

## RTC Series

### Installation and Maintenance Manual

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# 1. Warranty term

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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.

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## 2. General safety information

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### **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 HITER replacement parts.

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### **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.

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## *3. Introduction*

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The **RTC Series** is a triple offset butterfly valve, which is considered a high-quality valve. It is recommended for high-pressure and temperature applications. The offsets purpose is to reduce the attrition during opening and closing and the correspondent seat wastage. The soft seal seat is made by metallic laminas separated by graphite layers, which ensure a total blockage with no leakage. Due to the component responsibility for an adequate valve performance, for maintenance purpose, use only original parts supplied by **HITER**.

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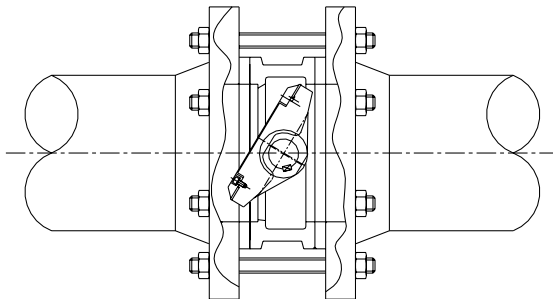
## 4. Installation

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**4.1.** The valve is inspected and shipped in a special packing with protection covers in the 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 or storage.

**4.2.** The valves must be kept with the disk in close position. If this is not possible, the disk and seat shields should be kept in order to avoid storage damage.

**4.3.** The flanges sealing surfaces (soft-seal faces) should be protected with proper protection grease.



**Figure 1 – Valve installation**

**4.4.** The valve faces should be protected with firmly fixed plastic or wooden disks.

**4.5.** The valve lifting or handling must be performed by proper means, respecting the loading limits. The load mooring and fixing should be performed with adequate devices (support, hooks, fasteners, ropes, etc.), followed by a study and use of balancing devices, avoiding drops or displacement during their lifting and handling.

**4.6.** Before installing the valve, remove the shields and clean them carefully. Next, clean the grease from surfaces using a solvent. Clean the valve internal part with compressed air. Check if there is no solid object inside the valve or in its seat.

**4.7.** Check if the seat and/or sealing ring were not damaged during the handling, mainly if the valve has been transported with the disk in open position.

**4.8.** Check the assembly position regarding the line pressure. The valve must be installed so that the main pressure side acts on the disk in the side where the axis is (in close position).

**4.9.** The valve should be assembled with the disk in close position.

**4.10.** Make a complete internal cleaning in the system lines and also inside the valve, aiming to remove rust, dust, welding debris and other debris. Among the cleaning methods used in piping, choose those which are applied to the case (e.g. cleaning with water, steam, compressed air, mechanical cleaning, and chemical cleaning).

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**4.11.** Be sure the adjacent flanges are perfectly aligned among them. The de-alignment may cause installation problems and seriously compromise the equipment performance due to abnormal stresses appearing. Thus, all recommendation regarding flanges and piping alignment must be rigorously followed.

**4.12.** Be sure the flange face is free of imperfections, live corners and burrs.

**4.13.** Be sure the flanges passage matches the piping. In negative case, make a carefully analysis to check if the valve disk moves freely. We stress the interference of the disk with the piping can cause permanent damage to the valve (figure 1).

**4.14.** Put the valve between the piping flanges (figure 1) and carefully centralize the body. Take measurements between the body and the edge of the flanges at vertical and horizontal directions to ensure the valve is very well centralized.

**4.15.** Interpose the proper gaskets between the valve body and the flanges (figure 1).

**4.16.** Insert the bolts and start tightening the nuts. The crossed sequence should be repeated several times, increasing in a gradual and uniform manner the stud bolt torque, until the recommended value is attained (table 1 - page 4).

**4.17.** The piping straight part, upstream and downstream the valve must be in accordance with the standards or recommendations on check valve installation.

**4.18.** In continuous operation process, the installation must include a blockage and by-pass systems, constituted of three manual valves.

**4.19.** Be careful not to install the valve in a system whose pressure and temperature values are not satisfying the valve classes.

**4.20.** In case of pneumatic actuator valve, consult the actuator instruction manual for installation and respective adjustments.

