

**PRECISION 10W HIGH VOLTAGE MODULES**  
**HP0.5, HP001, HP2.5, HP005, HP010, HP015, HP020, HP030**



**HP Series**

**Application:**

Photomultiplier tubes, mass spectrometers, electron microscopes, nuclear instruments, surface science analysis equipment and microchannel plates

**Features:**

- High stability, low ripple
- Externally programmable or Internal control (option)
- Short circuit and flashover proof
- 24 hour burn in
- Low radiated magnetic field
- Positive, negative & remote reversible versions
- Selected units UL recognised as a component under UL category OGTK2 No E254121



This range of precision high voltage modules has outputs that provide a low ripple, high stability source of high voltage for photomultiplier tubes, electron gun, nuclear and other applications. Control of the output voltage is by internal potentiometer or by an external 10 volt analogue control voltage. The units are pin compatible with the medium stability KS and 100 Watt HW ranges.

All units are short circuit proof and use proven linear regulator techniques to drive a high frequency FET oscillator and ferrite high voltage step-up transformer. The power supplies are constructed from conservatively rated components with the reliability further enhanced by information gained over many years of field operation.

**SPECIFICATIONS FOR: HP SERIES**

UNIPOLAR UNIT TYPE	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE AT FULL LOAD	TEMP-CO ( / °C)	SIZE (mm)	WEIGHT (kg)
HP0.5xAA025	10V to 500V	20mA	<20mV (pk-pk)	<25ppm <sup>1</sup>	147 x 98 x 47	0.8
HP001xAA025	10V to 1kV	10mA	<20mV (pk-pk)	<25ppm <sup>1</sup>	147 x 98 x 47	0.8
HP2.5xAA025	10V to 2.5kV	4mA	<10mV (pk-pk)	<25ppm <sup>1</sup>	147 x 98 x 47	0.8
HP005xAA025	10V to 5kV	2mA	<20mV (pk-pk)	<25ppm <sup>1</sup>	147 x 98 x 47	1.0
HP010xAA025	20V to 10kV	1mA	<50mV (pk-pk)	<25ppm <sup>1</sup>	200 x 98 x 47	1.2
HP015xAA025	30V to 15kV	0.66mA	<100mV (pk-pk)	<25ppm <sup>1</sup>	200 x 98 x 47	1.7
HP020xAA020	50V to 20kV	0.4mA	<200mV (pk-pk)	<20ppm <sup>1</sup>	210 x 120 x 55	1.7
HP030xAA020	100V to 30kV	0.25mA	<300mV (pk-pk)	<20ppm <sup>1</sup>	210 x 120 x 55	1,7

REVERSIBLE UNIT TYPE	OUTPUT VOLTAGE	OUTPUT CURRENT	RIPPLE AT FULL LOAD	TEMP-CO ( / °C)	SIZE (mm)	WEIGHT (kg)
HP001RAA025	±10V to ±1kV	10mA	<20mV (pk-pk)	25ppm <sup>1</sup>	200 x 98 x 47	1.0
HP2.5RAA025	±10V to ±2.5kV	4mA	<20mV (pk-pk)	<25ppm <sup>1</sup>	200 x 98 x 47	1.0
HP005RAA025	±10V to ±5kV	2mA	<40mV (pk-pk)	<25ppm <sup>1</sup>	200 x 98 x 47	1.2
HP010RAA025	±20V to ±10kV	1mA	<50mV (pk-pk)	<25ppm	155 x 216 x 52	1.5
HP015RAA020	±30V to ±15kV	0.4mA	<150mV (pk-pk)	<20ppm <sup>1</sup>	240 x 216 x 52	3.6
HP020RAA020	±50V to ±20kV	0.4mA	<200mV (pk-pk)	<20ppm <sup>1</sup>	240 x 216 x 52	3.6
HP030RAA020	±100V to ±30kV	0.25mA	<300mV (pk-pk)	<20ppm <sup>1</sup>	240 x 216 x 52	3.6

