensation)
Power supply	Two LR6 alkaline batteries
Auto power off	Power off after approx. 30 minutes since last operation
Power consumption	Approx. 7 mW TYP (at DCV)
Dimensions & mass	130 (L) x 75 (W) x 19.9 (D) mm (excluding protrusions), approx. 160 g (including protrusions)
Test lead length	Approx. 60 cm for both red and black
Safety standard	EN61010-1:2010, IEC 61010-1:2010, EN61326-1:2012, CAT I 300 V, CAT II 600 V, EN61010-3
EMC directive, RoHS directive	CE, RoHS
Accessories	Instruction manual

8-2 Measurement Range and Accuracy
 Accuracy assurance range: 23 ± 5 °C & less than 80 % R.H. No condensation

Function	Range	Accuracy	Input impedance	Remarks
DCV	600.0 mV	±1.1 % (typ)±3 (dig)	≥100 MΩ	Accuracy was measured after calibrating display value by the REL function.
	6.000 V	±0.7 % (typ)±3 (dig)	Approx. 10 MΩ	
DCV	60.00 V	±0.7 % (typ)±3 (dig)	Approx. 10 MΩ	Accuracy was measured after calibrating display value by the ZER0 set function.
	600.0 V	±1.1 % (typ)±3 (dig)	≥100 MΩ	
ACV	6.000 V	±1.1 % (typ)±3 (dig)	Approx. 10 MΩ	Accuracy was measured after calibrating display value by the ZER0 set function.
	60.00 V	±1.1 % (typ)±3 (dig)	≥100 MΩ	
Resistance Ω	600.0 Ω	±1.6 % (typ)±3 (dig)	≥100 MΩ	Open voltage: Approx. 1.78 V The measuring current changes according to the resistance of the test piece.
	6.000 kΩ	±1.6 % (typ)±3 (dig)	≥100 MΩ	
Temp. (°C)	0.000 °C	±1.0 % (typ)±3 (dig)	Open voltage: Approx. 1.2 V	Accuracy was measured after calibrating display value by the ZER0 set function.
	30.000 °C	±1.0 % (typ)±3 (dig)	Open voltage: Approx. 1.2 V	

Note: 3dig in the 66.0 mV range corresponds to 0.3 mV.

5-8 Clamp Current Measurement (CLAMP) **WARNING**
 1. The clamp sensor of this instrument is exclusively for low voltage. Perform the clamp current measurement on a power line with the design voltage compartments.
 2. Do not turn the function switch during measurement.
 3. During measurement, do not hold the clamp sensor at any point beyond the barrier.
 4. To prevent electric shock, be sure to store the test probe and test lead in the designated storage compartments.

CAUTION
 1. The measurable diameter of a conductor is 10 mm. Do not force a cable with an outer diameter of more than 10 mm into the clamp sensor section. Also do not apply external force to the clamp sensor section.
 2. Make sure that the conductor to be measured is aligned with the center of the arrows on the clamp sensor. Otherwise, a measurement error will result.
 3. Do not let this instrument come near a conductor in which large current flows or place it on a strong magnetic field. Since an error may occur, a current value is displayed even when the clamp current measurement is made (an error may occur). Since the clamp sensor of this instrument is a U-shaped open-type sensor, it is more susceptible to such an environment compared than a closed-type sensor.

Function: Max. rating input value / Measurement range
 DCA: DC 100.0 A / DC 100.0 A
 ACA: AC 100.0 A / AC 100.0 A

When the position of this instrument is changed during DC/AC measurement, the display may fluctuate due to geomagnetism.
 Because the AC sensing system of this instrument is an average value system, an error in the measured value will occur with waveforms other than sine waves.
 Accuracy is guaranteed in ACA measurement between 40 ~ 400 Hz.
 Measurement of an inverter power supply circuit may cause a malfunction.

7-1 AFTER-SALE SERVICE
 7-1-1 Warranty and Provision
 Sanwa offers comprehensive warranty services to its end-users and to its product resale partners. Please refer to the warranty policy, which is incorporated when shipped from the factory as a motor battery, so that its service life may be shorter than that of brand-name batteries. A main component of the battery is a type of battery used to check the functions of and performance of the product.

