

RPG-H-Series

RPG-H90 / RPG-H99 / RPG-H00

Regulator Pressure Gas

Installation, operation, and maintenance manual

REVISIONS

Rev.	Date/references	Changes
01	OBS-P12-210101-04	First release
02	OBS-P12-210922	Added figures, and service instructions
03	OBS-P12-230120	Update references for maintenance

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1 INTRODUCTION RPG-H-SERIES

The first regulator in the RPG-H-Series, RPG-H90, was released in 1990. The regulator was used in diving operations and is known for its stability and accurate deliverance. The RPG-H99 and RPG-H00 regulators are further developed regulators based on the same principal.



Figure 1:RPG-H00

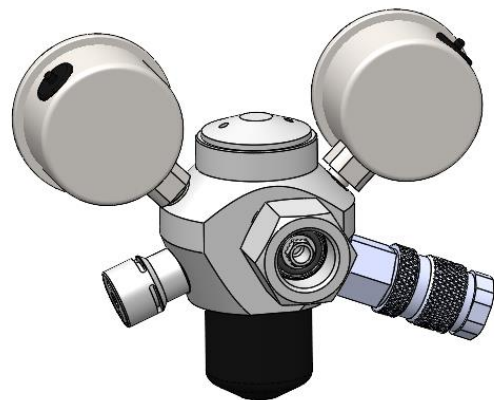


Figure 2:RPG-H00



Figure 3:RPG-H90

1.1 RPG-H-SERIES

1.1.1 RPG-H90

The RPG-H90 is a high-performance servo-controlled pressure reducer valve designed to provide a well stabilized LP outlet pressure of gas delivered from a HP gas reservoir (max 300 bar). The standard RPG-H90 is set to outlet pressure 8 barg. (Adjustable within 4-14 barg with the same springs)

LP outlet can on request be fit with a specially designed stainless steel **pressure relief valve** with high capacity.

Fig. 1



Figure 4: RPG-H90

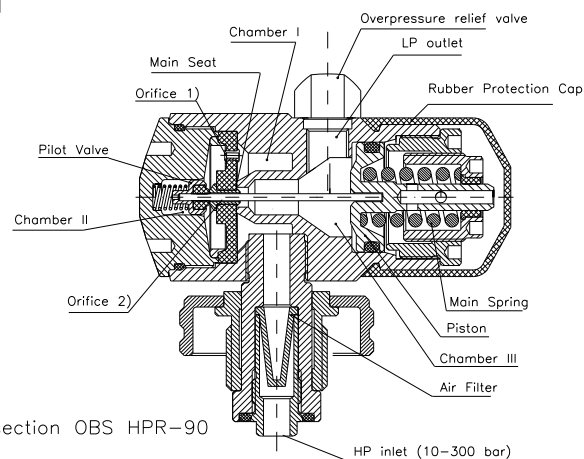


Figure 5: RPG-H90 Cross-section

1.1.2 RPG-H00 (also known as OBS HPR 2000)

The RPG-H00 is a high-performance servo-controlled pressure reducer valve designed to provide a well stabilized LP outlet pressure of gas delivered from an HP gas reservoir (max 300 barg). In the standard version, LP outlet pressure is adjustable from 6 to 10 barg. The RPG-H00 is based on the RPG-H90 that has been on the professional diving market since 1990. This regulator has demonstrated outstanding performance with respect to reliability and high flow capacity with a low drop in outlet pressure. High flow rate /stable outlet pressure is achieved even when HP supply has dropped to 25 - 30 barg. It has been verified that this regulator functions well even in very cold water.

All metal parts in RPG-H00 are made from high-quality stainless steel.

LP outlet is fitted with a pressure reducer valve that is specially designed to avoid deterioration of the pliable sealing disk.

The RPG-H00 is a high-performance servo-controlled pressure reducer valve designed to provide a well stabilized LP outlet pressure of gas delivered from an HP gas reservoir (max 300 bar)

In the standard versions, LP outlet pressure can be preset from 4 to 12 barg for the RPG-H00. By changing the spring stiffness lower pressure range is available on request.

