

# LOW-LIGHT-LEVEL MEASUREMENT IN THE NIR

## THERMOELECTRIC COOLED NIR-PMT UNIT

### H10330C-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 H10330C 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	H10330C-25	H10330C-45	H10330C-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 <sup>①</sup>	Less than 80			%
Storage temperature	-20 to +50			°C
Storage humidity <sup>①</sup>	Less than 80			%

① No condensation

## MAXIMUM RATING

Parameter	H10330C-25	H10330C-45	H10330C-75	Unit
PMT supply voltage	-900			V
Average PMT anode current	1			$\mu$ A

## CHARACTERISTICS (at -800 V, -60 °C)

Parameter	H10330C-25			H10330C-45			H10330C-75			Unit	
	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.		
Cathode sensitivity <sup>②</sup>	Quantum efficiency	1	2	—	1	2	—	1	2	—	%
	Radiant	—	18	—	—	21	—	—	25	—	mA/W
Anode sensitivity <sup>②</sup>	Radiant	—	$1.8 \times 10^4$	—	—	$2.1 \times 10^4$	—	—	$2.5 \times 10^4$	—	A/W
Gain	$5 \times 10^5$	$1 \times 10^6$	—	$5 \times 10^5$	$1 \times 10^6$	—	$5 \times 10^5$	$1 \times 10^6$	—	—	
Anode dark current <sup>②③</sup>	—	0.4	1	—	4	10	—	40	100	nA	
Anode dark count <sup>③</sup>	—	$2.5 \times 10^3$	—	—	$2.5 \times 10^4$	—	—	$2.5 \times 10^5$	—	s <sup>-1</sup>	
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 (H10330C-25), at 1300 nm (H10330C-45), at 1500 nm (H10330C-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 ( $\lambda$ 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) <sup>④</sup>	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) <sup>⑤</sup>	Main unit	100 × 186 × 150
	Controller	102 × 131 × 279.5
Weight	Main unit <sup>⑥</sup>	Approx. 2.13
	Controller <sup>⑦</sup>	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.

## TYPE NO. GUIDE

**H10330C-xx-C**□

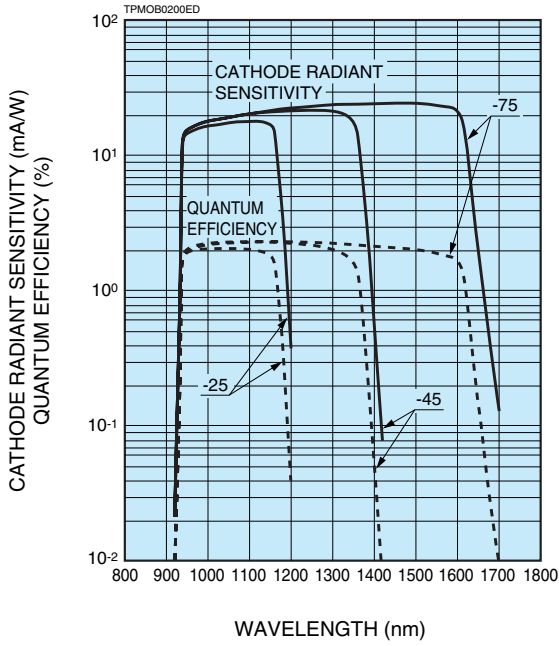
Number in □ indicates power cable specifications

