

HP Series Data Sheet

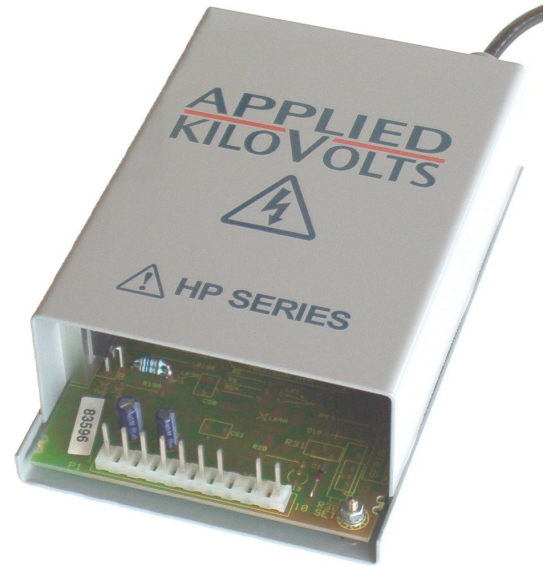
HP0.5, HP001, HP2.5, HP005, HP010, HP015, HP020, HP030

PRECISION 10W HIGH VOLTAGE MODULES

Application:

Photomultiplier tubes, Mass spectrometers, Electron microscopes, Nuclear instruments, Surface Science analysis, Microchannel plates

- 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
- Unipolar units now UL recognised



This range of precision high voltage modules has outputs that provide a low ripple, high stability source of high voltage for photo-multiplier 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.

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 ¹	147 x 98 x 47	0.8
HP001xAA025	10V to 1kV	10mA	<10mV (pk-pk)	<25ppm ¹	147 x 98 x 47	0.8
HP2.5xAA025	10V to 2.5kV	4mA	<10mV (pk-pk)	<25ppm ¹	147 x 98 x 47	0.8
HP005xAA025	10V to 5kV	2mA	<20mV (pk-pk)	<25ppm ¹	147 x 98 x 47	1.0
HP010xAA025	20V to 10kV	1mA	<50mV (pk-pk)	<25ppm ¹	200 x 98 x 47	1.2
HP015xAA025	30V to 15kV	0.66mA	<100mV (pk-pk)	<25ppm ¹	200 x 98 x 47	1.7
HP020xAA020	50V to 20kV	0.4mA	<200mV (pk-pk)	<20ppm ¹	210 x 120 x 55	1.7
HP030xAA020	100V to 30kV	0.25mA	<300mV (pk-pk)	<20ppm ¹	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	<10mV (pk-pk)	<25ppm ¹	200 x 98 x 47	1.0
HP2.5RAA025	±10V to ±2.5kV	4mA	<20mV (pk-pk)	<25ppm ¹	200 x 98 x 47	1.0
HP005RAA025	±10V to ±5kV	2mA	<40mV (pk-pk)	<25ppm ¹	200 x 98 x 47	1.2
HP010RAA025	±20V to ±10kV	1mA	<50mV (pk-pk)	<25ppm ¹	155 x 216 x 52	1.5
HP015RAA025	±30V to ±15kV	0.4mA	<150mV (pk-pk)	<20ppm ¹	240 x 216 x 52	3.6
HP020RAA025	±50V to ±20kV	0.4mA	<200mV (pk-pk)	<20ppm ¹	240 x 216 x 52	3.6
HP030RAA025	±100V to ±30kV	0.25mA	<300mV (pk-pk)	<20ppm ¹	240 x 216 x 52	3.6

Note 1: <12ppm/°C is available by special request

Electrical Specification

Input	+24V dc $\pm 10\%$ <1A. 0V input common to HV return and chassis.
Control of output	<ul style="list-style-type: none"> • 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	Option available on all unipolar units, HP015R, HP020R, and HP030R 0V to +10V $\pm 2\%$, Offset $\pm 0.1\%$ of FS for 0% to 100%. ($Z_{out} = 10\text{k}$)
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 - M4 studs. The remainder— 2 off M4 clearance holes
Input / control	Molex 0.2" 10 way (reversible units 12 way) connector
Output	By 1.0 metre screened cable (Unipolar HP series 15kV and below 0.5M) N.B. 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 24Vdc, 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)	5 Control Link: See diagram ¹	9 Signal ground
2 +24V dc input	6 Control Link: See diagram ¹	10 Supply 0V
3 Voltage Monitor o/p	7 Voltage Control i/p ²	11 Pol Indication L=-ve (Reversible Units)
4 Control Link: See diagram ¹	8 I Monitor o/p (Unipolar Units) Polarity Select i/p (Reversible Units) ³	12 Pol Indication L=+e (Reversible Units)

