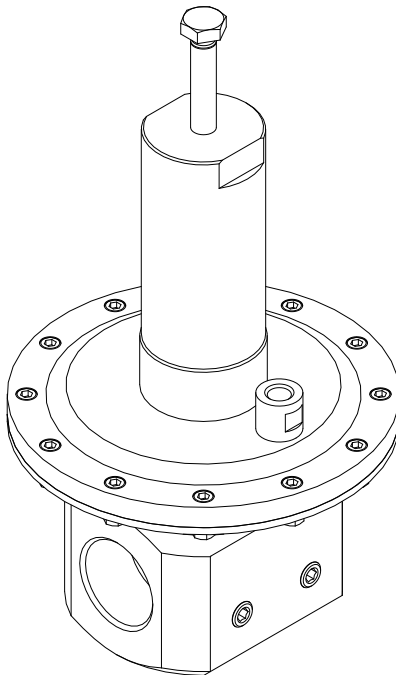


**RHPS Series
LPRD10, 15 -DP
User Manual**

Swagelok



Read the complete manual before installing and using the regulator.

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Introduction

This regulator is a diaphragm-sensing, dome-loaded, differential-pressure regulator, designed for low-pressure gases and liquids. The LPRD10, 15 -DP has a large diaphragm for high accuracy.

The regulator comprises a body and dome bolted together and has a removable seat and poppet.

The product is designed to be used between -20 °C and +80 °C, whether ambient temperature or media temperature.

The regulator is dome controlled, which means it must be connected to a controlled pressure source to operate. Our domes cannot be controlled using a liquid, the medium to fill the dome must be a gas.

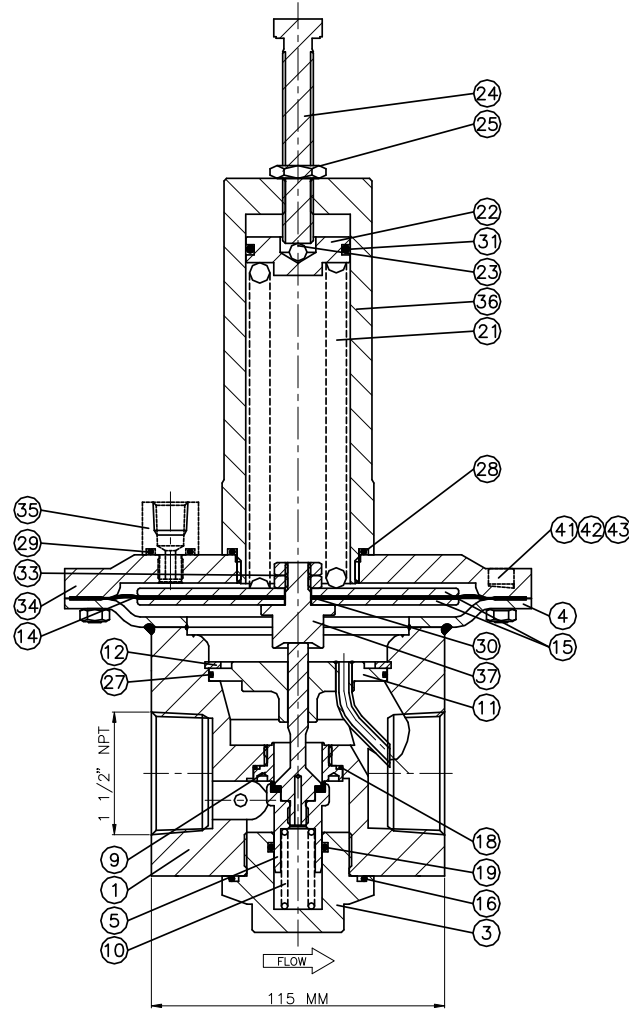
The regulator is soft seated for leak tight shut-off in zero flow conditions and is available in stainless steel and/or exotic alloys.

The maximum inlet and outlet pressure is, **limits for other connection types not included:**

- Threaded models LPRD10,15 : Inlet 16 bar Outlet 16 bar

Introduction continued

Representative drawing of the LPRD10,15



1	Body (assembly)	22	Spring guide
3	Body plug	24	Setscrew
5	Poppet (assembly)	28	Dome O-ring
9	Seat	29	Fitting O-ring
10	Poppet spring	31	Spring guide O-ring
12	Retaining ring	34	Top cover (Dome)
14	Diaphragm	35	Fitting (dome connection)
15	Diaphragm plate	36	Spring housing
19	Balancing O-ring	37	Diaphragm screw
21	Set spring	43	Socket head cap screw

Installation



WARNING

Self-venting and captured-venting regulators can release system fluid to atmosphere. Position the self-vent hole or the captured vent connection away from operating personnel.



WARNING

The working pressure of the diaphragm enclosure is 232 psig (16 bar). Do not exceed a downstream pressure of 232 psig (16 bar).



CAUTION

Because the dome pressure is higher than the outlet pressure, place a gauge on the outlet line to set or check the outlet pressure.

