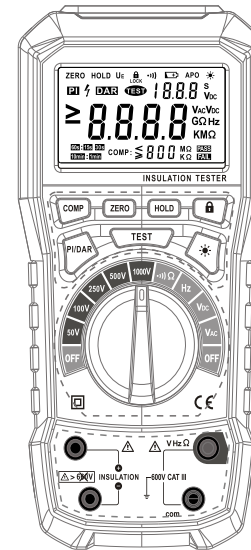


USERS MANUAL

PM1508 Insulation resistance tester



Y01-04-0182



Before using the instrument, please read this manual carefully, and save it well for future using.

尺寸 : 100*148mm
黑框不要印

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Declaration

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1. Overview

Pm1508 is a battery powered digital insulation resistance tester. It is equipped with a microprocessor chip and has high precision, stability and reliability. There are five levels of test voltage output in insulation resistance measurement (50V, 100V, 250V, 500V, 1000V). The maximum insulation resistance measurement is 100G Ω (the measurement range is from 0.00M Ω to 100G Ω), and the basic accuracy can reach +1.5%, which can meet more test demands of customers. In addition to insulation measurement, PM1508 can also measure ACV/DCV (AC/DC voltage) and frequency, and conduct low resistance measurement. It is mainly applied on insulation resistance measurement of various electrical equipment and insulating materials, such as transformers, motors, generators, cables, electrical appliances, etc. PM1508 is designed elaborately with durability and easy operation, making it an ideal tool for various scenarios of maintenance, commissioning and preventive maintenance.

2. Safety instructions

 **Warning** indicates the dangerous situation and operation that may cause personal injury or death. It also includes the condition or operation that may cause damage to the instrument or the tested equipment.

For various symbols used on the instrument and in this manual, see Table 1 for reference.

The instrument is designed and manufactured in strict accordance with IEC61010-1 safety standard and GB4793 safety requirements for electronic measuring instruments. It meets the safety standards of double insulation overvoltage class CATIII 600V and pollution class 2. If the instrument is not used in accordance with the relevant operating instructions, the protection provided by this instrument may be weakened or lost. Therefore, please read and understand the full text of this user manual carefully before using, especially the parts with“

 **Warning”**.

** Warning**

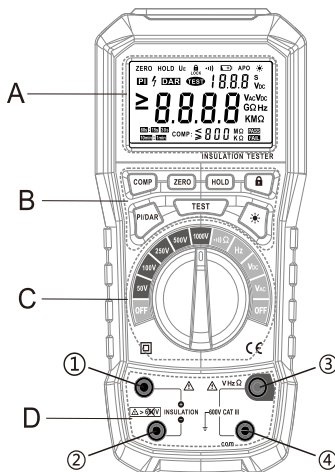
To avoid electric shock or personal injury, please use the instrument in accordance with the following guidelines:

- ① Check the instrument and the probe first before using to prevent any damage or abnormality. If any abnormality is found, such as exposed metal wire of the probe, damage on the instrument shell, no display or displaying messy code on LCD display, etc, please do not use it.
- ② If the probe is damaged, it must be replaced with a probe of the same model or the same electrical specification.
- ③ Before connecting the tester to the circuit-under-test, it is necessary to connect the test wire to the correct port, and switch the knob to the appropriate function position.
- ④ When measuring, do not touch exposed wires, connectors or unused input ports or circuits under test.
- ⑤ Do not apply voltage between terminals or between any single terminal and grounding point beyond the rated value indicated on this tester.
- ⑥ Take extra care when the voltage is above 30Vac (AC true virtual value), 42Vac (AC peak value) or 60Vdc (DC). These voltages are with potential danger of electric shock.
- ⑦ In order to avoid electric shock or personal injury caused by reading error, when the LCD display shows ""(low battery), replace the battery as soon as possible.
- ⑧ Before testing resistance, continuity, diode or capacitor, the power must be cut off and all high-voltage capacitors must be discharged.
- ⑨ Do not store and use this tester in environments with high temperature, high humidity, and inflammable, explosive and strong electromagnetic field environments.
- ⑩ Before opening the tester housing or battery cover, remove the test wire from the tester. Do not use the tester when the back cover or battery cover of the tester is open.

