Radial Diaphragm Valve

DR Series

- 316L stainless steel and modified PTFE wetted parts
- Variety of compact multivalve, multiport configurations
- Choice of sanitary clamp and butt weld end connections
- Choice of pneumatic or manual actuators in plastic or aluminum
- Five sizes from 1/2 to 2 in.

Swagelok

Contents

Features 2
DR Series versus Weir Style 3
Standard One-Valve Configurations 4
Standard Two-Valve Configurations 5
Typical Body Dimensions 6
Technical Data 7
Flow Data 7
Testing 7
Cleaning and Packaging 7
Inspection 7
Validation Documentation 7
Plastic Actuators 8
Aluminum Actuators 10
Point-of-Use Valves 12
Ordering Information 14
Position Indicator Switch Assemblies 15

The Swagelok® DR series radial diaphragm valve offers a cleaner, more compact way to manage sterile flow streams. The DR series valve minimizes entrapment areas, drains easily, maximizes cleanability, and provides extended diaphragm life. It provides a clean solution for many applications including media preparation, fermentation, harvest, separation, refining, purification, CIP, and SIP systems.

The single-body design can be manufactured in a wide range of configurations to include multiple valves and multiple ports, and point-of-use valves. A single Swagelok radial diaphragm valve can replace complex weir-style valve assemblies, resulting in a more compact system.

The DR series valve is designed for system pressures up to 150 psig (10.3 bar) and operating temperatures up to 280°F (137°C).

Features

Multivalve and Multiport Configurations

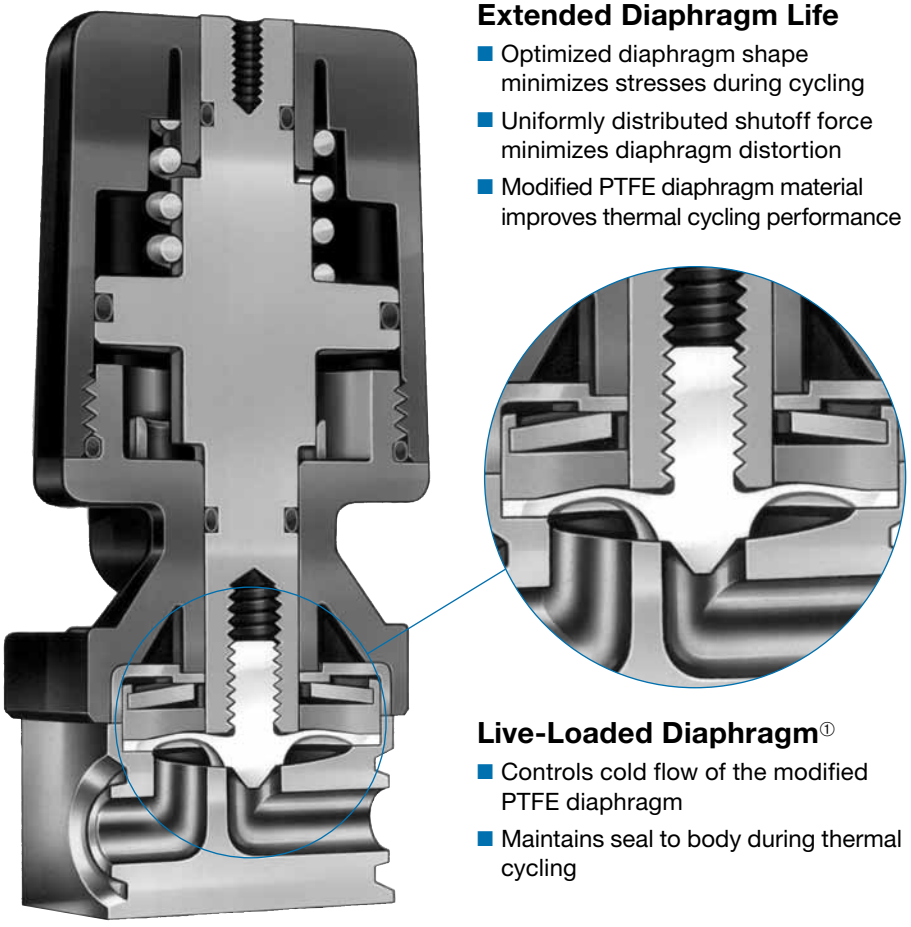
- Reduce overall system size
- Provide instantaneous flow shifts, reducing the potential for cross contamination
- Require fewer fittings and piping and less welding, making the system easier to validate
- Reduce or eliminate dead legs.

Pneumatic Actuators

- Choice of normally closed, normally open, and double-acting modes of actuation
- Are offered in plastic or aluminum
- Are available with an optional position indicator switch assembly.

Manual Actuators

- Feature a knob handle for 1/2, 3/4, and 1 in. sizes, and a hand wheel for 1 1/2, and 2 in. sizes
- Provide positive shutoff with minimal torque
- Open valve fully in 1 to 1 1/2 turns
- Are offered in plastic or aluminum.



Shown with pneumatic plastic actuator

Extended Diaphragm Life

- Optimized diaphragm shape minimizes stresses during cycling
- Uniformly distributed shutoff force minimizes diaphragm distortion
- Modified PTFE diaphragm material improves thermal cycling performance

Live-Loaded Diaphragm①

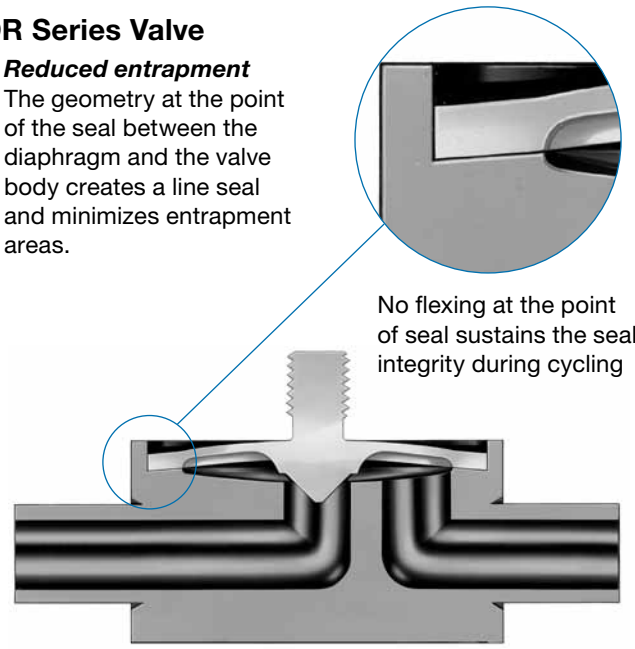
- Controls cold flow of the modified PTFE diaphragm
- Maintains seal to body during thermal cycling

