www.sciencetech-inc.com sales@sciencetech-inc.com +1 (519) 644 -0135

SCIENCETECH
Making Light Work Better

Features

- Xenon short arc lamp
- High collimation : ± 0.7° (half angle)
- Proprietary Fresnel lens optical system
- Illumination areas up to 22cm Ø
- Class ABA and AUA models available
- Optional vertical operation
- AM0 & AM1.5 filters available
- Advanced lamp alignment
- Adaptable framework
- Integrated power supply
- Simple operation

Applications

- Photovoltaic Testing
- Solar Thermal System Testing
- CPV Systems testing
- Space and extraterrestrial solar spectrum simulation
- Exposure Related Testing

HIGHLY COLLIMATED SOLAR SIMULATOR

MADE IN CANADA
FABRIQUÉ AU CANADA

Version 4.2 Nov 2023

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Highly Collimated Solar Simulator

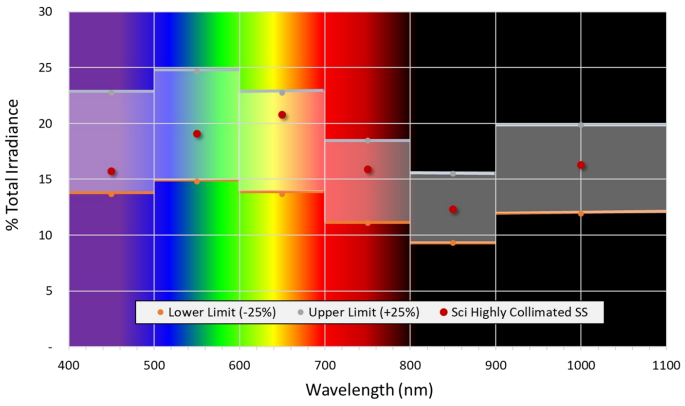
OVERVIEW

Sciencetech's highly collimated solar simulators are designed for photovoltaic cell testing applications where a very high degree of collimation of incident radiation is required. Space environmental simulation (AM0 spectrum), CPV and solar thermal applications generally require light sources with collimation angles approaching that of the sun (0.5 degree). Sciencetech's highly collimated solar simulators can provide continuous illumination (9" and 12" respectively) and high collimation (0.7 degrees half angle). The system uses Fresnel lens technology to achieve very high collimation. These solar simulators include integrated power supplies and an advanced lamp alignment tool which makes them easy to use.

Solar Simulator Classification

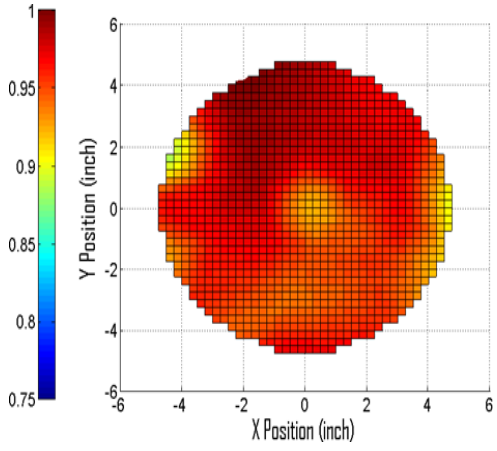
Highly Collimated Solar Simulator is aligned and tested in our calibration laboratory. Strict quality control procedures are enforced to ensure simulators meet the required specifications and a testing report is provided with each system.

Class A Spectral Match



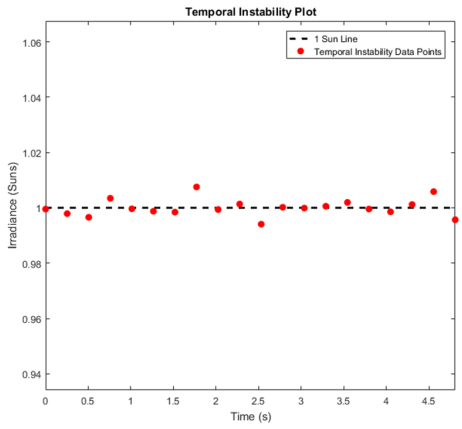
Range (nm)	ASTM Standard AM1.5D	Xe-FR Series Result	< ± 25 % of standard ?
400-500	16.90%	15.70%	pass
500-600	19.70%	19.10%	pass
600-700	18.50%	20.80%	pass
700-800	15.20%	15.90%	pass
800-900	12.90%	12.30%	pass
900-1100	16.80%	16.30%	pass
SUM	100%	100%	pass

Class B Spatial Non-uniformity*



*Measured NU < ± 5% for both the 3.0kW and 1.6kW class ABA solar simulators.

