

# Tank Blanketing Pressure Regulators RHPS Series



- Types: pressure reducing and vapor recovery
- 316L stainless steel construction
- 1/2, 1, and 2 in. end connections
- Working pressures up to 232 psig (16.0 bar)
- Temperatures from  $-4$  to  $212^{\circ}\text{F}$  ( $-20$  to  $100^{\circ}\text{C}$ )

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### Back-Pressure Regulators *Spring-Loaded—TBVS Series*

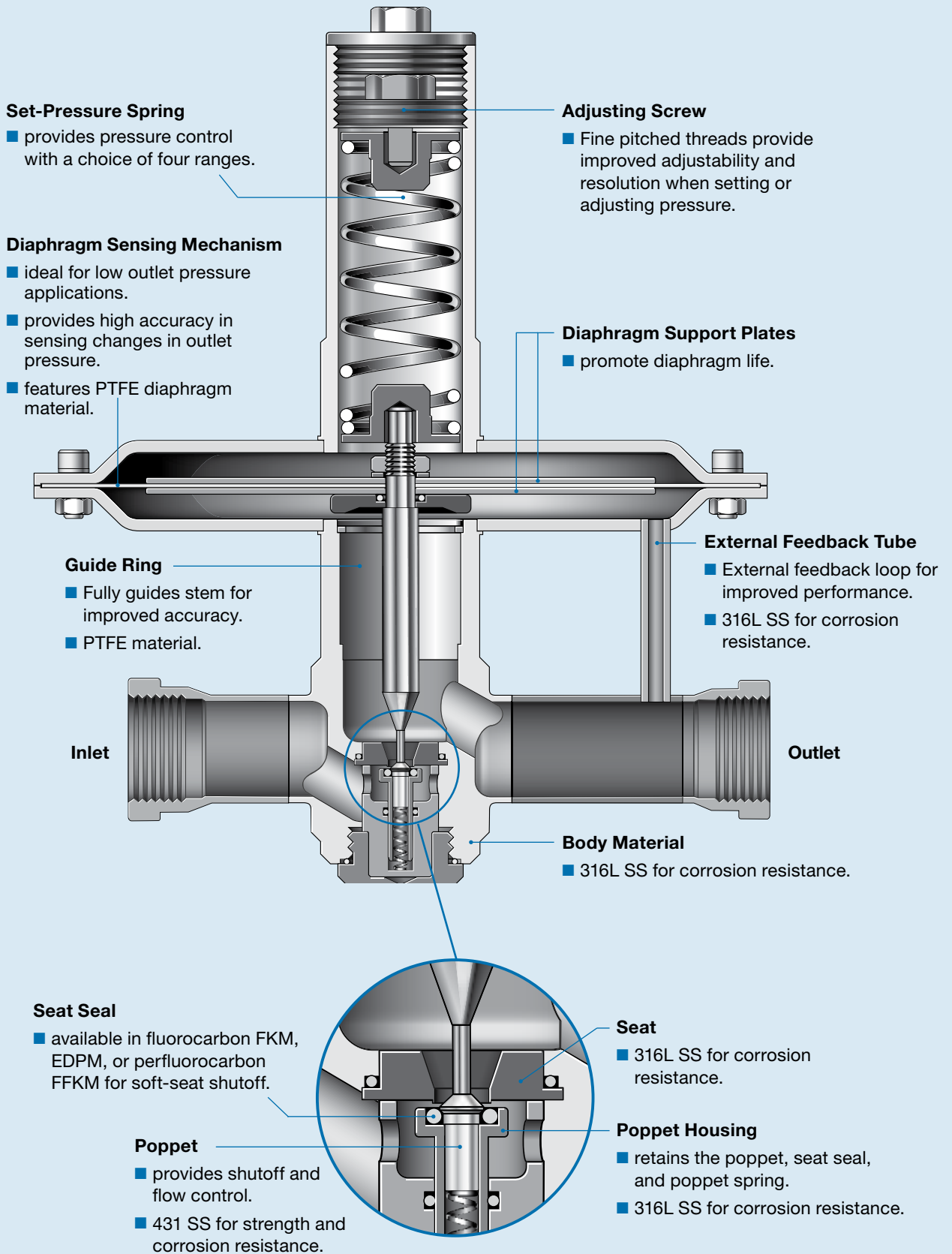
**TBVS4 Series, 12**



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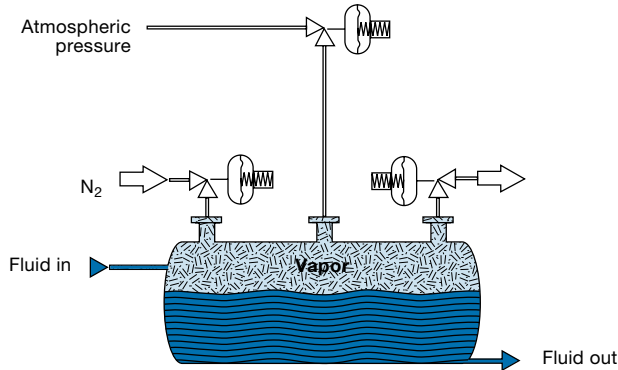
## Features



## Tank Blanketing

### What is Tank Blanketing

Tank blanketing, also known as padding, is the introduction of an inert gas into the vapor space of a storage tank. The pressure of the blanketing gas, usually nitrogen, is slightly higher than atmospheric pressure. The pressure requirement is low because higher pressures do not significantly improve results and waste expensive blanketing gas. Also storage tanks have thin walls which are not designed for high-pressure-containment applications. Tank blanketing is required in many industries where pressure-tight tanks are used for storage including the pharmaceutical, biochemical, electronics, sanitary, and waste water treatment industries.



### Purpose of Tank Blanketing

Tank blanketing is used for several reasons depending on the application:

- **Increase product shelf life and prevent tank corrosion.** Tank blanketing can prevent air from entering the storage tank. Air contains oxygen, moisture, and other contaminants which can degrade or contaminate the stored product or could lead to internal tank corrosion.
- **Improve safety.** Tank blanketing can reduce the oxygen content in the vapor space. The reduced oxygen content lowers the risk of combustion.
- **Ensure compliance with environmental standards.** Tank blanketing can dilute toxic vapors with inert gas to keep volatile and hazardous vapors from escaping to the atmosphere, thus ensuring compliance with emission requirements.
- **Maintain structural integrity of tank.** Tank blanketing can prevent tank collapse when the internal pressure drops, or prevent tank rupture when the internal pressure increases. The Internal pressure can drop with a decrease in temperature or when liquid is removed from the tank. The internal pressure can rise with an increase in temperature or when liquid is added to the tank.

