

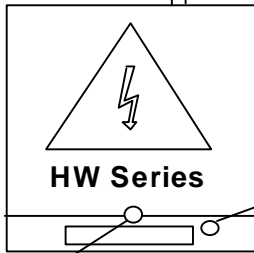
# APPLIED KILOVOLTS

SHW  
Constant I Option  
Nov 04

## SAFETY & INSTALLATION INSTRUCTIONS FOR NEW HW SERIES: With Constant Current O/P Control Option

**PLEASE READ CAREFULLY BEFORE INSTALLING OR OPERATING THIS POWER SUPPLY**

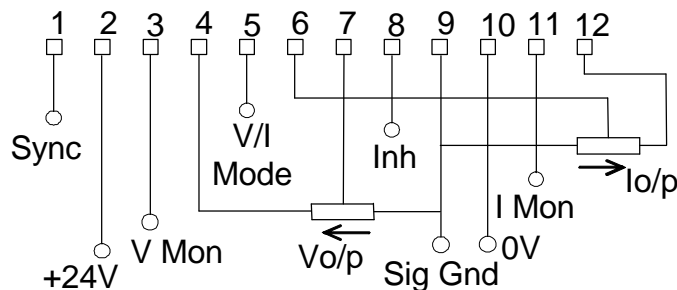
HV output connect screen (shield) of cable to system ground (earth).



Current Output Control Potentiometer.  
(Functions as set  $I_{max}$  in external potentiometer mode.)

Voltage Output Control Potentiometer.  
(Functions as set  $V_{max}$  in external potentiometer mode.)

Input Voltage: 24V  $\pm$  10% at 6A  
Operating Temperature: 0°C to +45°C.  
Storage Temperature: -35°C to +85°C.



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

Pin 1	Sync i/p (optional)	Pin 7	Voltage Control i/p 0 to +10V gives 0 to max. O/P.
Pin 2	+ 24 Volt at 6 Amps power input.	Pin 8	Low (<1.5V) unit operates. Resets trip.
Pin 3	Voltage monitor. 0 to +10V represents 0 to max O/P. Tolerance $\pm$ 5%. R source = 10 kohm.	Pin 9	Signal Gnd. All control & monitor signals are referenced to this pin.
Pin 4	10V reference o/p for External Potentiometer Control of Voltage	Pin 10	Power 0 volt return.
Pin 5	I/V Mode o/p ???	Pin 11	Current monitor. 0 to +10V represents 0 to max. current. Tol. $\pm$ 10%. R source = 10 K.
Pin 6	Current Control i/p 0 to +10V	Pin 12	10V reference o/p for External Potentiometer Control of o/p Current.

Pair of Back to Back diodes and 10R are connected between pins 9 & 10

### Order Code:

HW	o/p kV	Polarity	OC	TC
Series Code = HW	001 = 1kV	P= +ve	Options Code	Temp Co
	2.5 = 2.5kV	N= -ve		300
	005 = 5kV		IS = Stack Return Current Monitor	
	010 = 10kV		IP = Precision Current Monitor	
	015 = 15kV		CS=Constant Current Option + Stack Return Imon	
	020 = 20kV		CP=Constant Current Option + Precision Imon	
	030 = 30kV			
	040 = 40kV			
	050 = 50kV			

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## **GENERAL**

On receipt the unit should be carefully unpacked and inspected to ensure that no transit damage has occurred. Provided that this inspection is satisfactory and reveals no evidence of damage then installation can proceed.

If an electrical test is to be carried out prior to fitting the power supply, it is essential that the person undertaking this work be a qualified electronics technician who is fully aware of the particular dangers associated with high voltage switch mode power supplies. Metallic or conductive tools should not be used to adjust any of the potentiometers. The unit has no user serviceable parts and should not be dismantled.

