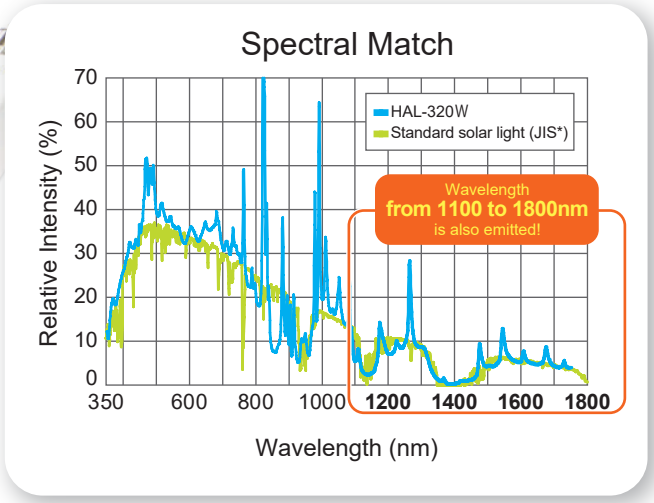
ASAHI SPECTRA

Solar Simulator (350-1800nm)
HAL-320W

95% high approximation of solar spectrum with AM1.5G, compact design and fiber illumination

Features

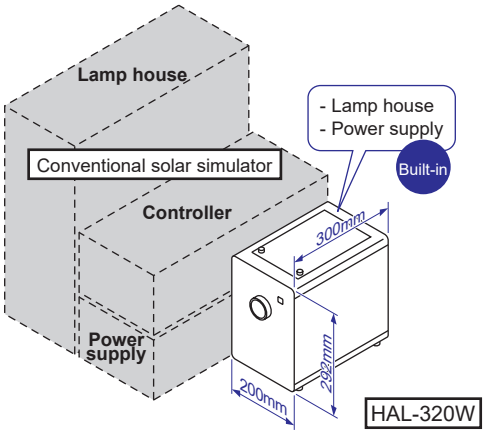
- High approximation of solar spectrum
- NIR output with high approximation
- Built-in AM1.5G filter
- Flexible illumination by light guide
- Adjustable light intensity
- Self-contained lamp and power supply
- No need of optical axis alignment
- External controller
- RS232C remote control



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

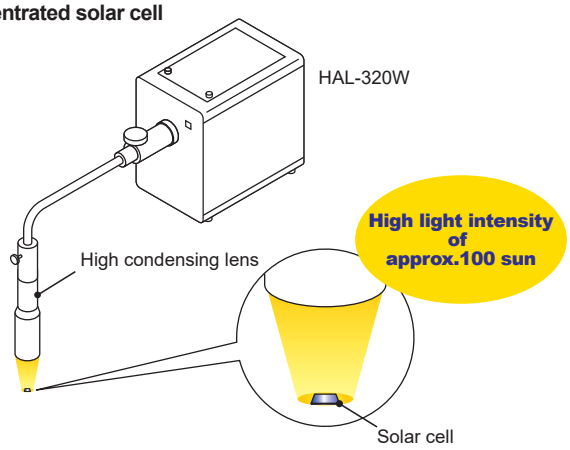
HAL-320W is a compact and easy-carrying solar simulator including an AM1.5G filter. HAL-320W achieves "Class A" spectral match in the broader wavelength inspite of the same size as the conventional model. Fiber output system enables flexible design of experiments: combination with a glove box, a prober, manufacturing line and so on.

Compact and Easy-carrying

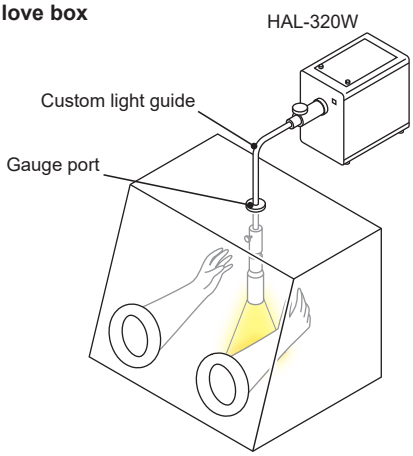


Flexible Configuration with Light Guide

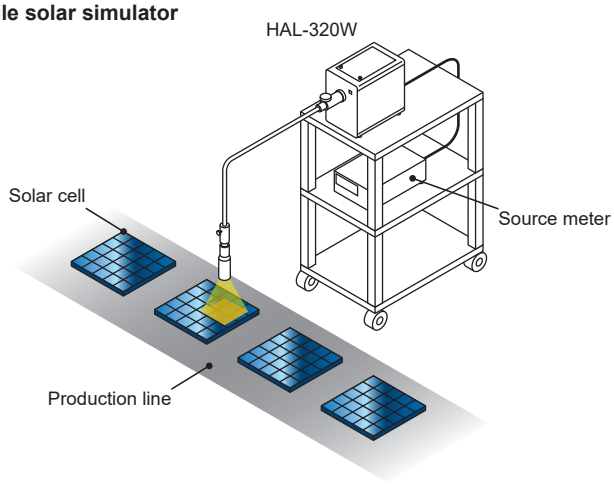
Solar simulator with high light intensity for concentrated solar cell