- 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. Control Voltage must be between -0.5V & 10.2V
3. Polarity Select Low <0.8V = +ve, High >2.5V or OC =-ve

Part Number Selection

Series Code	HP	o/p kV	Polarity	Options Code	Temp Co
		0.5 = 500V	P= +ve	AA= no options	025
		001= 1kV	N= -ve	IS = Stack Return Current Monitor	020 [20kV & 30kV unipolar only]
		015=15kV	R=Reversible	IP = Precision Current Monitor	012
				PR= Pot & Reference fitted	
				PS= Stack Return Imon + Pot & Reference	
				PP= Precision Current Monitor + Pot & Reference	

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

EXELIS

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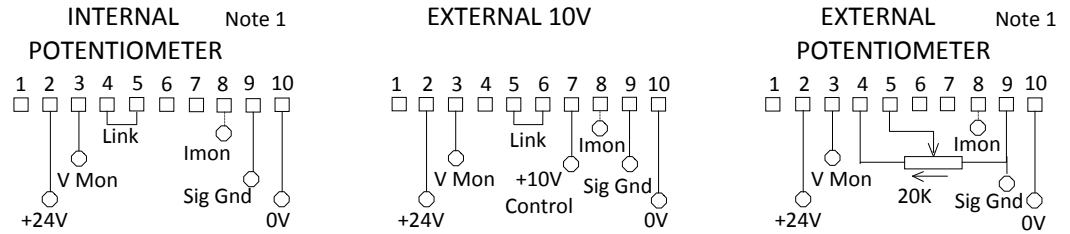
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Input Connections

Unipolar Units



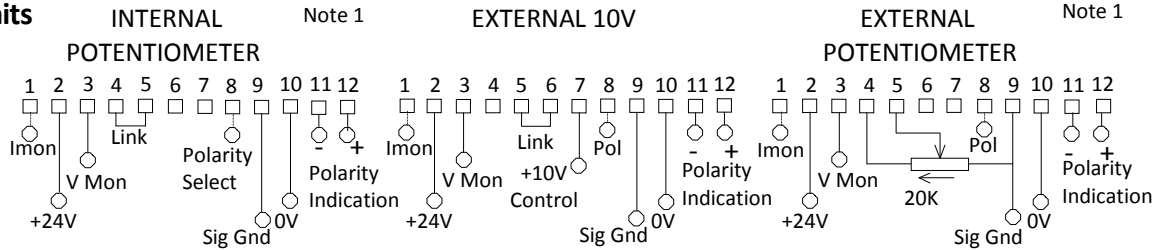
The Molex pins are part no 8500108 & the 10 pin socket 10011104.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1 Synchronisation i/p ² 2 Supply, +24V 3 Voltage Monitor o/p 4 Control Link: See diagram ¹ 5 Control Link: See diagram ¹ | <ol style="list-style-type: none"> 6 Control Link: See diagram 7 Voltage Control i/p ⁴ 8 Imon (if fitted)³ 9 Signal ground 10 Supply 0V |
|---|--|

Notes

1. The internal reference and potentiometer to enable internal or external potentiometer programming of the HP Series, are only fitted when the 'Plus Ref' option is requested with the order. External Potentiometer must be ≥ 10 kohms
2. Sync input – if used – must be 56kHz ± 1.5 kHz, 0 to 15V square wave of duty cycle between 10:90 (H-L) & 50:50
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 8 & Pin 9.
4. Control Voltage must be between -0.5V & 10.2V

Reversible Units



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

- | | |
|--|--|
| <ol style="list-style-type: none"> 1 Imon (if fitted) 2 Supply, +24V 3 Voltage Monitor o/p 4 Control Link: See diagram ¹ 5 Control Link: See diagram ¹ 6 Control Link: See diagram | <ol style="list-style-type: none"> 7 Voltage Control i/p ³ 8 Polarity Select⁴ 9 Signal ground 10 Supply 0V 11 -ve Polarity Monitor⁵ 12 +ve Polarity Monitor⁵ |
|--|--|