### Types of Tank Blanketing Pressure Regulators

There are two types of RHPS series tank blanketing pressure regulators:

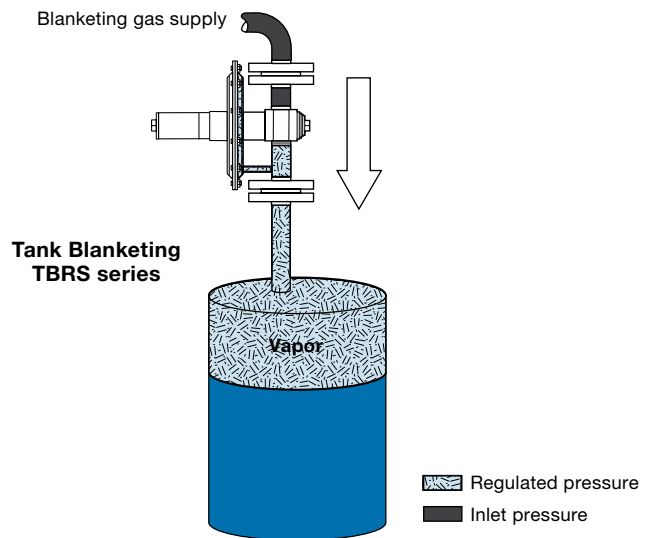
- pressure-reducing regulators
- vapor recovery regulators (back-pressure controllers)

### Tank Blanketing with Positive Pressure

Gas blanketing and vapor recovery are two techniques that can safely and effectively contain volatile vapors in tanks and other process vessels, preventing them from escaping into the atmosphere. The combination of gas blanketing and vapor recovery devices maintains a constant pressure in the tank's vapor space above the stored fluid. As a result, there will always be a constant pressure in the tank during pumping operations or when the temperature changes.

### Positive Pressure Tank Blanketing with TBRS Series Pressure-Reducing Regulators

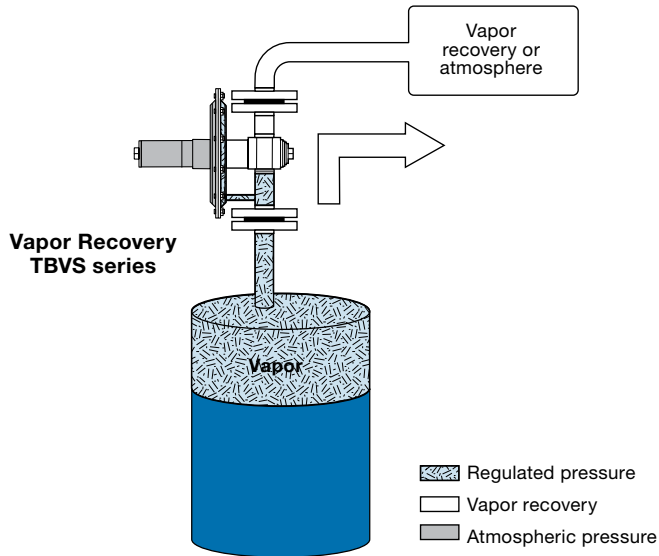
When the tank suddenly cools, the vapors inside the tank condense causing the tank pressure to decrease. The regulator opens which allows blanketing gas into the tank. Blanketing regulators also maintain a constant pressure in the tank during pump out to prevent the tank from collapsing.



## Tank Blanketing

### Vapor Recovery with TBVS Series Back-Pressure Regulators

When pressure inside the tank rises due to pump-in or thermal heating, the back-pressure regulator vents the excess pressure to an appropriate vapor recovery system. This prevents vapors from escaping into the atmosphere. Emergency vents or safety relief valves must be installed in the event of back-pressure regulator failure.



## Testing

Every RHPS series tank blanketing regulator is factory tested for shell and seat leakage 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 tank blanketing regulator is cleaned and packaged in accordance with Swagelok *Standard Cleaning and Packaging (SC-10)*, MS-06-62.

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

## Oxygen Service Hazards

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

- ⚠ **RHPS series tank blanketing regulators are not "Safety Accessories" as defined in the Pressure Equipment Directive 97/23/EC.**
- ⚠ **Do not use the regulator as a shutoff device.**

## Low-Pressure, Spring-Loaded, Pressure-Reducing Regulators— TBRs4 Series

### Features

- Spring-loaded pressure control
- Diaphragm sensing mechanism
- 316L stainless steel materials of construction
- Large diaphragm to seat ratio
- Compliance with FDA/USP class VI

