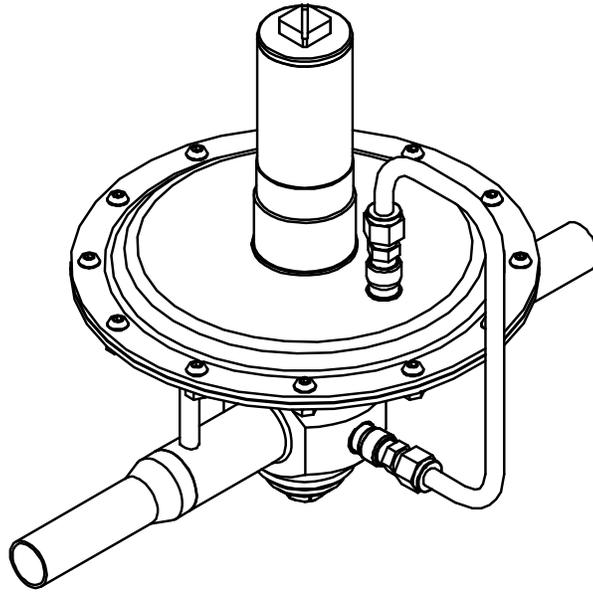


**RHPS Series  
VBS8  
User Manual**

*Swagelok*



**Read the complete manual before installing and using the regulator.**



## **WARNING**

**Before removing a regulator from the system for service, you must**

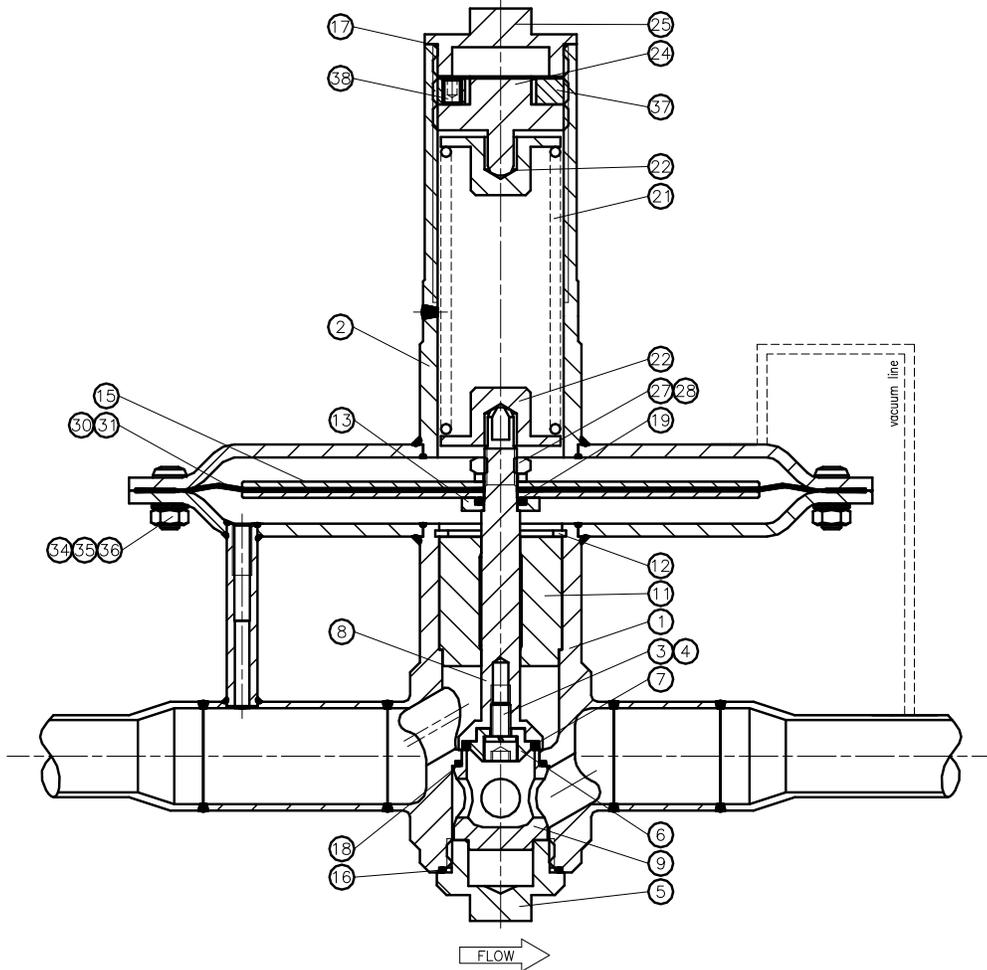
- depressurize system
- purge the system to remove any residual system media left in the regulator.

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# Introduction

## Representative drawing of the VBS8



1	body assembly	11	valve guiding ring	24	set screw
2	spring housing assembly	12	retaining ring	25	spring housing cover
3	ring	13	seal housing	27	ring
4	socket head screw	15	diaphragm plate	28	nut
5	body plug	16	O-ring	30	diaphragm
6	valve ring	17	O-ring	31	support diaphragm
7	valve O-ring	18	O-ring	34	nut
8	valve stem	19	O-ring	35	ring
9	valve seat	21	set spring	36	socket head cap screw
		22	spring guide		

## Installation



### WARNING

When installing a Swagelok® self-venting regulator, position the vent connection or line away from operating personnel. Operating personnel must protect themselves from exposure to system fluids.