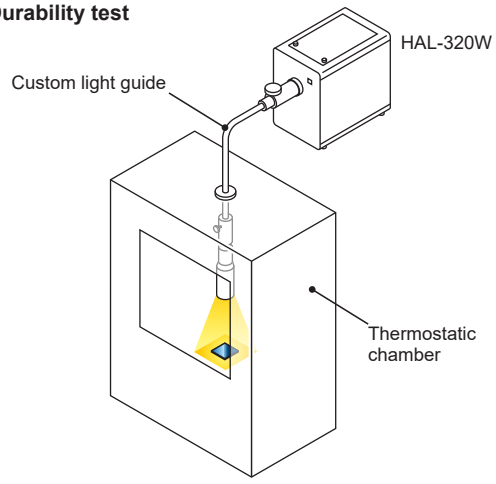
Glove box



Mobile solar simulator



Durability test



Compact solar simulator achieves high approximation in the range of 350-1800nm with fiber output system

Spectral Match *1 *5

◆Class Evaluation - JIS C8904-9:2017

Type of Solar Cell	Class
Crystal	A
Amorphous	
Copper Indium Selenide (CIS)	IB

JIS Classification

JIS C8904-9:2017

A / IA	B / IB	C / IC
0.75～1.25	0.6～1.4	0.4～2.0

Energy Distribution

Crystal	
Wavelength (nm)	(%)
400 - 500	18.4
500 - 600	19.9
600 - 700	18.4
700 - 800	14.9
800 - 900	12.5
900 - 1100	15.9

Amorphous	
Wavelength (nm)	(%)
350 - 400	6.2
400 - 450	11.8
450 - 500	14.9
500 - 550	14.6
550 - 600	14.3
600 - 650	13.8
650 - 700	12.9
700 - 750	11.5

CIS	
Wavelength (nm)	(%)
350 - 400	3.74
400 - 500	16.13
500 - 600	17.45
600 - 700	16.09
700 - 800	13.08
800 - 900	10.92
900 - 1100	13.97
1100 - 1300	8.62

◆Class Evaluation - Internal Standard *7

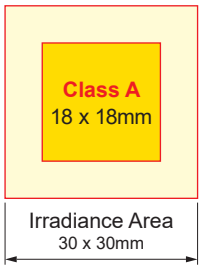
Class
A

Classification

A	B	C
0.75 - 1.25	0.6 - 1.4	0.4 - 2.0

Wavelength (nm)	(%)
400 - 500	15.3
500 - 600	16.5
600 - 700	15.2
700 - 800	12.4
800 - 900	10.3
900 - 1100	13.2
1100 - 1300	8.2
1300 - 1500	2.1
1500 - 1800	6.8

Non-uniformity of Irradiance *2

Condition	Class
Working distance: About 224mm Irradiance area: 30x30mm Class A area: 18x18mm (±9mm from the center) 	A

JIS Classification

JIS C8904-9:2017

A	B	C
≦ ±2 %	≦ ±3 %	≦ ±10 %

Temporal Instability of Irradiance *1

Measurement Item	Class
Short term instability (STI) *3 *6	B
Long term instability (LTI) *4	

JIS Classification

JIS C8904-9:2017

	A	B	C
STI	≦ ±0.5 %	≦ ±2 %	≦ ±10 %
LTI	≦ ±2 %	≦ ±5 %	≦ ±10 %

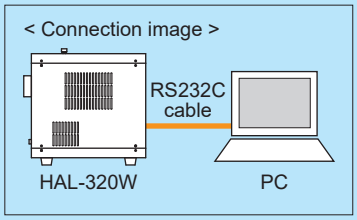
*1 Warming up: More than 30 minutes, measuring the center of Class A area.
*2 Warming up: More than 30 minutes, measuring the whole Class A area.
*3 Sampling time: 10 sec, Sampling interval: 1 ms
*4 Sampling time: 1 hour, Sampling interval: 0.1 sec
*5 It is confirmed at the time of shipment.
We are not able to guarantee it, when the lamp is degraded as time passes.
*6 Only for I-V measurement
*7 The internal standard is based on JIS C8904-3:2011

User-friendly External Controller

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

The HAL-320W 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.

