

# Sanitary Pressure Regulators RHPS Series



- Pressure-reducing regulators and tank blanketing regulators
- 316L stainless steel construction
- 1/2, 1, and 1 1/2 in. end connections
- Working pressures up to 232 psig (16.0 bar)
- Temperatures from -31 to 284°F (-35 to 140°C)
- FDA / USP Class VI compliant seals
- Cleanliness compliant with ASTM G93 Level C

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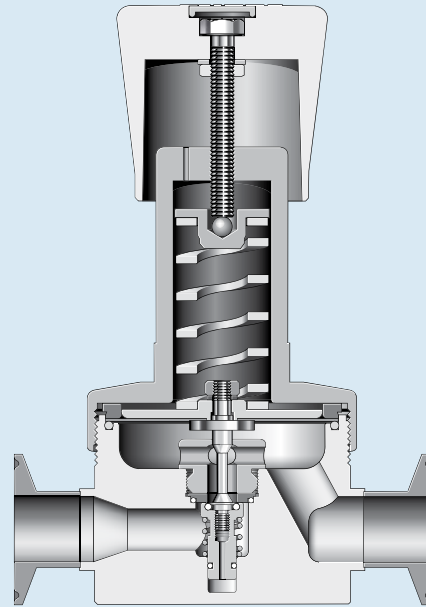
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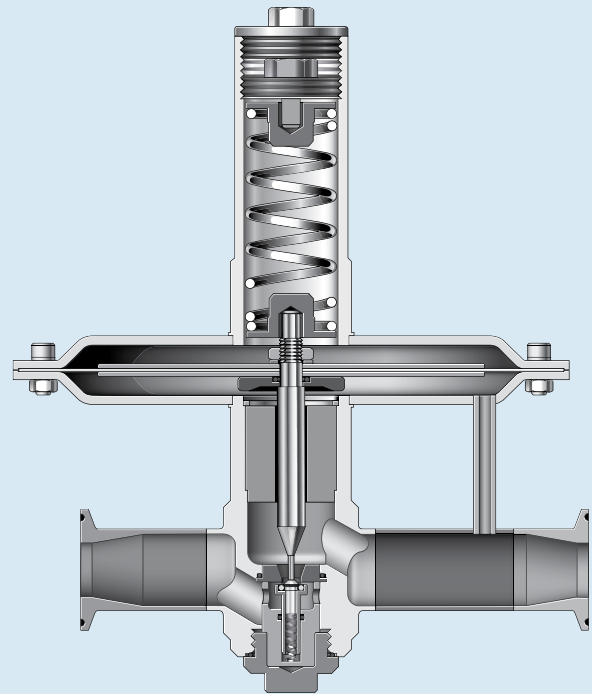
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PRS Series Pressure-Reducing Regulator



TBRS8 Series Tank Blanketing Regulator



## Introduction

The Swagelok® sanitary pressure regulators include the PRS series, a pressure-reducing regulator, and the TBRS series, a tank blanketing regulator. Both series feature 316L stainless steel metal components and FDA / USP Class VI compliant EPDM seals.

These sanitary regulators are designed for pressures up to 232 psig (16.0 bar) and are available with sanitary clamp end connections. The PRS series pressure regulator features a handle knob for pressure adjustment; the TBRS series tank blanketing regulator has an adjusting screw for pressure adjustment. The Sanitary line of regulators are best used with clean / dry gases for purging, interisation, tank blanketing and other process support applications.

## Testing

Every RHPS series sanitary pressure regulator is factory tested with nitrogen or air at 232 psig (16.0 bar), or its maximum rated pressure if less than 232 psig (16.0 bar). Shell testing is performed to a requirement of no detectable leakage with a liquid leak detector.

## Cleaning and Packaging

Every RHPS series sanitary pressure regulator is cleaned and packaged to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C.

## Oxygen Service Hazards

For more information about hazards and risks of oxygen-enriched systems, see the *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.**

## Sanitary, Pressure-Reducing Regulators— PRS4, PRS8, and PRS15 Series

### Features

- Spring-loaded pressure control
- Diaphragm sensing mechanism
- 316L stainless steel materials of construction
- Large diaphragm-to-seat ratio for increased sensitivity
- Internal surface finish of 16 µin. (0.4 µm) max
- 1/2, 1, and 1 1/2 in. sanitary clamp end connections
- Bottom mounting on PRS4 and PRS8 series
- FDA / USP Class VI compliant seals
- Special cleaning to ASTM G93 Level C



