LOW-LIGHT-LEVEL MEASUREMENT IN THE NIR

THERMOELECTRIC COOLED NIR-PMT UNIT

H12397-75

Wavelength Range: 950 nm to 1700 nm, TE Cooled, High Speed, High Sensitivity, Suitable for Photon Counting

Left: NIR-PMT Main Unit, Right: Controller

OVER VIEW

The H12397-75 is a photomultiplier tube unit that contains a thermoelectrically cooled photomultiplier tube having sensitivity in the near infrared region (950 nm to 1.7 µm).
The H12397-75 uses an optical fiber connector efficiently coupled to the unique internal optical system and cooling device. This minimizes the background light entering the photomultiplier tube, and so reduces the dark count to 1/50th that of the current product (H10330B-75).

APPLICATIONS

- Photoluminescence Measurement
- Cathodoluminescence Measurement
- Fluorescence, Fluorescence Life Time Measurement
- LIDAR
- Raman Spectroscopy
- Quantum Cryptography

FEATURES

- Optical Fiber Input (FC connector)
- Low Dark Count:1/50 of H10330B-75*
- Compact and lightweight due to vacuum sealed-off thermal insulation technology
- High sensitivity (Applicable to Photon Counting)
- Fast Time Response
  Rise Time: 0.9 ns, T.T.S.: 400 ps
- Simple Operation by Air Cooled TE Cooler
- HV Power Supply with Interlock Function

* H10330B series (1.2 µm, 1.4 µm, 1.7 µm types are also available)

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SPECIFICATIONS

GENERAL

Parameter	Description / Value	Unit
Spectral Response	950 to 1700	nm
Peak Sensitivity Wavelength	1500	nm
Photocathode Material	InP/InGaAs	—
Effective Area of PMT	ϕ1.6	mm
PMT Operating Temperature	-70	°C
Operating Ambient Temperature	+5 to +40	°C
Operating Ambient Humidity ①	Less than 80	%
Storage Temperature	-20 to +50	°C
Storage Humidity ①	Less than 80	%

① No condensation

MAXIMUM RATING

Parameter	Value	Unit
PMT Supply Voltage	-900	V
Average PMT Anode Current	1	µA

CHARACTERISTICS (at -800 V, -70 °C)

Parameter		Value			Unit
		Min.	Typ.	Max.	
Cathode Sensitivity ②	Quantum Efficiency	1	2	—	%
	Radiant	—	25	—	mA/W
Anode sensitivity ②	Radiant	—	2.5×10^4	—	A/W
Gain		5×10^5	1×10^6	—	—
Anode Dark Current ③		—	0.8	2	nA
Anode Dark Count ③		—	5000	—	s^{-1}
Time Response	Anode Pulse Rise Time	—	0.9	—	ns
	Anode Pulse Fall Time	—	1.7	—	ns
	Transit Time Spread	—	0.4	—	ns

② At 1500 nm
③ At 30 minutes after high voltage is applied with shutter closed and anode radiant sensitivity = 10000 A/W.

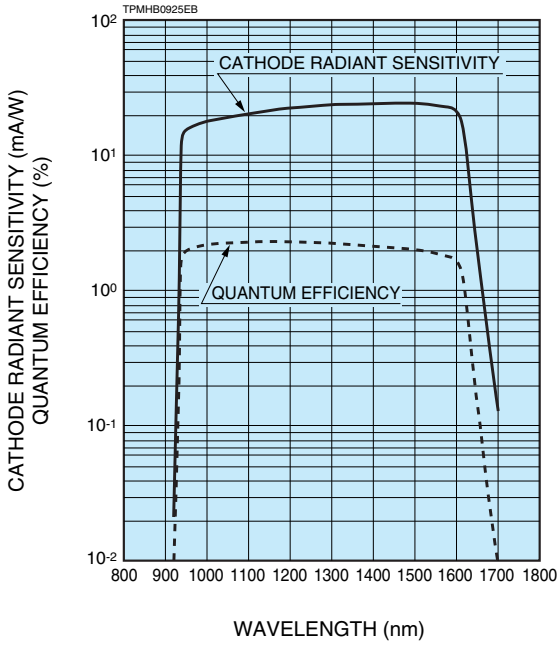
MAIN UNIT, CONTROLLER

Parameter		Description / Value	Unit
Cooling Method		Thermoelectric (Forced Air Cooling)	—
Optical Input Connector		FC Connector	—
Cooling Time Required for Operation		Approx. 60	min
Protection Function		High Voltage Interlock for Inappropriate Temperature	—
Input Voltage (AC)		100 to 240 (±10 %) (50 Hz / 60 Hz)	V
Dimensions (W × H × D) ④	Main Unit	100 × 186 × 150	mm
	Controller	102 × 131 × 279.5	
Weight	Main Unit ⑤	Approx. 2.20	kg
	Controller ⑥	Approx. 3.13	

