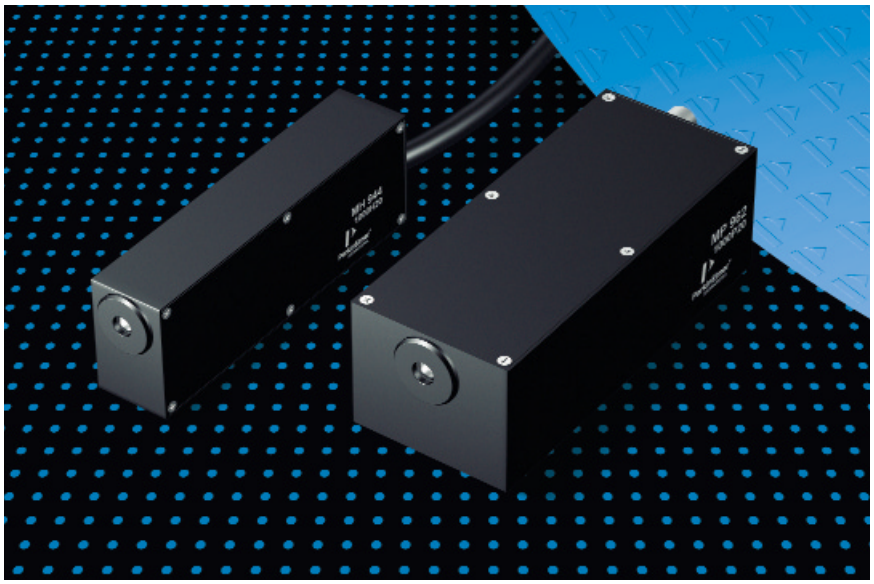
MH Series CPM Modules

Ultra High Sensitivity Channel Photomultiplier Head Including High Voltage Power Supply



Description

The Channel Photomultiplier module MH 900 series is designed for an easy to use application for both photoncounting and dc operating modes. It contains an adjustable high voltage supply and a Channel Photomultiplier of the C900 series.

The module also offers the possibility to apply an external gate function for time correlated photon counting or active quenching control (only bialkali types). 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.

Features

- High dynamic range
- No cooling required
- Very high stability in noise level
- Adjustable gain
- High stability over time
- Gateable CPM input for time resolved measurements
- Extremely fast high-light recovery times
- Rugged and compact design
- 5 volts operating voltage
- Monitor voltage output

PerkinElmer™ optoelectronics.

MH 900 Series
1/3” CPM Module

Technical Specifications

*Model *)* (also order no.)	Detector type	Installed CPM type	Photocathode diameter	Photocathode material	Window material	Spectral response / nm	Quantum efficiency	Equivalent noise input, ENI (W)	Dark current (pA) @ 5 x 10^7 gain	*Model *) P-Version* (also order no.)	Installed CPM type	Dark counts per second, cps (typ.)
MH 942	CPM-Channel Photomultiplier	C942	min. 5 mm	Bialkali	Quartz	165-650	20% typical (ext. red MA: 10% typ.)	$1x10^{-17}$	80	***MH 942 P***	C942 P	10
MH 943		C943		Bialkali	UV glass	185-650		$1x10^{-17}$	80	***MH 943 P***	C943 P	10
MH 952		C952		Low noise Multialk.	Quartz	165-750		$2.5x10^{-17}$	250	***MH 952 P***	C952 P	40
MH 953		C953		Low noise Multialk.	UV glass	185-750		$2.5x10^{-17}$	250	***MH 953 P***	C953 P	40
MH 962		C962		Multialk.	Quartz	165-850		$4x10^{-17}$	1000	***MH 962 P***	C962 P	100
MH 963		C963		Multialk.	UV glass	185-850		$4x10^{-17}$	1000	***MH 963 P***	C963 P	100
MH 972		C972		Extended red Multialk.	Quartz	165-900		$1.5x10^{-16}$	5000	***MH 972 P***	C972 P	400
MH 973		C973		Extended red Multialk.	UV glass	185-900		$1.5x10^{-16}$	5000	***MH 973 P***	C973 P	400
MH 982		C982		Low noise Bialkali	Quartz	165-650		$6x10^{-18}$	25	***MH 982 P***	C982 P	3
MH 983		C983		Low noise Bialkali	UV glass	185-650		$6x10^{-18}$	25	***MH 983 P***	C983 P	3

