HIOKI

INSULATION TESTER IR4053

For Photovoltaic Generation Systems

Perform PV insulation resistance measurements

Safely, Accurately, Quickly

- Safely and accurately measure PV insulation resistance even during the daytime
- Built-in PV dedicated function, displays measurements in 4 seconds
- Five ranges (50/125/250/500/1000V) built in for normal insulation resistance measurement
- Built-in 1000 VDC voltage measurement for open voltage tests of PV systems that support 1000 V

CE

Use the PV dedicated function for accurate, safe measurements in 4 seconds

Measurement not affected by generating PV

The IR4053, which was designed for PV, can accurately measure insulation resistance without being affected by the generating PV.

Accurate and safe measurement without creating shorts

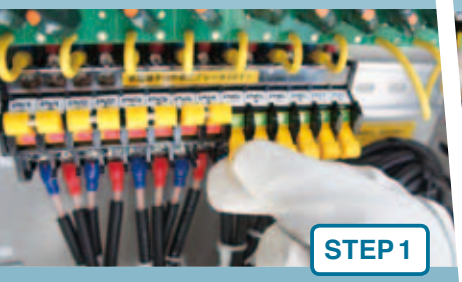
Normally, to accurately measure the insulation resistance of a generating PV, one needs to short the measured circuit. That's not necessary with the IR4053. (Left figure: Short-circuit switch)

Displays measurement in 4 seconds

The IR4053 displays the measured value just 4 seconds after starting measurement. After the first display, the displayed value is updated each second. Comfortably carry out swift measurements.

Flow of Measurement

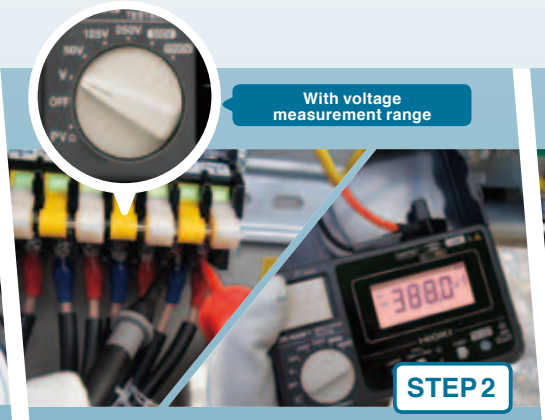
First, Pre-measurement Checks



Turn off the isolator

Be sure to turn the isolator and the output switch off before measurement.

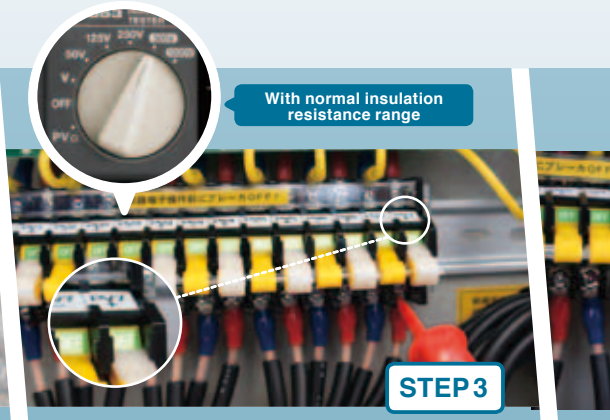
*If there is a surge absorber attached to the output switch input section, remove it prior to testing.



Check the open voltage and polarity

Place probes on P (+) and N (-) terminals to check the open voltage and polarity.
If the polarity is incorrect, the display will light up in red. You can also perform open voltage tests of PV systems that support 1000 V.

Check for Problems in a Second Easy Inspe



Measure between P (+) and the earth

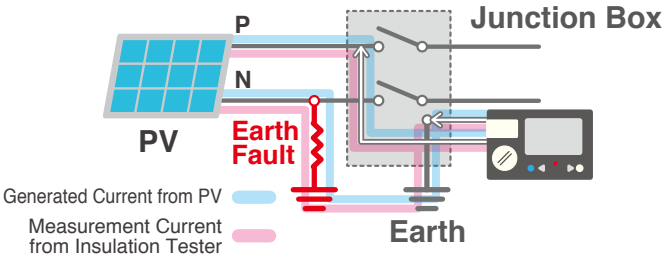
Once you check the polarity, be sure to measure the insulation resistance between P (+) and the earth first.* If there is a problem in the measurement value, do not measure between N (-) and the earth. Proceed to STEP 5 and measure between the earth and P again.

*Apply output voltage that matches the PV to be measured.

What are the problems with conventional insulation testers?

Problems with conventional insulation testers and
the 2 measurement methods determined by recognized guidelines

Measurement that involve a short-circuit



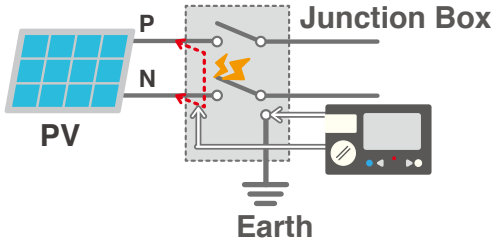
Problems when measuring with a conventional insulation tester

Can't accurately measure the insulation resistance

This is not as dangerous, but depending on the circuit status, the measurement may be affected by the generating PV and may produce a result different from the actual insulation resistance.

Safe, but not accurate

Measurement that does not involve a short-circuit



Problems when measuring with a conventional insulation tester

Very dangerous and complex

To accurately measure a generating PV, one needs to short the measured circuit, which requires that a short-circuit switch be separately installed. Short-circuiting will also pose the danger of creating an arc. In addition, to minimize hazards, it is recommended that the testing be conducted at night.

