

## *Excellence in High Voltage* HP Series Data Sheet

HP0.5, HP001, HP2.5, HP005, HP010,  
HP015, HP020, HP030

### PRECISION HIGH VOLTAGE MODULES

#### **Applications:**

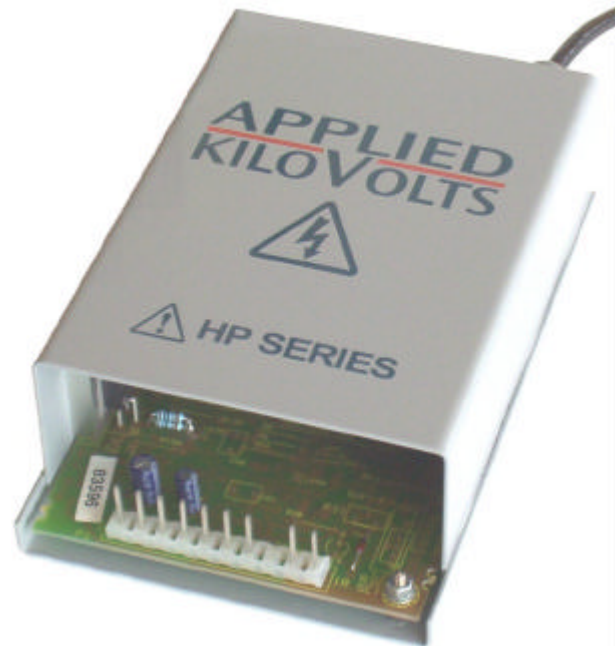
Photomultiplier tubes

Mass spectrometers

Electron microscopes

Nuclear instruments

Microchannel plates



- 0.5kV, 1kV, 2.5kV, 5kV, 10kV, 15kV, 20kV, 30kV
- High Stability, Low Ripple
- High frequency FET oscillator
- Externally programmable or Internal control (option)
- Short circuit and flashover proof
- 24 hour burn in
- Low radiated magnetic field
- Positive, negative & remote reversible versions

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 100watt 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.

Positive, negative, and electrically reversible outputs are available at voltages from 1kV to 30kV. The reversible HPR version has a latched output which can only be changed when the output is set to zero.

We manufacture a large number of special versions of these units and would be pleased to discuss your application with you.

**ELECTRICAL SPECIFICATION**  
**POSITIVE & NEGATIVE POLARITY UNITS**

UNIT TYPE	POLARITY	OUTPUT	RIPPLE AT FULL LOAD	SIZE (mm)
HP0.5PAA025	POSITIVE	10 volts to 500V at 20mA	20mV peak to peak	148 x 98 x 47
HP0.5NAA025	NEGATIVE			
HP001PAA025	POSITIVE	10 volts to 1kV at 10mA	10mV peak to peak	148 x 98 x 47
HP001NAA025	NEGATIVE			
HP2.5PAA025	POSITIVE	10 volts to 2.5kV at 4mA	10mV peak to peak	148 x 98 x 47
HP2.5NAA025	NEGATIVE			
HP005PAA025	POSITIVE	10volts to 5kV at 2mA	20mV peak to peak	148 x 98 x 47
HP005NAA025	NEGATIVE			
HP010PAA025	POSITIVE	20 volts to 10kV at 1mA	50mV peak to peak	200 x 98 x 47
HP010NAA025	NEGATIVE			
HP015PAA025	POSITIVE	30 volts to 15kV at 0.66mA	100mV peak to peak	200 x 98 x 47
HP015NAA025	NEGATIVE			
HP020PAA025	POSITIVE	50 volts to 20kV at 0.4mA	200mV peak to peak	210 x 120 x 60
HP020NAA025	NEGATIVE			
HP030PAA025	POSITIVE	100 volts to 30kV at 0.25mA	300mV peak to peak	210 x 120 x 60
HP030NAA025	NEGATIVE			

