

## FEATURES

- High quantum efficiency: GaAsP / GaAs photocathode
- Built-in thermoelectric cooler
- Low noise
- Built-in protection circuit (See Figure 3)



▲H7422 + A7423 (Heatsink with Fan)

## SPECIFICATIONS

(at +25 °C)

Parameter				H7422-40 H7422A-40	H7422P-40 H7422PA-40	H7422-50 H7422A-50	H7422P-50 H7422PA-50	Unit	
Input voltage				+11.5 to +15.5				V	
Max. input voltage for main unit				+18				V	
Max. input current for main unit ①				62				mA	
Max. input voltage for thermoelectric cooler				2.6				V	
Max. input current for thermoelectric cooler				2.2				A	
Max. output signal current				2				μA	
Max. control voltage				+0.9 (Input impedance 100 kΩ)				V	
Recommended control voltage adjustment range ②				+0.5 to +0.8				V	
Effective area				φ5				mm	
Photocathode material				GaAsP		GaAs		—	
Spectral response				300 to 740		380 to 900		nm	
Peak sensitivity wavelength				520		630		nm	
Cathode	Quantum efficiency	at peak quantum efficiency wavelength	Min.	40		14		%	
			Typ.	45		19			
	at 800 nm	Min.	—		11		%		
		Typ.	—		15				
Radiant sensitivity	at peak quantum efficiency wavelength	Min.	168		70		mA/W		
		Typ.	189		95				
	at 800 nm	Min.	—		71				
		Typ.	—		97				
Anode	Radiant sensitivity	at peak quantum efficiency wavelength	Min.	1.0 × 10 <sup>5</sup> ③	1.7 × 10 <sup>5</sup> ⑤	4.2 × 10 <sup>4</sup> ③	7.0 × 10 <sup>4</sup> ⑤	A/W	
			Typ.	1.9 × 10 <sup>5</sup> ③	3.8 × 10 <sup>5</sup> ⑤	9.5 × 10 <sup>4</sup> ③	1.9 × 10 <sup>5</sup> ⑤		
		at 800 nm	Min.	—		4.3 × 10 <sup>4</sup>			7.1 × 10 <sup>4</sup>
			Typ.	—		9.7 × 10 <sup>4</sup>			1.9 × 10 <sup>5</sup>
	Dark current ③④	Typ.		0.4		0.5		nA	
		Max.		1.0		1.3			
	Dark count ④⑤	Typ.		—		100		s <sup>-1</sup>	
		Max.		—		300			
Gain ③	Min.		6.0 × 10 <sup>5</sup>		1.0 × 10 <sup>6</sup>		—		
	Typ.		1.0 × 10 <sup>6</sup>		2.0 × 10 <sup>6</sup>				
Rise time ③			Typ.		1.0		ns		
Ripple noise ③⑥ (peak to peak)			Max.		0.6		mV		
Settling time ⑦			Typ.		0.2		s		
Operating ambient temperature ⑧				+5 to +35				°C	
Storage temperature ⑧				-20 to +50				°C	
Weight				Approx. 455				g	

① Input voltage = +15.0 V, Control voltage = +0.8 V in darkness, just after protection circuit works.

② Under protection circuit is active, Vcont outputs +15 V and high voltage turn off. (Output impedance 33 kΩ)

Status of protection operation can be checked by monitoring Vcont voltage.

③ Control voltage = +0.8 V ④ After 30 min storage in darkness, PMT setting temperature 0 °C, used with C8137-02 and A7423

⑤ Plateau voltage = control voltage ⑥ Cable RG-174/U, Cable length 450 mm, Load resistance = 1 MΩ, Load capacitance = 22 pF

⑦ The time required for the output to reach a stable level following a change in the control voltage from +1.0 V to +0.5 V.

⑧ No condensation

# PHOTOSENSOR MODULES H7422 SERIES

## COOLING SPECIFICATIONS

Parameter	H7422 series	Unit
Cooling method	Thermoelectric cooling	—
Max. cooling temperature ( $\Delta T$ ) <sup>⑨</sup>	35	°C
Time to reach Max. cooling temperature <sup>⑨</sup>	Approx. 5	min

