Type 3251 Valve · ANSI version

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

Edition October 2019
Note on these mounting and operating instructions

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

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

➔ If you have any questions about these instructions, contact SAMSON’s After-sales Service Department (aftersalesservice@samsongroup.com).

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.samsongroup.com > Service & Support > Downloads > Documentation.

Definition of signal words

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

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

⚠️ NOTICE
Property damage message or malfunction

ℹ️ Note
Additional information

☀️ Tip
Recommended action
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1 Safety instructions and measures

Intended use

The SAMSON Type 3251 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 operating conditions that meet the specifications used for sizing the valve at the ordering stage. In case operators intend to use the control valve in other applications or conditions than specified, contact SAMSON.

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

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

Reasonably foreseeable misuse

The control valve is not suitable for the following applications:

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

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

− Use of non-original spare parts
− Performing service and repair work not described 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.

Explosion-protected versions of this device must be operated only by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.
Safety instructions and measures

Personal protective equipment
We recommend checking the hazards posed by the process medium being used (e.g. GESTIS (CLP) hazardous substance database). Depending on the process medium and/or the activity, the protective equipment required includes:

- Protective clothing, gloves, eye protection and respiratory protection in applications with hot, cold and/or corrosive media
- Wear hearing protection when working near the valve
- Hard hat
- Safety harness when working at height
- Safety footwear, ESD (electrostatic discharge) footwear, if necessary

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

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

Safety features
The fail-safe position of the control valve upon air supply or control signal failure depends on the actuator used (see associated actuator documentation). When the valve is combined with a SAMSON Type 3271 or Type 3277 Pneumatic Actuator, the valve moves to a certain fail-safe position (see the 'Design and principle of operation' section) upon supply air or control signal failure. The fail-safe action of the actuator is the same as its direction of action and is specified on the nameplate of SAMSON actuators.

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.

Hazards resulting from the special working conditions at the installation site of the valve must be identified in a risk assessment and prevented through the corresponding safety instructions drawn up by the operator.
Responsibilities of the operator
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, the operator 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, warnings and caution notes. 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 and the Machinery Directive 2006/42/EC. Valves with a CE marking have a declaration of conformity which includes information about the applied conformity assessment procedure. The ‘Certificates’ section contains this declaration of conformity.

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 the mounted actuator, e.g. EB 8310-X for Type 3271 or Type 3277 Pneumatic Actuator
- Mounting and operating instructions for mounted valve accessories (positioner, solenoid valve etc.)
- AB 0100 for tools, tightening torques and lubricant
1.1 Notes on possible severe personal injury

⚠️ DANGER

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

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

1.2 Notes on possible personal injury

⚠️ WARNING

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

» Allow components and pipelines to cool down or heat up.
» Wear protective clothing and safety gloves.

Risk of hearing loss or deafness due to loud noise.
The noise emissions depend on the valve version, plant facilities and process medium.

» Wear hearing protection when working near the valve.

Risk of personal injury due to exhaust air being vented.
While the valve is operating, the actuator or valve accessories may vent during closed-loop control or when the valve opens or closes.

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

**WARNING**

**Crush hazard arising from moving parts.**

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

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

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

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

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

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

While working on the valve, residual 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 affected and the valve.
- Wear protective clothing, safety gloves, respiratory protection and eye protection.
Safety instructions and measures

**WARNING**

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

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

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

1.3 Notes on possible property damage

**NOTICE**

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

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

- Flush the pipelines before start-up.

Risk of valve damage due to unsuitable medium properties.

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

- Only use the process medium specified for sizing.

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).
1.4 Warnings on the device

<table>
<thead>
<tr>
<th>Warning</th>
<th>Meaning of the warning</th>
<th>Location on the device</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Warning against moving parts" /></td>
<td>Warning against moving parts There is a risk of injury to hands or fingers through the stroking movement of the actuator and plug stem if they are inserted into the yoke while the air supply is connected to the actuator.</td>
<td><img src="image" alt="Location on the device" /></td>
</tr>
</tbody>
</table>
# 2 Markings on the device

## 2.1 Valve nameplate

![Fig. 2-1: Inscriptions on the valve nameplate](image)

<table>
<thead>
<tr>
<th>Item</th>
<th>Inscription meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Data Matrix code</td>
</tr>
<tr>
<td>2</td>
<td>Type designation</td>
</tr>
<tr>
<td>4</td>
<td>Material</td>
</tr>
<tr>
<td>5</td>
<td>Month and year of manufacture</td>
</tr>
<tr>
<td>6</td>
<td>Valve size:</td>
</tr>
<tr>
<td></td>
<td>DIN: <strong>DN</strong> · ANSI: <strong>NPS</strong></td>
</tr>
<tr>
<td>7</td>
<td>Pressure rating:</td>
</tr>
<tr>
<td></td>
<td>DIN: <strong>PN</strong> · ANSI: <strong>CL</strong></td>
</tr>
<tr>
<td>8</td>
<td>Serial number</td>
</tr>
<tr>
<td></td>
<td>Order number/item</td>
</tr>
<tr>
<td>10</td>
<td>Flow coefficient:</td>
</tr>
<tr>
<td></td>
<td>DIN: <strong>KVS</strong> · ANSI: <strong>CV</strong></td>
</tr>
<tr>
<td>11</td>
<td>Characteristic:</td>
</tr>
<tr>
<td></td>
<td>%: equal percentage · <strong>LIN</strong>: linear</td>
</tr>
<tr>
<td></td>
<td><strong>mod-lin</strong>: modified linear</td>
</tr>
<tr>
<td></td>
<td><strong>NO/NC</strong>: on/off service</td>
</tr>
<tr>
<td>12</td>
<td>Seat-plug seal:</td>
</tr>
<tr>
<td></td>
<td><strong>ME</strong>: metal · <strong>HA</strong>: carbide metal</td>
</tr>
<tr>
<td></td>
<td><strong>ST</strong>: metal base material with Stellite® facing</td>
</tr>
<tr>
<td></td>
<td><strong>KE</strong>: ceramic · <strong>PK</strong>: PEEK soft seal</td>
</tr>
<tr>
<td>13</td>
<td>Seat code (trim material): on request</td>
</tr>
<tr>
<td>14</td>
<td>Pressure balancing:</td>
</tr>
<tr>
<td></td>
<td>DIN: <strong>D</strong> · ANSI: <strong>B</strong></td>
</tr>
<tr>
<td></td>
<td>Version:</td>
</tr>
<tr>
<td></td>
<td><strong>M</strong>: mixing valve · <strong>V</strong>: flow-diverting valve</td>
</tr>
</tbody>
</table>

**Note**

Fig. 2-1 and the inscription table list all possible characteristics and options that may appear on a valve nameplate. Only the inscriptions relevant to the ordered Type 3251 Valve actually appear on the nameplate.

