CENTER® 365

INSULATION TESTER

Instruction Manual

CE

PST
PACIFIC SENSOR TECHNOLOGIES
MEASURING THE WORLD AND BEYOND

TABLE OF CONTENTS

1. SAFETY INFORMATION

- Read all safety information carefully before attempting to operate or service the meter.
- Do not use the Tester around explosive gas, vapor, or in damp or wet environments.
- Keep fingers behind the finger guards on the probes.
- The circuit under test must be de-energized and isolated before connections are made except for voltage measurement.
- Circuit connections must not be touched during a test.
- After insulation test, capacitive circuits must be allowed to discharge before disconnecting the test leads.
- To avoid damage to the instrument, do not apply signals which exceed the maximum limits shown in the technical specification tables.
- Do not use the meter or test leads if they look damaged. Use extreme caution when working around bare conductors or bus bars.
- Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.
- Caution when working with voltages above 30 Vac rms, 42 Vac peak, or 60 Vdc. Such voltages pose a shock hazard.
- Before taking resistance measurements or testing continuity, disconnect the main power supply and all loads from the circuit.
- Remove all probes, test leads, and accessories before the battery door is opened.
- Replace the batteries when the low battery indicator shows to prevent incorrect measurements. False readings can lead to electric shock and injury.
- Replace all batteries with fresh batteries of the same manufacturer and type to prevent battery leakage.
- Remove the batteries if the Tester is not used for an extended period of time, or if stored in temperatures above 50 °C. If the batteries are not removed, battery leakage may result.

⚠ CAUTION!

- **Disconnect the test leads from the test points before changing the position of the function rotary switch**.
- **Never connect a source of voltage with the function rotary switch in Ω, LoΩ, 50V, 100V, 250V, 500V, 1000V position.**

Environment conditions:

- Installation categories CAT IV 600 V
- Pollution degree 2
- Altitude up to 2000 meters
- Indoors use only

- Relatively humidity 80% max. (Noncondensing)
- Operation temperature 0～40°C

Symbols:

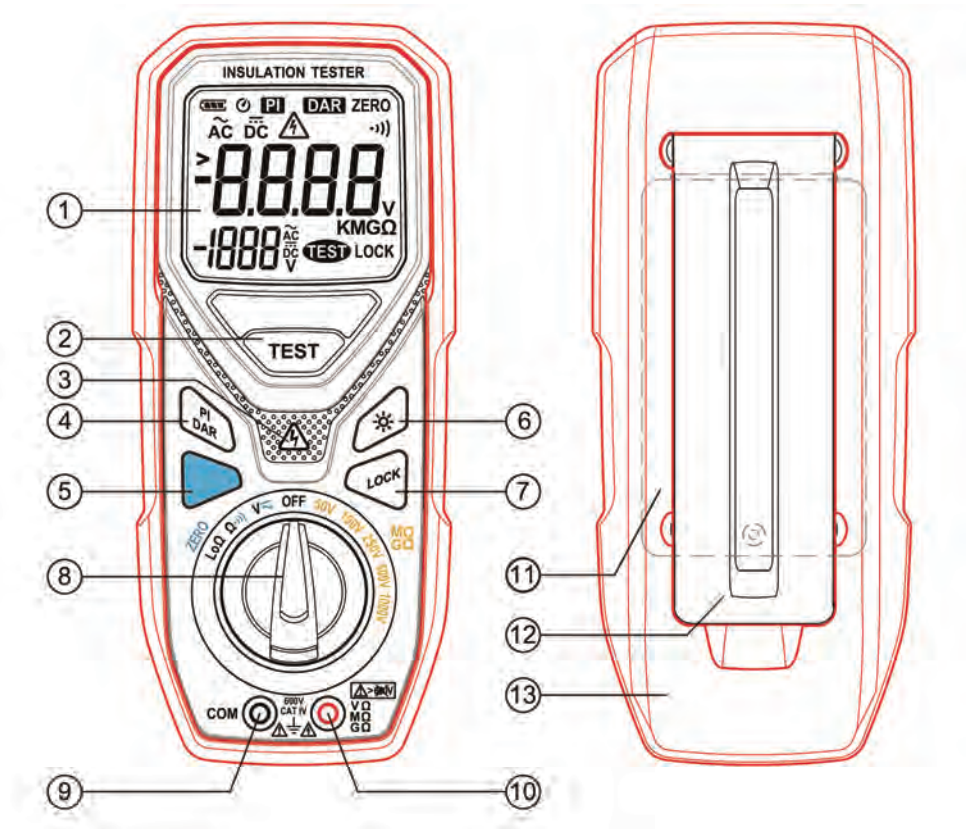
Symbol	Description
	WARNING. RISK OF DANGER. Attention refer to operation Instructions.
	WARNING. HAZARDOUS VOLTAGE. Risk of electric shock
	Double Insulated
	Fuse
	Battery
	Earth
	WARNING. Do not use in distribution systems with voltages > 660 V.
	Conform to European Union directives.
	Do not discard this product or throw away.
CAT IV	Measurement Category IV is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.