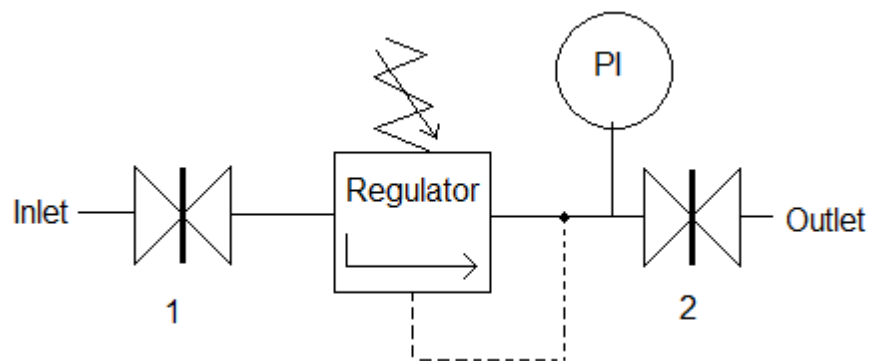
2 INSTALLATION

The function of the RPG-H-series is virtually unaffected by its orientation. These regulators are applicable in all kinds of system where a drop pressure is needed. The RPG-H-series is known for their accurate LP deliverance and stable flow.

IMPORTANT NOTICE:

The RPG-H series are manufactured to high precision and with tight tolerances. Hence, the cleanliness of connected tubing, fittings, and other auxiliary equipment as well as the gas is of utmost importance to the function and reliability of the regulator. Ensure that all connected units and tubing is properly cleaned and that the gas is filtered and verified clean before it is set in operation.

The critical part of operating a gas regulator is the startup sequence due to possible leakages caused by contamination or malfunction.



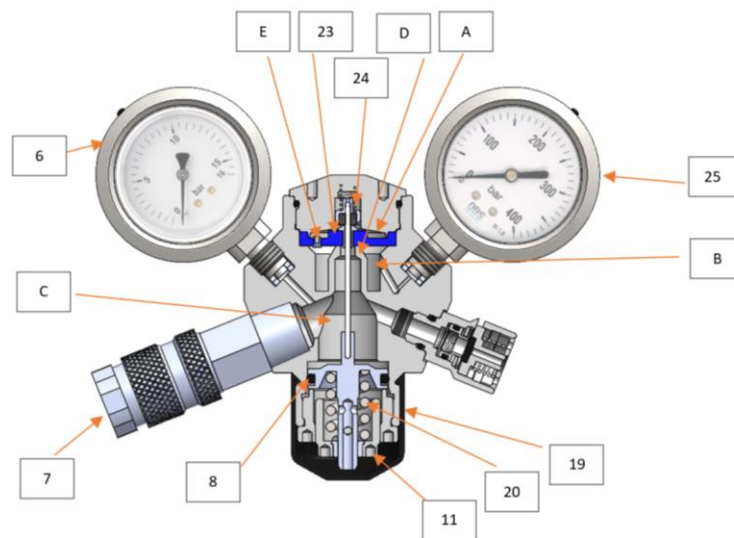
1. Start with closed valve 1 and check that regulator is fully connected at inlet/outlet ports.
2. Leave the Valve 2 with a small opening.
3. Carefully open valve 1 and verify that pressure is regulated on the PI.
4. Close valve 2 and open valve 1 fully.
5. With valve 1 fully open, the regulator will stabilize at set pressure.
6. The regulator is now set and will keep the pressure at the set pressure when valve 2 is open while supply is sufficient.

3 OPERATION

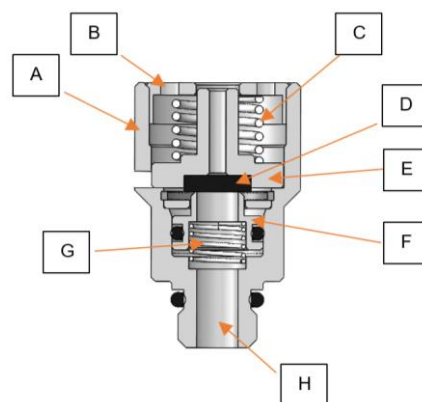
The regulators are preset by OBS, upon customers requested pressure settings.