<table>
<thead>
<tr>
<th>Item</th>
<th>Inscription meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Noise reduction:</td>
</tr>
<tr>
<td></td>
<td>1: flow divider (ST) 1 · 2: ST 2 · 3: ST 3</td>
</tr>
<tr>
<td></td>
<td>1/PSA: ST 1 standard and integrated in seat for PSA valve</td>
</tr>
<tr>
<td></td>
<td><strong>AC-1/AC-2/AC-3/AC-5</strong>: AC trim, versions 1 to 5</td>
</tr>
<tr>
<td></td>
<td><strong>LK</strong>: perforated plug · <strong>LK1/LK2/ LK3</strong>: perforated plug with flow divider ST 1 to ST 3 · <strong>MHC1</strong>: multi-hole cage</td>
</tr>
<tr>
<td></td>
<td><strong>CC1</strong>: Combi Cage · <strong>ZT1</strong>: Zero Travel</td>
</tr>
<tr>
<td>16</td>
<td>Country of origin</td>
</tr>
<tr>
<td>17</td>
<td>PSA version: <strong>PSA</strong></td>
</tr>
<tr>
<td>18</td>
<td>Cage/seat style:</td>
</tr>
<tr>
<td></td>
<td><strong>CC</strong>: clamped cage, clamped seat</td>
</tr>
<tr>
<td></td>
<td><strong>SF</strong>: suspended cage, flanged seat</td>
</tr>
<tr>
<td></td>
<td><strong>FF</strong>: flanged cage, flanged seat</td>
</tr>
<tr>
<td>19</td>
<td>CE marking</td>
</tr>
<tr>
<td>20</td>
<td>ID of the notified body</td>
</tr>
<tr>
<td></td>
<td><strong>PED</strong>: Pressure Equipment Directive</td>
</tr>
<tr>
<td></td>
<td><strong>G1/G2</strong>: gases and vapors</td>
</tr>
<tr>
<td></td>
<td>Fluid group 1 = hazardous</td>
</tr>
<tr>
<td></td>
<td>Fluid group 2 = other</td>
</tr>
<tr>
<td></td>
<td><strong>L1</strong>: liquids</td>
</tr>
<tr>
<td></td>
<td>Fluid group 1 = hazardous</td>
</tr>
<tr>
<td></td>
<td>Fluid group 2 = other</td>
</tr>
<tr>
<td></td>
<td><strong>I/II/III</strong>: Category 1 to 3</td>
</tr>
<tr>
<td>21</td>
<td>Serial number</td>
</tr>
<tr>
<td>22</td>
<td>NE 53 (NAMUR Recommendation)</td>
</tr>
</tbody>
</table>
Markings on the device

The nameplate (80) is affixed to the yoke of the valve (see Fig. 2-2).

**Fig. 2-2: Nameplate position**

#### 2.2 Actuator nameplate

See associated actuator documentation.

#### 2.3 Material numbers

The seat and plug of the valves have an item number written on them. Specifying this item 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.

#### 2.4 Label when an adjustable packing is installed

An instructional label is affixed to the valve when an adjustable packing is installed (see Fig. 2-3).

**Fig. 2-3: Label when an adjustable packing is installed**
3 Design and principle of operation

Refer to Fig. 3-1.

The Type 3251 Valve is a single-acting globe valve. This valve is preferably combined with a SAMSON Type 3271 or Type 3277 Pneumatic Actuator. It can also be combined with other actuators.

The seat (4) and plug with plug stem (5) are installed in the body (1). The plug stem is connected to the actuator stem (A7) by the stem connector clamps (A26) and is sealed by a spring-loaded V-ring packing (15). The springs in the pneumatic actuator (A) are located either above or below the diaphragm (A4) depending on the selected fail-safe action. 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. 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.

Fail-safe action

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

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

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

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

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**

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We recommend the use of positioners with integrated diagnostic firmware (see section 3.3) for valves used for on/off service. The partial stroke test included in this software helps prevent a shut-off valve normally in its end position from seizing up or getting jammed.
Fig. 3-1: Type 3251 Valve with Type 3271 Pneumatic Actuator (left) and Type 3277 Pneumatic Actuator (right)
3.1 Versions

With insulating section/bellows seal
The modular design allows an insulating section or bellows seal to be fitted to the standard valve version.

Actuators
In these instructions, the preferable combination with a SAMSON 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.

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.

The basic pneumatic actuator can be replaced by an actuator with additional handwheel, a pneumatic piston actuator or an electric actuator (see Information Sheet ► T 8300).

3.2 Additional fittings

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

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

Insulation
Control valves can be insulated to reduce heat energy transfer.
Refer to the instructions in the 'Installation' section.

Test connection
Versions with bellows seal fitted with a test connection (G ½") at the top flange allow the sealing ability of the bellows to be monitored.

Particularly for liquids and vapors, we recommend installing a suitable leakage indicator (e.g. a contact pressure gauge, an outlet to an open vessel or an inspection glass).

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

Noise reduction
Trims with flow dividers can be used to reduce noise emission (see ► T 8081).
3.3 Valve accessories

Information Sheet ▶ T 8350

3.4 Technical data

The nameplates on the valve and actuator provide information on the control valve version. See the ‘Markings on the device’ section.

Note
More information is available in Data Sheet ▶ T 8052.

Compliance
The Type 3251 Valve bears both the CE and EAC marks of conformity.

<table>
<thead>
<tr>
<th>Seal (12 on nameplate)</th>
<th>ME, ST</th>
<th>ME, ST</th>
<th>PT, PK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure balancing (14 on nameplate)</td>
<td>–</td>
<td>D/B</td>
<td>–</td>
</tr>
<tr>
<td>Leakage class (according to IEC 60534-4)</td>
<td>Min. IV</td>
<td>Min. IV</td>
<td>VI</td>
</tr>
</tbody>
</table>

Leakage class
Depending on the version, the following leakage class applies:

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

Temperature range
Depending on the version, the control valve is designed for a temperature range from –10 to +220 °C (14 to 428 °F). The use of an insulating section or bellows seal can extend the temperature range from –196 to +550 °C (–325 to +1022 °F) depending on the properties of the materials used.
## Dimensions and weights

Table 3-1 to Table 3-4 provide a summary of the dimensions and weights of the standard version of Type 3251 Valve. The lengths and heights in the dimension diagrams are shown on page 3-9.

Dimensions in mm · Weights in kg

### Table 3-1: Dimensions of Type 3251 Valve, up to NPS 6

<table>
<thead>
<tr>
<th>Valve</th>
<th>NPS</th>
<th>½</th>
<th>1</th>
<th>1½</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DN</td>
<td>15</td>
<td>25</td>
<td>40</td>
<td>50</td>
<td>80</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Class 150</td>
<td>in</td>
<td>7.25</td>
<td>7.25</td>
<td>8.75</td>
<td>10.00</td>
<td>11.75</td>
<td>13.88</td>
<td>17.75</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>184</td>
<td>184</td>
<td>222</td>
<td>254</td>
<td>298</td>
<td>352</td>
<td>451</td>
</tr>
<tr>
<td>Class 300</td>
<td>in</td>
<td>7.50</td>
<td>7.75</td>
<td>9.25</td>
<td>10.50</td>
<td>12.50</td>
<td>14.50</td>
<td>18.62</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>190</td>
<td>197</td>
<td>235</td>
<td>267</td>
<td>318</td>
<td>368</td>
<td>473</td>
</tr>
<tr>
<td>Class 600</td>
<td>in</td>
<td>8.00</td>
<td>8.25</td>
<td>9.88</td>
<td>11.25</td>
<td>13.25</td>
<td>15.50</td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>203</td>
<td>210</td>
<td>251</td>
<td>286</td>
<td>337</td>
<td>394</td>
<td>508</td>
</tr>
<tr>
<td>Class 900</td>
<td>in</td>
<td>8.50</td>
<td>10.00</td>
<td>12.00</td>
<td>14.50</td>
<td>15.00</td>
<td>18.00</td>
<td>24.00</td>
</tr>
<tr>
<td></td>
<td>mm</td>
<td>216</td>
<td>254</td>
<td>305</td>
<td>368</td>
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## Design and principle of operation

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**Table 3-2: Dimensions of Type 3251 Valve, NPS 8 and larger**

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## Design and principle of operation

### Valve

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| Class 1500     | in  |      |      |      |      |       |     |
|                | mm  |      |      |      |      |       |     |
| Class 2500     | in  |      |      |      |      |       |     |
|                | mm  |      |      |      |      |       |     |

1) NPS 10, Class 150 to 300: 17.40” or 442 mm
2) NPS 10, Class 600 to 900: 20.43” or 519 mm
3) H8 = 25.59” or 650 mm with 250 mm seat bore
Design and principle of operation