### Options

- Special cleaning to ASTM G93 Level C

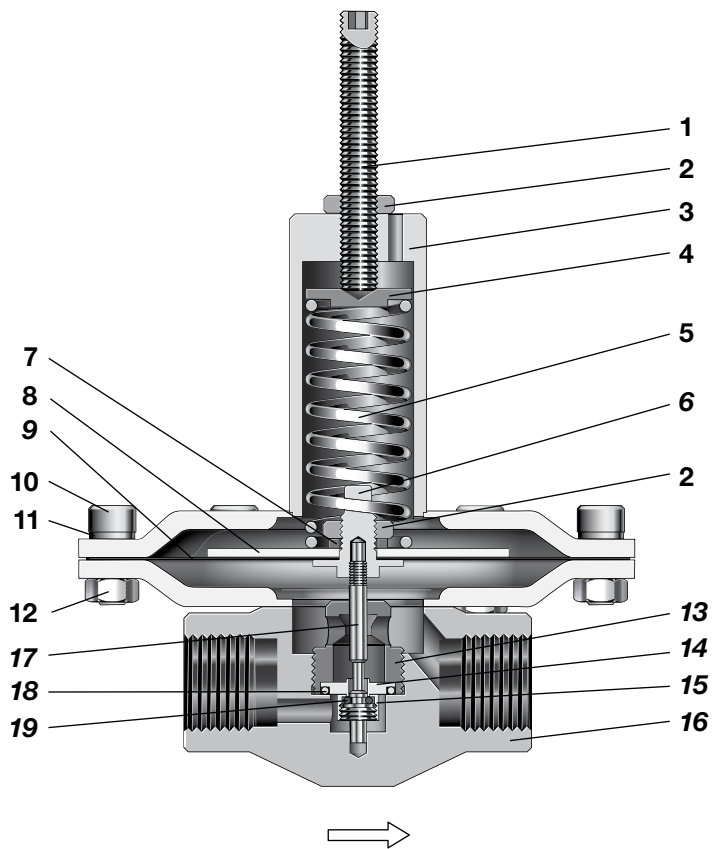


### Technical Data

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)
TBRs4	87.0 (6.0)	11.6 (321, 800)	Diaphragm	-4 to 212 (-20 to 100)	0.20	0.16 (4.0)	1/2 in. ISO/BSP parallel thread, sanitary clamp (BSOD), ASME or DIN flange	3.5 (1.6) without flanges

### Materials of Construction

TBRs4 Series Regulator



Component	Material / Specification
1 Set screw	A2-70
2 Nut	A2
3 Spring housing assembly	316L SS / A479 or EN10088
4 Spring guide	
5 Set spring	302 SS / A240
6 Clamp ring	316L SS / A479 or EN10088
7 Lock washer	A4
8 Diaphragm plate	316L SS / A479 or EN10088
9 Diaphragm	PTFE
10 Socket-head cap screw	A4-80
11 Lock washer	A2
12 Nut	
13 Seat retainer	316L SS / A479 or EN10088
14 Seat	
15 Poppet screw	
16 Body assembly (body, bottom dish)	316L SS / A479 or EN10088
17 Poppet	
18 Seat seal	PTFE
19 Poppet O-ring	Kalrez® 6230

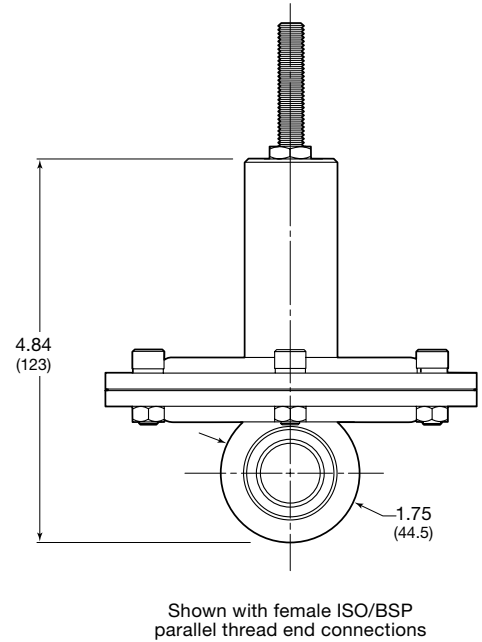
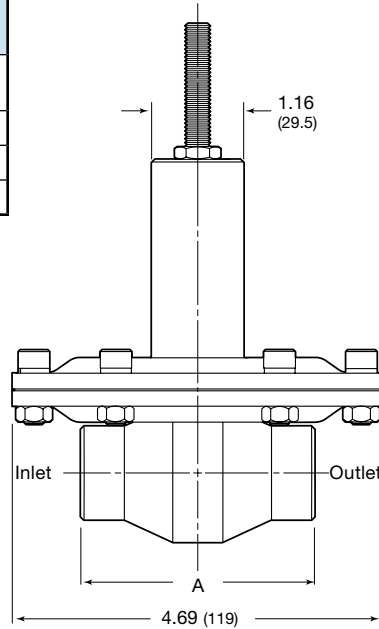
*Wetted lubricants: Silicone-based and synthetic hydrocarbon-based*

Wetted components listed in *italics*.

## Dimensions

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

End Connection Size and Type	A in. (mm)
1/2 in. female ISO/BSP parallel thread	2.95 (75.0)
DN15 PN16 flange	8.31 (211)
1/2 in. ASME class 150 flange	9.09 (231)
1/2 in. sanitary clamp (BSOD)	9.06 (230)



## Ordering Information

Build a TBRS4 series regulator ordering number by combining the designators in the sequence shown below.

1 2 3 4 5 6 7 8 9 10 11  
**TBRS FA 4 A 1 02 - 3 - T T F - G93**

### 1 Series

TBRS = 87.0 psig (6.0 bar) maximum inlet pressure

### 2 Inlet /Outlet

**B** = Female ISO/BSP parallel thread  
**FA** = ASME B16.5 flange  
**FD** = DIN flange  
**TC** = Sanitary clamp (BSOD)

### 3 Size

4 = 1/2 in. / DN15

### 4 Pressure Class

Omit designator if flanges are not ordered.

**A** = ASME class 150  
**M** = DN class PN16

### 5 Flange Facing

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

### 6 Body Material

02 = 316L SS

### 7 Pressure Control Range

**3** = 0.72 to 1.4 psig (20 to 40 in. H<sub>2</sub>O, 50 to 100 mbar)  
**4** = 0.72 to 2.9 psig (20 to 80 in. H<sub>2</sub>O, 50 to 200 mbar)  
**5** = 0.72 to 7.2 psig (20 to 200 in. H<sub>2</sub>O, 50 to 500 mbar)  
**6** = 0.72 to 11.6 psig (20 to 321 in. H<sub>2</sub>O, 50 to 800 mbar)

### 8 Seal Material

T = PTFE

### 9 Diaphragm Material

T = PTFE

### 10 Seat Seal Material

F = Kalrez 6230

### 11 Options

G93 = ASTM G93 Level C-cleaned

## Spring-Loaded, Pressure-Reducing Regulators— TBR8(H)8 Series

### Features

- Spring-loaded pressure control
- Diaphragm sensing mechanism
- Ultrasensitive with millibar control
- 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
- Compliance with FDA/USP class VI

### Options

- Factory set and locked
- Wetted components finished to 15.7 μin. (0.4 μm) or 31.5 μin. (0.8 μm)
- Special cleaning to ASTM G93 Level C