⑨ Input current to thermoelectric cooler = 2 A

Figure 1: Cathode radiant sensitivity

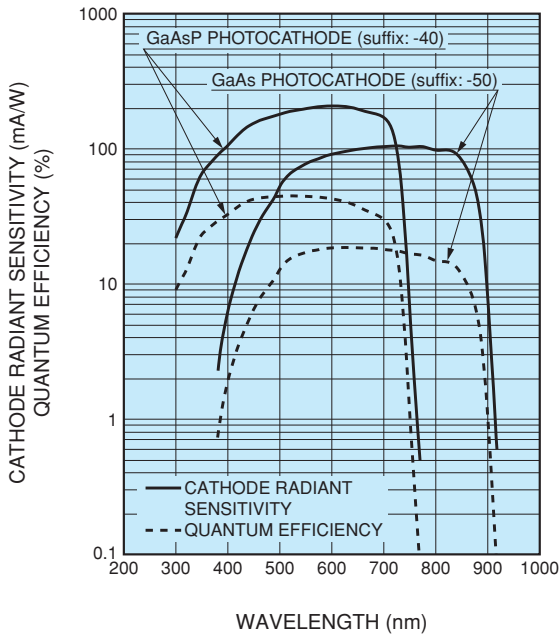


Figure 2: Gain

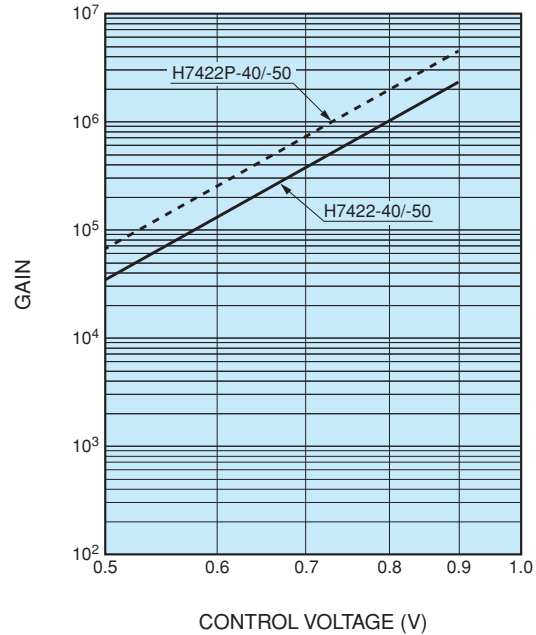
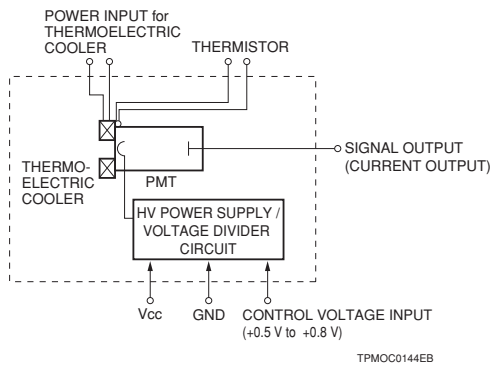
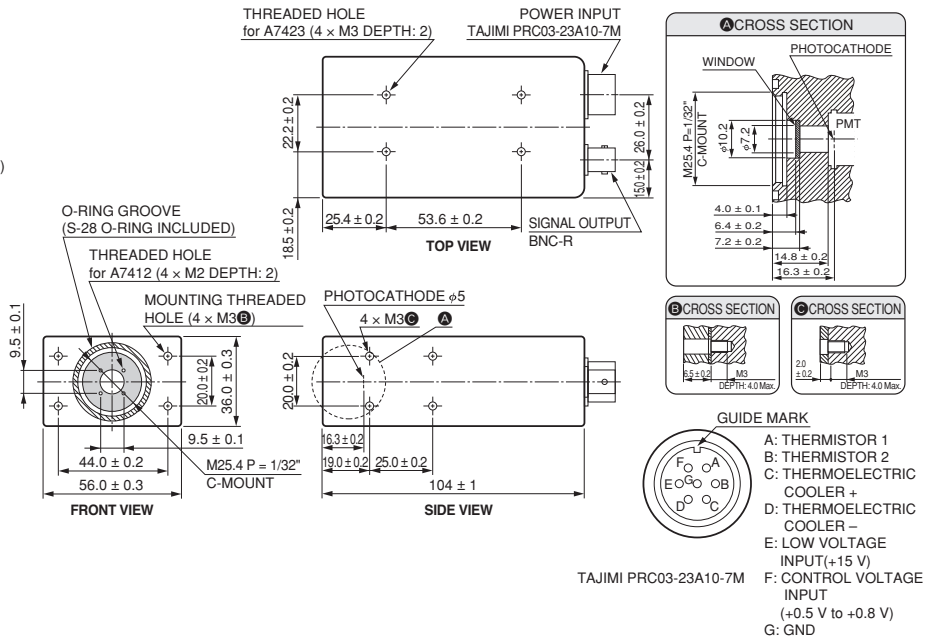


Figure 3: Block diagram



To prevent damage by excessive light, the H7422-40/-50 has a protection circuit that automatically turns off high voltage if the output current exceeds the preset current limit (approximately 10  $\mu A$ ). This protection circuit works whenever the preset current limit is exceeded, even for a very short moment. For example, in applications such as laser scanning microscopes, the output current may momentarily exceed the preset current limit of the protection circuit. This will trigger the protection circuit and interrupt measurement. For such applications, if the average output current is lower than the PMT module maximum rating (2  $\mu A$ ), we offer the H7422A-40/-50 series that uses a protection circuit with the preset current limit changed to approximately 50  $\mu A$  and so allows continuous operation without turning off high voltage even if a momentarily high output occurs.

