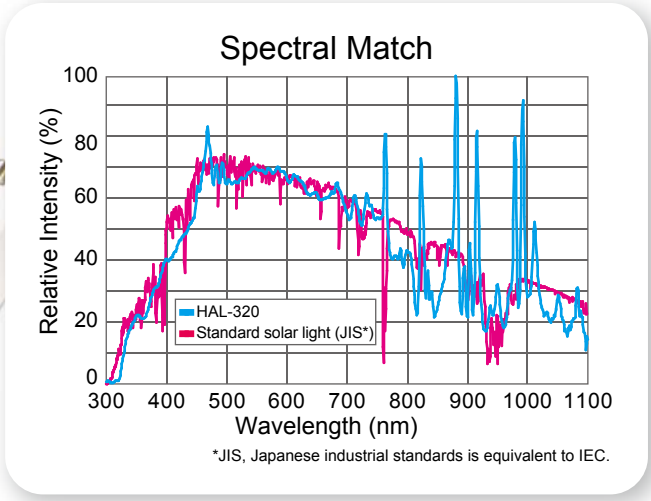
ASAHI SPECTRA

Evaluation for solar cell research
Solar Simulator (350-1100nm)
HAL-320

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

Features

- Spectral match achieves Class A for JIS*
- Spectral match in the range of NIR also achieves Class A
- Light guide enables the flexible illumination
- Both the lamp and the power supply are in one compact box
- External controller enables remote control
- Light intensity control is available by variable ND filter
- Remote control by PC via RS232C is available



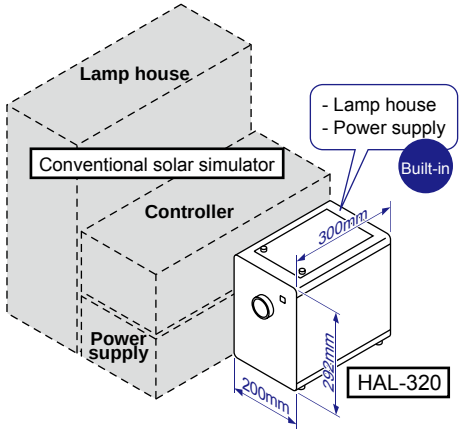
*JIS, Japanese industrial standards is equivalent to IEC.

www.asahi-spectra.com

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

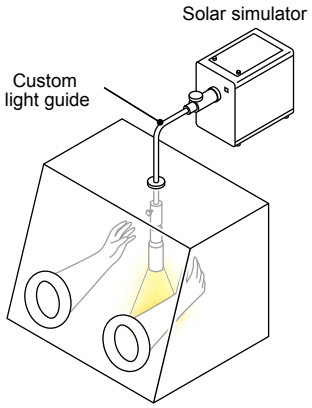
The solar simulator HAL-320, includes an AM1.5G filter, is a compact design and easy carrying.
Fiber output system enables flexible design of experiment : combination with a glove box, a prober,manufacturing line and so on.

