Type 3246 as globe and three-way valve

**Type 3246 Valve · ANSI and DIN versions**

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

Edition July 2016
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 later reference.

→ If you have any questions about these instructions, contact SAMSON’s After-sales Service Department (aftersalesservice@samson.de).

The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at www.samson.de > 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

ℹ️ Note
Additional information

☀️ Tip
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1 Safety instructions and measures

Intended use
The SAMSON Type 3246 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 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 servicing 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.
Safety instructions and measures

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
− Wear 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, 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. They must observe all hazard statements, warning and caution notes in these mounting and operating instructions, especially for installation, start-up, and servicing.

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 as well as the referenced documents 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 referenced documents and observe the specified hazard statements, warning, and caution notes specified in them. Furthermore, the operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.


**Referenced standards and regulations**

The control valves comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. Valves with a CE marking have a declaration of conformity which includes information about the applied conformity assessment procedure. This declaration of conformity is included in the Appendix of these instructions (see section 10.3).

According to the ignition risk assessment performed in accordance with EN 13463-1:2009, section 5.2, the non-electrical control valves do not have their own potential ignition source even in the rare incident of an operating fault. As a result, they do not fall within the scope of Directive 2014/34/EU.

➢ For connection to the equipotential bonding system, observe the requirements specified in section 6.4 of EN 60079-14 (VDE 0165 Part 1).

**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 Type 3271 and Type 3277 Actuators
- Mounting and operating instructions for mounted valve accessories (positioner, solenoid valve etc.)
- ➢ AB 0100 for tools, tightening torques, and lubricant
Safety instructions and measures

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 finger 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 the 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 silencers and vent plugs.

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

**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 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.
1.3 Notes on possible property damage

NOTICE

Risk of valve damage due to contamination (e.g. solid particles) in the pipeline.
The plant engineering company is responsible for cleaning the pipelines in the plant.

➤ Flush the pipelines before start-up.
➤ Observe the maximum permissible pressure for 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.
Observe the specified torques on tightening control valve components. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage.

➤ Observe the specified tightening torques (AB 0100).

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 (AB 0100).

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 (AB 0100).
# Markings on the control valve

## 2.1 Valve nameplate

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>PED</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5</td>
<td>PED (Pressure Equipment Directive), &quot;Art. 4, Abs. 3&quot;</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Type designation</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Year of manufacture</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Valve size:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DIN: DN · ANSI: NPS</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pressure rating:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DIN: PN · ANSI: CL</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Order no. with modification index</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For after-sales service orders: AA prefix</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Position in order</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For after-sales service orders: configuration ID</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Flow coefficient:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DIN: $K_{vs}$ · ANSI: $C_V$</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Characteristic:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>%: equal percentage · Lin: linear · NO/NC: quick opening</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Seat/plug seal:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ME: metal (see section 3.3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ST: Stellite® facing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT: soft seal with PTFE</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Seat code (trim material) · On request</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>For three-way valve:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mixing valve: M · Diverting valve: V</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Flow divider or perforated plug</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1: ST 1, 2: ST 2, 3: ST 3 · LK</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Country of origin</td>
<td></td>
</tr>
</tbody>
</table>

![Valve nameplate](image)
The nameplate is affixed to the intermediate piece (see Fig. 2) or yoke of the valve.

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 (17). For more details on the nameplate, see section 2.1.

![Diagram of nameplate on intermediate piece](Fig. 2: Nameplate on the intermediate piece)
3 Design and principle of operation

The Type 3246 is available in three different versions:

- Globe valve, Class 150 and 300/PN 16 and 40 (see Fig. 3)
- Globe valve, Class 600 and 900/PN 100 and 160 (see Fig. 5)
- Three-way valve, Class 150 and 300/PN 16 and 40 (see Fig. 4)

Globe valves

The seat (4) and plug (5) are installed in the body (1). For low pressure ratings (Class 150 and 300/PN 16 and 40), the plug is screwed to a plug stem extension (25). For Class 600/PN 100 and higher, the plug and plug stem are incorporated in one piece. The stem connector clamps connect the actuator stem of the mounted actuator. The plug stem or plug stem extension is sealed by a spring-loaded V-ring packing (15).

The medium flows through the valve in the direction indicated by the arrow. 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.

Three-way valve

Two seats (4, 141) are installed in the body (1) of the three-way valve. Depending on the version, the three-way valve can be used either as a mixing or diverting valve. In mixing valves, the process media to be mixed enter at valve ports A and B. The combined flow exits the valve at port AB. The flow rate from ports A or B to AB depends on the cross-sectional area of flow between the seats and plugs. Fig. 4 shows a mixing valve.

In diverting valves, the process medium enters at the valve port AB and the partial flows exit at ports A and B.

Note

The design of the mixing and diverting valves in sizes NPS ½ to 1 (DN 15 to 25) is identical.

