Type 3525 Globe Valve
In combination with an actuator such as SAMSON Type 3571 Pneumatic Actuator
ANSI version

Mounting and Operating Instructions

EB 8823 EN
Edition March 2017
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.

➢ For the safe and proper use of these instructions, read them carefully and keep them for future reference.

➢ If you have any questions about these instructions, contact SAMSON’s After-sales Service Department (samson@samsongroupna.com).

Referenced documentation

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

– Mounting and operating instructions for mounted actuator, e.g. EB 8820 for Type 3571 Pneumatic Actuator

– Mounting and operating instructions for mounted valve accessories (e.g. solenoid valve)

The mounting and operating instructions for all supplied devices are included in the delivery. The latest versions of the documents are available on our website at www.samsoncontrols.com.

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 or malfunction

ℹ️ Note
Additional information

☀️ Tip
Recommended action
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1 Safety instructions and safety measures

Intended use
The SAMSON Type 3525 Globe Valve in combination with an actuator (e.g. Type 3571 Pneumatic Actuator) is designed to regulate the flow rate, pressure or temperature of liquids, gases or vapors. The valve is designed for use in high-pressure on/off applications in upstream and midstream oil and gas production.

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 applications 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, SAMSON must be contacted.

SAMSON does not assume any liability for damage resulting from the failure to use the valve 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 in the technical data
- Use outside the limits defined by the valve accessories mounted on the control 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 in these instructions

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 are to 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.
Personal protective equipment

We recommend wearing the following protective equipment depending on the process medium:

- Protective clothing, gloves and eyewear in applications with hot, cold and/or corrosive media when working near or on the valve
- Hearing protection when working near the valve

Check with the plant operator for details on further protective equipment.

Revisions and other modifications

Revisions, conversions or other modifications to the product are not authorized by SAMSON. They are performed at the user’s own risk and may lead to safety hazards. Furthermore, the control valve 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. They must observe all hazard statements, warning and caution notes in these mounting and operating instructions, especially for installation, start-up and maintenance.

Responsibilities of the operator

The operator is responsible for proper operation 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 persons are not exposed to any danger.

Responsibilities of operating personnel

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

Referenced standards and regulations
The SAMSON Type 3525 Globe Valve complies with the requirements of ASME B16.34.

1.1 Notes on possible severe personal injury

**DANGER**
Risk of bursting in pressure equipment.
Control valves and pipelines are pressure equipment. Improper opening can lead to valve components bursting.

- Before starting any work on the control valve, depressurize all plant sections concerned and the valve.
- Drain the process medium from all the plant sections concerned as well as the valve.
- Wear personal protective equipment.

1.2 Notes on possible personal injury

**WARNING**
Crush hazard arising from moving parts.
The control valve contains moving parts (actuator and plug stems), which can injure hands or fingers if inserted into the valve.

- Do not insert hands or fingers into the yoke while the valve is in operation.
- While working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.

Risk of personal injury when actuator vents.
While the valve is operating, the actuator may vent during closed-loop control or when the valve opens or closes.

- Install the control valve in such a way that the actuator does not vent at eye level.
- Use suitable vent plugs.
- Wear eye protection when working in close proximity to the control valve.
Safety instructions and safety measures

**WARNING**

**Risk of personal injury due to sudden escape of process medium.**
The valve has a safety bleed to detect damaged or worn O-rings. The process medium may escape suddenly and at high pressure.

- Wear protective clothing, gloves and eyewear when working near or on the valve.
- Do not stay in the range of the safety bleed longer than necessary.

**Risk of personal injury due to residual process medium in the valve.**
While working on the valve, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.

- If possible, drain the process medium from all the plant sections concerned and the valve.
- Wear protective clothing, gloves and eyewear.

**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 heat up.
- Wear protective clothing and gloves.

**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).
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.  
➡️ Flush the pipelines before start-up.  
➡️ Observe the maximum permissible pressure for both the valve and plant.

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.

Risk of leakage and valve damage due to excessively high or low tightening torques. 
Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage.  
➡️ Observe the specified tightening torques (see Table 5 and Table 6).

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 the valve surface.  
➡️ Only use lubricants approved by SAMSON (see parts list).
2 Markings on the control valve

2.1 Valve nameplate

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Type designation</td>
</tr>
<tr>
<td>3</td>
<td>Type version</td>
</tr>
<tr>
<td></td>
<td>C: compact · S: standard</td>
</tr>
<tr>
<td>4</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>Material</td>
</tr>
<tr>
<td>6</td>
<td>Year of manufacture</td>
</tr>
<tr>
<td>7</td>
<td>Order number with modification index</td>
</tr>
<tr>
<td>8</td>
<td>Item in order</td>
</tr>
<tr>
<td>9</td>
<td>Conformity</td>
</tr>
<tr>
<td>10</td>
<td>Nominal size (NPS)</td>
</tr>
<tr>
<td>11</td>
<td>Pressure rating (Cl.)</td>
</tr>
<tr>
<td>12</td>
<td>For Intermediate Rating Standard Class: pressure and lower temperature limit</td>
</tr>
<tr>
<td></td>
<td>For other pressure ratings: lower temperature limit</td>
</tr>
<tr>
<td>13</td>
<td>Flow coefficient</td>
</tr>
<tr>
<td>14</td>
<td>Characteristic:</td>
</tr>
<tr>
<td></td>
<td>%: equal percentage · Lin: linear</td>
</tr>
<tr>
<td>15</td>
<td>Seat/plug sealing</td>
</tr>
<tr>
<td></td>
<td>ME: metal</td>
</tr>
<tr>
<td></td>
<td>ST: metal base material stellited® or base material pure Stellite®</td>
</tr>
<tr>
<td></td>
<td>TC: tungsten carbide</td>
</tr>
<tr>
<td>16</td>
<td>Option code for trim identification (stem, plug, seat)</td>
</tr>
<tr>
<td>17</td>
<td>For Intermediate Rating Standard Class: pressure and upper temperature limit</td>
</tr>
<tr>
<td></td>
<td>For other pressure ratings: upper temperature limit</td>
</tr>
<tr>
<td>18</td>
<td>Not used</td>
</tr>
</tbody>
</table>

Fig. 1: Type 3525 nameplate
The valve nameplate is affixed to the rear of the body.