Note 1: <12.5ppm/°C is available by special request

# HP Series

## ELECTRICAL SPECIFICATION

Input:	+24V dc $\pm 10\%$ <1A. 0V input common to HV return and chassis
Control of output:	0V to +10V for 0% to 100% $\pm 2\%$ , ( $Z_{in} = 200\text{Kohm}$ ) Internal or External potentiometer—see options
Polarity Control:	Low <0.8V = +ve, High >2.5V or OC = -ve
Voltage monitor:	0V to +10V $\pm 2\%$ for 0% to 100%. ( $Z_{out} = 10\text{k}$ )
Precision Current Monitor:	0V to +10V $\pm 2\%$ , Offset $\pm 0.1\%$ of FS for 0% to 100%. ( $Z_{out} = 10\text{k}$ ) [Option not available on reversible units up to 10kV]
Line regulation:	<10ppm for 1V change in input voltage
Load regulation:	<10ppm for 100uA to maximum load
Drift (after 1 hour warm up):	<0.01% per hour, <0.05% over an 8 hour period
Protection (all outputs):	Protected against intermittent arcing and continued short circuit to ground

## MECHANICAL SPECIFICATION

Mounting centres:	HP001P & N, HP001R, HP2.5P & N, HP2.5R, HP005P & N, HP005R, HP010P & N, HP015P & N - 2 off M4 studs HP020P & N & HP030P & N 3 off M4 clearance holes, HP010R, HP015R, HP020R & HP030R 4 off M4 clearance holes
Input / control:	Molex 0.2" connector crimps Molex part no 8500108 Unipolar units 10 Way housing Molex part no 10011104 Bipolar units 12 Way housing Molex part no 10011124
Output:	By 1.0 metre screened cable (Unipolar HP series 15kV and below 0.5m) Reducing cable length may increase the ripple voltage

## ENVIRONMENTAL SPECIFICATION

Temperature, operating:	+10°C to +50°C	Humidity (RH) <31°C non-condensing:	80% maximum
Temperature, storage:	-35°C to +85°C	Humidity (RH) >30°C non-condensing:	Decrease linearly to 50% @ 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 ASSIGNMENT

1	I monitor o/p (if fitted) (reversible units) <sup>3</sup>	5	Control link to pot wiper <sup>1</sup> or to pin 6 for 0 to 10V i/p	9	Signal ground
2	+24V dc input	6	Control link to pin 5 for 0 to 10V control i/p	10	Supply 0V
3	Voltage monitor o/p	7	0 to 10V voltage control i/p <sup>2</sup>	11	Pol indication L= -ve (reversible units) <sup>5</sup>
4	Internal variable voltage reference if fitted <sup>1</sup>	8	I monitor o/p (if fitted) (unipolar units) <sup>3</sup> Polarity select i/p (reversible units) <sup>4</sup>	12	Pol indication L= +ve (reversible units) <sup>5</sup>

- Notes: 1. The internal reference and potentiometer to enable internal or external potentiometer programming of the HP Series, are only fitted when the 'Pot & Ref' option is requested with the order. External Potentiometer must be  $\geq 10\text{kohms}$
2. 0 to 10V control voltage must be between -0.5V & 10.2V
3. For units fitted with the 'Stack Return' simple current monitor option, it is essential that a resistor of the appropriate size, is fitted between Pin 1 or Pin 8 & Pin 9. Refer to 'Imon on HP & KS' application note.
4. Polarity select: Low <0.8V = +ve, High >2.5V or OC = -ve
5. L=0V  $Z_{out}=1\text{k5}$  H = 24V  $Z_{out}=2\text{k2}$

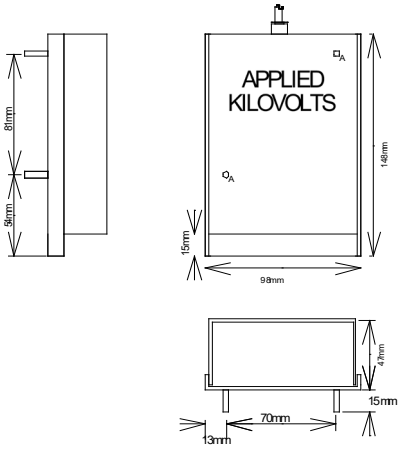
## PART NUMBER SELECTION

SERIES CODE: HP	O/P kV	POLARITY	OPTIONS CODE	TEMP-CO/°C	LEAD LENGTH (m)
	0.5 = 500V	P= +ve	AA= no options	025	-1.0
	001= 1kV	N= -ve	IS = Stack Return Imon	020	-1.5
	015=15kV	R=Reversible	IP = Precision Imon	012	-2.0
			PR= Pot & Ref Fitted		-2.5
			PS= Stack Return Imon + Pot & Ref		-3.0
			PP= Precision Imon + Pot & Ref		

