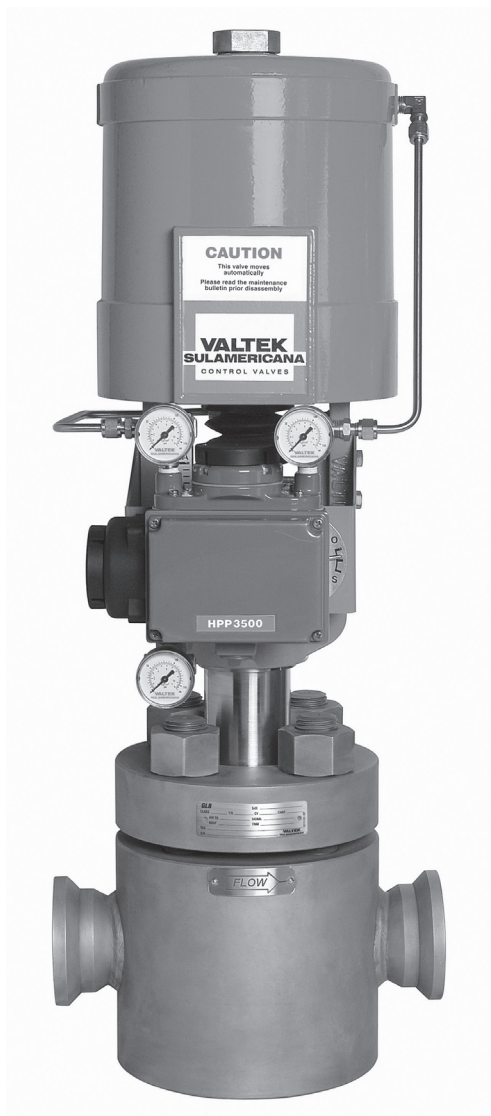


GLB[®] Control Valve

Body Sub-assembly

06



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1.1 - GENERAL INFORMATION

The following instructions are designed to assist in the installation, operation and maintenance of GL̄ globe control valve, as necessary.

Users and maintenance personnel should read this bulletin carefully before the installation, operation or servicing of the valve, actuator, positioner or any other accessory installed on the valve. Separate maintenance instructions cover additional characteristics such as special trims, manual handwheel, extended bonnet, etc.

Reading the maintenance bulletin of the actuator, positioner and other accessories installed on the valve is also recommended.



If it is necessary to store the products before field installation, Valtek Sulamericana recommends that valves be stored in dry, fresh, closed places. Do not store valves in places where relative humidity is higher than 85% or the room temperature is lower than 41°F or higher than 113°F (5 to 45°C). Environments containing excessive UV radiation, acid or alkaline mist or ozone sources must be avoided.

Product storage in non-recommended places may void the manufacturer warranty.

1.2 - UNPACKING

- When removing the valve from its package, check the packing list or the valve datasheet, comparing it with the received material. A specification sheet of the valve and assembled accessories is shipped inside each shipping container.
- When lifting the valve from shipping container, position the lifting straps properly in order to avoid damages to the tubings and accessories assembled in the valve. The GL̄ valves may be lifted by the lifting rings provided on the top of the actuators (only for sizes 25 and 50). In case there is no lifting ring provided, lift the valve using straps attached to the yoke legs.



When lifting the assembly using straps passed through the yoke legs, take care when the center of gravity is above the lifting point. An adequate support must be provided to prevent the assembly from turning. A failure in this procedure may cause severe injuries, as well as damage to the valve and to the equipment nearby.

- In case of damages during transport, immediately contact the shipper.
- In case of any problem, call your Valtek Sulamericana representative.

1.3 - IDENTIFICATION

All GL̄ valves have a stainless steel name plate (see Fig. 1). The name plate provides the following data:

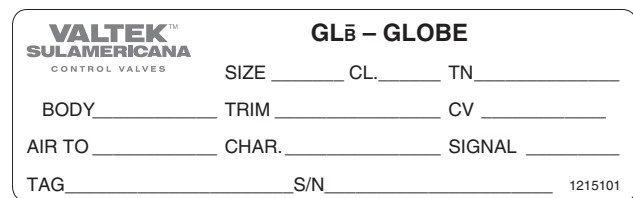


Figure 1 - Name Plate

- SIZE: Valve size in inches
- CL.: Body rating (ANSI)
- TN: Trim size
- BODY: Body material
- TRIM: Trim material
- CV: Rated Cv
- AIR TO: Air action (open/close)
- CHAR: Flow characteristic
- SIGNAL: Instrument signal range
- TAG: Customer identification
- S/N: Serial number



1.4 - SAFETY WARNINGS

To avoid potential injury and/or damage to the valve parts, **WARNING** and **CAUTION** notes must be strictly observed. Changing this product characteristics, using non-original spare parts or using maintenance procedures different from those presented herein may affect the performance of the valve, be hazardous to personnel and equipment and may void the manufacturer warranty.



WARNING

Standard industry safety practices must be applied when using this equipment. Industry safety standards for personal protection and for equipment handling must also be observed.



CAUTION

Removing the valve for maintenance: piping must be completely depressurized and process fluid drained. In case of toxic, caustic or hazardous fluid services, the valve must be decontaminated to avoid accidents.



WARNING

It is the user responsibility the proper material selection of the fasteners necessary to install the valve in the process. User will take into account the material strength and its resistance to stress corrosion cracking.

As with any mechanical equipment, periodic inspection and maintenance is required.



CAUTION

Consider the total weight before lifting or transporting the valve. A failure to observe this warning may result in serious injury.

1.5 - INSTALLATION

- Before installing the valve, clean the piping to remove any debris, scaling and other foreign material. Clean the gasket surfaces to assure that there is no leakage.
- The valve must be installed in the upright position whenever possible. The installation in the upright position allows easier maintenance.
- In case of valves for cryogenic applications, the upright position with the actuator installed towards the top is important to maintain the packing insulated from the fluid that flows through the valve, allowing the temperature of the packing to remain close to the environment temperature.



WARNING

Do not insulate extended bonnet expected to operate with too low or too high temperatures.

- Make sure that there is an adequate clearance above the actuator to allow the disassembly of the actuator from the valve body. Refer to Table I to find the necessary clearance for disassembling the actuator.

Table I: Free space necessary to disassemble the actuator

Valve Size (Inches)	ANSI Rating	Clearance	
		inches	mm
½ to 1	150 - 2500	3.0	76
1½ & 2	150 - 2500	5.0	127

⁽¹⁾ Consult factory for sizes and pressure classes not listed above.


- Check the flow direction to make sure that the valve is installed with the correct flow direction, indicated by the arrow plate attached to the bonnet flange. Valves with unbalanced, standard trims and air-to-open action (fail closed) must be installed with the flow tending to close the valve, except under special circumstances, which will be clearly indicated. Valves with unbalanced, standard trims and air-to-close action (fail open) must be installed with the flow tending to open the valve.
- If the valve is welded to the piping, care must

Installation, Operation and Maintenance Instructions

be taken to avoid excessive heat transfer to the valve.

- Connect air supply and instrument signal (throttling control valves are generally equipped with positioners). The air ports are identified indicating the air supply and the instrument signal. The actuator can operate with air supply pressure up to 150 psi (10.3 Bar). However, the sticker attached to the cylinder must be checked for maximum pressure allowed. Air filter is recommended, unless the instrument air is clean and dry.