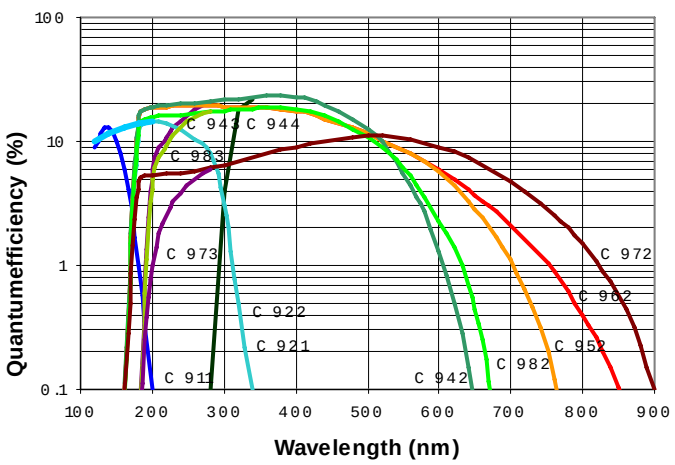
*) Additional models on request

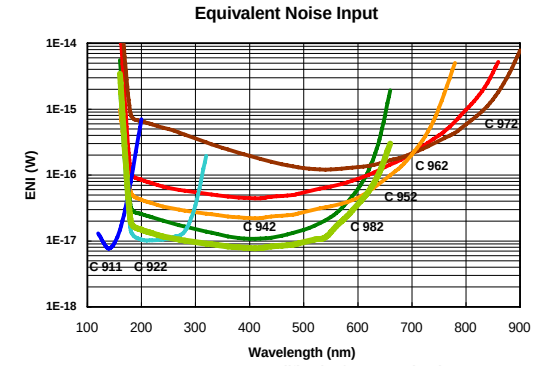
Operating Conditions

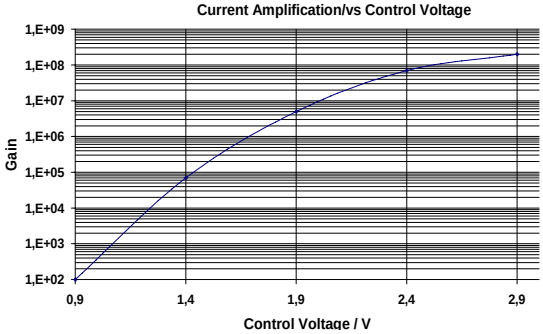
Input voltage	5 V to +5.5 V DC
Input current	< 200 mA
Max. linear anode current	(DC linearity limit) 10% of bias current
Max. anode current*	10 µA (max. 30 sec.)
Gating input	TTL, active high (switches cathode potential higher than channel entrance potential)
Monitor voltage out	$\lvert V_{ChannelEntrance}\rvert/1000$
High voltage adjust	by internal potentiometer, |0 ... 2900 V| $V_{ChannelEntrance}$
	by external control voltage (0 ... 3 V),via OpAmp circuit
Operating temperature	5 to 40 °C
Storage temperature	-20 to 50 °C
Weight:	approx. 225 g

