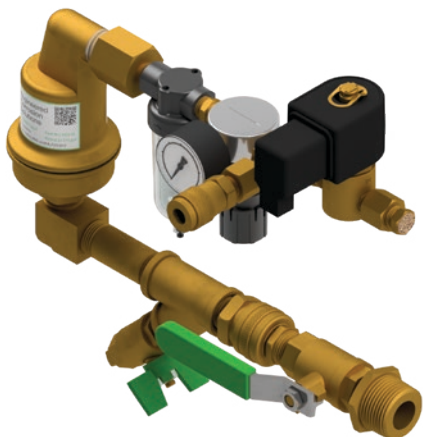


# PSV-D

ECS Protector Dry SMART Vent



For use under U.S. Patents  
8,720,591, 9,144,700, 9,186,533  
and 9,610,466

## Specifications

<b>Stock Number:</b>	PSV-D (PSV-DE)
<b>Service Pressure:</b>	Up to 175 PSIG (12 Bar)
<b>System Connection:</b>	1" NPT Male
<b>Power Supply:</b>	120VAC/60Hz (220-240VAC/50Hz); <2 Amps
<b>Temperature Range:</b>	40°F - 120°F (4.5°C - 49°C)
<b>Dimensions:</b>	
<b>Vent Assembly:</b>	13.5" (W) x 7.5" (H) x 4.25" (D) 343mm (W) x 191mm (H) x 108mm (D)
<b>Control Box:</b>	8" (W) x 10" (H) x 6" (D) 203mm (W) x 254mm (H) x 152mm (D)

- Support Hanger Not Required

## General Description

The ECS Protector Dry SMART Vent provides automatic oxygen venting in dry pipe fire sprinkler systems. As a fire sprinkler system is filled with a continuous supply of nitrogen gas from the ECS Protector Nitrogen Generator System, the ECS Protector Dry SMART Vent allows oxygen rich gas to be vented from the fire sprinkler system. Over a short period of time the ECS Protector Dry SMART Vent will almost completely remove oxygen from the fire sprinkler system (<2% oxygen). Once the desired system gas composition is reached the ECS Protector Dry SMART Vent will automatically close and prevent continuous venting.

The ECS Protector Dry SMART Vent must be installed as shown on the engineering design documents. If a location is not specified, install the ECS Protector Dry SMART Vent on the fire sprinkler system riser on the system side of the main control valve. The electric control box must be installed on an adjacent wall near the fire sprinkler system riser (see Figure 4).

The ECS Protector Dry SMART Vent is equipped with a levered float valve that allows gas to discharge but prevents liquid water from leaking through the restricted venting orifice in the event that water enters the fire sprinkler system. A back pressure regulator is also included to prevent total system depressurization from the vent assembly before the vent is electronically closed. The restricted venting orifice allows oxygen to be vented from the fire sprinkler system at a controlled rate to achieve a minimum nitrogen concentration of 98%. A special fitting is provided to receive 5/32" tubing when the vent is used in conjunction with the ECS Protector SMART Gas Analyzer (SGA-1).

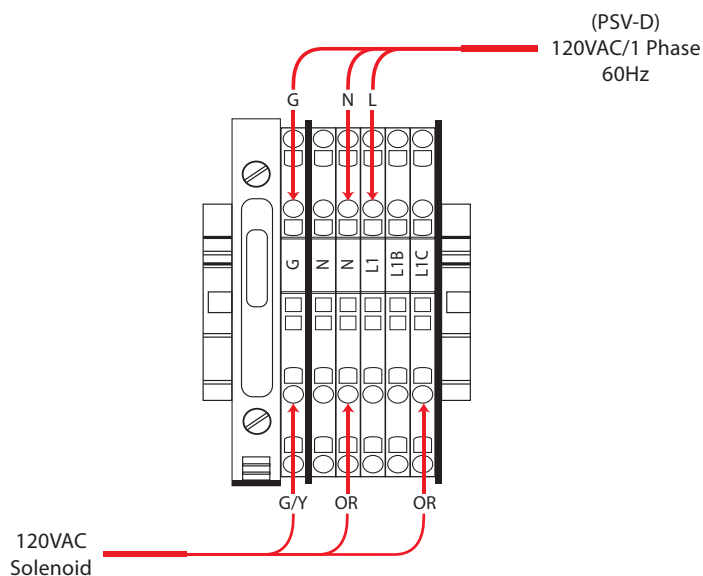
The ECS Protector Dry SMART Vent is equipped with an electronic solenoid valve that must be wired to the electric control box (conductors not included). The control box will automatically close the vent once the desired nitrogen concentration has been reached. The control box is equipped with an on/off switch and a vent button to provide a means to restart of the venting process should oxygen be reintroduced into the fire sprinkler system.