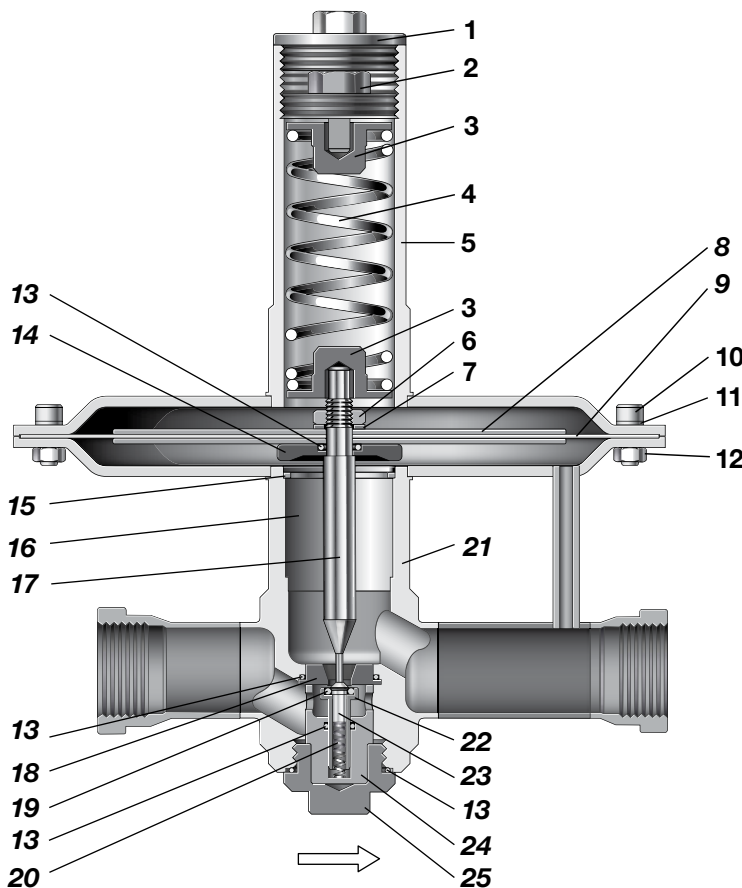


### Technical Data

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)
TBR8	87.0 (6.0)	7.2 (200, 500)	Diaphragm	-4 to 212 (-20 to 100)	1.0	0.31 (8.0)	1 in. NPT, ISO/BSP parallel thread, sanitary clamp (BSOD), ASME or DIN flange	Threaded 14.3 (6.5)
TBRSH8	232 (16.0)				0.3	0.20 (5.0)		Flanged 18.7 (8.5)

### Materials of Construction

TBR8 Series Regulator



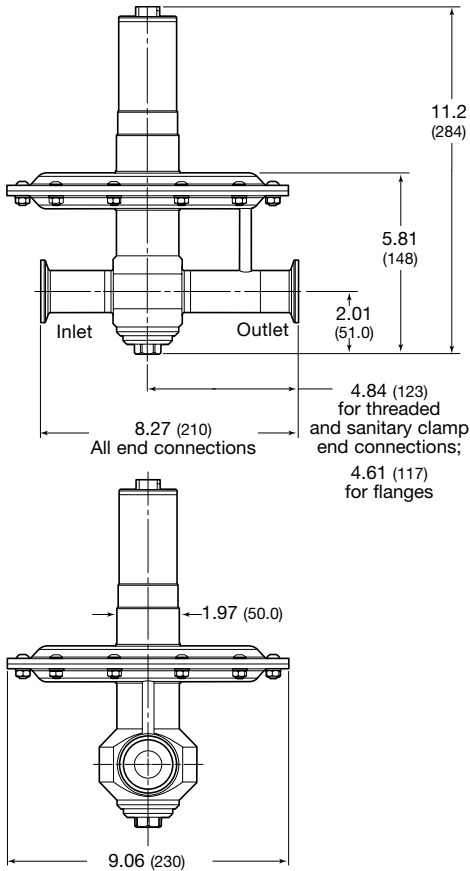
Component	Material / Specification
1 Cover	
2 Adjusting screw	316L SS / A479 or EN10088
3 Spring guide	
4 Set spring	302 SS / A240
5 Spring housing assembly	316L SS / A479 or EN10088
6 Nut	A2
7 Lock washer	A4
8 Diaphragm plate	316L SS/ A479 or EN10088
9 Diaphragm / support	PTFE / fluorocarbon FKM
10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

Wetted components listed in *italics*.



**Dimensions**

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



Shown with sanitary clamp end connections.

**Flow Tables**

**TBRSH8 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)
0.07 to 0.14 (2.0 to 4.0, 5 to 10)	2.3 (4.0)	4.7 (8.0)	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)
0.14 to 0.72 (4.0 to 20, 10 to 50)											
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.

**TBRSH8 Series Regulators with 0.20 in. (5.0 mm) Seat**

Outlet Pressure Range psig (in. H <sub>2</sub> O, mbar)	Inlet Pressure, psig (bar)					
	29 (2.0)	58 (4.0)	87 (6.0)	130 (9.0)	174 (12.0)	232 (16.0)
0.07 to 0.14 (2.0 to 4.0, 5 to 10)						
0.14 to 0.72 (4.0 to 20, 10 to 50)	9.4 (16)	18.8 (32)	28.2 (48)	41.1 (70)	52.9 (90)	70.6 (120)
0.29 to 2.9 (8.0 to 80, 20 to 200)						
0.72 to 7.2 (20 to 200, 50 to 500)						

Inlet pressure determines the maximum flow because the outlet pressure is less than 50 % of inlet pressure, and in this situation, the gas flows through the seat at sonic velocity. This is known as critical or choked flow. Flow will not increase even if outlet pressure decreases to 0.014 psig (0.40 in. H<sub>2</sub>O, 1.0 mbar).

**Ordering Information**

Build a TBRSH8 series regulator ordering number by combining the designators in the sequence shown below.