Insulating section and circulation inhibitor

To withstand low temperatures, the Type 3246 Valve is always fitted with a long insulating section (21). A circulation inhibitor (86) is installed in the lower section of the insulating section of all three versions. This prevents the cold process medium from circulating in the insulating section.

Actuators

The Type 3246 Valve is preferably combined with a SAMSON Type 3271 or Type 3277 Pneumatic Actuator (see Fig. 3). It can also be combined with other actuators.

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.
**Design and principle of operation**

*Fig. 3:* Type 3246 Globe Valve with welding ends, Class 150 and 300/PN 16 and 40

1. Body
2. Intermediate piece
4. Seat
5. Plug
8. Threaded bushing (packing nut)
9. Stem connector nut
10. Lock nut
14. Nuts
15. Packing
17. Body gasket
21. Insulating section
25. Plug stem extension
32. Bolt
33. Nut
39. Gasket (at the intermediate piece)
86. Circulation inhibitor
87. Threaded bushing (at the circulation inhibitor)
141. Bottom seat

*Fig. 4:* Type 3246 Three-way Valve with flanges
Design and principle of operation

Fig. 5: Type 3246 Globe Valve, Class 600 and 900/PN 100 and 160

1 Body
3 Yoke
4 Seat
5 Plug
8 Threaded bushing (packing nut)
9 Stem connector nut
10 Lock nut
14 Body nut
15 Packing
17 Body gasket
21 Insulating section
86 Circulation inhibitor
87 Threaded bushing (circulation inhibitor)
92 Castellated nut
3.1 Fail-safe positions

The fail-safe position depends on the valve version (globe or three-way valve) as well as the actuator used.

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

3.1.1 Globe valve

Depending on how the compression springs are arranged in the pneumatic actuator, the valve has 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.

3.1.2 Three-way valve

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

Actuator stem extends (FA)
When the signal pressure is reduced or the air supply fails, the springs cause port B (mixing valves) or port A (diverting valves) to close. The port B or A 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 cause port B (mixing valves) or port A (diverting valves) to open. The port B or A closes when the signal pressure is increased enough to overcome the force exerted by the springs.
3.2 Versions

Angle valve
The Type 3246 Valve is also available as an angle valve (special version) on request.

Actuators
In these instructions, the preferable combination with a Type 3271 or Type 3277 Pneumatic Actuator is described. The pneumatic actuator (with or without handwheel) can be replaced by another pneumatic actuator in a different size, but with the same travel.

➤ Observe the maximum permissible actuator force.

3.3 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 Sheets T 8046-1, T 8046-2, and T 8046-3.

Compliance
The Type 3246 Valve bears both the CE and EAC marks of conformity.

Temperature range
The Type 3246 Valve is designed for a temperature range from –325 to +149 °C (–196 to +65 °F).

Leakage class
Depending on the version, the following leakage class according to ANSI/FCI 70-2 or IEC 60534-4 applies:

<table>
<thead>
<tr>
<th>Valve</th>
<th>Seal (16 on nameplate)</th>
<th>Leakage class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Globe valve</td>
<td>Metal (ME) Stellite® facing (ST)</td>
<td>Min. IV</td>
</tr>
<tr>
<td></td>
<td>PTFE1) (PT)</td>
<td>VI</td>
</tr>
<tr>
<td>Three-way valve</td>
<td>Metal (ME)</td>
<td>I</td>
</tr>
</tbody>
</table>

1) Special version
Design and principle of operation

Noise emission

SAMSON is unable to make general statements about noise emission as it depends on the valve version, plant facilities, and process medium.

⚠️ WARNING

Risk of hearing loss or deafness due to loud noise.
Wear hearing protection when working near the valve.
### Design and principle of operation

#### Dimensions and weights

Table 1 to Table 3 provide a summary of the dimensions of the various versions of Type 3246 Valve. Table 4 shows the weights of the various versions of Type 3246 Valve. The lengths and heights in the dimensional drawings are shown on p. 24.

**Table 1: Dimensions of Type 3246 Globe Valve with welding ends · Class 150 and 300/PN 16 and 40**

<table>
<thead>
<tr>
<th>Valve size</th>
<th>NPS</th>
<th>½</th>
<th>⅔</th>
<th>1</th>
<th>1½</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>8</th>
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<td></td>
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<td>15</td>
<td>20</td>
<td>25</td>
<td>40</td>
<td>50</td>
<td>80</td>
<td>100</td>
<td>150</td>
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<td>mm</td>
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<td>337</td>
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<td>H4</td>
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<td>H5</td>
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<td>mm</td>
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<tr>
<td>≤750 cm²</td>
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<td>6.3</td>
<td>9.06</td>
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<td>in</td>
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<td>1000, 1400-60 cm²</td>
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<td>11.02</td>
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1) SB = Seat bore
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Design and principle of operation