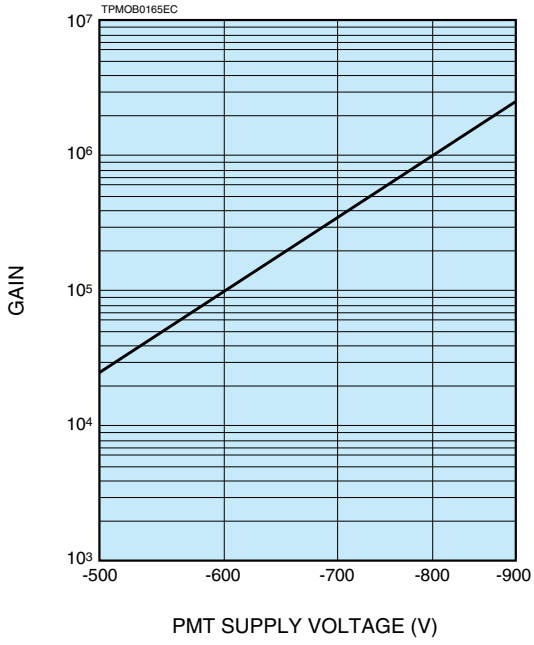
④ Excluding projections.
⑤ Including resistor box with BNC connectors.
⑥ Including high voltage cable and control cable.

CHARACTERISTICS

●Spectral Response

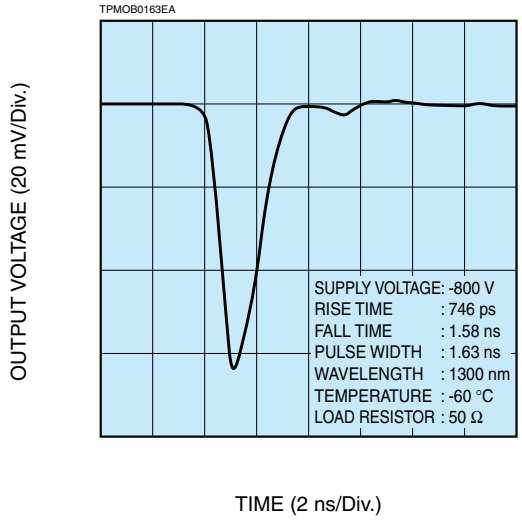


●Typical Gain

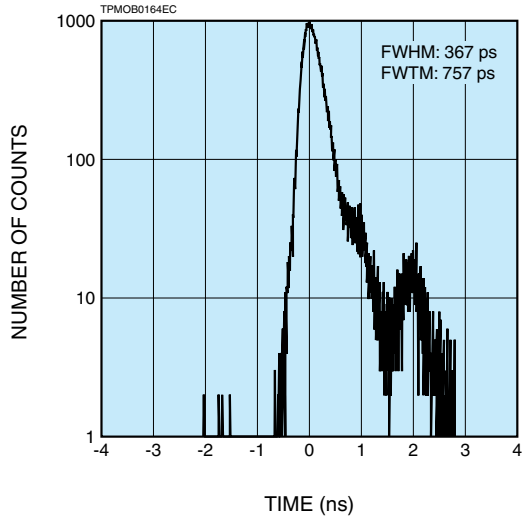


●Timing Properties

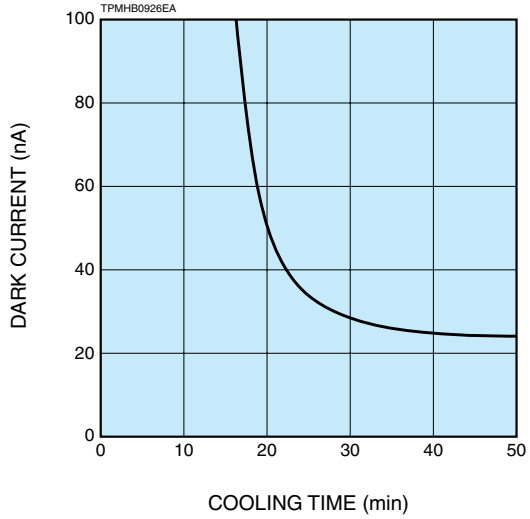
Waveform



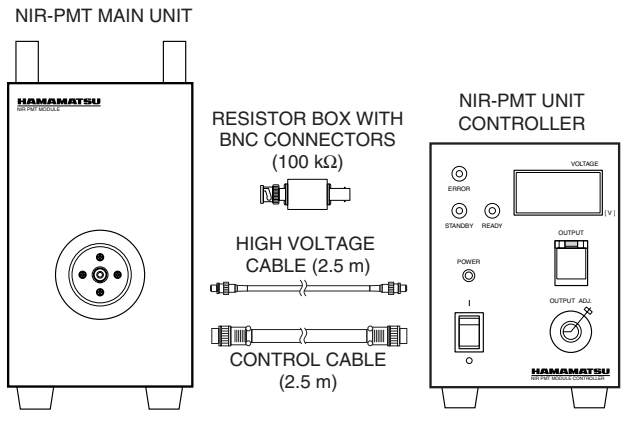
Transit Time Spread (T.T.S.)