PRS4 and PRS8

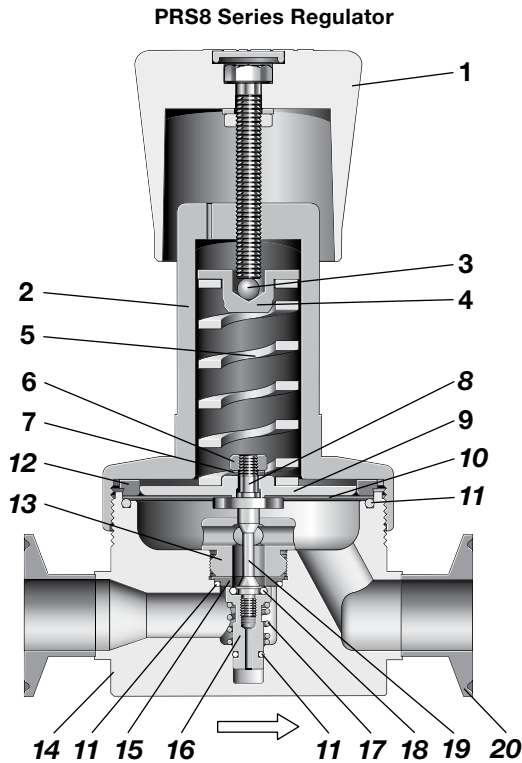


PRS15

### Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (bar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C <sub>v</sub> )	Seat Diameter in. (mm)	Inlet and Outlet Connections	Weight lb (kg)
PRS4	232 (16.0)	130 (9.0)	Diaphragm	-31 to 284 (-35 to 140)	0.70	0.24 (6.0)	1/2 in. sanitary clamp (BSOD)	7.3 (3.3)
PRS8					1.95	0.39 (10.0)	1 in. sanitary clamp (BSOD)	6.6 (3.0)
PRS15					5.48	0.67 (17.0)	1 1/2 in. sanitary clamp (BSOD)	10.3 (4.7)

### Materials of Construction



Component	Material / Specification
1 Knob assembly with adjusting screw, nut, washer, and cap	ABS with A2-70
2 Spring housing	316L SS / A479, EN10088
3 Ball	420 SS
4 Spring guide	316L SS / A479, EN10088
5 Set spring	CR50V4
6 Hex nut	A2
7 Washer	A4
8 Diaphragm screw	316L SS / A479, EN10088
9 Bottom spring guide	316L SS / A479, EN10088
10 Diaphragm	EPDM
11 O-ring	EPDM
12 Clamp ring	316L SS / A479, EN10088
13 Seat retainer	
14 Body	
15 Seat	
16 Poppet housing	316 SS / A313
17 Poppet spring	
18 Seat seal	EPDM
19 Poppet	316L SS / A479, EN10088
20 Ferrule	

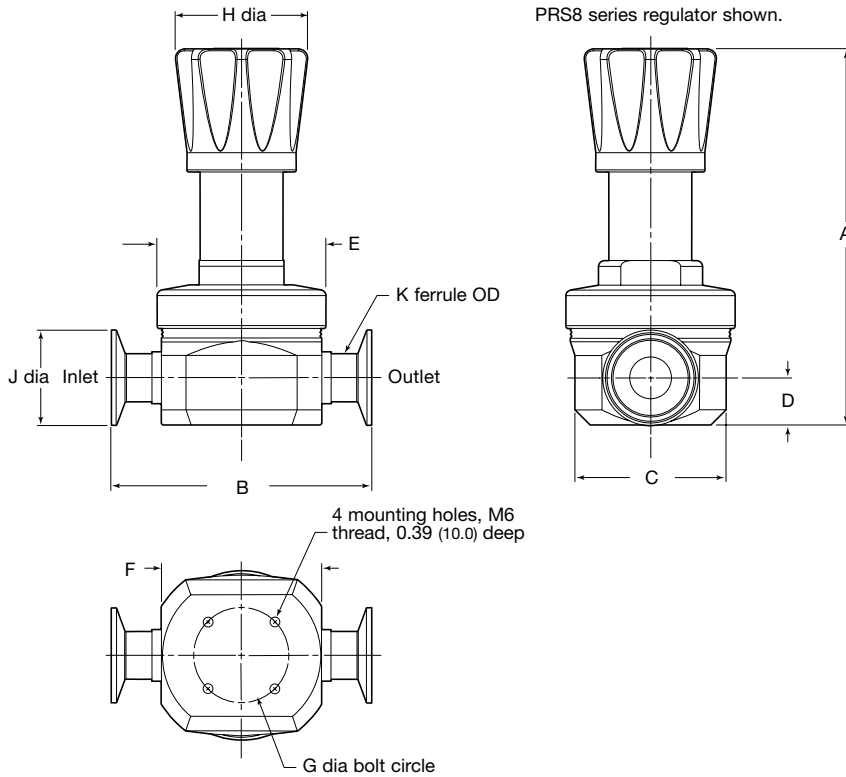
Wetted lubricants: *Silicone-based, synthetic hydrocarbon-based*

Wetted components listed in *italics*.

