

**ES-7109 NEGATIVE MWPC HIGH VOLTAGE POWER SUPPLY****SCOPE:**

A power supply for use with multi-wire proportional chambers and other application requiring high voltage at low current. Some specifications follow:

Output Voltage: .3 to 7.5 Kilovolt  
 Output Current: 500 Micro Amperes  
 Maximum Operating Temperature: 70'C  
 Drift: <.2% 25-50'C  
 Load Regulation: <.2% 0-200 Micro Ampere  
 Rise Time: 40 Milliseconds  
 Lead Transient Response: Recovers to .1% in 10 Milliseconds  
 Overshoot on Turn-On: <3%  
 Internal Capacity: .004 Microfarad  
 Output Series Resistance: 10K

**POWER REQUIREMENTS**

+12V - 690mA  
 -12V - 690mA  
 -24V - 32mA

**DESCRIPTION:**

The power supply is packaged with two complete units in a 2 wide NIM module. Front panel controls are provided to adjust the high voltage and read directly in kilovolts. In designing this supply, particular attention has been given to reducing the stored energy. It is designed with high internal resistance to limit the energy which can be delivered to a proportional chamber under spark conditions. The supply has high internal gain and good transient response to maintain good output regulation under varying loads. The output terminal is isolated from the power supply filter capacitor by a 10K resistor to limit peak chamber current from the power supply to less than one ampere.

The combination of moderate output resistance and trip circuitry has been found to be an adequate protection scheme for operating MWPC's at high rates where it is not possible to protect chambers with large series resistors without suffering loss of gain. Tests have been made with 1/2 meter chambers using 20 micron tungsten wire and smaller chambers using 7.5 micron wire. In all

cases the chambers survived thousands of sparks without wire damage using this supply.

This supply contains a number of features designed to meet the operational needs of proportional chambers.

**Fast Trip:** The power supply senses fast changes in output current and turns off its internal DC to DC converter. With a load short circuit or spark, the stored energy will be dissipated in a millisecond or less, most of the energy going into the internal resistance of the power supply. At higher output voltages the circuit is sensitive enough to trip out from corona without any visible sparking.

**Trip Reset:** The power supply by switch selection will either remain tripped, or reset automatically after a few hundred milliseconds.

**Slow Trip:** The power supply will trip from slowly applied loads which exceed a current trip level which is set to 80% of the full scale meter reading.

**Current Monitor:** A Lemo connector is provided which monitors chamber current scaled IOV = 1 millampere. A current zero front panel trimpot and careful guarding of the output current allow measurements of chamber current to 1 nanoampere with a typical DVM.

**Voltage Monitor:** A Lemo connector is provided which monitors chamber voltage scaled 1V = 1 kilovolt.

**Trip Monitor:** The trip monitor is a TTL compatible open collector output that is grounded when either supply is tripped.

A bridged Lemo connector provides the OR of the trip signal for the two supplies. This allows daisy-chaining a number of supplies to one alarm circuit.

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