**4.21.** For temperature over 200°C, it is recommended to thermally isolating the valve body.

**4.22.** For coated piping, avoid contact between the coating and the disk, aiming to prevent damage to the valve.

**4.23.** The packings must be tightened only the enough to stanch the stem leakage. An over-tightening shall shorten the packings life and increase the operation torque.

**4.24.** If the valve is used for blockage of the line hydrostatic test, this should be used without restriction only at preferential direction (disk axis side). For the non-preferential direction, the actuator dimensioning should be consulted regarding the hydrostatic test differential.

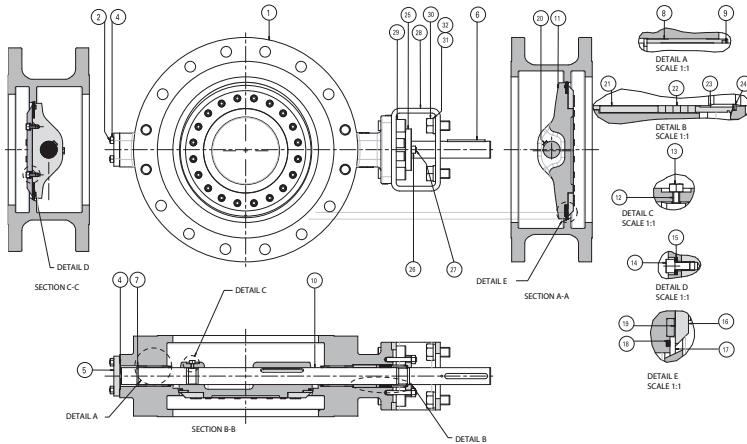


Figure 2 - RTC Series

## 5. Maintenance

### WARNING

For personnel safety and to avoid damage to the system, before start the line valve removal, isolate it using block valves and relief all pressure therein contained.

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

### 5.1- DISASSEMBLY

**5.1.1.** Disconnect the valve from the actuator, releasing the bolts and the components parts of the actuator, coupled to the valve axis (consult the Actuator Instruction Manual). Take note of the relative position of all parts for posterior assembly.

**5.1.2.** Remove the nuts (26), the packing flange (25), the split ring (24) (if any) and the packing follower (23).

**5.1.3.** Remove the packings (25) and the packings spacer (24).

**5.1.4.** Remove the nuts (3), the cover (4) and the gasket (5).

**5.1.5.** Remove the bolts (14), the washers (15) and the flange (16).

**5.1.6.** Check and identify the centering pins (19) of the seat (17) for later assembly. Remove the seat (17) ring and the gasket (18).

**5.1.7.** Remove the bolt (12) and the lock nut (13).

**5.1.8.** Remove the shaft (10) moving it to the cover (4) direction. When the keys (20) are in middle of the disk (13), remove the keys (23), and the ring (08).

**5.1.9.** Remove the disc (11) from the shaft (10). Mark the disc (11) position regarding the shaft (10) for later assembly.

**5.1.10.** If necessary remove the bearing bushes (8). The bushes (8) are assembled with interference, and the disassembly may result in irreversible damages.

## **5.2 – CLEANING, INSPECTION AND REPAIR.**

All valve metallic parts must be cleaned using solvent and dried with compressed air after inspection. Those approved should be kept clean and very well protected up to the assembly. The oil protector application to the steel carbon non-painted parts is recommended. If there is a damage that can not be resolved by parts replacement and/or corrective actions, the valve should be returned properly assembled to **HITER** for general revision.

**5.2.1.** 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 rectifying.

**5.2.2.** Normally it is not possible to get total sealing in me-tal-to-metal sealing valves. However, the leakage caused by small grooves or disarrangement of the surfaces can be reduced by obturator rectifying against the seal. When the mentioned damages are larger ones, it is necessary to look for a milling before rectifying.

**5.2.3.** 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.

**5.2.4.** Application of an Alvaiade layer on the seating surfaces should help the operation, avoiding excessive cutting and the grooves reduction. The Alvaiade must be applied apart and not together with the Carborundum.

**TABLE 1 – GUIDE TORQUE FOR ASSEMBLY**

<b>Thread (inches)</b>	<b>Torque (pound/feet)</b>
1/2"	43
5/8"	86
3/4"	151
7/8"	245
1"	375
1.1/4"	476

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

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## 5.3. ASSEMBLY

**5.3.1** When reassembling the valve, use only new gaskets and clean the bore surfaces which shall contact them.

**5.3.2.**If the bush (8) has been removed, assemble the new bush (8) with the help of the shaft (10) as a guide.

**5.3.3** Put the disc (11) in the body (1) according to the marking performed in item 8 of the valve disassembly and mounts the shaft (10).