2.2 Actuator nameplate

See associated actuator documentation.

2.3 Material number

The seat and plug of the valves have an article number written on them. Specifying this article number, you can contact us to find out which material is used. Additionally, a seat code is used to identify the trim material. This seat code is specified on the nameplate (seat/plug seal, 13). For more details on the nameplate, see section 2.1.

### Standard version

<table>
<thead>
<tr>
<th>Seat code</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>A351 CF3M</td>
</tr>
<tr>
<td>11</td>
<td>Stellite® 6</td>
</tr>
<tr>
<td>12</td>
<td>A747 CB7Cu1 H1150 DBL</td>
</tr>
<tr>
<td>14</td>
<td>WC/TC (HW-Co)/A747 CB7Cu1 H1150DBL</td>
</tr>
</tbody>
</table>

### Compact version

<table>
<thead>
<tr>
<th>Seat code</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Stellite® 6</td>
</tr>
<tr>
<td>13</td>
<td>WC/TC (HW-Co)/A479 XM-19-H</td>
</tr>
</tbody>
</table>
3 Design and principle of operation

The single-seated Type 3525 Globe Valve is combined with a SAMSON Type 3571 Pneumatic Actuator (see Fig. 4). The seat (4) and plug with plug stem (5) are assembled in the body (1). The plug stem is connected to the actuator stem (A7) by the stem connector clamps (A26) and is sealed by a spring-loaded V-ring packing (16). The springs in the pneumatic actuator (A) 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 standard valve body version normally operates in the flow-to-open direction (FTO). The medium flows across the plug from bottom to top. The compact valve body versions normally operate in the flow-to-close direction (FTC). The medium flows across the plug from top to bottom.

The valves have a safety bleed to detect damaged or worn O-rings.

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.

There are three versions available:
- Standard globe valve with flanges (see Fig. 3) or threaded ends
- Compact globe valve with threaded ends
- Compact T-pattern valve with threaded ends (see Fig. 5)

Standard globe valves >Class 900 with FKM O-ring are equipped with an additional support ring (244) which is inserted into the groove of the bottom O-ring (17).

Compact T-pattern valves are equipped with a screw plug (112). The screw plug can be positioned either at the bottom outlet or – depending on the flow direction – at the side outlet. It must not be positioned at the inlet.

Actuators

In these instructions, the combination with a Type 3571 Pneumatic Actuator is described. The pneumatic actuator for the standard version can be replaced by another Type 3571 Pneumatic Actuator in a different size, but with the same travel.

⇒ Observe the maximum permissible actuator force.

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.
**Design and principle of operation**

**Fig. 3:** Standard version
Type 3525 Globe Valve with Type 3571 Pneumatic Actuator

**Fig. 4:** Bonnet for standard version >Class 900 with FKM O-ring

---

1. Body
2. Bonnet
3. Seat
4. Plug (29, 36)
5. Guide bushing
6. Spring
7. Washer
8. Packing (11, 12, 16)
9. V-ring packing
10. O-ring
11. Plug head
12. Plug stem
13. Yoke assembly with travel indicator (82, 83, 84)
14. Screw
15. Hanger
16. Travel indicator scale
17. Seat ring gasket
18. Tab washer
19. Support washer
20. Actuator ring
21. Actuator stem
22. Stem connector clamp

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Design and principle of operation

3.1 Fail-safe positions

The fail-safe position depends on the actuator used.

Depending on how the compression springs are arranged in the pneumatic actuator, the valve has two different fail-safe positions:

**Actuator stem extends**

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**

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.
3.2 Technical data

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

![Note]

More information is available in Data Sheet T 8823.

Temperature range

The valve version with an HNBR O-ring is designed for a temperature range from –50 to +300 °F (–46 to +149 °C). By using an FKM O-ring the temperature range can be extended to –10 to +400 °F (–23 to +204 °C). In case of oils that cause severe swelling an FKM O-ring is to be used.

Leakage class

The leakage class according to ANSI/FCI 70-2 is IV for all sealing materials of the seat/plug sealing (see pos. 12 on nameplate: ME, ST, TC).

Noise emission

SAMSON is unable to make general statements about noise emission as it depends on the valve version, plant facilities and process medium. On request, SAMSON can perform calculations according to IEC 60534, Part 8-3 and Part 8-4 or VDMA 24422 (edition 89).

WARNING

Risk of hearing loss or deafness due to loud noise.

Wear hearing protection when working near the valve.

Dimensions and weights

Table 1 and Table 2 provide a summary of the dimensions and weights of the standard and compact version of Type 3525 Valve. The lengths and heights are shown in the dimensional drawings on p. 16 (standard version) and p. 17 (compact version).
## Design and principle of operation

### Table 1: Dimensions of Type 3525 Valve - standard version

<table>
<thead>
<tr>
<th>Body type</th>
<th>NPS</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Version</td>
<td>Standard globe valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Connection</td>
<td>RF</td>
<td>RJF</td>
<td>NPT</td>
</tr>
<tr>
<td>L</td>
<td>Class 600</td>
<td>in</td>
<td>8.27</td>
<td>8.27</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>210</td>
<td>210</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Class 900</td>
<td>in</td>
<td>10.75</td>
<td>10.75</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>273</td>
<td>273</td>
<td>159</td>
</tr>
<tr>
<td></td>
<td>Class 1500</td>
<td>in</td>
<td>10.75</td>
<td>10.75</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>273</td>
<td>273</td>
<td>155</td>
</tr>
<tr>
<td></td>
<td>Class 1700</td>
<td>in</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>–</td>
<td>–</td>
<td>155</td>
</tr>
<tr>
<td>H1</td>
<td>in</td>
<td>8.70</td>
<td>–</td>
<td>9.21</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>221</td>
<td>234</td>
<td>234</td>
</tr>
<tr>
<td>H2</td>
<td>in</td>
<td>1.85</td>
<td>–</td>
<td>2.95</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>47</td>
<td>–</td>
<td>75</td>
</tr>
</tbody>
</table>

### Dimensional drawings

- **Standard globe valve, NPS 1 to 3, flanges**
- **Standard globe valve, NPS 1 to 2, threaded ends**

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**EB 8823 EN**
Table 2: Dimensions of Type 3525 Valve - compact versions

<table>
<thead>
<tr>
<th>Body type</th>
<th>NPS</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Compact globe valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NPT</td>
</tr>
<tr>
<td>Connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 600</td>
<td>in</td>
<td>4.69</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>119</td>
</tr>
<tr>
<td>Class 900</td>
<td>in</td>
<td>6.18</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>157</td>
</tr>
<tr>
<td>Class 1500</td>
<td>in</td>
<td>1.69</td>
</tr>
<tr>
<td>Class 1700</td>
<td>mm</td>
<td>43</td>
</tr>
</tbody>
</table>

1) Length without threaded stopper. This length can be extended by approx. 1.14 in/29 mm depending on the position of the threaded stopper.

