

Pressure Regulators RHPS Series



- Pressure-reducing models
- Back-pressure models
- Spring-, dome-, and air-loaded
- 1/4 to 4 in. end connections
- Working pressures up to 10 150 psig (700 bar)
- Temperatures from -49 to 176°F (-45 to 80°C)

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Pressure-Reducing Regulators

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Back-Pressure Regulators

Dome-Loaded—BD Series

Contact your authorized Swagelok sales and service representative for information about dome-loaded, back-pressure regulators.

Features

Regulator Adjusting Screw

Fine pitched threads provide improved adjustability and resolution when setting or adjusting pressure.

Set-Pressure Spring

- provides pressure control across a wide range of flow rates
- long spring improves droop performance.

Diaphragm Sensing Mechanism

- typically used in low outlet pressure applications
- provides greater accuracy in sensing changes in outlet pressure
- available in PTFE and a variety of elastomers
- designed with a short stroke to maximize cycle life.

Diaphragm Support Plate

promotes diaphragm life.

Seal Materials

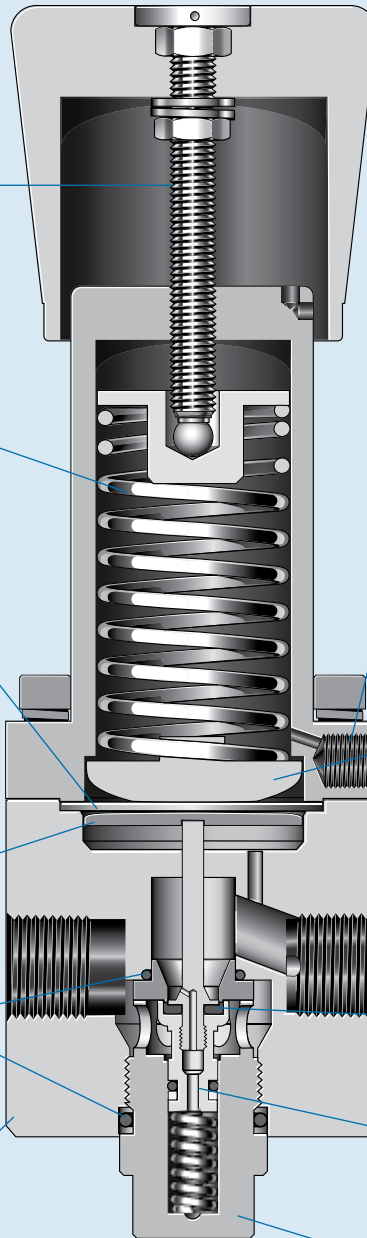
available in a variety of materials for enhanced chemical compatibility in a wide range of applications.

Body Material

316L SS for improved corrosion resistance.

Piston Sensing Mechanism

- typically used to regulate higher pressures than a diaphragm sensing mechanism
- more resistant to damage caused by pressure spikes
- designed with a short stroke to maximize cycle life.



Threaded Vent

allows monitoring of the diaphragm or piston sensing mechanism.

⊠ **WARNING: Threaded-vent regulators can release system fluid to atmosphere. Position the threaded vent connection away from operating personnel.**

Bottom Spring Guide

- engages diaphragm to distribute forces evenly
- protects diaphragm from premature failure.

Outlet

Seat Seal Materials

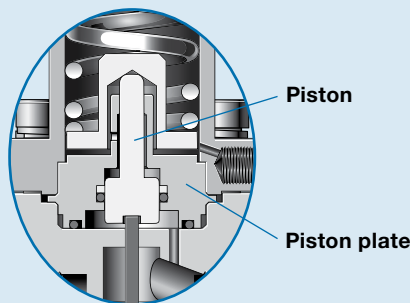
available in PCTFE, PEEK, and a variety of elastomers.

Balanced Poppet Design

reduces supply-pressure effect and lockup.

Body Plug

allows for easy maintenance and more up-time.



Piston

Piston plate

Types of Regulators

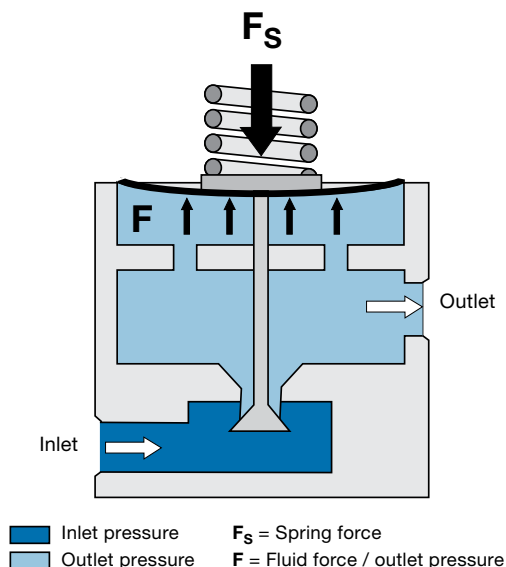
There are two types of RHPS series pressure regulators

- *Pressure-reducing* regulators with spring or dome loading
- *Back-pressure* regulators with spring or dome loading

How a Pressure Regulator Works

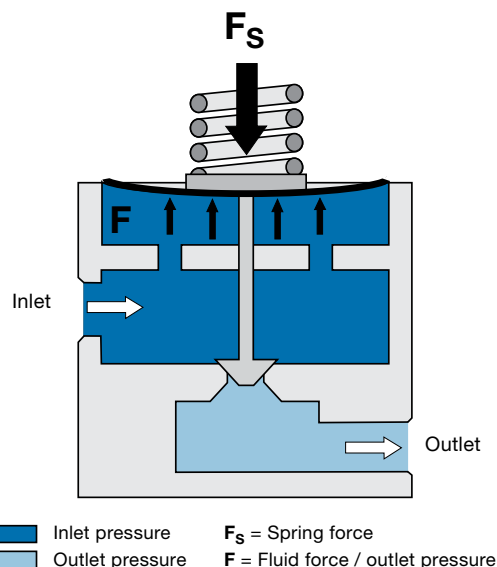
A pressure regulator has a sensing element (piston or diaphragm) which, on one side, is subjected to a load force (F_S) created by a spring (as shown below) or a gas pressure. On the other side, the sensing element is subject to the force (F) of the system fluid.

Pressure-Reducing Regulators



The function of a pressure-reducing regulator is to reduce a pressure and to keep this pressure as constant as possible while the inlet pressure and the flow may vary. This is accomplished by the fluid force (F) being equal to or slightly lower than load force (F_S) causing the poppet to open.

Back-Pressure Regulators



The function of a back-pressure regulator is to keep inlet pressure below a set pressure. This means the regulator can either **open** in case of excess pressure or **close** when the pressure drops below a desired pressure. This is accomplished by the fluid force (F) being equal to or slightly lower than load force (F_S) causing the poppet to close.

Terminology

Accumulation—an increase in inlet pressure caused by an increase in flow rate to a back-pressure regulator.

Creep—an increase in outlet pressure typically caused by regulator seat leakage.

Dependency—see supply pressure effect (SPE).

Droop—a decrease in outlet pressure caused by an increase in flow rate to a pressure-reducing regulator.

Lockup—an increase in outlet pressure that occurs as the flow rate is decreased to zero.

Self-venting—a feature that reduces outlet pressure in a pressure-reducing regulator when the regulator set point is decreased and there is no flow through the regulator.

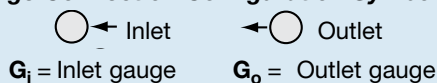
Sensitivity—the degree to which the regulator responds to force balance changes.

Set pressure—the desired outlet pressure of a pressure-reducing regulator, normally stated at a no-flow condition.

Supply pressure effect (SPE)—the effect on the set pressure of a pressure-reducing regulator as a result of a change in inlet pressure, normally experienced as an increase in outlet pressure due to a decrease in inlet pressure. Also known as Dependency.

Threaded vent—a connection that allows monitoring of the diaphragm or piston sensing mechanism.

Gauge Connection Configuration Symbols



Gauge Connection Configurations— Pressure-Reducing Regulators			
Standard	GN2	GN4	GN5

Components

Every RHPS series pressure regulator has three common design components:

- Loading mechanism (spring, dome, or combination spring and dome)
- Sensing mechanism (diaphragm or piston)
- Controlling mechanism (poppet)

Loading Mechanism

The loading mechanism is the component of the regulator that balances the force or pressure.

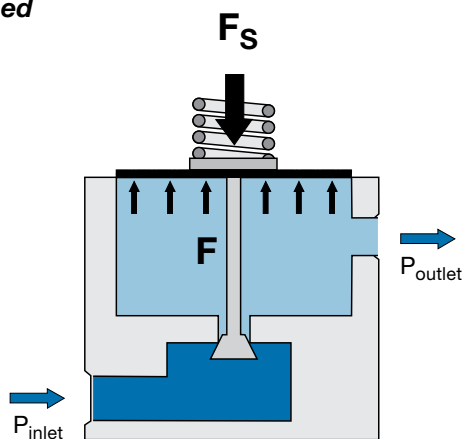
Spring-Loaded

In a spring-loaded regulator, a coil spring is used to generate a load (F_s) against the sensing mechanism. The amount of spring force or load can be adjusted by turning the handle or adjusting screw of the regulator.

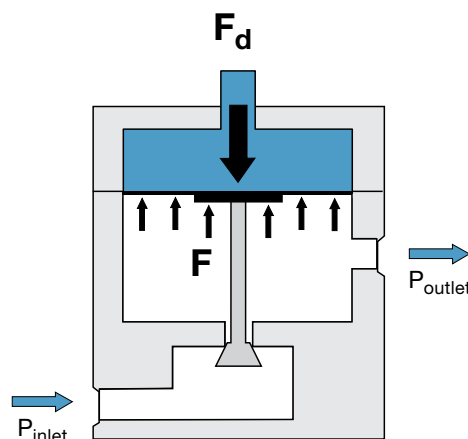
Dome-Loaded

In a dome-loaded regulator, a gas is fed into the dome chamber above the sensing mechanism at a pressure equal to or slightly above the required outlet pressure. This volume of gas is used like a spring. The dome pressure (F_d) is typically supplied by a second regulator called a pilot regulator.

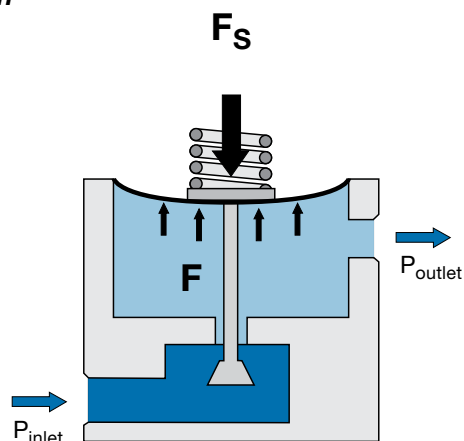
Closed



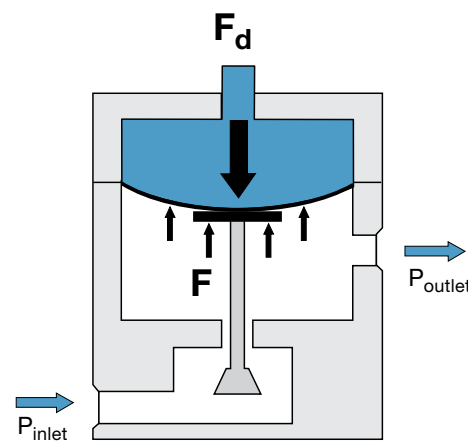
$$F_s \text{ or } F_d \leq F$$



Open



$$F_s \text{ or } F_d > F$$



Combination Spring- and Dome-Loaded

The spring- and dome-loaded mechanisms can be used in combination with one another. The resulting effect provides the function of a differential pressure regulator. This regulator is designed to control pressure which is the sum of a reference pressure (provided by the dome) and a bias pressure (provided by the spring). See RD(H)6DP series on page 55 for details.

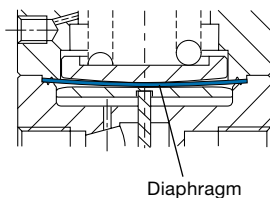
Components

Sensing Mechanisms

The sensing mechanism is the component separating the spring/dome force and the fluid force. It senses changes in pressure and allows the regulator to react and to try to restore the original set pressure.

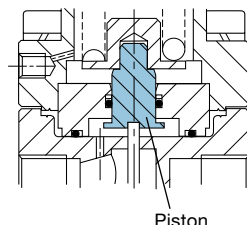
■ Diaphragm Sensing

The diaphragm is a large, flat piece of material usually made of an elastomer, PTFE, or metal depending on the application. A diaphragm is normally used for low control-pressure applications in spring-loaded regulators and in all dome-loaded regulators.



■ Piston Sensing

A piston is a cylindrical metal component which is generally used to regulate higher control pressures than a spring-loaded regulator with a diaphragm. They are also more resistant to damage caused by pressure spikes.

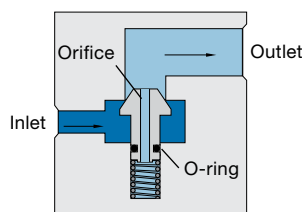


Controlling Mechanisms

The controlling mechanism, also known as a poppet, acts to reduce a high inlet pressure to a lower outlet pressure. There are two designs used in RHPS regulators.

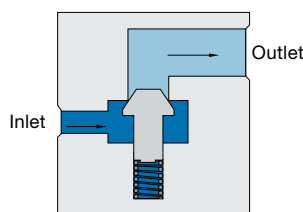
■ Balanced Poppet

In a balanced poppet design, the area on which the inlet pressure acts is reduced due to the orifice through the poppet and balancing O-ring. The advantages of this design are a reduced seat load, less sensitivity to SPE, and the ability to have a larger seat for more flow.



■ Unbalanced Poppet

In an unbalanced poppet design, the inlet pressure provides the majority of the shutoff force. Unbalanced poppets are generally used in small regulators or larger regulators in low-pressure applications.

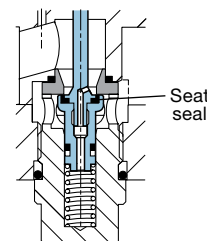


Seat Design

The poppet within the RHPS series regulator can have a *hard* or *soft* seat seal depending on the pressure requirements of the application.

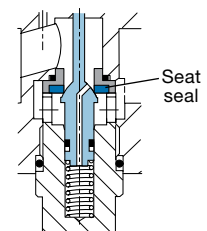
■ Soft Seat Seal

A soft seat seal is designed to regulate pressures up to 1015 psig (70.0 bar). The seat seal materials are generally elastomeric, and include fluorocarbon FKM, perfluorocarbon FFKM, nitrile, and EPDM.



■ Hard Seat Seal

A hard seat seal is designed to regulate pressures up to 10 150 psig (700 bar). The seat seal materials are PCTFE for pressures up to 5800 psig (400 bar) and PEEK for pressures up to 10 150 psig (700 bar).



Testing

Every RHPS series regulator is factory tested with nitrogen or air. Shell testing is performed to a requirement of no detectable leakage with a liquid leak detector.

Cleaning and Packaging

Every RHPS series regulator is cleaned and packaged in accordance with Swagelok *Standard Cleaning and Packaging* (SC-10) catalog, MS-06-62.

Cleaning and packaging to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C is available.

Oxygen Service Hazards

For more information about hazards and risks of oxygen-enriched systems, refer to Swagelok *Oxygen System Safety* technical report, MS-06-13.

- ⚠ **RHPS series pressure regulators are not “Safety Accessories” as defined in the Pressure Equipment Directive 2014/68/EU.**
- ⚠ **Do not use the regulator as a shutoff device.**
- ⚠ **WARNING: Self-venting and threaded-vent regulators can release system fluid to atmosphere. Position the self-vent hole or the threaded vent connection away from operating personnel.**

Pressure-Reducing, Spring-Loaded Regulators—RS Series

The RS series pressure-reducing regulators are suitable for most gases and liquids. The RS series regulators feature various poppet designs, a choice of sensing types (diaphragm or piston), and seat and seal materials to accommodate a variety of pressure, temperature, and flow conditions.

The RS series regulators are available in sizes from 1/4 to 2 in. with a choice of threaded or flange end connections.

The RSH series regulators are a high-pressure version of the RS series regulators, and the LRS and LPRS series are low-pressure, high-accuracy versions of the RS series regulators.

The RS series regulators are available with many options, including a variety of gauge connection configurations, self venting, internal filter, external feedback, antitamper, special cleaning to ASTM G93 Level C, and NACE MR0175/ISO 15156-compliant models.

Features

- Spring-loaded pressure control
- Diaphragm or piston sensing mechanisms
- Red knob handle or screw adjustment
- 316L stainless steel materials of construction for corrosion resistance
- Maximum inlet pressure ratings: 232 to 10 150 psig (16.0 to 700 bar)
- Pressure control ranges: Up to 0 to 10 150 psig (0 to 700 bar)



RS(H)2



RS(H)4, 6, 8



RS(H)10, 15, 20



LRS(H)4



LPRS4, 6, 8



LPRS10, 15

Pressure-Temperature Ratings

Seal Material	Temperature Range °F (°C)	Material Designator
Fluorocarbon FKM	5 to 176 (–15 to 80)	V
Standard Nitrile	–4 to 176 (–20 to 80)	N
Low-Temp Nitrile	–49 to 176 (–45 to 80)	L
EPDM	–4 to 176 (–20 to 80)	E
FFKM	14 to 176 (–10 to 80)	F

Seat Material	PCTFE	PEEK	Fluorocarbon FKM, Nitrile, EPDM, FFKM
Temperature °F (°C)	Maximum Inlet Pressure / Working Pressure psig (bar)		
-49 to -40 (-45 to -40)	—	—	1015 (70.0)
-40 to -4 (-40 to -20)	5800 (400)	5800 (400)	
95 (35)		10 150 (700)	
149 (65)	3987 (275)		
176 (80)	1812 (125)		

Technical Data—Performance

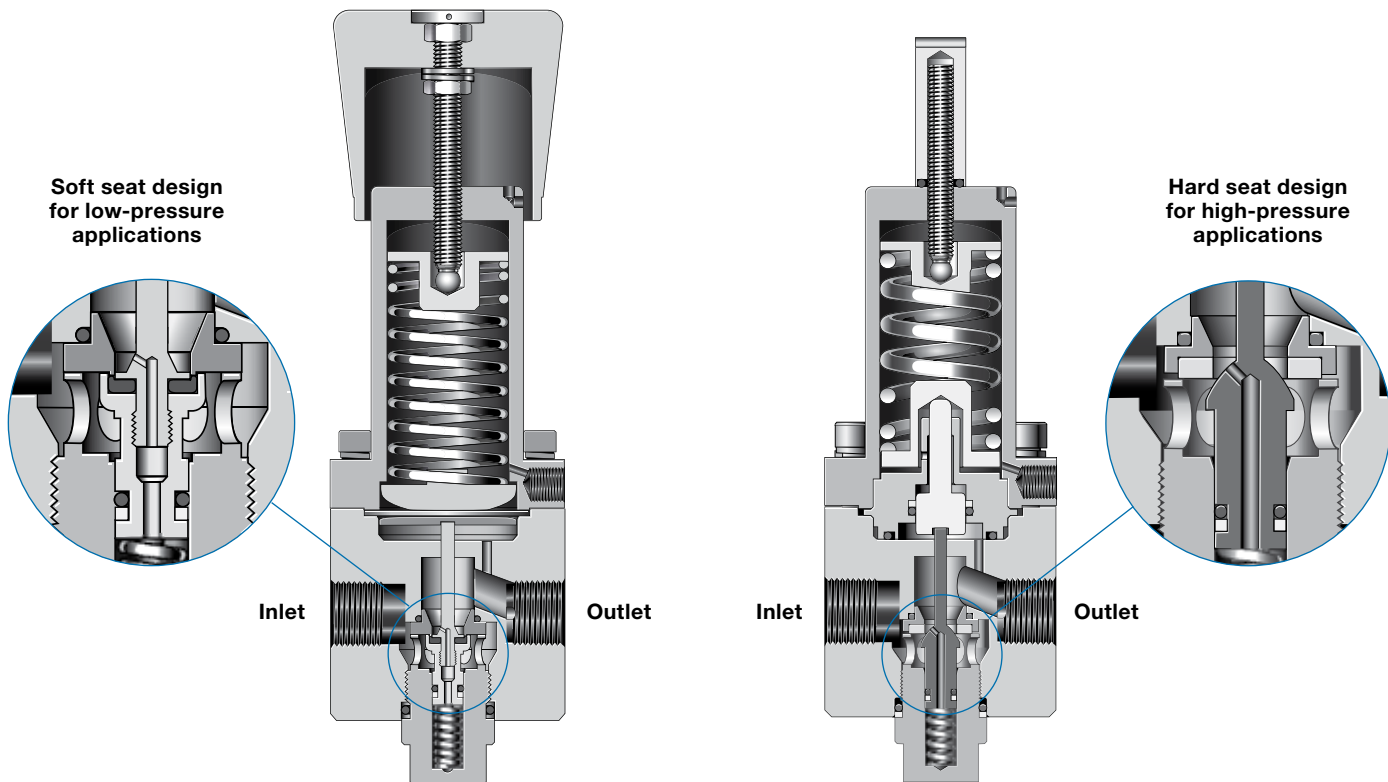
Series	Maximum Inlet Pressure ^① psig (bar)	Maximum Outlet Control Pressure ^① psig (bar)	Flow Coefficient (C _v)	Sensing Type	Flow Data on Page
RS2	5 800 (400)	5 075 (350)	0.05	Piston	11
RSH2	10 150 (700)	10 150 (700)			
RS4	1 015 (70.0)	406 (28.0) diaphragm	1.84	Diaphragm or piston	15
RSH4	5 800 (400)	5 800 (400) piston			
RS6	1 015 (70.0)	203 (14.0) diaphragm	1.95	Diaphragm or piston	17
RSH6	5 800 (400)	5 800 (400) piston			
RS8	1 015 (70.0)	203 (14.0) diaphragm	2.07	Diaphragm or piston	20
RSH8	5 800 (400)	5 800 (400) piston			
RS10	1 015 (70.0)	290 (20.0) diaphragm	3.79	Diaphragm or piston	23
RSH10	5 800 (400)	3 625 (250) piston			
RS15	1 015 (70.0)	290 (20.0) diaphragm	7.30	Diaphragm or piston	—
RSH15	5 800 (400)	3 625 (250) piston			
RS20	1 015 (70.0)	290 (20.0)	13	Diaphragm	—
RSH20	5 800 (400)				
LRS4	507 (35.0)	290 (20.0)	0.73	Diaphragm	30
LRS4	5 800 (400)		0.10		31
LPRS4	232 (16.0)	43 (3.0)	1.84	Diaphragm	—
LPRS6			1.95		
LPRS8			2.07		
LPRS10	232 (16.0)	43 (3.0)	3.79	Diaphragm	39
LPRS15			7.30		39

① Regulator pressure rating may be limited by end connection type.

Pressure-Reducing, Spring-Loaded Regulators—RS Series

**RS Series Regulator
with Diaphragm Sensing
and Standard Knob Handle**

**RSH Series Regulator
with Piston Sensing
and Antitamper Option**



Technical Data—Design

Series	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge Connection	Weight (Without Flanges) lb (kg)	More Information on Page
RS2	0.087 (2.2)	1/4 in. NPT	1/4 in. NPT	3.3 (1.5)	10
RSH2					
RS4	0.39 (10.0)	1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	7.7 (3.5)	14
RSH4					
RS6	0.39 (10.0)	3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	9.9 (4.5)	14
RSH6					
RS8	0.39 (10.0)	1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	9.9 (4.5)	14
RSH8					
RS10	0.55 (14.0)	1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT or ISO/BSP parallel thread	16.5 (7.5)	22
RSH10	0.53 (13.5)				
RS15	0.75 (19.0)	1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT or ISO/BSP parallel thread	22.0 (10.0)	22
RSH15					
RS20	0.98 (25.0)	2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	ISO/BSP parallel thread	39.6 (18.0)	22
RSH20					
LRS4	0.23 (6.0)	1/2 in. NPT	1/4 in. NPT	5.7 (2.6)	29
LRSH4	0.087 (2.2)				
LPRS4	0.39 (10.0)	1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	11.0 (5.0)	33
LPRS6		3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges		12.1 (5.5)	
LPRS8		1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges		12.1 (5.5)	
LPRS10	0.55 (14.0)	1 in. NPT, ISO/BSP parallel thread, EN or ASME flange	1/4 in. NPT or ISO/BSP parallel thread	17.6 (8.0)	38
LPRS15	0.75 (19.0)	1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges		22.0 (10.0)	

Compact, General-Purpose, Spring-Loaded Pressure-Reducing Regulators—RS(H)2 Series

Features

- Bottom mounting
- Sealed spring housing
- Low-friction piston for better control
- Cartridge poppet assembly with 25 µm filter for ease of service
- Self-venting
- Threaded vent below panel for safety

Options

- No filter—for liquid applications
- NACE MR0175/ISO 15156-compliant models (nonventing and no-filter models only)
- Nonventing
- Special cleaning to ASTM G93 Level C
- Panel mounting kit sold separately—no disassembly required



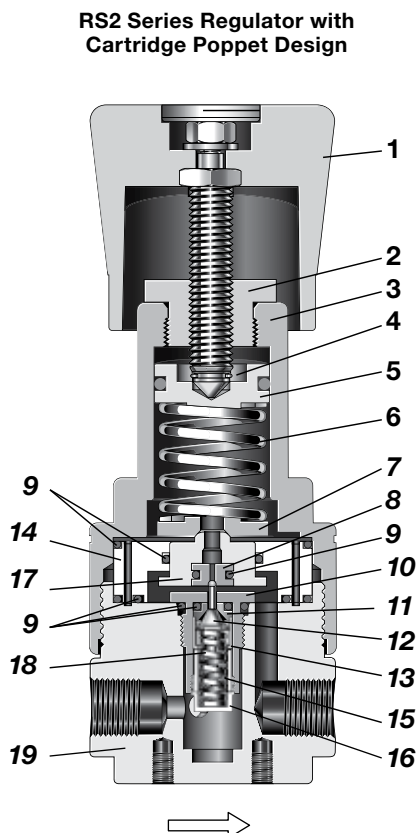
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Vent Connections	Weight lb (kg)
RS2	5 800 (400)	5 075 (350)	Piston	−40 to 176 (−40 to 80)	0.05	0.087 (2.2)	1/4 in. NPT	Gauge: 1/4 in. NPT Vent: 1/8 in. NPT	3.3 (1.5)
RSH2	10 150 (700)	10 150 (700)		−4 to 176 (−20 to 80)					

See **Pressure-Temperature Ratings**, page 8, for ratings.

See **Flow Data**, pages 11 to 12.

Materials of Construction



Component	Material / Specification
1 Knob assembly with adjusting screw, nuts, washer	Red ABS with 431 SS
2 Spring housing cover	431 SS / A276
3 Spring housing	316L SS / A479
4 C-ring	A2
5 Spring guide	316L SS / A479
6 Set spring	50CRV4
7 Bottom spring guide	316L SS / A479
8 Relief seat	PEEK or PCTFE
9 O-rings	EPDM, FKM, FFKM, or nitrile
10 Poppet housing	316L SS / A479
11 Seat	PEEK or PCTFE
12 Poppet	S17400 SS or 431 SS
13 Seat retainer	316L SS / A479
14 Piston plate	
15 Filter	316L SS
16 Plug	316L SS / A479
17 Piston	
18 Poppet spring	302 SS / A313
19 Body	316L SS / A479

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RS2 Series

Flow Coefficient: 0.05

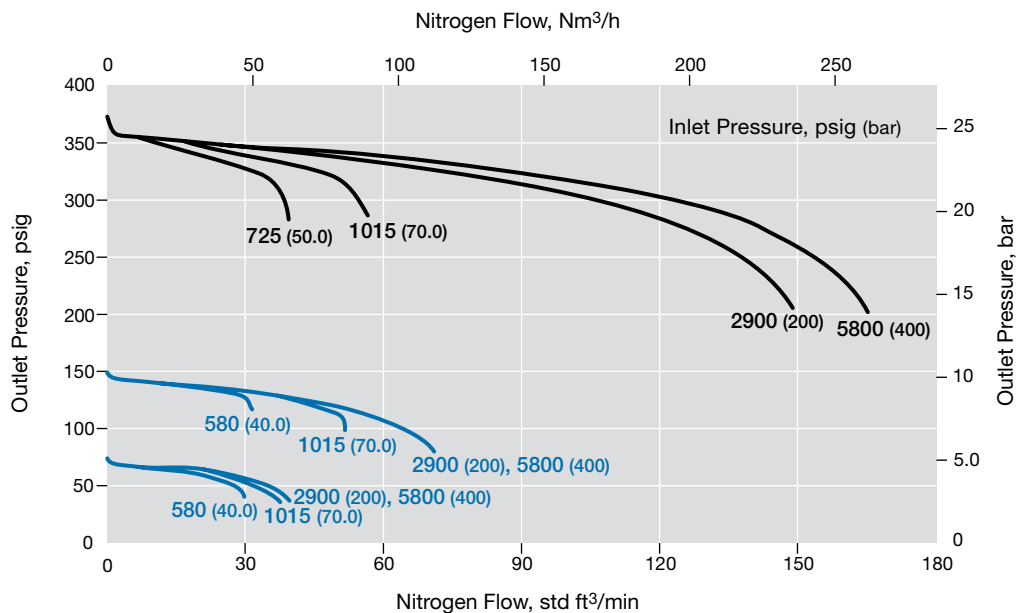
Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range

— 0 to 362 psig (0 to 25.0 bar)

— 0 to 145 psig (0 to 10.0 bar)



RS2 Series

Flow Coefficient: 0.05

Maximum Inlet Pressure: 5800 psig (400 bar)

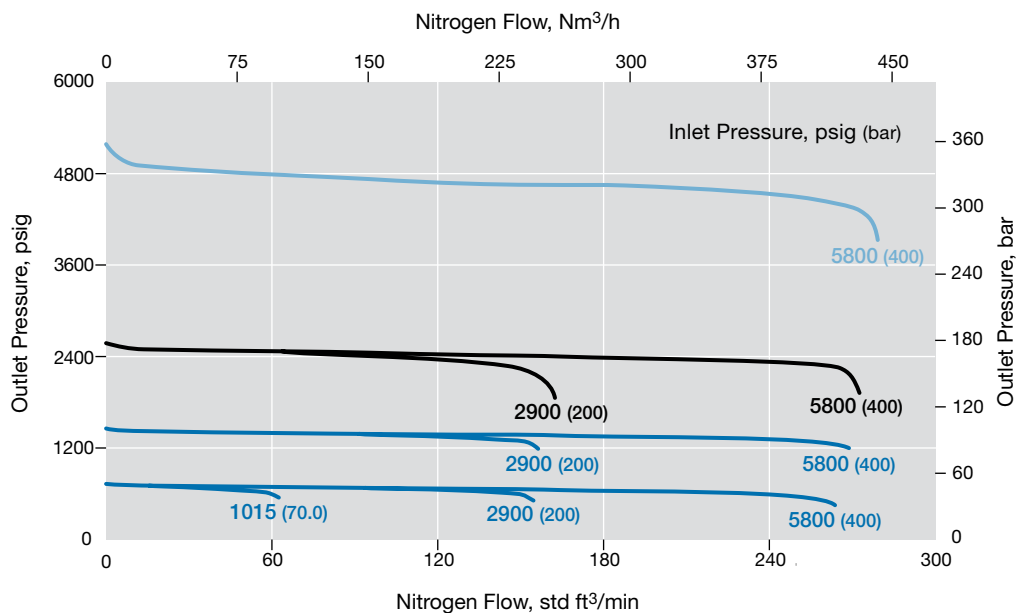
Outlet Pressure Control Range: 0 to 5075 psig (0 to 350 bar)

Pressure Control Range

— 0 to 5075 psig (0 to 350 bar)

— 0 to 2537 psig (0 to 175 bar)

— 0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RSH2 Series

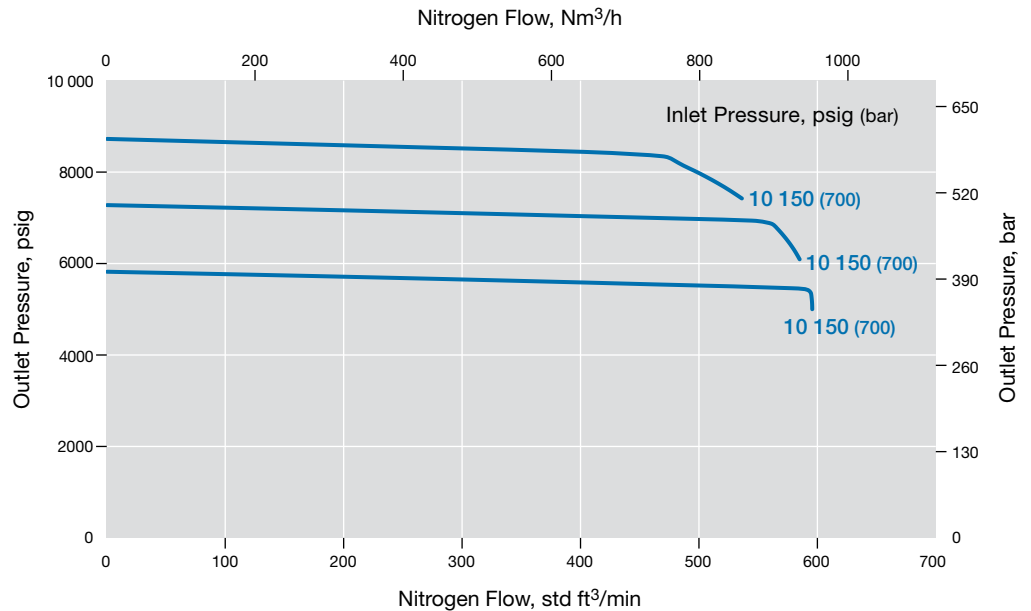
Flow Coefficient: 0.05

Maximum Inlet Pressure: 10 150 psig (700 bar)

Outlet Pressure Control Range: 0 to 10 150 psig (0 to 700 bar)

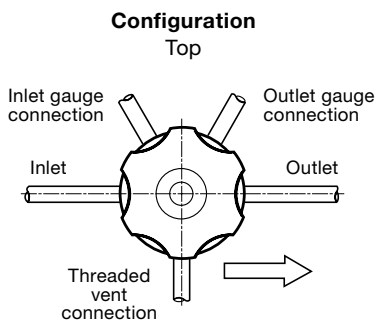
Pressure Control Range

— 0 to 10 150 psig (0 to 700 bar)



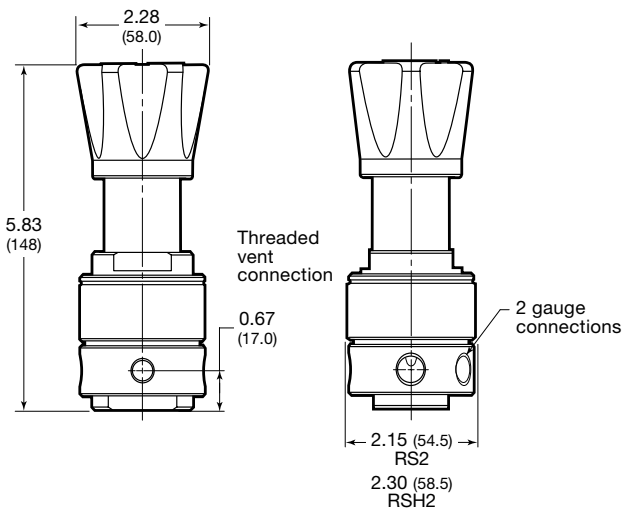
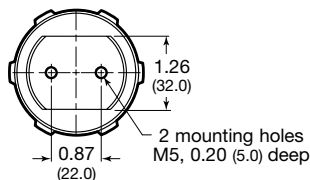
Dimensions

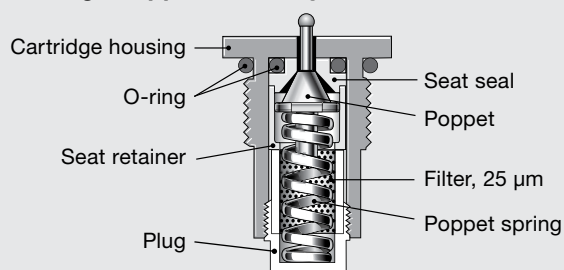
Dimensions, in inches (millimeters), are for reference only and are subject to change.



Shown with tubing for clarity; tubing not included.

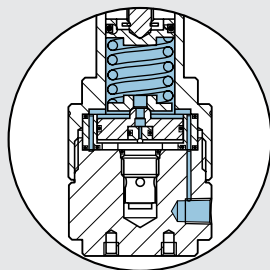
Bottom Mounting



Cartridge Poppet Assembly Detail**Venting**

- Self-venting is standard.
- Threaded vent connection is below panel for safety
- A nonventing option is available.

⚠ WARNING: Self-venting regulators can release system fluid to atmosphere. Position the self-vent hole away from operating personnel.

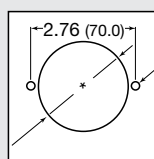
**Panel Mounting Kit**

No disassembly required when using panel mount kit.

Panel mounting kit ordering numbers:

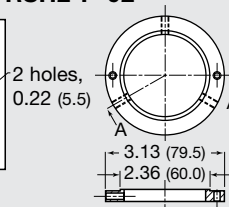
RS2 series: **RS2-P-02**

RSH2 series: **RSH2-P-02**

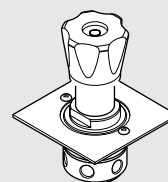


*RS: 2.15 (54.5)
*RSH: 2.36 (60.0)

Panel hole



Panel ring

**Ordering Information**

Build an RS2 or RSH2 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8
RS N2 - 02 - 1 - V V K - LNV

1 Series

RS = 5800 psig (400 bar) maximum inlet pressure
RSH = 10 150 psig (700 bar) maximum inlet pressure

2 Inlet / Outlet

N2 = 1/4 in. female NPT

3 Body Material

02 = 316L SS

4 Pressure Control Range

RS and RSH series

- 1** = 0 to 145 psig (0 to 10.0 bar)
- 2** = 0 to 362 psig (0 to 25.0 bar)
- 3** = 0 to 1450 psig (0 to 100 bar)
- 4** = 0 to 2537 psig (0 to 175 bar)
- 5** = 0 to 5075 psig (0 to 350 bar)

RSH series only

- 6** = 0 to 10 150 psig (0 to 700 bar)

5 Seal Material

RS and RSH series

- V** = Fluorocarbon FKM
- N** = Nitrile
- E** = EPDM
- F** = FFKM

RS series only

- L** = Low temperature Nitrile

6 Piston Seal Material

RS and RSH series

- V** = Fluorocarbon FKM
- N** = Nitrile
- E** = EPDM
- F** = FFKM

RS series only

- L** = Low temperature Nitrile

7 Seat Seal Material

RS series

- K** = PCTFE
- P** = PEEK

RSH series

- P** = PEEK

8 Options

- L** = No filter
- N** = NACE MR0175/ISO 15156
- NV** = Nonventing
- G93** = ASTM G93 Level C-cleaned

General-Purpose, Spring-Loaded Pressure-Reducing Regulators—RS(H)4, RS(H)6, and RS(H)8 Series

Features

- Balanced poppet design
- Diaphragm or piston sensing
- Threaded vent to monitor sensing seal integrity

Options

- Antitamper
- Gauge connections—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Self-venting
- Special cleaning to ASTM G93 Level C

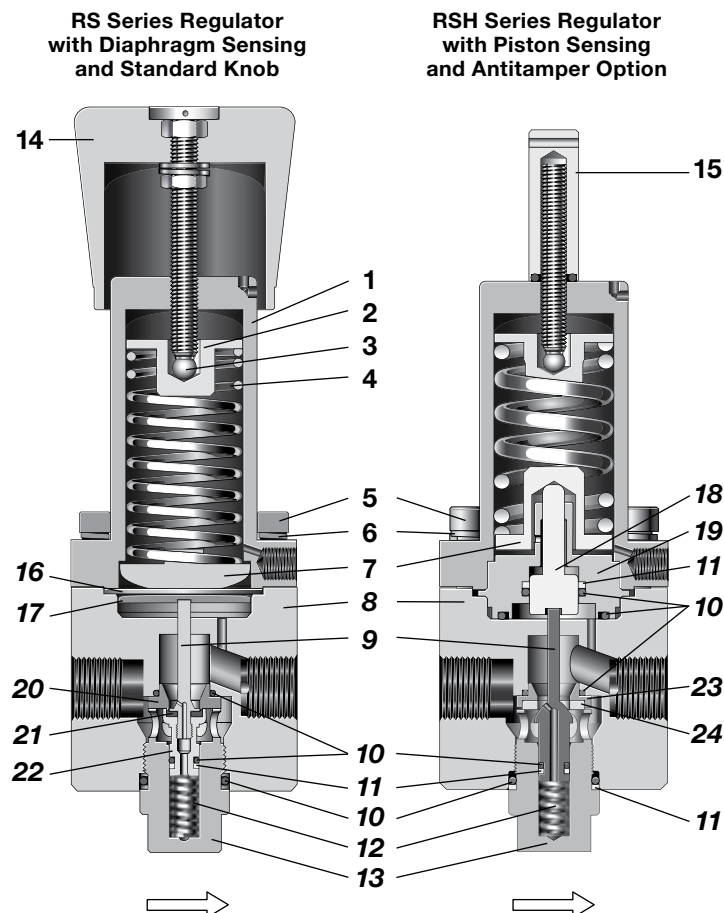


Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Connections			Weight (Without Flanges) lb (kg)
							Inlet and Outlet		Gauge and Vent	
							Size	Type		
RS(H)4	RS: 1015 (70.0) RSH: 5800 (400)	RS: 406 (28.0) RSH: 5800 (400)	Diaphragm: RS4: 0 to 406 psig (28.0 bar) RS6, 8: 0 to 203 psig (14.0 bar) Piston: 0 to 5800 psig (400 bar)	−49 to 176 (−45 to 80) See Pressure-Temperature Ratings , page 8.	1.84	0.39 (10.0)	1/2 in. DN15	NPT	Gauge: 1/4 in. NPT	7.7 (3.5)
RS(H)6							3/4 in. DN20	ISO/BSP parallel thread	Vent: 1/8 in. ISO/BSP parallel thread	9.9 (4.5)
RS(H)8							1 in. DN25	ASME or EN flange		

See pages 15 to 20 for flow data.

Materials of Construction



Component		Material / Specification
Common Components	1 Spring housing	316L SS / A479
	2 Spring guide	
	3 Ball	420 SS (Hardened)
	4 Set spring	302 SS / A313
	5 Cap screw	A4-80
	6 Washer	A4
	7 Bottom spring guide	316L SS / A479
	8 Body	
	9 Poppet	RS 316L SS / A479
		RSH S17400 SS / A276 or 431 SS
	10 O-rings	EPDM, FKM, or nitrile
	11 Backup ring	PTFE
	12 Poppet spring	302 SS / A313
	13 Body plug	316L SS / A479
Actuation	14 Knob assembly with adjusting screw, nuts, washers	Red ABS with A2-70
	15 Antitamper option with O-ring, set screw	316L SS and A2-70 (O-ring same as item 10)
Sensing Mechanism	Diaphragm Only	
	16 Diaphragm	EPDM, FKM, or nitrile
	17 Diaphragm plate	316L SS / A479
	Piston Only	
	18 Piston	316L SS / A479
	19 Piston plate	
RS Only	20 Seat	EPDM, FKM, or nitrile
	21 Seat seal	
RSH Only	22 Poppet housing	316L SS / A479
	23 Seat	
	24 Seat seal	PEEK or PCTFE

Wetted lubricant: Silicone-based, synthetic hydrocarbon-based

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

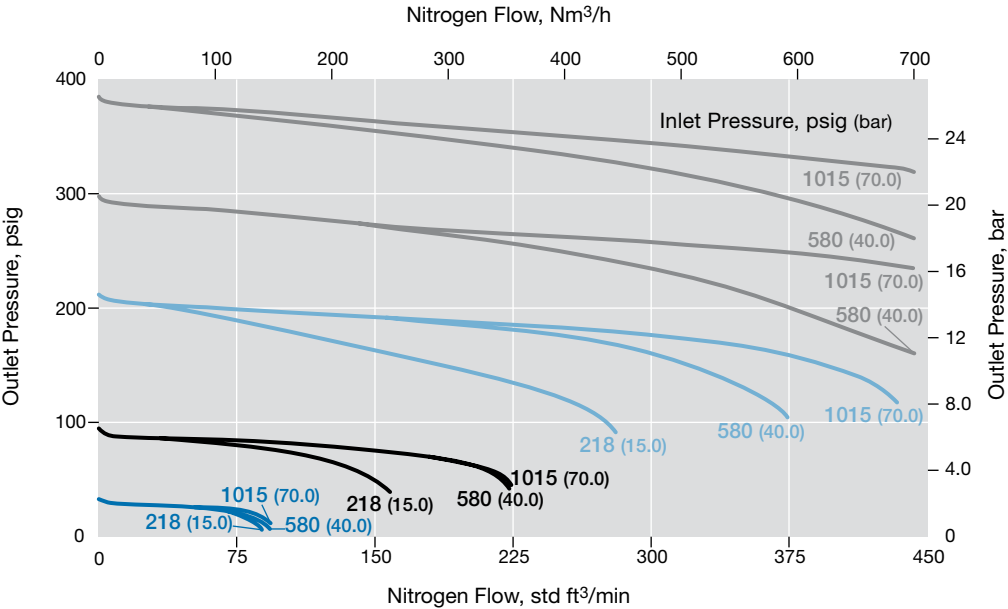
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS4 Series

Flow Coefficient: 1.84
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)

Pressure Control Range

- 0 to 406 psig (0 to 28.0 bar)
- 0 to 203 psig (0 to 14.0 bar)
- 0 to 101 psig (0 to 7.0 bar)
- 0 to 43 psig (0 to 3.0 bar)

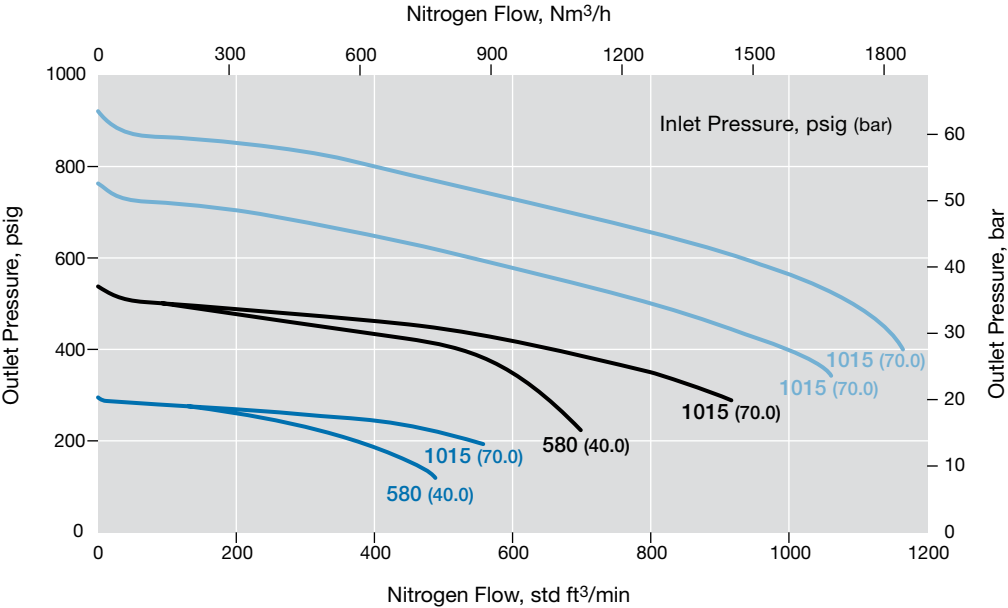


RS(H)4 Series

Flow Coefficient: 1.84
Maximum Inlet Pressure: RS4—1015 psig (70.0 bar); RSH4—5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 1160 psig (0 to 80.0 bar)

Pressure Control Range

- 0 to 1160 psig (0 to 80.0 bar)
- 0 to 580 psig (0 to 40.0 bar)
- 0 to 406 psig (0 to 28.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RSH4 Series

Flow Coefficient: 1.84

Maximum Inlet Pressure: 5800 psig (400 bar)

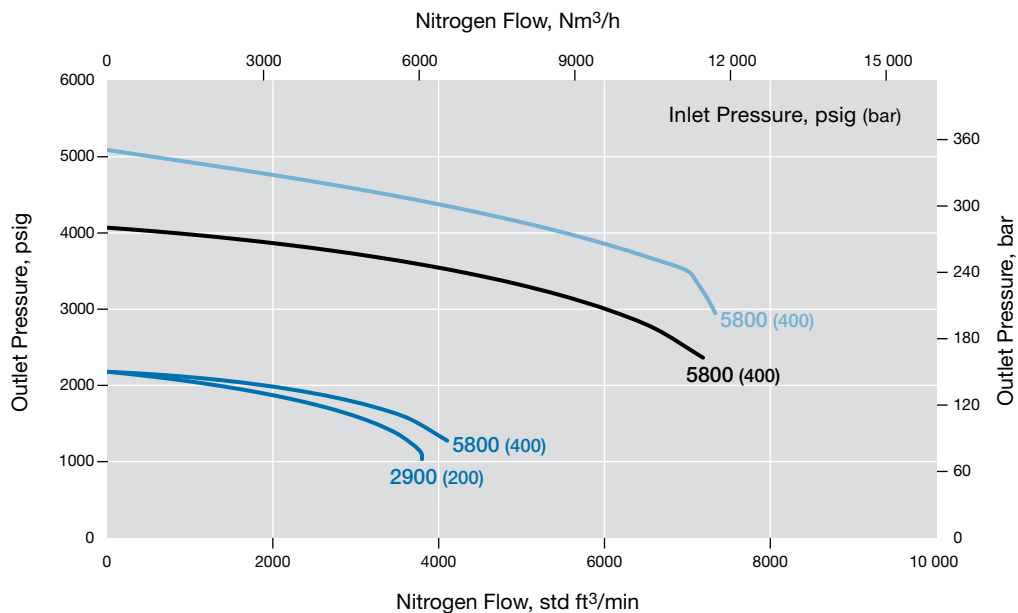
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

Pressure Control Range

— 0 to 5800 psig (0 to 400 bar)

— 0 to 4060 psig (0 to 280 bar)

— 0 to 2175 psig (0 to 150 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RS6 Series

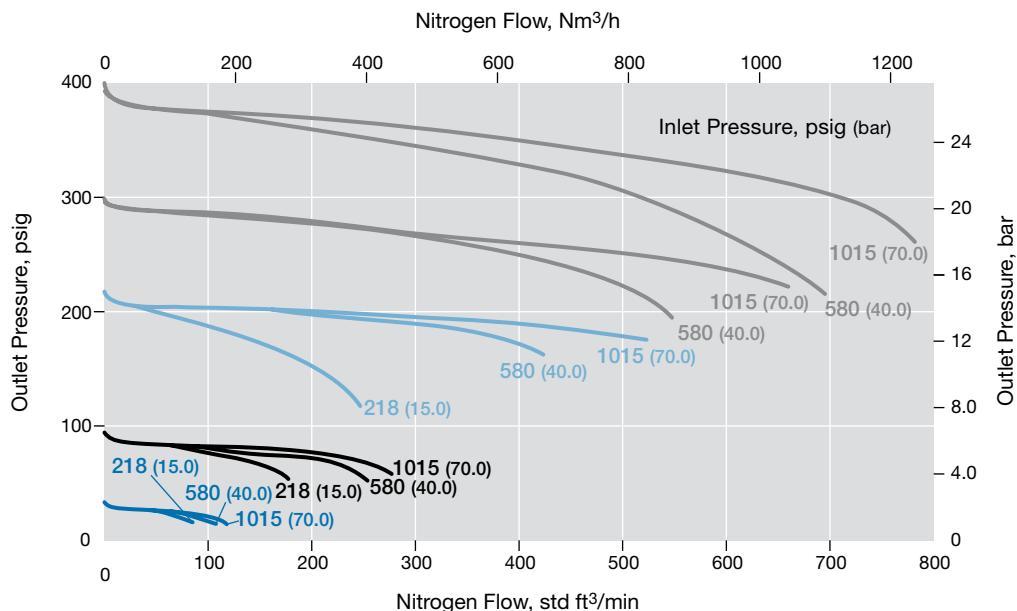
Flow Coefficient: 1.95

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)

Pressure Control Range

- 0 to 406 psig (0 to 28.0 bar)
- 0 to 203 psig (0 to 14.0 bar)
- 0 to 101 psig (0 to 7.0 bar)
- 0 to 43 psig (0 to 3.0 bar)



RS(H)6 Series

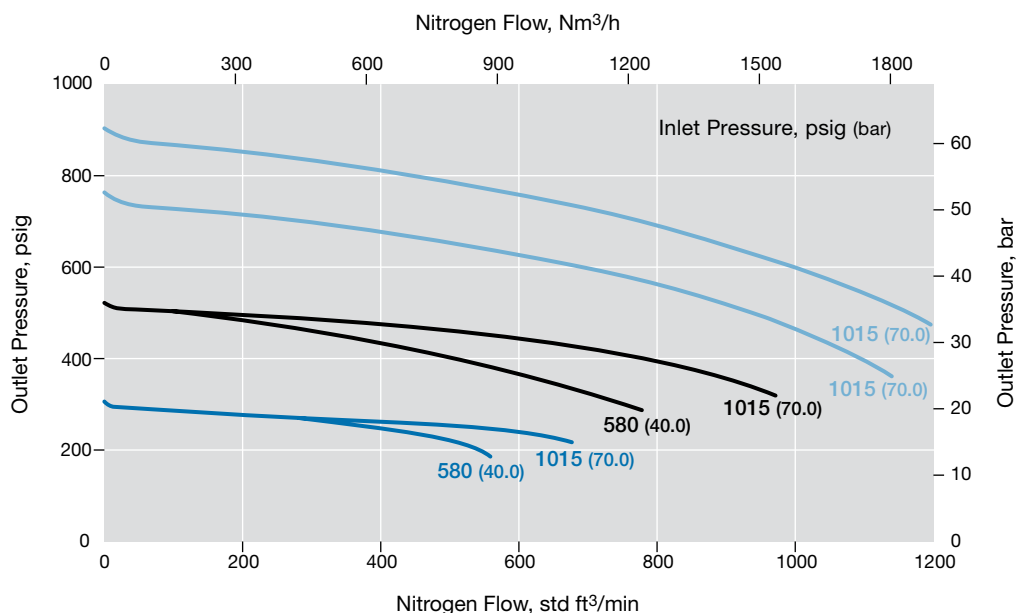
Flow Coefficient: 1.95

Maximum Inlet Pressure: RS6—1015 psig (70.0 bar); RSH6—5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 1160 psig (0 to 80.0 bar)

Pressure Control Range

- 0 to 1160 psig (0 to 80.0 bar)
- 0 to 580 psig (0 to 40.0 bar)
- 0 to 406 psig (0 to 28.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RSH6 Series

Flow Coefficient: 1.95

Maximum Inlet Pressure: 5800 psig (400 bar)

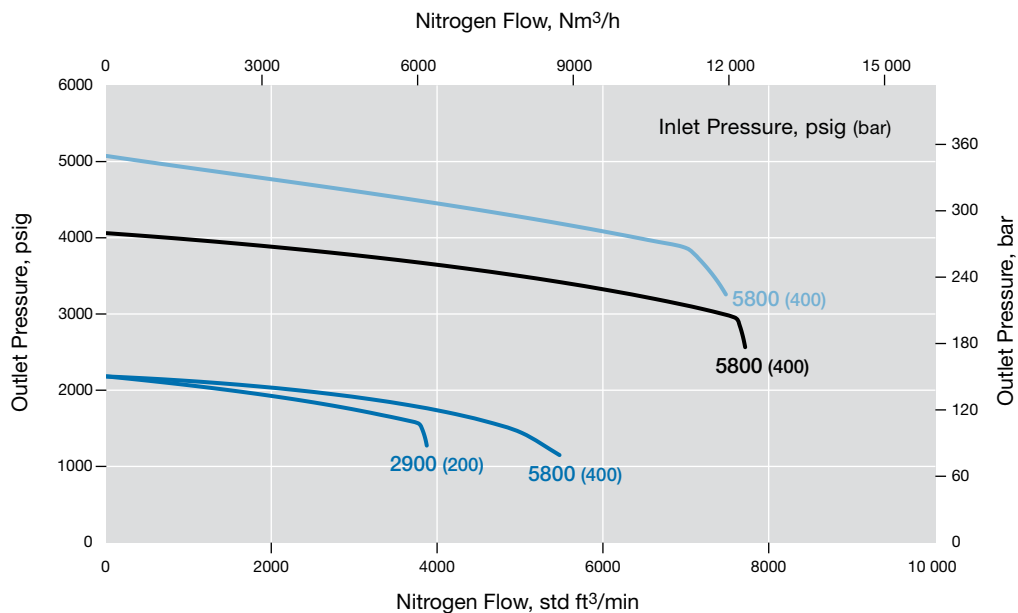
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

Pressure Control Range

— 0 to 5800 psig (0 to 400 bar)

— 0 to 4060 psig (0 to 280 bar)

— 0 to 2175 psig (0 to 150 bar)



Flow Data

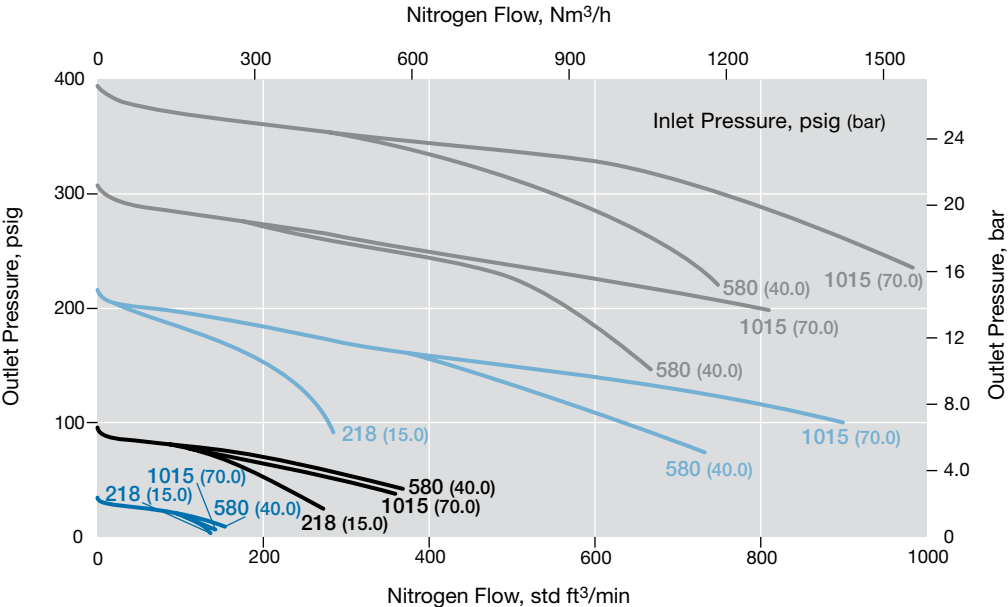
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS8 Series

Flow Coefficient: 2.07
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)

Pressure Control Range

- 0 to 406 psig (0 to 28.0 bar)
- 0 to 203 psig (0 to 14.0 bar)
- 0 to 101 psig (0 to 7.0 bar)
- 0 to 43 psig (0 to 3.0 bar)

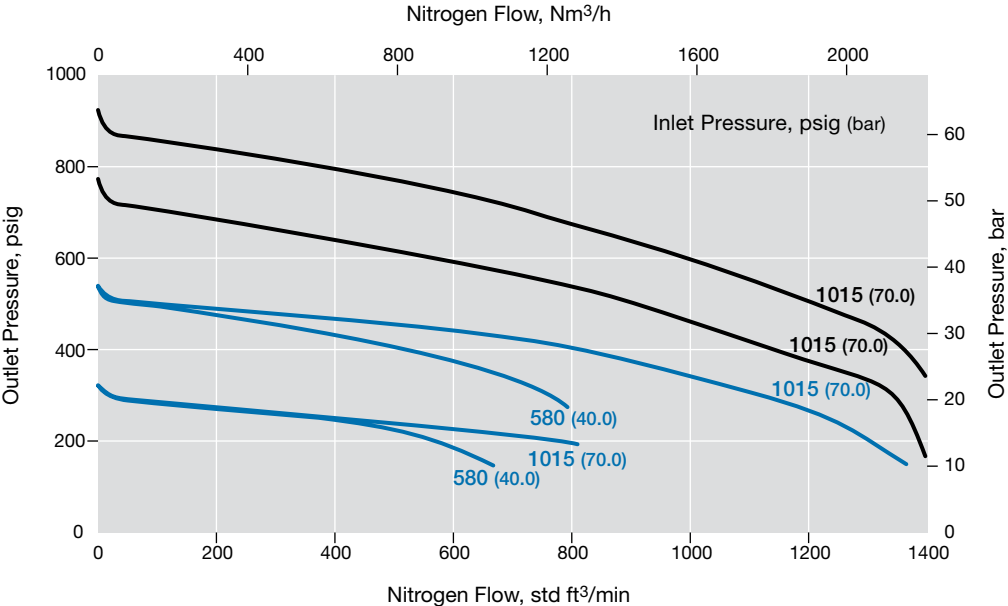


RS(H)8 Series

Flow Coefficient: 2.07
Maximum Inlet Pressure: RS8—1015 psig (70.0 bar); RSH8—5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 1160 psig (0 to 80.0 bar)

Pressure Control Range

- 0 to 1160 psig (0 to 80.0 bar)
- 0 to 580 psig (0 to 40.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RSH8 Series

Flow Coefficient: 2.07

Maximum Inlet Pressure: 5800 psig (400 bar)

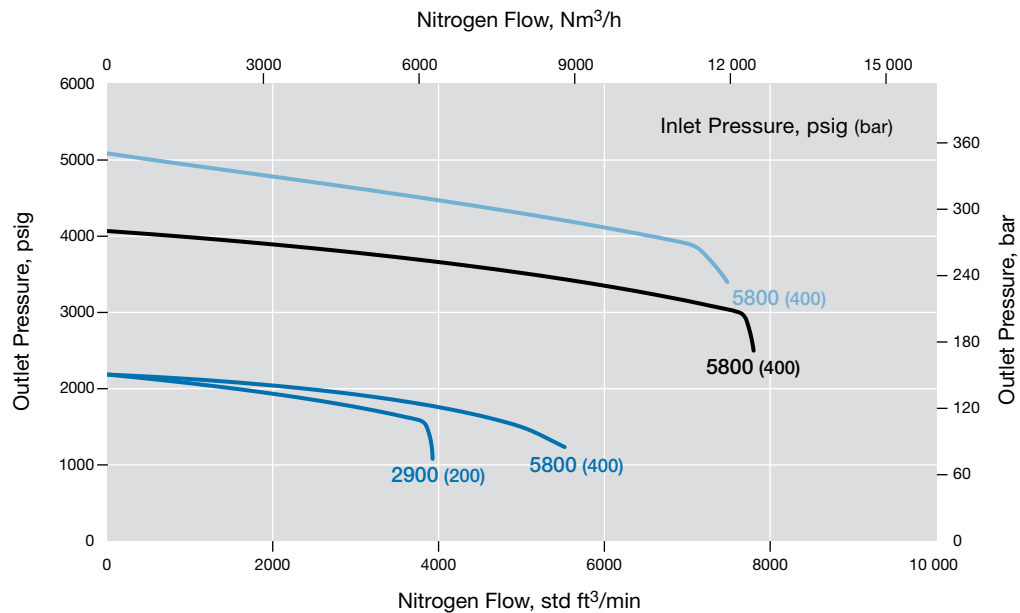
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

Pressure Control Range

— 0 to 5800 psig (0 to 400 bar)

— 0 to 4060 psig (0 to 280 bar)

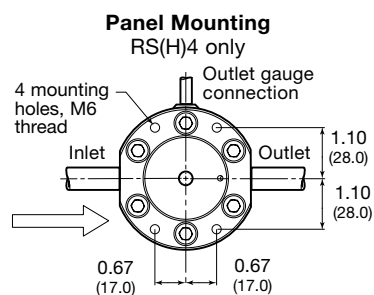
— 0 to 2175 psig (0 to 150 bar)



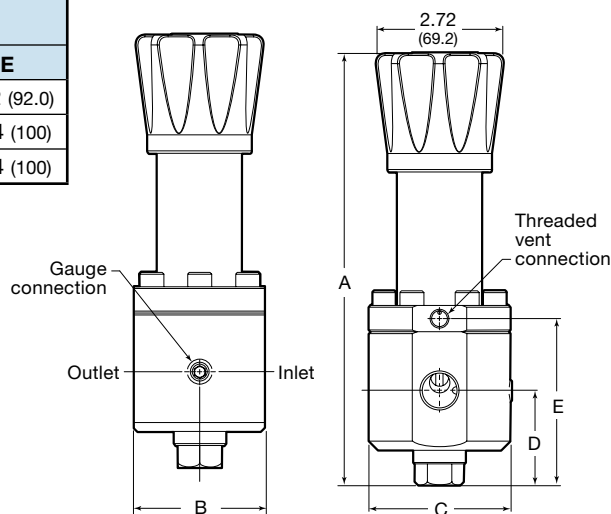
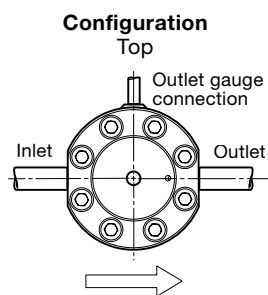
Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)				
		A	B	C	D	E
RS(H)4	1/2 in.	9.06 (230)	2.83 (72.0)	3.07 (78.0)	2.09 (53.0)	3.62 (92.0)
RS(H)6	3/4 in.	9.25 (235)	3.23 (82.0)	3.50 (89.0)	2.20 (56.0)	3.94 (100)
RS(H)8	1 in.	9.25 (235)	3.07 (78.0)	3.50 (89.0)	2.20 (56.0)	3.94 (100)



Shown with tubing for clarity; tubing not included.