2: For Japan / For North America 3: For EU 4: For China

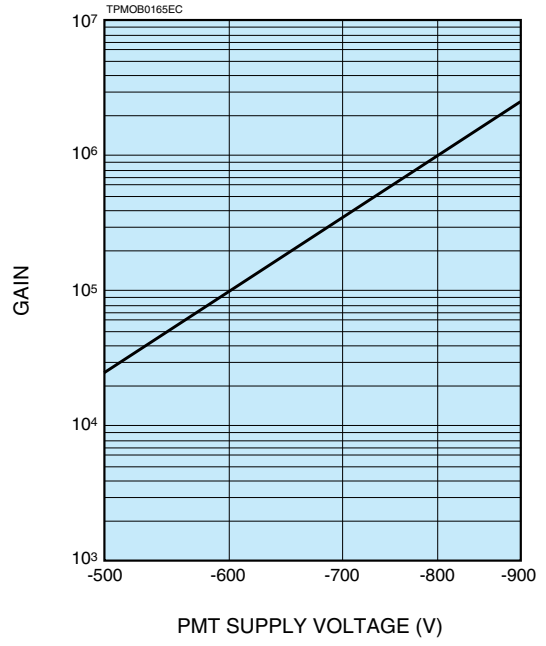
5: For UK 6: For Australia

# CHARACTERISTICS

## ●Spectral response

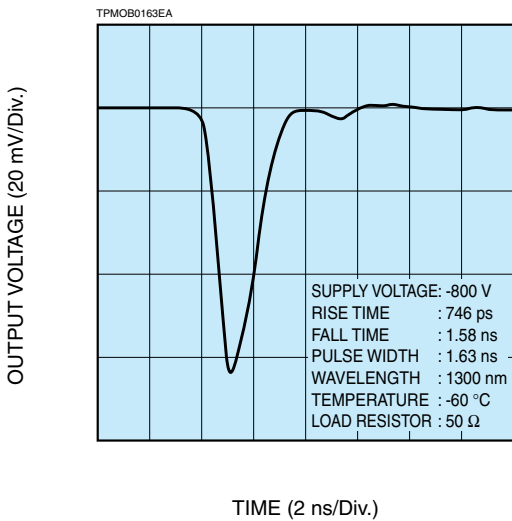


## ●Typical gain

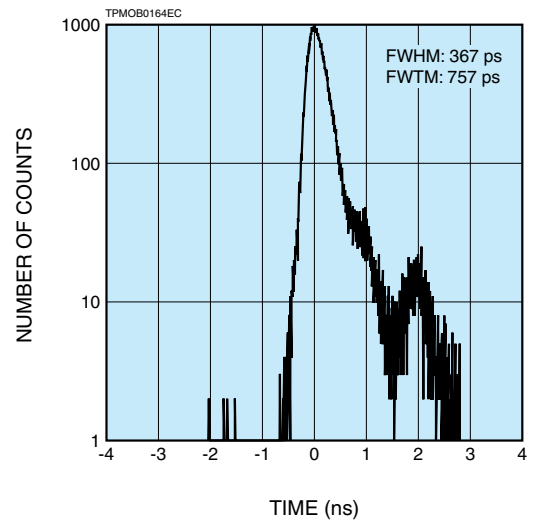


## ●Timing properties

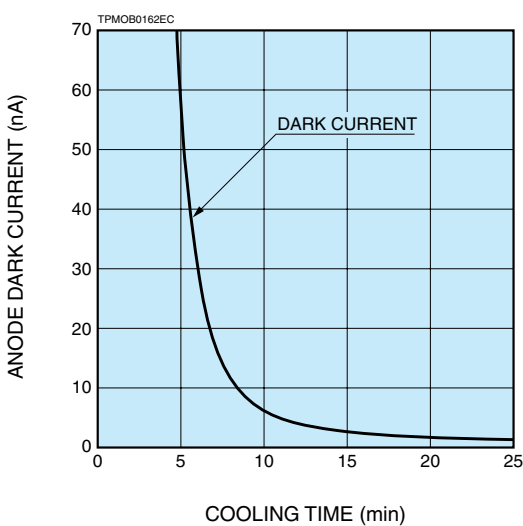
### Waveform



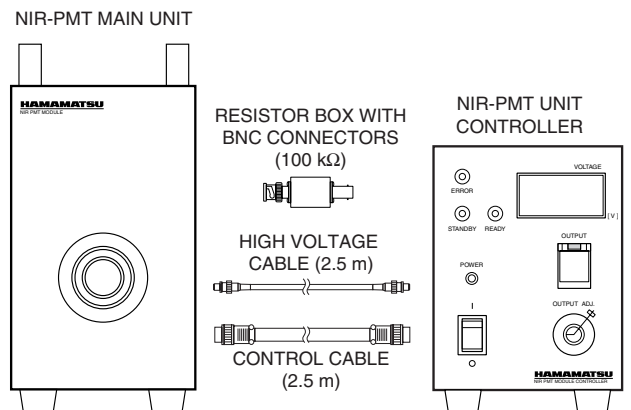
### Transit time spread (T.T.S.)