## Dimensions

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

End Connection Size and Type	Dimensions, in. (mm)									
	A	B	C	D	E	F	G	H	J	K
1/2 in. sanitary clamp	6.37 (162)	5.59 (142)	3.11 (79.0)	0.75 (19.0)	3.11 (79.0)	3.11 (79.0)	1.18 (30.0)	2.28 (58.0)	1.00 (25.4)	1/2
1 in. sanitary clamp	7.83 (199)	5.43 (138)	3.15 (80.0)	0.98 (25.0)	3.52 (89.5)	3.35 (85.0)	1.97 (50.0)	2.76 (70.0)	1.98 (50.4)	1
1 1/2 in. sanitary clamp	9.80 (249)	6.18 (157)	3.07 (78.0)	2.01 (51.0)	3.92 (99.5)	3.92 (99.5)	—	2.76 (70.0)	1.98 (50.4)	1 1/2



## Ordering Information

Build a PRS4, PRS8, and PRS15 series regulator ordering number by combining the designators in the sequence shown below.

**1** **2** **3** **4** **5** **6** **7**  
 PRS **TC4** - **02** - **1** - **E** **E** **E**

### 1 Series

PRS = 232 psig (16.0 bar) maximum inlet pressure

### 2 Inlet / Outlet

**TC4** = 1/2 in. sanitary clamp (BSOD)

**TC8** = 1 in. sanitary clamp (BSOD)

**TC15** = 1 1/2 in. sanitary clamp (BSOD)

### 3 Body Material

02 = 316L SS

### 4 Pressure Control Range

**1** = 4.3 to 43 psig (0.30 to 3.0 bar)

**2** = 14.5 to 130 psig (1.0 to 9.0 bar)

### 5 Seal Material

E = EPDM

### 6 Diaphragm Material

E = EPDM

### 7 Seat Material

E = EPDM

## Sanitary, Tank Blanketing Regulators— TBR Series

### Features

- Spring-loaded pressure control
- Diaphragm-sensing mechanisms
- Balanced poppet
- Diaphragm support plates allow for use in vacuum
- 316L stainless steel materials of construction
- Adjustable from 0.07 psig (2.0 in. H<sub>2</sub>O, 5 mbar) pressure
- Supply pressure effect ratio: 1:3000
- 1 in. sanitary clamp end connections
- FDA / USP Class VI compliant seals
- Special cleaning to ASTM G93 Level C

### Options

- Factory set and locked

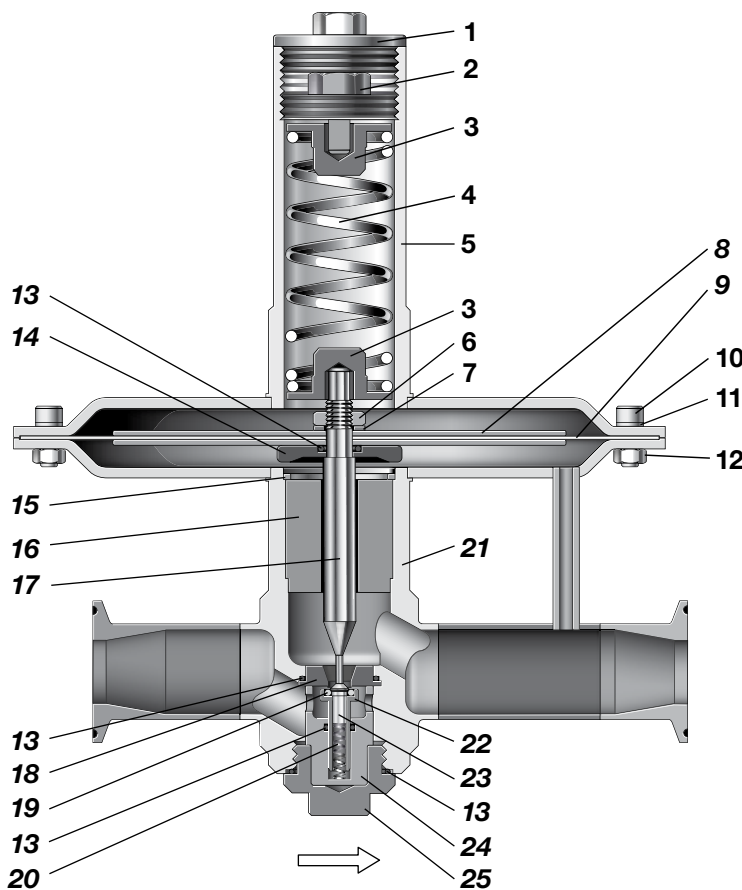


### Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (in. H <sub>2</sub> O, mbar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C <sub>v</sub> )	Seat Diameter in. (mm)	Inlet and Outlet Connections	Weight lb (kg)
TBR	87 (6.0)	7.2 (20, 500)	Diaphragm	-4 to 284 (-20 to 140)	1.0	0.31 (8.0)	1 in. sanitary clamp (BSOD)	14.3 (6.5)

