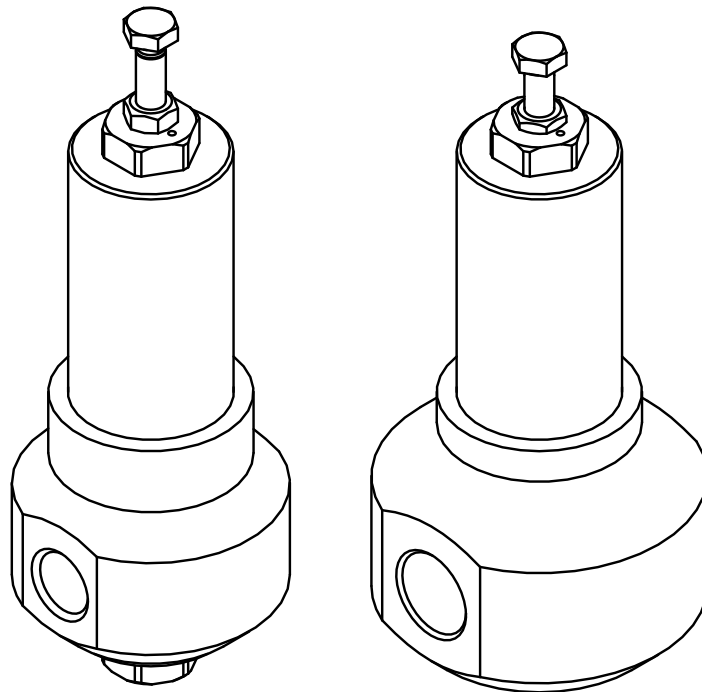


**RHPS Series
CRS4,6
User Manual**

Swagelok



Read the complete manual before installing and using the regulator.



WARNING

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

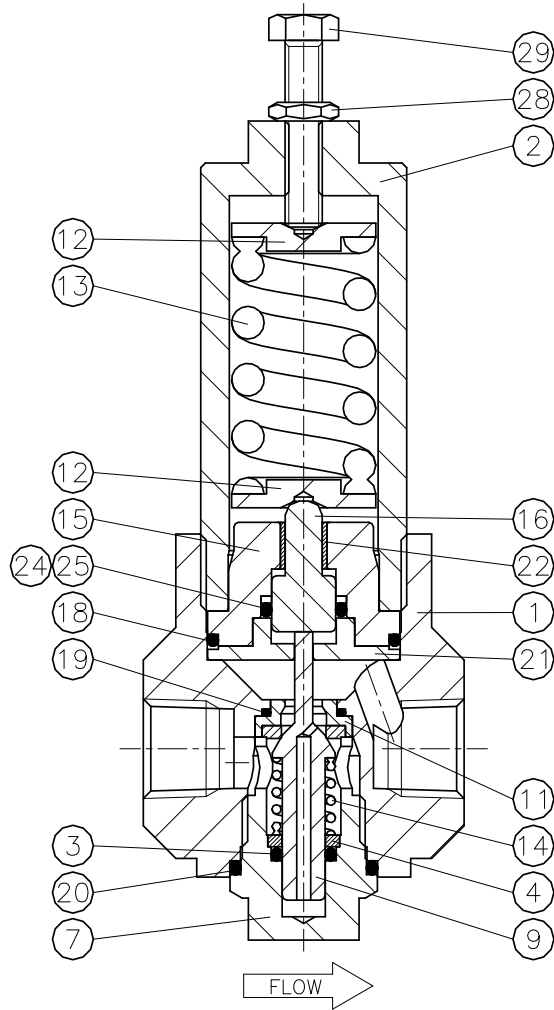
- depressurize system
- purge the system to remove any residual system media left in the regulator.

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Introduction

Representative drawing of a CRS4



1	body	12	springguide	20	(body) o-ring
2	springhousing	13	setspring	21	bodyplate
3	(balance) o-ring	14	valvespring	22	sliding bearing
4	ring	15	pistonplate	24	(piston) o-ring
7	bodyplug	16	piston	25	(piston) back-up ring
9	valve	18	(bodyplug) o-ring	28	nut
11	seat	19	(seat) o-ring	29	setscrew (hexagon head)

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 regulator as a shutoff device.

Connections to System

Before connecting to system, verify the regulator is closed by turning the handle or adjusting screw:

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

The preferred mounting position of the regulator is horizontal with the spring housing facing upwards.

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

Operation

Note: All directions are when viewed from above.