① 1/2 in. model maintains a seal without a live-loaded diaphragm

DR Series versus Weir Style

DR Series Valve

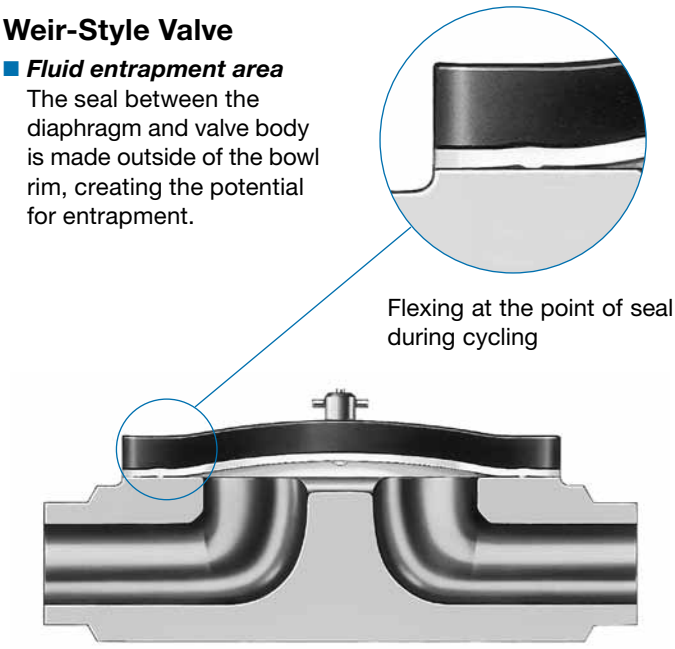
- ***Reduced entrapment***
  The geometry at the point of the seal between the diaphragm and the valve body creates a line seal and minimizes entrapment areas.



- ***Diaphragm containment***
  The outer diameter of the diaphragm is contained by a counterbore in the valve body. This design controls extrusion and sustains seal integrity during thermal cycling.
- ***Body bowl geometry***
  The rounded, open bowl enhances cleaning.

Weir-Style Valve

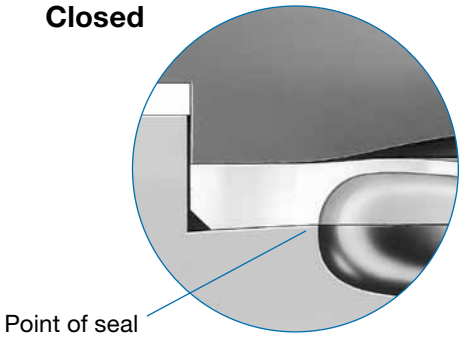
- ***Fluid entrapment area***
  The seal between the diaphragm and valve body is made outside of the bowl rim, creating the potential for entrapment.



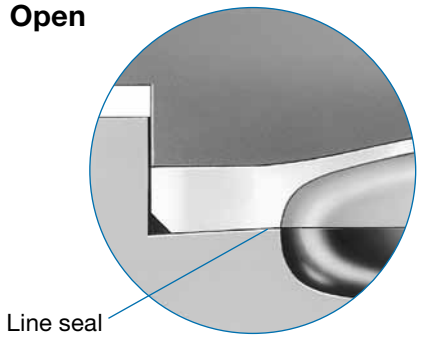
DR Series Valve

Line seal maintained during cycling of valve. No entrapment areas created.

Closed



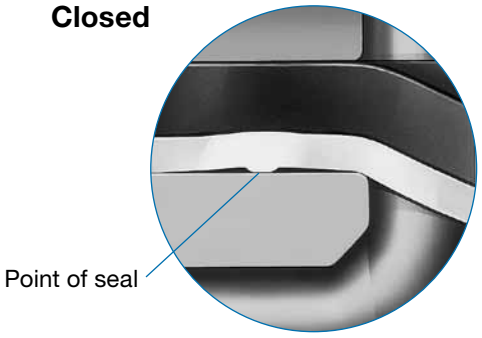
Open



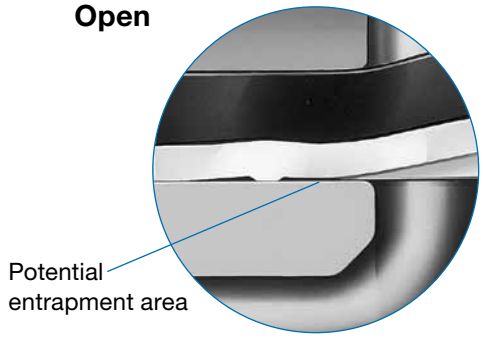
Weir-Style Valve

During cycling, flexing of the diaphragm at the point of seal creates a potential area of entrapment.

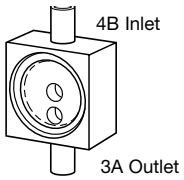
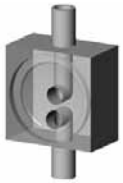
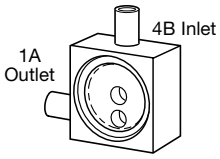
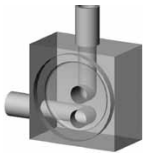
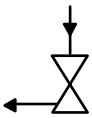
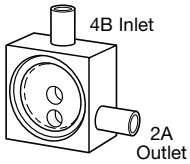
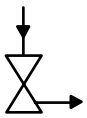
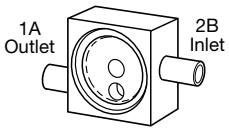
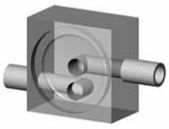
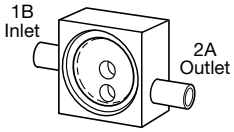
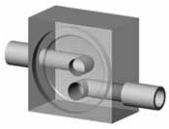
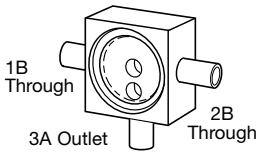
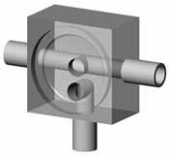
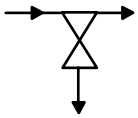
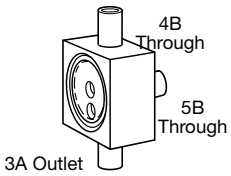
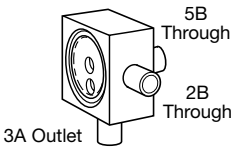
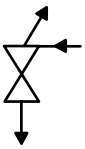
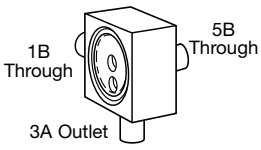
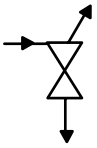
Closed



