

MOUNTING AND OPERATING INSTRUCTIONS



EB 8822 EN

Translation of original instructions



Type 3522 Globe Valve · ANSI version

In combination with an actuator,
e.g. a Type 3271 or Type 3277 Pneumatic Actuator

Edition September 2021

Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices. The images shown in these instructions are for illustration purposes only. The actual product may vary.

- For the safe and proper use of these instructions, read them carefully and keep them for later reference.
- If you have any questions about these instructions, contact SAMSON's After-sales Service (service-us@samsongroup.com).



Documents relating to the device, such as the mounting and operating instructions, are available on our website at <https://usa.samsongroup.com> > **Service & Support** > **Downloads** > **Documentation**.

Definition of signal words

DANGER

Hazardous situations which, if not avoided, will result in death or serious injury

WARNING

Hazardous situations which, if not avoided, could result in death or serious injury

NOTICE

Property damage message or malfunction

Note

Additional information

Tip

Recommended action

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1 Safety instructions and measures

Intended use

The SAMSON Type 3522 Globe Valve in combination with an actuator (e.g. Type 3271 or Type 3277 Pneumatic Actuator) is designed to regulate the flow rate, pressure or temperature of liquids, gases or vapors. The valve is designed for use in light industrial applications.

The valve with its actuator is designed to operate under exactly defined conditions (e.g. operating pressure, process medium, temperature). Therefore, operators must ensure that the control valve is only used in operating conditions that meet the specifications used for sizing the valve at the ordering stage. In case operators intend to use the control valve in other applications or conditions than specified, contact SAMSON.

SAMSON does not assume any liability for damage resulting from the failure to use the device for its intended purpose or for damage caused by external forces or any other external factors.

→ Refer to the technical data and nameplate for limits and fields of application as well as possible uses.

Reasonably foreseeable misuse

The control valve is not suitable for the following applications:

- Use outside the limits defined during sizing and by the technical data
- Use outside the limits defined by the valve accessories connected to the valve

Furthermore, the following activities do not comply with the intended use:

- Use of non-original spare parts
- Performing service and repair work not described
- Qualifications of operating personnel

The control valve must be mounted, started up, serviced and repaired by fully trained and qualified personnel only; the accepted industry codes and practices must be observed. According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible hazards due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.

Safety instructions and measures

Personal protective equipment

We recommend checking the hazards posed by the process medium being used (e.g.

▶ GESTIS (CLP) hazardous substances database). Depending on the process medium and/or the activity, the protective equipment required includes:

- Protective clothing, gloves, eye protection and respiratory protection in applications with hot, cold and/or corrosive media
 - Wear hearing protection when working near the valve
 - Hard hat
 - Safety harness when working at height
 - Safety footwear, ESD (electrostatic discharge) footwear, if necessary
- ➔ Check with the plant operator for details on further protective equipment.

Revisions and other modifications

Revisions, conversions or other modifications of the product are not authorized by SAMSON. They are performed at the user's own risk and may lead to safety hazards, for example. Furthermore, the product may no longer meet the requirements for its intended use.

Safety devices

Upon supply air or control signal failure, the valve moves to its fail-safe position (see section 3.1). The fail-safe action of the actuator is the same as its direction of action and is specified on the nameplate of SAMSON actuators (see actuator documentation).

Warning against residual hazards

To avoid personal injury or property damage, plant operators and operating personnel must prevent hazards that could be caused in the control valve by the process medium, the operating pressure, the signal pressure or by moving parts by taking appropriate precautions. Plant operators and operating personnel must observe all hazard statements, warning and caution notes in these mounting and operating instructions.

Hazards resulting from the special working conditions at the installation site of the valve must be identified in a risk assessment and prevented through the corresponding safety instructions drawn up by the operator.

Responsibilities of the operator

Operators are responsible for proper use and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions to the operating personnel and to instruct them in proper operation. Furthermore, operators must ensure that operating personnel or third parties are not exposed to any danger.

Operators are additionally responsible for ensuring that the limits for the product defined in the technical data are observed. This also applies to the start-up and shutdown procedures. Start-up and shutdown procedures fall within the scope of the operator's duties and, as such, are not part of these mounting and operating instructions. SAMSON is unable to make any statements about these procedures since the operative details (e.g. differential pressures and temperatures) vary in each individual case and are only known to the operator.

Responsibilities of operating personnel

Operating personnel must read and understand these mounting and operating instructions as well as the referenced documents and observe the specified hazard statements, warnings and caution notes. Furthermore, operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.

Referenced standards, directives and regulations

The SAMSON Type 3522 Globe Valve complies with the requirements of ASME B16.34, ASME B16.5 and ANSI/ISA 75.08.01-2002 (R2007).

Referenced documentation

The following documents apply in addition to these mounting and operating instructions:

- Mounting and operating instructions for mounted actuator, e.g. ► EB 8310-X for SAMSON Type 3271 and Type 3277 Actuators or ► EB 8313-X for SAMSON Type 3372 Actuator
- Mounting and operating instructions for mounted valve accessories (positioner, solenoid valve etc.)
- When a substance is used in the device, which is listed as being a substance of very high concern on the candidate list of the REACH regulation:

Information on safe use of the part affected

► www.samsongroup.com > About SAMSON > Material Compliance > REACH

If a device contains a substance which is listed as being a substance of very high concern on the candidate list of the REACH regulation, this circumstance is indicated on the SAMSON delivery note.

1.1 Notes on possible severe personal injury

DANGER

Risk of bursting in pressure equipment.

Valves and pipelines are pressure equipment. Impermissible pressure or improper opening can lead to valve components bursting.

- Observe the maximum permissible pressure for valve and plant.
- Before starting any work on the control valve, depressurize all plant sections affected as well as the valve.
- Drain the process medium from all the plant sections concerned as well as the valve.

1.2 Notes on possible personal injury

WARNING

Risk of burn injuries due to hot or cold components and pipelines.

Depending on the process medium, valve components and pipelines may get very hot or cold and cause burn injuries.

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

Risk of hearing loss or deafness due to loud noise.

The noise emissions depend on the valve version, plant facilities and process medium.

- Wear hearing protection when working near the valve.

Risk of personal injury due to exhaust air being vented.

While the valve is operating, air is vented from the actuator, for example, during closed-loop operation or when the valve opens or closes.

- Install the control valve in such a way that vent openings are not located at eye level and the actuator does not vent at eye level in the work position.
- Use suitable silencers and vent plugs.
- Wear eye protection when working in close proximity to the control valve.

⚠ WARNING**Crush hazard arising from moving parts.**

The control valve contains moving parts (actuator and plug stem), which can injure hands or fingers if inserted into the valve.

- Do not insert hands or finger into the yoke while the air supply is connected to the actuator.
- Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.
- Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.
- Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

Risk of personal injury due to preloaded springs.

Valves in combination with pneumatic actuators with preloaded springs are under tension. These control valves with SAMSON pneumatic actuators can be identified by the long bolts protruding from the bottom of the actuator.

- Before starting any work on the actuator, relieve the compression from the preloaded springs (see associated actuator documentation).

Risk of personal injury due to residual process medium in the valve.

While working on the valve, residual medium can flow out of the valve and, depending on its properties, cause personal injury, e.g. (chemical) burns.

- If possible, drain the process medium from all the plant sections affected and the valve.
- Wear protective clothing, safety gloves, respiratory protection and eye protection.

⚠ WARNING

Exposure to hazardous substances poses a serious risk to health.

Certain lubricants and cleaning agents are classified as hazardous substances. These substances have a special label and a material safety data sheet (MSDS) issued by the manufacturer.

- Make sure that an MSDS is available for any hazardous substance used. If necessary, contact the manufacturer to obtain an MSDS.
- Inform yourself about the hazardous substances and their correct handling.

Risk of personal injury through incorrect operation, use or installation as a result of information on the valve being illegible.

Over time, markings, labels and nameplates on the valve may become covered with dirt or become illegible in some other way. As a result, hazards may go unnoticed and the necessary instructions not followed. There is a risk of personal injury.

- Keep all relevant markings and inscriptions on the device in a constantly legible state.
- Immediately renew damaged, missing or incorrect nameplates or labels.

1.3 Notes on possible property damage

ⓘ NOTICE

Risk of valve damage due to contamination (e.g. solid particles) in the pipeline.

The plant operator is responsible for cleaning the pipelines in the plant.

- Flush the pipelines before start-up.

Risk of valve damage due to unsuitable medium properties.

The valve is designed for a process medium with defined properties.

- Only use the process medium specified for sizing the valve.

! NOTICE

Risk of leakage and valve damage due to excessively high or low tightening torques.

Observe the specified torques when tightening control valve components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.

→ Observe the specified tightening torques (see section 15.1).

Risk of valve damage due to the use of unsuitable tools.

Certain tools are required to work on the valve.

→ Only use tools approved by SAMSON (see section 15.1).