Class A Temporal Instability



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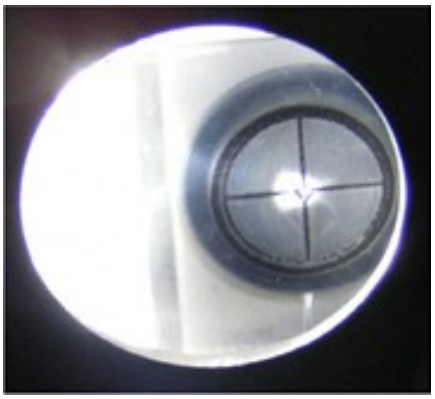
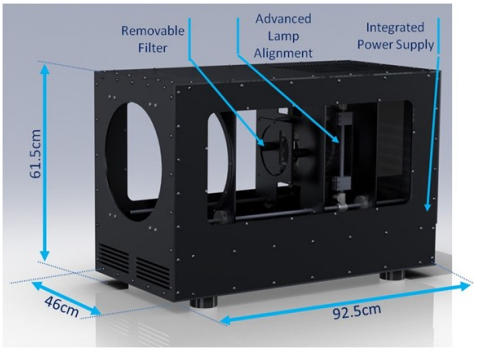
Highly Collimated Solar Simulator

SPECIFICATIONS

Specification	SS1.6k-Xe-FR ABA 164-9001	SS3.0k-Xe-FR ABA 164-9002	SS1.6k-Xe-FR 164-9005	SS3.0k-Xe-FR 164-9004
Illumination Area[1] Diameter Ø (AM1.5D)	22cm Ø	30cm Ø	22cm Ø	30cm Ø
Illumination Area[1] Diameter Ø (AM1.5G)	20cm Ø	28cm Ø	20cm Ø	28cm Ø
Illumination Area[1] Diameter Ø (AM0)	15cm Ø	21cm Ø	15cm Ø	21cm Ø
Collimation [2] (°)	± 0.7			
Spectral Match[3] Class	A	A	A	A
Spectral Match[3] (%)	<+25			
Filters	Various available			
Spatial Non-uniformity Class	B	B	U	U
Spatial Non-uniformity[4] (%)	±5°		±25°	
Temporal Instability Class	A	A	A	A
Temporal Instability (%)	<+2			
Working Distance (cm)	20—25			
Illumination Intensity[5] mW/cm²	With AM0 filter: 137 With AM1.5 filter: 90 Without filters: Up to 200			
Beam Orientation	Horizontal			
Lamp	1.6kW Xe Short Arc Lamp	3.0kW Xe Short Arc Lamp	1.6kW Xe Short Arc Lamp	3.0kW Xe Short Arc Lamp
Lamp voltage (V)	23	29	23	29
Lamp current (A)	65	100	65	100
Unfiltered Spectral range	250-2500nm			
Lamp life (hours)	2000	1000	2000	1000
Power supply	Integrated adjustable constant current supply			
Input Voltage (VAC)	220 - 240			
Input Frequency (Hz)	47 - 63			
Ripple (%)	< 0.5			
Lamp Cooling	Forced air, interlocked to power supply			
Dimensions (cm)	92.5 x 46 x 61.5			
Weight (kg)	50			

Two pinhole cameras with attached reticules are used to help align the lamp in the correct position.





1) Varies with required illumination intensity

2) Collimation measured is for >70% of the optical power at the target plane

3)With an appropriate filter, purchased separately

4) (B) option requires spatial mask which limits UV transmission, AM0 class B in 300-400 nm region

5) Depends on the target size. Output of the lamp is adjustable up +15% of rated current with a reduction in lifetime

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Highly Collimated Solar Simulator

ACCESSORIES

Internal Shutter (SSES-XE-FR)

Internal shutter designed for Sciencetech highly-collimated solar simulators model SS1.6K-XE-FR and SS3.0K-XE-FR. This shutter includes additional cooling fans and mounting hardware inside the simulator. It should be ordered at the time of purchasing the simulator.

Beam Turning Assembly (CTBT-XE-TR)

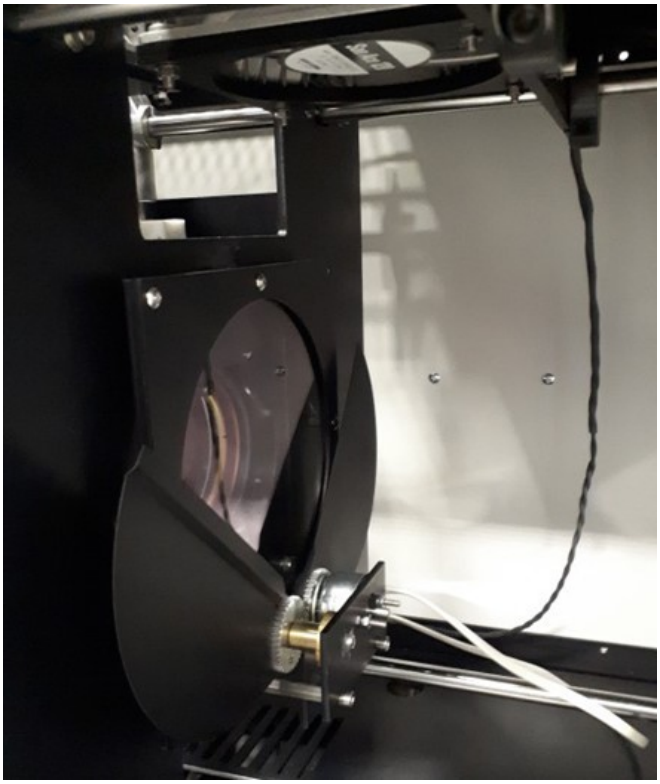
The XE-FR line of simulators produces a horizontal facing beam. The beam line can be turned vertically with an additional large mirror module on the output of the system. Alternatively, downward-facing operation is possible, but should be specified at the time of order.

Contact us for a quote or to tell us about your custom application today!

Light Stabilization

The FS-02-N module provides long-term light stabilization.

The module works by monitoring the optical intensity inside the simulator and increasing or decreasing the current to the lamp to maintain a stable optical output. The FS-02-N includes an external module as well as internal detectors and should be ordered with the initial purchase of the simulator.



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