

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°F (-20 to 100°C)

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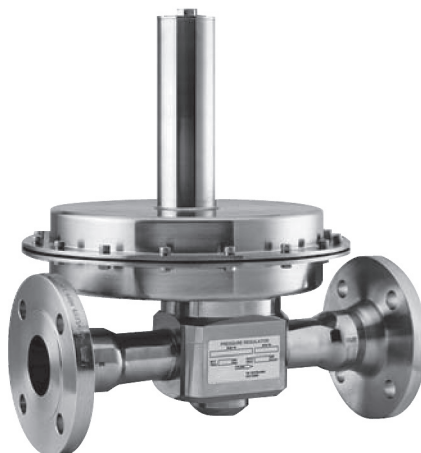
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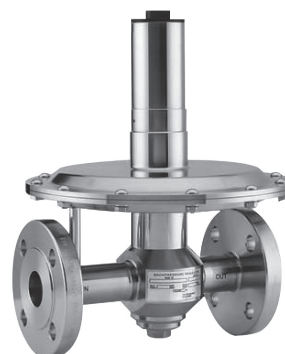


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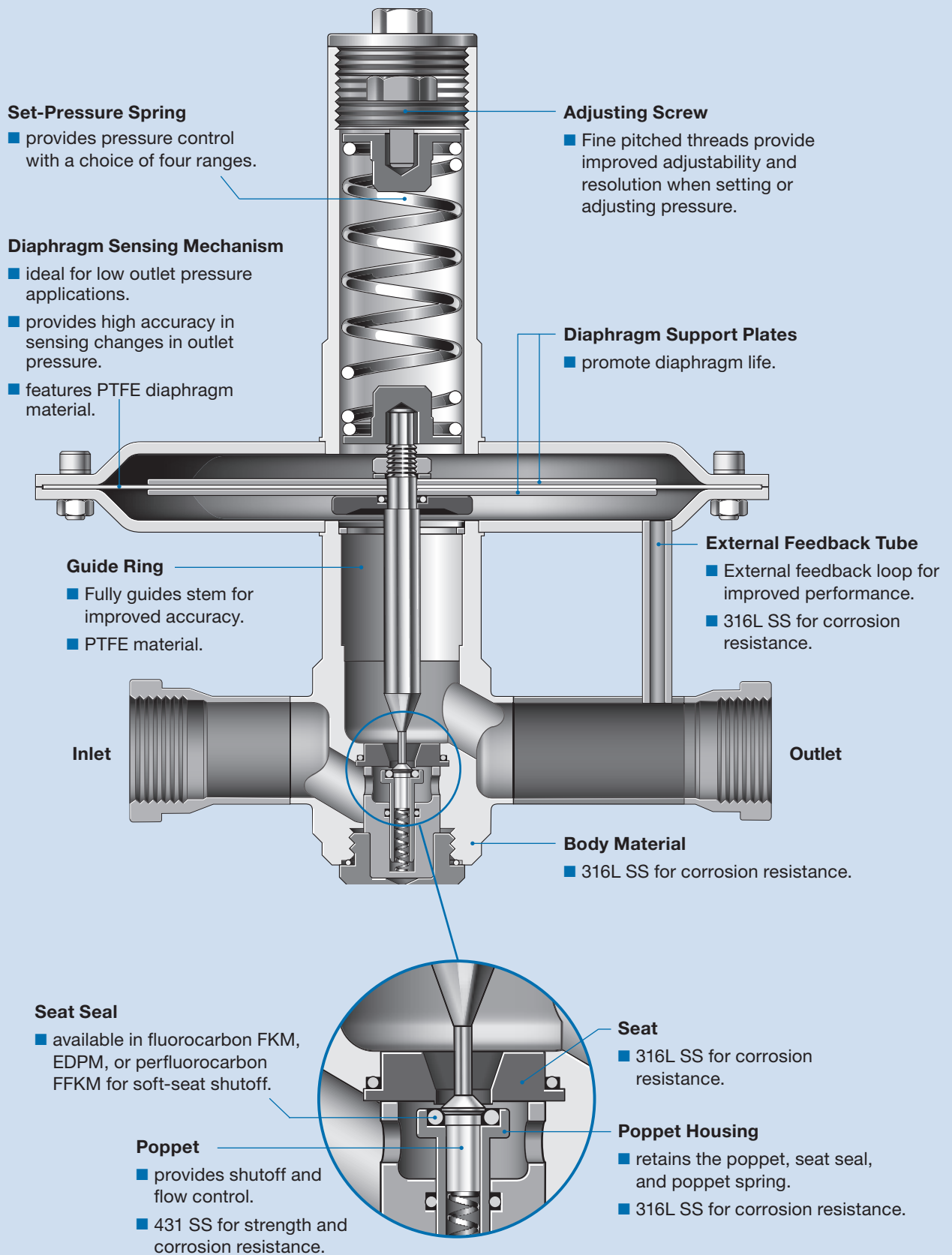


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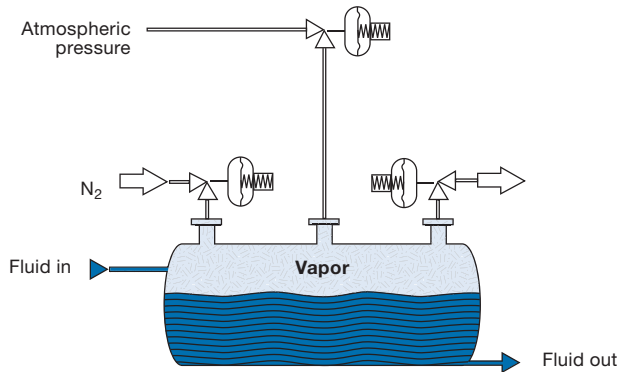
Features



