

RPH Series

Installation and Maintenance Manual



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1. Warranty term

Hiter Controls guarantees, subject to the conditions described below, to repair and replace as free of charge, including labor, any components that fail within 1 year of delivery of the product to the end customer. Such failure must have occurred due to a defect in material or workmanship, and not as a result of the product not having been used in accordance with the instructions in this instruction.

This warranty does not apply to products that require repair or replacement due to normal wear and tear on the product or products that are subject to accidents, misuse or improper maintenance. Hiter Controls only obligation with the Warranty Term is to repair or replace any product that we deem defective. Spirax Sarco reserves the right to inspect the product at the end customer's facility or request the return of the product with prepaid freight by the buyer.

Hiter Controls can replace with new equipment or improve any parts that are found to be defective without further liability. All repairs or services carry out ed by Hiter Controls , which are not covered by this warranty term, will be charged according to the current Hiter Controls price list.

THIS IS HITER CONTROLS ONLY WARRANTY TERM AND ONLY THROUGH HITER CONTROLS IS EXPRESSED AND THE BUYER DISCLAIMS ALL OTHER WARRANTIES, IMPLIED BY LAW, INCLUDING ANY MARKET WARRANTY FOR A PARTICULAR PURPOSE.

2. General safety information

Access.

Ensure safe access and if necessary a safe working platform (suitably guarded) before attempting to work on the product. Arrange suitable lifting gear if required.

Lighting.

Ensure adequate lighting, particularly where detailed or intricate work is required

Hazardous liquids or gases in the pipeline.

Consider what is in the pipeline or what may have been in the pipeline at some previous time. Consider; flammable materials, substances hazardous to health, extremes of temperature.

Hazardous environment around the product.

Consider; explosion risk areas, lack of oxygen (e.g. tanks, pits), dangerous gases, extremes of temperature, hot surfaces, fire hazard (e.g. during welding), excessive noise, moving machinery.

The system.

Consider the effect on the complete system of the work proposed. Will any proposed action (e.g. closing isolation valves, electrical isolation) put any other part of the system or any personnel at risk? Dangers might include isolation of vents or protective devices or the rendering ineffective of controls or alarms. Ensure isolation valves are turned on and off in a gradual way to avoid system shocks.

Pressure systems.

Isolation (double block and bleed) and the locking or labelling of closed valves. Do not assume that the system has depressurised even when the pressure gauge indicates zero.

Temperature.

Allow time for temperature to normalise after isolation to avoid danger of burns.

Tools and consumables

Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine Spirax Sarco replacement parts.

Protective clothing

Consider whether any protective clothing is required by yourself and/or others in the vicinity to protect against the hazards of, for example, chemicals, high/low temperature, noise, falling objects, and dangers to eyes and face.

Permits to work

All work must be carried out or be supervised by a suitably competent person.

Commissioning

After installation or maintenance, make sure that the system is working properly. Carry out tests on all alarms and protective devices.

Handling and Storage

The equipment and materials must be stored in their own premises and in a safe manner. See item 5.

Disposal

Unless otherwise stated in the Installation and Maintenance Instructions, this product is recyclable and no ecological hazard is anticipated with its disposal providing due care is taken. However, if the valve is fitted with a Viton seal, special care must be taken to avoid potential health hazards associated with decomposition/burning of this item.

Additional Information

Additional information and help is available worldwide at any Spirax Sarco service center.

3. Introduction

The **RPH Series** is a rotary eccentric plug type valve with a self alignment feature when in contact with the seat, providing excellent tightness with low drive torque.

Due to the component responsibility for an adequate valve performance, for maintenance use only original parts supplied by **HITER**.

4. Installation

1. The valve is inspected and shipped in a special pack-*ing* with protection covers in body openings. However, a carefully inspection should be performed in order to ensure there is no damage and that no material has penetrated in the valve during transportation.
2. Several valves are damaged when they are firstly placed in service due to the lack of a proper and com-*plete* internal cleaning of piping before the installa-*tion*. Make a complete internal cleaning in the sys-*tem* lines and also inside the valve, aiming to remove rust, dust, welding debris and other debris.
3. Be sure the adjacent flanges are perfectly aligned among them. The misalignment may cause installa-*tion* problems and seriously compromise the equip-*ment* performance due to abnormal stresses appear-*ing*. So, it is strongly recommended to follow the in-*structions* on flanges and pipelines alignment.

