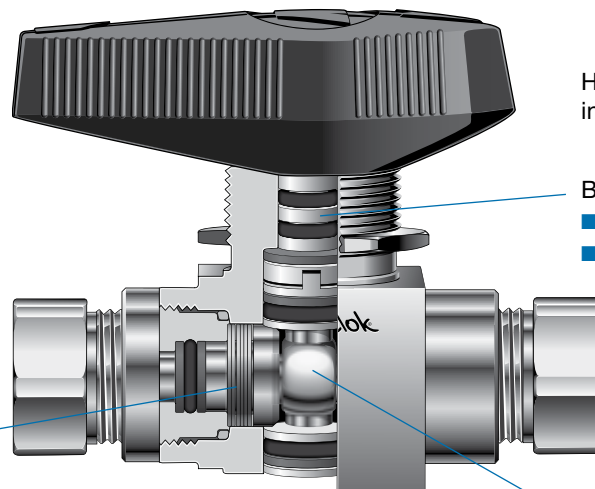


# Trunnion Ball Valves—Special Alloy Materials

## 83 Series

- Alloy 625, alloy 825, and SAF 2507™ super duplex stainless steel materials
- Working pressures up to 6000 psig (413 bar)
- 1/4 to 1/2 in. Swagelok® tube fitting or NPT end connections
- Compact, maximum-flow design
- Flow coefficient ( $C_v$ ) 0.75 to 1.6
- Low operating torque
- 2-way and 3-way flow pattern
- Panel mounting
- Pneumatic and electric actuators available



Heavy-duty handle indicates flow direction.

Bottom-loaded stem:  
 ■ prevents stem blowout  
 ■ enhances system safety.

Spring-loaded seats:

- provide leak-tight integrity in both low- and high-pressure systems
- contribute to low operating torque
- reduce seat wear from pressure surges.

Trunnion-style ball:  
 ■ prevents ball blowout  
 ■ contributes to low operating torque.

## Pressure-Temperature Ratings

Pressure-temperature ratings for 83 series valves are based on listed seat materials, fluorocarbon FKM O-rings, and reinforced PTFE backup rings.

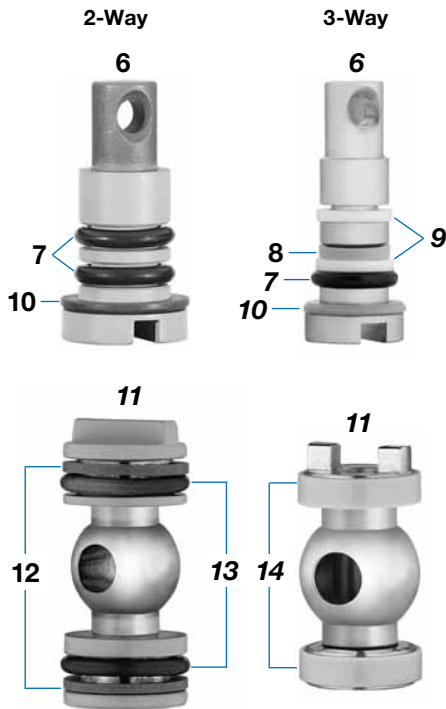
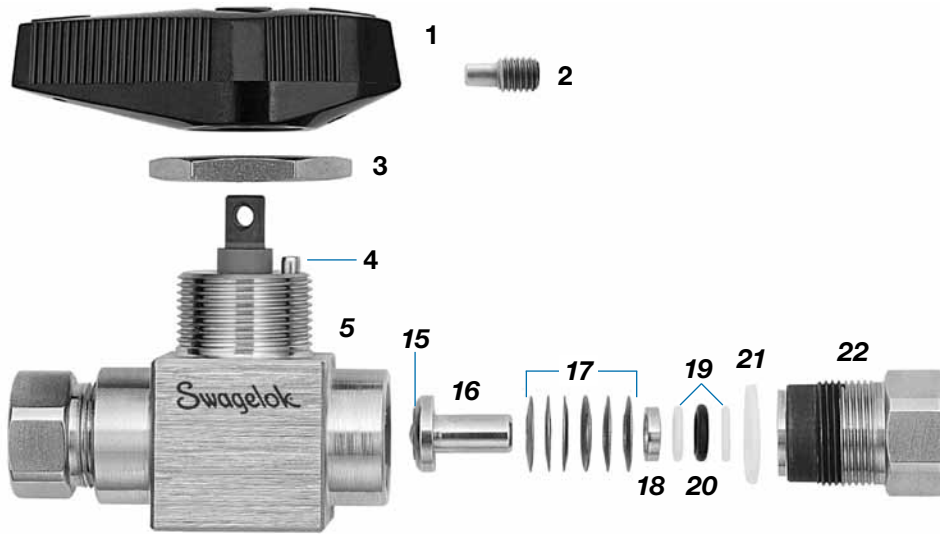
Low-temperature L83 series ball valves are available. See page 4.