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:

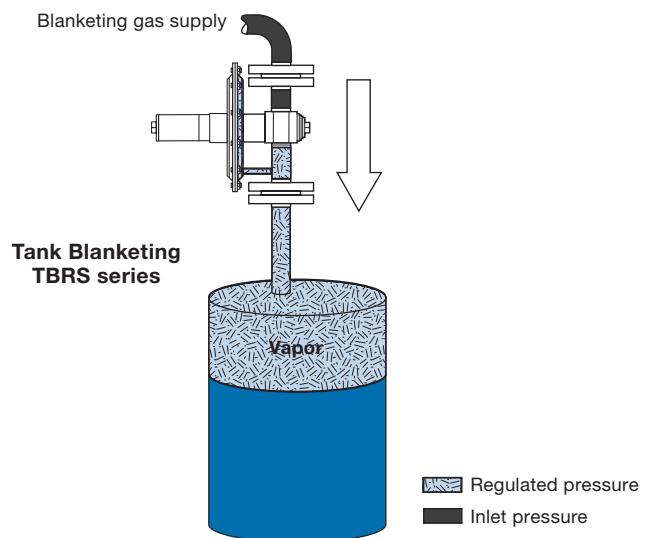
- pressure-reducing regulators
- vapor recovery regulators (back-pressure controllers)

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

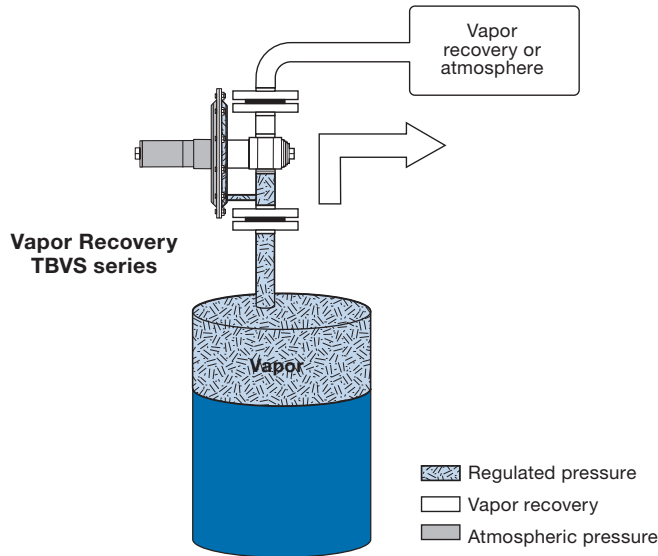
When the tank suddenly cools, the vapors inside the tank condense causing the tank pressure to decrease. The regulator opens which allows blanketing gas into the tank. Blanketing regulators also maintain a constant pressure in the tank during pump out to prevent the tank from collapsing.



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.



Temperature Ratings

Seal Material	Temperature Range °F (°C)	Material Designator
Fluorocarbon FKM	5 to 212 (-15 to 100)	V
EPDM	-4 to 212 (-20 to 100)	E
FFKM	14 to 212 (-10 to 100)	F

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 2014/68/EU.

⚠ 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

Options

- Special cleaning to ASTM G93 Level C
- Diaphragm material compliance to FDA and Seal compliance to FDA/USP class VI



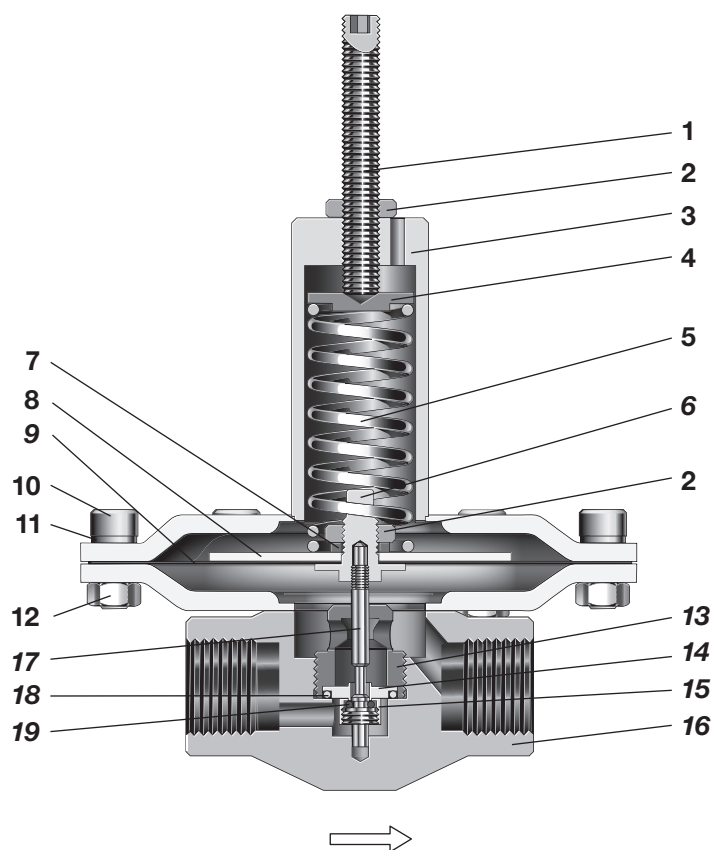
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (in. H ₂ O, mbar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	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

For temperature ratings see page 5.