Ordering Information

Build an RS(H)4, RS(H)6, and RS(H)8 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RS FA 4 A 1 - 02 - 1 - V V V - GN2

1 Series

RS = 1015 psig (70.0 bar) maximum inlet pressure
RSH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size

4 = 1/2 in. / DN15
6 = 3/4 in. / DN20
8 = 1 in. / DN25

4 Pressure Class

Omit designator if flanges are not ordered.
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material

02 = 316L SS

7 Pressure Control Range

Diaphragm sensing

1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 101 psig (0 to 7.0 bar)
3 = 0 to 203 psig (0 to 14.0 bar)
4 = 0 to 406 psig (0 to 28.0 bar)①

Piston sensing

4 = 0 to 406 psig (0 to 28.0 bar)②
5 = 0 to 580 psig (0 to 40.0 bar)
6 = 0 to 1160 psig (0 to 80.0 bar)
7 = 0 to 2175 psig (0 to 150 bar)
9 = 0 to 4060 psig (0 to 280 bar)
11 = 0 to 5800 psig (0 to 400 bar)

① RS(H)4 series only.

② RS(H)6 and RS(H)8 series only.

8 Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm / Piston O-Rings

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material

RS series
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile
RSH series
K = PCTFE
P = PEEK

11 Options

A = Antitamper
GN2 = Gauge connection, see below
GN4 = Gauge connection, see below
GN5 = Gauge connection, see below
 None = Standard connection, see below

Gauge Connection Configuration			
Standard	GN2	GN4	GN5

N = NACE MR0175/ISO 15156
S = Self-venting (with 1/8 in. NPT)
G93 = ASTM G93 Level C-cleaned

General-Purpose, Spring-Loaded Pressure-Reducing Regulators—RS(H)10, RS(H)15, and RS(H)20 Series

Features

- Balanced poppet design
- RS(H)10 and RS(H)15—diaphragm or piston sensing
- RS(H)20—diaphragm sensing only

Options

- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Connections			Weight (Without Flanges) lb (kg)
							Inlet and Outlet		Gauge ^{①②}	
							Size	Type		
RS(H)10	RS: 1015 (70.0) RSH: 5800 (400)	RS: 290 (20.0)	Diaphragm: 0 to 290 psig (20.0 bar)	−49 to 176 (−45 to 80) See Pressure-Temperature Ratings , page 8.	3.79	RS: 0.55 (14.0) RSH: 0.53 (13.5)	1 in. DN25	NPT ISO/BSP parallel thread ASME or EN flange	1/4 in. NPT or ISO/BSP parallel thread	16.5 (7.5)
RS(H)15		RSH: 3625 (250)	Piston: 0 to 3625 psig (0 to 250 bar)		7.30	0.75 (19.0)	1 1/2 in. DN40			22.0 (10.0)
RS(H)20		290 (20.0)	Diaphragm		13	0.98 (25.0)	2 in. DN50			39.6 (18.0)

See pages 23 to page 27 for flow data.

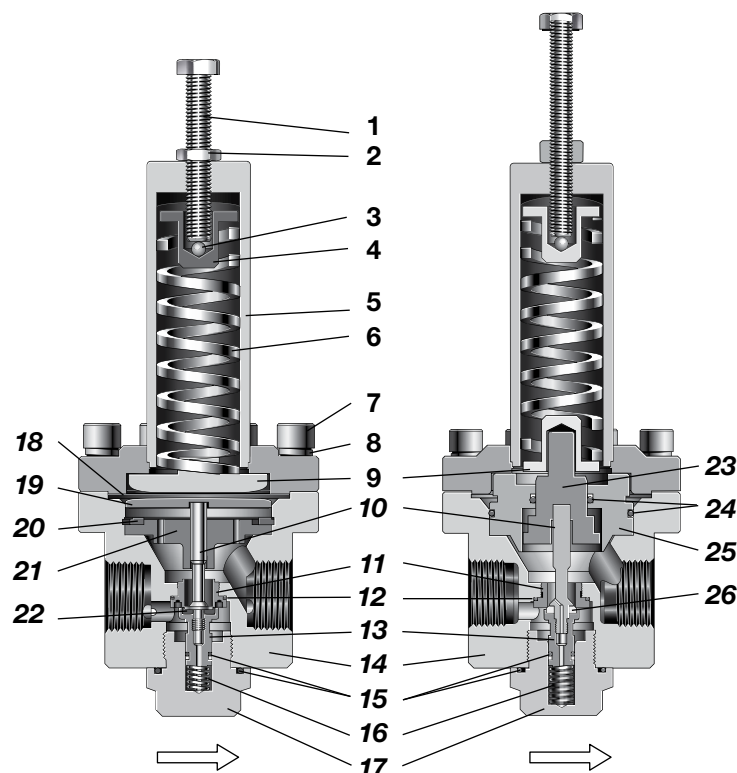
① Regulators with NPT inlet / outlet connections have 1/4 in. NPT gauge connections.

② All RS(H)20 regulators will have 1/4 in. ISO/BSP gauge ports.

Materials of Construction

RS Series Regulator
with Diaphragm Sensing and
Soft Seat Seal

RSH Series Regulator
with Piston Sensing and
Hard Seat Seal



	Component	Material / Specification
Common Components	1 Adjusting screw	A2-70
	2 Nut	A2
	3 Ball	420 SS (Hardened)
	4 Upper spring guide	316L SS / A479
	5 Spring housing assembly	316L SS / A479
	6 Set spring	50CRV4
	7 Cap screw	A4-80
	8 Washer	A4
	9 Bottom spring guide	316L SS / A479
	10 Poppet	S17400 SS or 316L SS
	11 Seat	316L SS / A479
	12 Seat O-ring	EPDM, FKM, or nitrile
	13 Poppet housing	316L SS / A479
	14 Body	316L SS / A479
	15 O-rings	EPDM, FKM, or nitrile
	16 Poppet spring	302 SS / A313
	17 Body plug	316L SS / A479
Diaphragm	18 Diaphragm	EPDM, FKM, or nitrile
	19 Diaphragm plate	316L SS / A479
	20 Retaining ring	Commercial stainless steel
	21 Body plate	316L SS / A479
	22 Seat seal	EPDM, FKM, or nitrile
Piston	23 Piston	316L SS / A479
	24 Piston O-rings	EPDM, FKM, or nitrile
	25 Piston plate	316L SS / A479
	26 Seat seal	PEEK or PCTFE

Wetted lubricant: Silicone-based, synthetic hydrocarbon-based

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

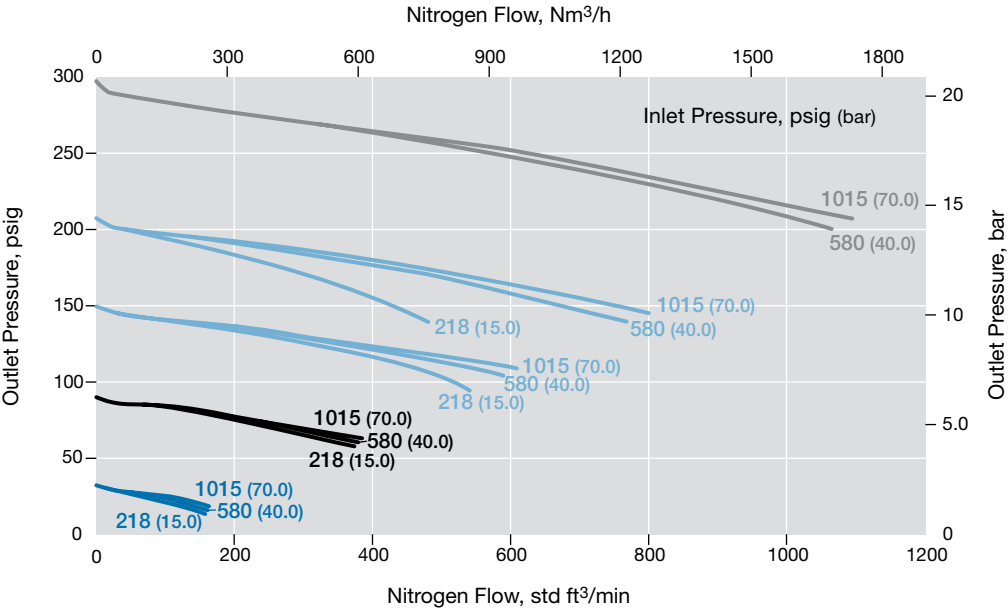
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS10 Series

Flow Coefficient: 3.79
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 406 psig (0 to 28.0 bar)

Pressure Control Range

- 0 to 580 psig (0 to 40.0 bar)
- 0 to 290 psig (0 to 20.0 bar)
- 0 to 145 psig (0 to 10.0 bar)
- 0 to 43 psig (0 to 3.0 bar)

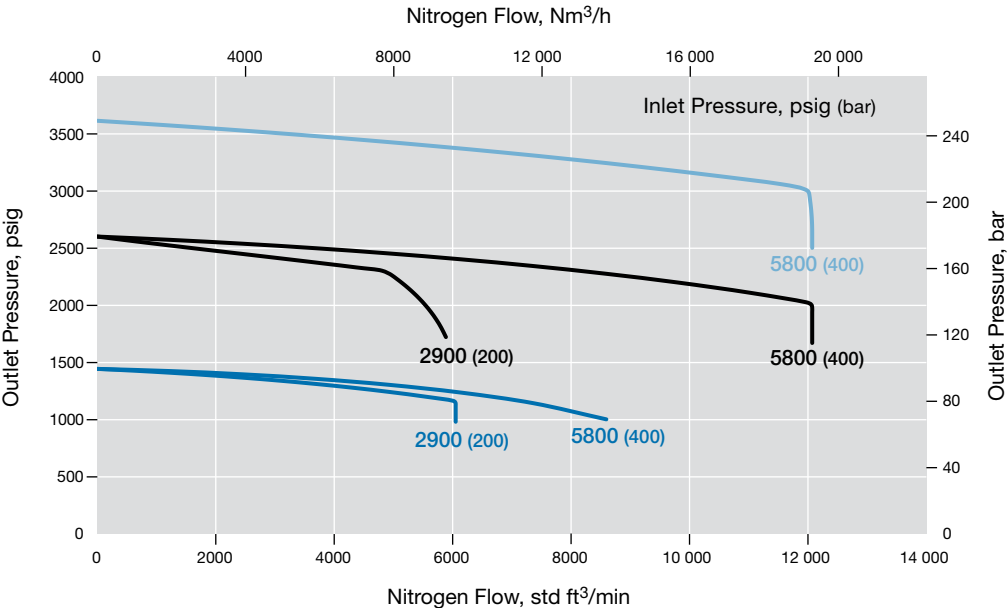


RSH10 Series

Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

- 0 to 3625 psig (0 to 250 bar)
- 0 to 2610 psig (0 to 180 bar)
- 0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RS15 Series

Flow Coefficient: 7.30

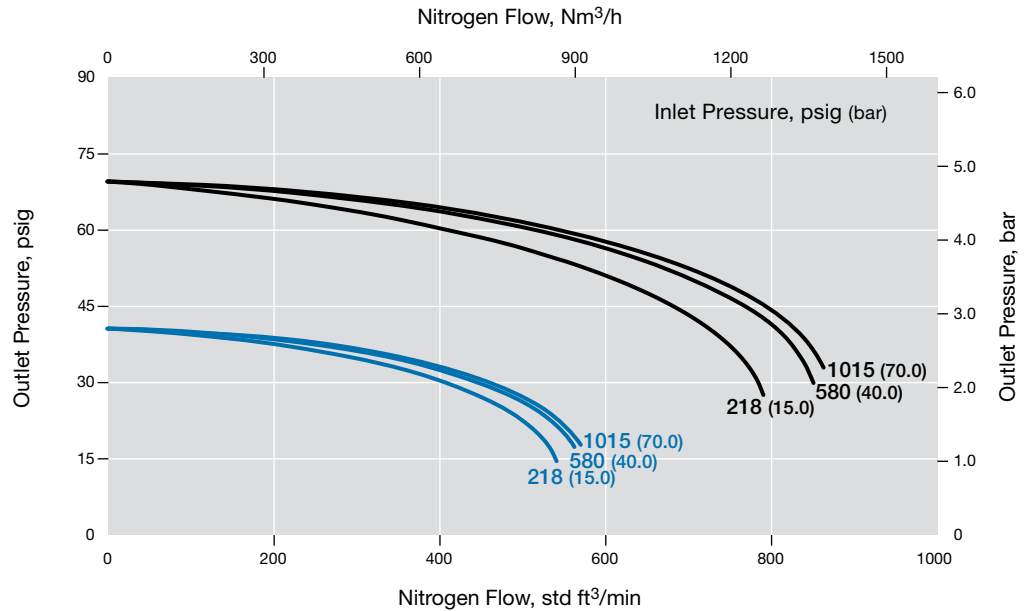
Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 72 psig (0 to 5.0 bar)

Pressure Control Range

— 0 to 72 psig (0 to 5.0 bar)

— 0 to 43 psig (0 to 3.0 bar)



RS15 Series

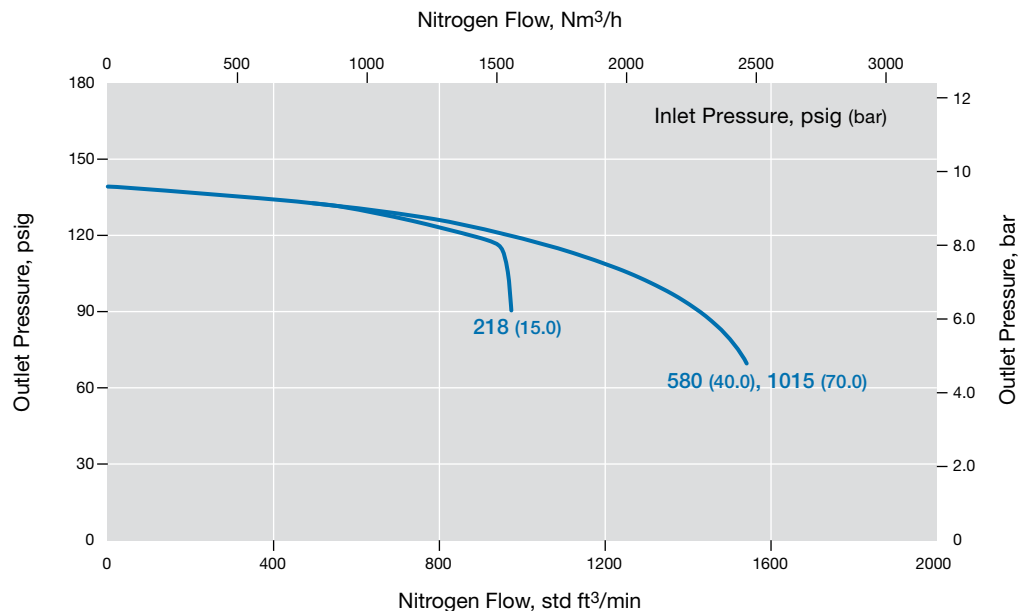
Flow Coefficient: 7.30

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 145 psig (0 to 10.0 bar)

Pressure Control Range

— 0 to 145 psig (0 to 10.0 bar)



Flow Data

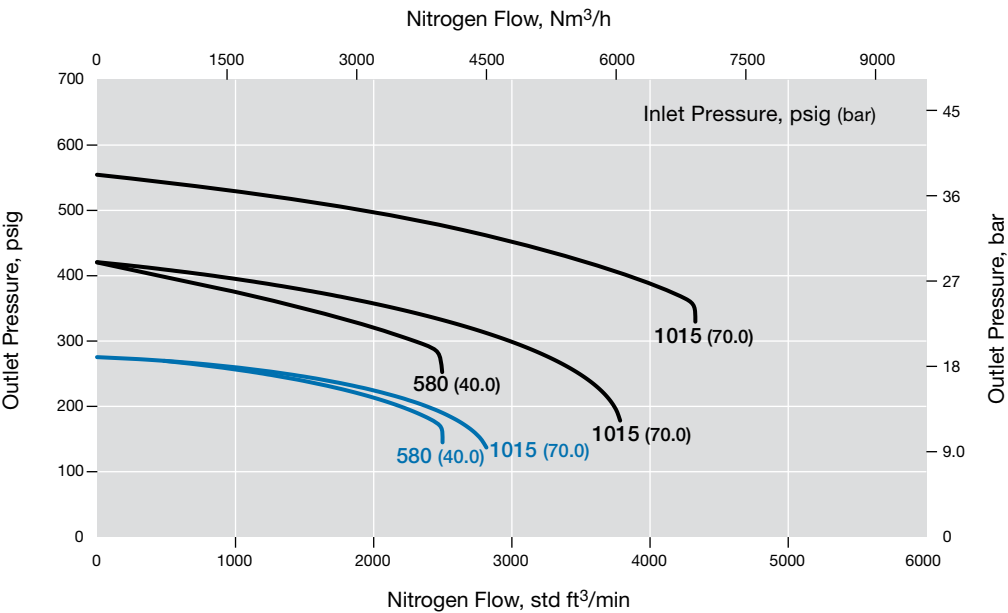
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS15 Series

Flow Coefficient: 7.30
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 580 psig (0 to 40.0 bar)

Pressure Control Range

- 0 to 580 psig (0 to 40.0 bar)
- 0 to 290 psig (0 to 20.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RSH15 Series

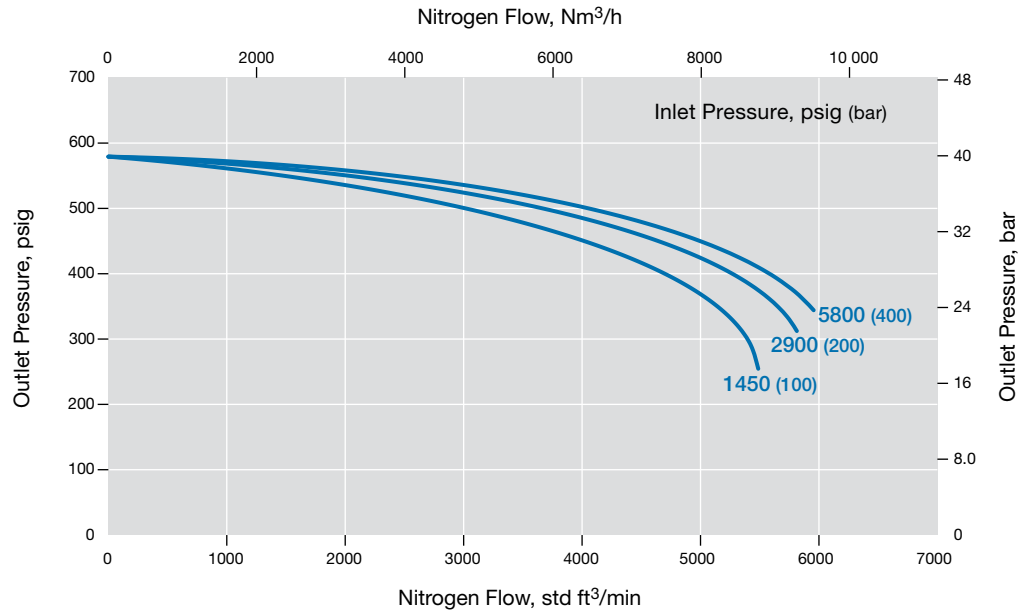
Flow Coefficient: 7.30

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 580 psig (0 to 40.0 bar)

Pressure Control Range

— 0 to 580 psig (0 to 40.0 bar)



RSH15 Series

Flow Coefficient: 7.30

Maximum Inlet Pressure: 5800 psig (400 bar)

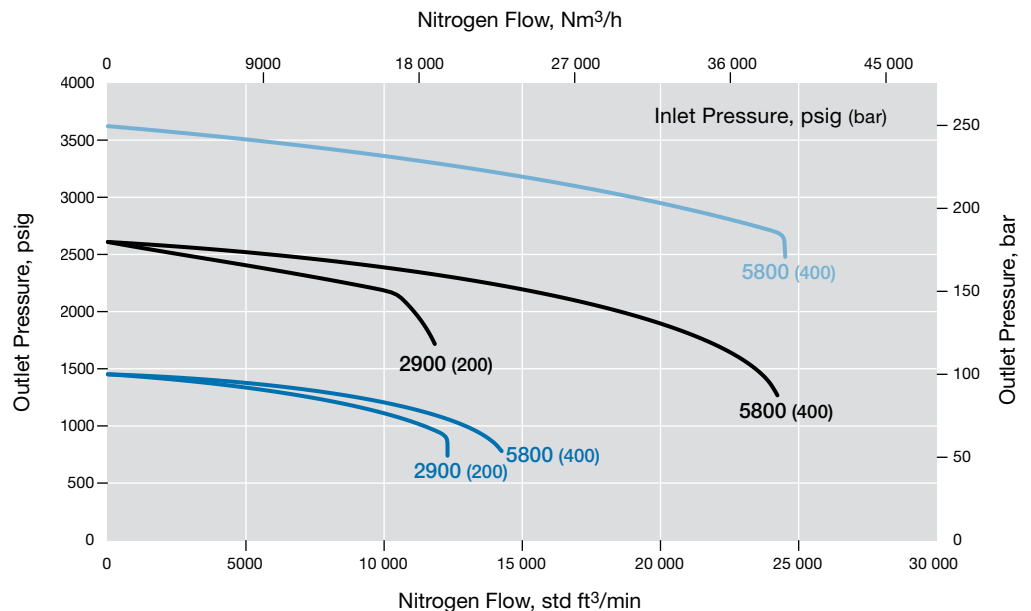
Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

— 0 to 3625 psig (0 to 250 bar)

— 0 to 2610 psig (0 to 180 bar)

— 0 to 1450 psig (0 to 100 bar)



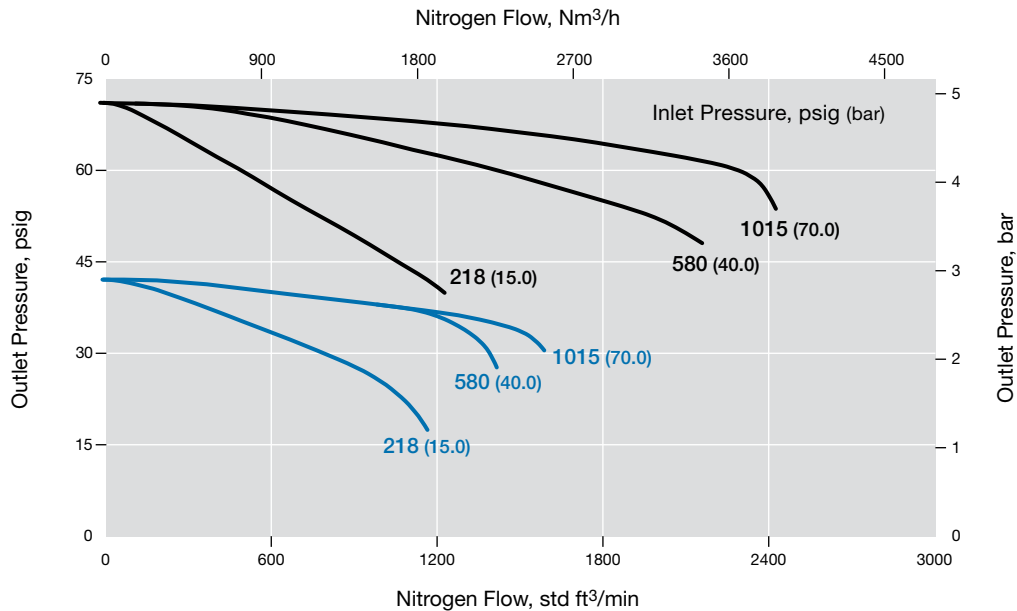
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RS20 Series

Flow Coefficient: 13
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 72 psig (0 to 5.0 bar)

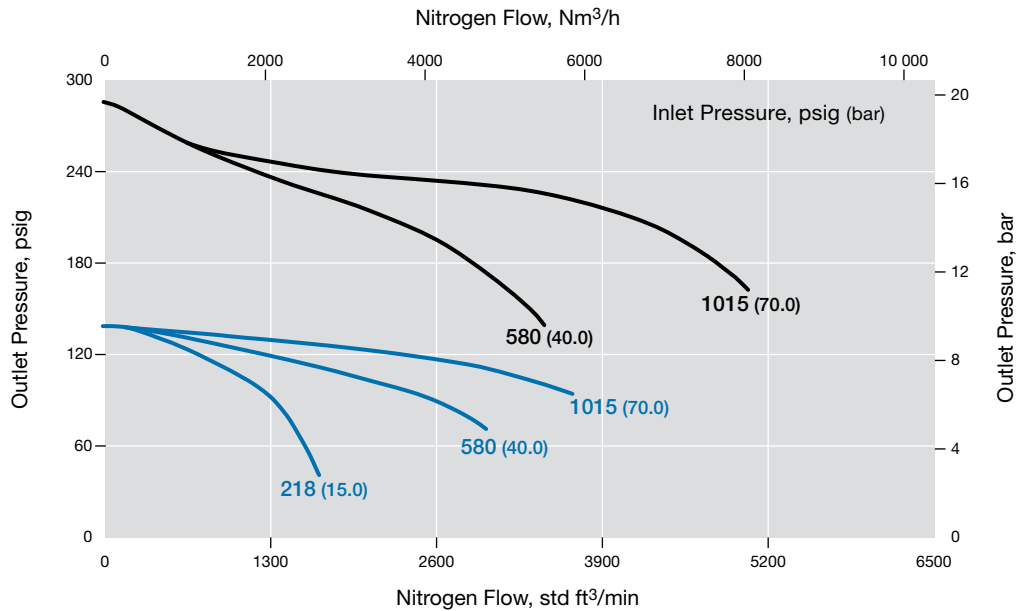
Pressure Control Range
0 to 72 psig (0 to 5.0 bar)
0 to 43 psig (0 to 3.0 bar)



RS20 Series

Flow Coefficient: 13
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range
0 to 290 psig (0 to 20.0 bar)
0 to 145 psig (0 to 10.0 bar)

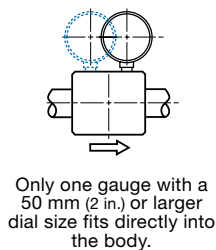


Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

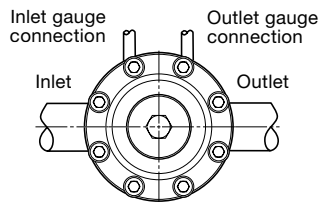
Series	End Connection Size	Dimensions, in. (mm)						
		A	B	C	D	E	F	G
RS(H)10	1 in.	10.5 (266)	3.54 (90.0)	3.07 (78.0)	2.28 (58.0)	1.97 (50.0)	1.77 (45.0)	4.53 (115)
RS(H)15	1 1/2 in.	10.8 (275)	4.53 (115)	3.78 (96.0)	2.44 (62.0)	2.01 (51.0)	1.77 (45.0)	4.53 (115)
RS(H)20	2 in.	11.3 (288)	5.51 (140)	3.93 (100)	2.44 (62.0)	1.85 (47.0)	2.56 (65.0)	6.30 (160)

Gauge Connection

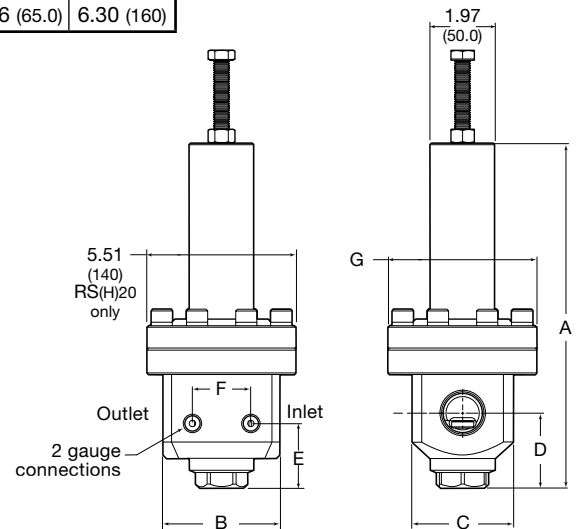


Configuration

Top



Shown with tubing for clarity; tubing not included.



Ordering Information

Build an RS(H)10, RS(H)15, and RS(H)20 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RS FA 10 A 1 - 02 - 1 - V V V - G93

1 Series

RS = 1015 psig (70.0 bar) maximum inlet pressure
RSH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size

10 = 1 in. / DN25
15 = 1 1/2 in. / DN40
20 = 2 in. / DN50

4 Pressure Class

Omit designator if flanges are not ordered.
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material

02 = 316L SS

7 Pressure Control Range

Diaphragm sensing

1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 72 psig (0 to 5.0 bar)
3 = 0 to 145 psig (0 to 10.0 bar)
4 = 0 to 290 psig (0 to 20.0 bar)

Piston sensing

5 = 0 to 580 psig (0 to 40.0 bar)^①
6 = 0 to 1450 psig (0 to 100 bar)^①
7 = 0 to 2610 psig (0 to 180 bar)^①
8 = 0 to 3625 psig (0 to 250 bar)^①

^① RS(H)10 and RS(H)15 series only.

8 Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm / Piston O-Rings

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material

RS series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

RSH series

K = PCTFE

P = PEEK

11 Options

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LRS(H)4 Series

Features

- Diaphragm sensing
- Large diaphragm for higher accuracy
- Diaphragm materials: PTFE or 316L SS for most pressure control ranges
- Bottom mounting
- Low torque minimizes stem wear
- Nonventing
- Cartridge poppet assembly in LRSH4 for ease of service

- Panel mounting—no disassembly required

Options

- External feedback
- Filter, 25 µm
- NACE MR0175/ISO 15156-compliant models
- Self-venting
- Special cleaning to ASTM G93 Level C



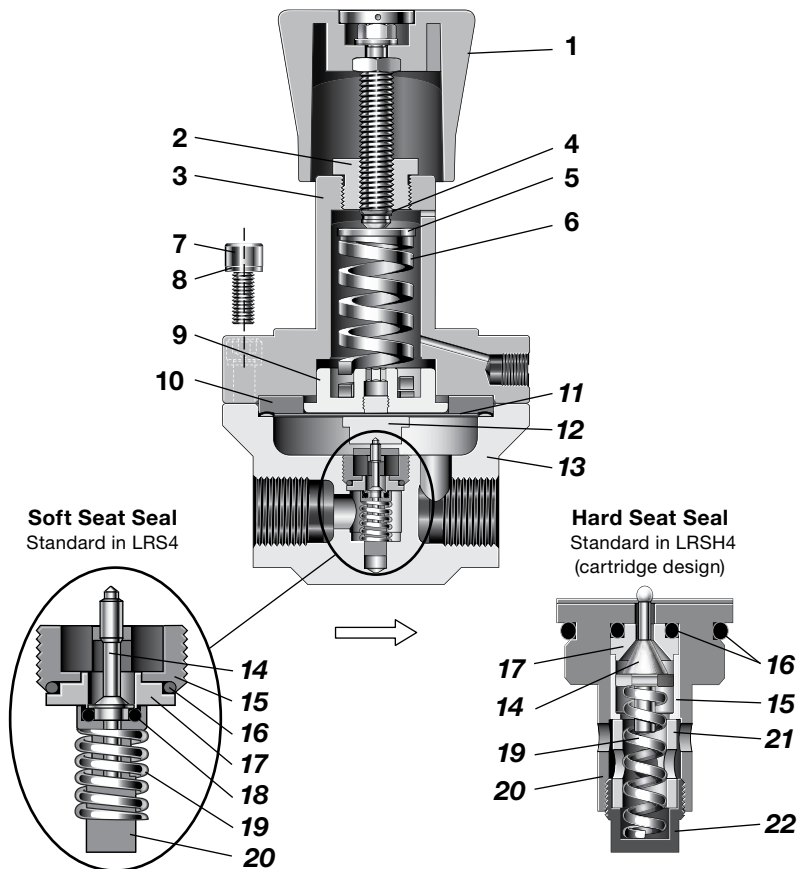
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Vent Connections	Weight lb (kg)
LRS4	507 (35.0)	290 (20.0)	Diaphragm	−49 to 176 (−45 to 80)	0.73	0.23 (6.0)	1/2 in. NPT	Gauge: 1/4 in. NPT Vent: 1/8 in. NPT	5.7 (2.6)
LRSH4	5800 (400)			See Pressure-Temperature Ratings , page 8.	0.10	0.087 (2.2)			

See pages 30 to 31 for flow data.

Materials of Construction

LRS Series Regulator with Soft Seat Seal



Component	Material / Specification
1 Knob assembly with adjusting screw, nuts	Red ABS with 431 SS
2 Spring housing cover	431 SS / A276
3 Spring housing	316L SS / A479
4 C-ring	A2
5 Spring guide	316L SS / A479
6 Set spring	50CRV4
7 Cap screw	A4-80
8 Washer	A2
9 Bottom spring guide	316L SS / A479
10 Clamp ring	
11 Diaphragm	PTFE or 316L SS
12 Diaphragm screw	316L SS / A479
13 Body	
14 Poppet	S17400 or 431 SS
15 Seat retainer	316L SS / A479
16 O-ring	EPDM, FKM, or FFKM
17 Seat	LRS 316L SS / A479
	LRSH PCTFE or PEEK
18 Seat seal (LRS only)	EPDM, FKM, or FFKM
19 Poppet spring	302 SS / A313
20 Poppet housing	316L SS / A479
21 Fluid case	
22 Cartridge plug	

Wetted lubricants: *Silicone-based, synthetic hydrocarbon-based*

Wetted components listed in *italics*.
Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

LRS4 Series

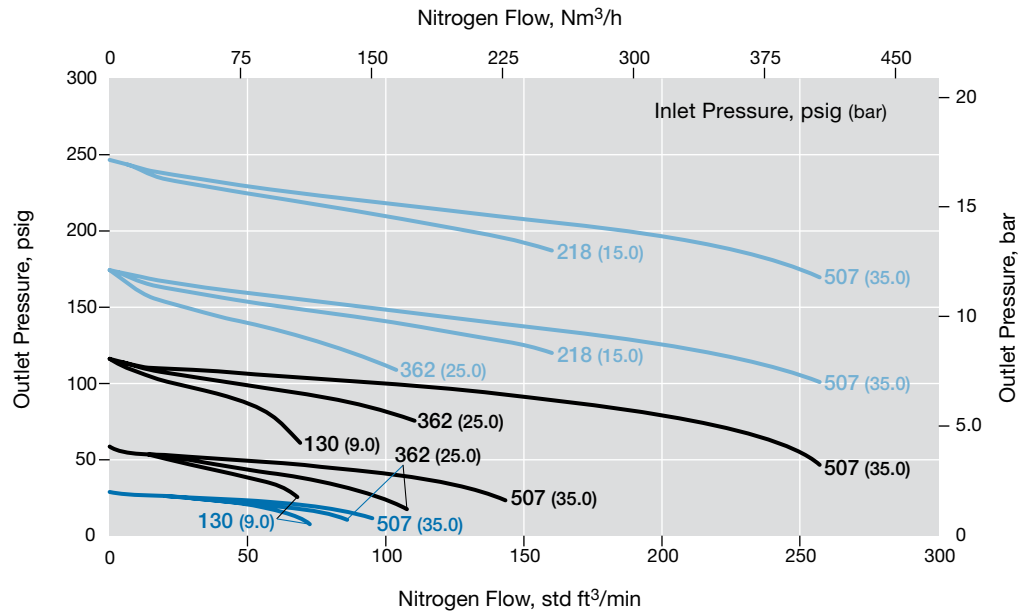
Flow Coefficient: 0.73

Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

- 0 to 290 psig (0 to 20.0 bar)
- 0 to 145 psig (0 to 10.0 bar)
- 0 to 43 psig (0 to 3.0 bar)



LRS4 Series with Optional External Feedback

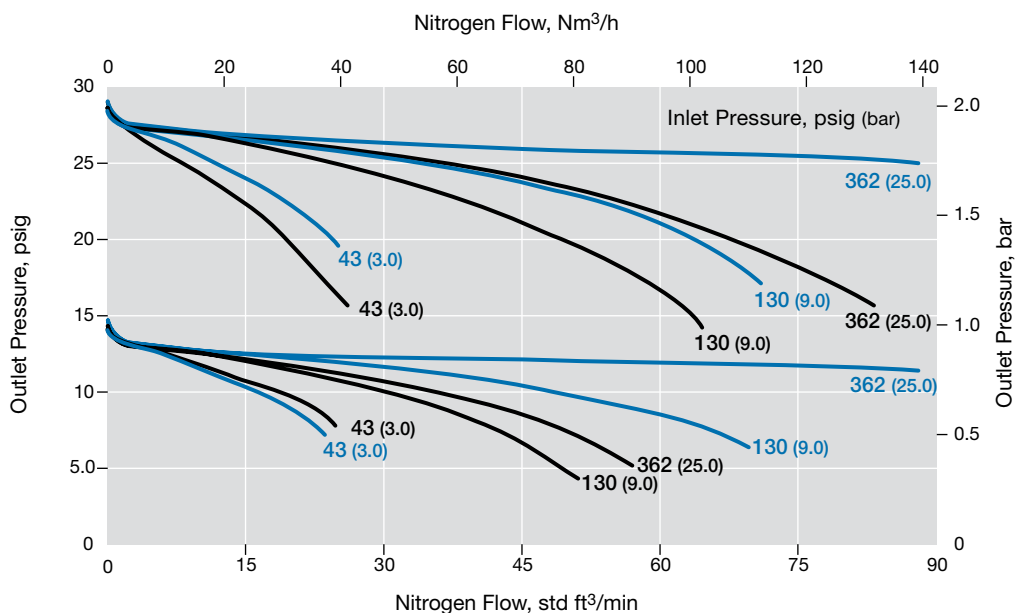
Flow Coefficient: 0.73

Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Comparative Flow

- Standard
- External Feedback



Flow Data

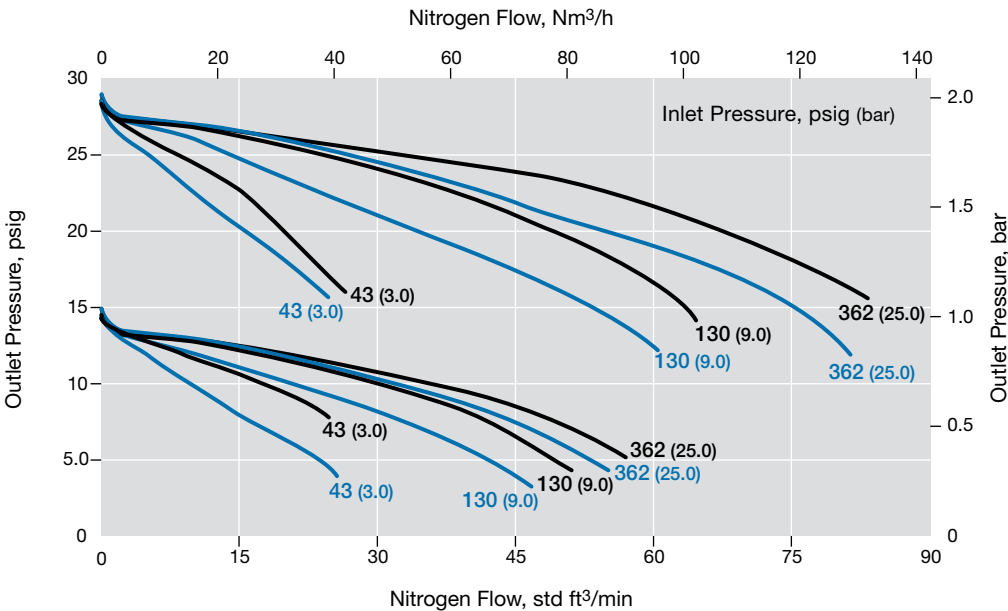
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LRS4 Series with Optional 316L SS Diaphragm

Flow Coefficient: 0.73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Comparative Flow

- Standard
- 316L SS Diaphragm

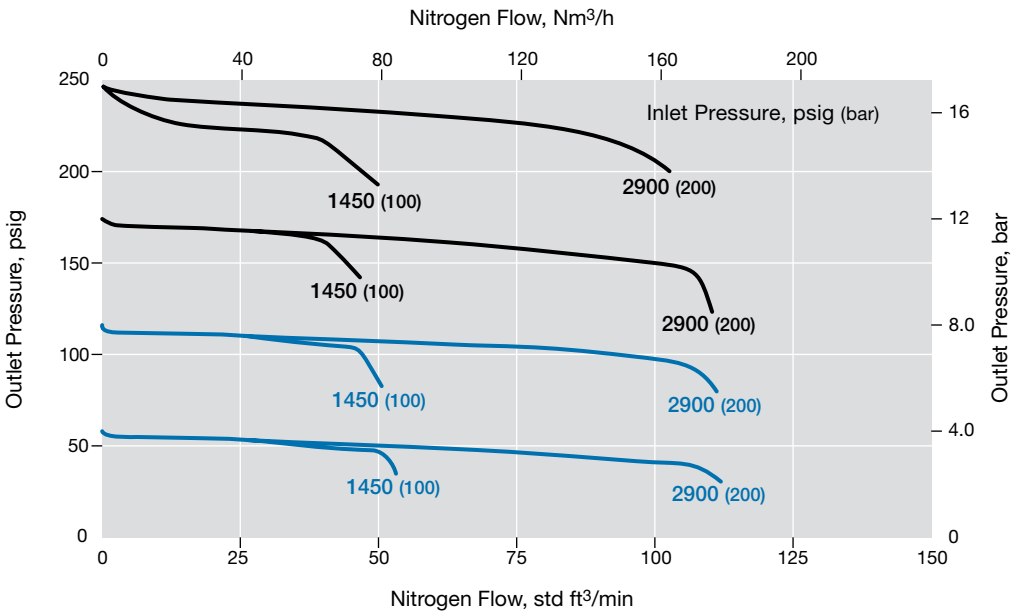


LRS4 Series

Flow Coefficient: 0.10
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

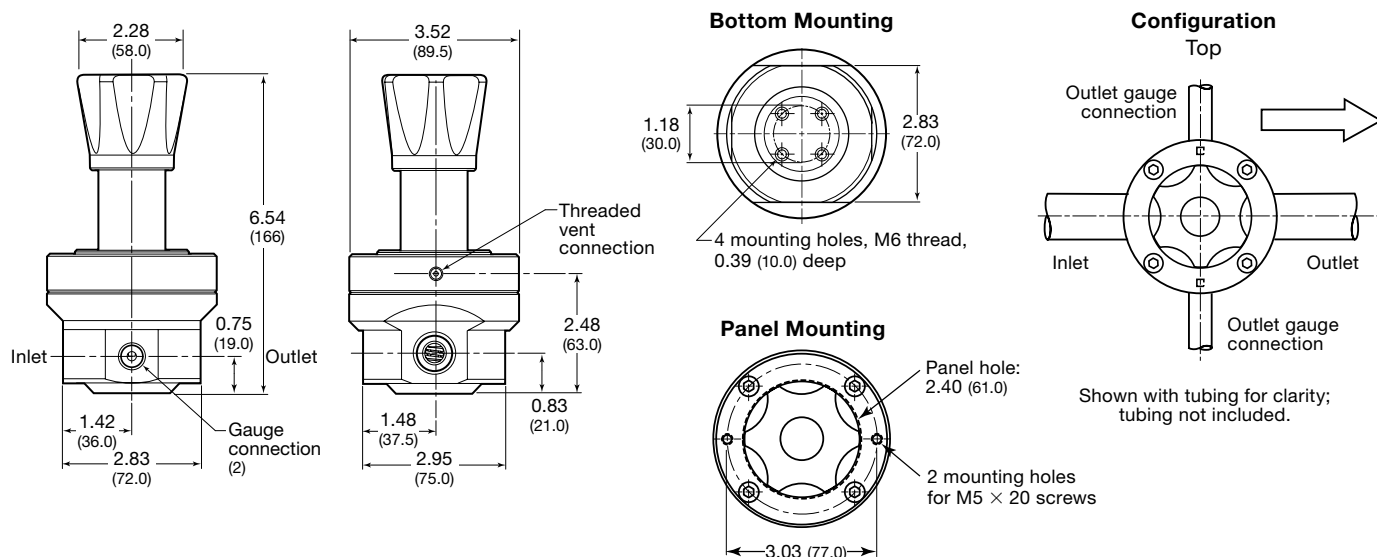
Pressure Control Range

- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)



Dimensions

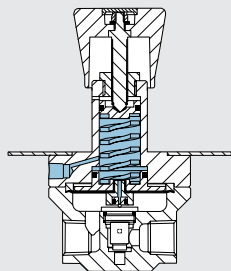
Dimensions, in inches (millimeters), are for reference only and are subject to change.



Options

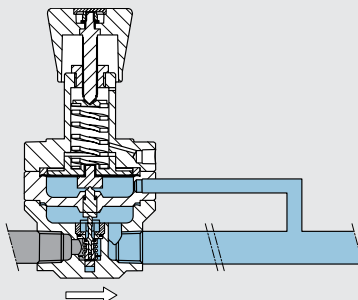
Self Venting

Threaded vent connection is below the panel in self-venting version.



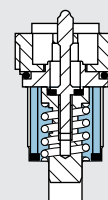
External Feedback

Compensates for pressure loss (droop).

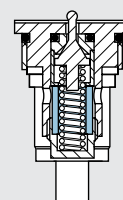


25 µm Filter

Reduces potential seat damage; will reduce flow.



LRS4 series cartridge



LRSH4 series cartridge

Ordering Information

Build an LRS4 or LRSH4 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8
LRS N4 - 02 - 1 - V T V - S

1 Series

LRS = 507 psig (35 bar) maximum inlet pressure
LRSH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

N4 = 1/2 in. female NPT

3 Body Material

02 = 316L SS

4 Pressure Control Range

1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 130 psig (0 to 9.0 bar)
3 = 0 to 290 psig (0 to 20.0 bar)

5 Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
F = FFKM
L = Low temperature Nitrile

6 Diaphragm

T = PTFE^①
M = 316L SS: only for 0 to 43 psig (0 to 3.0 bar) and 0 to 130 psig (0 to 9.0 bar) pressure control ranges

L = Low temperature Nitrile
^① Not available with Low temperature Nitrile seals.

7 Seat Seal Material

LRS series (seat seal)
V = Fluorocarbon FKM
N = Nitrile
E = EPDM
F = FFKM
L = Low temperature Nitrile
LRSH series (seat)
K = PCTFE
P = PEEK

8 Options

EF = External feedback
F = Filter, 25 µm
N = NACE MR0175/ISO 15156
S = Self venting
G93 = ASTM G93 Level C-cleaned

High Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LPRS4, LPRS6, and LPRS8 Series

Features

- Balanced poppet design
- Diaphragm sensing
- Large diaphragm for higher accuracy
- Suction tube for reduced droop
- Ideal as second-stage regulator

Options

- Antitamper
- Gauge connections—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



Technical Data

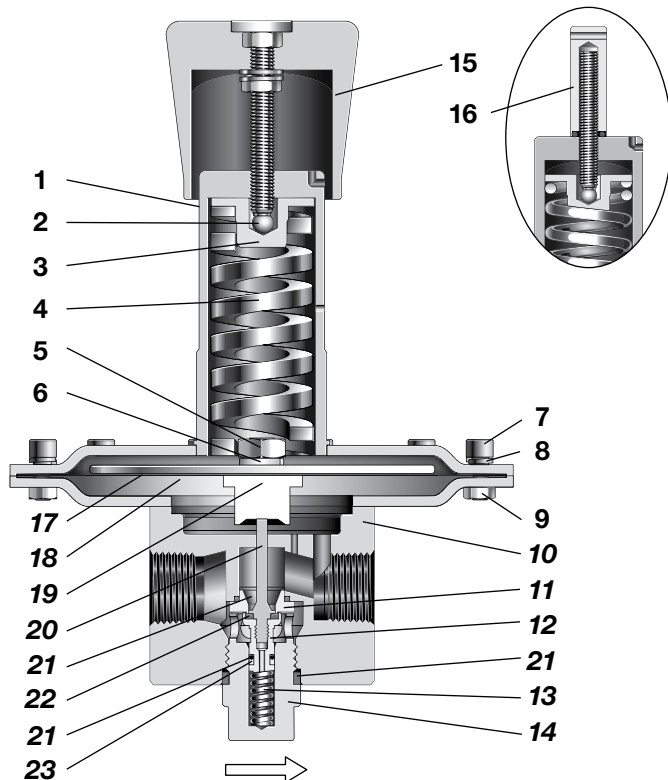
Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Connections			Weight
							Inlet and Outlet		Gauge	
							Size	Type		
LPRS4	232 (16.0)	43.0 (3.0)	Diaphragm	-49 to 176 (-45 to 80)	1.84	0.39 (10.0)	1/2 in. DN15	NPT	1/4 in. NPT	See Dimensions , page 36.
LPRS6				See Pressure-Temperature Ratings , page 887.	1.95		3/4 in. DN20	ISO/BSP parallel thread		
LPRS8				2.07	1 in. DN25		ASME or EN flange			

See pages 34 to 35 for flow data.

Materials of Construction

LPRS Series Regulator
with Standard Knob

Antitamper Option



Component	Material / Specification
1 Spring housing assembly	316L SS / A479
2 Ball	Commercial stainless steel
3 Spring guide	316L SS / A479
4 Set spring	50CRV4
5 Nut	A2
6 Washer	A4
7 Cap screw	A4-80
8 Washer	A4
9 Nut	A4-80
10 Body	316L SS / A479
11 Seat	
12 Poppet housing	
13 Poppet spring	302 SS / A313
14 Body plug	316L SS / A479
15 Knob assembly with adjusting screw, nuts	Red ABS with A2-70
16 Antitamper assembly with O-ring, adjusting screw	316L SS, nitrile, A2-70
17 Diaphragm plate	316L SS / A479
18 Diaphragm	PTFE, EPDM, FKM, or nitrile
19 Diaphragm screw	316L SS / A479
20 Poppet	
21 O-rings	EPDM, FKM, or nitrile
22 Seat seal	
23 Backup ring	PTFE

Wetted lubricants: *Silicone-based, synthetic hydrocarbon-based*

Wetted components listed in *italics*.
Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

LPRS4 Series

Flow Coefficient: 1.84

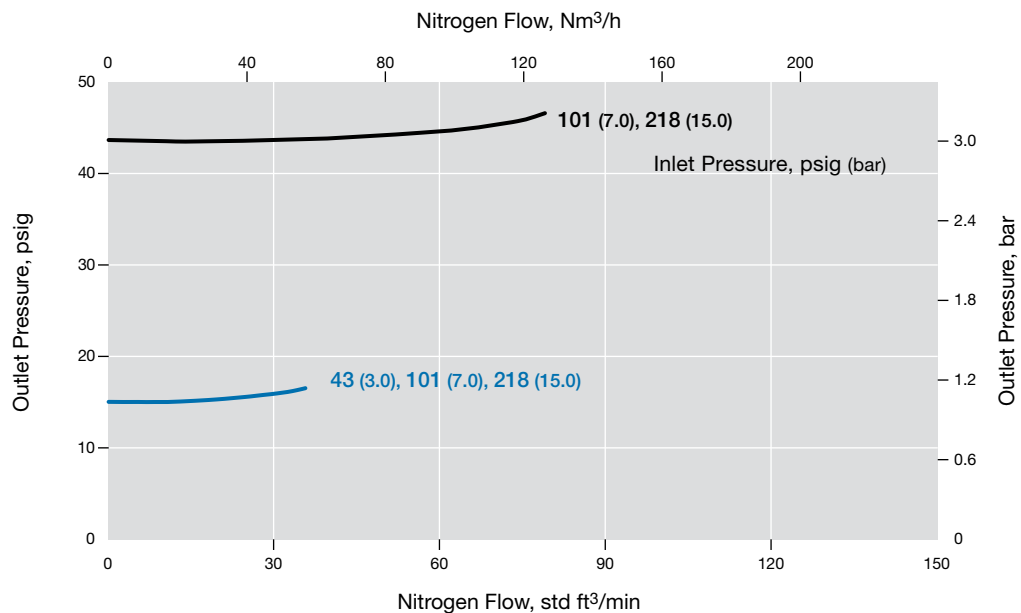
Maximum Inlet Pressure: 218 psig (15.0 bar)

Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range

— 4.3 to 43 psig (0.30 to 3.0 bar)

— 1.4 to 14.5 psig (0.10 to 1.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

LPRS8 Series

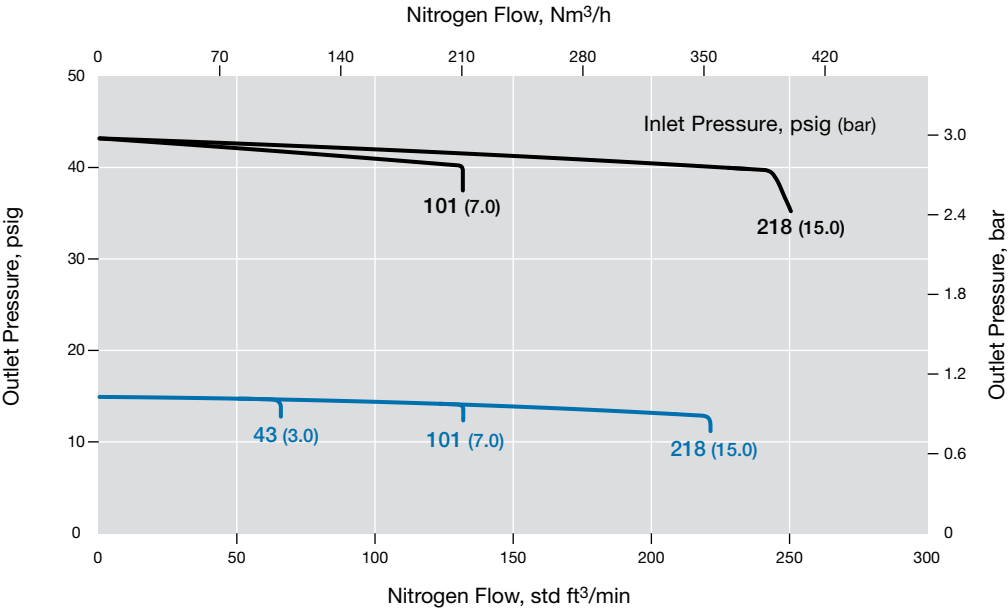
Flow Coefficient: 2.07

Maximum Inlet Pressure: 218 psig (15.0 bar)

Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range

- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.5 psig (0.10 to 1.0 bar)

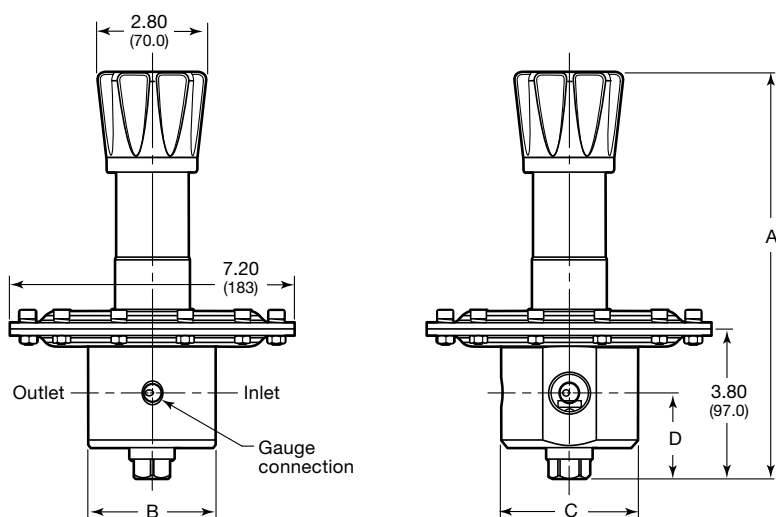


Dimensions

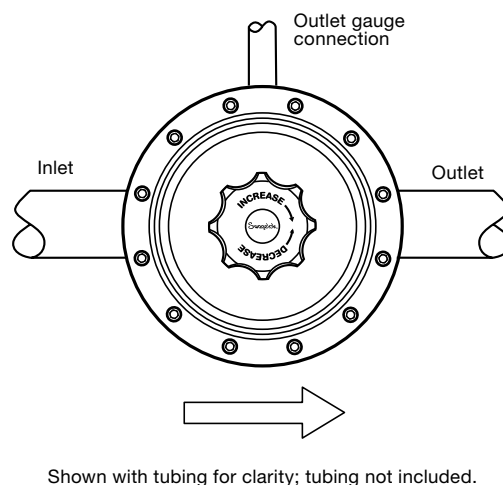
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size and Type	Dimensions, in. (mm)				Weight lb (kg)
		A	B	C	D	
LPRS4	1/2 in. NPT or ISO/BSP parallel thread	10.2 (258)	2.83 (72.0)	3.07 (78.0)	2.09 (53.0)	11.0 (5.0)
	DN15 PN40—EN 1092		10.2 (260)			14.3 (6.5)
	1/2 in. ASME class 150—B16.5		11.0 (280)			
LPRS6	3/4 in. NPT or ISO/BSP parallel thread		3.23 (82.0)	3.50 (89.0)	2.20 (56.0)	12.1 (5.5)
	DN20 PN40—EN 1092		10.2 (260)			17.6 (7.8)
	3/4 in. ASME class 150—B16.5		11.2 (285)			
LPRS8	1 in. NPT or ISO/BSP parallel thread		3.07 (78.0)	3.50 (89.0)	2.20 (56.0)	12.1 (5.5)
	DN25 PN40—EN 1092		10.2 (260)			18.3 (8.3)
	1 in. ASME class 150—B16.5		11.5 (291)			

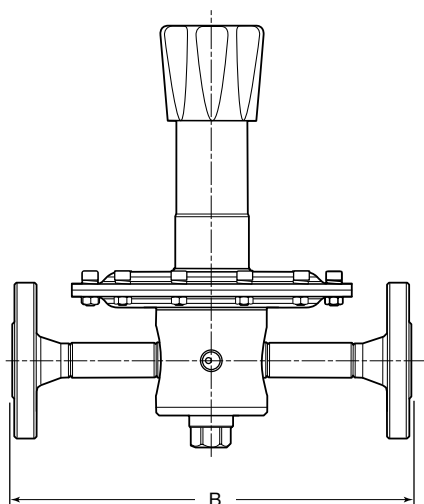
Regulators with Pipe Connections



Standard Configuration Top



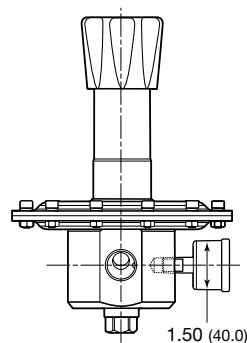
Regulators with Flange Connections



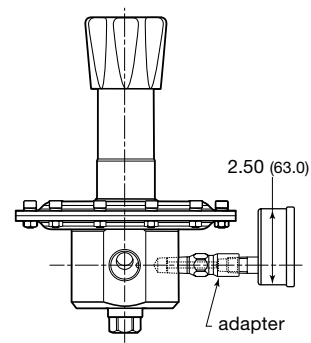
Gauges

Due to the size of the diaphragm enclosure it is not possible to fit a gauge without an adapter, unless a gauge with 40 mm (1 1/2 in.) dial and center-back mount is used.

