

APPLICATIONS

- High energy physics
(Neutrino experiments, Cosmic-ray experiments)

FEATURES

- Hemispherical window
- Fast time response
- High stability
- Low dark count



SPECIFICATIONS

Type No.	Diameter (mm) / (inch)	Minimum effective area (mm)	Surface area		Dynode		Weight (g)
			Min. (cm ²)	Typ. (cm ²)	Structure	Number of stages	
R5912	202 / 8	φ190	330	380	Box & Line	10	approx. 1100
R5912-20	202 / 8	φ190	330	380	Box & Line	14	approx. 1100
R5912-100	202 / 8	φ190	330	380	Box & Line	10	approx. 1100
R7081	253 / 10	φ220	470	530	Box & Line	10	approx. 1400
R7081-20	253 / 10	φ220	470	530	Box & Line	14	approx. 1400
R7081-100	253 / 10	φ220	470	530	Box & Line	10	approx. 1400
R12860	508 / 20	φ460	2120	2600	Box & Line	10	approx. 8000

COMMON SPECIFICATIONS

Parameter	Description / Value
Spectral response	300 nm to 650 nm
Peak wavelength	420 nm
Photocathode material	Bialkali
Window material	Borosilicate glass

LARGE PHOTOCATHODE AREA PHOTOMULTIPLIER TUBES

SPECIFICATIONS

Type No.	Cathode sensitivity					Anode sensitivity				
	Luminous (2856 K)		Radiant at 420 nm Typ. (mA/W)	Blue sensitivity index (CS 5-58)		Quantum efficiency at 390 nm Typ. (%)	Luminous (2856 K) Typ. (A/lm)	Radiant at 420 nm Typ. (A/W)	Gain Typ.	Applied voltage for typical gain Typ. (V)
	Min. (μ A/lm)	Typ. (μ A/lm)		Min.	Typ.					
R5912	40	80	80	6.0	10.0	25	800	8.0×10^5	1.0×10^7	1500
R5912-20	40	80	80	6.0	10.0	25	80 000	8.0×10^7	1.0×10^9	1500
R5912-100	80	130	110	12.5	13.5	35	1300	1.1×10^6	1.0×10^7	1500
R7081	40	80	80	6.0	10.0	25	800	8.0×10^5	1.0×10^7	1500
R7081-20	40	80	80	6.0	10.0	25	80 000	8.0×10^7	1.0×10^9	1500
R7081-100	80	130	110	12.5	13.5	35	1300	1.1×10^6	1.0×10^7	1500
R12860	40	80	90	10.0	12.0	30	800	9.0×10^5	1.0×10^7	2000

NOTE: Anode characteristics are measured with the voltage distribution ratio shown below.

Type No.	Maximum rating							Direct Interelectrode capacitances	
	Supply voltage		Average anode current (mA)	Operating ambient temperature (°C)	Storage temperature (°C)	Ambient pressure (Gauge) (MPa)	Anode to last dynode (pF)	Anode to all other dynodes (pF)	
	Anode to cathode (V)	Anode to last dynode (V)							
R5912	2000	300	0.1	-30 to +50	-30 to +50	0.7	approx. 3	approx. 7	
R5912-20	2000	300	0.1	-30 to +50	-30 to +50	0.7	approx. 3	approx. 7	
R5912-100	2000	300	0.1	-30 to +50	-30 to +50	0.7	approx. 3	approx. 7	
R7081	2000	300	0.1	-30 to +50	-30 to +50	0.7	approx. 3	approx. 7	
R7081-20	2000	300	0.1	-30 to +50	-30 to +50	0.7	approx. 3	approx. 7	
R7081-100	2000	300	0.1	-30 to +50	-30 to +50	0.7	approx. 3	approx. 7	
R12860	2500	300	0.1	-30 to +50	-30 to +50	0.8	approx. 21	approx. 35	

Anode sensitivity

(at +25 °C)

