Spectroscopic measurement system for photometric quantity evaluation

C14595 series

For measurement of absolute values of luminous flux, illuminance, and luminosity

We provide a highly reliable evaluation system by combining Hamamatsu Photonics' spectrophotometric technology and calibration technology.

The C14595 series, a photometric evaluation spectroscopic measurement system, measures the absolute values of luminous flux, illuminance, and luminosity by combining a Photonic multichannel analyzer with a dedicated optical system. The PMA-12 C14348 series, which achieves both high speed and miniaturization, is used for the Photonic multichannel analyzer. In addition to complying with Japanese Industrial Standards (JIS) Z8724 (color measurement method, light source color), the C14348 series is capable of photometric sensitivity calibration and provides highly reliable measurement. Moreover, the dedicated software (photometric evaluation software U14304-01) allows easy photometric evaluation from the spectral spectrum.

Two types of optical systems for different applications

- Transmissive diffuser (illuminance, luminosity)
- Integrating sphere (luminous flux, illuminance, luminosity)

Three types of PMA-12 Photonic multichannel analyzers with different sensitivity wavelengths

- Standard model 310 nm to 790 nm
- Ultraviolet compatible model 200 nm to 790 nm
- Near-infrared compatible model 360 nm to 1090 nm

Dedicated photometric evaluation software included

- Easy photometric evaluation
- Supports colorimetric evaluation

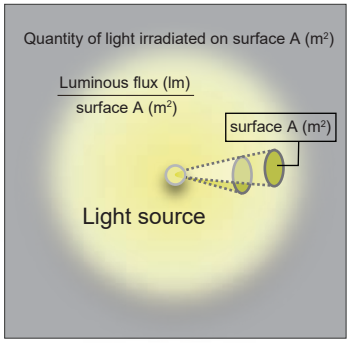
HAMAMATSU

PHOTON IS OUR BUSINESS

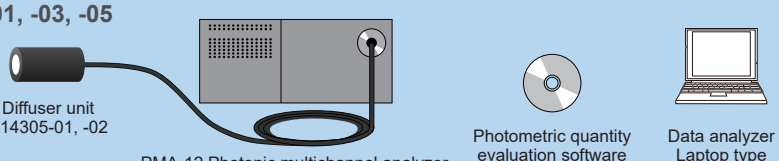
System configuration

Type number	Optics	Spectrometer	Software	Analyzer
C14595-01	Diffuser unit A14305-01	PMA-12 Photonic multichannel analyzer C14348-01	Photometric quantity evaluation software U14304-01	Data analyzer Laptop type C15163-01
C14595-02	Integrating sphere unit A14306-01			
C14595-03	Diffuser unit A14305-02	PMA-12 Photonic multichannel analyzer C14348-02		
C14595-04	Integrating sphere unit A14306-01			
C14595-05	Diffuser unit A14305-01	PMA-12 Photonic multichannel analyzer C14348-03		
C14595-06	Integrating sphere unit A14306-01			

Illuminance measurement (Unit: lx lux)

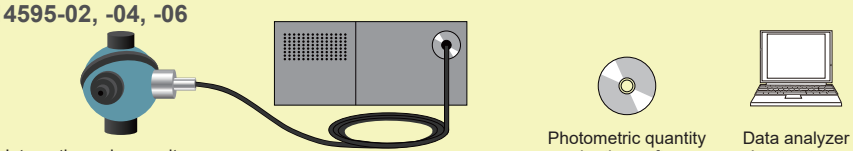


C14595-01, -03, -05



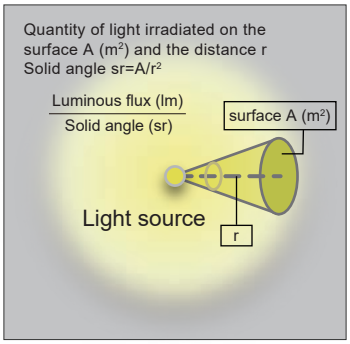
SY08-2038 Illuminance sensitivity calibration

C14595-02, -04, -06

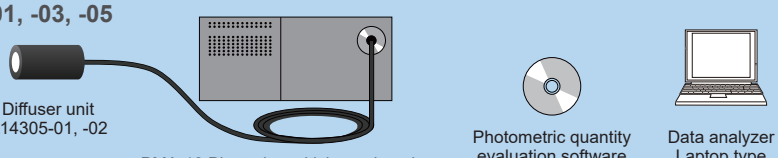


SY08-2038 Illuminance sensitivity calibration

Luminous intensity measurement (Unit: cd candela)