Dimensional drawings

Table 3-3: Weights for standard version of Type 3251 up to DN 150

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<td>kg</td>
<td>On request</td>
<td>34</td>
<td>57</td>
<td>72</td>
<td>158</td>
<td>225</td>
<td>560</td>
</tr>
<tr>
<td>Class 2500</td>
<td>lbs</td>
<td>On request</td>
<td>93</td>
<td>163</td>
<td>238</td>
<td>379</td>
<td>604</td>
<td>2198</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>On request</td>
<td>42</td>
<td>74</td>
<td>108</td>
<td>172</td>
<td>274</td>
<td>997</td>
</tr>
</tbody>
</table>
Design and principle of operation

### Table 3-4: Weights for standard version of Type 3251 in DN 200 and larger

<table>
<thead>
<tr>
<th>Valve without actuator</th>
<th>NPS</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 150</td>
<td>lbs</td>
<td>948</td>
<td>1892</td>
<td>2028</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>430</td>
<td>858</td>
<td>920</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 300</td>
<td>lbs</td>
<td>948</td>
<td>1892</td>
<td>2028</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>430</td>
<td>858</td>
<td>920</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 600</td>
<td>lbs</td>
<td>1096</td>
<td>1609</td>
<td>2535</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>497</td>
<td>730</td>
<td>1150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 900</td>
<td>lbs</td>
<td>1157</td>
<td>2844</td>
<td>3263</td>
<td></td>
<td>5732</td>
<td>2600</td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>525</td>
<td>1290</td>
<td>1480</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1500</td>
<td>lbs</td>
<td>1949</td>
<td>4630</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>884</td>
<td>2100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 2500</td>
<td>lbs</td>
<td>3990</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>kg</td>
<td>1810</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- T 8052 for valves with bellows seal, insulating section or heating jacket
- The associated actuator documentation applies to actuators, e.g. for SAMSON pneumatic actuators:
  - T 8310-1 for Type 3271 or Type 3277 Pneumatic 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
4 Shipment and on-site transport

The work described in this section is only to be performed by personnel qualified for the assignment accordingly.

4.1 Accepting the delivered goods

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Check that the specifications on the valve nameplate match the specifications in the delivery note. See the 'Markings on the device' section for nameplate details.
2. Check the shipment for transportation damage. Report any damage to SAMSON and the forwarding agent (refer to delivery note).
3. Determine the weight and dimensions of the units to be lifted and transported in order to select the appropriate lifting equipment and lifting accessories. Refer to the transport documents and the 'Technical data' section.

4.2 Removing the packaging from the valve

Observe the following sequence:

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

4.3 Transporting and lifting the valve

**DANGER**

Risk due to suspended loads falling.

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

**WARNING**

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

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

**WARNING**

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

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

**WARNING**

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

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

- Observe the guideline weight for manual handling: 15 to max. 55 kg taking into account age, gender and physical fitness.
- Observe the occupational health and safety regulations valid in the country of use.

**NOTICE**

Risk of valve damage due to incorrectly attached slings.

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

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

**Tip**

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

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

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

**Tip**

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

4.3.1 Transporting the valve

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

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

**Transport instructions**

- Protect the control valve against external influences (e.g. impact).
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
− Protect the piping and any mounted valve accessories against damage.
− Protect the control valve against moisture and dirt.
− The permissible transportation temperature of standard control valves is −20 to +65 °C (−4 to +149 °F).

**Note**

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

### 4.3.2 Lifting the valve

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

**Lifting instructions**

− Use a hook with safety latch (see Fig. 4-1) to secure the slings from slipping during lifting and transporting.
− Secure slings against slipping.
− Make sure the slings can be removed from the valve once it has been installed into the pipeline.

**Fig. 4-1:** Lifting points on the control valve: up to NPS 6 (left) and with welding ends (middle) · NPS 6 and larger with additional lashing point on the actuator (right)
Shipment and on-site transport

- Prevent the control valve from tilting or tipping over.
- Do not leave loads suspended when interrupting work for longer periods of time.
- Make sure that the axis of the pipeline is always horizontal during lifting and the axis of the plug stem is always vertical.
- Make sure that the additional sling between the lashing point on the actuator and rigging equipment (hook, shackle etc.) does not bear any load when lifting valves larger than NPS 6. The sling only protects the control valve from tilting while being lifted. Before lifting the control valve, tighten the sling.

a) Version with flanges

1. Attach one sling to each flange of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 4-1).
2. NPS 6 and larger: attach another sling to the lashing point 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 the 'Installation' section).
6. After installation in the pipeline, check whether the flanges are bolted tight and the valve in the pipeline holds.
7. Remove slings.

b) 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. 4-1).
2. Secure the slings attached to the body against slipping using a connector.
3. NPS 6 and larger: attach another sling to the lashing point 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.
6. Install the valve into the pipeline (see the 'Installation' section).
7. After installation, check whether the weld seams hold.
8. Remove connector and slings.

4.4 Storing the valve

**NOTICE**

*Risk of valve damage due to improper storage.*

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

**Note**

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

**Storage instructions**

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

**Special storage instructions for elastomers**

Elastomer, e.g. actuator diaphragm

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

**Tip**

Our after-sales service can provide more detailed storage instructions on request.
5 Installation

The work described in this section is only to be performed by personnel qualified for the assignment accordingly.

5.1 Installation conditions

Work position

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

Plant operators must ensure that, after installation of the device, the operating personnel can perform all necessary work safely and easily access the device from the work position.

Pipeline routing

The inlet and outlet lengths (see Table 5-1) vary depending on several variables and process conditions and are intended as recommendations. Contact SAMSON if the lengths are significantly shorter than the recommended lengths.

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

- Observe the inlet and outlet lengths (see Table 5-1). Contact SAMSON if the valve conditions or states of the medium process deviate.

- Install the valve free of stress and with the least amount of vibrations as possible. Read Mounting position and Support or suspension in this section.

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

Mounting position

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

In the following versions, the valve must be installed with the actuator on top:

- Valves in NPS 4 and larger
- Valves with insulating section for low temperatures below –10 °C (14 °F)

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

Support or suspension

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

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

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

Vent plugs

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). Further-
more, the vent plugs allow air intake to prevent a vacuum from forming in the device.

- Locate the vent plug on the opposite side to the work position of operating personnel.
- During connection of valve accessories, make sure that they are easily accessible and can be operated safely from the work position.

### 5.2 Preparation for installation

Before installation, make sure the following conditions are met:
- The valve is clean.
- The valve and all valve accessories (including piping) are not damaged.
- The valve data on the nameplate (type designation, valve size, material, pressure rating and temperature range) match the plant conditions (size and

#### Table 5-1: 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>Vapor</td>
<td>( Ma \leq 0.3 ) 1)</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>( 0.3 \leq Ma \leq 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; 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>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>

1) No saturated steam
pressure rating of the pipeline, medium temperature etc.). See the 'Markings on the device' section for nameplate details.

- The requested or required additional pipe fittings (see the 'Additional fittings' section) have been installed or prepared as necessary before installing the valve.

**NOTICE**

*Risk of control valve damage due to incorrect insulation.*

- Only insulate control valves with insulating section or bellows seal up to the bonnet flange of the valve body for medium temperatures below 0 °C (32 °F) and above 220 °C (428 °F). If the insulating section is insulated, it will not function properly.
- Do not insulate valves mounted to comply with NACE MR 0175 requirements.

Proceed as follows:

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

**Note**

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

- For steam applications, dry the pipelines. Moisture will damage the inside of the valve.
- Check any mounted pressure gauges to make sure they function properly.

- When the valve and actuator are already assembled, check the tightening torques of the bolted joints (► AB 0100). Components may loosen during transport.

### 5.3 Mounting the device

Proceed as follows for assembly and to prepare for start-up of the valve.

**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).
5.3.1 Mounting the actuator onto the valve

⚠️ WARNING

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

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

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

Versions with V-port plug

To achieve the best flow conditions inside the valve, the V-port plug must always be installed with the port that releases the flow first when the valve opens facing toward the valve outlet. This is the largest of the three V-shaped ports (see Fig. 5-1).

