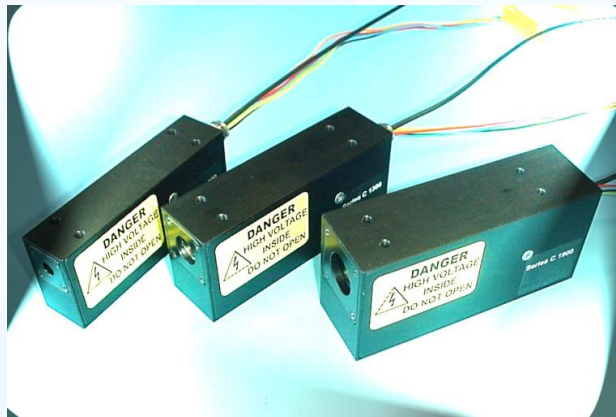


# **Customized Photon Multiplier Module Head PV- HM 9XZ / 13XZ /19XZ series**

*Preliminary Datasheet*



**- High Voltage Power Supply incorporated -  
For Counting and DC Application**

## **APPLICATIONS**

- ❖ Photon counting
- ❖ Luminescence & fluorescence spectroscopy
- ❖ Microplate readers
- ❖ Clinical diagnostics
- ❖ DNA & cell analysis
- ❖ Particle measurements
- ❖ Industrial spectroscopy
- ❖ Nucleic acid amplification (PCR)

## **FEATURES**

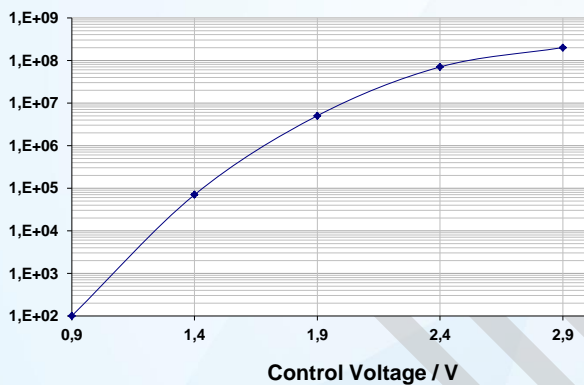
- ❖ Extremely low background noise
- ❖ Best low light level detection limits
- ❖ High dynamic range & gain
- ❖ Low microphonic & magnetic sensitivity
- ❖ Compact size & rugged design
- ❖ Multiple photocathode and window selections
- ❖ Plug and play for shortest design-in and time-to-market
- ❖ Customizations and added features available

The Channel Photomultiplier module HM - series is designed for an easy to use application for both photoncounting and analogue dc operating modes. It contains an adjustable high voltage supply and a Customized Photo Multiplier of the C - series. The module offers also the possibility to apply an external gate function for time correlated photon counting or active quenching control.

Strong variations in light levels are possible due to the high dynamic range of the installed CPM.

The exceptional low noise and high sensitivity facilitates detection of extremely weak light levels.

Current Amplification/vs Control Voltage



The modules can be equipped with various Customized Photo Multipliers in respect to window photocathode-material and active area.

### Specification Parameters

Parameter	Min	Typ	Max	Unit
Supply Current			0.2	A
Supply Voltage	4.9	5.0	5.5	V
Settling Time (time to stabilize HV after supply voltage applied)			1	s
Gain <sup>(1)</sup>			1 x 10 <sup>8</sup>	
GATE settling time t <sub>gate</sub> -> high to low		150		µs
GATE settling time t <sub>gate</sub> -> low to high		150		µs
High Voltage pre-adjusted		2400		V
High Voltage ADJUST <sup>(2)</sup>	0		2900	V
Monitor Voltage Out		$\frac{V_{ChannelEntrance}}{1000}$		V
Operating Temperature	5		40	°C
Storage Temperature	-20		50	°C

- 1) by internal potentiometer (or by external control voltage 0...3 V via ext. OpAmp circuit, see Fig.2)  
2) adjusted voltage refers to V<sub>ChannelEntrance</sub>

