

PRELIMINARY

NIR-PMT MODULE

(Thermoelectrically cooled)

H9170-45, -75

**Wavelength Range: 950 nm to 1400 nm / 950 nm to 1700 nm,
TE cooled, High Speed, Suitable for Photon counting**



* Rotary Vacuum Pump is not shown (included)

OVER VIEW

Hamamatsu has developed a highly sensitive semi-transparent NIR photocathode by the novel photocathode technology.

We have adopted this technology to a compact photomultiplier tube (PMT) and have developed a PMT module with the air cooled TE cooler and high voltage power supply with protection circuit. No liquid nitrogen or cooling water is necessary. The cooling unit is equipped with a condenser lens that allows large input area for easy optical coupling. Adaptors for optical fiber or monochromator are available as an option.

APPLICATIONS

- Photoluminescence
- Singlet Oxygen Measurement
- Raman Spectroscopy
- Cathodoluminescence
- Fluorescence, Fluorescence Life Time
- LIDAR

FEATURES

- High Sensitivity (Capable of Photon Counting)
- Fast Time Response
Rise Time: 900 ps, TTS: 300 ps
- Compact
- Simple Operation by Air Cooled TE Cooler
No Liquid Nitrogen, No Cooling Water in Necessary
- Operable in 20 min after Switched ON
- Large Detection Area
φ 19 mm for Collimated Light
- HV Power Supply with Interlock Function
- Mechanical Shutter
- Optional Adaptors are Available.
For Optical Fiber (FC type)
For Monochromator

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SPECIFICATIONS

GENERAL

Parameter	H9170-45	H9170-75	Unit
Spectral Response	950 to 1400	950 to 1700	nm
Photocathode Material	InP/InGaAsP	InP/InGaAs	—
Detection Area for Collimated Light	$\phi 19$		mm
Effective Area of PMT	$\phi 1.6$		mm
PMT Operating Temperature	-60		°C
PMT Supply Voltage	-500 to -900		V
Storage Ambient Temperature	-20 to +50		°C
Operating Ambient Temperature	+7 to +30		°C

MAXIMUM RATING

Parameter	H9170-45	H9170-75	Unit
PMT Supply Voltage	-900		V
Average PMT Anode Current	1		μ A

CHARACTERISTICS (at -800 V, -60 °C)

Parameter		H9170-45			H9170-75			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Cathode Sensitivity ①	Quantum Efficiency	0.48	—	—	0.29	—	—	%
	Radiant	5	—	—	3.5	—	—	mA/W
Anode sensitivity ①	Radiant	1000	—	—	700	—	—	A/W
	Gain	2×10^5	1×10^6	—	2×10^5	1×10^6	—	—
Anode Dark Current ②		—	4	10	—	40	100	nA
Anode Dark Count ②		—	2×10^4	—	—	2×10^5	—	s ⁻¹
Time Response	Anode Pulse Rise Time	—	0.9	—	—	0.9	—	ns
	Anode Pulse Fall Time	—	1.7	—	—	1.7	—	ns
	Transit Time Spread	—	0.3	—	—	0.3	—	ns

① At 1300 nm (H9170-45), at 1500 nm (H9170-75)

② At 30 minutes after high voltage is applied with shutter closed, and 1×10^6 gain.

MODULE, CONTROLLER

Parameter	Value / Description	Unit
Cooling Method	Thermoelectric / Air Cooled	—
Condenser Lens Material	BK7	—
Diameter of the Condenser Lens	$\phi 20$	mm
F Number of the Condenser Lens	1.25	—
Cooling Time to -60 °C PMT Temperature	20	min
Protection Function	High Voltage Interlock for Inappropriate Temperature	—
Input Voltage (AC)	90 to 264 (50 Hz / 60 Hz)	V
Dimensions (W × H × D) ③	Module	210 × 193 × 200
	Controller	100 × 193 × 310
Weight	Module	Approx. 8
	Controller	Approx. 3

③ Excluding projections.