Dark current (After 30 min storage in darkness)		Dark count (After 15 hours storage in darkness)		Time response			Single photo-electron (Peak to valley ratio)		Pulse linearity		Type No.
				Rise time	Electron transit time	Transit time spread (FWHM)			at 2 % Deviation	at 5 % Deviation	
Typ. (nA)	Max. (nA)	Typ. (s ⁻¹)	Max. (s ⁻¹)	Typ. (ns)	Typ. (ns)	Typ. (ns)	Min.	Typ.	Typ. (mA)	Typ. (mA)	
100	1000	4000	8000	3.6	54	2.4	1.5	2.8	40	60	R5912
5000	10 000	6000	12 000	4.4	72	3.0	1.5	2.8	30	60	R5912-20
500	1000	6000	10 000	3.6	54	2.4	1.5	2.8	40	60	R5912-100
100	1000	7000	15 000	3.8	62	3.4	1.5	2.8	40	60	R7081
5000	10 000	9000	19 000	5.0	80	3.9	1.5	2.8	30	60	R7081-20
500	1000	8000	16 000	3.8	62	3.4	1.5	2.8	40	60	R7081-100
500	1000	20 000	80 000	6.0	95	2.4	1.5	2.8	20 (100)	40 (150)	R12860

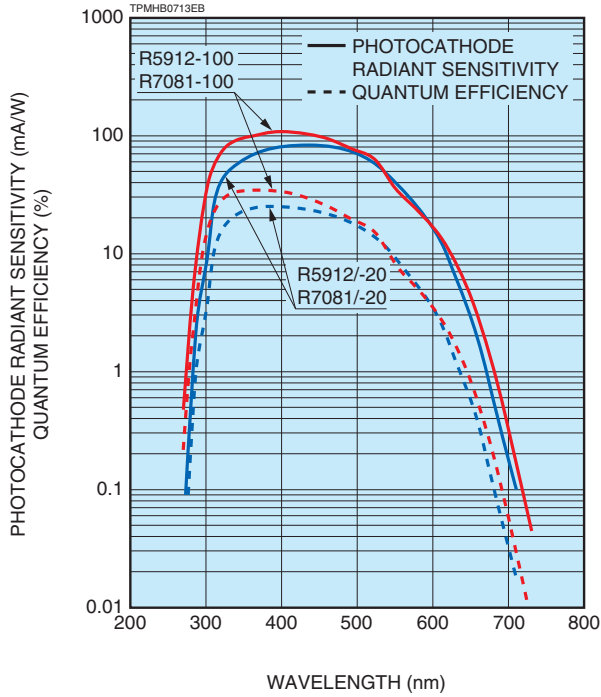
(): Measured with the special voltage distribution ratio (Tapered divider).

Type No.	Supply voltage (V)	Voltage distribution ratio																		
		K: Photocathode Dy: Dynode P: Anode G: Grid Acc: Accelerating electrode																		
		K	Dy1	G	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7(Acc)	Dy8	Dy9	Dy10	P						
R12860	2000	11.5	1	3.5	4	2	2	1	1	1	1	1	1	1						
		Capacitors in μF									0.01	0.01	0.01	0.01						
R12860 (Tapered divider type)	2000	11.5	1	3.5	4	2	2	1	1	1	2	3	2							
		Capacitors in μF									0.01	0.01	0.01	0.01						
		K	Dy1	G2	G1	G3	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	P				
R5912/-100 R7081/-100	1500	16.8	0	0.6	0	3.4	5	3.33	1.67	1	1.2	1.5	2.2	3	2.4					
		Capacitors in μF									0.01	0.01	0.01							
		K	Dy1	G2	G1	G3	Dy2	Dy3	Dy4	Dy5	Dy6	Dy7	Dy8	Dy9	Dy10	Dy11	Dy12	Dy13	Dy14	P
R5912-20 R7081-20	1500	11.3	0	0.6	0	3.4	5	3.33	1.67	1	1	1	1	1	1.2	1.5	2.2	3	2.4	
		Capacitors in μF										0.01	0.01	0.01	0.02	0.02				

