

## Applications

- Photovoltaic Testing
- Environmental Testing
- Material and degradation testing
- Photochemistry • Photocatalysis
- Photosynthesis • Photobiology

## Features

- Class AAA specification (ASTM, IEC)
- AM1.5G, AM0 spectral matches available
- Illumination area: 50 × 50mm
- Touchscreen-controlled power supply includes PLC with control software, manually-controlled option is simple, economical
- Beam turner provides continuously adjustable beam direction in 360°
- Manual shutter included (electronic shutter available)
- Variable attenuator from 0.1 – 2 suns
- Plug and play operation
- Long working distance can facilitate glovebox integration
- CE Compliant

SciSun-300 (left) shown with included CTBT-3 beam turner, included power supply, optional HAS adjustable stand, and optional SCI-SCC-3 cell chuck.

# Low Cost Solar Simulators SciSun Series



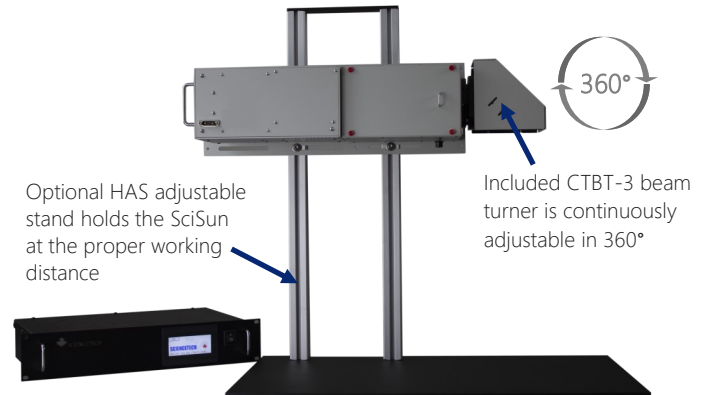
# SciSun Solar Simulators

## OVERVIEW & SPECIFICATIONS

Sciencetech's line of SciSun solar simulators are easy to use, economically priced, and technically superior. The SciSun line is designed to affordably provide a solution for researchers who require a relatively small field of illumination. They can produce an irradiance of up to **2 Suns** and feature Class AAA specifications.

The SciSun series provides a flexible output orientation that can be adapted to different requirements. The standard configuration is downward-facing; however, a horizontal output can be achieved easily.

### Specifications



Model	SciSun-AM0		SciSun-AM1.5G
	300W	300W	150W
Target Area	50 × 50 mm		
Spectral Match <sup>2</sup>	A	A	A
Spatial Non-Uniformity <sup>1</sup>	A	A	A
Temporal Instability <sup>3</sup>	A	A	A
Irradiance at Target (AM1.5G 1 Sun = 1000W/m <sup>2</sup> ) (AM0 1 Sun = 1366 W/m <sup>2</sup> )	Up to 1.5 Sun <sup>1</sup>	Up to 2 Sun <sup>1</sup>	Up to 1 Sun <sup>1</sup>
Lamp Wattage (watts)	300	300	150
Lamp Type	Xenon Short Arc , Ozone free		
Working Distance (mm)	With CTBT-3: 380 ± 15 With Beam Turner Removed: 475 ± 15		
Manual Shutter	Included, Motorized shutter available		
Manual/Motorized Variable Attenuator	Optional		
Dimensions (L×W×H)	535 × 183 × 188 mm		
Weight without PS (kg)	8.5 + 8 (stand)		
Touchscreen Power Supply Model	601-300	601-300	601-150
Manual Power Supply Model	EPS-300	EPS-300	EPS-150
Power Requirements	110-240V, 50Hz/60Hz , 450W	110-240V, 50Hz/60Hz , 450W	110-240V, 50Hz/60Hz , 250W
Stability / Ripple / Regulation	0.05% / < 1% / 0.02% current variation for 5V line charge		

Due to our continuous improvement system, all specifications are subject to change without notice.

### Standard Included Components

Air mass filter

Arc Lamp Housing with integrated igniter

Xenon arc lamp

Filter holder

Neutral Density Filter for 1 Sun Operation  
(AM1.5G, 300W version only)

Quality Control Report

Power supply

Power supply control software (touchscreen  
version only)

Manually-adjustable shutter (motorized  
available)

### STANDARDS

SciSun Solar Simulators are designed to meet the following standards:

