USER MANUAL

INSULATION TESTER

PCE-IT 200

ENGLISH



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski) can be found via our product search on:
www.pce-instruments.com

SAFETY WARNING

In order to use this instrument correctly, please read this manual carefully before use. This manual contains warning information and safety regulations. When using this instrument, please strictly observe it to ensure operation safety of users and the instrument.

Note:

- Before using this instrument, please read and understand contents included in this manual.
- The instrument must be used in strict accordance with test procedures described in this manual.
- Be sure to understand the safety aspects in this manual in detail.
- This instrument must be operated by qualified and qualified technician, and use under conditions specified in this manual.
- The company is not responsible for equipment damage caused by improper use or violation of safety operation regulations of this manual.

The safety symbol ⚠ has three implications in this manual. Users should pay special attention to operation with ⚠ symbol during reading.

DANGER	To avoid serious or fatal damage that may be caused by operation under certain conditions.
WARNING	To avoid danger of electric shock.
CAUTION	To avoid damage to the instrument and make accurate measurements.

⚠ DANGER

- Never measure current circuit above 600V AC.
- Do not test in flammable environment. Sparks may cause explosion.
- If the surface of the instrument is wet or the operator's hands are wet,do not operate the instrument.
- During measurement, do not touch conductive part of test pen.
- Do not open battery cover during measurement.
- When measuring insulation resistance, do not touch circuit under test.

⚠ WARNING

- If the instrument is abnormal, stop using it. For example: the instrument is broken or bare metal parts are exposed.
- Be careful when working under voltages exceeding 33Vrms, 46.7Vacrms or 70Vdc, which can cause electric shock.
- Do not replace batteries when the instrument is wet.
- Make sure that all test leads are firmly connected to test interface of the instrument.
- When opening battery cover, make sure that the instrument is turned off.
- Please read and understand this instruction manual before using the instrument.
- Always follow the requirements of the manual at all times, and keep the manual so that it can be used for reference at any time.
- While the instrument is tested, incorrect operation may cause accidents and damage to the instrument.

⚠ CAUTION

- Before measuring the insulation resistance, the circuit under test must be completely discharged and completely isolated from other power circuits.
- If test pen is damaged and needs to be replaced, it must be replaced with test pen of the same model and the same electrical specifications.
- Do not use the instrument when the battery indicator indicates that the power is exhausted. If the instrument will not be used for a long time, please remove and store batteries.
- Do not store or use this instrument in high temperature, high humidity, flammable, explosive and strong electromagnetic field environment.

Implication of relevant icons of this instrument:

ACV	AC
	Grounding
	The instrument is double insulated or reinforced

Applicable standard of this instrument: IEC 6010-1 **CATIII 600V**
CATI 2500V

INTRODUCTION

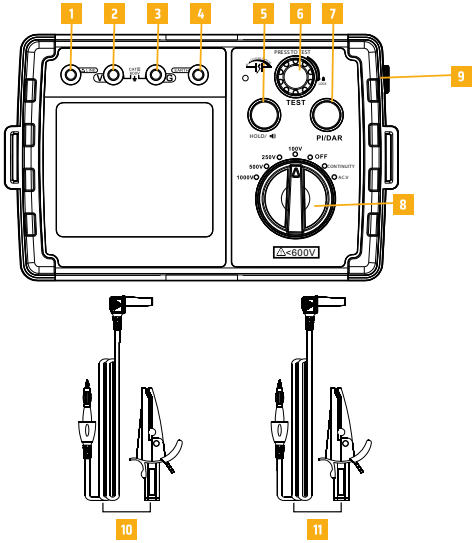
This instrument applies a new design and a large-scale integrated circuit to complete the measurement of parameters such as insulation resistance, DC voltage, and AC voltage; it has comprehensive functions, high accuracy, stable performance, convenient and reliable operation. It is suitable for measuring insulation resistance of various electrical equipment and insulation materials such as transformers, motors, cables, switches, electrical appliances, etc., and for maintenance, testing and verification of various electrical equipment.