➤ When mounting the actuator, turn the plug stem of the valve to correctly align the V-port plug.

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

5.3.2 Installing the valve into the pipeline

⚠️ NOTICE

Premature wear and leakage due to insufficient support or suspension.

➤ Support or suspend the valve sufficiently at suitable points.
Installation

a) Version with flanges

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

b) Version with welding ends

1. Proceed as described above under Version with flanges, steps 1 to 4.
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. Attach a support or suspension on the valve, if necessary.

5.4 Testing the installed valve

**DANGER**

Risk of bursting due to incorrect opening of pressurized equipment or components. Valves and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of compressed medium can cause serious injury or even death.

Before working on the control valve:

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

**WARNING**

Risk of personal injury due to pressurized components and process medium escaping under pressure.

- Do not loosen the screw of the test connection while the valve is pressurized.

**WARNING**

Risk of hearing loss or deafness due to loud noise.

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

Accessories not fitted with noise-reducing fittings. Both can damage hearing.

⇒ Wear hearing protection when working near the valve.

**WARNING**

Crush hazard arising from actuator and plug stem moving.

⇒ Do not insert hands or finger into the yoke while the air supply is connected to the actuator.

⇒ Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.

⇒ Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.

⇒ Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

**WARNING**

Risk of personal injury due to preloaded springs.

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

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

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

### 5.4.1 Leak test

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

**Tip**

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

1. Close the valve.

2. Slowly apply the test medium to the inlet space upstream of the valve. A sudden surge in pressure and resulting high velocities can damage the valve.

3. Open the valve.

4. Apply the required test pressure.

Risk of personal injury due to exhaust air being vented.

While the valve is operating, the actuator or valve accessories may vent during closed-loop control or when the valve opens or closes.

⇒ Wear eye protection when working in close proximity to the control valve.
5. Check the valve for leakage to the atmosphere.
6. Depressurize the pipeline section and valve.
7. Rework any parts that leak (see information below under Adjusting the packing) and repeat the leak test.

Adjusting the packing
A label on the flange or yoke indicates whether an adjustable packing is installed (see the 'Markings on the device' section).

⚠️ NOTICE

Impaired valve functioning due to increased friction as a result of the threaded bushing being tightened too far.

- Make sure that the plug stem can still move smoothly after the threaded bushing has been tightened.

1. Tighten the threaded bushing gradually (by turning it clockwise) until the packing seals the valve.
2. Open and close the valve several times.
3. Check the valve for leakage to the atmosphere.
4. Repeat steps 1 and 2 until the packing completely seals the valve.

- If the adjustable packing does not seal properly, contact our after-sales service.

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

- 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.

5.4.3 Fail-safe position

- Shut off the signal pressure line.
- Check whether the valve moves to the fail-safe position (see the 'Design and principle of operation' section).

5.4.4 Pressure test
The plant operator is responsible for performing the pressure test.

💡 Tip

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

During the pressure test, make sure the following conditions are met:
- Retract the plug stem to open the valve.
- Observe the maximum permissible pressure for both the valve and plant.
6 Start-up

The work described in this section is only to be performed by personnel qualified for the assignment accordingly.

**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 safety gloves.

**WARNING**
Risk of personal injury due to pressurized components and process medium escaping under pressure.
- Do not loosen the screw of the test connection while the valve is pressurized.

**WARNING**
Risk of hearing loss or deafness due to loud noise.
Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions. Additionally, a brief loud noise may occur through the sudden venting of the pneumatic actuator (see 'Fail-safe position') or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.
- Wear hearing protection when working near the valve.

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

**WARNING**
Risk of personal injury due to exhaust air being vented.
While the valve is operating, the actuator or valve accessories may vent during closed-loop control or when the valve opens or closes.
- Wear eye protection when working in close proximity to the control valve.
Start-up

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

- The valve is properly installed into the pipeline (see the 'Installation' section).
- The leak and function tests have been completed successfully (see 'Testing the installed valve' in the 'Mounting and assembly' section).
- The prevailing conditions in the plant section concerned meet the valve sizing requirements (see information under 'Intended use' in the 'Safety instructions and measures' section).

Start-up/putting the regulator back into operation

1. Allow the valve to cool down or warm up to reach ambient temperature before start-up when the ambient temperature and process medium temperature differ greatly or the medium properties require such a measure.

2. Slowly open the shut-off valves in the pipeline. Slowly opening these valves prevents a sudden surge in pressure and resulting high velocities that can damage the valve.

3. Check the valve to ensure it functions properly.
7 Operation

Immediately after completing start-up or putting the valve back into operation (see the 'Start-up' section), the valve is ready for use.

**WARNING**

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

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

- Allow components and pipelines to cool down or heat up.
- Wear protective clothing and safety gloves.

**WARNING**

*Risk of personal injury due to pressurized components and process medium escaping under pressure.*

- Do not loosen the screw of the test connection while the valve is pressurized.

**WARNING**

*Risk of hearing loss or deafness due to loud noise.*

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

- Wear hearing protection when working near the valve.

**WARNING**

*Cush hazard arising from actuator and plug stem moving.*

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

**WARNING**

*Risk of personal injury due to exhaust air being vented.*

While the valve is operating, the actuator or valve accessories may vent during closed-loop control or when the valve opens or closes.

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

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

7.2 Manual operation
Valves with actuators with a handwheel can be manually closed or opened in case of supply air failure.
# 8 Malfunctions

## 8.1 Troubleshooting

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Possible reasons</th>
<th>Recommended action</th>
</tr>
</thead>
</table>
| Actuator and plug stem does not move on demand.                | Actuator is blocked.                                   | Check attachment. Unblock the actuator. 
**WARNING!** A blocked actuator or plug stem (e.g. due to seizing up after remaining in the same position for a long time) can suddenly start to move uncontrollably. Injury to hands or fingers is possible if they are inserted into the actuator or valve. Before trying to unblock the actuator or plug stem, disconnect and lock the pneumatic air supply as well as the control signal. Before unblocking the actuator and piston stem, release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation. |
| Diaphragm in the actuator defective                            |                                                      | See associated actuator documentation.                                                                                                                                                                               |
| Signal pressure too low                                        |                                                      | Check the signal pressure. Check the signal pressure line for leakage.                                                                                                                                              |
| Jolting movement of the actuator and plug stem                | Version with adjustable packing ²: packing not tightened correctly | Tighten the packing correctly (see information under 'Adjusting the packing' in the 'Testing the installed valve' section).                                                                                                                                                       |
| Actuator and plug stem does not stroke through the entire range.| Signal pressure too low                              | Check the signal pressure. Check the signal pressure line for leakage.                                                                                                                                              |
|                                                                | Travel stop active                                    | See associated actuator documentation.                                                                                                                                                                               |
|                                                                | Incorrect setting of valve accessories                | Check the settings of the valve accessories.                                                                                                                                                                         |
| Increased flow through closed valve (seat leakage)            | Dirt or other foreign particles deposited between the seat and plug. | Shut off the section of the pipeline and flush the valve.                                                                                                                                                           |
|                                                                | Valve trim, particularly with soft seat, is worn.    | Replace seat and plug (see the 'Servicing' section) or contact our after-sales service.                                                                                                                              |
### 8.2 Emergency action

The plant operator is responsible for emergency action to be taken in the plant.

In the event of a valve malfunction:

1. Close the shut-off valves upstream and downstream of the control valve to stop the process medium from flowing through the valve.

2. Perform troubleshooting (see section 8.1).

3. Rectify those malfunctions that can be remedied based on the instructions provided here. Contact our after-sales service in all other cases.

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

The work described in this section is only to be performed by personnel qualified for the assignment accordingly.