Figure 4: Dimensional outline (Unit: mm)

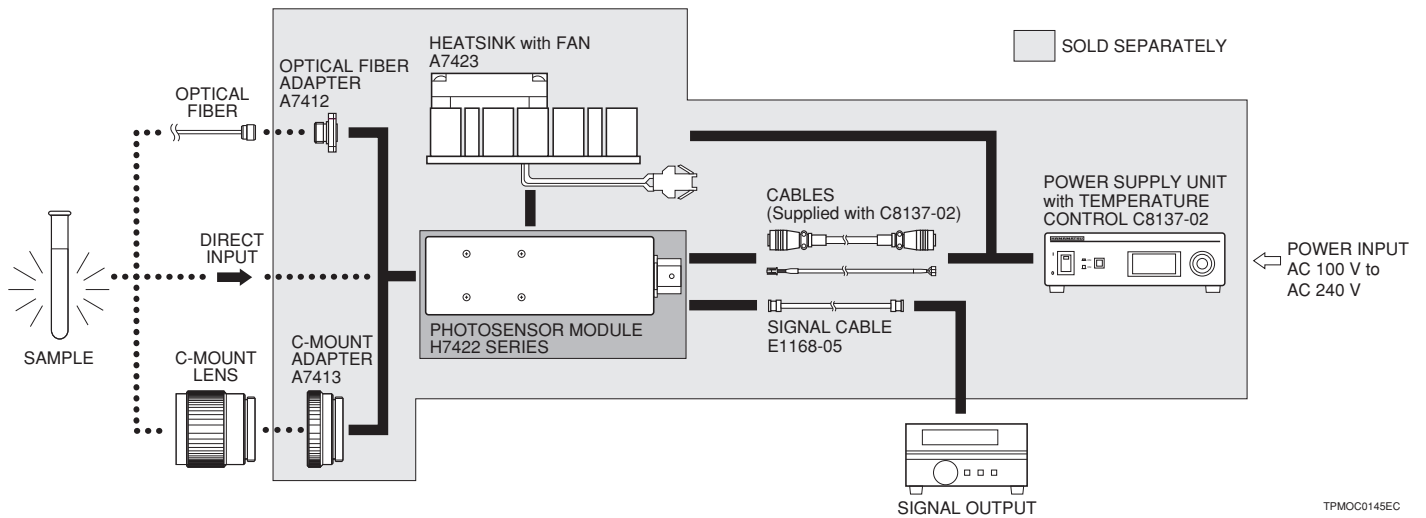


TAJIMI PRC03-23A10-7M

GUIDE MARK

A: THERMISTOR 1  
 B: THERMISTOR 2  
 C: THERMOELECTRIC COOLER +  
 D: THERMOELECTRIC COOLER -  
 E: LOW VOLTAGE INPUT(+15 V)  
 F: CONTROL VOLTAGE INPUT (+0.5 V to +0.8 V)  
 G: GND

## H7422 SERIES OPTION



### ● Heatsink with Fan A7423

The temperature of the H7422 outer case rises due to the thermoelectric cooler housed in the case. The A7423 heatsink efficiently radiates away this heat to prevent a temperature rise in the H7422. The A7423 can be easily installed onto the H7422 with four M3 screws. Apply a heat conductive grease onto the joint surface shared by the H7422 and A7423.

Parameter	Value	Unit	
Input voltage	12	V	
Input current	During lock	140	mA
	During operation	90	mA
Operating voltage	10.2 to 13.8	V	
Weight	128	g	

### ● Signal cable E1168-05

This signal cable is terminated with a BNC connector for easily connecting the H7422 to external equipment.

### ● Optical fiber adapter (FC type) A7412

The A7412 is an FC type optical fiber connector that attaches to the light input window of the H7422. The A7412 can easily be secured in place with four M2 screws.

### ● C-mount adapter A7413

The A7413 mount adapter is used when a C-mount lens protruding 4 mm or more from the flange-back must be installed onto the H7422.