Dimensional drawings

Compact globe valve, NPS 1
Compact T-pattern valve, NPS 1
**Design and principle of operation**

### Table 3: Weights for Type 3525 Valve

<table>
<thead>
<tr>
<th>Body type</th>
<th>NPS</th>
<th>Version</th>
<th>Compact globe valve</th>
<th>Compact T-pattern valve</th>
<th>Standard globe valve</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class 600</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF/RTJ</td>
<td>lbs</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>34.4, 60.6, 83.8</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>15.6, 27.5, 38</td>
</tr>
<tr>
<td>NPT</td>
<td>lbs</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>44.1</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>20</td>
</tr>
<tr>
<td><strong>Class 900</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF/RTJ</td>
<td>lbs</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>45.2, 90.4/91.5, 108.0</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>20.5, 41/41.5, 49</td>
</tr>
<tr>
<td>NPT</td>
<td>lbs</td>
<td>9.5</td>
<td>11.0</td>
<td>27.6</td>
<td>44.1</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>4.3</td>
<td>5</td>
<td>12.5</td>
<td>20</td>
</tr>
<tr>
<td><strong>Class 1500</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RF/RTJ</td>
<td>lbs</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>45.2, 90.4/91.5, 135.6</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>20.5, 41/41.5, 61.5</td>
</tr>
<tr>
<td>NPT</td>
<td>lbs</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>27.6, 44.1</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>12.5, 20</td>
</tr>
<tr>
<td><strong>Class 1700</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPT</td>
<td>lbs</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>27.6, 44.1</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>12.5, 20</td>
</tr>
</tbody>
</table>

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

- T 8820 for Type 3571 Pneumatic Actuator
4 Preparation

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Compare the shipment received against the delivery note.
2. Check the shipment for transportation damage. Report any damage to SAMSON and the forwarding agent (refer to delivery note).

4.1 Unpacking

**Note**

Do not remove the packaging until immediately before installing the valve into the pipeline.

Proceed as follows to lift and install the valve:

1. Remove the packaging from the valve.
2. Dispose of the packaging in accordance with the valid regulations.

**Notice**

Risk of valve damage due to foreign particles entering the valve.
The protective caps fitted on the valve’s inlet and outlet prevent foreign particles from entering the valve and damaging it. Do not remove the protective caps until immediately before installing the valve into the pipeline.

4.2 Transporting and lifting

**DANGER**

Hazard due to suspended loads falling. Stay clear of suspended or moving loads.

**WARNING**

Risk of lifting equipment tipping 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, if applicable).
- Refer to section 3.2 or Data Sheet T 8823 for weights.

**WARNING**

Risk of personal injury due to control valve tipping.

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

4.2.1 Transporting

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). Remove any damage immediately.
- 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).

Contact SAMSON’s After-sales Service department for the transportation temperatures of other valve versions.

4.2.2 Lifting

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

Lifting instructions

- Secure slings against slipping.
- Make sure the slings can be removed from the valve once it has been installed into the pipeline.
Preparation

- Prevent the control valve from tilting or tipping.
- 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 lifting eyelet and rigging equipment (hook, shackle etc.) does not bear any load when lifting control valves with 116 in² (750 cm²) actuators. The sling only protects the control valve from tilting while being lifted. Before lifting the control valve, tighten the sling.

**Version with flanges or threaded ends**

1. Attach one sling to each flange or threaded end of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 6).
2. **Actuator with 116 in² (750 cm²) actuator area**: Attach another sling to the lifting eyelet on the actuator and to the rigging equipment.
3. **Version with threaded ends**: Secure the slings attached to the body against slipping using a connector.

![Fig. 6: Lifting points on the control valve](image-url)
4. Carefully lift the control valve. Check whether the lifting equipment and accessories can bear the weight.

5. Move the control valve at an even pace to the site of installation.

6. Install the valve into the pipeline (see section 5.2).

7. **Version with flanges:** Check whether the flanges are bolted tight and the valve in the pipeline holds.

   **Version with threaded ends:** Check whether the threaded connection is tight and the valve in the pipeline holds. Check whether an appropriate sealing is installed.

8. Remove slings and, if applicable, connector.

---

**Tip**

We recommend using a hook with safety latch (see Fig. 6). The safety latch prevents the slings from slipping during lifting and transporting.

---

### 4.3 Storage

---

**NOTICE**

Risk of valve damage due to improper storage.

- Observe 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 times.

---

**Storage instructions**

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

---

**Note**

Contact SAMSON’s After-sales Service department for the storage temperatures of other valve versions.

- Do not place any objects on the control valve.
Preparation

Special storage instructions for soft parts
Soft parts, e.g. actuator diaphragm

− To keep soft parts in shape and to prevent cracking, do not bend them or hang them up.
− We recommend a storage temperature of 59 °F (15 °C) for soft parts.
− Store soft parts away from lubricants, chemicals, solutions and fuels.

For steam applications, make sure that the pipelines are dry. Moisture will damage the inside of the valve.

Check any mounted pressure gauges to make sure they function.

When the valve and actuator are already assembled, check the tightening torques at the bonnet. Components may loosen during transport.

Tip

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

4.4 Preparation for installation

Proceed as follows:

⇒ Flush the pipelines.

Note

The plant operator is responsible for cleaning the pipelines. Observe the maximum permissible pressure for both the valve and plant.