7-1-2 Repair during the warranty period:
 The failed meter will be repaired in accordance with the conditions stipulated in 7-1-1 "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 date 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 be 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.

7-2 Sanwa Website
 http://www.sanwa-meter.co.jp
 E-mail: exp_sales@sanwa-meter.co.jp

7-2 Repair during the warranty period:
 Customers are asked to provide the following information when requesting repairs:
 1. Customer name, address, and contact information
 2. Description of problem
 3. Description of product configuration
 4. Model Number
 5. Product Serial Number
 6. Proof of Date-of-Purchase
 7. Where you purchased the product
 Please contact Sanwa authorized agent / distributor / service provider, listed in our website, in your country with above information. An information of Sanwa / agent / distributor without those information will be returned to the customer.
 Note:
 1. Prior to requesting repair, please check the following:
 - Capacity and installation position of the built-in batteries.
 - Continuity of the test leads.

MEASUREMENT CATEGORY
 CAT II: Primary electrical circuits in equipment connected to an AC electrical utility by a power cord.
 CAT III: Primary electrical circuits of heavy equipment connected directly to the distribution panel, and feeders from the distribution panel to outlets.

8-2 Measurement Range and Accuracy
 Accuracy assurance range: 23 ± 5 °C & less than 80 % R.H. No condensation

Function	Range	Accuracy	Input impedance	Remarks
DCV	600.0 mV	±1.1 % (typ)±3 (dig)	≥100 MΩ	Accuracy was measured after calibrating display value by the REL function.
	6.000 V	±0.7 % (typ)±3 (dig)	Approx. 10 MΩ	
DCV	60.00 V	±0.7 % (typ)±3 (dig)	Approx. 10 MΩ	Accuracy was measured after calibrating display value by the ZER0 set function.
	600.0 V	±1.1 % (typ)±3 (dig)	≥100 MΩ	
ACV	6.000 V	±1.1 % (typ)±3 (dig)	Approx. 10 MΩ	Accuracy was measured after calibrating display value by the ZER0 set function.
	60.00 V	±1.1 % (typ)±3 (dig)	≥100 MΩ	
Resistance Ω	600.0 Ω	±1.6 % (typ)±3 (dig)	≥100 MΩ	Open voltage: Approx. 1.78 V The measuring current changes according to the resistance of the test piece.
	6.000 kΩ	±1.6 % (typ)±3 (dig)	≥100 MΩ	
Temp. (°C)	0.000 °C	±1.0 % (typ)±3 (dig)	Open voltage: Approx. 1.2 V	Accuracy was measured after calibrating display value by the ZER0 set function.
	30.000 °C	±1.0 % (typ)±3 (dig)	Open voltage: Approx. 1.2 V	

Note: 3dig in the 66.0 mV range corresponds to 0.3 mV.

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

• ACA: No adjustment is necessary.
 • Align one line of the conductor to be measured with the center of the arrows on the clamp sensor.
 • DCA: Point the object to be measured in the same direction as the current direction marking. If it is pointed in the opposite direction, "-" will be displayed.
 • ACA: The current direction of the object to be measured is retained.
 • Read the measurement value in the display.
 • After measurement, remove the conductor from the clamp sensor.

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 3. Description of product configuration
 4. Model Number
 5. Product Serial Number
 6. Proof of Date-of-Purchase
 7. Where you purchased the product
 Please contact Sanwa authorized agent / distributor / service provider, listed in our website, in your country with above information. An information of Sanwa / agent / distributor without those information will be returned to the customer.
 Note:
 1. Prior to requesting repair, please check the following:
 - Capacity and installation position of the built-in batteries.
 - Continuity of the test leads.

MEASUREMENT CATEGORY
 CAT II: Primary electrical circuits in equipment connected to an AC electrical utility by a power cord.
 CAT III: Primary electrical circuits of heavy equipment connected directly to the distribution panel, and feeders from the distribution panel to outlets.

8-2 Measurement Range and Accuracy
 Accuracy assurance range: 23 ± 5 °C & less than 80 % R.H. No condensation

Function	Range	Accuracy	Input impedance	Remarks
DCV	600.0 mV	±1.1 % (typ)±3 (dig)	≥100 MΩ	Accuracy was measured after calibrating display value by the REL function.
	6.000 V	±0.7		