RHPS Gauge Adapter



40 mm (1 1/2 in.) gauge
dial size with center-
back mount



63 mm (2 1/2 in.) or larger
gauge dial size requires the
use of an adapter.

Flow Table

1/2 in. DN15, 3/4 in. DN20, 1 in. DN25 Connections

Inlet Pressure P1 psig (bar)	Set Pressure P2 psig (bar)	Pressure Control Range psig (bar)	Flow std ft ³ /min (Nm ³ /h)
14.5 (1.0)	1.4 (0.10)	1.4 to 14.5 (0.10 to 1.0)	12.9 (22)
	4.3 (0.30)		17.6 (30)
43 (3.0)	1.4 (0.10)	1.4 to 14.5 (0.10 to 1.0)	12.9 (22)
	4.3 (0.30)		23.5 (40)
	11 (0.80)		35.3 (60)
	29 (2.0)	4.3 to 43 (0.30 to 3.0)	47.0 (80) ^①
72 (5.0)	1.4 (0.10)	1.4 to 14.5 (0.10 to 1.0)	12.9 (22)
	4.3 (0.30)		23.5 (40)
	11 (0.80)		35.3 (60)
	29 (2.0)	4.3 to 43 (0.30 to 3.0)	76.5 (130) ^①
145 (10.0)	4.3 (0.30)	1.4 to 14.5 (0.10 to 1.0)	23.5 (40)
	11 (0.80)		35.3 (60)
	29 (2.0)	4.3 to 43 (0.30 to 3.0)	76.5 (130) ^①
232 (16.0)	4.3 (0.30)	1.4 to 14.5 (0.10 to 1.0)	23.5 (40)
	11 (0.80)		35.3 (60)
	29 (2.0)	4.3 to 43 (0.30 to 3.0)	76.5 (130) ^①

① Droop is approximately 15 %.

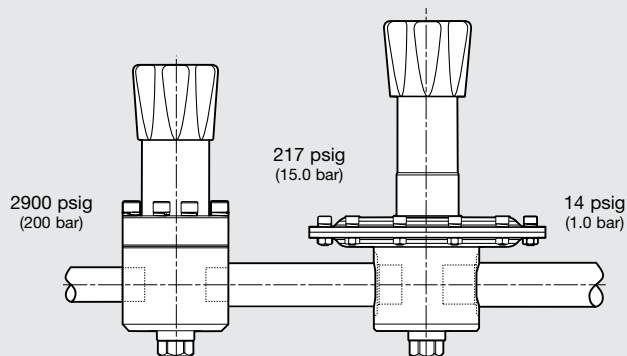
Droop

Due to the working of the suction tube, LPRS series regulators show little or no droop.

Flow

If the flows given in the table are exceeded, the set pressure P2 may rise above the original setting.

Typical 2-Stage Reduction for improved set-pressure control



Ordering Information

Build an LPRS4, LPRS6, and LPRS8 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
LPRS FA 4 A 1 - 02 - 2 - V V V - GN2

1 Series

LPRS = 232 psig (16.0 bar)
maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size

4 = 1/2 in. / DN15
6 = 3/4 in. / DN20
8 = 1 in. / DN25

4 Pressure Class

Omit designator if flanges are not ordered.
A = ASME class 150
N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.
1 = Raised face smooth

6 Body Material

02 = 316L SS

7 Pressure Control Range

2 = 1.4 to 14.5 psig (0.10 to 1.0 bar)
3 = 4.3 to 43 psig (0.30 to 3.0 bar)

8 Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

11 Options

A = Antitamper
GN2 = Gauge connection, see below
GN4 = Gauge connection, see below
GN5 = Gauge connection, see below
 None = Standard connection, see below

Gauge Connection Configuration			
Standard	GN2	GN4	GN5

N = NACE MR0175/ISO 15156
G93 = ASTM G93 Level C-cleaned

High-Sensitivity, Spring-Loaded Pressure-Reducing Regulators—LPRS10 and LPRS15 Series

Features

- Balanced poppet design
- Diaphragm sensing
- High flow and high accuracy
- Suction tube for reduced droop
- Ideal as second-stage regulator

Options

- Antitamper
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



Technical Data

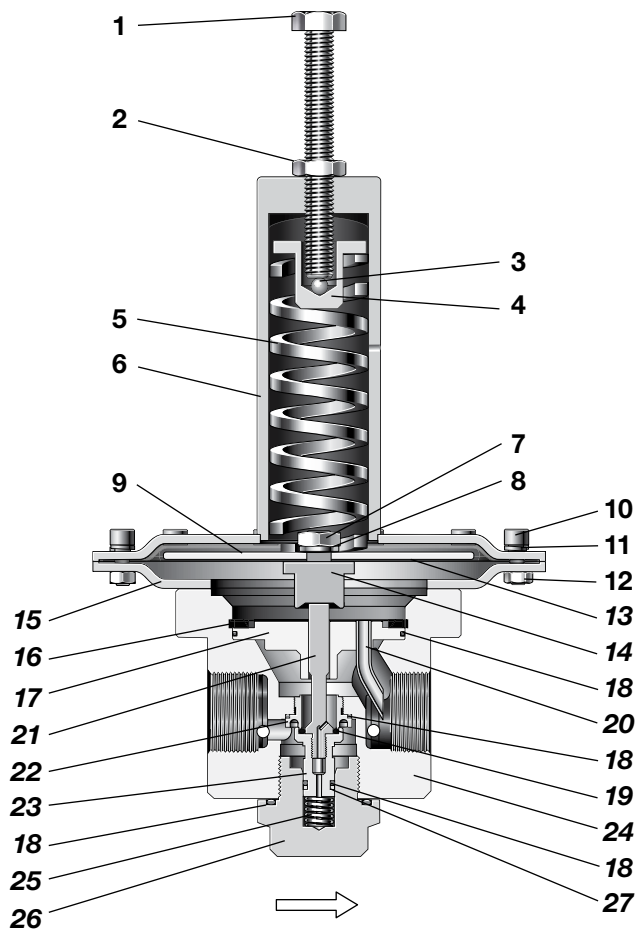
Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °C (°F)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Connections			Weight (Without Flanges) lb (kg)
							Inlet and Outlet		Gauge	
							Size	Type		
LPRS10	232 (16.0)	43.0 (3.0)	Diaphragm	−49 to 176 (−45 to 80) See Pressure-Temperature Ratings , page 887.	3.79	0.55 (14.0)	1 in. DN25	NPT ISO/BSP parallel thread	1/4 in. NPT or ISO/BSP parallel thread ^①	17.6 (8.0)
LPRS15							1 1/2 in. DN40	ASME or EN flange		22.0 (10.0)

See page 39 for flow data.

① Regulators with NPT inlet / outlet connections have 1/4 in. NPT gauge connections.

Materials of Construction

LPRS10 Series Regulator



Component	Material / Specification
1 Adjusting screw	A2-70
2 Nut	A2
3 Ball	Commercial stainless steel
4 Spring guide	316L SS / A479
5 Set spring	50CRV4
6 Spring housing assembly	316L SS / A479
7 Nut	A2
8 Washer	A4
9 Diaphragm plate	316L SS / A479
10 Cap screw	A4-80
11 Washer	A2
12 Nut	A2
13 Diaphragm	PTFE, FKM, EPDM, or nitrile
14 Diaphragm screw	316L SS / A479
15 Bottom cover	
16 Retaining ring	Commercial stainless steel
17 Body plate	316L SS / A479
18 O-rings	EPDM, FKM, or nitrile
19 Seat seal	
20 Suction tube	316L SS / A479
21 Poppet	
22 Seat	
23 Poppet housing	
24 Body	302 SS / A313
25 Poppet spring	
26 Body plug	316L SS / A479
27 Backup ring	PTFE

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

LPRS10 Series

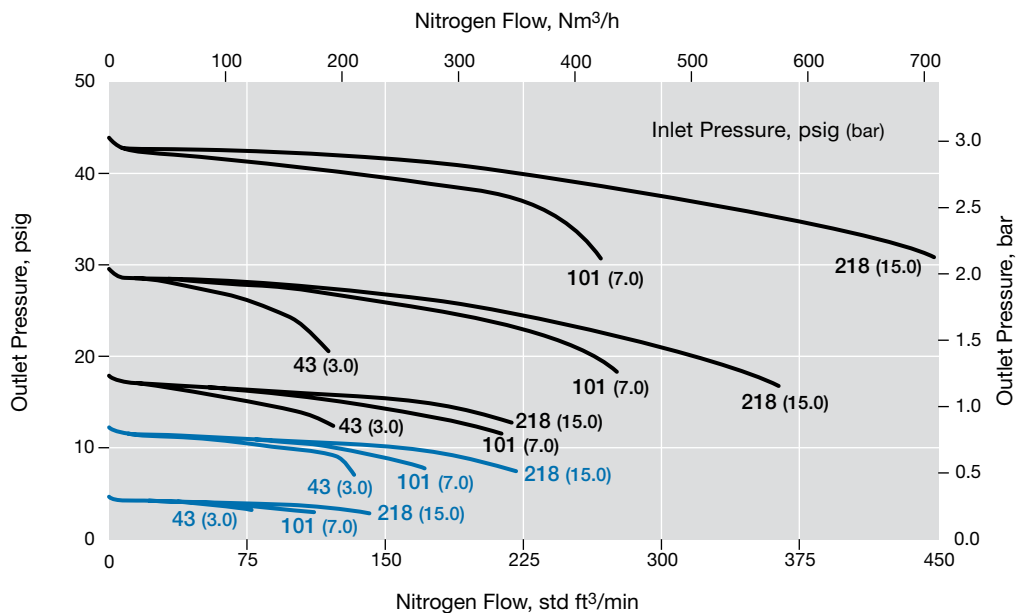
Flow Coefficient: 3.79

Maximum Inlet Pressure: 232 psig (16.0 bar)

Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range

- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.0 psig (0.10 to 1.0 bar)



LPRS15 Series

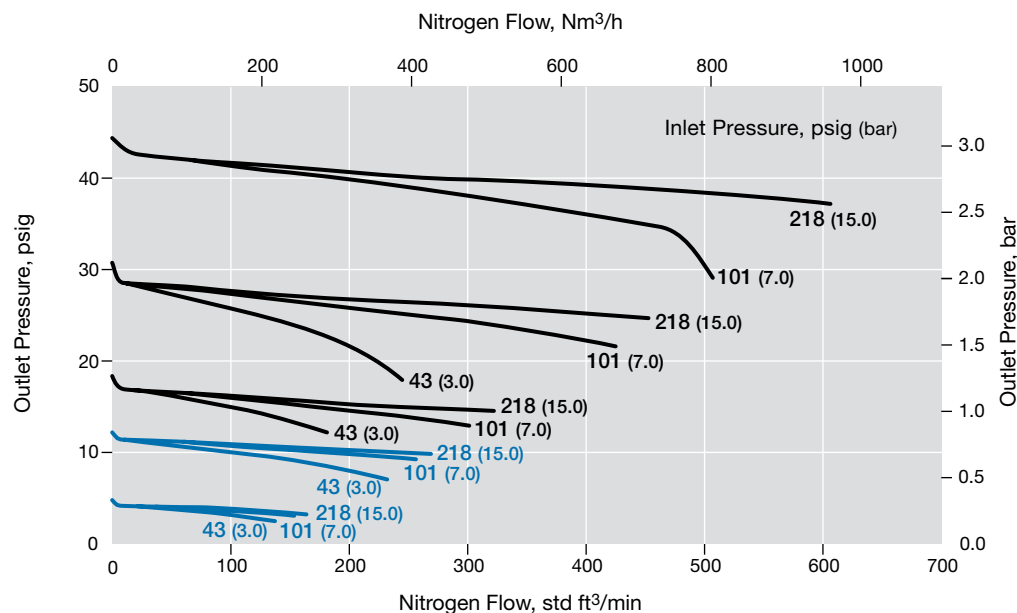
Flow Coefficient: 7.3

Maximum Inlet Pressure: 232 psig (16.0 bar)

Outlet Pressure Control Range: 1.4 to 43 psig (0.10 to 3.0 bar)

Pressure Control Range

- 4.3 to 43 psig (0.30 to 3.0 bar)
- 1.4 to 14.0 psig (0.10 to 1.0 bar)

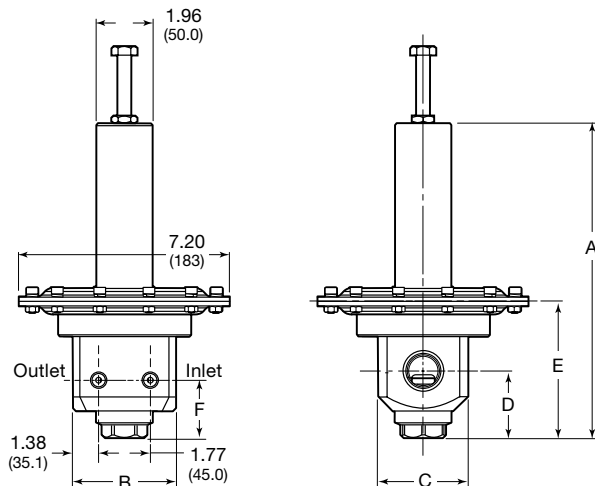


Dimensions

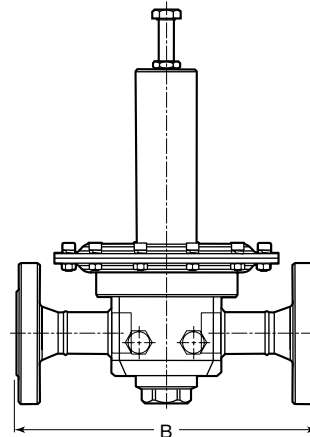
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size and Type	Dimensions, in. (mm)					
		A	B	C	D	E	F
LPRS10	1 in. NPT or ISO/BSP parallel thread	10.8 (275)	3.54 (90.0)	3.07 (78.0)	2.28 (58.0)	4.69 (119)	2.00 (50.8)
	DN25 PN40—EN 1092		9.69 (246)				
	1 in. ASME class 150—B16.5		9.65 (245)				
LPRS15	1 1/2 in. NPT or ISO/BSP parallel thread	11.3 (286)	4.53 (115)	3.78 (96.0)	2.44 (62.0)	5.12 (130)	2.03 (51.6)
	DN40 PN40—EN 1092		11.0 (280)				
	1 1/2 in. ASME class 150—B16.5		12.4 (314)				

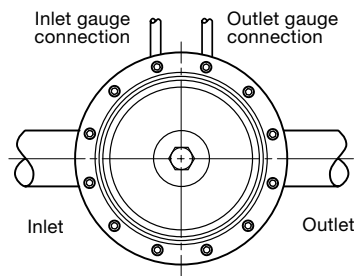
Regulators with Pipe Connections



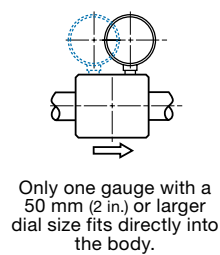
Regulators with Flange Connections



**Configuration
Top**



Gauge Connection



Shown with tubing for clarity;
tubing not included.

Ordering Information

Build an LPRS10 and LPRS15 series regulator ordering number by combining the designators in the sequence shown below.

1
2
3
4
5
6
7
8
9
10
11
LPRS FA 10 A 1 - 02 - 2 - V V V - G93

1 Series

LPRS = 232 psig (16.0 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread

N = Female NPT

FA = ASME B16.5 flange

FD = EN 1092 (DIN) flange

3 Size

10 = 1 in. / DN25

15 = 1 1/2 in. / DN40

4 Pressure Class

Omit designator if flanges are not ordered.

A = ASME class 150

N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.

1 = Raised face smooth

6 Body Material

02 = 316L SS

7 Pressure Control Range

2 = 1.4 to 14.5 psig (0.10 to 1.0 bar)

3 = 4.3 to 43 psig (0.30 to 3.0 bar)

8 Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

9 Diaphragm

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

10 Seat Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

11 Options

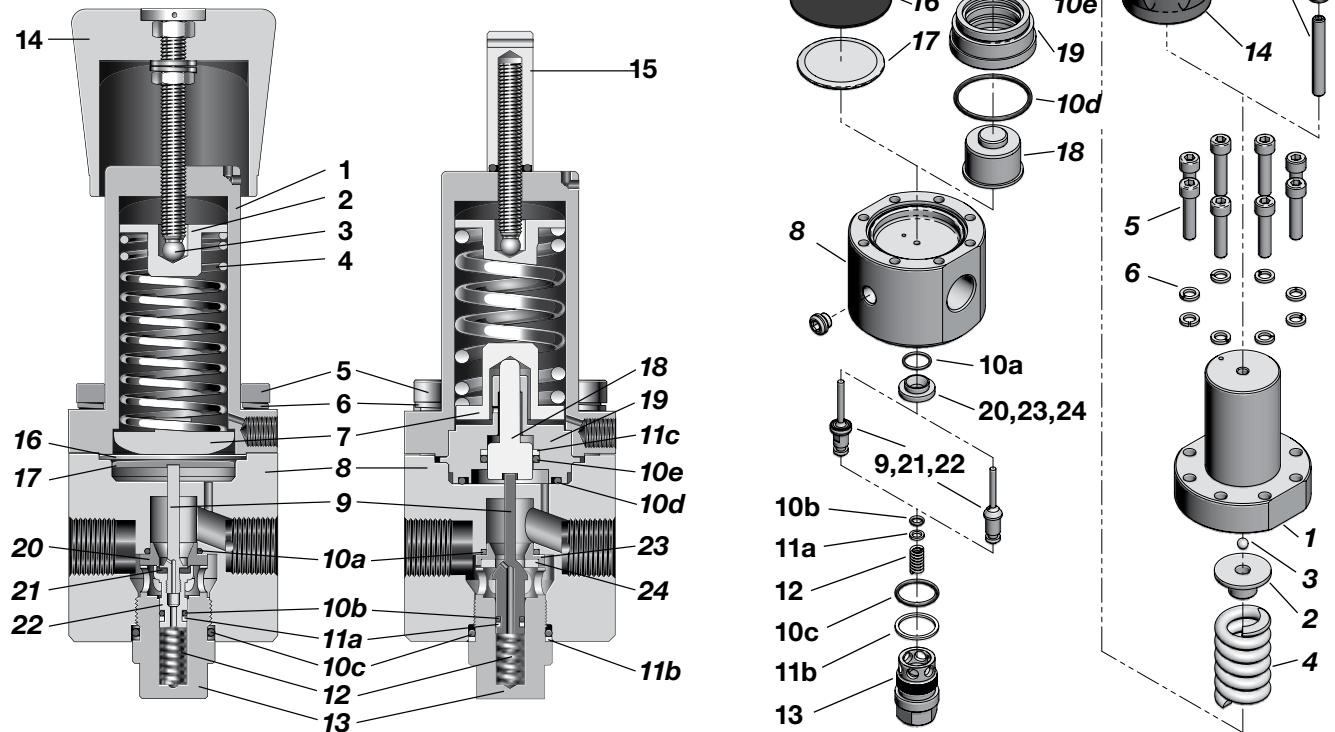
A = Antitamper

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

Pressure-Reducing Regulators Spring-Loaded—RS Series Maintenance Kits

Regular maintenance of pressure regulator components is an important part of keeping pressure regulators operating successfully. Swagelok offers several maintenance kit options to help keep components and systems performing well. Outlined below are the standard maintenance kit offerings and an example of which parts are included in each kit. For more detailed information of which parts will be included within a kit for a specific regulator model, please reference the appropriate owner's manual or contact your authorized Swagelok Sales and Service center.



Designator	Kit Type	Diaphragm Sensing Typical Contents	Piston Sensing Typical Contents
A1	Valve kit	Poppet and housing (9, 21, 22), O-rings (10a, 10b), Back-up ring (11a), Seat (20)	Poppet (9), O-rings (10a, 10b), Back-up rings (11a), Seat (23), Seat seal (24)
A2	Soft valve kit	Poppet and housing (9, 21, 22), O-ring (10b), Back-up ring (11a)	O-ring (10a), Seat (23), Seat seal (24)
B1	Service kit	Poppet and housing (9, 21, 22), O-rings (10a, 10b, 10c), Back-up ring (11a), Diaphragm (16), Seat (20)	Poppet (9), O-rings (10a, 10b, 10c, 10d, 10e), Back-up rings (11a, 11b, 11c), Seat (23), Seat seal (24)
B2	Seal kit	O-rings (10a, 10b, 10c), Back-up ring (11a), Diaphragm (16)	O-rings (10a, 10b, 10c, 10d, 10e), Back-up rings (11a, 11b, 11c)
C1	Overhaul kit	Spring guides (2, 7), Ball (3), Set spring (4), Poppet and housing (9, 21, 22), O-rings (10a, 10b, 10c), Back-up ring (11a), Poppet spring (12), Body plug (13), Diaphragm (16), Diaphragm plate (17), Seat (20)	Spring guide (2), Ball (3), Set spring (4), Poppet (9), O-rings (10a, 10b, 10c, 10d, 10e), Back-up rings (11a, 11b, 11c), Poppet spring (12), Body plug (13), Piston (18), Piston plate (19), Seat (23), Seat seal (24)
C2	Body plug kit	O-ring (10c), Body plug (13)	O-ring (10c), Body plug (13), Back-up ring (11b)
C3	Sensing kit	Diaphragm (16)	Piston (18), Piston plate (19), O-rings (10d, 10e), Back-up ring (11c)
C4	Range spring kit	Range spring (4)	Range spring (4)
C5	Poppet spring kit	Poppet spring (12)	Poppet spring (12)
D1	Handle kit	Handle assembly (14)	Handle assembly (14)
E1	Hardware kit	Bolts (5), Washers (6)	Bolts (5), Washers (6)

Ordering Information

To order a maintenance kit, add the **kit type designator** to the regulator ordering number. Example: RSN4-02-1-VVV-B1

Pressure-Reducing, Dome-Loaded and Air-Loaded Regulators—RD and RA Series

These pressure-reducing, dome-loaded and air-loaded regulators are suitable for most gases and liquids, including acids and oils. These regulators feature various poppet designs, a pressure-sensing diaphragm (piston in RD2 series), and a choice of seat and seal materials to accommodate a variety of pressure, temperature, and flow conditions.

These regulators are available with a choice of threaded end connections from 1/4 to 2 in., and with flange end connections from 1/2 to 4 in.

The RDH series regulators are high-pressure versions of the RD series regulators, and the LPRD series are low-pressure, high-accuracy versions of the RD series regulators. The RA series regulators are air-loaded regulators.

These regulators are available with many options, including a variety of gauge connection configurations, a pilot regulator (RD series only), external feedback (RD series only), special cleaning to ASTM G93 Level C, and NACE MR0175/ISO 15156-compliant models.

Features

- Dome-loaded and air-loaded pressure control
- Diaphragm sensing design except RD2 series
- 316L stainless steel materials of construction for corrosion resistance
- Maximum inlet pressure ratings:
1015 to 5800 psig (70.0 to 400 bar)
- Outlet pressure control ranges:
Up to 0 to 5800 psig (0 to 400 bar)



RD2



RD(H)6, 8



RD(H)10, 15



RD(H)6DP



RA4, 6, 8



RD(H)20, 25



RD(H)30, 40



LPRD25, 30, 40

Pressure-Reducing, Dome-Loaded and Air-Loaded Regulators—RD and RA Series

Pressure-Temperature Ratings

Seal Material	Temperature Range °F (°C)	Material Designator
Fluorocarbon FKM	5 to 176 (–15 to 80)	V
Standard Nitrile	–4 to 176 (–20 to 80)	N
Low-Temp Nitrile	–49 to 176 (–45 to 80)	L
EPDM	–4 to 176 (–20 to 80)	E
FFKM	14 to 176 (–10 to 80)	F

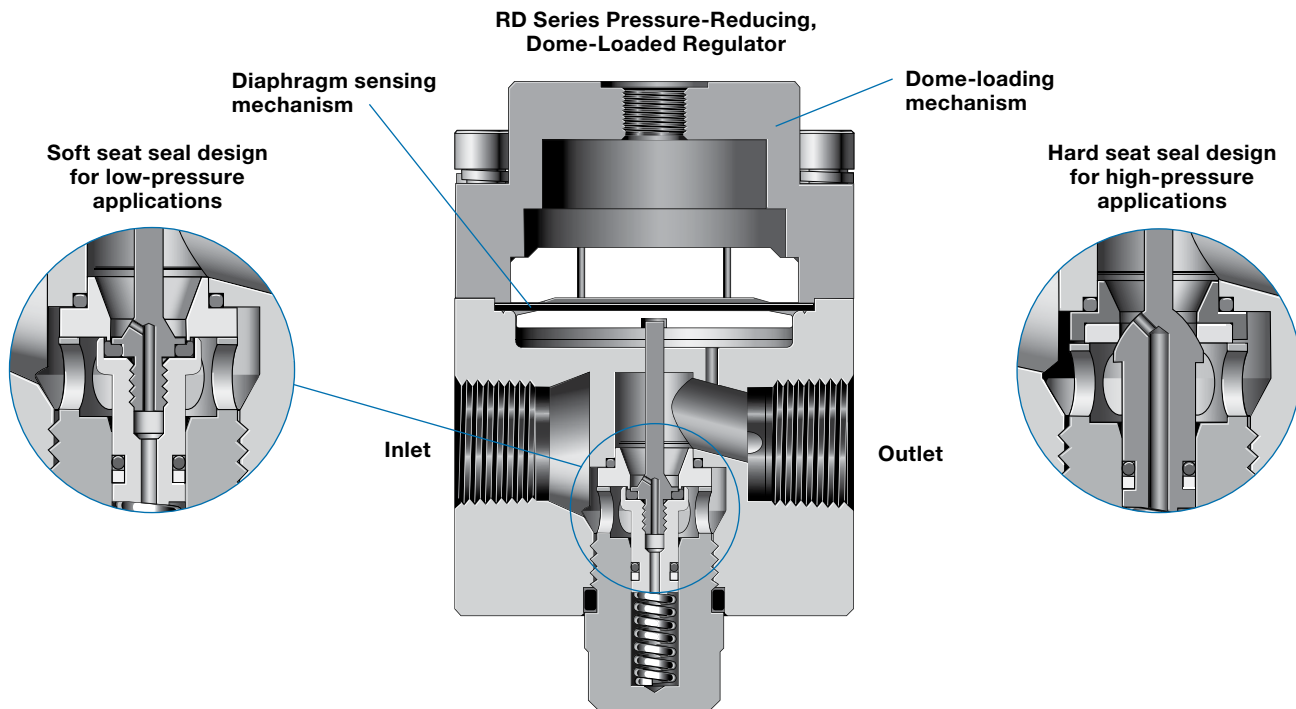
Seat Material	PCTFE	PEEK	Fluorocarbon FKM, Nitrile, EPDM, FFKM
Temperature °F (°C)	Maximum Inlet Pressure / Working Pressure psig (bar)		
-49 to -40 (-45 to -40)	—	—	1015 (70.0)
-40 to 95 (-40 to 35)	5 800 (400)	5 800 (400)	
149 (65)	3987 (275)		
176 (80)	1812 (125)		

Technical Data—Performance

Series	Maximum Inlet Pressure ^① psig (bar)	Maximum Outlet Control Pressure ^① psig (bar)	Flow Coefficient (C _v)	Sensing Type	Flow Data on Page
RD2	5800 (400)	5800 (400)	0.05	Piston	47
RD6DP	1015 (70.0)	1015 (70.0)	1.95	Diaphragm	—
RDH6DP	5800 (400)	3335 (230)			
RD6	1015 (70.0)	1015 (70.0)	1.95	Diaphragm	51
RDH6	5800 (400)	5800 (400)			
RD8	1015 (70.0)	1015 (70.0)	2.07	Diaphragm	—
RDH8	5800 (400)	5800 (400)			
RD10	1015 (70.0)	1015 (70.0)	3.79	Diaphragm	61
RDH10	5800 (400)	3625 (250)			
RD15	1015 (70.0)	1015 (70.0)	7.30	Diaphragm	66, 70
RDH15	5800 (400)	3625 (250)			
RD20	1015 (70.0)	1015 (70.0)	13	Diaphragm	73, 74
RDH20	5800 (400)	2900 (200)			
RD25	1015 (70.0)	1015 (70.0)	21	Diaphragm	—
RDH25	4060 (280)	2900 (200)			
RD30	1015 (70.0)	1015 (70.0)	36	Diaphragm	—
RDH30	4060 (280)	2900 (200)			
RD40	1015 (70.0)	1015 (70.0)	73	Diaphragm	—
RDH40	4060 (280)	2900 (200)			
LPRD20	232 (16.0)	29 (2.0)	13	Diaphragm	—
LPRD25			21		
LPRD30			36		
LPRD40			73		
RA4	5800 (400)	5800 (400)	1.84	Diaphragm	—
RA6					
RA8					

① Regulator pressure rating may be limited by connection type.

Pressure-Reducing, Dome-Loaded and Air-Loaded Regulators—RD and RA Series



Technical Data—Design

Series	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge Connection	Dome Connection	Weight (Without Flanges) lb (kg)	More Information on Page
RD2	0.087 (2.2)	1/4 in. NPT	1/4 in. NPT	1/8 in. NPT	3.1 (1.4)	46
RD6DP RDH6DP	0.39 (10.0)	3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	1/4 in. NPT	10.6 (4.8)	55
RD6 RDH6	0.39 (10.0)	3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	1/4 in. ISO/BSP parallel thread	8.8 (4.0)	50
RD8 RDH8	0.39 (10.0)	1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	1/4 in. ISO/BSP parallel thread	8.8 (4.0)	50
RD10 RDH10	0.55 (14.0) 0.53 (13.5)	1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT or ISO/BSP parallel thread	1/4 in. ISO/BSP parallel thread	17.6 (6.0)	59
RD15 RDH15	0.75 (19.0)	1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT or ISO/BSP parallel thread	1/4 in. ISO/BSP parallel thread	19.8 (9.0)	59
RD20 RDH20	0.98 (25.0)	2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	Use P1 gauge connections on pilot regulator	1/4 in. ISO/BSP parallel thread	44.0 (20)	72
RD25 RDH25	1.25 (32.0)	2 1/2 in. EN or ASME flanges	Use P1 gauge connections on pilot regulator	1/4 in. ISO/BSP parallel thread	88.0 (40)	72
RD30 RDH30	1.65 (42.0)	3 in. EN or ASME flanges	Use P1 gauge connections on pilot regulator	1/4 in. ISO/BSP parallel thread	136 (62)	84
RD40 RDH40	2.36 (60.0)	4 in. EN or ASME flanges	Use P1 gauge connections on pilot regulator	1/4 in. ISO/BSP parallel thread	183 (83)	84
LPRD20	0.98 (25.0)	2 in. EN or ASME flanges	Inlet and outlet gauges included	1/4 in. ISO/BSP parallel thread	Varies with model and end connection	99
LPRD25	1.25 (32.0)	2 1/2 in. EN or ASME flanges				99
LPRD30	1.65 (42.0)	3 in. EN or ASME flanges				99
LPRD40	2.36 (60.0)	4 in. EN or ASME flanges				99
RA4	0.39 (10.0)	1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	1/4 in. ISO/BSP parallel thread	12.5 (5.7)	101
RA6		3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges			13.6 (6.2)	
RA8		1 in. ISO/BSP parallel thread, EN or ASME flanges			13.6 (6.2)	

Compact, General-Purpose Dome-Loaded Pressure-Reducing Regulators—RD2 Series

Features

- Piston sensing
- Integral 25 µm filter
- Cartridge poppet assembly for ease of service
- Bottom mounting

Options

- No filter—for liquid applications
- NACE MR0175/ISO 15156-compliant models (nonventing and no-filter models only)
- Special cleaning to ASTM G93 Level C
- Panel mounting kit sold separately—no disassembly required

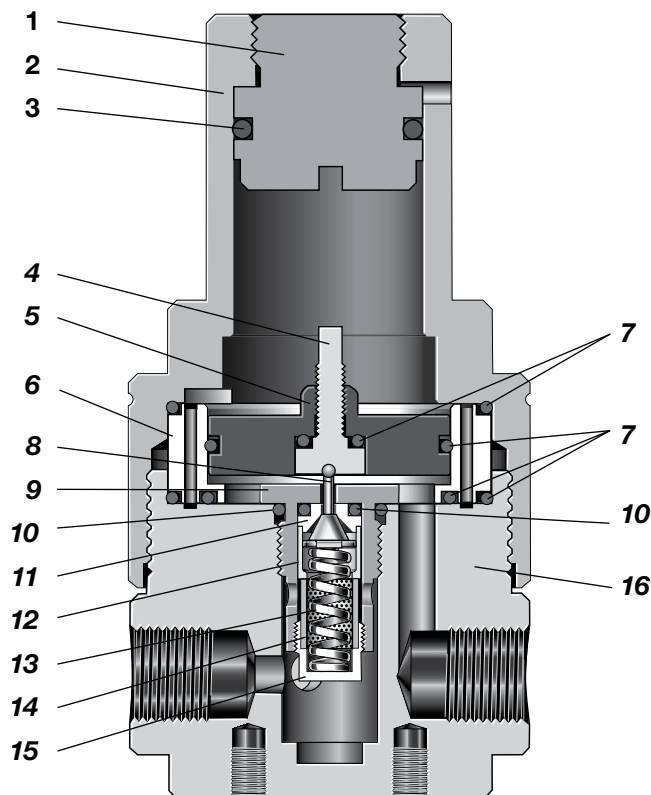


Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Dome Connection	Weight lb (kg)
RD2	5800 (400)	5800 (400)	Piston	-40 to 95 (-40 to 35) See Pressure-Temperature Ratings , page 921.	0.05	0.087 (2.2)	1/4 in. NPT	Gauge: 1/4 in. NPT Dome: 1/8 in. NPT	3.1 (1.4)

See page 47 to 48 for flow data.

Materials of Construction



Component	Material / Specification
1 Dome plug	316L SS / A479
2 Dome	
3 Dome plug O-ring	FKM, EPDM, nitrile, or FFKM
4 Non-relieving plug	316L SS / A479
5 Piston	
6 Piston plate	FKM, EPDM, nitrile, or FFKM
7 Piston O-rings	
8 Poppet	431 SS / A276
9 Poppet housing	316L SS / A479
10 O-rings	FKM, EPDM, nitrile, or FFKM
11 Seat	PEEK or PCFTE
12 Seat retainer	316L SS / A479
13 Poppet spring	302 SS / A313
14 Filter	316L SS
15 Plug	316L SS / A479
16 Body	

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

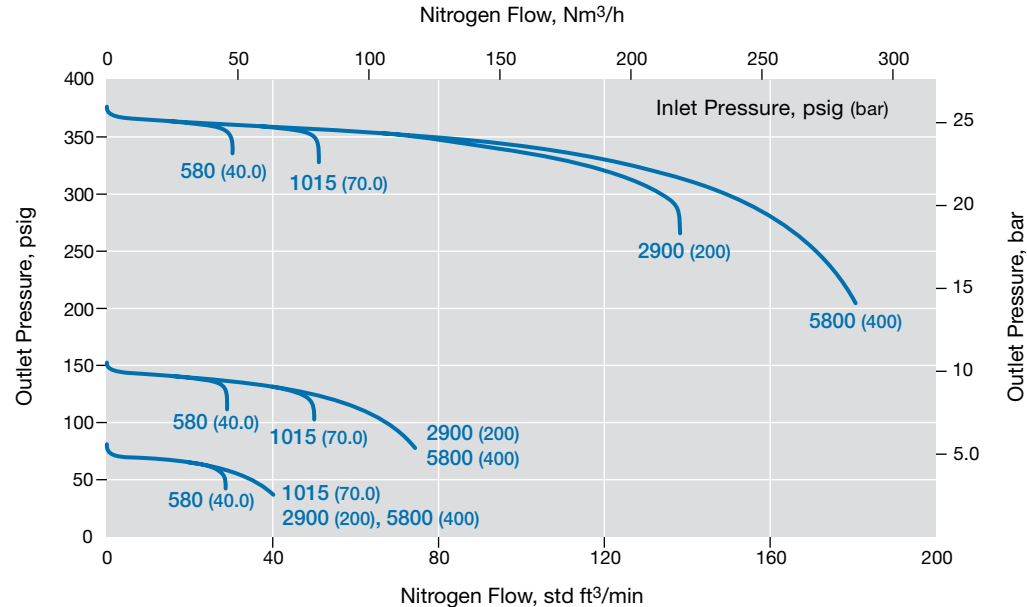
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD2 Series

Flow Coefficient: 0.05
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

Pressure Control Range

0 to 5800 psig (0 to 400 bar)

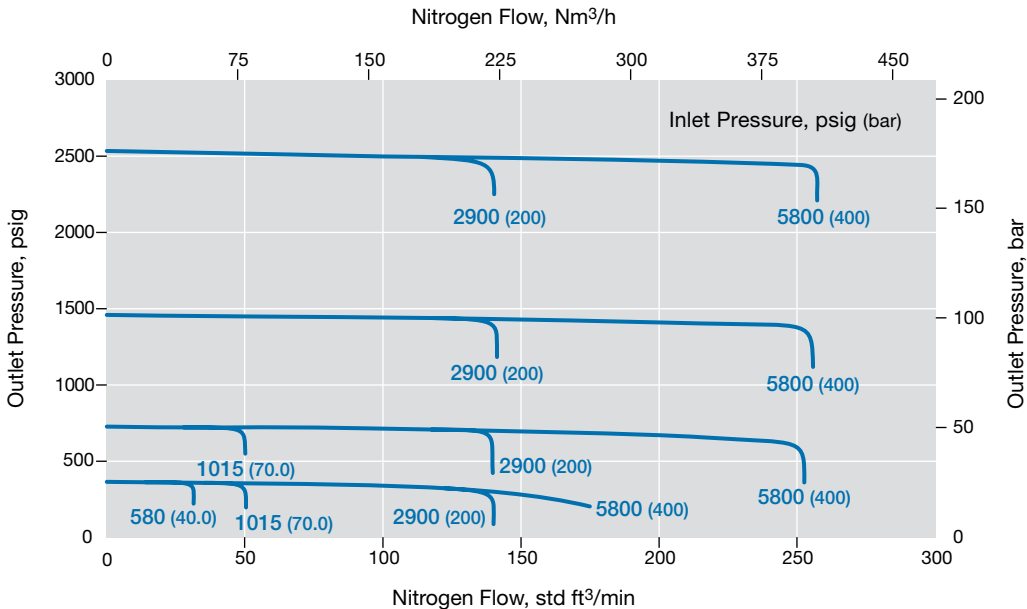


RD2 Series

Flow Coefficient: 0.05
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

Pressure Control Range

0 to 5800 psig (0 to 400 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD2 Series

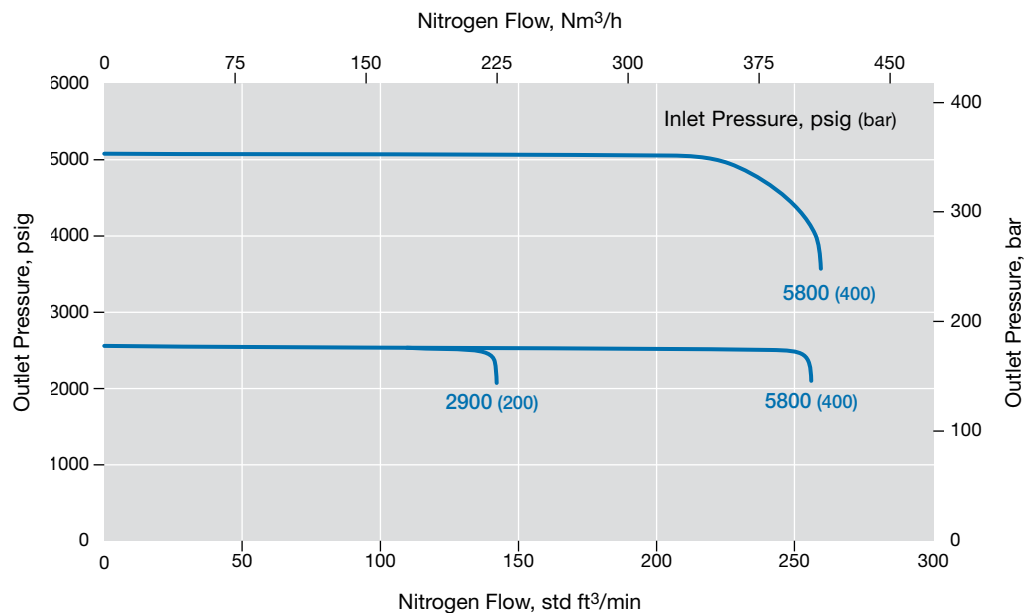
Flow Coefficient: 0.05

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 5800 psig (0 to 400 bar)

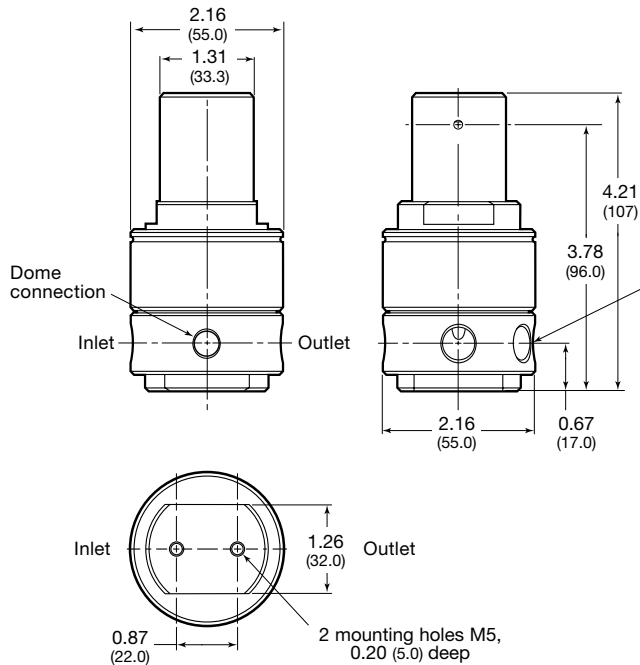
Pressure Control Range

— 0 to 5800 psig (0 to 400 bar)

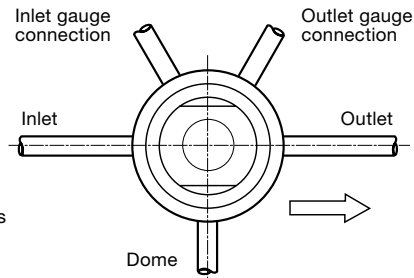


Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.



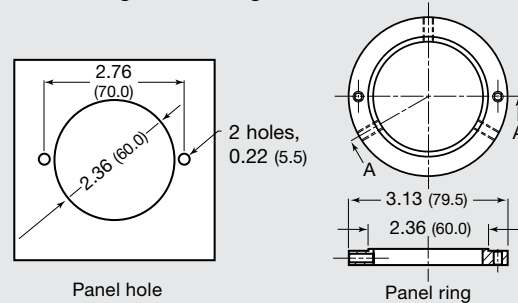
Configuration
Top



Shown with tubing for clarity; tubing not included.

Panel Mounting Kit

No disassembly required when using panel mount kit.
Panel mounting kit ordering number: **RS2-P-02**



Ordering Information

Build an RD2 series regulator ordering number by combining the designators in the sequence shown below.

1 **RD** **2** **N2** **3** **- 02** **4** **- V** **5** **V** **6** **K** **7** **- L**

1 Series

RD = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

N2 = 1/4 in. female NPT

3 Body Material

02 = 316L SS

4 Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

F = FFKM

L = Low temperature Nitrile

5 Piston Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

F = FFKM

L = Low temperature Nitrile

6 Seat Material

K = PCTFE

P = PEEK

7 Options

L = No filter

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

General-Purpose, Dome-Loaded Pressure-Reducing Regulators—RD(H)6 and RD(H)8 Series

Features

- Balanced poppet design
- Diaphragm sensing
- Dome-to-outlet pressure ratio approximately 1:1

Options

- Antitamper
- Pilot regulator (not shown)
- Gauge connections—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

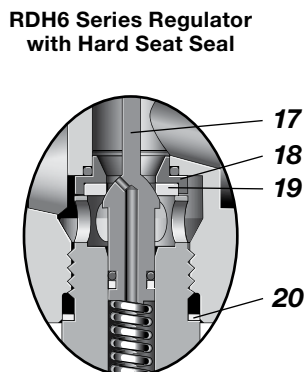
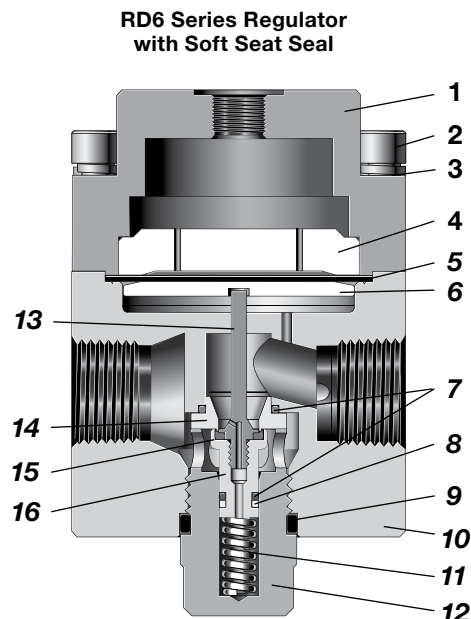


Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Dome Connection	Weight (Without Flanges) lb (kg)
RD6 RDH6	RD: 1015 (70.0)	RD: 1015 (70.0)	Diaphragm	-49 to 176 (-45 to 80) See Pressure-Temperature Ratings , page 921.	1.95	0.39 (10.0)	3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flange	Gauge: 1/4 in. NPT; Dome: 1/4 in. ISO/BSP parallel thread	8.8 (4.0)
RD8 RDH8	RDH: 5800 (400)	RDH: 5800 (400) (2537 [175] with pilot regulator)			2.07		1 in. NPT, ISO/BSP parallel thread, EN or ASME flange		

See page 51 to 53 for flow data.

Materials of Construction



Component	Material / Specification
1 Dome	316L SS / A479
2 Cap screw	A4-80
3 Washer	A4
4 Dome plate	316L SS / A479
5 Diaphragm	EPDM, FKM, or nitrile
6 Diaphragm plate	316L SS / A479
7 O-ring	EPDM, FKM, or nitrile
8 Backup ring	PTFE
9 Plug O-ring	EPDM, FKM, or nitrile
10 Body	316L SS / A479
11 Poppet spring	302 SS / A313
12 Body plug	316L SS / A479
RD Series Only Components	
13 Poppet	316L SS / A479
14 Seat	
15 Seat seal	EPDM, FKM, or nitrile
16 Poppet housing	316L SS / A479
RDH Series Only Components	
17 Poppet	S17400 or 431 SS / A276
18 Seat	316L SS / A479
19 Seat seal	PCTFE or PEEK
20 Backup ring	PTFE
Wetted lubricants: Silicone-based and synthetic hydrocarbon-based	

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

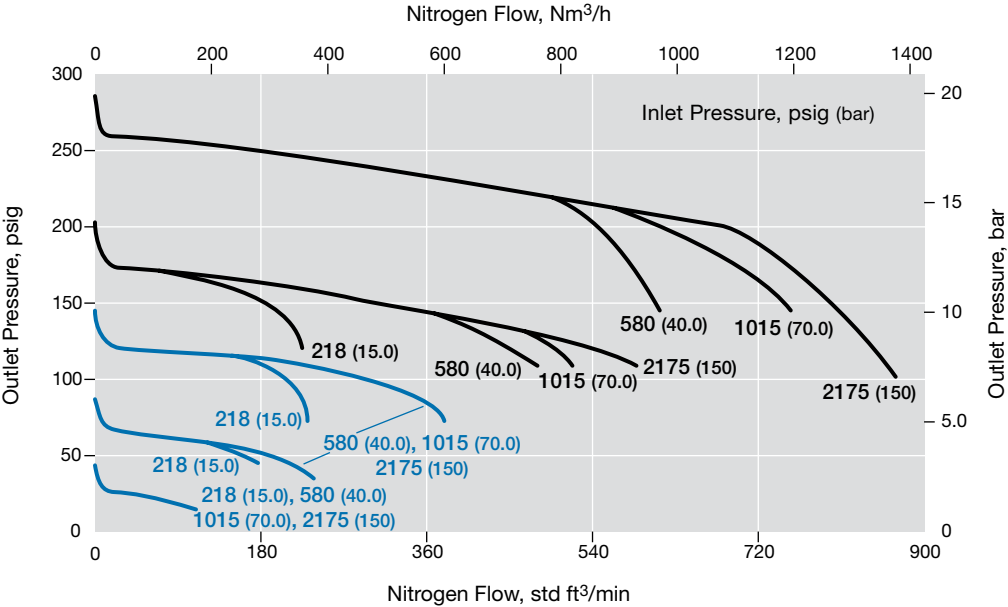
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH6 Series

Flow Coefficient: 1.95
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range

- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

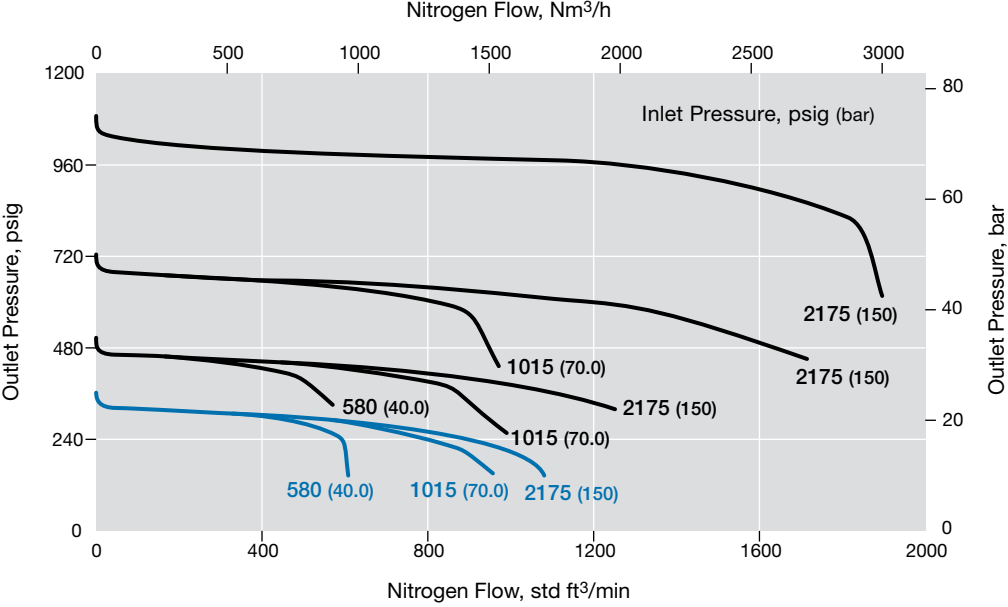


RDH6 Series

Flow Coefficient: 1.95
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

- 0 to 1450 psig (0 to 100 bar)
- 0 to 362 psig (0 to 25.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH6 Series

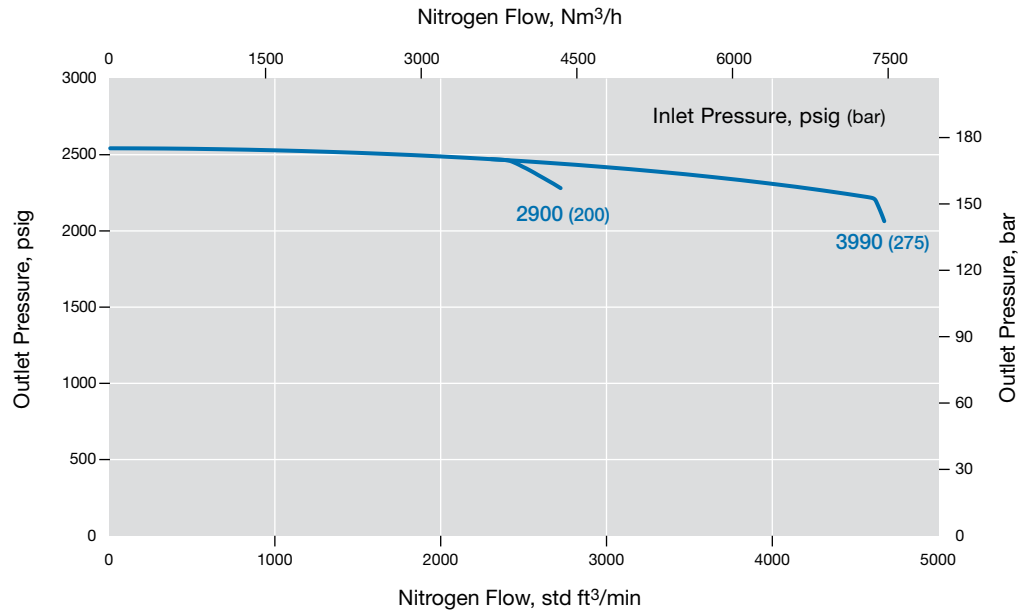
Flow Coefficient: 1.95

Maximum Inlet Pressure: 3990 psig (275 bar)

Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)

Pressure Control Range

— 0 to 2537 psig (0 to 175 bar)



RD8 Series

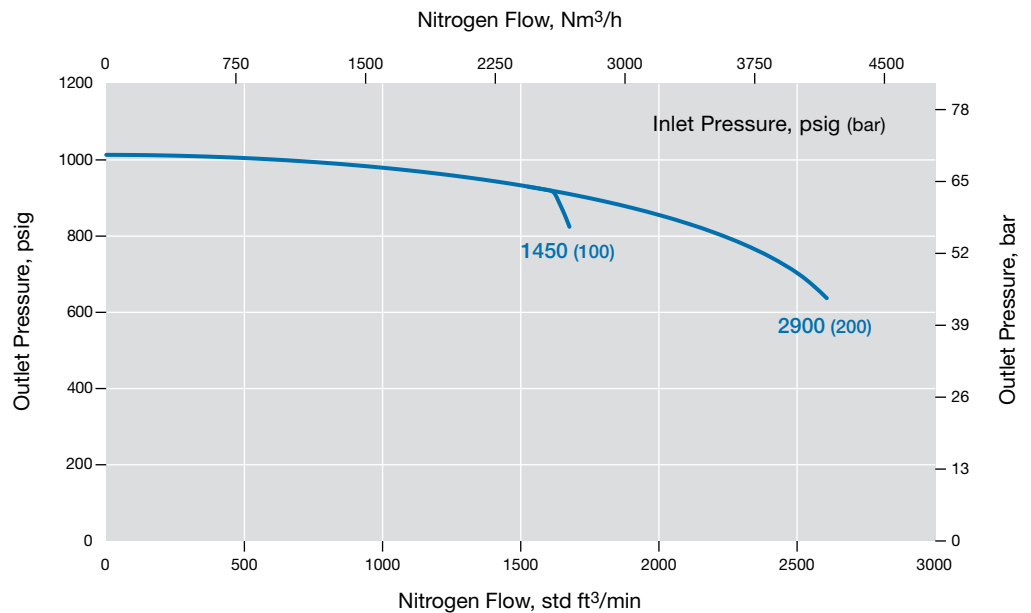
Flow Coefficient: 2.07

Maximum Inlet Pressure: 2900 psig (200 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)



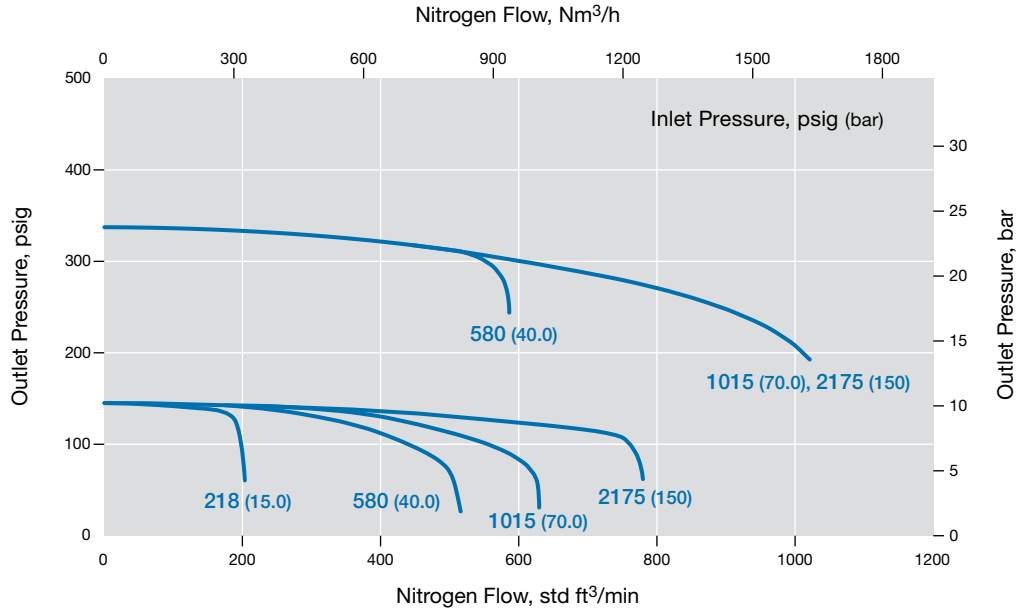
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH8 Series

Flow Coefficient: 2.07
Maximum Inlet Pressure: 2175 psig (150 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

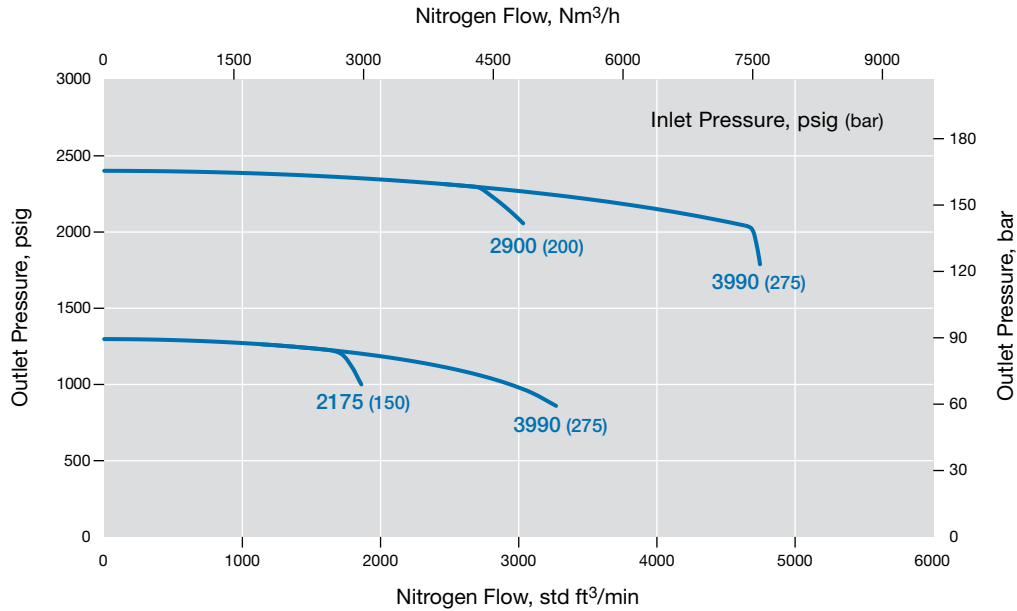
Pressure Control Range
0 to 362 psig (0 to 25.0 bar)



RDH8 Series

Flow Coefficient: 2.07
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)

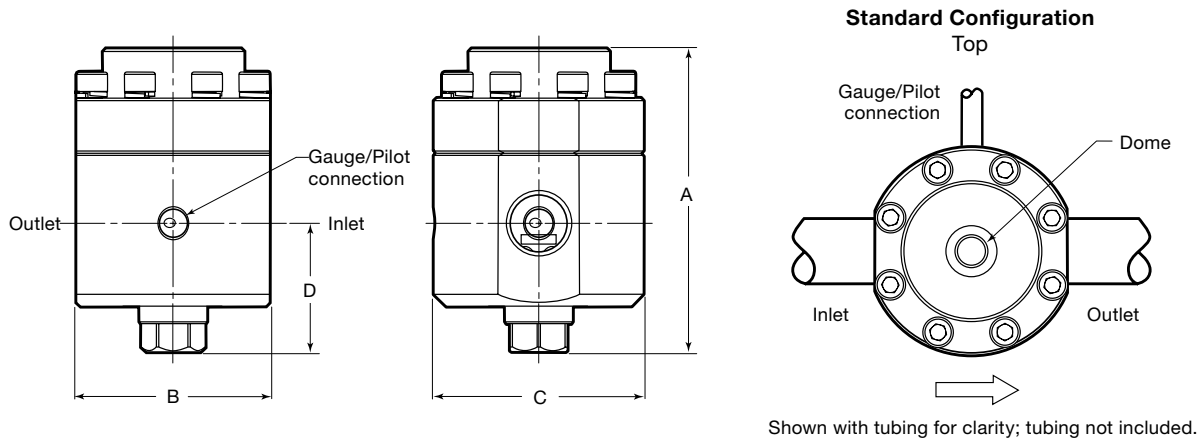
Pressure Control Range
0 to 2537 psig (0 to 175 bar)



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)			
		A	B	C	D
RD(H)6	3/4 in.	5.12 (130)	3.22 (82.0)	3.50 (89.0)	2.16 (55.0)
RD(H)8	1 in.		3.07 (78.0)		



Ordering Information

Build an RD(H)6 and RD(H)8 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RD FA 6 A 1 - 02 - X - V V V - GN2

1 Series

RD = 1015 psig (70.0 bar) maximum inlet pressure
RDH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size

6 = 3/4 in. / DN20
8 = 1 in. / DN25

4 Pressure Class

Omit designator if flanges are not ordered.

