

PV100

Solar Installation Test Kit



The world's first all-inclusive solar PV specific installation electrical safety testing kit.

The recently published IEC 62446 international standard defines in detail the electrical test requirements of solar PV installations. These tests include ground continuity between any exposed metal parts and the protective ground in the building, the insulation resistance between the DC conductors and exposed metal parts, the open circuit voltage of each PV string, short circuit current of each string and an operational test.

Ordinarily, this requires the use of three separate test instruments: a continuity/insulation resistance tester, a digital multimeter and a DC current clamp. The test leads supplied with these instruments are not designed for direct connection to the interconnections commonly found on PV systems, resulting in the installer using makeshift test adaptors to connect to the PV system and to short circuit the PV strings for short circuit current measurement. This poses the risk of accidental contact with live DC conductors or damage to the PV panels. An additional drawback is that three discrete test instruments means three annual calibration charges and hence a relatively high cost of ownership.

Seaward's Solar Installation PV100 Test Kit includes all of the tools needed to fulfil the electrical test requirements of IEC 62446, including a world first Solar Installation PV100 handheld multifunction tester.

KEY FEATURES:

- Simple and safe user interface
- Clear and unambiguous display of all measurement data from a single key press
- Simple and safe test connections which can easily be used when the PV array is energized
- Rugged and robust
- Test connection system compatible with all major PV modules
- Ground continuity measurement with zeroing out of test leads up to 10Ω
- PV string open circuit voltage measurement up to 1000V DC
- Automatic indication of voltage polarity with audible and visual warning when polarity is incorrect
- PV string short circuit current measurement up to 10A DC
- PV array insulation test at 250/500/1000V
- Store up to 9 sets of measurement for string to string comparison
- Visual indication when string voltage/current measurements deviate by >5%
- Operational test (using Solar AC/DC Current Clamp)

The Solar Installation PV100 is an easy-to-use tester which enables the performance and electrical safety of Solar PV installations to be tested at the push of a single button.

The Solar Installation PV100 connects directly to the installation using the supplied MC4 or Sunclix connectors, ensuring that there are no exposed live DC conductors and all tests are performed in a safe and controlled manner. Measurement results are displayed concisely on the large backlit display and can be stored in the internal memory for review (the internal memory can store full measurement data for up to 9 PV strings) with automatic comparison of voltage and current measurements between strings and on-screen warning if there is greater than 5% variation.

The Solar Installation PV100 connects directly to all standard PV modules, strings and arrays using the supplied test adaptors (MC4 and Sunclix included in kit. MC3 adaptors are available separately).

There is no requirement for external test boxes or fixtures – all test connections for open circuit voltage, short circuit current and insulation resistance are automatically configured inside the test instrument ensuring that testing is performed in the correct manner and without risk of damage to the solar PV modules or danger to the operator. The insulation resistance test voltages of 250V, 500V and 1000V are available, allowing testing of all PV installations with a system voltage up to 1000V.

Ground continuity measurements between any exposed metal parts of the array and the protective ground conductor in the building can be performed using the supplied 4mm test leads. If longer test leads are required, errors due to the resistance of the test leads can be eliminated using the built in capability to zero out test leads.

The supplied AC/DC current clamp allows measurement of currents up to 40A.

The on-board memory allows measurement data to be stored for later review. When testing multiple string installations, the automatic measurement comparison feature allows the operator to quickly and easily ensure that any variations in open circuit voltage or short circuit current measurements are within 5%, as required by IEC 62446.

What is IEC 62446?

IEC 62446: 2009 Grid connected PV systems – minimum requirements for system documentation, commissioning tests, and inspection' specifies the minimum requirements for system documentation, commissioning tests and inspections on PV installations.

In short the standard sets out measures to ensure that:

- The PV panels and electrical supply connections have been wired up correctly
- That the electrical insulation is good
- The protective ground connection is as it should be
- There has been no damage to cables during installation
- That the PV installation performance is as expected

Seaward's Solar Installation Solar PV100 Test Kit helps to meet these requirements.

KIT INCLUDES:

- Seaward Solar Installation PV100 Tester
- 2 x MC4 test lead adaptors
- 2 x Sunclix test lead adaptors
- Test lead, red, with test probe and detachable alligator clip
- Test lead, black, with test probe and detachable alligator clip
- AC/DC current clamp
- Rugged carry bag
- Quick Start Guide
- Support CD Rom including instructional video guide
- Calibration Certificate

ACCESSORIES: (optional)

- MC3 test lead adaptors
- Fused test leads - 1 pair of fused red and black test probes with alligator clips
- SolarTags
- PV Inspection & Test Report and PV System Verification Certificate Pads

TECHNICAL SPECIFICATION:

GROUND CONTINUITY

Display Range	0.00 Ω to 199 Ω
Measuring Range	0.01 Ω to 199 Ω
Resolution	0.01 Ω maximum
Open Circuit Test Voltage	4Vdc, nominal
Short Circuit Test Current	>200mA (as per IEC 61557-4)
Test Lead Compensation	Zeroes out test lead resistance up to 10 Ω
User Protection	Warning and test inhibited if $\geq 30V$ AC/DC detected at inputs

INSULATION RESISTANCE

Display Range	0.05M Ω to 199M Ω
Measuring Range	0.05M Ω to 199M Ω
Resolution	0.01M Ω maximum
Open Circuit Test Voltage	250V, 500V, 1000V (as per IEC 61557-2)
Short Circuit Test Current	>1mA, <2mA s/c as per IEC 61557-2
Audible/Visible Warning	$\geq 30V$ AC or DC at inputs
User Protection	Test inhibited if $\geq 30V$ AC/DC detected at inputs

OPEN CIRCUIT VOLTAGE

Display Range	0.0V to 1000V
Measuring Range	5.0V to 1000V
Resolution	0.1V maximum
Enunciators	DC voltage polarity correct or reversed

SHORT CIRCUIT CURRENT

Display Range	0.0A – 9.99A
Measurement Range	0.5A – 9.99A
Resolution	0.01A

OPERATING CURRENT (USING AC/DC CURRENT CLAMP)

Display Range	0.0A – 40A
Measurement Range	0.5A – 40A
Resolution	0.1A max

GENERAL SPECIFICATIONS

Display	Custom LCD with backlight
Power Supply	6 x 1.5V AA Alkaline LR06
Battery Life	>1000 test sequences
Auto Power Down	After 1 minute

ADDITIONAL INFORMATION

Warranty Period	2 years
Calibration Interval	1 year

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