

MOUNTING AND OPERATING INSTRUCTIONS

The SAMSON logo consists of the word "SAMSON" in a bold, white, sans-serif font, centered within a solid black circle. This circle is itself centered within a white square frame.

EB 8048 EN

Translation of original instructions



Ball body version



Special version with packing

Type 3249 Valves with Type 3277 Actuator and integral positioner

Type 3249 Aseptic Angle Valve

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

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 (aftersaleservice@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

Note

Additional information

Tip

Recommended action

1	Safety instructions and measures	5
1.1	Notes on possible severe personal injury	8
1.2	Notes on possible personal injury	8
1.3	Notes on possible property damage	10
2	Markings on the device	12
2.1	Body inscription	12
2.2	Actuator nameplate	12
2.3	Material numbers	12
2.4	Label when an adjustable packing is installed	12
3	Design and principle of operation	14
3.1	Fail-safe positions	14
3.2	Versions	15
3.3	Additional fittings	17
3.4	Technical data	18
4	Shipment and on-site transport	22
4.1	Accepting the delivered goods	22
4.2	Removing the packaging from the valve	22
4.3	Transporting and lifting the valve	22
4.3.1	Transporting the valve	23
4.3.2	Lifting the valve	24
4.4	Storing the valve	25
5	Mounting	26
5.1	Installation conditions	26
5.2	Preparation for installation	27
5.3	Mounting the device	28
5.3.1	Mounting the actuator onto the valve	29
5.3.2	Installing the valve into the pipeline	29
5.4	Testing the installed valve	30
5.4.1	Leak test	31
5.4.2	Travel motion	32
5.4.3	Fail-safe position	32
5.4.4	Pressure test	32
6	Start-up	33
7	Operation	35
7.1	CIP (cleaning-in-place)	36
7.2	SIP (sterilization-in-place)	36

Contents

8	Malfunctions	37
8.1	Troubleshooting	37
8.2	Emergency action	38
9	Servicing.....	39
9.1	Periodic testing	41
9.2	Preparing the valve for service work	41
9.3	Mounting the valve after service work.....	42
9.4	Service work.....	43
9.4.1	Replacing the diaphragm and plug	43
9.4.2	Replacing the packing	44
9.5	Ordering spare parts and operating supplies	44
10	Decommissioning	45
11	Disassembly.....	47
11.1	Removing the valve from the pipeline.....	48
11.2	Removing the actuator from the valve	48
12	Repairs	49
12.1	Returning devices to SAMSON	49
13	Disposal.....	50
14	Certificates.....	51
15	Annex.....	54
15.1	Tightening torques, lubricants and tools	54
15.2	Spare parts	54
15.3	After-sales service	56

1 Safety instructions and measures

Intended use

The SAMSON Type 3249 Angle 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 angle valve is suitable for use in aseptic applications (e.g. in the pharmaceutical and food industries).

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.

Safety instructions and measures

Personal protective equipment

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

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

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

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

Revisions and other modifications

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

Safety 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 upon supply air or control signal failure (see section 3.1). The fail-safe action of the actuator is the same as its direction of action and is specified on the nameplate of SAMSON actuators.

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.

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.

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 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 meet the requirements in the Regulation (EC) No. 1935/2004 for materials and articles intended to come into contact with food

The control valves comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. Valves with a CE marking have a declaration of conformity, which includes information about the applied conformity assessment procedure. Section 14 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 0165-1).

Referenced documentation

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

- See Data Sheet ► T 8048 for technical data as well as dimensions and weights
- 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.

⚠ 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 and eye protection.

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).

! NOTICE

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

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

→ Only use lubricants approved by SAMSON (▶ AB 0100).

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

→ Only use lubricants approved by SAMSON (▶ AB 0100).

