

# QuickSun<sup>®</sup> 540XLi

Solar simulator for the largest BIPV modules



- ✓ Class AAA solar simulator
- ✓ 360 × 210 cm<sup>2</sup> test area sunny-side up
- ✓ Compact system size of 430 cm × 360 cm × 325 cm
- ✓ Optional EL imaging

## 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 540XLi is a versatile testing system for qualifying the largest-area BIPV modules with dimensions up to 360 × 210 cm<sup>2</sup>. The basic setup includes a top-class solar simulator that measures modules in the sunny-side up position. Additional measurement methods can be integrated into the same system, including high-resolution EL imaging. With the easy-to-operate system and our expert support, even entrants into the photovoltaics manufacturing business can easily adopt the best quality control practices established in the industry.

Thanks to an innovative Xenon lamp system, the overall dimensions of the system are kept compact. Compared to a full-length flash tunnel, which can be up to 10 meters long, the overall dimensions are only 4.3 x 3.6 x 3.3 meters. A guided procedure allows the end user to verify irradiance non-uniformity at regular intervals.

## Certified Performance

A detailed test report is included with every simulator, proving a class AAA performance with respect to spectrum, irradiance non-uniformity, and short-term instability (STI). A feedback controlled electronic load and sampling unit measures the voltage, current, and irradiance signals when the module is swept, e.g., from a short circuit to an open circuit. Forward and backward voltage sweeps can be combined in a novel procedure that enables the accurate measurement of very high capacitance and top efficiency c-Si modules. The applied test procedures and reports comply fully with the standards IEC 60904-1 and IEC 60904-9, as inspected and proved by SGS Fimko Ltd.

## EL Imaging

EL images are recorded with two 8.3 MP NIR CCD cameras. This enables the detection of faults, such as shunts and dark areas. An 850-W power supply can provide up to 3 A for a 300-V module. Typical exposure times vary between 5–20 seconds, depending on the desired image quality.

## 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         | 1–300 V (max. 500V scale on request) | Accuracy better than 0.2 %            |
| Current measurement         | 0.5–25 A (other scales on request)   | Accuracy better than 0.2 %            |
| Irradiance control          | 200–1200 W/m <sup>2</sup>            | Resolution 1 W/m <sup>2</sup>         |
| Pmp repeatability           | (Max-min) / (max+min) < 0.25 %       | Std. < 0.1 %                          |
| Average flash tube lifetime | 300 000 flashes                      |                                       |
| EL image                    | 12 MP                                | Typ. exposure time 5-10 secs          |
| Operation temperature       | 15–35 °C                             |                                       |
| Main utilities              | 3~, 400 Vac, 3 x 16 A, 50–60 Hz      |                                       |
| Dimensions, weight          | 430 x 360 x 326 cm                   | 1200 kg, depending on options         |