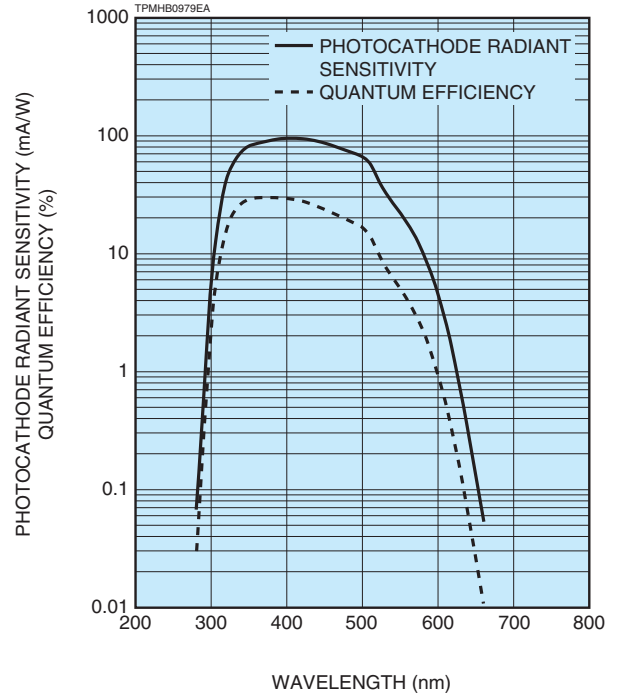
LARGE PHOTOCATHODE AREA PHOTOMULTIPLIER TUBES

SPECTRAL RESPONSE CHARACTERISTICS

- R5912/-20/-100
- R7081/-20/-100

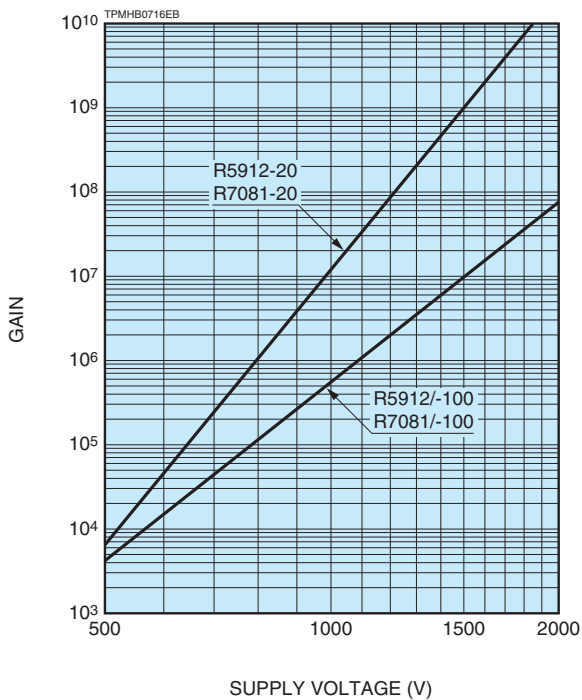


- R12860

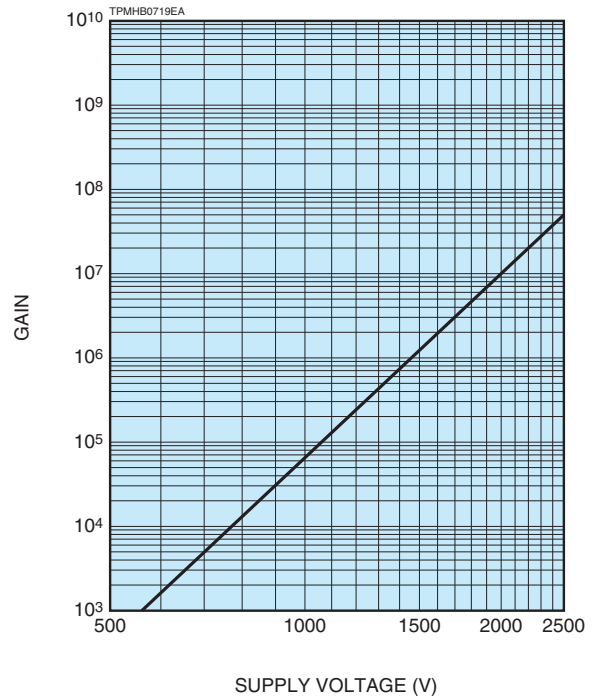


GAIN

- R5912/-20/-100