**REVERSIBLE POLARITY UNITS**

UNIT TYPE	POLARITY	OUTPUT	RIPPLE AT FULL LOAD	SIZE (mm)
HP001RAA025	REVERSIBLE	10V to 1kV at 10mA	10mV peak to peak	200 x 98 x 47
HP2.5RAA025	REVERSIBLE	10V to 2.5kV at 4mA	20mV peak to peak	200 x 98 x 47
HP005RAA025	REVERSIBLE	10V to 5kV at 2mA	40mV peak to peak	200 x 98 x 47
HP010RAA025	REVERSIBLE	20V to 10kV at 1mA	50mV peak to peak	155 x 216 x 47
HP015RAA025	REVERSIBLE	35V to 15kV at 0.4mA	150mV peak to peak	240 X 216 X 52
HP020RAA025	REVERSIBLE	50V to 20kV at 0.4mA	200mV peak to peak	240 x 216 x 52
HP030RAA025	REVERSIBLE	100V to 30kV at 0.25mA	300mV peak to peak	240 x 216 x 52

See HPRZC data sheet for continuously variable zero crossing power supplies

INPUT VOLTAGE: +24 volt d.c.  $\pm 10\%$  at less than 1A. Negative input terminal common to HV earth return.

OUTPUT VOLTAGE: See tables above.

LINE REGULATION: <10ppm of maximum voltage for input changes of 1 volt. (<100ppm for HP0.5)

LOAD REGULATION: <10ppm for load changes from 100 $\mu$ A to maximum. (Measured at maximum voltage). (<100ppm for HP0.5)

OVERLOAD PROTECTION: Flashover and short circuit proof. Re-entrant current limit.

TEMPERATURE CO-EFFICIENT: <25ppm/°C [ $<12\text{ppm}/^\circ\text{C}$  by special request – see order code below]

DRIFT: Typically 0.01% per hour, Measured at constant input voltage, load current & ambient temperature after 1 hour warm up.  
0.02% per 8 hours

CONTROL: 10V analogue signal. (0 to +10V gives zero to maximum output, tolerance  $\pm 2\%$ ).  
Input impedance > 100Kohm.  
OPTIONAL - INTERNAL or EXTERNAL potentiometer control.

READOUT: - Voltage monitor: 0 to +10V represents zero to maximum output, tolerance  $\pm 2\%$  (Source resistance 10k).  
Precision Current Monitor: Option available on all unipolar units, HP020R, and HP030R  
0-10V represents zero to maximum output, tolerance  $\pm 2\%$ , Offset  $\pm 0.1\%$  of FS.

Note - Precision current monitor removes internally used feedback current, buffers and scales the output.

Stack Return Current Monitor: Option available on all units  
Note - simple stack return current monitor includes the internally used feedback current.

OPERATING TEMPERATURE: 0 °C to +50 °C

STORAGE TEMPERATURE: -35 °C to +85 °C

R.F.I.: Steel case for low radiated magnetic field.

SYNCHRONISATION: Oscillator frequency can be locked to a suitable external frequency.

**MECHANICAL SPECIFICATION**

Fixings: HP001P & N, HP001R, HP2.5P & N, HP2.5R, HP005P & N, HP005R, HP010P & N, HP015P & N - M4 studs.

Output: By 1.0 metre screened cable (Unipolar HP series 15kV and below 0.5M).  
N.B. Reducing the cable length may increase the ripple voltage.

Input: Molex 10 pin (reversible units 12 pin), mating connector supplied.

Connector:

Order Code: Series Code	o/p kV	Polarity	Options Code	Temp Co
HP	0.2 = 200V	P= +ve	AA= no options	025
	0.5 = 500V	N= -ve	IS = Stack Return Current Monitor	012
	001= 1kV	R=Reversible	IP = Precision Current Monitor	
	2.5 = 2.5kV		PR= Pot & Reference fitted	
	010=10kV		PS= Stack Return Imon + Pot & Reference	
	020= 20kV		PP= Precision Current Monitor + Pot & Reference	
	005=5kV			
	015=15kV			
	030=30kV			

e.g +10kV HP series with Stack Return Current Monitor and Pot & Reference fitted: HP010PPS025