ASTM E927-19 | IEC-60904-9-Ed.3

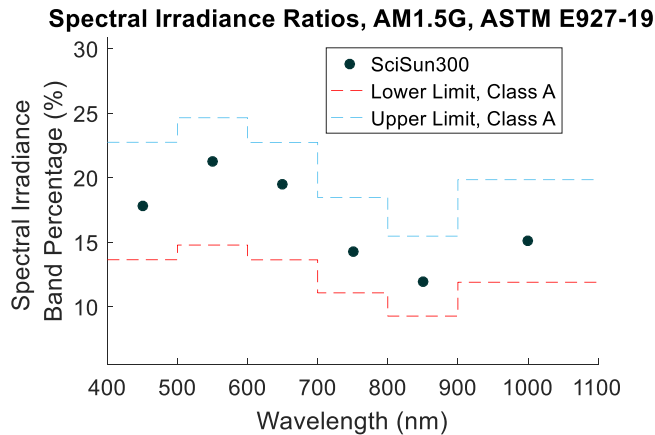
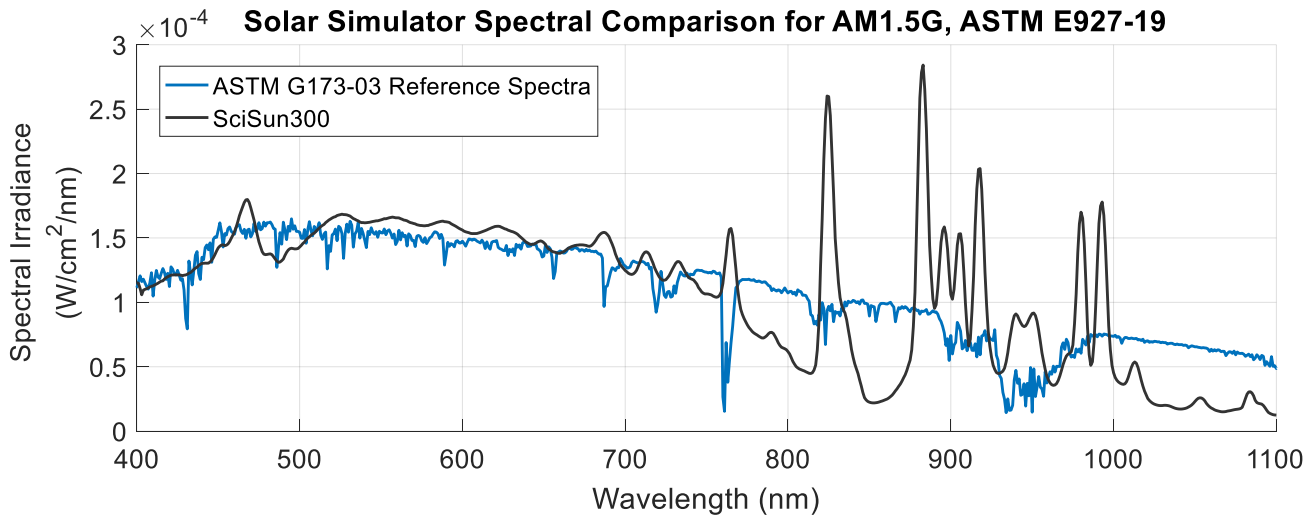
- 1) Measured using NIST-traceable secondary reference cell.
- 2) Measured with scanning spectroradiometer calibrated as per ASTM G138-06.
- 3) Determined from 20 measurements spaced at 250ms, Number of power line cycles (NPLC)=1.

# SciSun Solar Simulators

## CLASSIFICATION AAA

### Class A Spectral Match

SciSun solar simulators match Class A spectral match when used with a compatible air mass filter (see below using an AM1.5G filter). All testing results are for an example SciSun-300 and individual reports will vary.



### Solar Simulator Standards

SciSun solar simulator specifications listed are according to ASTM E927-19 and IEC-60904-9-Ed.3 unless otherwise stated. We can accommodate testing to match several standards. Testing procedure as per ASTM E927-19 provided by default. Please specify upon ordering if testing against IEC-60904-9-Ed.3 is required.

# SciSun Solar Simulators

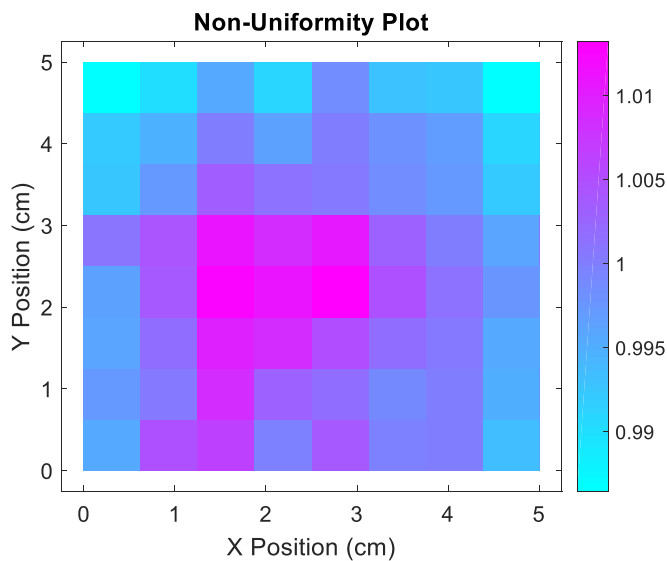
## CLASSIFICATION AAA

### Class A spatial non-uniformity (NU):

SciSun solar simulators meet Class A spatial non-uniformity by default (see below).

