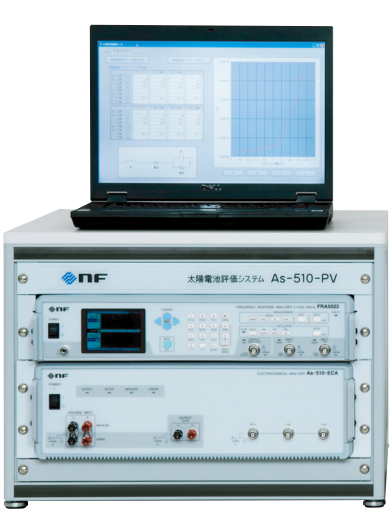
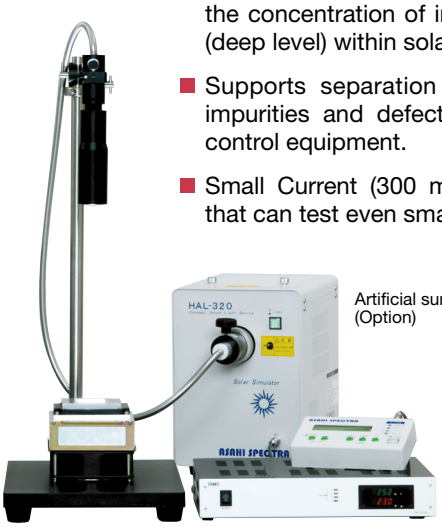
As-510-PV Series

Solar Cell Test System

Suitable for research to improve the conversion efficiency and durability of compound and organic solar cells, and for research on new materials.



Measuring device (300 mA model)



Peltier temperature control equipment (Option)

Artificial sunlight source (Option)

- Automatically measures and collects data for estimating the concentration of impurities (shallow level) and defects (deep level) within solar cells.
- Supports separation research on the concentration of impurities and defects in combination with temperature control equipment.
- Small Current (300 mA), high-resolution model available that can test even small cells in the R&D stage.

Lineup

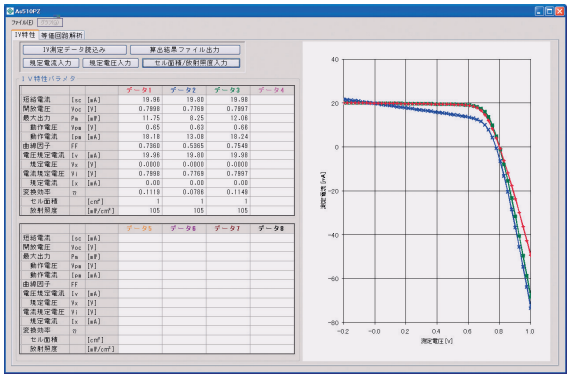
As-510-PV03	300 mA
As-510-PV	4 A

Functions

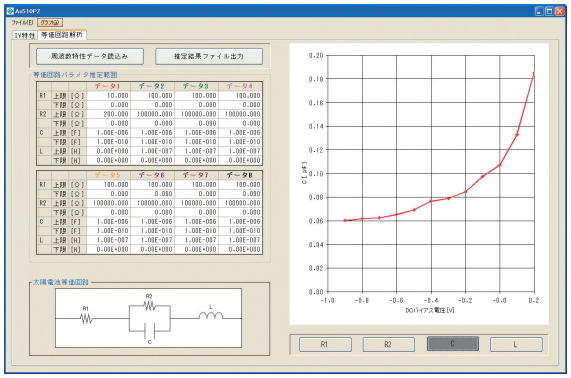
- **Measuring IV characteristics**
  Can perform measurements automatically and calculate the solar cell's conversion efficiency when combined with an artificial sunlight source and Peltier temperature control equipment.
- **Measuring CV characteristics**
  Equivalent circuit estimation is performed automatically based on the AC impedance measurement results, the effects of the induction component (L) and series/parallel resistance component (R) from the electrodes are separated, and the calculated capacitance component (C) is displayed on a graph.
- **Measuring CVT* characteristics**
  Supports analysis of the effects on conversion efficiency of the concentration of impurities and defects, based on variations in the capacitance (C) of the solar cell when the temperature changes.