### Table 3: Dimensions of Type 3246 Three-way Valve with flanges · Class 150 and 300/ PN 16 and 40

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### Table 4: Weights for Type 3246

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**Note**

Refer to the following data sheets for dimensions and weights of the SAMSON pneumatic actuators:

- T 8310-1 for Type 3271 and Type 3277 Actuators up to 750 cm² actuator area
- T 8310-2 for Type 3271 Actuator with 1000 cm² actuator area and larger
- T 8310-3 for Type 3271 Actuator with 1400-60 cm² actuator area
Design and principle of operation

Dimensional drawings

Type 3246 · NPS ½ to 10 (DN 15 to 250),
Class 150 and 300 (PN 16 and 40)

Type 3246 · NPS ½ to 8 (DN 15 to 200),
Class 600 and 900 (PN 100 and 160)
Type 3246 as three-way valve · NPS ½ to 6 (DN 15 to 150), Class 150 and 300 (PN 16 and 40)
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 3.3 and the corresponding data sheets for the 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

**NOTICE**

Risk of valve damage due to incorrectly attached slings.
The welded-on lifting eyelet on SAMSON actuators is only intended for mounting and removing the actuator as well as lifting the actuator without valve. Do not use this lifting eyelet 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 4.2.2).

**Tip**

SAMSON's After-sales Service department can provide more detailed transport and lifting instructions on request.

**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).

**Note**

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

**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.
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.
- 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 actuators with an actuator surface of 700 cm² or larger. The sling only protects the control valve from tilting while being lifted. Before lifting the control valve, tighten the sling.

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

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. 6).
2. 700 cm² and larger: attach another sling to the lifting eyelet on the actuator and to the rigging equipment.
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 5.2.3).
6. After installation in the pipeline, check whether the flanges are bolted tight and the valve in the pipeline holds.
7. Remove slings.

Version with welding ends
1. Attach one sling to each welding end of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 6).
2. Secure the slings attached to the body against slipping using a connector.
3. 700 cm² and larger: attach another sling to the lifting eyelet on the actuator and to the rigging equipment.
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.
Fig. 6: Lifting points on the control valve: with flanges and insulating section (left) · With welding ends and insulating section (right)
Preparation

6. Install the valve into the pipeline (see section 5.2.3).
7. After installation in the pipeline, check whether the weld seams hold.
8. Remove connector and slings.

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 long storage periods.

**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 °C).

**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.

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 59 °F (15 °C) for elastomers.
- Store elastomers away from lubricants, chemicals, solutions, and fuels.

**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 engineering company is responsible for cleaning the pipelines in the 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.).
- Check any mounted pressure gauges to make sure they function.
- When the valve and actuator are already assembled, check the tightening torques of the bolted joints (AB 0100). Components may loosen during transport.
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.

**NOTICE**
Risk of valve damage due to excessively high or low tightening torques.
Observe the specified torques on tightening control valve components. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage.
Observe the specified tightening torques (► AB 0100).

**NOTICE**
Risk of valve damage due to the use of unsuitable tools.
Only use tools approved by SAMSON (► AB 0100).

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:

**Versions with V-port plug**
Each V-port plug has three V-shaped ports. Depending on the valve size, the size of the symmetrically arranged V-shaped ports varies. The process medium in the valve flows through the V-shaped ports as soon as the plug is lifted out of the seat (i.e. the valve opens).

1. Before mounting the actuator, determine which V-shaped port is uncovered first when the plug is lifted out of the seat.
   - Usually, this is the largest V-shaped port.

2. On mounting the actuator, make sure that the V-shaped port uncovered first faces toward the valve outlet.

**NOTICE**
Medium flow obstructed due to incorrect installation of the V-port plug.
To achieve the best flow conditions inside the valve, the V-port plug must always be installed with the largest port facing toward the valve outlet.
Make sure the V-port plug is installed correctly.

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versions with V-port plug

Each V-port plug has three V-shaped ports. Depending on the valve size, the size of the symmetrically arranged V-shaped ports varies. The process medium in the valve flows through the V-shaped ports as soon as the plug is lifted out of the seat (i.e. the valve opens).

1. Before mounting the actuator, determine which V-shaped port is uncovered first when the plug is lifted out of the seat.
   - Usually, this is the largest V-shaped port.

2. On mounting the actuator, make sure that the V-shaped port uncovered first faces toward the valve outlet.
Mounting and start-up

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 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. 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.

Note
- 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).

Mounting position
We recommend mounting the valve at an angle between 15 and 25° to the horizontal plane.

→ Contact SAMSON if the mounting position is not as specified here.

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.

Notice
Premature wear and leakage due to insufficient support or suspension.