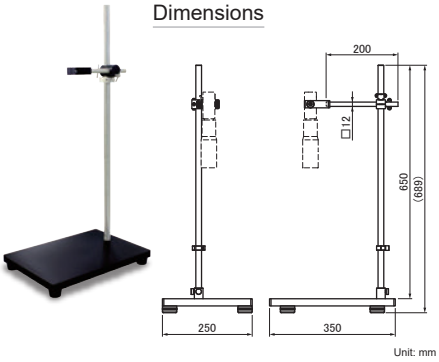
RS232C Remote Control



The HAL-320W can be controlled remotely via RS232C.

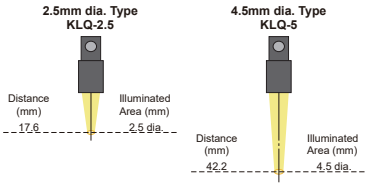
Options

Stand for Collimator Lens

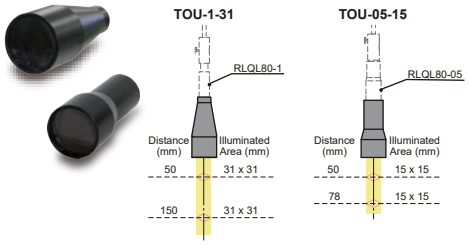


Unit: mm

High Condensing Lens



Telecentric uniform illumination unit



1 SUN Checker CS-40

1 SUN Checker is used for checking the light intensity (1 SUN) of HAL-320W.
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.

Package Contents

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

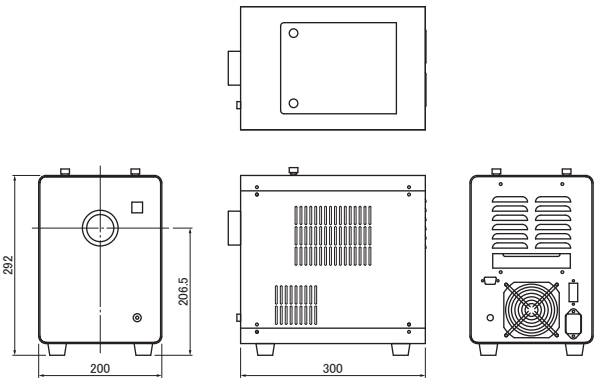
General Specifications

Model:	HAL-320W
Output wavelength:	350 - 1800nm *AM1.5G filter made by ASC is equipped as standard.
Lighting mode:	Continuous
Scope of application:	I-V measurement, irradiation test
Irradiance:	1000W/m2 (1 SUN condition) *Confirmed with a reference solar device.
Max. AOI on irradiance area:	≦15°
Input voltage:	AC100 - 240V±10% 50/60Hz
Apparent power:	Less than 510VA (AC100V/50Hz) Less than 500VA (AC240V/50Hz)
Lamp type:	Xenon lamp 300W (UV)
Lamp voltage, current:	14V, 21A (DC) *Representative value
Lamp control method:	Constant power control
Lamp life:	500h *1
Optical axis alignment:	Cartridge type (Alignment-free)
Cooling method:	Forced air cooling
Functions:	Shutter, Timer, Lamp life *2, Light intensity control 100-20 (steps) continuously variable
Remote control:	RS232C *The cable must be less than 3m.
Controller:	Remote controller
Safety mechanism:	Lamp turns off and warning lamp turns on: - Xenon lamp problem - Top door is open - Cooling fan problem - Temperature anomaly Circuit protector is used, shut off when AC input is overcurrent
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)

*1 Less than 1 year after delivery, under our condition.
*2 Count the lamp usage hours. (Unit: h)

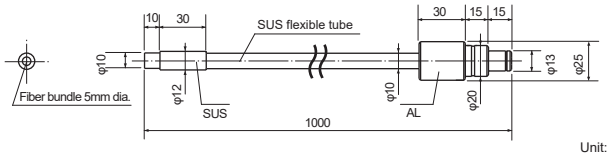
Dimensions

Main unit



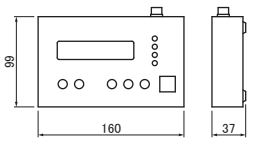
Unit: mm

Light guide



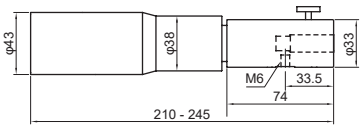
Unit: mm

Controller



Unit: mm

Collimator lens



Unit: mm

*Product specifications are subject to change without notice.

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