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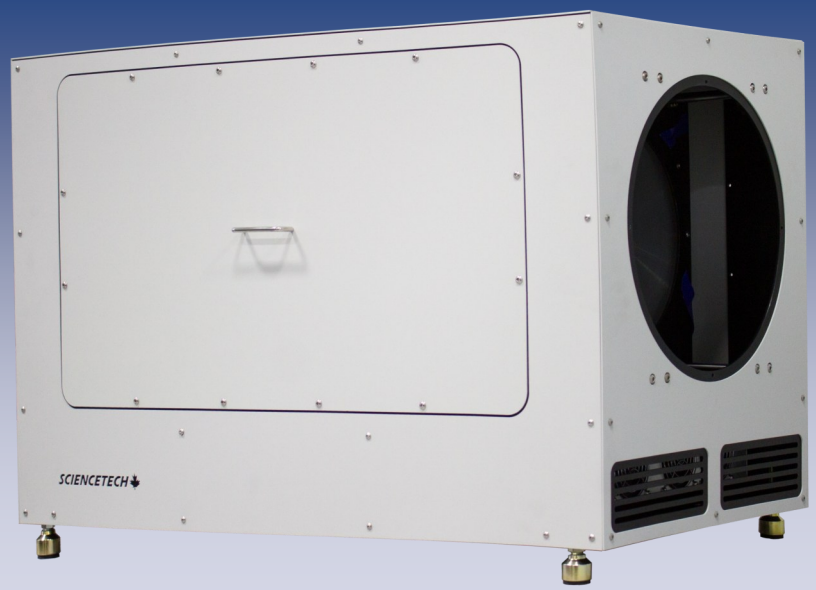
Making Light Work Better



Features

- Xenon short arc lamp
- High collimation : ± 0.7° (half angle)
- Proprietary Fresnel lens optical system
- Illumination areas up to 28cm Ø
- Class ABA and AUA models available
- Optional vertical operation
- AM1.5G filters included and other AM filters are available
- Advanced lamp alignment
- Adaptable framework
- Simple operation
- Electronic Shutter

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

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Highly Collimated Solar Simulator

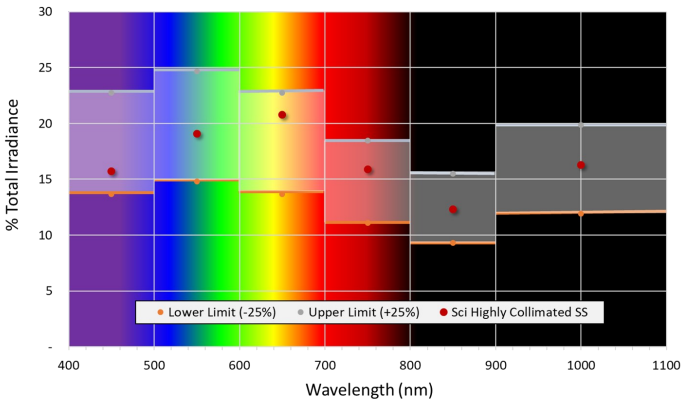
OVERVIEW

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 (20 cm (8") for 1.6 kW lamps and 28 cm (11") for 3 kW lamps) 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

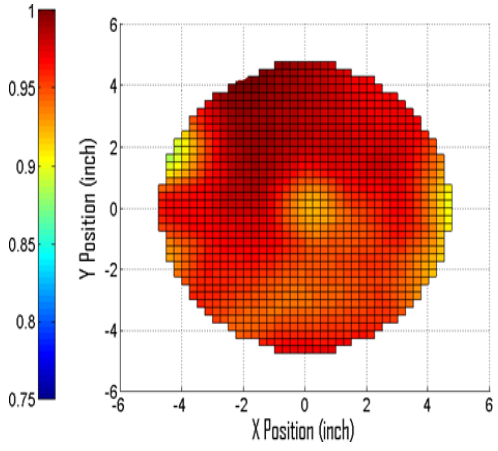
Highly Collimated Solar Simulator is aligned and tested in our calibration laboratory. Strict quality control procedures are enforced to ensure simulators meet the required specifications and a testing report is provided with each system.