The following documents are also necessary for servicing the valve:

- Mounting and operating instructions for the mounted actuator, e.g. EB 8310-X for Type 3271 or Type 3277 Pneumatic Actuator
- AB 0100 for tools, tightening torques and lubricant

⚠️ DANGER

Risk of bursting due to incorrect opening of pressurized equipment or components.
Valves and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of compressed medium can cause serious injury or even death.

Before working on the control valve:

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

⚠️ WARNING

Risk of personal injury due to pressurized components and process medium escaping under pressure.

⇒ Do not loosen the screw of the test connection while the valve is pressurized.

⚠️ WARNING

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

⇒ Wear hearing protection when working near the valve.

⚠️ WARNING

Crush hazard arising from actuator and plug stem moving.

⇒ Do not insert hands or finger into the yoke while the air supply is connected to the actuator.
⇒ Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.

⇒ Allow components and pipelines to cool down or heat up.
⇒ Wear protective clothing and safety gloves.
Servicing

- Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.
- Before unblocking the actuator and plug stem after they have become blocked (e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

**WARNING**

Risk of personal injury due to exhaust air being vented.
While the valve is operating, the actuator or valve accessories may vent during closed-loop control or when the valve opens or closes.
- Wear eye protection when working in close proximity to the control valve.

**WARNING**

Risk of personal injury due to preloaded springs.
Actuators with preloaded springs are under tension. They can be identified by the long bolts protruding from the bottom of the actuator.
- Before starting any work on the actuator, relieve the compression from the preloaded springs (see associated actuator documentation).

**WARNING**

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

**WARNING**

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).

**NOTICE**

Risk of valve damage due to the use of unsuitable lubricants.
- Only use lubricants approved by SAMSON (☞ AB 0100).
The control valve was checked by SAMSON before it left the factory.

- Certain test results certified by SAMSON lose their validity when the valve is opened. Such testing includes seat leakage and leak tests.
- The product warranty becomes void if service or repair work not described in these instructions is performed without prior agreement by SAMSON’s After-sales Service.
- Only use original spare parts by SAMSON, which comply with the original specifications.

### 9.1 Periodic testing

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

#### Tip

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

---

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

<table>
<thead>
<tr>
<th>Inspection and testing</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check the markings, labels and nameplates on the valve for their readability and completeness.</td>
<td>Immediately renew damaged, missing or incorrect nameplates or labels.</td>
</tr>
<tr>
<td>Clean any inscriptions that are covered with dirt and are illegible.</td>
<td></td>
</tr>
<tr>
<td>Check the pipe connections and gaskets on the valve and actuator for leakage.</td>
<td>Check the bolted joint (tightening torque).</td>
</tr>
<tr>
<td>Replace the gasket on the flanged joint as described in section 9.4.</td>
<td></td>
</tr>
<tr>
<td>Version with adjustable packing ²): adjust the packing (see information under ‘Adjusting the packing’ in the ‘Testing the installed valve’ section) or replace the packing ¹) (see section 9.4).</td>
<td></td>
</tr>
</tbody>
</table>
### Servicing

<table>
<thead>
<tr>
<th>Inspection and testing</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check the test connection and bellows seal (if used) for external leakage. <strong>WARNING!</strong> Risk of personal injury due to pressurized components and process medium escaping under pressure. Do not loosen the screw of the test connection while the valve is pressurized.</td>
<td>Put the control valve out of operation (see the 'Decommissioning' section). To repair the bellows section, contact our after-sales service (see the 'Repairs' section).</td>
</tr>
<tr>
<td>Check the valve's seat leakage.</td>
<td>Shut off the section of the pipeline and flush the valve to remove any dirt and/or deposited foreign particles between the seat and plug. Replacing the seat and plug (see section 9.4)</td>
</tr>
<tr>
<td>Check the valve for external damage (e.g. corrosion).</td>
<td>Remove any damage immediately. If necessary, put the control valve out of operation (see the 'Decommissioning' section).</td>
</tr>
<tr>
<td>Check the valve accessories to ensure they are mounted properly.</td>
<td>Tighten the connections of the valve accessories.</td>
</tr>
<tr>
<td>Check to ensure that the actuator and plug stem move smoothly.</td>
<td>Version with adjustable packing 2): tighten the packing correctly (see information under 'Adjusting the packing' in the 'Testing the installed valve' section). Unblock a blocked actuator and plug stem. <strong>WARNING!</strong> A blocked actuator or plug stem (e.g. due to seizing up after remaining in the same position for a long time) can suddenly start to move uncontrollably. Injury to hands or fingers is possible if they are inserted into the actuator or valve. Before trying to unblock the actuator or plug stem, disconnect and lock the pneumatic air supply as well as the control signal. Before unblocking the actuator and piston stem, release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.</td>
</tr>
<tr>
<td>If possible, check the valve's fail-safe position by briefly interrupting the air supply.</td>
<td>Put the control valve out of operation (see the 'Decommissioning' section). Identify the cause for the malfunction and rectify it (see the 'Troubleshooting' section).</td>
</tr>
</tbody>
</table>

1) Only replace the packing in versions without bellows seal
2) See the 'Markings on the device' section
Fig. 9-1: Standard version of Type 3251 with Type 3271 Actuator (left) and Type 3251 in version with insulating section (right)
9.2 Preparing the valve for service work

1. Lay out the necessary material and tools to have them ready for the service work.
2. Put the control valve out of operation (see the 'Decommissioning' section).
3. Remove the actuator from the valve. See associated actuator documentation.

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

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

The following service work can be performed after preparation is completed:
- Replacing the gasket (see section 9.4.1)
- Replacing the packing (see section 9.4.2)
- Replacing the seat and plug (see section 9.4.3)

9.3 Mounting the valve after service work

1. Mount actuator. See associated actuator documentation.
2. Adjust lower or upper signal bench range. See associated actuator documentation.
3. Put the control valve back into operation (see the 'Start-up' section). Make sure the requirements and conditions for start-up or putting the valve back into operation are met.

9.4 Service work

Before performing any service work, preparations must be made to the control valve (see section 9.2).

After all service work is completed, check the control valve before putting it back into operation (see the 'Testing the installed valve' section).

9.4.1 Replacing the gasket

Tip
Risk of control valve damage due to incorrect servicing.
- The gasket can only be replaced when all the following conditions are met:
  - The valve size is ≤NPS 4.
  - The valve does not have a balanced plug.
  - The valve does not have a flow divider.
To replace the gasket in other valve versions, contact our after-sales service.

a) Standard version

1. Undo the body nuts (14) gradually in a crisscross pattern.
2. Lift the flange (2) and plug with plug stem (5) off the body (1).
3. Remove the gasket (17). Carefully clean the sealing faces in the valve body (1) and on the flange (2).
4. Insert a new gasket (17) into the body.
5. Place the flange (2) onto the body.
   Version with V-port plug: place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See the 'Mounting the actuator onto the valve' section.
6. Firmly press the plug (5) into the seat (4). Fasten down the flange (2) with the body nuts (14). Tighten the nuts gradually in a crisscross pattern. Observe tightening torques.

b) Version with insulating section or bellows seal

1. Undo the body nuts (14) gradually in a crisscross pattern.
2. Lift the insulating section (21) and plug with plug stem (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. Place the insulating section (21) onto the body.
   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 the 'Mounting the actuator onto the valve' section.
6. Firmly press the plug (5) into the seat (4). Fasten down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a crisscross pattern. Observe tightening torques.

9.4.2 Replacing the packing

Risk of control valve damage due to incorrect servicing.

The packing can only be replaced when all the following conditions are met:
- The valve size is ≤NPS 4.
- The valve does not have a balanced plug.
- The valve does not have a bellows seal.
- The standard or ADSEAL packing is installed in the valve.