Symbol definition (Table 1):

	Warning, danger
	The applied voltage shall not exceed 660V
	Double insulation
	Compliance with EU directives
	Warning, dangerous voltage, electric shock hazard
	Grounding
	This product shall not be discarded as household waste or treated as unclassified urban waste.
	Low battery

3.Appearance of instrument



Piture2

A: LCD display area: display symbols of measurement data, function and unit:

B: Key area: selection of various function keys.

C: Function position selection area: select various function positions.

D: Input port area:

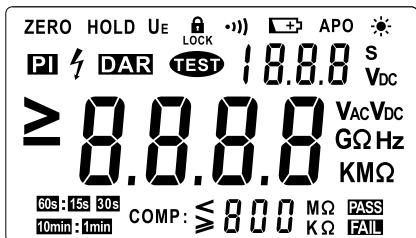
① Insulated input positive(⊕)

② Insulated input negative(⊖)

③ Voltage, frequency, low resistance input terminal.

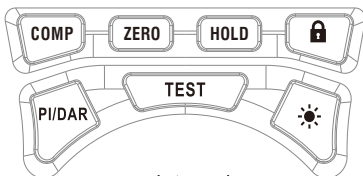
④ Voltage, frequency, low resistance input common terminal.

4.LCD full display sketch



picture 3

5.Function of keys:(sketch attached)



picture 4

5.1 COMP

In the insulation resistance measurement mode, press the “COMP” key to open the Compare function. The insulation resistance can be selected as 100Ω 200KΩ, 300KΩ, 400KΩ, 500KΩ, 1MΩ, 2MΩ, 3MΩ, 4MΩ, 5MΩ, 10MΩ, 20MΩ, 30MΩ, 40MΩ, 50MΩ, 100MΩ, 200MΩ, 300MΩ, 400MΩ, 500MΩ comparison value, and press and hold this key to exit the Compare function. Press the key in the low resistance position to open/close the continuity beeping function.

5.2 ZERO

In the continuity/low resistance measurement mode, press the “ZERO” key to turn on/off the Zeroing function, which is only effective when the short-circuit resistance is less than 2Ω.

5.3 HOLD

In the non-insulation test mode, press the "HOLD" key to enter/exit the reading holding mode. In the insulation resistance test mode, when a single measurement ends, the HOLD mode will be automatically activated. Press the key to exit HOLD mode.

5.4 LOCK

This function is only valid in insulation resistance measurement mode. Press this key to turn on/off the LOCK function. In the process of insulation resistance measurement, press the key to end the measurement.

5.5 Polarization Index(PI) / Dielectric Absorption Ratio (DAR)

In the insulation resistance test mode, press this key when the measurement is not started to turn on/off the polarization index/dielectric absorption ratio measurement function. When this function is on, PI(10min:1min) and DAR (60s:15s or 60s:30s) can be selected. After the PI/DAR measurement, press this key to switch the ratio of insulation resistance value

5.6 TEST

In the insulation resistance test mode, when the LOCK function is on, press the "TEST" key to start/end the test. When the LOCK function is not on, press and hold the "TEST" key and keep measuring, and release the key to end the measurement.

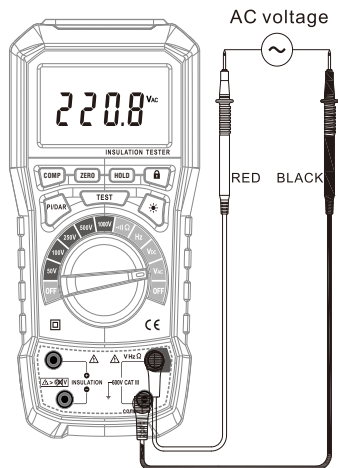
5.7 Backlight

In the ON state, press this key to turn on/off the LCD backlight. If the backlight is not turned off manually, it will turn off automatically after 30 seconds.