* for long term operation: max average anode current of <100 nA is recommended

Performance Characteristics







MH 1300 Series
1/2” CPM Module

Technical Specifications

*Model *)* (also order no.)	Detector type	Installed CPM type	Photocathode diameter	Photocathode material	Window material	Spectral response / nm	Quantum efficiency	Equivalent noise input, ENI (W)	Dark current (pA) @ 5 x 10^7 gain	*Model *) P-Version* (also order no.)	Installed CPM type	Dark counts per second, cps (typ.)
MH 1342	CPM-Channel Photomultiplier	C1342	min. 9 mm	Bialkali	Quartz	165-650	20% typical (ext. red MA: 10% typ.)	$2x10^{-17}$	320	***MH 1342P***	C1342P	40
MH 1343		C1343		Bialkali	UV glass	185-650		$2x10^{-17}$	320	***MH 1343P***	C1343P	40
MH 1352		C1352		Low noise Multialk.	Quartz	165-750		$4x10^{-17}$	1000	***MH 1352P***	C1352P	160
MH 1353		C1353		Low noise Multialk.	UV glass	185-750		$4x10^{-17}$	1000	***MH 1353P***	C1353P	160
MH 1362		C1362		Multialk.	Quartz	165-850		$8x10^{-17}$	4000	***MH 1362P***	C1362P	400
MH 1363		C1363		Multialk.	UV glass	185-850		$8x10^{-17}$	4000	***MH 1363P***	C1363P	400
MH 1372		C1372		Extended red Multialk.	Quartz	165-900		$3x10^{-16}$	20000	***MH 1372P***	C1372P	2000
MH 1373		C1373		Extended red Multialk.	UV glass	185-900		$3x10^{-16}$	20000	***MH 1373P***	C1373P	2000
MH 1382		C1382		Low noise Bialkali	Quartz	165-650		$1x10^{-17}$	100	***MH 1382P***	C1382P	10
MH 1383		C1383		Low noise Bialkali	UV glass	185-650		$1x10^{-17}$	100	***MH 1383P***	C1383P	10

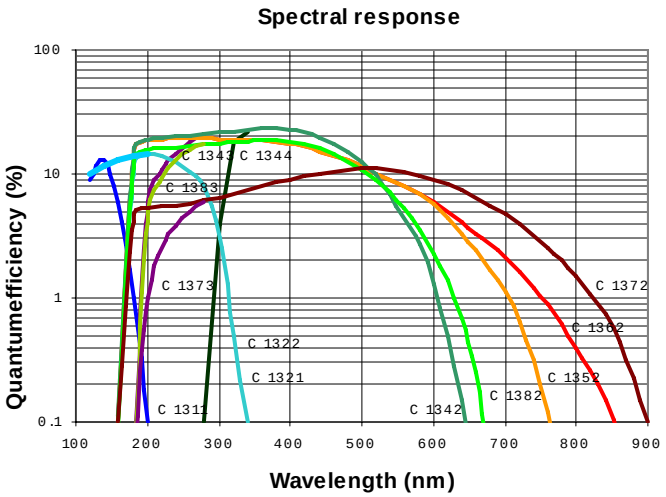
*) Additional models on request

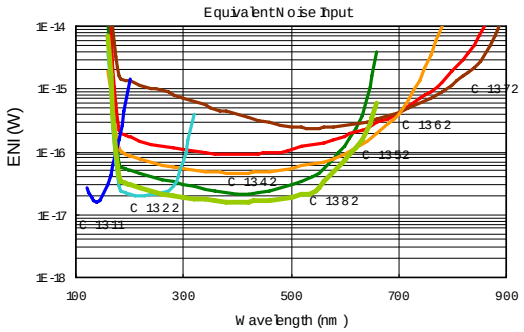
Operating Conditions

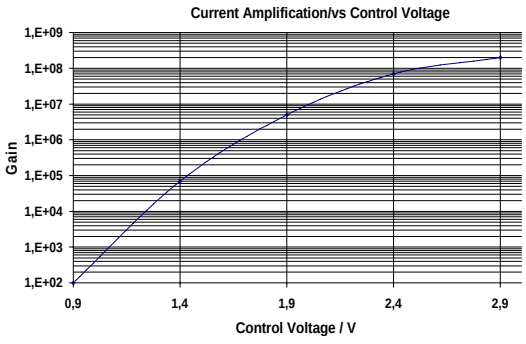
Input voltage	5 V to +5.5 V DC
Input current	< 200 mA
Max. linear anode current	(DC linearity limit) 10% of bias current
Max. anode current*	10 µA (max. 30 sec.)
Gating input	TTL, active high (switches cathode potential higher than channel entrance potential)
Monitor voltage out	$\lvert V_{ChannelEntrance}\rvert/1000$
High voltage adjust	by internal potentiometer, |0 ... 2900 V| $V_{ChannelEntrance}$ by external control voltage (0 ... 3 V),via OpAmp circuit
Operating temperature	5 to 40 °C
Storage temperature	-20 to 50 °C
Weight:	approx. 290 g