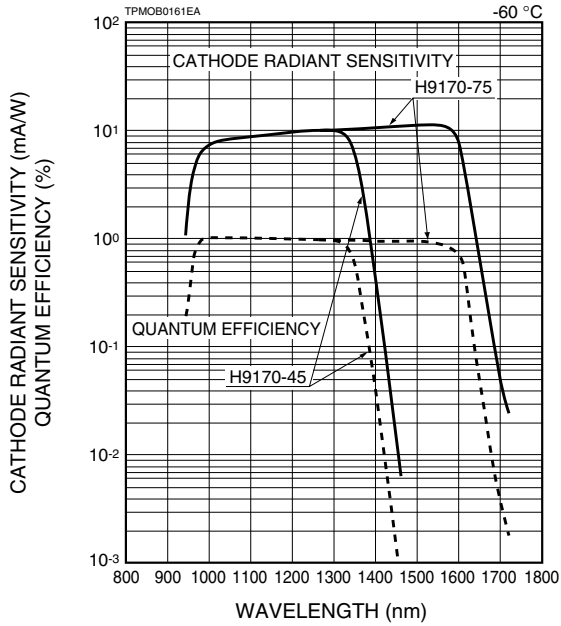
ROTARY VACUUM PUMP

Parameter	Value / Description	Unit
Type	Oil-Sealed Rotary Vacuum Pump	—
Input Voltage (AC) ④	90 to 126 or 180 to 252 (50 Hz / 60 Hz), Single Phase	V
Pumping Speed	50 (50 Hz), 60 (60 Hz)	l/min
Dimensions (W × H × D)	150 × 251 × 427	mm
Weight	Approx. 16	kg

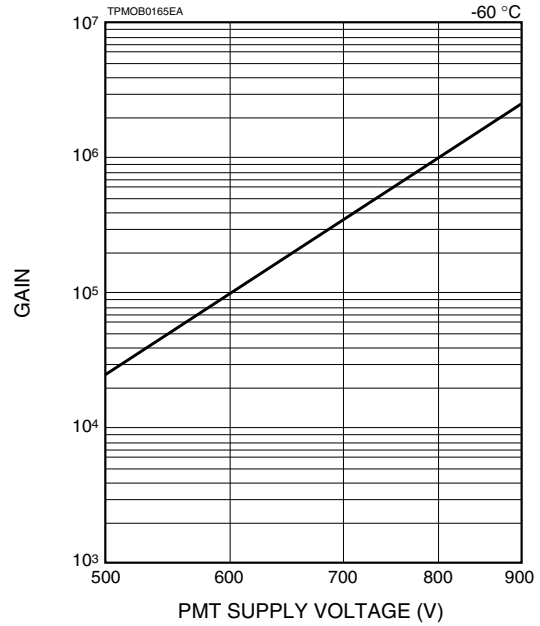
④ The voltage is set at the factory. If change is necessary, please consult with your local Hamamatsu office.