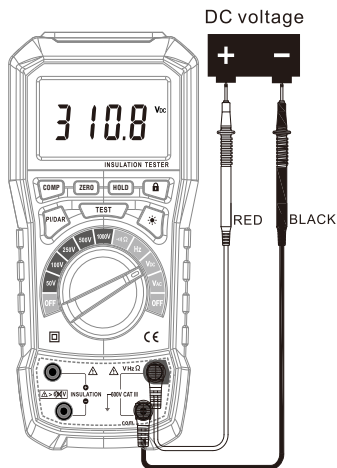
6.Measurement operation instructions:

6.1 AC voltage measurement(As shown in Picture 5)

As shown in the picture below:



Picture 5



Picture 6

- ① Insert the red probe into the “V/Hz/Ω” hole and the black probe into the “COM” hole.
- ② Turn the function selection knob to VAC, and connect the probe reliably in parallel to the circuit-under-test.
- ③ The AC voltage value of the circuit-under-test can be read from the screen.
- ④ Press the “HOLD” key to turn on/off the reading holding mode. Press the backlight key to turn on/off the backlight of the screen. Other keys have no function definition that they will make a prompt tune of “beep-beep” when being pressed.

Warning

- Do not connect the voltage over 600V to avoid unnecessary instrument damage and personnel injury.
- Apply corresponding protective measures during high voltage measurement, such as wearing insulating gloves, etc.
- Disconnect the instrument and the circuit-under-test in time after the measurement.

6.2 DC voltage measurement(as shown in Picture 6)

- ① Insert the red probe into the “V/Hz/ Ω ” hole and the black probe into the “COM” hole.
- ② Turn the function selection knob to VAC, and connect the probe reliably in parallel to the circuit-under-test.
- ③ The DC voltage value of the circuit-under-test can be read from the screen.
- ④ Press “HOLD” key to turn on/off reading holding mode.
- ⑤ Press the backlight key to turn on/off the backlight of the screen; Other keys have no function definition that they will make a prompt tune of “beep-beep” when being pressed.

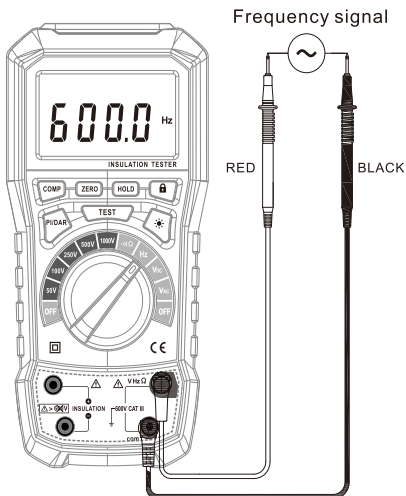
Warning

- Do not connect the voltage over 600V to avoid unnecessary instrument damage and personnel injury.
- Apply corresponding protective measures during high voltage measurement, such as wearing insulating gloves, etc.
- Disconnect the instrument and the circuit-under-test in time after the measurement.

6.3 Frequency measurement

- ① Insert the red probe into the “W/Hz/ Ω ” hole and the black probe into the “COM” hole.
- ② Turn the function selection knob to Hz, and connect the probe reliably in parallel to the circuit-under-test.
- ③ The frequency value of the circuit-under-test can be read from the screen.
- ④ Press the “HOLD” key to turn on/off the reading holding mode. Press the backlight key to turn on/off the backlight of the screen. Other keys have no function definition that they will make a prompt tune of “beep-beep” when being pressed.

As shown in Picture 7:



Picture 7



Warning

- Do not connect the voltage over 600V to avoid unnecessary instrument damage and personnel injury.
- Apply corresponding protective measures during high voltage measurement, such as wearing insulating gloves, etc.
- Disconnect the instrument and the circuit-under-test in time after the measurement.