FUNCTIONS

- Measurement of insulation resistance
- AC measurement
- DC measurement
- Small resistance measurement
- Live detection of tested resistance
- Short circuit protection of measured resistance
- AC and DC automatic identification
- Measurement data is locked.
- Polarization Index
- Absorption ratio test
- Automatic discharge
- Low battery reminder
- Large LCD screen digital display
- External DC power supply DC9V 1.5A
- 15.10M internal resistance measurement
- Over limit alarm
- Auto range
- Red alarm light, buzzer alarm.
- High voltage alarm
- Test voltage display

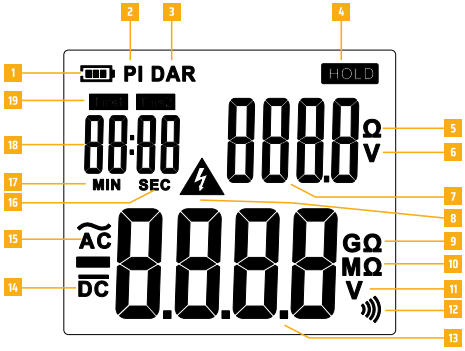
NAME OF PARTS

1 - LINE hole
2 - V hole
3 - G hole
4 - EARTH hole
5 - HOLD / Sound switch button
6 - TEST button
7 - PI / DAR button
8 - Rotary gear
9 - Technical parameters of
DC port for external power
10 - Black test lead with crocodile clip
11 - Red test lead with crocodile clip



LCD DISPLAYS

1 - Battery power
2 - Polarization index measurement
3 - Absorption ratio measurement
4 - Reading lock
5 - Resistance unit
6 - Voltage unit
7 - Resistance or voltage value
8/9 - Resistance unit
10 - Voltage unit
11 - Beep icon
12 - Resistance or voltage value
13 - Warning icon
14 - DC voltage
15 - AC voltage
16 - Second
17 - Minute
18 - Timing value
19 - Timing icon



SPECIFICATIONS

Technical specifications:

Technical parameters	Technical index
Display	Large-screen LCD (up to 500 counts)
Over limit indication	Hi: The mark appears on insulation resistance range.
Auto range	Higher range: 500 counts Lower range: 1 count (only on insulation resistance range)
Sampling Rate	2 times / second.
Allowed altitude	≤2000m (for indoor use)
Operation environment	Temperature: 0 °C ... -40 °C / Humidity: ≤85 %
Operation environment	Temperature: -20 °C -60 °C / Humidity: ≤90 %
Overload protection	Insulation resistance range: AC 1200V / 10 seconds Voltage range: AC 720V / 10 seconds
Withstand voltage	AC 6000V (50 / 60 Hz) / 5 seconds (between circuit and periphery
Insulation resistance	≥1000MΩ/ DC 1000V (between circuit and periphery)
Power supply	DC9V (6x1.5V AA batteries
Current consumption	Approximately 1.5A (maximum) (normally maintained at approximately 50mA)
Battery Life	About 12 hours
Dimension	176 x 110 x 77 mm

2.Insulation resistance test:

Rated voltage	100V	250V	500V	1000V
Measurement range	0 ... 1.5GΩ	0 ... 5.5GΩ	0 ... 5.5GΩ	0 ... 5.5GΩ
Open circuit voltage	DC 100V +20% -0%	DC 250V +20% -0%	DC 500V +20% -0%	DC 1000V +20% -0%
Standard test Constant current	0.1MΩ load time 1mA ... 1.2mA	0.25MΩ load time 1mA ... 1.2mA	0.5MΩ load time 1mA ... 1.2mA	1.0MΩ load time 1mA ... 1.2mA
Short circuit	About 2.0mA			
Accuracy	±5 % rdg ±3 % dgt (above 100KΩ)			

3.Small resistance measurement:

Open circuit voltage	About 5.0V
Measuring range	0.0 ... 999Ω que cu
Resolution	0.1Ω
Accuracy	± (2 % + 3)