Class A Spectral Match



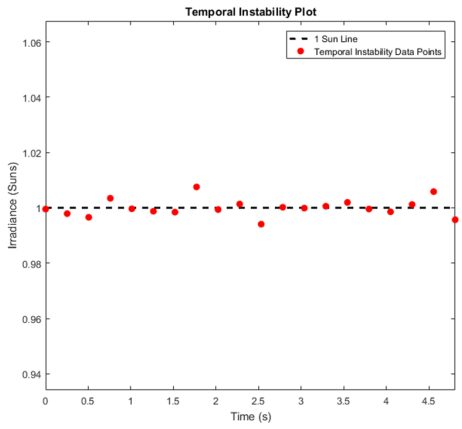
Range (nm)	ASTM Standard AM1.5D	SHC Series Result	< ± 25 % of standard ?
400-500	16.90%	15.70%	pass
500-600	19.70%	19.10%	pass
600-700	18.50%	20.80%	pass
700-800	15.20%	15.90%	pass
800-900	12.90%	12.30%	pass
900-1100	16.80%	16.30%	pass
SUM	100%	100%	pass

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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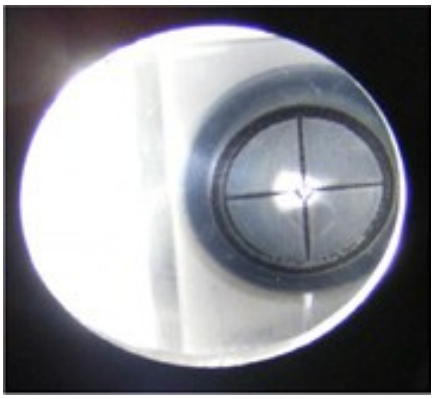
Highly Collimated Solar Simulator

SPECIFICATIONS

Specification	SHC-1.6K-B 164-9001	SHC-1.6K 164-9005	SHC-3.0K-B 164-9002	SHC-3.0K 164-9004
Illumination Area[1] Diameter Ø (AM1.5D)	20 cm (8") Ø		28 cm (11") Ø	
Illumination Area[1] Diameter Ø (AM1.5G)	20 cm (8") Ø		28 cm (11") Ø	
Illumination Area[1] Diameter Ø (AM0)	15 cm (6") Ø		21 cm (8.26") Ø	
Collimation [2] (º)	± 0.7			
Spectral Match Class	A			
Filters	AM1.5G is included and other AM filters are available[3]			
Spatial Non-uniformity Class	B	U	B	U
Spatial Non-uniformity[4] (%)	±5	±25	±5	±25
Temporal Instability Class	A			
Temporal Instability (%)	<±2			
Working Distance (cm [inches])[5]	20 to 30 [7.87 to 11.81]		30 to 40 [11.81 to 15.75]	
Illumination Intensity[6] mW/cm^2	With AM0 filter: 137 With AM1.5G filter: 100 Without filters: Up to 200			
Beam Orientation	Horizontal			
Lamp	1.6kW Xe Short Arc Lamp		3.0kW Xe Short Arc Lamp	
Unfiltered Spectral range	250-2500nm			
Lamp life (hours)	2500			
Power supply	Adjustable constant current supply			
Input Voltage (VAC)	220 - 240			
Input Current (A)	12.1 - 9.0		19.8 - 16.5	
Input Frequency (Hz)	50/60 Hz			
Ripple (%)	< 0.5			
Lamp Cooling	Forced air, interlocked to power supply			
Dimensions (mm [inches])	578 × 576 × 522 [22.75 × 22.67 × 20.55]		819 × 533 × 574 [32.24 × 20.98 × 22.60]	
Weight (kg)	44		64	



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

[1] Varies with required illumination intensity.

[2] >70% of the optical power is within this collimation angle.

[3] Other AM filters are available but they may change the target size achievable. Contact a Sciencetech technical sales representative for details.

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

[5] The specific instrument's working distance will be supplied with the unit's test report after alignment. This distance will fall inside the specified range. The working distance is not adjustable. Please contact us if you require a specific working distance.

[6] 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

Light Stabilization (LIS-SH)

The LIS-SH module provides long-term light stabilization.