6.4 Continuity/Low resistance measurement

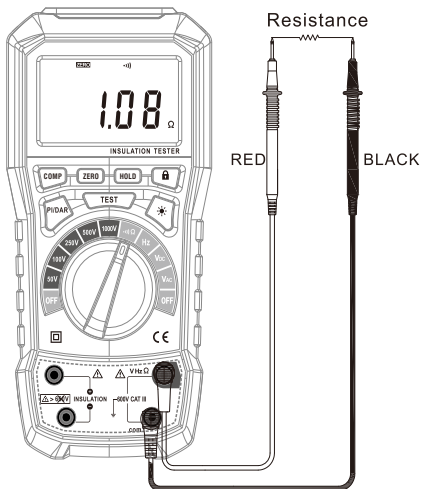
- ① Insert the red probe into the “V/Hz/Ω” hole and the black probe into the “COM” hole.
- ② Turn the function selection knob to Ω , and connect the probe reliably in parallel to the circuit-under-test.
- ③ The resistance value of the circuit-under-test can be read from the screen.

④ In order to ensure the measurement accuracy, the instrument probe shall be zeroed before the measurement, so as to eliminate the deviation caused by the instrument probe. Zeroing: short circuit the probe, press the “ZERO” key to zero after the reading is stable, and the zeroing is only effective when the reading is less than 2.000. After it’s successfully zeroed, the “ZERO” symbol will be displayed on the screen. Press the “ZERO” key again to cancel the zeroing operation, and the “ZERO” symbol will disappear.

⑤ Press the “Comp” key to turn on/off the buzzer function. When the reading is $\leq 30 \Omega$, the buzzer will beep for a long time.

⑥ Press the “HOLD” key to turn on/off the reading holding mode, short press the backlight key to turn on/off the backlight of the screen. Other keys have no function definition that they will make a prompt tune of “beep-beep” when being pressed.

As shown in the picture 8 below:

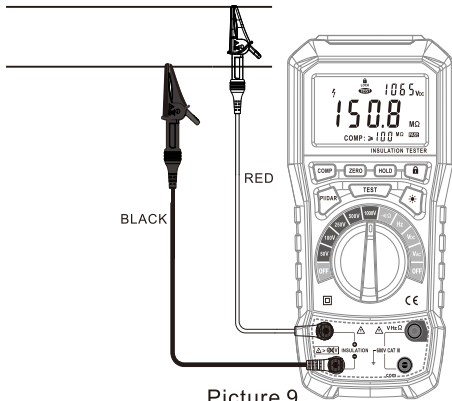


picture 8

 Warning

- Before measuring, ensure that the circuit-under-test is not electrified, so as to avoid unnecessary deviation and damage of instruments and personnel.
- Disconnect the instrument and the circuit-under-test in time after the measurement.

6.5 Insulation resistance measurement (As shown in Picture 9)



Picture 9

- ① Insert the red probe into “INSTALLATION  ” hole and the black probe into “INSTALLATION  ” hole.
- ② Turn the function selection knob to select different insulation test voltage levels, and connect the probes reliably in parallel to the circuit-under-test.
- ③ Press the “LOCK” key to turn on/off the locking mode; Under locking mode, press the “TEST” key to start the measurement, and press the “LOCK” or “TEST” key to end the measurement. When not in locking mode, press and hold the “TEST” key to start the measurement, and release the “TEST” key to end the measurement. Wait until the high voltage symbol stops flashing after the measurement and then disconnect the instrument from the circuit.

④ During the measurement, the high voltage symbol flashes, the secondary display shows the current insulation test voltage, and the main display shows the insulation resistance value.

⑤ After the measurement, press the “HOLD” key to clear the measurement result, press the backlight key to turn on/off the backlight of the screen. Other keys have no function definition that they will make a prompt tune of “beep-beep” when being pressed.

⑥ Before the measurement starts, the instrument will automatically detect the voltage of the circuit-under-test and the battery voltage. If the external AC voltage exceeds 30V, it is forbidden to start the measurement and the screen will display “UE.Hi” with a beep prompt (if it is not discharged completely after the insulation test, the screen will also display “UE.Hi” with a beep prompt and stop testing if it is immediately switched to other insulation function positions to start another test). If the battery voltage is low, it is forbidden to start the measurement, and the screen displays “ ” with a beep prompt. During the measurement process, if the battery voltage is detected to be low for 50s, the measurement will be stopped automatically, and the screen will display “BATT” with a beep prompt.