Compact and easy carrying

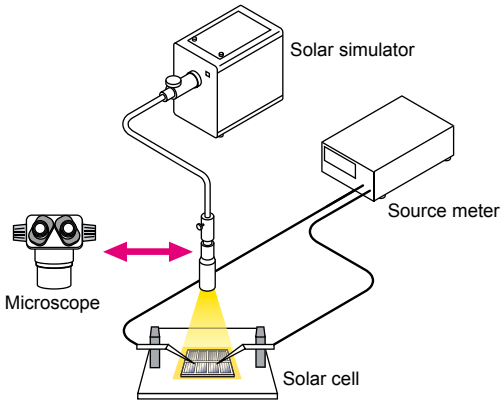


Flexible configuration with light guide

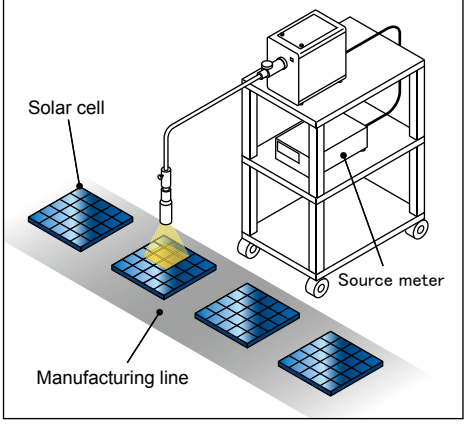
Glove box



Prober

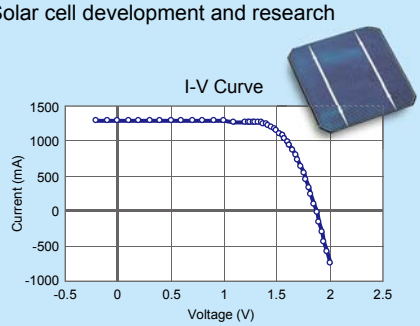


Mobile solar simulator

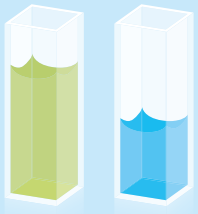


Application field — Solar simulator for various inspection and research

Solar cell development and research



Photocatalyst research



Display inspection

Cosmetics research and evaluation

Compact solar simulator which achieves Class A for JIS C8912* with fiber output system

Spectral match

Class A

Our own designed AM1.5G filter arranges xenon own emission lines, and achieves Class A.
This simulator can evaluate not only a crystal type, also Dye-sensitized solar cells, CIGS etc.

JIS C 8912-2011* Reference data

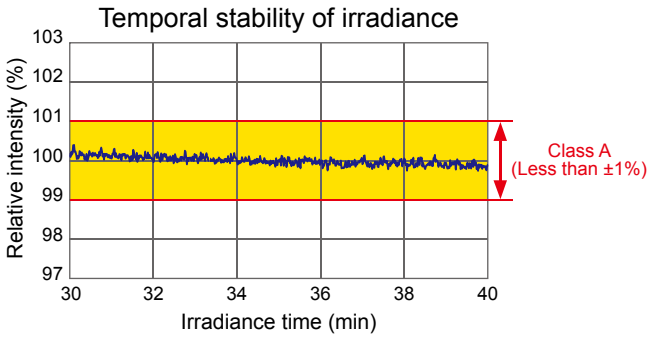
Wavelength (nm)	Energy Distribution (%)		Spectral Match	Class
	HAL-320	JIS		
400 - 500	17.1	18.4	0.93	A
500 - 600	19.9	19.9	1.00	A
600 - 700	18.4	18.4	1.00	A
700 - 800	15.3	14.9	1.03	A
800 - 900	11.5	12.5	0.92	A
900 - 1100	17.8	15.9	1.12	A

*JIS, Japanese industrial standards is equivalent to IEC.

Temporal stability of irradiance

Class A

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.

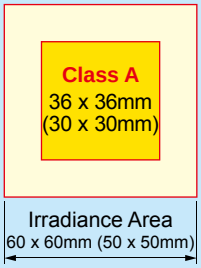
Uniformity

Class A

The calculated value of 1SUN in the range from 400 to 1100nm is about 75mW/cm^2.
Working distance: about 450mm (370mm)

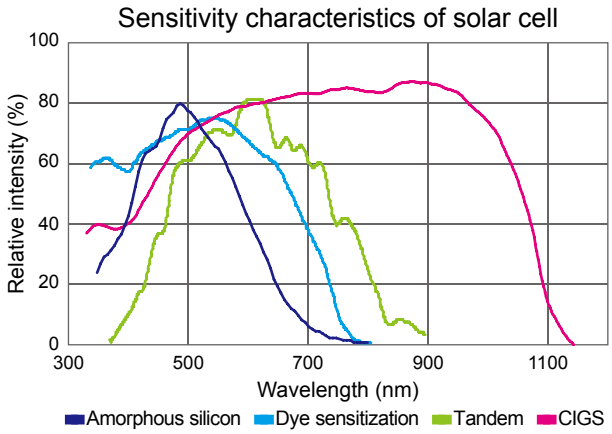
You can obtain Class A uniformity in the area 36x36mm with 1 SUN intensity when you set the ND control by about 70% of initial lamp as described in the right figure.(factory default setting) Light intensity decline due to a lamp life can be adjusted by light intensity control.
Above the size of Class A area is reference value. Please be noted that the output of lamp varies between 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.



Target solar cell

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



JIS classification

JIS C8912-2011

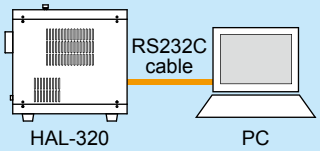
Item	Class A	Class B	Class C
Positional uniformity of irradiance (%)	≦±2	≦±3	≦±10
Temporal stability of irradiance (%)	≦±1	≦±3	≦±10
Spectral match	0.75 - 1.25	0.6 - 1.4	0.4 - 2.0

User-friendly controller

< Operation contents >
1. Shutter OPEN/CLOSE
2. Exposure time set
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.