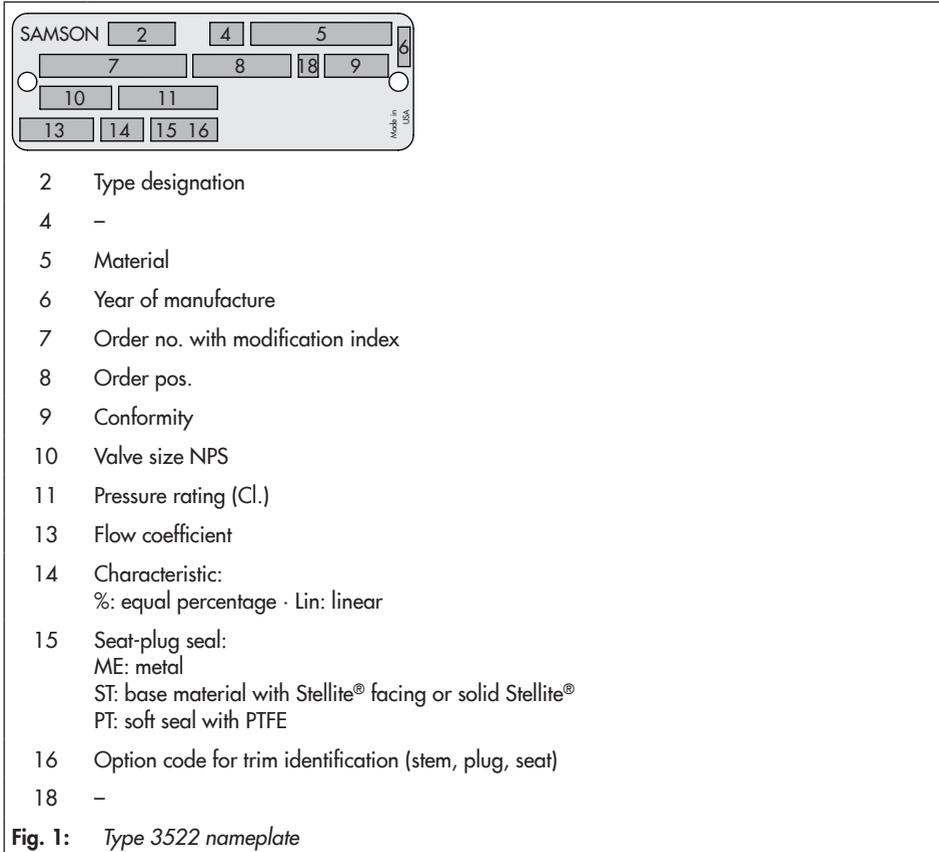
Risk of valve damage due to the use of unsuitable lubricants.

The lubricants to be used depend on the valve material. Unsuitable lubricants may corrode and damage surfaces.

→ Only use lubricants approved by SAMSON (see bill of materials and section 15.1).

2 Markings on the control valve

2.1 Valve nameplate



The nameplate is affixed to the back of the valve body.

2.2 Actuator nameplate

See associated actuator documentation.

2.3 Material identification number

The seat and plug of the valves have an item number written on them. You can contact us stating this item number to find out which material is used. Additionally, a seat code is used to identify the trim material (see Table 1). This seat code is specified on the nameplate (seat/plug seal, 15). For more details on the nameplate, see section 2.1.

Table 1: *Seat codes*

Valve	Type 3522		
Plug stem material	A479 316/A479 316L		
Plug material	A479 316/A479 316L	A182 F316/ A182 F316L	R30006 (Stellite® 6)
Seat material	Seat code		
A479 316, A479 316L	04	05	06
A182 F316, A182 F316L	07	08	09

3 Design and principle of operation

The Type 3522 Valve is a single-seated globe valve. This valve is preferably combined with a SAMSON Type 3271 or Type 3277 Pneumatic Actuator (see Fig. 2). It can also be combined with other actuators.

The seat (4) and plug with plug stem (5) are installed in the body (1). The plug stem is connected to the actuator stem (A7) by the stem connector clamps (A26/27) and is sealed by a spring-loaded V-ring packing (15). The springs in the pneumatic actuator are located either above or below the diaphragm depending on the selected fail-safe action (see section 3.1). A change in the signal pressure acting on the diaphragm causes the plug to move. The actuator size is determined by the diaphragm area.

The medium flows through the valve in the direction indicated by the arrow. The valve normally operates in the flow-to-open direction (FTO). The standard version normally operates in the flow-to-open direction (FTO). The medium flows across the plug from bottom to top.

A rise in signal pressure causes the force acting on the diaphragm in the actuator to increase. The springs are compressed. Depending on the selected direction of action, the actuator stem retracts or extends. As a result, the plug position in the seat changes and determines the flow rate through the valve.

Actuators

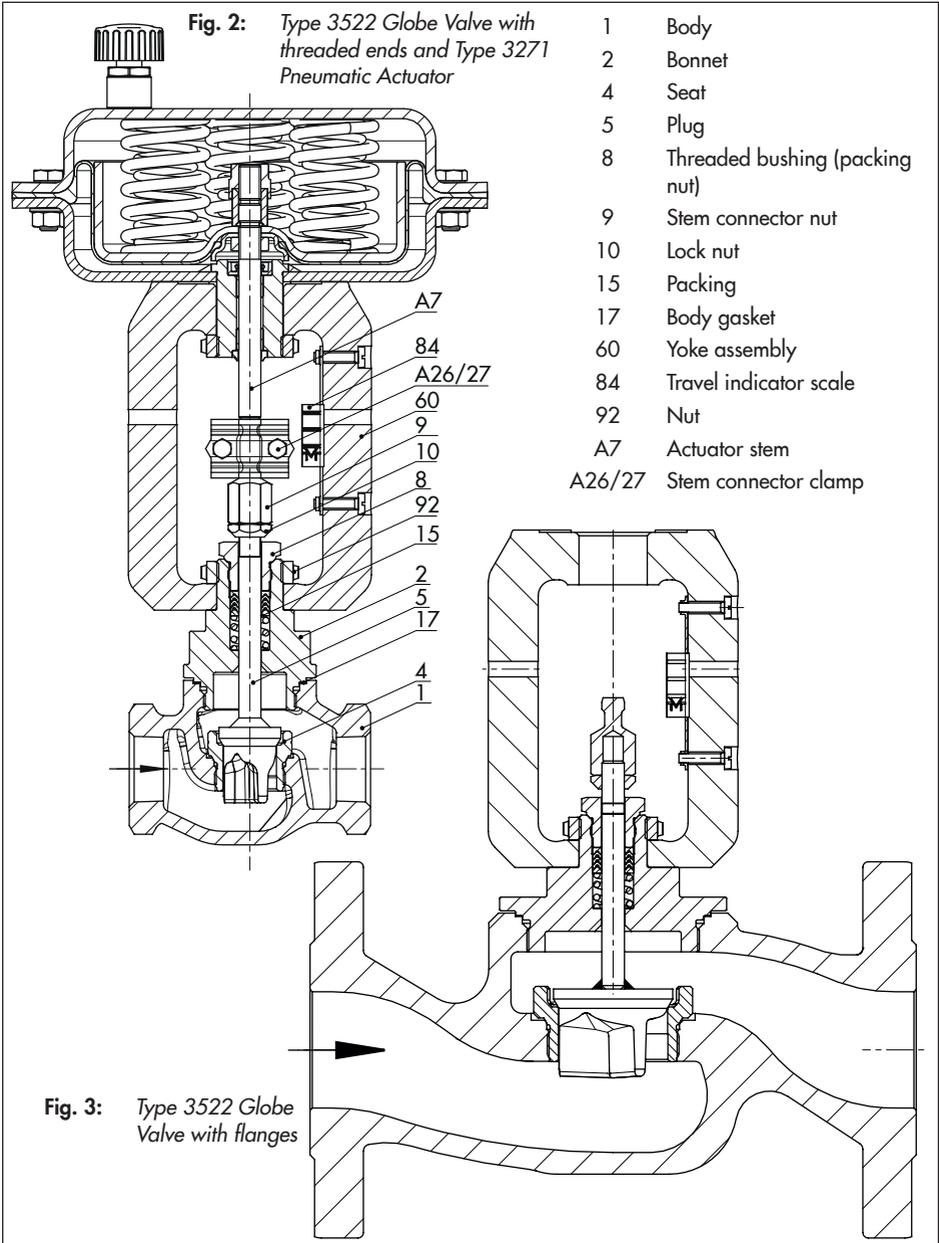
In these instructions, the combination with a Type 3271 or Type 3277 Pneumatic Actuator is described. The pneumatic actuator can be replaced by another pneumatic actuator in a different size, but with the same travel.

→ Observe the maximum permissible actuator force.

i Note

If the travel range of the actuator is larger than the travel range of the valve, the spring assembly in the actuator must be preloaded so that the travel ranges match. See associated actuator documentation.

As an alternative, the control valve can be combined with a Type 3372 Electropneumatic Actuator (see ► T 8313).



3.1 Fail-safe positions

The fail-safe position of the control valve upon air supply or control signal failure depends on the actuator used (see associated actuator documentation).