In the following versions, the control valve must be supported or suspended:
- For versions with side-mounted handwheel which are installed at an angle of <45° to the horizontal plane

Attach a suitable support or suspension to the valve.
Mounting and start-up

Table 5: 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>$Ma \leq 0.3$</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>$0.3 \leq Ma \leq 0.7$</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Liquid</td>
<td>Free of cavitation/$w &lt; 10 \text{ m/s}$</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Cavitation producing noise/$w \leq 3 \text{ m/s}$</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Cavitation producing noise/$3 &lt; w &lt; 5 \text{ m/s}$</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Critical cavitation/$w \leq 3 \text{ m/s}$</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Critical cavitation/$3 &lt; w &lt; 5 \text{ m/s}$</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Flashing</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Multi-phase</td>
<td>-</td>
<td>10</td>
</tr>
</tbody>
</table>

**Vent plug**

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

**Insulation**

Control valves with cover plates can be insulated up to the cover plate. Control valves without cover plates must only be insulated up to the bonnet flange of the body.
Safety guard
To reduce the crush hazard arising from moving parts (actuator and plug stem), a safety guard can be installed.

Noise emission
Trims with flow dividers (see T 8081) or perforated plugs (see T 8086) can be used to reduce noise emission.

5.2.3 Installing the control valve

Version with flanges
1. Close the shut-off valve in the pipeline 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 open the shut-off valve in the pipeline after the valve has been installed.

**NOTICE**

Risk of valve damage due to a sudden pressure increase and resulting high flow velocities.
Slowly open the shut-off valve in the pipeline during start-up.

8. Check the valve to ensure it functions properly.

Version with welding ends
1. Proceed as described for Version with flanges (steps 1 to 3).
2. Completely retract the actuator stem to protect the plug from sparks during welding.
3. Weld the valve free of stress into the pipeline.
4. 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 open the shut-off valve in the pipeline.

**NOTICE**
Risk of valve damage due to a sudden pressure increase and resulting high flow velocities. 
Slowly open the shut-off valve in the pipeline during start-up.

3. Check the valve for leakage (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 test

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 valve and plant.

**Note**
The plant engineering company is responsible for performing the pressure test. SAMSON’s After-sales Service department can support you to plan and perform a 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 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.
Wear protective clothing and gloves.

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

6.1 Working in manual mode

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

➤ For normal closed-loop operation, move the handwheel to the neutral position.
7 Servicing

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 an inspection plan for your plant.

We recommend removing the valve from the pipeline or 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 bursting of the valve.

− 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 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.

**NOTICE**

Risk of valve damage due to incorrect servicing or repair.

Service and repair work must only be performed by trained staff.

**NOTICE**

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

Observe the specified torques on tightening control valve components. Excessively tightened torques lead to parts wearing out quicker. Parts that are too loose may cause leakage.

Observe the specified tightening torques (▶ AB 0100).

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properties, may lead to personal injury, e.g. (chemical) burns.

Wear protective clothing, gloves, and eyewear.

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Wear protective clothing, gloves, and eyewear.
Servicing

7.1 Replacing the gasket

Risk of valve damage due to the use of unsuitable tools.
Only use tools approved by SAMSON (AB 0100).

Risk of valve damage due to the use of unsuitable lubricants.
Only use lubricants approved by SAMSON (AB 0100).

Note
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 servicing 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.

1. Undo the body nuts (14) gradually in a criss-cross pattern.

2. Class 150 and 300/PN 16 and 40: lift the insulating section (21) together with the intermediate piece (2), plug (5), and plug stem extension (25) off the body (1).
   Class 600 and 900/PN 100 and 160: lift the insulating section (21) together with the yoke (3) and plug (5) off the body (1).

3. Remove the gasket (17). Carefully clean the sealing faces in the valve body (1) and on the insulating section (21).

4. Insert a new gasket (17) into the body.

5. Class 150 and 300/PN 16 and 40: place the insulating section (21) together with the intermediate piece (2), plug (5), and plug stem extension (25) on the body (1).
   Class 600 and 900/PN 100 and 160: place the insulating section (21) together
Fig. 7: Type 3246 Globe valve · Class 150 and 300/PN 16 and 40 (left) · Class 600 and 900/ PN 100 and 160 (right)
with the yoke (3) and plug (5) on the body (1).

**Version with V-port plug:** place the assembly onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.

6. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.

### 7.2 Replacing the circulation inhibitor

#### 7.2.1 Globe and three-way valve, Class 150 and 300/PN 16 and 40

**NOTICE**

*Risk of control valve damage due to incorrect service or repair.*

The circulation inhibitor can only be replaced when all the following conditions are met:

- The valve size is \( \leq \text{NPS 6/DN 150} \).

**Note**

The actuator can remain mounted on the valve.