Note: under special circumstances, the maximum air supply pressure must be limited to 80 or 100 psi depending on the actuator size and the positioner installed.




WARNING

For transport reasons, the air filter may be installed out of the vertical position. Before operating the actuator, position the air filter pointing down.

1.6 - QUICK CHECK

Prior to start-up, check the control valve according to the following steps:

- Check the full stroke making appropriate instrument signal change. Observe the position indicator of the plug, located on the stem clamp, and the stroke plate. The plug must move smoothly, from one end position to the other end.




CAUTION

When operating the valve, keep your hands, hair, clothes, etc. away from moving parts. Failure to follow this warning may result in serious injury.

- Check all air connections for leaks. Tighten the fittings connections and replace any leaking ferrule, if necessary.
- Tighten the packing gland nuts evenly (the usual torque for braided PTFE packing is around 14 ft.lbs/19 Nm). After the valve has been in operation for a short time or a temperature gradient has occurred, make sure that the bonnet flange nuts

and the packing nuts are correctly tightened (re-tighten if necessary). In case there is a leakage in the packing, tighten the packing nuts only enough to stop the leakage. The bonnet flange nuts must be retightened to assure that the bonnet gasket does not leak. See table II.

Note: The procedure above is particularly important in case the valves operate at high temperatures.



WARNING

Do not overtighten packing. This may cause excessive packing wear and increase the friction on the plug stem, blocking its movement.

- Check the failsafe position in case of air supply or instrument signal lack. Position the valve in the middle of its stroke and shutoff the air supply to the actuator or cut-off the instrument signal sent to positioner. Observe the stroke plate to confirm that the plug reaches the specified failsafe position. If specified failsafe position is not reached, refer to section “Reversing the Air Action”.

Table II: Suggested Bonnet Bolting Torque Values

Bolt Size	Torque			
	Carbon Steel		Stainless Steel	
	ft-lbs (± 10)	Nm (± 13)	ft-lbs (± 10)	Nm (± 13)
5/8 UNC	80	109	50	68
3/4 UNC	140	190	90	122
7/8 UNC	230	312	150	203
1 UNC	350	475	220	298
1.1/8 - 8 UN	510	691	330	447
1.1/4 - 8 UN	730	990	460	624
1.3/8 - 8 UN	990	1342	630	854
1.1/2 - 8 UN	1320	1790	840	1139

1.7 - PREVENTIVE MAINTENANCE

Check if the valve is working properly at least every six months following the preventive steps indicated below.

This sequence can be performed with the valve installed in the line and, in some cases, without disturbing operation. In case there is a potential problem inside the valve, refer to the section “Disassembly and Reassembly”:

Installation, Operation and Maintenance Instructions

- Inspect signs of leakage in the bonnet gasket and in the piping flanges. Tighten the nuts of bonnet flange (see Table II) and of the piping flanges, if necessary.
- In case the valve is equipped with a metal bellows seal or with a drain plug, check if there is a leakage to the atmosphere through these components.
- Observe if corrosive vapors or process fluid dripping is damaging the valve.
- Clean valve and repaint areas of severe oxidation.
- Check tightness of the packing box nuts. Packing nuts must be tightened with a torque slightly over finger-tight; however, tighten just enough to avoid leakage through the plug stem.
- If the valve is supplied with a lubricator, check the lubricant reservoir and add new lubricant, if necessary. Refer to the recommended lubricants chart on Table III.
- If possible stroke the valve and, observing the stroke plate, check if the valve travels its full stroke in a smooth and uniform way. An unsteady movement of the stem may indicate an internal problem of the valve (jerky stem motion is normal when graphite packing is used).
- Verify valve calibration, comparing the pressure indicated in the positioner gauges against the stroke plate of the actuator. Make sure that

the positioner is calibrated within the correct range.

Refer to the positioner instructions for information about preventive maintenance.



CAUTION

When operating the valve, keep your hands, hair, clothes, etc. away from moving parts. Failure to follow this warning may result in serious injury.

- Make sure that mechanical linkage of the positioner with the actuator is connected in a safe way. Verify also if the stem clamp is properly tightened and if the plug stem is correctly threaded into the actuator stem.
- Make sure all accessories, brackets and bolts are properly tightened.
- If possible, shut-off air supply and observe on the stroke plate if the specified failsafe position is reached.
- Verify if actuator stem bellows is worn out.
- Apply a soap solution around the cylinder retaining ring, adjusting screw and actuator bushings to check if there are air leaks through the O-rings and adjusting screw gasket.
- Remove any contaminant or other foreign material from the exposed areas of valve stem.
- If an air filter is supplied, check and replace cartridge if necessary.

Table III: Recommended Lubricants for Packings

Lubricant	Manufacturer	Temperature Range	Description / Applications
Krytox 206	E. I. DuPont	-5 to 550°F (-20 to 288°C)	Fluorinated general purpose grease; handles common liquids and gases; good lubricity in harsh mediums; nonflammable, chemically inert; will not harm plastic or metal parts
GP 460	Graphite Products Co.	32 to 1000°F (0 to 540°C)	Graphite in petrolatum; high pressures; anti-galling, graphite remains above 600°F / 316°C
Aeroshell Grease 7	Shell Oil Co.	-100 to 300°F (-75 to 150°C)	Synthetic oil based; low temperature applications
Garlock Luball	Garlock Inc.	32 to 500°F (0 to 260°C)	General purpose molybdenum disulfide lubricant; economical; good in water, steam and common chemicals; not good in harsh mediums where Krytox 206 is recommended

DISASSEMBLY AND REASSEMBLY

1.8 - DISASSEMBLING THE BODY

In case any internal problem is suspected with the valve requiring its disassembly, observe Figures 2, 3 and 4 and proceed as follows:



CAUTION

Removing the valve for maintenance: piping must be completely depressurized and process fluid drained. In case of toxic, caustic or hazardous fluid services, the valve must be decontaminated to avoid accidents.

- If the valve is air-to-close (normally open in case of air failure), proceed to the next step. In case the valve is air-to-open (normally closed in case of air supply failure); pressurize the lower chamber of the actuator to lift the plug off the seat, before disassembling the valve.
- Remove the bonnet flange nuts and then lift the actuator, bonnet and the plug, taking them out of the valve.



CAUTION

Heavy actuators may require using a hoist for their removal. In case the actuator has one lifting ring, use it to lift the actuator, otherwise, use a hook or pass lifting straps through the yoke legs to raise the assembly. During the disassembly, the actuator must be maintained in the upright position to prevent damages to the plug and to the seat.

- Remove the seat retainer, seat ring and gaskets from the body.
- Check if the seating surfaces on the seat ring and plug are not damaged and can assure tight shutoff. Check if the gasket seating surfaces on the seat, bonnet and body are clean and not damaged.
- To inspect the plug, release the clamp that secures the plug stem in the actuator, remove the gland flange and the yoke fixing clamps. Turn the actuator to unfasten the plug from the actuator stem. Use an open wrench to avoid the plug rotation in-

side the bonnet. Pull the plug carefully through the packing box.