A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.

1 = Raised face smooth
3 = RTJ

6 Body Material

02 = 316L SS

7 Pressure Control Range

X = No pilot regulator, standard

RD series with RS2 series pilot regulator

3 = 0 to 1015 psig (0 to 70.0 bar)

RDH series with RS2 series pilot regulator

4 = 0 to 145 psig (0 to 10.0 bar)

5 = 0 to 362 psig (0 to 25.0 bar)

6 = 0 to 1450 psig (0 to 100 bar)

7 = 0 to 2537 psig (0 to 175 bar)

For higher pressure control ranges with a pilot regulator, contact your authorized Swagelok representative for information.

8 Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm / Piston O-Rings

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material

RD series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

RDH series

K = PCTFE

P = PEEK

11 Options

A = Antitamper

GN2 = Gauge connection, see below

GN4 = Gauge connection, see below

GN5 = Gauge connection, see below

None = Standard connection, see below

Gauge Connection Configuration			
Standard	GN2	GN4	GN5

Standard (GN1) and GN4 only available with no pilot.

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

Differential Pressure, Dome-Loaded Pressure Reducing Regulators—RD(H)6DP Series

Features

- Balanced poppet design
- Diaphragm sensing
- Adjustable bias
- Dome-to-outlet pressure ratio approximately 1:1
- Antitamper and anti-blowout stem

Options

- Gauge connection—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

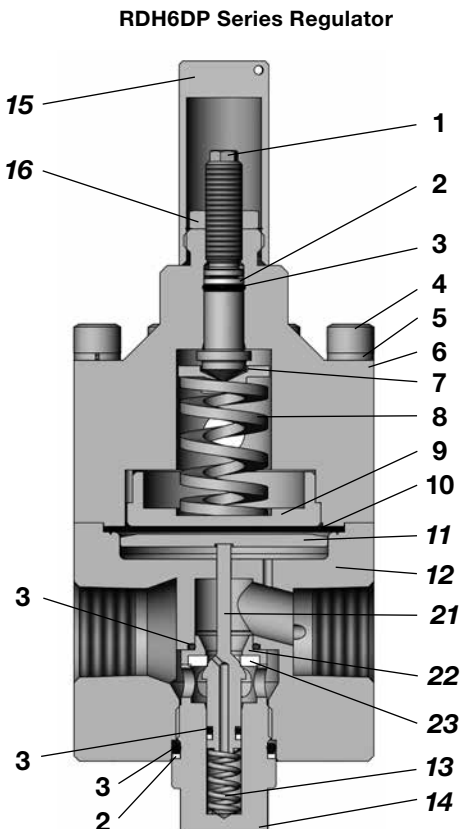


Technical Data

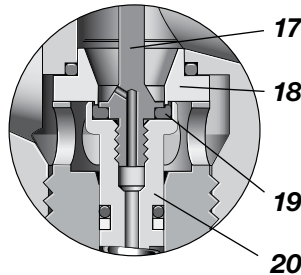
Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Bias Range psig (bar)	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Dome Connection	Weight (Without Flanges) lb (kg)
RD6DP	1015 (70.0)	1015 (70.0)	Diaphragm	14.5 to 145 (1.0 to 10.0)	-49 to 176 (-45 to 80) See Pressure-Temperature Ratings , page 921.	1.95	0.39 (10.0)	3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flange	Gauge: 1/4 in. NPT; Dome: 1/4 in. NPT	11.2 (5.1)
RDH6DP	5800 (400)	3335 (230)								

See page 56 to 57 for flow data.

Materials of Construction



Soft seat seal design for low-pressure applications



Component	Material / Specification
1 Adjustment screw	316L SS / A479
2 Backup ring	PTFE
3 O-ring	EPDM, FKM, nitrile
4 Cap screw	A4-80
5 Washer	A4
6 Dome	316L SS / A479
7 Upper spring guide	316L SS / A479
8 Differential spring	50CRV4
9 Lower spring guide	316L SS / A479
10 Diaphragm	EPDM, FKM, or nitrile
11 Diaphragm plate	316L SS / A479
12 Body	
13 Poppet spring	302 SS / A313
14 Body plug	316L SS / A479
15 Antitamper cover	316L SS / A479
16 Lock Nut	A4-80
RD Series Only Components	
17 Poppet	316L SS / A479
18 Seat	
19 Seat seal	EPDM, FKM, or nitrile
20 Poppet housing	316L SS / A479
RDH Series Only Components	
21 Poppet	S17400 / A276 or 431 SS
22 Seat	316L SS / A479
23 Seat seal	PCTFE or PEEK
Wetted lubricants: Silicone-based and synthetic hydrocarbon-based	

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Lockwire and lead seal for anti-tamper (not shown): 304 LEAD

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD6DP Series

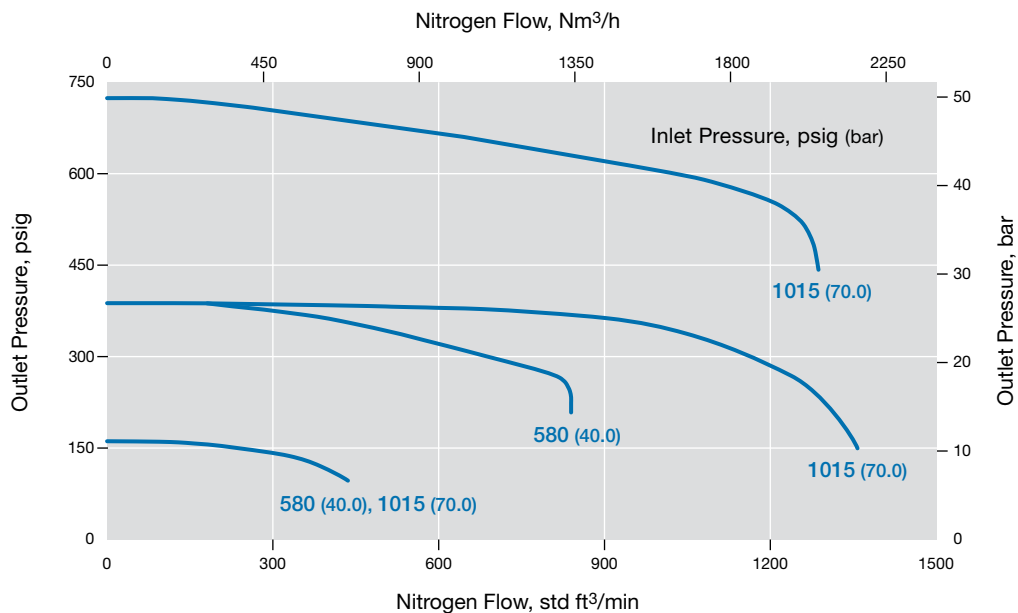
Flow Coefficient: 1.95

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)
All curves 29 psig (2.0 bar) bias



RD6DP Series

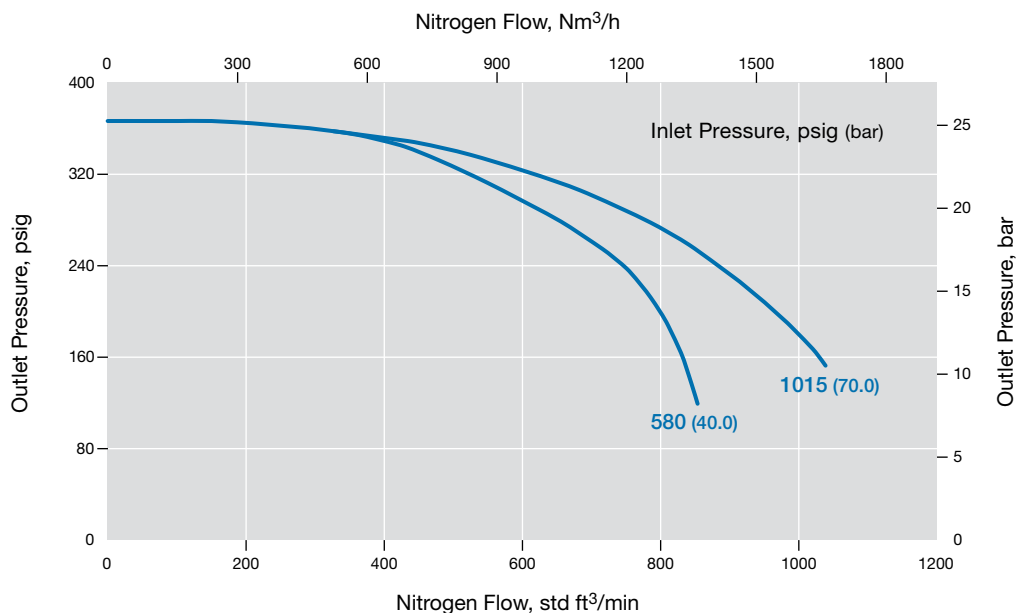
Flow Coefficient: 1.95

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)
All curves 116 psig (8.0 bar) bias



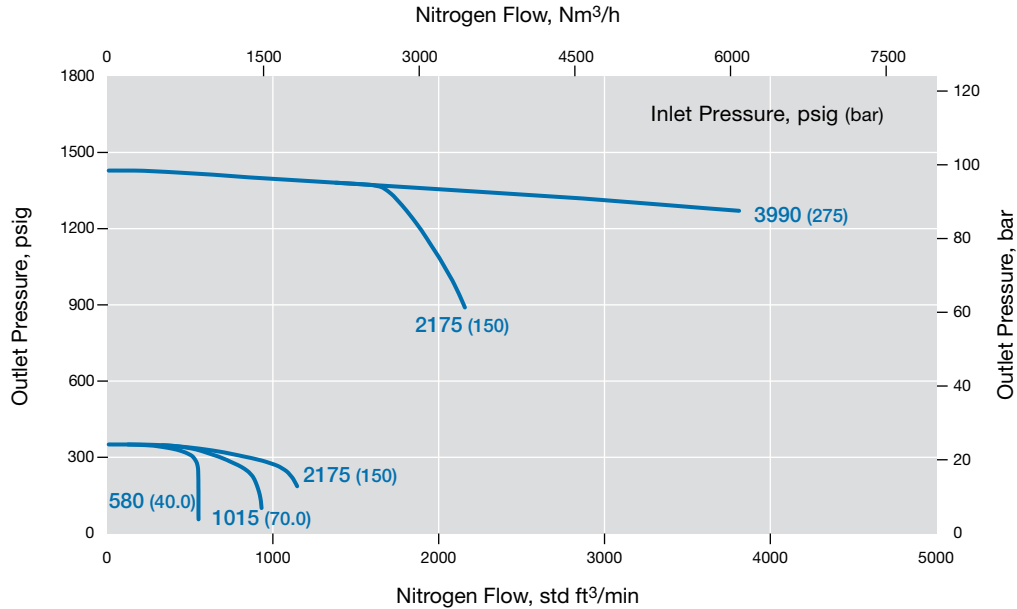
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH6DP Series

Flow Coefficient: 1.95
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 3335 psig (0 to 230 bar)

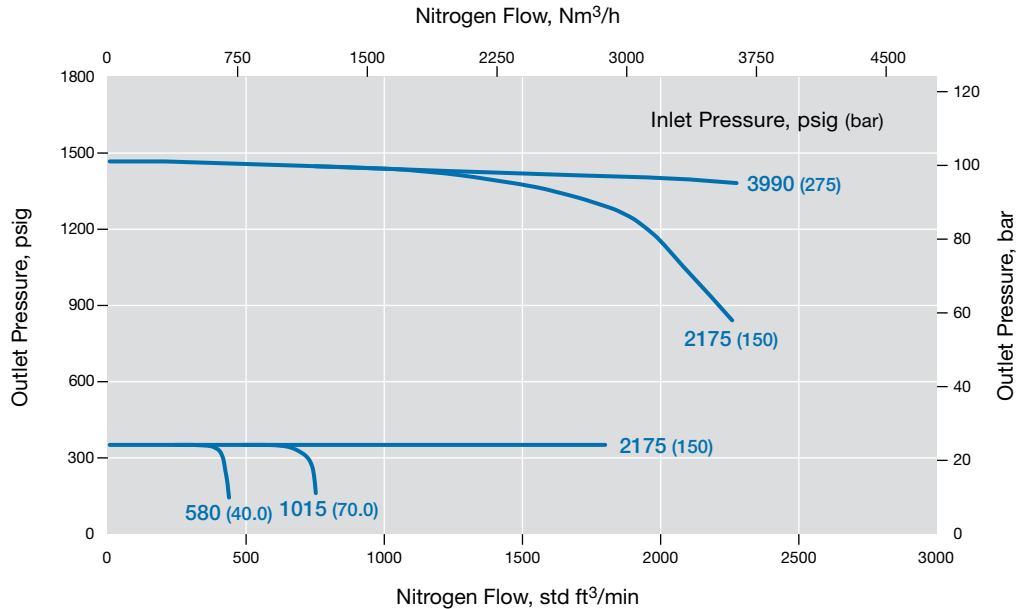
Pressure Control Range
0 to 3335 psig (0 to 230 bar)
All curves 29 psig (2.0 bar) bias



RDH6DP Series

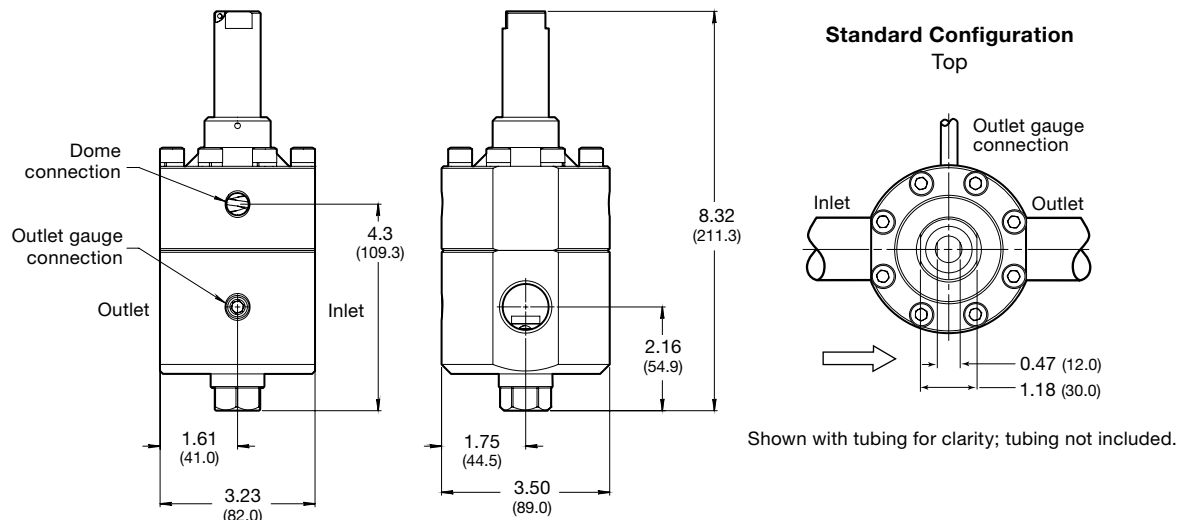
Flow Coefficient: 1.95
Maximum Inlet Pressure: 3990 psig (275 bar)
Outlet Pressure Control Range: 0 to 3335 psig (0 to 230 bar)

Pressure Control Range
0 to 3335 psig (0 to 230 bar)
All curves 116 psig (8.0 bar) bias



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.



Ordering Information

Build an RD(H)6DP series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RD FA 6 A 1 - 02 - V V V DP2 - GN2

1 Series

RD = 1015 psig (70.0 bar) maximum inlet pressure

RDH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread

N = Female NPT

FA = ASME B16.5 flange

FD = EN 1092 (DIN) flange

3 Size

6 = 3/4 in. / DN20

8 = 1 in. / DN25

4 Pressure Class

Omit designator if flanges are not ordered.

A = ASME class 150

B = ASME class 300

C = ASME class 600

E = ASME class 1500

F = ASME class 2500

M = EN class PN16

N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.

1 = Raised face smooth

3 = RTJ

6 Body Material

02 = 316L SS

7 Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

8 Diaphragm Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

9 Seat Seal Material

RD series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

RDH series

K = PCTFE

P = PEEK

10 Differential Pressure

DP2 = 0 to 43 psig
(0 to 3.0 bar) bias

DP3 = 0 to 145 psig
(0 to 10.0 bar) bias

11 Options

GN2 = Gauge connection, see below

GN4 = Gauge connection, see below

GN5 = Gauge connection, see below

None = Standard connection, see below

Gauge Connection Configuration			
Standard	GN2	GN4	GN5

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)10 and RD(H)15 Series

Features

- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation
- Dome-to-outlet pressure ratio approximately 1:1
- Large dome for improved stability
- Pilot regulator for improved performance

Options

- External feedback (EF) for improved performance
 - EF to main regulator limited by standard outlet pressure range
 - EF to pilot regulator limited to 290 psig (20.0 bar)
- Gauge connections
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections		Gauge / Dome Connection	Weight (Without Flanges and PR) lb (kg)
							Size	Type		
RD10 RDH10	RD: 1015 (70.0) (507 [35.0] with LRS4 pilot regulator)	RD: 1015 (70.0) RDH: 3625 (250)	Diaphragm	-49 to 176 (-45 to 80) See Pressure-Temperature Ratings , page 921.	3.79	0.55 (14.0) 0.53 (13.5)	1 in.	NPT, ISO/BSP parallel thread, EN or ASME flange	Gauge / pilot: 1/4 in. NPT or ISO/BSP parallel thread ^①	17.6 (8.0)
RD15 RDH15	RDH: 5800 (400)				7.30	0.75 (19.0)	1 1/2 in.		Dome: 1/4 in. ISO/BSP parallel thread	19.8 (9.0)

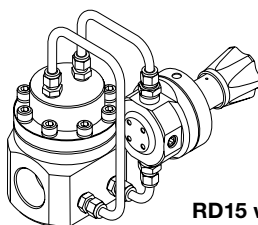
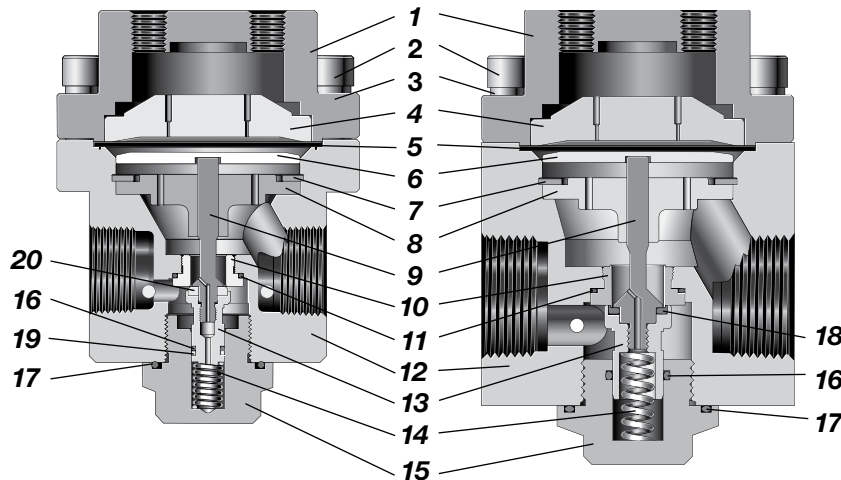
See pages 60 to 70 for flow data.

① Regulators with NPT inlet / outlet connections have 1/4 in. NPT gauge connections.

Materials of Construction

RDH10 Series Regulator
with Hard Seat Seal

RD15 Series Regulator
with Soft Seat Seal



RD15 with LRS4 pilot regulator

Component	Material / Specification
1 Dome	316L SS / A479
2 Cap screw	A4-80
3 Washer	A4
4 Dome plate	316L SS / A479
5 Diaphragm	EPDM, FKM, or nitrile
6 Diaphragm plate	316L SS / A479
7 Retaining ring	Commercial stainless steel
8 Body plate	316L SS / A479
9 Poppet	
10 Seat	
11 O-ring	EPDM, FKM, or nitrile
12 Body	316L SS / A479
13 Poppet housing	
14 Poppet spring	302 SS / A313
15 Body plug	316L SS / A479
16 O-ring	EPDM, FKM, or nitrile
17 Plug O-ring	
RD Series Only Components	
18 Seat seal	EPDM, FKM, or nitrile
RDH Series Only Components	
19 Backup ring (RDH10 only)	PTFE
20 Seat seal	PCTFE or PEEK
Wetted lubricants: Silicone-based and synthetic hydrocarbon-based	

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD10 Series

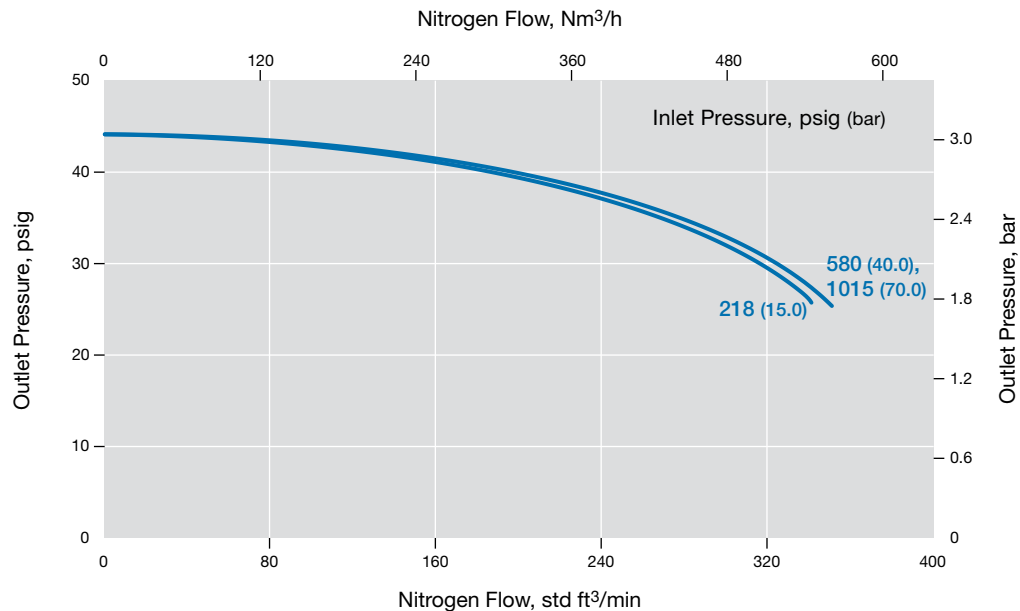
Flow Coefficient: 3.79

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

Pressure Control Range

— 0 to 43 psig (0 to 3.0 bar)



RD10 Series

Flow Coefficient: 3.79

Maximum Inlet Pressure: 1015 psig (70.0 bar)

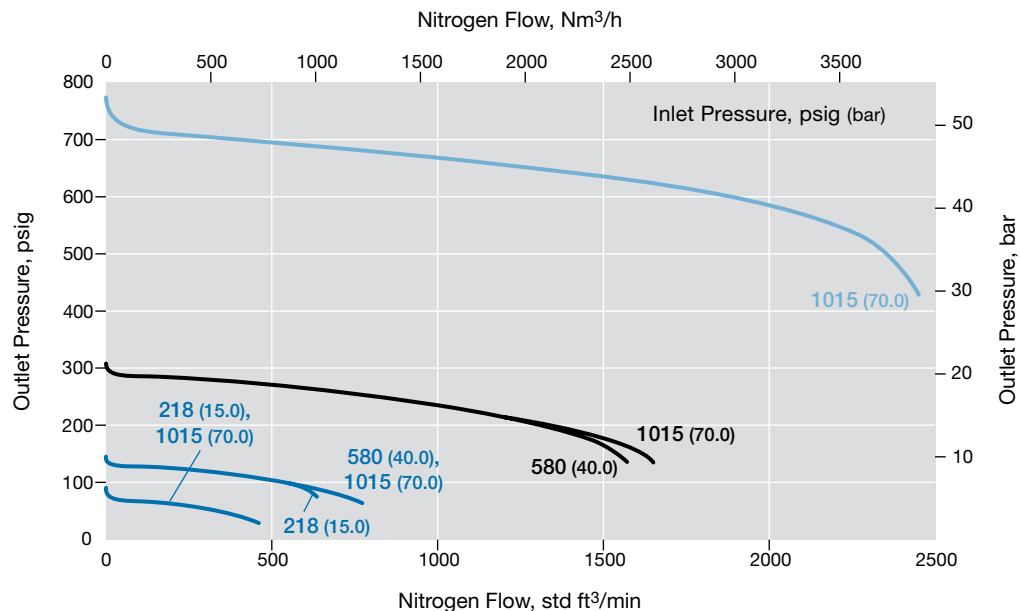
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)

— 0 to 290 psig (0 to 20.0 bar)

— 0 to 130 psig (0 to 9.0 bar)



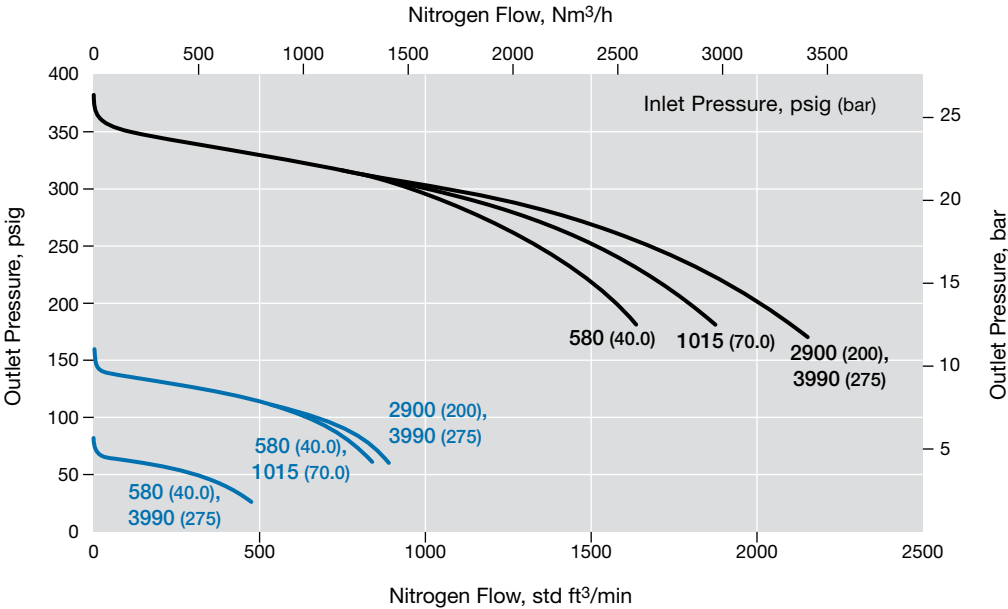
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH10 Series

Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

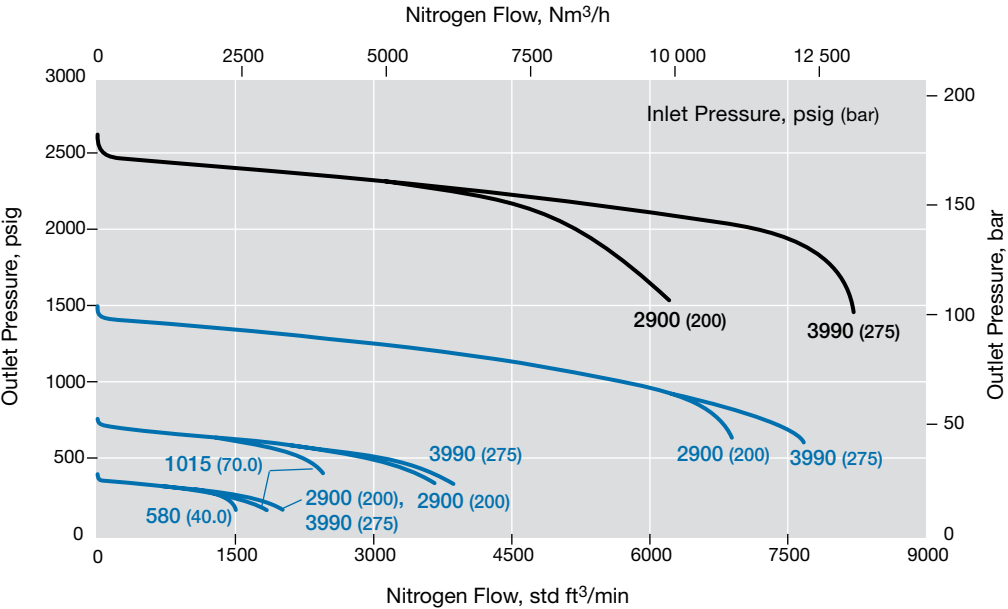
Pressure Control Range
— 0 to 362 psig (0 to 25.0 bar)
— 0 to 145 psig (0 to 10.0 bar)



RDH10 Series

Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)

Pressure Control Range
— 0 to 2537 psig (0 to 175 bar)
— 0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH10 Series

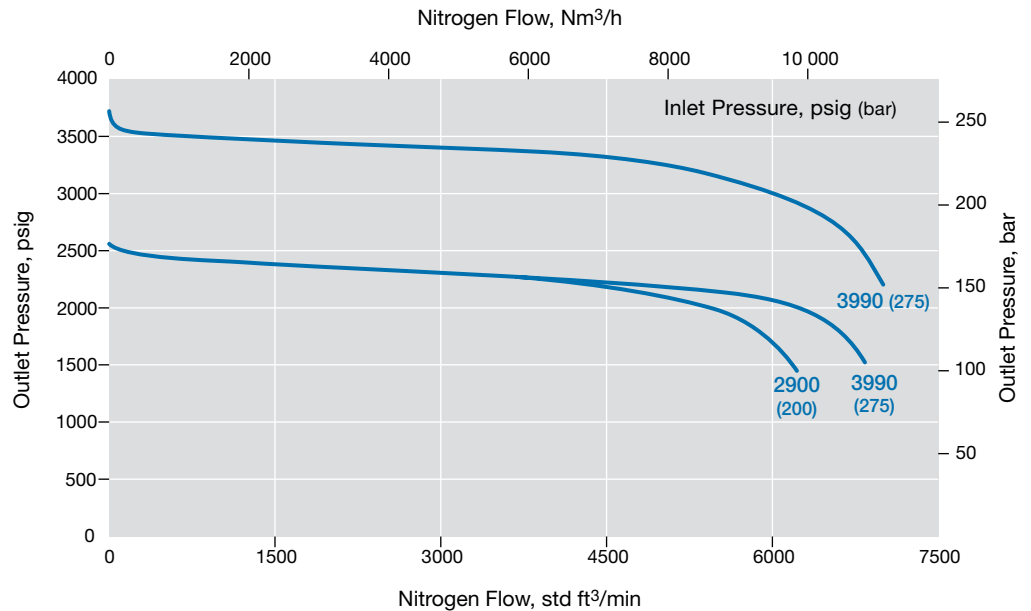
Flow Coefficient: 3.79

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

— 0 to 3625 psig (0 to 250 bar)



RD10-EF Series

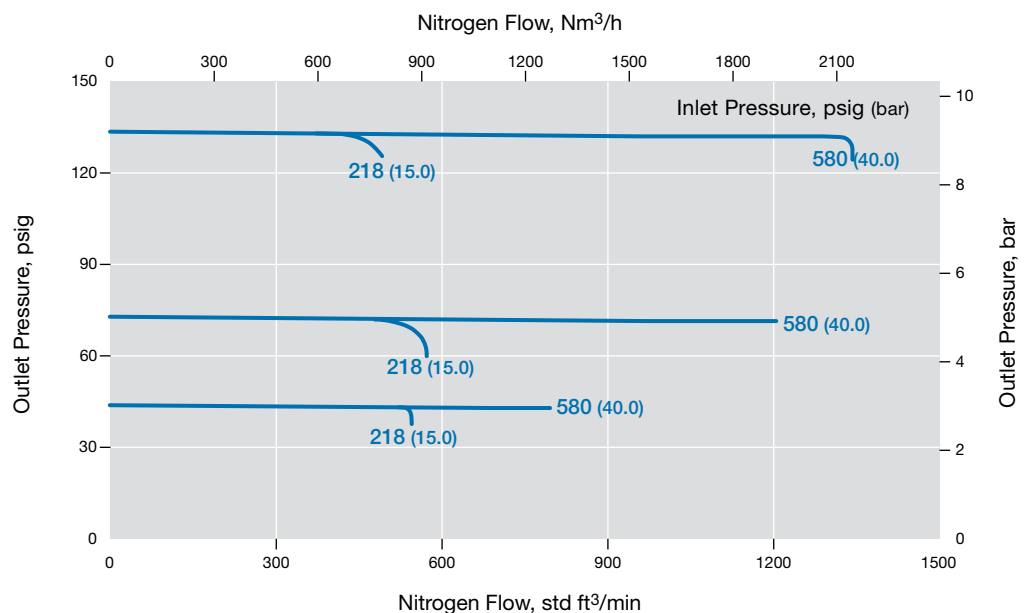
Flow Coefficient: 3.79

Maximum Inlet Pressure: 580 psig (40.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)



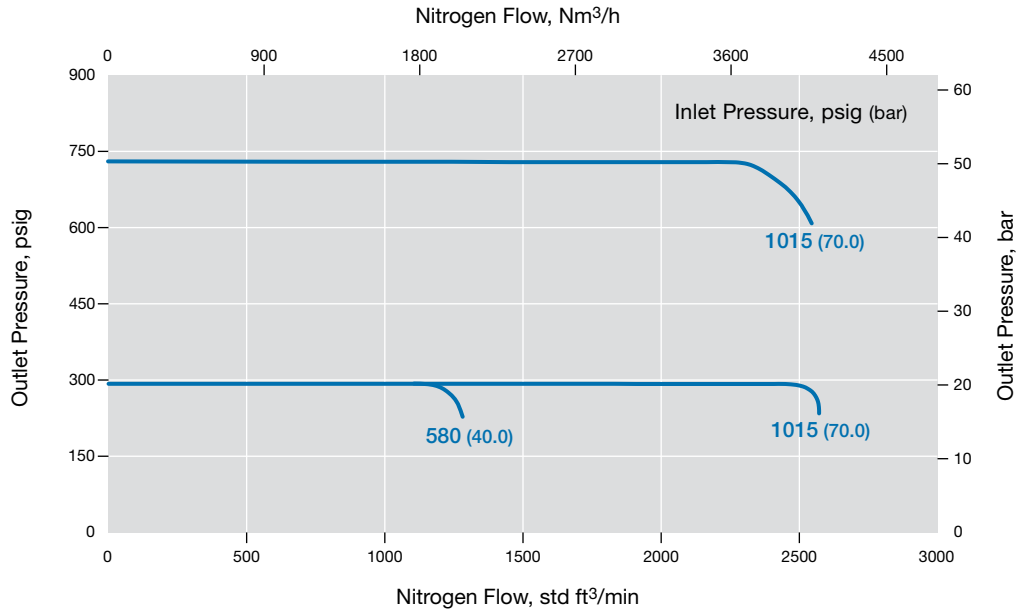
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD10-EF Series

Flow Coefficient: 3.79
Maximum Inlet Pressure: 580 psig (40.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

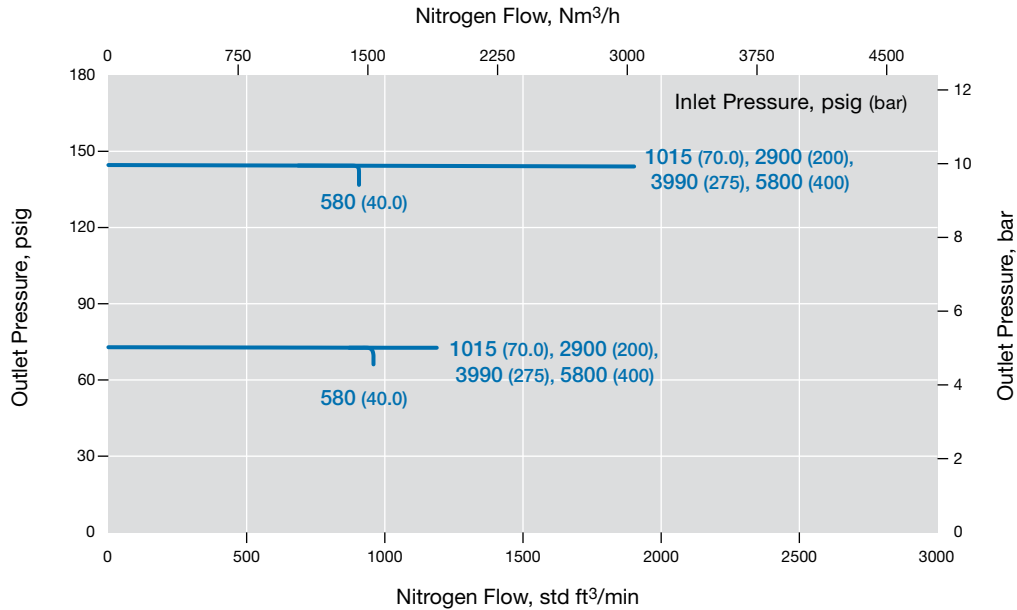
Pressure Control Range
0 to 1015 psig (0 to 70.0 bar)



RDH10-EF Series

Flow Coefficient: 3.79
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 145 psig (0 to 10.0 bar)

Pressure Control Range
0 to 145 psig (0 to 10.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH10-EF Series

Flow Coefficient: 3.79

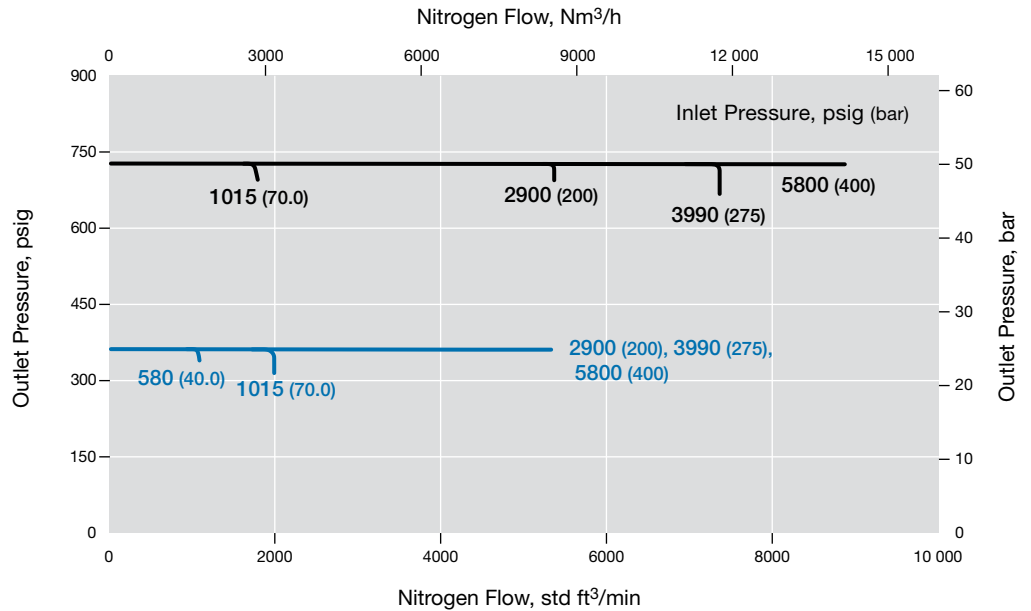
Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

— 0 to 1450 psig (0 to 100 bar)

— 0 to 362 psig (0 to 25.0 bar)



RDH10-EF Series

Flow Coefficient: 3.79

Maximum Inlet Pressure: 5800 psig (400 bar)

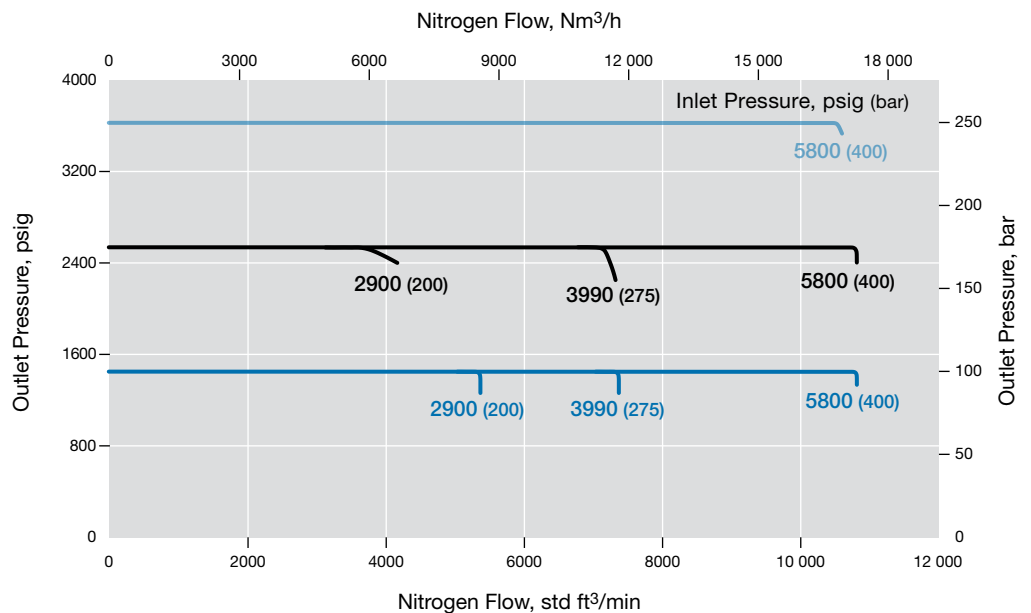
Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

— 0 to 3625 psig (0 to 250 bar)

— 0 to 2537 psig (0 to 175 bar)

— 0 to 1450 psig (0 to 100 bar)



Flow Data

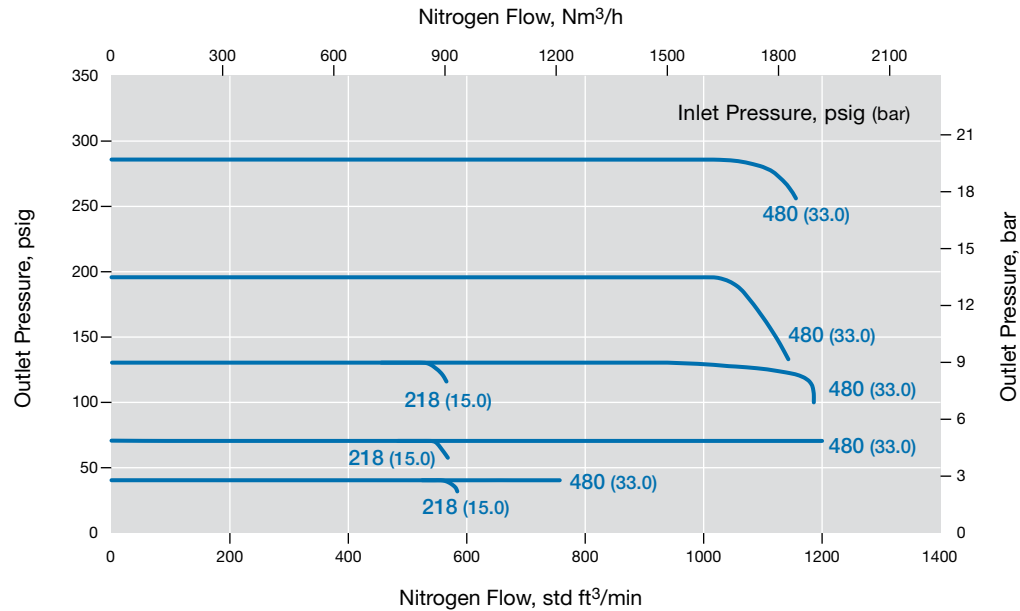
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD10-EFP Series

Flow Coefficient: 3.79
Maximum Inlet Pressure: 218 psig (15.0 bar)
Outlet Pressure Control Range: 0 to 500 psig (0 to 34.5 bar)

Pressure Control Range

0 to 500 psig (0 to 34.5 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD15 Series

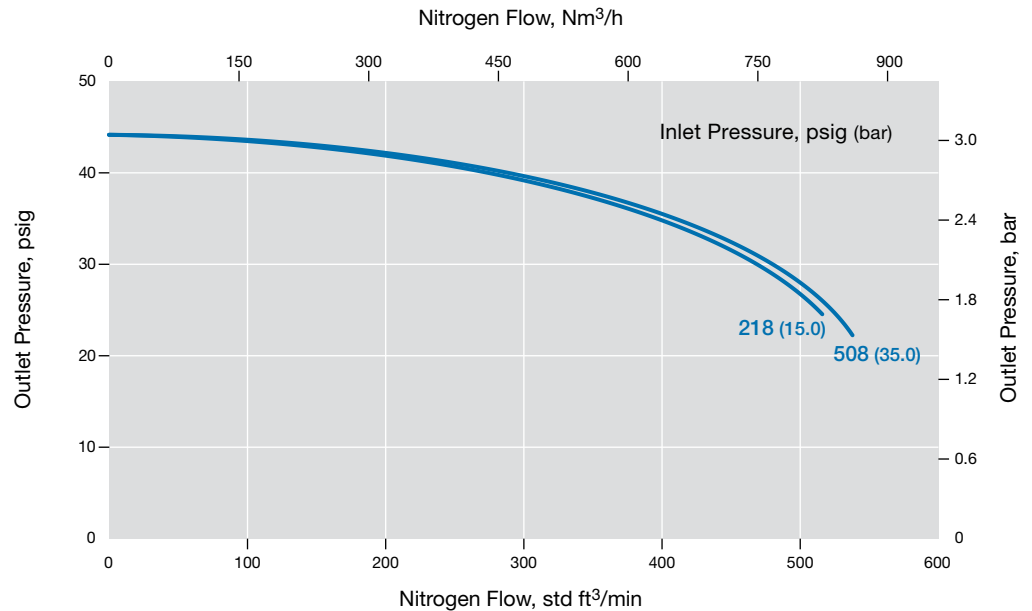
Flow Coefficient: 7.30

Maximum Inlet Pressure: 508 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

Pressure Control Range

— 0 to 43 psig (0 to 3.0 bar)



RD15 Series

Flow Coefficient: 7.30

Maximum Inlet Pressure: 1015 psig (70.0 bar)

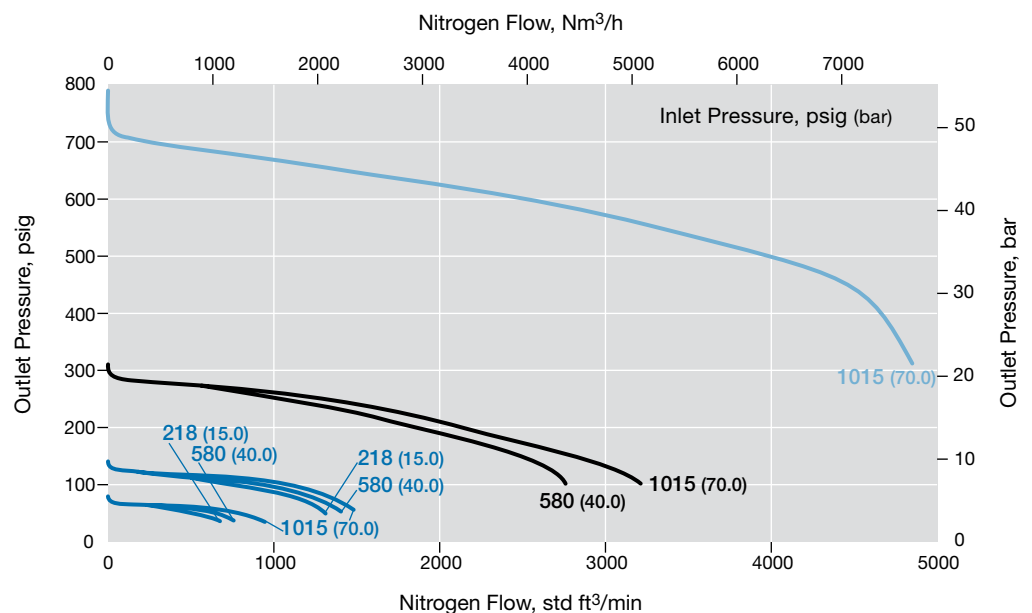
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)

— 0 to 290 psig (0 to 20.0 bar)

— 0 to 130 psig (0 to 9.0 bar)



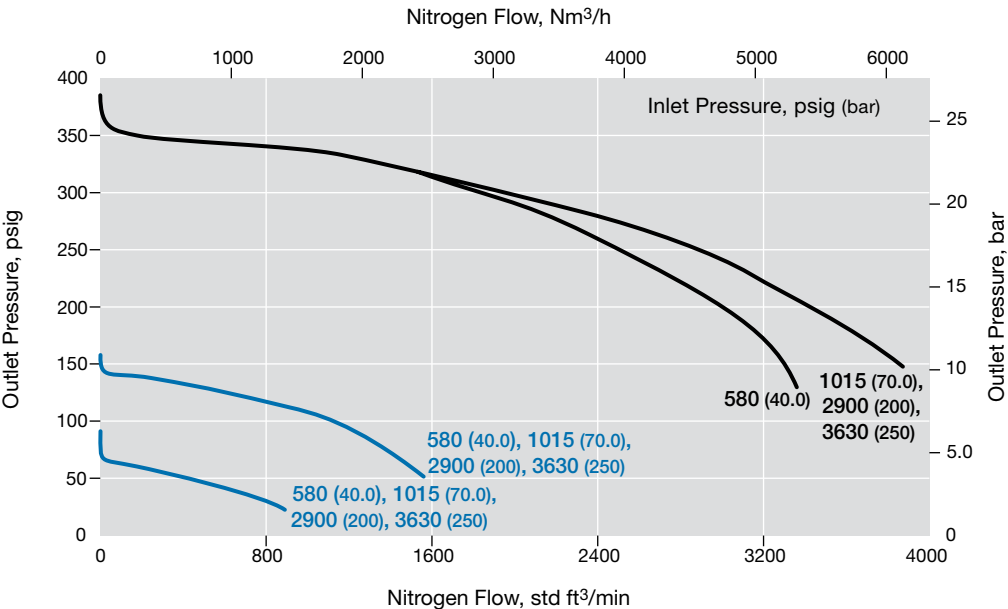
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH15 Series

Flow Coefficient: 7.30
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

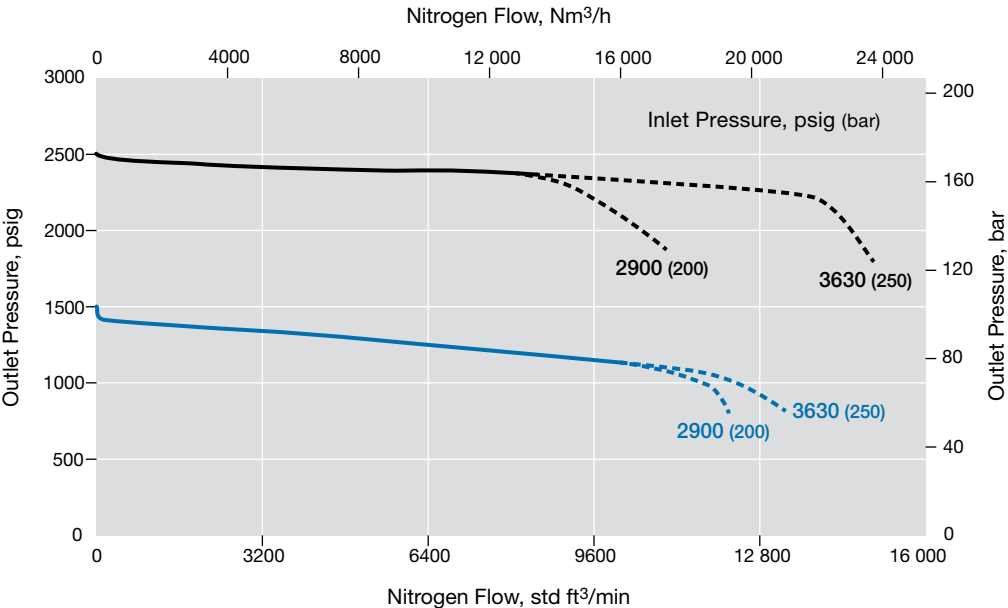
Pressure Control Range
— 0 to 362 psig (0 to 25.0 bar)
— 0 to 145 psig (0 to 10.0 bar)



RDH15 Series

Flow Coefficient: 7.30
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 2537 psig (0 to 175 bar)

Pressure Control Range
— 0 to 2537 psig (0 to 175 bar)
- - - 0 to 2537 psig (0 to 175 bar),
calculated
— 0 to 1450 psig (0 to 100 bar)
- - - 0 to 1450 psig (0 to 100 bar),
calculated



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH15 Series

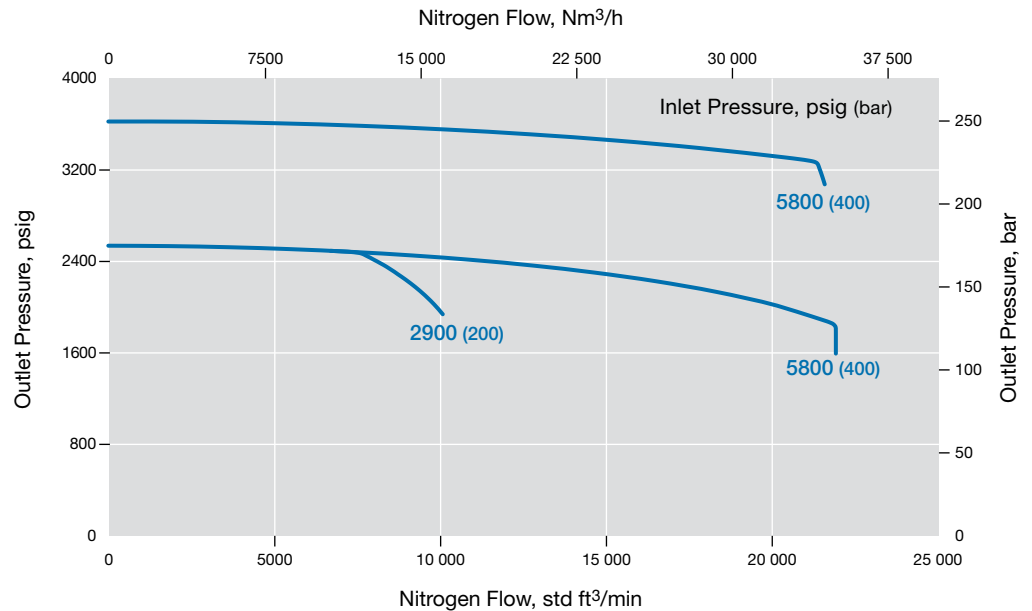
Flow Coefficient: 7.30

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

— 0 to 3625 psig (0 to 250 bar)



