

**1.25kV MCP + 4kV SCINTILLATOR PSU
FLOATING AT UP TO 10 kV**



HFD Series

Application:

MCP + SCINT detectors for mass spectrometers & electron microscopes

- 10kV isolation
- Remote, ground referenced voltage programming
- 24V ground referenced supply
- High stability MCP supply, (temp-co <200ppm)
- MCP voltage monitor
- Flashover & short circuit protected
- Scint voltage clamped to protect the scintillator



These power supplies, based on the standard HF series (data sheet HF Series refers) are intended to power detectors where a Microchannel Plate is directly coupled to a Scintillator to make a composite detector. The one unit provides the HV for both sections of the detector, and can be floated on voltages up to ± 10 kV. These units use differential feedback techniques to allow the 24 volt power, control and monitor signals to be at ground potential.

The control input sets the MCP voltage up to 1.25kV, while the Scint voltage follows the MCP voltage, but is clamped at approximately 4.75kV above the MCP voltage. This output clamp also helps protect the Scintillator in the event of arcing.

ELECTRICAL SPECIFICATION: HFD SERIES

UNIT TYPE	MCP OUTPUT	SCINTILLATOR OUTPUT	ISOLATION	OUTPUT RIPPLE	INJECTED RIPPLE ¹	SIZE (mm)	WEIGHT (kg)
HFD005PAA010	112V to 1.25kV 100 μ A	MCP Volts x4.5 Clamped @ 4.75kV	± 10 kV	MCP <150mV pk to pk SCINT <500mV pk to pk	<50mV (pk-pk)	185 x 120 x 60	1.5

1) ripple injected into the power supply providing the floating voltage, measured assuming load capacitance of 1000 pF.

The critical MCP voltage, for setting the gain of the detector, is directly controlled by the 10V control input. The Scintillator voltage is X4 the MCP volts, on top of the MCP voltage, so with an MCP voltage of 1kV the Scintillator will be at 4kV (i.e. 4kV above the MCP voltage.)

We manufacture a large number of these supplies, customised for different detector characteristics.

The ratio of MCP voltage to Scintillator Voltage, and final Scintillator clamping voltage and Zout can readily be customised for your specific detector application. Please consult the factory with your details.

Input:	+24V dc $\pm 10\%$ <0.7A. 0V input common to chassis.
Control of output at Ground Potential:	- 0V to +10V for 0% to 100% $\pm 3\%$, (Zin = 100Kohm) MCP Voltage - INTERNAL or EXTERNAL potentiometer—see options—option code PR
MCP Voltage monitor:	0V to +10V $\pm 3\%$ for 0% to 100%. (Zout= 10k)
MCP Temp co-efficient:	<0.02% / °C
MCP Drift (after 1 hour warm up):	<0.1% per hour
SCINT o/p Voltage:	MCP X4.5 $\pm 5\%$ clamped at 4.75kV $\pm 15\%$ Clamp Temp co <650ppm/°C
Line regulation:	<0.2% for 1V change in input voltage
Load regulation:	<0.2% for 25% to 100% MCP voltage
Protection (all outputs):	Protected against intermittent arcing and continued short circuit to ground

HFD Series

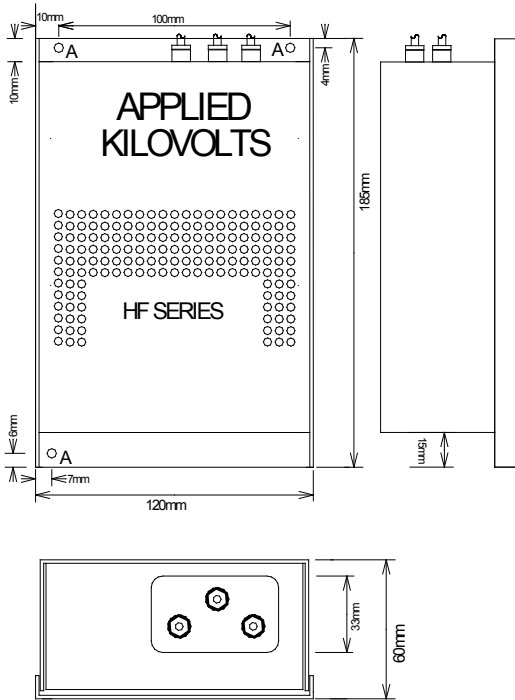
MECHANICAL SPECIFICATION

Mountings:	3 off M4 clearance holes—see outline drg
Input & control:	Molex 0.2" 12 way connector (24V power, control and monitor are all at Ground potential)
Output:	By three 0.5m flying screened (shielded) leads type URM43 labelled 'INPUT', 'MCP', 'SCINT'

ENVIRONMENTAL SPECIFICATION

Temperature, operating:	+10°C to +50°C	Humidity (RH) <30°C non-condensing:	80% maximum
Temperature, storage:	-35°C to +85°C	Humidity (RH) >30°C non-condensing:	Decrease linearly to 50% at 40°C
Altitude, operating:	Up to 2,000m	Altitude, storage:	Up to 18,000m

The unit is to be supplied from a current limited supply providing 24V dc, impulse limited to overvoltage Category I (of IEC60364-4-443).
For use in an environment of pollution degree 2.



PIN ASSIGNMENTS

1	nc	7	Voltage Control i/p ²
2	+24V dc input	8	TTL Inhibit (H= Inhibit)
3	Voltage Monitor o/p	9	Signal ground
4	Control Link: See diagram ¹	10	Supply 0V
5	Control Link: See diagram ¹	11	Status o/p o/c=OK
6	Control Link: See diagram	12	nc

Notes:

- The internal reference and potentiometer to enable internal or external potentiometer programming of the HFD Series, are only fitted on the PR option code versions. (See order code details above)
- Control Voltage must be between -0.5V & 10.2V

The Molex pins are part no 8500108 & the 12 pin socket 10011124.

INTERNAL POTENTIOMETER

□ 1
+24V □ 2
V Mon □ 3
□ 4
□ 5
□ 6
□ 7
Inhibit □ 8
0V Signal □ 9
0V Pwr □ 10
Status o/p □ 11
□ 12

EXTERNAL 0 to 10V

○ □ 1
+24V ○ □ 2
V Mon ○ □ 3
□ 4
□ 5
□ 6
0 – 10V Control ○ □ 7
Inhibit ○ □ 8
0V signal ○ □ 9
0V Pwr ○ □ 10
Status ○ □ 11
○ □ 12

EXTERNAL POTENTIOMETER

○ □ 1
+24V ○ □ 2
V Mon ○ □ 3
□ 4
□ 5
□ 6
□ 7
Inhibit ○ □ 8
□ 9
0V Pwr ○ □ 10
Status ○ □ 11
○ □ 12

PART NUMBER SELECTION

SERIES CODE: HFD

O/P kV	POLARITY	OPTIONS CODE	ISOLATION VOLTAGE
005 = 1.25kV +4.75kV	P= +ve	AA= no options	010 = 10kV

PR= Pot & Reference fitted

Example: HFD005PPR010 = 10kV isolated supply with Pot & Reference option.

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