Note: On air-to-close valves (normally open in case of air supply lack), it may be necessary to pressurize the upper chamber of the actuator to move the plug out of the bonnet. If this is not carried out, the plug stem may be scratched or scored.



WARNING

To prevent scratching the guides and the plug stem, follow exactly the procedure described above.

- Remove the gland flange, the yoke clamp and separate the bonnet from the actuator assembly.
- To replace the packing set or change configuration of the packing box, remove the upper guide and, with the aid of a hook or one dowel of the same approximate size as the plug stem, remove the packing and other internal components of the valve bonnet.



WARNING

Take care to avoid scratching the plug guides and the internal surface of the packing box during the disassembly of the bonnet internal components.

1.9 – RESASSEMBLING THE BODY

To reassembly the body of the GL̄ Series control valve, observe Figures 2, 3 and 4 and proceed as indicated below:

- If the packing set has been removed, refer to Figure 4 and reassemble new packing set exactly as indicated. When reassembling the packing set into the bonnet, make sure that a gap of at least 1/8 in. (3.2 mm) is left on the top of the packing box to assemble the upper guide. Spacers with different lengths allow using several configurations of packing, as twin seal or packing for vacuum applications. Lubrication of packing set is recommended and this facilitates the reassemble (see recommended lubricants on Table III).

 **WARNING**

On valves with extended bonnets or metal bellows seal, the lower packing set cannot be installed. However, in such cases, the lower packing set must be installed together with the upper assembly. The installation of the packing in the lower part of bonnet when the valve is equipped with extended bonnet or metal bellows seal will reduce the integrity of the stem sealing.

- In case the valve has guides with graphite inserts, these inserts must be replaced whenever the packing set has to be replaced. In whatever circumstance the valve will be reassembled without the graphite inserts on these stem guides.
- Insert the plug into the bonnet, taking care to avoid scratching any component.
- Secure the bonnet in a vise, in the upright position with the plug head supported over a soft surface.

 **WARNING**

Take care to avoid damages to the plug head during the step above.

- Place the actuator back on top of the plug, without allowing the plug to rotate inside the bonnet. Make sure that the bonnet flange, gland flange and stem locknut (if applicable) are in their respective places before threading the actuator stem on plug stem.

Note: do not allow the gland flange to touch or scratch the polished surfaces of the plug stem.

- Taking care to prevent turning the plug over the seat, turn the actuator over the plug stem. Let approximately 3 or 4 threads exposed. Install the yoke clamp bolts or the yoke bolts, tightening then firmly. Tighten the bolts of the packing box with a torque slightly over finger-tight.
- Install new bonnet and seat gaskets with beveled edge up for Teflon gaskets.
- Insert the seat ring into the body with the step side downward. Place the seat retainer into the body, with the thinner end of the cathedral window downward.

Note: For valves with sizes from 1/2 to 1 1/2 inch and high pressures classes (ANSI 900 and above), the seat retainer should be placed in the body with the cathedral window facing toward the valve ports. On valves with sizes 2 inches and larger (ANSI 900 and above), the retainer's bar should face toward the valve ports.

- On valves with air-to-open configuration (fail-close), apply air in the lower chamber of the actuator to retract the plug.
- Keeping the assembly comprised by the actuator, bonnet and plug in the upright position, lower this assembly over the valve body, taking care to prevent scratching or damaging the plug while being inserted into the valve body.
- To align the plug and the seat properly, tighten the bonnet flange nuts with your fingers. In case of valves equipped with pneumatic actuators, apply air pressure in the actuator upper chamber to seat the plug into the seat ring. Proceed to the next step.

Note: the next step is applicable only to valves equipped with pneumatic actuators. In case an electrical or hydraulic actuator is used, return the plug for the half-stroke position and continue to tighten the nuts of the bonnet flange.

 **WARNING**

Failure to return the plug to the half-stroke position (for valves equipped with electrical or hydraulic actuators) will cause damages to the actuator and/or to the valve during the bonnet tightening sequence. This is caused because the majority of electrical and hydraulic actuators is unable to retract 1/8 in. (3.2 mm) during the tightening sequence of the bonnet flange.

- On valves with air-to-close configuration (fail-open), skip this step and proceed to the next one. On valves with air-to-open configuration (fail-close), check the correct seating of the plug as follows: when the correct seat/plug seating is achieved, the bonnet flange is forced upward, against the flange nuts with a force that will render it impossible to move the flange. If the seating is not correct, the bonnet flange can be wiggled with light hand force. If this occurs, apply air in the ac-

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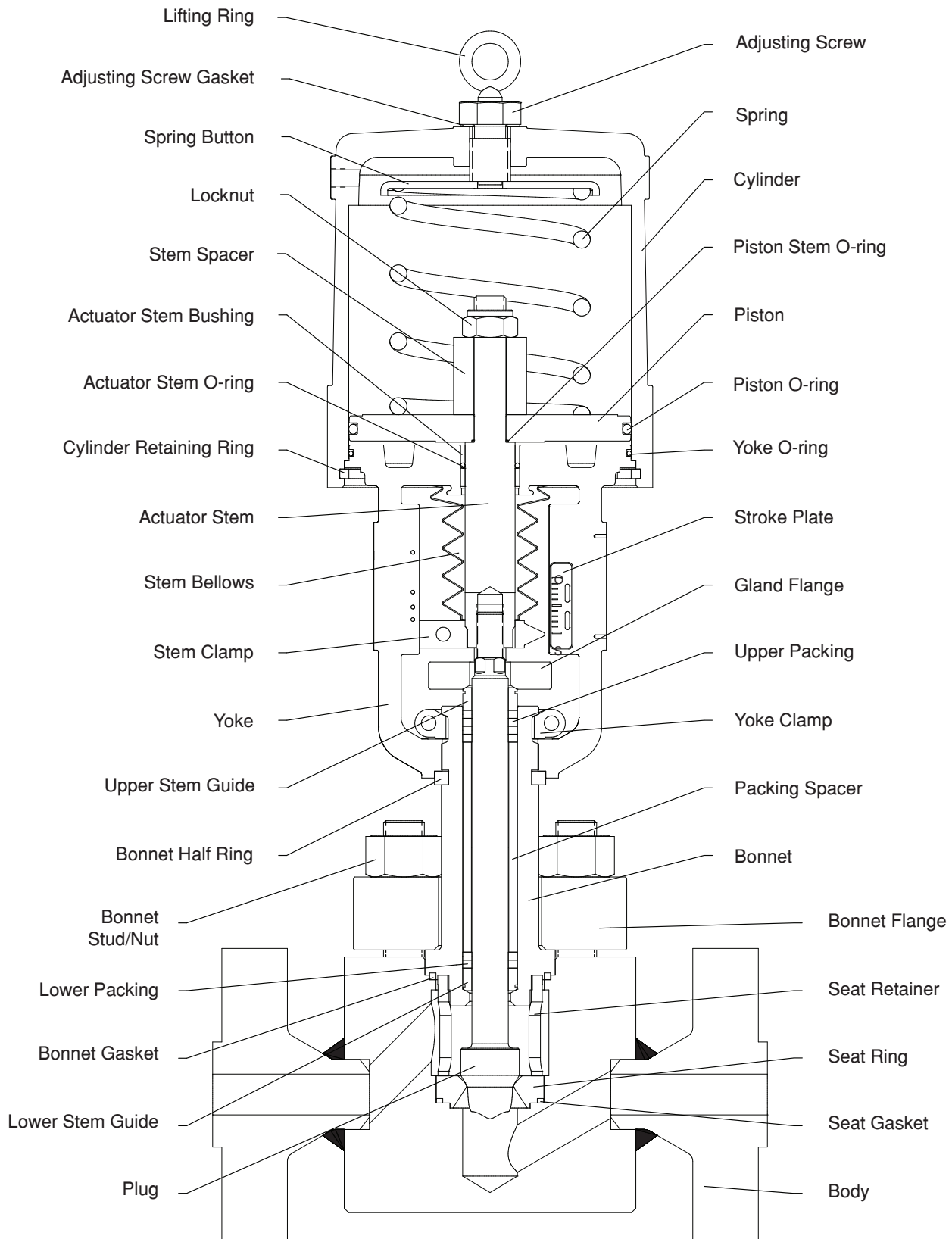