### ● Power supply unit with temperature control C8137-02

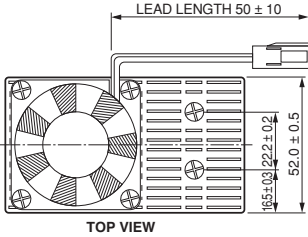
The C8137-02 is a power supply unit with a temperature control function. Just connecting to an AC source of 100 V to 240 V generates the output voltages for the thermoelectric cooler and the A7423 fan, needed for operating the H7422. The photomultiplier tube temperature can be maintained to 0 °C by monitoring the thermistor and regulating the output current for the thermoelectric cooler. Control voltage can be varied by a knob on the front panel.

Parameter	Value	Unit
Max. cooling temperature ( $\Delta T$ )	35	°C
Setting cooling temperature (preset at factory)	0	°C
AC input voltage	100 to 240	V
Input voltage frequency	50 / 60	Hz
Power consumption	30	V·A
Main circuit output voltage	+15	V
Max. current for thermoelectric cooler	2.2	A
Output voltage for fan	12	V
Control voltage adjustment range	0 to +0.9	V
Weight	1.1	kg

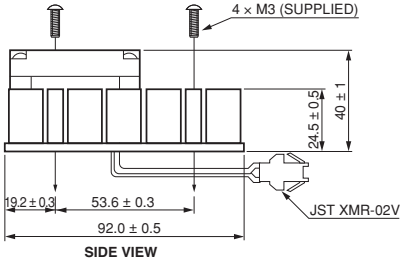
# PHOTOSENSOR MODULES H7422 SERIES

## OPTIONS (Unit: mm)

### ●Heatsink with fan A7423



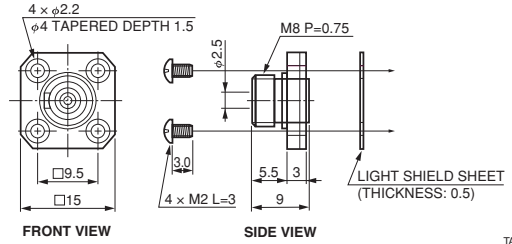
TOP VIEW



SIDE VIEW

TACCA0188ED

### ●Optical fiber adapter (FC type) A7412

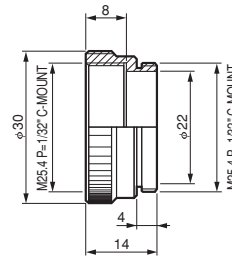


FRONT VIEW

SIDE VIEW

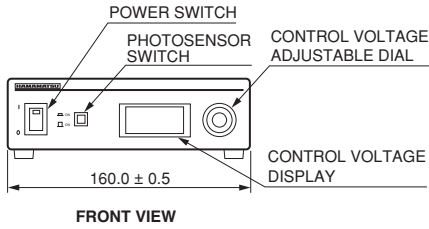
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### ●C-mount adapter A7413

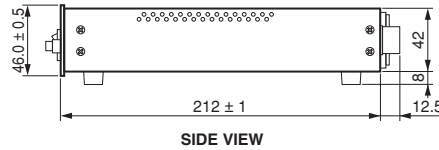


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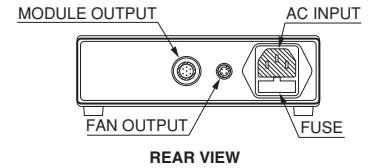
### ●Power supply unit with temperature control C8137-02



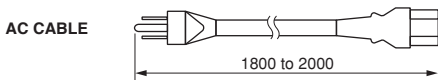
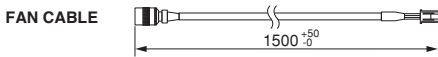
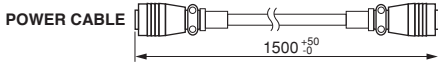
FRONT VIEW



SIDE VIEW

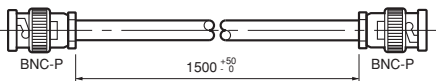


REAR VIEW



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### ●Signal cable E1168-05



TACCA0148EA

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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](mailto:usa@hamamatsu.com)

Germany: HAMAMATSU PHOTONICS DEUTSCHLAND GMBH.: Arzbergerstr. 10, 82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: [info@hamamatsu.de](mailto: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](mailto:infos@hamamatsu.fr)

United Kingdom: HAMAMATSU PHOTONICS UK LIMITED: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294838, Fax: (44)1707-325777 E-mail: [info@hamamatsu.co.uk](mailto: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](mailto:info@hamamatsu.se)

Italy: HAMAMATSU PHOTONICS ITALIA S.R.L.: Strada della Moia, 1 int. 6, 20044 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: [info@hamamatsu.it](mailto: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](mailto:hpc@hamamatsu.com.cn)

Taiwan: HAMAMATSU PHOTONICS TAIWAN CO., LTD.: 8F-3, No.158, Section 2, 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](mailto:info@hamamatsu.com.tw)

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