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 ≥ 10 kohms
2. 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 & Pin 9.
4. Polarity Select Low <0.8V = +ve, High >2.5V or OC = -ve
5. L=0V Zout=1k5 H = 24V Zout=2k2

http://www.else.sk/product.php?id_product=3236



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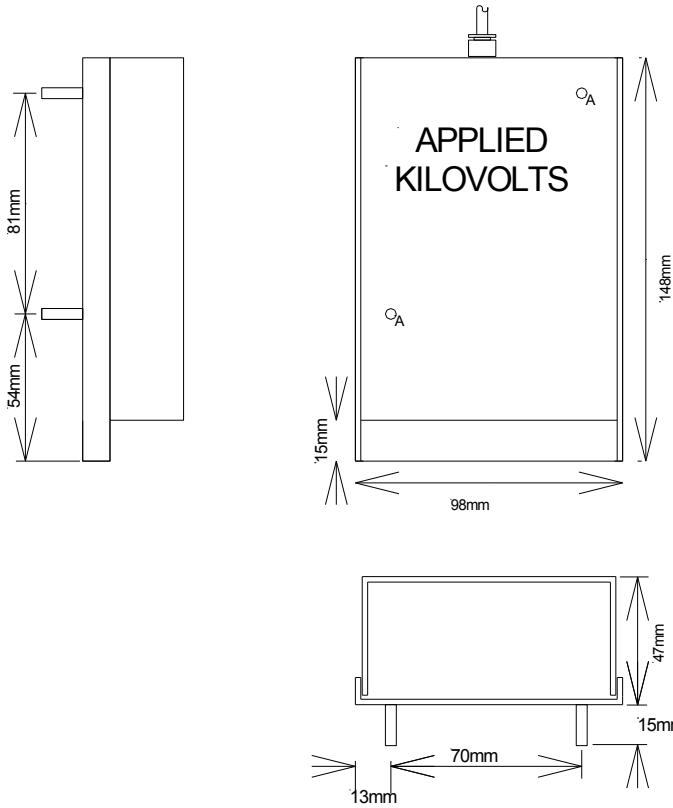
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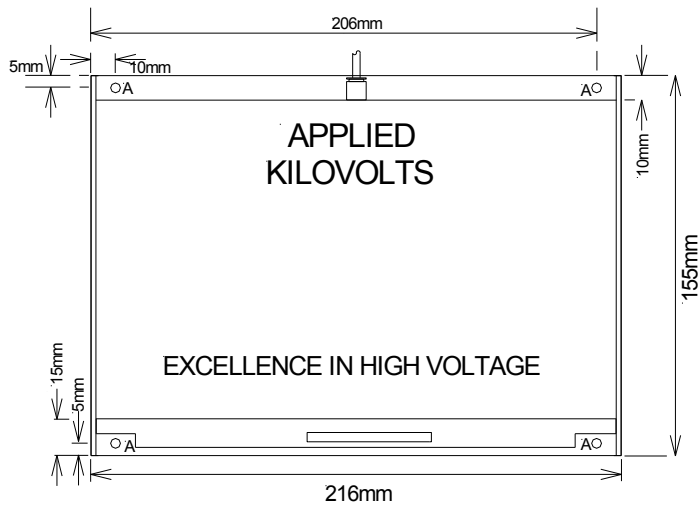
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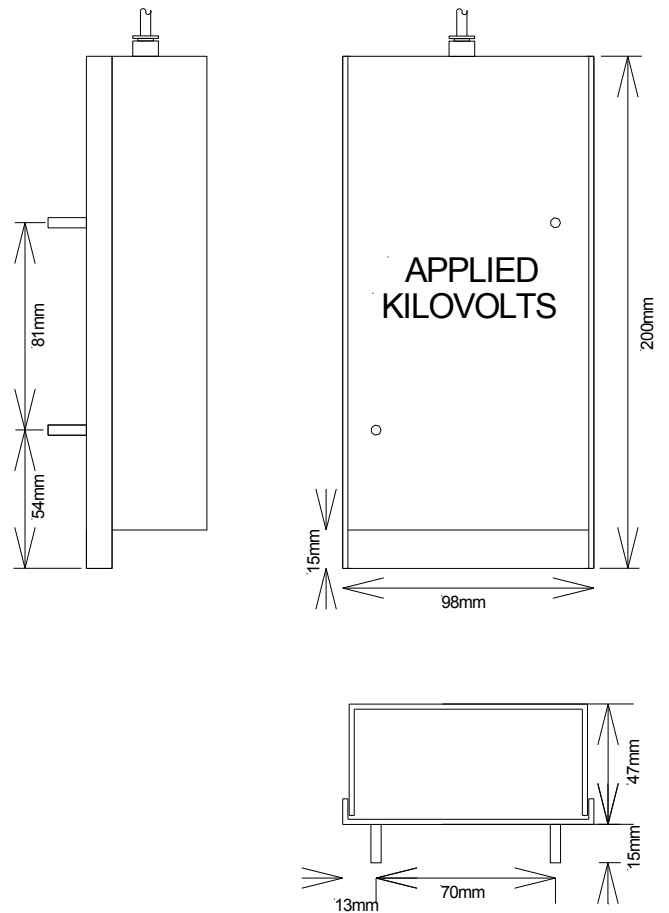
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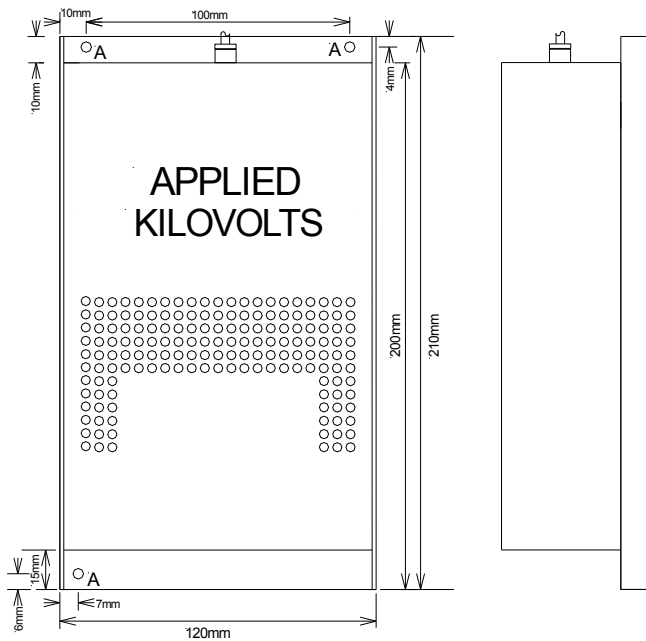
HP001, HP2.5, & HP5 Unipolar
Mounting 2 off M4 Studs to base