2 Markings on the device

2.1 Body inscription

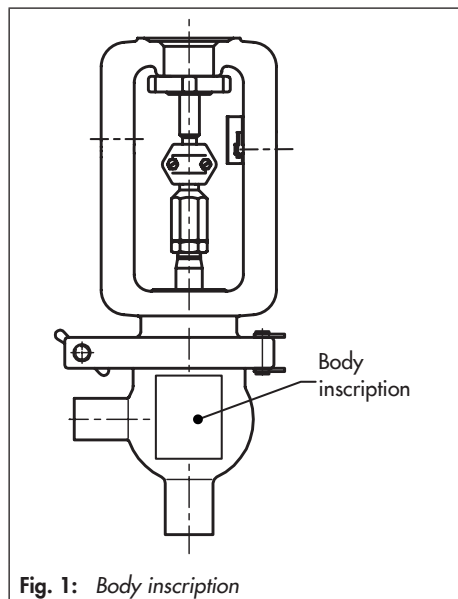
The details on the valve version are lasered onto the front and back of the valve body (see Fig. 3). No nameplate is used.

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.



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).



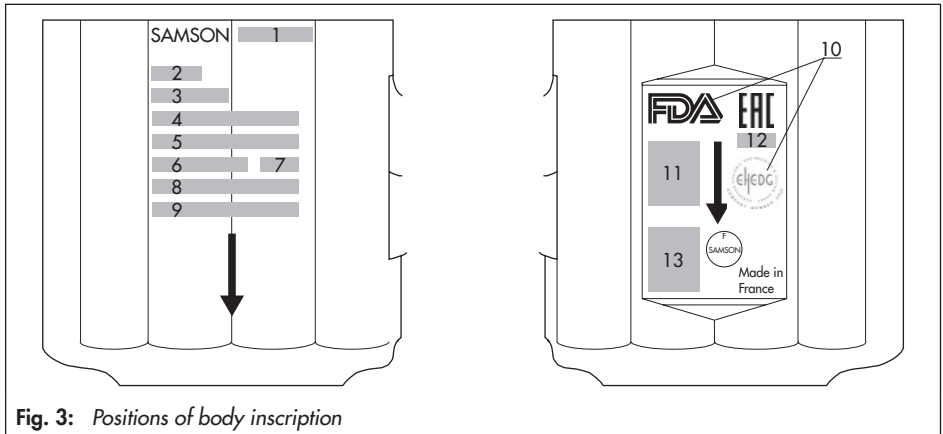


Fig. 3: Positions of body inscription

Legend for Fig. 3

- | | | | |
|---|--|----|--|
| 1 | Device modification index | 8 | Serial number |
| 2 | Valve size:
DIN: DN · ANSI: NPS | 9 | Configuration ID |
| 3 | Body material | 10 | Compliance with food industry requirements |
| 4 | Perm. operating gauge pressure at 20 °C
bar/psi | 11 | CE marking or "Art. 4, Abs. 3" (PED 2014/68/EU) |
| 5 | Max. operating temperature °C/°F | 12 | If applicable, EAC mark including month and year of production |
| 6 | Flow coefficient:
$K_v \cdot C_v$
Characteristic:
% = equal percentage · L = linear | 13 | SAMSON material marking |
| 7 | Seat/plug seal:
ME: metal
PK: soft PEEK seal
PT: soft PTFE seal | | |

3 Design and principle of operation

The Type 3249 Angle Valve is preferably combined with either a Type 3271 Pneumatic Actuator or a Type 3277 Pneumatic Actuator with integral positioner attachment.

The standard valve has a ball body design with clamp connection of the bonnet without packing. The stem is sealed by an EPDM diaphragm with PTFE facing. The standard valve has a bar stock body in valve size DN 15 to 100 with welding ends according to DIN EN 10357 Series A or NPS ½ to 4 with welding ends according to BS 4825. Special versions of the bar stock version are available in DN 15 to 80 or NPS ½ to 3, up to K_{VS} 60, with bolted-on valve bonnet and additional PTFE V-ring packing.

The valve is suitable for aseptic applications. It has a valve body designed without cavities, allowing it to be cleaned or sterilized prior to the production process according to the CIP (clean-in-place) or SIP (sterilization-in-place) method.