Flow Data

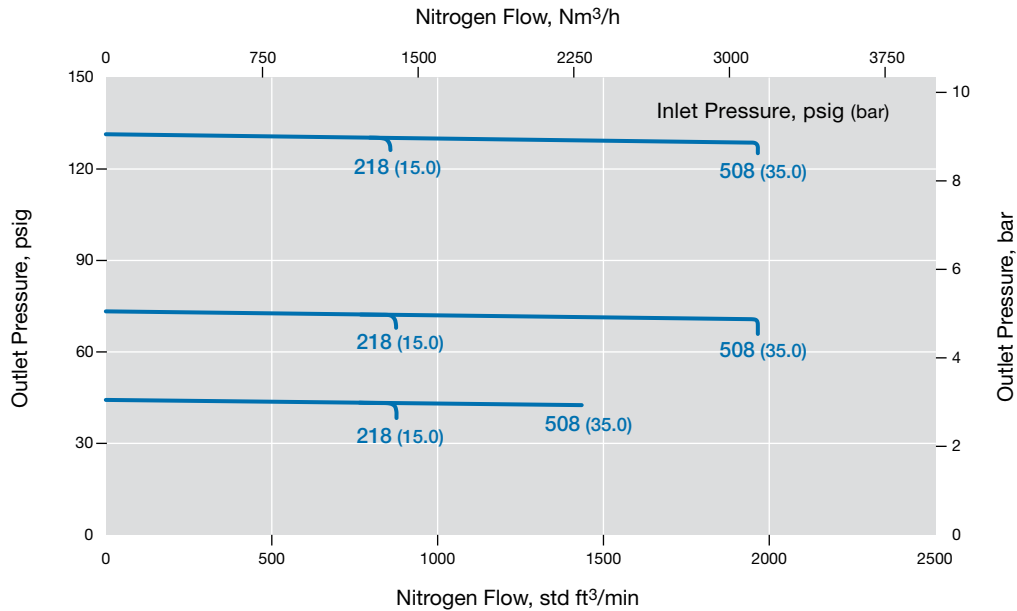
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD15-EF Series

Flow Coefficient: 7.30
Maximum Inlet Pressure: 508 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

0 to 1015 psig (0 to 70.0 bar)

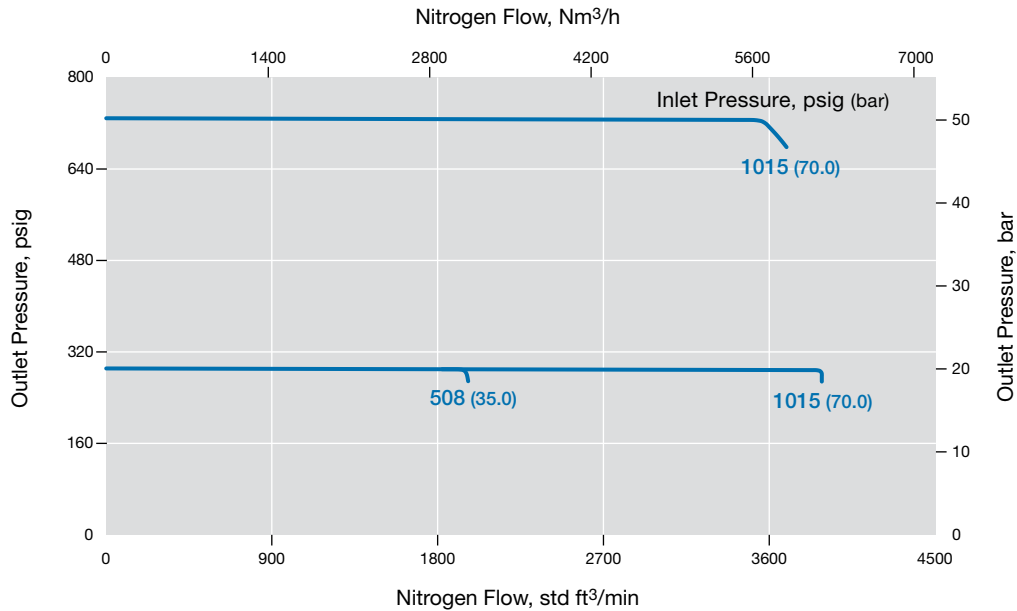


RD15-EF Series

Flow Coefficient: 7.30
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

0 to 1015 psig (0 to 70.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH15-EF Series

Flow Coefficient: 7.30

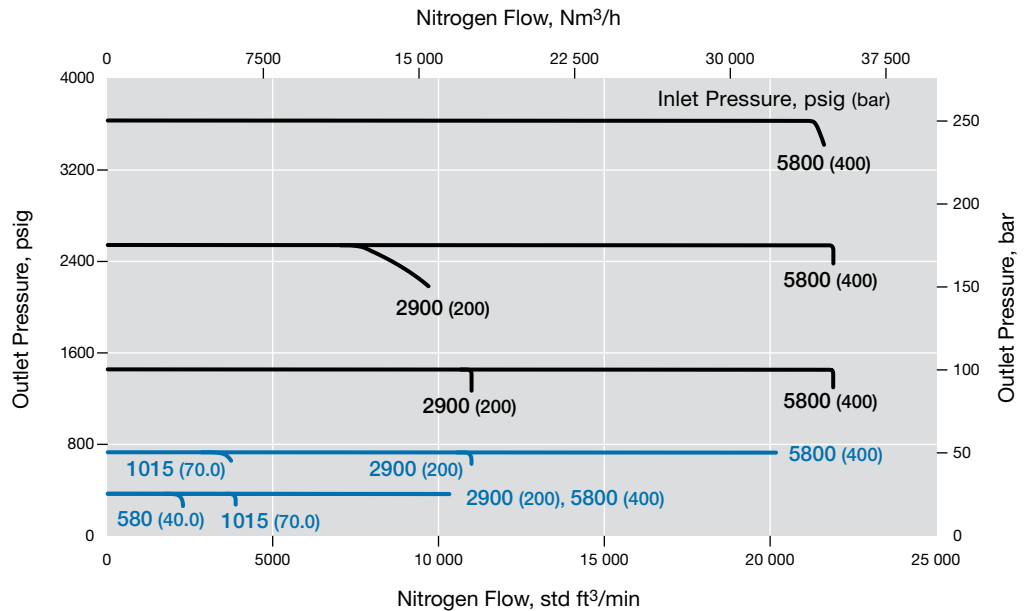
Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

— 0 to 3625 psig (0 to 250 bar)

— 0 to 1450 psig (0 to 100 bar)



RD15-EFP Series

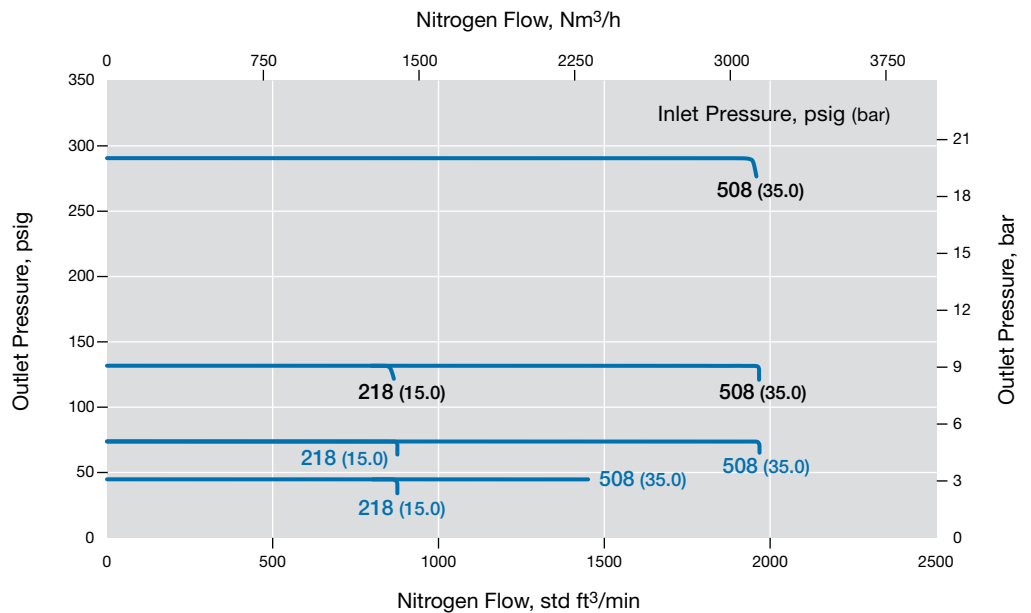
Flow Coefficient: 7.30

Maximum Inlet Pressure: 508 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

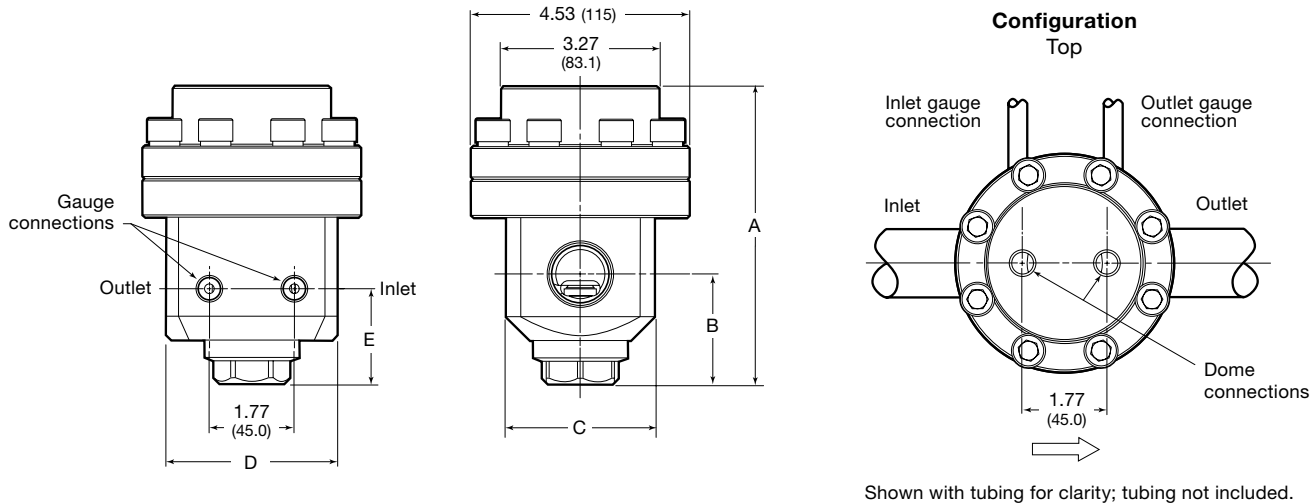
— 0 to 290 psig (0 to 20.0 bar)



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)				
		A	B	C	D	E
RD(H)10	1 in.	6.18 (157)	2.28 (58.0)	3.07 (78.0)	3.54 (90.0)	1.97 (50.0)
RD(H)15	1 1/2 in.	6.61 (168)	2.44 (62.0)	3.78 (96.0)	4.53 (115)	2.03 (51.5)



Ordering Information

Build an RD(H)10 and RD(H)15 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RD FA 10 A 1 - 02 - X - V V V - EF

1 Series

RD = 1015 psig (70.0 bar) maximum inlet pressure (507 psig [35.0 bar] with pilot regulator, options **0**, **1**, or **2**)

RDH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread

N = Female NPT

FA = ASME B16.5 flange

FD = EN 1092 (DIN) flange

3 Size

10 = 1 in. / DN25

15 = 1 1/2 in. / DN40

4 Pressure Class

Omit designator if flanges are not ordered.

A = ASME class 150

B = ASME class 300

C = ASME class 600

E = ASME class 1500

F = ASME class 2500

M = EN class PN16

N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.

1 = Raised face smooth

3 = RTJ

6 Body Material

02 = 316L SS

7 Pilot Regulator Options

Pressure Control Range

X = No pilot regulator, optional

RD series with LRS4 series pilot regulator

0 = 0 to 43 psig (0 to 3.0 bar)

1 = 0 to 130 psig (0 to 9.0 bar)

2 = 0 to 290 psig (0 to 20.0 bar)

RD series with RS2 series pilot regulator

3 = 0 to 1015 psig (0 to 70.0 bar)

RDH series with RS2 series pilot regulator

4 = 0 to 145 psig (0 to 10.0 bar)

5 = 0 to 362 psig (0 to 25.0 bar)

6 = 0 to 1450 psig (0 to 100 bar)

7 = 0 to 2537 psig (0 to 175 bar)

8 = 0 to 3625 psig (0 to 250 bar)

8 Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

9 Diaphragm Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

10 Seat Seal Material

RD series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

RDH series

K = PCTFE

P = PEEK

11 Options

EF = External feedback to main regulator

EFP = External feedback to pilot regulator, limited to 290 psig (20.0 bar)

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)20 and RD(H)25 Series

Features

- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation
- Dome-to-outlet pressure ratio approximately 1:1
- Large dome for improved stability

Options

- External feedback (EF) for improved performance
 - EF to main regulator limited by standard outlet pressure range
 - EF to pilot regulator limited to 290 psig (20.0 bar)
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



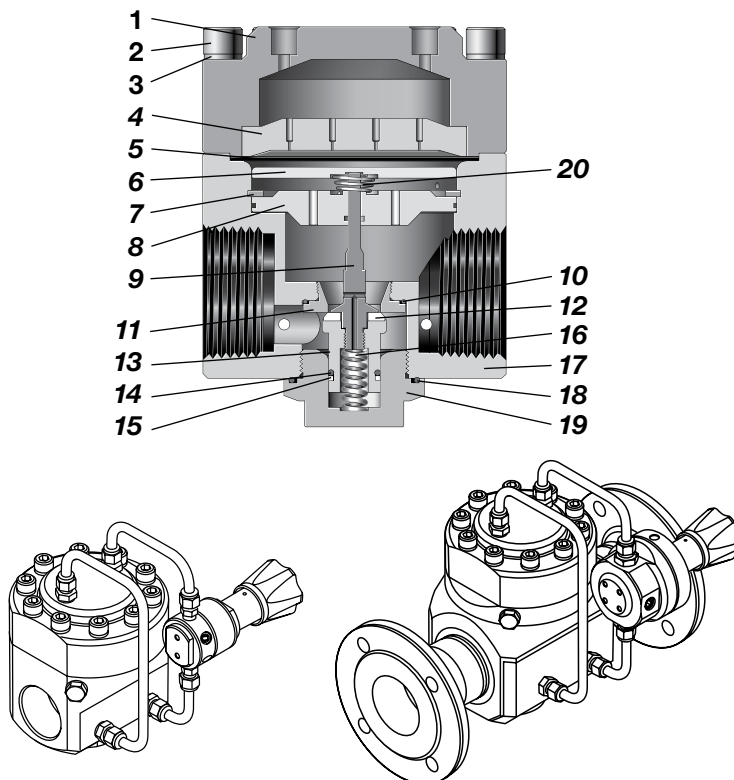
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Dome Connection	Weight (Without Flanges) lb (kg)
RD20 RDH20	RD: 1015 (70.0) (507 [35.0] with LRS4 pilot regulator) RDH: 5800 (400)	RD: 1015 (70.0) RDH: 2900 (200)	Diaphragm	-49 to 176 (-45 to 80) See Pressure-Temperature Ratings , page 921.	13	0.98 (25.0)	2 in. NPT, ISO/BSP parallel thread, EN or ASME flange	Use P1 gauge connection of pilot regulator.	44 (20)
RD25 RDH25	RD: 1015 (70.0) (507 [35.0] with LRS4 pilot regulator) RDH: 4060 (280)				21	1.25 (32.0)	2 1/2 in. EN or ASME flange	Dome: 1/4 in. ISO/BSP parallel thread	88 (40)

See pages 73 to 82 for flow data.

Materials of Construction

RDH20 Series Regulator with Hard Seat Seal



RDH20 with RS2 Pilot Regulator

RD25 with LRS4 Pilot Regulator

Component	Material / Specification
1 Dome	316L SS / A479
2 Cap screw	A4-80
3 Washer	A4
4 Dome plate	316L SS / A479
5 Diaphragm	EPDM, FKM, or nitrile
6 Diaphragm plate	316L SS / A479
7 Retaining ring	Commercial stainless steel
8 Body plate	316L SS / A479
9 Poppet	
10 O-ring	EPDM, FKM, or nitrile
11 Seat	316L SS / A479
12 Seat seal	RD EPDM, FKM, or nitrile
	RDH PCTFE or PEEK
13 Poppet housing	316L SS / A479
14 O-ring	EPDM, FKM, or nitrile
15 Backup ring	PTFE
16 Poppet spring	302 SS / A313
17 Body	316L SS / A479
18 Plug O-ring	EPDM, FKM, or nitrile
19 Body plug	316L SS / A479
20 Conical spring (RDH20 only)	302 SS / A313
Wetted lubricants: Silicone-based and synthetic hydrocarbon-based	

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

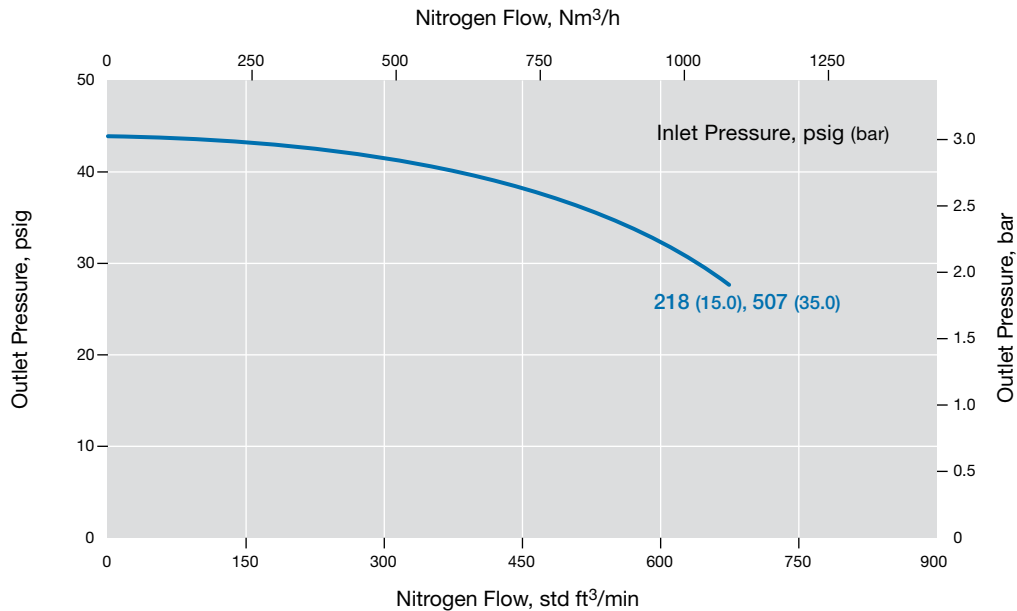
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD20 Series

Flow Coefficient: 13
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

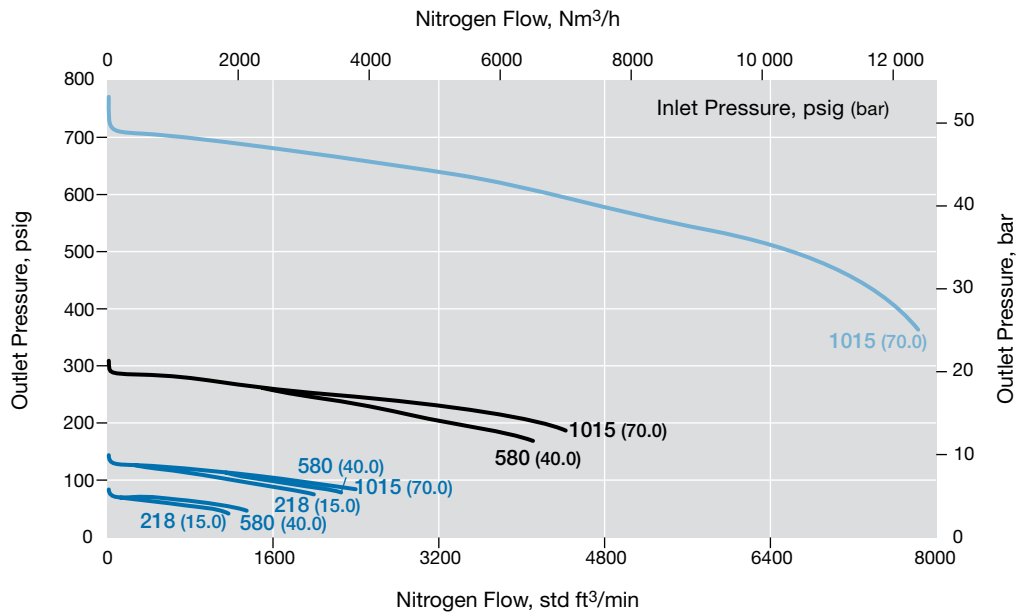
Pressure Control Range
0 to 43 psig (0 to 3.0 bar)



RD20 Series

Flow Coefficient: 13
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range
0 to 1015 psig (0 to 70.0 bar)
0 to 290 psig (0 to 20.0 bar)
0 to 130 psig (0 to 9.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH20 Series

Flow Coefficient: 13

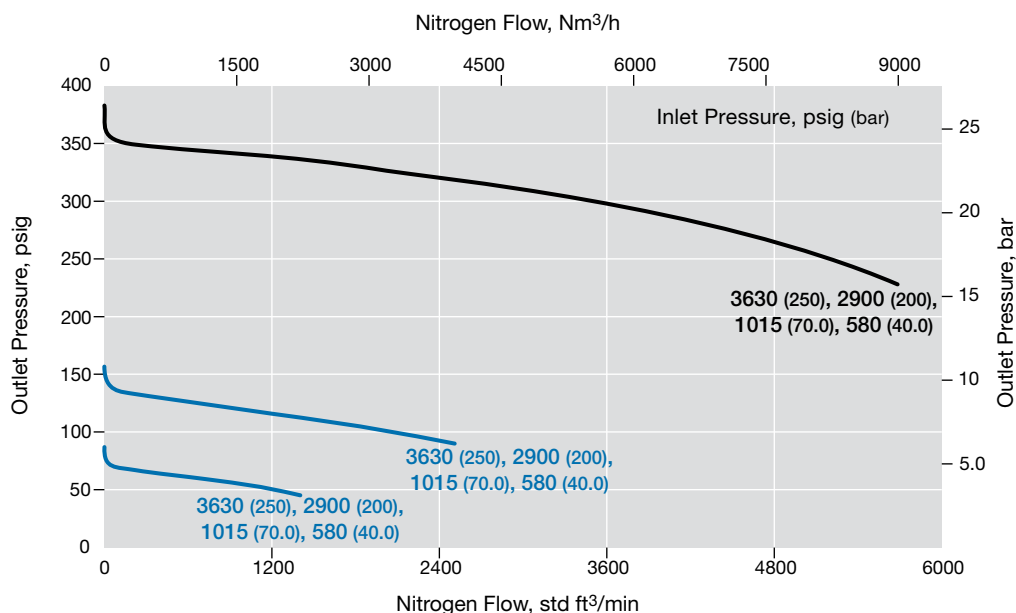
Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range

— 0 to 362 psig (0 to 25.0 bar)

— 0 to 145 psig (0 to 10.0 bar)



RDH20 Series

Flow Coefficient: 13

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range

— 0 to 2900 psig (0 to 200 bar)

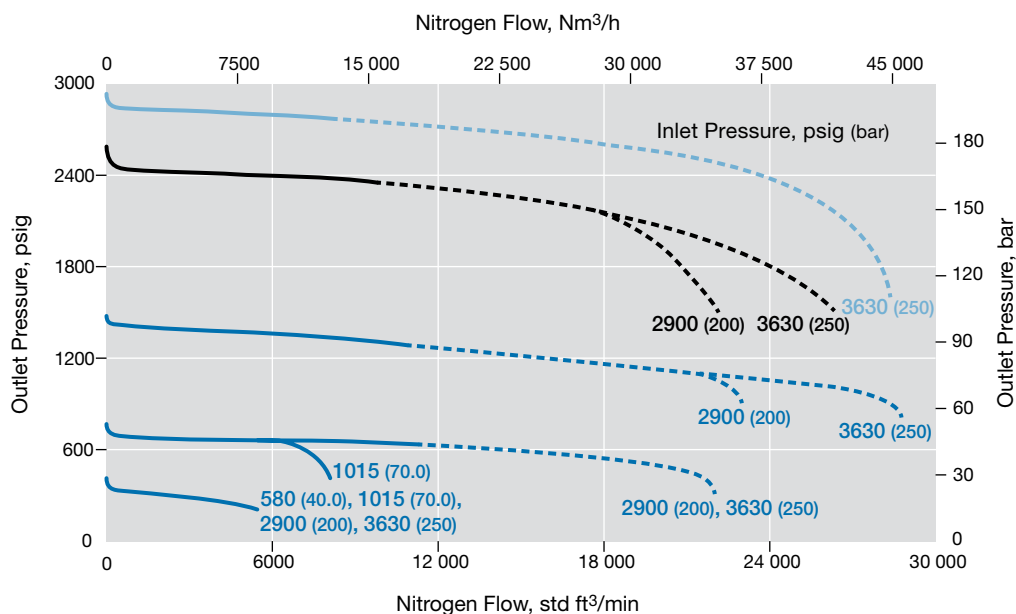
--- 0 to 2900 psig (0 to 200 bar),
calculated

— 0 to 2537 psig (0 to 175 bar)

--- 0 to 2537 psig (0 to 175 bar),
calculated

— 0 to 1450 psig (0 to 100 bar)

--- 0 to 1450 psig (0 to 100 bar),
calculated



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD20-EF Series

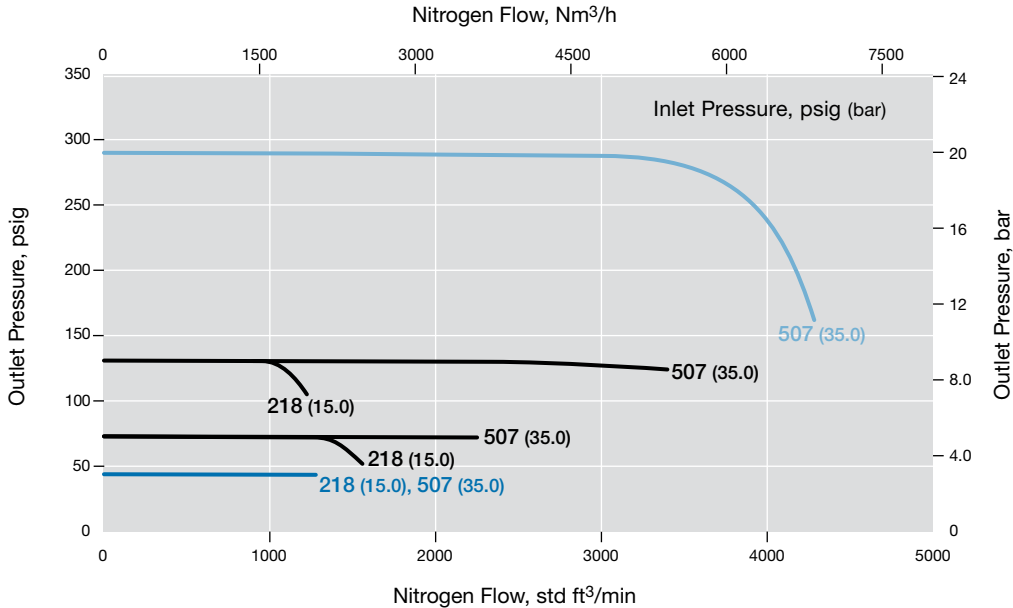
Flow Coefficient: 13

Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

- 0 to 290 psig (0 to 20.0 bar)
- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)



RD20-EF Series

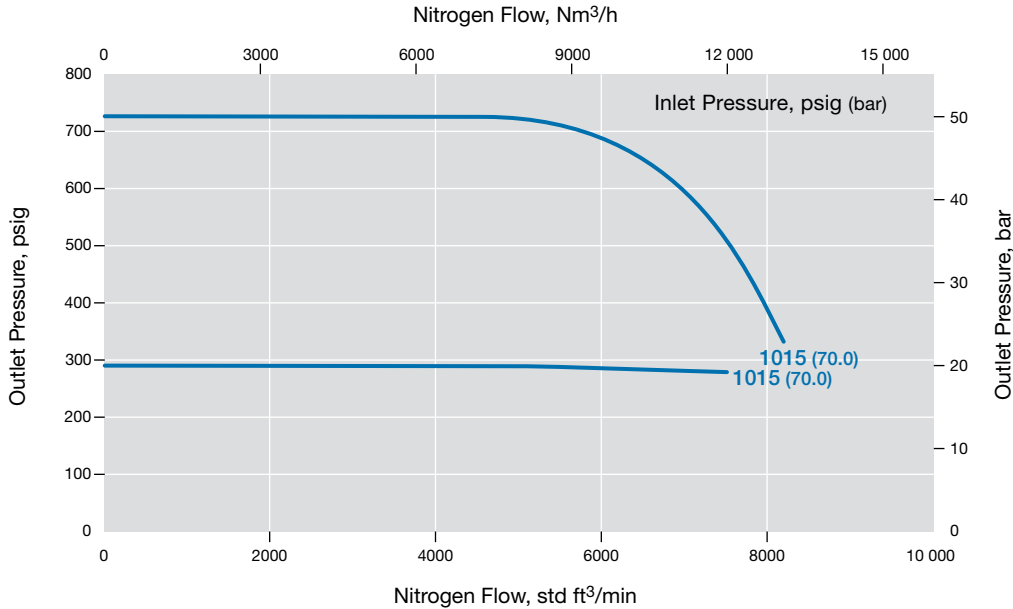
Flow Coefficient: 13

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

- 0 to 1015 psig (0 to 70.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD(H)20-EF Series

Flow Coefficient: 13

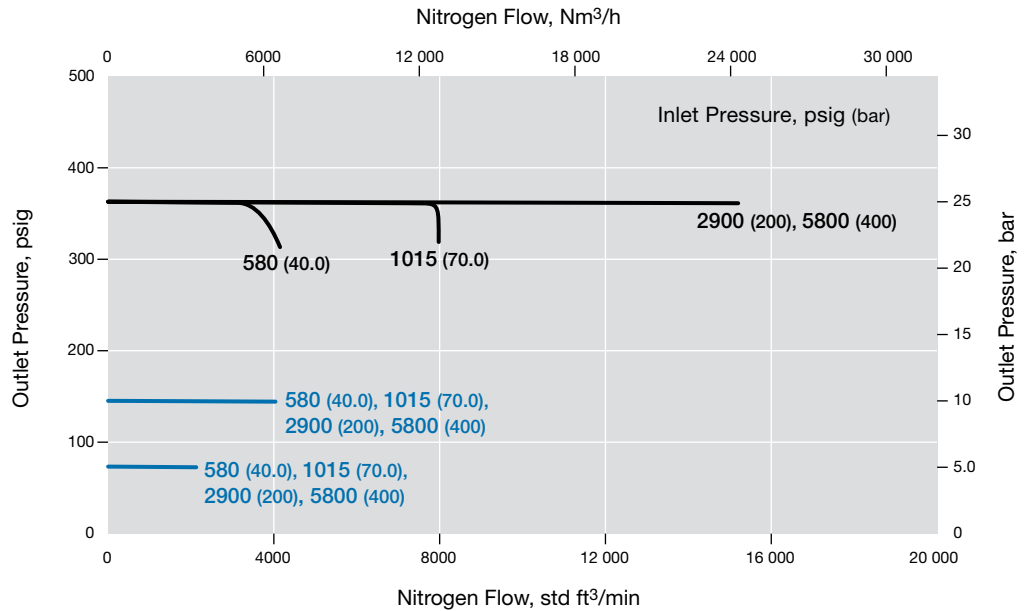
Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range

— 0 to 362 psig (0 to 25.0 bar)

— 0 to 145 psig (0 to 10.0 bar)



RD(H)20-EF Series

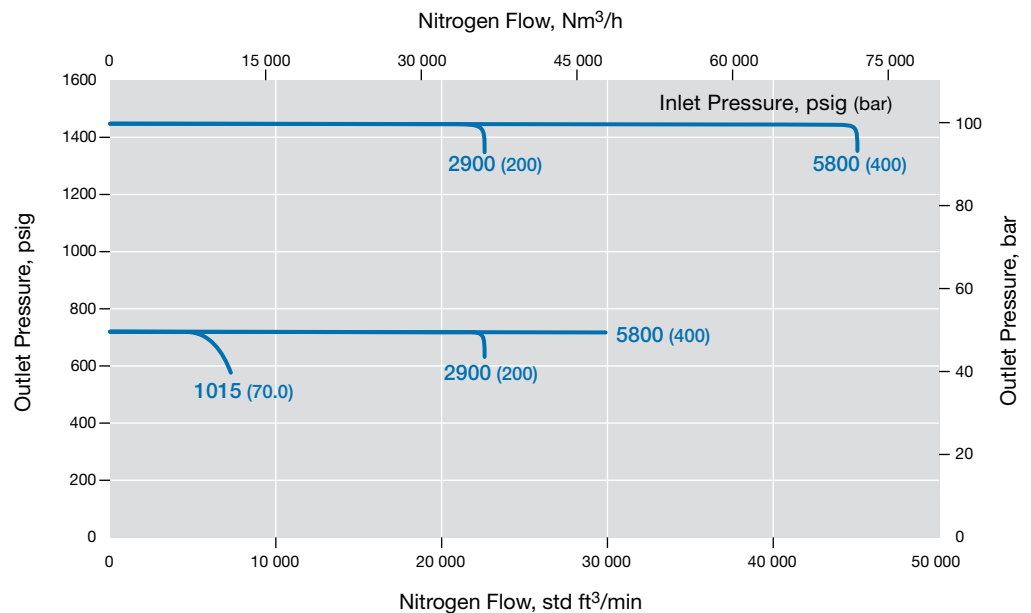
Flow Coefficient: 13

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

— 0 to 1450 psig (0 to 100 bar)

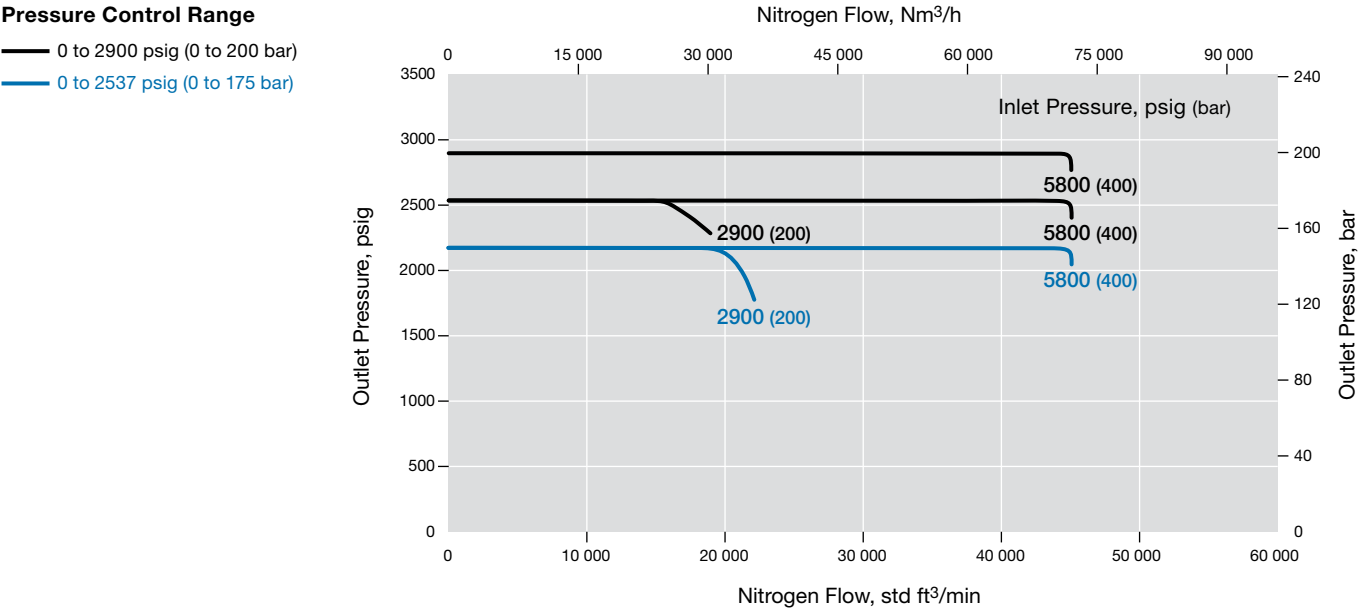


Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

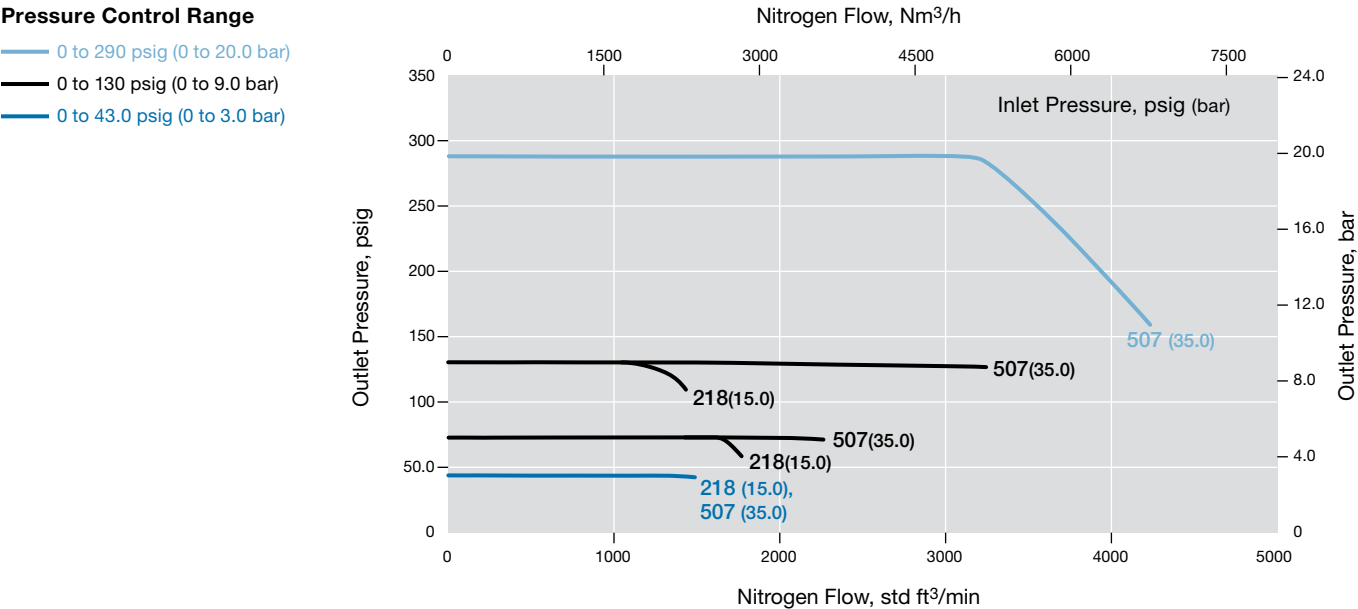
RD(H)20-EF Series

Flow Coefficient: 13
Maximum Inlet Pressure: 5800 psig (400 bar)
Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)



RD20-EFP Series

Flow Coefficient: 13
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD25 Series

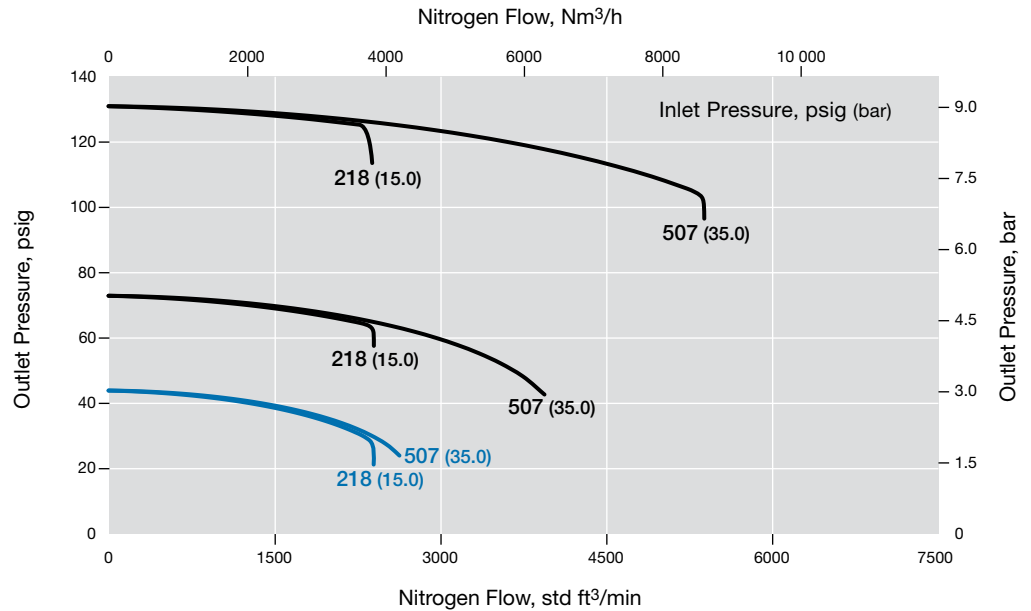
Flow Coefficient: 21

Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)



RD25 Series

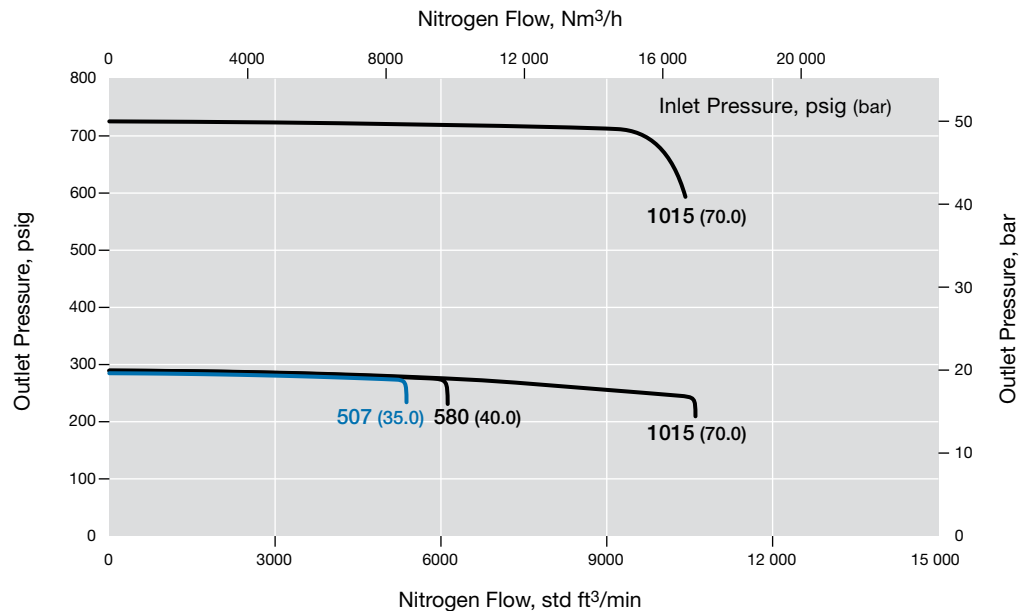
Flow Coefficient: 21

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)



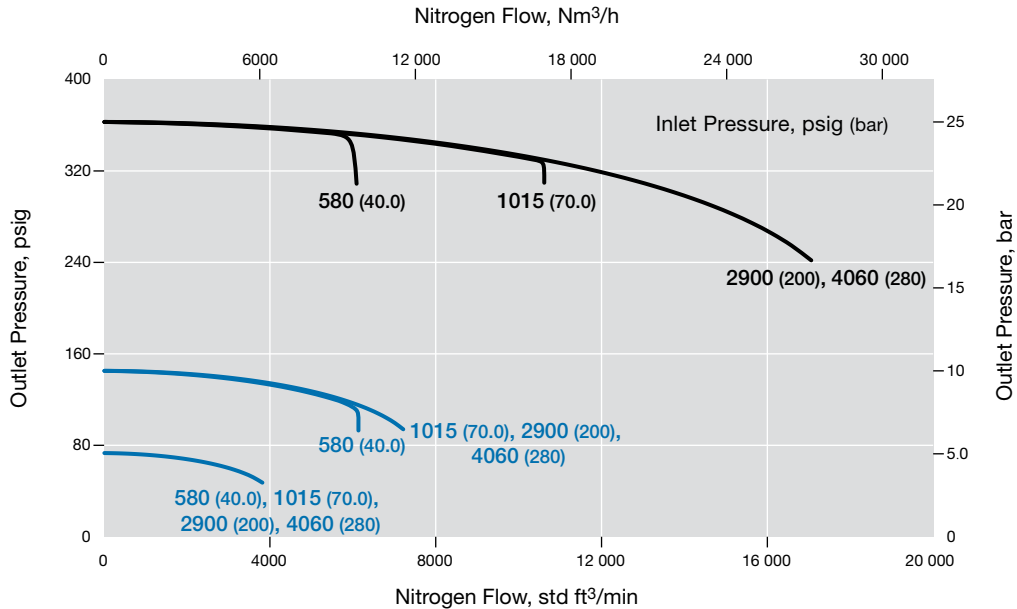
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH25 Series

Flow Coefficient: 21
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

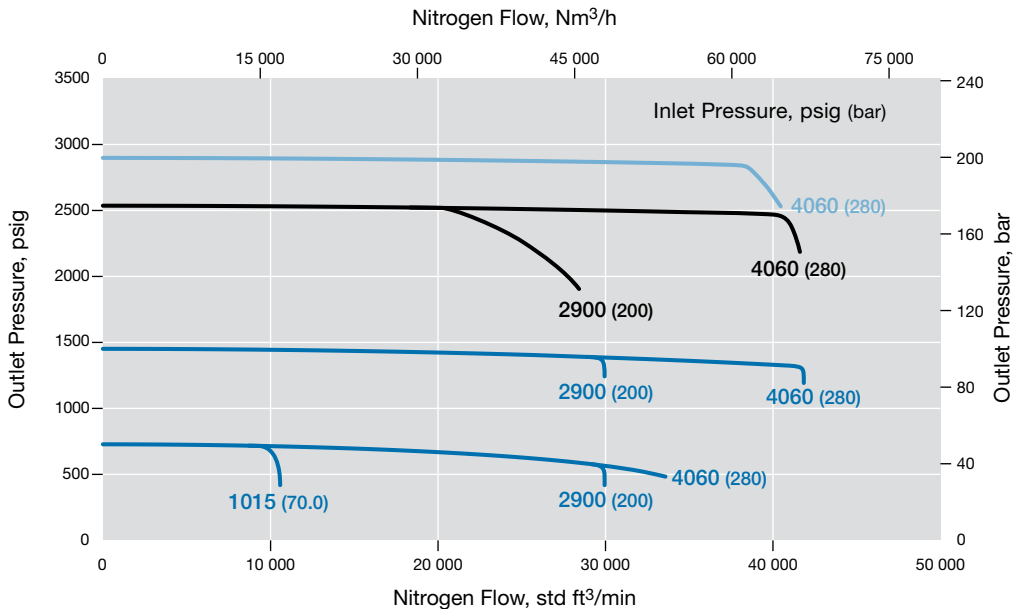
Pressure Control Range
— 0 to 362 psig (0 to 25.0 bar)
— 0 to 145 psig (0 to 10.0 bar)



RDH25 Series

Flow Coefficient: 21
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range
— 0 to 2900 psig (0 to 200 bar)
— 0 to 2537 psig (0 to 175 bar)
— 0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD25-EF Series

Flow Coefficient: 21

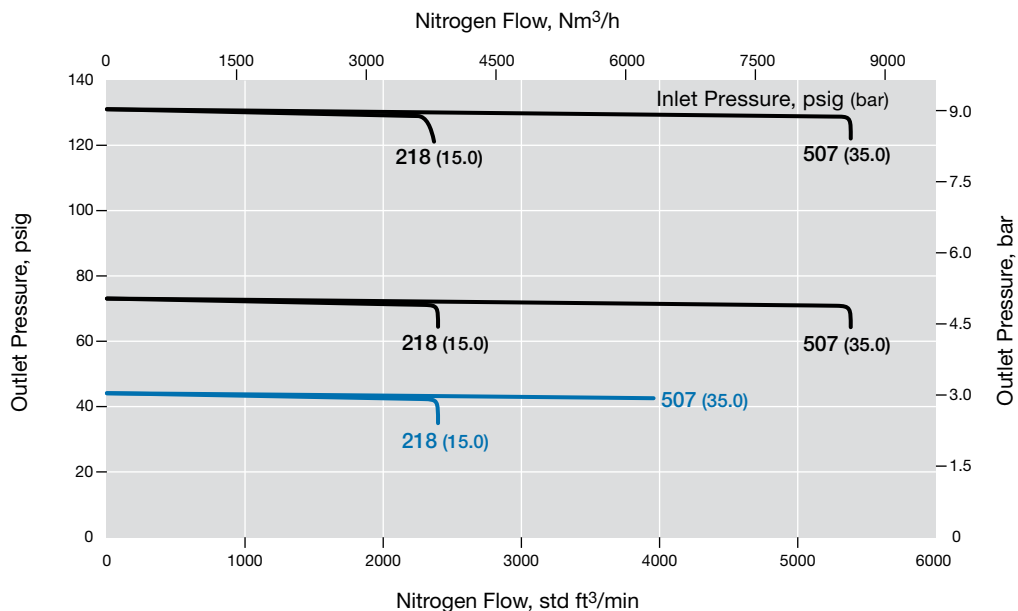
Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

— 0 to 130 psig (0 to 9.0 bar)

— 0 to 43.0 psig (0 to 3.0 bar)



RD25-EF Series

Flow Coefficient: 21

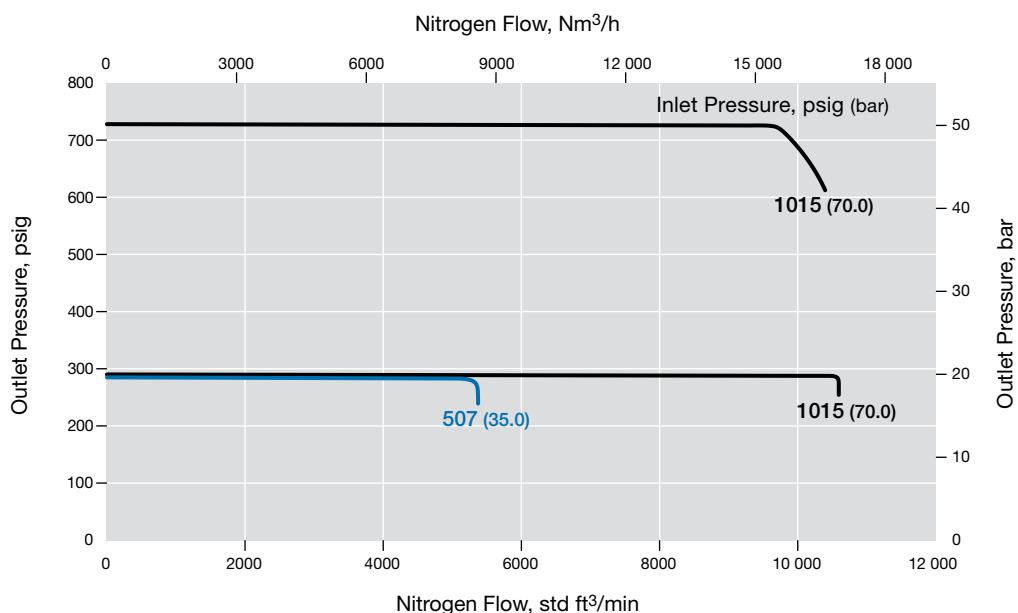
Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)

— 0 to 290 psig (0 to 20.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH25-EF Series

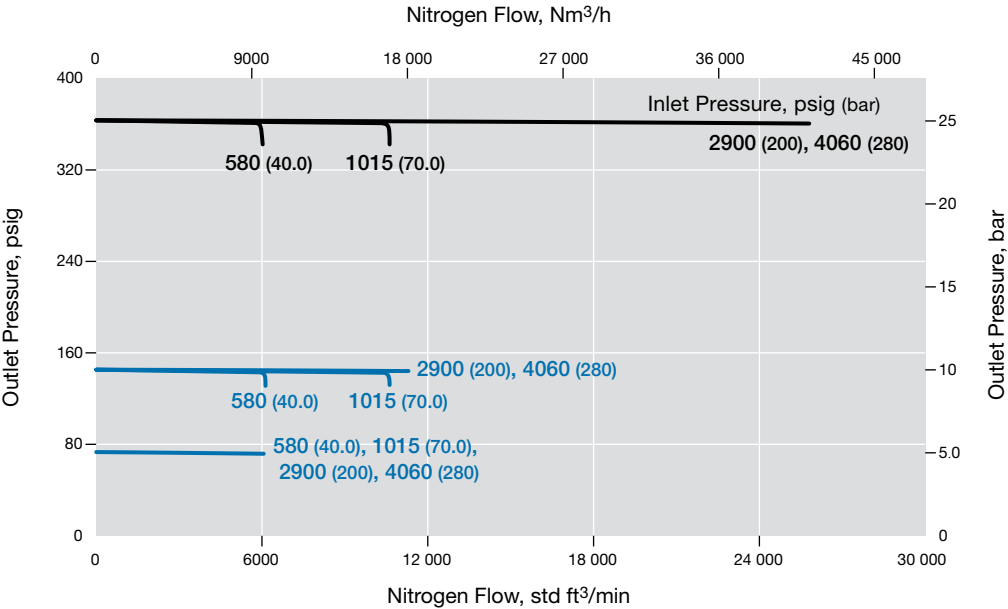
Flow Coefficient: 21

Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range

- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)



RDH25-EF Series

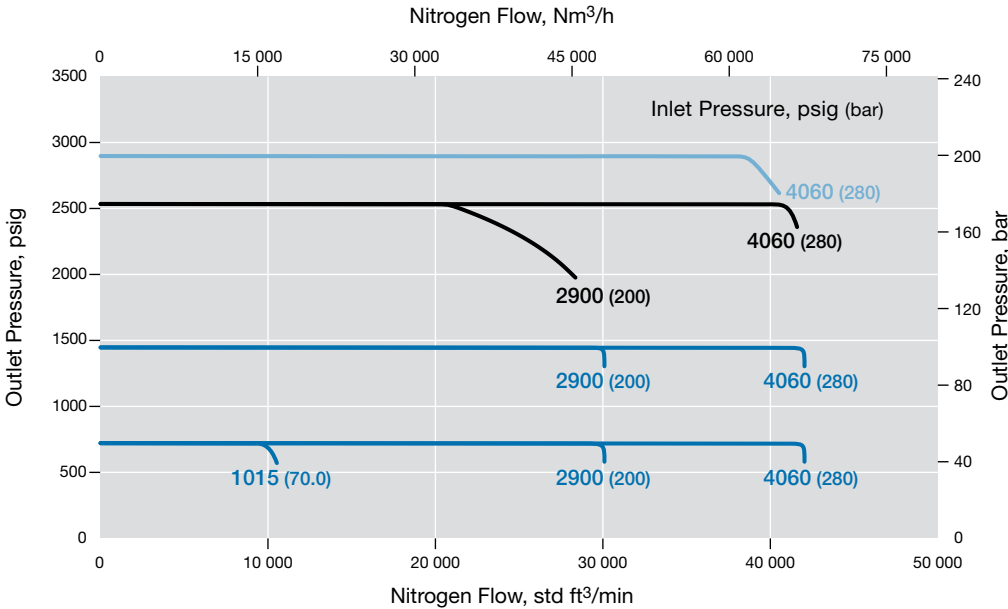
Flow Coefficient: 21

Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range

- 0 to 2900 psig (0 to 200 bar)
- 0 to 2537 psig (0 to 175 bar)
- 0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD25-EFP Series

Flow Coefficient: 21

Maximum Inlet Pressure: 507 psig (35.0 bar)

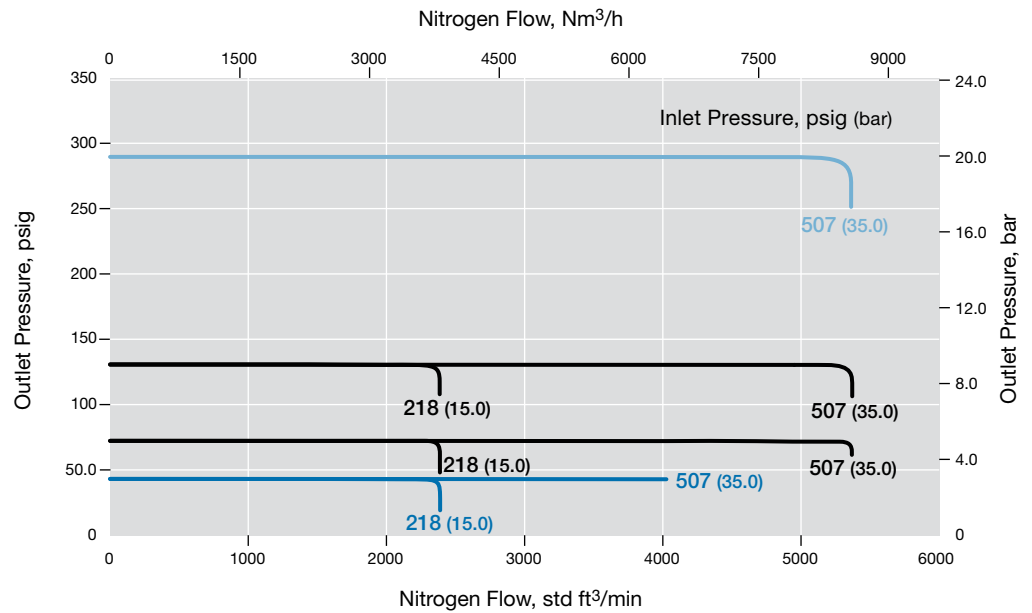
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

— 0 to 290 psig (0 to 20.0 bar)

— 0 to 130 psig (0 to 9.0 bar)

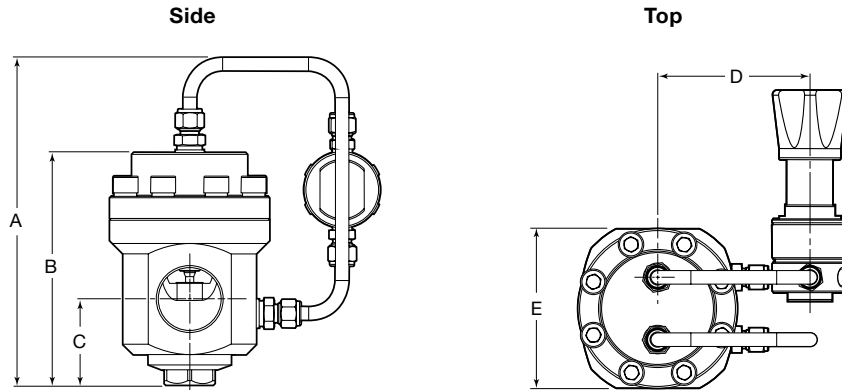
— 0 to 43.0 psig (0 to 3.0 bar)



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)				
		A	B	C	D	E
RD(H)20	2 in.	9.33 (237)	7.28 (185)	2.44 (62.0)	4.33 (110)	5.51 (140)
RD(H)25	2 1/2 in.	11.8 (300)	9.25 (235)	3.42 (87.0)	4.92 (125)	6.69 (170)



Shown with RS2 series pilot regulator.

Ordering Information

Build an RD(H)20 and RD(H)25 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RD FA 20 A 1 - 02 - 0 - V V V - EF

1 Series

RD = 1015 psig (70.0 bar) maximum inlet pressure (507 psig [35.0 bar] with pilot regulator, options **0**, **1**, or **2**)

RDH = 5800 psig (400 bar) maximum inlet pressure (RDH20); 4060 psig (280 bar) maximum inlet pressure (RDH25)

2 Inlet / Outlet

B = Female ISO/BSP parallel thread^①

N = Female NPT^①

FA = ASME B16.5 flange

FD = EN 1092 (DIN) flange

^① RD(H)20 only.

3 Size

20 = 2 in. / DN50

25 = 2 1/2 in. / DN65

4 Pressure Class

Omit designator if flanges are not ordered.

A = ASME class 150

B = ASME class 300

C = ASME class 600

E = ASME class 1500

F = ASME class 2500

M = EN class PN16

N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.