Materials of Construction

TBRs4 Series Regulator



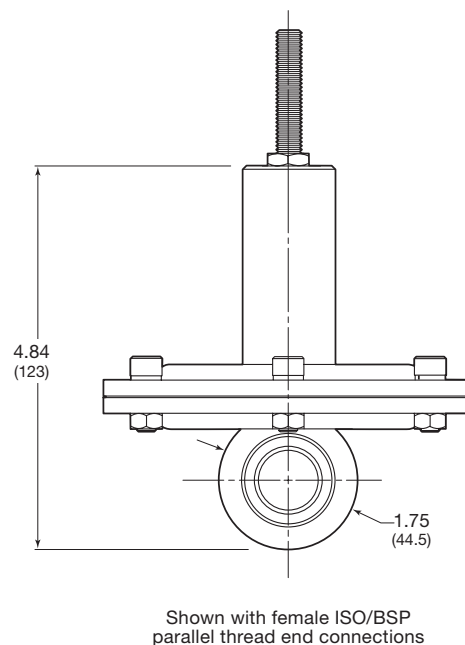
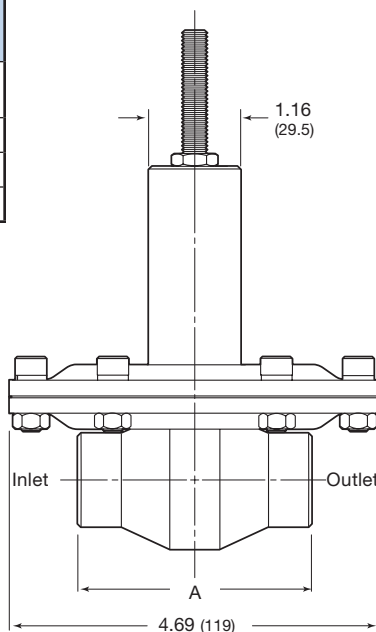
Component	Material / Specification
1 Set screw	A2-70
2 Nut	A2
3 Spring housing assembly	316L SS / A479 or EN10088
4 Spring guide	
5 Set spring	302 SS / A240
6 Clamp ring	316L SS / A479 or EN10088
7 Lock washer	A4
8 Diaphragm plate	316L SS / A479 or EN10088
9 Diaphragm	PTFE
10 Socket-head cap screw	A4-80
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)	
17 Poppet	316L SS / A479 or EN10088
18 Seat seal	PTFE
19 Poppet O-ring	FFKM
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.

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. H₂O, 50 to 100 mbar)
4 = 0.72 to 2.9 psig (20 to 80 in. H₂O, 50 to 200 mbar)
5 = 0.72 to 7.2 psig (20 to 200 in. H₂O, 50 to 500 mbar)
6 = 0.72 to 11.6 psig (20 to 321 in. H₂O, 50 to 800 mbar)

8 Seal Material

T = PTFE

9 Diaphragm Material

T = PTFE

10 Seat Seal Material

F = FFKM

11 Options

G93 = ASTM G93 Level C-cleaned

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

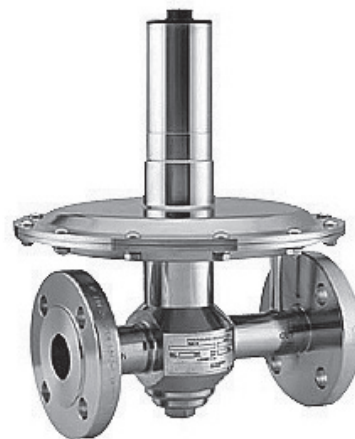
Features

- 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. H₂O, 5 mbar) pressure
- Supply pressure effect ratio: 1:3000

Options

- Factory set and locked
- Special cleaning to ASTM G93 Level C
- Diaphragm material compliance to FDA and Seal compliance to FDA/ USP class VI



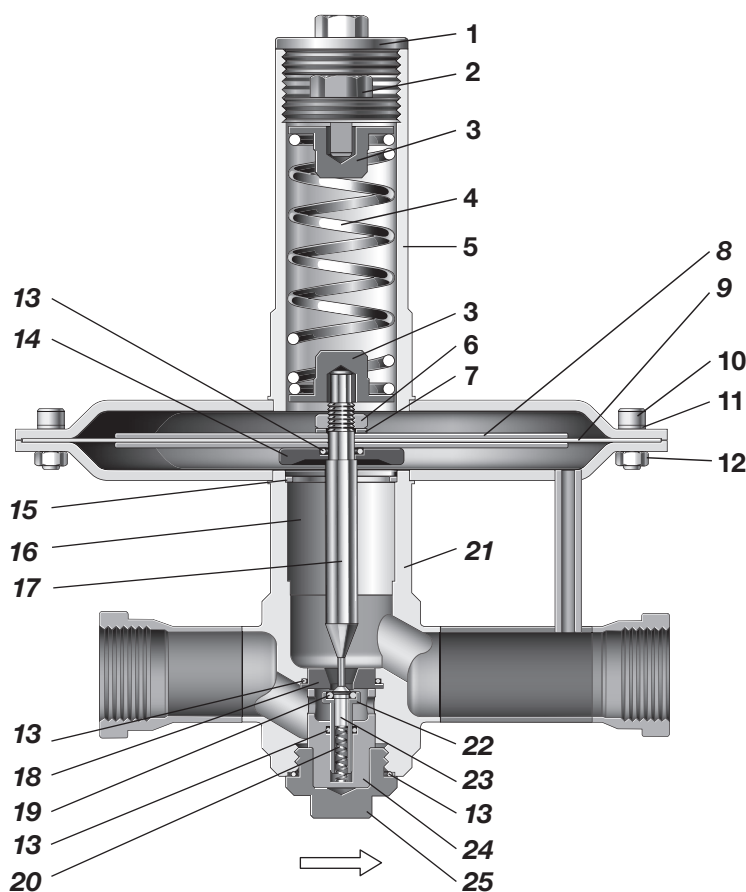
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Outlet Control Pressure psig (in. H ₂ O, mbar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	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)

For temperature ratings see page 5.