### Materials of Construction

TBR Series Regulator



Component	Material / Specification
1 Cover	316L SS / A479, EN10088
2 Adjusting screw	
3 Spring guide	
4 Set spring	302 SS / A240
5 Spring housing assembly	316L SS / A479, EN10088
6 Nut	A2
7 Lock washer	A4
8 Diaphragm plate (2)	316L SS / A479, EN10088
9 Diaphragm / support	PTFE / Fluorocarbon FKM
10 Socket-head cap screw	A4-80
11 Lock washer	A2
12 Nut	
13 O-ring	EDPM, Kalrez® 6230
14 Seal housing	316L SS / A479, EN10088
15 Retaining ring	
16 Guide ring	PTFE
17 Stem	316L SS / A479, EN10088
18 Seat	
19 Seat seal	EDPM, Kalrez 6230
20 Poppet spring	302 SS / A240
21 Body assembly (body, outlet tube, EF tube, fittings, lower dish)	316L SS / A479, EN10088
22 Poppet housing	
23 Poppet	
24 Balance housing	
25 Body plug	
Wetted lubricants: <i>Silicone-based and synthetic hydrocarbon-based</i>	

Wetted components listed in *italics*.

## Flow Tables

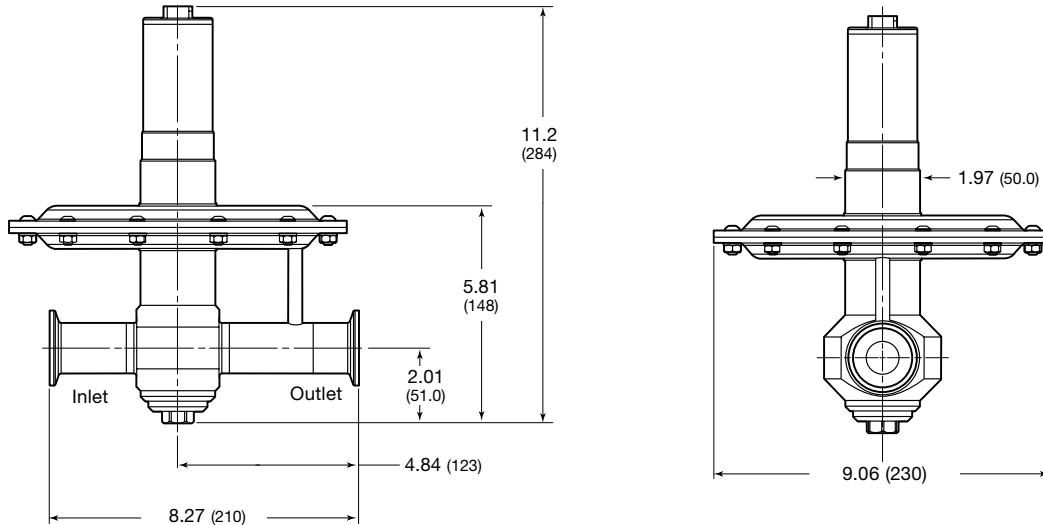
### TBRS Series Regulators with 0.31 in. (8.0 mm) Seat

Outlet Pressure Range psig (in. H <sub>2</sub> O, mbar)	Inlet Pressure, psig (bar)										
	1.4 (0.10)	2.9 (0.20)	5.8 (0.40)	8.7 (0.60)	11.6 (0.80)	14 (1.0)	29 (2.0)	43 (3.0)	58 (4.0)	72 (5.0)	87 (6.0)
Air Flow, std ft <sup>3</sup> /min (Nm <sup>3</sup> /h)											
0.07 to 0.14 (2.0 to 4.0, 5 to 10)	2.3 (4.0)	4.7 (8.0)									
0.14 to 0.72 (4.0 to 20, 10 to 50)			9.4 (16)	14.1 (24)	18.8 (32)	23.5 (40)	38.2 (65)	50.0 (85)	61.7 (105)	73.5 (125)	85.3 (145)
0.29 to 2.9 (8.0 to 80, 20 to 200)	—	—									
0.72 to 7.2 (20 to 200, 50 to 500)	—	—	—	—	—						

If inlet pressure is less than 14 psig (1.0 bar), the outlet pressure should not exceed 50 % of inlet pressure in order to reach the stated flow.