## ●Dark current vs. cooling time (H10330C-45)

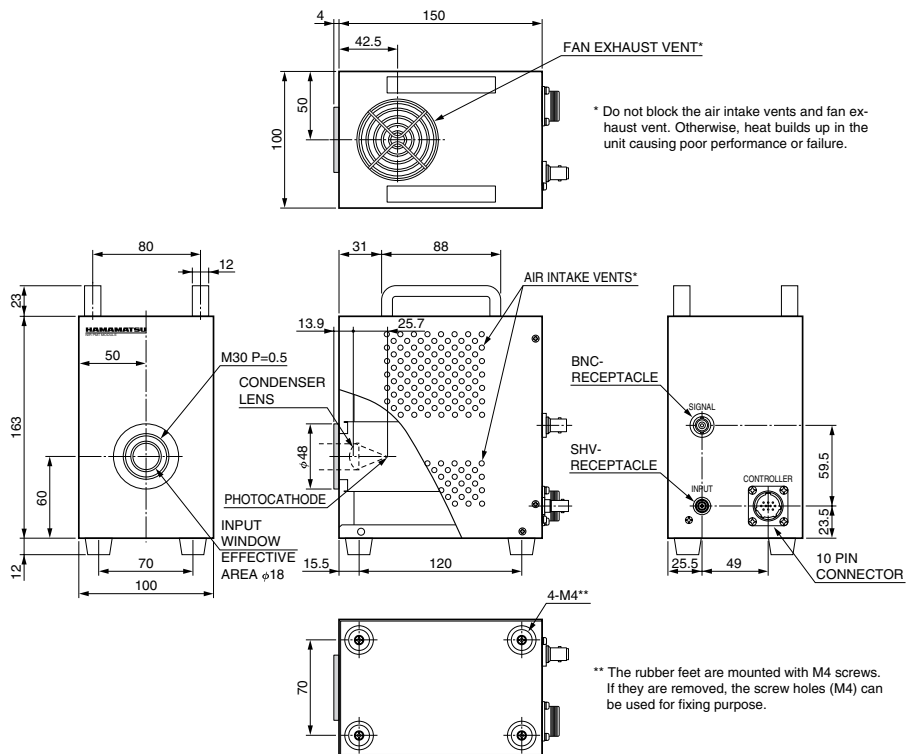


# SYSTEM CONFIGURATION (CONNECTION DIAGRAM)



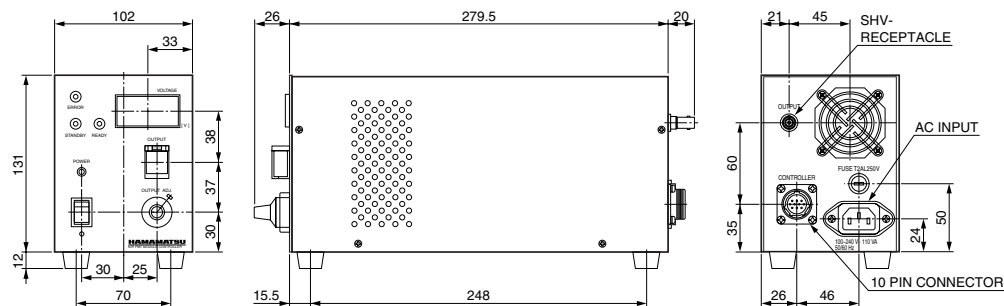
# DIMENSIONAL OUTLINES (Unit: mm)

## ●NIR-PMT main unit



TPMOA0040EB

## ●NIR-PMT unit controller



TPMOA0041ED

# OPTIONS (sold separately)

Adapters to match optical fiber connectors or monochromators are available.

### ●Optical fiber adapters A10463 series

These adapters allow light from an optical fiber to efficiently enter the PMT. Specify an FC type (A10463-01) or SMA type (A10463-02) adapter when ordering.

### ●Monochromator adapter A10464 series

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

### ●Resistor box with BNC connectors A9267 series

A 50 Ω resistor box with BNC connectors (A9267-01) is available.

Use the 100 kΩ resistor box (A9267-02, supplied with H10330C) for use with a lock-in amplifier.

\*Please contact your local Hamamatsu office for any assistance.

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