Hazardous voltage warning:

When the Tester detects a voltage > 30 V in insulation test, > 2 V in Low Ω, or a voltage >30V during voltage measurement function, the  red LED will be on and the  symbol on LCD will display.

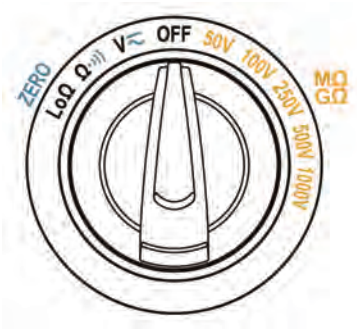
2. DESCRIPTION OF THE INSTRUMENT

2-1. Front and rear:



① LCD display
② TEST button
③ Warring light
④ PI / DAR function select button
⑤ Blue button
⑥ Backlight button
⑦ LOCK button
⑧ Measurement function selection switch
⑨ COM input terminal
⑩ Positive input terminal
⑪ Battery cabinet
⑫ Foldable stand
⑬ Holster

2-2. Rotary switch:



Rotary switch selections:

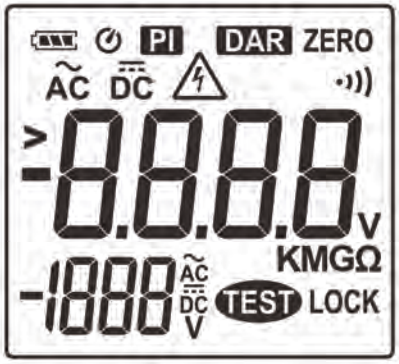
Switch Position	Measurement Function
LoΩ	Measuring low resistance from 0.01 to 60.0Ω (Open voltage ≥ 4V, short current ≥ 200mA)
Ω	Measuring resistance or continuity
V	Measuring AC or DC voltage
OFF	Turn off the tester
50V 100V 250V 500V 1000V	Perform insulation tests with 50, 100, 250, 500, 1000 V test voltage.

2-3. Button and indicators:

Button / Indicator	Description
	Config the Tester for a polarization index or dielectric absorption ratio test.
	Press the blue button to select alternate measurement functions.
	(1) Initiate an insulation test when the rotary switch is in INSULATION(MΩ GΩ) position. Causes the Tester to source (output) a high voltage and measure insulation resistance. (2) Initiate a resistance test when the rotary switch is in the LoΩ position.
	Backlight ON/OFF (1)To turn on Backlight: Press Backlight button once to turn on the Backlight. And it will automatically turn off after 30 seconds. Press and hold Backlight button for 2 seconds and it will sound “beep” to keep “Backlight always ON” until Auto power off. (2)To turn off Backlight: Press Backlight button once to turn off Backlight when it is under “Backlight always ON” or “Backlight ON”.

	Test lock. When pressed before the TEST button, the test remains active until you press the lock or test button again to release the lock.
	Hazardous voltage warning LED will be on when: (1) > 2V or > 30 V (ac or dc depending on the rotary switch position) is detected on the input. (2) Insulation test is active. (3) The " batt " symbol appears on the display.