Non-uniformity = 1.4% Less than 2%.

Class B may also be available over larger target sizes upon request.

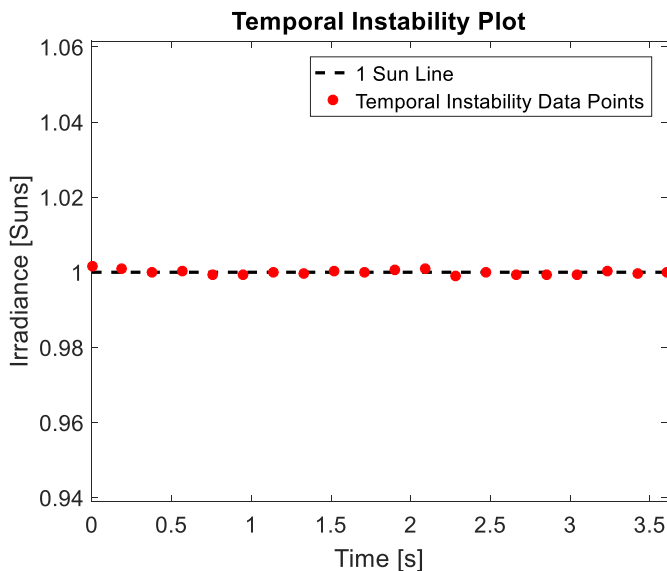


<b>Detector Area:</b>	0.30 cm <sup>2</sup>
<b>Number of Measurement Points:</b>	64
<b>Measurement Point Area:</b>	0.39 cm <sup>2</sup>
<b>Maximum Irradiance:</b>	1.013 Suns
<b>Minimum Irradiance:</b>	0.986 Suns
<b>Sample Standard Deviation of Spatial Non-Uniformity:</b>	0.006 Suns
<b>Spatial Non-Uniformity of Irradiance:</b>	1.40%
<b>Classification:</b>	A

Non Uniformity Map of a SciSun Solar Simulator.

### Class A Temporal Instability:

SciSun solar simulators meet Class A temporal instability. 0.13% Less than 2%.



<b>Detector Area:</b>	4 cm
<b>Time Between Data Points:</b>	0.253 Sec
<b>Number of Power Line Cycles (NPLC):</b>	1
<b>Total Measurement Points:</b>	20
<b>Maximum Irradiance:</b>	1.002 Suns
<b>Minimum Irradiance:</b>	0.999 Suns
<b>Temporal Instability of Irradiance:</b>	0.13%

# SciSun Solar Simulators

## CONFIGURATION OPTIONS

### Power Supply Option

The power supply selection dictates what kind of control options are available

The manual power supply is the most economical solution. With this option you can turn the power supply on and off manually and set the current level to the lamp. No other control options are available with the manual power supply

The computer controlled power supply (model 601) allows access to a variety of computer-controllable systems. Selecting this power supply option provides the greatest number of control options.

#### Power Supply Options

- Computer-controlled power supply
- Manual power supply



### Spectral Filter Options

AM1.5G: See the SciSun-AM1.5G line (160-9108)

AM0: See the SciSun-AM0 line (160-9109)

### Xenon Lamp Power

The selection of xenon lamp power limits the sun level achievable.



#### Xenon Lamp Options

- 150W Xenon Arc Lamp
- 300W Xenon Arc Lamp

### Shutter

A manual or motorized shutter may be configured. Motorized shutters require 601 series power supplies.

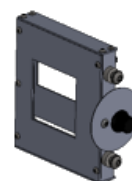


#### Shutter Options

- Manual Shutter
- Motorized Shutter

### Variable Attenuator

Controls the output irradiance level without adjusting the power supply. The range of attenuation is continuously variable from 10% to 100%. Uniformity is best maintained at specific output levels. Non-uniformity versus output level for the VAR-ATTN-M may vary between models. Motorized attenuators require 601-series power supplies.



#### Variable Attenuator options

- None
- Manual attenuator
- Motorized attenuator

# SciSun Solar Simulators

## POWER SUPPLY SELECTION

### Touchscreen Power Supply - 601

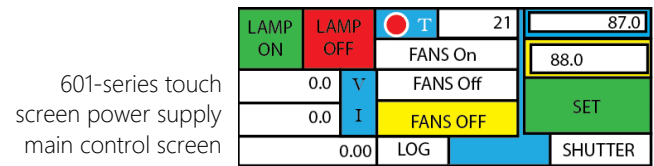
Selecting the computer controlled power supply option will include the 601 series power supply.