- R7081/-20/-100

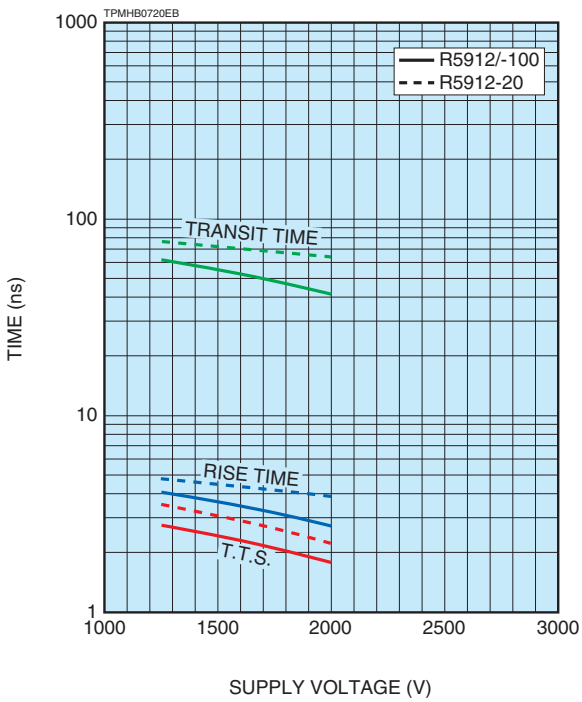


- R12860

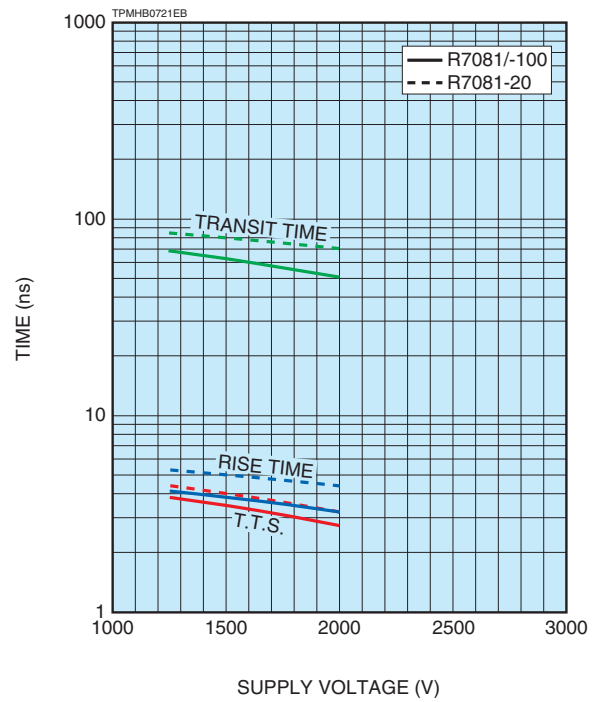


TYPICAL TIME RESPONSE

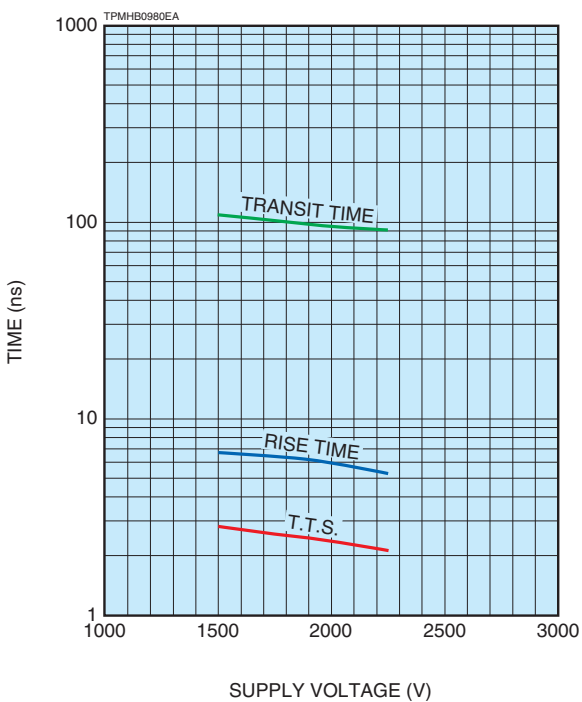
●R5912/-20/-100



●R7081/-20/-100



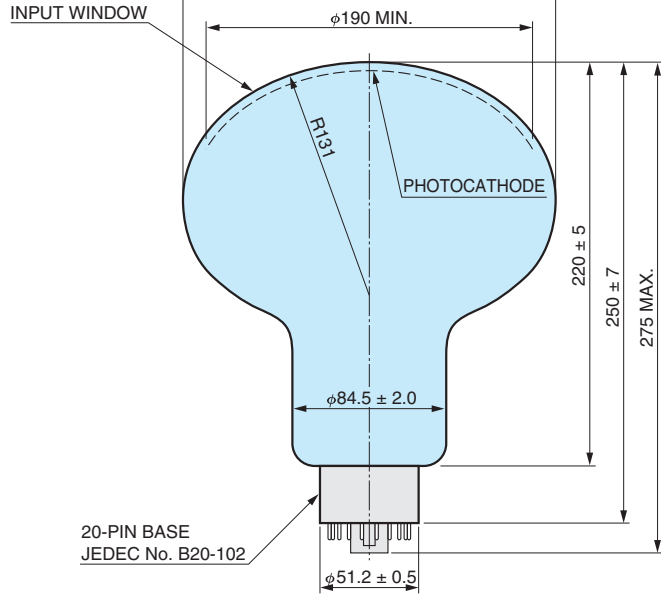
●R12860