**1 2 3 4 5 6 7 8 9 10 11**  
**TBRSH8A1-02-3-VTV-FS**

**1 Series**

**TBRSH** = 87.0 psig (6.0 bar) maximum inlet pressure  
**TBRSH** = 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** = DIN flange  
**TC** = Sanitary clamp (BSOD)

**3 Size**

8 = 1 in. / DN25

**4 Pressure Class**

Omit designator if flanges are not ordered.  
**A** = ASME class 150  
**M** = DN class PN16

**5 Flange Facing**

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

**6 Body Material**

02 = 316L SS

**7 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)

**8 Seal Material**

**V** = Fluorocarbon FKM  
**E** = EPDM  
**F** = Kalrez 6230

**9 Diaphragm Material**

T = PTFE

**10 Seat Seal Material**

**V** = Fluorocarbon FKM  
**E** = EPDM  
**F** = Kalrez 6230

**11 Options**

**FS** = Factory set and locked  
**P4** = Wetted components finished to 15.7 μin. (0.4 μm)  
**P8** = Wetted components finished to 31.5 μin. (0.8 μm)  
**G93** = ASTM G93 Level C-cleaned

## Spring-Loaded, Pressure-Reducing Regulators— TBR516 Series

### Features

- Spring-loaded pressure control
- Diaphragm sensing mechanism
- Ultrasensitive with millibar control
- Balanced poppet
- 316L stainless steel materials of construction

- External feedback
- Adjustable from 0.07 psig (2.0 in. H<sub>2</sub>O, 5 mbar) pressure
- Supply pressure effect ratio: 1:3000

### Options

- Factory set and locked
- Special cleaning to ASTM G93 Level C

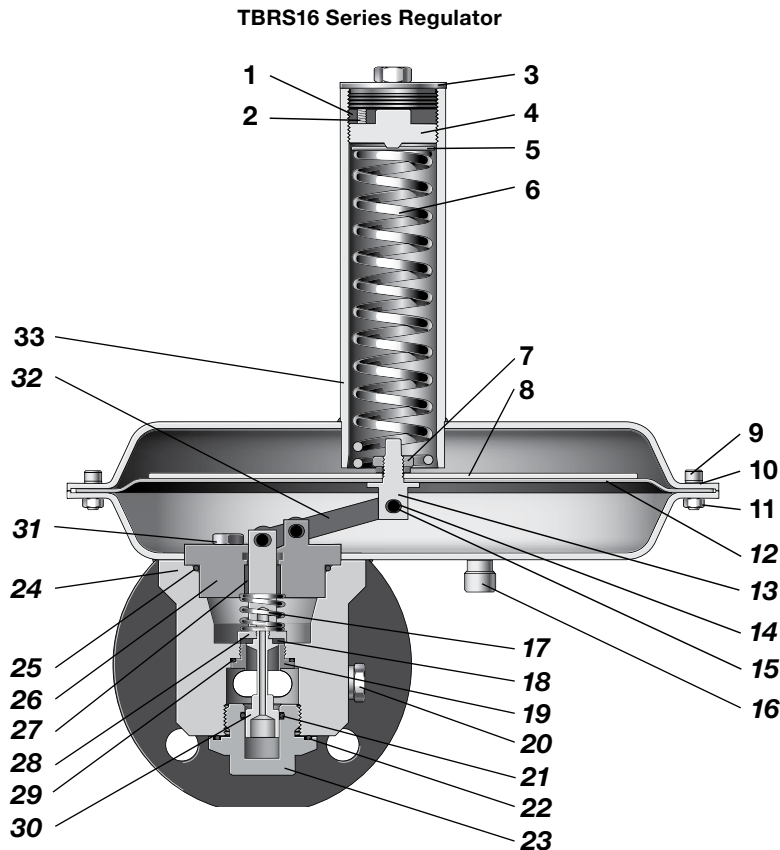


### Technical Data

Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (in. H <sub>2</sub> O, mbar)	Temperature Range °F (°C)	Flow Coefficient (C <sub>v</sub> )
232 (16.0)	2.9 (80, 200)	-4 to 212 (-20 to 100)	6.9

Seat Diameter in. (mm)	Inlet and Outlet Connections	Gauge / EF Connections	Weight lb (kg)
0.75 (19.0)	2 in. ASME or DIN flanges	Gauge: 1/4 in. NPT External feedback: 1/2 in. NPT	25 (14.3)

### Materials of Construction

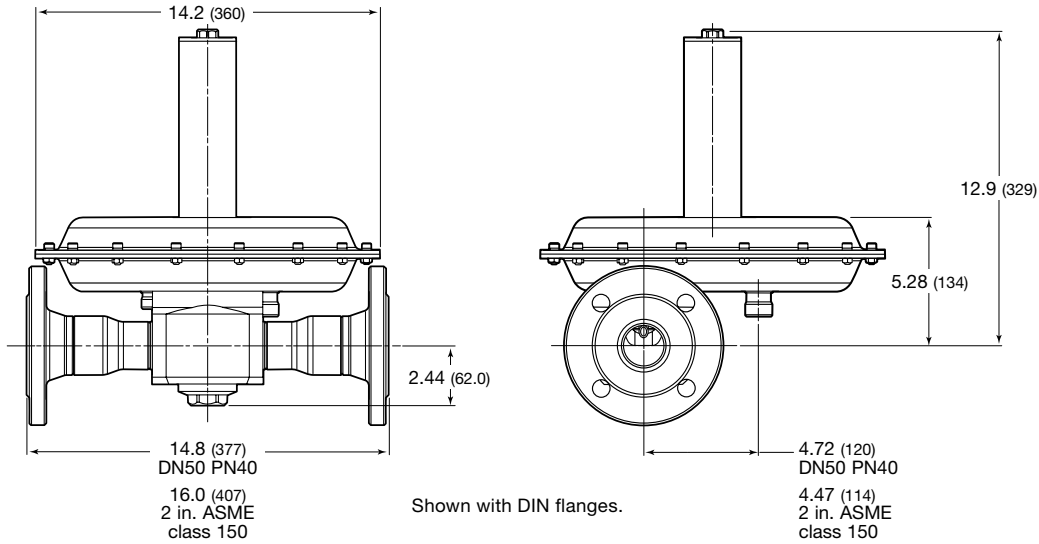


Component	Material / Specification	
1 Lock screw	A2-70	
2 Set screw	A2	
3 Cover	316L SS / A479 or EN10088	
4 Adjusting screw		
5 Spring guide		
6 Set spring		302 SS / A240
7 Lock nut	A4	
8 Diaphragm plate	316L SS / A479 or EN10088	
9 Socket-head cap screw	A4-80	
10 Lock washer	A2	
11 Nut		
12 Diaphragm / liner	PTFE / butyl	
13 Diaphragm screw	316L SS / A479 or EN10088	
14 Bushing		
15 Hex head screw		
16 Gauge and EF fittings		
17 Poppet spring	302 SS / A240	
18 Poppet insert	431 SS / A276	
19 Seat	316L SS / A479 or EN10088	
20 Plug		
21 Poppet O-ring	EPDM, FFKM, FKM, nitrile	
22 Plug O-ring		
23 Body plug	316L SS / A479 or EN10088	
24 Body assembly (body, reducers, flanges, lower dish)		
25 Holder O-ring		EPDM, FFKM, FKM, nitrile
26 Valve holder		316L SS / A479 or EN10088
27 Guide bushing		
28 Poppet housing	EPDM, FFKM, FKM, nitrile	
29 Seat seal		
30 Poppet	316L SS / A479 or EN10088	
31 Hex head screw		
32 Lever		
33 Spring housing assembly	316L SS / A479 or EN10088	

