Model TSV-D SMART Air Vent, Dry

IMPORTANT
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

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General Description

The TYCO Model TSV-D SMART Air Vent, Dry 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 TYCO nitrogen generator, the SMART air vent allows oxygen rich gas to be vented from the fire sprinkler system. Over a period of 14 days, the SMART air vent almost completely removes oxygen from the fire sprinkler system (< 2% oxygen). After 14 days, the SMART air vent automatically closes and prevents continuous venting.

The SMART air vent includes two separate components:

- vent assembly
- electric control box

The vent assembly is equipped with a ball valve to be connected to the fire sprinkler riser. The electric control box is available in two inline voltage models - 120 VAC/60 Hz or 230 VAC/50 Hz.

The SMART air vent must be installed as shown on the engineering design documents. If a location is not specified, install the SMART air 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, as shown in Figure 4.

The SMART air 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.

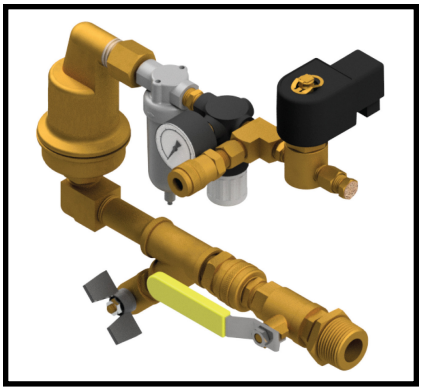
A back pressure regulator is also included to prevent total system depressurization from the vent assembly before the vent is electronically closed.

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 in. tubing when the vent is used in conjunction with the TYCO Model TSGA SMART Gas Analyzer.

The SMART air vent is equipped with an electronic solenoid valve that must be wired to the electric control box (conductors not included). The control box automatically closes the vent after 14 days as the desired nitrogen concentration will have been achieved. 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. See Figure 1.

NOTICE

The TYCO Model TSV-D SMART Air Vent, Dry described herein must be installed and maintained in compliance with this document, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of the related devices. The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.



Technical Data

Service Pressure
Up to 175 psig (12 bar)

System Connection
1 in. NPT Male

Electrical Connection
120 VAC/60 Hz or 230 VAC/50 Hz;
<2 Amps

Temperature Range
40°F to 120°F (4,5°C to 49°C)

Vent Assembly Dimensions
W x D x H
12.0 in. x 4.65 in. x 11.2 in.
(305 mm x 118 mm x 285 mm)

Control Box Dimensions
W x D x H
9 in. x 7 in. x 10 in.
(229 mm x 178 mm x 254 mm)