Standard features included with Sciencetech's 601-series power supplies:

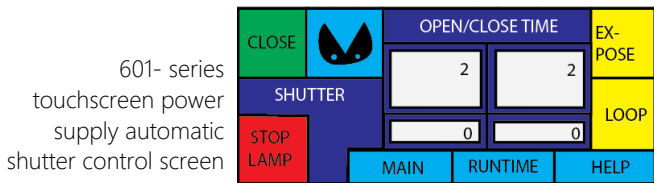
- Touchscreen interface
- Shutter and exposure control (if electronic shutter is supplied)
- Single connection for lamp power, cooling, and communication
- Lamp starts and timer log
- Fan cooling safety interlock
- RS232 software GUI included



601- series power supply



601-series touch screen power supply main control screen

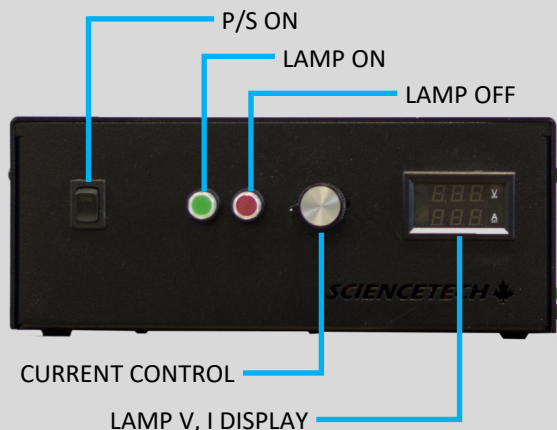


601- series touchscreen power supply automatic shutter control screen

### Manual Power Supply - EPS

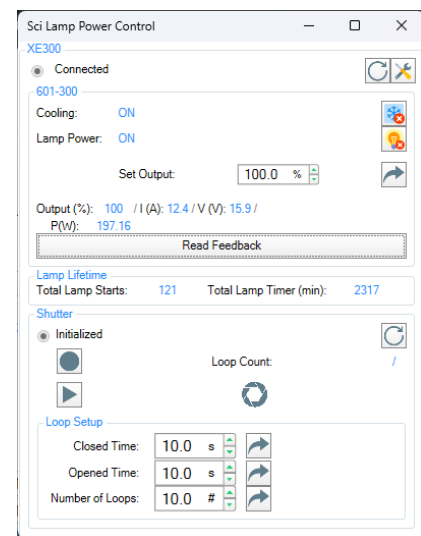
Selecting the manual power supply option (EPS) provides the most economical solution. The EPS supply includes Lamp On/ Off buttons, lamp current control dial, and a display that indicates lamp voltage and current. The lamp current indicator can be used to assist in setting the correct lamp current for 1 sun.

The EPS does not include software and **cannot** be computer-controlled. It cannot control an automated shutter.



### Software Included

SciSun Solar Simulators with 601-series (touchscreen) power supply selected come with SciLampPower Control.



Software GUI for power supply control

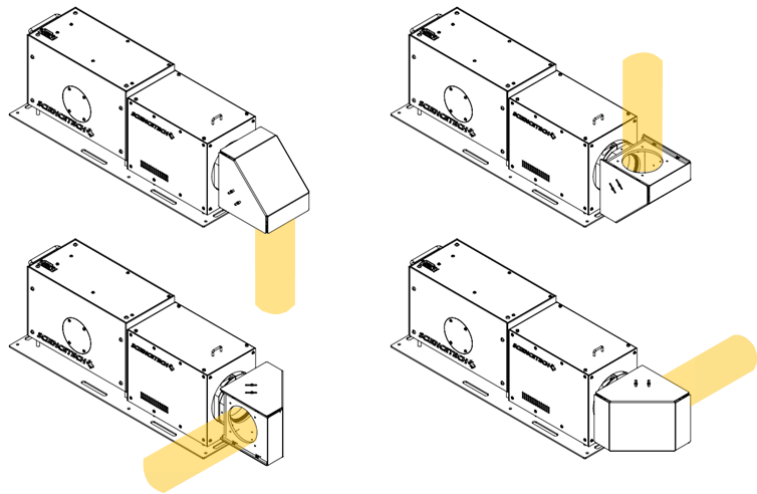
# SciSun Solar Simulators

## BEAM DIRECTION OPTIONS

A CTBT-3 beam turning unit is **included** with each SciSun solar simulator to manipulate output beam direction. It is possible for the user to remove the CTBT-3.