CHARACTERISTICS

● Spectral Response

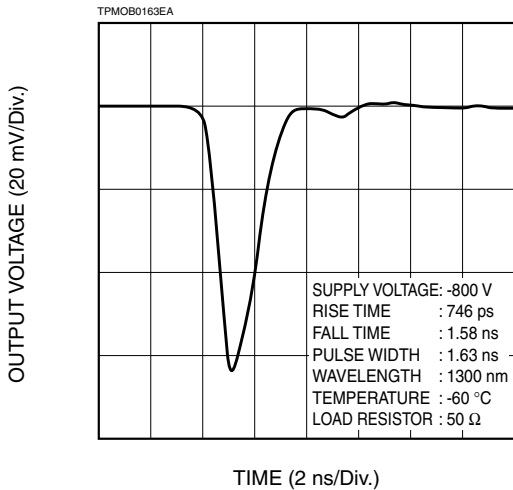


● Typical Gain

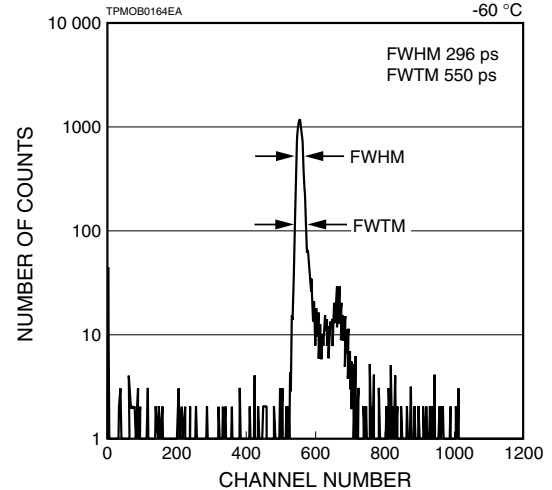


● Timing Properties

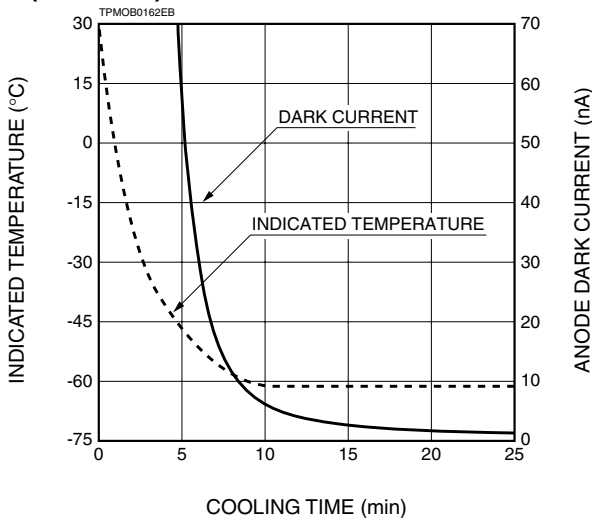
Waveform



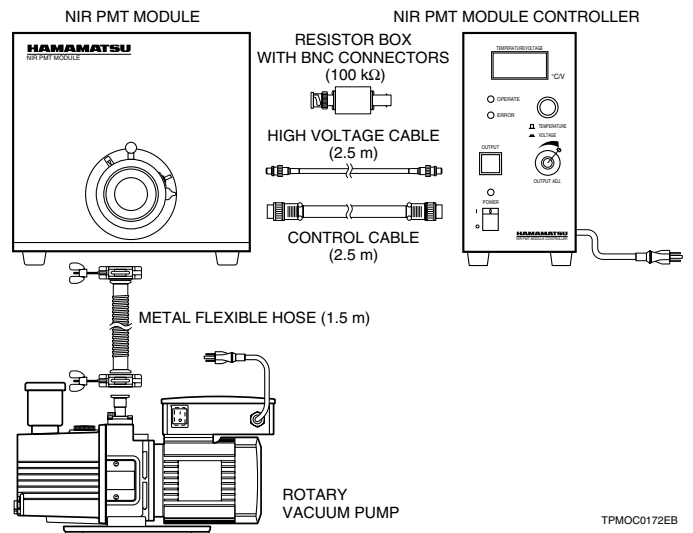
Transit Time Spread (T.T.S.)



● Temperature / Dark Current vs. Cooling Time (H9170-45)