Open



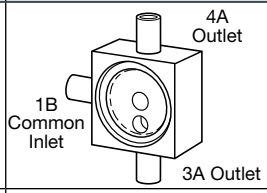
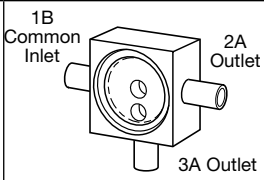
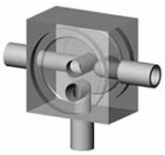
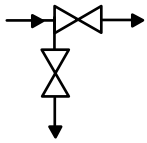
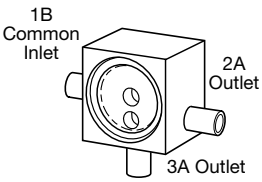
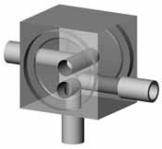
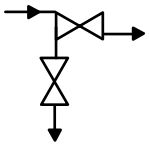
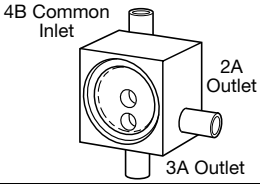
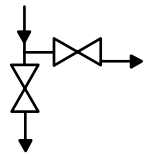
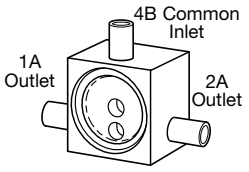
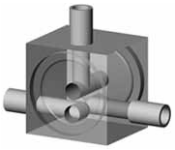
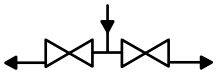
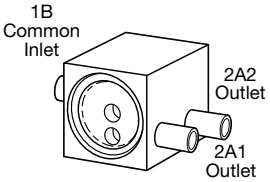
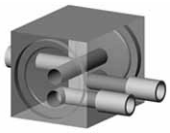
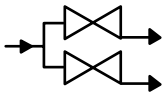
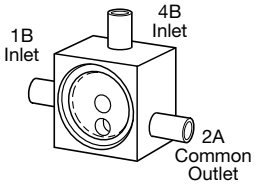
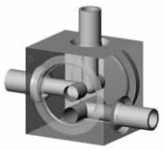
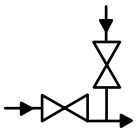
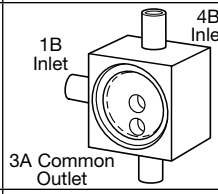
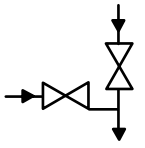
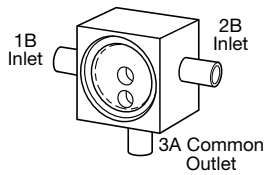
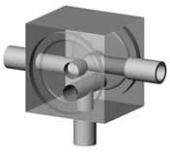
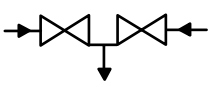
Standard One-Valve Configurations

Body Style Designator	External View	Internal View	Schematic Diagram	Description/ Application
1A straight				Shutoff two-way vertical
1B elbow to left				Shutoff two-way elbow with flow down and to left
1C elbow to right				Shutoff two-way elbow with flow down and to right
1E offset flow to left				Shutoff two-way horizontal with flow to left
1F offset flow to right				Shutoff two-way horizontal with flow to right
1G tee with outlet to bottom				■ Tee configuration ■ Ideal for use as point-of-use, drain or sample port
1K vertical elbow with outlet to bottom				
1N right elbow with outlet to bottom				
1R left elbow with outlet to bottom				

All body configurations are shown in the most drainable position.
Valves may be used in the reverse direction, but may not be fully drainable.

Connections are marked with a 1, 2, 3, 4, or 5, followed by an A or B. (See diagram on page 14 for more information.) The letter A indicates an outlet connection; B indicates an inlet connection.

Standard Two-Valve Configurations

Body Style Designator	External View	Internal View	Schematic Diagram	Description/ Application
2A common center				Ideal for diverting where drainability is not critical
2B common left				
2C offset 90°, common left				■ Ideal for diverting ■ Diaphragm closes on common port to control flow
2D offset 90°, common top				
2E offset side common top				
2F offset horizontal				
2K mixing 90° common side				■ Ideal for mixing ■ Common port is outlet port
2L mixing 90°, common bottom				
2M mixing side, common bottom				

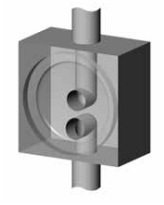
All body configurations are shown in the most drainable position.
Valves may be used in the reverse direction, but may not be fully drainable.

Connections are marked with a 1, 2, 3, or 4, followed by an A or B. (See diagram on page 14 for more information.) The letter A indicates an outlet connection; B indicates an inlet connection.

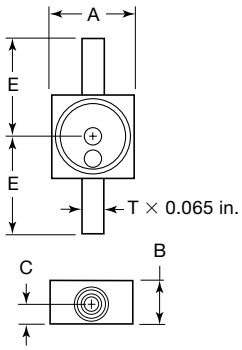
Typical Body Dimensions

Dimensions are for reference only and are subject to change.

1A Body



Typical 1-valve configuration with 2 ports

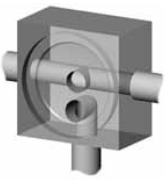


Shown with TB (tube butt weld) ends

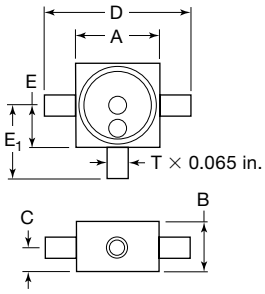
Body Style	Valve Size in.	Dimensions, in. (mm) A	B	C	E TB①	E SC①	T	Body Weight lb (kg)
1A	1/2	2.00 (50.8)	1.13 (28.7)	0.50 (12.7)	2.50 (63.5)	1.75 (44.4)	0.50 (12.7)	1.1 (0.5)
	3/4	3.00 (76.2)	1.44 (36.6)	0.62 (15.7)	3.00 (76.2)	2.50 (63.5)	0.75 (19.1)	3.1 (1.4)
	1	4.00 (102)	2.00 (50.8)	0.81 (20.6)	3.50 (88.9)	3.25 (82.6)	1.00 (25.4)	7.5 (3.4)
	1 1/2	5.18 (132)	2.56 (65.0)	1.00 (25.4)	4.25 (108)	4.25 (108)	1.50 (38.1)	15.2 (6.9)
	2	6.00 (152)	3.19 (81.0)	1.32 (33.5)	4.75 (121)	4.75 (121)	2.00 (50.8)	24.9 (11.3)

① **TB** = tube butt weld ends; **SC** = TS series and Kwik-Clamp sanitary clamp end connections.