Figure 2 - GLB Control Valve

¹ As standard, the lifting rings are provided just for actuators sizes 25 and 50.

Installation, Operation and Maintenance Instructions

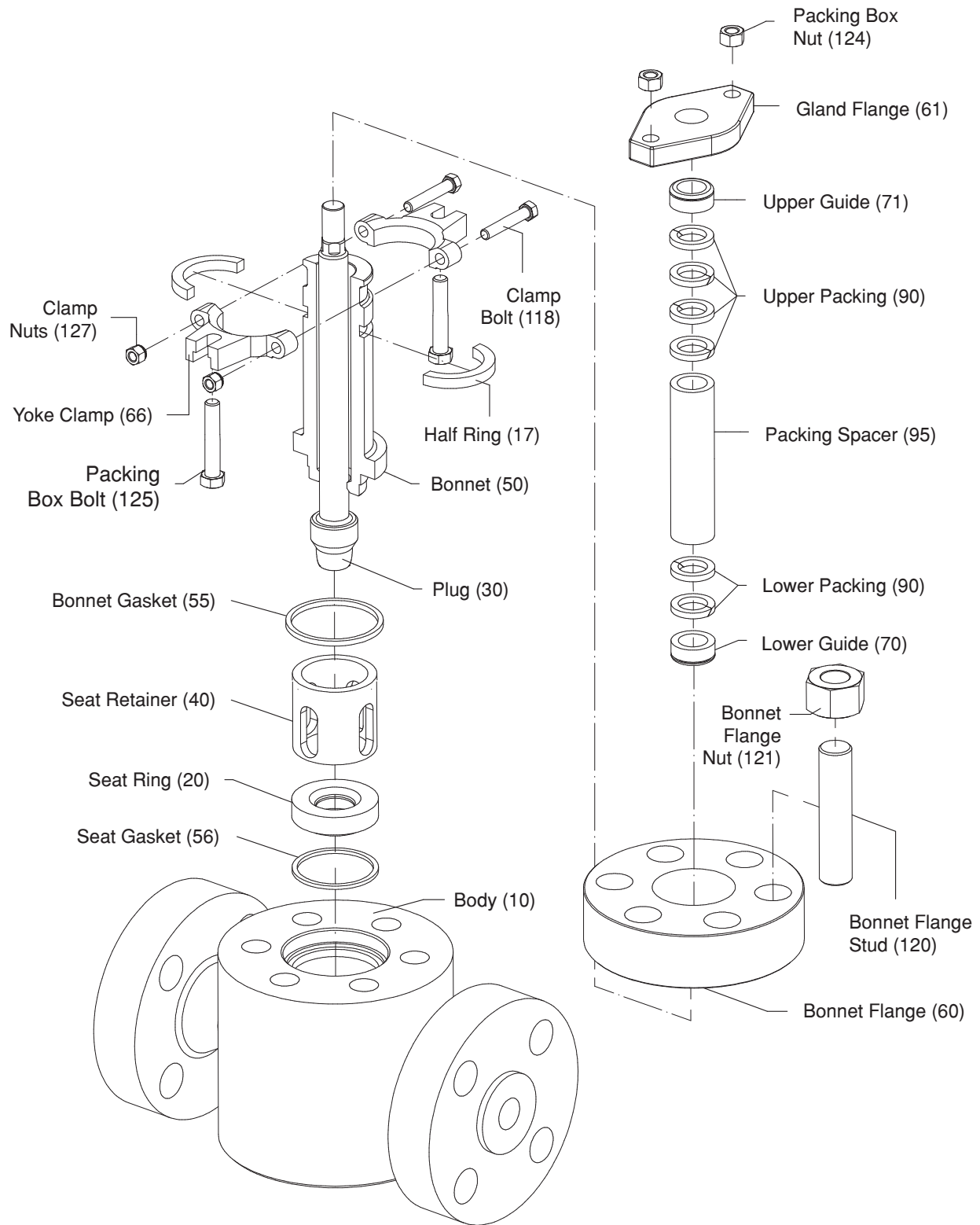


Figure 3 - Exploded View of the Body Sub-assembly

¹ Item numbers above correspond directly to the valve's bill of material.

