

# Process Ball Valve Vent Options

## External and Internal Ball Vents

For valve ordering information, pressure ratings, and other technical data, see the Swagelok® *Ball Valves, General Purpose and Special Application—60 Series* catalog, [MS-01-146](#).

### External Ball Vents—4-Bolt, 2-Way Valves

#### Purpose

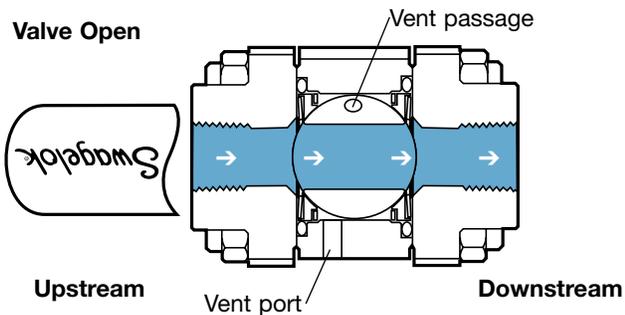
The vent port evacuates trapped pressure from the system directly to atmosphere when the valve is closed. The ball contains a vent passage isolated from the ball orifice to prevent continuous leakage from the body vent port when the valve is open.

The downstream vent provides an escape path for system fluid downstream of the valve. The upstream vent provides an escape path for system fluid upstream of the valve.

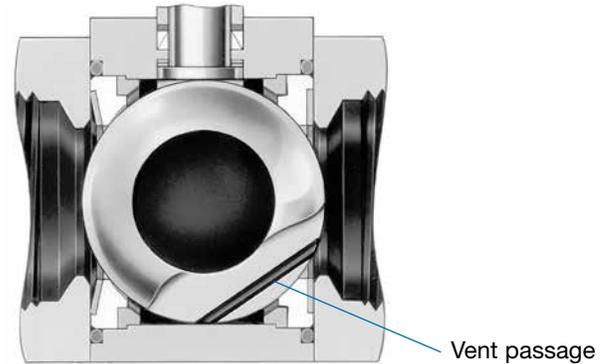
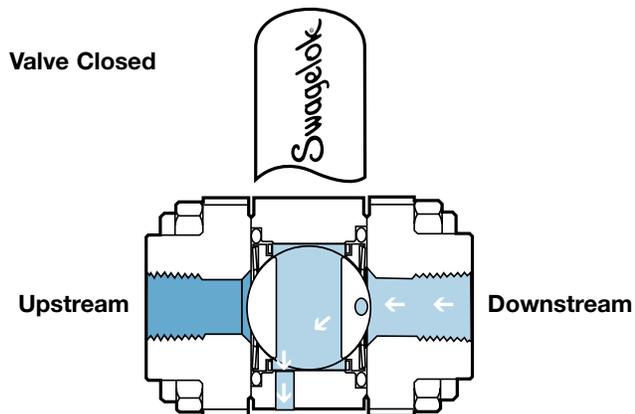
#### Operation

##### External Downstream Vent (DV)

When the valve is open, system fluids flow through the valve. No venting occurs because the vent passage is isolated from the flow path.

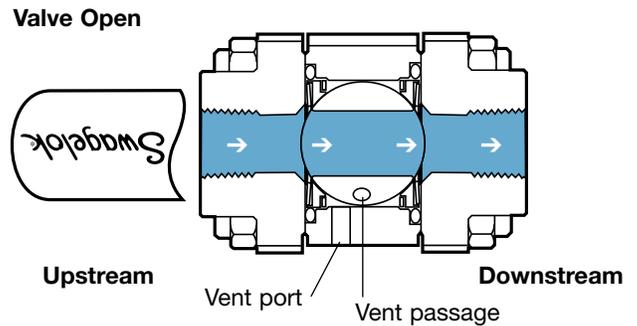


When the valve is closed, shutoff occurs only on the upstream side. Downstream fluids flow through the vent passage to the vent port and are released to atmosphere.