**5.3.4** Assemble the lock (12, 13) positioning the axis groove (10) between the disc (11) bearings.

**5.3.5** Move the shaft (10) so that the shaft key(10) key is placed between the disc (11) bearings and assemble the key (23). Also assemble the ring (7) in the shaft (10), ending the shaft assembly.

**5.3.6** Position the shaft (10) with the bolt (12) and the nut (13).

**5.3.7.** Assemble the gasket (5), the cover (4) with the nuts (3).

**5.3.8.** Centralize the disc (11) carefully in the body (1) and tight the bolt (12), locking it with the nut (13).

**5.3.9.** Assemble the spacer (21) and the packing (22). Assemble the packings (22) individually with the help of the gland (23). Assemble the packing (25) with the ring (24), the flange (25) tightening the nuts (26) in the stud bolts (27).

### **5.3.10 Follow the next steps for seat assembly:**

- Inspect carefully the seal surfaces of the body (1) and of the seat ring (17). Any irregularity may result in leakage after assembling.

- Apply a thin layer of light mineral oil in the disc (11) surface, where the seat ring (17) shall be supported, and where the gasket (18) is going to be fitted.

- Place the gasket (18) in the disc (11) channel.

- Place the seat ring (17) checking the positioning through the pin (19).

- Apply a thin layer of lubricant in the body (1) seat and in the tapered surface of the seat ring sealing. The lubricant may be MOLYKOTE spray 321R or equivalent.

- Assemble the flange (16) tightening the bolts (14) by hands with the washers (15) only to make contact, using Loctite 270 or equivalent on threads.

- Check if the seat ring (19) may be freely dislocated, without rotating it.

- Close the valve carefully until it contacts and loses the contact with the sealing seat. This procedure must be performed twice.

- Keep the valve in close position without applying any torque. Tighten the bolts (14) in order to avoid the seat ring (19) leave the position.



- Open the disc (11) by some degrees and tight all bolts (14) using the crossed method.
- Tight the bolts (17) up to attain the torque specified in table 1, opening and closing the valve some times

**5.3.11.** Install the actuator using bolts, supports (28), adapter, key (6) and other components according to the actuator, adjusting the course according to the Actuator Instruction Manual.

**5.3.12.** Test the valve sealing. The sealing test should be performed with the valve assembled between the flanges according to the standard for all flange stud bolts.

**5.3.13.** In case of leakage, loose the bolts (14) and re-tight according to the torque specified in table 1.

**TABLE 2 – TORQUES FOR SEAT BOLTS**

Thread (inches)	Torque (Nm)	Torque (pounds x inches)
5/16"	20	170
3/8"	34	300
7/16"	55	485
1/2"	85	750
9/16"	104	920

## *6. Action of the valve and position by failure*

**6.1.1** Due to the construction, the action of the valve and the safety position by failure in rotary valves depends exclusively on the actuator. There are two possibilities for rotary valves 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.

**6.1.2** The instructions for connection between the valve and the actuator are contained in the Actuator Installation and Maintenance Manual.

# 7. Part List

TABLE 3 – PART LIST (Figure 2)

Item	Description	Item	Description
1	BODY	• 17	SEAT
2	STUD	• 18	GASKET
3	NUT	19	PIN
4	COVER	20	DISK KEY
• 5	GASKET	21	SPACER
6	SHAFT KEY	• 22	PACKING
7	RING	23	PACKING FOLLOWER
• 8	PACKING (BUSH)	24	SPLIT RING
• 9	BEARIG BUSH	25	FLANGE (PACKING FOLLOWER)
10	SHAFT	26	NUT (PACKING FOLLOWER)
11	DISK	27	STUD (PACKING FOLLOWER)
12	BOLT (LOCK)	28	SUPPORT
13	NUT (LOCK)	29	BOLT (SUPPORT)
14	BOLT (DISK)	30	BOLT (ACTUATOR)
15	WASHER (LOCK)	31	WASHER
16	FLANGE	32	WASHER

- Recommended spare parts

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More information on  
our website in English:



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