Installation, Operation and Maintenance Instructions

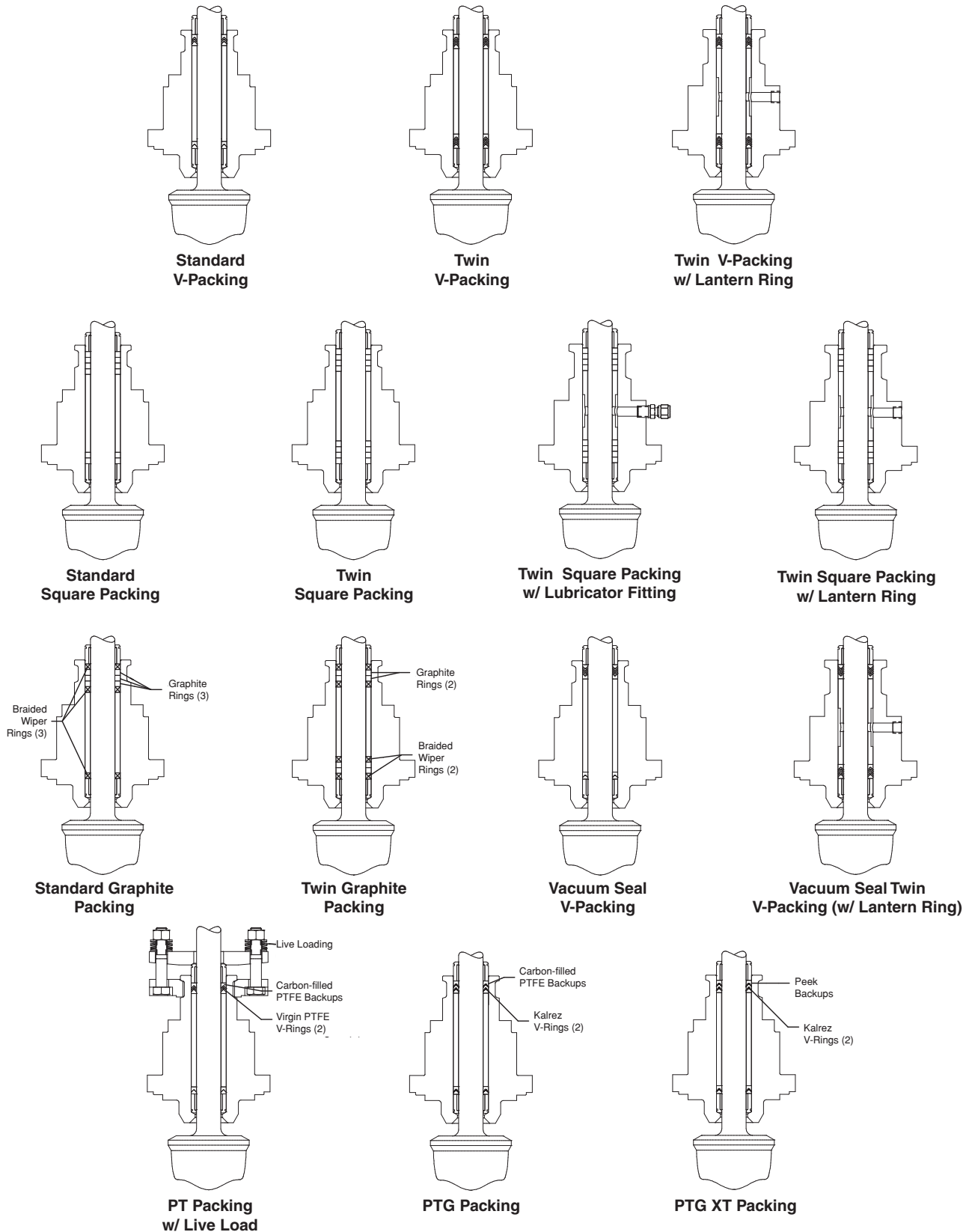


Figure 4 - Typical Packing Configurations

tuator lower chamber and retract the plug to the half-stroke position. Turn the plug outwards from the actuator stem exposing another thread of plug stem. When it is not possible to move the bonnet flange with your hands, the correct seating of the plug has been achieved. If necessary, repeat this procedure until the plug is correctly seated.

- Move the plug to the closed position, in case of valves equipped with pneumatic actuators, or to the half-stroke position in case of valves equipped with hydraulic, electrical or mechanical actuators. Start by tightening the bonnet flange nuts in order to maintain the bonnet flange parallel to the body. Tighten the first nut with a 1/6 of a turn, and then tighten the directly opposite nut with 1/6 of a turn, and so on, successively. Tighten completely all nuts to seat the bonnet and assure the compression of the gaskets (see Table II for the suggested tightening torque values).
- Apply air in the upper chamber of the actuator to seat the plug. Adjust the stem clamp in a such way that, with the maximum signal of the instrument sent to positioner, the line indicating "maximum signal" on the positioner cam is positioned toward the center of the cam roller bearing.

Note: On on-off valves, the lower part of the stem clamp must be simply aligned at 1/16 in. (1.6 mm) of the actuator stem end.

- Tighten the stem clamp bolt. The appropriate tightening is important, as the clamp secures the plug stem in the actuator stem. Adjust the stroke plate so that the stem clamp indicates the "closed" position.
- If the valve has been removed of the piping, make sure it is reinstalled with the correct flow direction.

1.10 – DISASSEMBLING THE ACTUATOR

On normally closed valves, the actuator can be disassembled with the actuator yoke still connected to the valve. On normally open valves, the actuator must be removed from the valve before its disassembly. To disassemble the actuator, observe the Figures 5, 6 and 7 and proceed as follows:

Removal of the actuator from the valve:

- Make sure that the plug is not seated in the seat ring or resting in the bottom of the bonnet. To do

this, apply air in the proper chamber of the cylinder and release the pressure on the opposite chamber.



WARNING

Roughness on critical surfaces may indicate that the plug is not correctly positioned between the seat and the bonnet during disassembly.

- Loose the stem clamp.
- Remove the bolts from the gland flange and from the yoke clamp. Remove the clamp itself.
- Turn the actuator completely outward the plug stem, preventing the plug to rotate inside the bonnet.



WARNING

Do not allow that after the removal of the actuator the plug drops over the valve seat.

With the actuator removed out of the valve:

- Disconnect the tubings.
- Release the compression of the spring, removing completely the adjusting screw.



CAUTION

The spring compression must be completely relieved before disassembling the actuator. If this is not done, the cylinder may be ejected out of the yoke when the retaining ring is removed from the cylinder, causing serious injury.

- Remove the retaining ring from the groove at the base of the cylinder using two screwdrivers. Introduce the tip of a screwdriver in the slot on the ring and remove the ring out of its channel. Use another screwdriver to help the operation of removing the ring.
- Pull the cylinder out of the yoke and piston (some O-ring resistance may be felt).



CAUTION

Do not use air pressure to remove cylinder. This may cause the cylinder to be ejected out of the yoke, causing serious injury.

Installation, Operation and Maintenance Instructions

- In the “air-to-open” configuration, remove the spring(s) and the spring button for cleaning and inspection (see Figure 5). Remove the locknut and slide the piston and the stem spacer out from the actuator stem. On actuators with dual springs the spring guide must be removed also.
- In the “air-to-close” configuration (Fig. 6), slowly release and remove the actuator stem locknut, making sure that the piston follows the locknut and is not jammed on the actuator stem. Remove the stem locknut, spring button, piston, spring and stem spacer.
- Remove the O-rings from the piston, the piston stem and from the yoke.



WARNING

The maintenance step indicated below can only be performed if the actuator has been removed from the valve.

- To inspect the actuator stem O-ring, remove the stem clamp and corresponding rubber bellows. Push the actuator stem through the yoke, taking care not to gall the stem. The O-ring may now be inspected and replaced if necessary.



WARNING

The upper and lower actuator stem bushings are pressed into the yoke. It is not necessary to remove them to replace the actuator stem O-ring.

- If the bushings are worn out or damaged use a press with appropriate size to extract the used bushings and insert the new ones in the yoke.

1.11 – REASSEMBLING THE ACTUATOR

To reassemble the actuator refer to the Figures 5, 6 and 7 and proceed as follows:

- All the O-Rings must be replaced and the new ones must be lubricated. The majority of the O-rings can be lubricated with silicone lubricant (Dow Corning 55M or equivalent). Silicone O-rings must be lubricated with Magnalube-G or equivalent (do not use a silicone lubricant on silicone O-rings).
- Assure that all internal parts are completely clean before starting to assemble. Apply the proper lubricant to the cylinder wall.

- If the bushings have been removed, lubricate the external side of the replacement bushings. Press the new lower stem bushing into the yoke until it touches the bottom shoulder. Press the upper stem bushing until it is aligned with the top of the yoke (see Figure 5 or 6).
- Replace the O-rings on the actuator stem and on the yoke. Reassemble the actuator stem.
- Reassemble the piston, the piston stem O-ring and the stem spacer in the actuator stem, according to the desired air action (see Figure 5 or 6). Replace the piston O-ring. The air-to-extend configuration requires that the spring button be fixed by the actuator stem locknut. Tighten the nut firmly.
- In the air-to-close configuration, place the spring below the piston and insert the actuator stem through the yoke, taking care not to strike (and scratch) the stem or bushings. For air-to-open configurations insert the actuator stem through the yoke and place the spring(s) and the spring button on the top of the piston.
- Assemble the cylinder in the yoke, assuring that these parts are correctly positioned to allow the installation of the cylinder retaining ring. Care must be taken to avoid scratching or cutting the O-rings on the piston and on the yoke.
- Insert the retaining ring into the cylinder groove, by steps, until it is fitted in place. Using a hammer and a drift rod, tap gently on the retaining ring, already fitted in place, to confirm that it is securely installed.



