

## Power Vent Installation Instructions – By Zephyr Industries

### Battery Box Ventilator And Back-Draft Damper

The POWER VENT must be placed vertically with the label right side up in order for the backdraft damper to function properly. Place the POWER VENT higher than the top of the battery box and indoors, especially in cold climates.

Use no more than four 90° bends including one at the exterior terminus facing down. Put a screen on the outside pipe terminus to keep insects and debris out. If installed in a dusty or construction environment put a porous foam or paper filter on the battery box inlet. DO NOT glue the Power Vents in place. Friction fit is adequate. DO NOT drip glue onto the fan blades. Use 2" PVC DWV pipe on 12 and 24 volt systems. Use 2" intake and 3" output PVC DWV pipe on 48 Vdc systems.

Place a 1 Amp fuse (included) at the start of the positive circuit wire. Thermostat wire and phone splice/tap connectors (ULG or UG)) work well to connect the Power Vent. Use a cable tie around the base of the Power Vent and wires to provide strain relief and create a neat wire job

A controller is usually used in the circuit to cycle the fan. OutBack Power inverters and charge controllers have a 12 Vdc powered auxiliary relay available. Other inverters or solar charge controllers may not have a voltage controlled auxiliary relay. Please refer to your solar manufacturers equipment manual for hook up and programming instructions. The voltage set points for turning the fan on and off are above the full state of charge voltage of the battery but below the battery gassing voltage.

In the case of grid tied systems where the batteries are kept at float voltage 24 hours/day it may be necessary to run the fan full time as the batteries are always gassing. An alternative is to remove the backdraft damper to allow passive venting and only switch fan on when batteries are above float voltage. For the inquisitive, please note that the 48 volt Power Vents are built with two 24 volt fans wired in series.

### SET POINTS FOR FLOODED LEAD ACID BATTERIES

SYSTEM VOLTAGE	FAN ON SET POINT	FAN OFF SET POINT	HYSTERESIS (Trace inverters)
12	13.2 VOLTS	13.0 VOLTS	0.2
24	26.4 VOLTS	26.1 VOLTS	0.3
48	52.8 VOLTS	52.2 VOLTS	0.6

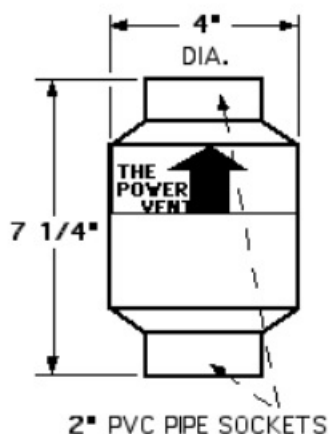
## Power Vent Testing

November, 1995. Initial explosion proof tests were performed in an acetylene/air environment. The fan was cycled on/off every 15 seconds for three hours. There were no explosions. The unit was then placed in the battery compartment of a prototype power shed. The power shed included a 530 Watt, 24 Vdc array charging a 350 Amp/Hour battery bank. A plastic tent covered the battery tops and was tied tight to the batteries allowing very little fresh air to be introduced into the system. The Power Vent was ducted to return the battery fumes back into the tent. (Not recommended practice!) The fan was operated by a cycle timer, turning on or off every 45 seconds or 1.5 minutes per cycle for 120 days and then 3 minutes per cycle for another 40 days. Battery temperature ranged from 50 to 77 degrees F over the 160 days of testing. The battery voltage was regulated by an APT charge controller and battery voltage was 25.4 to 29.4 Vdc at all times except when 4 equalize charges raised the voltage to 33 volts for several hours. More than two gallons of water were added to the 4 batteries in 160 days. Under these extreme conditions the unit cycled over one hundred and thirty thousand times without failure or explosion. We are currently still using this unit in our shop system! The only unit that has failed under testing was subjected to battery acid poured directly into the fan motor. Oddly enough the electronics continued to work but the acid coagulated the ball bearing grease and the motor could not overcome the friction. A small hole has been placed on the battery side of the damper to allow hydrogen to escape in the event the unit does fail. Reports from customers who have had POWER VENTS in operation since January, 1996 are very satisfactory.

### WARRANTY, LIMITATIONS AND DISCLAIMER.

This vent only moves a small volume of air. It is designed for home systems with typical charging capabilities of 150 DC amps or less. Hydrogen gas creates an explosion risk at concentrations of only 4%. Make sure vent openings are free and clear including safety vent hole at the bottom of the POWER VENT. Periodically check to make sure fan is running during charge periods. Keep your batteries and connections clean and tight. During equalization charges on large systems provide additional ventilation. Having no control over the use or installation of this product, we assume no liability connected with its' use. The Power Vent itself is warranted for 2 years if installed in accordance with these instructions.

### 12 & 24 Volt Power Vent      48 Volt Power Vent

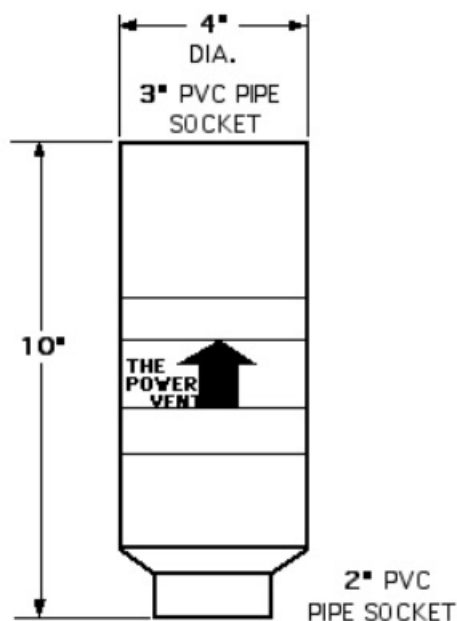


Size: 4" Dia. x 7.25"

Power consumption: 3 watts or less

Voltage: 12 or 24 VDC

Air volume: 6 cfm with 360°  
maximum change of direction



Size: 4" Dia. x 10"

Power consumption: 6 watts or less

Voltage: 48 VDC

Air volume: 8 cfm with 360°  
maximum change of direction

**For more info we are always here to help! • 888-826-0939 • [info@thesolar.biz](mailto:info@thesolar.biz)**