All pressure settings of the regulator must be performed by qualified personnel. Any pressure adjustment not performed, or executed by qualified personnel, may void manufacturer warranty and/or reduce system integrity and/or lead to damage of the system.

LP outlet pressure is defined by the preset tension of the spring (pos. 20). To increase LP outlet pressure the adjustment screw (pos. 11) must be turned clockwise. To decrease LP outlet pressure the adjustment knob must be turned counter-clockwise. When decreasing the pressure, be sure to open the line on the LP before increasing to the final adjustment.



Adjustment of LP outlet pressure require removal of the rubber cap (pos. 19). When adjustment is finished, the rubber cap must be put back in position. This will prevent sand and dust from causing harm to the piston O-ring. Furthermore, this will decrease risk of freezing problems when ambient air is cold and/or moist.



LP relief pressure is defined by the preset tension of the spring (pos. C). To increase relieving pressure, the adjustment screw (pos. B) must be turned clockwise. To decrease relieving pressure the adjustment knob must be turned counterclockwise.

4 TROUBLE SHOOTING

Symptom / problem	Probable cause.	Action
Regulators show unstable regulating characteristic	Contamination in regulator. Pilot Valve or Piston not moving properly.	Clean and inspect inside surface
LP outlet pressure is decreased/increased from pre-settings.	Spring is out of pre-settings, or out of order	Visually inspect spring, if damaged replace and preset adjustment nut to set pressure
Regulator leakage	Membrane and/or pilot issue -Pilot length, Pilot Membrane damaged -Membrane damaged or not in position	Visually inspect Membrane and Pilot -Clean and inspect -Replace if damaged

If above actions don't fix the problem or for any other issues, the regulator should be returned to vendor for service/refurbishment.

5 PERIODIC MAINTENANCE

All maintenance of the regulator should be performed by qualified maintenance personnel. Any maintenance performed, or executed by unqualified personnel, may void manufacturer guaranty and/or reduce system integrity and/or lead to damage of the regulator/system.

Interval	Recommended maintenance
Weekly	Inspect connection points and downstream pressure. Listen for pressure build up or leakage.
100 hours	Visual check/clean/change of HP air filter.
2-3 years	Change O-rings in the Pressure House
3-5 years	Full service: Replacement of Membrane, Pilot, and all O-rings

If there are any concerns or no qualified personnel at site, we recommend that each RPG-H unit in operational use should be sent to OBS for maintenance at least every third year. OBS has qualified offshore personnel and is able to offer service on-site if necessary.

Mail contact: post@obstechnology.no.

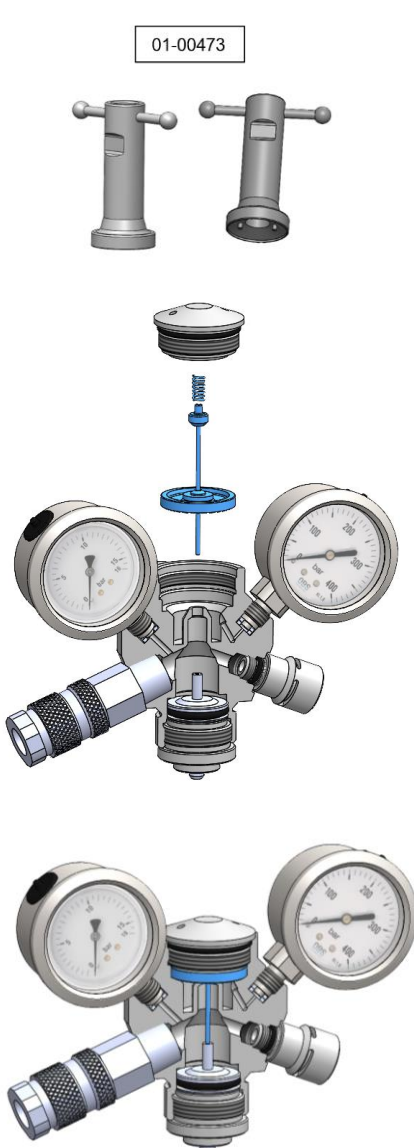
Full service at OBS will include the following steps:

Service tasks	Internal procedure
Inspection, control prior to disassembly	<i>OBS-P06-KA-000190</i>
Maintenance incl. complete disassembly, cleaning and inspection of all parts, replacement of all O-rings. If Inlet Valve and Dump Valve are worn, we also replace these parts.	<i>OBS-P06-KA-000190</i> <i>OBS-P06-KA-000157</i>
Re-Assembly	<i>RPG-H00-P06-KM-000008</i>

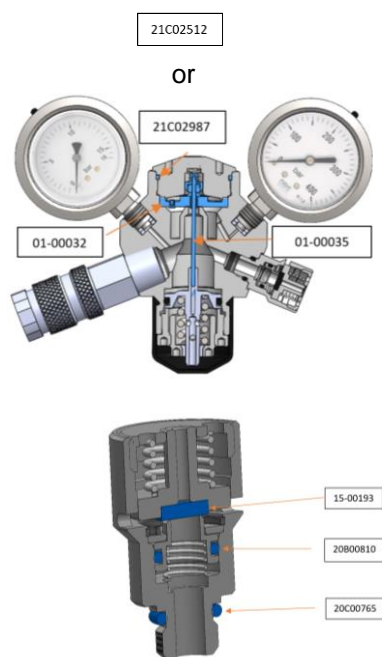
Final test RPG-H-regulator (functional testing in the test rig, functionality due to customers requested working pressure.)	RPG-H-P06-KC-000004
Fill in Service Report	OBS-P06-KA-000190

6 SERVICE RPG-H-SERIES

6.1 PROCEDURE FOR CHANGE OF MEMBRANE AND PILOT

 <p>01-00473</p>	<ul style="list-style-type: none"> • The system must be without pressure, and all valves upstream/downstream to the regulator must be closed • Make sure to follow local procedures if necessary • Remove cap with special tool 01-00473, or an adjustable pin-type face wrench • Remove Spring • Inspect O-ring at cap, replace if damaged. • Pull out Pilot • Pull out Membrane, if it's stuck – disassembly the regulator from underneath (adjustment screw – remove piston) and pressure the membrane out with a tool $\varnothing 4$ from underneath. • Positioning the new Membrane, push the Membrane into the Pressure Housing by using your finger or special tool. • Insert the new Pilot into the Membrane • Insert Spring • Assemble the Cap into Pressure Housing, make sure the Spring is in position if friction reassembles for inspection. • Lubricate threads with Molykote DX paste • Lubricate all O-rings with Molykote 111
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6.2 SPARE PART LIST



Qty	PN:24-00030	SSK RPG-H00 Soft seal kit	Material
1	20E02024	O-ring for Piston	NBR 70Sh
1	21B00710	O-ring	NBR 90Sh
1	21C02512	O-ring for Cap (serie no. 684-)	NBR 90Sh
1	21C02987	O-ring for Cap (serie no. 001-683)	NBR 90Sh
1	22-00001	O-ring	PU 92Sh
Qty	PN:60-00011	RK1 RPG-H00, RPG-H90, RPG-H99	Material
1	01-00032	Membrane assembly	
1	01-00035	Pilot Valve	
1	21C02512	O-ring for Cap (serie no. 684-)	NBR 90Sh
1	21C02987	O-ring for Cap (serie no. 001-683)	NBR 90Sh
Qty	PN:60-00061	RK2 for Safety Valve RPG-H-Series	Material
1	15-00193	Membrane, safety valve	
1	20B00810	O-ring for Piston	NBR 70Sh
1	20C00765	O-ring	NBR 70Sh
Qty	PN:60-00051	Gauge 0-400 w/Disc	Material
1	38-00007	Gauge 0-400Bar	
2	39-00156	Disc	alu
Qty	PN:60-00062	Gauge 0-16 w/disc	Material
1	38-00006	Gauge 0-16 bar	
2	39-00156	Disc	alu