1G Body



Typical 1-valve configuration with 3 ports

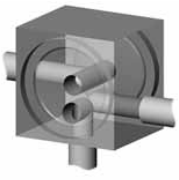


Shown with TB (tube butt weld) ends

Body Style	Valve Size in.	Dimensions, in. (mm) A	B	C	D TB①	D SC①	E	E1 TB①	E1 SC①	T	Body Weight lb (kg)
1G	1/2	2.00 (50.8)	1.13 (28.7)	0.50 (12.7)	5.00 (127)	3.50 (88.9)	1.00 (25.4)	2.50 (63.5)	1.75 (44.4)	0.50 (12.7)	1.1 (0.5)
	3/4	3.00 (76.2)	1.44 (36.6)	0.62 (15.7)	6.00 (152)	5.00 (127)	1.50 (38.1)	3.00 (76.2)	2.50 (63.5)	0.75 (19.1)	3.1 (1.4)
	1	4.00 (102)	2.00 (50.8)	0.81 (20.6)	7.00 (178)	6.50 (165)	2.00 (50.8)	3.50 (88.9)	3.25 (82.6)	1.00 (25.4)	7.5 (3.4)
	1 1/2	5.18 (132)	2.56 (65.0)	1.00 (25.4)	8.50 (216)	8.50 (216)	2.59 (65.8)	4.25 (108)	4.25 (108)	1.50 (38.1)	15.2 (6.9)
	2	6.00 (152)	3.19 (81.0)	1.32 (33.5)	9.50 (241)	9.50 (241)	3.00 (76.2)	4.75 (121)	4.75 (121)	2.00 (50.8)	24.9 (11.3)

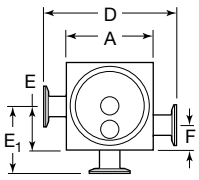
① **TB** = tube butt weld ends; **SC** = TS series and Kwik-Clamp sanitary clamp end connections.

2C Body

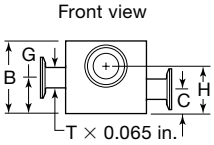


Typical 2-valve configuration with 3 ports

Top view



Front view



Shown with SC (sanitary clamp fitting) ends

Body Style	Valve Size in.	Dimensions, in. (mm) A	B	C	D TB①	D SC①	E	E_1 TB①	E_1 SC①	F	G	H	T	Body Weight lb (kg)
2C	1/2	2.00 (50.8)	1.75 (44.4)	0.50 (12.7)	5.00 (127)	3.50 (88.9)	1.00 (25.4)	2.50 (63.5)	1.75 (44.4)	0.50 (12.7)	0.63 (16.0)	0.88 (22.4)	0.50 (12.7)	1.7 (0.8)
	3/4	3.00 (76.2)	2.50 (63.5)	0.62 (15.7)	6.00 (152)	5.00 (127)	1.50 (38.1)	3.00 (76.2)	2.50 (63.5)	0.69 (17.5)	1.25 (31.8)	1.68 (42.7)	0.75 (19.1)	5.2 (2.4)
	1	4.00 (102)	3.50 (88.9)	0.81 (20.6)	7.00 (178)	6.50 (165)	2.00 (50.8)	3.50 (88.9)	3.25 (82.6)	0.92 (23.4)	1.75 (44.4)	2.31 (58.7)	1.00 (25.4)	12.5 (5.7)
	1 1/2	5.18 (132)	4.63 (118)	1.00 (25.4)	8.50 (216)	8.50 (216)	2.59 (65.8)	4.25 (108)	4.25 (108)	1.08 (27.4)	2.31 (58.7)	3.07 (78.0)	1.50 (38.1)	25.7 (11.7)
	2	6.00 (152)	6.00 (152)	1.32 (33.5)	9.50 (241)	9.50 (241)	3.00 (76.2)	4.75 (121)	4.75 (121)	1.18 (30.0)	3.00 (76.2)	4.13 (105)	2.00 (50.8)	46.2 (21.0)

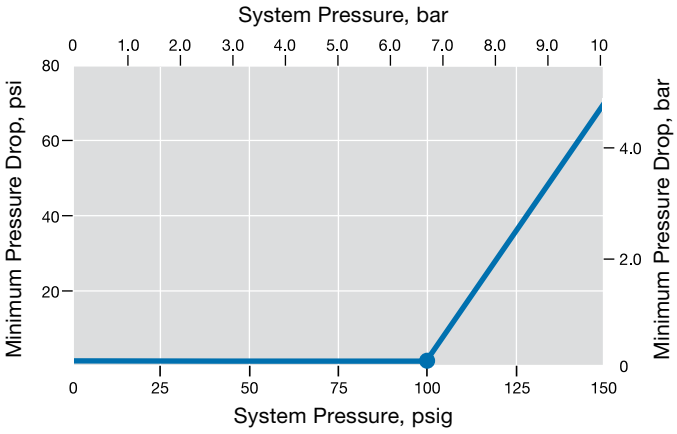
① **TB** = tube butt weld ends; **SC** = TS series and Kwik-Clamp sanitary clamp end connections.