⇒ Check the valve to make sure it is clean.
⇒ Check the valve for damage.
⇒ Check to make sure that the type designation, valve size, material, pressure rating and temperature range of the valve match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.).
Mounting and start-up

5 Mounting and start-up

SAMSON valves are delivered ready for use. In special cases, the valve and actuator are delivered separately and must be assembled on site. The procedure to mount and start up the valve are described in the following.

Risk of valve damage due to excessively high or low tightening torques. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage. Observe the specified tightening torques (see Table 5 and Table 6).

5.1 Mounting the actuator onto the valve

Proceed as described in the actuator documentation if the valve and actuator have not been assembled by SAMSON:

- Remove the mounted actuator before mounting the other actuator (see associated actuator documentation).
- Preloading the actuator springs increases the thrust of a pneumatic actuator and reduces the travel range of the actuator (see associated actuator documentation).

5.2 Installing the valve into the pipeline

5.2.1 Checking the installation conditions

Pipeline routing
The inlet and outlet lengths vary depending on the process medium. To ensure the control valve functions properly, follow the installation instructions given below:

- Observe the inlet and outlet lengths (see Table 4). 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. If necessary, attach supports to the valve.
- 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 for alternative mounting positions.

Support or suspension
Depending on the valve version and mounting position, the control valve and pipeline must be supported or suspended. The plant engineering company is responsible in this case.
### Table 4: Inlet and outlet lengths

<table>
<thead>
<tr>
<th>State of process medium</th>
<th>Valve conditions</th>
<th>Inlet length a</th>
<th>Outlet length b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>Ma ≤ 0.3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>0.3 ≤ Ma ≤ 0.7</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Vapor</td>
<td>Ma ≤ 0.3 ¹</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>0.3 ≤ Ma ≤ 0.7 ¹</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Saturated steam (percentage of condensate &gt; 5 %)</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Liquid</td>
<td>Free of cavitation/w &lt; 33 ft/s (w &lt; 10 m/s)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Cavitation producing noise/w ≤ 10 ft/s (w ≤ 3 m/s)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Cavitation producing noise/10 &lt; w &lt; 16 ft/s (3 &lt; w &lt; 5 m/s)</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Critical cavitation/w ≤ 10 ft/s (w ≤ 3 m/s)</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Critical cavitation/10 &lt; w &lt; 16 ft/s (3 &lt; w &lt; 5 m/s)</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Flashing</td>
<td>−</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Multi-phase</td>
<td>−</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>
Mounting and start-up

**NOTICE**
Premature wear and leakage due to insufficient support or suspension. Attach a suitable support or suspension on the valve, if necessary.

**Vent plugs**
Vent plugs are screwed into the exhaust air ports of pneumatic, electropneumatic and electric devices. 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 workplace of operating personnel.
- On mounting valve accessories, make sure that they can be operated from the workplace of the operating personnel.

**Note**
The workplace of operating personnel is the location from which the valve, actuator and any mounted valve accessories can be accessed to operate them.

**5.2.2 Additional fittings**

**Strainer**
For certain applications an additional strainer can be installed in order to reduce excessive wear.

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

**Note**
Contact SAMSON's After-sales Service department in case that an insulation is required.

**5.2.3 Installing the control valve**

**Version with flanges**
1. Depressurize the plant and interrupt the medium flow while the valve is being installed.
2. Remove the protective caps from the valve ports before installing the valve.
3. Lift the valve using suitable lifting equipment to the site of installation (see section 4.2.2). Observe the flow direction through the valve. The arrow on the valve indicates the direction of flow.
4. Make sure that the correct flange gaskets are used.
5. Bolt the pipe to the valve free of stress.
6. Depending on the field of application, allow the valve to cool down or heat up to reach ambient temperature before start up.
7. Slowly resume medium flow in the pipeline after the valve has been installed.
Mounting and start-up

8. Check the valve to ensure it functions properly.

Version with threaded ends
1. Proceed as described for Version with flanges (steps 1 to 3).
2. Screw the valve onto the pipeline. Install an appropriate sealing. Make sure that the valve is free of stress.
   T-pattern: Screw the screw plug into the desired outlet. The screw plug, too, needs to be installed with an appropriate sealing.
3. Proceed as described for Version with flanges (steps 6 to 8).

5.3 Quick check
SAMSON valves are delivered ready for use. To test the valve’s ability to function, the following quick checks can be performed:

Tight shut-off
1. Close the valve.
2. Slowly resume medium flow in the pipeline.

NOTICE
Risk of valve damage due to a sudden pressure increase and resulting high flow velocities.

Slowly resume medium flow during start-up.

3. Check the valve for leakage to the atmosphere (visual inspection).

Travel motion
The movement of the actuator stem must be linear and smooth.
→ Open and close the valve, observing the movement of the actuator stem.
→ Apply the maximum and minimum control signals to check the end positions of the valve.
→ Check the travel reading at the travel indicator scale.

Fail-safe position
→ Shut off the signal pressure line.
→ Check whether the valve moves to the fail-safe position.

Pressure testing
When pressure testing make sure that the following conditions are met:
– Retract the plug to open the valve.
– Observe the maximum permissible pressure for both the valve and plant.

Note
The plant operator is responsible for pressure testing. SAMSON’s After-sales Service department can support you in planning and implementing the pressure test for your plant.
6  Operation

Immediately after completing mounting and start-up (see section 5), the valve is ready for use.

**WARNING**
Crush hazard arising from moving parts (actuator and plug stem).
Do not insert hands or finger into the yoke while the valve is in operation.

**WARNING**
Risk of personal injury when the actuator vents.
Wear eye protection when working in close proximity to the control valve.

**WARNING**
Risk of personal injury due to sudden escape of process medium.
The valve has a safety bleed to detect damaged or worn O-rings. The process medium may escape suddenly and at high pressure.
– Wear protective clothing, gloves and eyewear when working near or on the valve.
– Do not stay in the range of the safety bleed longer than necessary.

**NOTICE**
Operating disturbed by a blocked actuator and plug stem.
Do not impede the movement of the actuator or plug stem by inserting objects into their path.

