

QuickSun[®] 550Ei

Versatile module inspection system for laboratories and quality control



- ✓ Class A+A+A+ solar simulator with 105 x 205 cm test area
- ✓ EL imaging and analysis with 200 μm resolution
- ✓ True leakage current measurements with nA scale sensitivity
- ✓ Reference bifacial module measurements

Endeas Oy

has been providing innovative testing technology to the PV industry since 2001. We satisfy the needs of our customers with precise, dependable, and easily operated equipment and expert support based on our profound understanding of photovoltaics measurement technology. The reliability of our solutions is proven by more than 550 systems delivered worldwide.

QuickSun 550Ei is a versatile testing system for qualifying of PV modules with dimensions up to 105 x 205 cm². Basic set up includes a top class solar simulator which measures modules in sunny side up position enabling e.g. soiling simulations. Several additional measurement methods can be integrated to the same system including high resolution EL imaging with analysis software from one of the most recognized EL system suppliers. Several additional measurement methods can be integrated to the same system including high resolution EL imaging, bypass diode functionality test, temperature coefficient measurement, and true nA scale leakage current measurement.

Solar Simulator

A detailed test report is included with every simulator, proving a class A+A+A+ performance with respect to spectrum, irradiance non-uniformity, and short-term instability (STI). The Xenon technology spectrum is continuous, from 300 nm up to 1,200 nm, and it complies without any reservations with the future standard IEC 60904-9 Ed. 3. Long-term instability (LTI) is also within class A+ tolerances during the 40-ms-long flash pulse – even the high efficiency and capacitance IBC and HJT modules can be measured accurately by applying the Capacitance Compensation (CAC) method. This scientifically justified procedure enables the measurement of steady-state I-V curve in only 40 ms, eliminating the need for longer flash pulses. The QuickSun 550Ei testing chamber is inherently designed to enable the single-side testing of bifacial modules at elevated intensities. The applied test procedures and reports comply fully with the standards IEC 60904-1 and IEC 60904-9.

EL Imaging

EL-images having 200 µm pixel resolution are recorded with six 8.3 Mpixel NIR ccd cameras. This enables software based automatic image analysis in order to identify and categorize small faults like microcracks and finger interruptions. If automatic analysis is not required cost effective 500 µm resolution EL picture can be recorded with two corresponding ccd cameras. A 850 W power supply can provide upto 14 A even to 72 cell modules. Typical exposure times vary between 5–20 seconds depending on the desired image quality.

Electrical Safety

QuickSun 550Ei has the capability to perform insulation resistance, dielectric withstand and ground con-

tinuity tests as stipulated in the applicable UL and IEC standards.

Actual leakage current of PV modules is a few hundred nano amperes with a typical 4 KV test voltage while the widely applied dielectric withstand test acceptance criteria is 50 µA. QuickSun 550Ei surpasses this minimum requirement and measures true insulation resistance and leakage currents accurately with sensitive enough instruments. This enables run time diagnosis of both contacting reliability and real module leakage characteristics.

Key Characteristics

Contacting	Module cables	4-wire
Load	feedback controlled MOSFET	adjustable bias 0 – 4.5 V
Voltage sweep	Isc -> Voc, Voc -> Isc	Capacitance Compensation (CAC) method
Voltage measurement	1 – 100 V (other scales on request)	Accuracy better than 0.2 %
Current measurement	0.5 – 25 A (other scales on request)	Accuracy better than 0.2 %
Irradiance control	100 – 1200 W/m ²	Resolution 1 W/m ²
Pmp repeatability	(Max-min) / (max+min) < 0.25 %	Std. < 0.1 %
Average flash tube lifetime	500 000 flashes	
Temperature coeff. measurement	RT + 10 °C	IEC 60891
EL image	12 – 40 MP	Typ. exposure time 3–5 secs
Hipot	Max 6.5 kV	0.1 nA measurement sensitivity
Ground Bond	0.2 mohm sensitivity	
Operation temperature	15–35 °C	
Mains utilities	3~, 400 Vac, 3 x 16 A, 50–60 Hz	
Total dimensions, weight	310 x 180 x 250 cm	850 - 1100 kg, depending on options