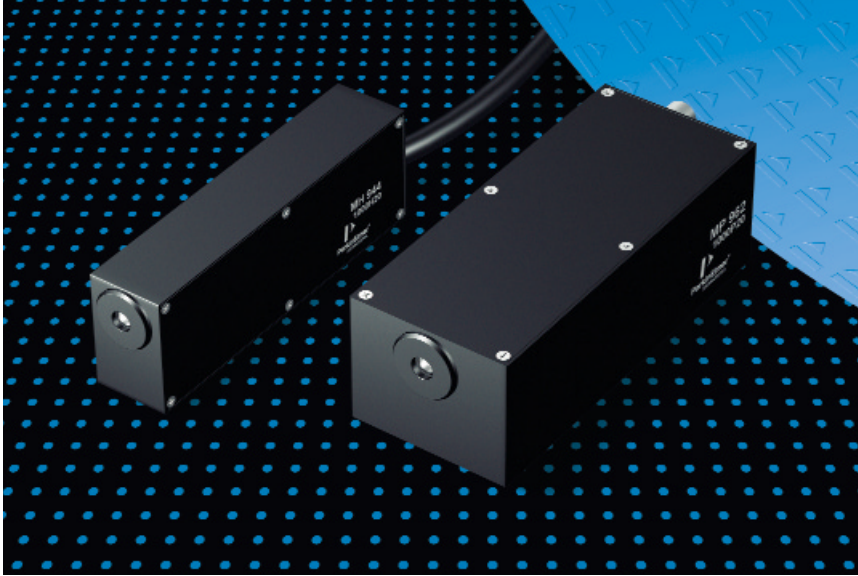


MH Series CPM Modules

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

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 ⁶ 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

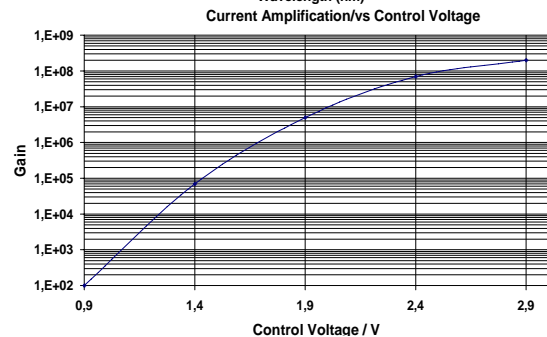
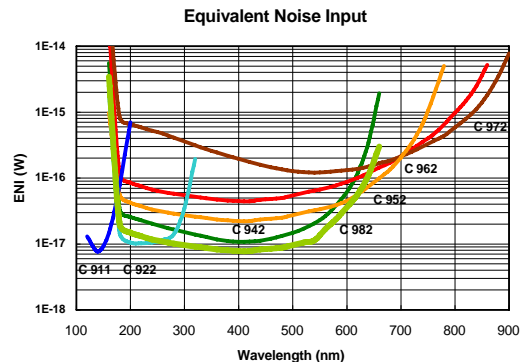
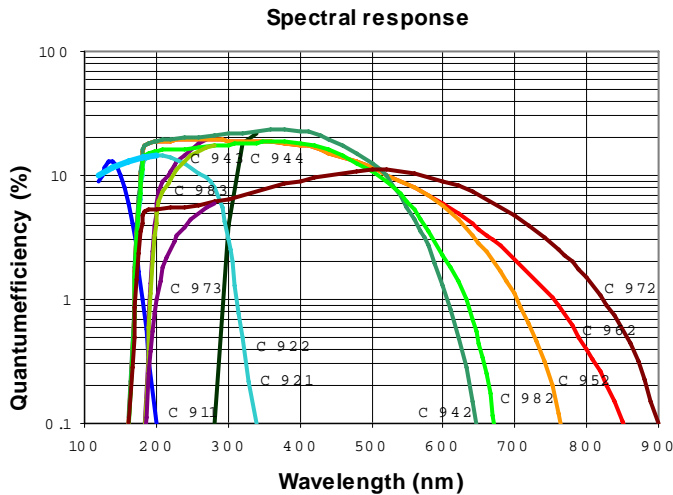
*) Additional models on request