CTBT-3 (160-9029)



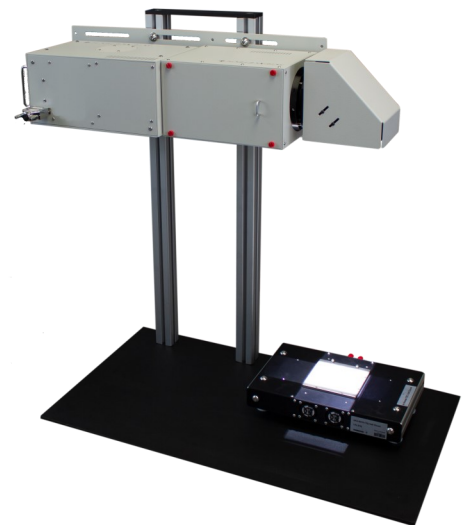
360° beam output orientation options available.

### Effect on Working Distance

By default, the SciSun working distance (including the CTBT-3) is 380mm. If a CTBT-3 is removed, the working distance is 475mm.

Adding a height-adjustable stand (HAS, 101-8024) , provides simple, manual height adjustment. Screws are used to manually secure the SciSun to the stand. Best for infrequent height changes.

- Add a HAS to the standard system (including CTBT-3) to produce a downward- facing beam.
- Remove the CTBT-3 or orient it to the side and use a HAS stand to provide horizontal illumination at a wide range of heights.

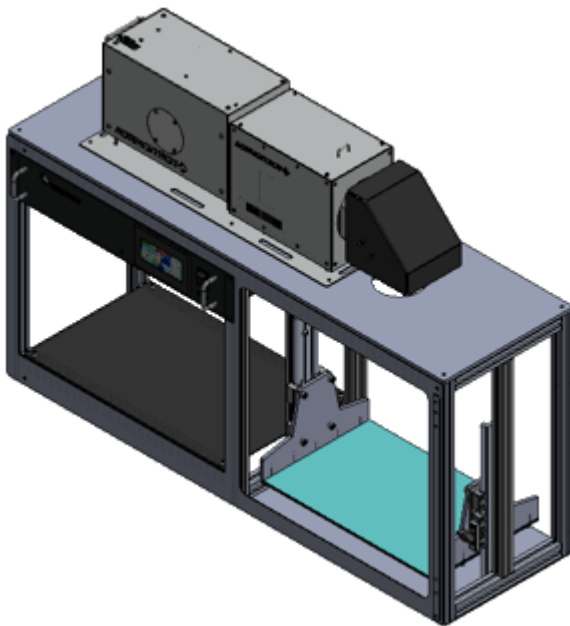


SciSun with HAS Stand Option

# SciSun Solar Simulators

## WORKSTATION OPTIONS

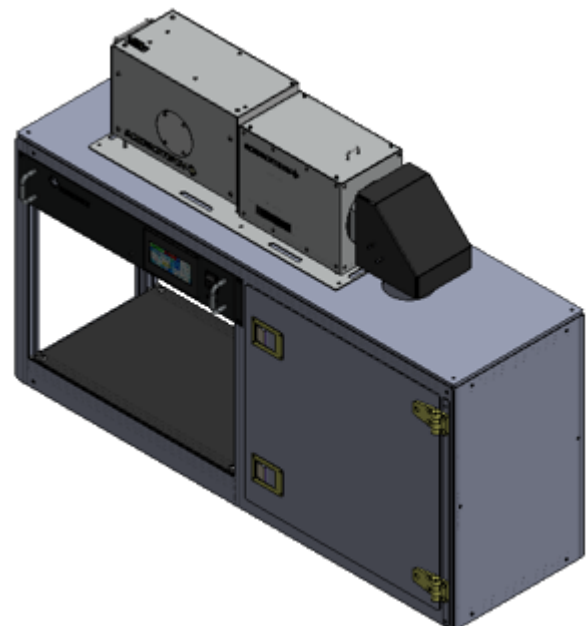
Workstation stands provide a convenient option for positioning your sample in the SciSun's target area. Workstation options feature a convenient rack for mounting the power supply, with an adjustable sample tray and shelf for storing accessories. Adjusting the sample tray is easier and more convenient with the workstation, so it is recommended to select a workstation-style stand if the sample height needs to be adjusted frequently. A built-in dark chamber option is available for convenient exclusion of extraneous light.



SCISUN-WS (160-9030)

Workstation Stand option for SciSun. Includes mounting for compatible power supply and adjustable sample stage.

A good choice for frequent stage height changes (due to varying sample thickness, etc.)



SCISUN-WS-D (160-9031)

Workstation for SciSun with dark chamber. Includes mounting for compatible power supply and adjustable sample stage.

