

POWER PLANT TESTING AND COMMISSIONING SERVICES

The bare minimum standard applied:

- IEC 62446: Grid Connected Photovoltaic Systems-Minimum Requirements for System Documentation, Commissioning Tests, and Inspections.



VALUE PROPOSITION

Knights Energy offers independent third-party End of Construction **testing and commissioning services to help solar PV** customers ensure that solar plants meet all specifications in **design, regulations and performance according to the provision of globally accepted standard IEC 62446**. Additionally, we offer EPC services from feasibility through construction to Solar PV O&M services at the highest standards in the local market.

With this Industry Standard Best practice, customers attain confidence in the Performance of their Solar PV Plants.

SCOPE OF SERVICE

From electrical measurements to **final acceptance tests**, our services include:

- I. PV DC Array Design and Installation to the requirements of IEC 60364 in general
- II. PV System Protection against Overvoltage, Electric shock to the requirements of IEC 60364.
- III. PV System, AC Circuit special considerations (isolating inverter on AC side and having inverter protection settings to local regulations.
- IV. PV System – General installation, Labelling and Identification.

- Solar Plant Feasibility studies
- Full EPC scope
- Plant Design review – Third party service as per IEC 62548:2016
Photovoltaic (PV) arrays - Design requirements
- Verification of Compliance with local regulations – Third party Service
- Plant acceptance tests and protocols with necessary corrections measures according to standards.
- **Final acceptance tests for Photovoltaic (PV)** installations, including calculations of energy yield, efficiency, performance ratios, power rating, inverter efficiency, module temperature, array yield, system losses, etc.
- **Final acceptance tests for Mini Grids and Battery storage systems.**
- Complete inspection of the facility for **final acceptance**
- Permitting and documentation review
- Witnessing of commissioning

1. Plants Certifications

These certifications assure that the solar power plant is compliant with the industrial standards as best and safe practices.

2. Reports Development

The reports from plant audits and performance tests and Operations and Maintenance are developed following the IEC 62446.

3. Operations and Maintenance

This section covers cost-effective solutions to prolong the solar system life cycle, keep it performing at its highest rate and decrease the risk of failure of various components.

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TOOLS AND EQUIPMENT



Insulation Resistance Tester, Fluke 1507

Ideal for troubleshooting, preventive maintenance applications.



Visual IR Thermometer, VT04

Visual IR Thermometers blend a visual image with a heat map overlay, to help quickly identify the location of issues.



Solar Installation PV 150- Seaward Solar

Comprehensive test kit designed to meet all test requirements of PV systems in accordance with IEC 62446, BS EN 62446, EN 62446 etc.



True RMS Multi-meter, Fluke 117

Ideal meter for demanding settings like commercial buildings, hospitals and schools.



Earth Resistance Tester 382252

Necessary to measure earth ground in 3 ranges from 20 to 2000 ohms. Also tests AC/DC Voltage, resistance and continuity



Solar 300N- HT Instruments

Device for verification of single-phase and three-phase PV system efficiency and Power Quality analysis



Visual IR Thermometer VT04

Visual IR Thermometers blend a visual image with a heat map overlay, to help quickly identify the location of issues.



MPP300- HT Instruments

Device for measuring and recording the main parameters which characterize single- and three phase, single and multi-string photovoltaic systems (up to three MPPT).

HT Solar I-V e



Measurement of efficiency of a single phase PV system, Voc 1500V, ISC 15A and measurement of I-V Curve for 1500V/10A-1000V-15A.

PVCHECK



The multifunction instrument PVCHECK allows prompt and safe electrical checks required for a PV system (DC side) as well as operating controls on modules and strings in accordance with IEC/EN62446 guidelines.



HT Instruments PV CHECK

The multifunction device PVCHECK allows quickly and safely carrying out the electric safety tests provided for a PV system (section in DC) and the functional test of modules/strings the system consists of according to the requirements of Standard IEC/EN62446



HT Instruments Solar I-Ve 1500

I-V500w allows field detection of I-V Curve and of the main characteristic parameters both of a single module and of strings of modules for PV installations up to a maximum of 1500V and 10A or 1000V and 15A



Seaward Solar Utility Pro

With the Seaward Solar Utility pro we are able to:
Test multiple strings in parallel up to 1500V 40A.
Test at a string level or in the combiner box.
Record up to 999 full sets of string data.
Test open circuit voltage (Voc), short circuit current (Isc), irradiance (W/m²), ambient temperature & more.



Seaward Solar PV150

The PV150 is part of our comprehensive test kit designed to meet all test requirements of PV systems in accordance with IEC 62446, BS EN 62446, EN 62446 and other certification schemes, standards and recommendations for best practice.



Solar Thermal Inspection – and Aerial surveillance

We incorporate thermal inspections into our routine maintenance plan and reduce our inspection times significantly using our UAS solutions rather than using handheld thermal imaging solutions. We work more safely during inspections by reducing exposure to the elements, and it will help improve your overall efficiency.



PHOTOS SHOWING SERVICES OFFERED