Technical Data

Valve Pressure-Temperature Ratings

Temperature °F (°C)	Working Pressure psig (bar)
14 (–10) to 190 (87)	150 (10.3)
200 (93)	138 (9.5)
250 (121)	67 (4.6)
280 (137)	40 (2.7)

Required Pressure Drop for Valves with Normally Closed Pneumatic Actuators



Actuator Pressure-Temperature Ratings

Material	Temperature Rating, °F (°C) Operating	Ambient	Working Pressure psig (bar)
Aluminum	14 to 280°F (–10 to 137°C)	Autoclavable to 300°F (148°C) max	70 to 120 psig (4.8 to 8.2 bar)
Plastic		190°F (89°C) max	70 to 100 psig (4.8 to 6.8 bar)

Design Specifications

The design and fabrication of Swagelok radial diaphragm valves are in compliance with **Part SD-4.6 Process (Hygienic) Valves of ASME BPE.**

Material Specifications

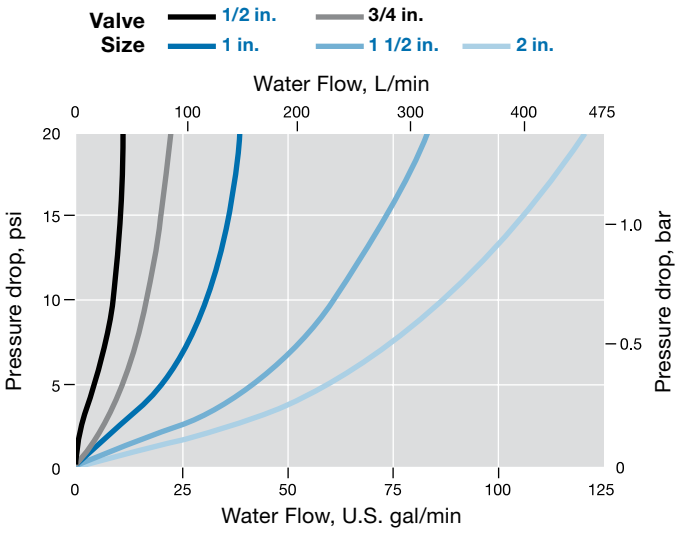
The wetted components of Swagelok radial diaphragm valves are traceable: valve bodies and fittings are heat traceable; diaphragm materials are lot traceable. All DR series valve bodies are machined from 316L stainless steel in accordance with ASTM A479 specifications, providing integrity, strength, and high levels of purity.

Surface Finish

- Interior body surfaces are electropolished and finished to 15 µin. (0.38 µm) R_a max. All accessible welds are ground flush on the inside diameter.
- Exterior body surfaces are passivated and finished to 63 µin. (1.60 µm) R_a avg.

Flow Data

Water



Flow Coefficient

Flow Coefficient C_v	Valve Size, in. 1/2	3/4	1	1 1/2	2
	1.6	4.6	8.7	18.7	27.2

Testing

Every Swagelok DR series radial diaphragm valve is inboard helium leak tested to a maximum allowable leak rate of 2.5×10^{-3} std cm^3/s, at the seat, envelope, and port welds, using FCI 70-2 as a guideline.

Cleaning and Packaging

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

Inspection

- The interior surfaces of Swagelok DR series valve bodies are 100 % visually inspected.
- All welds are performed by ASME Section IX certified welders and are 100 % visually inspected.
- All completed valve assemblies are 100 % visually inspected prior to shipment.

Validation Documentation

The following validation documentation can be provided upon request:

- Certified mill test report on the valve body
- Certification of compliance to specifications
- Certification of compliance to 21CFR Part 177
- Quality Assurance Manual
- ISO 9001 certification

Plastic Actuators

Features

- Available for 1/2, 3/4, and 1 in. valves
- Choice of manual and pneumatic models
- Resistant to caustic washdowns

Pneumatic Models

- Choice of actuation modes: normally closed, normally open, or double acting
- Reliable piston-driven actuation
- Optional Westlock® position indicator switch assembly

Manual Models

- Open fully in one turn
- Positive shutoff with minimal torque; no travel stop required.
- Visual indication of open position with rising handle button
- Low thermal conductivity of plastic handle provides comfortable operation in steam applications.

Materials of Construction

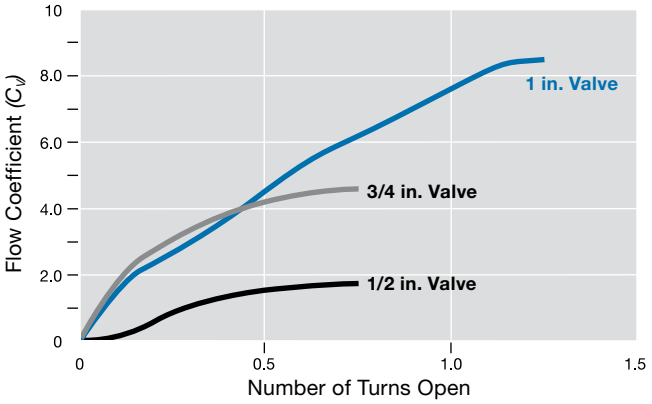
Item	Material Grade/ ASTM Specification
1 Cap screws	304 SS
2 Washers	304 SS
3 Actuator assembly	FDA-compliant polyethersulfone housing with FDA-compliant fluorocarbon FKM O-rings
4 *Diaphragm*	*Modified PTFE/D4894*
5 *Body*	*316L SS/A479*

Wetted components listed in *italics.*

Plastic Actuators

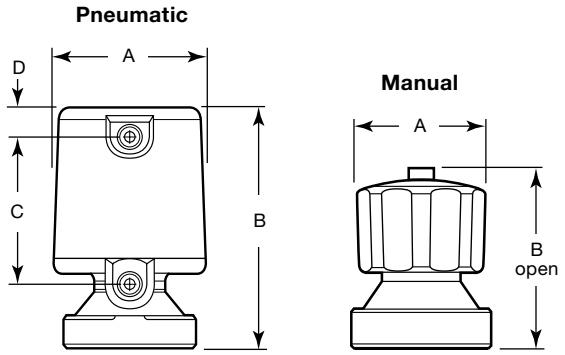
Manual Models

Flow Coefficient at Turns Open



Dimensions

Dimensions are for reference only and are subject to change.



Valve Size in.	Dimensions, in. (mm)							
	Pneumatic					Manual		
	A	B	C	D	Weight lb (kg)	A	B	Weight lb (kg)
1/2	2.57 (65.3)	4.08 (104)	2.47 (62.7)	0.49 (12.4)	1.0 (0.5)	2.10 (53.3)	2.83 (71.9)	0.5 (0.2)
3/4	3.25 (82.6)	4.44 (113)	2.84 (72.1)		2.1 (1.0)	2.58 (65.5)	3.30 (83.8)	1.5 (0.7)
1	4.25 (108)	4.73 (120)	3.12 (79.2)	0.53 (13.4)	4.3 (2.0)	3.25 (82.6)	4.57 (116)	3.7 (1.7)

Pneumatic Models

- Air inlet port is 1/8-27 NPT.
- Vent port is M5 × 0.8-6H thread for leak detection (accepts 10-32 UNF fitting).
- Mounting holes for an optional Westlock position indicator assembly include two M5 × 0.8-6H threaded holes in the top of the cap and one 10-24 UNC-2B threaded hole in the center of the piston.