Depending on how the compression springs are arranged in the SAMSON Type 3271 and Type 3277 Pneumatic Actuator, the valve has one of two different fail-safe positions:

– **Actuator stem extends (FA)**

When the signal pressure is reduced or the air supply fails, the springs move the actuator stem downward and close the valve. The valve opens when the signal pressure is increased enough to overcome the force exerted by the springs.

– **Actuator stem retracts (FE)**

When the signal pressure is reduced or the air supply fails, the springs move the actuator stem upwards and open the valve. The valve closes when the signal pressure is increased enough to overcome the force exerted by the springs.



Tip

The actuator's direction of action can be reversed, if required. Refer to the mounting and operating instructions of the pneumatic actuator:

▶ *EB 8310-X for Type 3271 and Type 3277*

3.2 Additional fittings

Strainers

We recommend installing a SAMSON strainer upstream of the valve. It prevents solid particles in the process medium from damaging the valve.

Bypass and shut-off valves

We recommend installing a shut-off valve both upstream of the strainer and downstream of the valve and installing a bypass line. The bypass ensures that the plant does not need to be shut down for service and repair work on the valve.

Insulation

Do not insulate valves mounted to comply with NACE MR 0175 requirements.

i Note

Contact SAMSON's After-sales Service in case that insulation is required.

Safety guard

For operating conditions that require increased safety (e.g. in cases where the valve is freely accessible to untrained staff), a safety guard must be installed to rule out a crush hazard arising from moving parts (actuator and plug stem). Plant operators are responsible for deciding whether a guard is to be used. The decision is based on the risk posed by the plant and its operating conditions.

3.3 Accessories

Information Sheet ▶ T 8350

3.4 Technical data

The nameplates on the valve and actuator provide information on the control valve version. See section 2.1 and the actuator documentation.

i Note

More information is available in Data Sheet
▶ T 8822.

Temperature range

The valve is designed for a temperature range from 14 to +430 °F (-10 to +220 °C).

Leakage class

Seal (15 on nameplate)	ME, ST	PT
Leakage class according to ANSI/FCI 70-2	IV or V	VI

Noise emissions

SAMSON is unable to make general statements about noise emissions. The noise emissions depend on the valve version, plant facilities and process medium.

Dimensions and weights

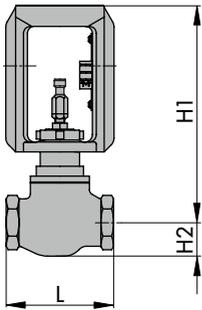
Table 2 to Table 4 provide an overview of the dimensions and weights of the threaded and flanged version of Type 3522 Valve. The lengths and heights are shown in the dimensional drawings on page p. 18 and p. 19.

Design and principle of operation

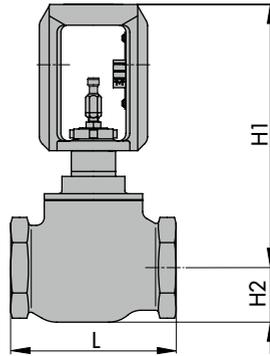
Table 2: Dimensions of Type 3522 Valve · Version with threaded ends

Valve		NPS	½	¾	1	1¼	1½	2
Length L	Class 300	in	3.5	3.5	4.31	4.63	5.31	6.66
		mm	89	89	109	118	135	169
H1 for actuator	Type 3271, Type 3277 ≤350 cm ²	in	8.66			8.75		8.98
		mm	220			222		228
	Type 3372	in	10.6			-		
mm	269							
H2		in	1.13	1.13	1.38	1.50	1.68	1.75
		mm	28.5	28.5	35	38	43	44.5

Dimensional drawings



NPS ½ to 1, threaded ends

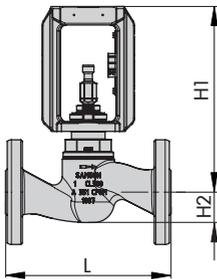


NPS ¼ to 2, threaded ends

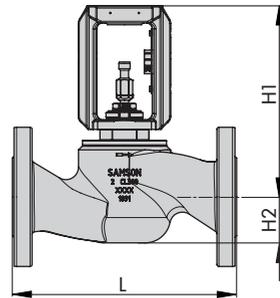
Table 3: Dimensions of Type 3522 Valve · Version with flanges

Valve	Pressure rating	NPS	½	¾	1	1¼	1½	2
Length L	Class 150	in	7.3	7.3	7.3	-	8.7	10
		mm	184	184	184		222	254
	Class 300	in	7.5	7.6	7.8	-	9.3	10.5
		mm	190	194	197		235	267
H1 for actuator	Type 3271, Type 3277 ≤350 cm ²	in	8.66			-	8.98	
		mm	220			-	228	
	Type 3372	in	10.6			-		
		mm	269					
H2		in	1.3	1.2	1.4	-	2.1	2.1
		mm	33	31	36	-	54.5	54.5

Dimensional drawings



NPS ½ to 1, flanges



NPS 1½ to 2, flanges

Design and principle of operation

Table 4: *Weights of Type 3522 Valve without actuator*

Valve	NPS	½	¾	1	1¼	1½	2
Version with threaded ends	lbs	7	7.5	9	11	12	17
	kg	3	3.4	4	5	5.4	7.7
Version with flanges	lbs	11.5	14.8	16.8	–	31.1	34.6
	kg	5.2	6.7	7.6	–	14.1	15.7

i Note

Refer to the following data sheets for more dimensions and weights:

- ▶ T 8310-1 for Type 3271 or Type 3277 Pneumatic Actuators up to 750 cm² actuator area
- ▶ T 8313 for Type 3372 Electropneumatic Actuator

4 Shipment and on-site transport

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

4.1 Accepting the delivered goods

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Check that the specifications on the valve nameplate match the specifications in the delivery note. For more details on the nameplate, see section 2.
2. Check the shipment for transportation damage. Report any damage to SAMSON and the forwarding agent (refer to delivery note).
3. Determine the weight and dimensions of the units to be lifted and transported in order to select the appropriate lifting equipment and lifting accessories, if required. Refer to the transport documents and section 3.4.

4.2 Removing the packaging from the valve

Observe the following sequence:

- Do not open or remove the packaging until immediately before lifting to install the valve into the pipeline.

- Leave the control valve in its transport container or on the pallet to transport it on site.
- Do not remove the protective caps from the inlet and outlet until immediately before installing the valve into the pipeline. They prevent foreign particles from entering the valve.
- Dispose and recycle the packaging in accordance with the local regulations.

4.3 Transporting and lifting the valve

⚠ DANGER

Danger due to suspended loads falling.

- *Stay clear of suspended or moving loads.*
 - *Close off and secure the transport paths.*
-

⚠ WARNING

Risk of lifting equipment tipping over and risk of damage to lifting accessories due to exceeding the rated lifting capacity.

- *Only use approved lifting equipment and accessories whose minimum lifting capacity is higher than the weight of the valve (including actuator and packaging, if applicable).*
-

WARNING

Risk of personal injury due to the control valve tipping over.

- Observe the valve's center of gravity.
 - Secure the valve against tipping over or turning.
-

WARNING

Risk of injury due to incorrect lifting without the use of lifting equipment.

Lifting the control valve without the use of lifting equipment may lead to injuries (back injury in particular) depending on the weight of the control valve.

- Observe the occupational health and safety regulations valid in the country of use.
-

NOTICE

Risk of valve damage due to incorrectly attached slings.

The lifting eyelet/eyebolt on SAMSON actuators is only intended for mounting and removing the actuator as well as lifting the actuator without valve. Do not use this lashing point to lift the entire control valve assembly.

- When lifting the control valve, make sure that the slings attached to the valve body bear the entire load.
 - Do not attach load-bearing slings to the actuator, handwheel or any other parts.
 - Observe lifting instructions (see section 4.3.2).
-

Tip

A swivel hoist can be screwed into SAMSON actuators with a female thread on the top diaphragm case in place of the eye-bolt (see associated actuator documentation).

In contrast to the lifting eyelet/eyebolt, the swivel hoist is designed for setting a control valve assembly upright.

The sling between the swivel hoist and rigging equipment (hook, shackle etc.) must not bear any load when lifting a control valve assembly. The sling only protects the control valve from tilting while being lifted.

Tip

Our after-sales service can provide more detailed transport and lifting instructions on request.

4.3.1 Transporting the valve

The control valve can be transported using lifting equipment (e.g. crane or forklift).

- Leave the control valve in its transport container or on the pallet to transport it.
- Observe the transport instructions.

Transport instructions

- Protect the control valve against external influences (e.g. impact).
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.

- Protect the piping and any mounted valve accessories against damage.
- Protect the control valve against moisture and dirt.
- The permissible transportation temperature of standard control valves is -4 to $+149$ °F (-20 to $+65$ °C).

i Note

Contact our after-sales service for the transportation temperatures of other valve versions.