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	$ V_{\text{ChannelEntrance}} /1000$
High voltage adjust	by internal potentiometer, 0 ... 2900 V $V_{\text{ChannelEntrance}}$ 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



Technical Specifications

**MH 1300 Series
1/2" CPM Module**

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 min. 9 mm	C1342		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

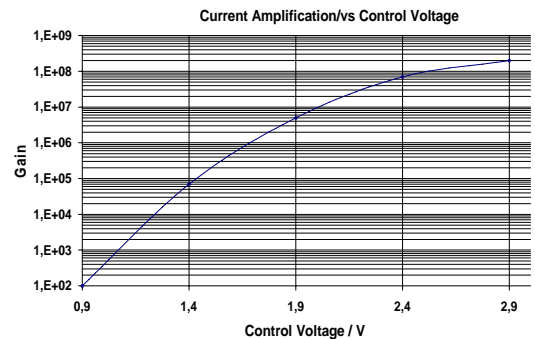
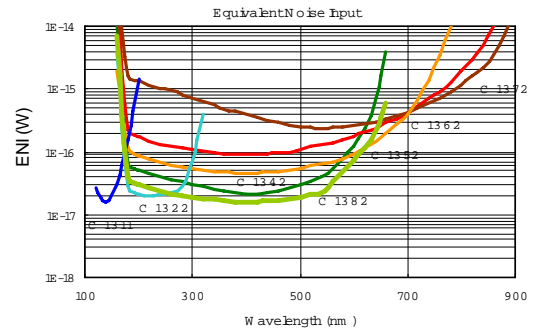
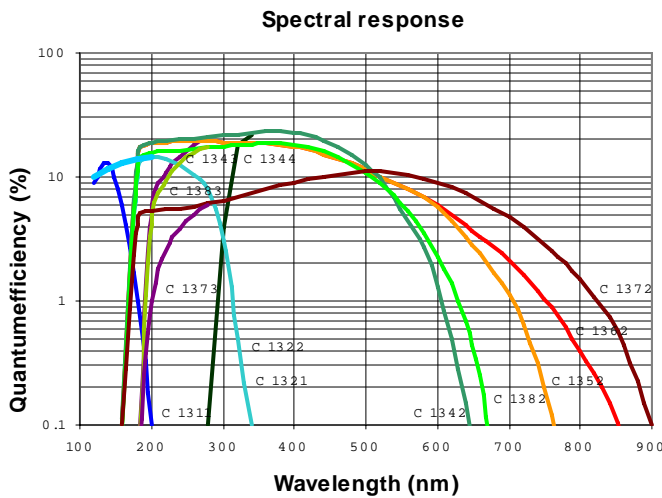
*) Additional models on request

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	V _{ChannelEntrance} /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

