
2003 Series Classes 900 to 2500 ANSI 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 **85 Series** check valve, which is considered a high-quality valve, provides excellent sensibility, fine control and easy adjustment, with very-reduced weight and size. Due to the component responsibility for an adequate valve performance, for maintenance use only original parts supplied by **HITER**.

4. Installation

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 Several valves are damaged when they are firstly in service due to the lack of a proper and complete internal cleaning of piping before installation. Make a complete internal cleaning in the system lines and also inside the valve, aiming to remove rust, dust, welding debris and other debris.

4.3 In case of small bore valves, such as low-noise or anti-cavitation cages, it is recommended the upstream installation of a filter, avoiding bore clogging if the fluid is dirty or the line is not cleaned.

4.4 Be sure the adjacent flanges are perfectly aligned to each other. The de-alignment may cause installation problems and seriously compromise the equipment performance due to abnormal stresses appearing.

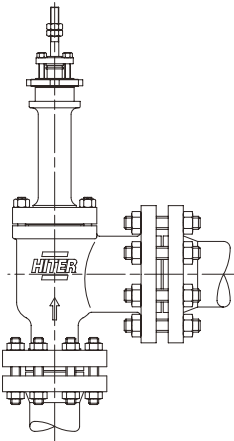


Fig. 1 – 2003 Series

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

4.6 During installation the actuator must be positioned on valve in vertical position. If this is not possible, look for a position closer the vertical one. The horizontal position should be avoided and, in some cases, there should be a support to the actuator.

4.7 Install the valve obeying the flow direction indicated by arrow in body.

4.8 For flanged valves, use a proper gasket between the valves and piping flanges.

4.9 Insert the stud-bolt and tighten the nuts alternately in a diametrically crossed sequence. The torques must not 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).

4.10 For valves welded on piping, with internal elastomers, the removal of all inner components before welding is recommended. If the valve body material requires post-welding heat treatment, the internal parts also must be removed to avoid damage.

4.11 The straight piping length upstream the valve shall be in accordance with the valve installation standards or recommendations.

4.12 In continuous operation units, the installation shall include blockage and by-pass systems, constituted of three manual valves.

4.13 Do not install the valve in a system whose pressure and temperature values are not satisfying the valve classes. When a valve is manufactured the internal component materials are selected for a specific service condition. So, do not apply the valve in a more critical service without firstly consulting **HITER**.

4.14 Check valves should be installed in an easy-maintenance place, with enough space for actuator removal and internal parts disassembly.

4.15 Refers to the Actuator Installation and Maintenance Manual for installation and respective adjustments.

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.

In disassembly procedure description, our reference shall be Figure 2, except when adversely indicated.

5.1 DISASSEMBLY

5.1.1 Separate the actuator from valve, according to disassembly procedure described in the Actuator Installation and Maintenance Manual.

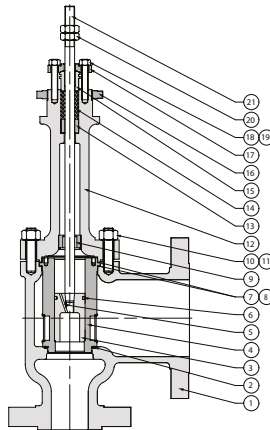


Fig. 2 – 2003 Series

5.1.2 Remove the stem nuts (20), packing flange nuts (18), packing flange (17) and packing (15).

5.1.3 Remove the nuts (10), bonnet (12) and plug (3) together with the stem (21).

5.1.4 Remove the plug (3) with the stem (21). Do not damage packings (14) when the stem thread (21) passes by them.

5.1.5 The 2003-01 type valve has a sealing ring (6) in the plug (3). Depending on construction, the sealing-ring types are: O-ring, PTFE or a two-piece graphite ring.

5.1.6 If necessary, remove the stem (21) from plug (3) and the pin (5). The stem (21) only can be removed from plug (3) in case of replacement. In case of plug (3) replacement, a new stem (21) should be installed.

WARNING

Never install a new plug (3) on a used stem. The plug installation requires a new bore for pin and, if the stem already has a bore, the threads shall be weakened.

