

LOW-LIGHT-LEVEL MEASUREMENT IN THE NIR

THERMOELECTRIC COOLED NIR-PMT UNIT

H10330B-25/-45/-75

**Wavelength Range: 950 nm to 1200 nm / 950 nm to 1400 nm / 950 nm to 1700 nm,
TE Cooled, High Speed, Suitable for Photon Counting**



Left: NIR-PMT Main Unit, Right: Controller

OVER VIEW

The H10330B series is an NIR-PMT unit using a compact NIR-PMT (near infrared photomultiplier tube) developed by our advanced photocathode technology. The NIR-PMT is contained in a thermally insulated sealed-off housing evacuated to a high vacuum. The internal thermoelectric cooler eliminates the need for liquid nitrogen and cooling water. The light input window of these unit use a condenser lens to provide a virtually larger photosensitive area allowing easy optical coupling. Adapters for connection to an optical fiber and monochromator are also available as options.

APPLICATIONS

- Photoluminescence Measurement
- Singlet Oxygen Measurement
- LIDAR
- Raman Spectroscopy Measurement
- Cathodoluminescence Measurement
- Fluorescence, Fluorescence Life Time Measurement
- Optical Communication Device Evaluation

FEATURES

- 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
No Liquid Nitrogen, No Cooling Water is Necessary
- Operable in 20 min after Switched ON
- Large Detection Area
φ 18 mm for Collimated Light
- HV Power Supply with Interlock Function
- Optional Adapters are Available
For Optical Fiber
For Monochromator

SPECIFICATIONS

GENERAL

Parameter	H10330B-25	H10330B-45	H10330B-75	Unit
Spectral Response	950 to 1200	950 to 1400	950 to 1700	nm
Photocathode Material	InP/InGaAsP	InP/InGaAsP	InP/InGaAs	—
Detection Area for Collimated Light	$\phi 18$			mm
Effective Area of PMT	$\phi 1.6$			mm
PMT Operating Temperature	-60			°C
PMT Operating Guaranteed Voltage	-500 to -900			V
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	H10330B-25	H10330B-45	H10330B-75	Unit
PMT Supply Voltage	-900			V
Average PMT Anode Current	1			μ A

CHARACTERISTICS (at -800 V, -60 °C)

Parameter	H10330B-25			H10330B-45			H10330B-75			Unit	
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
Cathode Sensitivity ^②	Quantum Efficiency	1	2	—	1	2	—	1	2	—	%
	Radiant	—	18	—	—	21	—	—	25	—	mA/W
Anode sensitivity ^②	Radiant	—	1.8×10^4	—	—	2.1×10^4	—	—	2.5×10^4	—	A/W
Gain	5×10^5	1×10^6	—	5×10^5	1×10^6	—	5×10^5	1×10^6	—	—	
Anode Dark Current ^{②③}	—	0.4	1	—	4	10	—	40	100	nA	
Anode Dark Count ^③	—	2.5×10^3	—	—	2.5×10^4	—	—	2.5×10^5	—	s ⁻¹	
Time Response	Anode Pulse Rise Time	—	0.9	—	—	0.9	—	—	0.9	—	ns
	Anode Pulse Fall Time	—	1.7	—	—	1.7	—	—	1.7	—	ns
	Transit Time Spread	—	0.4	—	—	0.4	—	—	0.4	—	ns

② At 1100 nm (H10330B-25), at 1300 nm (H10330B-45), at 1500 nm (H10330B-75)

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

MAIN UNIT, CONTROLLER

Parameter	Value / Description	Unit
Cooling Method	Thermoelectric (Forced Air Cooling)	—
Condenser Lens Material	BK7 AR Coating (λ 900 nm to 1700 nm)	—
Diameter of the Condenser Lens (Effective Area)	$\phi 20$ ($\phi 18$)	mm
F Number of the Condenser Lens (Focal length) ^④	1.4 (f=25.7)	—
Cooling Time Required for Operation	Approx. 20	min
Protection Function	High Voltage Interlock for Inappropriate Temperature	—
Input Voltage (AC)	100 to 240 ($\pm 10\%$) (50 Hz / 60 Hz)	V
Dimensions (W × H × D) ^⑤	Main Unit	100 × 186 × 150
	Controller	102 × 131 × 279.5
Weight	Main Unit ^⑥	Approx. 2.13
	Controller ^⑦	Approx. 2.90