Warning

- Before measurement, ensure that the circuit-under-test or the object itself is not electrified, so as to avoid instrument and personnel damage and other electrical safety accidents
- Do not switch function during insulation test.
- Apply corresponding protective measures during high voltage measurement, such as wearing insulating gloves, etc.
- After the completion of the test and the automatic discharge of the instrument, the instrument shall be disconnected from the circuit-under-test in time.

6.6 Polarization index/Dielectric absorption ratio measurement

In the insulation resistance measurement mode, press the “PI/DAR” key to set the measurement mode before starting the measurement: DAR (dielectric absorption ratio) measurement: 60s:15s, 60s:30s; PI (polarization index) measurement: 10min:1min. After the measurement mode is set, the measurement can be started in accordance with the operation process of the

insulation measurement function. During the measurement, the secondary display area on the upper right of the display shows the second counting. When the second counting reaches the maximum time of the selected measurement mode, the measurement will be stopped automatically with three prompt beeps indicating the end of measurement. Press the “PI/DAR” key to switch the display of the insulation resistance value and PI/Dar values. If the test is interrupted (invalid), there will display a “NO”. If using it to calculate the value of PI or Dar and when the insulation resistance value at any time is greater than the maximum display value of the function or is 0, the main display position will display “Err”.

6.7 Using Compare function

In insulation resistance measurement mode, press the “COMP” key to select the comparison value before starting the measurement, and then start the measurement in accordance with the operation guidance of insulation resistance measurement mode. During the measurement, the comparison result will be displayed on the display in real time. If the measured insulation resistance value is greater than or equals to the comparison value set, the symbol of “≥” and “PASS” will be on in front of the comparison value; otherwise, the symbol of “<” and “FAIL” will be on.

6.8 Auto sleep function

① If there is no operation on the instrument within 10 minutes, it will enter the sleep mode, and there will be five prompt beeps in the 60 seconds before entering the sleep mode. After entering the sleep mode, press any key including “COMP”, “ZERO”, “HOLD” and “LOCK” to wake the instrument up.

② The auto sleep function is enabled by default. Press and hold the “HOLD” key to turn on the instrument to temporarily cancel the auto sleep function, and the screen displays “APO OFF”.

③ In the insulation resistance test mode and when the insulation resistance measurement is already started, if the automatic sleep function is turned on, it will be temporarily turned off. After the completion of the measurement, the automatic sleep function will be restored automatically.

7. Specifications

7.1 General features

① This tester conforms to the measurement standard of IEC 61010-1 CATIII 600V Class of Pollution 2.

② The input terminals are V and COM: the maximum overload voltage is 600V when measuring voltage and frequency; the maximum overload protection voltage is 250V (10 seconds) when measuring Continuity/Low resistance.

③ When the input terminal is insulated positive pole and insulated negative pole: the maximum overload protection voltage is AC 660V (10 seconds).

④ Size: 189 cm x 93.8 cm x 55 cm

⑤ Weight: 450g (batteries included)

⑥ Battery: four AA alkaline batteries (IEC LR6)

⑦ Altitude:

Operating altitude $\leq 2000\text{m}$

Storage altitude $\leq 12000\text{m}$

⑧ Storage conditions: temperature - 20°C to 60°C / humidity 75%RH or less (non-condensing)

⑨ Operating conditions: temperature 0°C to 40°C / humidity 85%RH or less (non-condensing)

⑩ Temperature coefficient: when the temperature $< 18^{\circ}\text{C}$ or $> 28^{\circ}\text{C}$, the coefficient = $0.1 \times (\text{specified accuracy})/^{\circ}\text{C}$

7.2 Technical indicators

(Temperature: $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, Humidity: 45~75%RH)

Note: the calibration period is one year, and the accuracy is valid within one year after calibration.

① AC and DC voltage measurement:

Voltage measurement	Voltage type	Measuring range	Resolution	Accuracy
	ACV	1.0~600.0V(50/60Hz)	0.1V	$\pm (1.5\% + 5)$
	DCV	0~ $\pm 600.0\text{V}$	0.1V	$\pm (1.5\% + 5)$

Note: ACV is the average value response.