1 = Raised face smooth

3 = RTJ

6 Body Material

02 = 316L SS

7 Pilot Regulator Options

Pressure Control Range

X = No pilot regulator, optional

RD series with LRS4 series pilot regulator

0 = 0 to 43 psig (0 to 3.0 bar)

1 = 0 to 130 psig (0 to 9.0 bar)

2 = 0 to 290 psig (0 to 20.0 bar)

RD series with RS2 series pilot regulator

3 = 0 to 1015 psig (0 to 70.0 bar)

RDH series with RS2 series pilot regulator

4 = 0 to 145 psig (0 to 10.0 bar)

5 = 0 to 362 psig (0 to 25.0 bar)

6 = 0 to 1450 psig (0 to 100 bar)

7 = 0 to 2537 psig (0 to 175 bar)

8 = 0 to 2900 psig (0 to 200 bar)

8 Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

9 Diaphragm Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

10 Seat Seal Material

RD series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

RDH series

K = PCTFE

P = PEEK

11 Options

EF = External feedback to main regulator

EFP = External feedback to pilot regulator, limited to 290 psig (20.0 bar)

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

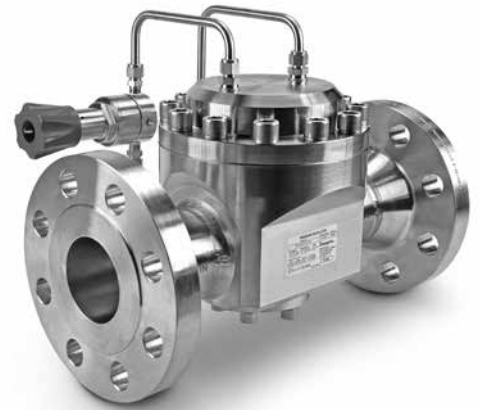
Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators—RD(H)30 and RD(H)40 Series

Features

- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator with dynamic regulation
- Dome-to-outlet pressure ratio approximately 1:1
- Large dome for stability
- Floating seat for improved sealing reliability (patent pending)

Options

- External feedback (EF) for improved performance
 - EF to main regulator limited by standard outlet pressure range
 - EF to pilot regulator limited to 290 psig (20.0 bar)
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C

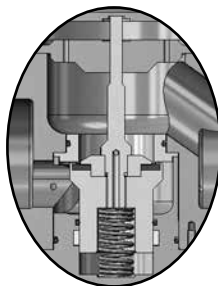
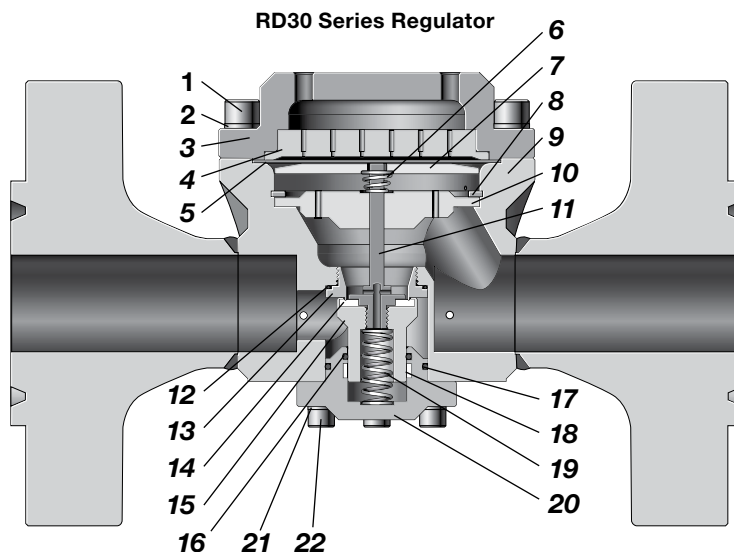


Technical Data

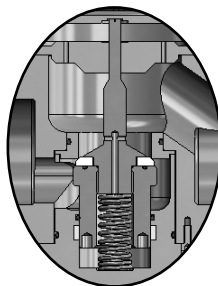
Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (C°)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Dome Connection	Weight (With Class 150 Flanges) lb (kg)
RD	1015 (70.0) (507 [35.0] with LRS4 pilot regulator)	1015 (70.0)	Diaphragm	-49 to 176 (-45 to 80) See Pressure-Temperature Ratings , page 921.	RD(H)30: 36 RD(H)40: 73	RD(H)30: 1.65 (42.0) RD(H)40: 2.36 (60.0)	EN or ASME flanges— RD(H)30: 3 in. RD(H)40: 4 in.	Use P1 gauge connection of pilot regulator. Dome: 1/4 in. ISO/BSP parallel thread	RD(H)30: 136 (62) RD(H)40: 183 (83)
RDH	4060 (280)	2900 (200)							

See pages 85 to 97 for flow data.

Materials of Construction



RD
Poppet and Seat



RDH
Poppet and Seat

Component		Material / Specification
1	Cap screw	A4-80
2	Washer	A4
3	Dome	316L SS / A479
4	Dome plate	316L SS / A479
5	Diaphragm	EPDM, FKM, or nitrile
6	Conical spring (RD[H]30 only)	302 SS / A313
7	Diaphragm plate	316L SS / A479
8	Retaining ring	Commercial stainless steel
9	Body assembly (body, reducers, flanges)	316L SS / A479
10	Body plate	
11	Poppet	316L SS / A479
12	O-ring	EPDM, FKM, or nitrile
13	Seat	316L SS / A479
14	Seat seal	RD EPDM, FKM, or nitrile
		RDH PEEK
15	Poppet housing	316L SS / A479
16	O-ring	EPDM, FKM, or nitrile
17	Plug O-ring	
18	Guide ring	PTFE
19	Poppet spring	302 SS / A313
20	Body plug	316L SS / A479
21	Washer	A4
22	Cap Screw	A4-80

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

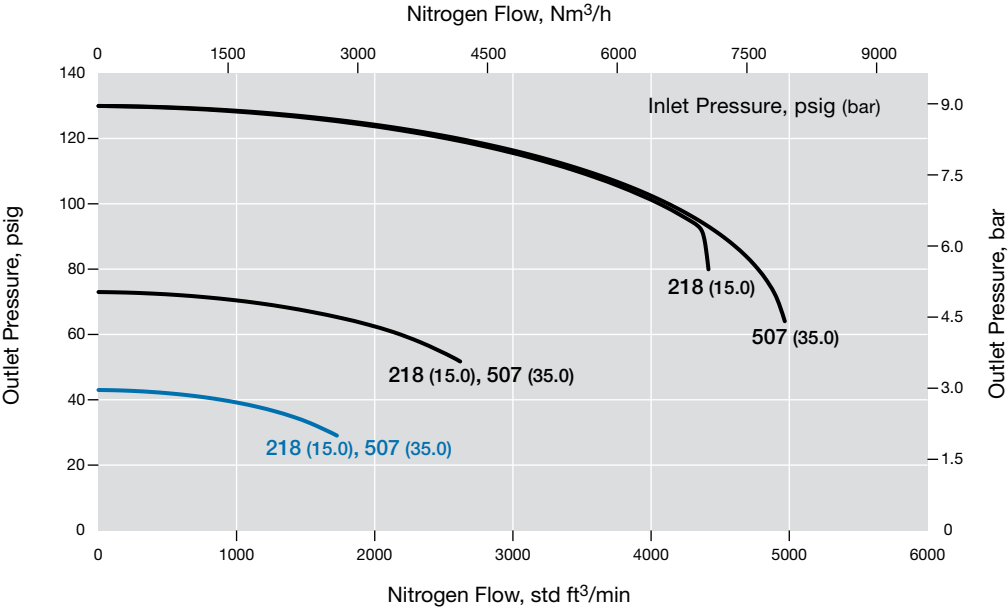
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD30 Series

Flow Coefficient: 36
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)

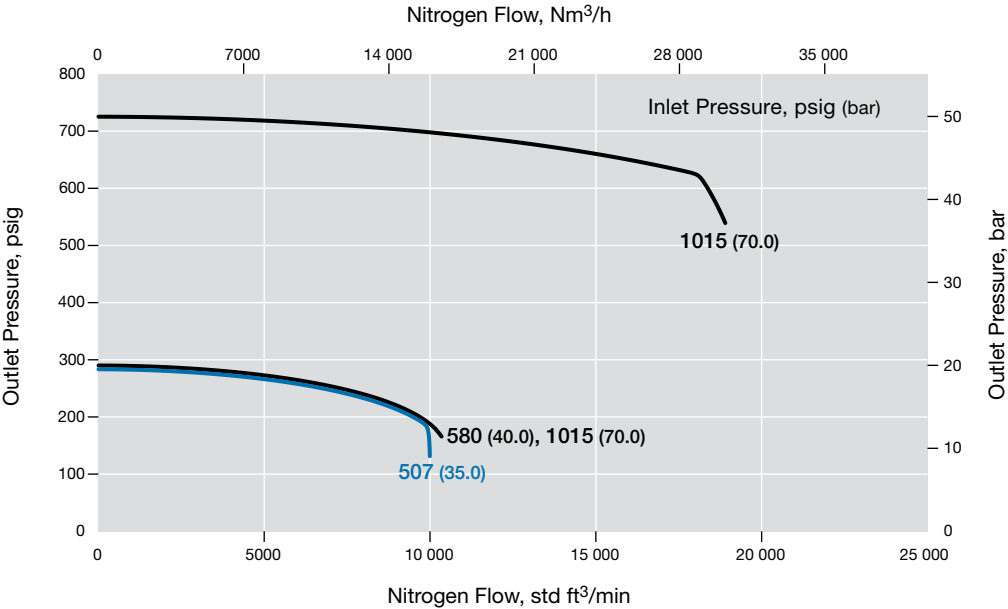


RD30 Series

Flow Coefficient: 36
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH30 Series

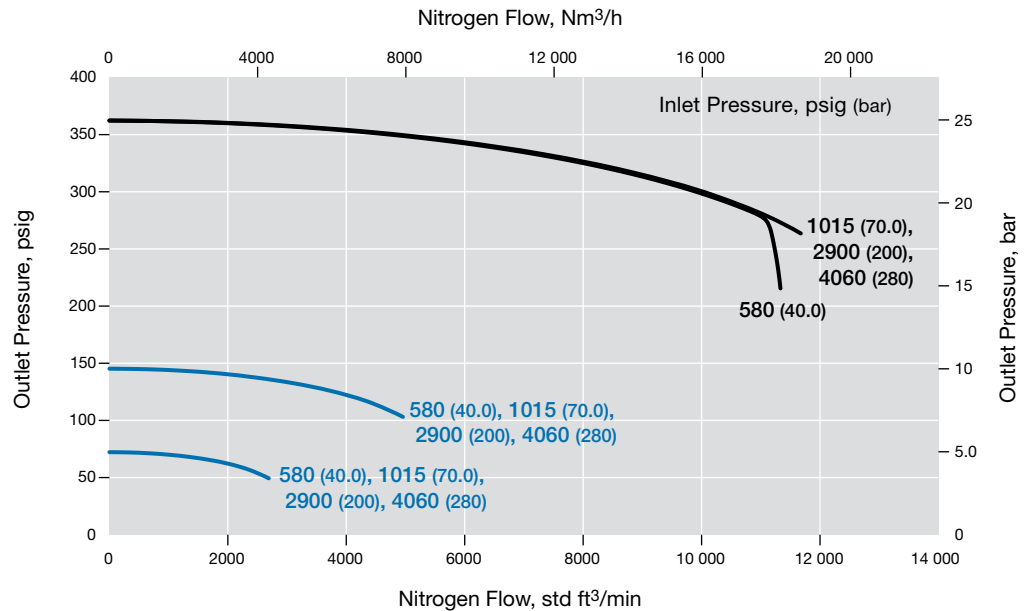
Flow Coefficient: 36

Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range

- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)



RDH30 Series

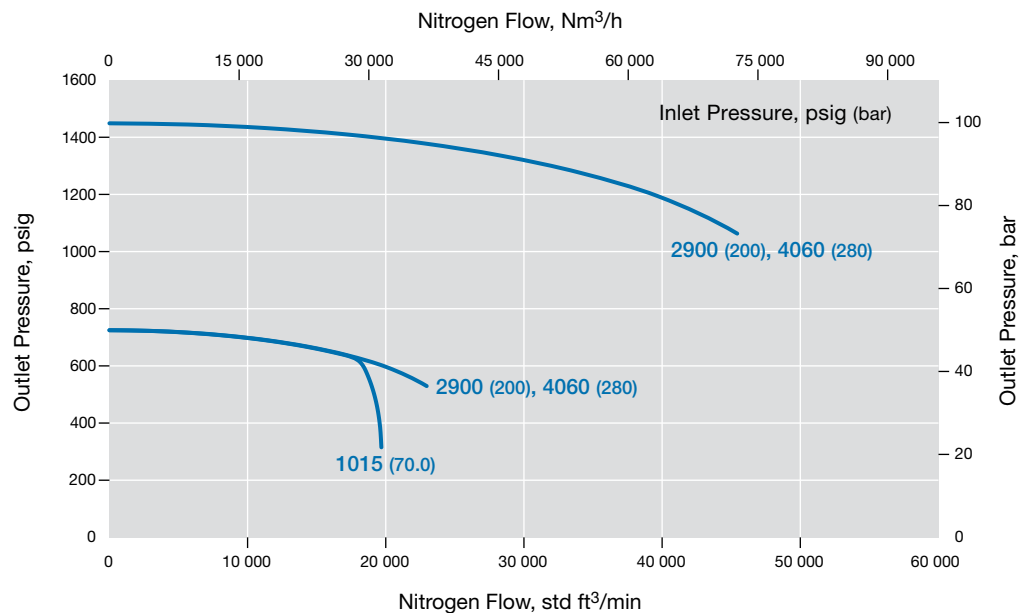
Flow Coefficient: 36

Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

- 0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH30 Series

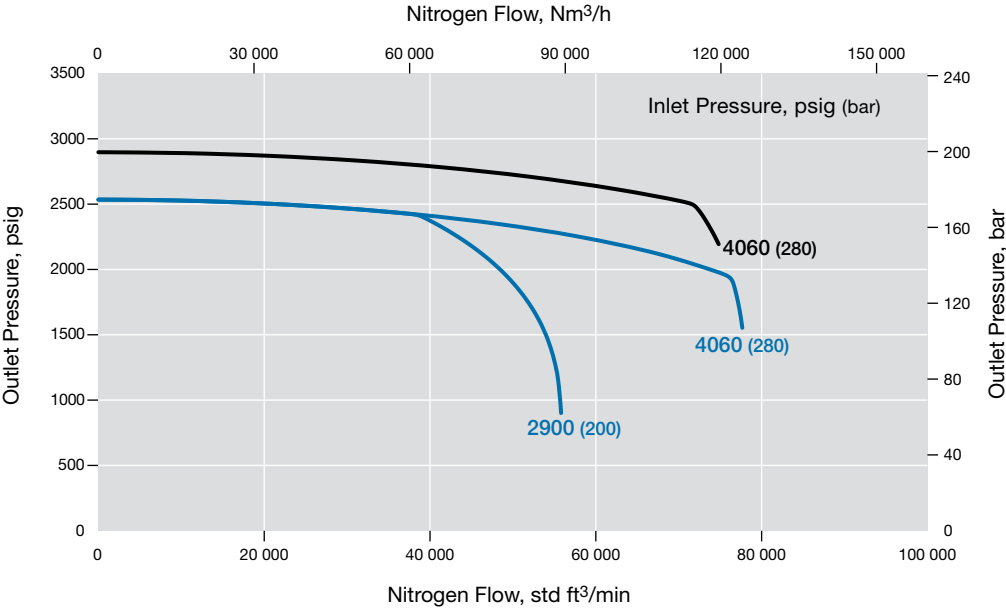
Flow Coefficient: 36

Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range

- 0 to 2900 psig (0 to 200 bar)
- 0 to 2537 psig (0 to 175 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD30-EF Series

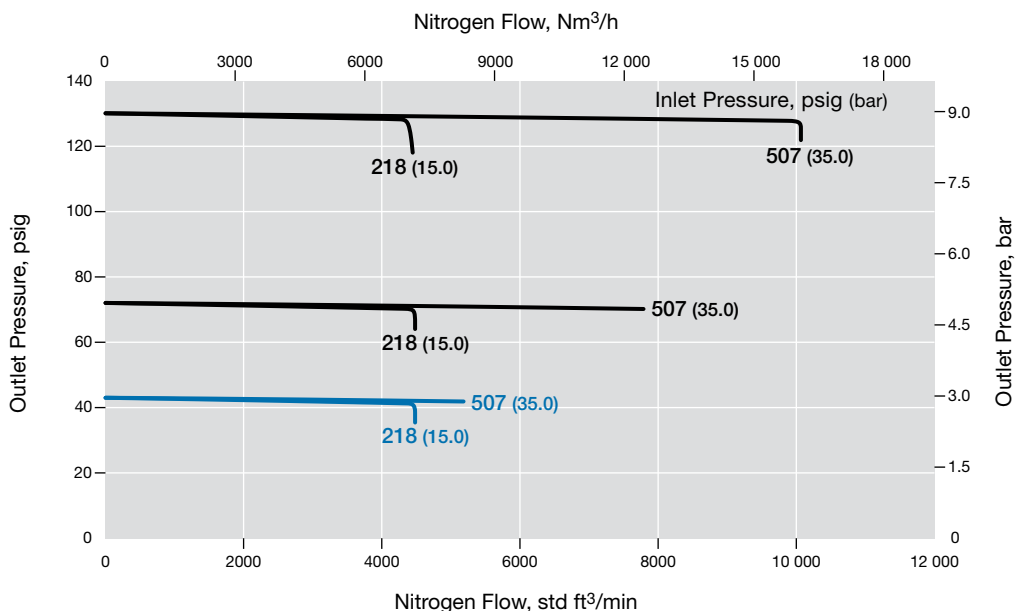
Flow Coefficient: 36

Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)



RD30-EF Series

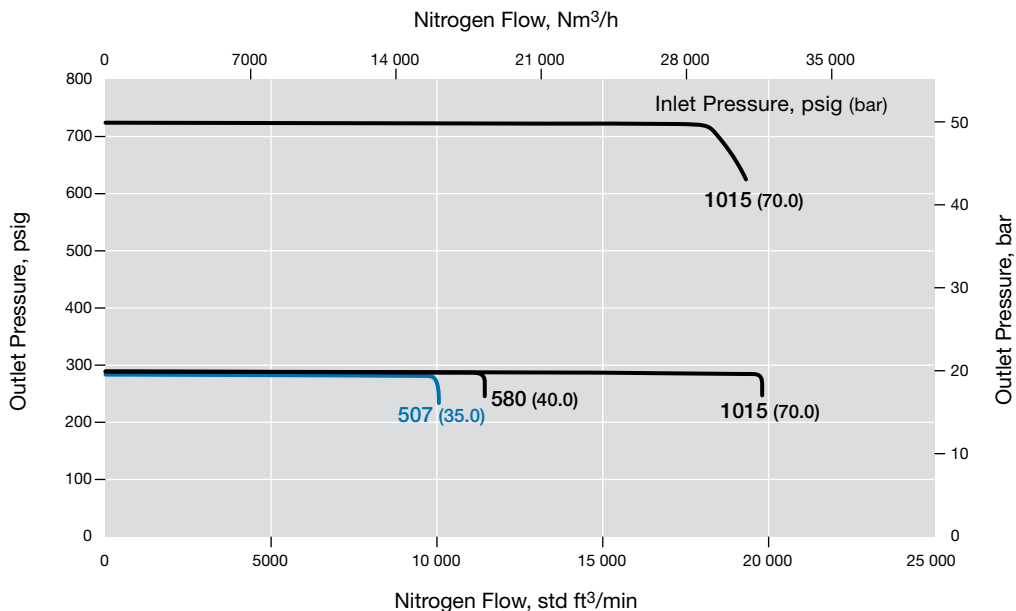
Flow Coefficient: 36

Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

- 0 to 1015 psig (0 to 70.0 bar)
- 0 to 290 psig (0 to 20.0 bar)



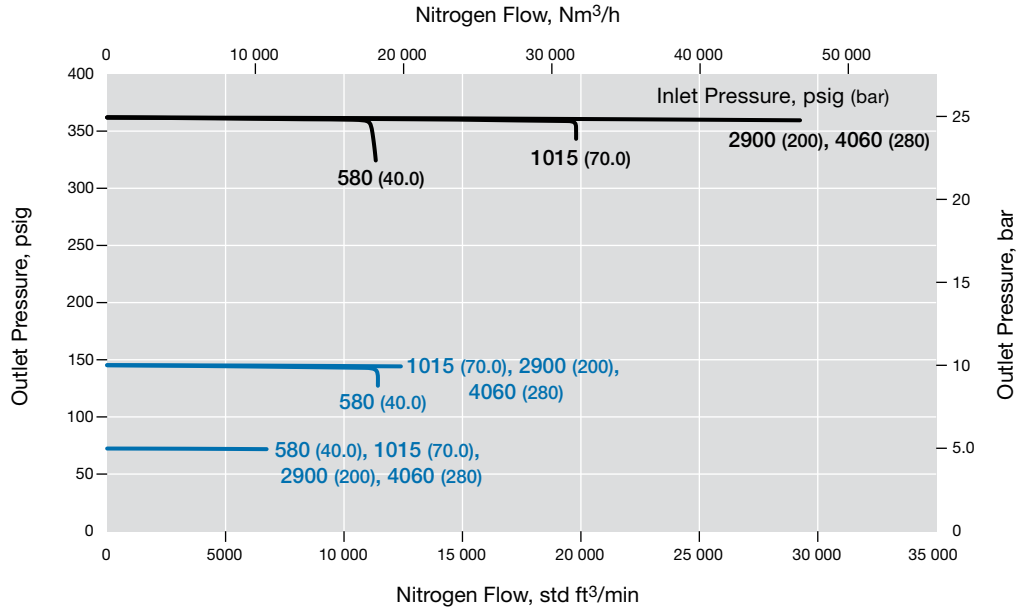
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH30-EF Series

Flow Coefficient: 36
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

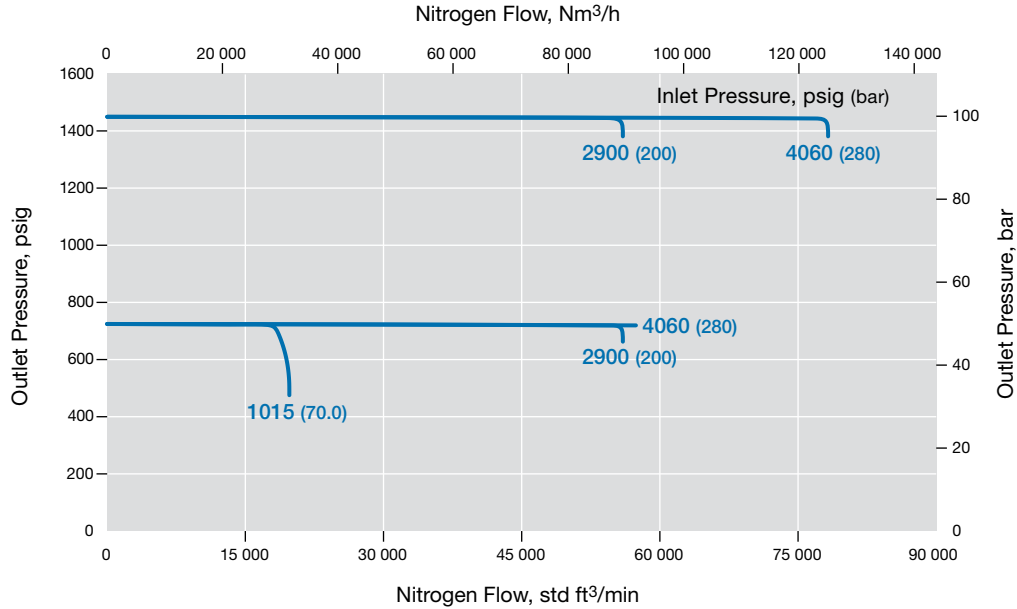
Pressure Control Range
0 to 362 psig (0 to 25.0 bar)
0 to 145 psig (0 to 10.0 bar)



RDH30-EF Series

Flow Coefficient: 36
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range
0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH30-EF Series

Flow Coefficient: 36

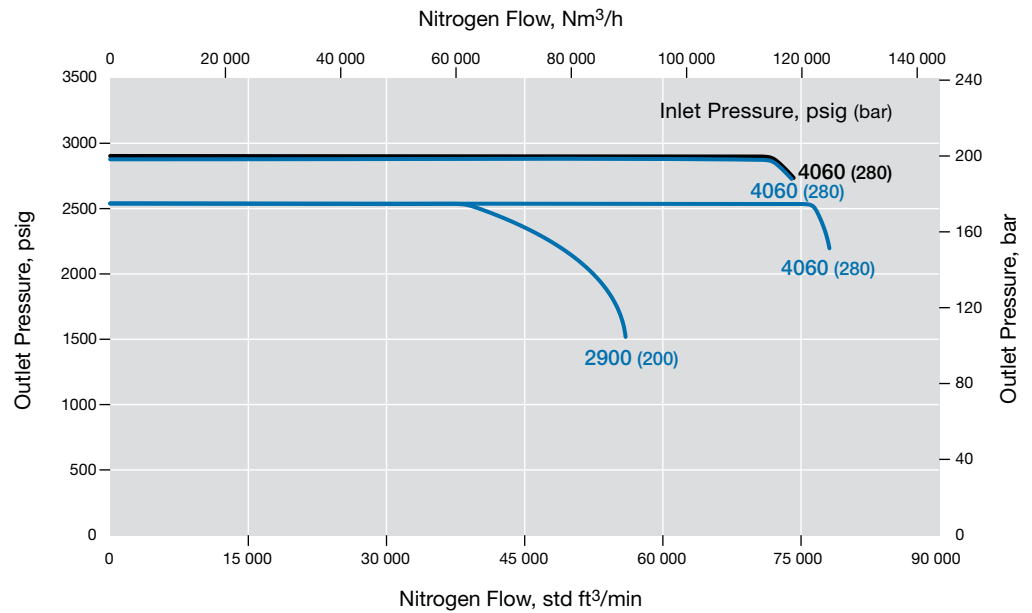
Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range

— 0 to 2900 psig (0 to 200 bar)

— 0 to 2537 psig (0 to 175 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD30-EFP Series

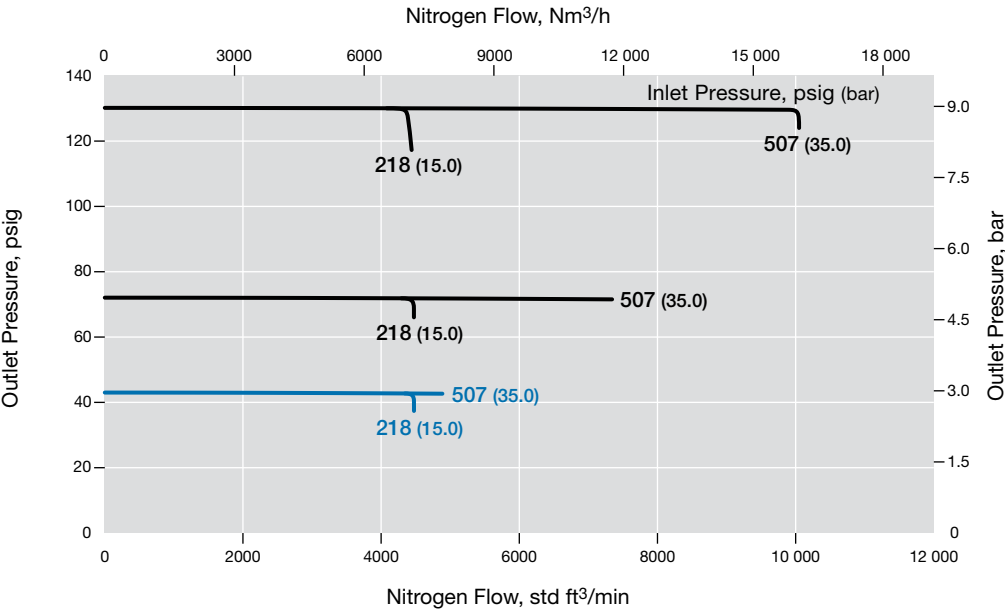
Flow Coefficient: 36

Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

- 0 to 130 psig (0 to 9.0 bar)
- 0 to 43.0 psig (0 to 3.0 bar)



RD30-EFP Series

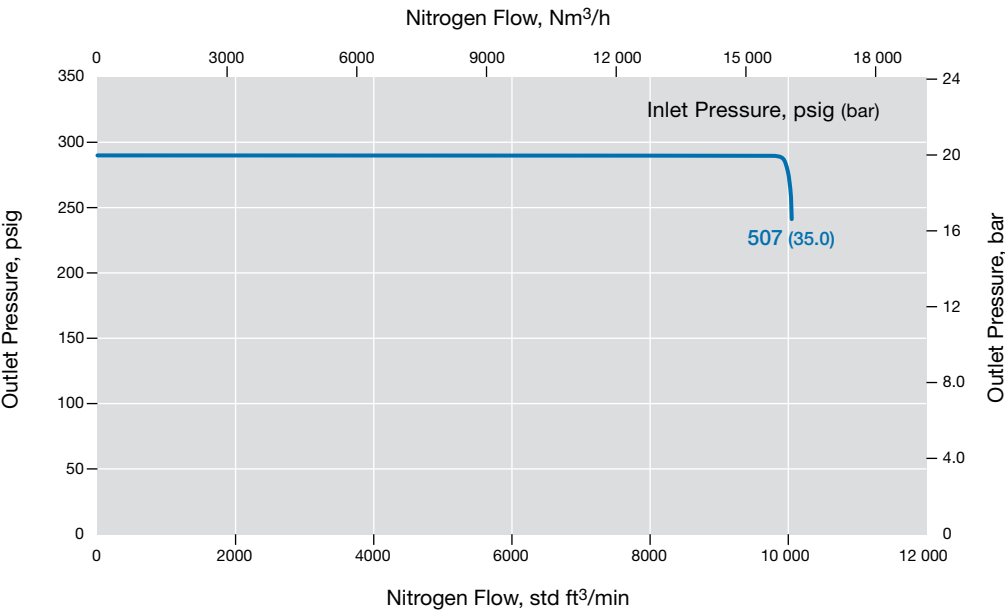
Flow Coefficient: 36

Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

- 0 to 290 psig (0 to 20.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RD40 Series

Flow Coefficient: 73

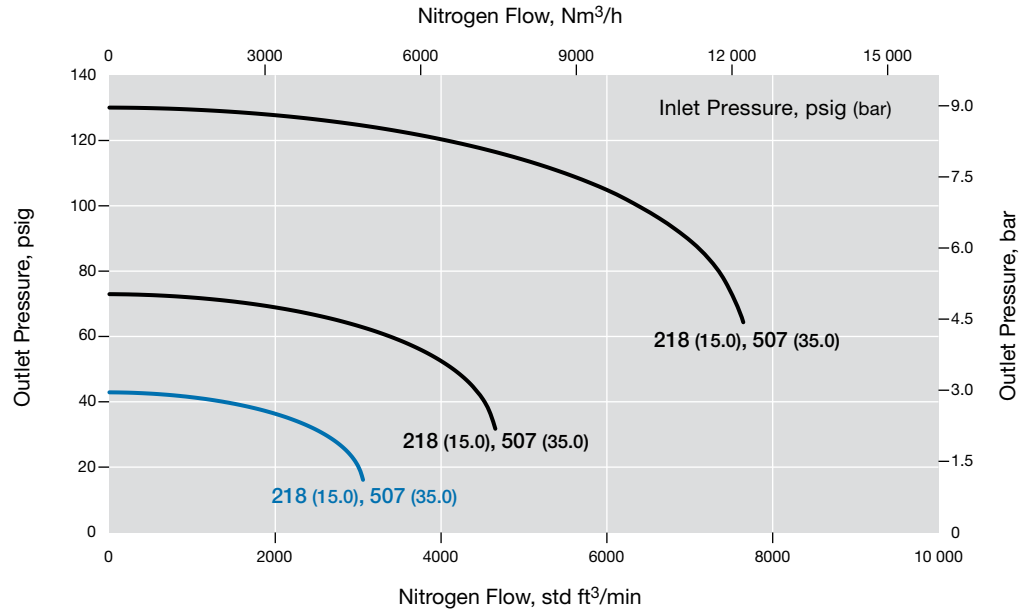
Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

— 0 to 130 psig (0 to 9.0 bar)

— 0 to 43.0 psig (0 to 3.0 bar)



RD40 Series

Flow Coefficient: 73

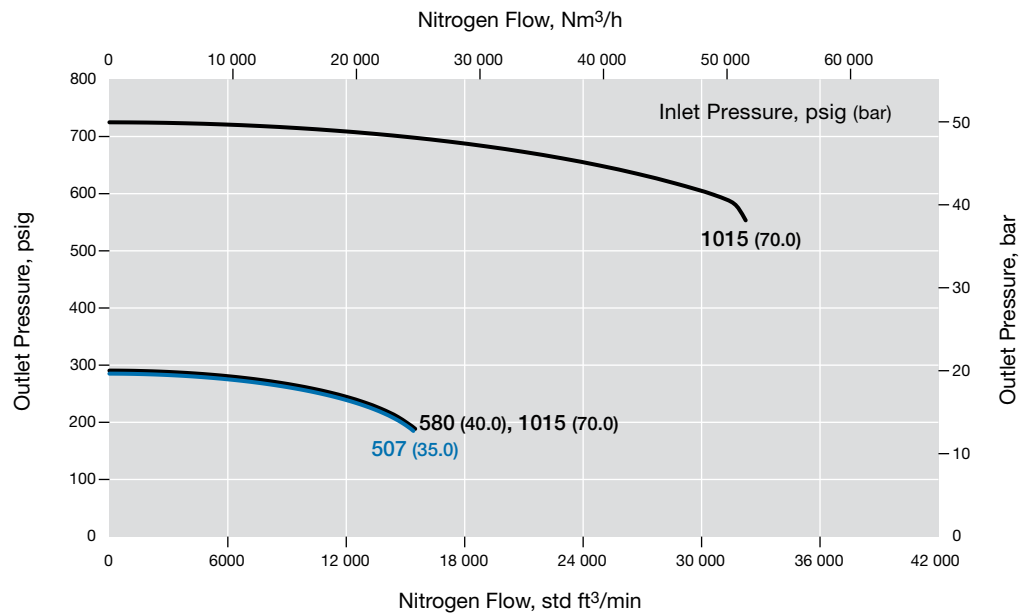
Maximum Inlet Pressure: 1015 psig (70.0 bar)

Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

Pressure Control Range

— 0 to 1015 psig (0 to 70.0 bar)

— 0 to 290 psig (0 to 20.5 bar)



Flow Data

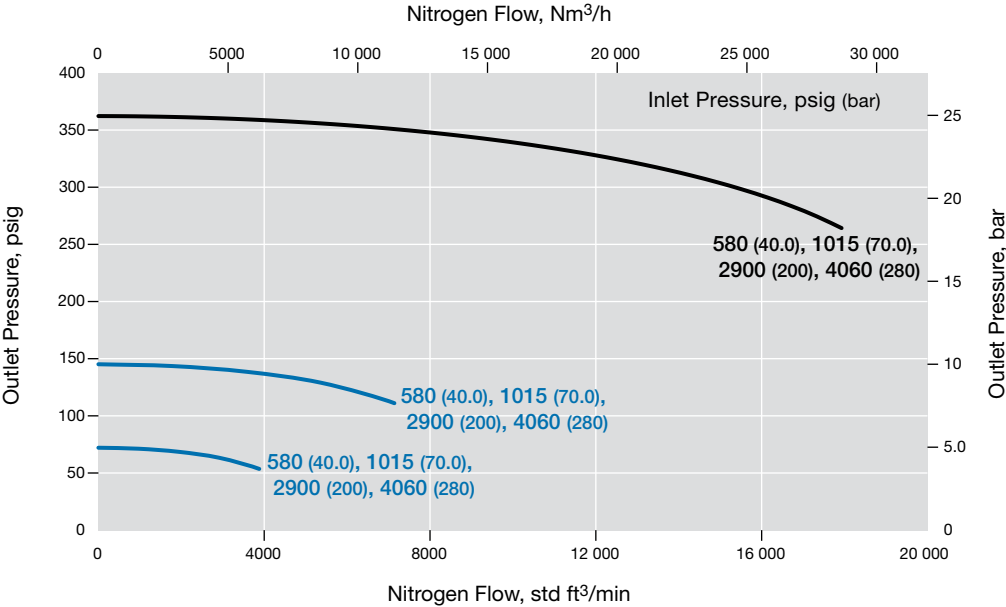
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RDH40 Series

Flow Coefficient: 73
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range

- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)

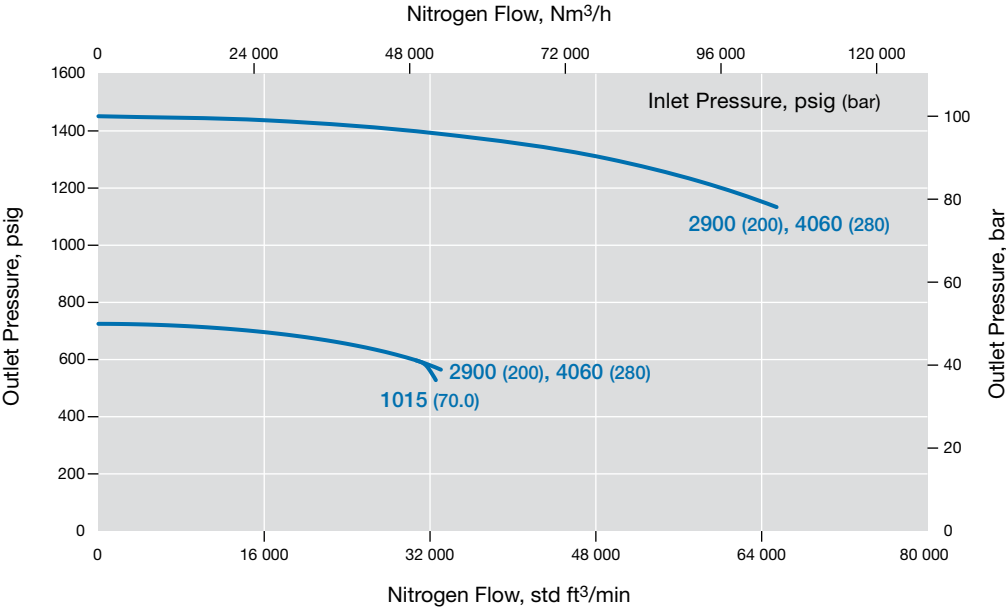


RDH40 Series

Flow Coefficient: 73
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

- 0 to 1450 psig (0 to 100 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH40 Series

Flow Coefficient: 73

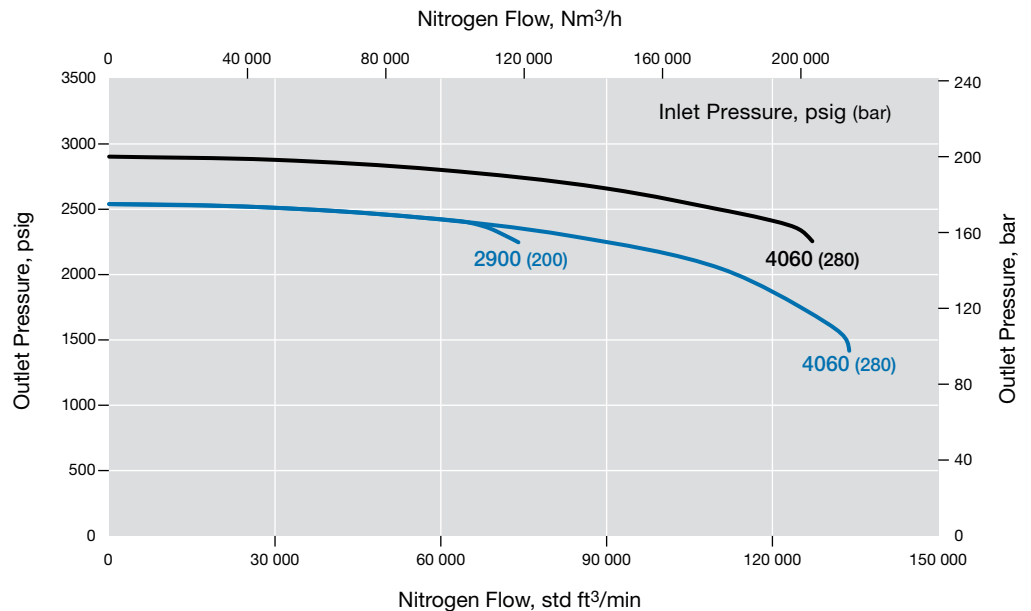
Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range

— 0 to 2900 psig (0 to 200 bar)

— 0 to 2537 psig (0 to 175 bar)



RD40-EF Series

Flow Coefficient: 73

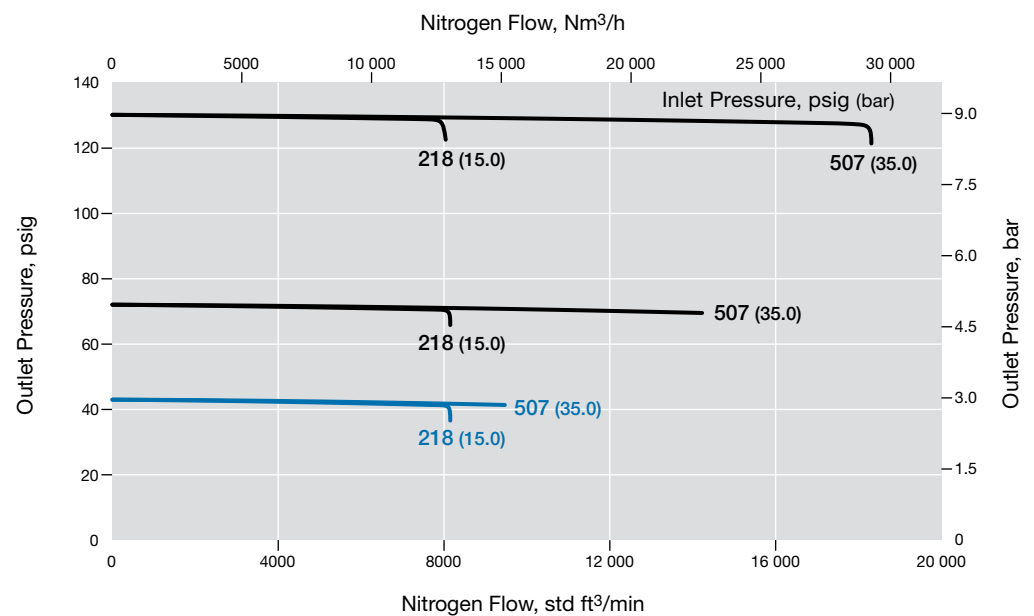
Maximum Inlet Pressure: 507 psig (35.0 bar)

Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

— 0 to 130 psig (0 to 9.0 bar)

— 0 to 43.0 psig (0 to 3.0 bar)



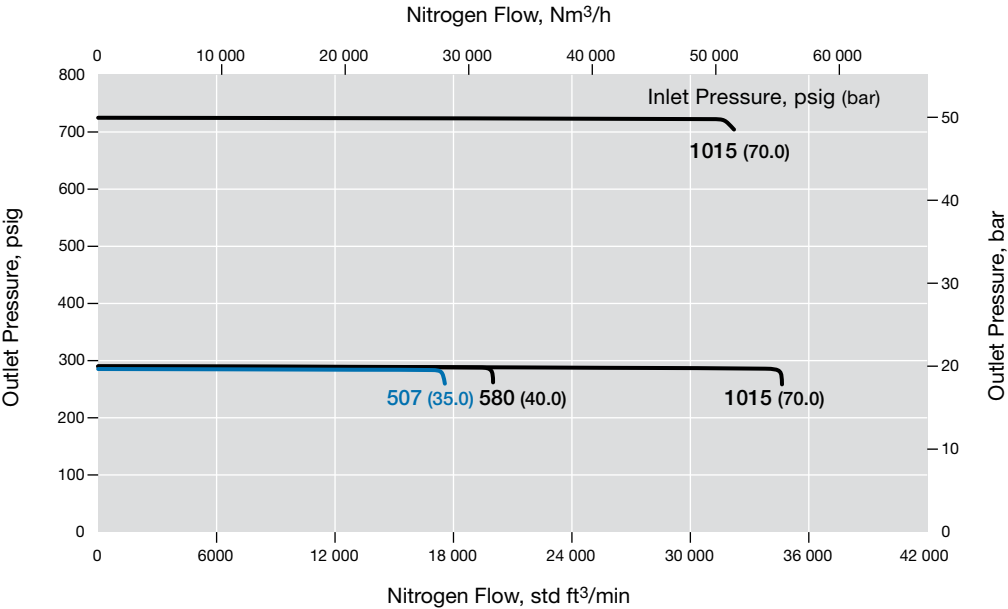
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD40-EF Series

Flow Coefficient: 73
Maximum Inlet Pressure: 1015 psig (70.0 bar)
Outlet Pressure Control Range: 0 to 1015 psig (0 to 70.0 bar)

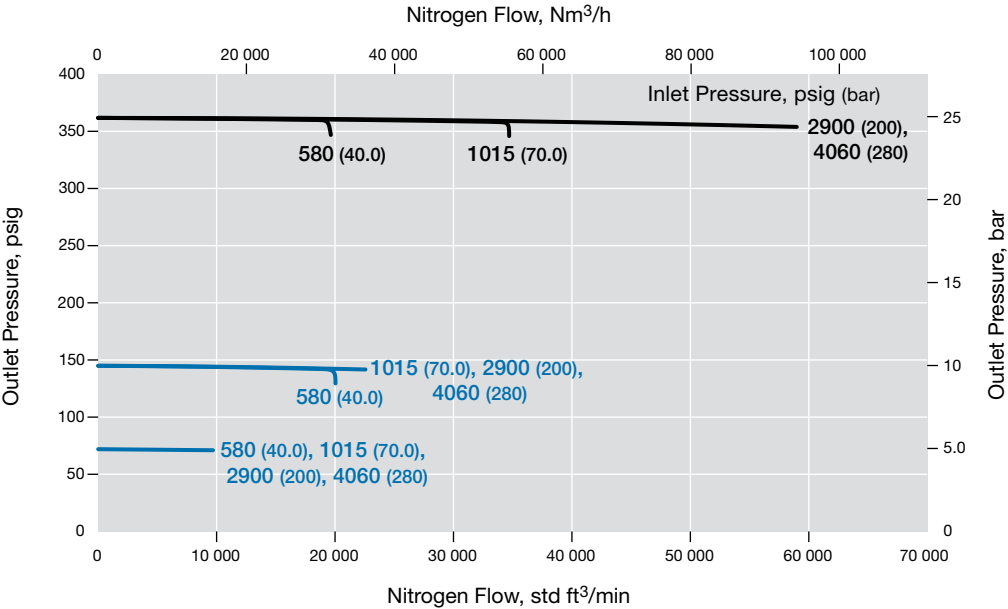
Pressure Control Range
0 to 1015 psig (0 to 70.0 bar)
0 to 290 psig (0 to 20.0 bar)



RDH40-EF Series

Flow Coefficient: 73
Maximum Inlet Pressure: 4060 psig (280 bar)
Outlet Pressure Control Range: 0 to 362 psig (0 to 25.0 bar)

Pressure Control Range
0 to 362 psig (0 to 25.0 bar)
0 to 145 psig (0 to 10.0 bar)



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RDH40-EF Series

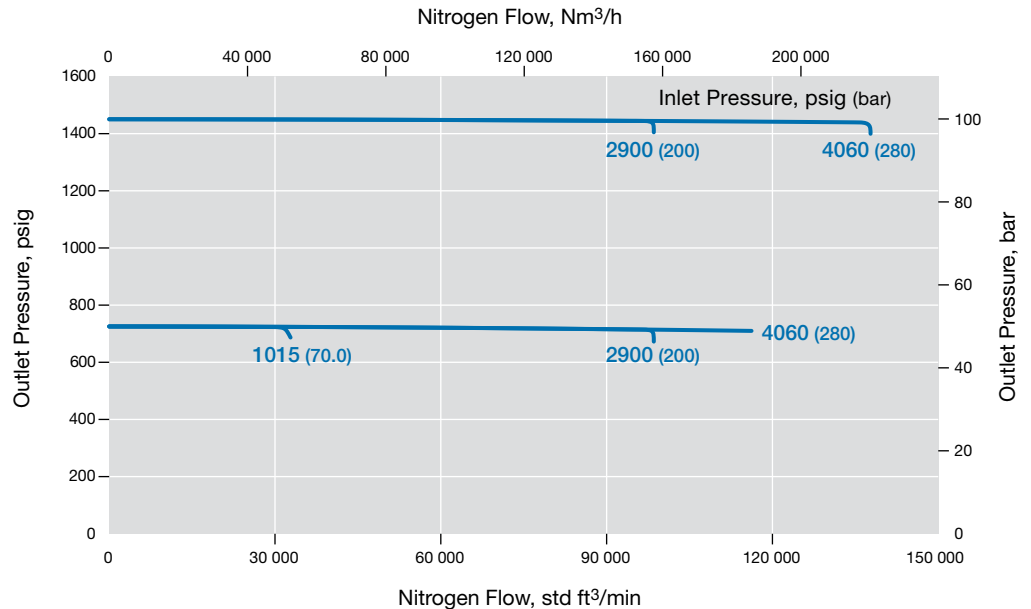
Flow Coefficient: 73

Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

— 0 to 1450 psig (0 to 100 bar)



RDH40-EF Series

Flow Coefficient: 73

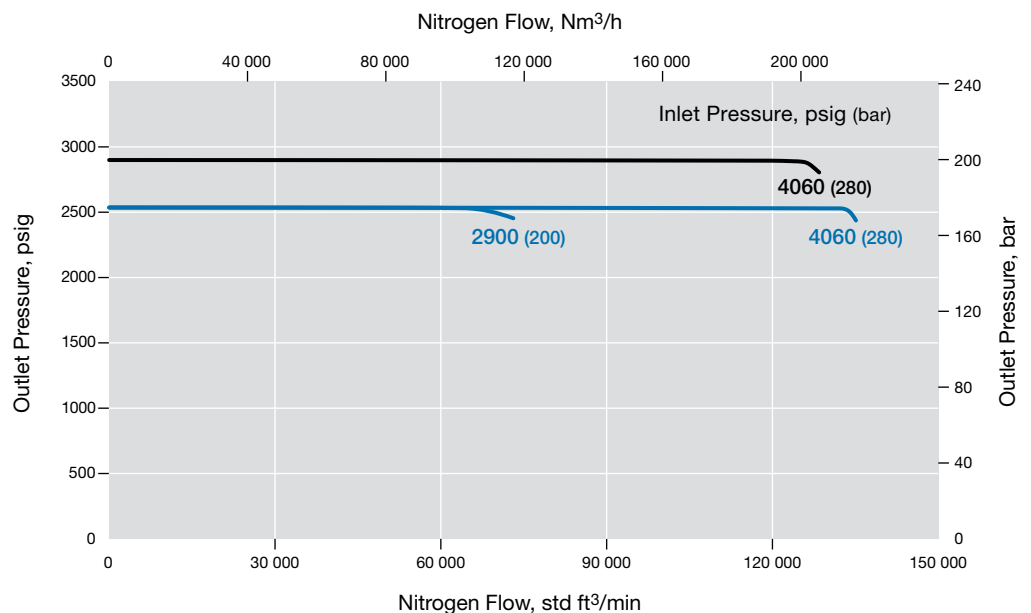
Maximum Inlet Pressure: 4060 psig (280 bar)

Outlet Pressure Control Range: 0 to 2900 psig (0 to 200 bar)

Pressure Control Range

— 0 to 2900 psig (0 to 200 bar)

— 0 to 2537 psig (0 to 175 bar)



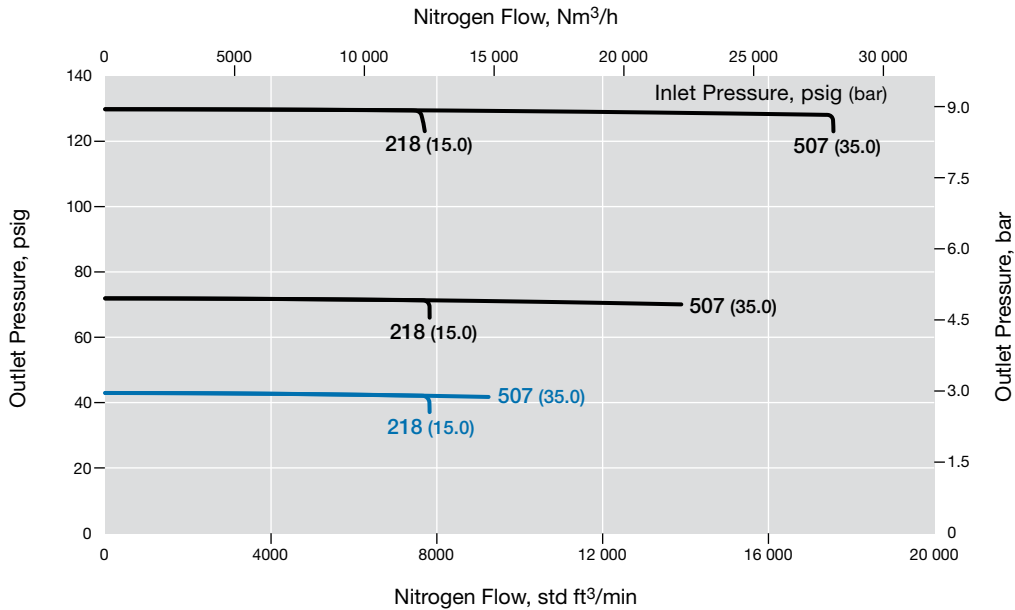
Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.
For more flow curve information, contact your authorized Swagelok representative.

RD40-EFP Series

Flow Coefficient: 73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

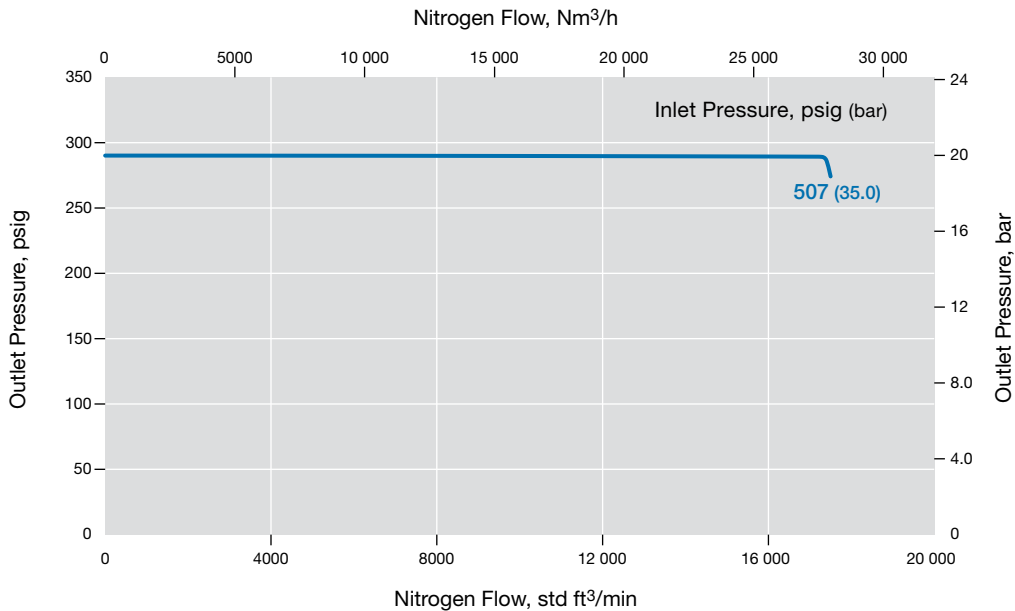
Pressure Control Range
0 to 130 psig (0 to 9.0 bar)
0 to 43.0 psig (0 to 3.0 bar)



RD40-EFP Series

Flow Coefficient: 73
Maximum Inlet Pressure: 507 psig (35.0 bar)
Outlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

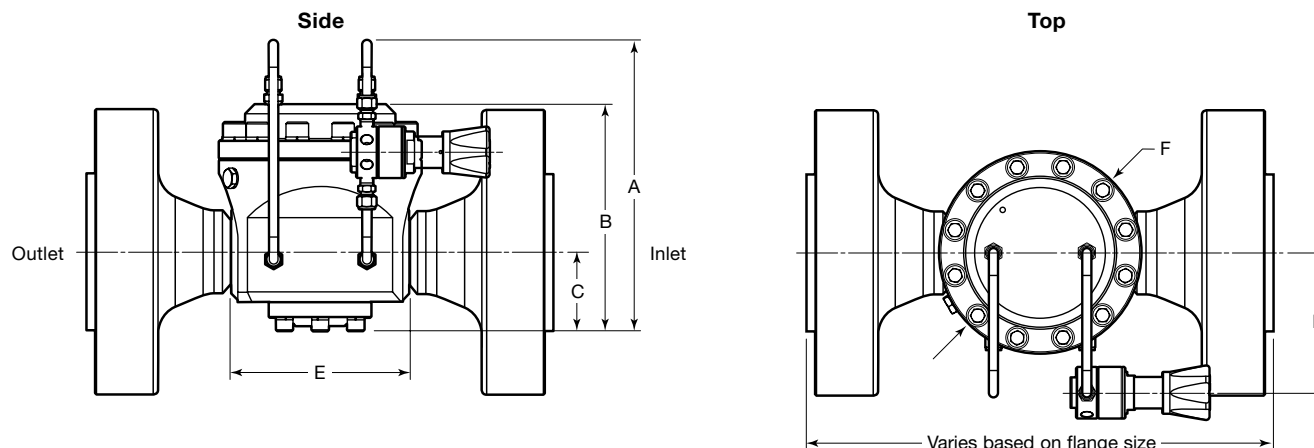
Pressure Control Range
0 to 290 psig (0 to 20.0 bar)



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)					
		A	B	C	D	E	F
RD(H)30	3 in.	12.2 (310)	9.55 (243)	3.33 (84.6)	5.91 (150)	7.48 (190)	8.50 (216)
RD(H)40	4 in.	14.0 (356)	11.4 (290)	4.37 (111)	5.91 (150)	8.27 (210)	8.50 (216)



Shown with RS2 series pilot regulator.