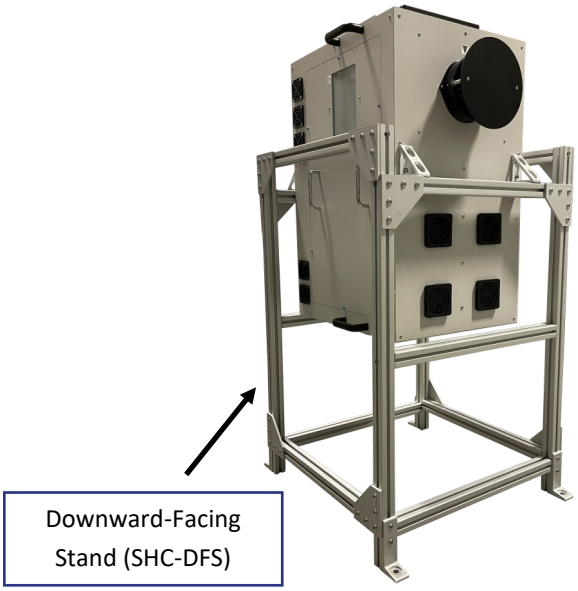
The module works by monitoring the optical intensity inside the simulator and increasing or decreasing the current to the lamp to maintain a stable optical output. The LIS-SH includes an external module as well as internal detectors and needs be ordered with the initial purchase of the simulator.

Beam Turning Assembly (CTBT-SHC)

The SHC 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.

Downward Facing Stand (SHC-DFS)

The SHC line of simulators produces a horizontal facing beam. Downward-facing operation is possible through use of a stand, but needs to be specified at the time of order.



Downward-Facing Stand (SHC-DFS)

Contact us for a quote or to tell us about

your custom application today!

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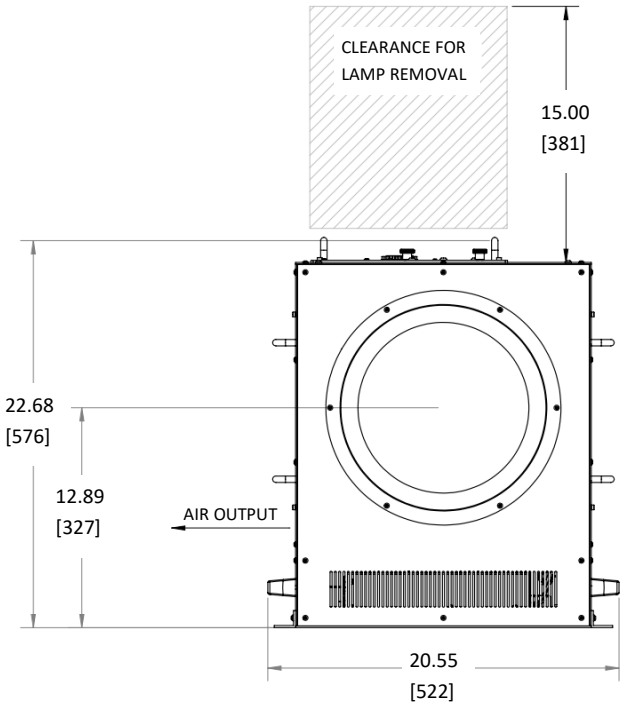
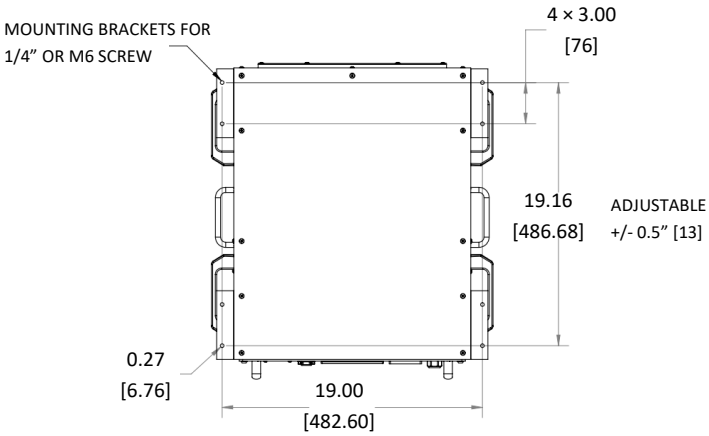
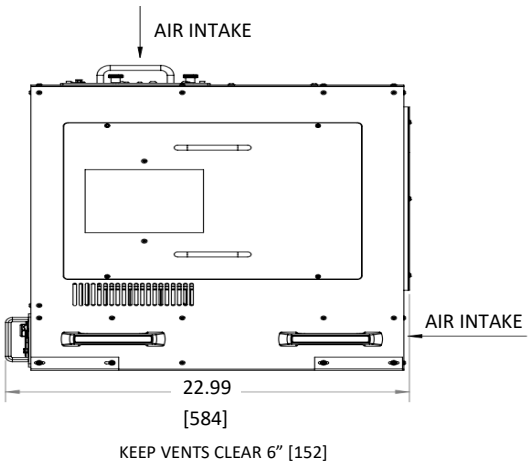
Highly Collimated Solar Simulator