* for long term operation: max average anode current of <100 nA is recommended

Performance Characteristics







MH 1900 Series
3/4” CPM Module

Technical Specifications

*Model *)* (also order no.)	Detector type	Installed CPM type	Photocathode diameter	Photocathode material	Window material	Spectral response / nm	Quantum efficiency	Equivalent noise input, ENI (W)	Dark current (pA) @ 5 x 10^7 gain	*Model *) P-Version* (also order no.)	Installed CPM type	Dark counts per second, cps (typ.)
MH 1942	CPM-Channel Photomultiplier	C1942	min. 5 mm	Bialkali	Quartz	165-650	20% typical (ext. red MA: 10% typ.)	$3x10^{-17}$	800	***MH 1942P***	C942 P	100
MH 1943		C1943		Bialkali	UV glass	185-650		$3x10^{-17}$	800	***MH 1943P***	C943 P	100
MH 1952		C1952		Low noise Multialk.	Quartz	165-750		$8x10^{-17}$	2500	***MH 1952P***	C952 P	400
MH 1953		C1953		Low noise Multialk.	UV glass	185-750		$8x10^{-17}$	2500	***MH 1953P***	C953 P	400
MH 1962		C1962		Multialk.	Quartz	165-850		$1x10^{-16}$	10000	***MH 1962P***	C962 P	1000
MH 1963		C1963		Multialk.	UV glass	185-850		$1x10^{-16}$	10000	***MH 1963P***	C963 P	1000
MH 1972		C1972		Extended red Multialk.	Quartz	165-900		$5x10^{-16}$	50000	***MH 1972P***	C972 P	5000
MH 1973		C1973		Extended red Multialk.	UV glass	185-900		$5x10^{-16}$	50000	***MH 1973P***	C973 P	5000
MH 1982		C1982		Low noise Bialkali	Quartz	165-650		$2x10^{-17}$	250	***MH 1982P***	C982 P	25
MH 1983		C1983		Low noise Bialkali	UV glass	185-650		$2x10^{-17}$	250	***MH 1983P***	C983 P	25

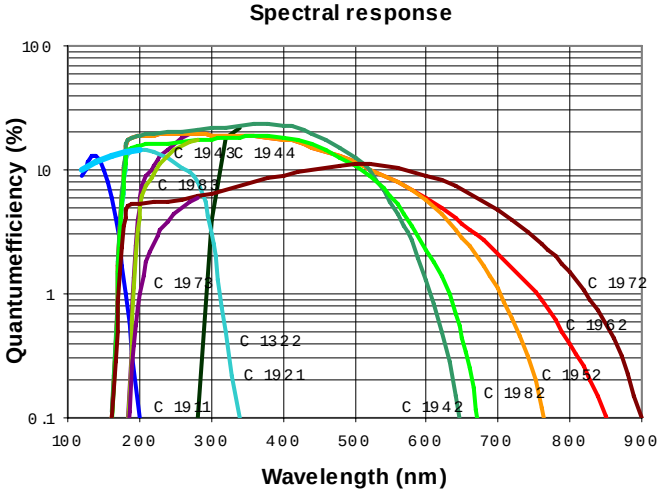
*) Additional models on request

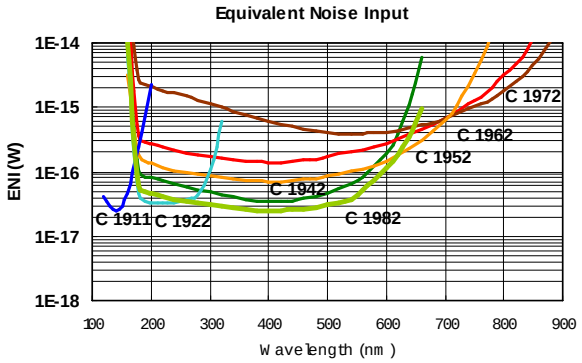
Operating Conditions

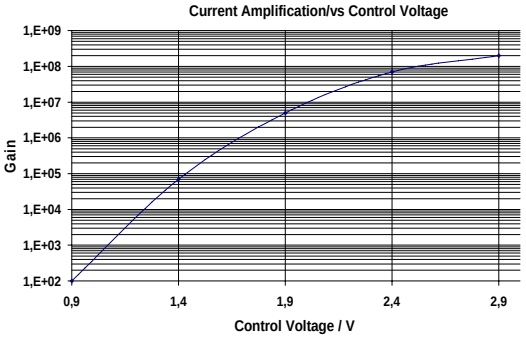
Input voltage	5 V to +5.5 V DC
Input current	< 200 mA
Max. linear anode current	(DC linearity limit) 10% of bias current
Max. anode current*	10 µA (max. 30 sec.)
Gating input	TTL, active high (switches cathode potential higher than channel entrance potential)
Monitor voltage out	$\lvert V_{ChannelEntrance}\rvert/1000$
High voltage adjust	by internal potentiometer, |0 ... 2900 V| $V_{ChannelEntrance}$
	by external control voltage (0 ... 3 V),via OpAmp circuit
Operating temperature	5 to 40 °C
Storage temperature	-20 to 50 °C
Weight:	approx. 370 g