CAUTION

The cylinder retaining ring must be securely fixed into the groove so that the cylinder does not escape when pressurized, causing personal injury. During installation, avoid damaging or deforming the edge of the retaining ring square section.

- Reinstall the adjusting screw, using a new adjusting screw gasket.



WARNING

In the air-to-open configuration make sure that the hole in the spring button is centered directly under the adjusting screw hole.

Installation, Operation and Maintenance Instructions

- Tighten the adjusting screw sufficiently so that the gasket provides a leak proof sealing. Do not over-tighten it.

 **WARNING**

Do not use a screwdriver, bar, etc. to turn the adjusting screw since this procedure may cause damages to the lifting ring weld. Use an adequate open wrench on flat surfaces of the screw head.

- Replace the stem bellows and reinstall the stem clamp.

 **WARNING**

When installing the stem clamp, make sure that the bolt of the clamp is square to one of the flat faces machined on the actuator stem. This assures a more rigid connection.

- Apply air in the upper chamber of the cylinder and place the actuator subassembly onto the valve, making sure that the gland flange and the bonnet flange are in their respective places. Connect the threads of the actuator stem to the plug stem. Carefully, turn the actuator clockwise until the plug stem is connected by 3 or 4 threads.

 **WARNING**

To prevent roughness in the plug stem or in the seating surfaces, do not allow that the plug turns inside the bonnet and over the seat during the maintenance steps described above and below.

- Apply enough air in the lower chamber of the actuator (in air-to-open configuration) or in the upper chamber of the actuator (in the air-to-close configuration) to prevent the plug head from touching the seat ring or the bottom of the bonnet. Continue to turn the actuator over the plug stem until only 2 or 3 threads of the plug stem are exposed.

 **WARNING**

Do not allow the gland flange to touch or scratch the polished surfaces of the plug stem.

 **WARNING**

To prevent possible scratching of the plug stem and/or seat ring, do not allow that the plug turns inside the bonnet and over the seat.

- Apply air over the top of the piston. This will make the plug to rest over the seat ring and will raise the actuator yoke about 1/16 in. (1.6 mm) above the bonnet. If the gap created is lower than 1/16 in. (1.6 mm), apply air in the lower chamber of the actuator to retract the actuator stem and thread the plug inward or outward, as necessary. Repeat this step until a 1/16 in. (1.6 mm) gap is created.
- Apply air in the actuator lower chamber, secure the yoke clamps and tighten the packing box bolting. Tighten the yoke clamps bolting firmly. The packing box nuts must be tightened slightly over finger-tight.

 **WARNING**

Do not overtighten packing. This may cause excessive packing wear and increase the friction on the plug stem, blocking its movement.

- Apply air in the upper chamber of the actuator to seat the plug. Adjust the stem clamp in a such way that, with the maximum signal of the instrument sent to positioner, the line indicating “maximum signal” on the positioner cam is positioned toward the center of the cam roller bearing.

Note: On on-off valves, the lower part of the stem clamp must be simply aligned at 1/16 in. (1.6 mm) of the actuator stem end.

- Tighten the stem clamp bolt. The appropriate tightening is important, as the clamp secures the plug stem in the actuator stem. Adjust the stroke plate so that the stem clamp indicates the “closed” position.
- Reconnect the tubings, the supply line and the signal line.

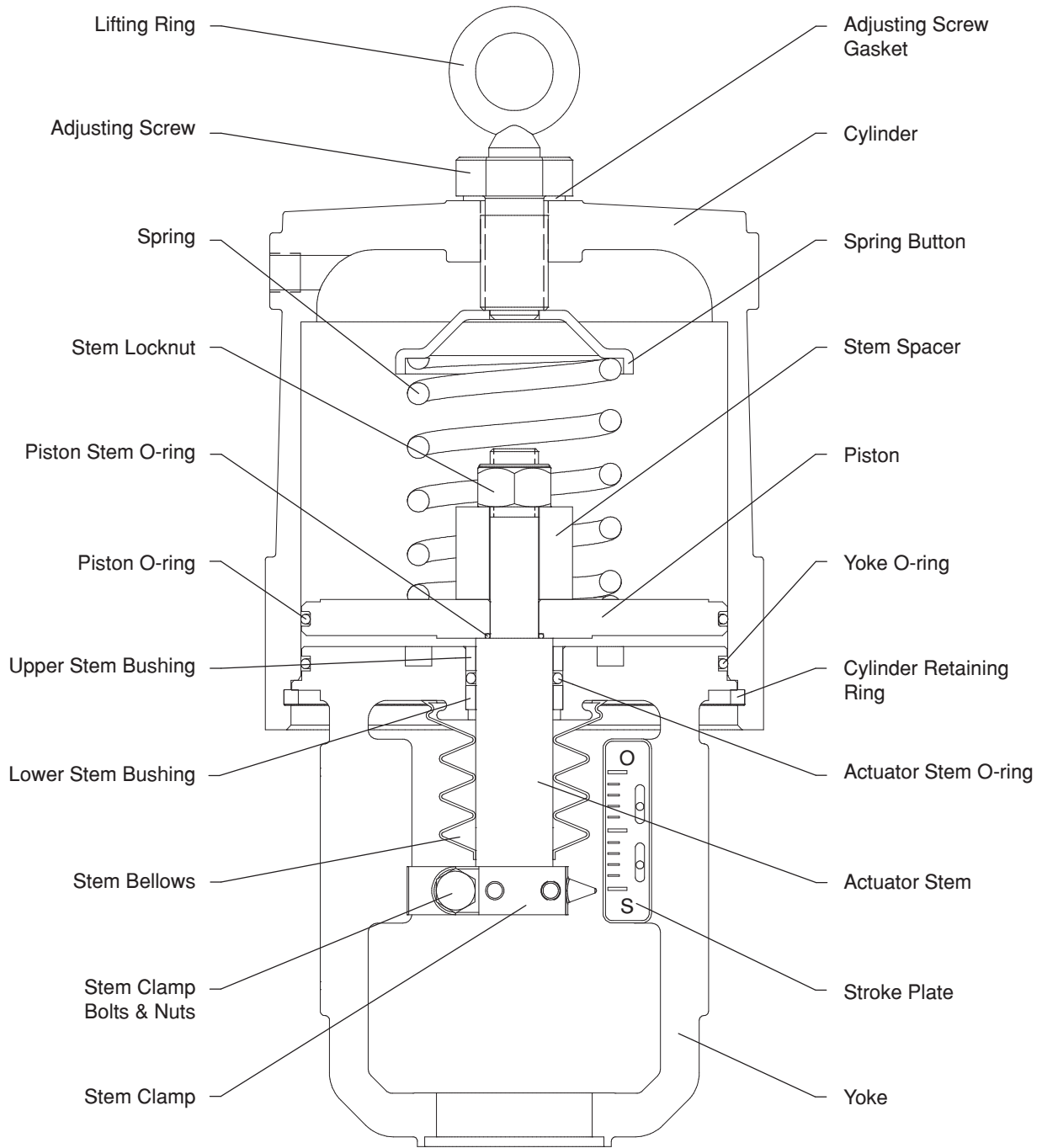


Figure 5 - Spring-Cylinder Actuator (Air-to-Open)

¹ As standard, the lifting rings are provided just for actuators sizes 25 and 50.