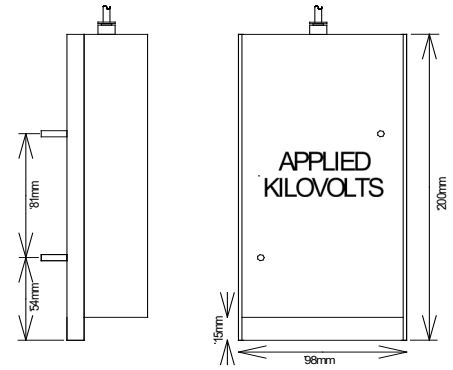
Example HP010RPR025-1.5 =10kV reversible version with Pot & Reference option fitted and 1.5m o/p lead.

Special configurations are available for custom requirements in volume applications.

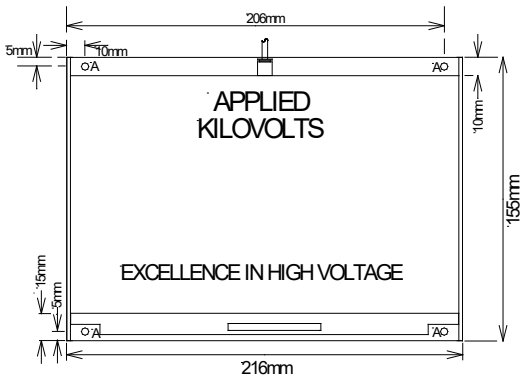
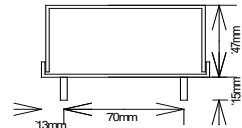
# HP Series



HP unipolar 1-5kV units  
Mounting - 2 off M4 studs fitted to base of unit - marked 'A'

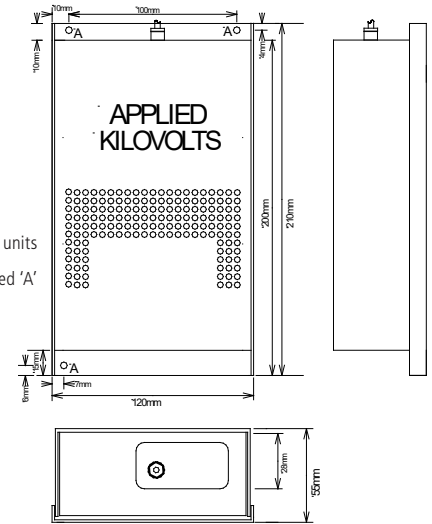


HP unipolar 10kV, 15kV and HP1-5kV reversible units  
Mounting - 2 off M4 studs fitted to base of unit

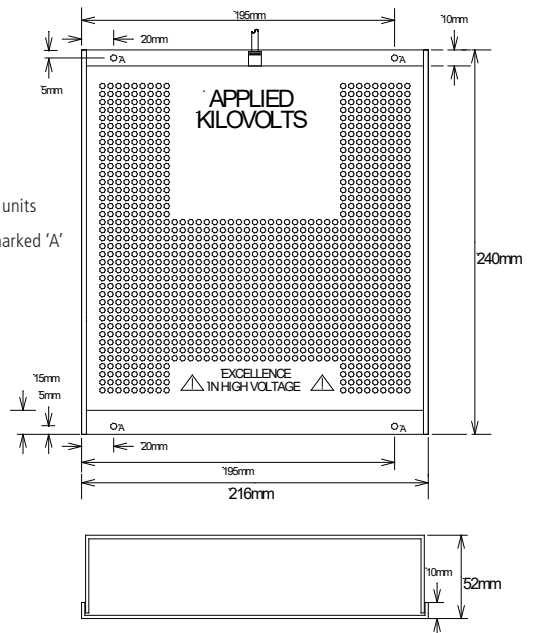


HP Reversible 10kV units  
Mounting - 4 off M4 clearance holes - marked 'A'

HP unipolar 20kV and 30kV units  
Mounting - 3 off M4 clearance holes - marked 'A'



HP Reversible 15kV, 20kV and 30kV units  
Mounting - 4 off M4 clearance holes - marked 'A'



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