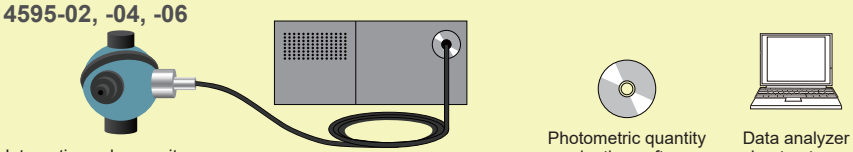


C14595-01, -03, -05



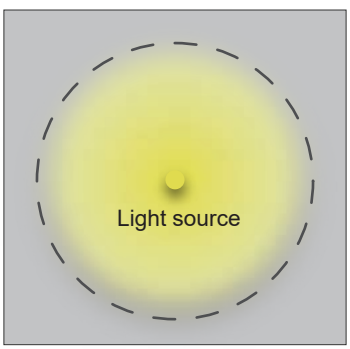
SY08-2039 Luminosity sensitivity calibration

C14595-02, -04, -06

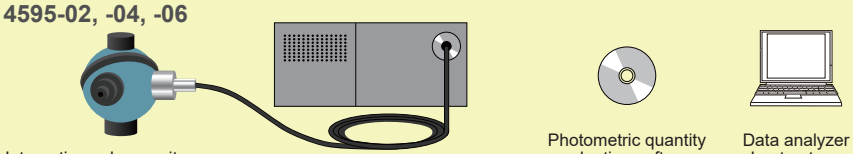


SY08-2039 Luminosity sensitivity calibration

Total luminous flux measurement (Unit: lm lumen)



C14595-02, -04, -06



SY08-2040 Luminous flux sensitivity calibration

System components

Spectroscopic measurement system for photometric quantity evaluation C14595-01, -03, -05

Diffuser unit model

Diffuser unit A14305-01, -02

This is a unit for diffusing light from a source by transmitting it. It is used as standard when measuring illuminance and luminosity.

Spectroscopic measurement system for photometric quantity evaluation C14595-02, -04, -06

Integrating sphere unit model

Integrating sphere unit A14306-01

By introducing the light from the source, it becomes possible to evaluate photometric quantity regardless of the direction of the light. It is indispensable for luminous flux evaluation. It can also be used for photometry of illuminance and luminosity.

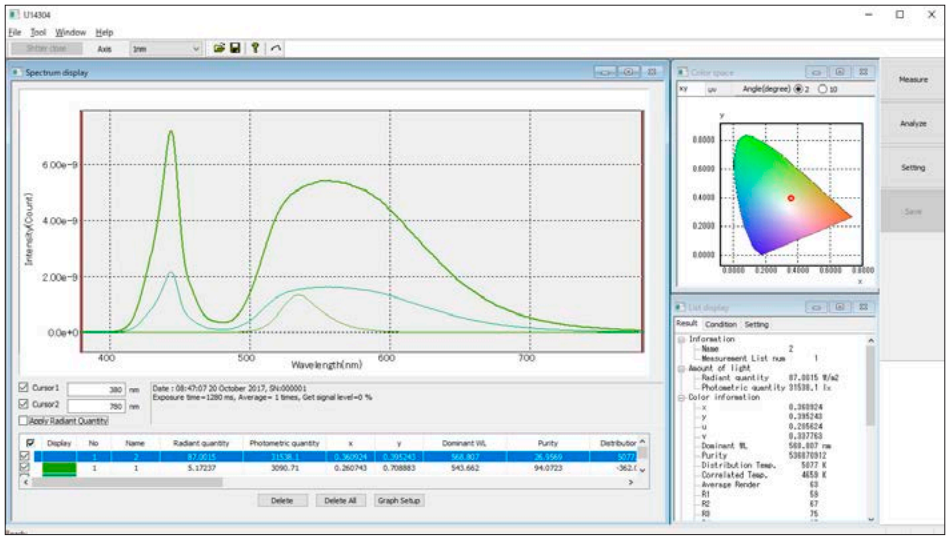
PMA-12 Photonic multichannel analyzer C14348-01, -02, -03

A high-speed model of the PMA-12 Photonic multichannel analyzer series. Adopting a back-thinned type CCD linear image sensor and improving the drive circuit achieves high speed, high sensitivity, and low stray light. It is smaller in size than conventional products.

- In compliance with JIS Z 8724-2015
- Sensitivity wavelength can be selected according to the application
  - C14348-01 (standard model): 310 nm to 790 nm
  - C14348-02 (ultraviolet compatible model): 200 nm to 790 nm
  - C14348-03 (near-infrared compatible model): 360 nm to 1090 nm

Photometric quantity evaluation software U14304-01

This software enables easy evaluation of the absolute amount of light. In addition to photometric quantity, it is also possible to evaluate radiant quantity, color measurement, and spectral information.



Evaluation items

- Photometric quantity
  - Illuminance
  - Luminosity
  - Luminous flux
- Radiant quantity
  - Irradiance
  - Radiant intensity
  - Radiant flux
- Colorimetry
  - Chromaticity
  - Correlated color temperature
  - Color rendering property
- Spectral information
  - Peak wavelength
  - Peak intensity
  - FWHM

Photometric quantity: a physical quantity that is weighted by visual sensitivity to the radiant quantity, which is a physical quantity that expresses the intensity of light; examples include illuminance, luminosity, and luminous flux.