6.1  Reversing the flow direction

The medium flows through the valve in the direction indicated by the arrow. The standard valve body version normally operates in the flow-to-open direction (FTO). The medium flows across the plug from bottom to top. The compact valve body versions normally operate in the flow-to-close direction (FTC). The medium flows across the plug from top to bottom.
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 SAMSON's After-sales Service department.
7 Maintenance

The control valve is subject to normal wear, especially at the seat, plug and packing. Depending on the operating conditions, check the valve at regular intervals to prevent possible failure before it can occur.

Tip
SAMSON’s After-sales Service department can support you to draw up a maintenance plan for your plant.

We recommend removing the valve from the pipeline for service or repair work (see section 9.2).

DANGER
Risk of bursting in pressure equipment. Control valves and pipelines are pressure equipment. Improper opening can lead to valve components bursting.
– Before starting any work on the control valve, depressurize all plant sections concerned and the valve.
– Drain the process medium from all the plant sections concerned as well as the valve.
– Wear personal protective equipment.

WARNING
Risk of personal injury due to sudden escape of process medium. The valve has a safety bleed to detect damaged or worn O-rings. The process medium may escape suddenly and at high pressure.
– Wear protective clothing, gloves and eyewear when working near or on the valve.
– Do not stay in the range of the safety bleed longer than necessary.

WARNING
Risk of personal injury due to residual process medium in the valve. While working on the valve, residual process medium can escape and, depending on its properties, may lead to personal injury, e.g. (chemical) burns.
Wear protective clothing, gloves and eyewear.

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 heat up.
– Wear protective clothing and gloves.
Risk of valve damage due to incorrect maintenance or repair. Service and repair work must only be performed by trained staff.

Risk of valve damage due to excessively high or low tightening torques. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage. Observe the specified tightening torques (see Table 5 and Table 6).

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 the valve surface. Only use lubricants approved by SAMSON (see parts list).

The control valve was checked by SAMSON before it left the factory.
- Certain test results (seat leakage and leak test) certified by SAMSON lose their validity when the valve body or actuator housing is opened.
- The product warranty becomes void if maintenance or repair work not described in these instructions is performed without prior agreement by SAMSON’s After-sales Service department.
- Only use original spare parts by SAMSON, which comply with the original specifications.

7.1 Standard version

7.1.1 Replacing the O-rings

Risk of valve damage due to abrasion. The plug and seat facings are very sensitive. Before unscrewing the bonnet from the body, apply a signal pressure to the actuator to slightly lift the plug off the seat. This prevents the plug and seat from being damaged.

Note
It is not necessary to remove the actuator from the valve to replace the O-rings.

1. Bend down the flap of the tab washer (224).
2. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).
3. Lift bonnet (2) and plug with plug stem (5) off the body (1). Remove tab washer (224).
4. Remove O-rings (17) from the bonnet (2) and carefully clean the grooves.

>Class 900 with FKM O-ring: Remove support ring (244).
Fig. 7: Standard version Type 3525
Globe Valve with Type 3571
Pneumatic Actuator

1  Body
2  Bonnet
4  Seat
5  Plug (29, 36)
7  Guide bushing
11 Spring
12 Washer
15 Packing (11, 12, 16)
16 V-ring packing
17 O-ring
29 Plug head
36 Plug stem
60 Yoke assembly with travel indicator (82, 83, 84)
82 Screw
83 Hanger
84 Travel indicator scale
127 Seat ring gasket
224 Tab washer
A28 Stem connector clamp
5. Apply a suitable lubricant to the new O-rings (17). Insert O-rings into the bonnet (2). Make sure that the O-rings rest on the non-pressurized groove side (see Fig. 8).

>Class 900 with FKM O-ring: Place a new support ring (244) into the groove above the bottom O-ring (17). Firmly press the O-ring against the support ring. Make sure that the top O-ring rests on the non-pressurized groove side (see Fig. 8).

6. Apply a suitable lubricant to the bonnet (2).

7. Place a new tab washer (224) onto the bonnet (2). Make sure that the flap points towards the valve front (see Fig. 9) and that the anchorages are inserted in the corresponding boreholes.

8. Place bonnet (2) with plug and plug stem (5) onto the body (1). Tighten by hand.

9. When the protruding part of the bonnet is at an angle of 70 to 100° to its end position (see Fig. 9), screw bonnet (2) into the body (1) observing the tightening torques.

10. Bend up the flap of the tab washer (224) so that it rests against the bonnet (see Fig. 9).

---

**Fig. 8:** O-rings for standard version (left) · O-rings and support ring for standard version >Class 900 with FKM O-ring (right)
7.1.2 Replacing the packing

**NOTICE**
Risk of valve damage due to abrasion. The plug and seat facings are very sensitive. Before unscrewing the bonnet from the body, apply a signal pressure to the actuator to slightly lift the plug off the seat. This prevents the plug and seat from being damaged.

1. Bend down the flap of the tab washer (224).
2. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).
3. Lift bonnet (2) and plug with plug stem (5) off the body (1). Remove tab washer (224).
4. Unscrew guide bushing (7) placing a suitable tool on the flats.

6. Pull the plug with plug stem (5) out of the bonnet (2).
7. Pull all the packing parts out of the packing chamber using a suitable tool.
8. Replace damaged parts. Clean the packing chamber thoroughly.
9. Apply a suitable lubricant to the guide bushing (7), to all the packing parts and to the plug stem (36).
10. Slide guide bushing (7) and packing parts over the plug stem. Make sure you observe the proper order (see Fig. 10).
11. Carefully insert plug with plug stem, packing parts and guide bushing into the bonnet.

**Note**
It is not necessary to completely remove the actuator from the valve to replace the packing.
Maintenance

NOTICE
Risk of leakage due to damaged packing chamber, packing parts and plug stem. When inserting the assembly into the bonnet make sure that the packing chamber, packing parts and plug stem do not get damaged. Otherwise leakage may occur.

12. Thread guide bushing (7) into the bonnet (2) and tighten it placing a suitable tool on the flats. Observe tightening torques.

13. Check O-rings for damage. Replace O-rings, if necessary (see section 7.1.1).

14. Apply a suitable lubricant to the bonnet (2).

15. Place a new tab washer (224) onto the bonnet (2).

16. Screw bonnet (2) with plug and plug stem (5) into the body (1). Observe tightening torques.

17. Bend up the flap of the tab washer (224) so that it rests against the bonnet.

Note
For detailed information on mounting the tab washer and bonnet see section 7.1.1, steps 7 to 10.