A good choice for frequent stage height changes (due to varying sample thickness, etc.)

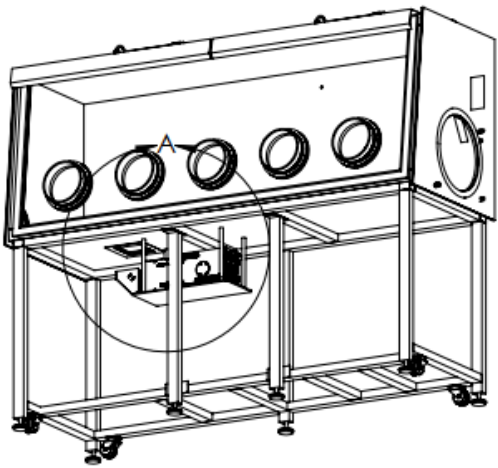


# SciSun Solar Simulators

## GLOVEBOX INTEGRATION

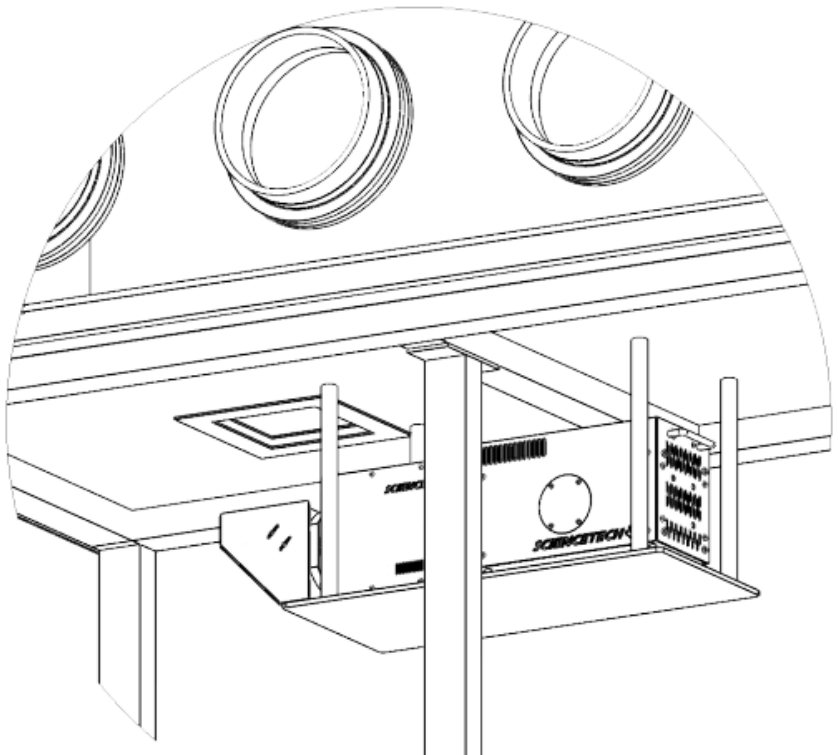
### SciSun Integrates Easily with a Glovebox

The compact size and flexible output of the SciSun allows for easy integration with a glovebox. Using the included beam turner to orient the beam in an upward-facing direction, the output light can be directed up through a window onto a sample.



SciSun-300 with glovebox. Power supply not shown.

Mounting tray for glovebox is not included.



Model	SKU	Description
MF-71-FT-3	640-9007	Standard 75 mm (3") neutral density mesh filter. 71% transmission options is recommended for glovebox integration to accommodate potential losses through glovebox window.

DETAIL A  
SCALE 1 : 8

# SciSun Solar Simulators

## FILTERING OPTIONS

### Filter Box Assembly

SciSun simulators have a modular optics assembly which can hold a range of filters in Sciencetech's standard FT-style filter holder. SciSun simulators include two FT-style filter slots. The most popular options are AM filters; however, a range of other filter options are available, such as bandpass filters and neutral density filters.



**HPF-LP-###-FT-3**

**(640-90##)**

High power long pass filters. Various cut-on wavelengths available.  
Filters must be FT-3 format



**HPF-BB-###-FT-3**

**(640-90##)**

High power band block filters. Various configurations available. Filters must be FT-3 format



**HPF-BP-###-FT-3**

**(640-90##)**

High power bandpass filters. Various configurations available. Filters must be FT-3 format



**MF-FT-3**

**(640-9050)**

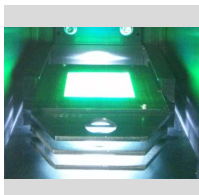
Standard 75 mm (3") neutral density mesh filters. Made from stainless steel mesh 12, 20, 34, 40, 49, 55, 71, and 80% transmission options available.