The pressure of the special valve version with packing (4.2) can be monitored at the test connection (4.4).

The medium flows through the valve in the direction indicated by the arrow. The plug (3) is moved by changing the signal pressure acting on the diaphragm of the actuator (8.4).

The plug stem (6) is connected to the actuator stem (8.1) by the stem connector (7). The plug stem is sealed by the diaphragm (6.3)

and in the special version additionally by the backup packing (4.1, 4.2, 4.3).

3.1 Fail-safe positions

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

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

Actuator stem extends (FA)

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

Actuator stem retracts (FE)

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



Tip

The direction of action of the Type 3271 and Type 3277 Pneumatic Actuator can be reversed, if required. Refer to the mounting and operating instructions of the pneumatic actuator:

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

3.2 Versions

Materials

The valve body can be manufactured on request in various materials (e.g. 1.4435).

Connections

The Type 3249 Valve can also be delivered with the following end connections:

- Welding ends according to DIN EN ISO 1127, ISO 2037 (SMS) or NFA 49249
- Threaded connections according to DIN 11851 (11887)
- Threaded connections according to SMS or IDF
- Clamp connections according to ISO 2852, DIN 32676 or BS 4825
- Flanges
- Aseptic flanges according to DIN 11864 with groove or collar

Optionally, the valve is available with a test connection with nipple fitting

Actuators

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

- Observe the maximum permissible actuator force.

i Note

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

As an alternative, the control valve can be combined with a Type 3274 Electropneumatic Actuator.