Remotely controllable by PC via RS232C

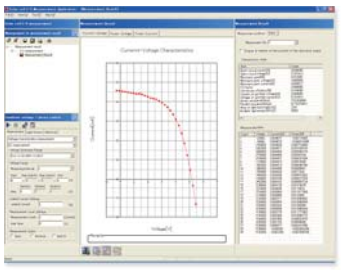


The HAL-320 can be controlled remotely via RS232C.

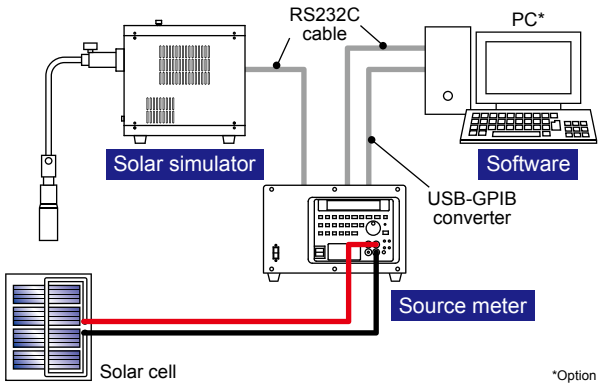
Options

I-V measurement system (Custom)

This system gives you simple and high precision I-V measurement. You can easily construct the evaluation system of solar cell by combining it with the HAL-320. Measurement can be controlled from our original software. All measured data can be saved as CSV file, so that you can easily edit the measured data.
It also can measure rise characteristics with the shutter function of the HAL-320.

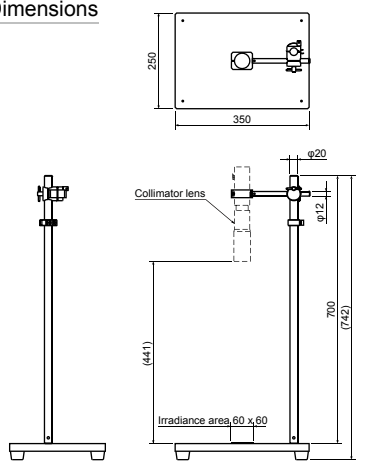


Example of system configuration



Stand for collimator lens

Dimensions



Unit : mm

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.

Scope of Delivery

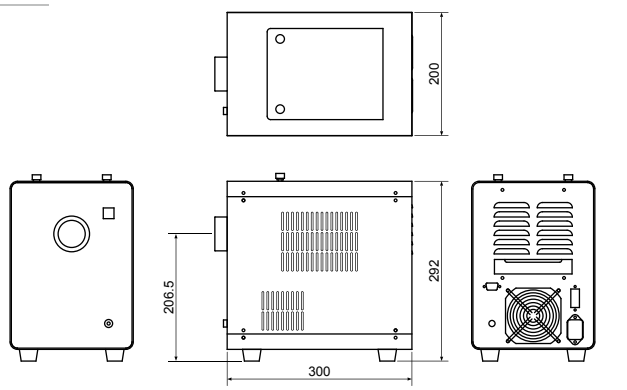
- HAL-320 main unit
- Quartz light guide (1m)
- Collimator lens
- Controller
- Controller cable (2m)
- AC cable (3m)
- Instruction manual
  etc.

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) *When the light intensity has decreased by 50% from the initial value.
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)

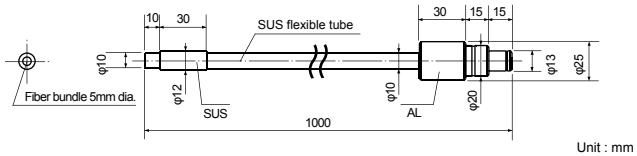
Dimensions

Main unit



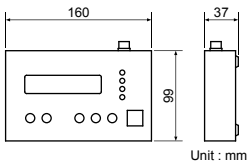
Unit : mm

Light guide



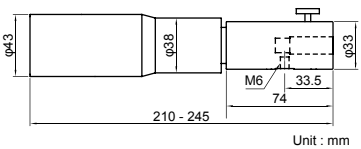
Unit : mm

Controller



Unit : mm

Collimator lens



Unit : mm

*Product specifications are subject to change without notice.

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