Note: *A support hanger is not required.*

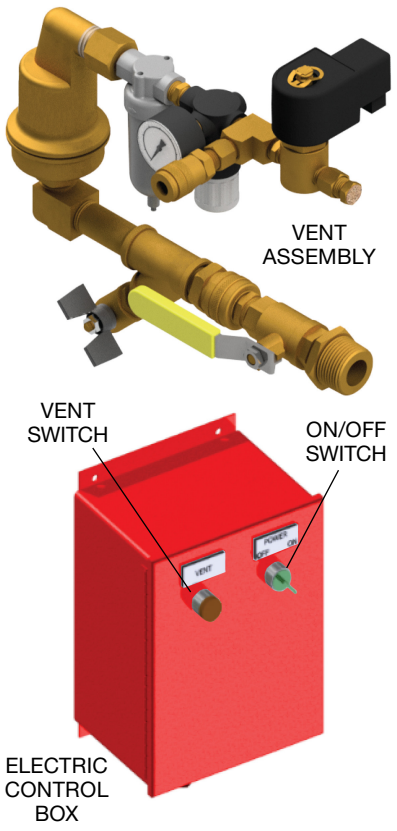


FIGURE 1
MODEL TSV-D SMART AIR VENT DRY COMPONENTS

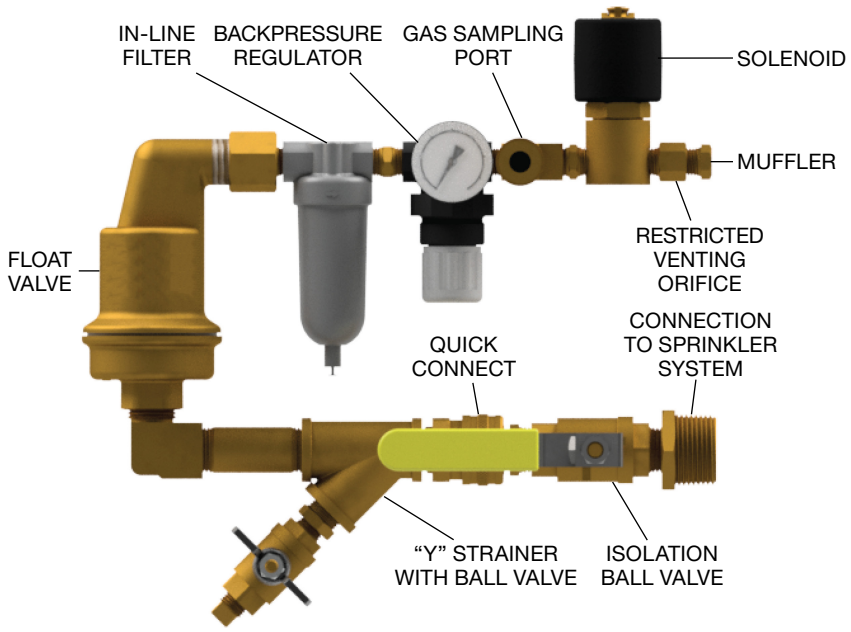


FIGURE 2
MODEL TSV-D SMART AIR VENT DRY ASSEMBLY

Operation

The TYCO Model TSV-D SMART Air Vent, Dry must be operated in accordance with this section.

Step 1. Verify the SMART air vent assembly is equipped with a restricted venting orifice downstream of the backpressure regulator.

Note: *If the vent assembly is not equipped with a restricted venting orifice, contact Johnson Controls Technical Services. The restricted venting orifice must be installed before proceeding with steps 2 to 8.*

Step 2. Determine the low air alarm pressure and the turn-on pressure of the nitrogen generator.

Step 3. Choose a pressure setting for the backpressure regulator that is 3 to 5 psig (0.2 to 0.3 bar) above the low air alarm pressure but below the turn-on pressure of the nitrogen generator.

Step 4. Pull the grey knob out from the regulator to adjust pressure setting. Turn the knob clockwise to raise the pressure, counter-clockwise to lower the pressure.

Step 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.*

Step 6. Push the grey knob back into the regulator until it clicks into place.

Step 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'
- timer knob set to '35'

If needed, a small flathead screwdriver can be used to make the timer setting adjustments.

Step 8. Once the nitrogen generator is commissioned, open the isolation ball valve on the SMART air vent assembly, turn the green power switch on the electric control box to the ON position and push the orange VENT button. The VENT button illuminates indicating the SMART air vent is in an active state.

Note: *The SMART air vent is now open and actively purging oxygen from the fire sprinkler system. It will remain open for approximately 14 days. The orange VENT button will turn off when the vent is closed.*

If the sprinkler system actuates or another event introduces oxygen to the sprinkler system, press the orange VENT button to restart the purging cycle.

Installation

The TYCO Model TSV-D SMART Air Vent, Dry must be installed in accordance with this section.

Step 1. Install a 1 in. outlet (welded or mechanical) to connect the vent assembly to the sprinkler system on the system side of the main control valve, as shown in Figure 2. The isolation ball valve shall remain in the closed position until the nitrogen generator system is commissioned.