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

### Dimensions

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



### Flow Table

Outlet Pressure Range psig (in. H <sub>2</sub> O, mbar)	Inlet Pressure, psig (bar)											
	14 (1.0)	29 (2.0)	43 (3.0)	58 (4.0)	72 (5.0)	87 (6.0)	101 (7.0)	116 (8.0)	130 (9.0)	145 (10.0)	159 (11.0)	174 (12.0)
0.07 to 0.14 (2.0 to 4.0, 5 to 10)	Air Flow, std ft <sup>3</sup> /min (Nm <sup>3</sup> /h)											
0.14 to 0.72 (4.0 to 20, 10 to 50)	52.9 (90)	106 (180)	159 (270)	212 (360)	265 (450)	318 (540)	371 (630)	424 (720)	530 (900)	636 (1080)	742 (1260)	848 (1440)
0.29 to 2.9 (8.0 to 80, 20 to 200)												

Inlet pressure determines the maximum flow because the outlet pressure is less than 50 % of inlet pressure, and in this situation, the gas flows through the seat at sonic velocity. This is known as critical or choked flow. Flow will not increase even if outlet pressure decreases to 0.014 psig (0.40 in. H<sub>2</sub>O, 1.0 mbar).

### Ordering Information

Build a TBRS16 series regulator ordering number by combining the designators in the sequence shown below.

**1 2 3 4 5 6 7 8 9 10 11**  
**TBRS FA 16 A 1 - 02 - 3 - V T V - FS**

**1 Series**

TBRS = 232 psig (16.0 bar) maximum inlet pressure

**2 Inlet /Outlet**

FA = ASME B16.5 flange  
 FD = DIN flange

**3 Size**

16 = 2 in. / DN50

**4 Pressure Class**

A = ASME class 150  
 M = DN class PN16

**5 Flange Facing**

1 = Raised face smooth

**6 Body Material**

02 = 316L SS

**7 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)

**8 Seal Material**

- V = Fluorocarbon FKM
- E = EPDM
- F = FFKM

**9 Diaphragm Material**

T = PTFE

**10 Seat Seal Material**

- V = Fluorocarbon FKM
- E = EPDM
- F = FFKM

**11 Option**

- FS = Factory set and locked
- G93 = ASTM G93 Level C-cleaned

## Low-Pressure, Spring-Loaded, Back-Pressure Regulators—TBVS4 Series

### Features

- Spring-loaded pressure control
- Diaphragm sensing mechanism
- 316L stainless steel materials of construction
- Large diaphragm to seat ratio
- Compliance with FDA/USP class VI

### Options

- Special cleaning to ASTM G93 Level C

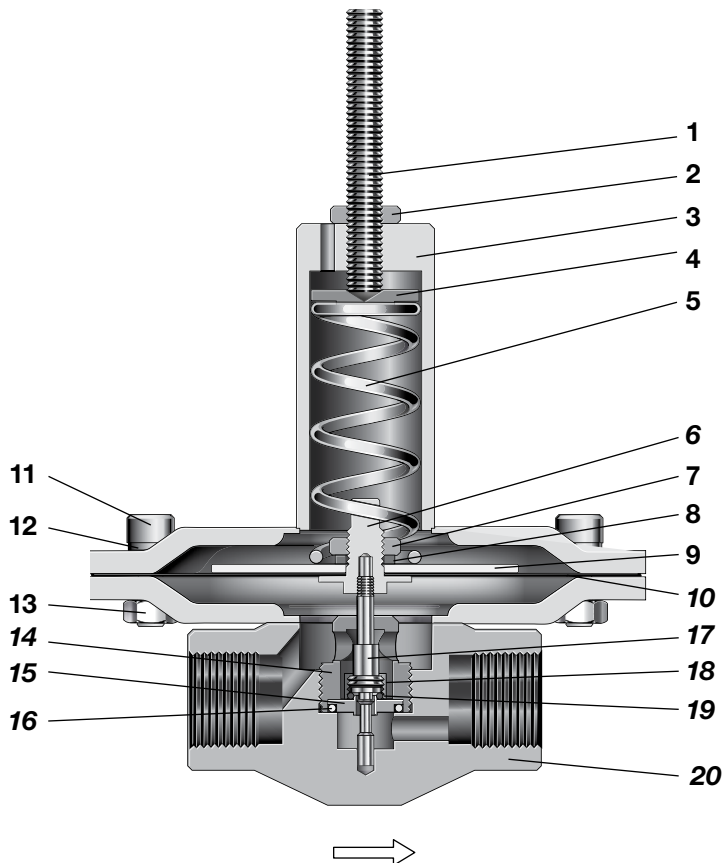


### Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet 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)
TBVS4	14.5 (1.0)	11.6 (321, 800)	Diaphragm	-4 to 212 (-20 to 100)	0.2	0.16 (4.0)	1/2 in. ISO/BSP parallel thread, sanitary clamp (BSOD), ASME or DIN flange	3.5 (1.6) without flanges

