

Solar Simulator (350-1100nm) HAL-320

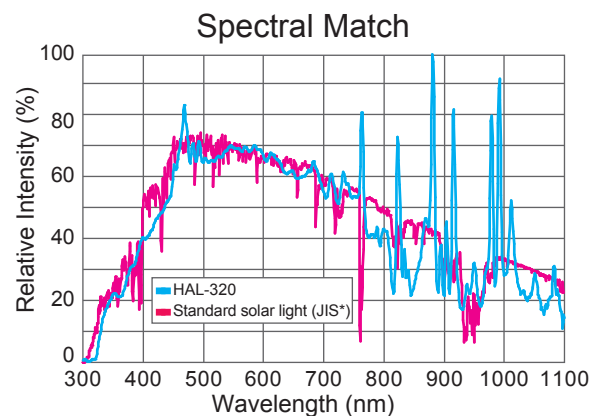
High approximation of solar spectrum with AM1.5G, compact design and fiber illumination



Features

- JIS* Class AAA solar simulator (350-1100nm)
- Built-in AM1.5G filter
- Flexible illumination by light guide
- Adjustable light intensity
- Self-contained lamp and power supply
- No need of optical axis alignment
- External controller
- RS232C remote control

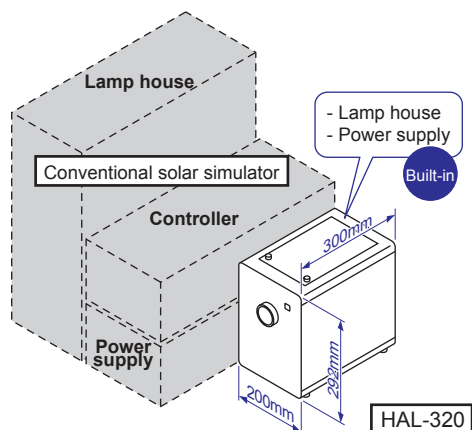
*JIS, Japanese industrial standards is equivalent to IEC.



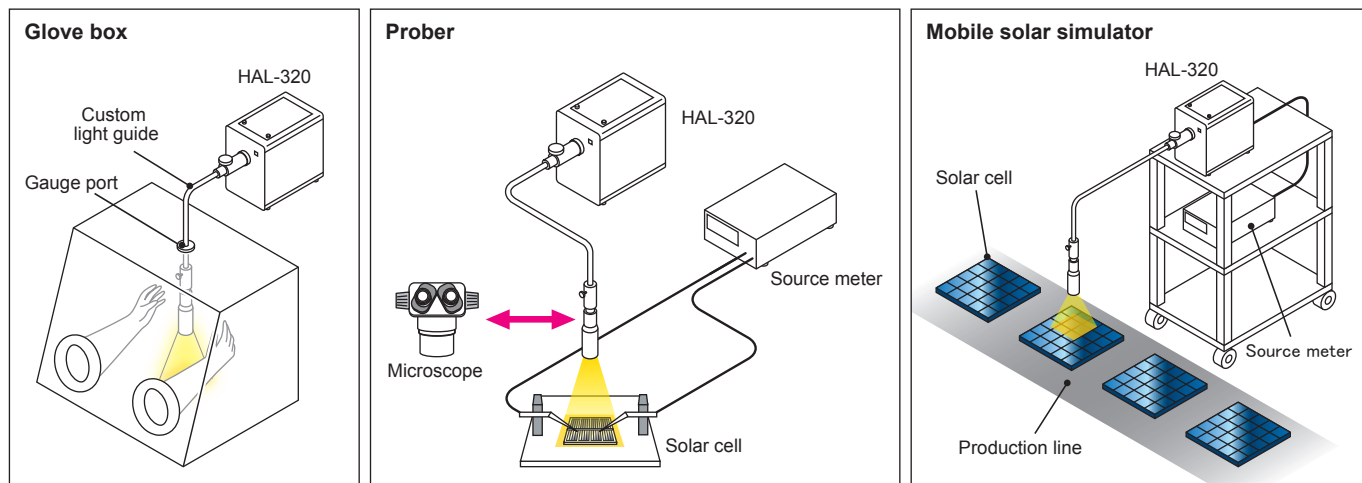
Our unique fiber output method enables the use in various experimental configurations

The solar simulator HAL-320, includes an AM1.5G filter, is a compact design and easy-carrying. Fiber output system enables flexible design of experiment: combination with a glove box, a prober, manufacturing line and so on.