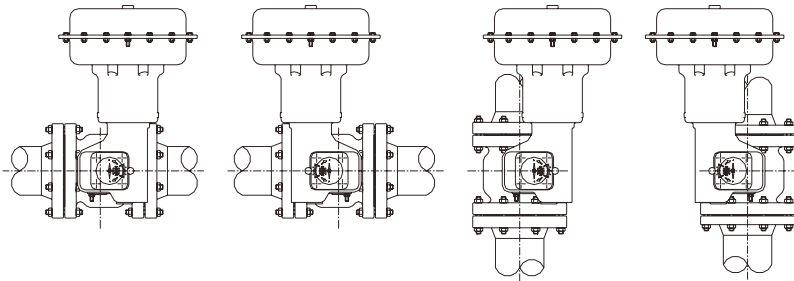


Fig. 1 - Valve Installation

4. Be sure the flange face is free of imperfections, live corners and burrs.
5. During the installation the actuator must be posi-*tioned* on the valve in vertical position. Figure 1 shows several assembling alternatives that may be supplied.
6. Position the valve between the pipeline flanges and place the proper gasket among them.
7. Introduce the studs and tight the nuts alternately in a diametrically crossed sequence. The torques must no be applied only at a time. The crossed sequence should be repeated several times, increasing the stud-bolt torque in a gradual and uniform manner, until the recommended value is reached (Table 1 – page 4).
8. The straight piping length upstream the valve must be in accordance with the valve installation standards or recommendations.
9. Do not install the valve in a system whose pres-*sure* and temperature values are not satisfying the valve classes.
10. The valves should be installed in an easy-*main-tenance* place, with space for the actuator removal and the internal parts disassembly.
11. Consult the Actuator Installation and Maintenance Manual for installation and the respective adjustments.

On the disassembly procedure description our reference shall be the figure 2, except when adversely indicated.

5.1- DISASSEMBLY

1. Separate the actuator from the valve, according to the disassembly procedure described in the Ac-*tuator* Installation and Maintenance Manual.

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- 2.Remove the packing flange (13) and the packing follower (12).
 - 3.Remove the safety pin (10).
 - 4.Remove the shaft (14), together with packings (11) and retaining ring (9).
 - 5.Remove the plug (4) from the valve body (1) and spacer (7) by packings side.
 - 6.Remove the bottom guide bushing (5) and the top guide bushing (6).
 - 7.Remove the seat retaining ring (2). It is recom-mended to use extractor wrench that may be manu-factured or acquired from HITER, in order to easy removal and assembly.
 - 8.Remove the seat (3).

5. Maintenance

WARNING

For personnel safety and to avoid damage to the system, before starting the piping check valve removal, isolate it through block valves and relief all pressure therein contained.

5.2 – CLEANING, INSPECTION AND REPAIR

All valve metallic parts must be cleaned using sol-vent and dried with compressed air after inspection. Those approved should be kept clean and very well protected up to the assembly. The oil protector appli-cation to the steel carbon non-painted parts is rec-ommended. If there is a damage that can not be re-solved by parts replacement and/or corrective ac-tions, the valve should be returned properly as-sem-bled to **HITER** for general revision.

- 1.Inspect the seal surfaces (seat areas). Deep scratches or other imperfections on this area may compromise the valve sealing, damaging the seat. They only can be eliminated through the surface rec-tifying.
- 2.Normally it is not possible to get total sealing in metal-to-metal sealing valves. However, the leakage caused by small grooves or disarrangement of the surfaces can be reduced by plug (4) rectifying against the seal in body (1).
- 3.In the market place there is a great variety of pastes used for rectifying, thus a good quality paste can be used. Also, the paste can be prepared by mixing 600 granulation Carborundum, with solidified vegetal oil.
- 4.Application of an Alvyade layer on the seating surfaces should help the operation, avoiding exces-sive cutting and the grooves reduction. The Alvyade must be applied apart and not together with the Carborundum.
- 5.Apply a small quantity of abrasive in seat backup (3) in the body (1). Lapidate it by rotating the seat (3) in the body (1) ensuring the whole contact surface is being lapidated. Do not rotate the seat (3) in a sole direction.
- 6.After seat (3) backup lapidation, apply abrasive in the plug (4) at the seat (3) contact area.
- 7.Lapidate the seat (3) (except for PTFE seat) against the plug (4), alternately performing the rotation and oscillation movement in all directions, in order to cover the whole plug (4) sealing surface.
- 8.Repeat procedures 5 and 6 many times until the sealing surfaces are totally lapidated, which can be checked by the bright difference between lapidated and non-lapidated surfaces.