1. Undo the body nuts (14) gradually in a criss-cross pattern.

2. Lift the insulating section (21) together with the intermediate piece (2), plug (5), and plug stem extension (25) off the body (1).

3. Undo the grub screw (88) at the threaded bushing (87) using a hexagon socket screw.

**Note**

Do not completely unscrew the grub screw.

4. Loosen the threaded bushing (87).

5. Unscrew the plug with plug stem (5) from the plug stem extension (25) and pull out of the insulating section (21).

6. Carefully pull all the individual parts of the circulation inhibitor out of the packing chamber using a suitable tool.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Intermediate piece</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>Yoke</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>Seat</td>
<td>17</td>
</tr>
<tr>
<td>5</td>
<td>Plug (with plug stem)</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>Threaded bushing (packing nut)</td>
<td>25</td>
</tr>
<tr>
<td>9</td>
<td>Stem connector nut</td>
<td>30</td>
</tr>
<tr>
<td>32</td>
<td>Bolt</td>
<td>33</td>
</tr>
<tr>
<td>39</td>
<td>Gasket (intermediate piece)</td>
<td>86</td>
</tr>
<tr>
<td>87</td>
<td>Threaded bushing</td>
<td>92</td>
</tr>
</tbody>
</table>
7. Renew the damaged parts and carefully clean the packing chamber.
8. Carefully slide the individual parts of the circulation inhibitor into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 8).

**NOTICE**

*Damage to the packing by applying lubricant.
Do not apply any lubricant to the packing rings of the circulation inhibitor.*

9. Lightly screw in the threaded bushing (87), but do not tighten it yet.

10. Slide the plug with plug stem (5) into the insulating section (21) and screw it onto the plug stem extension (25). Make sure that the two washers (30) are still in the plug stem extension. Renew the washer, if necessary.
11. Tighten the threaded bushing (87). Observe tightening torques.
12. Tighten the grub screw (88) using a hexagon socket screw.
13. Place the insulating section (21) together with the intermediate piece (2), plug (5), and plug stem extension (25) on the body (1).

**Version with V-port plug:** place the insulating section (21) onto the valve body, making sure that the largest V-shaped

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**Fig. 8:** Circulation inhibitor for globe valve, Class 150 and 900/PN 16 and 160 (left) · For three-way valve, Class 150 and 300/PN 16 and 140 (right)
Servicing

Port of the V-port plug faces toward the valve outlet. See section 5.1.

14. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.

7.2.2 Globe valve, Class 600 and 900/PN 100 and 160

**NOTICE**

Risk of control valve damage due to incorrect service or repair.
The circulation inhibitor can only be replaced when all the following conditions are met:
– The valve size is ≤NPS 4/DN 100.
To replace the circulation inhibitor in other valve versions, contact SAMSON’s After-sales Service department.

1. Remove the actuator from the valve. See associated actuator documentation.
2. Unscrew castellated nut (92) and lift the yoke (3) off the insulating section (21).
3. Undo the body nuts (14) gradually in a criss-cross pattern.
4. Lift the insulating section (21) together with the plug stem and plug (5) off the body (1).
5. Unthread the stem connector nut (9) and lock nut (10) from the plug stem (5).
6. Unscrew the top threaded bushing (8).
7. If necessary, replace the packing. See section 7.3.2.
8. Undo the grub screw (88) at the bottom threaded bushing (87) using a hexagon socket screw.

**i Note**

Do not completely unscrew the grub screw.

9. Loosen the threaded bushing (87).
10. Pull the plug with plug stem (5) out of the insulating section (21).
11. Carefully pull all the individual parts of the circulation inhibitor out of the packing chamber using a suitable tool.
12. Renew the damaged parts and carefully clean the packing chamber.
13. Carefully slide the individual parts of the circulation inhibitor into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 8).

**NOTICE**

Damage to the packing by applying lubricant.
Do not apply any lubricant to the packing rings of the circulation inhibitor.

14. Lightly screw in the threaded bushing (87), but do not tighten it yet.
15. Slide the plug with plug stem (5) into the insulating section (21).
16. Tighten the bottom threaded bushing (87). Observe tightening torques.
17. Tighten the grub screw (88) using a hexagon socket screw.
18. Screw in the top threaded bushing (8) and tighten it. Observe tightening torques.
19. Place the insulating section (21) together with the plug stem and plug (5) onto the body (1).

**Version with V-port plug:** place the insulating section (21) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.

20. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
21. Place yoke (3) on the insulating section (21) and fasten tight using the castellated nut (92).
22. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem (5).
23. Mount actuator. See associated actuator documentation.
24. Adjust lower or upper signal bench range. See associated actuator documentation.