Compact and Easy-carrying



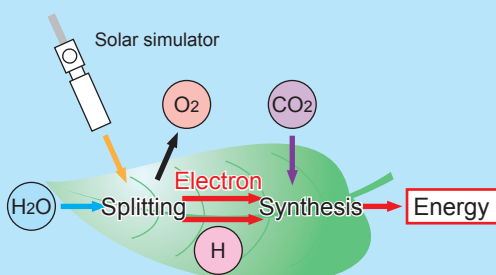
Flexible Configuration with Light Guide



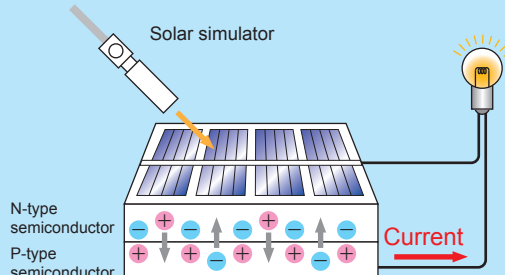
Applications

Solar simulator for various inspection and research

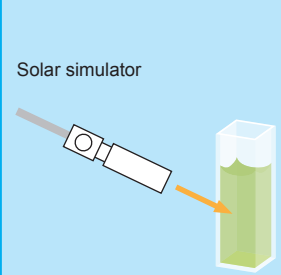
Artificial photosynthesis



Solar cell research



Photocatalytic research



Compact solar simulator achieves Class AAA with fiber output system

Spectral Match



Our own designed AM1.5G filter corrects xenon emission lines according to Class A.

This simulator can evaluate not only a crystal type, also dye-sensitized solar cells, CIGS and so on.

JIS C 8912-2011

Reference data

Wavelength (nm)	Energy Distribution (%)		Spectral Match	Class
	HAL-320	JIS		
400 - 500	17.1	18.4	0.93	A
500 - 600	19.9	19.9	1.00	A
600 - 700	18.4	18.4	1.00	A
700 - 800	15.3	14.9	1.03	A
800 - 900	11.5	12.5	0.92	A
900 - 1100	17.8	15.9	1.12	A

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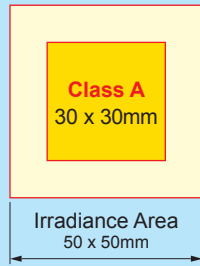
Uniformity



The calculated value of 1SUN in the range of 400-1100nm is about 75mW/cm².

Working distance: about 370mm

You can obtain Class A uniformity in the area 30x30mm with 1 SUN intensity when you set the ND control by about 70% of initial lamp as described in the right figure.(factory default setting) Light intensity decline due to a lamp life can be adjusted by light intensity control. Above the size of Class A area is reference value. Please note that the output of lamp varies among the manufacturing lots.



The values shown in parenthesis are the values of illumination at the recommended size. In this case, it needs to check the light intensity separately.

JIS Classification

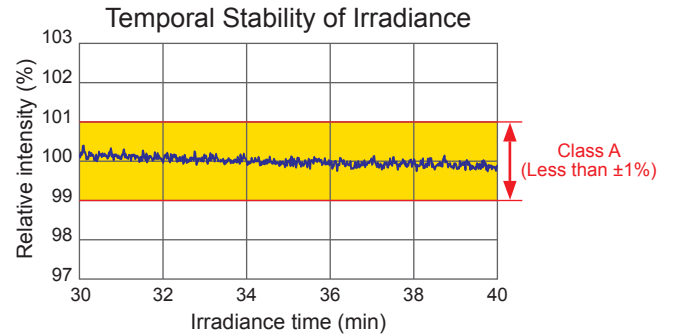
JIS C8912-2011

Item	Class A	Class B	Class C
Positional uniformity of irradiance (%)	≤±2	≤±3	≤±10
Temporal stability of irradiance (%)	≤±1	≤±3	≤±10
Spectral match	0.75 - 1.25	0.6 - 1.4	0.4 - 2.0

Temporal Stability of Irradiance



There is less flicker and stable output at long times.

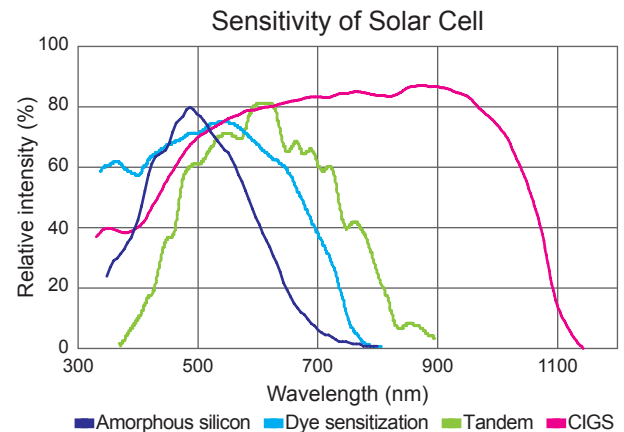


*10 minutes measurement after turning on the lamp for 30 minutes.
*The values are for reference only.

*If you use the HAL-320 for a long time, we recommend that you use the constant-voltage power supply so that the HAL-320 is not influenced by the change of load.

Target Solar Cell

The HAL-320 is suited for the evaluation for development and prototype of next-generation solar cell.