②Frequency measurement:

Frequency measurement	Test range	Resolution	Accuracy
	1~1KHz (voltage $\geq 10V$)	0.1Hz	$\pm (0.1\%+3)$

③Low resistance measurement:

Low resistance measurement	Test range	Resolution	Accuracy
	0.00~200 Ω	0.01 Ω	$\pm (2\%+5)$

④Insulation resistance measurement(when insulation test resistance value $> 20G\Omega$, humidity range: 45~65%RH):

Insulation resistance measurement	Output voltage	Test range	Minimum resolution	Accuracy
	50V (100% ~ 120%)	0.00 ~ 50.0M Ω	0.01M Ω	$\pm (1.5\%+5)$
		50 ~ 500M Ω	1M Ω	$\pm (5\%+5)$
		500M ~ 1.0G Ω	1M Ω	$\pm (10\%+5)$
	100V (100% - 120%)	0.00 ~ 100.0M Ω	0.01M Ω	$\pm (1.5\%+5)$
		100 ~ 500M Ω	1M Ω	$\pm (5\%+5)$
		500 ~ 5.0G Ω	0.1M Ω	$\pm (10\%+5)$
	250V (100% ~ 120%)	0.00 ~ 200M Ω	0.01M Ω	$\pm (1.5\%+5)$
		200 ~ 1000M Ω	1M Ω	$\pm (5\%+5)$
		1.0 ~ 5.0G Ω	0.1G Ω	$\pm (10\%+5)$
	500V (100% ~ 120%)	0.00 ~ 500M Ω	0.01M Ω	$\pm (1.5\%+5)$
		500 ~ 1000M Ω	1M Ω	$\pm (5\%+5)$
		1.0 ~ 10G Ω	0.1G Ω	$\pm (10\%+5)$
	1000V(100%~120%)	0.00 ~ 2000M Ω	0.01M Ω	$\pm (1.5\%+5)$
		2.0 ~ 10G Ω	0.1G Ω	$\pm (5\%+5)$
		10 ~ 20G Ω	1G Ω	$\pm (10\%+5)$
		20 ~ 100G Ω	1G Ω	± 20

Note:the short-circuit current of insulation resistance test $< 2mA$.

8. Maintenance:

8.1 Clean

Clean the housing regularly with wet cloth and mild detergent; do not use corrosive agent or solvent; after cleaning, please dry it with dry cloth and store it.

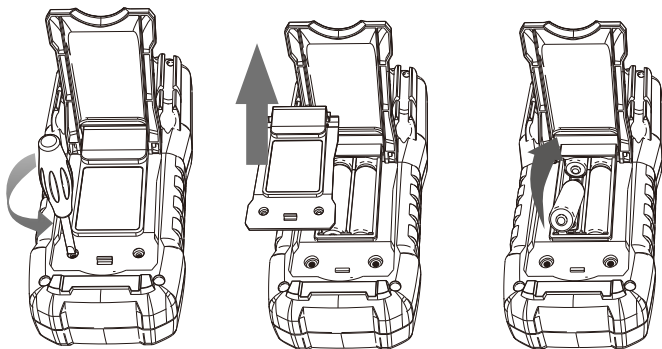
8.2 Battery replacement(As Shown In Picture 10)

Follow the following steps to replace batteries:

⚠ Warning To prevent possible electric shock, fire or personal injury:

- When the battery indicator shows low battery, replace the battery to prevent incorrect measurement.
- When the cover is removed or the housing is opened, do not operate the product in case of exposure to dangerous voltages.
- Before cleaning the product, remove the test probe.
- Only approved professional technicians are allowed to repair this product.

1. Turn the rotary switch to OFF position and remove the test wire from the terminal.
2. Use a standard screwdriver to unscrew the fastening screws on the battery cover, and then remove the battery cover.
3. Remove and replace the batteries.
4. Install back the battery cover and fasten the screws.



Picture 10