18. Mount stem connector clamp (A28) and adjust travel. See associated actuator documentation.

![Diagram of Packing Components]

Fig. 10: Packing

1 Guide bushing
11 Spring
12 Washer
15 Packing
16 V-ring packing
7.1.3 Replacing the seat and plug

**NOTICE**
Risk of damage to the facing of the seat and plug due to abrasion and incorrect service or repair.
The plug and seat facings are very sensitive.
- Before unscrewing the bonnet from the body, apply a signal pressure to the actuator to slightly lift the plug off the seat. This prevents the plug and seat from being damaged.
- Always replace both the seat and plug.

**Note**
It is not necessary to remove the actuator from the valve to replace the seat and the plug.

**Tip**
When replacing the seat and plug, we also recommend replacing the packing. See section 7.1.2.

1. Bend down the flap of the tab washer (224).
2. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).
3. Lift bonnet (2) and plug with plug stem (5) off the body (1). Remove tab washer (224).
4. Replace O-rings (17) as described in section 7.1.1.
5. Unscrew the seat (4) using a suitable tool.
6. Remove seat ring gasket (127) from the body (1) and carefully clean the sealing face. Insert a new seat ring gasket into the body.
7. Apply a suitable lubricant to the thread and the sealing cone of the new seat.
8. Screw in the new seat (4) using a suitable tool. Observe tightening torques.
9. Carefully warm up the plug (29) so that it can be removed from the plug stem (36) in the next step.
10. Apply a signal pressure to the actuator so that the flats at the plug stem (36) emerge from the bonnet. Place wrench on flats.
11. Place another wrench on the flats of the plug (29).
12. Loosen plug with wrench while countering with the top wrench.
13. Apply suitable threadlocker to the thread of the new plug (29).
14. Screw plug head (29) onto the plug stem (36) using a suitable tool. Observe tightening torques.
15. Replace packing (15) as described in section 7.1.2.
16. Apply a suitable lubricant to the bonnet (2).
17. Place a new tab washer (224) onto the bonnet (2).
18. Screw bonnet (2) with plug and plug stem (5) into the body (1). Observe tightening torques.

19. Bend up the flap of the tab washer (224) so that it rests against the bonnet.

**Note**
For detailed information on mounting the tab washer and bonnet see section 7.1.1, steps 7 to 10.

### 7.1.4 Tools and tightening torques

See Table 5.

#### Table 5: Tools and tightening torques for standard version

<table>
<thead>
<tr>
<th>Component</th>
<th>Tool</th>
<th>Standard version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonnet (2)</td>
<td>–</td>
<td>221.27 to 346.65</td>
</tr>
<tr>
<td>Guide bushing (7)</td>
<td>1¼&quot; crowfoot wrench</td>
<td>66.38</td>
</tr>
<tr>
<td>Seat (4)</td>
<td>Socket wrench</td>
<td>NPS 1: 147.5</td>
</tr>
<tr>
<td></td>
<td>NPS 2 to 3: 590</td>
<td>NPS 2 to 3: 800</td>
</tr>
<tr>
<td>Plug head (29), plug stem (36)</td>
<td>Crowfoot wrench</td>
<td>14.75</td>
</tr>
</tbody>
</table>

For detailed information on mounting the tab washer and bonnet see section 7.1.1, steps 7 to 10.
7.2 Compact version

7.2.1 Replacing the O-rings

**NOTICE**
Risk of valve damage due to abrasion. The plug and seat facings are very sensitive. Before unscrewing the bonnet from the body, apply a signal pressure to the actuator to slightly lift the plug off the seat. This prevents the plug and seat from being damaged.

**Note**
It is not necessary to remove the actuator from the valve to replace the O-rings.

1. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).
2. Lift bonnet (2), yoke (3) and plug with plug stem (5) off the body (1).
3. Remove O-rings (17) from the bonnet (2) and carefully clean the grooves.
4. Insert new O-rings (17) into the bonnet (2).
5. Apply a suitable lubricant to the bonnet (2).
6. Screw bonnet (2) with yoke (3) and plug with plug stem (5) into the body (1). Observe tightening torques.

7.2.2 Replacing the packing

**NOTICE**
Risk of valve damage due to abrasion. The plug and seat facings are very sensitive. Before unscrewing the bonnet from the body, apply a signal pressure to the actuator to slightly lift the plug off the seat. This prevents the plug and seat from being damaged.

1. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).
2. Lift bonnet (2), yoke (3) and plug with plug stem (5) off the body (1).
3. Unscrew guide bushing (7) placing a suitable tool on the flats.

**Note**
It is not necessary to completely remove the actuator from the valve to replace the packing.

1. Pull the plug with plug stem (5) out of the bonnet (2).
2. Pull all the packing parts out of the packing chamber using a suitable tool.
3. Replace damaged parts. Clean the packing chamber thoroughly.
4. Apply a suitable lubricant to the guide bushing (7), to all the packing parts and to the plug stem (36).
Fig. 11: Compact version Type 3525
T-pattern Valve with Type 3571
Pneumatic Actuator

Fig. 12: Packing

1  Body
2  Bonnet
3  Yoke
4  Seat
5  Plug (29, 36)
7  Guide bushing
11 Spring
12 Washer
15 Packing (11, 12, 16)
16 V-ring packing
17  O-ring
29  Plug head
36  Plug stem
92  Lock nut
112 Screw plug
127 Seat ring gasket
A7  Actuator stem
A16 Vent plug
A28 Stem connector clamp
S  Signal pressure connection
9. Slide guide bushing (7) and packing parts over the plug stem. Make sure you observe the proper order (see Fig. 12).

10. Carefully insert plug with plug stem, packing parts and guide bushing into the bonnet.

**NOTICE**
Risk of leakage due to damaged packing chamber, packing parts and plug stem. When inserting the assembly into the bonnet make sure that the packing chamber, packing parts and plug stem do not get damaged. Otherwise leakage may occur.

11. Thread guide bushing (7) into the bonnet (2) and tighten it placing a suitable tool on the flats. Observe tightening torques.