④ At 1300 nm

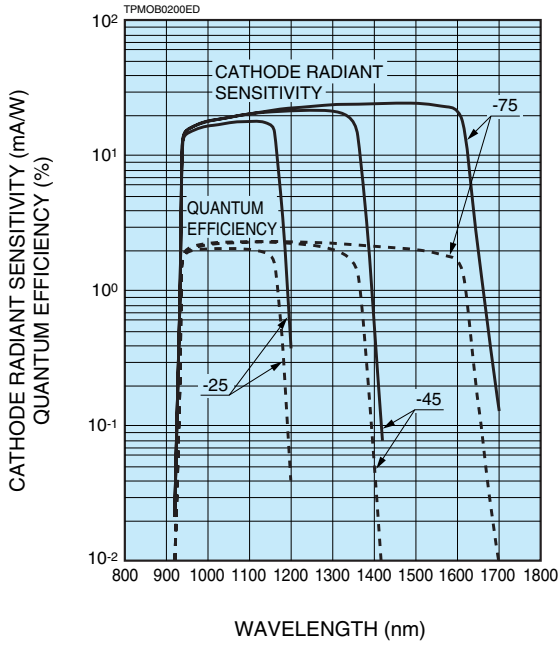
⑤ Excluding projections.

⑥ Including resistor box with BNC connectors.

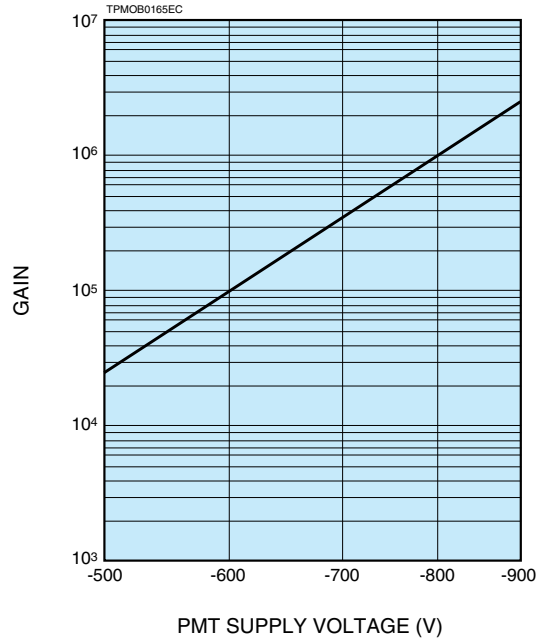
⑦ Including high voltage cable and control cable.

