
900 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 **900 Series**, is a high-quality globe-type valve, providing excellent sensibility, fine control and easy-adjustment.

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 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 and storage.

4.2. Several valves are damaged when they are firstly placed in service due to the lack of a proper and complete internal cleaning of piping before the 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 bores valves, such as low-noise or anti-cavitation cages, it is recommended the upstream installation of a filter, avoiding the bores clogging if the fluid is dirty or the line is not cleaned.

4.4. Be sure adjacent flanges are perfectly aligned among them. The misalignment may cause installation problems and seriously compromise the equipment performance due to abnormal stresses appearing.

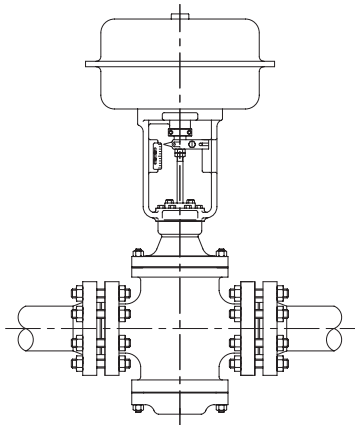


Fig. 1 – Valve installation

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

4.6. During the installation the actuator must be positioned on the valve and in vertical position. If possible, find a position closer the vertical one (Figure 1). 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 the arrow in the body.

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

4.9. 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-screw 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 is recommended before welding. If the valve body material requires post-welding thermal treatment, the internal parts also must be removed to avoid damage.

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

4.12. In continuous operation units, the installation must include a 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 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. Control valves should be installed in an easy-maintenance place, with space for the actuator removal and trims disassembly

4.15. Consult 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 the disassembly procedure description, our reference shall be figures 2 and 3, except when adversely recommended.

5.1. DISASSEMBLY

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

5.1.2. After removing the stem (10), nut (stem) (23) and backing nut (stem) (22), remove the nuts (body) (11) and separate the bonnet (9) from body (3). Depending on valve body, the plug (6) comes out together with the bonnet (9) (valve type: down to close or it shall come out in separate).

5.1.3. Before separating the plug (6) from bonnet (9), loose the nuts (packing) (20) and, on separating those parts, do not damage the packings (14, 15, 16 or 26), when the stem threaded part pass by them. Thus, those valves where the bonnet (9) comes out from plug (6), loose the nuts (packing) (20) before removing the nuts (body) (11) and separating the bonnet (9) from body (3), as recommended in the previous step.

5.1.4. To remove bonnet (9) trims, remove the packing nuts and the glands (19). Next, adopt one of the following procedures:

- - Remove the packings (33) and other bonnet internal components by using a wire hook, pull the packings and other components out.
- - Using a stem or a stick, press the ring (retainer) (24) in order to force the components to come out by the bonnet top end, or;
- Remove the lubricator (27) and, via connection, apply a pressure to expulse the components. Last procedure should be applied to the bonnet (9) still screwed to the body (3).

WARNING

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

5.1.5. Remove the bottom flange nuts (bottom flange) (11) and bottom flange (1). If the plug (6) has not been under assembled (valve type : down to close, remove it by body bottom opening (3).

NOTES:

1. The disassembly procedure for double seat valve is identical to the previous one.
2. Valves equipped with other type of bonnets (see figure 10) are disassembled in the same way. The bonnet CE-4-equipped valves are considered exceptions. In this case, step 2 and 3 of the last procedure should be replaced by the following:
 - After removing the stem (10), stem nut (23) and backing nut (stem) (22), loose the packing nuts (20). Next, remove the bonnet nuts (32) and bonnet studs (33); lift the bonnet (9), removing it carefully so that the stem thread packings are not damaged. Remove the bonnet gaskets (31) and the sealing subassembly (30).
 - Remove the body nuts (11) and the housing (sealing subassembly) (29). In case of direct-acting valve down to close, the plug (6) shall come out too; thus, remove the pin (stem lock) (7) and separate the obturator (6); remove the pin (intermediary stem) (34) and separate the sealing subassembly (30) of the stem (10). In the inverse acting valves down to close, CE-4 bonnet is not used, once it does not allow assembly.

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 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 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 Alvalyade layer on seating surfaces should help the operation, avoiding excessive cutting and the grooves reduction. The Alvalyade must be applied apart and not together with the Carborundum.