### 7.3 Replacing the packing

#### NOTICE

**Risk of control valve damage due to incorrect service or repair.**
The packing can only be replaced when all the following conditions are met:
- Class 150 and 300/PN 16 and 40: The valve size is ≤NPS 6/DN 150.
- Class 600 and 900/PN 100 and 160: The valve size is ≤NPS 4/DN 100.
- The standard packing is installed in the valve.

To replace the packing in other valve versions, contact SAMSON’s After-sales Service department.

#### 7.3.1 Globe and three-way valve, Class 150 and 300/PN 16 and 40

1. Remove the actuator from the valve. See associated actuator documentation.
2. Unthread the stem connector nut (9) and lock nut (10) from the plug stem extension (25).
3. Unscrew the threaded bushing (8).
4. Remove nuts (33) and bolts (32).
5. Carefully lift the intermediate piece (2) over the plug stem extension (25).
6. Pull all the packing parts out of the packing chamber using a suitable tool.
7. Renew the damaged parts and carefully clean the packing chamber.
8. Remove the gasket (39). Carefully clean the sealing faces in the intermediate piece (2) and on the insulating section (21).

9. Insert a new gasket (39) into the insulating section (21).

10. Apply a suitable lubricant to all the packing parts and to the plug stem extension (25).

11. Carefully slide the packing parts over the plug stem extension into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 9).

12. Carefully place the insulating section (2) over the plug stem extension (25) onto the insulating section (21).

13. Fasten the intermediate piece (2) with nuts (33) and bolts (32). Observe tightening torques.

14. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.

15. Loosely thread the lock nut (10) and stem connector nut (9) onto the plug stem extension (25).


17. Adjust lower or upper signal bench range. See associated actuator documentation.

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**Fig. 9:** Packing for globe and three-way valves, Class 150 and 300/PN 16 and 40 (left) · For globe valve, Class 600 and 900/PN 100 and 160 (right)

8   Threaded bushing (packing nut)
11  Spring
12  Washer
15  Packing
16  V-ring packing/seals
19  Bushing
39  Gasket (intermediate piece)
92  Castellated nut
7.3.2 Globe valve, Class 600 and 900/PN 100 and 160

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

2. Unscrew castellated nut (92) and lift the yoke (3) off the insulating section (21).

3. Unthread the stem connector nut (9) and lock nut (10) from the plug stem (5).

4. Unscrew the threaded bushing (8).

5. Pull all the packing parts out of the packing chamber using a suitable tool.

6. Renew the damaged parts and carefully clean the packing chamber.

7. Apply a suitable lubricant to all the packing parts and to the plug stem (5).

8. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Make sure to observe the proper sequence (see Fig. 9).

9. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.

10. Place yoke (3) on the insulating section (21) and fasten tight using the castellated nut (92).

11. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem (5).


13. Adjust lower or upper signal bench range. See associated actuator documentation.

7.4 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 gasket (see section 7.1), the circulation inhibitor (see section 7.2) and the packing (see section 7.3).
### 7.4.1 Globe valve, Class 150 and 300/PN 16 and 40

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**NOTICE**

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

Seat and plug can only be replaced when all the following conditions are met:
- The valve size is ≤NPS 6/DN 150.
- The standard packing is installed in the valve.

To replace seat and plug in other valve versions, contact SAMSON's After-sales Service department.

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**Note**

The actuator can remain mounted on the valve.

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1. Undo the body nuts (14) gradually in a criss-cross pattern.
2. Lift the insulating section (21) together with the plug stem extension (25), plug stem and plug (5) off the body (1).
3. Replace gasket as described in section 7.1.
4. Undo the grub screw (88) at the bottom threaded bushing (87) using a hexagon socket screw.
5. Loosen the threaded bushing (87).
6. Replace the circulation inhibitor (see section 7.2.1).
7. Unscrew the seat (4) using a suitable tool.
8. Apply a suitable lubricant to the thread and the sealing cone of the new seat.
10. Unscrew the plug and plug stem (5) from the plug stem extension (25) using a suitable tool and take them out of the insulating section (21).
11. Apply a suitable lubricant to the end of the plug stem of the new plug (5).
12. Make sure that the two washers (30) are still in the plug stem extension (25). Renew the washer, if necessary.
13. Screw the new plug and plug stem (5) onto the plug stem extension (25) using a suitable tool. Observe tightening torques.
14. Tighten the bottom threaded bushing (87). Observe tightening torques.
15. Tighten the grub screw (88) using a hexagon socket screw.
16. Place the insulating section (21) together with the plug stem extension (25), plug stem, and plug (5) onto the body (1).

**Version with V-port plug:** place the insulating section (21) onto the valve body, making sure that the largest V-shaped...
port of the V-port plug faces toward the valve outlet. See section 5.1.

17. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.