●Dark Current vs. Cooling Time (H12397-75)



SYSTEM CONFIGURATION
(CONNECTION DIAGRAM)



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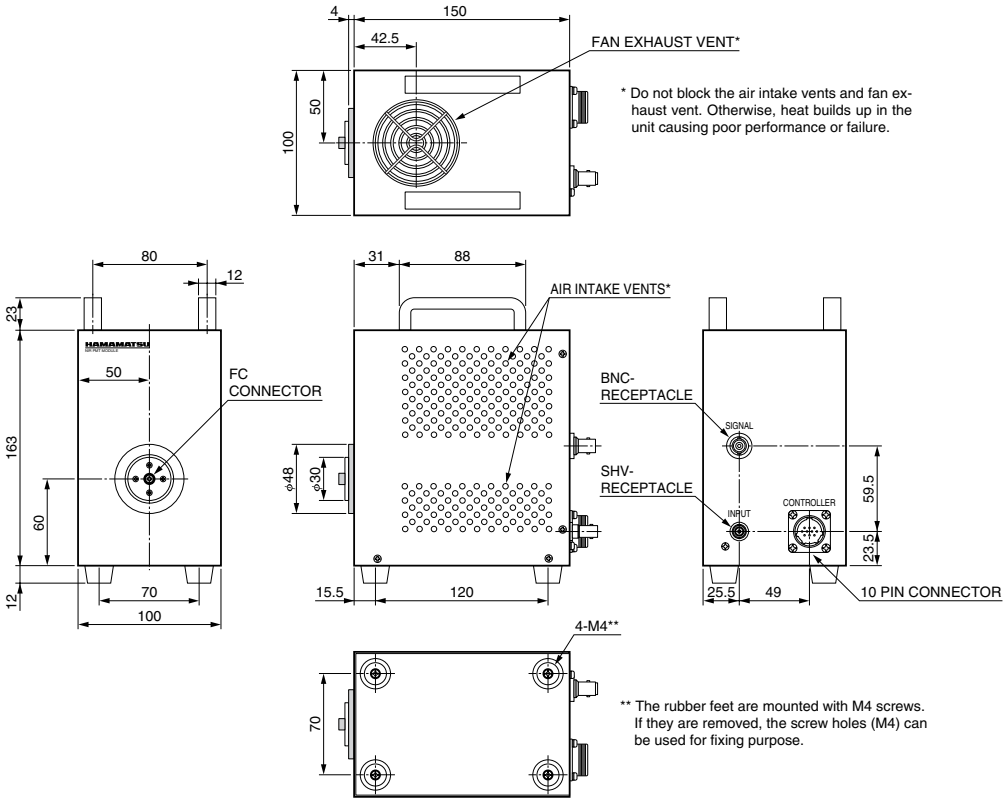
DIMENSIONAL OUTLINES (Unit: mm)

●NIR-PMT Main Unit



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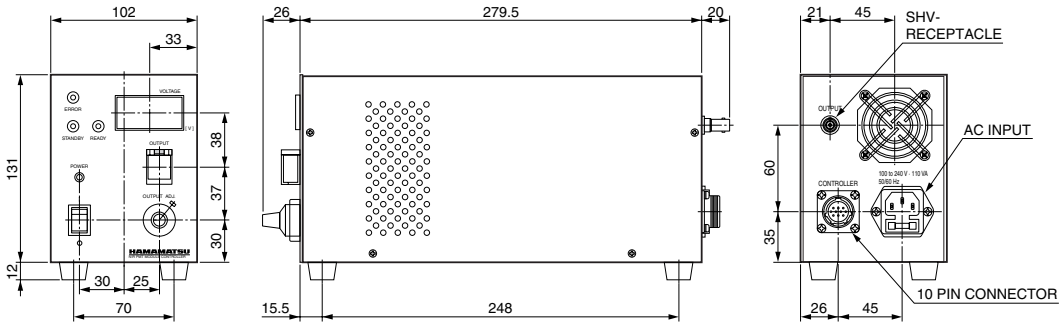
●NIR-PMT Unit Controller



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OPTIONS (sold separately)

●Resistor Box with BNC Connectors

A 50 Ω resistor box with BNC connectors is available.

Use the 100 kΩ resistor box (supplied with H12397-75) for use with a lock-in amplifier.

*Please contact your local Hamamatsu office for any assistance.

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