2-4. LCD display:



Symbol	Description
	Battery indication. The " " symbol appears when low battery.
	Auto Power OFF indication.
PI / DAR	Polarization index or dielectric absorption ratio test is selected.
ZERO	Lo Ω lead zero is active.
AC/DC	Alternative or Direct source indication
	Unsafe voltage warning.
	Continuity measurement.
>	Greater than symbol.
	Minus symbol
V/Ω KΩ/MΩ/GΩ	Measuring unit indication
TEST	Insulation test or LoΩ resistance measurement indicator. Appears when test voltage is present.
LOCK	Indicate an insulation or LoΩ resistance test is locked on.
8888	Primary display
1888	Secondary display

3. SPECIFICATIONS

Auto power off: Approx. 10 minutes.
The 10-minute timer is disabled during any insulation resistance or Low resistance measurement.

Low battery indication:

The symbol "  " and message " batt " will be shown when the batteries need to be replaced.

Operating temperature and Humidity: 0°C to 40°C (32°F to 104°F), below 80% RH

Storage temperature: -10°C to 60°C (14°F to 140°F), below 80% RH

Batteries: Size AA batteries (IEC LR6) X 4pcs

Battery life:
Insulation test use: Tester can perform at least 1200 insulation tests with fresh alkaline batteries at room temperature. Test conditions are 1000 V into 1 MΩ with a duty cycle of 5 seconds on and 25 seconds off.
LoΩ Resistance Measurements: Tester can perform at least 2600 LoΩ resistance measurements with fresh alkaline batteries at room temperature. Test conditions are 1 Ω with a duty cycle of 5 seconds on and 25 seconds off.

Dimension: 206(L) x 90(W) x 51(H) mm

Weight: Approx. 510g (With holster and battery)

Accessories:
Test lead, large jaw alligator clips, batteries, holster, carrying case, instruction manual.

Approvals: EN61010 600V CAT IV

AC voltage:

Range	Resolution	Accuracy	Protection
60.00V	0.01V	±2%rdg+5dgts(45~500Hz)	600Vrms
600.0V	0.1V		

DC voltage:

Range	Resolution	Accuracy	Protection
60.00V	0.01V	±2%rdg+5dgts	600Vrms
600.0V	0.1V		

Resistance:

Range	Resolution	Accuracy	Protection
600.0Ω	0.1Ω	2%rdg+5dgts	600Vrms
6.000KΩ	0.001KΩ		
60.00KΩ	0.01KΩ		
600.0KΩ	0.1KΩ		

Continuity:

Range	Resolution	Beeper	Protection
600.0Ω	0.1Ω	≤ 7Ω±1Ω	600Vrms

LoΩ:

Range	Resolution	Accuracy
6.00Ω	0.01Ω	2%rdg+3dgts
60.0Ω	0.1Ω	

Open circuit test voltage : > 4.0V, < 8V

Short circuit current : > 200.0mA

Live circuit detection: Inhibit test if terminal voltage > 2V prior to initialization of test.

Insulation resistance measurement:

Test Voltage	Range	Accuracy
50V	300KΩ / 3.00MΩ / 30.0MΩ 300MΩ / 1.00GΩ	±(3%rdg+5dgts) (30KΩ~1.00GΩ)
100V	600KΩ / 6.00MΩ / 60.0MΩ 600MΩ / 2.00GΩ	±(3%rdg+5dgts) (60KΩ~2.00GΩ)
250V	1.50MΩ / 15.0MΩ / 150MΩ / 1.50GΩ	±(3%rdg+5dgts) (0.15MΩ~1.50GΩ)
	5.0GΩ	±(10%rdg+3dgts)
500V	3.00MΩ / 30.0MΩ / 300MΩ / 3.00GΩ	±(3%rdg+5dgts) (0.30MΩ~3.00GΩ)
	10.0GΩ	±(10%rdg+3dgts)
1000V	6.00MΩ / 60.0MΩ / 600MΩ / 6.00GΩ	±(3%rdg+5dgts) (0.60MΩ~6.00GΩ)
	20.0GΩ	±(10%rdg+3dgts)

Test voltage accuracy: 0% to +20%

Test voltage vs. Maximum resistance range:

50V/1.00GΩ, 100V/2.00GΩ, 250V/5.0Ω, 500V/10.0GΩ and 1000V/20.0GΩ.