Design and principle of operation

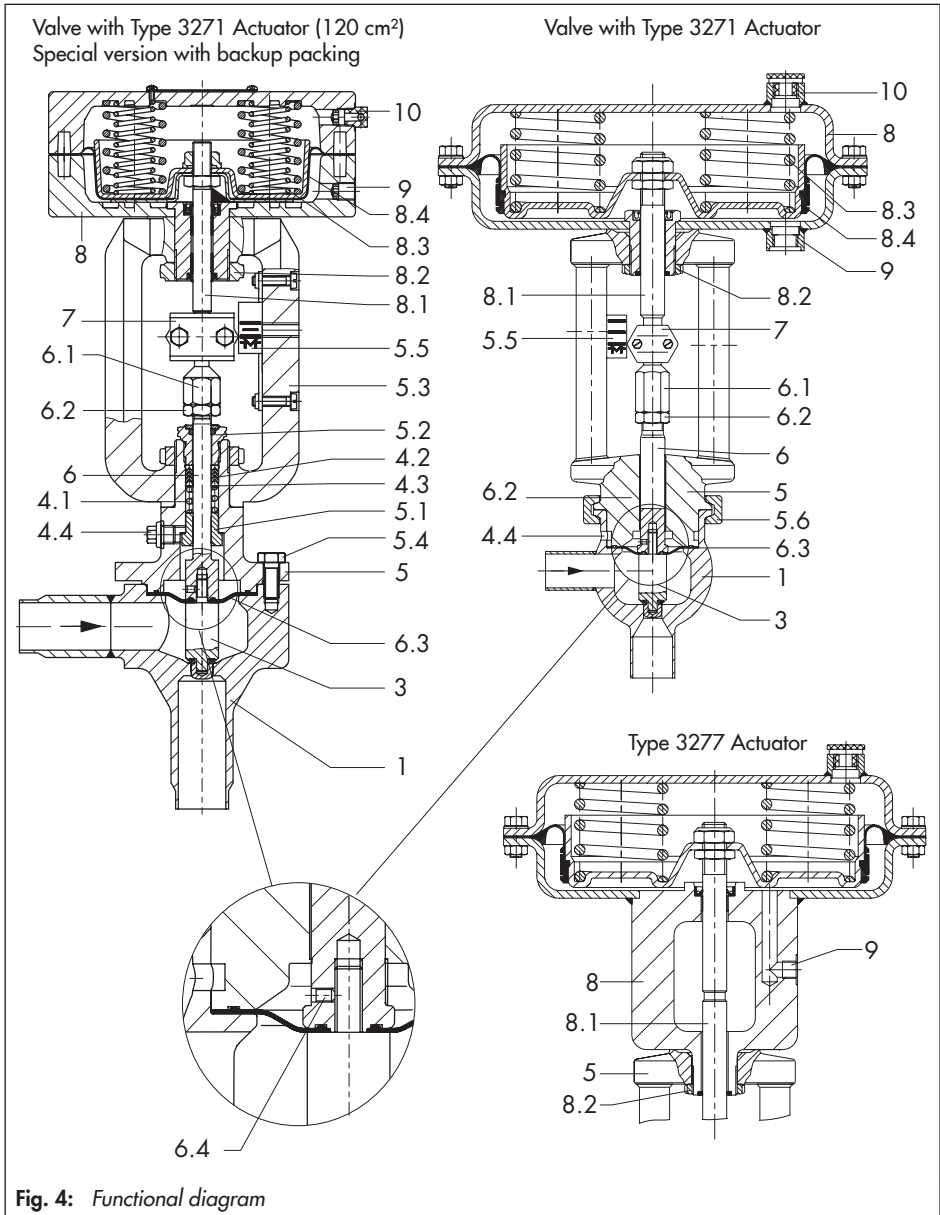


Fig. 4: Functional diagram

Legend for Fig. 4

1	Valve body	6	Plug stem
3	Plug	6.1	Stem connector nut
4.1	Spring	6.2	Lock nut
4.2	Packing	6.3	Diaphragm
4.3	Washer	6.4	Grub screw
4.4	Test connection	7	Stem connector
5	Valve bonnet	8	Actuator
5.1	Guide bushing	8.1	Actuator stem
5.2	Threaded bushing	8.2	Ring nut
5.3	Yoke	8.3	Compression spring
5.4	Screws	8.4	Rolling diaphragm
5.5	Travel indicator scale	9	Signal pressure connection
5.6	Clamp	10	Vent screw

3.3 Additional fittings**Safety guard**

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

Test connection

A pressure sensor can be connected at the test connection (4.4) in the valve bonnet of the special valve version with packing to monitor the diaphragm for leakage.

3.4 Technical data

The inscription on the valve body and the nameplate on the actuator provide information on the control valve version. See section 2.1 and the actuator documentation.

i Note

Further technical data for the valve are available in the data sheet ▶ T 8048, for actuators in the associated data sheets, for example ▶ T 8310-X for Type 3271 or Type 3277 Actuator.

Conformity

The Type 3249 Valve bears both the CE and EAC marks of conformity.



Application range

DIN or ANSI valve versions for aseptic applications in the food and pharmaceutical industries.

Valve size	DN 15 to 100	NPS ½ to 4
Maximum pressure	10 bar	150 psi
Temperature range	0 to 160 °C	32 to 320 °F

Leakage class

Depending on the version, the following leakage class applies:

Seal (7 on nameplate)	ME	PT, PK
Leakage class (acc. to IEC 60534-4 or ANSI/FCI 70-2)	Min. IV	VI

Noise emissions

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

Dimensions and weights

Table 1: Dimensions for Types 3249-1 and 3249-7 Control Valves · Dimensions in mm

Table 1.1: Standard version (N) with ball body and special version (S) with backup packing

