

Solar Inverter Laboratory : Ensuring Efficiency, Reliability and Compliance



**Proposed 3D Layout of
New Solar Inverter Laboratory**

Solar Inverters are part of mandatory testing requirement as per Bureau of Indian Standards (BIS) and Ministry of New and Renewable Energy (MNRE) guidelines.

ERDA, with its upcoming state of the art laboratory, will undertake all types of testing on grid tied and off grid inverters up to 250kVA rating and up to 1500V of solar array voltage level.

Infrastructure

Solar PV Array Simulators

It offers a 200 Hz sweeping speed for MPPT, with 1% voltage accuracy, 2% current accuracy, and less than 1% ripple. It can program custom I-V curves, including complex "multiple hump" characteristics, and simulate irradiance levels from 0 to 1500 W/m², temperatures from -10°C to +100°C, and temperature coefficients from +1% to -1%/°C.

Grid Simulator

The Grid Simulator will be suitable for inverter testing up to a total rated power of 270 kVA. It features a grid-side rating of 400V ±10% at 50Hz ±3%, and an inverter-side rating of 200-800V line-to-line, with a frequency range of 20-550Hz. Equipped with a regenerative source, it offers precise voltage and frequency control, maintaining voltage regulation at 0.1%.

Programmable RLC load

The 300kW RLC load bank is designed for anti-islanding testing, featuring an automatic resonant point loading function. It allows pre-setting of the load based on the inverter's active and reactive power outputs. With a resolution of 5 watts, the load bank enables precise control of individual phases for accurate testing.

Upcoming Laboratory Facility consist of

- Anti-islanding tests
- LVRT, HVRT, FRT & power Quality
- Grid connectivity
- MPPT Efficiency
- Conversion Efficiency
- Safety test

Available Facility Consists of

- EMI/EMC Laboratory
- Ingress Protection Laboratory
- Solar PV Module Laboratory

Applicable Standards

- IS 16221
- IEC 62109 (Part1 & 2)
- IEC 61727
- IEC 62116/IS 16169
- IEC 61683
- IEEE 1547
- EN 50530
- IEC 62891