

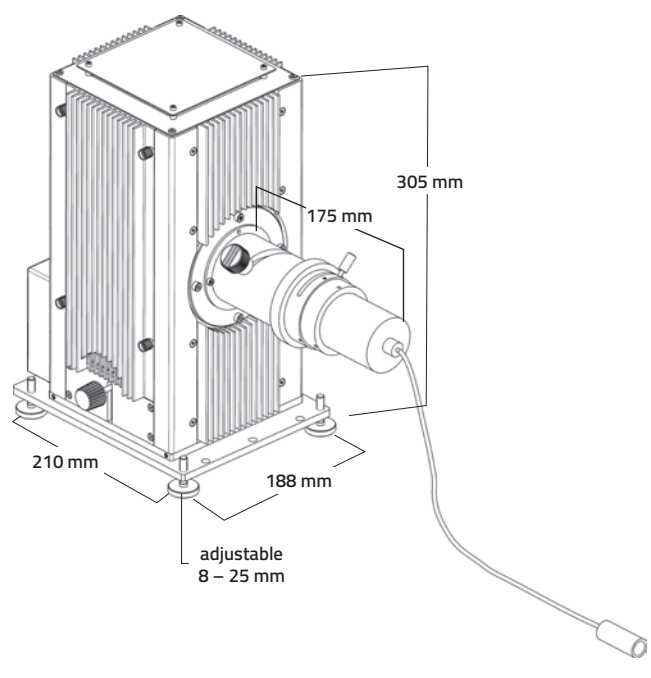
# Solar simulator with fiber optic coupling

- 1 sun ( $1000 \text{ W/m}^2$ ) irradiance
- Collimated beam at fiber output with 15 mm diameter
- Compact size
- Optional manual or electronic shutter

This solar simulator provides a low cost alternative to the fully featured and more expensive large area solar simulator systems. The optical system of this source produces a uniform, collimated beam of 15 mm diameter provided from a 1 m long fiber optic.

## Housing and lamp

The lamp housing is a free standing unit that contains the arc lamp, arc lamp ignitor, collecting and collimating optics, cooling fan, external lamp adjusters and required electronics. The ignitor is built into the housing, minimizing stray radiated and conducted EMI. The lamp is a high pressure 300 W xenon short arc lamp. It is ozone-free and has a negligible output below 260 nm.



Dimensions Solar simulator with fiber optic coupling



Solar simulator with fiber optic coupling and power supply

The system is designed to produce an output of min. 1 sun at a distance of 200 mm from the fiber optic end. The beam diameter is 15 mm for illumination of a 1 square cm area. The optical system includes a fiber optic focusing assembly which focuses the collimated light from the lamp directly into the fiber. A closed filter holder for mounting the air mass filter meeting IEC specifications is also part of the optical system. An iris diaphragm is included between the filter holder and the fiber coupler. This allows manual adjustment of the output intensity from 20 – 100 %.

The output of the fiber comes with a fiber collimating optic. It collimates the diverging output from the fiber. The collimating optic holder is prepared to accept a second optional lens, so the collimated beam can be focused one focal length away from the optional lens. The nominal magnification is defined as the ratio of the focal lengths of lens 2 to lens 1. The optic can be positioned on the fiber to produce a more diverging or converging beam.

## Power supply

The highly regulated power supply provides constant current to the xenon lamp. The current is adjustable to maintain constant light output.

## Spectral match

No solar simulator matches the spectrum of the Sun exactly, and the simulator's spectrum changes with the age of the lamp. The terrestrial solar spectrum itself varies with solar altitude and atmospheric constituents. The Xe lamp spectrum must be filtered to match standard air mass spectra. However, air mass filters are only an approximation of an average of atmospheric conditions.

# Solar simulator with fiber optic coupling

## Accessories

By adding filters to the optical path a great variety of spectral output shapings become possible. We offer open and closed filter holders which directly mount into the solar simulator beam path.

## Shutter

Optionally the solar simulator can be equipped with either a manual or electronic shutter integrated into the optical beam path. The shutter closes off the beam and especially prevents organic cells from heating. The electronic shutter with driver has an open/close switch on the front panel and a TTL input (via BNC), that can be used to control the shutter from another source. Optional software allows for external control via USB and includes a development kit with C++, VB and LabView code examples.

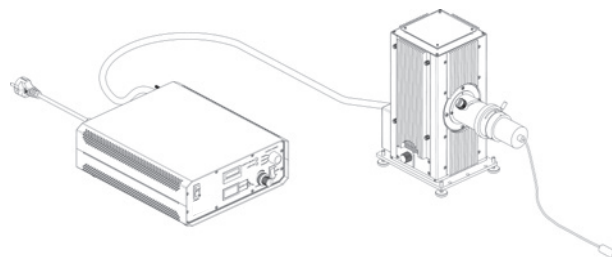
## Safety

Our solar simulators emit dangerous levels of UV radiation harmful to the eyes and skin. Personnel working near the source should wear UV protective goggles and avoid direct exposure of the output beam to the skin!

Learn more about UV safety: "[Ultraviolet safety considerations](#)".

Specification solar simulator	
Illumination field	15 mm diameter
Working distance	200 mm (recommended)
Irradiance	1 sun (min.) @ working distance
Spectral match	AM1,5 G, IEC 60904-9, class B
Temporal stability	1% RMS, typ.
Lamp type	Xenon short arc, 300 W, ozone free, average life: 900 h
Input	90 - 250 VAC, 48 - 63 Hz

Ordering information	
The LS0400 solar simulator <b>includes</b> everything needed for proper operation (lamp housing, power supply, lamp, cables and adapters).	
Part number	Description
LS0400	Full spectrum solar simulator, with AM1,5G filter and fiber optic coupling, 15 mm illuminated area
Shutter (optional)	
LSZ158	Manual shutter, condenser Ø 25/35 mm
LSZ166	Electronic shutter with driver, condenser Ø 25/35 mm
LSZ165	Shutter control software and USB relais with modi: manual - count down - interval switching and software development kit (C++, VB, LabView)
LSB530	Replacement lamp, 300 W Xenon, ozone free



Solar simulator with fiber optic coupling