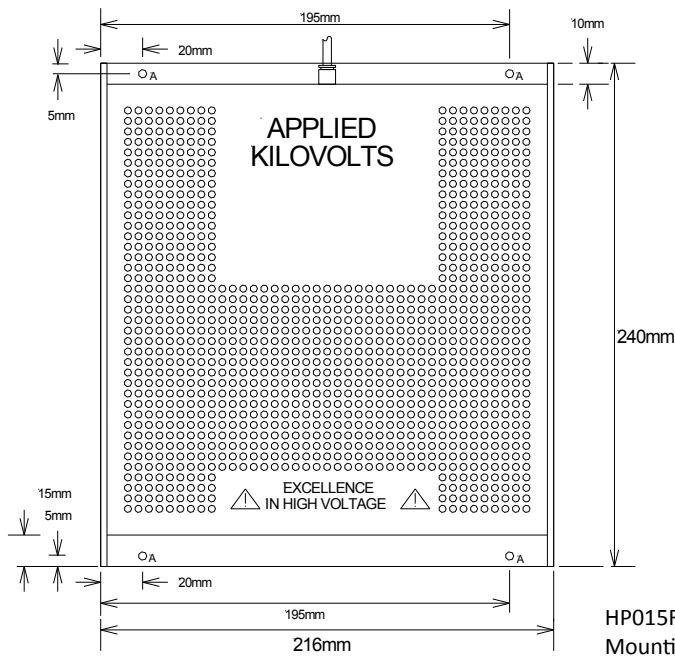
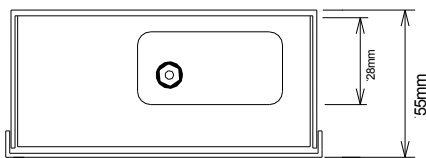
HP010R Reversible
Mounting 4 off M4 Clearance marked A



HP010 Unipolar, &
HP001R, HP2.5R, & HP5R Reversible
Mounting 2 off M4 Studs to base



HP020 & HP030 Unipolar
Mounting 3 off M4 Clearance marked 'A'



HP015R, HP020R, & HP030R Reversible
Mounting 4 off M4 Clearance marked 'A'



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