12. Check O-rings for damage. Replace O-rings, if necessary (see section 7.2.1).

13. Apply a suitable lubricant to the bonnet (2).

14. Screw bonnet (2) with yoke (3) and plug with plug stem (5) into the body (1). Observe tightening torques.

15. Mount stem connector clamp (A28) and adjust travel. See associated actuator documentation.

### 7.2.3 Replacing the seat and plug

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

- Before unscrewing the bonnet from the body, apply a signal pressure to the actuator to slightly lift the plug off the seat. This prevents the plug and seat from being damaged.
- Always replace both the seat and plug.

**Tip**
When replacing the seat and plug, we also recommend replacing the packing. See section 7.2.2.

**Standard plug material (Stellite® 6)**

**Note**
It is not necessary to remove the actuator from the valve to replace the seat and the plug.

1. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).

2. Lift bonnet (2), yoke (3) and plug with plug stem (5) off the body (1).

3. Replace O-rings (17) as described in section 7.2.1.
4. Unscrew the seat (4) using a suitable tool.

5. Remove seat ring gasket (127) from the body (1) and carefully clean the sealing face. Insert a new seat ring gasket into the body.

6. Apply a suitable lubricant to the thread and the sealing cone of the new seat.

7. Screw in the new seat (4) using a suitable tool. Observe tightening torques.

8. Carefully warm up the plug (29) so that it can be removed from the plug stem (36) in the next step.

9. Apply a signal pressure to the actuator so that the flats at the plug stem (36) emerge from the bonnet. Place wrench on flats.

10. Place another wrench on the flats of the plug (29).

11. Loosen plug with wrench while counteracting with the top wrench.

12. Apply suitable threadlocker to the thread of the new plug (29).

13. Screw plug head (29) onto the plug stem (36) using a suitable tool. Observe tightening torques.

14. Replace packing (15) as described in section 7.2.2.

15. Apply a suitable lubricant to the bonnet (2).

16. Screw bonnet (2) with yoke (3) and plug with plug stem (5) into the body (1). Observe tightening torques.

**Tungsten carbide or ceramic plug**


2. Apply a signal pressure to the actuator to slightly lift the plug off the seat. Unscrew the bonnet (2).

3. Lift bonnet (2), yoke (3) and plug with plug stem (5) off the body (1).

4. Replace O-rings (17) as described in section 7.2.1.

5. Unscrew the seat (4) using a suitable tool.

6. Remove seat ring gasket (127) from the body (1) and carefully clean the sealing face. Insert a new seat ring gasket into the body.

7. Apply a suitable lubricant to the thread and the sealing cone of the new seat.

8. Screw in the new seat (4). Observe tightening torques.

9. Replace plug with plug stem (5) and insert it into the bonnet (2).

10. Apply a suitable lubricant to the bonnet (2).

11. Screw bonnet (2) with yoke (3) and plug with plug stem (5) into the body (1). Observe tightening torques.
12. Mount stem connector clamp (A28) and adjust travel. See associated actuator documentation.

7.2.4 **Tools and tightening torques**

See Table 6.

**7.3 Preparation for return shipment**

Defective valves can be returned to SAMSON for repair.

Proceed as follows to return valves to SAMSON:

1. Put the control valve out of operation (see section 9).
2. Decontaminate the valve. Remove any residual process medium.
3. Fill in the Declaration on Contamination, which can be downloaded from the SAMSON AG website at www.samson.de > Services > Checklists for after-sales service > Declaration on Contamination.
4. Send the valve together with the filled-in form to your nearest SAMSON subsidiary. SAMSON subsidiaries are listed on our website at www.samsoncontrols.com > Contact.

---

**Table 6: Tools and tightening torques for compact version**

<table>
<thead>
<tr>
<th>Component</th>
<th>Tool</th>
<th>Tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>lb-ft</td>
</tr>
<tr>
<td>Bonnet (2)</td>
<td>2½&quot; socket wrench</td>
<td>368.78</td>
</tr>
<tr>
<td>Yoke (3)</td>
<td>–</td>
<td>110.63</td>
</tr>
<tr>
<td>Guide bushing (7)</td>
<td>⅜&quot; crowfoot wrench</td>
<td>44.25</td>
</tr>
<tr>
<td>Seat (4)</td>
<td>¾&quot; socket wrench with hexagon bit socket</td>
<td>59</td>
</tr>
<tr>
<td>Plug head (29), plug stem (36)</td>
<td>Crowfoot wrench Plug head: ½&quot; Plug stem: ⅜&quot;</td>
<td>5.9</td>
</tr>
</tbody>
</table>
7.4 Ordering spare parts and operating supplies

Spare Parts
See section 10.3 for details on spare parts.

Lubricants
Details on suitable lubricants can be found in the parts list.

Note
For further information contact your nearest SAMSON subsidiary or the SAMSON After-sales Service department.
8 Malfunctions

Depending on the operating conditions, check the valve at certain intervals to prevent possible failure before it can occur. Operators are responsible for drawing up a test plan.

Tip

SAMSON’s After-sales Service department can support you to draw up an inspection plan for your plant.

8.1 Troubleshooting

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Possible reasons</th>
<th>Recommended action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuator or plug stem does not move on demand.</td>
<td>Actuator is blocked.</td>
<td>Check attachment. Unblock the actuator.</td>
</tr>
<tr>
<td></td>
<td>Signal pressure too low.</td>
<td>Check the signal pressure. Check the signal pressure line for leakage.</td>
</tr>
<tr>
<td>Actuator or plug stem does not move through the whole range.</td>
<td>Signal pressure too low.</td>
<td>Check the signal pressure. Check the signal pressure line for leakage.</td>
</tr>
<tr>
<td>The valve leaks to the atmosphere (fugitive emissions).</td>
<td>The packing is defective.</td>
<td>Replace packing (see section 7.1.2 or 7.2.2) or contact SAMSON’s After-sales Service department.</td>
</tr>
<tr>
<td></td>
<td>Flange joint loose.</td>
<td>Check the flange joint. Re-tighten, if necessary.</td>
</tr>
<tr>
<td>Thread joint loose or seal worn.</td>
<td>Check the threaded joint.</td>
<td>Re-tighten, if necessary. Check the seal at the threaded joint. Exchange, if necessary.</td>
</tr>
<tr>
<td>O-rings worn out.</td>
<td>Replace O-rings at the bonnet (see section 7.1.1 or 7.2.1) or contact SAMSON’s After-sales Service department.</td>
<td></td>
</tr>
</tbody>
</table>
### Malfunctions

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Possible reasons</th>
<th>Recommended action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased flow through closed valve (seat leakage)</td>
<td>Dirt or other foreign particles deposited between the seat and plug.</td>
<td>Shut off the section of the pipeline and flush the valve.</td>
</tr>
<tr>
<td></td>
<td>Valve trim is worn out.</td>
<td>Replace seat and plug (see section 7.1.3 or 7.2.3) or contact SAMSON’s After-sales Service department.</td>
</tr>
</tbody>
</table>

**Note**

Contact SAMSON’s After-sales Service department for malfunctions not listed in the table.