4. Voltage measurement:
30 ... 600V (resolution 1V):

	DC voltage	AC voltage
Measurement range	±30 ... ±600V	30 ... 600VV (50/60Hz)
Resolution	1V	
Accuracy	±2%rdg±3dgt	

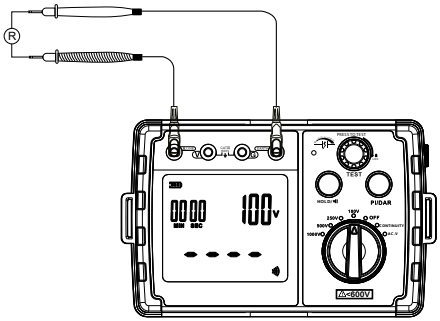
OPERATION MANUAL

Measurement

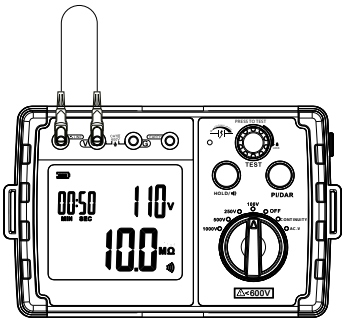
1. Measurement of insulation resistance

- Before measurement, be sure to connect first, connecting red test lead to LINE, connecting black test lead to EARTH, holding tested object with clip, then start measuring after ensure safety; as shown below;
- Turn the knob to the insulation resistance gear, with the corresponding gear value displaying on the upper right corner of the screen, and „___“ or the last measured resistance value is displayed below, press TEST button and turn clockwise to lock, start with high voltage starts, and tart to measure the resistance of tested object.
- After measurement starts, the voltage value is displayed on the upper right corner of LCD, measured time on the upper left corner, and resistance value of the measured object is displayed on the lower part. At the same time, warning icon appears, red alarm light is on, and the buzzer let out „didi“ sound to remind users to pay attention to safety and prevent electric shock danger;)
- Press HOLD button once to lock the reading with HOLD icon displayed at the same time. Press HOLD button again for unlocking, and HOLD icon is no longer displayed; long press HOLD button to turn beep sound on or off;
- After measuring resistance value, turn TEST button counterclockwise and release it. The high voltage is off, with the measurement and timing stopping; the gear value will be displayed on the upper right corner, and the resistance reading will be locked;
- After measurement is completed, twist the knob to OFF to turn off the meter;
- Before starting the measurement, press PI / DAR button to switch polarization index / absorption ratio measurement function, as following steps.

Pi (polarization index measurement)	10-minute insulation resistance value / 1-minute insulation resistance value			
Pi (polarization index measurement)	> OR = 4	4——2	2.0——1.0	< OR = 1
Judgement standard	best	good	warning	bad
DAR (absorption ratio measurement)	1-minute insulation resistance / 30-seconds insulation resistance			
DAR (absorption ratio measurement)	1-minute insulation resistance / 15-seconds insulation resistance			
DAR (absorption ratio measurement)	> OR = 1.4	1.25——1.0	< OR = 1	
Judgement standard	best	good	bad	



Note: **This instrument is equipped with a 10MΩ precision resistor for self-test. Connect test lead to LINE and V holes, and twist the knob to any range of the insulation measurements. Press „TEST“ button, and the screen will display 10.0MΩ, as shown below:**



2. Small resistance measurement (0 ... 999ΩΩ)

» Before measurement, connect wires first, with red wire to EARTH, and black wire to GND; holding tested object with clip, then start measuring after ensure safety; as shown below;

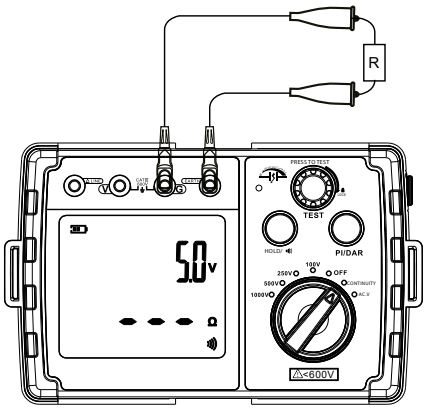
» Turn the knob to the small resistance position. The upper-right corner of the screen displays gear voltage 5.0V, and the lower part displays „---“ or small resistance value measured last time;