Ordering Information

Valve with Plastic Actuator

To order a complete valve with a plastic actuator, see **Ordering Information** on page 14.

Plastic Actuator Kit

The plastic actuator kit includes a fully assembled actuator—manual or pneumatic, cap screws, flat washers (as required), and service instructions. Diaphragm is not included.

To order a plastic actuator kit, select the actuator kit basic ordering number and add **BK** for manual actuation, **C** for normally closed, **O** for normally open, or **D** for double acting actuation.

Example: P-DR8-K1-**C**

Valve Size in.	Basic Ordering Number
1/2	P-DR8-K1-
3/4	P-DR12-K1-
1	P-DR16-K1-

Diaphragm Kit

The diaphragm kit includes a diaphragm and service instructions.

Valve Size in.	Ordering Number
1/2	NXT-3D-SV8
3/4	NXT-3D-SV12
1	NXT-3D-SV16

Aluminum Actuators

Features

- Available for 1/2, 3/4, 1, 1 1/2, and 2 in. valves
- Manual and pneumatic models
- Suitable for autoclave applications

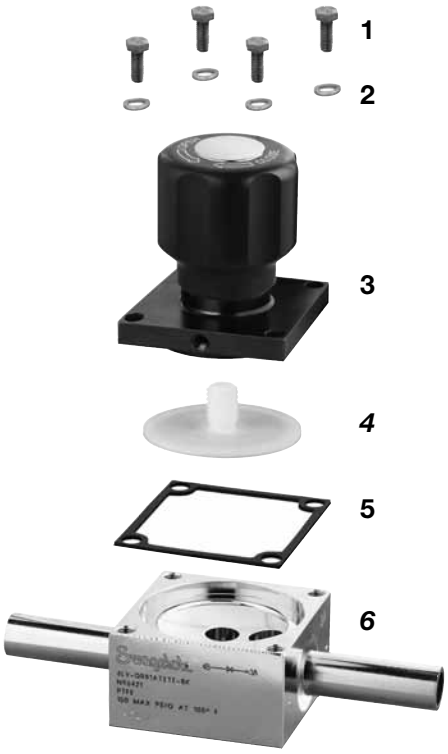
Pneumatic Models

- Choice of actuation mode: normally closed, normally open, or double acting
- Reliable piston-driven actuation
- Optional Westlock position indicator assemblies are available.

Manual Models

- Open fully in 1 1/2 turns.
- Provide positive shutoff with minimal torque.
- Feature knob handle for 1/2 through 1 in. sizes and hand wheel for 1 1/2 and 2 in. sizes.

Belleville springs (not shown) are included on all sizes except 1/2 in.



Materials of Construction

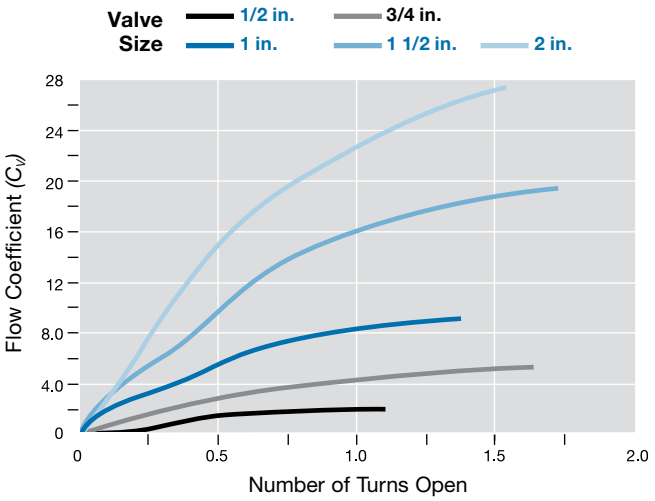
Item	Material Grade/ ASTM Specification
1 Cap screws	304 SS
2 Belleville springs	Inconel® 718/AMS 5596
3 Actuator assembly	Aluminum, hard anodized, PTFE impregnated housing with FDA-compliant fluorocarbon FKM O-rings
4 *Diaphragm*	*Modified PTFE/D4894*
5 Body gasket	FDA-compliant EPDM
6 *Body*	*316L SS/A479*

Wetted components listed in *italics.*

Aluminum Actuators

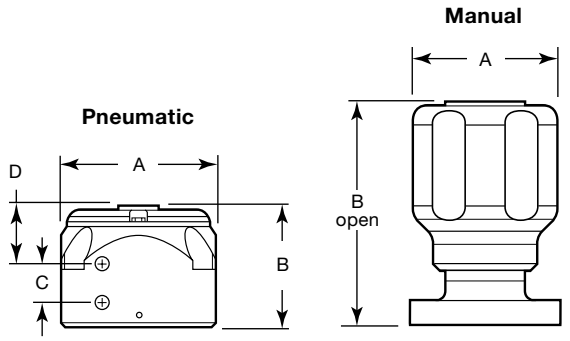
Manual Models

Flow Coefficient at Turns Open



Dimensions

Dimensions are for reference only and are subject to change.



Valve Size in.	Dimensions, in. (mm)							
	Pneumatic					Manual		
	A	B	C	D	Weight lb (kg)	A	B	Weight lb (kg)
1/2	2.00 (50.8)	2.91 (73.9)	0.75 (19.1)	1.10 (27.9)	0.8 (0.4)	2.00 (50.8)	3.08 (78.2)	0.8 (0.4)
3/4	3.00 (76.2)	3.82 (97.0)	1.00 (25.4)	1.43 (36.3)	2.7 (1.2)	2.75 (69.9)	3.59 (91.2)	2.0 (0.9)
1	4.00 (102)	3.78 (96.0)	1.04 (26.4)	1.45 (36.8)	4.8 (2.2)	5.00 (127)	4.32 (110)	3.9 (1.8)
1 1/2	5.18 (132)	5.15 (131)	1.30 (33.0)	2.37 (60.2)	8.6 (3.9)	5.00 (127)	6.60 (168)	7.9 (3.6)
2	6.00 (152)	5.24 (133)	1.15 (29.2)	2.49 (63.2)	13.8 (6.3)	6.00 (152)	6.57 (167)	9.9 (4.5)

Pneumatic Models

- Air inlet port is 1/8-27 NPT.
- Vent port is M5 × 0.8-6H thread for leak detection (accepts 10-32 UNF fitting).
- Mounting holes for an optional Westlock position indicator assembly include two M5 × 0.8-6H threaded holes in the top of the cap and one 10-24 UNC-2B threaded hole in the center of the piston.