7.4.2 Globe valve, Class 600 and 900/PN 100 and 160

NOTICE
Risk of control valve damage due to incorrect service or repair.
Seat and plug can only be replaced when all the following conditions are met:
– The valve size is ≤NPS 4/DN 100.
– The valve does not have a flow divider.
– The standard packing is installed in the valve.
To replace seat and plug in other valve versions, contact SAMSON’s After-sales Service department.

1. Remove the actuator from the valve. See associated actuator documentation.
2. Unscrew castellated nut (92) and lift the yoke (3) off the insulating section (21).
3. Undo the body nuts (14) gradually in a criss-cross pattern.
4. Lift the insulating section (21) together with the plug stem and plug (5) off the body (1).
5. Replace gasket as described in section 7.1.
6. Unthread the stem connector nut (9) and lock nut (10) from the plug stem (5).
7. Unscrew the top threaded bushing (8).
8. Replace the packing. See section 7.3.2.
9. Undo the grub screw (88) at the bottom threaded bushing (87) using a hexagon socket screw.

Note
Do not completely unscrew the grub screw.

10. Loosen the threaded bushing (87).

Note
The threaded bushing does not need to be completely unscrewed on replacing the seat and plug.

11. Replace the circulation inhibitor (see section 7.2.2).
12. Pull the plug with plug stem (5) out of the insulating section (21).
13. Unscrew the seat (4) using a suitable tool.
14. Apply a suitable lubricant to the thread and the sealing cone of the new seat.
15. Screw in the seat (4). Observe tightening torques.
16. Apply a suitable lubricant to the new plug stem (5).
17. Slide the new plug with plug stem (5) into the insulating section (21).
18. Tighten the bottom threaded bushing (87). Observe tightening torques.
19. Tighten the grub screw (88) using a hexagon socket screw.
20. Screw in the top threaded bushing (8) and tighten it. Observe tightening torques.
21. Place the insulating section (21) together with the plug stem and plug (5) onto the body (1).
   **Version with V-port plug:** place the insulating section (21) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See section 5.1.
22. Press the plug (5) firmly into the seat (4), while fastening down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a criss-cross pattern. Observe tightening torques.
23. Place yoke (3) on the insulating section (21) and fasten tight using the castellated nut (92).
24. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem (5).
26. Adjust lower or upper signal bench range. See associated actuator documentation.

### 7.4.3 Three-way valve, Class 150 and 300/ PN 16 and 40

**NOTICE**

Risk of control valve damage due to incorrect service or repair.
To replace seat and plug in the three-way valve, contact SAMSON’s After-sales Service department.

### 7.5 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 our website at [www.samson.de > Services > Check lists for after sales service > Declaration on Contamination](http://www.samson.de).
4. Send the valve together with the filled-in form to your nearest SAMSON subsidiary. SAMSON subsidiaries are listed on our website at [www.samson.de > Contact](http://www.samson.de).
7.6 Ordering spare parts and operating supplies

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

**Spare parts**
Details on spare parts are available on request.

**Lubricant**
Details on suitable lubricants can be found in the document AB 0100.

**Tools**
Details on suitable tools can be found in the document AB 0100.
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 an inspection 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>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, particularly with soft seat, is worn.</td>
<td>Replace seat and plug (see section 7.4 or contact SAMSON’s After-sales Service department).</td>
</tr>
<tr>
<td>The valve leaks to the atmosphere (fugitive emissions).</td>
<td>The packing is defective.</td>
<td>Replace packing (see section 7.3) or contact SAMSON’s After-sales Service department.</td>
</tr>
<tr>
<td></td>
<td>Flange joint unbolted.</td>
<td>Check the flange joint.</td>
</tr>
<tr>
<td></td>
<td>Gasket worn out.</td>
<td>Replace body gasket (see section 7.1) or contact SAMSON’s After-sales Service department.</td>
</tr>
<tr>
<td>Icing up of the insulating section and/or packing chamber.</td>
<td>Circulation inhibitor defective.</td>
<td>Replace circulation inhibitor (see section 7.2) or contact SAMSON’s After-sales Service department.</td>
</tr>
</tbody>
</table>
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. Close the shut-off valves upstream and downstream of the control valve to stop the process medium from flowing through the valve.

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 open the shut-off valves. Allow the process medium to flow into the valve slowly.

Contact SAMSON's After-sales Service department for malfunctions not listed in the table.
9 Decommissioning and disassembly

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

– 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 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 eye-wear.

**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. 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. 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).

**Version with welding ends**

1. Put the control valve out of operation (see section 9.1).
2. Cut the pipeline in front of the weld seam.
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 hazardous substances together with your other household waste.
10 Appendix

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

E-mail
You can reach the After-sales Service Department at aftersalesservice@samson.de.