CHARACTERISTICS

●Spectral Response

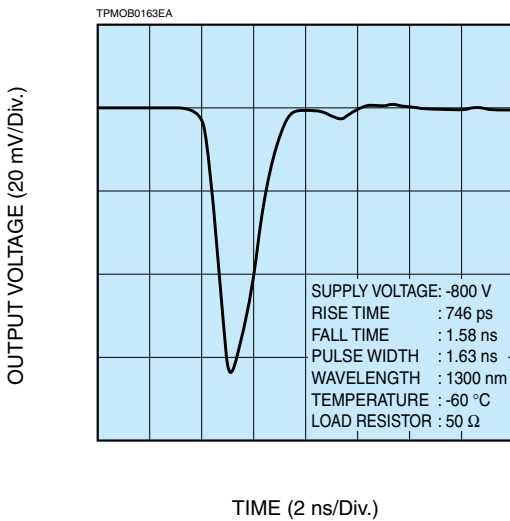


●Typical Gain

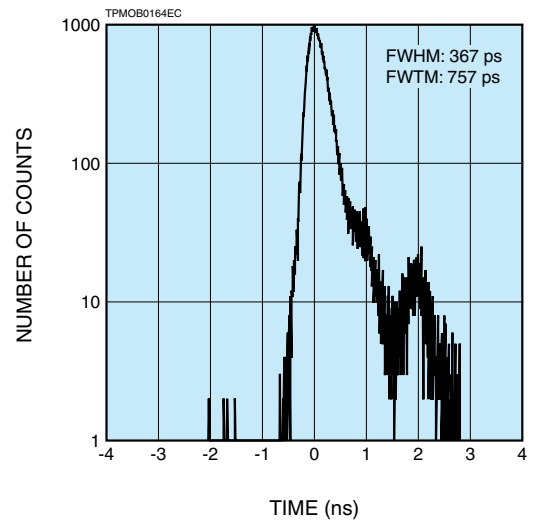


●Timing Properties

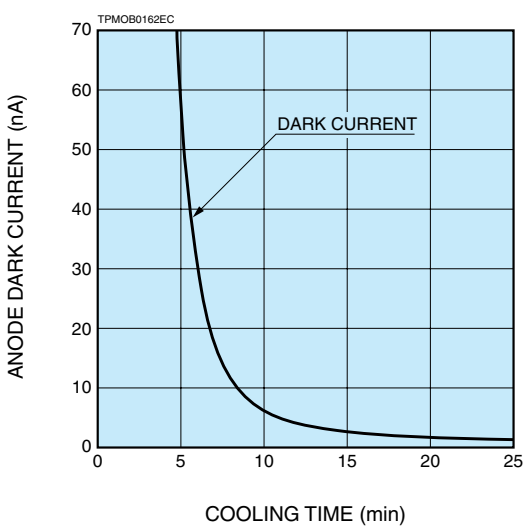
Waveform



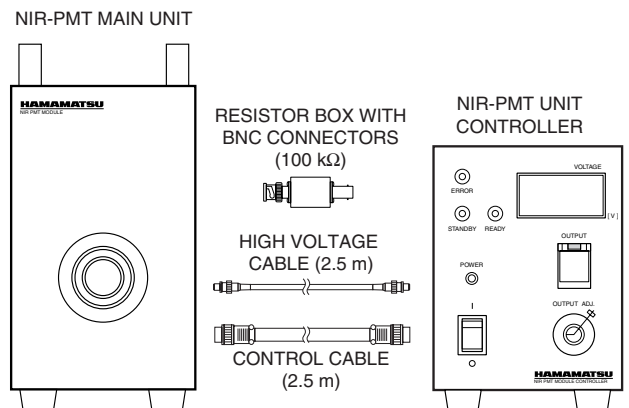
Transit Time Spread (T.T.S.)



●Dark Current vs. Cooling Time (H10330B-45)

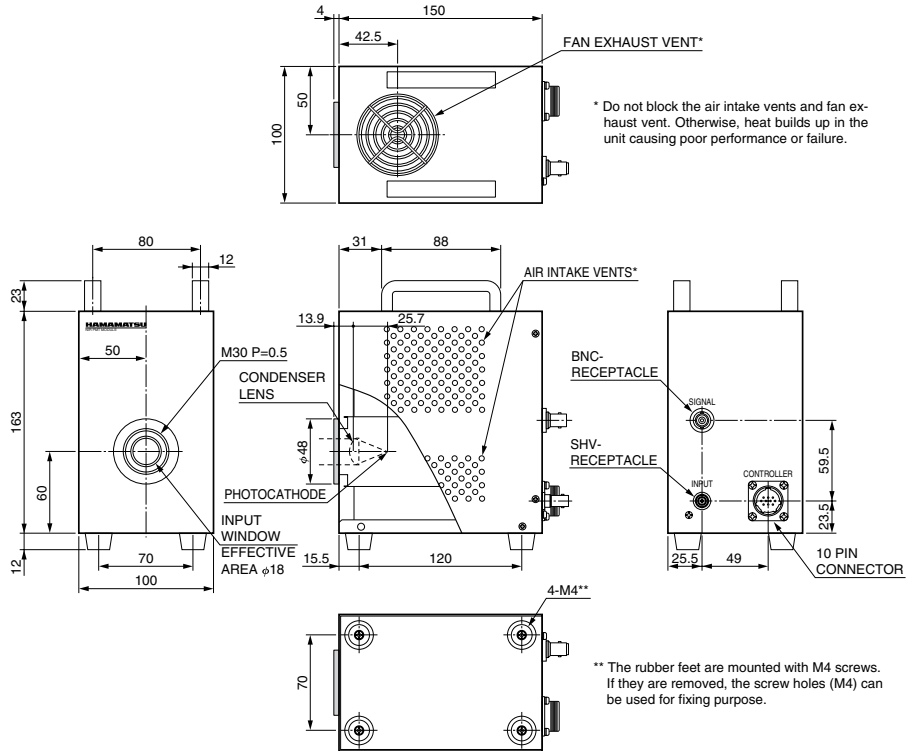


SYSTEM CONFIGURATION (CONNECTION DIAGRAM)



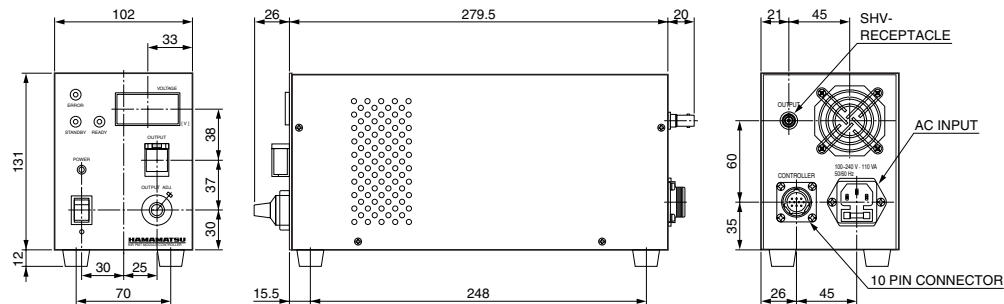
DIMENSIONAL OUTLINES (Unit: mm)

●NIR-PMT Main Unit



TPMOA0040EB

●NIR-PMT Unit Controller



TPMOA0041EC

OPTIONS (sold separately)

Adapters to match optical fiber connectors or monochromators are available.

●Optical Fiber Adapters

These adapters allow light from an optical fiber to efficiently enter the PMT. Specify an FC type or SMA type adapter when ordering.

●Monochromator Adapter

The adapter 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 k Ω resistor box (supplied with H10330B) for use with a lock-in amplifier.

*Please contact your local Hamamatsu office for any assistance.

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