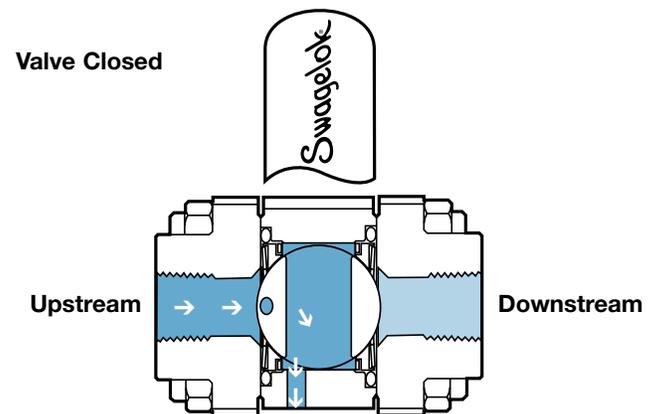


##### External Upstream Vent (UV)

When the valve is open, system fluids flow through the valve. No venting occurs because the vent passage is isolated from the flow path.



When the valve is closed, shutoff occurs only on the downstream side. Upstream fluids flow through the vent passage to the vent port and are released to atmosphere.



### Pressure-Temperature Ratings

Ratings for 60 series valves with external ball vents are the same as those of switching (3-way) valves containing the same seat material. See the Swagelok *Ball Valves, General Purpose and Special Application—60 Series* catalog, [MS-01-146](#), for complete pressure-temperature ratings.

### Testing

#### Valves with Reinforced PTFE, Carbon/Glass PTFE, Polyethylene, and Virgin PTFE Seats

Every 60 series ball valve with externally vented ball is factory tested with nitrogen at its maximum pressure rating. Seats have a maximum allowable leak rate of 0.1 std cm<sup>3</sup>/min.

Shell testing with nitrogen at the maximum rated pressure is performed on 62, 63, and 65 series valves to a requirement of no detectable leakage with a liquid leak detector.

Shell testing with water at 1.5 times the maximum working pressure is performed on 67 and 68 series valves.

#### Valves with PEEK Seats

Every 60 series ball valve with externally vented ball is factory tested with nitrogen at 50 psig (3.4 bar) for leak-tight integrity of the seats as specified by FCI 70-2 Specification Class VI.

Shell testing with nitrogen at the maximum rated pressure is performed on 62, 63, and 65 series valves to a requirement of no detectable leakage with a liquid leak detector.

Shell testing with water at 1.5 times the maximum working pressure is performed on 67 and 68 series valves.

### Ordering Information

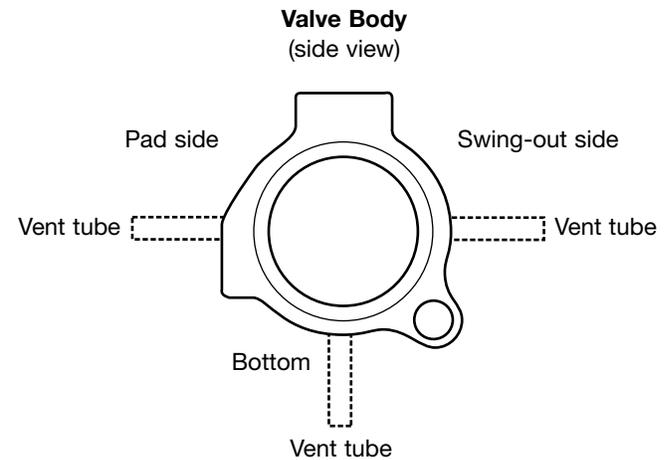
#### Valves with External Ball Vents

Valves contain a vent port on the pad side of the valve body. To order, select a valve ordering number from the Swagelok *Ball Valves, General Purpose and Special Application—60 Series* catalog, [MS-01-146](#), and insert **DV** for downstream vent or **UV** for upstream vent.

Example: SS-62TDVS4

Balls with external vents are not available in chlorine series (C60V) valves or in any other valves with internal vents.

#### Valves with External Ball Vents and Vent Tubes



Tubes welded to vent ports allow controlled release or recovery of vented fluids.