| Material             | Alloy 625, Alloy 825, SAF 2507 |             |
|----------------------|--------------------------------|-------------|
| Seat Material        | PCTFE                          | PEEK        |
| Temperature, °F (°C) | Working Pressure, psig (bar)   |             |
| 0 (-17) to 100 (37)  | 6000 (413)                     | 6000 (413)  |
| 150 (65)             | 3000 (206)                     | 5800 (399)  |
| 200 (93)             | 2000 (137)                     | 5000 (344)  |
| 250 (121)            | —                              | 4100 (282)  |
| 300 (148)            | —                              | 3200 (220)  |
| 350 (176)            | —                              | 2300 (158)  |
| 400 (204)            | —                              | 1400 (96.4) |
| 450 (232)            | —                              | 500 (34.4)  |

## Important Information About Ball Valves

- ⚠ Swagelok ball valves are designed to be used in a fully open or fully closed position.
- ⚠ Valves that have not been cycled for a period of time may have a higher initial actuation torque.

## Materials of Construction



| Component                               | Valve Body Material   |                       |                      |
|---|---|-----------------------|----------------------|
|   | Alloy 625   | Alloy 825             | SAF 2507             |
|   | Material Grade/ASTM Specification   |                       |                      |
| 1 Handle                                | Phenolic with brass insert  |                       |                      |
| 2 Set screw                             | S17400 SS   |                       |                      |
| 3 Panel nut                             | 316 SS/B783   |                       |                      |
| 4 Stop pin<br>(2-way—2; 3-way—1)        | Stainless steel   |                       |                      |
| 5 Body                                  | <i>Alloy 625/B446</i>   | <i>Alloy 825/B425</i> | <i>SAF 2507/A479</i> |
| 6 Stem                                  | <i>Alloy 625/B446</i>   | <i>Alloy 825/B425</i> | <i>SAF 2507/A479</i> |
| 7 Stem O-rings<br>(2-way—2; 3-way—1)    | <i>Fluorocarbon FKM</i>   |                       |                      |
| 8 Primary stem backup ring<br>(3-way)   | PEEK  |                       |                      |
| 9 Secondary stem backup ring<br>(3-way) | PTFE/D1710  |                       |                      |
| 10 Stem bearing                         | 2-way—Reinforced PTFE; 3-way—PEEK   |                       |                      |
| 11 Ball <sup>①</sup>                    | <i>Alloy 625/B446</i>   | <i>Alloy 825/B425</i> | <i>SAF 2507/A479</i> |
| 12 Trunnion backup rings (2)<br>(2-way) | Reinforced PTFE   |                       |                      |
| 13 Trunnion O-rings (2)<br>(2-way)      | <i>Fluorocarbon FKM</i>   |                       |                      |
| 14 Trunnion bearings (3-way)            | PEEK  |                       |                      |
| 15 Seats (2)                            | <i>PCTFE/AMS 3650 or PEEK</i>   |                       |                      |
| 16 Seat carriers (2)                    | <i>Alloy 625/B446</i>   | <i>Alloy 825/B425</i> | <i>SAF 2507/A479</i> |
| 17 Seat springs (12)                    | <i>Alloy X-750/AMS 5542</i>   |                       |                      |
| 18 Seat carrier guides (2)              | <i>Alloy 625/B446</i>   | <i>Alloy 825/B425</i> | <i>SAF 2507/A479</i> |
| 19 Seat carrier backup rings (4)        | Reinforced PTFE   |                       |                      |
| 20 Seat carrier O-rings (2)             | <i>Fluorocarbon FKM</i>   |                       |                      |
| 21 End screw seals (2)                  | PTFE/D1710  |                       |                      |
| 22 End screws (2)                       | <i>Alloy 625/B446</i>   | <i>Alloy 825/B425</i> | <i>SAF 2507/A479</i> |
| Lubricants                              | <i>Fluorinated-based (all valves);<br/>tungsten disulfide additive (valves with PEEK seats)</i> |                       |                      |

Wetted components listed in *italics*.

① Ball trunnions are PTFE coated in all 2-way valves.