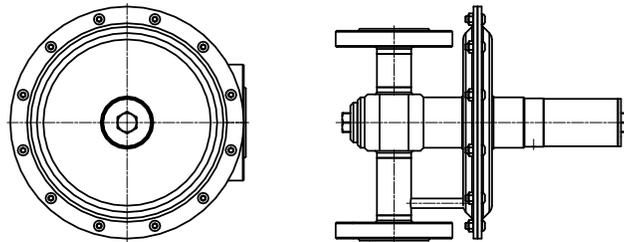
### CAUTION

Do not use the regulators as a shutoff device.

### Connections to System

Before connecting to system, verify the regulator is closed by turning the set screw:

- Counterclockwise, when viewed from above, until it stops for pressure reducing regulators,
- Clockwise, when viewed from above, until it stops for back-pressure regulators.



mounting modes

The preferred mounting position of the regulator is vertical with the spring housing facing horizontal. (see above sketch).

If grounding is required, connect a ground wire under a spring housing bolt.

## Operation

Note: All handle directions are when viewed from above.

- Outlet and control pressure settings are obtained by adjusting the set screw.
  - To increase the outlet or control pressure, rotate the set screw *clockwise*.
  - To decrease the outlet or control pressure, rotate the set screw *counterclockwise* and vent the downstream side of the regulator.
  - Make the final setting in the direction of increasing pressure to obtain the most accurate set points.
- Once fluid is flowing through the system, fine tuning may be required.
- Icing of the regulator at high flow rates or high pressure drops may occur if the gaseous media or atmosphere contains moisture.
- An auxiliary upstream filter is recommended for use in all but the cleanest of media.
- Installation of a downstream pressure relief is recommended for regulator and system protection.
- After flow, the inlet pressure will fall a little under the set pressure.  
This is because of the closing force required for bubble-tight closing of the regulator.  
This phenomenon is usually referred to as the “**reseal pressure**” and does not indicate a problem with the regulator.
- An increase in the flow will result in a rise of the set pressure.  
A decrease in the flow will result in a fall of the set pressure.  
This is because of the force required for opening the valve of the regulator.  
This phenomenon is usually referred to as the “**accumulation pressure**” and does not indicate a problem with the regulator.
- An increase of the outlet pressure will result in a fall of the set pressure.  
A decrease of the outlet pressure will result in a rise of the set pressure.  
This phenomenon is usually referred to as the “**dependency**” and does not indicate a problem with the regulator.

# Maintenance

## Required tools for maintenance

- a vice to fasten the regulator
- pincers to take out the O-rings
- a torque wrench
- a torque wrench hexagon head key 5 mm
- socket wrenches 10 / 17 / 19 mm
- open end wrench, 6 mm and 11/16 in.
- snap ring pliers for retaining ring 38 mm
- media and temperature compatible lubricant for reassembling threaded parts
- media and temperature compatible lubricant for O-rings
- Snoop® liquid leak detector

## Disassembly

- Loosen the socket head screws (12 pcs.# M6) and remove the spring housing and the set spring.
- Loosen the nut on the valve stem and remove the diaphragm plates and diaphragm.
- Remove the retaining ring, and take out the valve guiding ring and the valve assembly.
- Loosen the body plug from the body and remove the body plug and seat.
- Loosen the socket head screw from the valve assembly and remove the valve O-ring.

## Inspection of disassembled parts

- Check all parts for abnormal wear. Replace all parts in case of doubt.

## Points of attention before assembly

- All parts must be clean and undamaged before starting assembly.
- Swagelok recommends replacing all O-rings and the diaphragm before assembly.
- All threaded parts must be lightly lubricated before assembly, this to avoid galling of threads.

## Assembly

Follow the points for disassembly in reverse order to assemble the regulator.

## Recommended torques



### CAUTION

Only tighten the bolts or parts if the regulator is completely depressurized.

Body plug	40 N·m (353 in.·lb)
Valve assembly socket head screw	10 N·m (88 in.·lb)
Nut on the diaphragm screw - M10	10 N·m (88 in.·lb)
Socket head cap screws - 16 pcs M06	10 N·m (88 in.·lb)
Spring housing cover	5 N·m (44 in.·lb)

## Testing

Check the VBS8 for leakage across the seat, body plug and the diaphragm.  
Check the required set pressure range and function.

A well performing regulator is 100% bubble tight.

## Troubleshooting

Problem:	Constant leakage from the outlet before the relief set pressure is reached.
Cause:	A damaged valve and/or seat O-ring.
Solution:	Replace the valve and/or seat O-ring

Problem:	Constant leak through the hole at the side of the spring housing.
Cause:	Damaged diaphragm or not enough torque on the nut on the diaphragm screw.
Solution:	Replace the diaphragm or tighten the nut.

Problem:	Leakage between the body and the spring housing.
Cause:	A damaged diaphragm or insufficient torque on the bolts.
Solution:	Check the torque on the bolts or replace the diaphragm.

Problem:	The required set pressure can not be reached.
Cause:	The inlet pressure is not high enough.
Solution:	Make sure that the inlet pressure is sufficient.

Problem:	The outlet pressure rises too much when flow increases.
Cause:	There is too much flow passing through the regulator.
Solution:	Check the specific application data with the flow tables in our product literature. Note that the differential pressure over the seat is very low.

Problem:	The regulator keeps venting in a tankblanketing application.
Cause:	Thermal expansion of the blanket gas.
Solution:	This is not a problem, the regulator functions well.

Problem:	The regulator is placed in the system, and has different flow characteristics than printed in the product literature.
Cause:	Inside diameter of the piping or fittings are too small. Piping too long.
Solution:	Install the regulator with proper piping and connections. Consider the pressure drop caused by piping resistance.

### 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.

For additional information, see [www.swagelok.com](http://www.swagelok.com).

#### 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.

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