9. After lapidation, clean the plug (4), seat (3) and body (1).

On the assembly procedure description, our reference shall be figure 2, except when adversely recommended.

5.3. ASSEMBLY

1. When reassembling the valve, use only new packings and clean all surfaces which shall contact them.
2. Apply a thin layer of sealant compatible to the process conditions in the seat lug (3), which shall be fitted in the body (1), and install it in the body (1).
3. Apply a small quantity of lubricant for threads compatible with the conditions of process in the seat (2) retaining ring and tight it manually.
4. Put lubricant compatible to the process conditions in the bottom guide bushing (5) and assemble in the body (1).
5. Assemble the elastic ring (8) in the groove in the shaft (14).
6. Assemble the spacer (7) on the shaft (14), observing the fitted side with the elastic ring (8). Assemble the top bushing guide (6) on the shaft (14).
7. Position the plug (4) so that its sealing area is turned to the side of the seat (3) and the groove is aligned with the shaft (14) bore.
8. Insert the mounted shaft subassembly according item 6, fitting it in the plug (4) and in the bottom guide bushing (5). The shaft (14) shall be assembled so that the slot existing in its end is perpendicular to the valve flow direction, keeping the plug (4) in closed position.
9. Assemble the retaining ring (9) with the concave side turned to the packings (11) side and the bore aligned to the body (1) threaded hole.
10. Apply a sealant compatible to the service conditions in the safety pin (10) thread and tight it firmly in the body (1). Note the end should be fitted in the retaining ring (9) hole.
11. Install the packings (11) placing their of-phased slots approximately 120°. Use seven packings (11) for 1" to 3" valves and six packings (11) for the other ones.
12. Install the packings follower (12) with concave side turned to the packings (11).
13. Assemble the packing flange (13), lightly tighten the nuts (15).

SEAT ADJUSTMENT

Valve performance depends on the correct seat (3) adjustment. Put the valve in a horizontal surface with the seat (3) side turned up and provide an auxiliary device to move the shaft (14) manually to open and close the valve.

1", 1.1/2" and 2" diameters with metal-to-metal seat:

1. Manually close the valve several times up to get plug (4) and seat (3) alignment.
2. At same time, gradually tight the seat retaining ring (2) until the final tightening.
3. Check correct alignment placing a piece of paper (0.1 mm thicker by 6 mm width) in all seating points. With a light closing torque, the paper should be trapped. If this does not happen, release the seat retaining ring (2) and repeat 1 and 2 procedures.

3", 4" and 6" diameters with metal-to-metal seat.

1. Place a paper as described item 3 between the plug (4) and the seat (3) conductor side.
2. Manually close the plug (4) so that the plug (4) and the seat (3) secure the paper.

3. Tight the seat retaining ring (2) (table 2).

4. Check the correct alignment putting a piece of paper in the conductor side and other in the plug (4) dragging side. Manually closing the valve, the paper of the dragging side should be secured, and the paper of the conductor side should be free. If this does not occur, release the seat retaining ring (2) and re-peat 1 and 2 procedures.

8", 10" and 12" diameters with metal-to-metal seat:

1. Place two piece of paper (25mm width by 0.1mm thick [total 0.2mm]) between the plug (4) and the seat (3) conductor side.

2. Manually close the plug so that plug (4) and seat (3) secure the paper.

3. Tight the seat retaining ring (9) (table 2).

4. Check the correct alignment putting a piece of paper in the conductor side and other in the plug (4) dragging side. Manually closing the valve, the paper of the dragging side should be secured, and the paper of the conductor side should be free. If this does not occur, release the seat retaining ring (9) and re-peat 1, 2 and 3 procedures.