### Materials of Construction

TBVS4 Series Regulator



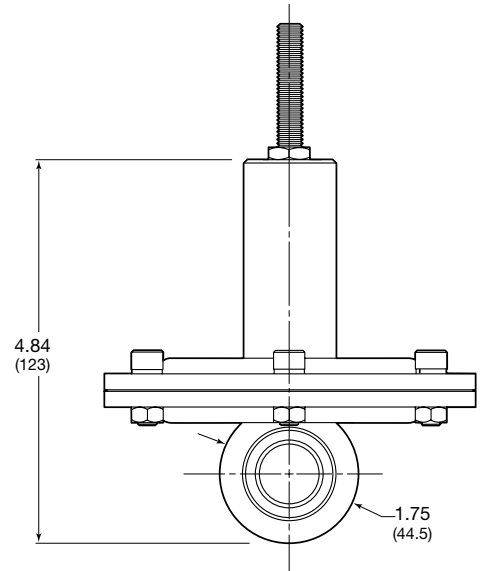
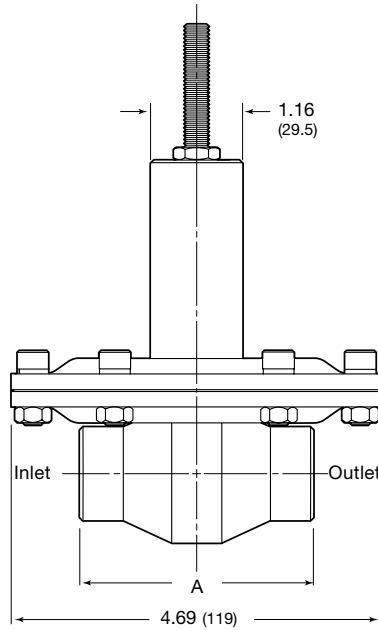
Component	Material / Specification
1 Set screw	A2-70
2 Nut	A2
3 Spring housing assembly	316L SS / A479 or EN10088
4 Spring guide	
5 Set spring	302 SS / A240
6 Clamp ring	316L SS / A479 or EN10088
7 Nut	A4
8 Washer	A2
9 Diaphragm plate	316L SS / A479 or EN10088
10 Diaphragm	PTFE
11 Socket-head cap screw	A4-80
12 Washer	A2
13 Nut	A4
14 Seat retainer	316L SS / A479 or EN10088
15 Seat	
16 Seat seal	PTFE
17 Poppet	316L SS / A479 or EN10088
18 Poppet screw	
19 Poppet O-ring	Kalrez 6230
20 Body assembly (body, bottom dish)	316L SS / A479 or EN10088
<i>Wetted lubricants: Silicone-based and synthetic hydrocarbon-based</i>	

Wetted components listed in *italics*.

### Dimensions

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

End Connection Size and Type	A in. (mm)
1/2 in. female ISO/BSP parallel thread	2.95 (75.0)
DN15 PN16 flange	8.31 (211)
1/2 in. ASME class 150 flange	9.09 (231)
1/2 in. sanitary clamp (BSOD)	9.06 (230)



### Ordering Information

Build a TBVS4 series regulator ordering number by combining the designators in the sequence shown below.

1
2
3
4
5
6
7
8
9
10
11  
**TBVS FA 4 A 1 - 02 - 3 - T T F - G93**

**1 Series**

TBVS = 14.5 psig (1.0 bar) maximum inlet pressure

**2 Inlet /Outlet**

**B** = Female ISO/BSP parallel thread  
**FA** = ASME B16.5 flange  
**FD** = DIN flange  
**TC** = Sanitary clamp (BSOD)

**3 Size**

4 = 1/2 in. / DN15

**4 Pressure Class**

Omit designator if flanges are not ordered.

**A** = ASME class 150  
**M** = DN class PN16

**5 Flange Facing**

Omit designator if flanges are not ordered.

1 = Raised face smooth

**6 Body Material**

02 = 316L SS

**7 Pressure Control Range**

**3** = 0.72 to 1.4 psig (20 to 40 in. H<sub>2</sub>O, 50 to 100 mbar)

**4** = 0.72 to 2.9 psig (20 to 80 in. H<sub>2</sub>O, 50 to 200 mbar)

**5** = 0.72 to 7.2 psig (20 to 200 in. H<sub>2</sub>O, 50 to 500 mbar)

**6** = 0.72 to 11.6 psig (20 to 321 in. H<sub>2</sub>O, 50 to 800 mbar)

**8 Seal Material**

T = PTFE

**9 Diaphragm Material**

T = PTFE

**10 Seat Seal Material**

F = Kalrez 6230

**11 Options**

G93 = ASTM G93 Level C-cleaned

## Spring-Loaded, Back-Pressure Regulators—TBVS8 Series

### Features

- Spring-loaded pressure control
- Diaphragm sensing mechanism
- 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

- Compliance with FDA/USP class VI

### Options

- Factory set and locked
- Wetted components finished to 15.7 μin. (0.4 μm) or 31.5 μin. (0.8 μm)
- Special cleaning to ASTM G93 Level C

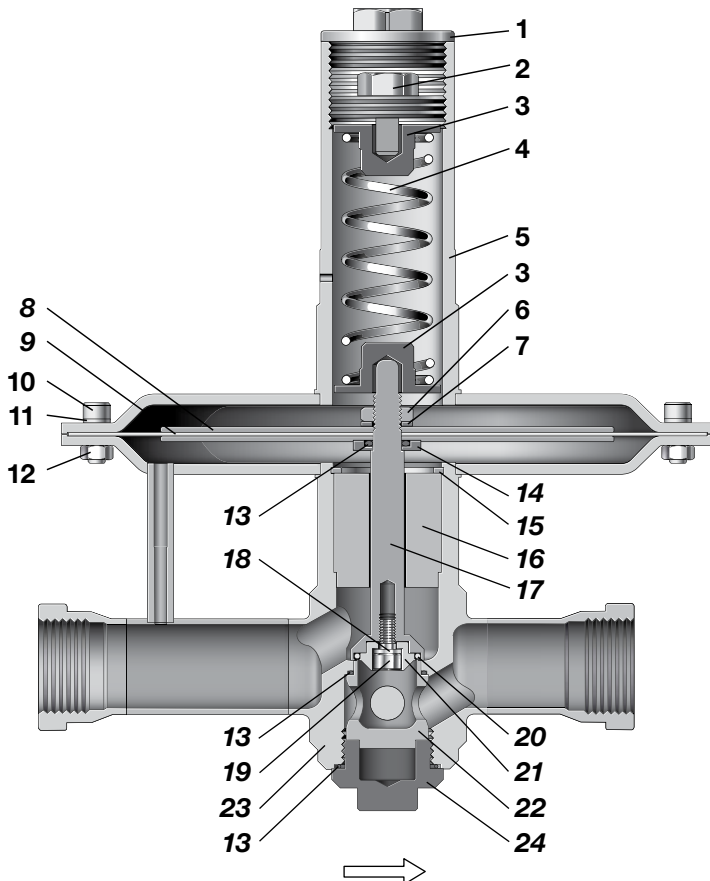


### Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet 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)
TBVS8	87.0 (6.0)	7.2 (200, 500)	Diaphragm	-4 to 212 (-20 to 100)	8.35	0.83 (21.0)	1 in. NPT, ISO/BSP parallel thread, sanitary clamp (BSOD), ASME or DIN flange	Threaded 14.3 (6.5) Flanged 18.7 (8.5)