**DO NOT HANDLE OR TOUCH THESE UNITS WHEN THE SUPPLY IS CONNECTED. AFTER DISCONNECTION FROM THE SUPPLY, ALLOW 30 SECONDS BEFORE HANDLING SO THAT ALL THE CAPACITORS CAN DISCHARGE.** To ensure that the output is fully discharged short to ground before touching any high voltage circuit.

Care should be taken not to operate the unit outside the specified limits given above, failure to do so may damage the unit.

## **COMPLIANCE WITH SAFETY STANDARDS**

The unit is designed to meet Normalised European Safety Standards and hence installation of the power supply unit into the equipment should comply with the following requirements.

- a. A PROTECTIVE EARTH must be provided for safety in accordance with EN61010 Part 1 : 1993 : Clause 6.5.1. The case of the units should be bonded to this protective earth.
- b. The output is classed as hazardous and must therefore not be accessible to operators. The output must be isolated from accessible circuits by Double Insulation or a protective screen as defined in EN61010-1.
- c. The unit is intended to be installed in an electrical enclosure and should not be accessible to the operator. Access should be restricted to authorised service personnel only, with use of a tool. Care should be taken to prevent access to the interior of the unit and protect against items (e.g. tools or wires) inadvertently entering the interior of the unit.

## **INSTALLATION**

The outputs of these units are considered hazardous and should be installed such that they cannot become accessible. The output should be connected such that the shortest creepage and clearance path is to a protective earth connection. ENSURE that a LOW IMPEDANCE connection is made to the unit chassis from the system PROTECTIVE EARTH. The safety earth conductor must not contain any switches or fuses.

Under worst case conditions the unit draws a current of 6A and any input supply cable must be of a suitable type and rating. The unit is not fitted with a fuse and so should be operated from a limited supply. Fuses may be fitted externally to the unit to protect unit and interconnecting wiring etc. but these should be rated to prevent nuisance failures. Care should be taken in the design of the interconnecting wiring within the system to ensure that connectors with hazardous voltages cannot be connected to accessible circuits.

Ensure that the output is connected to the load prior to operation of the unit and that a good low impedance high voltage joint is made. Sharp points on either the high voltage or return joint should be avoided as this will cause corona which will make the output appear noisy. In general a tracking distance (creepage distance) of 25mm (1 inch), per 10kV to earth is advised as a minimum to ensure no breakdown or corona occurs, a much greater distance will be required under adverse conditions. Care must be taken not to damage the cable inner when forming the connections.

During arcing currents exceeding 1000 Amps will flow. It is important that these currents return to the high voltage power supply by the shortest possible route using the screen (shield) of the output cable. Failure to observe this will result in the control terminals of the unit seeing large voltage spikes during arcing and radiation of electromagnetic interference.

Adequate ventilation should be provided to keep the unit cool and the ventilation inlets should not be covered in any way. The ambient air temperature around the inlet must not exceed 45 °C. The unit is fitted with a thermal cut-out to protect itself should the ambient temperature exceed this level, to restart the unit must be disconnected from the +24V supply and allowed to cool, the unit does not restart unless the input supply is removed. The unit will operate in any orientation, however it is not recommended to operate with the side fitted with the silk-screen as the lowest face.

## **OPERATING NOTES**

- 1/ HIGH VOLTAGES ARE DANGEROUS. ENSURE THE OUTPUT IS FULLY DISCHARGED BY SHORTING TO GROUND BEFORE TOUCHING ANY HIGH VOLTAGE CIRCUIT.
- 2/ The unit is short circuit proof but care should be taken that the high voltage cannot be shorted into one of the control pin connections.
- 3/ TO ENABLE THE UNIT PIN 8 MUST BE TAKEN TO LESS THAN 1.5V WITH RESPECT TO PIN 9.
- 4/ POWER SUPPLIES ARE DISPATCHED WITH INTERNAL POTENTIOMETER SET TO MAXIMUM. TURN DOWN TO ZERO BEFORE CONNECTING TO 24 VOLT SUPPLY.