Materials of Construction

TBR8 Series Regulator

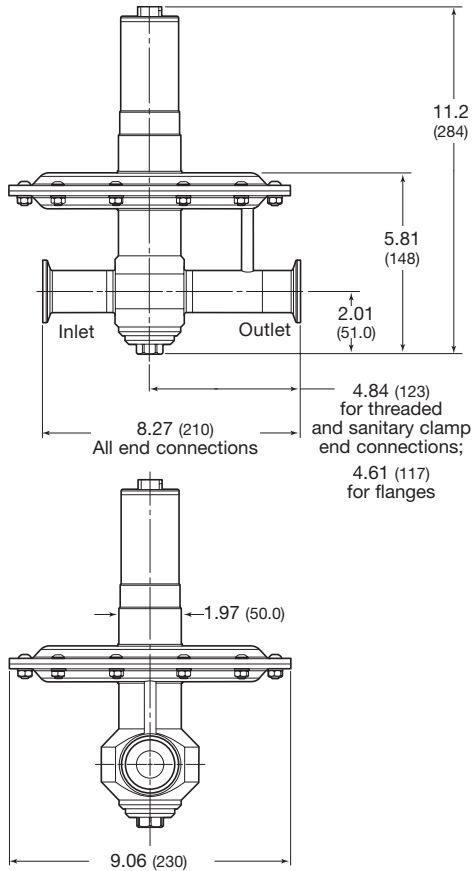


Component	Material / Specification
1 Cover	316L SS / A479 or EN10088
2 Adjusting screw	
3 Spring guide	
4 Set spring	302 SS / A240
5 Spring housing assembly	316L SS / A479 or EN10088
6 Nut	A2
7 Lock washer	A4
8 Diaphragm plate	316L SS/ A479 or EN10088
9 Diaphragm / support	PTFE / fluorocarbon FKM
10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



Shown with sanitary clamp end connections.

Flow Tables

TBRS8 Series Regulators with 0.31 in. (8.0 mm) Seat

Outlet Pressure Range psig (in. H ₂ 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 ³ /min (Nm ³ /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)						
0.29 to 2.9 (8.0 to 80, 20 to 200)	—	—				23.5 (40)	38.2 (65)	50.0 (85)	61.7 (105)	73.5 (125)	85.3 (145)
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.

TBRS8H Series Regulators with 0.20 in. (5.0 mm) Seat

Outlet Pressure Range psig (in. H ₂ O, mbar)	Inlet Pressure, psig (bar)					
	29 (2.0)	58 (4.0)	87 (6.0)	130 (9.0)	174 (12.0)	232 (16.0)
	Air Flow, std ft ³ /min (Nm ³ /h)					
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. H₂O, 1.0 mbar).

Ordering Information

Build a TBRS(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
TBRS FA 8 A 1 - 02 - 3 - V T V - FS

1 Series

TBRS = 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. H₂O, 5 to 10 mbar)
2 = 0.14 to 0.72 psig (4.0 to 20 in. H₂O, 10 to 50 mbar)
3 = 0.29 to 2.9 psig (8.0 to 80 in. H₂O, 20 to 200 mbar)
4 = 0.72 to 7.2 psig (20 to 200 in. H₂O, 50 to 500 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 Options

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

Spring-Loaded, Pressure-Reducing Regulators— TBRs16 Series

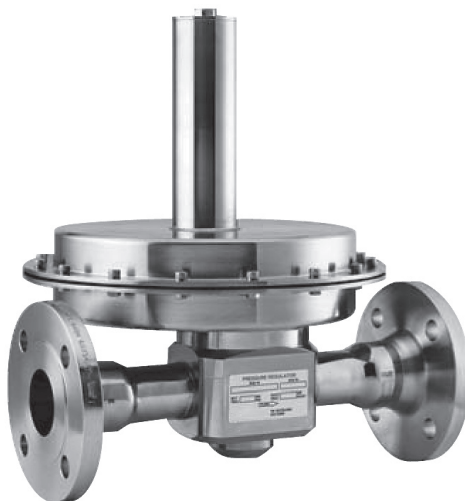
Features

- 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. H₂O, 5 mbar) pressure
- Supply pressure effect ratio: 1:3000