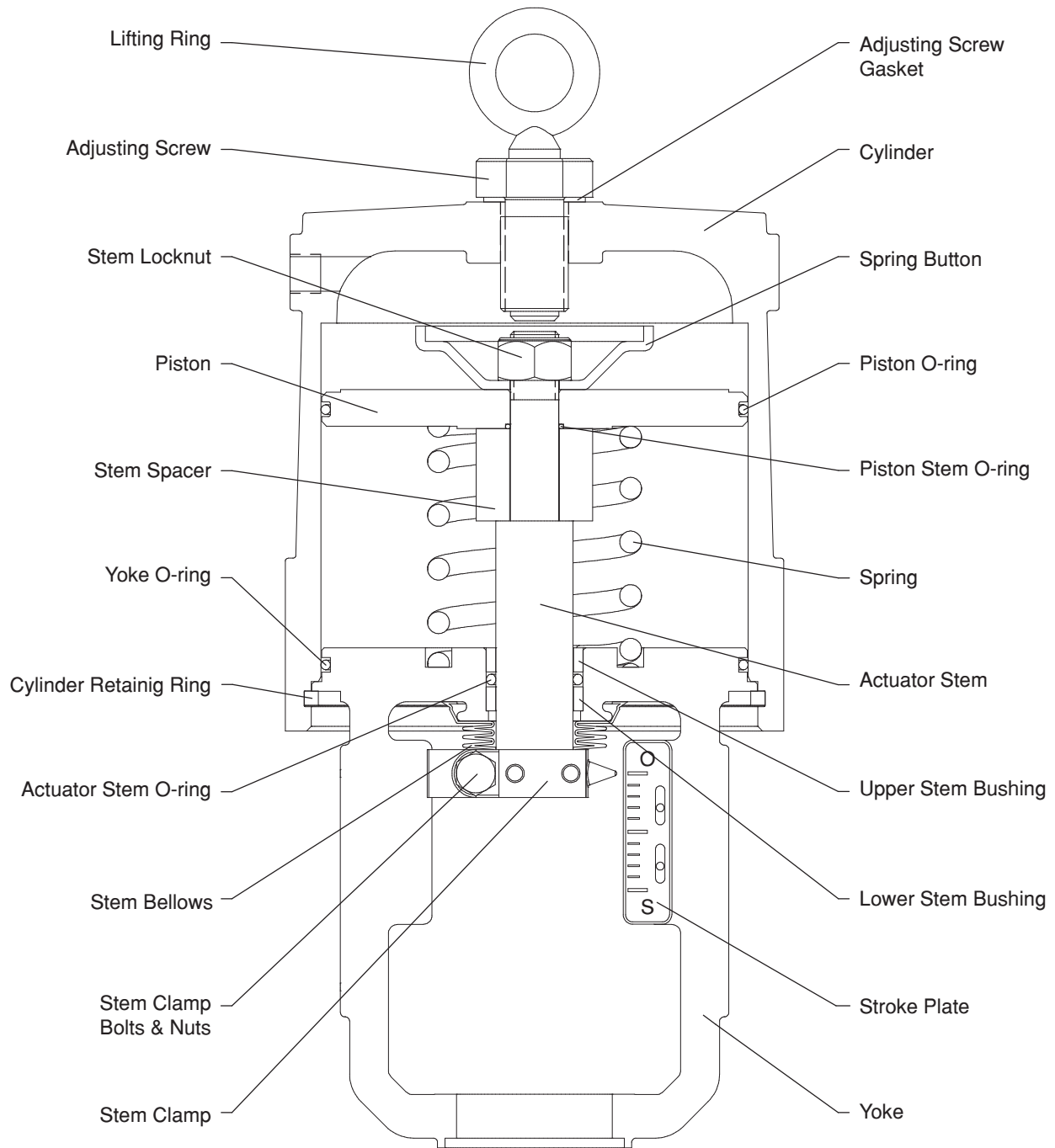


Figure 6 - Spring-Cylinder Actuator (Air-to-Close)

¹ As standard, the lifting rings are provided just for actuators sizes 25 and 50.

1.12 – REVERSING THE AIR ACTION

Changing to Air-to-Open

To reverse the configuration from “air-to-close” to “air-to-open”, refer to Figure 7 and proceed as follows:

- Disassemble the actuator according to the section “Disassembling the Actuator”.
- Reassemble the actuator with the stem spacer, the spring and the spring button over the piston (make sure that the hole in the spring button is centered directly under the adjusting screw hole). The central hole of the spring button must fit at the adjusting screw end.
- If the actuator is equipped with a positioner, the positioner must be reversed too (refer to positioner IOM prior to proceed).

Changing to Air-to-Close

To reverse the configuration from “air-to-open” to “air-to-close”, refer to Figure 7 and proceed as follows:

- Disassemble the actuator according to the section “Disassembling the Actuator”.
- Reassemble the actuator with the stem spacer and the spring underneath the piston. The spring must be seated on the groove existing on the top of the yoke and the spring button must be stored above the piston (secured by the stem locknut).
- If the actuator is equipped with a positioner, the positioner must be reversed too (refer to positioner IOM prior to proceed).