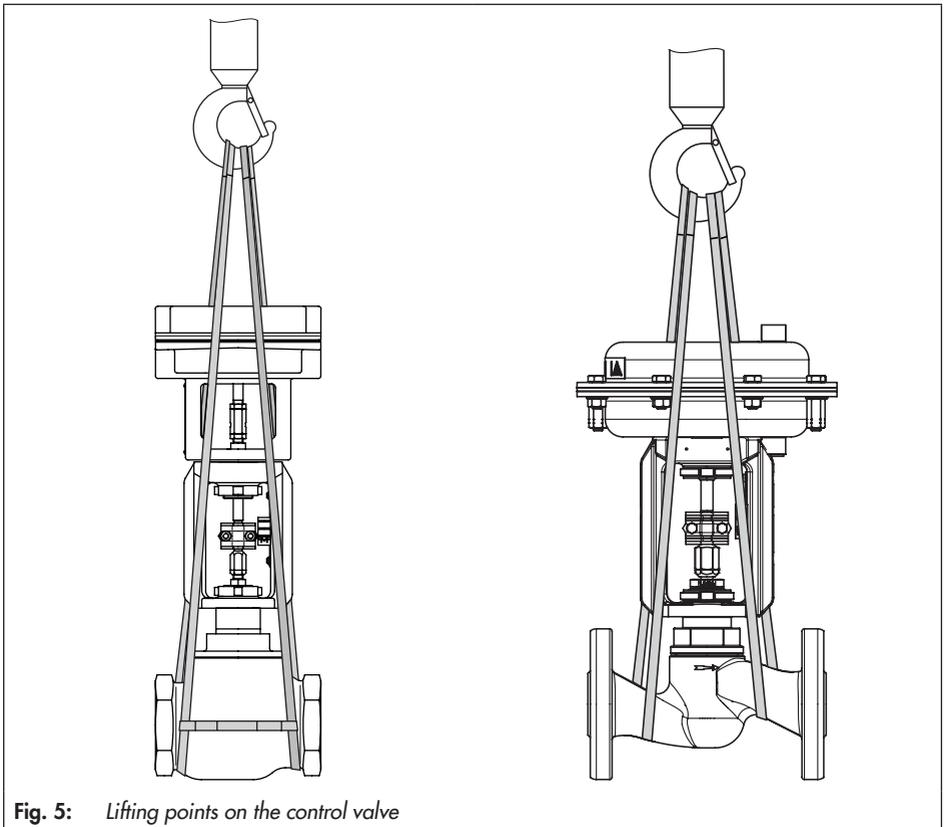


Fig. 5: Lifting points on the control valve

4.3.2 Lifting the valve

To install a large valve into the pipeline, use lifting equipment (e.g. crane or forklift) to lift it.

Lifting instructions

- Use a hook with safety latch (see Fig. 5) to secure the slings from slipping off the hook during lifting and transporting.
- Secure slings against slipping.
- Make sure the slings can be removed from the valve once it has been installed into the pipeline.
- Prevent the control valve from tilting or tipping over.
- Do not leave loads suspended when interrupting work for longer periods of time.
- Make sure that the axis of the pipeline is always horizontal during lifting and the axis of the plug stem is always vertical.
- Make sure that the additional sling between the lashing point on the actuator and rigging equipment (hook, shackle etc.) does not bear any load when lifting valves with an actuator that has a lifting eyelet/eyebolt on it. The sling only protects the control valve from tilting while being lifted. Before lifting the control valve, tighten the sling.

2. Carefully lift the control valve. Check whether the lifting equipment and accessories can bear the weight.
3. Move the control valve at an even pace to the site of installation.
4. Install the valve into the pipeline (see section 5).
5. After installation in the pipeline, check whether the flanges are bolted tight and the valve in the pipeline holds.
6. Remove slings.

b) Version with threaded ends

1. Attach one sling to each threaded end of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 5).
2. Secure the slings attached to the body against slipping using a connector.
3. Carefully lift the control valve. Check whether the lifting equipment and accessories can bear the weight.
4. Move the control valve at an even pace to the site of installation.
5. Install the valve into the pipeline (see section 5).
6. After installation in the pipeline, check whether the pipe screw joint holds.
7. Remove slings.

a) Version with flanges

1. Attach one sling to each flange of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 5).

4.4 Storing the valve

NOTICE

Risk of valve damage due to improper storage.

- Observe the storage instructions.
- Avoid long storage times.
- Contact SAMSON in case of different storage conditions or longer storage times.

Note

We recommend regularly checking the control valve and the prevailing storage conditions during long storage periods.

Storage instructions

- Protect the control valve against external influences (e.g. impact).
- Secure the valve in the stored position against slipping or tipping over.
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
- Protect the control valve against moisture and dirt. Store it at a relative humidity of less than 75 %. In damp spaces, prevent condensation. If necessary, use a drying agent or heating.
- Make sure that the ambient air is free of acids or other corrosive media.
- The permissible storage temperature of standard control valves is -4 to $+149$ °F (-20 to $+65$ °C). Contact our after-sales

service for the storage temperatures of other valve versions.

- Do not place any objects on the control valve.

Special storage instructions for elastomers

Elastomer, e.g. actuator diaphragm

- To keep elastomers in shape and to prevent cracking, do not bend them or hang them up.
- We recommend a storage temperature of 15 °C for elastomers.
- Store elastomers away from lubricants, chemicals, solutions and fuels.

Tip

SAMSON's After-sales Service can provide more detailed storage instructions on request.

5 Installation

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

5.1 Installation conditions

Work position

The work position for the control valve is the front view looking onto the operating controls (including valve accessories).

Plant operators must ensure that, after installation of the device, the operating personnel

Installation

can perform all necessary work safely and easily access the device from the work position.

Pipeline routing

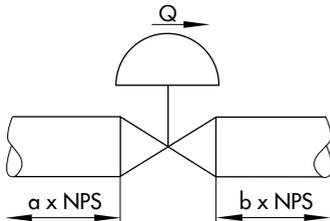
The inlet and outlet lengths (see Table 5) vary depending on several variables and process conditions and are intended as recommendations. Contact SAMSON if the lengths are significantly shorter than the recommended lengths.

To ensure that the valve functions properly, proceed as follows:

- Observe the recommended inlet and outlet lengths (see Table 5). Contact SAMSON if the valve conditions or states of the medium process deviate.
- Install the valve free of stress and with the least amount of vibrations as possible. Read information under "Mounting posi-

Table 5: *Inlet and outlet lengths*

State of process medium	Valve conditions	Inlet length a	Outlet length b
Gas	$Ma \leq 0.3$	2	4
	$0.3 \leq Ma \leq 0.7$	2	10
Vapor	$Ma \leq 0.3$ ¹⁾	2	4
	$0.3 \leq Ma \leq 0.7$ ¹⁾	2	10
	Saturated steam (percentage of condensate > 5 %)	2	20
Liquid	Free of cavitation/ $w < 10$ m/s	2	4
	Cavitation producing noise/ $w \leq 3$ m/s	2	4
	Cavitation producing noise/ $3 < w < 5$ m/s	2	10
	Critical cavitation/ $w \leq 3$ m/s	2	10
	Critical cavitation/ $3 < w < 5$ m/s	2	20
Flashing	–	2	20
Multi-phase	–	10	20



Q Flow rate
a Inlet length
b Outlet length

¹⁾ No saturated steam

tion" and "Support or suspension" in this section.

- ➔ Install the valve allowing sufficient space to remove the actuator and valve or to perform service and repair work on them.

Mounting position

Generally, we recommend installing the valve with the actuator upright and on top of the valve.

- ➔ Contact SAMSON if the mounting position is not as specified above.

Support or suspension

i Note

The plant engineering company is responsible for selecting and implementing a suitable support or suspension of the installed control valve and the pipeline.

Depending on the valve version and mounting position, the valve, actuator and pipeline must be supported or suspended.

Valves, which are not installed in the pipeline in the upright position with the actuator on top, must be supported or suspended.

Valve accessories

- ➔ During connection of valve accessories, make sure that they are easily accessible and can be operated safely from the work position.

Vent plugs

Vent plugs are screwed into the exhaust air ports of pneumatic and electropneumatic de-

vices. They ensure that any exhaust air that forms can be vented to the atmosphere (to avoid excess pressure in the device). Furthermore, the vent plugs allow air intake to prevent a vacuum from forming in the device.

- ➔ Locate the vent plug on the opposite side to the work position of operating personnel.

5.2 Preparation for installation

Before installation, make sure the following conditions are met:

- The valve is clean.
- The valve and all valve accessories (including piping) are not damaged.
- The valve data on the nameplate (type designation, valve size, material, pressure rating and temperature range) match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.). For more details on the nameplate, see section 2.
- The requested or required additional pipe fittings (see section 3.2) have been installed or prepared as necessary before installing the valve.

! NOTICE

Risk of control valve damage due to incorrect insulation.

- ➔ *Do not insulate valves mounted to comply with NACE MR0175 requirements and which have nuts and bolts that are not suitable for sour gas environments.*

Installation

Proceed as follows:

- Lay out the necessary material and tools to have them ready during installation work.
- Flush the pipelines.

i Note

The plant operator is responsible for cleaning the pipelines in the plant.

- For steam applications, dry the pipelines. Moisture will damage the inside of the valve.
- Check any mounted pressure gauges to make sure they function properly.
- When the valve and actuator are already assembled, check the tightening torques of the bolted joints. Components may loosen during transport.