* T indicates temperature. The system uses Peltier temperature control equipment (option) to adjust the temperature.

▼IV Characteristics



▼CV Characteristics



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◆ Specifications

300A model: **As-510-PV03** 4A model: **As-510-PV**

▼ Bipolar voltage output

Output voltage: Ranges –5 V to +5 V
Sweep rate 0.1 mV/s to 10 V/s
Accuracy ± (0.1% of setting +5 mV)
Output current ranges:
As-510-PV03 300 mA range: –300 mA to +300 mA
30 mA range: –30 mA to +30 mA
3 mA range: –3 mA to +3 mA
As-510-PV 4 A range: –4 A to +4 A
400 mA range: –0.4 A to +0.4 A
Frequency response: Output ±3 dB @ 50 kHz
Measurement ±1 dB @ 100 kHz

▼ AC Measurement

Frequency ranges: 0.1 mHz to 100 kHz
Items: AC impedance

▼ DC Measurement

Voltage: Ranges –5 V to +5 V
Accuracy ±(0.05% of reading +3 mV)
Current: Ranges As-510-PV03: –300 mA to +300 mA
As-510-PV: –4 A to +4 A
Accuracy As-510-PV03: 300 mA range: ± (0.1% of reading +500 µA)
30 mA range: ± (0.1% of reading +100 µA)
3 mA range: ± (0.1% of reading +10 µA)
As-510-PV: 4 A range: ± (0.1 % of reading +5 mA)
400 mA range: ± (0.1% of reading +1 mA)
Sampling number: Max. 20,000 points
Sampling rate: 0.01 to 100 Samples/second

Power requirements: AC 100 V: ±10% 50 Hz/60 Hz ±2 Hz
Power consumption: Max. 205 VA
Dimension: 520 (W) × 363 (H) × 600 (D) mm (Not including protrusion)

▼ System software

IV measurement:
- Display of up to 8 superimposed graphs of IV characteristics.
- Calculation of short-circuit current (I_{sc}), open-circuit voltage (V_{oc}), maximum output (P_m), fill factor (FF), current of specified voltage (I_V), voltage of specified current (V_I), and conversion efficiency (η) from IV measurement results.

CV measurement:
- Graphical display of DC bias characteristics relative to capacitance, series resistance, parallel resistance, and inductance components.
- Display of up to 8 superimposed graphs.
- Possible to save all measurement data and calculation results in CSV file format.
- Automatic temperature control for both IV and CV measurements.

Option Peltier temperature control equipment

■ Heat sink electronic cooling unit
Model: OKT7070-UHS-2 (manufactured by Okano Electric Wire Co., Ltd.)
Constant-temperature plate dimensions: 92 × 92 mm
Heat dispersion method: Air-cooled heat sink + fan
Max. cooling capacity (Δt = 0°C): 70 W
Dimensions: 122 × 100 × 90 mm excluding protrusions

■ Thermo-controller for Peltier control
Model: OKS-EC201 (manufactured by Okano Electric Wire Co., Ltd.)
Temperature control method: Digital PID automatic control
Power requirements: AC 100 V ±10%, power consumption 240 W max.
Dimensions: 3300 (W) × 300 (D) × 170 (H) mm
excluding protrusions and feet
Weight: 3 kg or less

Option Light source

■ Artificial sunlight source
Model: HAL-320 (manufactured by Asahi Spectra Co., Ltd.)
Lamp type: Compact xenon lamp, 300 W
Output wavelength: 350 to 1100 nm
Power requirements: Rated 100 V, 50/60 Hz
(allowable input range: 100 V to 240 V)
Power consumption: 540 VA or less (AC 240 V input/at 50 Hz)
Dimensions (excluding protrusions):
Body: 200 (W) × 300 (D) × 292 (H) mm
Controller: 160 (W) × 37 (D) × 99 (H) mm
Weight: Body: 10.2 kg Controller: 0.5 kg

● These products can be customized to match customer requirements. Please contact us for details.

* The contents of this catalog are current as of October 3, 2009.
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