Options

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



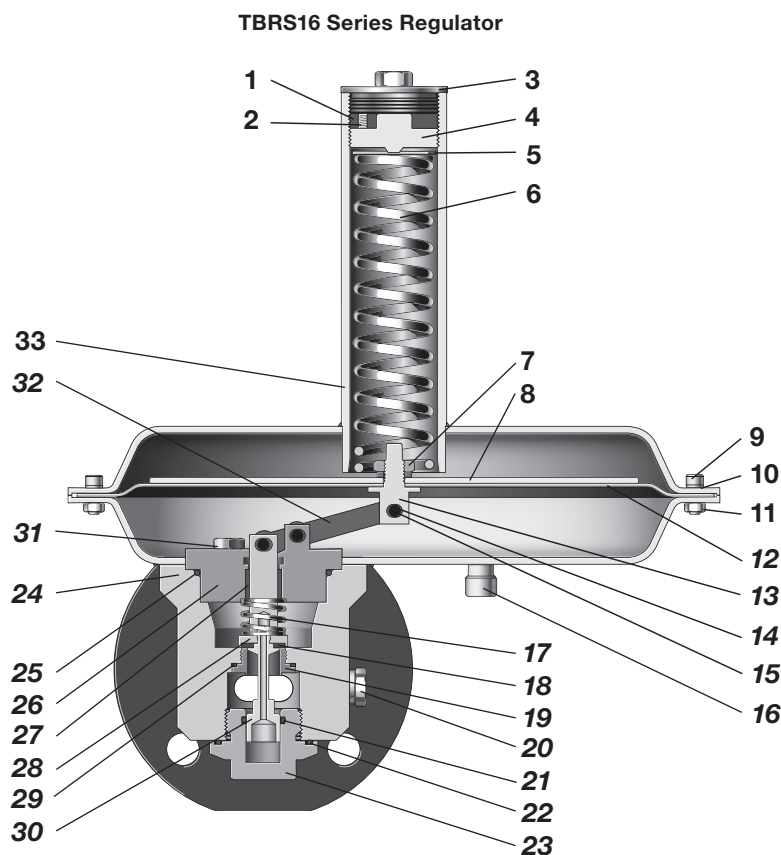
Technical Data

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

For temperature ratings see page 5.

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

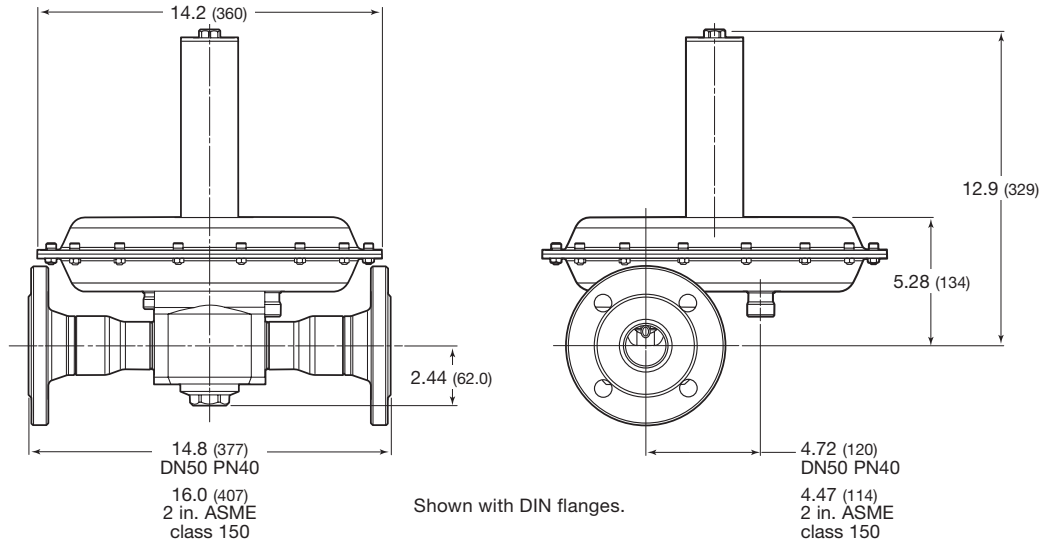


Component	Material / Specification
1 Lock screw	A2-70
2 Set screw	A2
3 Cover	316L SS / A479 or EN10088
4 Adjusting screw	
5 Spring guide	
6 Set spring	302 SS / A240
7 Lock nut	A4
8 Diaphragm plate	316L SS / A479 or EN10088
9 Socket-head cap screw	A4-80
10 Lock washer	A2
11 Nut	
12 Diaphragm / liner	PTFE / butyl
13 Diaphragm screw	316L SS / A479 or EN10088
14 Bushing	
15 Hex head screw	
16 Gauge and EF fittings	302 SS / A240
17 Poppet spring	
18 Poppet insert	
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	
26 Valve holder	316L SS / A479 or EN10088
27 Guide bushing	
28 Poppet housing	
29 Seat seal	EPDM, FFKM, FKM, nitrile
30 Poppet	
31 Hex head screw	316L SS / A479 or EN10088
32 Lever	
33 Spring housing assembly	316L SS / A479 or EN10088

Wetted components listed in *italics*.

Dimensions

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



Flow Table

Outlet Pressure Range psig (in. H ₂ 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)
	Air Flow, std ft ³ /min (Nm ³ /h)											
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)	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. H₂O, 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. H₂O, 5 to 10 mbar)
 2 = 0.14 to 0.72 psig (4.0 to 20 in. H₂O, 10 to 50 mbar)
 3 = 0.29 to 2.9 psig (8.0 to 80 in. H₂O, 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

Options

- Special cleaning to ASTM G93 Level C
- Diaphragm material compliance to FDA and Seal compliance to FDA/USP class VI