**Custom Filters**

**(Custom)**

Sciencetech has years of experience designing and sourcing custom filters. Contact us with your application and requirements now!



**FH-SS-ADD**

**(160-8044)**

This option adds an additional 2 filter positions to the FH-SS filter holder. Designed to be used with Sciencetech FT-3 type filter holders.

# SciSun Solar Simulators

## MONITORING ACCESSORIES



### SOL-METER

(125-9011)

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Solar Power Meter, a digital meter for use with solar calibrated detectors (e.g. SOL-REF-Q and SSIVT-REF).



### SCI-MO Reference Cell

(125-9040)

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A robust, PCB-mounted solar cell with active area of 22x7mm, it is intended to be used as a reference monitors for determining solar simulator sun level. Sciencetech's most economical monitoring solution.



### MULTIMETER

(125-9030)

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The SCI-MO reference cell can be paired with a multi-meter to take fast measurement of solar simulator irradiance level.



### SOL-REF-Q

(125-9060)

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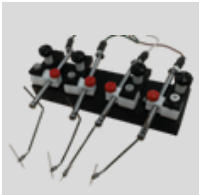
Calibrated Reference Cell, Quartz Window, options available for Sciencetech calibration or NIST/NREL-traceable calibration by third party ISO/IEC 17025 accredited laboratory. 20x20mm monocrystalline silicon device. Includes RTD and IV connections.

# SciSun Solar Simulators

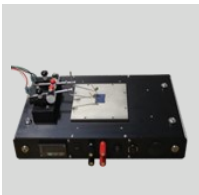
## IV ACCESSORIES

**SSIVT-CN-020-1****(175-9120-C03)**

20W IV Tester for Continuous Solar Simulators (current range = 1  $\mu$ A - 1 A, voltage range = 200mV - 20 V). Other IV measurement options available.

**SCP-4G****(165-8214)**

Probe Station, 4 Probes, Gold Spring Probes

**SCI-SCC3-TE****(165-8202)**

3.5" x 3.5" Solar Cell Chuck, TE Cooled, Computer controllable, Vacuum ready.

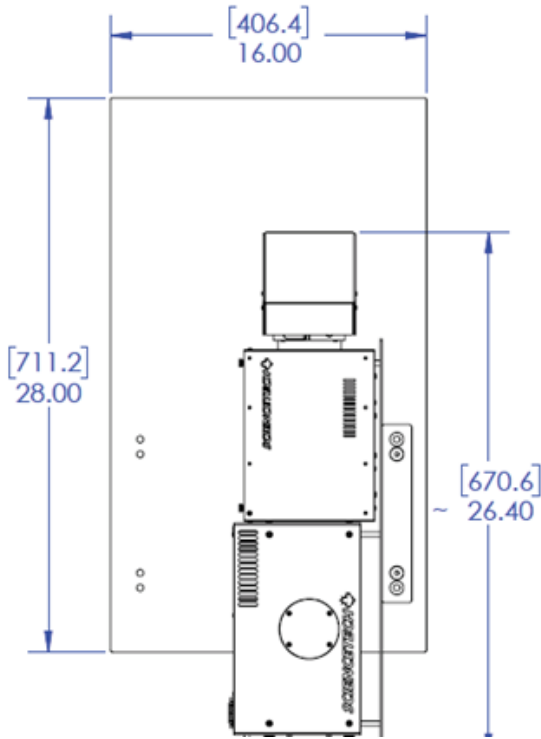
**SCI-SCC3-L-B****(165-8221)**

3.5" x 3.5" Solar Cell Chuck, Liquid Cooled, Rear Contact.