» Press TEST button and turn it clockwise to start small resistance measurement. The upper right corner of the screen displays voltage value across the measured object, that is, the voltage value between the two red and black test leads, and the measured small resistance value is displayed below;

» When the measured resistance is less than 20Ω, a buzzer lets out beeping;

» Turn TEST button counterclockwise and release it to stop measurement. The upper-right corner will restore and display voltage of 5.0V, and measurement resistance reading is locked;

» After measurement is completed, twist the knob to OFF to turn off the meter;



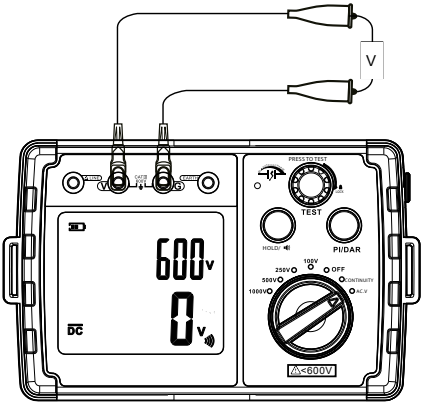
3. Voltage measurement:

» Before measurement starts, connect the wires first, with red wire to V, and black wire to GND; as shown below;

» Turn the knob to voltage gear. At this time, the upper right corner of the screen displays the highest voltage that the instrument can measure, and the lower part displays voltage value measured in real time;

» When AC power is measured, AC icon appears, and when DC power is measured, DC icon appears. If potential of red test pen is lower than that of black test pen, negative reading is displayed, otherwise positive reading is displayed;

» After the measurement is completed, twist the knob to OFF to turn off the meter;



ATTENTIONS

Note:

- During measurement above, when the voltage between red and black test leads is high, a warning icon will be displayed to warn operator that there is high voltage, pay attention to safety and prevent the danger of electric shock;
- During measurement, press HOLD once to lock the reading, but the measurement is still going on, with reading not updated; do not take the reading as safe even if it is small. You still need to prevent the danger of high voltage electric shock;
- When measuring insulation resistance or small resistance, before measurement starts, if a warning icon appears on the screen, it indicates that the measured object may be charged. Pressing TEST button at this time will not start measurement; you must discharge the power first.
- When measuring small resistance, after measurement starts, if the measured object is charged and the voltage between the red and black test leads is greater than 5.4V, the measurement will stop automatically;
- When switching gear knob, the last ongoing measurement will stop and the high voltage will be off at the same time;
- When red and black wires have been inserted into EARTH and GND, it is strictly forbidden to insert two test leads into high voltage, otherwise the instrument will be burnt out, and even cause electric shock, fire, explosion and other accidents that endanger personal safety;
- When measuring insulation resistance, after measurement starts, the measurement will be automatically stopped when resistance value is less than 1MΩ for 20 seconds, or the resistance value is 0 for 5 seconds.
- If battery icon appears on LCD, it means that batteries are low and need to be replaced. You can also remove batteries and connect them to DC 9V power adapter.

MAINTENANCE

Maintenance:

- Do not store or use the unit in following locations where the unit may be subject to:
  Splashes of water or high levels of dust.
  Air with high salt or sulphur content.
  Air with other gases or chemical materials.
  High temperature or humidity (above 60oC, 90%,) or direct sunlight.
- Do not disassemble the unit or attempt internal alterations.
- Never use alcohol or thinner to clean the unit casing that will especially erode the LCD surface; just clean the unit lightly as needed with little clean water.

DISPOSAL

For the disposal of batteries in the EU, the (EU) 2023/1542 directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose. In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law. For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations. If you have any questions, please contact PCE Instruments.

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