Valve	DN	15	20	25	32	40	50	65	80	100	
	NPS	½	¾	1	1¼	1½	2	2½	3	4	
Rated travel	mm	7.5			15				30		
Welding ends for pipes according to DIN 11850 Series 2	L (N)	70 ¹⁾	70 ¹⁾	70 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	150 ¹⁾	150 ¹⁾
	L (S)	90	90	90	105	105	115	115	115	–	–
	Ød2	19	23	29	35	41	53	70	85		104
	t	1.5	1.5	1.5	1.5	1.5	1.5	2	2		2
Welding ends for pipes according to DIN EN ISO 1127	L (N)	70 ¹⁾	70 ¹⁾	70 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	150 ¹⁾	150 ¹⁾
	L (S)	90	90	90	105	105	115	115	115	–	–
	Ød2	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9		114.3
	t	1.6	1.6	2	2	2	2.6	2.6	2.6		2.6
Welding ends for pipes according to BS 4825	L (N)	70 ¹⁾	70 ¹⁾	70 ¹⁾	–	105 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	150 ¹⁾	150 ¹⁾
	L (S)	90	90	90		105	115	115	115	–	–
	Ød2	12.7	19.1	25.4		38.1	50.8	63.5	76.2		97.6
	t	1.6	1.6	1.6		1.6	1.6	1.6	1.6		2
Welding ends for pipes according to ISO 2037 (SMS), NFA 49-249	L (N)	–	–	70 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	150 ¹⁾	150 ¹⁾
	L (S)			90	105	105	115	115	115	–	–
	Ød2			25	33.7	38	51	63.5	76.1		104 ¹⁾
	t			1.2	1.2	1.2	1.2	1.6	1.6		2 ¹⁾
Thread according to DIN 11887	L1 (N)	64 ¹⁾	64 ¹⁾	64	100 ¹⁾	100 ¹⁾	100 ¹⁾	100	115	155 ¹⁾	155 ¹⁾
	Ød1	16	20	26	32	38	50	66	81		100
	ØC1	34 x 1/8"	44 x 1/8"	52 x 1/8"	58 x 1/8"	65 x 1/8"	78 x 1/8"	95 x 1/8"	110 x 1/4"		130 x 1/4"
Thread according to SMS 1146	L2 (N)	–	–	55 ¹⁾	105 ¹⁾	105 ¹⁾	105 ¹⁾	105	110	155 ¹⁾	155 ¹⁾
	Ød1			22.6	29.6	35.6	48.6	60.3	72.9		100 ¹⁾
	ØC2			40 x 1/8"	48 x 1/8"	60 x 1/8"	70 x 1/8"	85 x 1/8"	98 x 1/8"		125 x 1/4"

Design and principle of operation

Valve	DN	15	20	25	32	40	50	65	80		100
	NPS	½	¾	1	1¼	1½	2	2½	3		4
Clamp connections acc. to ISO 2852 (pipeline acc. to ISO 2037)	L3 (N)	60.3 ¹⁾	60.3 ¹⁾	60.3 ¹⁾	88.9 ¹⁾	88.9 ¹⁾	88.9 ¹⁾	88.9 ¹⁾	95.3 ¹⁾	150 ¹⁾	150 ¹⁾
	Ød1			22.6	31.3	35.6	48.6	60.3	72.9		97.6
	ØC3			50.5	50.5	50.5	64	77.5	91		119
Flanges acc. to DIN EN 1092-1 (EN 558-1, Series 8)	L4 (N)	90	95	100	105	115	125	145	155	155 ¹⁾	175
	Ød1	16	20	26	32	38	50	66	81		100
Common dimensions	A	80	80	80	110	110	110	110	110	155	155
	H1 (N)	225	228	231	257	260	265	275	280	300	310

¹⁾ Not standardized

Table 1.2: Dimensions for Type 3271 and Type 3277 Actuators

Actuator area		cm ²	120	240	350	700
Diaphragm ØD	mm		168	240	280	390
H ¹⁾	mm		69	62	82	199
H3 ²⁾	mm		110	110	110	190
H5	Type 3277 mm		88	101	101	101
Thread	Type 3271	M30x1.5				
	Type 3277	M30x1.5				
α	Type 3271	G ½ (½ NPT)	G ¼ (¼ NPT)	G ¾ (¾ NPT)	G ¾ (¾ NPT)	
α2	Type 3277	–	G ¾	G ¾	G ¾	

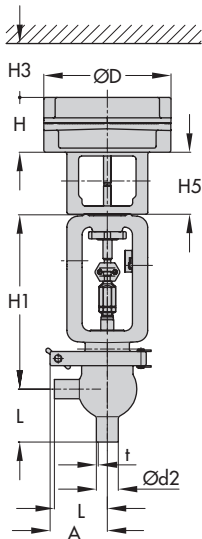
¹⁾ Height with welded-on lifting eyelet or height of eyebolt according to DIN 580. Height of the swivel hoist may differ. Actuators up to 350 cm² without lifting eyelet