5.1.7. Remove the cage (4) and respective gaskets.

5.1.8 Remove the metallic ring (2). Do not damage the cams surface at ring faces (2) and the respective support surfaces in the cage (4) and body (1), once they are lapped.

5.1.9 Remove the packings (14) and bonnet (12) spacer (13), using a wire hook.

5.2 CLEANING, INSPECTION AND REPAIR

All valve metallic parts must be cleaned using solvent and dried with compressed air after inspection. The approved parts should be kept clean and very well protected up to the assembly. Oil protector application on 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 sealing surface (seat sealing areas). Deep scratches or other imperfections in this area compromise valve sealing, causing damage to the seat. They can be eliminated when these surfaces are rectified.

5.2.2 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 obturator rectifying against the seal. When the mentioned damages are larger ones, it is necessary to look for machining 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 The application of an Alvyade layer on seating surfaces shall help the operation, avoiding excessive cutting and groove decrease. The Alvyade must be applied apart and not together with the Carborundum.

5.2.5 In order to help the plug (3) alignment to the seat (5) and also to position the cage, assemble the bonnet on body and the respective gaskets. For seal ring (7) plug, it shall not be installed.

5.3.6 A simple tool may be provided to help the rectifying. This tool can be provided with a steel disk connected to the plug stem by nuts.

5.3.7 After operation, remove the bonnet, clean the seating surfaces and make a seal testing. Repeat the operation if necessary.

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

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 Place on body: (1) graphite gasket (8), body gasket (7) and other graphite gasket (8) over the latter.

5.3.3 In case of sealing ring (6), it must be replaced if there are visible damages. Do not to scratch the sealing ring (6) surfaces or the channel housing on plug (3). In this case, the proper sealing shall not be reached anymore. 2003-20-type valve has no sealing ring.

5.3.4 Place on cage: a graphite gasket (8), another body gasket (8) and another graphite gasket (8) over the latter.

5.3.5 In case of sealing ring (6), it must be replaced if there are visible damages. Do not to scratch the sealing ring (6) surfaces or the channel housing on plug (3). In this case, the proper sealing shall not be reached anymore. 2003-20-type valve has no sealing ring.

5.3.6 In case of stem replacement, thread the new stem (21) on plug (3) up to the end of threading, so that it is very well tightened. Make a passage bore for the pin (5) through the plug (3) and the stem (21) using the plug bore (3) as a guide. Install a new pin (5) and lock it.

WARNING

Never install a new plug (3) on a used stem. The plug installation requires a new bore for pin and, if the stem already has a bore, the threads shall be weakened. However, an used plug can be assembled with a new stem.

5.3.7 Insert the plug set (3) and stem (21) in the cage (4). Be careful in case of sealing ring (6) plugs, once they shall be damaged if it is not in perfect alignment to the bevel at the cage (4) superior entrance.

5.3.8 Assemble the bonnet (12) on body (1). Tighten the nuts (10) using the torques showed in Table 1 as reference for cleaned threads. Tighten the nuts gradually in the opposed crossed sequence.

TABLE 1 – GUIDE TORQUE FOR ASSEMBLY

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

6. Action Of The Valve and Position by Failure

6.1 Due to the construction, the action of the valve and the safety position by failure in 2003 Series valves depends exclusively on the actuator. A direct action actuator shall provide a normally opened valve (air for closing). An inverse action actuator shall provide a normally closed valve (air for opening).

6.2 The instructions for connection between valve and actuator are described in the Actuator Installation and Maintenance Manual.

7. Part List

TABELA 2 – LISTA DE PEÇAS (Fig.2)

Item	Descrição	Item	Descrição	Item	Descrição
1	BODY	• 8	GRAPHITE GASKET	15	PACKING FOLLOWER
• 2	METALLIC RING	9	BONNET BUSHING GUIDE	16	BONNET LOCK NUT
• 3	PLUG	10	BODY NUT	17	PACKING FLANGE
• 4	SEAT CAGE	11	BODY STUD	18	PACKING NUT
• 5	PIN	12	BONNET	19	PACKING STUD
• 6	SEALING RING	13	SPACER	20	STEM NUT
• 7	BODY GASKET	• 14	PACKING	• 21	STEM

• Recommended spare parts

More information on
our website in English:



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