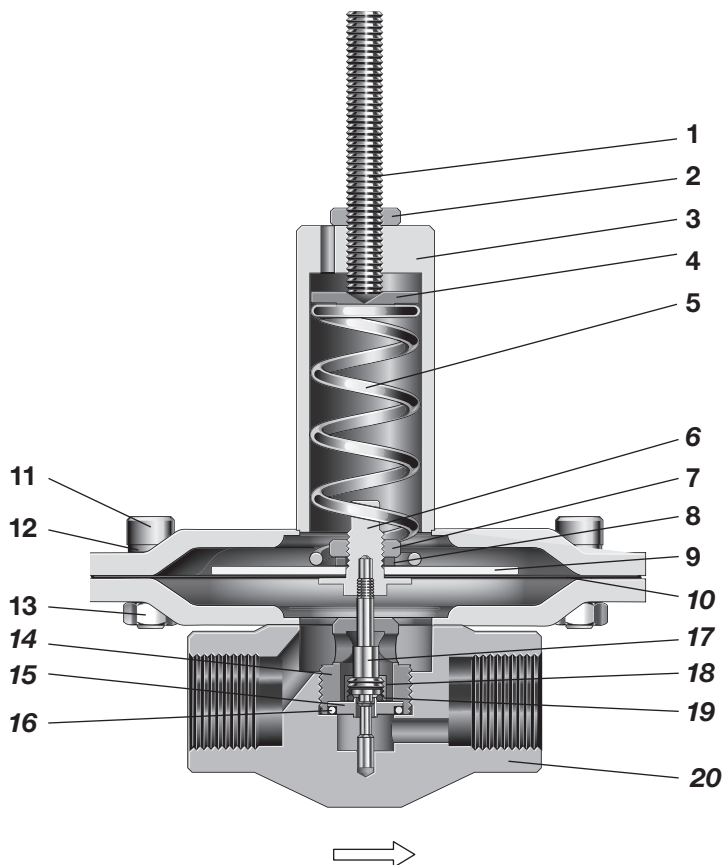
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet Control Pressure psig (in. H ₂ O, mbar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	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

For temperature ratings see page 5.

Materials of Construction

TBVS4 Series Regulator



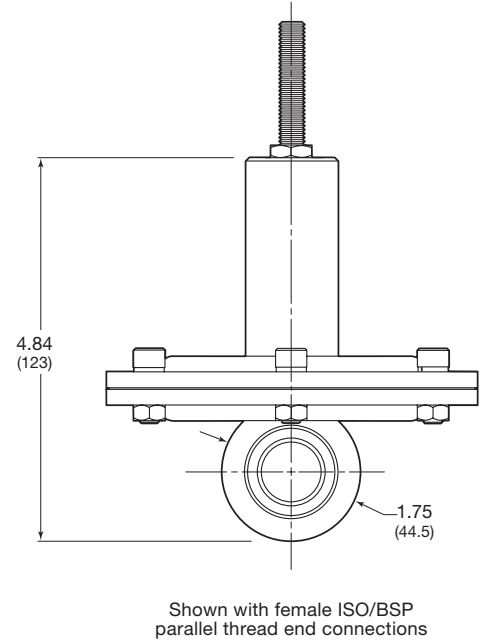
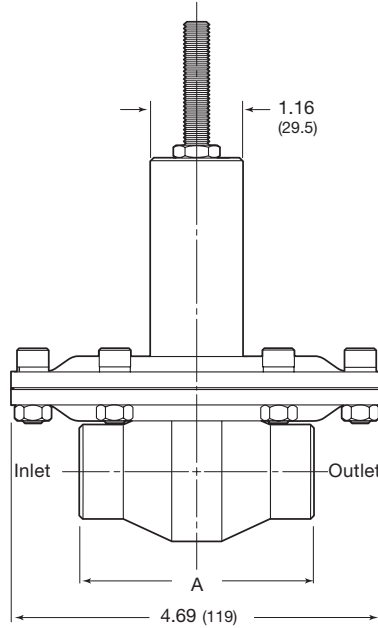
Component	Material / Specification
1 Set screw	A2-70
2 Nut	A2
3 Spring housing assembly	316L SS / A479 or EN10088
4 Spring guide	
5 Set spring	302 SS / A240
6 Clamp ring	316L SS / A479 or EN10088
7 Nut	A4
8 Washer	A2
9 Diaphragm plate	316L SS / A479 or EN10088
10 Diaphragm	PTFE
11 Socket-head cap screw	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	FFKM
20 Body assembly (body, bottom dish)	316L SS / A479 or EN10088
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 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. H₂O, 50 to 100 mbar)

4 = 0.72 to 2.9 psig (20 to 80 in. H₂O, 50 to 200 mbar)

5 = 0.72 to 7.2 psig (20 to 200 in. H₂O, 50 to 500 mbar)

6 = 0.72 to 11.6 psig (20 to 321 in. H₂O, 50 to 800 mbar)

8 Seal Material

T = PTFE

9 Diaphragm Material

T = PTFE

10 Seat Seal Material

F = FFKM

11 Options

G93 = ASTM G93 Level C-cleaned

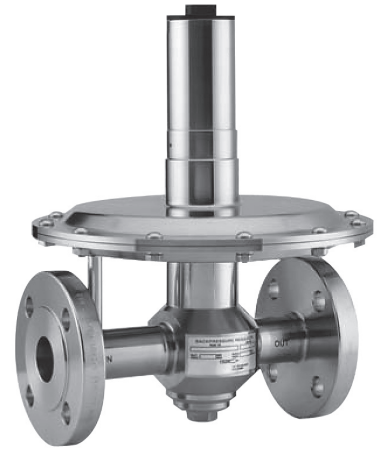
Spring-Loaded, Back-Pressure Regulators—TBVS8 Series

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. H₂O, 5 mbar) pressure

Options

- Factory set and locked
- Special cleaning to ASTM G93 Level C
- Diaphragm material compliance to FDA and Seal compliance to FDA/USP class VI