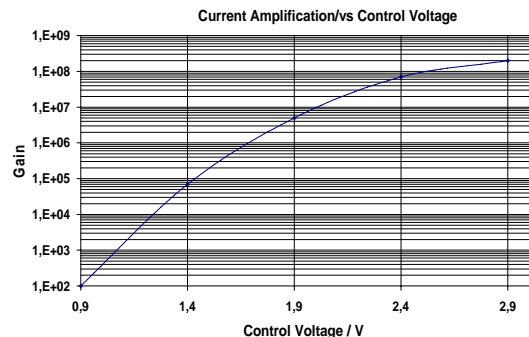
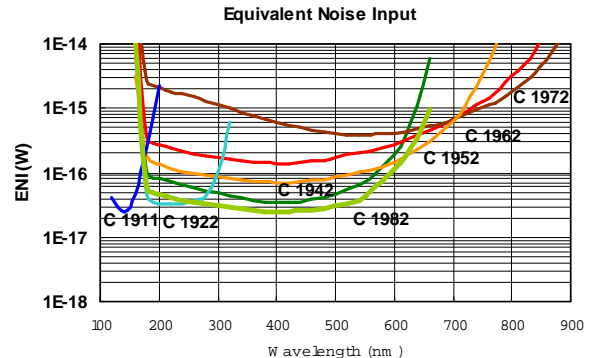
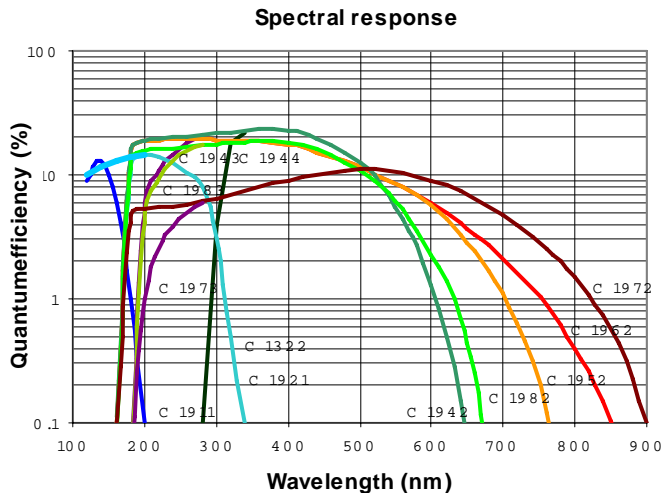
*) Additional models on request

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	V _{ChannelEntrance} /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

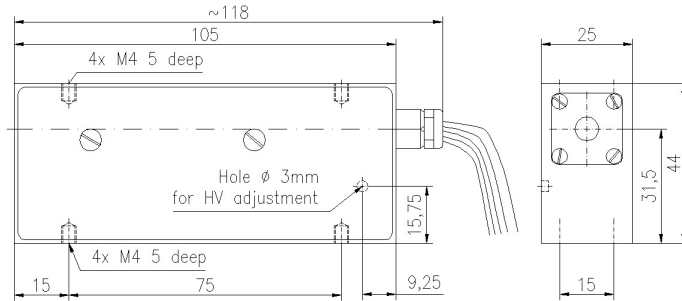
* for long term operation: max average anode current of <100 nA is recommended

Performance Characteristics

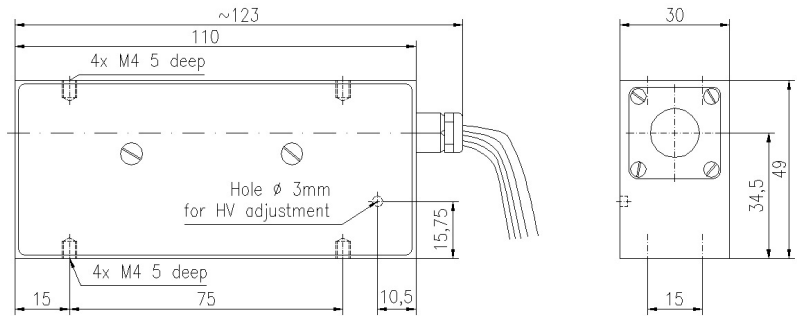


Dimensions (mm)

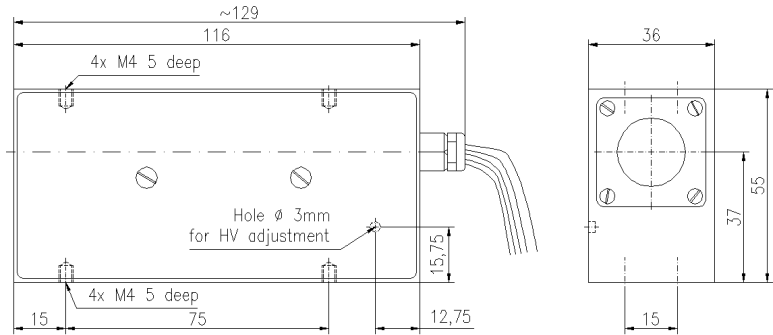
MH 900 Series



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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