5.2.5. In order to help the obturator alignment (6) with the seat (4), assemble the bonnet on the body and the respective gaskets.

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 obturator stem by nuts.

5.3.7. After operation, remove the bonnet, clean the seating surfaces and make a seal testing. If need, repeat the operation.

For disassembly continuation, come back to step 7 above.

WARNING

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

In the assembly procedure description, our reference shall be figures 2 and 3 except when adversely recommended.

5.3. ASSEMBLY

5.3.1. When reassembling the valve, use only new sealing disk (5) and ring (2) and clean all surfaces contacting them.

5.3.2. Reinstall the bottom flange (1). For valves down to close the plug (6) should be inserted before bottom flange (1) assembly.

Use a new gasket also between the body (3) and bottom flange (1). Tighten the nuts (bottom flange) (11) according to table 1.

5.3.3. After install the plug and bottom flange (1), assemble the bonnet (9), tighten the body nuts (11) according to table 1. Lubricate the threads when inserting the nuts. Always tighten the nuts gradually, in the opposed crossed sequence.

5.3.4. Clean carefully the stuff box and the metallic trims. Insert the packings and other components in the sequence indicated by figures 3 to 9. When inserting the packings, do not damage the packings when the stem threaded part passes by them.

5.3.5. Insert the packing follower (18), flange (packing) (19) and packing nuts (20); tighten these nuts properly (see item –Packings Replacing).

5.3.6. When the assembly is over, insert the backing nut (stem) (22), nut (stem) (23), stroke indicator; assembly the actuator on the valve and redone the connection between valve stem and actuator stem. The instructions related to this step can be found in the Actuator Installation and Maintenance Manual.

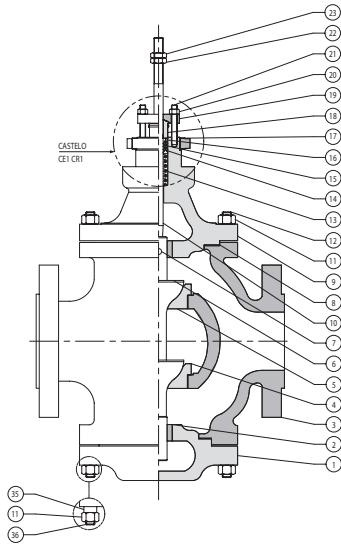
TABLE 1 – GUIDE TORQUE FOR ASSEMBLY

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

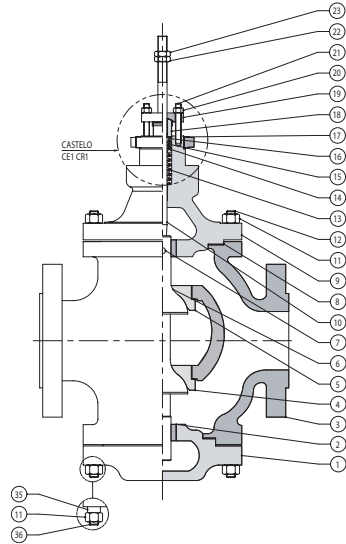
6. Action Of The Valve and Position by Failure

6.1. Due to the construction, the action of the valve and the safety position by failure in the linear valves depends exclusively on the actuator. A straight action actuator shall supply a normally opened valve (air to close). An inverse action actuator shall supply a normally closed valve (air to open). For the valve action inversion, when the actuator has no wheel, an inverse assembly should be done, once the without-wheel actuators used in 900 Series are totally reversible.

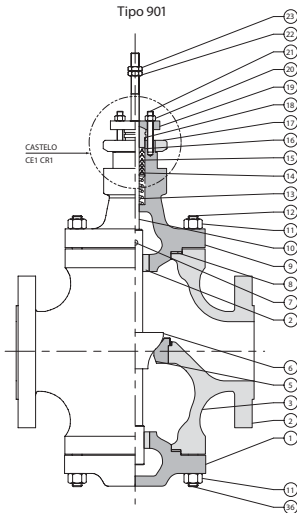
6.2. The instructions for connection between the valve and the actuator are described in the Actuator Installation and Maintenance Manual.