²⁾ Minimum clearance required to remove the actuator

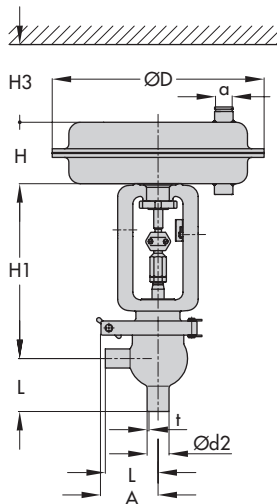
Table 2: Weights for Type 3249 Valve · Weights in kg

Valve	DN	15	20	25	32	40	50	65	80	100	
	NPS	½	¾	1	1¼	1½	2	2½	3	4	
Weight with welding ends	kg (approx.)	6			16			20		36	40 (30 mm travel)

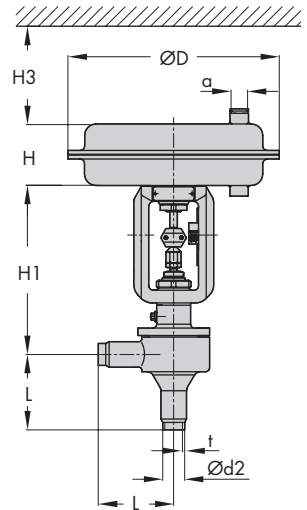
Dimensional drawings



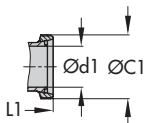
Type 3249-7, ball body with welding ends



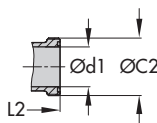
Type 3249-1, ball body with welding ends



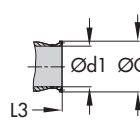
Type 3249-1, special version with welding ends



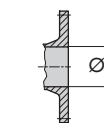
Threaded couplings according to DIN 11887



Threaded couplings according to SMS 1146



Clamp connections ISO 2852



Flange according to DIN EN 1092-1

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

4.2 Removing the packaging from the valve

Observe the following sequence:

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

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

4.3 Transporting and lifting the valve

⚠ DANGER

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).

⚠ 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

Lifting equipment (e.g. crane or forklift) can be used to transport heavy control valves.

- 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.

Shipment and on-site transport

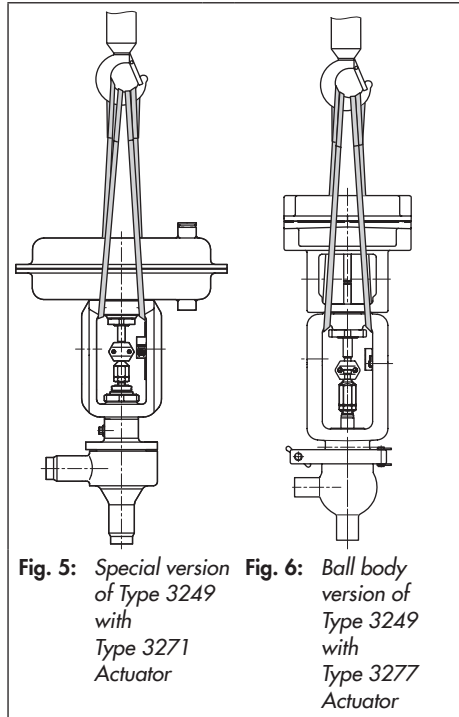
- Protect the piping and any mounted valve accessories against damage.
- Protect the control valve against moisture and dirt.
- The permissible transportation temperature of standard control valves is -20 to $+65$ °C (-4 to $+149$ °F).

i Note

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

- Make sure that the additional sling between the lashing point on the actuator and rigging equipment (hook, shackle etc.) does not bear any load. The sling only protects the control valve from tilting while being lifted. Before lifting the control valve, tighten the sling.