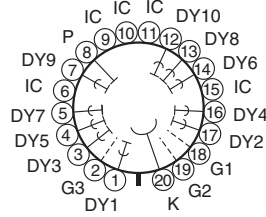
LARGE PHOTOCATHODE AREA PHOTOMULTIPLIER TUBES

DIMENSIONAL OUTLINE (Unit: mm)

●R5912/-20/-100

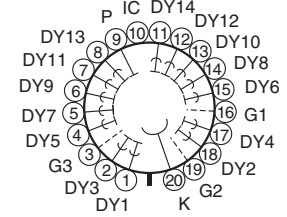


R5912/-100



(Bottom view)

R5912-20

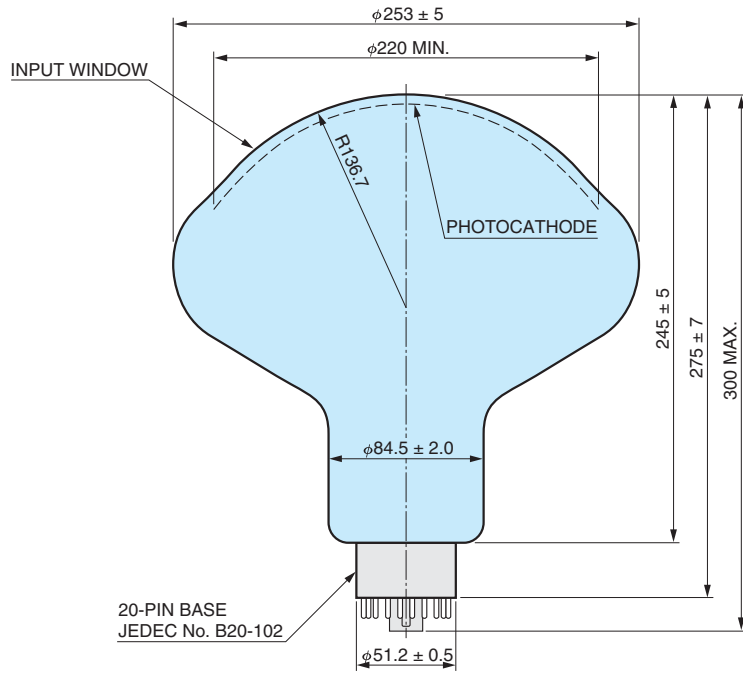


(Bottom view)