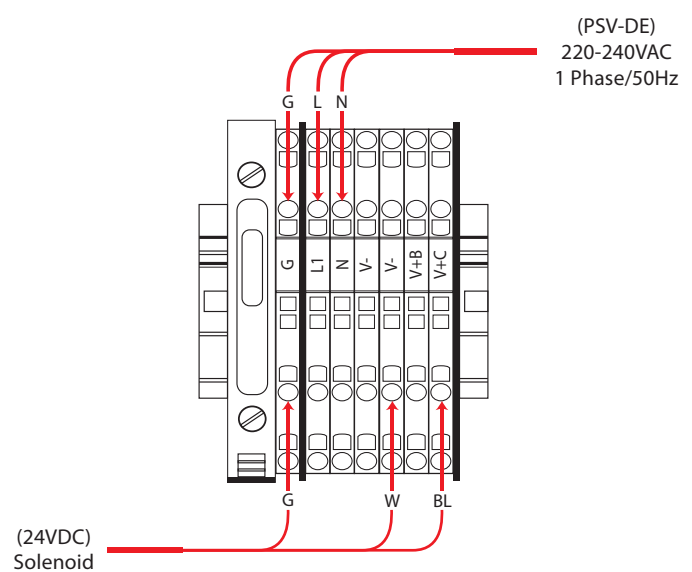
## Installation Instructions

1. The ECS Protector Dry SMART Vent includes two (2) separate components. The first component is the vent assembly equipped with a ball valve to be connected to the fire sprinkler riser. The contractor must install a 1" outlet (welded or mechanical) to connect the vent assembly to the sprinkler system on the system side of the main control valve (see Figure 2). The isolation ball valve is to remain in the closed position until the ECS Protector Nitrogen Generator System has been commissioned.
2. Install the vent assembly in a level position. Recommended mounting height is between 5'-10' (2-3m) above the finished floor.  
**NOTE:** Piping to the vent assembly cannot be installed in a configuration that would trap water and prevent drainage to the sprinkler system; a water trap impedes the ability of the vent assembly to vent oxygen from the fire sprinkler system.
3. The second component of the ECS Protector Dry SMART Vent is the electric control box. The control box must be installed on a wall or vertical surface adjacent to the vent assembly installation location.
4. Provide conductors from 120VAC/60Hz (220-240VAC/50Hz) power supply to designated terminals in the electric control box in accordance with national/local codes (i.e. NFPA-70), (see Figure 1). The device draws less than 2 amps. Contractor must drill hole in the control box for the 120VAC/60Hz (220-240VAC/50Hz) power supply conductors.
5. Provide conductors to connect the 120VAC/60Hz (24VDC) coil leads of the electronic solenoid valve on the vent assembly to the designated terminals in the electric control box in accordance with national/local codes (i.e. NFPA-70), (see Figure 1). Contractor must drill hole on side or top of the control box to provide access.
6. The green power switch on the electric control box must remain in the OFF position until the ECS Protector Nitrogen generator has been commissioned.
7. Inspection of the vent assembly should be performed after installation and hydrostatic testing of the fire sprinkler system. The inspection should be performed periodically thereafter in accordance with applicable national codes, NFPA codes and standards and/or the authority having jurisdiction.  
**NOTE:** Inspection must include verifying the condition of the inline filter and checking for blockage in the "Y" strainer and the restricted venting orifice.

**FIGURE 1a - ECS Protector Dry SMART Vent Control Box**



**FIGURE 1b - ECS Protector Dry SMART Vent Control Box**



## Operating Instructions

1. Verify the vent assembly has been equipped with a restricted venting orifice downstream of the backpressure regulator.

**NOTE:** If the vent assembly is not equipped with a restricted venting orifice, one will be provided by ECS during system commissioning. The restricted venting orifice must be installed before proceeding with the steps below.

2. Determine the low air alarm pressure and the turn-on pressure of the nitrogen generator.
3. Choose a pressure setting for the backpressure regulator that is above the low air alarm pressure but below the turn-on pressure of the nitrogen generator.
4. Pull the knob out from the regulator to adjust pressure setting. Turn the knob clockwise to raise the pressure, counter-clockwise to lower the pressure.
5. Close the isolation ball valve and allow device to depressurize through restricted venting orifice to pressure setting. Make adjustment to pressure setting using the knob, then open the isolation ball valve to pressurize device and close the isolation ball valve again to check pressure setting. Repeat process until desired pressure setting is achieved.

**NOTE:** This process can only be performed when the solenoid on the vent is energized and fire sprinkler system is at normal operating pressure.