Lifting points on the control valve



4.3.2 Lifting the valve

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

Lifting instructions

- Use a hook with safety latch (see Fig. 5, Fig. 6 and Fig. 7) to secure the slings from slipping off the hook during lifting and transporting.
- Secure slings against slipping.
- Make sure the slings can be removed from the valve once it has been installed into the pipeline.
- Prevent the control valve from tilting or tipping over.
- Do not leave loads suspended when interrupting work for longer periods of time.
- Make sure that the axis of the pipeline is always horizontal during lifting and the axis of the plug stem is always vertical.

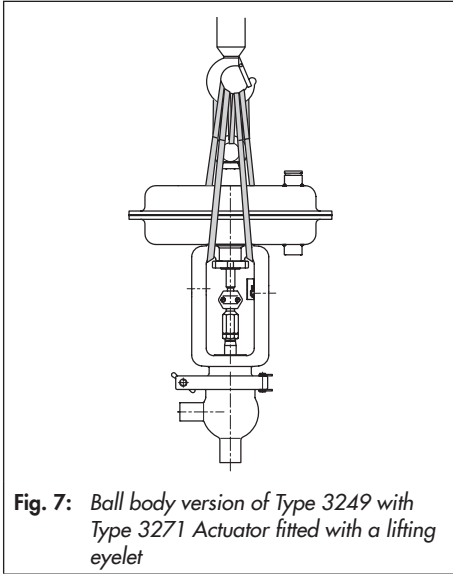


Fig. 7: Ball body version of Type 3249 with Type 3271 Actuator fitted with a lifting eyelet

Lifting the control valve

1. Carefully guide two slings through the yoke and attach them to the rigging equipment of the crane or forklift (see Fig. 5 and Fig. 6). Make sure that the actuator stem and valve accessories are not damaged.

For actuator versions with lifting eyelet, attach an additional sling to the lifting eyelet of the actuator and to the rigging equipment of the crane or forklift (see Fig. 7).

2. Carefully lift the control valve. Check whether the lifting equipment and accessories can bear the weight.
3. Move the control valve at an even pace to the site of installation.

4. Install the valve into the pipeline (see section 5.3.2).
5. After installation into the pipeline: depending on the type of connection (e.g. welding joint, flanged joint etc.) check whether the valve in the pipeline holds.
6. Remove 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

Mounting

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

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

5 Mounting

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 3) 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 3). 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.

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

Support or suspension

Depending on the valve version and mounting position, the control valve and pipeline can be supported or suspended. The plant engineering company is responsible for selecting and implementing a suitable support or suspension of the control valve.

Vent plugs

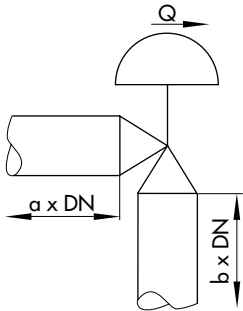
Vent plugs are screwed into the exhaust air ports of pneumatic and electropneumatic de-

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

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

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

Table 3: Inlet and outlet lengths



Q Flow rate
a Inlet length
b Outlet length

State of process medium	Valve conditions ^{1) 2)}	Inlet length a	Outlet length b
Gas	$Ma \leq 0.3$	2	4
Vapor	$Ma \leq 0.3$ ³⁾	2	4
Liquid	Free of cavitation/ $w < 10$ m/s	2	4
	Cavitation producing noise/ $w \leq 3$ m/s	2	4
	Cavitation producing noise/ $3 < w < 5$ m/s	2	10

1) Ma: Mach number (dimensionless quantity for velocity)

2) w: Flow velocity

3) No saturated steam

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 included in the body inscription (type designation, valve size, material, pressure rating and temperature range) match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.). For more details on the body inscription (see section 2).
- The requested or required additional pipe fittings (see section 3.3) have been installed or prepared as necessary before installing the valve.