### Absolute Maximum Ratings

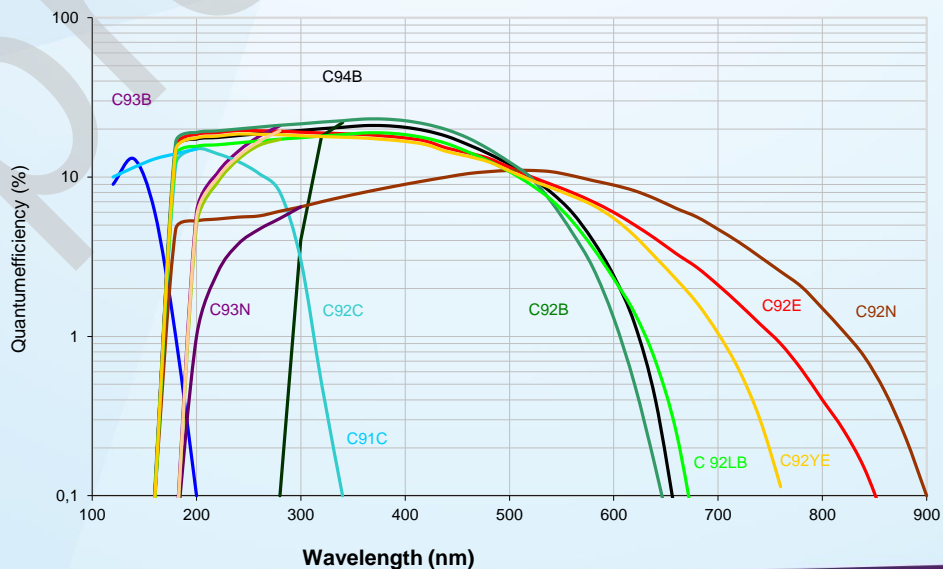
Input Voltage	+5.5V
Max. Anode Current	10µA for max. 30 seconds
Operating Temperature	+5 to +40°C
Storage Temperature	-20 to +50°C
Weight	~ 225g /290g / 370g (HM 9XZ / HM 13XZ / HM 19XZ)