Step 2. Install the SMART air vent assembly in a level position. Recommended mounting height is between 5 ft to 10 ft (2 m to 3 m) 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.*

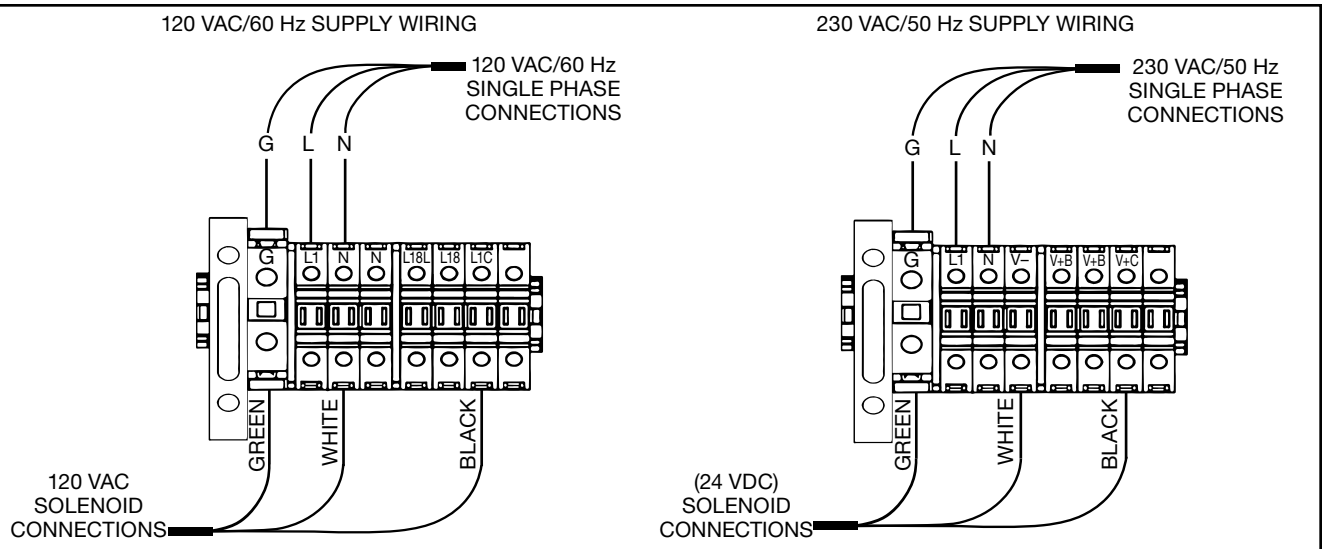


FIGURE 3
MODEL TSV-D SMART AIR VENT
POWER WIRING

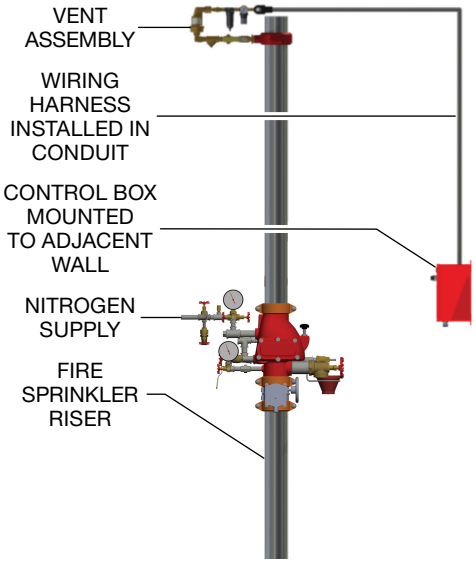


FIGURE 4
MODEL TSV-D SMART AIR VENT
INSTALLATION SCHEMATIC

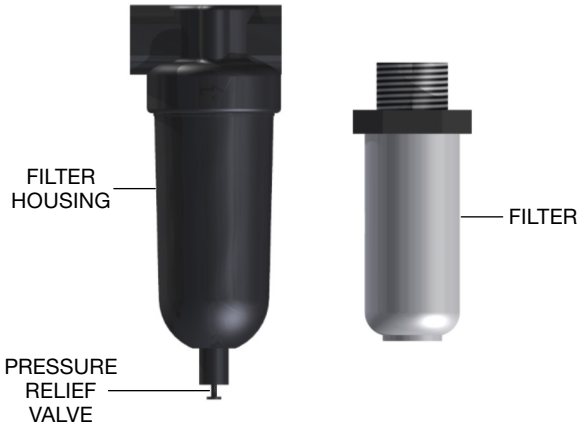


FIGURE 5
MODEL TSV-D SMART AIR VENT
IN-LINE FILTER

Step 3. The control box must be installed on a wall or vertical surface adjacent to the vent assembly installation location.