## Dimensions

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



## Ordering Information

Build a TBRS series regulator ordering number by combining the designators in the sequence shown below.

**1** **2** **3** **4** **5** **6** **7** **8**  
**TBRS TC8 - 02 - 3 - E T E - FS**

### 1 Series

TBRS = 87 psig (6.0 bar) maximum inlet pressure

### 2 Inlet / Outlet

TC8 = 1 in. sanitary clamp (BSOD)

### 3 Body Material

02 = 316L SS

### 4 Pressure Control Range

1 = 0.07 to 0.14 psig (2.0 to 4.0 in. H<sub>2</sub>O, 5 to 10 mbar)

2 = 0.14 to 0.72 psig (4.0 to 20 in. H<sub>2</sub>O, 10 to 50 mbar)

3 = 0.29 to 2.9 psig (8.0 to 80 in. H<sub>2</sub>O, 20 to 200 mbar)

4 = 0.72 to 7.2 psig (20 to 200 in. H<sub>2</sub>O, 50 to 500 mbar)

### 5 Seal Material

E = EPDM

F = Kalrez 6230

### 6 Diaphragm Material

T = PTFE

### 7 Seat Material

E = EPDM

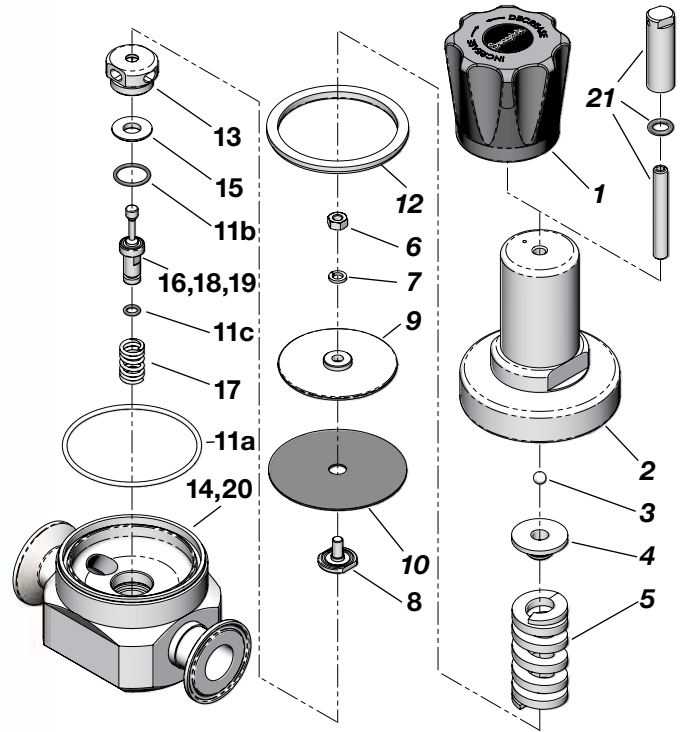
F = Kalrez 6230

### 8 Options

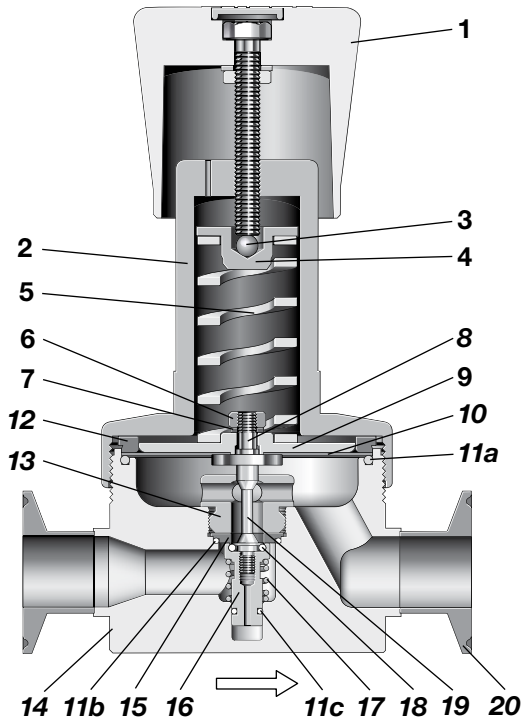
FS = Factory set and locked

## Sanitary Pressure Regulators—RHPS 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.



PRS8 Series Regulator



Designator	Kit Type	Typical Contents
A1	Valve kit	Poppet and housing (16, 18, 19), O-rings (11b, 11c), Seat (15)
A2	Soft valve kit	O-rings (11c), Poppet and housing (16, 18, 19)
B1	Service kit	Poppet and housing (16, 18, 19), O-rings (11a, 11b, 11c), Diaphragm (10), Seat (15)
B2	Seal kit	O-rings (11a, 11b, 11c), Diaphragm (10)
C1	Overhaul kit	Spring guides (4, 9), Ball (3), Set spring (5), Poppet and housing (16, 18, 19), O-rings (11a, 11b, 11c), Poppet spring (17), Diaphragm (10), Seat (15), Hex nut (6), Washer (7), Diaphragm screw (8), Seat retainer (13), Clamp ring (12)
C3	Sensing kit	Diaphragm (10)
C4	Range spring kit	Range spring (5)
C5	Poppet spring kit	Poppet spring (17)
D1	Handle kit	Handle assembly (1)