5.3 Mounting the device

The activities listed below are necessary to install the valve and before it can be started up.

! NOTICE

Risk of valve damage due to excessively high or low tightening torques.

Observe the specified torques when tightening control valve components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.

- *Observe the specified tightening torques (see section 15.1).*

! NOTICE

Risk of valve damage due to the use of unsuitable tools.

- *Only use tools approved by SAMSON (see section 15.1).*

5.3.1 Mounting the actuator onto the valve

! WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. They can be identified by the long bolts protruding from the bottom of the actuator.

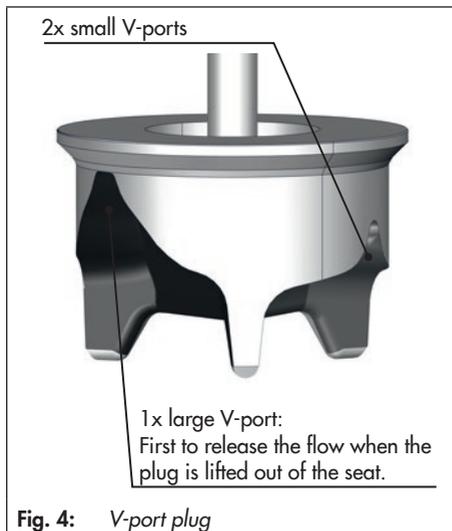
- *Before starting any work on the actuator, relieve the compression from the preloaded springs (see associated actuator documentation).*

Depending on the version, SAMSON control valves are either delivered with the actuator already mounted on the valve or the valve and actuator are delivered separately. When delivered separately, the valve and actuator must be assembled together on site.

Versions with V-port plug

To achieve the best flow conditions inside the valve, the V-port plug must always be installed with the port that releases the flow first when the valve opens facing toward the valve outlet. This is the largest of the three V-shaped ports (see Fig. 4).

- Before mounting the actuator, determine which V-shaped port is uncovered first when the plug is lifted out of the seat.
- On mounting the actuator, make sure that the V-shaped port uncovered first faces toward the valve outlet.



Mounting the actuator

- To mount the actuator, proceed as described in the associated actuator documentation.

5.3.2 Installing the valve into the pipeline

! NOTICE

Premature wear and leakage due to insufficient support or suspension.

- Support or suspend the valve sufficiently at suitable points.

1. Close the shut-off valves in the pipeline at the inlet and outlet of the plant section while the valve is being installed.
2. Prepare the relevant section of the pipeline for installing the valve.
3. Remove the protective caps from the valve ports before installing the valve.
4. Lift the valve using suitable lifting equipment to the site of installation (see section 4.3.2). Observe the flow direction through the valve. The arrow on the valve indicates the direction of flow.
5. Install the valve into the pipeline. Install an appropriate sealing. Make sure the valve is installed free of stress.
6. Attach a support or suspension on the valve, if necessary.

5.4 Testing the installed valve

⚠ DANGER

Risk of bursting due to incorrect opening of pressurized equipment or components.

Valves and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of process medium under pressure can cause serious injury or even death.

Before working on the control valve:

- Depressurize all plant sections affected and the valve (including the actuator). Release any stored energy.
- Drain the process medium from all the plant sections concerned as well as the valve.

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions. Additionally, a loud noise may briefly occur through the sudden venting of the pneumatic actuator or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.

- Wear hearing protection when working near the valve.

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

- Do not insert hands or finger into the yoke while the air supply is connected to the actuator.
- Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.
- Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.
- Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

While the valve is operating, air is vented from the actuator, for example, during closed-loop operation or when the valve opens or closes.

- Wear eye protection when working in close proximity to the control valve.

⚠ WARNING**Risk of personal injury due to preloaded springs.**

Actuators with preloaded springs are under tension. They can be identified by the long bolts protruding from the bottom of the actuator.

→ Before starting any work on the actuator, relieve the compression from the preloaded springs (see associated actuator documentation).

To test the valve functioning before start-up or putting back the valve into operation, perform the following tests:

5.4.1 Leak test

The plant operator is responsible for performing the leak test and selecting the test method. The leak test must comply with the requirements of the national and international standards that apply at the site of installation.

**Tip**

Our after-sales service can support you to plan and perform a leak test for your plant.

1. Close the valve.
2. Slowly apply the test medium to the inlet space upstream of the valve. A sudden surge in pressure and resulting high flow velocities can damage the valve.
3. Open the valve.
4. Apply the required test pressure.

5. Check the valve for leakage to the atmosphere.
 6. Depressurize the pipeline section and valve.
 7. Rework any parts that leak and repeat the leak test, if necessary.
- If the packing does not seal properly, contact our after-sales service.

5.4.2 Travel motion

The movement of the actuator stem must be linear and smooth.

- Apply the maximum and minimum control signals to check the end positions of the valve while observing the movement of the actuator stem.
- Check the travel reading at the travel indicator scale.

5.4.3 Fail-safe position

- Shut off the signal pressure line.
- Check whether the valve moves to the fail-safe position (see section 3.1).

5.4.4 Pressure test

The plant operator is responsible for performing the pressure test.

**Tip**

Our after-sales service can support you to plan and perform a pressure test for your plant.

Start-up

During the pressure test, make sure the following conditions are met:

- Retract the plug stem to open the valve.
- Observe the maximum permissible pressure for both the valve and plant.

6 Start-up

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

⚠ WARNING

Risk of burn injuries due to hot or cold components and pipeline.

Valve components and the pipeline may become very hot or cold. Risk of burn injuries.

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions. Additionally, a loud noise may briefly occur through the sudden venting of the pneumatic actuator or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.

- Wear hearing protection when working near the valve.

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

- Do not insert hands or finger into the yoke while the air supply is connected to the actuator.
- Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.
- Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.
- Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

While the valve is operating, air is vented from the actuator, for example, during closed-loop operation or when the valve opens or closes.

- Wear eye protection when working in close proximity to the control valve.

Before start-up or putting the valve back into service, make sure the following conditions are met:

- The valve is properly installed into the pipeline (see section 5).

- The leak and function tests have been completed successfully (see section 5.4).
- The prevailing conditions in the plant section concerned meet the valve sizing requirements (see information under “Intended use” in section 1).

6.1 Start-up/putting the device back into operation

1. Allow the valve to cool down or warm up to reach ambient temperature before start-up when the ambient temperature and process medium temperature differ greatly or the medium properties require such a measure.
2. Slowly open the shut-off valves in the pipeline. Slowly opening these valves prevents a sudden surge in pressure and high flow velocities which can damage the valve.
3. Check the valve to ensure it functions properly.

6.2 Reversing the flow direction

The medium flows through the valve in the direction indicated by the arrow. The standard version normally operates in the flow-to-open direction (FTO). The medium flows across the plug from bottom to top.

The flow direction can be reversed from FTO to FTC and vice versa.

NOTICE

Risk of valve damage due to altered forces.
When reversing the flow direction, altered forces occur which may damage the valve if incorrectly calculated.

→ To reverse the flow direction, contact our after-sales service.

7 Operation

Immediately after completing start-up or putting the valve back into operation, the valve is ready for use.

WARNING

Risk of burn injuries due to hot or cold components and pipeline.

Valve components and the pipeline may become very hot or cold. Risk of burn injuries.

→ Allow components and pipelines to cool down or warm up to the ambient temperature.

→ Wear protective clothing and safety gloves.

WARNING

Risk of hearing loss or deafness due to loud noise.

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions. Additionally, a loud noise may briefly occur through the sudden venting of the

Operation

pneumatic actuator or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.

- *Wear hearing protection when working near the valve.*
-

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

- *Do not insert hands or finger into the yoke while the air supply is connected to the actuator.*
 - *Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.*
 - *Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.*
 - *Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.*
-

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

While the valve is operating, air is vented from the actuator, for example, during closed-loop operation or when the valve opens or closes.

- *Wear eye protection when working in close proximity to the control valve.*
-

7.1 Normal operation

The handwheel of valves with actuators fitted with a handwheel must be in the neutral position during normal operation.

7.2 Manual operation

Valves with actuators fitted with a handwheel can be manually closed or opened in case of supply air failure.

8 Malfunctions

Read hazard statements, warnings and caution notes in sections 1.1, 1.2 and 1.3.

8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action
Actuator and plug stem does not move on demand.	Actuator is blocked.	Check attachment. Remove the blockage. WARNING! A blocked actuator or plug stem (e.g. due to seizing up after remaining in the same position for a long time) can suddenly start to move uncontrollably. Injury to hands or fingers is possible if they are inserted into the actuator or valve. Before trying to unblock the actuator or plug stem, disconnect and lock the pneumatic air supply as well as the control signal. Before unblocking the actuator, release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.
	Diaphragm in the actuator defective	See associated actuator documentation.
	Signal pressure too low	Check the signal pressure. Check the signal pressure line for leakage.
Actuator and plug stem does not stroke through the entire range.	Signal pressure too low	Check the signal pressure. Check the signal pressure line for leakage.
	Travel stop active	See associated actuator documentation.
	Incorrect setting of valve accessories	Check the settings of the valve accessories.
Increased flow through closed valve (seat leakage)	Dirt or other foreign particles deposited between the seat and plug.	Shut off the section of the pipeline and flush the valve.
	Valve trim is worn out.	Replace seat and plug (see section 9) or contact our after-sales service.