Step 4. Provide conductors from a 120 VAC/60 Hz or 230 VAC/50 Hz power supply to the designated terminals in the electric control box per the NATIONAL FIRE PROTECTION AGENCY (NFPA) standard NFPA 70 and local requirements as shown in Figure 3. The device draws less than 2 Amps. Holes must be drilled in the control box for the 120 VAC/60 Hz (230 VAC/50 Hz) power supply conductors.

Step 5. Provide conductors to connect the 120 VAC/60 Hz (24 VDC) coil leads of the electronic solenoid valve on the vent assembly to the designated terminals in the electric control box per NFPA 70 and local requirements as shown in Figure 3. Holes must be drilled on the side or top of the control box to provide access.

Step 6. The green power switch on the electric control box must remain in the OFF position until the TYCO nitrogen generator is commissioned.

Step 7. Inspect the vent assembly after installation and hydrostatic testing of the fire sprinkler system. The inspection should be performed periodically thereafter in accordance with the applicable NATIONAL FIRE PROTECTION ASSOCIATION 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.*

Care and Maintenance

The TYCO Model TSV-D SMART Air Vent, Dry must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must first be obtained from the proper authorities. All personnel who may be affected by this decision must be notified.

Inspection, testing, and maintenance must be performed in accordance with the requirements of the NFPA, and any impairment must be immediately corrected.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of any authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Inspection Instructions
Step 1. The SMART air vent must be inspected annually at 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.

Step 2. While isolation ball valve is in the closed position inspect the condition of the inline filter and for blockage in the "Y" strainer and restricted venting orifice. Twist the black filter housing clockwise until it can be removed to expose the filter element.

Step 3. Replace the in-line filter element if a visual inspection reveals a significant collection of debris.

In-Line Filter Replacement Instructions
Step 1. Close the isolation ball valve.

Step 2. Depressurize the housing by pressing the pressure relief valve on the bottom of the in-line filter housing, as shown in Figure 5.

Step 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.*

Step 4. Remove the old filter by turning the filter counterclockwise.

Step 5. Replace with new filter, TYCO Model TFLT Replacement Filter Kit. The filter is secured to the housing by turning the filter clockwise.

Note: *Ensure the filter housing is secured only finger/hand tight.*

Step 6. Install the rubber o-ring/seal on the lower section of the filter housing.

Step 7. Re-install the filter housing by turning the filter housing clockwise.

Step 8. Open the isolation ball valve.

Note: *Ensure the filter housing is secured only finger/hand tight.*

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

SMART Air Vent, Dry
Specify: Model TSV-D SMART Air Vent, Dry, (specify power supply), P/N (specify):

120 VAC/60 Hz TSVD02

230 VAC/50 Hz TSVD02E

Note: *Part numbers TSVD02 and TSVD02E replace the legacy part numbers TSVD01 and TSVD01E respectively.*

Replacement Filter Kit
Replacement filter may be ordered for Model TSV-D SMART Air Vent, Dry (current part numbers TSVD02 and TSVD02E).

Specify: Model TFLT Replacement filter kit, P/N TVDFLT2

Replacement filter may be ordered for Model TSV-D SMART Air Vent, Dry (legacy part numbers TSVD01 and TSVD01E).

Specify: Model TFLT Replacement filter kit, P/N TVDFLT

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TFP1263
Change History Appendix

ISSUE DATE	NOTES
08-22	Reduced document to 4 pages, formerly 6 pages; Page 1, added QR code and URL to allow convenient access to electronic version from printed document; Page 4, changed corporate address and telephone number to 1467 Elmwood Avenue, Cranston, RI 02910 | Telephone +1-401-781-8220, formerly 1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700.
09-20	Changed solenoid power connection wire colors in Figure 3.
06-20	Updated to indicate vent removes oxygen, reduced to < 2% oxygen as desired nitrogen concentration level in fire sprinkler system is achieved, automatically closing 14 days after nitrogen generation system activation to prevent continuous venting.
09-19	New Technical Data Sheet TFP1263 describes Model TSV-D SMART Air Vent, Dry.

Johnson Controls