Accurate, but not safe

STEP 4

Measure between N (-) and the earth

If there is no problem in the measurement between the earth and P (+), continue on to measure the insulation resistance between N (-) and the earth. If there is a problem in the measurement value, perform measurement again in STEP 5.When the voltage is detected, the IR4053 will inform you of earth fault with a red flash.

With PVΩ function

Measurement when there is a 0.4MΩ earth fault between N and E

STEP 5

Measure with PVΩ function

Use the PVΩ function to accurately measure the insulation resistance. Because it is a PV dedicated function, you can get accurate values that is impossible with normal insulation resistance measurement.

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Measurement Done in 4 Seconds

Accurate Measurements

Functions useful in the field

Comparator function / Red light

You can compare measurements to any set values. If the result does not meet the set value, the red light will warn of non-conformance.

Drop proof

The sturdy design won't break even if dropped onto concrete from 1 m, so you can use it with peace of mind.

Test lead with remote switch

This allows you to apply output voltage with the switch in your hand, work with a light, and see the result of the comparator with an LED.

Specifications

Accuracy guaranteed for 1 year, Post-adjustment accuracy guaranteed for 1 year
Accuracy guarantee for temperature and humidity: 23°C±5°C (73°F ±9°F) and 90% rh or lower

Insulation resistance measurement

Output voltage (DC)	50 V	125 V	250 V	500 V	1000 V
Effective maximum indicated value	100 MΩ	250 MΩ	500 MΩ	2000 MΩ	4000 MΩ
1st effective measuring range [MΩ]	0.200 to 10.00	0.200 to 25.0	0.200 to 50.0	0.200 to 500	0.200 to 1000
Accuracy	±4% rdg.				
2nd effective measuring range [MΩ]	10.1 to 100.0	25.1 to 250	50.1 to 500	501 to 2000	1010 to 4000
Accuracy	±8% rdg.				
Other measuring range [MΩ]	0 to 0.199				
Accuracy	±2% rdg. ±6 dgt.				
Lower limit resistance value to maintain nominal output voltage	0.05 MΩ	0.125 MΩ	0.25 MΩ	0.5 MΩ	1 MΩ

Voltage measurement

DC V	Range	4.2 V	42 V	420 V	1000 V
	Maximum indicated value	4.200 V	42.00 V	420.0 V	1100 V
	Accuracy	±1.3% rdg. ±4 dgt. (Ranges in excess of 1000 V are not guaranteed for accuracy.)			
AC V	Range	420 V		600 V	
	Maximum indicated value	420.0 V		750 V	
	Accuracy	±2.3% rdg. ±8 dgt. (Ranges in excess of 600 V are not guaranteed for accuracy.)			

PVΩ measurement

Output voltage (DC)	500 V		1000 V	
Maximum indicated value	2000 MΩ		4000 MΩ	
Measurement range [MΩ]	0.200 to 500	501 to 2000	0.200 to 1000	1010 to 4000
Accuracy	±4% rdg.	±8% rdg.	±4% rdg.	±8% rdg.
Other measuring range [MΩ]	0 to 0.199			
Accuracy	±2% rdg. ±6 dgt.			

Functions

Backlight	YES
Drop proof	On concrete: 1 m (3.28 ft)
Battery power indicator	YES
Auto power save	Turns off after approx. 10 minutes
Live circuit indicator	YES
Automatic electric discharge	YES
Comparator	YES
Automatic DC/AC detection	YES

Basic specifications

Operating temperature and humidity	0°C to 40°C (32 to 104°F), 90% rh or lower (non-condensing)
Storage temperature and humidity	-10°C to 50°C (14 to 122°F), 90% rh or lower (non-condensing)
Maximum rated voltage to earth	600 V AC/DC, Measurement category III, Anticipated transient overvoltage: 6000 V
Dielectric strength	7060 V AC, 50/60 Hz, Measurement terminals - electrical enclosure, 1 min
Degree of protection	IP40 (EN60529)
Standards	JIS C1302 (Insulation resistance measurement), EN61326 (EMC), EN61557-1/-2

Power supply

Power supply type	AA alkaline batteries (LR6) ×4
Continuous operating time	Approx. 20 hours

Dimensions and mass

Dimensions	159W × 177H × 53D mm (6.26"W × 6.97"H × 2.09"D)
Mass	Approx. 600 g (21.2 oz) (including batteries, excluding test lead)

Model : INSULATION TESTER IR4053

Model No. (Order Code) (Note)

IR4053-10 (Bundled Test lead L9787)

TEST LEAD L9787

[Other Accessories] Neck strap ×1, Instruction manual ×1
AA alkaline batteries (LR6) ×4

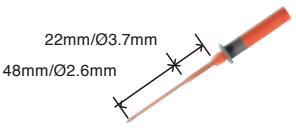
options

TEST LEAD SET WITH REMOTE SWITCH L9788-11

Bundled with Remote switch type test lead L9788-10/ Earth lead, alligator clip, 1.2 m (3.94 ft) length

L9787 options

For checking breaker terminals
Attach to the L9787's red probe tip

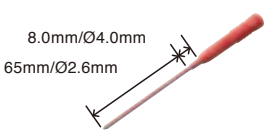


BREAKER PIN L9787-91

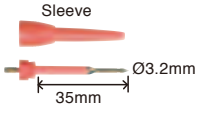
L9788-11 options

TEST LEAD WITH REMOTE SWITCH L9788-10

For checking breaker terminals
Attach to the L9788-10's red probe tip



BREAKER PIN L9788-92



TIP PIN L9788-90

Shared options

Attaches to tip of the earth lead;
11 mm diameter.

MAGNETIC ADAPTER 9804-02

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