Malfunctions

Malfunction	Possible reasons	Recommended action
The valve leaks to the atmosphere (fugitive emissions).	Defective packing	Replace packing (see section 9) or contact our after-sales service.
	Thread joint loose or seal worn.	Check the screw joint. Re-tighten, if necessary. Check the seal at the threaded joint. Exchange, if necessary.
	Body gasket worn out.	Replace body gasket on the bonnet (see section 9) or contact our after-sales service.

i Note

Contact our after-sales service for malfunctions not listed in the table.

8.2 Emergency action

Plant operators are responsible for emergency action to be taken in the plant.

In the event of a valve malfunction:

1. Close the shut-off valves upstream and downstream of the control valve to stop the process medium from flowing through the valve.
2. Perform troubleshooting (see section 8.1).
3. Rectify those malfunctions that can be remedied based on the instructions provided here. Contact our after-sales service in all other cases.

Putting the valve back into operation after a malfunction

See section 6.

9 Servicing

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

The following documents are also required for servicing the valve:

- Mounting and operating instructions for mounted actuator, e.g. ► EB 8310-X for Type 3271 and Type 3277 Actuators or ► EB 8313-X for Type 3372 Actuator

⚠ DANGER

Risk of bursting due to incorrect opening of pressurized equipment or components.

Valves and pipelines are pressure equipment that may burst when handled incorrectly.

Flying projectile fragments or the release of process medium under pressure can cause serious injury or even death.

Before working on the control valve:

- Depressurize all plant sections affected and the valve (including the actuator). Release any stored energy.
- Drain the process medium from all the plant sections concerned as well as the valve.

⚠ WARNING

Risk of burn injuries due to hot or cold components and pipeline.

Valve components and the pipeline may become very hot or cold. Risk of burn injuries.

- Allow components and pipelines to cool down or warm up to the ambient temperature.

- Wear protective clothing and safety gloves.

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions. Additionally, a loud noise may briefly occur through the sudden venting of the pneumatic actuator or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.

- Wear hearing protection when working near the valve.

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

- Do not insert hands or finger into the yoke while the air supply is connected to the actuator.
- Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.
- Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.
- Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

While the valve is operating, air is vented from the actuator, for example, during closed-loop operation or when the valve opens or closes.

→ Wear eye protection when working in close proximity to the control valve.

⚠ WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. They can be identified by the long bolts protruding from the bottom of the actuator.

→ Before starting any work on the actuator, relieve the compression from the preloaded springs (see associated actuator documentation).

⚠ WARNING

Risk of personal injury due to residual process medium in the valve.

While working on the valve, residual medium can flow out of the valve and, depending on its properties, cause personal injury, e.g. (chemical) burns.

→ Wear protective clothing, safety gloves, respiratory protection and eye protection.

ⓘ NOTICE

Risk of valve damage due to excessively high or low tightening torques.

Observe the specified torques when tightening control valve components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.

→ Observe the specified tightening torques (see section 15.1).

ⓘ NOTICE

Risk of valve damage due to the use of unsuitable tools.

→ Only use tools approved by SAMSON (see section 15.1).

ⓘ NOTICE

Risk of valve damage due to the use of unsuitable lubricants.

→ Only use lubricants approved by SAMSON (see section 15.1).

i Note

The control valve was checked by SAMSON before it left the factory.

– Certain test results certified by SAMSON lose their validity when the valve is opened. Such testing includes seat leakage and leak tests.

– The product warranty becomes void if service or repair work not described in these instructions is performed without prior agreement by SAMSON's After-sales Service.

– Only use original spare parts by SAMSON, which comply with the original specifications.



Tip

Our after-sales service can support you in drawing up an inspection and test plan for your plant.

9.1 Periodic testing

Depending on the operating conditions, check the valve at certain intervals to prevent possible failure before it can occur. Plant operators are responsible for drawing up an inspection and test plan.

We recommend the following inspection and testing which can be performed while the process is running:

Inspection and testing	Action to be taken in the event of a negative result:
Check the markings, labels and name-plates on the valve for their readability and completeness.	Immediately renew damaged, missing or incorrect name-plates or labels. Clean any inscriptions that are covered with dirt and are illegible.
Check the pipe connections and gaskets on the valve and actuator for leakage.	Check the flange/screw joint (tightening torque). Renew the gasket at the flange or screw joint. Replace the body gasket on the bonnet (see section 9.4.1). Replace the packing (see section 9.4.2)
Check the valve's seat leakage.	Shut off the section of the pipeline and flush the valve to remove any dirt and/or deposited foreign particles between the seat and plug.
Check the valve for external damage (e.g. corrosion).	Repair any damage immediately. If necessary, put the control valve out of operation (see section 10).
Check the valve accessories to ensure they are mounted properly.	Tighten the connections of the valve accessories.

Inspection and testing	Action to be taken in the event of a negative result:
<p>Check to ensure that the actuator and plug stem move smoothly.</p>	<p>Unblock a blocked actuator and plug stem. WARNING! A blocked actuator or plug stem (e.g. due to seizing up after remaining in the same position for a long time) can suddenly start to move uncontrollably. Injury to hands or fingers is possible if they are inserted into the actuator or valve. Before trying to unblock the actuator or plug stem, disconnect and lock the pneumatic air supply as well as the control signal. Before unblocking the actuator, release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.</p>
<p>If possible, check the valve's fail-safe position by briefly interrupting the air supply.</p>	<p>Put the control valve out of operation (see section 10). Identify the cause for the malfunction and rectify it.</p>

9.2 Preparing the valve for service work

1. Lay out the necessary material and tools to have them ready for the service work.
2. Put the control valve out of operation (see section 10).



We recommend removing the valve from the pipeline before performing any service work (see section 11).

The following service work can be performed after preparation is completed:

- Replace the body gasket. See section 9.4.1.
- Replace the packing (see section 9.4.2)
- Replace the seat and plug (see section 9.4.3)

9.3 Installing the valve after service work

1. Remount the actuator if it has been removed. See associated actuator documentation and section 5.
2. Adjust lower or upper signal bench range. See associated actuator documentation.
3. If the valve has been removed, re-install the valve into the pipeline (see section 5).
4. Put the control valve back into operation (see section 6). Observe the requirements and conditions for start-up or putting the valve back into operation.

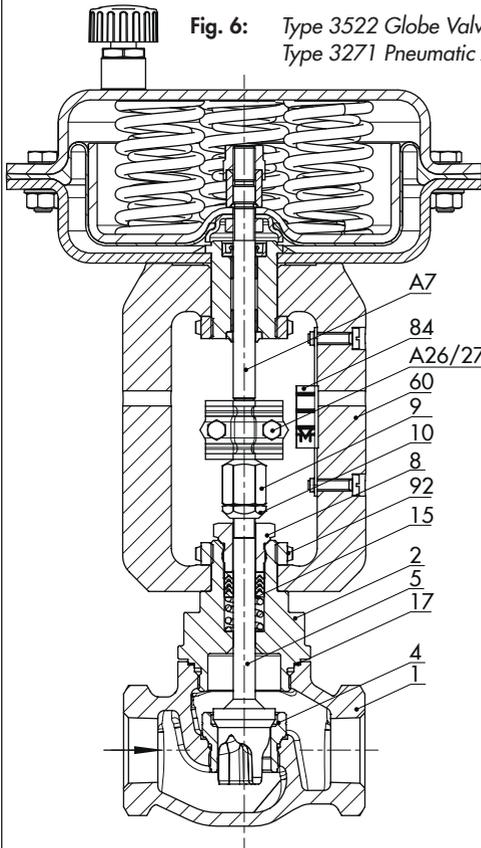


Fig. 6: Type 3522 Globe Valve with threaded ends and Type 3271 Pneumatic Actuator

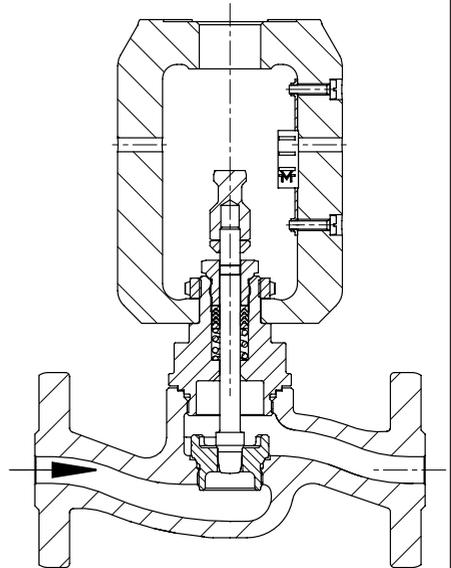


Fig. 7: Type 3522 Globe Valve with flanges

- | | | | |
|----|--------------------------------|--------|------------------------|
| 1 | Body | 15 | Packing (complete) |
| 2 | Bonnet | 17 | Body gasket |
| 4 | Seat | 60 | Yoke assembly |
| 5 | Plug | 84 | Travel indicator scale |
| 8 | Threaded bushing (packing nut) | 92 | Nut |
| 9 | Stem connector nut | A7 | Actuator stem |
| 10 | Lock nut | A26/27 | Stem connector clamp |

9.4 Service work

- ➔ Before performing any service work, preparations must be made to the control valve (see section 9.2).
- ➔ After all service work is completed, check the control valve before putting it back into operation (see section 5.4).