### Testing

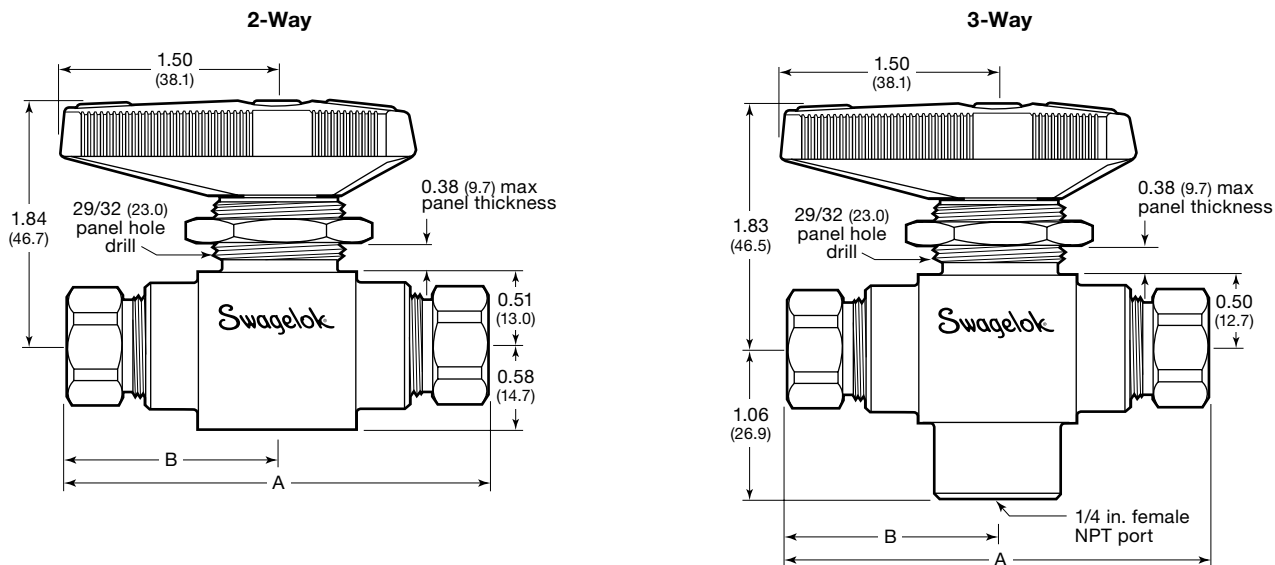
Every Swagelok trunnion ball valve is factory tested with nitrogen at 1000 psig (69 bar). Seats have a maximum allowable leak rate of 0.1 std cm<sup>3</sup>/min. Shell testing is performed to a requirement of no detectable leakage with a liquid leak detector.

### Cleaning and Packaging

All Swagelok trunnion ball valves are cleaned and packaged in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)*, MS-06-62.

### Ordering Information and Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change. Dimensions shown with Swagelok tube fitting nuts finger-tight.



Select a basic valve ordering number from the table below. Add the material designator from the table to the right.

Example: **625-83KF4**

Valve ordering numbers specify a PCTFE seat. To order valves with PEEK seat, replace **K** in the ordering number with a **P**.

Example: **625-83PF4**

| Material  | Designator |
|-----------|------------|
| Alloy 625 | 625        |
| Alloy 825 | 825        |
| SAF 2507  | 2507       |

| End Connections                                 |                      | Flow Coefficient (C <sub>v</sub> ) | Basic Ordering Number | Dimensions, in. (mm) |             |
|---|----------------------|------------------------------------|-----------------------|----------------------|-------------|
| Type  | Size                 |                                    |                       | A                    | B           |
| <b>2-Way Valve, 0.187 in. (4.75 mm) Orifice</b> |                      |                                    |                       |                      |             |
| Female NPT                                      | 1/4 in.              | 1.0                                | SS-83KF4              | 2.94 (74.7)          | 1.47 (37.3) |
|   | 1/2 in. <sup>①</sup> | 1.2                                | SS-83KF8              | 4.25 (108)           | 2.13 (54.1) |
| Fractional Swagelok tube fitting                | 1/4 in.              | 1.6                                | SS-83KS4              | 4.14 (105)           | 2.07 (52.6) |
|   | 3/8 in.              | 1.4                                | SS-83KS6              | 4.39 (112)           | 2.19 (55.6) |
|   | 1/2 in. <sup>①</sup> | 1.0                                | SS-83KS8              | 4.60 (117)           | 2.30 (58.4) |
| <b>3-Way Valve, 0.187 in. (4.75 mm) Orifice</b> |                      |                                    |                       |                      |             |
| Female NPT <sup>②</sup>                         | 1/4 in.              | 0.75                               | SS-83XKF4             | 2.94 (74.7)          | 1.47 (37.3) |
|   | 1/2 in. <sup>①</sup> |                                    | SS-83XKF8             | 4.25 (108)           | 2.13 (54.1) |
| Fractional Swagelok tube fitting <sup>②</sup>   | 1/4 in.              |                                    | SS-83XKS4             | 4.14 (105)           | 2.07 (52.6) |
|   | 3/8 in.              |                                    | SS-83XKS6             | 4.39 (112)           | 2.19 (55.6) |
|   | 1/2 in. <sup>①</sup> |                                    | SS-83XKS8             | 4.60 (117)           | 2.30 (58.4) |

For more information about pressure ratings of valves with tube fitting end connections, see Swagelok *Tubing Data*, MS-01-107.