To replace the packing in other valve versions, contact our after-sales service.
a) Standard version

Standard packing (PTFE)
1. Unscrew the castellated nut (92) and lift the yoke (3) off the flange (2).
2. Undo the body nuts (14) gradually in a crisscross pattern.
3. Lift the flange (2) and plug with plug stem (5) off the body (1).
4. Unthread the stem connector nut (9) and lock nut (10) from the plug stem.
5. Unscrew the threaded bushing (8).
6. Pull the plug with plug stem (5) out of the flange (2).
7. Pull the entire packing out of the packing chamber using a suitable tool.
8. Renew damaged parts. Clean the packing chamber thoroughly.
9. Apply a suitable lubricant to all the packing parts and to the plug stem (5).
10. Slide the plug with plug stem (5) into the flange (2).
11. Place the flange (2) together with the plug stem and plug (5) onto the body.
**Version with V-port plug:** place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See the 'Mounting the actuator onto the valve' section.
12. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Observe the proper sequence (see Fig. 9-2).
13. Firmly press the plug (5) into the seat (4). Fasten down the flange (2) with the body nuts (14). Tighten the nuts gradually in a crisscross pattern. Observe tightening torques.
14. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
15. Place yoke (3) on the flange (2) and fasten tight using the castellated nut (92).
16. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem.

ADSEAL packing
1. Proceed as described in Standard packing (PTFE), steps 1 to 11.
2. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Observe the proper sequence (see Fig. 9-3).
3. Slide the seals (15.2) over the plug stem. Insert the wire of the red spacer ring (15.1) into the groove of the retaining ring. Slide the retaining ring over the plug stem.
4. Insert the red spacer ring (15.1) between the threaded bushing (8) and retaining ring. See Fig. 9-3.
5. Proceed as described in Standard packing (PTFE), steps 13 to 16.
b) **Version with insulating section**

**Standard packing (PTFE)**

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

2. Undo the body nuts (14) gradually in a crisscross pattern.

3. Lift the insulating section (21) and plug with plug stem (5) off the body (1).

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

5. Unscrew the threaded bushing (8).

6. Pull the plug with plug stem (5) out of the insulating section (21).

7. Pull the entire packing out of the packing chamber using a suitable tool.

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

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

10. Slide the plug with plug stem (5) into the insulating section (21).

11. Place the insulating section (21) together with the plug stem and plug (5) onto the body.

---

**Fig. 9-2:** Standard packing: NPS ½ to 1 ½ (left) and NPS 2 to 4 (right)

- 8 Threaded bushing
- 11 Spring
- 12 Washer
- 16 Packing ring
- 19 Spacer
**Servicing**

**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 the 'Mounting the actuator onto the valve' section.

12. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Observe the proper sequence (see Fig. 9-2).

13. Firmly press the plug (5) into the seat (4). Fasten down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a crisscross pattern. Observe tightening torques.

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

---

**Fig. 9-3:** ADSEAL packing: NPS ½ to 1½ (left) and NPS 2 to 4 (right)

- 8 Threaded bushing
- 11 Spring
- 12 Washer
- 15 Packing (entire)
- 15.1 Shim with retaining ring
- 15.2 Seal
- 16 Packing ring
- 18 Bushing
- 19 Spacer
15. Place yoke (3) on the insulating section (21) and fasten tight using the castellated nut (92).

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

**ADSEAL packing**
1. Proceed as described in Standard packing (PTFE), steps 1 to 11.
2. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Observe the proper sequence (see Fig. 9-3).
3. Slide the seals (15.2) over the plug stem. Insert the wire of the red spacer ring (15.1) into the groove of the retaining ring. Slide the retaining ring over the plug stem.
4. Insert the red spacer ring (15.1) between the threaded bushing (8) and retaining ring. See Fig. 9-3.
5. Proceed as described in Standard packing (PTFE), steps 13 to 16.

**9.4.3 Replacing the seat and plug**

**NOTICE**
**Risk of control valve damage due to incorrect servicing.**
→ Seat and plug can only be replaced when all the following conditions are met:
  – The valve size is ≤NPS 4.

→ The valve does not have a balanced plug.
→ The valve does not have a bellows seal.
→ The valve does not have a flow divider.
→ The valve does not have a AC trim.
→ The standard or ADSEAL packing is installed in the valve.

→ To replace seat and plug in other valve versions, contact our after-sales service.

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
</table>

**Risk of damage to the facing of the seat and plug due to incorrect servicing.**
→ Always replace both the seat and plug.

**Tip**
When replacing the seat and plug, we also recommend replacing the packing (see section 9.4.2).

**a) Standard version**
1. Unscrew the castellated nut (92) and lift the yoke (3) off the flange (2).
2. Undo the body nuts (14) gradually in a crisscross pattern.
3. Lift the flange (2) and plug with plug stem (5) off the body (1).
4. Replace the gasket as described in section 9.4.1.
5. Unthread the stem connector nut (9) and lock nut (10) from the plug stem.
6. Unscrew the threaded bushing (8).
7. Pull the plug with plug stem (5) out of the flange (2).
8. Pull the entire packing out of the packing chamber using a suitable tool.
9. Make sure that the guide bushing (7) is not damaged. If necessary, replace the guide bushing using a suitable tool.
10. Unscrew the seat (4) using a suitable tool.
11. Apply a suitable lubricant to the thread and the sealing cone of the new seat.
13. Apply a suitable lubricant to all the packing parts and to the new plug stem (5). We recommend replacing the packing as well. See section 9.4.2.
14. Slide the new plug with plug stem (5) into the flange (2).
15. Place the flange (2) together with the plug stem and plug (5) onto the body (1).

**Version with V-port plug:** place the flange (2) onto the valve body, making sure that the largest V-shaped port of the V-port plug faces toward the valve outlet. See the 'Mounting the actuator onto the valve' section.

16. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool. Observe the proper sequence (see Fig. 9-2).
17. Firmly press the plug (5) into the seat (4). Fasten down the flange (2) with the body nuts (14). Tighten the nuts gradually in a crisscross pattern. Observe tightening torques.
18. Screw in the threaded bushing (8) and tighten it. Observe tightening torques.
19. Place yoke (3) on the flange (2) and fasten tight using the castellated nut (92).
20. Loosely screw the lock nut (10) and stem connector nut (9) onto the plug stem.

**b) Version with insulating section**

1. Unscrew the castellated nut (92) and lift the yoke (3) off the insulating section (21).
2. Undo the body nuts (14) gradually in a crisscross pattern.
3. Lift the insulating section (21) together with the plug stem and plug (5) off the body (1).
4. Replace the gasket as described in section 9.4.1.
5. Unthread the stem connector nut (9) and lock nut (10) from the plug stem (5).
6. Unscrew the threaded bushing (8).
7. Pull the plug with plug stem (5) out of the insulating section (21).
8. Pull the entire packing out of the packing chamber using a suitable tool.
9. Make sure that the guide bushing (7) is not damaged. If necessary, replace the guide bushing using a suitable tool.
10. Unscrew the seat (4) using a suitable tool.
11. Apply a suitable lubricant to the thread and the sealing cone of the new seat.


13. Apply a suitable lubricant to all the packing parts and to the new plug stem (5). We recommend replacing the packing as well. See section 9.4.2.

14. Slide the new plug with plug stem (5) into the insulating section (21).

15. 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 the 'Mounting the actuator onto the valve' section.

16. Carefully slide the packing parts over the plug stem extension into the packing chamber using a suitable tool. Observe the proper sequence (see Fig. 9-2).

17. Firmly press the plug (5) into the seat (4). Fasten down the insulating section (21) with the body nuts (14). Tighten the nuts gradually in a crisscross pattern. Observe tightening torques.

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

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

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

### 9.5 Ordering spare parts and operating supplies

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

**Spare parts**

See the Annex for details on spare parts.

**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.
Servicing
10 Decommissioning

The work described in this section is only to be performed by personnel qualified for the assignment accordingly.

⚠️ DANGER

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

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

Before working on the control valve:

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

⚠️ WARNING

Risk of personal injury due to pressurized components and process medium escaping under pressure.

- Do not loosen the screw of the test connection while the valve is pressurized.