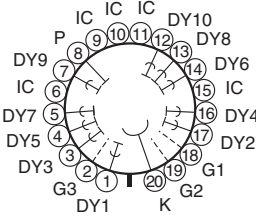
IC: Internal connection
(Do not use)

TPMHA0500EC

●R7081/-20/-100

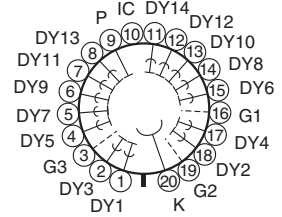


R7081/-100



(Bottom view)

R7081-20

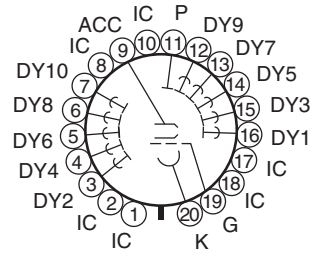
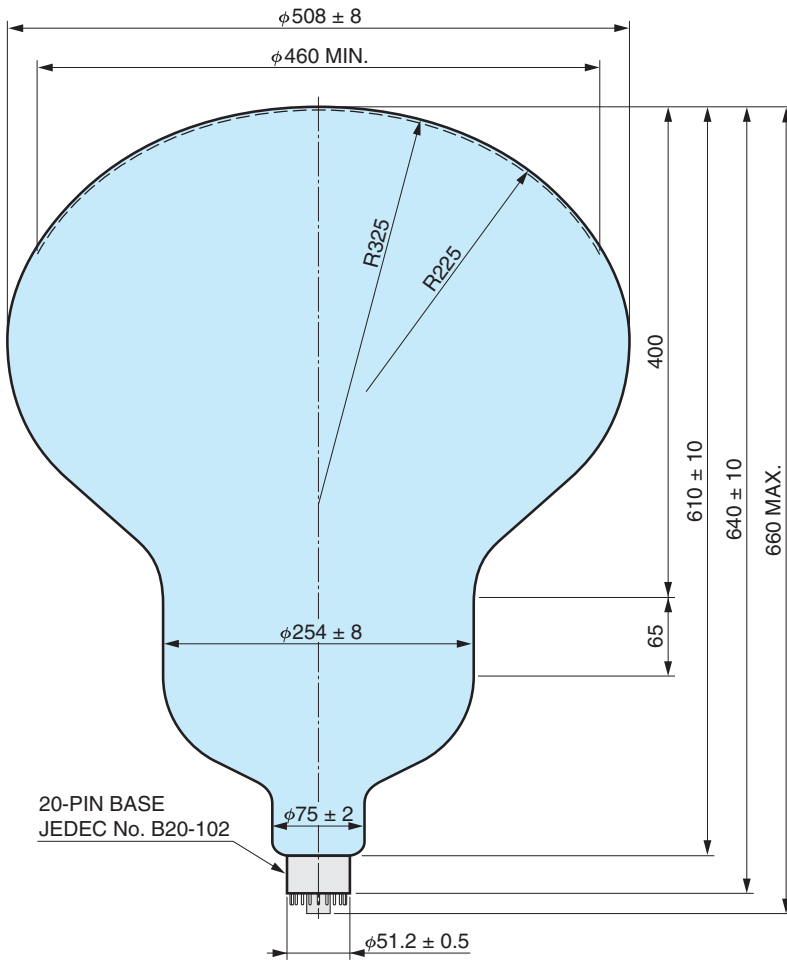


(Bottom view)

IC: Internal connection
(Do not use)

TPMHA0501EC

●R12860



LARGE PHOTOCATHODE AREA PHOTOMULTIPLIER TUBES

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Electron Tube Division

314-5, Shimokanzo, Iwata City, Shizuoka Pref., 438-0193, Japan, Telephone: (81)539/62-5248, Fax: (81)539/62-2205

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 08807, 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)8152-265-8 E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, 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, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, 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 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw

TPMH1376E01
MAR. 2019 IP