Test voltage vs. Minimum resistance (with test current=1mA):

50V/50KΩ, 100V/100KΩ, 250V/250KΩ, 500V/500KΩ and 1000V/1MΩ.

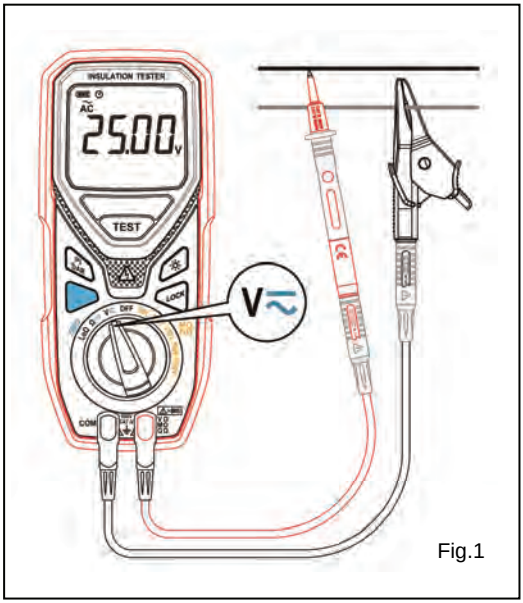
Short circuit test current: 1mA(nominal)

Live circuit detection: Inhibit test if terminal voltage > 30 V prior to initialization of test.

4. MAKING MEASUREMENTS

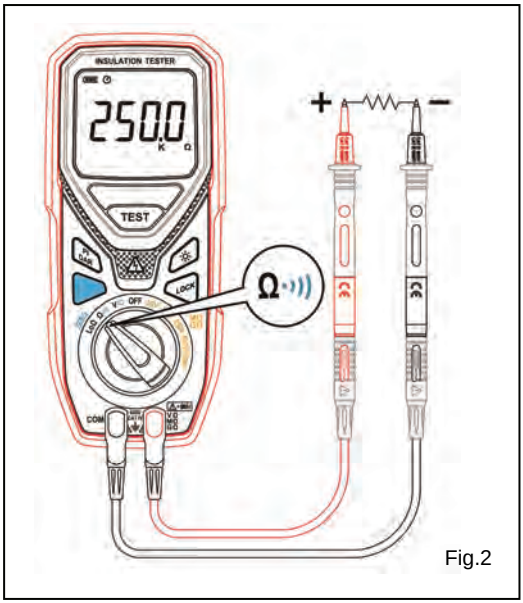
4.1 Measuring volts:

Press the  blue button to switch ACV or DCV measurement.



4.2 Measuring ohms / continuity:

Press the  blue button to select the measuring function.



4.3 Measuring low resistance:

The circuit under test must be completely de-energized.
Check the fuse before testing. See Testing the fuse section later in this manual.
Connecting the tester to an energized circuit while the test is active will blow the fuse.

(1) Short the end of probes together and press the blue button to compensate the probe resistance for ≤ 2Ω, the " ZERO " symbol will be displayed when the compensating is finished. The range of compensation needs to be less than 2Ω. The value of compensation will be kept next time you use this function.
(2) Connect the probes to the circuit to be measured. The Tester automatically detects if the circuit is energized. If the detected voltage is above 2V, " > 2V " and " ⚡ " will appear on the LCD display. In this condition, the test is inhibited. Disconnect the Tester and remove power before proceeding.
(3) Push and hold TEST button to start the test. The " TEST " symbol appears on the LCD display until you release the TEST button. The resistance reading appears on the primary display until a new test is started or a different function or range is selected. If it beeps 4 times, means the tester has not finished the terminal voltage test. You need to start the test again.