① Not recommended for panel mounting.  
 ② Bottom port of all 3-way valves is 1/4 in. female NPT.

## Options and Accessories

### 83 Series Handles

Black phenolic handles are standard. Colored phenolic and 316 stainless steel bar handles are available. To order, add a handle designator to the valve ordering number.

Example: 625-83KF4-**RD**

| Handle              | Designator |
|---------------------|------------|
| Black phenolic      | -BK        |
| Blue phenolic       | -BL        |
| Green phenolic      | -GR        |
| Orange phenolic     | -OG        |
| Red phenolic        | -RD        |
| Yellow phenolic     | -YW        |
| Stainless steel bar | -SH        |

### Handle Kits

Handle kits contain a handle and set screw.

Standard black phenolic handle kit ordering number: **PH-5K-83-BK**

To order handles in other colors, replace **-BK** in the kit ordering number with a handle designator.

Example: PH-5K-83-**RD**

Stainless steel bar handle kit ordering number: **SS-5K-83**

### 83 Series Seal Kits

Seal kits contain components of the same materials as new components. See **Materials of Construction**, page 2, or **Low-Temperature Service**, this page.

For a complete ordering number, add a special alloy material designator and a seat material designator to a basic seal kit ordering number.

Examples: **625-9K-83K**  
**825-9K-L83P**

| Special Alloy Material | Designator |
|------------------------|------------|
| Alloy 625              | 625        |
| Alloy 825              | 825        |
| SAF 2507               | 2507       |

| Seat Material | Designator |
|---------------|------------|
| PEEK          | P          |
| PCTFE         | K          |

| Valve Series             | Basic Seal Kit Ordering Number | Kit Contents   |
|--------------------------|--------------------------------|--|
| 83 2-way                 | -9K-83                         | Instructions, O-rings, stem bearing, ball, seat subassemblies (seats and seat carriers), seat springs, end screw seals, lubricant, and lubricant Material Safety Data Sheet (MSDS) |
| Low-temperature 83 2-way | -9K-L83                        |  |
| 83 3-way                 | -9K-83X                        | Instructions, stem, O-rings, backup rings, bearings, ball, seat subassemblies (seats and seat carriers), seat springs, end screw seals, lubricant, and lubricant MSDS              |
| Low-temperature 83 3-way | -9K-L83X                       |  |

#### 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.**

**Caution: Do not mix or interchange parts with those of other manufacturers.**

## Low-Temperature Service Options

Trunnion ball valves for low-temperature service, with a temperature rating of -40 to 200°F (-40 to 93°C), are available. Low-temperature valves have low-temperature Buna C O-rings. All other materials and ratings are the same as those of standard valves.

To order a valve for low-temperature service, insert **L** into the valve ordering number.

Example: 625-**L**83KF4

### L83 Series Pressure-Temperature Ratings

| Material             | Alloy 625, Alloy 825, SAF 2507 |            |
|----------------------|--------------------------------|------------|
|                      | Seat Material                  | PEEK       |
| Temperature, °F (°C) | Working Pressure, psig (bar)   |            |
|                      | -40 (-40) to 100 (37)          | 6000 (413) |
|                      | 150 (65)                       | 3000 (206) |
|                      | 200 (93)                       | 2000 (137) |
|                      |                                | 6000 (413) |
|                      |                                | 5800 (399) |
|                      |                                | 5000 (344) |

## Pneumatic Actuators

Pneumatic actuators are available for the special alloy, 83 series trunnion ball valves. See the Swagelok *Trunnion Ball Valves—83 Series and H83 Series* catalog, MS-01-166.

### Options for Pneumatic Actuators

Swagelok can provide factory assemblies with pneumatic actuators, solenoid valves, limit switches, and position sensors, as well as kits for field assembly. For more information, see the *Swagelok Ball Valve Actuation Options* catalog, MS-02-343.

Mounting bracket kits for ISO 5211-compliant actuators are available. See the *Actuated Ball Valve Selection Guide—ISO 5211-Compliant Actuator Mounting Bracket Kits*, MS-02-136.

## Electric Actuators

Electric actuators are available. See the *Swagelok Electric Actuators, 141 and 142 Series* catalog, MS-01-35.



## Warranty Information

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