* for long term operation: max average anode current of <100 nA is recommended

Performance Characteristics

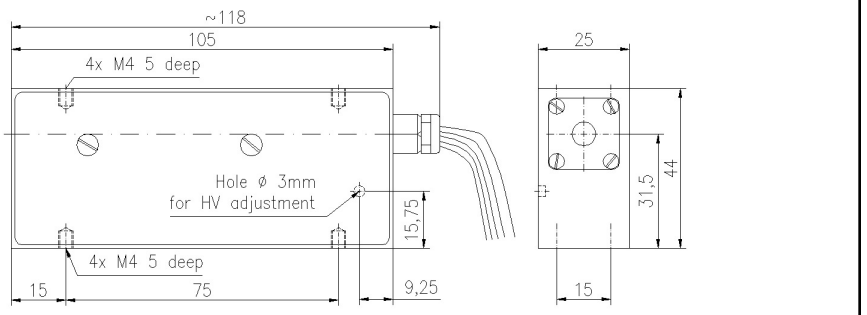




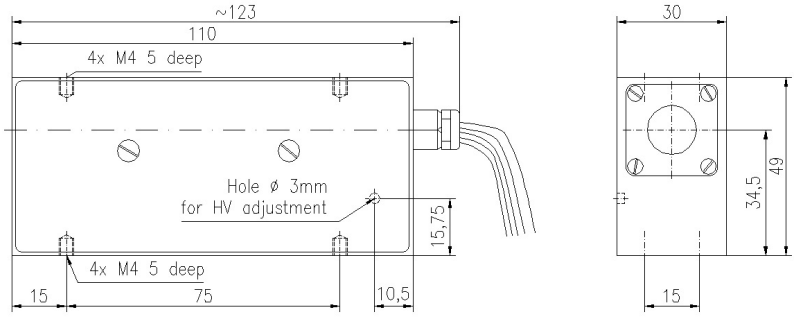


Dimensions (mm)

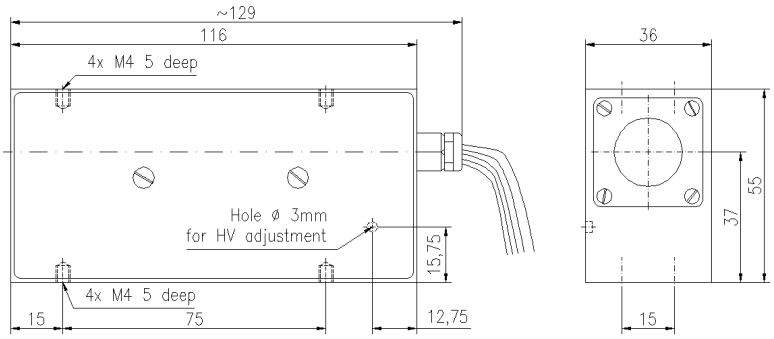
MH 900 Series



MH 1300 Series



MH 1900 Series



Connections

Red	5 V
Black	Gnd
Yellow	Monitor voltage (Vch-ent)
Green	optional (with ext. OpAmp):
	External control voltage HV-supply (0 ... 3 V)
Coax (brown)	External Gate in (only bialkali CPMs)
Coax (black)	Anode signal out (shielding to be connected to ground !)

· CAUTION: HIGH VOLTAGE WARNING

This product operates at high voltage. Extreme care must be taken to ensure operator safety and to avoid damage to other instruments. Avoid direct contact with the entrance window of the built in CPM when high voltage is applied. Avoid placing conductive material close to the cathode.

Ensure that no light levels are applied, generating higher anode currents than specified.

All given values are nominal/typical @ 20 °C ambient temperature; specification subject to change without notice

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