6. Push knob back into regulator until it clicks into place.
7. Verify the timer settings inside the electric control box. The settings should be as follows: mode set to 'E', scale set to '20, 30, 40, 50, 60', range set to '10h', and timer knob set to '35'. If needed, a small flathead screwdriver can be used to make the timer setting adjustments.
8. Once the ECS Protector Nitrogen Generator System has been commissioned, open the isolation ball valve on the vent assembly, turn the green power switch on and depress orange "Vent" button to start 14-day nitrogen inerting process.

## Maintenance Instructions

1. The ECS Protector SMART Vent must be inspected annually at a minimum. While the isolation ball valve is in the open position check for air/water leaks and ensure the pressure gauge is displaying normal system pressure.
2. While isolation ball valve is in closed position, inspection must include the condition of the in-line filter, and for blockage in the "Y" strainer and restricted venting orifice. Twist the filter housing clockwise until it can be removed to expose the filter element.
3. The filter element in the in-line filter should be replaced if a visual inspection reveals a significant collection of debris.

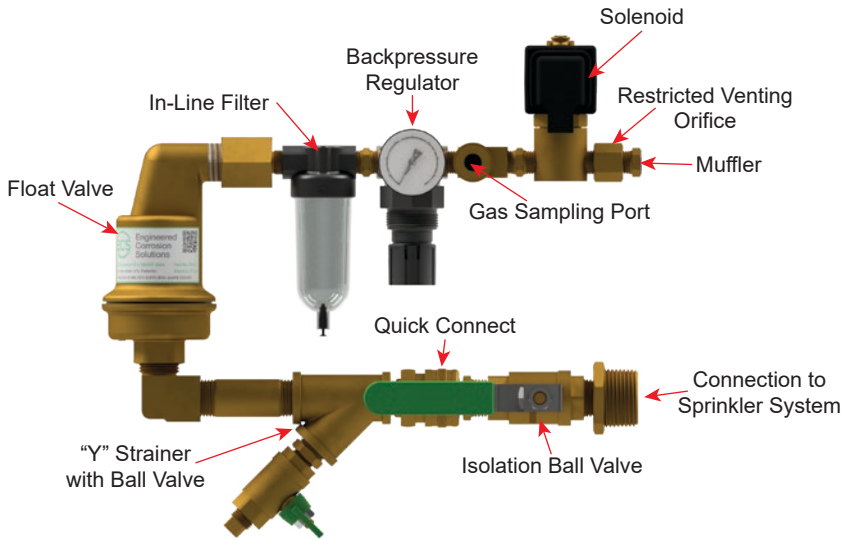
## In-Line Filter Replacement Instructions

1. Close the isolation ball valve.
2. Depressurize the housing by pressing the pressure relief valve on the bottom of the in-line filter housing (see Figure 3).
3. Remove the lower section of the in-line filter housing by turning the filter housing counterclockwise.  
**NOTE:** A rubber o-ring/seal is located between the upper and lower sections of the filter housing.
4. Remove the old filter by turning the filter counterclockwise.
5. Replace with new filter (PV-DRF2-Clear Housing). The filter is secured to the housing by turning the filter clockwise.  
**NOTE:** Ensure the filter is secured only finger/hand tight.
6. Install the rubber o-ring/seal on the lower section of the filter housing.
7. Re-install the filter housing by turning the filter housing clockwise.  
**NOTE:** Ensure the filter housing is secured only finger/hand tight.
8. Open the isolation ball valve.

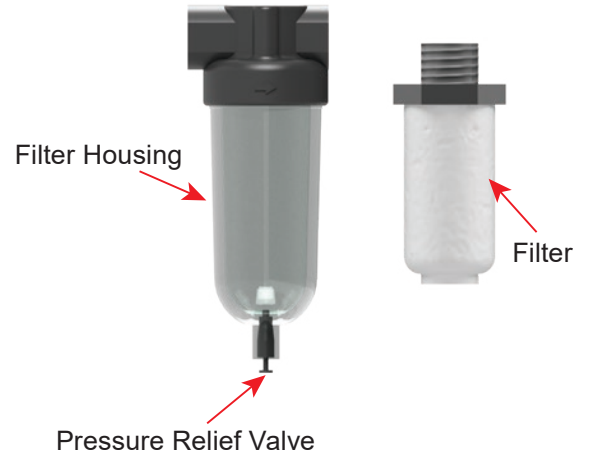
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ECS Protector Dry SMART Vent

**FIGURE 2 - ECS Protector Dry SMART Vent Assembly**



**FIGURE 3 - In-Line Filter**



**FIGURE 4 – ECS Protector Dry SMART Vent Installation Schematic**