Ordering Information

Valve with Aluminum Actuator

To order a complete valve with an aluminum actuator, see Ordering Information on page 14.

Aluminum Actuator Kit

The aluminum actuator kit includes a fully assembled actuator—manual or pneumatic, cap screws, Belleville springs (as required), body gasket, and service instructions. Diaphragm is not included.

To order an aluminum actuator kit, select the actuator kit basic ordering number, then add **BK** for manual actuation, **C** for normally closed, **O** for normally open, or **D** for double acting actuation.

Example: A-DR8-K1-**C**

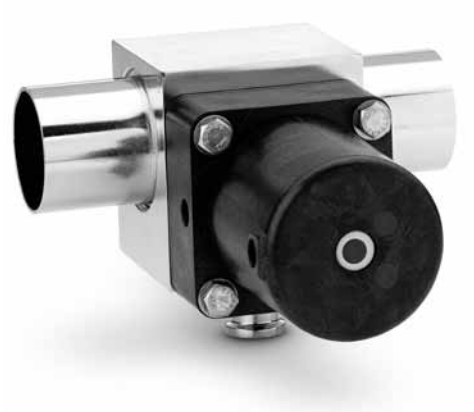
Valve Size in.	Basic Ordering Number
1/2	A-DR8-K1-
3/4	A-DR12-K1-
1	A-DR16-K1-
1 1/2	A-DR24-K1-
2	A-DR32-K1-

Diaphragm-Body Gasket Kit

The diaphragm-body gasket kit includes a diaphragm, body gasket, and service instructions.

Valve Size in.	Ordering Number
1/2	NXT-3DK-DR8
3/4	NXT-3DK-DR12
1	NXT-3DK-DR16
1 1/2	NXT-3DK-DR24
2	NXT-3DK-DR32

Point-of-Use Valves

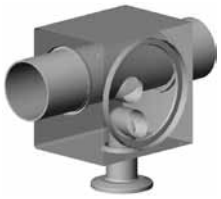


Point-of-use valve with plastic pneumatic actuator, straight tube extension header, and TS series sanitary clamp fitting at takeoff port

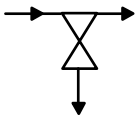
Description

Point-of-use radial diaphragm valves are multiport, tee configurations featuring a large flow-through header and a small drop-down isolation valve. These valves are ideal for:

- point-of-use drops
- sampling product from a process line
- draining, diverting, and controlling process fluids
- pure, clean steam takeoff.



Internal view



Schematic diagram

Features

- Reduced hold-up volume; improved cleaning efficiency
- Four valve sizes: 1/2, 3/4, 1, and 1 1/2 in.
- Four header sizes: 1 1/2, 2, 2 1/2, and 3 in.
- Straight tube extensions for header
- TS series sanitary clamp fitting for take-off port; available with optional butt weld end or Kwik-Clamp sanitary clamp fitting
- Choice of plastic and aluminum actuators
- Meets ASME BPE Bioprocessing Equipment Specification and FDA 6D guidelines.

Technical Data

Same as standard DR series radial diaphragm valve. See page 7.

Testing

Same as standard DR series radial diaphragm valve. See page 7.

Materials of Construction

Same as standard DR series radial diaphragm valve. See page 8 for valves with plastic actuators; see page 10 for valves with aluminum actuators.

Ordering Information

To order, select a basic ordering number from page 13, and add an actuator designator shown below.

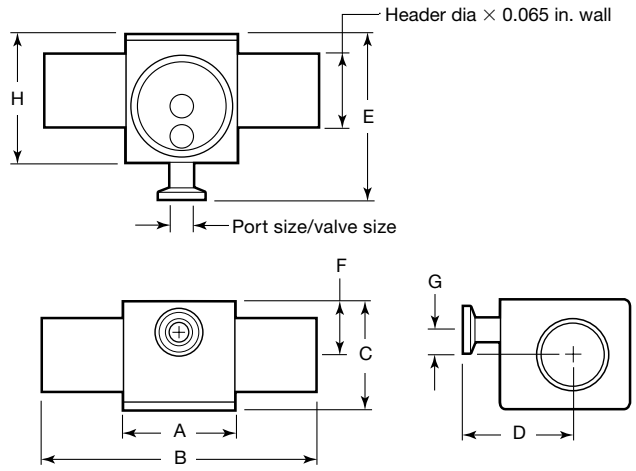
Actuation Mode	Actuator Material	Actuator Designator
Manual	Aluminum	BK
	Plastic	BKP
Normally closed	Aluminum	C
	Plastic	CP
Normally open	Aluminum	O
	Plastic	OP
Double acting	Aluminum	D
	Plastic	DP

Example: 6L-DR81PTLSETL-**BK**

Point-of-Use Valves

Ordering Information and Dimensions

Dimensions are for reference only and are subject to change.