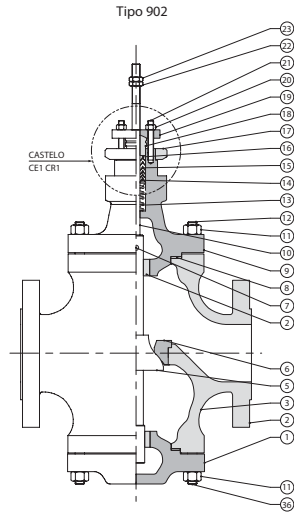
Tipo 901



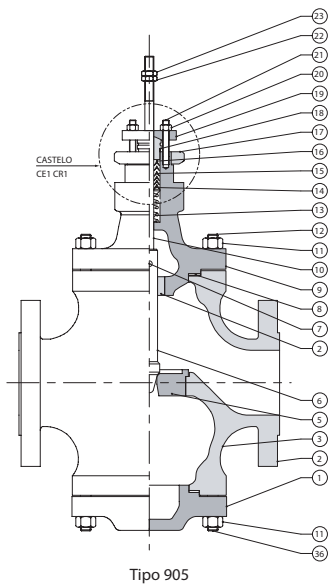
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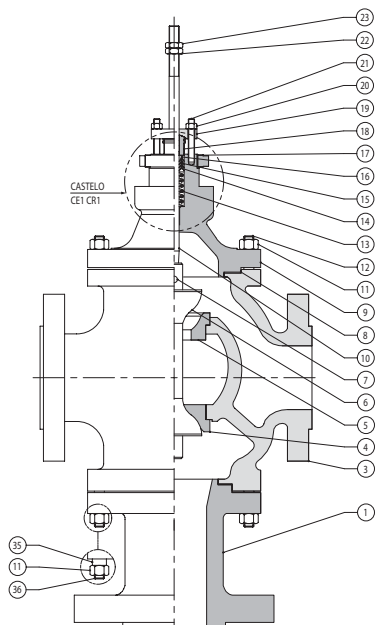
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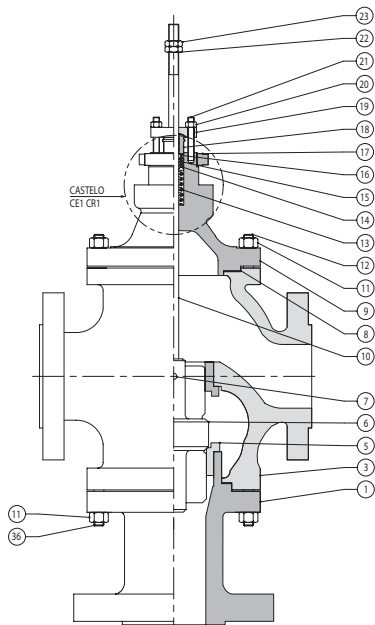
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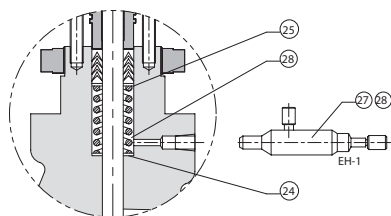
Tipo 905



Tipo 906



Tipo 907



DETALHE - A
FIGS. 2, 3, 4, 5, 6, 7 E 8

7. Part List

Item	Description	Item	Description
1	FLANGE (BOTTOM)	19	FLANGE (PACKING)
2	BUSHING (GUIDE)	20	NUT (PACKING)
3	BODY	21	STUD (PACKING)
• 4	SEAT (bottom)	22	BACKING NUT (STEM)
• 5	SEAT ((TOP)	23	NUT (STEM)
• 6	PLUG	24	RING (RETAINER)
• 7	PIN (STEM LOCK)	25	RETAINER (GREASE)
8	GASKET (BODY)	• 26	PACKING (OPEN SQUARE SECTION)
9	BONNET	27	SUB ASSEMBLY - EH1 LUBRICATOR
• 10	STEM	28	GREASE
11	NUT	29	HOUSING (SEALING SUB-ASSEMBLY)
12	STUD (BODY)	• 30	SEALING SUB-ASSEMBLY
13	SPRING (PACKING)	• 31	GASKET (BONNET)
• 14	PACKING (V-RING – BOTTOM)	32	NUT (BONNET)
• 15	PACKING (V-RING – INTERMEDIARY)	33	STUD (BONNET)
• 16	PACKING (V-RING – TOP)	• 34	PIN (INTERMEDIARY STEM)
17	NUT (LOCKING)	35	SPACER (NUT)
18	PACKING FOLLOWER	36	STUD (BODY)

More information on
our website in English:



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