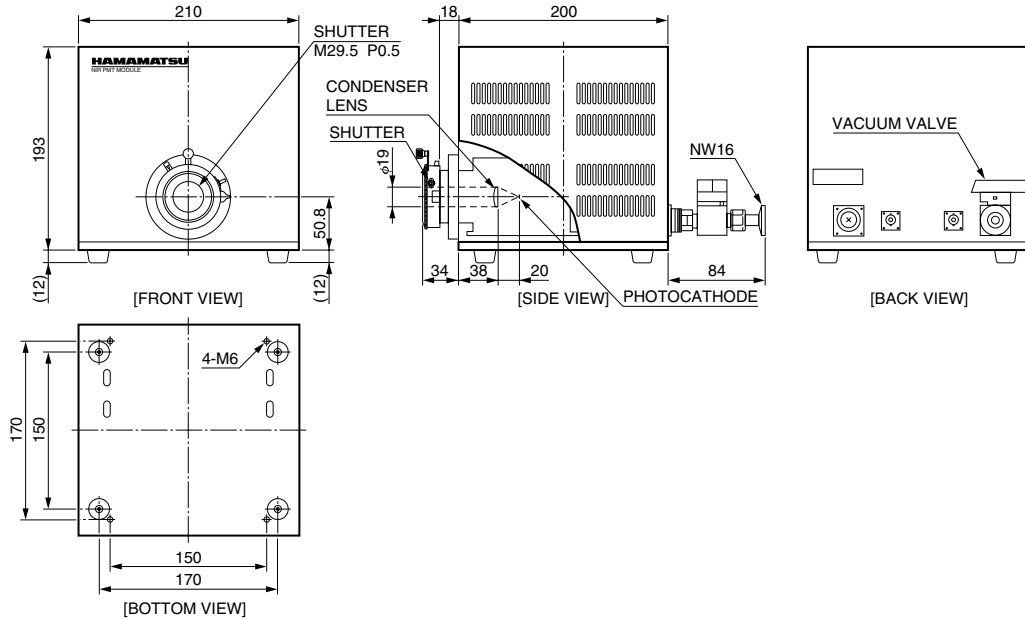


SYSTEM CONFIGURATION (CONNECTION DIAGRAM)

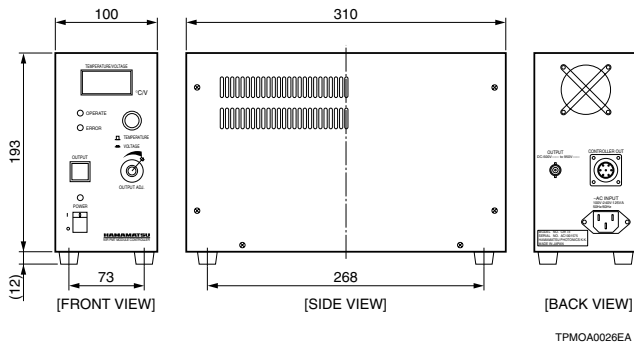


DIMENSIONAL OUTLINES (Unit: mm)

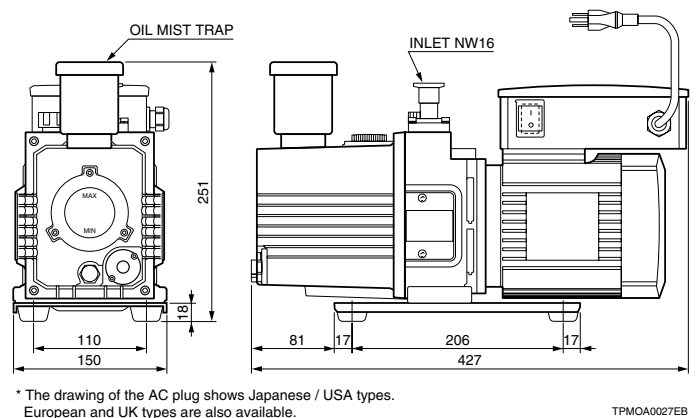
●NIR-PMT Module



●NIR-PMT Module Controller



●Rotary Vacuum Pump



OPTIONS (sold separately)

Adaptors to match optical fiber connectors or monochromators are available.

●Optical Fiber Adaptor

The adaptor efficiently collects light from the optical fiber with FC connector.

●Monochromator Adaptor

The adaptor collects light from a monochromator efficiently. Please inform us of the type of the monochromator.

●Resistor Box with BNC Connectors

A 50 Ω resistor box with BNC connectors is available.

Use the 100 kΩ resistor box (supplied with H9170) for use with a lock-in amplifier.

*Please contact your local Hamamatsu office for any assistance.

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WEB SITE <http://www.hamamatsu.com>

HAMAMATSU PHOTONICS K.K., Electron Tube Center

314-5, Shimokanzo, Toyooka-village, Iwata-gun, Shizuoka-ken, 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, P. O. Box 6910, Bridgewater, N.J. 08807-0910, 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)8152-2658 E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 8, 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, United Kingdom, Telephone: 44-(0)1707-294888, Fax: 44(0)1707-325777 E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Smidesvägen 12, SE-171-41 SOLNA, 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/E, 20020 Arese, (Milano), Italy, Telephone: (39)02-935 81 733, Fax: (39)02-935 81 741 E-mail: info@hamamatsu.it

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