Valve Size in.	Header Dia in.	Basic Ordering Number	Dimensions, in. (mm)								Body Weight lb (kg)
			A	B	C	D	E	F	G	H	
1/2	1 1/2	6L-DR81PTLSETL-	2.25 (57.2)	5.57 (141)	2.13 (54.1)	2.25 (57.2)	3.25 (82.6)	1.13 (28.7)	0.50 (12.7)	2.50 (63.5)	2.6 (1.2)
	2	6L-DR81PTNSETN-		5.76 (146)	2.57 (65.3)	2.50 (63.5)	3.69 (93.7)	1.38 (35.1)	0.75 (19.1)	2.94 (74.7)	3.3 (1.5)
	2 1/2	6L-DR81PTPSETP-①		6.16 (156)	3.07 (78.0)	2.75 (69.9)	4.19 (106)	1.63 (41.4)	1.00 (25.4)	3.44 (87.4)	4.3 (2.0)
	3	6L-DR81PTRSETR-①			3.56 (90.4)	3.00 (76.2)	4.69 (119)	1.85 (47.0)	1.23 (31.2)	3.94 (100)	5.3 (2.4)
3/4	1 1/2	6L-DR121PTLSGTL-	3.25 (82.6)	6.56 (167)	2.19 (55.6)	2.87 (72.9)	3.75 (95.2)	1.19 (30.2)	0.37 (9.4)	3.00 (76.2)	4.5 (2.0)
	2	6L-DR121PTNSGTN-		6.75 (171)	2.82 (71.6)	3.12 (79.2)	4.07 (103)	1.63 (41.1)	0.81 (20.6)	3.32 (84.3)	6.0 (2.7)
	2 1/2	6L-DR121PTPSGTP-		7.15 (182)	3.44 (87.4)	3.37 (85.6)	4.57 (116)	1.98 (50.3)	1.16 (29.5)	3.82 (97.0)	8.1 (3.7)
	3	6L-DR121PTRSGTR-		7.18 (182)	3.81 (96.8)	3.62 (91.9)	5.07 (129)	2.08 (52.8)	1.26 (32.0)	4.32 (110)	9.4 (4.3)
1	1 1/2	6L-DR161PTLSJTL-	4.00 (102)	7.06 (179)	2.46 (62.5)	3.50 (88.9)	4.75 (121)	1.46 (37.1)	0.27 (6.9)	4.00 (102)	8.4 (3.8)
	2	6L-DR161PTNSJTN-		7.25 (184)	2.97 (75.4)	3.75 (95.2)		1.71 (43.4)	0.52 (13.2)		9.2 (4.2)
	2 1/2	6L-DR161PTPSJTP-		7.65 (194)	3.71 (94.2)	4.00 (102)	4.94 (125)	2.26 (57.4)	1.07 (27.2)	4.19 (106)	11.8 (5.4)
	3	6L-DR161PTRSJTR-			4.38 (111)	4.25 (108)	5.44 (138)	2.66 (67.6)	1.47 (37.3)	4.69 (119)	15.2 (6.9)
1 1/2	3	6L-DR241PTRSLTR-	5.18 (132)	9.09 (231)	4.00 (102)	5.03 (128)	6.87 (174)	2.25 (57.2)	0.94 (23.9)	5.18 (132)	23.1 (10.5)

① ASME BPE L/D is greater than 2.

Ordering Information

To order a DR series valve, select designators in the sequence shown.

6L – DR **24** **2E** **SL** **SL** **SL** – **C** **P**

Material

316L stainless steel

Series

DR series radial diaphragm valve

Valve Size

8 = 1/2 in.
12 = 3/4 in.
16 = 1 in.
24 = 1 1/2 in.
32 = 2 in.

Body Style

One valve, 2-port

1A = straight
1B = elbow to left
1C = elbow to right
1E = offset flow to left
1F = offset flow to right

One valve, 3-port

1G = tee with outlet to bottom
1K = vertical elbow with outlet to bottom
1N = right elbow with outlet to bottom
1R = left elbow with outlet to bottom

Two valve, 3-port

2A = common center
2B = common left
2C = offset 90°, common left
2D = offset 90°, common top
2E = offset side, common top
2F = offset horizontal
2K = mixing 90°, common side
2L = mixing 90°, common bottom
2M = mixing side, common bottom

Actuator Material

P = Plastic
= Aluminum (no designator)

Note: On a two-valve model, the **P** designator denotes that *both* actuators are plastic.

Actuator Style

BK = Manual
C = Pneumatic, normally closed
O = Pneumatic, normally open
D = Pneumatic, double acting

One-valve models—select *one* designator.

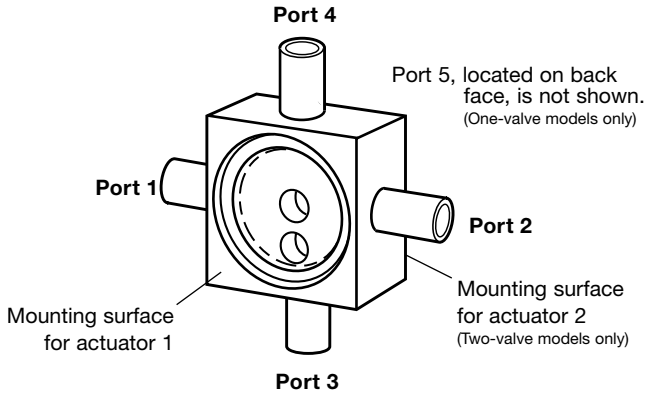
Two-valve models—select *one* designator if actuator styles are identical; select *two* designators if actuator styles are different. See sketch below to identify correct actuator sequence.

End Connection Size and Style

Size *in.*		*Tube Butt Weld*	*TS Series Sanitary Fitting*	*Kwik-Clamp Sanitary Fitting*
1/2	=	**TE**	**SE**	**IE**
3/4	=	**TG**	**SG**	**IG**
1	=	**TJ**	**SJ**	**IJ**
1 1/2	=	**TL**	**SL**	**IL**
2	=	**TN**	**SN**	**IN**

Select *two* designators for a 2-port valve; select *three* designators for a 3-port valve. Start with Port 1 and continue in numerical sequence, selecting designators for Ports 2, 3, 4, and 5. See sketch for port identification.

Example: 6L-DR242ESLSLSL-**CBK**



⚠ **To increase service life, ensure proper valve performance, and prevent leakage, apply only as much torque as is required to achieve positive shutoff.**

Note: For Westlock position indicator switch options and ordering information, see page 15.

Position Indicator Switch Assemblies

- Provide electronic and visual indication of valve position
- Feature an internal proximity switch
- Include solenoid control capability

Technical Data

Position Indicator Switch Model	Westlock 99P2
Electronic Indication	Yes
Visual Indication	Yes
Temperature Rating	32 to 140°F (0 to 60°C)
Enclosure Material	Resin
NEMA Enclosure Rating	Class I, II, III, Division 2, Groups A, B, C, D, F, G
Solenoid Option	Contact your authorized Swagelok representative.
Maximum Current Rating	2 A at 24 V
Low Current Rating	1 mA at 5 V

Ordering Information

Valve with Position Indicator Switch Assembly

To order a valve with a position indicator switch assembly, add **M3** to the valve ordering number.

Example: 6L-DR81ATETE-C**M3**

Position Indicator Switch Kit

To order a position indicator switch kit for an existing valve, select a kit ordering number.

Valve Size in.	Kit Ordering Number
1/2	MS-ISK-DR8-M3
3/4	
1	MS-ISK-DR16-M3
1 1/2	
2	

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.

Warranty Information

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

Printed in U.S.A., AGS
MS-02-186, R4