Installation, Operation and Maintenance Instructions

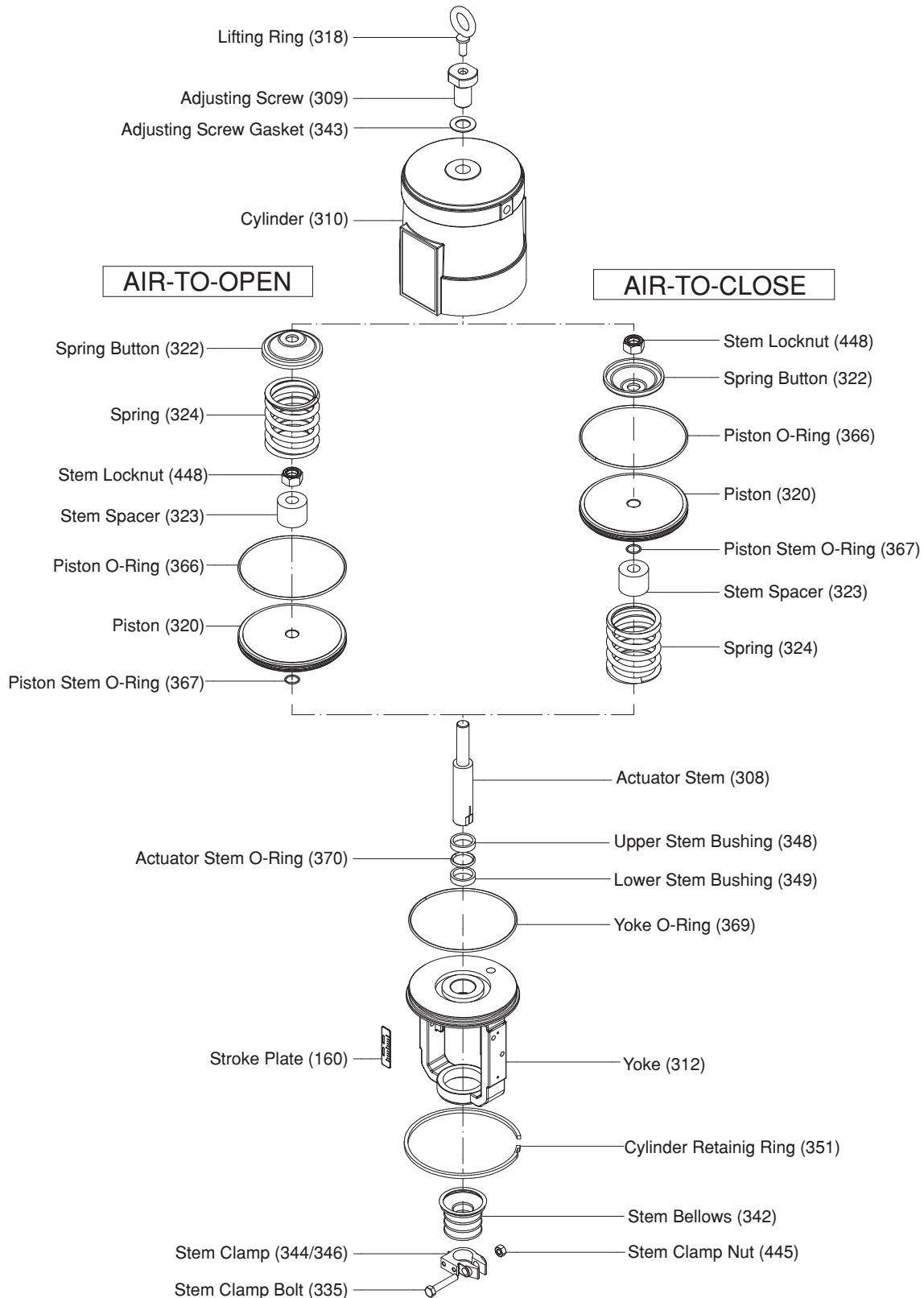


Figure 7 - Exploded View, Spring-Cylinder Actuator

¹ Item numbers above correspond directly to the valve's bill of material.

² As standard, the lifting rings (iten no. 318) are provided just for actuators sizes 25 and 50.

1.13 - GL̄ Valve Troubleshooting Chart

Problem	Probable Cause	Corrective Action
Stem moves slowly or does not move	<ul style="list-style-type: none"> • Overtightened packing • Service temperature is above the operating limits of trim design • Insufficient air supply • Malfunctioning positioner • Insufficient actuator thrust 	<ul style="list-style-type: none"> • Adjust packing box nuts to slightly over finger-tight • Reconfirm service conditions and contact the manufacturer • Check for leaks in air supply or instrument signal system; tighten loose fittings and replace the leaking ferrules • See positioner IOM • Verify air supply pressure to actuator; if pressure is adequate, double check service conditions and contact the manufacturer
Excessive leakage through the valve seat	<ul style="list-style-type: none"> • Insufficient tightness on the bonnet flange nuts • Worn or damaged seat ring • Worn or damaged seat gasket • Insufficient actuator thrust • Improper plug adjustment • Zero adjustment incorrectly carried out • Worn or damaged plug seating surface • Incorrect flow direction • Inccorret adjustment of the auxiliary handwheel, limiting the stroke 	<ul style="list-style-type: none"> • See steps on “Reassembling the Body” for tightening procedures • Disassemble valve and change or repair seat ring • Disassemble valve and replace gaskets • Verify air supply pressure to actuator; if pressure is adequate, double check service conditions and contact the manufacturer • See section “Reassembling the Body” for correct plug adjustment • Carry out the positioner calibration • Disassemble the valve and replace plug • Correct flow direction • Adjust the handwheel until the plug is correctly seated
Inadequate flow	<ul style="list-style-type: none"> • Incorrect plug adjustment, limiting the stroke • Malfunctioning positioner • Service conditions exceed the trim nominal capacity • Insufficient air supply • Incorrect flow direction 	<ul style="list-style-type: none"> • See section “Reassembling the Body” for correct plug adjustment • See positioner IOM • Check service conditions and contact the manufacturer • Check air supply requirements • Correct flow direction
Valve does not fail in correct position	<ul style="list-style-type: none"> • Incorrect flow direction • Incorrect assembly of the actuator • Insufficient actuator thrust 	<ul style="list-style-type: none"> • Correct flow direction • Change failsafe position of the actuator spring; see section “Reversing the Air Action” • Recheck service conditions and contact the manufacturer
The plug is hitting	<ul style="list-style-type: none"> • Incorrect adjustment of the plug allowing the formation of an inadequate air cushion between the piston and the yoke of the actuator • Inadequate air supply • Trim size is too large for the flow rate through the valve 	<ul style="list-style-type: none"> • Refer to the section “Reassembling the Body” for the correct adjustment of the plug • Check the adequate supply pressure for the actuator, repair leakages and remove any restrictions in the supply line • Install a trim with lower Cv
Excessive air consumption	<ul style="list-style-type: none"> • Leaks in air supply or instrument signal system • Malfunctioning positioner • Leaks through O-rings or through the adjusting screw gasket 	<ul style="list-style-type: none"> • Tighten the fittings and replace any leaking ferrule • See positioner IOM • Replace O-rings and gasket

1.14 - SPARE PARTS

For the supply of spare parts it is necessary to inform Valtek Sulamericana the name and the part number of the required item and/or the name of the required component and the valve serial number. To facilitate this task, lists containing the part numbers of all valve and actuator components are provided inside each transport packaging.

In case the valve is disassembled the user may also check the component part number marked in a permanent way in all metallic components of the valve.

1.15 - RECYCLING INFORMATION

GLB control valves may present a very long operational life depending on the application they are provided for and the proper maintenance care.

However, at the end of their operational life the part number marked on all metallic components may help the user to adopt the best procedure for disposal of the materials that may be recycled.

In case of doubt, please contact your Valtek Sulamericana representative.

Although Valtek Sulamericana provides precise and detailed installation, operation and maintenance instructions, in accordance with their design reviews, the customer/user shall be responsible for the information provided to generate product specifications, shall understand precisely the operation and maintenance instructions provided with the products and shall provide training for their employees and contracted personnel regarding the safe use of Valtek Sulamericana products, in accordance with the specific applications they were designed for. The information herein shall not be considered as a certificate for assurance of satisfactory results. Valtek Sulamericana products are continuously improved and upgraded and the specification, dimensions and information contained herein are subject to change without notice. For further information or to confirm these presented here, consult Valtek Sulamericana at Rua Goiás, 345, Diadema, São Paulo, Brasil, CEP 09941-690, Phone: 55-11 4072-8600, Fax: 55-11 4075-2477.

Quality Management System



Certificate No. 311001 QM

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