- Outlet and control pressure settings are obtained by adjusting the set screw with a 13 mm open end wrench.
 - To increase the outlet or control pressure, rotate the set screw *clockwise*.
 - To decrease the outlet or control pressure, rotate the set screw *counter clockwise* 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.
- If the shut-off valve at the outlet side is closed after changing the set pressure, the outlet pressure will rise a little because of the closing force required for bubble-tight closing of the regulator.
 - This phenomenon is usually referred to as the “**lock-up**” and does not indicate a problem with the regulator.
- A decrease in the flow will result in a rise of the outlet pressure.
 - An increase in the flow will result in a fall of the outlet pressure and is usually referred to as the “**droop**”.
 - This phenomenon does not indicate a problem with the regulator.
- A decrease of the inlet pressure will result in a rise of the outlet pressure.
 - An increase of the inlet pressure will result in a fall of the outlet pressure.
 - This phenomenon is usually referred to as the “**dependency**” or “supply pressure effect” and does not indicate a problem with the regulator.

Maintenance

Required tools for maintenance

- a vice to fasten the regulator
- pincers to take out and place the o-rings
- a torque wrench
- socket to fit the torque wrench: 24 mm or 15/16 in.
- socket wrench 13 mm, to adjust the set screw
- media and temperature compatible lubricant for reassembling threaded parts
- media and temperature compatible lubricant for o-rings
- Snoop® liquid leak detector

Disassembly instructions

- Clamp the regulator in a vice.
- Remove the setscrew from the springhousing.
- Loosen the springhousing by turning it counter clockwise and put it aside.
- Take the setspring and spring guides out and put them aside.
- Take out the piston plate together with the piston and push the piston out of the pistonplate.
- Push the sliding bearing out of the pistonplate.
- Take the body out of the vice.
Catch the bodyplate in your hand, while you turn the body upside down.
- Clamp the body in the vice, with the bodyplug facing upwards.
- Loosen the bodyplug by turning it counter clockwise and take it out of the body.
- Remove the valve, valvespring and valvering out of the bodyplug.
- Remove the seat and all the o-rings from the body, bodyplug and pistonplate.

Inspection of disassembled parts

- Check the sealing edge of the seat and the sealing surface of the valve.
- 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 before assembly.
- All threaded parts must be lightly lubricated before assembly to avoid galling of threads.
- All o-rings need to be lightly lubricated to improve the lifetime of the o-ring and the performance of the regulator.

Assembly instructions

- Clamp the body in the vice, with the bodyplug side upwards.
- Place the correct o-ring around the seat and place the seat in the body.
- Place the correct o-ring, the valvering, the valvespring and the valve into the bodyplug.
- Carefully place the bodyplug along with the correct o-ring in the body, do not damage the seat with the valvestem.
Tighten the bodyplug with the recommended torque.
- Take the assembled bottom out of the vice, turn it around and clamp it in the vice with the bodyplug facing downwards.
- Place the bodyplate into the body.
- Place the sliding bearing around the piston and push the sliding bearing into the pistonplate. You could use the vice to press it into the pistonplate.
Check the mounted sliding bearing, by moving the piston. You should not feel friction when you move the piston.
- Place the back-up ring and then the piston o-ring into the pistonplate.
- Place the assembled pistonplate with the correct o-ring into the body.
- Place the spring guides and the setspring on top of the piston and keep them on place with one hand.
- Place the springhousing over the setspring and screw it into the body.
Tighten the springhousing with the recommended torque.
- Screw the setscrew into the springhousing.

Recommended torques



CAUTION

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

- Bodyplug 50 N·m (442 in.·lb)
- Spring housing 50 N·m (442 in.·lb)

Testing

Check the regulator for leakage across the seat, with low- and high inlet pressure.

Check the regulator for leakage across the piston, with low- and high outlet pressure.

Check the required outlet pressure range.

A well performing regulator is 100 % bubble tight.

If there is a leakage across the seat or the piston or leakage to the outside, the damaged parts must be replaced.

Troubleshooting

Problem:	The outlet pressure creeps up, without turning the setscrew.
Cause:	A damaged valve and/or seat.
Solution:	Replace the valve and/or the seat.
Problem:	Leakage around the body plug.
Cause:	A damaged o-ring or insufficient torque on the body plug.
Solution:	Replace the o-ring ring or tighten the body plug according to the torque specifications.
Problem:	Leakage between the body and the spring housing or through the relief hole on top of the spring housing.
Cause:	A damaged piston o-ring or insufficient torque on the springhousing.
Solution:	Replace the piston o-ring or tighten the springhousing according to the torque specifications.
Problem:	The required outlet 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 going from a dynamic to a static situation.
Cause:	There is too much flow in the dynamic situation.
Solution:	A larger regulator is required. Check the specific application data with the flow curves in our product literature, if available.
Problem:	The outlet pressure does not drop if the setscrew is turned counterclockwise.
Cause:	The regulator is non-venting.
Solution:	A shut-off valve in the outlet line must be opened to reduce the outlet pressure.
Problem:	The outlet pressure has changed without turning the setscrew.
Cause:	Changes to the inlet pressure will result in changes to the outlet pressure.
Solution:	Maintain a constant inlet pressure to the regulator. See section "operation" about dependency.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty.

For a copy, visit swagelok.com or contact your authorized Swagelok representative.

For additional information, see 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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