

# — APPLICATION NOTE

## HOW TO CONNECT AND TEST A PROPORTIONAL MODEL

This Application Note details how to connect and test an XP Power high voltage proportional type model to verify operation.

This Application Note applies to these XP Power products:

- A Series
- AG Series
- AGH Series
- AH Series
- D Series
- DX Series
- E Series
- F Series
- FS Series
- G Series
- GP Series
- Q Series

### **Safety Warning**

High voltage power supplies present a serious risk of personal injury if not used in accordance with design and/or use specifications, if used in applications on products for which they are not intended or designed, or if they are used by untrained or unqualified personnel.

For more information, please refer to the XP Power Safety Warning and Disclaimer at the end of this document.

## General Information

- The output voltage is load dependent – they are not load regulated.
- The Full Load vs. No Load variation depends on the selected model.
- Proportional models are typically isolated.

See the product series data sheets for more information.

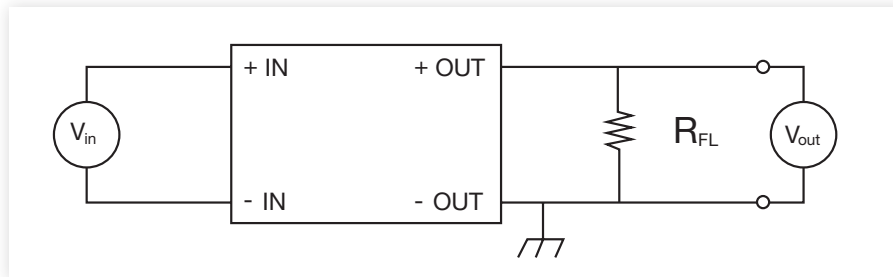


Figure 1: Open frame power supply

## Necessary Equipment / Parts

### 1. Input supply (V<sub>in</sub>):

Low voltage DC power supply to power the XP Unit: Refer to the data sheets to determine input voltage and input current specifications. Select a low voltage DC power supply that matches the required input voltage and meets or exceeds the input current requirements.

### 2. High voltage rated resistor:

Select a high voltage rated resistor sized for a Full Load output.

(Max rated output voltage / Max rated output current = Full Load Resistor R<sub>FL</sub>)

### 3. High voltage rated oscilloscope probe or high voltage rated resistor divider:

Use a high voltage rated oscilloscope probe or resistor divider to measure the actual high voltage output.

See XP Power accessory model [V1G](#) for a resistor divider.

## Test Procedure

### • Full Load Test:

For a basic operational test, provide 100% input voltage using a resistive load sized for the maximum rated current to produce the specified max output voltage. Measure this output with a high voltage rated scope probe or a simple voltage divider.

### • No Load Test:

To test the unit under Light or No Load conditions, use a variable DC input supply. Slowly increase the low voltage DC supply to the XP Power unit. When the DC input is >0.7VDC, there should be a high voltage output on toutput pins. Continue to increase the input voltage until the unit reaches its maximum rated output voltage. Under this condition, the input voltage will be LESS than the maximum.

## Example

### XP Power Model F20

- Output Ratings: 10Watts = 2000V x 5mA
- Input Supply Ratings: 0 to +12VDC adjustable, rated for at least 1.5A
- Full Load Resistor: 2000V / 5mA = 400Kohm [rated for at least 2KV]



Figure 2: F Series

## Results

The Full Load test will produce the maximum rated output voltage (Vout) of 2000 Volts across the Full Load resistor for the model F20 when +12V is applied to the input. The oscilloscope will show the DC value of 2000V at the output.

For the No Load test, remove the Full Load resistor. Then slowly increase the input supply until the max output voltage of 2KV is reached. In this case, the input voltage is +9.6VDC when the output voltage (Vout) is 2KV with No Load.

## Video Resources

Please see our tutorial on How to Connect and Test a Proportional Model:

<https://www.xppower.com/resources/videos/how-to-connect-and-test-a-proportional-model>

### Safety Information

High voltage power supplies present a serious risk of personal injury if not used in accordance with design and/or use specifications, if used in applications on products for which they are not intended or designed, or if they are used by untrained or unqualified personnel. Before testing, incorporating or using XP Power's products, read, understand and thereafter adhere to all instructions, protocol, cautions and safety procedures applicable not only to XP Power's products but to each product and/or application into which XP Power's products are incorporated or assembled, as well as industry standard safe practices and rules and regulations regarding the use of high voltage.