Terrestrial - High Intensity Pulsed Solar Simulator (T-HIPSS)

Table top Solar Simulator providing up to 3000 Suns (1500 Suns for Model 460) for Terrestrial solar cell testing.

Benefits

- System allows for testing of Terrestrial Solar Cells at very high (up to 3000 suns on Model 420 and up to 1500 suns on Model 460) fluence levels.
- Illuminated area is 10cm x 10cm.
  - 8cm by 8cm Class A Standard.
  - Well defined and repeatable intensity distribution from uncorrected system.
  - Optional intensity distribution correction masks are available to allow enhanced uniformity control.
- Adjustable, unobstructed volume between lamp housing and illuminated volume for easy tooling and robotic manipulations.
- System is pulsed (2.5 millisecond) so thermally induced temperature changes are minimized.
- Pulse rates of 1 pulse per 15 seconds are standard; faster production rates achievable.
- High speed Data Acquisition Unit (DAU) can perform I-V curve measurements within 2.5 millisecond pulse duration.
- Fundamental spectral content is from a high pressure Xenon Lamp, close to Air Mass 0.
  - Spectral content can be changed to simulate various Air Mass Values from AM0 to AM2.5
  - Model 420: uses absorbing filters
  - Model 460: uses wavelength selective mirrors
- Optional diagnostics include intensity distribution measurement system and single pulse spectrometers. (300 nm to 1700 nm)
- Thin nickel attenuating screens allow intensity changes without changing the energy distribution throughout entire spectrum.

Product Description

- Lamphouse: Projects multiple, overlapping images of one single lamp at a point in space 25° from the lamp. Spectral filtering can be achieved by introducing balanced spectral filters in matched beam paths (on Model 420) or by aperturing wave length specific mirrors (on Model 460).
- Control Unit: Contains Pulse Forming Network (PFN), charging and triggering circuits, trigger control logic and safety interlocks.
- Pulse Forming Network (PFN): Produces required voltage and current pulses for lamphouse.

Features

- Data Acquisition Unit (DAU): Performs data capture, buffering and data manipulation. Monitors and reports on optical pulse parameters, current and voltage parameters for each pulse. Provides computer interface to master control computer.
- Control Computer: PC-based control computer for instrument control, data acquisition, diagnostic control, data manipulation and display. Includes large data storage capability and laser printer capability.
- Provides for measurement of the I-V Curve on Terrestrial Solar Cells in up to a Class A illuminated area.
  - 4 Reference channels held at ISC
  - 2 Device Under Test (DUT) channels
  - 50 amps @ 20 volts
- Adjustable illumination pulse of <50 Suns to >1500 Suns (<200 to >3000 for Model 420) for 2.5 ms every 15 seconds.
- Optical spectrum from 250 nm to 2500 nm approximately matching AM0, modifiable to beyond AM1.5.
- Internal diagnostics include current, voltage, optical signals for each pulse.
- Optional diagnostics include single pulse Intensity Distribution measurement capability and single shot spectral measurements.
- Clear area under lamphouse for test fixtures and / or robotic manipulations.

The information contained on this sheet is for reference only. Specifications subject to change without notice. (REV. AIST)
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SYSTEM SPECIFICATIONS

T-HIPSS 400 SERIES

- Test Plane Area
  - Model 420: 10cm x 10cm
  - Model 460: 10cm x 10cm

- Test Plane Uniformity, (raw, unfiltered)
  - Model 420:
    - ~6cm @ 1.87%, parallel to lamp
    - ~7cm @ .877%, perpendicular to lamp
  - Model 460:
    - ~6cm @ 1.87%, parallel to lamp
    - ~7cm @ .877%, perpendicular to lamp

- Irradiance Levels
  - Model 420: 200 - 3000 Suns
  - Model 460: 50 - 1500 Suns

- Spectral Adjustability
  - Type
    - Absorbing Filters
  - Range
    - ± 10% per filter pair
    - < 1%

  - Model 460:
    - Dielectric Mirrors, Computer Controlled
    - ± 5% per dielectric mirror pair
    - < 1%

SYSTEM COMPONENTS

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<th>ITEM</th>
<th>WIDTH</th>
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<tbody>
<tr>
<td>Lamphouse</td>
<td>508mm</td>
<td>635mm</td>
<td>330mm</td>
<td>46kg</td>
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<tr>
<td>Pulse Forming Network (PFN)</td>
<td>533mm</td>
<td>1,232mm</td>
<td>1,830mm</td>
<td>682kg</td>
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<td>Control Unit (w/Workstation Table)</td>
<td>762mm</td>
<td>1,300mm</td>
<td>2,133mm</td>
<td>92kg</td>
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Included Standard Equipment, not pictured:
- Pulse Forming Network (PFN)
- Control Unit
- Data Acquisition Unit (DAU)
- Control Computer

Contact Spectrolab Customer Service for price and availability.
+1 (800) 936-4888 or DL-SYLCustomerservice@boeing.com

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