Ordering Information

Build an RD(H)30 and RD(H)40 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RD FA 30 A 1 - 02 - 0 - V V V - EF

1 Series

RD = 1015 psig (70.0 bar) maximum inlet pressure (507 psig [35.0 bar] with pilot regulator, options **0**, **1**, or **2**)

RDH = 4060 psig (280 bar) maximum inlet pressure

2 Inlet / Outlet

FA = ASME B16.5 flange

FD = EN 1092 (DIN) flange

3 Size

30 = 3 in. / DN80

40 = 4 in. / DN100

4 Pressure Class

A = ASME class 150

B = ASME class 300

C = ASME class 600

E = ASME class 1500

F = ASME class 2500

M = EN class PN16

N = EN class PN40

5 Flange Facing

1 = Raised face smooth

3 = RTJ

6 Body Material

02 = 316L SS

7 Pilot Regulator Options

Pressure Control Range

X = No pilot regulator, optional

RD series with LRS4 series pilot regulator

0 = 0 to 43 psig (0 to 3.0 bar)

1 = 0 to 130 psig (0 to 9.0 bar)

2 = 0 to 290 psig (0 to 20.0 bar)

RD series with RS2 series pilot regulator

3 = 0 to 1015 psig (0 to 70.0 bar)

RDH series with RS2 series pilot regulator

4 = 0 to 145 psig (0 to 10.0 bar)

5 = 0 to 362 psig (0 to 25.0 bar)

6 = 0 to 1450 psig (0 to 100 bar)

7 = 0 to 2537 psig (0 to 175 bar)

8 = 0 to 2900 psig (0 to 200 bar)

8 Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

9 Diaphragm Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

10 Seat Seal Material

RD series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

RDH series

P = PEEK

11 Options

EF = External feedback to main regulator

EFP = External feedback to pilot regulator [outlet pressure limited to 290 psig (20.0 bar)]

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

Integral Pilot-Operated, Dome-Loaded Pressure-Reducing Regulators, High Sensitivity—LPRD20, LPRD25, LPRD30, LPRD40 Series

Features

- Balanced poppet design
- Diaphragm sensing
- Integral pilot regulator (LPRS4 series) with dynamic regulation
- High flow
- Large diaphragm for high accuracy
- Integral feedback line
- Inlet and outlet gauges

Options

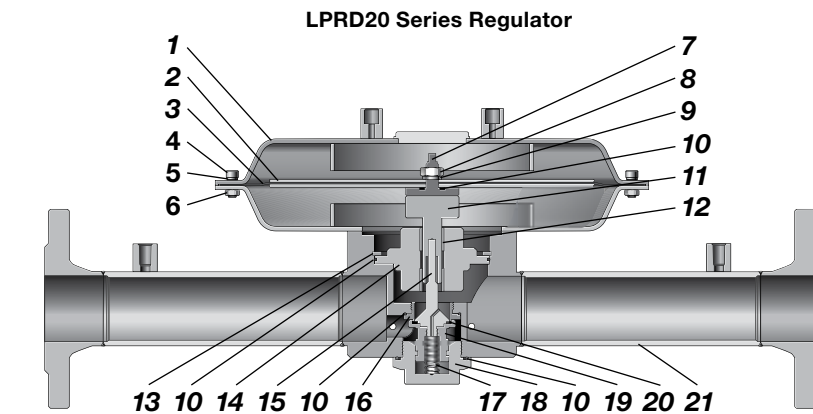
- Special cleaning to ASTM G93 Level C



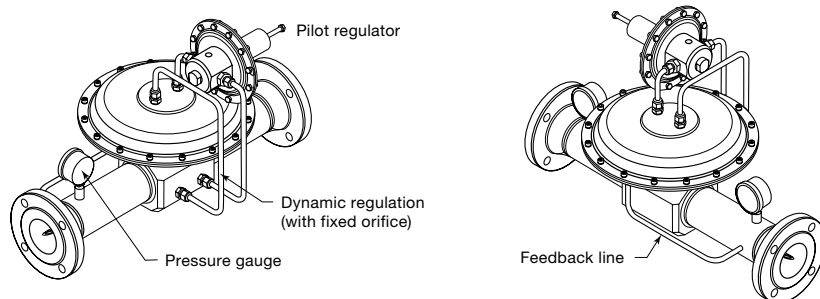
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauges / Dome Connection	Weight lb (kg)
LPRD	232 (16.0)	29.0 (2.0)	Diaphragm	-49 to 176 (-45 to 80) See Pressure-Temperature Ratings , page 921.	LPRD20: 13 LPRD25: 21 LPRD30: 36 LPRD40: 73	LPRD20: 0.98 (25.0) LPRD25: 1.25 (32.0) LPRD30: 1.65 (42.0) LPRD40: 2.36 (60.0)	EN or ASME flanges— LPRD20: 2 in. LPRD25: 2 1/2 in. LPRD30: 3 in. LPRD40: 4 in.	Inlet and outlet gauges included. Dome: 1/4 in. ISO/BSP parallel thread	Varies with model and end connection

Materials of Construction



LPRD20 with LPRS4 Pilot Regulator



Component	Material / Specification
1 Dome assembly	316L SS / A479
2 Dome plate (2)	
3 Diaphragm	EPDM, FKM, or nitrile
4 Cap screw	A4-80
5 Washer	A4
6 Nut	A2
7 Diaphragm screw	316L SS / A479
8 Nut	A2
9 Washer	A4
10 O-ring	EPDM, FKM, or nitrile
11 Push rod	316L SS / A479
12 Guide bushing	PTFE
13 Retaining ring	Commercial stainless steel
14 Body plate	316L SS / A479
15 Poppet	431 SS / A276
16 Seat	316L SS / A479
17 Poppet spring	302 SS / A313
18 Body plug	316L SS / A479
19 Poppet housing	
20 Seat seal	EPDM, FKM, or nitrile
21 Body assembly	316L SS / A479
Wetted lubricants: <i>Silicone-based and synthetic hydrocarbon-based</i>	

Wetted components listed in *italics*.
Gauge plugs (not shown): 431 SS / A276.

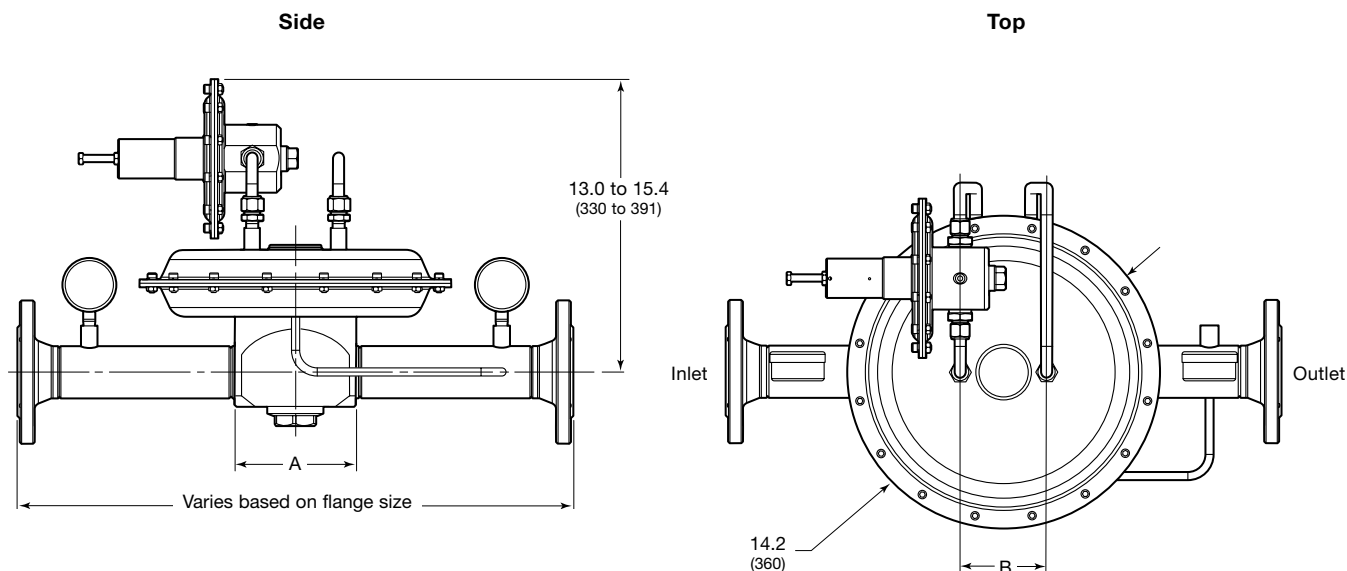
Flow Data

For flow curve information, contact your authorized Swagelok representative.

Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)	
		A	B
LPRD20	2 in.	5.87 (149)	3.94 (100)
LPRD25	2 1/2 in.	7.01 (178)	2.56 (65.0)
LPRD30	3 in.	5.87 (149)	3.94 (100)
LPRD40	4 in.	8.66 (220)	3.94 (100)



Ordering Information

Build an LPRD series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
LPRD FA 20 A 1 - 02 - 2 - V V V - G93

1 Series

LPRD = 232 psig (16.0 bar) maximum inlet pressure

2 Inlet / Outlet

FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size

20 = 2 in. / DN50
25 = 2 1/2 in. / DN65
30 = 3 in. / DN80
40 = 4 in. / DN100

4 Pressure Class

A = ASME class 150
N = EN class PN40

5 Flange Facing

1 = Raised face smooth
3 = RTJ

6 Body Material

02 = 316L SS

7 Pressure Control Range

2 = 1.4 to 14.5 psig (0.10 to 1.0 bar)
3 = 4.3 to 29 psig (0.30 to 2.0 bar)

8 Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

11 Options

G93 = ASTM G93 Level C-cleaned

Air-Loaded, Pressure-Reducing Regulators—RA Series

Features

- Balanced poppet design
- Diaphragm sensing
- Air-loaded pressure control with a choice of pilot-to-outlet pressure ratios.
- Remote control
- Captured self-vent
- Choice of dome-to outlet pressure ratios: 1:15, 1:40, or 1:70
- Pneumatic actuation by spring-loaded regulator or proportional regulator

Options

- Gauge connection—choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



⚠ WARNING: Self-venting regulators can release system fluid to atmosphere. Position the self-vent hole away from operating personnel.

Technical Data

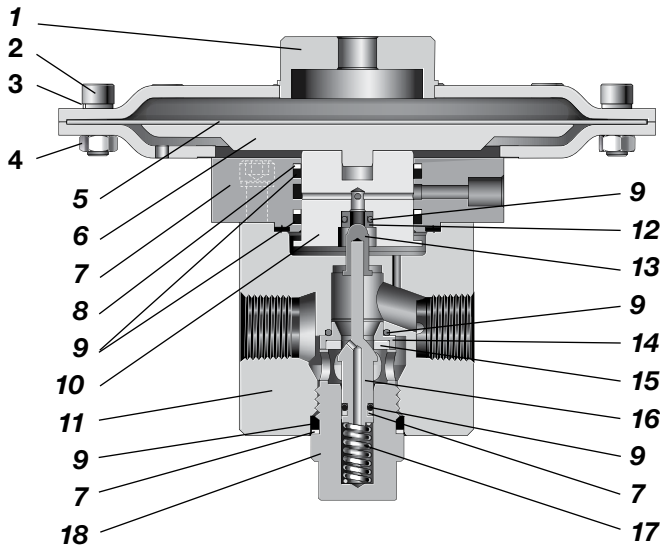
Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure ^① psig (bar)	Temperature Range °C (°F)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Dome / Vent Connections	Weight (Without Flanges) lb (kg)
RA4	5800 (400)	5800 (400)	-40 to 176 (-40 to 80) See Pressure-Temperature Ratings , page 921.	1.84	0.39 (10.0)	1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	Gauge: 1/4 in. NPT Dome: 1/4 in. ISO/BSP parallel thread	12.5 (5.7)
RA6						3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	ISO/BSP parallel thread	13.6 (6.2)
RA8						1 in. ISO/BSP parallel thread, EN or ASME flanges	Vent: 1/8 in. ISO/BSP parallel thread	13.6 (6.2)

See pages 102 to 104 for flow data.

① Outlet control limited to 2175 psig (150 bar) for RA series with dome-to-pressure ratio of 1:15.

Materials of Construction

RA4 Series Regulator



Component	Material / Specification
1 Dome assembly	316L SS / A479
2 Cap screw	A4-80
3 Washer	A4
4 Nut	A2
5 Diaphragm / support	EPDM, FKM, or nitrile / PTFE
6 Diaphragm plate	316L SS / A479
7 Piston plate assembly	316L SS / A479
8 Backup ring	PTFE
9 O-ring	EPDM, FKM, or nitrile
10 Piston	316L SS / A479
11 Body	
12 Relief seat	PCTFE or PEEK
13 Venting poppet	316L SS / A479
14 Seat	
15 Seat seal	PCTFE or PEEK
16 Poppet	431 SS / A276
17 Poppet spring	302 SS / A313
18 Body plug	316L SS / A479
Wetted lubricants: <i>Silicone-based and synthetic hydrocarbon-based</i>	

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RA4 Series

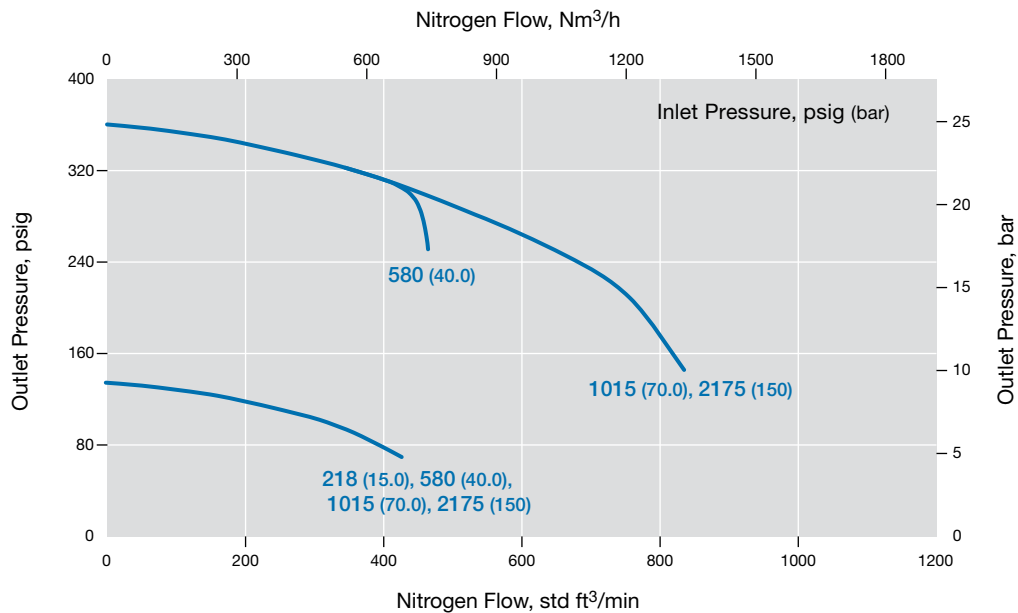
Flow Coefficient: 1.84

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Ratio: 1:15, 1:40, 1:70

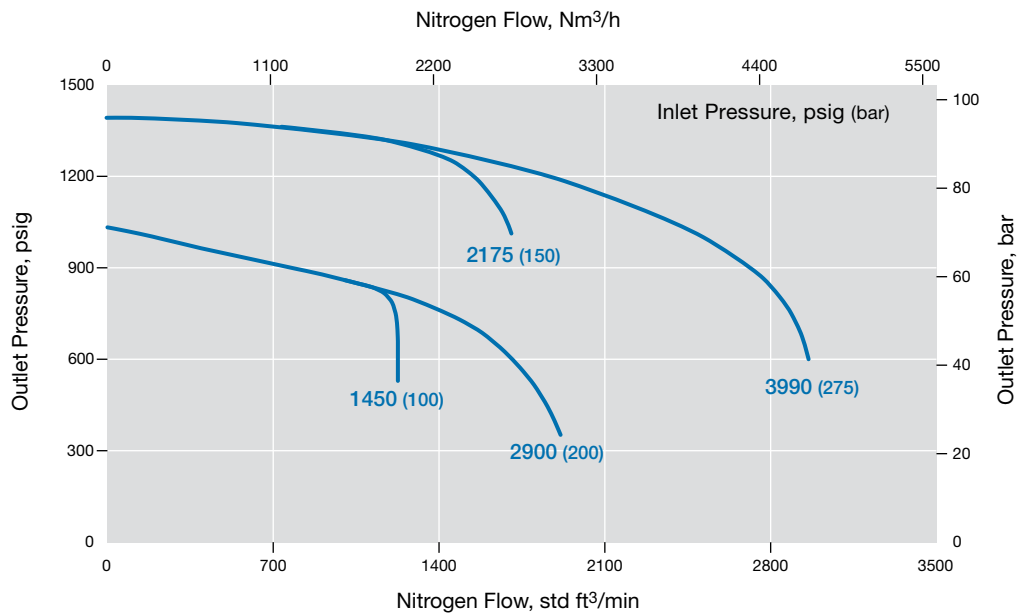
Pressure Ratio

— 1:15, 1:40, 1:70



Pressure Ratio

— 1:15, 1:40, 1:70



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RA4 Series

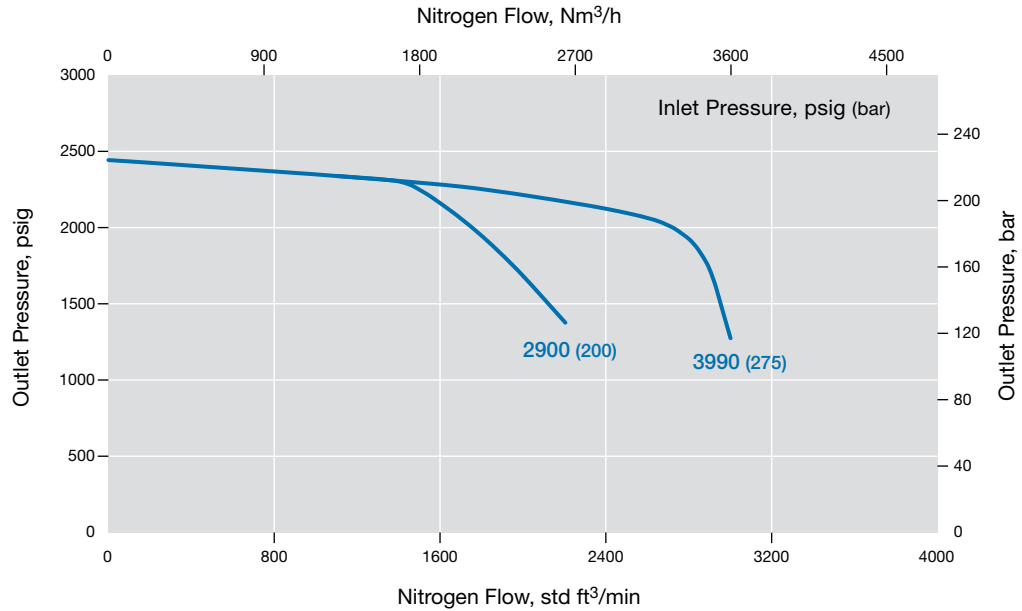
Flow Coefficient: 1.84

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Ratio: 1:40, 1:70

Pressure Ratio

— 1:40, 1:70



RA6 and RA8 Series

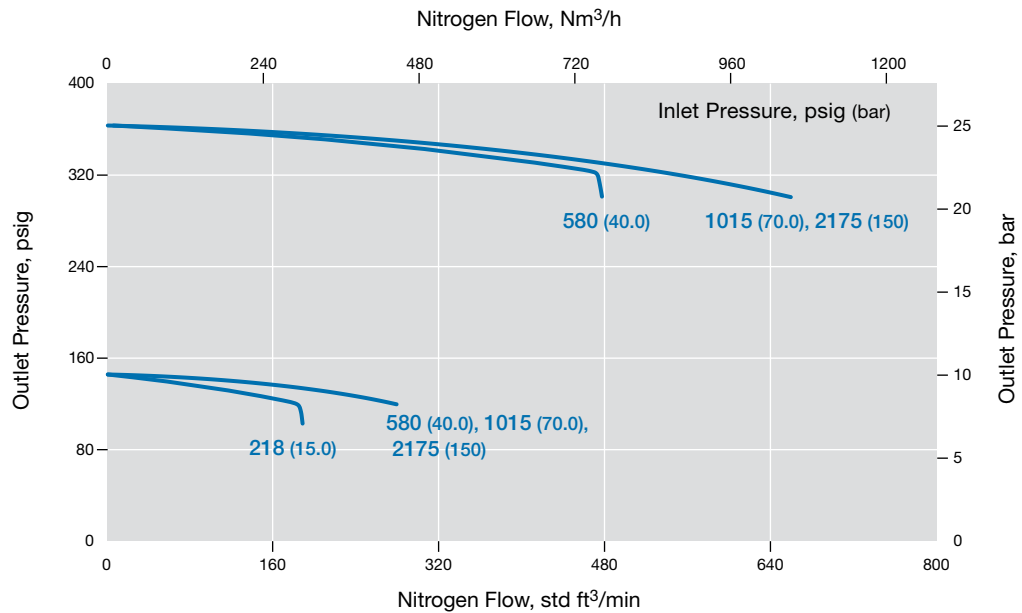
Flow Coefficient: 1.84

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Ratio: 1:15, 1:40, 1:70

Pressure Ratio

— 1:15, 1:40, 1:70



Flow Data

The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

RA6 and RA8 Series

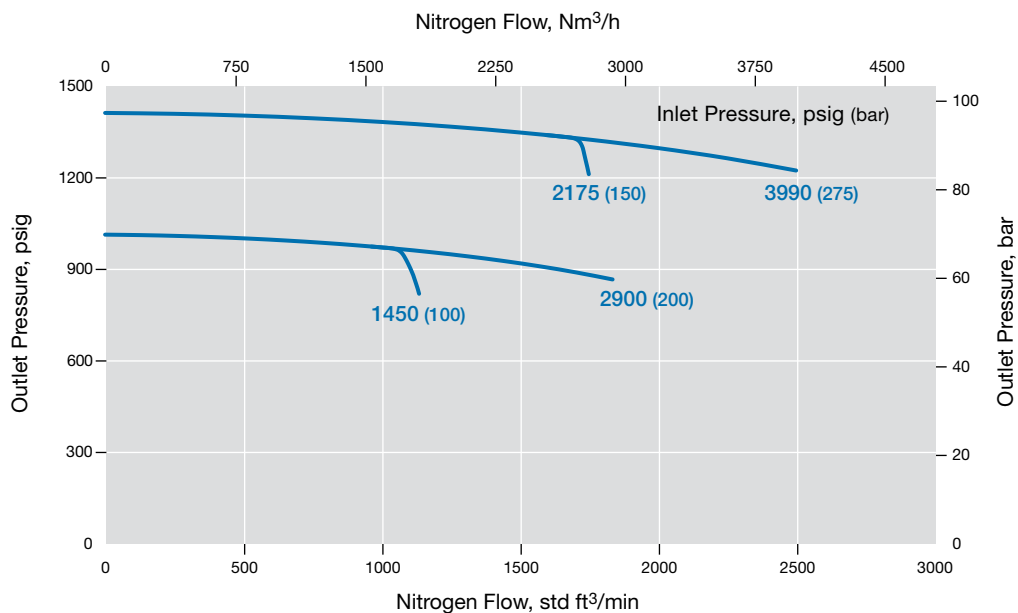
Flow Coefficient: 1.84

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Ratio: 1:15, 1:40, 1:70

Pressure Ratio

— 1:15, 1:40, 1:70



RA6 and RA8 Series

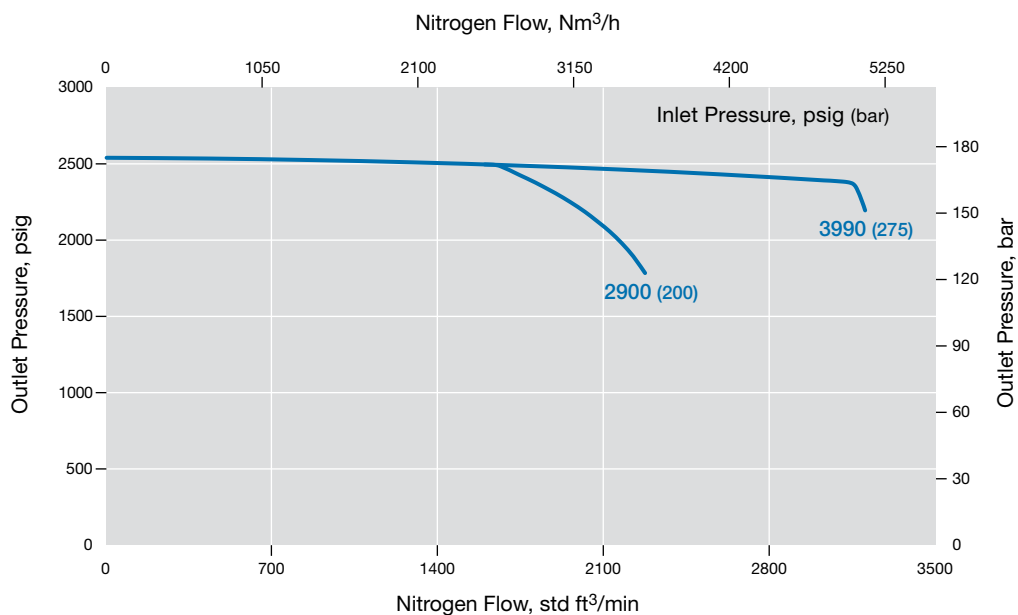
Flow Coefficient: 1.84

Maximum Inlet Pressure: 5800 psig (400 bar)

Outlet Pressure Ratio: 1:40, 1:70

Pressure Ratio

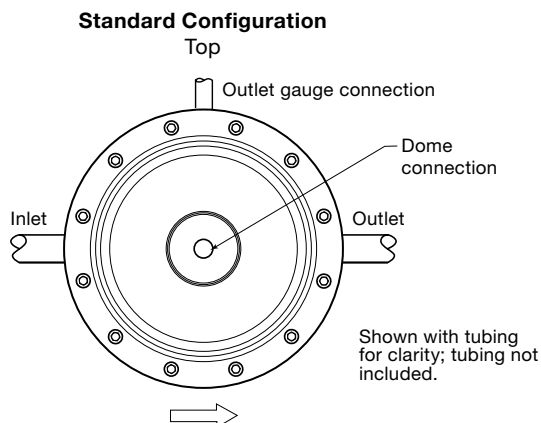
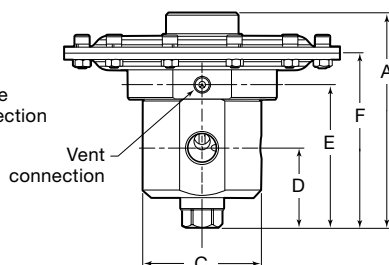
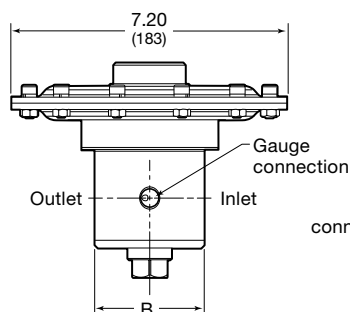
— 1:40, 1:70



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)					
		A	B	C	D	E	F
RA4	1/2 in.	5.75 (146)	2.83 (72.0)	3.07 (78.0)	2.13 (54.0)	3.72 (94.6)	4.56 (116)
RA6	3/4 in.		3.20 (82.0)	3.50 (89.0)	2.20 (56.0)	3.72 (94.6)	
RA8	1 in.		3.07 (78.0)	3.50 (89.0)	2.20 (56.0)	4.02 (102)	



Ordering Information

Build an RA series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
RA FA 4 A 1 - 02 - V V K - 15 - GN2

1 Series

RA = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size

4 = 1/2 in. / DN15
6 = 3/4 in. / DN20
8 = 1 in. / DN25

4 Pressure Class

Omit designator if flanges are not ordered.
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material

02 = 316L SS

7 Seal Materials

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

8 Diaphragm Materials

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Seat Seal Materials

K = PCTFE
P = PEEK

10 Ratio (Dome-to-Outlet Pressure)

15 = 1:15^②
40 = 1:40
70 = 1:70

11 Options

GN2 = Gauge connection, see below^①
GN4 = Gauge connection, see below
GN5 = Gauge connection, see below^①
 None = Standard connection, see below

Gauge Connection Configuration			
Standard	GN2	GN4	GN5

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

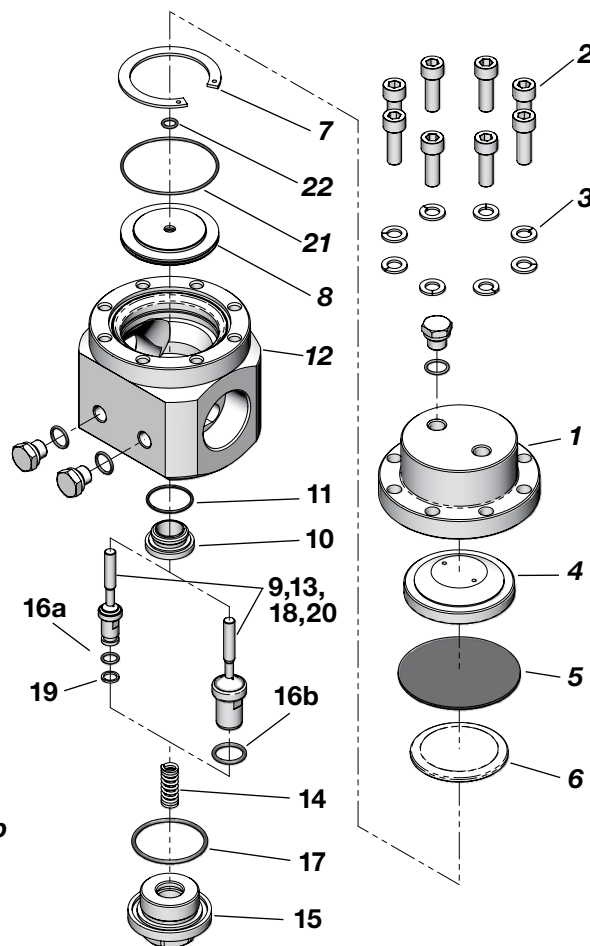
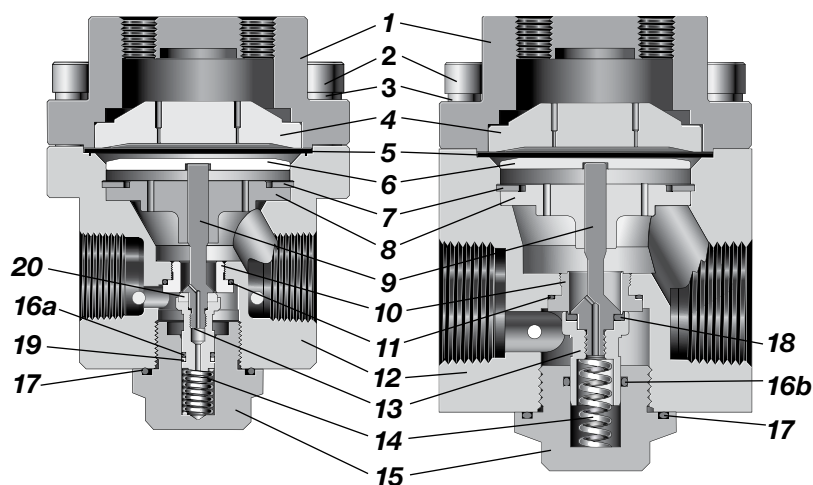
^① Not available in combination with flanges.

^② Outlet control range limited to 2175 psig (150 bar).

Pressure-Reducing Regulators

Dome-Loaded—RD Series Maintenance Kits

Regular maintenance of pressure regulator components is an important part of keeping pressure regulators operating successfully. Swagelok offers several maintenance kit options to help keep components and systems performing well. Outlined below are the standard maintenance kit offerings and an example of which parts are included in each kit. For more detailed information of which parts will be included within a kit for a specific regulator model, please reference the appropriate owner's manual or contact your authorized Swagelok Sales and Service center.



Designator	Kit Type	Typical Contents
A1	Valve kit	Poppet and housing (9, 13, 18 or 20), O-rings (11, 16a), Back-up rings (19), Seat (10),
A2	Soft valve kit	Poppet and housing (9, 13, 18 or 20), O-rings (16a), Back-up rings (19)
B1	Service kit	Poppet and housing (9, 13, 18 or 20), O-rings (11, 16a, 16b, 17, 21, 22), Back-up rings (19), Diaphragm (5), Seat (10)
B2	Seal kit	O-rings (11, 16a, 16b, 17, 21, 22), Back-up rings (19), Diaphragm (5)
C1	Overhaul kit	Poppet and housing (9, 13, 18 or 20), O-rings (11, 16a, 16b, 17, 21, 22), Back-up rings (19), Poppet spring (14), Body plug (15), Diaphragm (5), Diaphragm plate (6), Seat (10)
C2	Body plug kit	O-ring (17, 16b), Body plug (15)
C3	Sensing kit	Diaphragm (5)
C5	Poppet spring kit	Poppet spring (14)
E1	Hardware kit	Bolts (2), Washers (3)

Ordering Information

To order a maintenance kit, add the **kit type designator** to the regulator ordering number.

Example: RDN10-02-2-VVV-**C1**

Back-Pressure, Spring-Loaded Regulators—BS Series

The BS series back-pressure regulators are suitable for most gases and liquids. The BS series regulators feature a choice of sensing types (diaphragm or piston), and seat and seal materials to accommodate a variety of pressure, temperature, and flow conditions.

The BS series regulators are available in sizes from 1/4 to 1 1/2 in. with a choice of threaded or flange end connections.

The BSH series regulators are high-pressure versions of the BS series regulators, and the LBS series are low-pressure, high-accuracy versions of the BS series regulators.

The BS series regulators are available with several options, including a variety of gauge connection configurations, antitamper, special cleaning to ASTM G93 Level C, and NACE MR0175/ISO 15156-compliant models.

Features

- Spring-loaded pressure control
- Diaphragm or piston sensing types
- Blue knob or screw adjustment
- 316L SS materials of construction for corrosion resistance
- Maximum inlet pressure rating: 507 to 10 150 psig (35.0 to 700 bar)
- Inlet control pressure range: Up to 0 to 10 150 psig (0 to 700 bar)



BS(H)2



BS(H)4, 6, 8



BS(H)10, 15



LBS4

Pressure-Temperature Ratings

Seal Material	Temperature Range °F (°C)	Material Designator
Fluorocarbon FKM	5 to 176 (–15 to 80)	V
Standard Nitrile	–4 to 176 (–20 to 80)	N
Low temperature Nitrile	–49 to 176 (–45 to 80)	L
EPDM	–4 to 176 (–20 to 80)	E
FFKM	14 to 176 (–10 to 80)	F

Seat Material	PCTFE	PEEK	Fluorocarbon FKM, Nitrile, EPDM, FFKM
Temperature °F (°C)	Maximum Inlet Pressure / Working Pressure psig (bar)		
-49 to -40 (-45 to -40)	—	—	1015 (70.0)
-40 to -4 (-40 to -20)	5800 (400)	5800 (400)	
95 (35)		10 150 (700)	
149 (65)	3987 (275)		
176 (80)	1812 (125)		

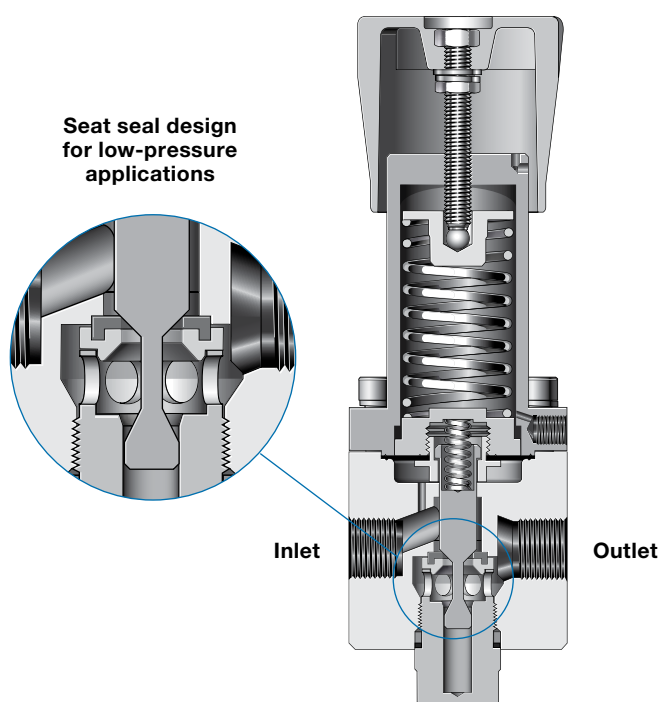
Technical Data—Performance Ratings

Series	Maximum Inlet Pressure ^① psig (bar)	Maximum Inlet Control Pressure ^① psig (bar)	Flow Coefficient (C _v)	Sensing Type	Flow Data on Page
BS2	5 800 (400)	5 075 (350)	0.10	Piston	110
BSH2	10 150 (700)	10 150 (700)			
BS4	1 015 (70.0)	406 (28.0) diaphragm	1.84 (0.39 in. [10.0 mm] seat) 0.49 (0.19 in. [5.0 mm] seat)	Diaphragm or piston	114
BSH4	5 800 (400)	5 220 (360) piston			
BS6	1 015 (70.0)	203 (14.0) diaphragm	1.95 (0.39 in. [10.0 mm] seat) 0.49 (0.19 in. [5.0 mm] seat)	Diaphragm or piston	115
BSH6	5 800 (400)	5 220 (360) piston			
BS8	1 015 (70.0)	203 (14.0) diaphragm	2.07 (0.39 in. [10.0 mm] seat) 0.49 (0.19 in. [5.0 mm] seat)	Diaphragm or piston	116
BSH8	5 800 (400)	5 220 (360) piston			
BS10	1 015 (70.0)	290 (20.0) diaphragm	3.84	Diaphragm or piston	—
BSH10	3 625 (250)	3 625 (250) piston			
BS15	1 015 (70.0)	290 (20.0) diaphragm	7.3	Diaphragm or piston	—
BSH15	3 625 (250)	3 625 (250) piston			
LBS4	507 (35.0)	290 (20.0)	1.3	Diaphragm	125

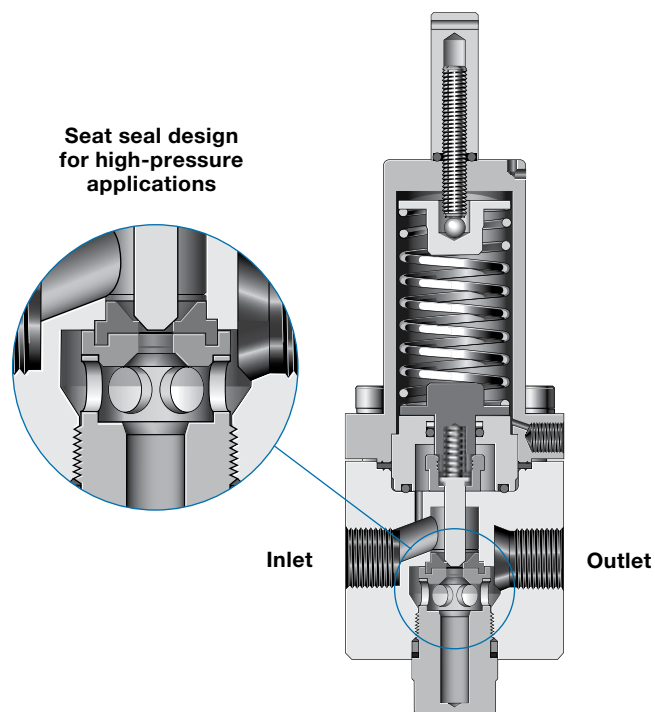
① Regulator pressure rating may be limited by connection type.

Back-Pressure, Spring-Loaded Regulators—BS Series

**BS Series Regulator
with Diaphragm Sensing and
Standard Knob Handle**



**BSH Series Regulator
with Piston Sensing and
Antitamper Option**



Technical Data—Design

Series	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge Connection	Weight (Without Flanges) lb (kg)	More Information on Page
BS2	0.087 (2.2)	1/4 in. NPT	1/4 in. NPT	3.3 (1.5)	109
BSH2					
BS4	0.39 (10.0) or 0.19 (5.0)	1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	7.7 (3.5)	113
BSH4					
BS6	0.39 (10.0) or 0.19 (5.0)	3/4 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	9.9 (4.5)	113
BSH6					
BS8	0.39 (10.0) or 0.19 (5.0)	1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT	9.9 (4.5)	113
BSH8					
BS10	0.53 (13.5)	1 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT or ISO/BSP parallel thread	16.7 (7.6)	118
BSH10					
BS15	0.75 (19.0)	1 1/2 in. NPT, ISO/BSP parallel thread, EN or ASME flanges	1/4 in. NPT or ISO/BSP parallel thread	22.0 (10)	118
BSH15					
LBS4	0.31 (8.0)	1/2 in. NPT	1/4 in. NPT	5.7 (2.6)	124

Compact, General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)2 Series

Features

- Piston sensing
- Bottom mounting
- Low-friction piston for better control

Options

- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C
- Panel mounting kit sold separately—no disassembly required



Technical Data

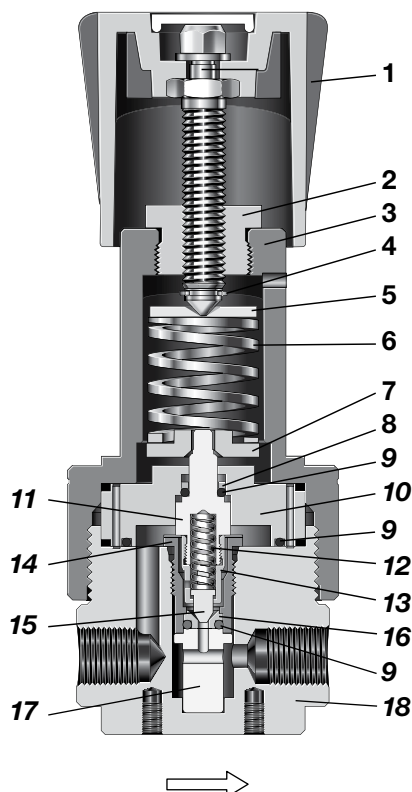
Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / Vent Connection	Weight lb (kg)
BS2	5 800 (400)	5 075 (350)	Piston	−40 to 176 (−40 to 80)	0.10	0.087 (2.2)	1/4 in. NPT	Gauge: 1/4 in. NPT Vent: 1/8 in. NPT	3.3 (1.5)
BSH2	10 150 (700)	10 150 (700)		−4 to 176 (−20 to 80)					

See **Pressure-Temperature Ratings**, page 107, for ratings.

See pages 110 to 111 for flow data.

Materials of Construction

**BS2 Series Regulator
with Standard Threaded Vent**



Component	Material / Specification
1 Knob assembly with adjusting screw, nuts, washer	Blue ABS with 431 SS
2 Spring housing cover	431 SS / A276
3 Spring housing	316L SS / A479
4 C-ring	A2
5 Spring guide	316L SS / A479
6 Set spring	50CRV4
7 Bottom spring guide	316L SS / A479
8 Backup ring (BSH only)	PTFE
9 O-rings	EPDM, FKM, FFKM, or nitrile
10 Piston plate	316L SS / A479
11 Piston	
12 Overtravel spring	302 SS / A313
13 Piston screw	316L SS / A479
14 Body plug	
15 Poppet	431 SS / A276
16 Seat	PCTFE or PEEK
17 Seat retainer	316L SS / A479
18 Body	316L SS / A479

Wetted lubricants: Silicone-based and synthetic hydrocarbon-based

Wetted components listed in italics.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

BS(H)2 Series

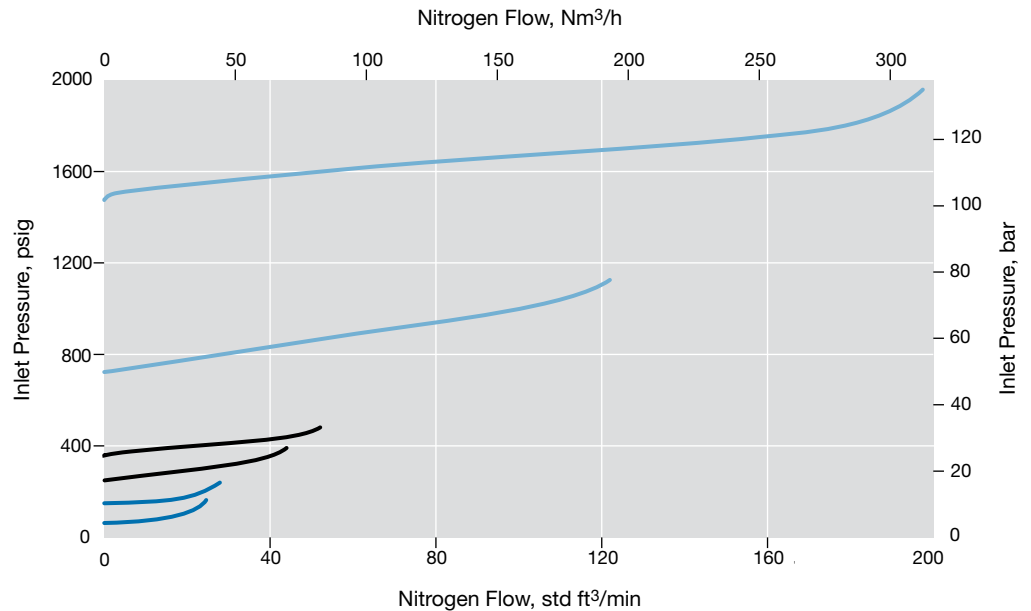
Flow Coefficient: 0.10

Maximum Inlet Pressure: BS2—5800 psig (400 bar); BSH2—10 150 psig (700 bar)

Inlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

- 0 to 1450 psig (0 to 100 bar)
- 0 to 362 psig (0 to 25.0 bar)
- 0 to 145 psig (0 to 10.0 bar)



BS(H)2 Series

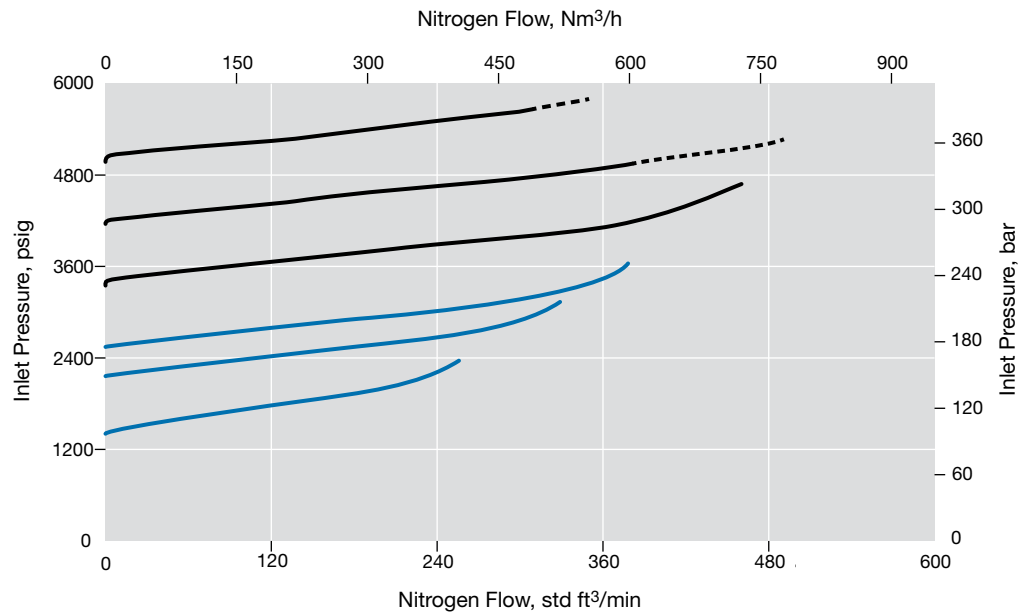
Flow Coefficient: 0.10

Maximum Inlet Pressure: BS2—5800 psig (400 bar); BSH2—10 150 psig (700 bar)

Inlet Pressure Control Range: 0 to 5075 psig (0 to 350 bar)

Pressure Control Range

- 0 to 5075 psig (0 to 350 bar)
- - - 0 to 5075 psig (0 to 350 bar), calculated
- 0 to 2537 psig (0 to 175 bar)



Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

BSH2 Series

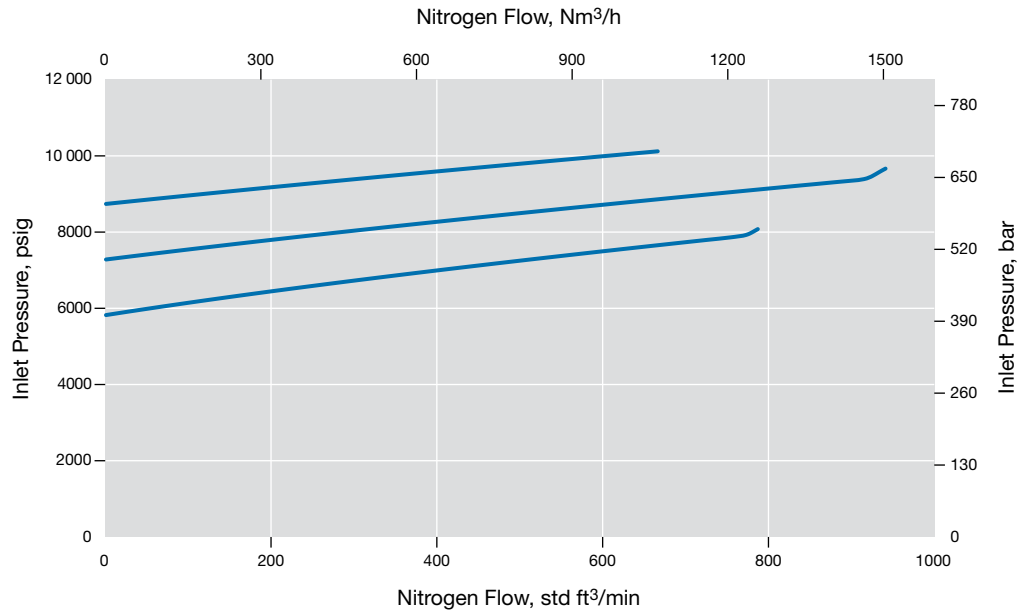
Flow Coefficient: 0.10

Maximum Inlet Pressure: 10 150 psig (700 bar)

Inlet Pressure Control Range: 0 to 10 150 psig (0 to 700 bar)

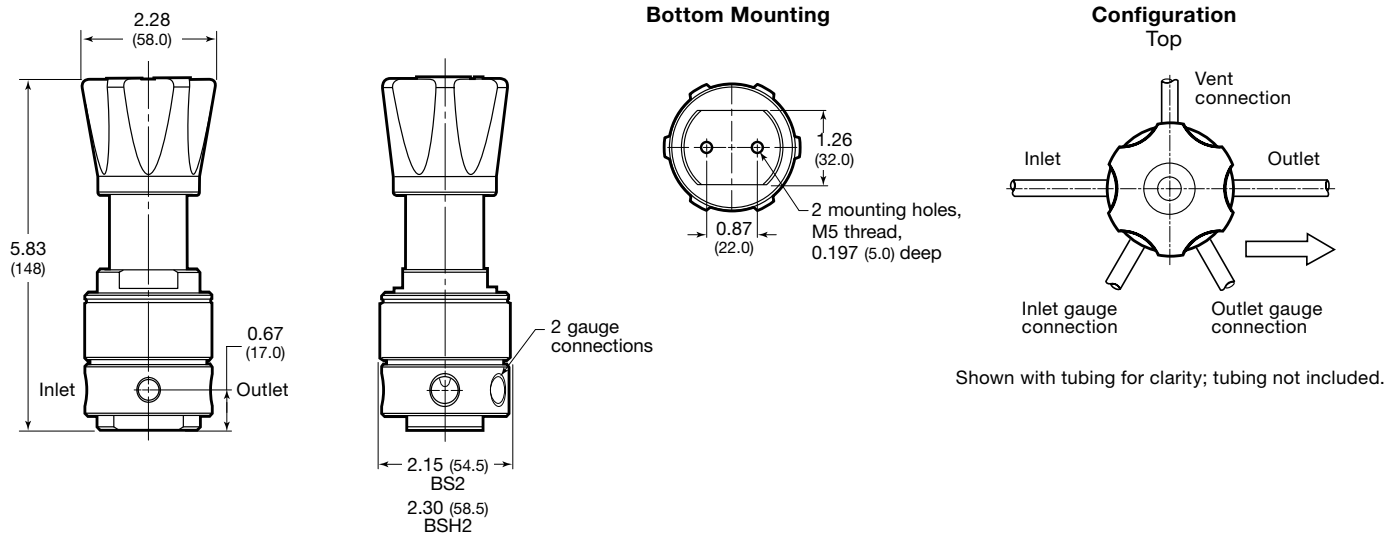
Pressure Control Range

— 0 to 10 150 psig (0 to 700 bar)



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

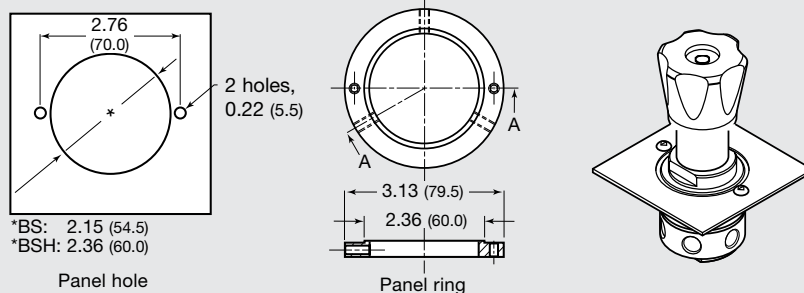


Panel Mounting Kit

No disassembly required when using panel mount kit. Panel mounting kit ordering numbers:

BS2 series: **RS2-P-02**

BSH2 series: **RSH2-P-02**



Ordering Information

Build a BS2 or BSH2 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8
BS N2 - 02 - 1 - V V K - N

1 Series

BS = 5800 psig (400 bar) maximum inlet pressure

BSH = 10 150 psig (700 bar) maximum inlet pressure

2 Inlet / Outlet

N2 = 1/4 in. female NPT

3 Body Material

02 = 316L SS

4 Pressure Control Range

BS and BSH series

1 = 0 to 145 psig (0 to 10.0 bar)

2 = 0 to 362 psig (0 to 25.0 bar)

3 = 0 to 1450 psig (0 to 100 bar)

4 = 0 to 2537 psig (0 to 175 bar)

5 = 0 to 5075 psig (0 to 350 bar)

BSH series only

6 = 0 to 10 150 psig (0 to 700 bar)

5 Seal Material

BS and BSH series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

F = FFKM

BS series only

L = Low temperature Nitrile

6 Piston Seals

BS and BSH series

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

F = FFKM

BS series only

L = Low temperature Nitrile

7 Seat Material

BS series

K = PCTFE

P = PEEK

BSH series

P = PEEK

8 Options

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)4, BS(H)6, and BS(H)8 Series

Features

- Diaphragm sensing:
0 to 406 psig (0 to 28.0 bar)
- Piston sensing:
0 to 5220 psig (0 to 360 bar)
- Threaded vent to monitor seal integrity

Options

- Antitamper
- Gauge connections —choice of 4 configurations
- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



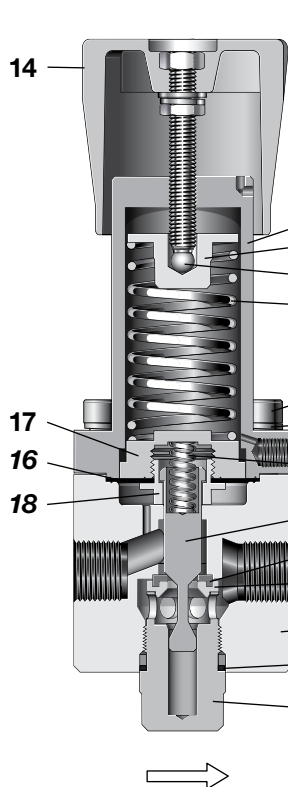
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Connections			Weight (Without Flanges) lb (kg)
							Inlet and Outlet		Gauge and Vent	
							Size	Type		
BS(H)4	BS: 1015 (70.0) BSH: 5800 (400)	BS4: 0 to 406 psig (28.0 bar) BS6, 8: 0 to 203 psig (14.0 bar) BSH: 5220 (360)	Diaphragm: BS4: 0 to 406 psig (28.0 bar) BS6, 8: 0 to 203 psig (14.0 bar) Piston: 0 to 5220 psig (360 bar)	−40 to 176 (−40 to 80) See Pressure-Temperature Ratings , page 985.	BS4: 1.84 BS6: 1.95 BS8: 2.07 with 0.39 in. (10.0 mm) seat; All: 0.49 with 0.19 in. (5.0 mm) seat	0.39 (10.0) for up to 1160 psig (80.0 bar) 0.19 (5.0) for 2175 to 5220 psig (150 to 360 bar)	1/2 in. DN15	NPT ISO/BSP parallel thread ASME or EN flange	Gauge: 1/4 in. NPT Vent: 1/8 in. ISO/BSP parallel thread	7.7 (3.5)
BS(H)6							3/4 in. DN20		9.9 (4.5)	
BS(H)8							1 in. DN25			

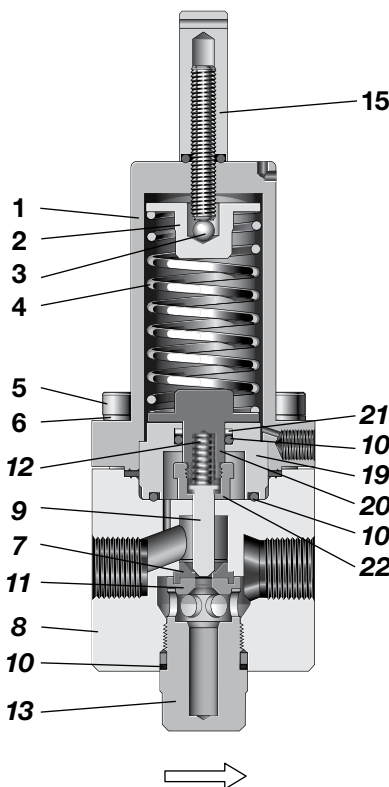
See pages 114 and 116 for flow data.

Materials of Construction

BS Series Regulator with Diaphragm Sensing and Standard Knob



BSH Series Regulator with Piston Sensing and Antitamper Option



Component		Material / Specification
Common Components	1 Spring housing	316L SS / A479
	2 Spring guide	
	3 Ball	Commercial stainless steel
	4 Set spring	302 SS / A313
	5 Cap screw	A4-80
	6 Washer	A4
	7 Seat seal	PCTFE or PEEK
	8 Body	316L SS / A479
	9 Poppet	431 SS / A276
	10 O-rings	EPDM, FKM, or nitrile
	11 Seat	316L SS / A479
	12 Overtravel spring	302 SS / A313
	13 Body plug	316L SS / A479
Actuation	14 Knob assembly with adjusting screw, nuts, washers	Blue ABS with A2-70
	15 Antitamper with O-ring, adjusting screw	316L SS and A2-70 (O-ring same as item 10)
Sensing Mechanism	Diaphragm Only	
	16 Diaphragm	EPDM, FKM, or nitrile
	17 Diaphragm plate	316L SS / A479
	18 Diaphragm screw	316L SS / A479
	Piston Only	
	19 Piston plate	316L SS / A479
	20 Piston	
	21 Backup ring	PTFE
	22 Piston screw	316L SS / A479 ^①

Wetted lubricant: Silicone-based, synthetic hydrocarbon-based

① BSH4 (range 5 and 6), BSH6 (range 6), and BSH8 (range 6) the material will be Alloy 2507.