If you press LOCK button to enter the Lock Mode, and then press button to start the test. The" TEST " symbol appears on the LCD display and the test voltage will continue to be applied until the LOCK or TEST button is pressed again.

When resistance is higher than the maximum measuring range, the Tester displays the " > " symbol and the maximum resistance for the range.

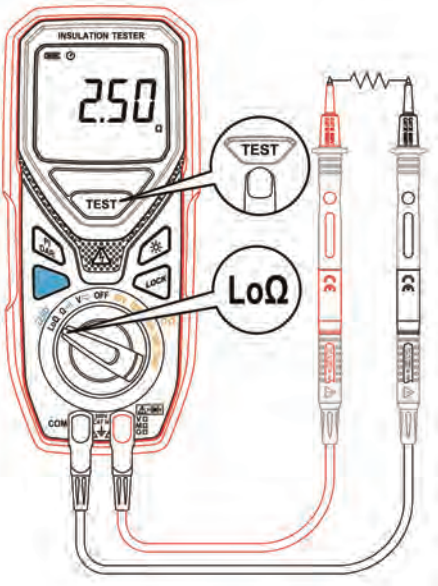


Fig.3

4.4 Measuring insulation resistance:

The circuit under test must be completely de-energized before testing.

(1) Turn the rotary switch to the desired test voltage.

(2) Connect the probes to the circuit to be measured. The Tester automatically detects if the circuit is energized. If the detected voltage is above 30V, " > 30V " and " ⚠ " will appear on the LCD display. In this condition, the test is inhibited. Disconnect the Tester and remove power before proceeding.

(3) Push and hold TEST button to start the test. The " TEST " symbol appears on the LCD display until you release the TEST button. The resistance reading appears on the primary display until a new test is started or a different function or range is selected. The secondary display shows the test voltage applied to circuit under test. If it beeps 4 times, means the tester has not finished the terminal voltage test. You need to start the test again.

If you press LOCK button to enter the Lock mode, before pressing TEST button to start the test. The" TEST " symbol appears on the LCD display and the test voltage will be continuously applied and the voltage be shown on secondary display until another LOCK or TEST button is pressed.

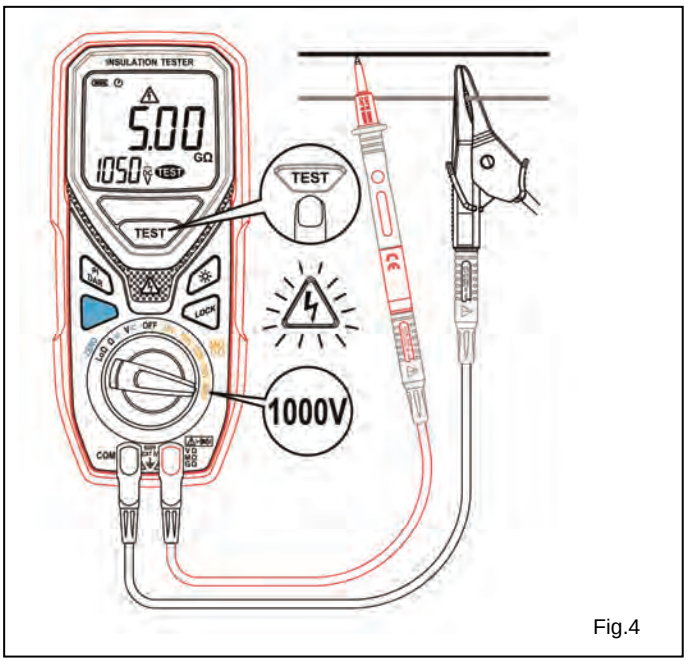


Fig.4

4.5 Measuring PI / DAR:

Polarization Index (PI) is the ratio of the 10-minute insulation resistance to the 1 -minute insulation resistance.

Dielectric Absorption Ratio (DAR) is the ratio of the 1-minute insulation resistance to the 30 second insulation resistance.

(1) Turn the rotary switch to the desired test voltage.

(2) Press the PI DAR button to select polarization index or dielectric absorption ratio.