⚠️ WARNING

Risk of hearing loss or deafness due to loud noise.

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

- Wear hearing protection when working near the valve.

⚠️ WARNING

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 safety gloves.

⚠️ WARNING

Crush hazard arising from actuator and plug stem moving.

- Do not insert hands or finger into the yoke while the air supply is connected to the actuator.
- Before working on the control valve, disconnect and lock the pneumatic air supply as well as the control signal.
- Do not impede the movement of the actuator and plug stem by inserting objects into the yoke.
- Before unblocking the actuator and plug stem after they have become blocked
Decommissioning

(e.g. due to seizing up after remaining in the same position for a long time), release any stored energy in the actuator (e.g. spring compression). See associated actuator documentation.

WARNING

Risk of personal injury due to exhaust air being vented.
While the valve is operating, the actuator or valve accessories may vent during closed-loop control or when the valve opens or closes.

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

WARNING

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

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

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

1. Close the shut-off valves upstream and downstream of the control valve to stop the process medium from flowing through the valve.

2. Completely drain the pipelines and valve.

3. Disconnect and lock the pneumatic air supply to depressurize the actuator.

4. If necessary, allow the pipeline and valve components to cool down.
11 Removal

The work described in this section is only to be performed by personnel qualified for the assignment accordingly.

⚠️ 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 safety gloves.

⚠️ WARNING

*Crush hazard arising from actuator and plug stem moving.*

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

⚠️ WARNING

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

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

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

⚠️ WARNING

*Risk of personal injury due to preloaded springs.*

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

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

Before removing the valve, make sure the following conditions are met:
- The control valve is put out of operation (see the 'Decommissioning' section).
11.1 Removing the valve from the pipeline

a) Version with flanges

1. Support the valve to hold it in place when separated from the pipeline (see the 'Shipment and on-site transport' section).
2. Unbolt the flange joint.
3. Remove the valve from the pipeline (see the 'Shipment and on-site transport' section).

b) Version with welding ends

1. Support the valve to hold it in place when separated from the pipeline (see the 'Shipment and on-site transport' section).
2. Cut the pipeline in front of the weld seam.
3. Remove the valve from the pipeline (see the 'Shipment and on-site transport' section).

11.2 Removing the actuator from the valve

See associated actuator documentation.
12 Repairs

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

⚠️ NOTICE

Risk of valve damage due to incorrect repair work.

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

12.1 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

1. Exceptions apply concerning some special device models ➤ www.samsongroup.com > Service & Support > After-sales Service.

2. Send an e-mail ➤ retouren@samsongroup.com to register the return shipment including the following information:
   - Type
   - Article no.
   - Configuration ID
   - Original order

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

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

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

4. Send the shipment to the address given on the RMA.

ℹ️ Note

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

➤ Observe local, national and international refuse regulations.

➤ Do not dispose of components, lubricants and hazardous substances together with your household waste.
14 Certificates

The declarations are included on the next pages:


− Declaration of conformity in compliance with Machinery Directive 2006/42/EC for Types 3251-1 and 3251-7 Control Valves on page 14-3

− Declaration of incorporation in compliance with Machinery Directive 2006/42/EC for the Type 3251 Valve with other actuators other than Types 3271 and 3277 Actuators on page 14-4
SAMSON erklärt in alleiniger Verantwortung für folgende Produkte:

<table>
<thead>
<tr>
<th>Gerät/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 ab DN150, gr. iron-Body ab DN100, Fluid/Fluids G2, L1, L2</td>
</tr>
<tr>
<td>Dreiwegeventil/Three-way Valve</td>
<td>240</td>
<td>3244</td>
<td>DIN, Gehäuse GG ab DN150; Gehäuse GG ab DN150, gr. iron-Body ab DN100, Fluid/Fluids G2, L1, L2</td>
</tr>
<tr>
<td>Tiefentemperaturventil/Cryogenic Valve</td>
<td>240</td>
<td>3248</td>
<td>DIN/ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>250</td>
<td>3251</td>
<td>DIN/ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Dreiwegeventil/Three-way Valve</td>
<td>250</td>
<td>3253</td>
<td>DIN/ANSI, Geh. Stahl u.a./Body Steel etc., alle Fluid/Fluids</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>250</td>
<td>3254</td>
<td>DIN/ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Splitt-Body-Ventil/Splitt-Body Valve</td>
<td>250</td>
<td>3258</td>
<td>DIN, alle Fluid/Fluids</td>
</tr>
<tr>
<td>IG-Eckventil/IG-Angle Valve</td>
<td>250</td>
<td>3259</td>
<td>DIN, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Dampfumformventil/Steam-converting Valve</td>
<td>280</td>
<td>3281</td>
<td>DIN/ANSI, alle Fluid/Fluids; Einzeldrosselscheibe mit Anschweißende/Single attenuation plate with welding end</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>V2001</td>
<td>3284</td>
<td>DIN, Geh. Stahl u.a./Body Steel etc., alle Fluid/Fluids</td>
</tr>
<tr>
<td>Dreiwegeventil/Three-way Valve</td>
<td>V2001</td>
<td>3286</td>
<td>DIN/ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Schrägsitzventil/Bevel-Valve</td>
<td>--</td>
<td>3288</td>
<td>DIN, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Drosselschalldämpfer/Silencer</td>
<td>3381</td>
<td>3381-1</td>
<td>DIN/ANSI, alle Fluid/Fluids; Einzeldrosselscheibe mit Anschweißender/Single attenuation plate with welding end</td>
</tr>
<tr>
<td>Dampfumformventil/Steam-converting Valve</td>
<td></td>
<td>3381-3</td>
<td>DIN/ANSI, alle Fluid/Fluids; Einzeldrosselscheibe mehrstufig mit Anschweißender/Single attenuation plate multi-stage with welding end</td>
</tr>
<tr>
<td>Dreiwegeventil/Three-way Valve</td>
<td></td>
<td>3381-4</td>
<td>DIN/ANSI, alle Fluid/Fluids; Einzeldrosselscheibe mehrstufig mit Anschweißender/Single attenuation plate multi-stage with welding end</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>240</td>
<td>3241</td>
<td>ANSI, Gehäuse C125 ab 5&quot;; Cast iron-Body C125 from 5&quot;, Fluid/Fluids G2, L1, L2</td>
</tr>
<tr>
<td>Tiefentemperaturventil/Cryogenic Valve</td>
<td>240</td>
<td>3246</td>
<td>DIN/ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Dreiwegeventil/Three-way Valve</td>
<td>250</td>
<td>3253</td>
<td>DIN, Gehäuse GG ab DN200, PF 16; Cast iron-Body from DN200, Fluid/Fluids G2, L1, L2</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>250</td>
<td>3291</td>
<td>ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Eckventil/Angle Valve</td>
<td>250</td>
<td>3296</td>
<td>ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Durchgangsventil/Globe Valve</td>
<td>589</td>
<td>3591</td>
<td>ANSI, alle Fluid/Fluids</td>
</tr>
<tr>
<td>Eckventil/Angle Valve</td>
<td>589</td>
<td>3596</td>
<td>ANSI, alle Fluid/Fluids</td>
</tr>
</tbody>
</table>

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


Angewandtes Konformitätsbewertungsverfahren/ Applied Conformity Assessment Procedure

<table>
<thead>
<tr>
<th>Modul H/ Module H</th>
<th>durch/ by Bureau Veritas 0062</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014/68/EU vom/of</td>
<td>15.05.2014</td>
</tr>
</tbody>
</table>

Das Qualitätssicherungssystem des Herstellers wird von folgender benannter Stelle überwacht/The Manufacturer’s Quality Assurance System is monitored by following Notified Body:
Bureau Veritas S. A. nr 0062 67/71, boulevard du Château, 92200 Neuilly-sur-Seine, France

Angewandte technische Spezifikation/Technical Standards used: DIN EN12516-2; DIN EN12516-3; ASME B16.34

Hersteller/Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt

Klaus Hörschken
Zentralabteilungsleiter / Head of Central Department
Entwicklung Ventile und Antriebe / R&D Valves and Actuators

Günther Scherer
Zentralabteilungsleiter / Head of Central Department
Qualitätsmanagement / Total Quality Management

SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt
Telefon: 069 4009-0 · Telefax: 069 4009-1507
E-Mail: samson@samson.de

Revision 01
EU DECLARATION OF CONFORMITY
TRANSLATION

Declaration of conformity according to Machinery Directive 2006/42/EC

For the following products:
Types 3251-1/-7 Pneumatic Control Valves consisting of Type 3251 Valve and
Type 3271 or Type 3277 Actuator plus one or more valve accessories listed under
"Product descriptions of the valve accessories"

We hereby declare that the machinery mentioned above complies with all applicable re-
quirements stipulated in Machinery Directive 2006/42/EC.