DIMENSIONS

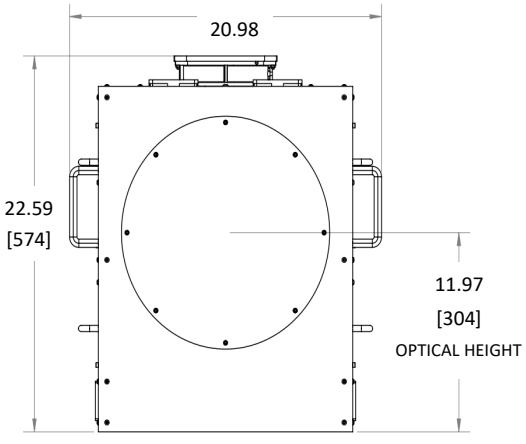
SHC – 1.6k

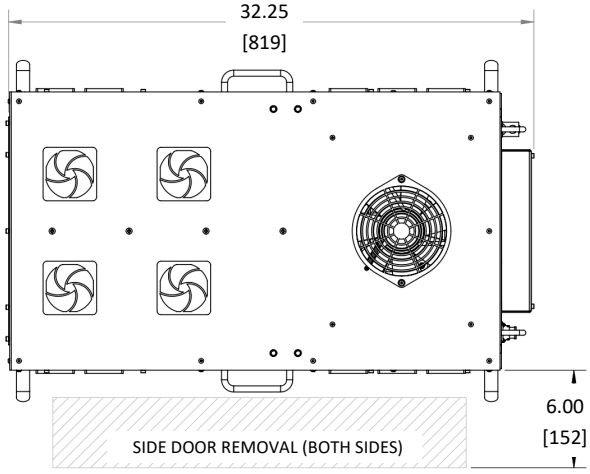


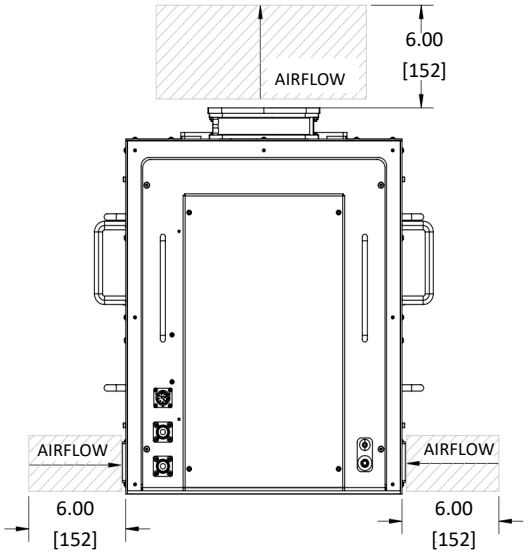




SHC – 3.0k







Dimensions in [mm] and inches.

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SciSun Solar Simulators

ORDERING INFORMATION

Model	Part Number	Description
SHC-1.6K-B	164-9001	Solar Simulator, Highly Collimated, Class ABA, 8" diameter, Fresnel lens
SHC-1.6K	164-9005	Solar Simulator, Highly Collimated, Class AUA, 8" diameter, Fresnel lens
SHC-3.0K-B	164-9002	Solar Simulator, Highly Collimated, Class ABA, 11" diameter, Fresnel lens
SHC-3.0K	164-9004	Solar Simulator, Highly Collimated, Class AUA, 11" diameter, Fresnel lens
LIS-SH	115-9033-C07	Light Intensity Stabilizer for Xe Touchscreen Power Supplies
SHC-DFS-1.6	164-8014	Downward Facing Stand for SHC-1.6k
SHC-DFS-3.0	164-8016	Downward Facing Stand for SHC-3.0k
CTBT-SHC	Contact Us	Beam Turning Assembly for SHC-series solar simulators