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### 8.2 Emergency action

Upon supply air or control signal failure, the valve moves to its fail-safe position (see section 3.1).

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

In the event of a valve malfunction:

1. Depressurize the plant and interrupt the medium flow.
2. Check the valve for damage. If necessary, contact SAMSON’s After-sales Service department.

**Putting the valve back into operation after a malfunction**

- Slowly resume medium flow in the pipeline.
9 Decommissioning and disassembly

**DANGER**
Risk of bursting in pressure equipment. Control valves and pipelines are pressure equipment. Improper opening can lead to valve components bursting.
- Before starting any work on the control valve, depressurize all plant sections concerned and the valve.
- Drain the process medium from all the plant sections concerned as well as the valve.
- Wear personal protective equipment.

**WARNING**
Risk of personal injury due to sudden escape of process medium.
The valve has a safety bleed to detect damaged or worn O-rings. The process medium may escape suddenly and at high pressure.
- Wear protective clothing, gloves and eyewear when working near or on the valve.
- Do not stay in the range of the safety bleed longer than necessary.

**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 heat up.
- Wear protective clothing and gloves.

9.1 Decommissioning

To decommission the control valve for service and repair work or disassembly, proceed as follows:
1. Interrupt the medium flow.
2. Completely drain the pipelines and valve.
3. Disconnect and lock the pneumatic air supply to depressurize the actuator.
4. If necessary, allow the pipeline and valve components to cool down or heat up.

9.2 Removing the valve from the pipeline

**Version with flanges**
1. Put the control valve out of operation (see section 9.1).
2. Unbolt the flange joint.
3. Remove the valve from the pipeline (see section 4.2).

Wear protective clothing, gloves and eyewear.
Decommissioning and disassembly

Version with threaded ends
1. Put the control valve out of operation (see section 9.1).
2. Unscrew the valve from the pipeline.
3. Remove the valve from the pipeline (see section 4.2).

9.3 Removing the actuator from the valve
See associated actuator documentation.

9.4 Disposal

⇒ Observe local, national and international refuse regulations.
⇒ Do not dispose of components, lubricants and hazard substances together with your other household waste.
10 Appendix

10.1 Customer inquiries

Contact SAMSON’s After-sales Service department for support concerning maintenance or repair work or when malfunctions or defects arise.

E-mail

You can reach the After-sales Service department at samson@samsongroupna.com.

Addresses of SAMSON AG and its subsidiaries

The addresses of SAMSON AG, its subsidiaries, representatives and service facilities worldwide can be found on the SAMSON website, in all SAMSON product catalogs or on the back of these Mounting and Operating Instructions.

Required specifications

Please submit the following details:

- Order number and position number in the order
- Type, model number, nominal size and valve version
- Pressure and temperature of the process medium
- Flow rate
- Bench range of the actuator (e.g. 9 to 35 psi)
- Is a strainer installed?
- Installation drawing

10.2 Certificates

Certificates are available on request. Please contact After-sales Service department at samson@samsongroupna.com.
10.3 Spare parts

Standard version Type 3525 Globe Valve

1  Body
2  Bonnet
4  Seat
5  Plug (29, 36)
7  Guide bushing
11 Spring
12 Washer
15 Packing (11, 12, 16)
16 V-ring packing
17 O-ring
29 Plug head
36 Plug stem
60 Yoke assembly with travel indicator (82, 83, 84)
82 Screw
83 Hanger
84 Travel indicator scale
91 Protective cap
127 Seat ring gasket
224 Tab washer
244 PTFE support ring ¹)

¹) only for versions > Class 900 with FKM O-ring
Standard version Type 3525 Globe Valve
### Compact version Type 3525 Globe Valve and T-pattern Valve

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
</tr>
<tr>
<td>2</td>
<td>Bonnet</td>
</tr>
<tr>
<td>3</td>
<td>Yoke</td>
</tr>
<tr>
<td>4</td>
<td>Seat</td>
</tr>
<tr>
<td>5</td>
<td>Plug (29, 36)</td>
</tr>
<tr>
<td>7</td>
<td>Guide bushing</td>
</tr>
<tr>
<td>11</td>
<td>Spring</td>
</tr>
<tr>
<td>12</td>
<td>Washer</td>
</tr>
<tr>
<td>15</td>
<td>Packing (11, 12, 16)</td>
</tr>
<tr>
<td>16</td>
<td>V-ring packing</td>
</tr>
<tr>
<td>17</td>
<td>O-ring</td>
</tr>
<tr>
<td>29</td>
<td>Plug head</td>
</tr>
<tr>
<td>36</td>
<td>Plug stem</td>
</tr>
<tr>
<td>60</td>
<td>Yoke assembly with travel indicator (82, 83, 84)</td>
</tr>
<tr>
<td>82</td>
<td>Screw</td>
</tr>
<tr>
<td>83</td>
<td>Hanger</td>
</tr>
<tr>
<td>84</td>
<td>Travel indicator scale</td>
</tr>
<tr>
<td>91</td>
<td>Protective cap</td>
</tr>
<tr>
<td>92</td>
<td>Lock nut</td>
</tr>
<tr>
<td>112</td>
<td>Screw plug</td>
</tr>
<tr>
<td>127</td>
<td>Seat ring gasket</td>
</tr>
<tr>
<td>221</td>
<td>Seat ring</td>
</tr>
</tbody>
</table>
Compact version Type 3525
Globe Valve and T-pattern Valve