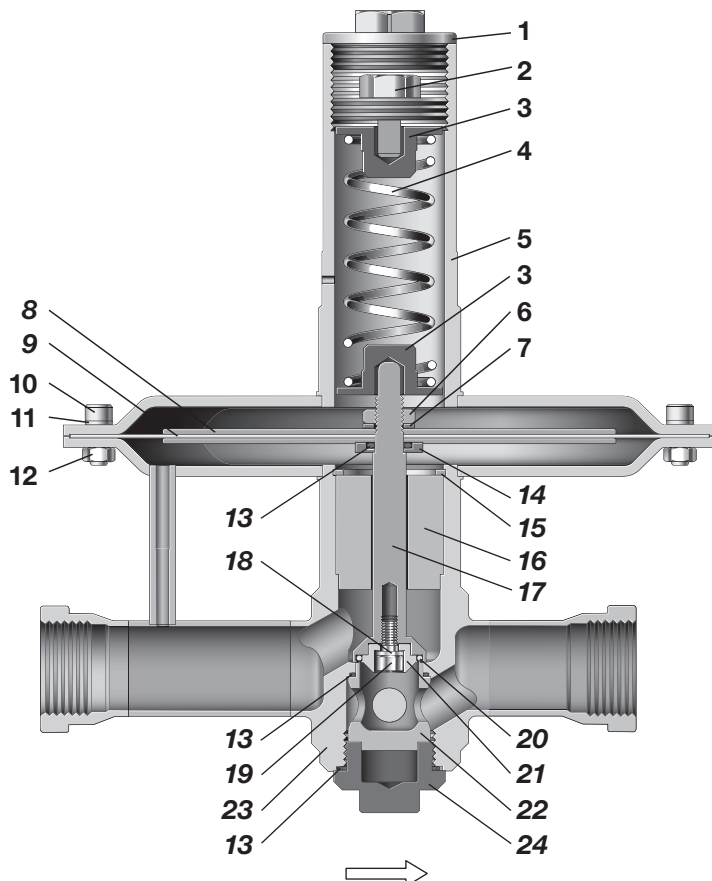
Technical Data

Series	Maximum Inlet Pressure psig (bar)	Maximum Inlet Control Pressure psig (in. H ₂ O, mbar)	Sensing Type	Temperature Range °F (°C)	Flow Coefficient (C _v)	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)

For temperature ratings see page 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	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	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, FFKM
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*.

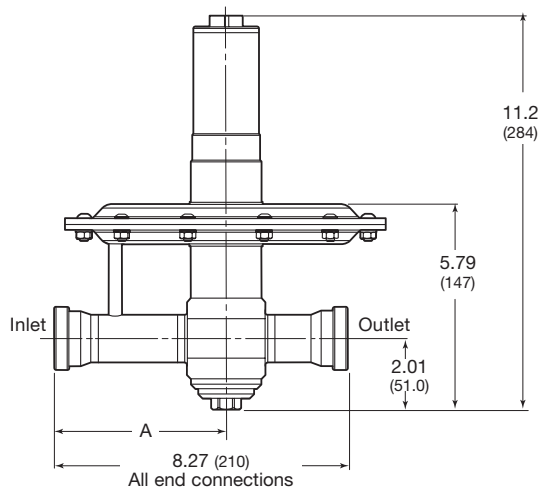
Dimensions

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

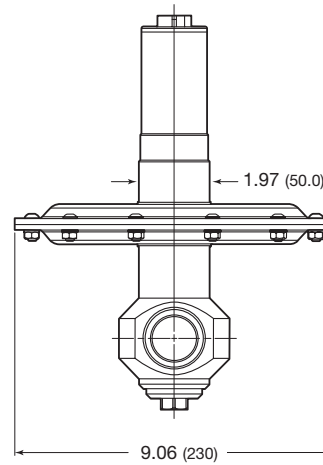
End Connection Size and Type	A in. (mm)
1 in. female ISO/BSP parallel thread	4.84 (123)
1 in. female NPT	4.84 (123)
DN25 PN16 flange	4.61 (117)
1 in. ASME class 150 flange	4.61 (117)
1 in. sanitary clamp (BSOD)	4.84 (123)

Flow Table

Set Pressure	Inlet Pressure, psig (in. H ₂ 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 ³ /min (Nm ³ /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. H₂O, 5 to 10 mbar)

2 = 0.14 to 0.72 psig (4.0 to 20 in. H₂O, 10 to 50 mbar)

3 = 0.29 to 2.9 psig (8.0 to 80 in. H₂O, 20 to 200 mbar)

4 = 0.72 to 7.2 psig (20 to 200 in. H₂O, 50 to 500 mbar)