- Vent tubes are 2 in. (50.8 mm) long with 1/4 in. (6.4 mm) outside diameter and 0.049 in. (1.24 mm) wall thickness. Stainless steel valves have 316L vent tubes; brass valves have copper vent tubes. For information about vent tube materials used with other valve body materials, contact your authorized Swagelok sales and service representative.
- Up to three vent tubes can be ordered and their locations specified for each valve.
- A vent tube on the swing-out side of the valve does not interfere with the swing-out feature.

To order optional vent tubes, add a vent tube designator to the ordering number.

Number of Vent Tubes	Vent Tube Location	Designator
1	Swing-out side Pad side Bottom	-SX -XP -XB
2	Swing-out and pad sides Pad and bottom sides Swing-out and bottom sides	-SP -PB -SB
3	Swing-out, pad, and bottom sides	-SPB

Example: SS-62TDVS4-**SX**

**⚠ Caution: When installing a Swagelok externally vented valve, position the vent port or tube so that system fluid is directed away from operating personnel. Operating personnel must take suitable measures to protect themselves from exposure to system fluids.**

## Internal Ball Vents—2-Way Valves

### Purpose

The internal vent equalizes pressure in the ball and body to that of the system, protecting the valve from temperature-induced overpressurization. The ball contains a vent passage that intersects the ball orifice at a 90° angle. There are no external vent ports.

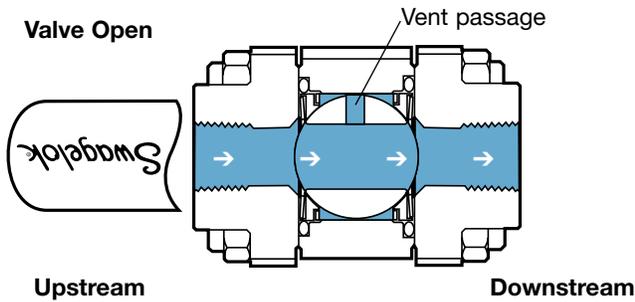
The downstream vent equalizes pressure in the ball and body to that of the downstream system in the closed position.

The upstream vent equalizes fluid pressure to that of the upstream system in the closed position.

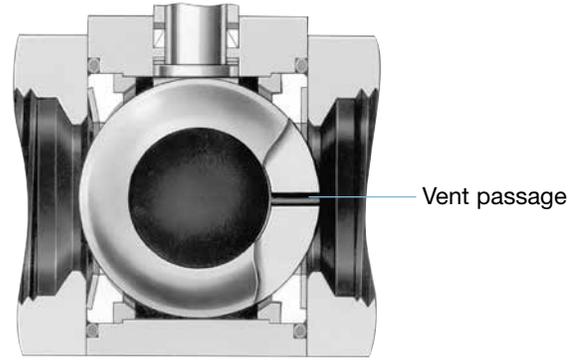
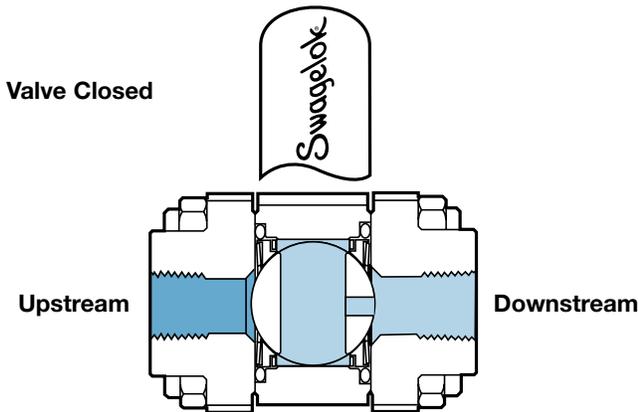
### Operation

#### Internal Downstream Vent (NDV)

When the valve is open, system fluids flow through the valve. The vent passage allows pressure inside the valve to remain equal to system pressure.