### Ordering Information

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

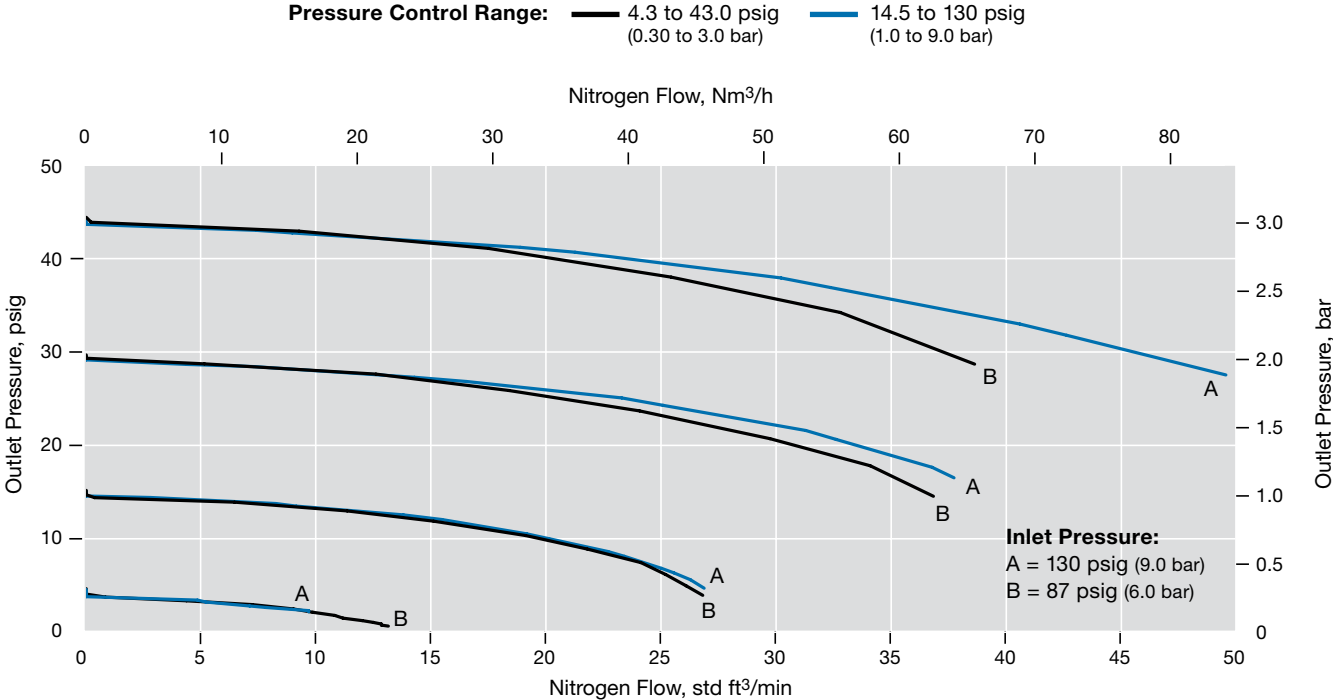
Example: PRSTC8-02-1-EEE-**B1**



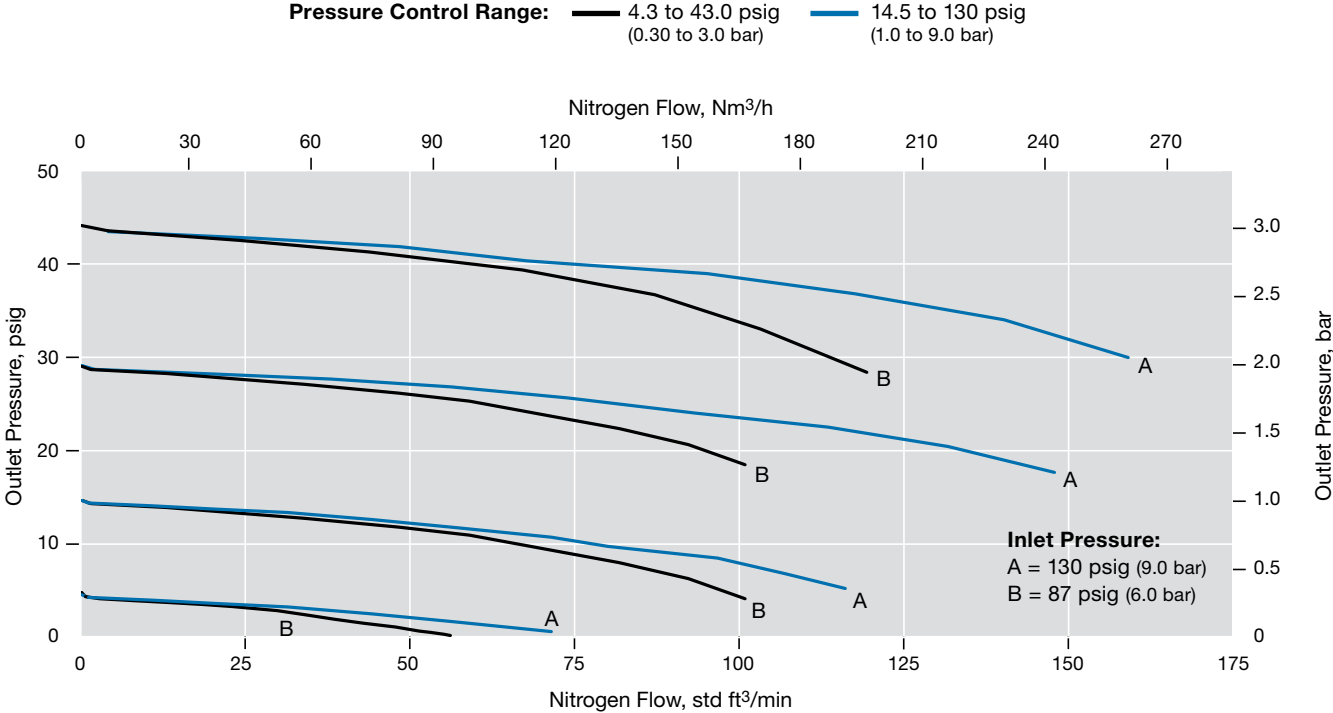
**Flow Data**

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

**PRS4 Series**



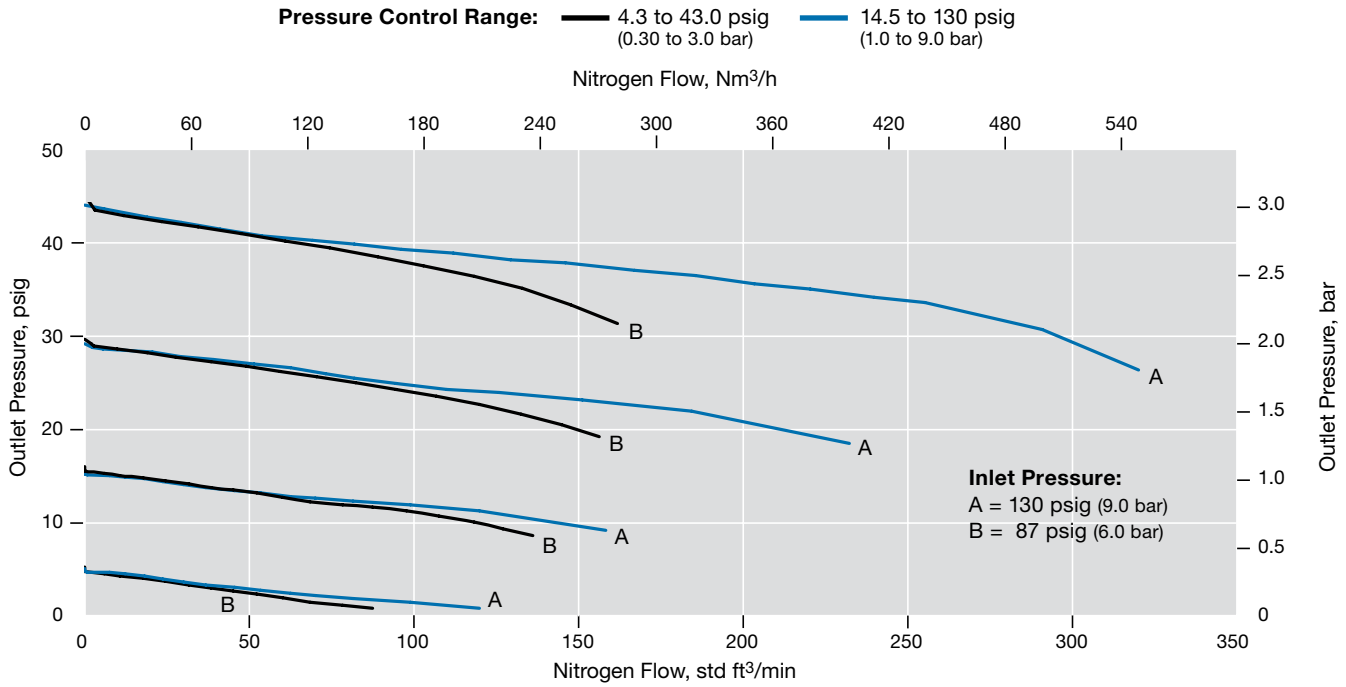
**PRS8 Series**



## Flow Data

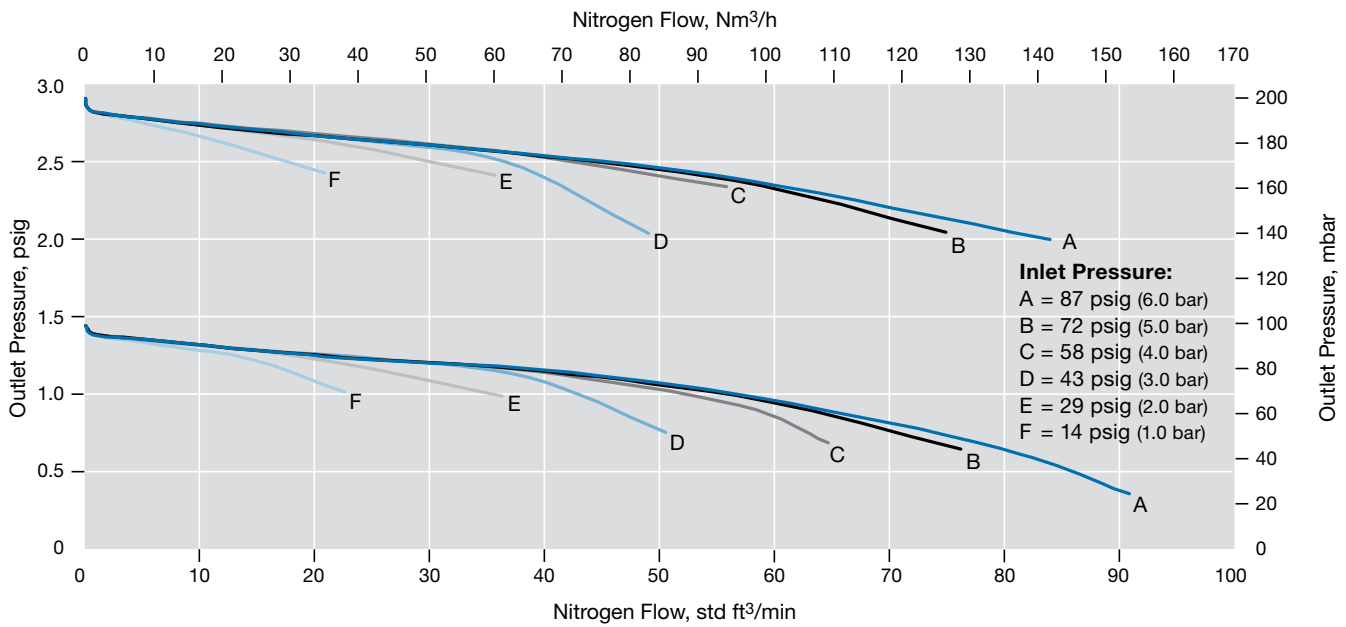
The graphs illustrate the change or “droop” in outlet pressures as the flow rate increases.

### PRS15 Series



### TBRS Series

**Pressure Control Range:** 0.29 to 2.9 psig (8.0 to 80 in. H<sub>2</sub>O, 20 to 200 mbar)



## Other Regulators

- For general-use RHPS series regulators, see the *Pressure Regulators, RHPS Series* catalog, [MS-02-430](#).



- For tank blanketing regulators, see the *Tank Blanketing Pressure Regulators, RHPS Series* catalog, [MS-02-431](#).



- For additional Swagelok pressure regulators, see the *Pressure Regulators* catalog, [MS-02-230](#).



## Additional Products.

- For Swagelok tube fittings products, see the *Gaugeable Tube Fittings and Adapter Fittings* catalog, [MS-01-140](#).



- For Swagelok pressure gauges, see the *Industrial and Process Pressure Gauges* catalog, [MS-02-170](#).



- For Swagelok S and U series fluoropolymer hose, see the *Hose and Flexible Tubing* catalog, [MS-01-180](#).



⚠ **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.**

#### **Safe Product Selection**

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

#### **⚠ WARNING**

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

## **Warranty Information**

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