Head-on PMT

Photon Counting Head H9319 Series

The H9319 series photon counting heads are designed to perform photon counting by just connecting to a PC. The H9319 series includes a 25-mm (1") diameter head-on photomultiplier tube, a photon counting circuit, a high-voltage power supply circuit, counter and a microprocessor. Data transfer, measurement time and other necessary adjustments can be controlled by commands from the PC through the RS-232C interface.

Since the H9319 series performs linearity correction by the internal microprocessor, it provides excellent count linearity within a range of ±1 % at 20×10^6 s^{-1}.

Product Variations

Type No.	Spectral Response	Sample Program	Prescaler
H9319-01	300 nm to 650 nm	yes	1/4
H9319-11		no	1/4
H9319-02	300 nm to 850 nm	yes	1/4
H9319-12		no	1/4

This product can't be used at vacuum environment or reduced pressure environment.

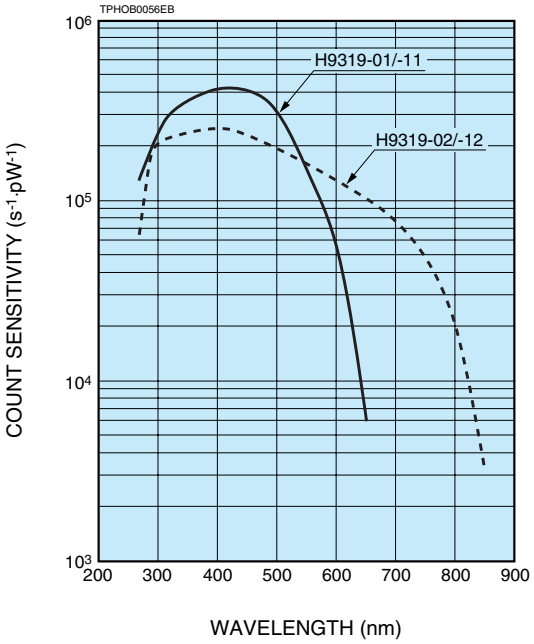
Specifications

(at +25 °C)

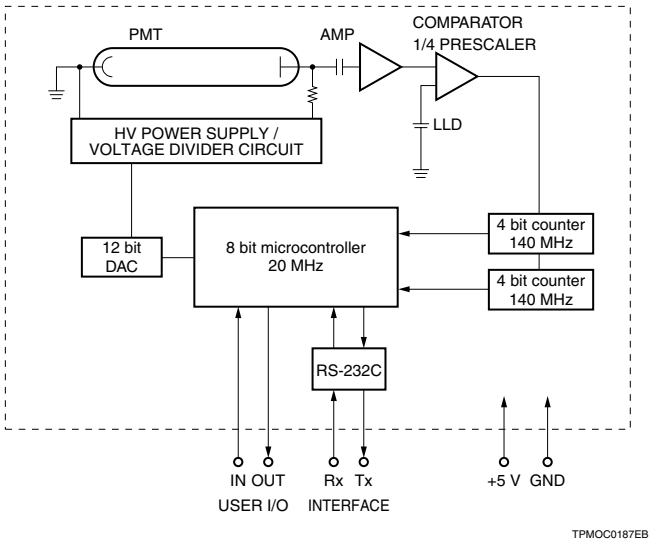
Parameter			H9319-01	H9319-11	H9319-02	H9319-12	Unit
Input Voltage			+4.75 to +5.25				V
Max. Input Voltage			+6				V
Max. Input Current			60				mA
Effective Area			ϕ 22				mm
Peak Sensitivity Wavelength			420				nm
Count Sensitivity	Typ.	300 nm	2.3×10^5		2.1×10^5		$s^{-1} \cdot pW^{-1}$
		400 nm	4.1×10^5		2.5×10^5		
		500 nm	3.4×10^5		2.0×10^5		
		600 nm	5.7×10^4		1.3×10^5		
		700 nm	—		7.8×10^4		
Count Linearity *1			20×10^6				s^{-1}
Dark Count *2		Typ.	150		10 000		s^{-1}
		Max.	300		15 000		
PMT Operating Voltage Range			+300 to +1200				V
Integration Time			10 to 1000				ms
Settling Time			1 *3				s
			5 *4				s
Input Signal (External Trigger Input) *5			TTL level signal				—
Output Signal (User Line Output) *6			TTL level signal				—
Interface			RS-232C, 9600 baud, Parity none, 8 data bit, 1 stop bit				—
Operating Ambient Temperature *7			+5 to +50				°C
Storage Temperature *7			-20 to +50				°C
Weight *8			280				g

*1: Random pulse, within ±1 % count loss (by count linearity compensation)
*2: After 30 minutes storage in darkness
*3: The time required for the output to reach a stable level following a change in the control voltage from 500 V to 1000 V in darkness
*4: The time required for the output to reach a stable level following a change in the control voltage from 1000 V to 500 V in darkness
*5: Selectable ECR mode or LCR mode (refer to command list)
*6: Controllable by RS-232C command
*7: No condensation
*8: Main body: Approx. 180 g

Characteristic (Count sensitivity)



Block Diagram



Command List

Action	Command *9	Explanation	Argument	Response *10
Set the Integration Time	P#CR	Set the number of 10 msec intervals to sum. Same as integration time for 1 reading.	1 to 100	VA, BC, BA
Set the Sequence of Readings	R#CR	Set sequence of readings, where each reading uses the integration time set with the P command.	1 to 255	VA, BC, BA
Set the PMT Input Voltage	V##CR	Change the high voltage applied to the tube.	300 to 1200	VA, BC, BA
	DCR	Re-set the default high voltage to the tube	—	VA, BC
Set the Output of the User Line	O#CR	Set the output of the user digital output line. 0: Low level output 1: High level output	0 or 1	VA, BC, BA
Start the Reading Sequence	SCR	Start the reading sequence	—	4 byte/reading
	CCR	Start a continuous reading process. Will continue indefinitely until a STOP character (CR) is sent.	—	4 byte/reading
	ECR	Start a reading sequence for each positive-edge TTL transition applied to the purple stripe user line.	—	4 byte/reading
	LCR	Start a reading sequence for each positive-level TTL transition applied to the purple stripe user line.	—	4 byte/reading

*9: The Response acknowledgment is returned having two bytes.
*10: VA: valid command, BC: bad command, BA: bad argument

Dimensional Outlines (Unit: mm)