List of Module Variations

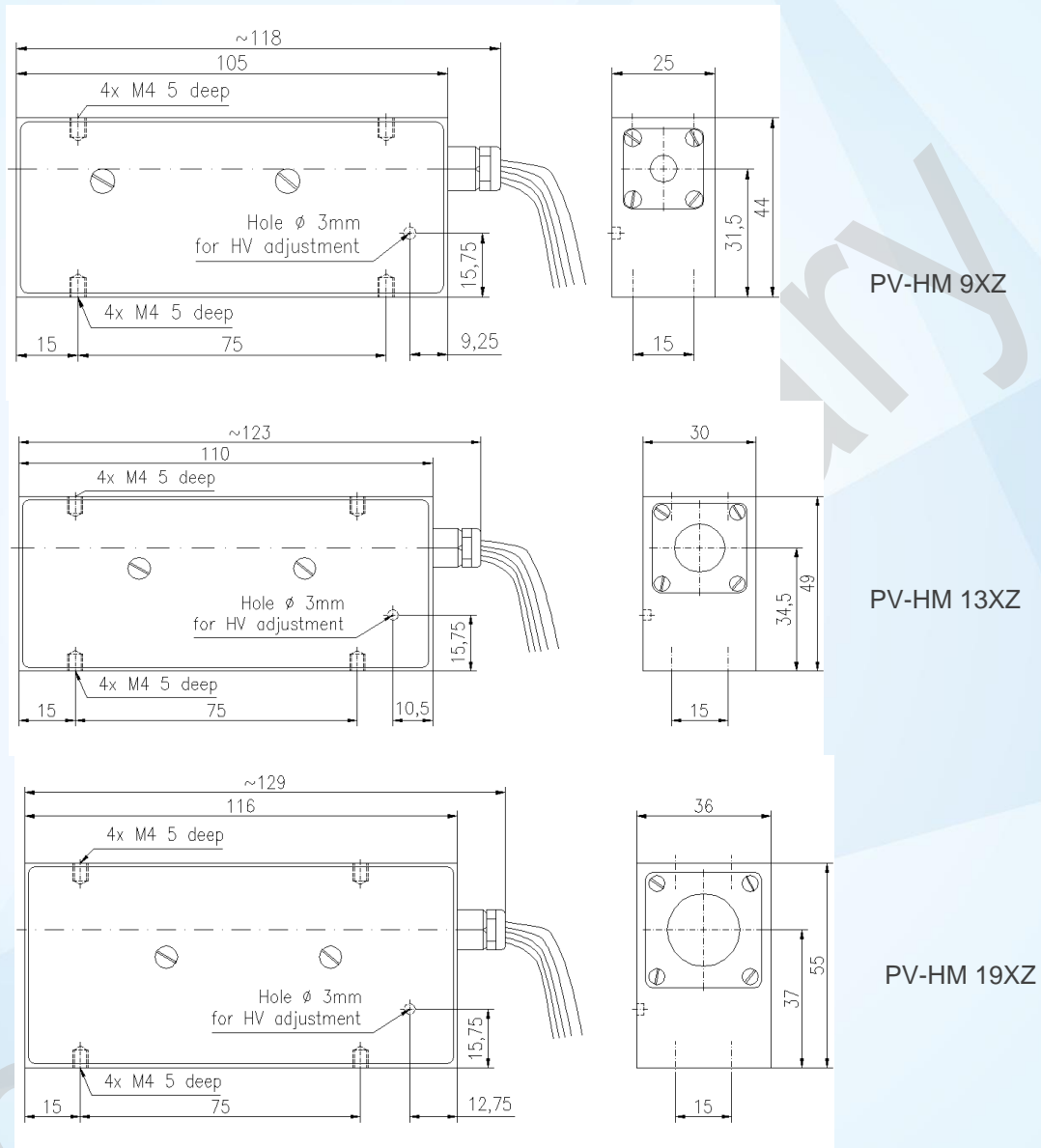
Model (also order no.)	Detector type	Photocathode diameter	Window material	Photocathode material	Spectral response / nm	Quantum efficiency	Typ. dark counts per second (cps)	Typ. dark current (pA) @ 5x10 <sup>7</sup> Gain
HM 91CI HM131CI HM191CI	Customized Photo Multiplier (CPM)	HM 9XZ min. 5mm	MgF <sub>2</sub> (1)	Csl (CI)	115-200	Peak Value 20% typical (ext. red MA: 10% typ.)	0.1 0.4 1	2 8 20
HM 92B HM132B HM192B			Quartz (2)	Bialkali (B)	165-650		10 40 100	80 320 800
HM 93B HM133B HM193B			UV Glass (3)	Bialkali (B)	185-650		10 40 100	80 320 800
HM 92E HM132E HM192E			Quartz	S20 (E)	165-850		100 400 1000	1.000 4.000 10.000
HM 93E HM133E HM193E			UV Glass	S20 (E)	185-850		100 400 1000	1.000 4.000 10.000
HM 92N HM132N HM192N			Quartz	S25 (N)	165-900		500 2000 5000	5.000 20.000 50.000
HM 93N HM133N HM193N			UV Glass	S25 (N)	185-900		500 2000 5000	5.000 20.000 50.000
HM 92LB HM132LB HM192LB			Quartz	Low Noise Bialkali (LB)	165-650		3 10 25	50 100 250
HM 93LB HM133LB HM193LB			UV Glass	Low Noise Bialkali (LB)	185-650		3 10 25	50 100 250
HM 92YE HM132YE HM192YE			Quartz	Yellow Enhanced (YE)	165-750		10 40 100	80 320 800
HM 93YE HM133YE HM193YE			UV Glass	Yellow Enhanced (YE)	185-750		10 40 100	80 320 800

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Subject to change without notice

Spectral response of various CPM types



Module Dimensions (mm) for Different CPM Formats



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Subject to change without notice

<b>Window Material = X</b>		<b>Photocathode Type = Z</b>	
MgF <sub>2</sub>	=1	Cesium Iodid	=CI
Quartz	=2	Cesium Tellurid	=C
UV-Glass	=3	Bialkali	=B
Borosilicat	=4	LowNoise Bialkali	=LB
		S20	=E
		S25	=N
		YellowEnhanced	=YE