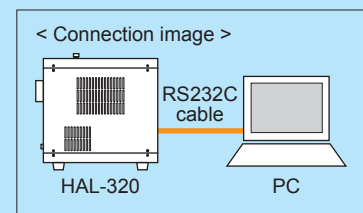
User-friendly External Controller



< Operation contents >
1. Shutter function Open/Close
2. Timer function
3. Light intensity adjustment etc.

The HAL-320 is controlled by our proprietary controller. Various functions can be easily controlled just by pressing the control buttons of the controller and it has a comprehensive display.

RS232C Remote Control



The HAL-320 can be controlled remotely via RS232C.

Options

1 SUN Checker CS-20



1 SUN Checker is used for checking the light intensity (1 SUN) of HAL-320. It is battery operated and portable.

Light Guide (TPO)



This light guide is the option for bringing a light into a glove box. The gauge port is equipped.

Scope of Delivery

- HAL-320 main unit
- Lamp cartridge
- Quartz light guide (1m)
- Light guide adapter
- Collimator lens
- Controller
- Controller cable (2m)
- AC cable (3m)
- RS232C cable (1.8m)
- Instruction manual

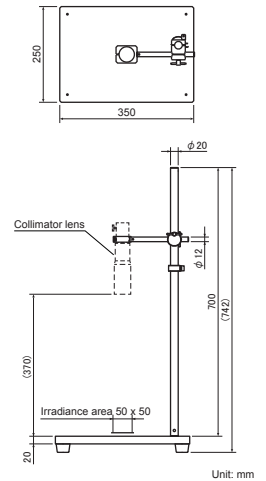
General Specifications

- Model: HAL-320
- Output wavelength: 350 - 1100nm
- Circuit method: Switching power supply
- Input voltage: AC100 - 240V 50/60Hz (Input range: AC90 - 264V)
- Apparent power: Less than 510VA (AC100V/50Hz)
Less than 500VA (AC240V/50Hz)
- Lamp type: Compact xenon lamp 300W
- Lamp voltage, current: 14V, 21A (DC) *Representative value
- Lamp life: 500h (Average)
- Optical axis alignment: Cartridge type (Alignment-free)
- Cooling method: Forced air cooling
- Shutter: Solenoidal drive
- Exposure time set: 0.5 - 99999.9sec
- Light intensity control: 100 - 30 (Steps)
Continuously variable
- Air Mass filter: Air Mass 1.5G filter
- Emitting method: Bundled light guide
- Controller: Remote controller (Cable length=2m)
- Remote control: RS232C *The cable must be less than 3m.
- Safety mechanism: Xenon lamp problem, Top door is open,
Lamp usage exceeds 500 hours,
Cooling fan problem, Temperature anomaly
- Recommended environment: Temperature 10 - 35 deg C
Humidity 20 - 80% *Avoid condensation
- Dimensions: Main unit 200(W) x 300(D) x 292(H)mm
Controller 160(W) x 37(D) x 99(H)mm
- Weight: Main unit 11.3kg
Controller 0.6kg (including cable)

Stand for Collimator Lens



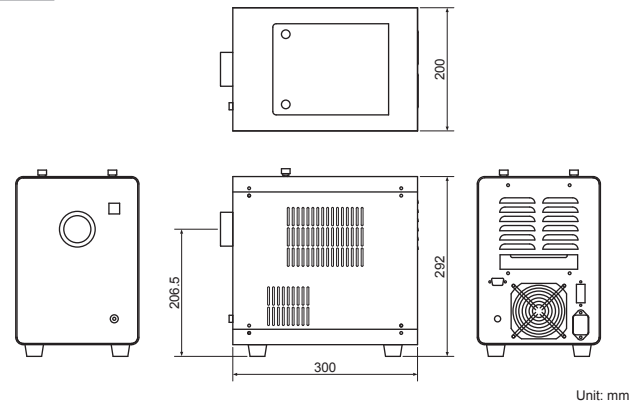
Dimensions



Unit: mm

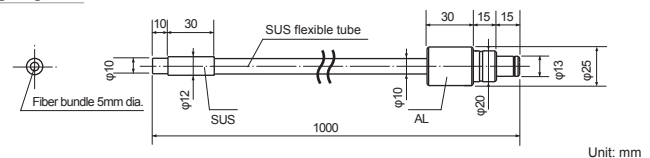
Dimensions

Main unit



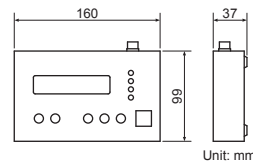
Unit: mm

Light guide



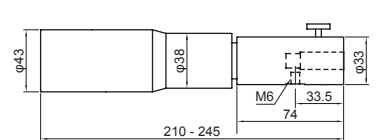
Unit: mm

Controller



Unit: mm

Collimator lens



Unit: mm

*Product specifications are subject to change without notice.

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