PTFE SEAT VALVES

1. Manually close the valve many times up to get plug (4) and seat (3) alignment.

2. At same time, gradually tight the seat retaining ring (2) (table 2) until the final tightening.

FINAL ASSEMBLY

1. Remove the nuts (15) and the packing flange (13).

2. Assemble the coupling support (18) and reassemble the packing flange (13).

3. Tight the nuts (15).

4. Hook up the actuator carefully observing the de-sired failure position and its positioning regarding the valve.

TABLE 1 – GUIDE TORQUE FOR ASSEMBLY

Thread (inch)	Torque (lb x ft)
1/2"	43
5/8"	86
3/4"	151
7/8"	245
1"	375
1.1/4"	476

TABLE 2 – TORQUE IN THE SEAT RETAINING RING

Thread (inch)	Minimum Torque	
	(Lbxfxt)	(Nm)
1"	60	81
1.1/2"	95	129
2"	100	136
3"	290	393
4"	363	492
6"	825	1119
8"	975	1322
10"	1350	1830
12"	2250	3051

6. Action Of The Valve and Position by Failure

1. Due to the construction, the action of the valve and the safety position by failure in the rotary valves depends exclusively on the actuator. There are two possibilities for rotary valve actuation with pneumatic actuator by spring return.

Normally closed: the lack of air from feeding closes the valve by the actuator spring action.

Normally opened: The lack of air from feeding opens the valve by the actuator spring action.

2. The instructions for valve action inversion and the connection between the valve and the actuator are in the Actuator Installation and Maintenance Manual.

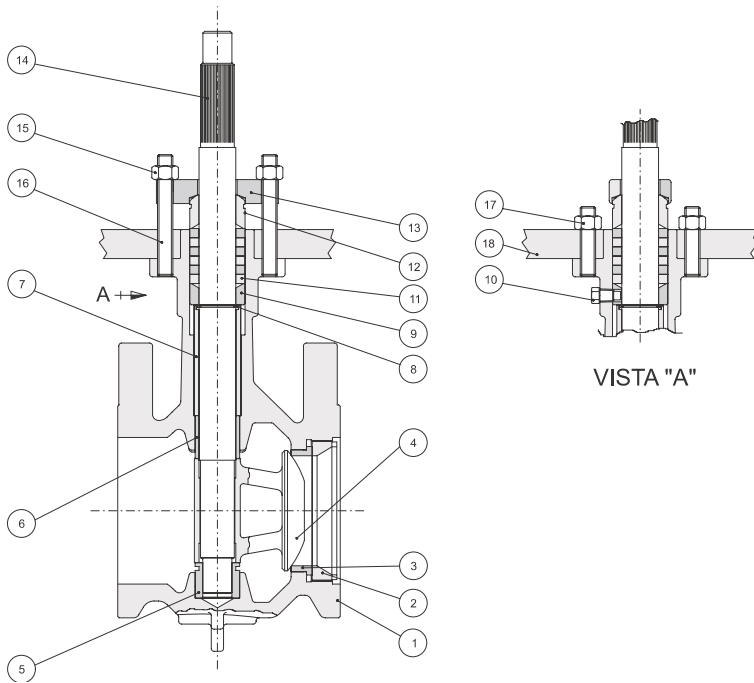


Fig. 2 - RPH Series

7. Part List

TABLE 3 – PART LIST (Fig. 2)

Item	Description	Item	Description
1	BODY	10	SAFETY PIN
• 2	SEAT REATINING RING	11	PACKING
• 3	SEAT	12	PACKING FOLLOWER
• 4	ECCENTRIC PLUG	13	PACKING FLANGE
• 5	BOTTOM BUSHING GUIDE	14	SHAFT
• 6	TOP BUSHING GUIDE	15	NUT (PACKING)
7	SPACER	16	STUD BOLT (PACKING)
• 8	ELASTIC RING	17	NUT (ACTUATOR)
9	RETAINING RING (SHAFT)	18	SUPPORT ACTUATOR

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our website in English:



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