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

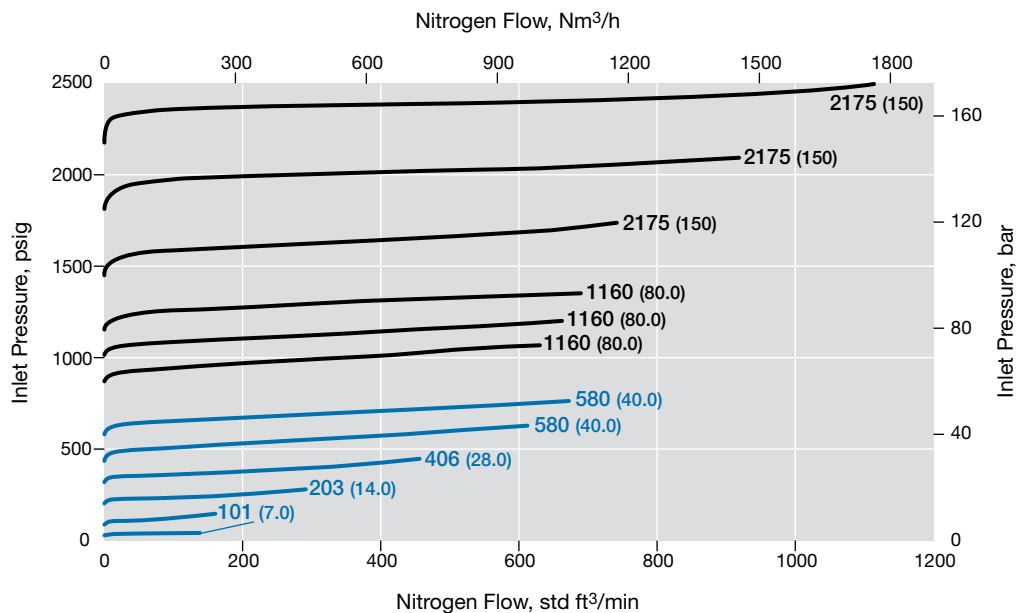
BS(H)4 Series

Flow Coefficient: 1.84

Maximum Inlet Pressure: BS4—1015 psig (70.0 bar); BSH4—5800 psig (400 bar)

Regulator Series

— BSH4 only
— BS4 and BSH4



BSH4 Series

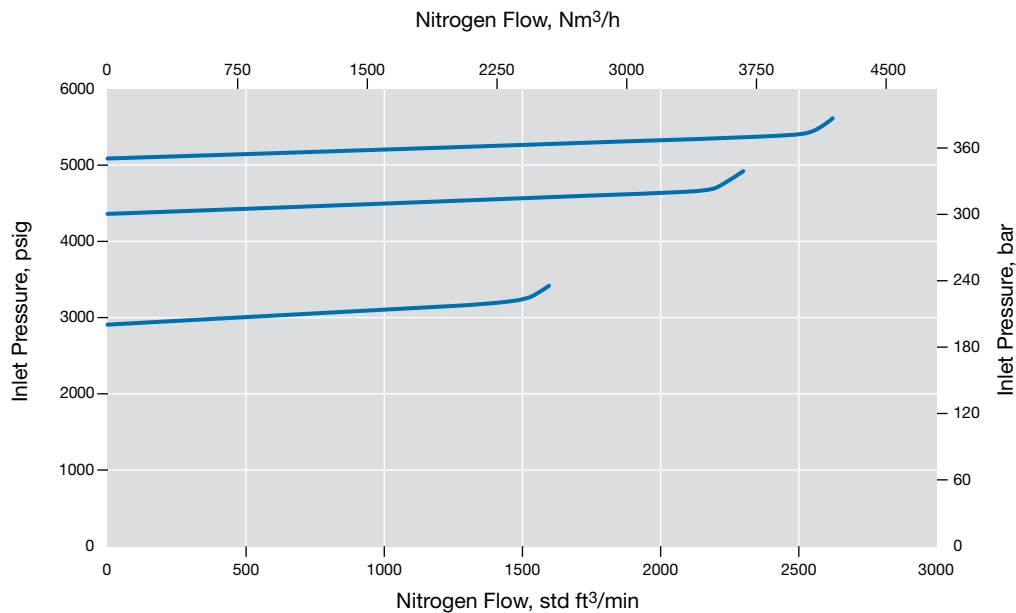
Flow Coefficient: 0.49

Maximum Inlet Pressure: 5800 psig (400 bar)

Inlet Pressure Control Range: 0 to 5220 psig (0 to 360 bar)

Pressure Control Range

— 0 to 5220 psig (360 bar)



Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

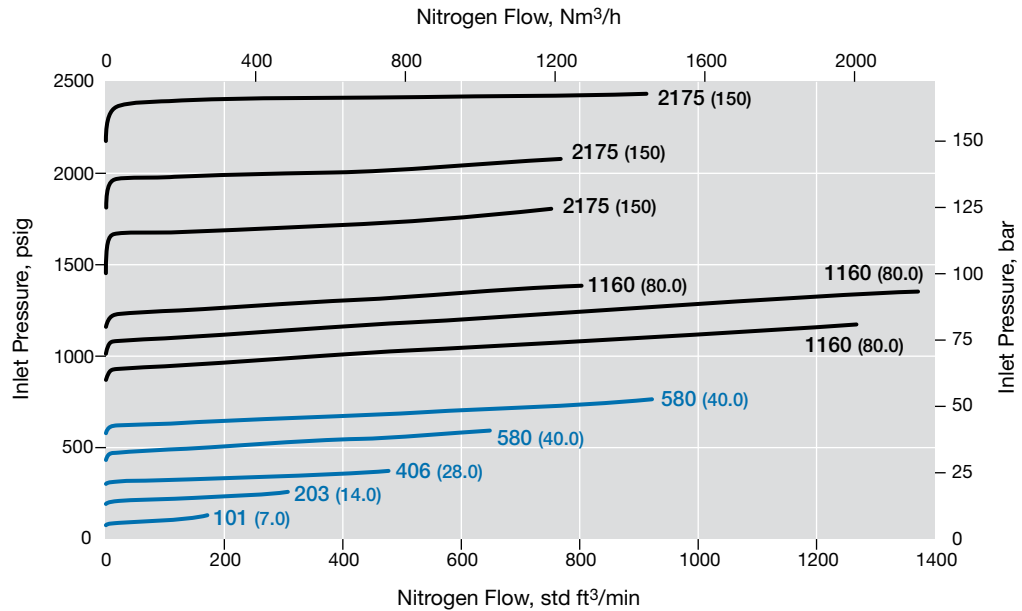
BS(H)6 Series

Flow Coefficient: 1.95

Maximum Inlet Pressure: BS6—1015 psig (70.0 bar); BSH6—5800 psig (400 bar)

Regulator Series

— BSH6 only
— BS6 and BSH6



BSH6 Series

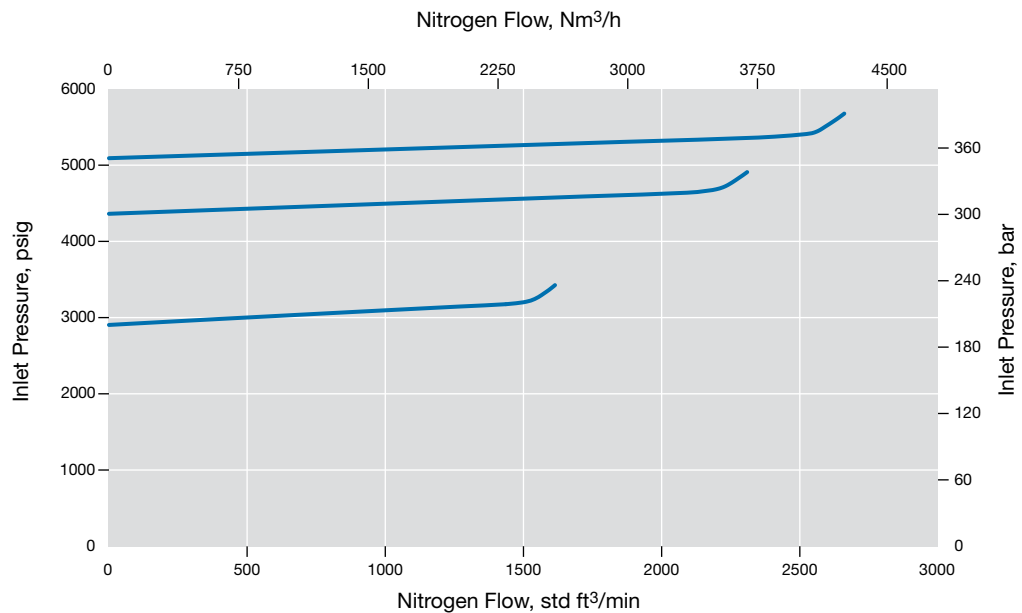
Flow Coefficient: 0.49

Maximum Inlet Pressure: 5800 psig (400 bar)

Inlet Pressure Control Range: 0 to 5220 psig (0 to 360 bar)

Pressure Control Range

— 0 to 5220 psig (360 bar)



Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

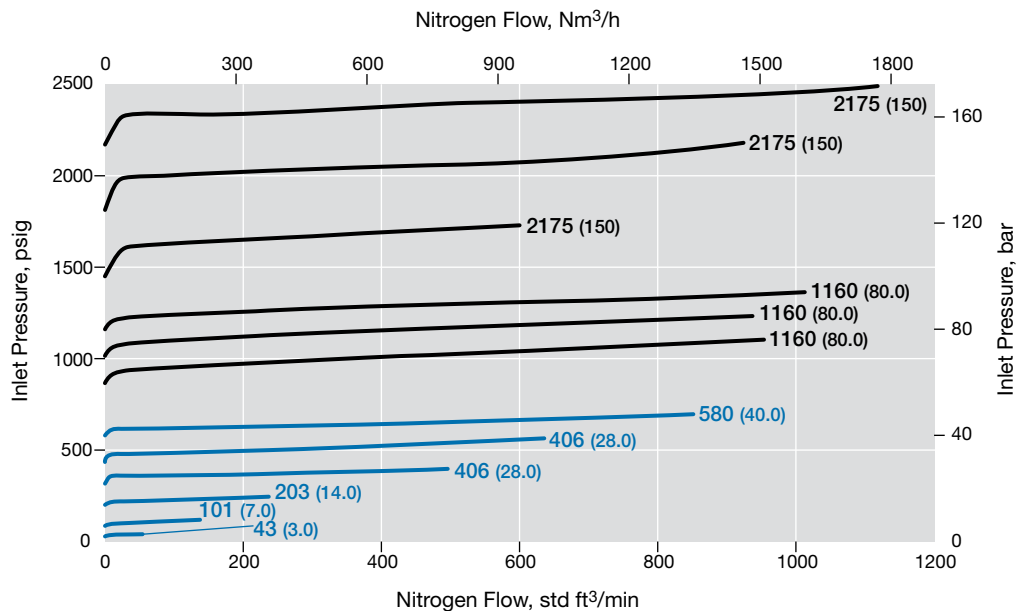
BS(H)8 Series

Flow Coefficient: 2.07

Maximum Inlet Pressure: BS8—1015 psig (70.0 bar); BSH8—5800 psig (400 bar)

Regulator Series

— BSH8 only
— BS8 and BSH8



BSH8 Series

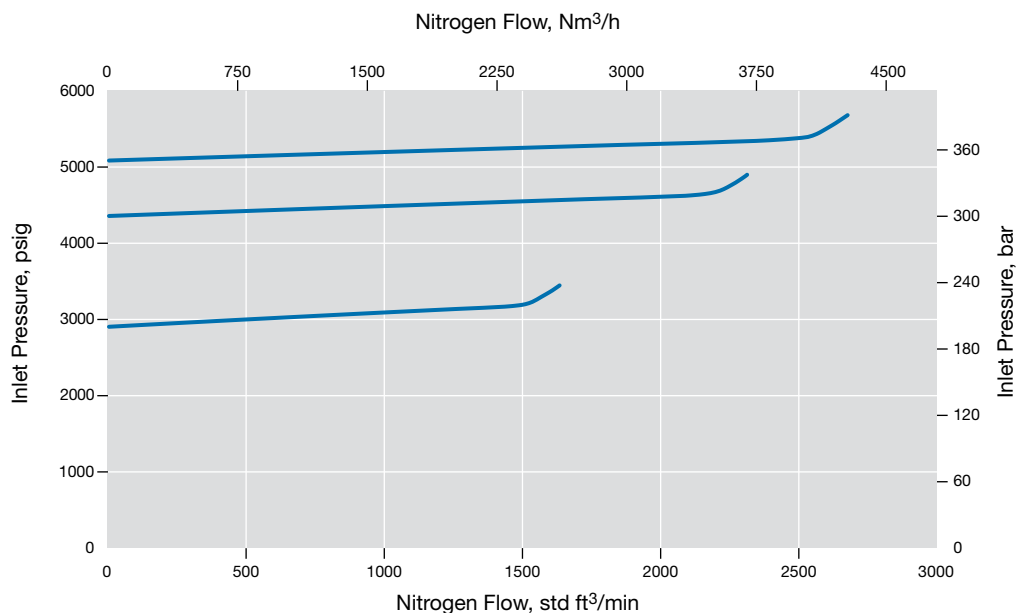
Flow Coefficient: 0.49

Maximum Inlet Pressure: 5800 psig (400 bar)

Inlet Pressure Control Range: 0 to 5220 psig (0 to 360 bar)

Pressure Control Range

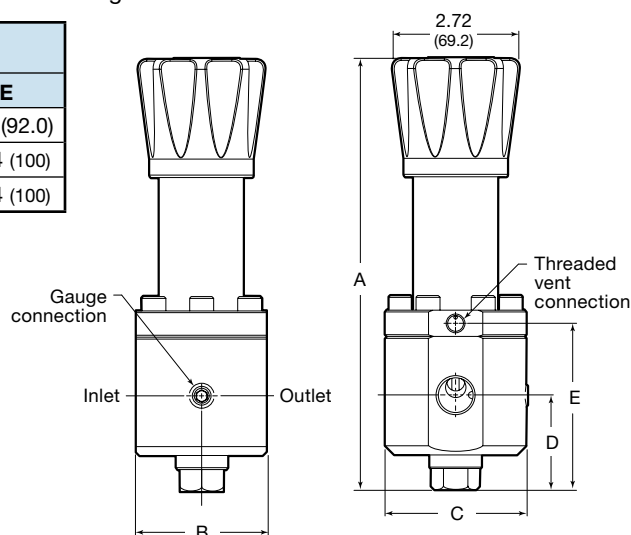
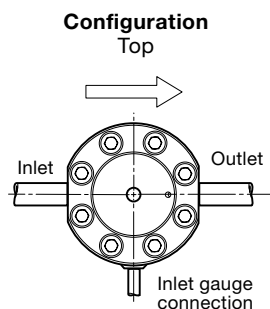
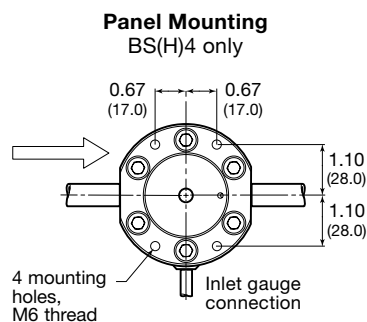
— 0 to 5220 psig (360 bar)



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)				
		A	B	C	D	E
BS(H)4	1/2 in.	9.06 (230)	2.83 (72.0)	3.07 (78.0)	2.09 (53.0)	3.62 (92.0)
BS(H)6	3/4 in.	9.25 (235)	3.23 (82.0)	3.50 (89.0)	2.20 (56.0)	3.94 (100)
BS(H)8	1 in.	9.25 (235)	3.07 (78.0)	3.50 (89.0)	2.20 (56.0)	3.94 (100)



Shown with tubing for clarity; tubing not included.

Ordering Information

Build a BS(H)4, BS(H)6, and BS(H)8 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
BS FA 4 A 1 - 02 - 1 - V V K - GN2

1 Series

BS = 1015 psig (70.0 bar) maximum inlet pressure

BSH = 5800 psig (400 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread

N = Female NPT

FA = ASME B16.5 flange

FD = EN 1092 (DIN) flange

3 Size

4 = 1/2 in. / DN15

6 = 3/4 in. / DN20

8 = 1 in. / DN25

4 Pressure Class

Omit designator if flanges are not ordered.

A = ASME class 150

B = ASME class 300

C = ASME class 600

E = ASME class 1500

F = ASME class 2500

M = EN class PN16

N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.

1 = Raised face smooth

3 = RTJ

6 Body Material

02 = 316L SS

7 Pressure Control Range

Diaphragm sensing

1 = 0 to 43 psig (0 to 3.0 bar)

2 = 0 to 101 psig (0 to 7.0 bar)

3 = 0 to 203 psig (0 to 14.0 bar)

4 = 0 to 406 psig (0 to 28.0 bar)^①

Piston sensing

4 = 0 to 406 psig (0 to 28.0 bar)^②

5 = 0 to 580 psig (0 to 40.0 bar)

6 = 0 to 1160 psig (0 to 80.0 bar)

7 = 0 to 2175 psig (0 to 150 bar)

9 = 0 to 4060 psig (0 to 280 bar)

11 = 0 to 5220 psig (0 to 360 bar)

^① BS(H)4 series only.

^② BS(H)6 and BS(H)8 series only.

8 Seal Material

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

9 Diaphragm / Piston O-Rings

V = Fluorocarbon FKM

N = Nitrile

E = EPDM

L = Low temperature Nitrile

10 Seat Seal Material

K = PCTFE

P = PEEK

11 Options

A = Antitamper

GN1 = Gauge connection, see below

GN2 = Gauge connection, see below

GN5 = Gauge connection, see below

None = Standard connection, see below

Gauge Connection Configuration			
Standard	GN1	GN2	GN5
			

N = NACE MR0175/ISO 15156

G93 = ASTM G93 Level C-cleaned

General-Purpose, Spring-Loaded Back-Pressure Regulators—BS(H)10 and BS(H)15 Series

Features

- Balanced poppet design
- Diaphragm sensing:
0 to 290 psig (0 to 20.0 bar)
- Piston sensing:
0 to 3625 psig (0 to 250 bar)
- High flow capacity

Options

- NACE MR0175/ISO 15156-compliant models
- Special cleaning to ASTM G93 Level C



Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Connections			Weight (Without Flanges) lb (kg)
							Inlet and Outlet		Gauge	
BS(H)10	BS: 1015 (70.0)	BS: 290 (20.0)	Diaphragm: 0 to 290 psig (20.0 bar)	-49 to 176 (-45 to 80) See Pressure-Temperature Ratings , page 985.	3.84	0.53 (13.5)	1 in. DN25	NPT ISO/BSP parallel thread	1/4 in. NPT or ISO/BSP parallel ^①	16.7 (7.6)
BS(H)15	BSH: 3625 (250)	BSH: 3625 (250)	Piston: 0 to 3625 psig (0 to 250 bar)		7.3	0.75 (19.0)	1 1/2 in. DN40	ASME or EN flange		22.0 (10.0)

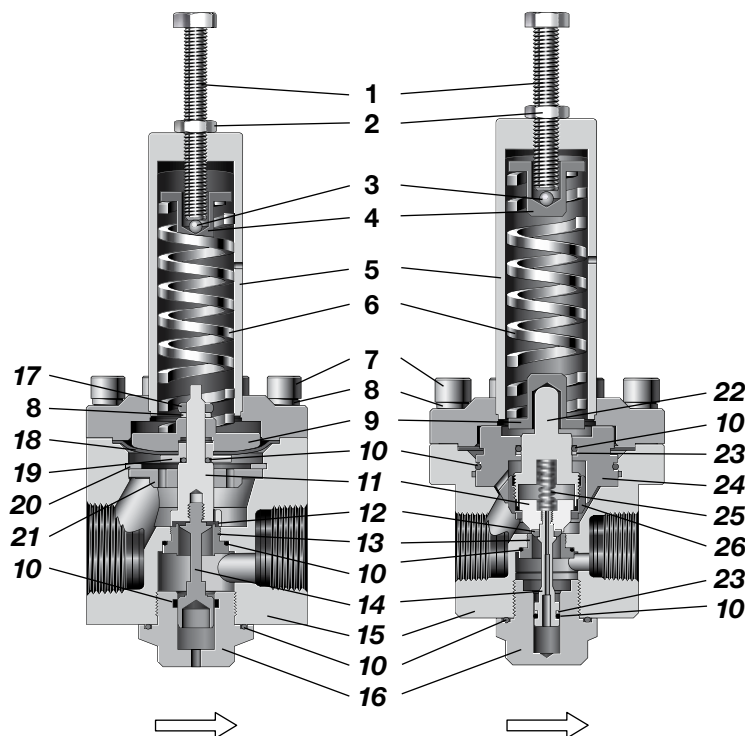
See pages 119 to 122 for flow data.

① Regulators with NPT inlet / outlet connections have 1/4 in. NPT gauge connections.

Materials of Construction

**BS Series Regulator
with Diaphragm Sensing and
Soft Seat Seal**

**BSH Series Regulator
with Piston Sensing and
Hard Seat Seal**



Component		Material / Specification
Common Components	1 Adjusting screw	A2-70
	2 Set screw nut	A2
	3 Ball	420 SS (Hardened)
	4 Upper spring guide	316L SS / A479
	5 Spring housing assembly	
	6 Set spring	50CRV4
	7 Cap screw	A4-80
	8 Washer	A4
	9 Bottom spring guide	316L SS / A479
	10 O-ring	EPDM, FKM, or nitrile
	11 Poppet housing	316L SS / A479
	12 Seat seal	BS EPDM, FKM, or nitrile
		BSH PCTFE or PEEK
	13 Seat	316L SS / A479
	14 Poppet	
	15 Body	
	16 Body plug	
Diaphragm Only	17 Nut	A4
	18 Diaphragm	EPDM, FKM, or nitrile
	19 Clamp plate	316L SS / A479
	20 Retaining ring	1.4122 Steel
	21 Body plate	316L SS / A479
Piston Only	22 Piston	316L SS / A479
	23 Backup ring	PTFE
	24 Piston plate	316L SS / A479
	25 Overtravel spring	302 SS / A313
	26 Piston screw	316L SS / A479

Wetted lubricant: Silicone-based, synthetic hydrocarbon-based

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

BS10 Series

Flow Coefficient: 3.84

Maximum Inlet Pressure: 1015 psig (70 bar)

Inlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

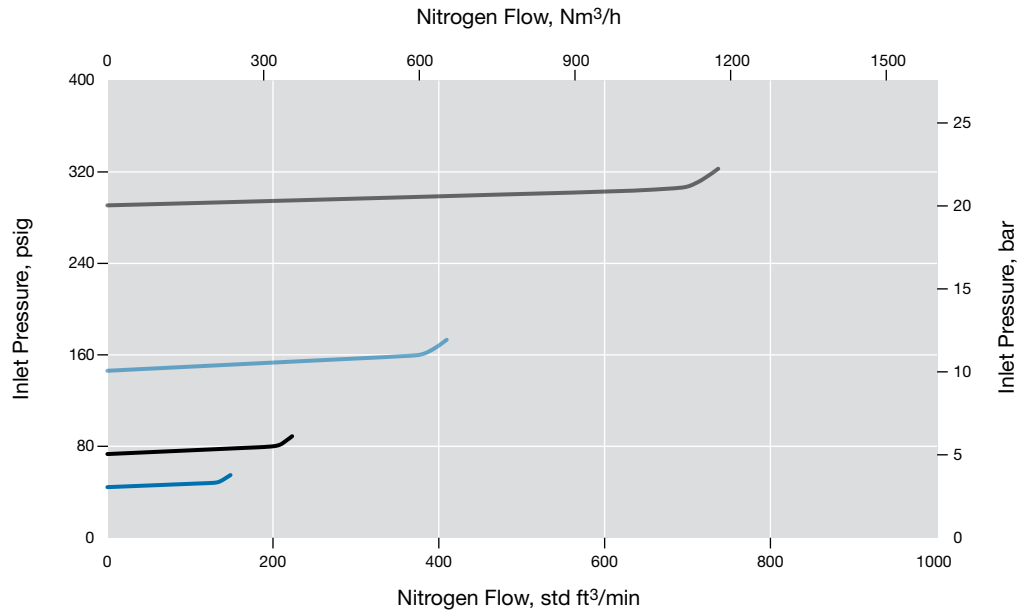
Pressure Control Range

— 0 to 290 psig (0 to 20.0 bar)

— 0 to 145 psig (0 to 10.0 bar)

— 0 to 72 psig (0 to 5.0 bar)

— 0 to 43 psig (0 to 3.0 bar)



Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

BSH10 Series

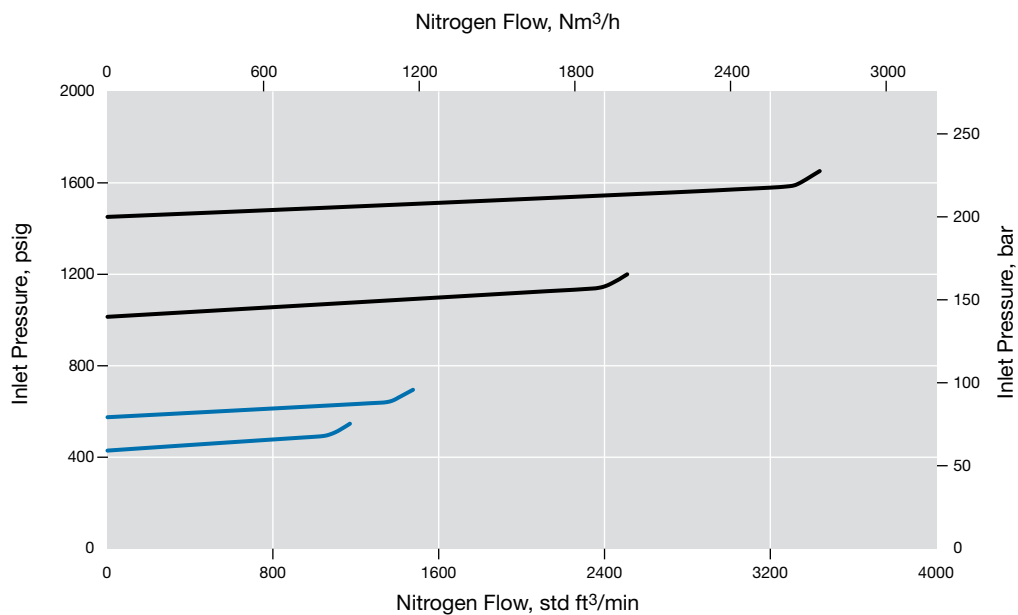
Flow Coefficient: 3.84

Maximum Inlet Pressure: 3625 psig (250 bar)

Inlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

— 0 to 1450 psig (0 to 100 bar)
— 0 to 580 psig (0 to 40.0 bar)



BSH10 Series

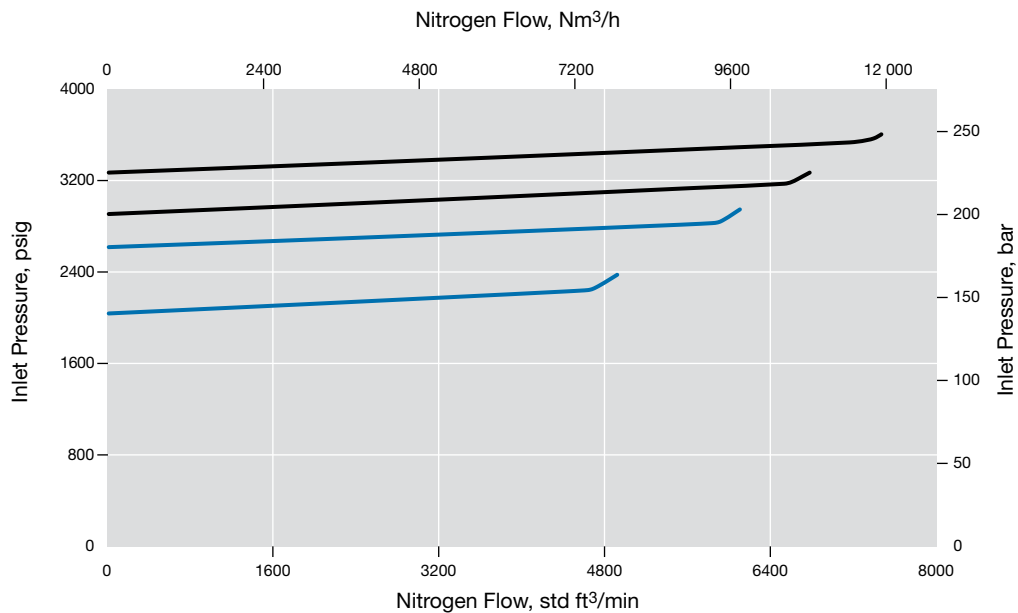
Flow Coefficient: 3.84

Maximum Inlet Pressure: 3625 psig (250 bar)

Inlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

— 0 to 3625 psig (0 to 250 bar)
— 0 to 2610 psig (0 to 180 bar)



Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

BS15 Series

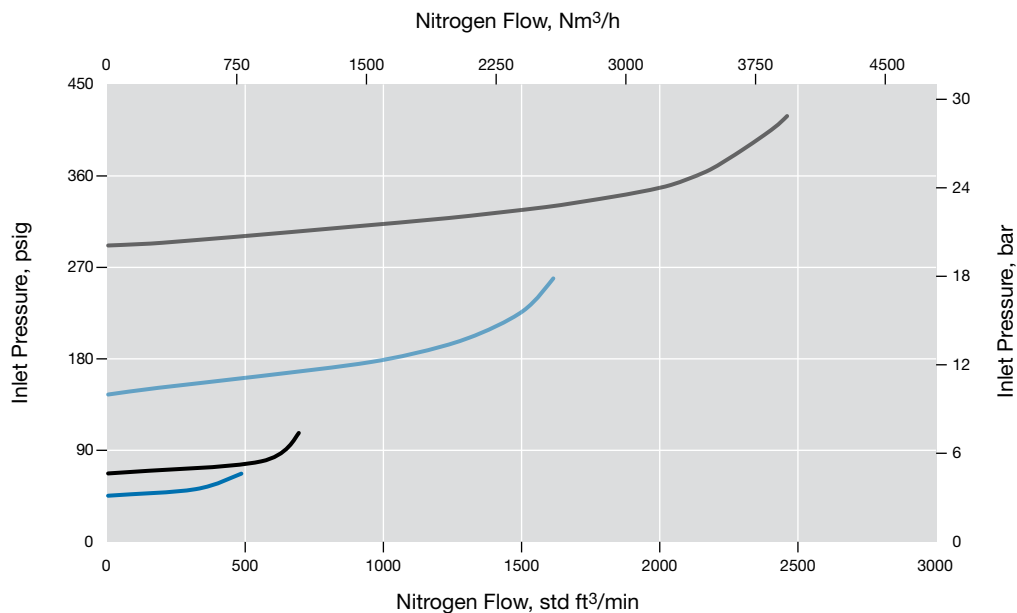
Flow Coefficient: 7.3

Maximum Inlet Pressure: 1015 psig (70 bar)

Inlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

- 0 to 290 psig (0 to 20.0 bar)
- 0 to 145 psig (0 to 10.0 bar)
- 0 to 72 psig (0 to 5.0 bar)
- 0 to 43 psig (0 to 3.0 bar)



Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

BSH15 Series

Flow Coefficient: 7.3

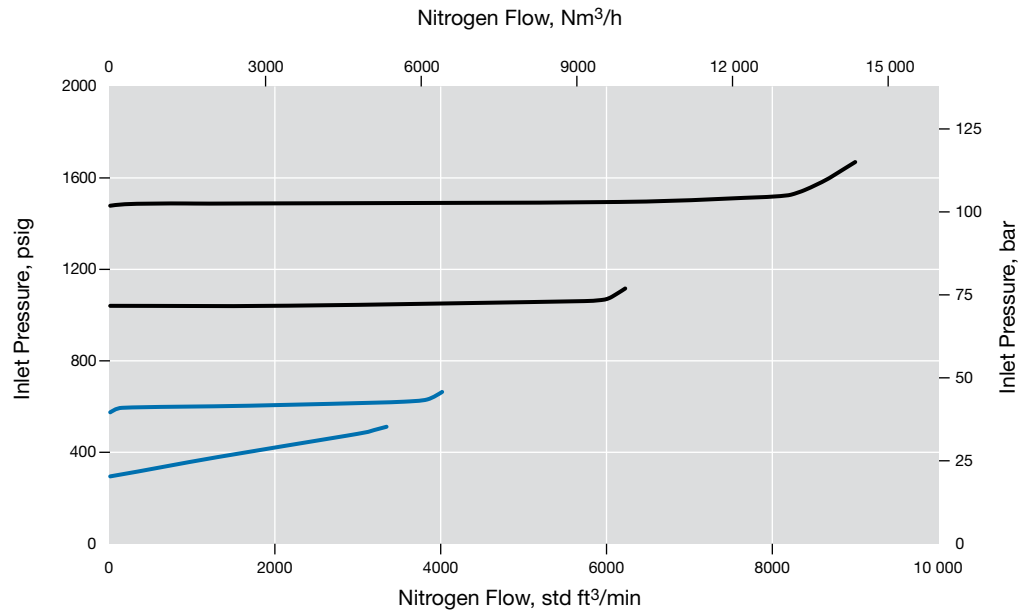
Maximum Inlet Pressure: 3625 psig (250 bar)

Inlet Pressure Control Range: 0 to 1450 psig (0 to 100 bar)

Pressure Control Range

— 0 to 1450 psig (0 to 100 bar)

— 0 to 580 psig (0 to 40.0 bar)



BSH15 Series

Flow Coefficient: 7.3

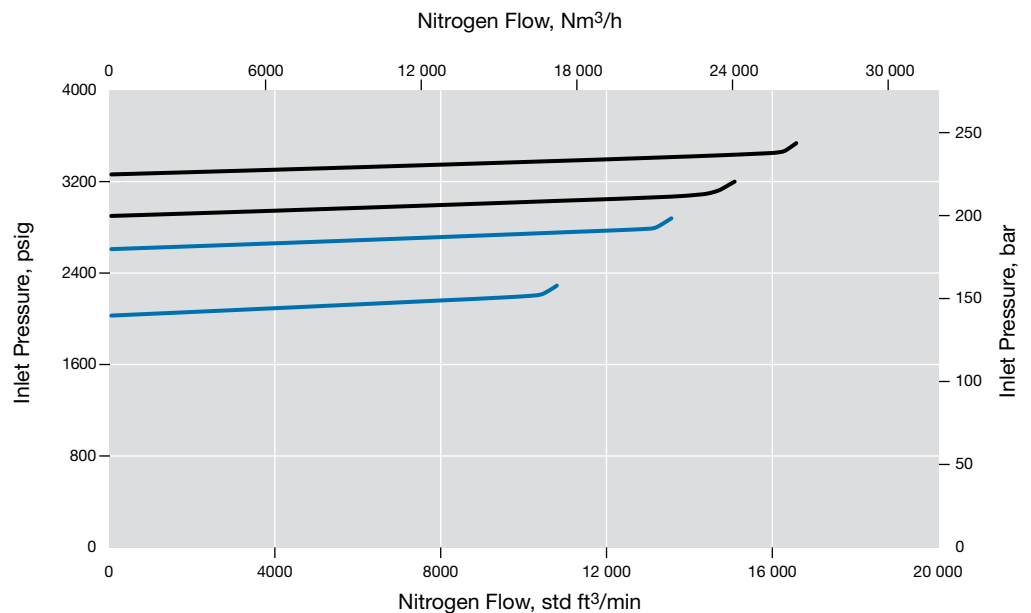
Maximum Inlet Pressure: 3625 psig (250 bar)

Inlet Pressure Control Range: 0 to 3625 psig (0 to 250 bar)

Pressure Control Range

— 0 to 3625 psig (0 to 250 bar)

— 0 to 2610 psig (0 to 180 bar)

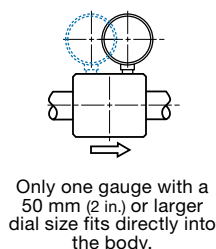


Dimensions

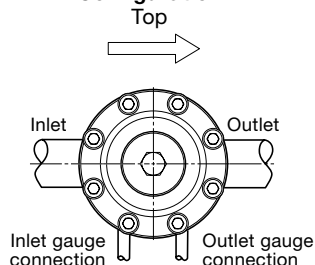
Dimensions, in inches (millimeters), are for reference only and are subject to change.

Series	End Connection Size	Dimensions, in. (mm)					
		A	B	C	D	E	F
BS(H)10	1 in.	10.5 (266)	3.54 (90.0)	3.07 (78.0)	2.28 (58.0)	1.97 (50.0)	1.77 (45.0)
BS(H)15	1 1/2 in.	10.8 (275)	4.53 (115)	3.78 (96.0)	2.44 (62.0)	2.01 (51.0)	1.77 (45.0)

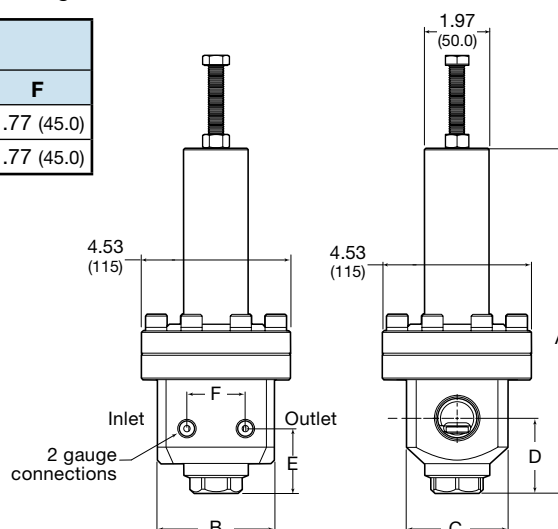
Gauge Connection



Configuration



Shown with tubing for clarity; tubing not included.



Ordering Information

Build a BS(H)10 and BS(H)15 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11
BS FA 10 A 1 - 02 - 1 - V V V - N

1 Series

BS = 1015 psig (70.0 bar) maximum inlet pressure
BSH = 3625 psig (250 bar) maximum inlet pressure

2 Inlet / Outlet

B = Female ISO/BSP parallel thread
N = Female NPT
FA = ASME B16.5 flange
FD = EN 1092 (DIN) flange

3 Size

10 = 1 in. / DN25
15 = 1 1/2 in. / DN40

4 Pressure Class

Omit designator if flanges are not ordered.
A = ASME class 150
B = ASME class 300
C = ASME class 600
E = ASME class 1500
F = ASME class 2500
M = EN class PN16
N = EN class PN40

5 Flange Facing

Omit designator if flanges are not ordered.
1 = Raised face smooth
3 = RTJ

6 Body Material

02 = 316L SS

7 Pressure Control Range

Diaphragm sensing (BS series only)

1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 72 psig (0 to 5.0 bar)
3 = 0 to 145 psig (0 to 10.0 bar)
4 = 0 to 290 psig (0 to 20.0 bar)

Piston sensing (BSH series only)

5 = 0 to 580 psig (0 to 40.0 bar)
6 = 0 to 1450 psig (0 to 100 bar)
7 = 0 to 2610 psig (0 to 180 bar)
8 = 0 to 3625 psig (0 to 250 bar)

8 Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

9 Diaphragm / Piston O-Rings

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

10 Seat Seal Material

BS series

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
L = Low temperature Nitrile

BSH series

K = PCTFE
P = PEEK

11 Options

N = NACE MR0175/ISO 15156
G93 = ASTM G93 Level C-cleaned

High-Sensitivity, Spring-Loaded Back-Pressure Regulators—LBS4 Series

Features

- Diaphragm sensing
- Bottom mounting and panel mounting

Options

- NACE MR0175/ISO 15156-compliant model
- Special cleaning to ASTM G93 Level C



Technical Data

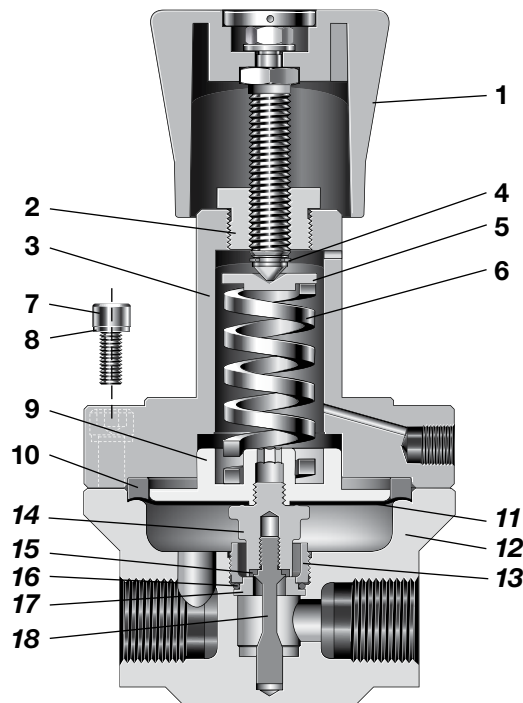
Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet Control Pressure ^① psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	Seat Diameter in. (mm)	Inlet and Outlet Connection	Gauge Connection	Weight lb (kg)
LBS4	507 (35.0)	290 (20.0)	Diaphragm	−49 to 176 (−45 to 80) See Pressure-Temperature Ratings , page 985.	1.3	0.31 (8.0)	1/2 in. NPT	1/4 in. NPT	5.7 (2.6)

See pages 125 and 126 for flow data.

① Maximum inlet control pressure limited to 130 psig (9.0 bar) for regulators built with 316SS diaphragms.

Materials of Construction

LBS Series Regulator with Soft Seat



Component	Material / Specification
1 Knob assembly with adjusting screw, nuts	Blue ABS with 431 SS
2 Spring housing cover	316L SS / A479
3 Spring housing	
4 C-ring	A2
5 Spring guide	316L SS / A479
6 Set spring	50CRV4
7 Cap screw	A4-80
8 Washer	A2
9 Bottom spring guide	316L SS / A479
10 Clamp ring	
11 Diaphragm	PTFE or 316L SS
12 Body	316L SS / A479
13 Seat retainer	
14 Poppet housing	
15 Seat seal	FKM, FFKM, EPDM, or nitrile
16 O-ring	PTFE
17 Seat	316L SS / A479
18 Poppet	431 SS / A276

Wetted lubricants: *Silicone-based, synthetic hydrocarbon-based*

Wetted components listed in *italics*.

Gauge plugs (not shown): 431 SS / A276.

Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

LBS4 Series

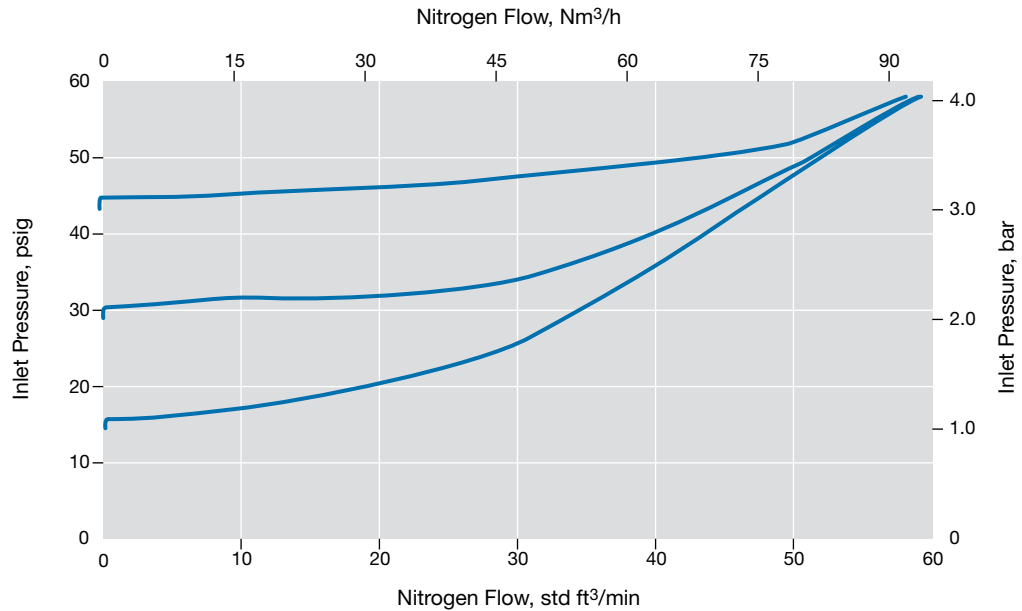
Flow Coefficient: 1.3

Maximum Inlet Pressure: 507 psig (35.0 bar)

Inlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

Pressure Control Range

— 0 to 43 psig (0 to 3.0 bar)



LBS4 Series

Flow Coefficient: 1.3

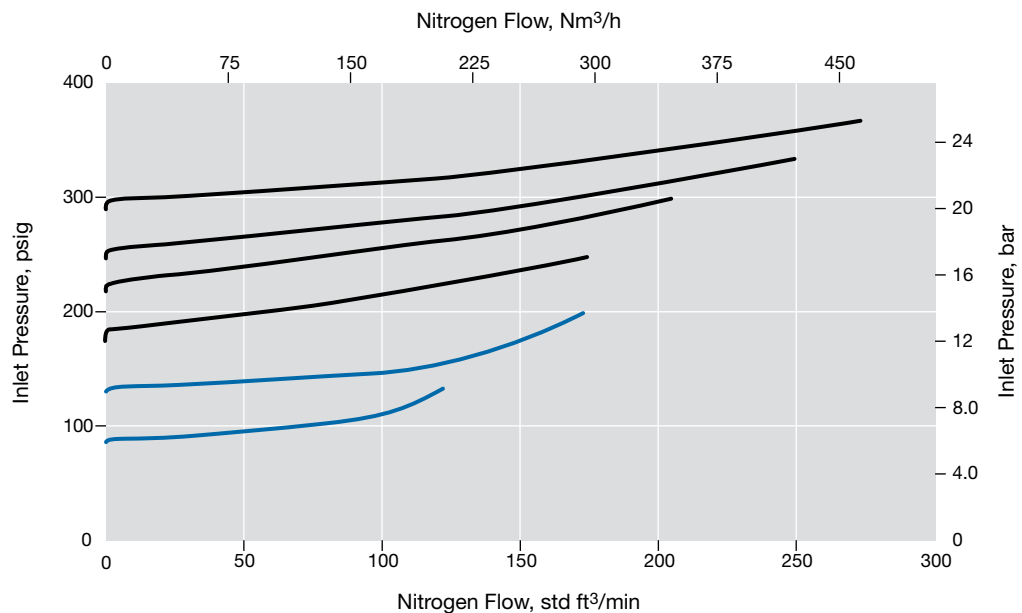
Maximum Inlet Pressure: 507 psig (35.0 bar)

Inlet Pressure Control Range: 0 to 290 psig (0 to 20.0 bar)

Pressure Control Range

— 0 to 130 psig (0 to 9.0 bar)

— 0 to 290 psig (0 to 20.0 bar)



Flow Data

The graphs illustrate the change in inlet or outlet pressure as the flow rate increases.

For more flow curve information, contact your authorized Swagelok representative.

LBS4 Series

Flow Coefficient: 1.3

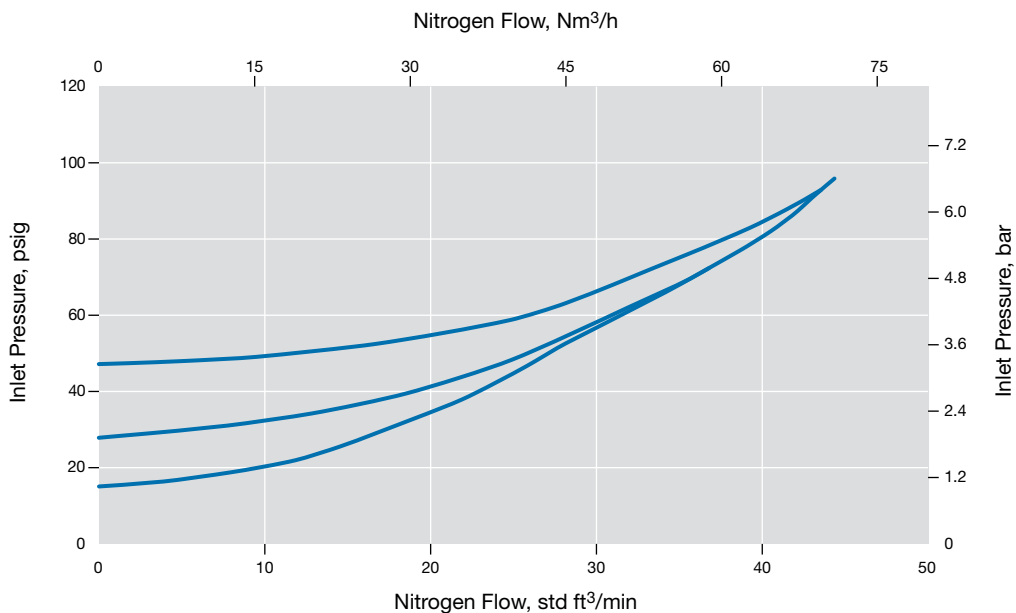
Maximum Inlet Pressure: 507 psig (35.0 bar)

Inlet Pressure Control Range: 0 to 43 psig (0 to 3.0 bar)

Pressure Control Range

— 0 to 43 psig (0 to 3.0 bar)

Optional 316L SS Diaphragmh



LBS4 Series

Flow Coefficient: 1.3

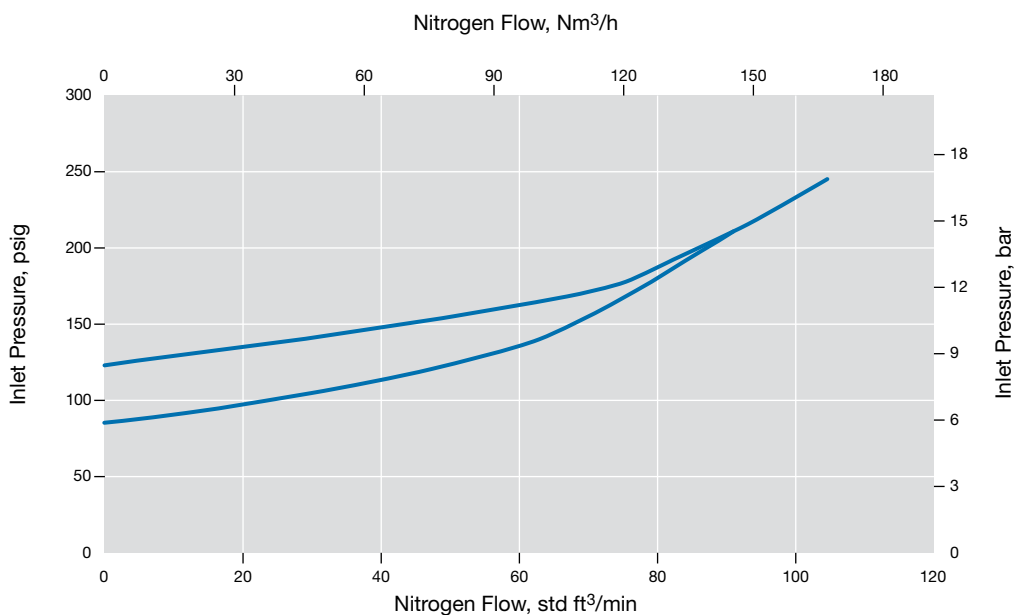
Maximum Inlet Pressure: 507 psig (35.0 bar)

Inlet Pressure Control Range: 0 to 130 psig (0 to 9.0 bar)

Pressure Control Range

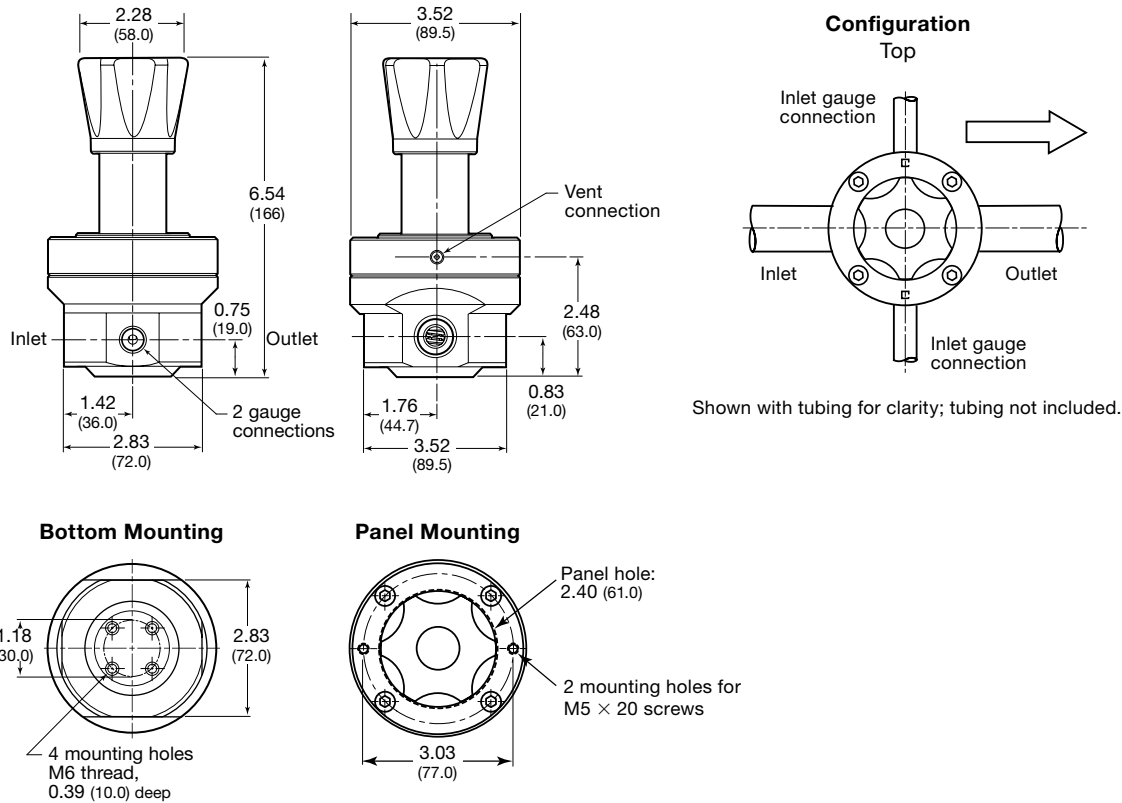
— 0 to 130 psig (0 to 9.0 bar)

Optional 316L SS Diaphragmh



Dimensions

Dimensions, in inches (millimeters), are for reference only and are subject to change.



Ordering Information

Build an LBS4 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8
LBS N4 - 02 - 1 - T T V - N

1 Series

LBS = 507 psig (35.0 bar) maximum inlet pressure

2 Inlet / Outlet

N4 = 1/2 in. female NPT

3 Body Material

02 = 316L SS

4 Pressure Control Range

1 = 0 to 43 psig (0 to 3.0 bar)
2 = 0 to 130 psig (0 to 9.0 bar)
3 = 0 to 290 psig (0 to 20.0 bar)

5 Seal Material

T = PTFE
L = Low temperature Nitrile

6 Diaphragm

T = PTFE^①
M = 316L SS: only for 0 to 43 psig (0 to 3.0 bar) and 0 to 130 psig (0 to 9.0 bar) pressure control ranges
L = Low temperature Nitrile

^① Not available with Low temperature Nitrile option

7 Seat Seal Material

V = Fluorocarbon FKM
N = Nitrile
E = EPDM
F = FFKM
L = Low temperature Nitrile

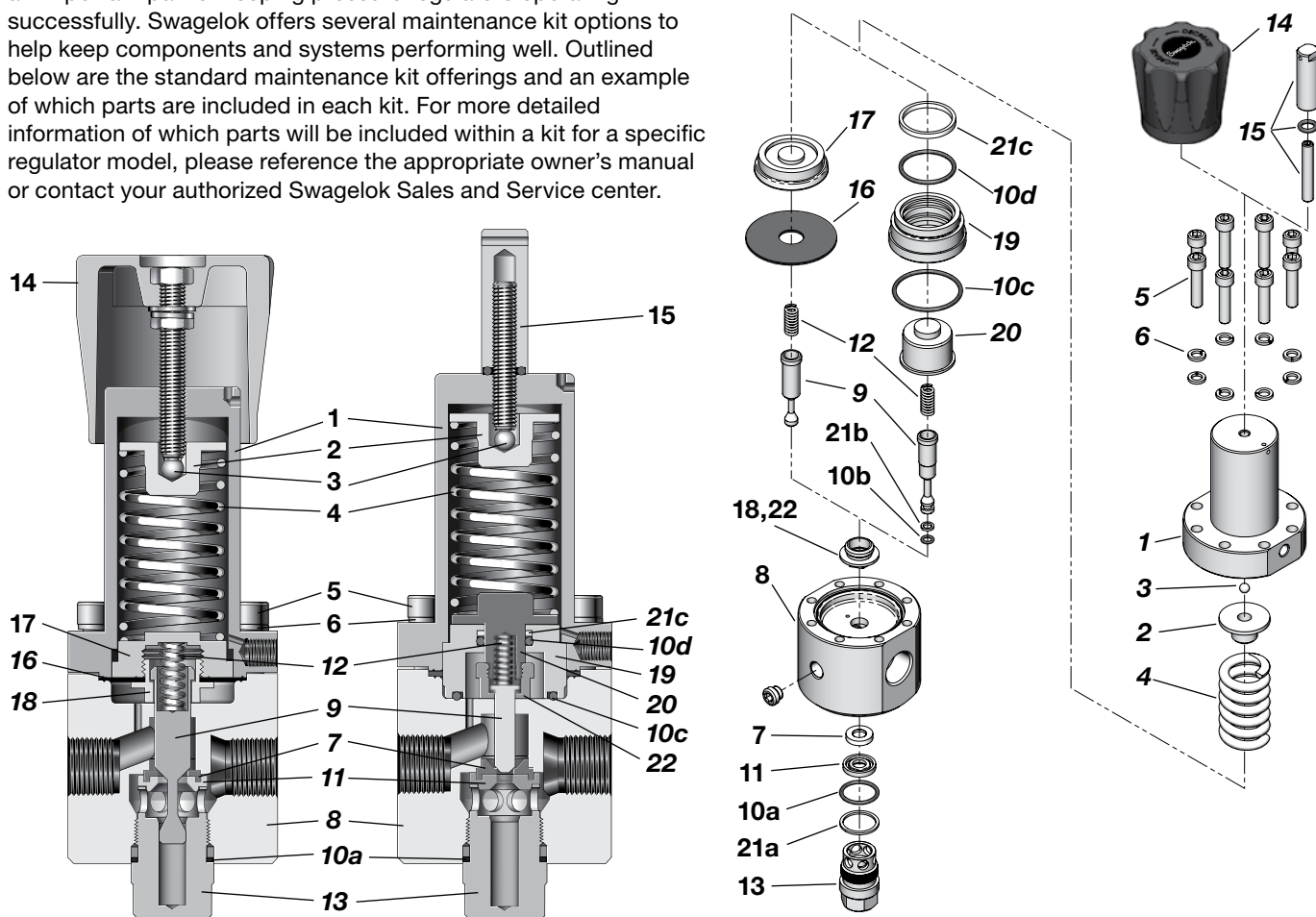
8 Options

N = NACE MR0175/ISO 15156
G93 = ASTM G93 Level C-cleaned

Back-Pressure Regulators

Spring-Loaded—BS Series Maintenance Kits

Regular maintenance of pressure regulator components is an important part of keeping pressure regulators operating successfully. Swagelok offers several maintenance kit options to help keep components and systems performing well. Outlined below are the standard maintenance kit offerings and an example of which parts are included in each kit. For more detailed information of which parts will be included within a kit for a specific regulator model, please reference the appropriate owner's manual or contact your authorized Swagelok Sales and Service center.



Designator	Kit Type	Diaphragm Sensing Typical Contents	Piston Sensing Typical Contents
A1	Valve kit	Poppet (9), Seat seal (7)	Poppet (9), Seat seal (7)
A2	Soft valve kit	Seat seal (7)	Seat seal (7)
B1	Service kit	Poppet (9), O-ring (10a), Diaphragm (16), Seat seal (7)	Poppet (9), O-rings (10a, 10b, 10c, 10d), Back-up rings (21a, 21b, 21c), Seat seal (7)
B2	Seal kit	O-ring (10a), Diaphragm (16)	O-rings (10a, 10b, 10c, 10d), Back-up rings (21a, 21b, 21c)
C1	Overhaul kit	Spring guide (2), Ball (3), Set spring (4), Poppet (9), O-ring (10a), Overtravel spring (12), Body plug (13), Diaphragm (16), Diaphragm plate (17), Diaphragm screw (18), Seat seal (7), Seat (11)	Spring guide (2), Ball (3), Set spring (4), Poppet (9), O-rings (10a, 10b, 10c, 10d), Back-up rings (21a, 21b, 21c), Overtravel spring (12), Body plug (13), Piston (20), Piston plate (19), Piston screw (22), Seat seal (7), Seat (11)
C2	Body plug kit	Body plug (13), O-ring (10a)	Body plug (13), O-ring (10a), Back-up ring (21a)
C3	Sensing kit	Diaphragm (16)	Piston (20), Piston plate (19), O-rings (10c, 10d), Back-up ring (21c)
C4	Range spring kit	Range spring (4)	Range spring (4)
C5	Poppet spring kit	Overtravel spring (12)	Overtravel spring (12)
D1	Handle kit	Handle assembly (14)	Handle assembly (14)
E1	Hardware kit	Bolts (5), Washers (6)	Bolts (5), Washers (6)

Ordering Information

To order a maintenance kit, add the **kit type designator** to the regulator ordering number. Example: BSN4-02-2-VVK-C1

Additional Products

- For additional Swagelok pressure regulators, refer to *Pressure Regulators catalog*, MS-02-230.



- For tank blanketing regulators, refer to *Tank Blanketing Pressure Regulators, RHPS Series catalog*, MS-02-431.



- For Swagelok pressure gauges, refer to *Industrial and Process Pressure Gauges catalog*, MS-02-170.



- For sanitary pressure regulators, refer to *Sanitary Pressure Regulators, RHPS Series catalog*, MS-02-436.



- For Swagelok tube fittings products, refer to *Gaugeable Tube Fittings and Adapter Fittings catalog*, MS-01-140.



⚠ **RHPS series pressure regulators are not “Safety Accessories” as defined in the Pressure Equipment Directive 2014/68/EU.**

⚠ **Do not use the regulator as a shutoff device.**

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

Introduction

Since 1947, Swagelok has designed, developed, and manufactured high-quality, general-purpose and specialty fluid system products to meet the evolving needs of global industries. Our focus is on understanding our customers' needs, finding timely solutions, and adding value with our products and services.

We are pleased to provide this global edition of the book-bound *Swagelok Product Catalog*, which compiles more than 100 separate product catalogs, technical bulletins, and reference documents into one convenient, easy-to-use volume. Each product catalog is up to date at the time of printing, with its revision number shown on the last page the individual catalog; for example, the Swagelok *Gaugeable Tube Fittings and Tube Adapters* catalog is MS-01-140, RevW. Subsequent revisions will supersede the printed version and will be posted on the Swagelok website and in the Swagelok electronic Desktop Technical Reference (eDTR) tool.

For more information, visit your Swagelok website or contact your authorized Swagelok sales and service representative.

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.

Swagelok, Ferrule-Pak, Goop, Hinging-Collecting, IGC, Kenmac, Micro-Fit, Nupro, Snoop, Sno-Trik, SWAK, VCO, VCR, Ultra-Torr, Whitey—TM Swagelok Company
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AccuTrak, Beacon, Westlock—TM Tyco International Services
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