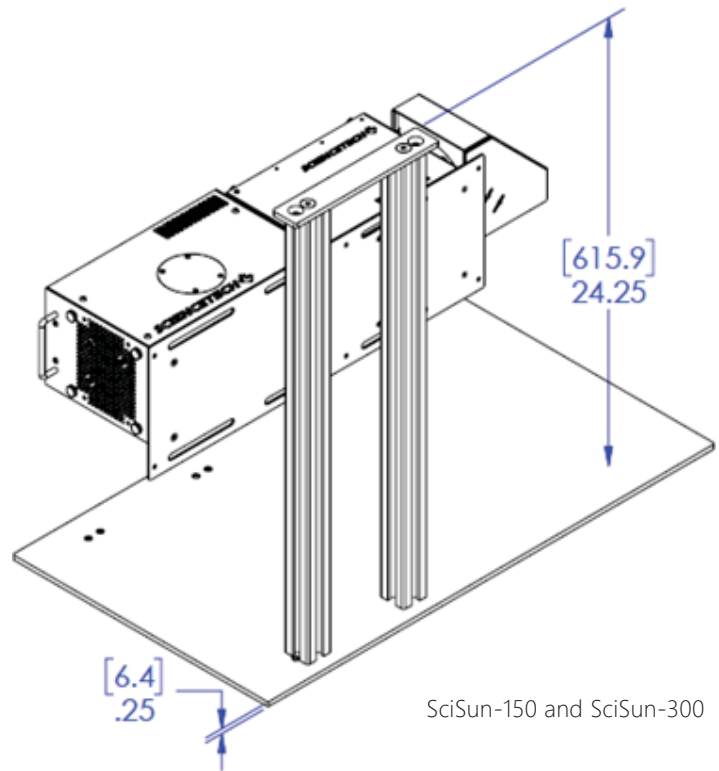
# SciSun Solar Simulators

## DIMENSIONS

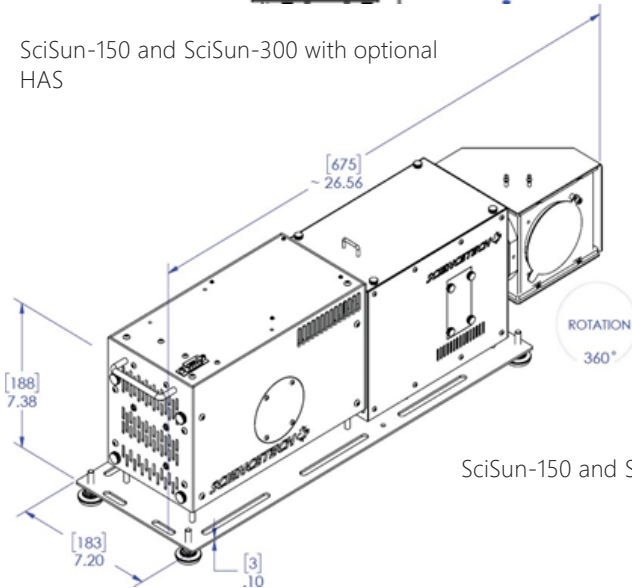
Dimensions are in [mm] and inches.



SciSun-150 and SciSun-300 with optional HAS



SciSun-150 and SciSun-300



SciSun-150 and SciSun-300

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# SciSun Solar Simulators

## ORDERING INFORMATION

Model	Part Number	Description
SciSun-AM1.5G	160-9108	SciSun solar simulator with AM1.5G filter.
SciSun-AM0	160-9109	SciSun solar simulator with AM0 filter and AM0 1 sun irradiance.
HAS	101-8024	Height Adjustable Stand, SciSun Solar Simulator
SCISUN-WS	160-9030	Workstation Stand for Scisun Solar Simulator
SCISUN-WS-D	160-9031	Workstation Stand for Scisun Solar Simulator, with Dark Chamber
HPF-LP-400-FT-3	640-9021	Long Pass Filter, 400nm cut-on
HPF-LP-420-FT-3	640-9020	Long Pass Filter, 420nm cut-on
HPF-LP-NIR-FT-3	640-9015	Long Pass Filter, 700nm cut-on
HPF-LP-UVA-FT-3	640-9017	Long Pass Filter, 320nm cut-on
HPF-LP-VIS-FT-3	640-9014	Long Pass Filter, 400nm cut-on, for mid-range power
HPF-BB-NIR-FT-3	640-9012	Hot Mirror for UV Applications, 700-1100nm block
HPF-BB-UVB-FT-3	640-9018	Bandblock Filter, 300-420nm block
HPF-BB-VIS-FT-3	640-9016	Bandblock Filter, 400-700nm block
HPF-BP-VIS-FT-3	640-9019	Bandpass Filter, Visible, Blocks UV/NIR
MF-FT-3	640-9050	Mounted Mesh Neutral Density Filter, Various Transmissions
Custom Filters	Custom	Custom filters—please inquire.
FH-SS-ADD	160-8044	2 additional filter slots for FT-3-style filters
SOL-METER	125-9011	Calibrated Sun Meter
SOL-REF-Q	125-9060	Calibrated Reference Cell, Sciencetech or external lab calibration options
SCI-MO	125-9040	Monitor Detector Assembly
MULTIMETER	125-9030	Multi-ranging Multimeter and Test Leads
SSIVT-C	175-9120	Current-Voltage Measurement System (IV Tester) for Continuous Solar
SCP-4G	165-8214	Probe Station, 4 Probes, Gold Spring Probes
SCI-SCC3-TE	165-8202	Solar Cell Chuck, TE-cooled, Vacuum-ready, 9 cm × 9 cm (3.5" × 3.5")
SCI-SCC3-L-B	165-8221	Solar Cell Chuck, Liquid-cooled, Rear Contact, 9 cm × 9 cm (3.5" × 3.5")