(3) Press TEST button to start the test. During testing, the primary display shows the measured resistance and the secondary display shows the test voltage applied to the circuit under test.

When the test is completed, the PI or DAR value is displayed on the primary display.

If either value used to calculate PI or DAR was greater than the maximum measuring range, the primary display will show " **Err** " for PI or DAR value.

Because of the time required to perform the PI and DAR tests, use of test clips is recommended.

To interrupt a PI or DAR test before it is completed, momentarily press TEST.

5. TESTING FUSE

Warring!

To avoid electrical shock or injury, remove the test leads and any input signals before replacing the fuse.

(1) Turn the rotary switch to the LoΩ position.

(2) Press and hold TEST. If the display reading is " FUSE ", the fuse is bad and should be replaced.

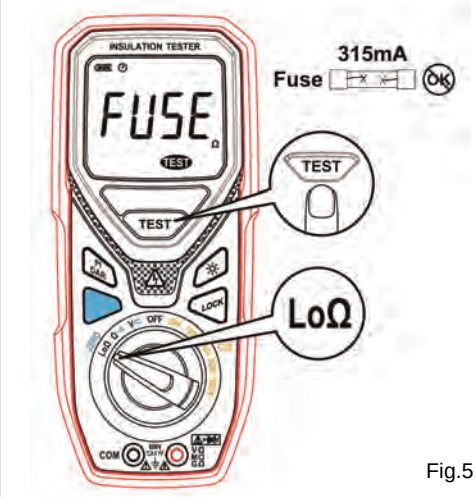


Fig.5

6. REPLACING BATTERIES AND FUSE

Warning!

To avoid shock, injury, or damage to the Tester:

- To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the battery indicator " ▭ " appears.
- Use ONLY fuses with the amperage, interrupt, voltage, and speed ratings specified.
- Turn the rotary switch to OFF and remove the test leads from the terminals.

Fuse rating: Fast 315mA, 1000V, Min Interrupt Rating 10000 A

Battery: 1.5 V AA alkaline (NEDA 15A, IEC LR6) x 4 pcs

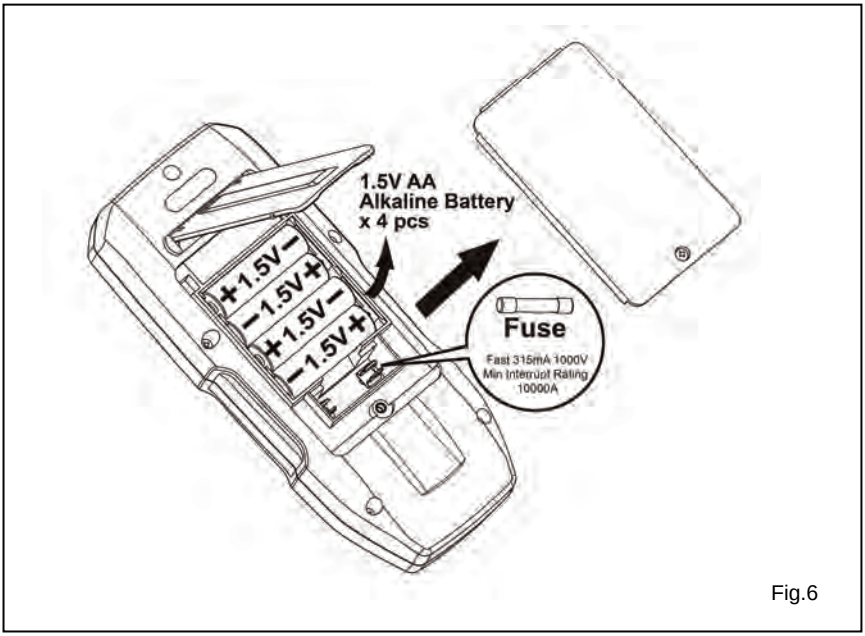


Fig.6

7. MAINTENANCE & CLEANING

(1) Only qualified personnel should perform repairs or servicing not covered in this manual.

(2) Periodically wipe the case with a dry cloth. Do not use abrasives or solvents on these instruments.

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