APPLIED KILOVOLTS

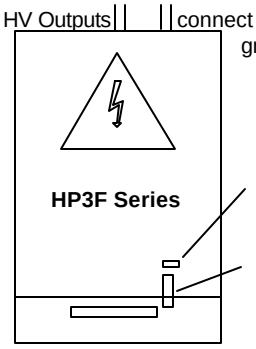
SAFETY & INSTALLATION INSTRUCTIONS FOR HF3 Series

PLEASE READ CAREFULLY BEFORE INSTALLING OR OPERATING THIS POWER SUPPLY

Power Supply Warning Symbols

Caution,
Risk of electric shock

Caution
Refer to accompanying documentation

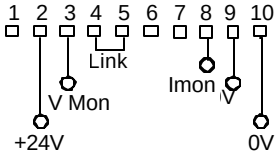


Order Code:

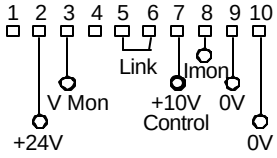
HF003PAA2.5	3.5kV Isolated to ±2.5kV
HF003PAA010	3.5kV isolated to ±10kV
HF003PAA020	3.5kV isolated to ±20kV
HF003PAA030	3.5kV isolated to ±30kV

AA= Option Code:
AA= Standard PR = Pot & Ref Control
AL= Low Ripple Option PL = Pot & Ref + Low Ripple Option

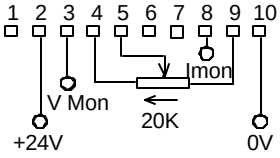
INTERNAL POTENTIOMETER Note 1



EXTERNAL 10V



EXTERNAL POTENTIOMETER Note 1



Pin 1 nc
Pin 2 + 24 Volt power input.
Pin 3 Voltage monitor. 0 to +10V represents 0 to max. output. Tol. ± 2%, Source resistance 10 kohms.
Pin 4 Control link, see diagrams above.[1]
Pin 5 Control link, see diagrams above.[1]
Pin 6 Control link, see diagrams above.
Pin 7 Analogue voltage input 0 to +10V gives 0 to max. O/P. Input impedance > 100 kohms.
Pin 8 nc
Pin 9 Signal 0 volt return.
Pin 10 Power 0 volt return.

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

Note 1 The internal reference and potentiometer to enable internal or external potentiometer programming of the HF3 Series, are only fitted on the PR & PL option code versions. (See order code details below)

UNIT TYPE	OUTPUT	ISOLATION	OUTPUT RIPPLE	INJECTED RIPPLE (1)
HF003PAA2.5	0 TO +3.5 kV at 1 ma	±2.5 kV (2)	50 mV peak to peak	50 mV peak to peak (25 mV L option)
HF003PAA010	0 TO +3.5 kV at 1 ma	±10 kV (3)	75 mV peak to peak	75 mV peak to peak (35 mV L option)
HF003AA020	0 TO +3.5 kV at 1 ma	±20 kV (3)	100 mV peak to peak	150 mV peak to peak (75 mV L option)
HF003AA030	0 TO +3.5kV at 1mA	±30 kV (3)	150mV peak to peak	200mV peak to peak

1) ripple injected into the power supply providing the floating voltage, measured assuming load capacitance of 1000 pF.
2) resistance to ground 400 Mohm on each output. (3) resistance to ground 600 Mohm on each output.

SPECIFICATION

Input voltage: 24Vdc ± 10% at 0.7amp
Size: 210 X 120 X 60mm **Mounting:** by 3 off M4 clearance holes.

Cleaning: Use a lint free cloth soaked with isopropyl alcohol, ensuring the unit is completely dry before use.

Environmental Conditions:

Indoor use only, Operating Temperature 0°C to +50°C,
Altitude up to 2000m, Storage Temperature -35°C to +85°C.

Maximum relative humidity 80% for temperatures up to 31ºC, decreasing linearly to 50% relative humidity at 40º C,
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.

Applied Kilovolts Ltd., Woods Way, Goring by Sea, West Sussex BN12 4QY, UK.
Tel: +44 (0) 1903 708850 Fax +44 (0) 1903 708851

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 has received appropriate technical training to be aware of the hazards to which that person may be exposed in performing the tests, and of measures to minimise the risks to themselves, and other personnel. 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 24V SUPPLY, IS CONNECTED. AFTER DISCONNECTION FROM THE SUPPLY, ALLOW 30 SECONDS BEFORE HANDLING SO THAT ALL THE CAPACITORS CAN DISCHARGE. ALSO ENSURE THAT THE POWER INPUT TO THE BIASING SUPPLY IS REMOVED AND THIS SUPPLY ALSO IS FULLY DISCHARGED. 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 Standards for installation in equipment conforming to EN61010 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 : latest : Clause 6.5.1. The case of the units must 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.
d. The unit is not fitted with a fuse and so should be operated from a limited supply of <2 amp.
e. The o/p current of the biasing supply, providing the floating voltage **must** be limited to 10mA.

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 (ground) conductor must not contain any switches or fuses.

Under worst case conditions the unit draws a current of 1A 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 50°C . 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/ Option Codes PR & PL POWER SUPPLIES ARE DISPATCHED WITH INTERNAL POTENTIOMETER SET TO MAXIMUM. TURN DOWN TO ZERO BEFORE CONNECTING TO 24 VOLT SUPPLY.