Visual sensitivity: The degree to which the human eye perceives the brightness of other wavelengths is quantified, with 1 corresponding to the wavelength (555 nm) that the human eye perceives most strongly.

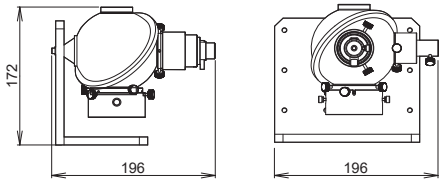
Specifications

	C14595-01	NEW C14595-03	NEW C14595-05	C14595-02	NEW C14595-04	NEW C14595-06
Optics	Transmittance diffuser			Integrating sphere		
Material of optics	White diffuser	Synthetic quartz	White diffuser	Spectralon		
Size of light receiving area	100 mm^2					
Contents of measurement	Photometric quantity(illuminance, luminosity), Radiation puantity(irradiance, radiation, intensity), Colorimetry, Spectral information			Photometric quantity(illuminance, luminosity, luminous flux), Radiation puantity(irradiance, radiation, intensity, radiant flux), Colorimetry, Spectral information		
Analysis	Four arithmetic operation					
Derector	Back thinned type BT-CCD linear image sensor					
Wavelength (nm)	310 to 790	200 to 790	360 to 1090	310 to 790	200 to 790	360 to 1090
Wavelength resolution	≤3 nm					
Wavelength accuracy	<±0.3 nm					
Exposure time	0 ms to 30 s(Internal exposure start mode / External exposure start mode)					
Repetition rates	<238 Hz					
Number of photosensitive device channels	1024 ch					
Device cooling temperature	0 ˚C					
AD resolution	16 bit					
Spectrograph	Concave grating					
Spectrograph F number	3					
Fiber length	2 m					
Fiber receiving area	φ1 mm					
External trigger input	TTL level / High impedance					
Interface	USB 2.0					
Power supply	AC100 V to AC240 V, 50 Hz/60 Hz					
Power consumption	Approx. 40 VA *					
Ambient operation temperature	+10 ˚C to +35 ˚C (Recommended temp. +25 ˚C)					

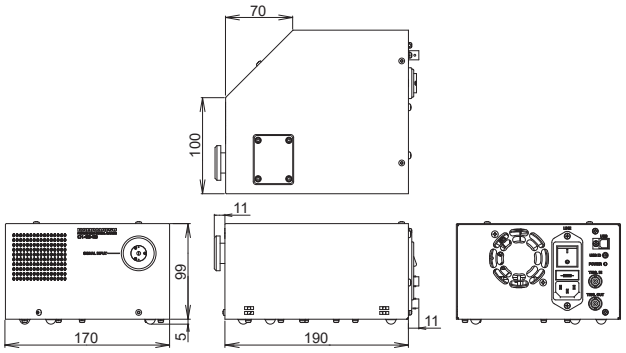
* This is the value for Photonic multichannel analyzer only.

Dimensional outlines (Unit : mm)

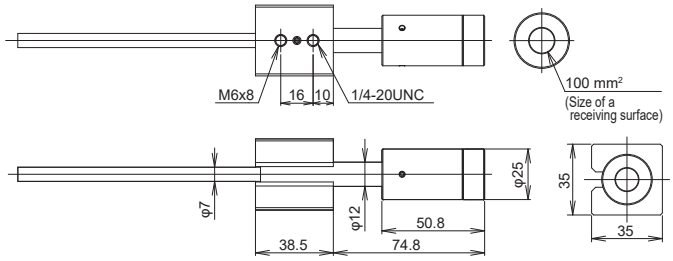
Integrating sphere unit A14306-01 (Approx. 2.5 kg)



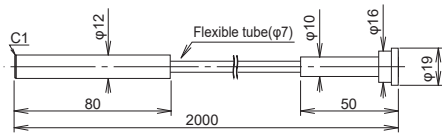
Photonic multichannel analyzer C14348-01, -02, -03 (Approx. 2.6 kg)



Diffuser unit A14305-01, -02 (Approx. 170 g)



Fiber input optical system (Approx. 200 g)



HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

Systems Division
812 Joko-cho, Higashi-ku, Hamamatsu City, 431-3196, Japan, Telephone: (81)53-431-0124, Fax: (81)53-433-8031, E-mail: export@sys.hpk.co.jp

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com
Germany: Hamamatsu Photonics Deutschland GmbH.: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de
France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court,10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk
North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01 E-mail: info@hamamatsu.se
Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it
China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R. China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn
Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section 2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw

Cat. No. SDSS0017E01
JAN/2021 HPK
Created in Japan