### Materials of Construction

TBVS8 Series Regulator



Component	Material / Specification
1 Cover	316L SS / A479 or EN10088
2 Adjusting screw	
3 Spring guide	
4 Set spring	
5 Spring housing assembly	316L SS / A479 or EN10088
6 Nut	A2
7 Lock washer	A4
8 Diaphragm plate	316L SS/ A479 or EN10088
9 Diaphragm / support	PTFE / fluorocarbon FKM
10 Socket-head cap screw	A4-80
11 Lock washer	A2
12 Nut	
13 O-ring	PTFE
14 Seal housing	316L SS/ A479 or EN10088
15 Retaining ring	
16 Guide ring	PTFE
17 Stem	316L SS/ A479 or EN10088
18 Washer	A4
19 Socket-head screw	
20 Seat seal	FKM, EDPM, Kalrez 6230
21 Valve ring	316L SS/ A479 or EN10088
22 Valve seat	
23 Body assembly (body, outlet tube, EF tube, fittings, lower dish)	
24 Body plug	

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

Wetted components listed in *italics*.

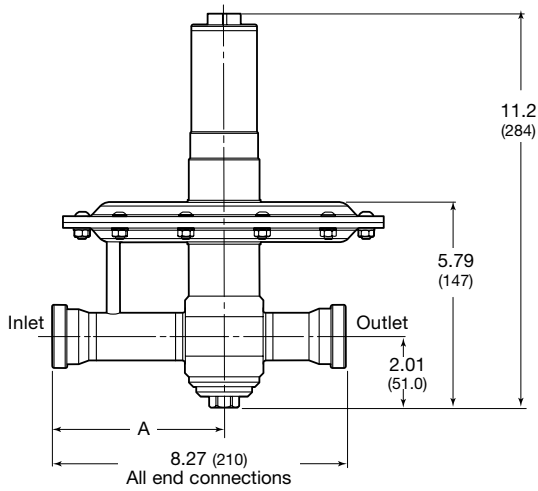
### Dimensions

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

End Connection Size and Type	A in. (mm)
1 in. female ISO/BSP parallel thread	4.84 (123)
1 in. female NPT	4.84 (123)
DN25 PN16 flange	4.61 (117)
1 in. ASME class 150 flange	4.61 (117)
1 in. sanitary clamp (BSOD)	4.84 (123)

### Flow Table

Set Pressure	Inlet Pressure, psig (in. H <sub>2</sub> O, mbar)					
	0.14 (4.0, 10)	0.29 (8.0, 20)	0.58 (16, 40)	1.4 (40, 100)	2.9 (80, 200)	7.2 (200, 500)
	Air Flow, std ft <sup>3</sup> /min (Nm <sup>3</sup> /h)					
25 % overpressure	3.2 (5.5)	7.0 (12.0)	11.1 (19.0)	19.4 (33.0)	31.7 (54.0)	64.7 (110)
50 % overpressure	4.4 (7.5)	8.8 (15.0)	15.8 (27.0)	24.7 (42.0)	40.0 (68.0)	76.5 (130)
75 % overpressure	5.0 (8.5)	10.2 (17.5)	18.4 (31.4)	29.4 (50.0)	49.4 (84.0)	82.3 (140)
100 % overpressure	6.4 (11.0)	11.1 (19.0)	21.7 (37.0)	31.7 (54.0)	54.7 (93.0)	88.2 (150)



Shown with female ISO/BSP parallel thread end connections

### Ordering Information

Build a TBVS8 series regulator ordering number by combining the designators in the sequence shown below.

**1 2 3 4 5 6 7 8 9 10 11**  
**TBVS FA 8 A 1 - 02 - 3 - T T V - FS**

**1 Series**

TBVS = 87.0 psig (6.0 bar) maximum inlet pressure

**2 Inlet /Outlet**

**B** = Female ISO/BSP parallel thread  
**N** = Female NPT  
**FA** = ASME B16.5 flange  
**FD** = DIN flange  
**TC** = Sanitary clamp (BSOD)

**3 Size**

8 = 1 in. / DN25

**4 Pressure Class**

Omit designator if flanges are not ordered.  
**A** = ASME class 150  
**M** = DN class PN16

**5 Flange Facing**

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

**6 Body Material**

02 = 316L SS

**7 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)

**8 Seal Material**

T = PTFE

**9 Diaphragm Material**

T = PTFE

**10 Seat Seal Material**

**V** = Fluorocarbon FKM  
**E** = EPDM  
**F** = Kalrez 6230

**11 Options**

**FS** = Factory set and locked  
**P4** = Wetted components finished to 15.7 μin. (0.4 μm)  
**P8** = Wetted components finished to 31.5 μin. (0.8 μm)  
**G93** = ASTM G93 Level C-cleaned

## Other Regulators

- For general-use RHPS series regulators, see the Swagelok *Pressure Regulators, RHPS Series* catalog, MS-02-430.



- For additional Swagelok pressure regulators, see the Swagelok *Pressure Regulators* catalog, MS-02-230.



## Additional Products.

- For Swagelok tube fitting products, see the Swagelok *Gaugeable Tube Fittings and Adapter Fittings* catalog, MS-01-140.



- For flange adapters, see the Swagelok *Flange Adapters* catalog, MS-02-200.



- For 60 series ball valves, see the Swagelok *Ball Valves, General Purpose and Special Application* catalog, MS-01-146.



- For piping products, see the Swagelok *Process Interface Valves* catalog, MS-02-340.



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



⚠ RHPS series pressure regulators are not “Safety Accessories” as defined in the Pressure Equipment Directive 97/23/EC.

⚠ 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.

**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](http://swagelok.com) or contact your authorized Swagelok representative.