Install a downstream pressure relief for regulator and system protection.

An upstream filter is recommended for use in all but the cleanest of media.

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

The standard connection is female ISO/BSP parallel thread (RP). Use a bonded seal ring with this end connection.

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

Operation



CAUTION

Do not use the regulator as a shutoff device.

- Make the final pressure 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.
- A decrease of the inlet pressure will result in a rise of the outlet pressure. This phenomenon is usually referred to as the “**dependency**” and does not indicate a problem with the regulator.
- An increase in the flow will result in a decrease in the outlet pressure. This phenomenon is usually referred to as the “**droop**” and does not indicate a problem with the regulator.
- If the shut-off valve at the outlet side is closed after changing the set pressure, the outlet pressure will increase 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.
- After flow, the inlet pressure will decrease 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 “**reset pressure**” and does not indicate a problem with the regulator.

Changing the differential set pressure

- Check the supply of medium at the inlet side.
- Make sure the inlet pressure is higher than the required outlet pressure and that the inlet pressure does not exceed the maximum allowed inlet pressure. Open the shutoff valve at the inlet side.
- Open the shut-off valve at the outlet side slightly to allow a minimal flow.
- Controlled outlet pressure settings are obtained by filling the dome.
- Turn the adjustment knob or setscrew clockwise to increase, and counterclockwise to decrease the differential set pressure.



A shut-off valve on the outlet side must be opened to relief the pressure on the outlet side.

- Open the shut-off valve at the outlet side fully to allow full flow during operation.

Maintenance



WARNING

Before servicing any installed regulator, you must

- depressurize system and dome
- cycle the regulator
- purge the regulator.

Required tools for maintenance

- a vise to fasten the regulator
- pincers to take out the O-rings
- a pair of tongs for a retaining ring 70 mm
- a torque wrench
- a torque wrench hexagon head key 5
- a torque wrench “open end insert tool”, 32 mm (LPRD10)
- a torque wrench “open end insert tool”, 42 mm (LPRD15)
- an open end wrench, 10 mm
- an open end wrench, 11 mm (LPRD10)
- an open end wrench, 17 mm
- an open end wrench, 19 mm
- an open end wrench, 50 mm
- media and temperature compatible lubricant for reassembling threaded parts
- media and temperature compatible lubricant for O-rings
- Snoop® liquid leak detector

Disassembly instructions

- Loosen the hexagon socket head screws and remove the dome, spring, and spring guide. Also remove the diaphragm and diaphragm plate, together with the diaphragm screw.
- Loosen the body plug and remove the poppet, poppet spring, and seat.

Inspection of disassembled parts

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

Assembly instructions

- Replace all O-rings and the diaphragm before assembly.
- Lubricate threaded components to avoid galling of threads.
- Lubricate O-rings to promote service life and performance.
- Follow the points for disassembly in reverse order to assemble the regulator.

Testing

- Test the regulator for proper operation.



CAUTION

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

Recommended torques

Hexagon socket head screws M6	88.5 in.·lb (10 N·m)
Spring housing	885 in.·lb (100 N·m)
Body plug	442 in.·lb (50 N·m)
Fitting (dome connection)	177 in.·lb (20 N·m)

Troubleshooting

Problem:	Outlet pressure drops off sharply even when the flow is within regulator capabilities.
Cause:	The upstream filter has an obstruction.
Solution:	Replace the obstructed filter element or elements.

Problem:	The outlet pressure has changed without adjusting the regulator.
Cause:	Changes to the inlet pressure result in changes to the outlet pressure. <ul style="list-style-type: none"> ○ A decrease in the inlet pressure results in an increase in the outlet pressure. ○ An increase in the inlet pressure results in a decrease in the outlet pressure.
Solution:	Maintain a constant regulator inlet pressure. See “dependency” in section 3, Operation.

Problem:	The outlet pressure slowly increases, without increasing the dome pressure.
Cause:	A damaged valve or seat or both.
Solution:	Replace the valve or the seat or both.

Problem:	The outlet pressure does not decrease when adjusted to decrease the pressure.
Causes:	The regulator is non-self-venting.
Solutions:	Open a downstream shutoff valve to reduce the outlet pressure.

Problem:	Ice forms on the regulator.
Cause:	Most gases cool with a sudden pressure drop. Moisture in the gas promotes icing.
Solution:	Remove moisture from the gas or heat the regulator.

Problem:	Leakage around the body plug.
Causes:	A damaged O-ring or back-up ring or both. Insufficient torque on the body plug.
Solutions:	Replace the O-ring or back-up ring or both. Tighten the body plug according to the recommended torque.

Problem:	Leakage between the top cover and the spring housing
Causes:	A damaged diaphragm Insufficient torque on the spring housing
Solutions:	Replace the diaphragm. Tighten the spring housing to the recommended torque.

Problem:	Leakage between the set screw and the spring housing
Causes:	A damaged diaphragm and spring guide O-ring Insufficient torque on the cap screws
Solutions:	Replace the diaphragm and spring guide O-ring. Tighten the cap screws to the recommended torque.

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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