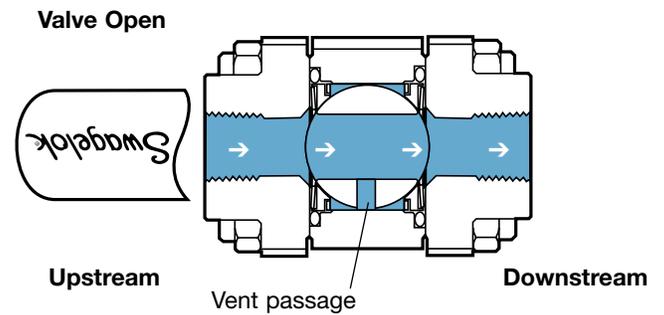


When the valve is closed, the vent passage faces downstream, allowing pressure to equalize between the body and the downstream system.

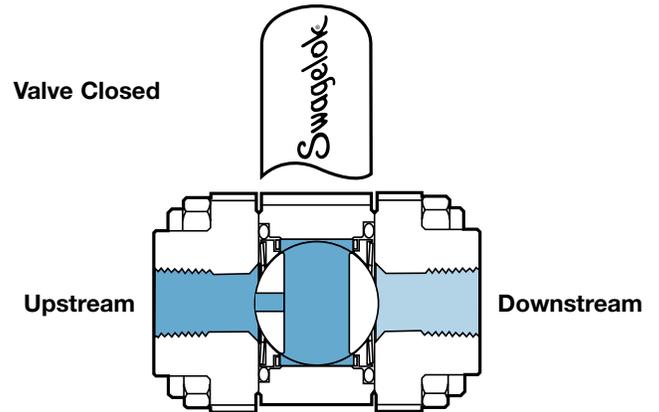


#### Internal Upstream Vent (NUV)

When the valve is open, system fluids flow through the valve. The vent passage allows pressure inside the valve to remain equal to system pressure.



When the valve is closed, the vent passage faces upstream, allowing pressure to equalize between the body and the upstream system.



## Pressure-Temperature Ratings

### Valves with Upstream Internal Vents

Ratings for 60 series valves with upstream internal ball vents are the same as those of standard 2-way (on-off) valves containing the same seat material. See the Swagelok *Ball Valves, General Purpose and Special Application—60 Series* catalog, [MS-01-146](#), for complete pressure-temperature ratings.

### Valves with Downstream Internal Vents

Ratings for 60 series valves with downstream internal ball vents are the same as those of switching (3-way) valves containing the same seat material. See the Swagelok *Ball Valves, General Purpose and Special Application—60 Series* catalog, [MS-01-146](#), for complete pressure-temperature ratings.

## Testing

### Valves with Reinforced PTFE, Carbon/Glass PTFE, Polyethylene, and Virgin PTFE Seats

Every 60 series ball valve with internally vented ball is factory tested with nitrogen at the pressures shown in the table at right.

Seats have a maximum allowable leak rate of 0.1 std cm<sup>3</sup>/min.

Valve Series	Vent Option	Test Pressure psig (bar)
62, 63, 65	Upstream and downstream	1000 (69)
67, 68	Downstream	500 (34.4)
	Upstream	1000 (69)

Shell testing with nitrogen at the maximum rated pressure is performed on 62, 63, and 65 series valves to a requirement of no detectable leakage with a liquid leak detector.

Shell testing with water at 1.5 times the maximum working pressure is performed on 67 and 68 series valves.

### Valves with PEEK Seats

Every 60 series ball valve with externally vented ball is factory tested with nitrogen at 50 psig (3.4 bar) for leaktight integrity of the seats as specified by FCI 70-2 Specification Class VI.

Shell testing with nitrogen at the maximum rated pressure is performed on 62, 63, and 65 series valves to a requirement of no detectable leakage with a liquid leak detector.

Shell testing with water at 1.5 times the maximum working pressure is performed on 67 and 68 series valves.

#### Safe Product Selection

**When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.**

#### WARNING

**Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.**

## Ordering Information

Select a valve ordering number from the Swagelok *Ball Valves, General Purpose and Special Application—60 Series* catalog, [MS-01-146](#), and insert **NDV** for downstream vent or **NUV** for upstream vent.

Example: SS-62TNDVS4

Balls with internal vents are standard in fire series (A60T) and chlorine series (C60V) valves.

## Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](#) or contact your authorized Swagelok representative.