9.4.1 Replacing the body gasket

! NOTICE

Risk of valve damage due to abrasion.

The plug and seat facings are very sensitive. To avoid seat and plug damage:

- ➔ *Before removing the bonnet, apply a signal pressure to the actuator to slightly lift the plug off the seat.*

i Note

It is not necessary to remove the actuator from the valve to replace the body gasket.

1. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).
2. Lift bonnet (2) and plug with plug stem (5) off the body (1).
3. Remove body gasket (17) from the bonnet (2) and carefully clean the grooves.
4. Insert new body gasket (17) into the bonnet (2). Make sure that the body gasket completely rests on the body's facing.

5. Apply a suitable lubricant to the bonnet (2).
6. Place bonnet (2) together with plug and plug stem (5) onto the body (1).
7. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Tighten the bonnet (2). Observe tightening torques.

Version with V-port plug: place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces towards the valve outlet (see section 5.3.1).

9.4.2 Replacing the packing

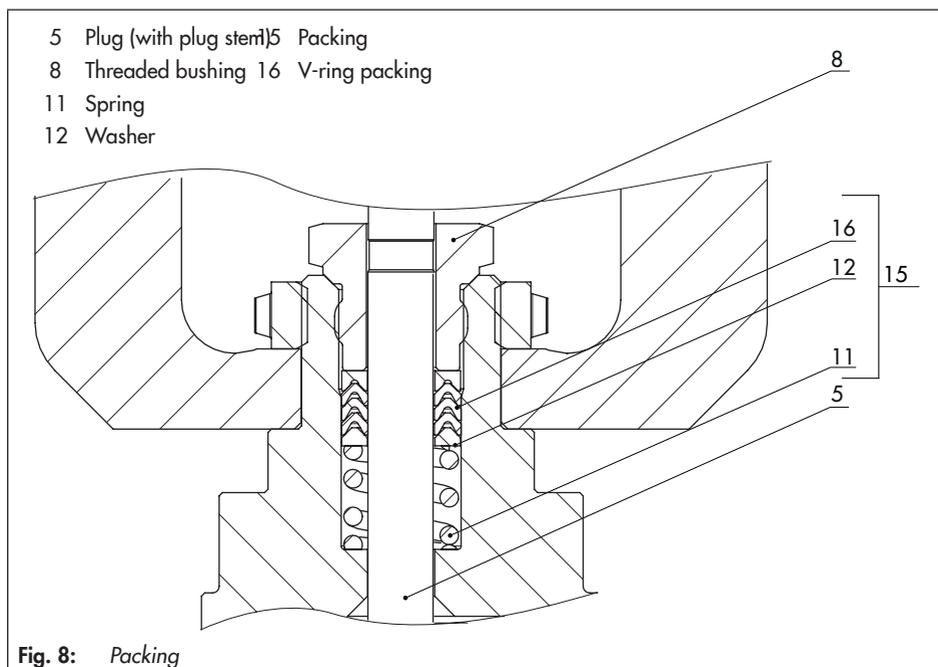
1. Remove the actuator from the valve. See associated actuator documentation.

i Note

To remove an actuator with "stem extends" fail-safe action and/or with preloaded springs, a certain signal pressure must be applied to the actuator (see associated actuator documentation). Afterwards, the signal pressure must be removed and the air supply disconnected again and locked.

2. Unscrew the nut (92) and lift the yoke (3) off the bonnet (2).
3. Unscrew the stem connector nut (9) and lock nut (10) from the plug stem (5).
4. Unscrew the threaded bushing (8).
5. Pull the entire packing out of the packing chamber using a suitable tool.

6. Renew damaged parts. Clean the packing chamber thoroughly.
 7. Apply a suitable lubricant to all the packing parts and to the plug stem (5).
-
- NOTICE**
- Risk of damaging to the packing due to lubrication.**
- Do not use lubricant on graphite packings.
-
8. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Observe the proper sequence (see Fig. 8).
 9. **Version with V-port plug:** place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces towards the valve outlet (see section 5.3.1).
 10. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
 11. Place yoke (3) on the bonnet (2) and fasten using the nut (92).
 12. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem (5).
 13. Mount actuator and adjust travel. See associated actuator documentation.



9.4.3 Replacing the seat and plug

NOTICE

Risk of damage to the facing of the seat and plug due to incorrect service or repair.

→ Always replace both the seat and plug.

Tip

When replacing the seat and plug, we also recommend replacing the body gasket and the packing. See sections 9.4.1 and 9.4.2.

1. Remove the actuator from the valve. See associated actuator documentation.

Note

To remove an actuator with "stem extends" fail-safe action and/or with preloaded springs, a certain signal pressure must be applied to the actuator (see associated actuator documentation). Afterwards, the signal pressure must be removed and the air supply disconnected again and locked.

2. Unscrew the nut (92) and lift the yoke (3) off the bonnet (2).
3. Unscrew the bonnet (2) and lift it off the body (1).
4. Replace the body gasket (17). See section 9.4.1.
5. Unscrew the stem connector nut (9) and lock nut (10) from the plug stem (5).
6. Unscrew the threaded bushing (8).

7. Pull the plug with plug stem (5) out of the bonnet (2).
8. Replace the packing (15) (see section 9.4.2)
9. Unscrew the seat (4) using a suitable tool.
10. Apply a suitable lubricant to the thread and the sealing cone of the new seat.
11. Screw in the new seat (4) using a suitable tool. Observe tightening torques.
12. Apply a suitable lubricant to all the packing parts and to the new plug stem (5).

NOTICE

Risk of damaging to the packing due to lubrication.

→ Do not use lubricant on graphite packings.

13. Slide the new plug with plug stem (5) into the bonnet (2).
14. Apply a suitable lubricant to the bonnet (2).
15. Screw bonnet (2) with plug and plug stem (5) into the body (1). Observe tightening torques.
16. **Version with V-port plug:** place the flange (2) onto the valve body, making sure that the largest V-shaped part of the V-port plug faces towards the valve outlet (see section 5.3.1).
17. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
18. Place yoke (3) on the bonnet (2) and fasten using the nut (92).

19. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem (5).
20. Mount actuator and adjust travel. See associated actuator documentation.

9.5 Ordering spare parts and operating supplies

Contact your nearest SAMSON subsidiary or SAMSON's After-sales Service for information on spare parts, lubricants and tools.

Spare parts

See section 15.2 in Annex for details on spare parts.

Lubricant

See section 15.1 in Annex for details on suitable lubricants.

Tools

See section 15.1 in Annex for details on suitable tools.

10 Decommissioning

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

⚠ DANGER

Risk of bursting due to incorrect opening of pressurized equipment or components.

Valves and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of

process medium under pressure can cause serious injury or even death.

Before working on the control valve:

- Depressurize all plant sections affected and the valve (including the actuator). Release any stored energy.
- Drain the process medium from all the plant sections concerned as well as the valve.

⚠ WARNING

Risk of burn injuries due to hot or cold components and pipeline.

Valve components and the pipeline may become very hot or cold. Risk of burn injuries.

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions. Additionally, a loud noise may briefly occur through the sudden venting of the pneumatic actuator or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.

- Wear hearing protection when working near the valve.

Removal

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

- ➔ *Do not insert hands or finger into the yoke while the air supply is connected to the actuator.*
 - ➔ *Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.*
 - ➔ *Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.*
 - ➔ *Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.*
-

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

While the valve is operating, air is vented from the actuator, for example, during closed-loop operation or when the valve opens or closes.

- ➔ *Wear eye protection when working in close proximity to the control valve.*
-

⚠ WARNING

Risk of personal injury due to residual process medium in the valve.

While working on the valve, residual medium can flow out of the valve and, depend-

ing on its properties, cause personal injury, e.g. (chemical) burns.

- ➔ *Wear protective clothing, safety gloves, respiratory protection and eye protection.*
-

To decommission the control valve for service work or to remove it from the pipeline, proceed as follows:

1. Close the shut-off valves upstream and downstream of the control valve to stop the process medium from flowing through the valve.
2. Completely drain the pipelines and valve.
3. Disconnect and lock the pneumatic air supply to depressurize the actuator.
4. Release any stored energy.
5. If necessary, allow the pipeline and valve components to cool down or warm up to the ambient temperature.

11 Removal

The work described in this section is only to be performed by personnel appropriately qualified to carry out such tasks.

⚠ WARNING

Risk of burn injuries due to hot or cold components and pipeline.

Valve components and the pipeline may become very hot or cold. Risk of burn injuries.