8 Seal Material

E = EPDM

F = FFKM

T = PTFE

V = Fluorocarbon FKM

9 Diaphragm Material

T = PTFE

10 Seat Seal Material

V = Fluorocarbon FKM

E = EPDM

F = FFKM

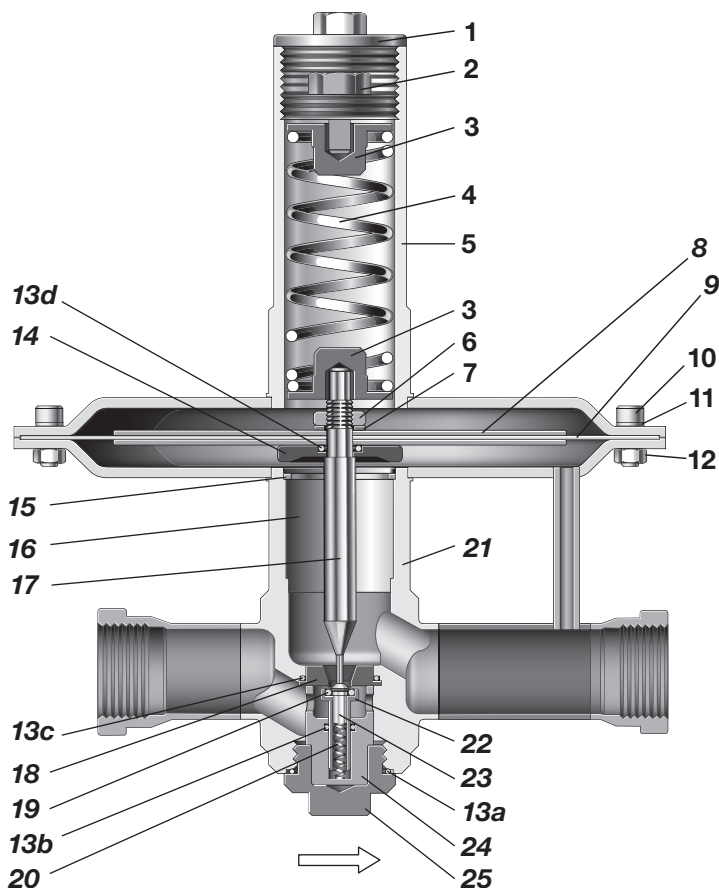
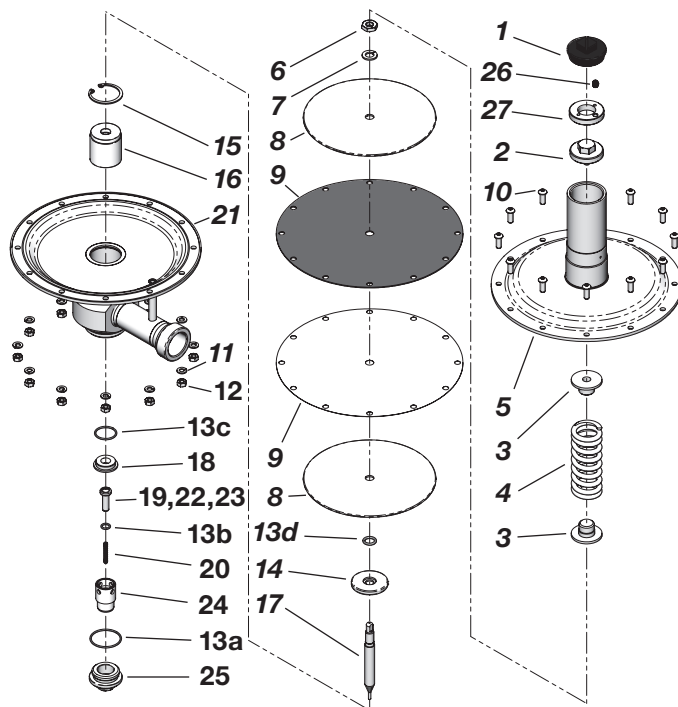
11 Options

FS = Factory set and locked

G93 = ASTM G93 Level C-cleaned

Tank Blanketing 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.



Designator	Kit Type	Typical Contents
A1	Valve kit	Poppet and housing (19, 22, 23), O-rings (13c), Seat (18)
A2	Soft valve kit	Poppet and housing (19, 22, 23)
B1	Service kit	Poppet and housing (19, 22, 23), O-rings (13a, 13b, 13c, 13d), Diaphragm (9), Seat (18)
B2	Seal kit	O-rings (13a, 13b, 13c, 13d), Diaphragm (9)
C1	Overhaul kit	Spring guides (3), Set spring (4), Poppet and housing (19, 22, 23), O-rings (13a, 13b, 13c, 13d), Poppet spring (20), Body plug (25), Diaphragm (9), Diaphragm plates (8), Seat (18), Nut (6), Lock washer (7), Stem (17), Seal housing (14), Balance housing (24), Guide ring (16)
C2	Body plug kit	O-ring (13a, 13b), Body plug (25), Balance housing (24)
C3	Sensing kit	Diaphragm (9)
C4	Range spring kit	Range spring (4)
C5	Poppet spring kit	Poppet spring (20)
D1	Handle kit	Cover (1), Adjusting screw (2)
E1	Hardware kit	Socket-head cap screw (10), Lock washer (11), Nut (12)

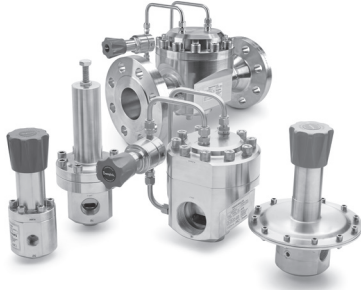
Ordering Information

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

Example: TBRN8-02-2-VTV-**B1**

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.

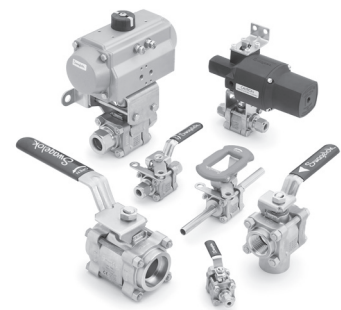
- For Swagelok tube fitting products, see the Swagelok *Gageable Tube Fittings and Adapter Fittings* catalog, [MS-01-140](#).



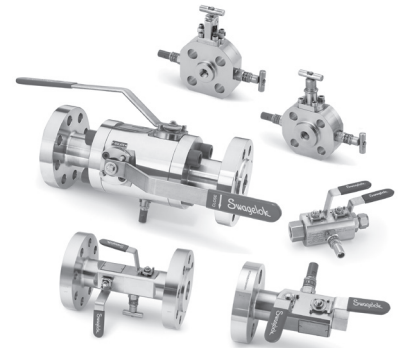
- For flange adapters, see the Swagelok *Flange Adapters* catalog, [MS-02-200](#).



- 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 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](https://www.swagelok.com) or contact your authorized Swagelok representative.