For product descriptions of the valve and actuator, refer to:
- Type 3251 Valve (DIN): Mounting and Operating Instructions EB 8051
- Type 3251 Valve (ANSI): Mounting and Operating Instructions EB 8052
- Types 3271 and 3277 Actuators: Mounting and Operating Instructions EB 8310-X

For product descriptions of the valve accessories, refer to:
- Type 4706-64 Supply Pressure Regulator: Mounting and Operating Instructions EB 8546, EB 8546-1
- Type 3756 Booster Valve: Mounting and Operating Instructions EB 3756
- Type 3726 Positioner: Mounting and Operating Instructions EB 8394
- TROVIS 3730-1/3 Positioners: Mounting and Operating Instructions EB 8494-X
- Types 3730-1/2/3 Positioners: Mounting and Operating Instructions EB 8394-1/2/3
- TROVIS 3753 Positioner: Mounting and Operating Instructions EB 8493
- Type 3766 Positioner: Mounting and Operating Instructions EB 8355-X
- Type 4703 Positioner: Mounting and Operating Instructions EB 8359-X
- Type 4705 Positioner: Mounting and Operating Instructions EB 8359-X
- Type 3953 Solenoid Valve: Mounting and Operating Instructions EB 3963
- Type 3957 Solenoid Valve: Mounting and Operating Instructions EB 3967
- Type 3968 Solenoid Valve: Mounting and Operating Instructions EB 3969
- Type 3758 Limit Switch: Mounting and Operating Instructions EB 8355
- Type 3776 Limit Switch: Mounting and Operating Instructions EB 3776
- Type 4746 Limit Switch: Mounting and Operating Instructions EB 8355
- Type 4747 Limit Switch: Mounting and Operating Instructions EB 4747
- Type 3708 Pneumatic Firing Valve: Mounting and Operating Instructions EB 8391

Referenced technical standards and/or specifications:
- VDI, VDMA, VGB: Leitfaden Maschinennisiclinie (2006/42/EG) – Bedeutung für Armaturen, May 2018
  [German only]
- VDI, VDMA, VGB: Zusatzdokument zum „Leitfaden Maschinennisiclinie (2006/42/EG) – Bedeutung für
Armaturen“ vom Mai 2018 [German only], based on DIN EN ISO 12103:2011-03

Comments:
- See mounting and operating instructions for residual hazards.
- Also observe the referenced documents listed in the mounting and operating instructions.

Persons authorized to compile the technical file:

SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany
Frankfurt am Main, 1 October 2019

Dr. Michael Heß
Director
Product Management and Technical Sales

Peter Schermesser
Director
Product Upgrades and ETO Valves and Actuators

Classification: Public SAMSON AKTIENGESELLSCHAFT Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
DECLARATION OF INCORPORATION
TRANSLATION

Declaration of Incorporation in Compliance with Machinery Directive 2006/42/EC

For the following products:
Type 3251 Globe Valve

We certify that the Type 3251 Globe Valves are partly completed machinery as defined in the Machinery Directive 2006/42/EC and that the safety requirements stipulated in Annex I, 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4 and 1.3.7 are observed. The relevant technical documentation described in Annex VII, part B has been compiled.

Products we supply must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive 2006/42/EC.

Operators are obliged to install the products observing the accepted industry codes and practices (good engineering practice) as well as the mounting and operating instructions. Operators must take appropriate precautions to prevent hazards that could be caused by the process medium and operating pressure in the valve as well as by the signal pressure and moving parts.

The permissible limits of application and mounting instructions for the products are specified in the associated data sheets as well as the mounting and operating instructions; the documents are available in electronic form on the Internet at .

For product descriptions of the valve, refer to:
- Type 3251 Valve (DIN): Mounting and Operating Instructions EB 8051
- Type 3251 Valve (ANSI): Mounting and Operating Instructions EB 8052

Referenced technical standards and/or specifications:
- VCI, VDMA, VGB: Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, May 2018
  [German only]

Comments:
- See mounting and operating instructions for residual hazards.
- Also observe the referenced documents listed in the mounting and operating instructions.

Persons authorized to compile the technical file:

SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany
Frankfurt am Main, 1 October 2019

Dr. Michael Haß
Director
Product Management and Technical Sales

Peter Scheermesser
Director
Product Upgrades and ETO Valves and Actuators

Revision no. 00

Classification: Public - SAMSON AKTIENGESELLSCHAFT · Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany

Page 1 of 1
Annex

15.1 Tightening torques, lubricants and tools
▶ AB 0100 for tools, tightening torques and lubricants

15.2 Spare parts

1 Body
2 Flange
3 Yoke
4 Seat
5 Plug
6 Bellows nut
7 Guide bushing
8 Threaded bushing (packing nut)
9 Stem connector nut
10 Lock nut
11 Spring
12 Washer
13 Stud bolt
14 Body nut
15 Packing (adjustable)
16 Packing
17 Body gasket
18 Bushing
19 Insulating section
20 Bellows seal
21 Guide bushing
22 Label (bellows seal or insulating section)
23/24 Fastening parts
25/26/31/34

29 Plug for version with bellows seal
30 Retaining washers
32 Bolt
33 Nut
37 Plug stem with metal bellows
39 Gasket
42/43 Screw plug with seal
44 Ring/ring nut
45 Packing ring
46 Gasket
47 Support
48 Hex screw
49 Hex screw
50 Lock
51 Guide (several guides only for version with graphite seal)
52 Ring (only for version with graphite seal)
53 Snap ring
54 Flow divider ST 2
55 Flow divider ST 1 or ST 3
56 Ring
57 Gasket
58 Nameplate
59 Grooved pin
60 Screw
61 Hanger
62 Travel indicator scale
63 Screw
64 Nameplate
65 Gasket
66 Nameplate
67 Grooved pin
68 Screw
69 Screw
70 Hanger
71 Travel indicator scale
72 Screw
73 Pin
74 Screw
75 Hanger
76 Travel indicator scale
77 Screw
78 Pin
79 Screw
80 Nameplate
81 Grooved pin
82 Screw
83 Hanger
84 Travel indicator scale
85 Screw
86 Nameplate
87 Grooved pin
88 Screw
89 Hanger
90 Travel indicator scale
91 Protective caps
92 Castellated nut
93 Expansion sleeve
94 Expansion sleeve
95 Protective caps
96 Castellated nut
97 Expansion sleeve
98 Protective caps
99 Castellated nut
100 Expansion sleeve
101 Bellows bonnet
102/103 Screw with snap

1) Version with balanced valve plug
2) Version with flow divider
15.3 After-sales service

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

E-mail address

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

Addresses of SAMSON AG and its subsidiaries

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

Required specifications

Please submit the following details:

− Order number and position number in the order
− Type, model number, nominal size and valve version
− Pressure and temperature of the process medium
− Flow rate in m³/h
− Bench range of the actuator (e.g. 0.2 to 1 bar)
− Is a strainer installed?
− Installation drawing