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

- Do not insert hands or finger into the yoke while the air supply is connected to the actuator.
- Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.
- Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.
- Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

⚠ WARNING

Risk of personal injury due to residual process medium in the valve.

While working on the valve, residual medium can flow out of the valve and, depending on its properties, cause personal injury, e.g. (chemical) burns.

- Wear protective clothing, safety gloves, respiratory protection and eye protection.

⚠ WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. They can be identified by the long bolts protruding from the bottom of the actuator.

- Before starting any work on the actuator, relieve the compression from the preloaded springs.

Before removing the valve, make sure the following conditions are met:

- The control valve is put out of operation (see section 10).

11.1 Removing the valve from the pipeline

1. Support the valve to hold it in place when separated from the pipeline (see section 4).
2. **Version with threaded ends:** Unscrew the valve from the pipeline.
Version with flanges: Unbolt the flange joint.
3. Remove the valve from the pipeline (see section 4).

11.2 Removing the actuator from the valve

See associated actuator documentation.

12 Repairs

If the valve does not function properly according to how it was originally sized or does not function at all, it is defective and must be repaired or exchanged.

! NOTICE

Risk of valve damage due to incorrect service or repair work.

- Do not perform any repair work on your own.
 - Contact SAMSON's After-sales Service for repair work.
-

12.1 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

1. Exceptions apply concerning some special device models
 - ▶ www.samsongroup.com > Service & Support > After-sales Service.
2. Send an e-mail
 - ▶ retouren@samsongroup.com to register the return shipment including the following information:
 - Type
 - Article number
 - Configuration ID
 - Original order

- Completed Declaration on Contamination, which can be downloaded from our website at
 - ▶ www.samsongroup.com > Service & Support > After-sales Service.

After checking your registration, we will send you a return merchandise authorization (RMA).

3. Attach the RMA (together with the Declaration on Decontamination) to the outside of your shipment so that the documents are clearly visible.
 4. Send the shipment to the address given on the RMA.
-

i Note

Further information on returned devices and how they are handled can be found at
▶ www.samsongroup.com > Service & Support > After-sales Service.

13 Disposal

- Observe local, national and international refuse regulations.
- Do not dispose of components, lubricants and hazardous substances together with your household waste.

14 Certificates

Certificates are available on request. If in doubt, contact our after-sales service.

15 Annex

15.1 Tools, tightening torques and lubricants

See Table 6, Table 7, Table 8, and Table 9.

⚠ WARNING

Damage to health after contact with hazardous substances.

Certain lubricants (e.g. 8150-4008) are classified as hazardous substances. These substances have a special label and a material safety data sheet (MSDS) issued by the manufacturer.

- Make sure that an MSDS is available for any hazardous substance used. If necessary, contact the manufacturer to obtain an MSDS.
- Inform operating personnel about these hazardous substances and their correct handling.

Table 6: Tools and tightening torques for seat

Version	Valve size NPS	Seat wrench order number	Tightening torques for seat	
			lb-ft	Nm
Threaded ends	½ to 1	9119-8002	125.4	170
	1¼ to 1½	9119-8005	221.3	300
	2	9110-2464	368.8	500
Flanges	½ to 1	9119-8002	125.4	170
	1½ to 2	9110-2464	368.8	500

Table 7: Tools and tightening torques for bonnet

Version	Valve size NPS	Bonnet tool order number	Tightening torques for bonnet gasket made of					
			Bronze/copper		Stainless steel		PTFE	
			lb-ft	Nm	lb-ft	Nm	lb-ft	Nm
Threaded ends	½ to 1	9119-8006	148	200	185	250	192	260
	1¼ to 1½	9119-8009	295	400	369	500	207	280
	2	9119-8009	517	700	590	800	295	400
Flanges	½ to 1	9119-8006	–	–	185	250	192	260
	1½ to 2	9119-8009	–	–	590	800	295	400

Table 8: Other tightening torques

Part	Number within drawing	Tightening torque	
		lb-ft	Nm
Threaded bushing	8	37	50

Table 9: Lubricants sorted by parts

Part	Bonnet (female thread)	Seat	Plug stem	Thread on plug stem (at the top)	Threaded bushing	Packing
Number within drawing	2	4	5	5	8	15
Lubricant (113)	–	–	8150-0111	–	–	8150-0111
Lubricant (114)	8150-4008	8150-4008	–	8150-4008	8150-4008	–

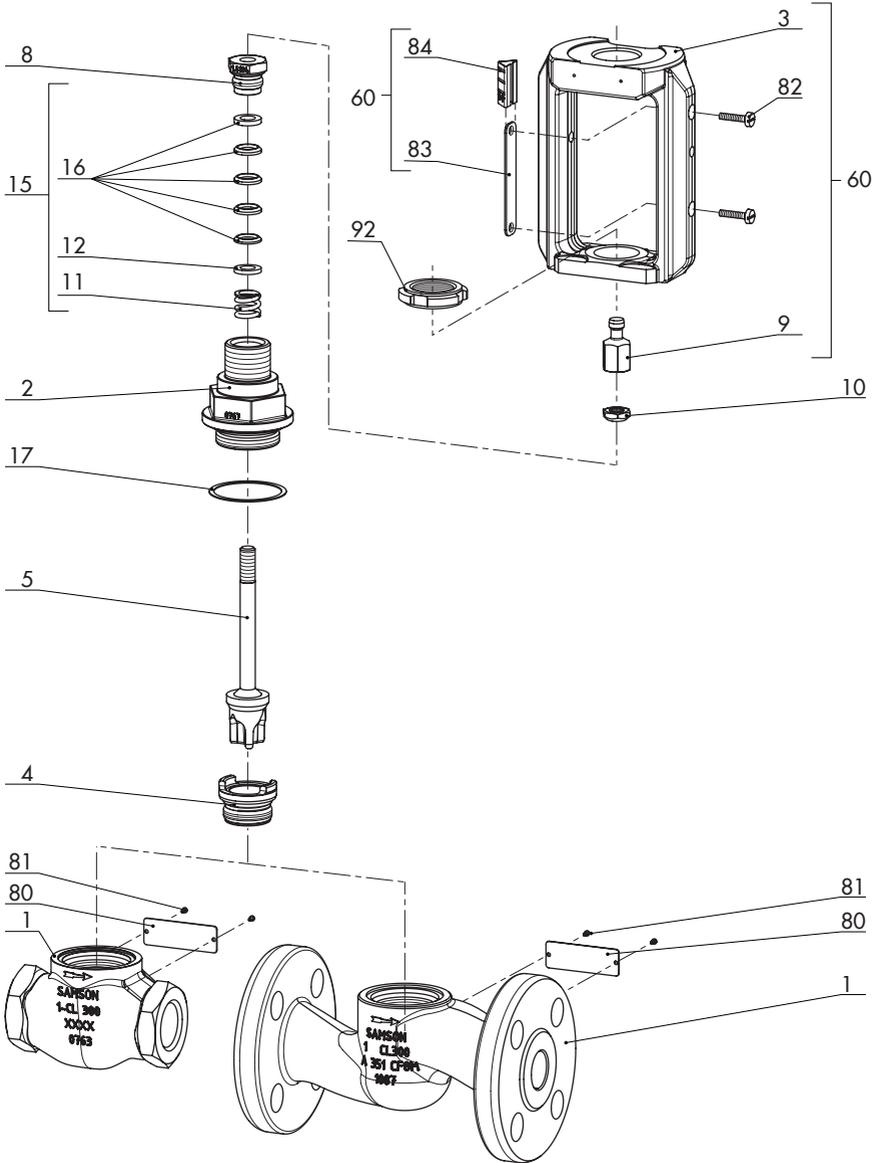
NOTICE

Risk of damaging to the packing due to lubrication.

→ Do not use lubricant on graphite packings.

15.2 Spare parts

- 1 Body
- 2 Bonnet
- 3 Yoke
- 4 Seat
- 5 Plug
- 8 Threaded bushing (packing nut)
- 9 Stem connector nut
- 10 Lock nut
- 11 Spring
- 12 Washer
- 15 Packing (complete)
- 16 V-ring packing
- 17 Body gasket
- 60 Yoke assembly with travel indicator scale
(82, 83, 84)
- 80 Nameplate
- 81 Grooved pin
- 82 Screw
- 83 Hanger
- 84 Travel indicator scale
- 92 Nut



15.3 After-sales service

Contact our after-sales service for support concerning service or repair work or when malfunctions or defects arise.

E-mail address

You can reach our after-sales service at service-us@samsongroup.com.

Addresses of SAMSON AG and its subsidiaries

The addresses of SAMSON AG, its subsidiaries, representatives and service facilities worldwide can be found on our website (www.samsongroup.com) or in all SAMSON product catalogs.

Required specifications

Please submit the following details:

- Order number and position number in the order
- Type, model number, valve size and valve version
- Pressure and temperature of the process medium
- Flow rate
- Direction of flow
- Bench range of the actuator (e.g. 2.9 to 14.5 psi)
- Is a strainer installed?
- Installation drawing

EB 8822 EN



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