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 in cu.ft/min or m³/h
- Bench range of the actuator (e.g. 0.2 to 1 bar)
- Is a strainer installed?
- Installation drawing

10.2 Spare parts
Details on spare parts are available on request.
EU-KONFORMITÄTSERKLÄRUNG
EU DECLARATION OF CONFORMITY

Modul/Module H / N° CE-PED-H-SAM 001-13-DEU

SAMSON erklärt in alleiniger Verantwortung für folgende Produkte:

<table>
<thead>
<tr>
<th>Geräte/Devices</th>
<th>Bauart/Series</th>
<th>Typ/Type</th>
<th>Ausführung/Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>240</td>
<td>3241</td>
<td>DIN, Gehäuse GG ab DN150, Gehäuse GG/Sph. gr. iron-Body ab DN150, Fluids G2, L1, L2</td>
</tr>
<tr>
<td>Dreieckventil/Three-way Valve</td>
<td>240</td>
<td>3244</td>
<td>DIN, Gehäuse GG/Sph. gr. iron-Body ab DN150, Fluids G2, L1, L2</td>
</tr>
<tr>
<td>Teilempfindendventil/Cryogenic Valve</td>
<td>250</td>
<td>3251</td>
<td>DIN/Sph. gr. iron-Body etc., Fluids</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>325</td>
<td>3254</td>
<td>DIN/Sph. gr. iron-Body etc., Fluids</td>
</tr>
<tr>
<td>Dreieckventil/Three-way Valve</td>
<td>325</td>
<td>3256</td>
<td>DIN/Sph. gr. iron-Body etc., Fluids</td>
</tr>
<tr>
<td>Dreieckventil/Angle Valve</td>
<td>325</td>
<td>3258</td>
<td>DIN, alle Fluids</td>
</tr>
<tr>
<td>Doppelkammerverschlagventil/Steam-converting Valve</td>
<td>280</td>
<td>3281</td>
<td>DIN, alle Fluids</td>
</tr>
<tr>
<td>Dreiweg-Ventil/Three-way Valve</td>
<td>2001</td>
<td>3231</td>
<td>DIN, Gehäuse Stahl u.a., alle Fluids</td>
</tr>
<tr>
<td>Dreieckventil/Three-way Valve</td>
<td>2001</td>
<td>3233</td>
<td>ANSI, alle Fluids</td>
</tr>
<tr>
<td>Schrägsitzventil/Bevel-Valve</td>
<td>3353</td>
<td>3354</td>
<td>DIN, alle Fluids</td>
</tr>
<tr>
<td>Drosselschalldämpfer/Silencer</td>
<td>3381</td>
<td>3381-1</td>
<td>DIN/Sph. gr. iron-Body etc., alle Fluids</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>240</td>
<td>3246</td>
<td>DIN/Sph. gr. iron-Body etc., alle Fluids</td>
</tr>
<tr>
<td>Dreieckventil/Three-way Valve</td>
<td>250</td>
<td>3258</td>
<td>ANSI, alle Fluids</td>
</tr>
<tr>
<td>Eckventil/Angle Valve</td>
<td>250</td>
<td>3259</td>
<td>ANSI, alle Fluids</td>
</tr>
<tr>
<td>Eckventil/Angle Valve</td>
<td>250</td>
<td>3260</td>
<td>ANSI, alle Fluids</td>
</tr>
<tr>
<td>Eckventil/Angle Valve</td>
<td>250</td>
<td>3261</td>
<td>ANSI, alle Fluids</td>
</tr>
<tr>
<td>Eckventil/Angle Valve</td>
<td>250</td>
<td>3262</td>
<td>ANSI, alle Fluids</td>
</tr>
</tbody>
</table>


2014/68/EU vom/of 15.05.2014

Angewandtes technisches Merkblatt/Technical Standard used:

DIN EN12516-2; DIN EN12516-3; ASME B16.34

Die Konformität mit nachfolgender Anforderung/We declare conformity with the demands of:

Modul H/ Module H durch/by Bureau Veritas 0062

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Revision 01

19.07.2016
Appendix

10.4 Spare parts

1 Body
2 Intermediate piece
3 Yoke
4 Seat 1)
5 Plug (with plug stem)
8 Threaded bushing (packing nut)
9 Stem connector nut
10 Lock nut
11 Spring
12 Washer
13 Stud bolt
14 Body nut
15 Packing (assembly)
16 V-ring packing
17 Body gasket
19 Bushing
21 Insulating section
25 Plug stem extension
30 Retaining washers
32 Bolt
33 Nut
39 Gasket (at the intermediate piece)
70 Seal
77 Plate (direction of flow)
80 Nameplate
81 Grooved pin
82 Screw
83 Hanger
84 Travel indicator scale
85 Screw
86 Circulation inhibitor
87 Threaded bushing (at the circulation inhibitor)
88 Threaded pin
92 Castellated nut
141 Bottom seat
1) Top seat (three-way valve)
Globe and three-way valve, Class 150 and 300
Globe valve, Class 600 and 900