Proceed as follows:

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

i Note

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

- ➔ For steam applications, dry the pipelines. Moisture will damage the inside of the valve.
- ➔ Check any mounted pressure gauges to make sure they function properly.
- ➔ When the valve and actuator are already assembled, check the tightening

torques of the bolted joints (▶ 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 contamination of the process medium through the use of unsuitable lubricants and/or contaminated tools and components.

- ➔ *Keep the valve and the tools used free from solvents and grease.*
 - ➔ *Make sure that only suitable lubricants are used (▶ AB 0100).*
-

! 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.

- To mount the actuator, proceed as described in the associated actuator documentation.
- After an actuator has been mounted, the travel indicator must be realigned. See associated actuator documentation.

5.3.2 Installing the valve into the pipeline

1. Close the shut-off valves in the pipeline at the inlet and outlet of the plant section while the valve is being installed.
2. Prepare the relevant section of the pipeline for installing the valve.

3. Remove the protective caps from the valve ports before installing the valve.
4. Lift the valve using suitable lifting equipment to the site of installation (see section 4.3.2). Observe the flow direction through the valve. The arrow on the valve indicates the direction of flow.

Valve with welding ends:

5. Completely retract the actuator stem to protect the plug from sparks during welding.

Alternatively:

Undo the clamp (5.6) and remove the entire valve-actuator extension from the valve body.

6. Weld the valve body free of stress into the pipeline.
If necessary, mount the valve-actuator extension back onto the valve body and fasten the clamp (5.6).

Valve with flanges, threaded ends or clamp connections:

5. Make sure that the correct flange gaskets are used.
6. Bolt the valve to the pipe free of stress or fasten the clamp connections to the pipe.

Further procedure:

7. 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-

cessories 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.

⚠ 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).

📌 NOTICE**Diaphragm damage through the use of an incompressible medium.**

Closing the valve when the shut-off valves upstream and downstream of the valve are closed may lead to the diaphragm rupturing in plants with liquid media flowing through them.

➔ Only close the valve when the shut-off valves upstream and downstream of the valve are open.

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.

📌 NOTICE**Valve malfunction due to a leaking diaphragm.**

➔ The screw at the test connection (4.4) can be replaced by a pressure sensor to monitor the diaphragm (6.3) for leakage.

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.
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 valve bonnet or yoke indicates whether an adjustable packing is installed (see section 2).

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 section 3.1).

5.4.4 Pressure test

The plant operator is responsible for performing the pressure test.

Tip

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

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.

⚠ NOTICE

Risk of impairment of aseptic or hygienic service.

In the version with backup packing, the test connection is sealed by a stopper.

➔ *To guarantee aseptic or hygienic service, connect a leakage detection device to the test connection.*

⚠ NOTICE

Diaphragm damage through the use of an incompressible medium.

Closing the valve when the shut-off valves upstream and downstream of the valve are closed may lead to the diaphragm rupturing in plants with liquid media flowing through them.

➔ *Only close the valve when the shut-off valves upstream and downstream of the valve are open.*

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

- The valve is properly installed into the pipeline (see section 5).
- The leak and function tests have been completed successfully (see section 5.4).
- The prevailing conditions in the plant section concerned meet the valve sizing requirements (see information under Intended use in section 1).

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 section 6), 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 loud noise may briefly occur through the sudden venting of the pneumatic actuator or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.

- Wear hearing protection when working near the valve.

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

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

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

While the valve is operating, 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.

⚠ NOTICE

Diaphragm damage through the use of an incompressible medium.

Closing the valve when the shut-off valves upstream and downstream of the valve are

Operation

closed may lead to the diaphragm rupturing in plants with liquid media flowing through them.

→ *Only close the valve when the shut-off valves upstream and downstream of the valve are open.*

! NOTICE

Diaphragm damage due to uncontrolled pressure surges.

→ *Avoid surges in signal pressure as they may damage the rolling diaphragm.*

7.1 CIP (cleaning-in-place)

CIP can be performed with commonly used cleaning fluids.

→ Observe the applicable hygiene regulations.

7.2 SIP (sterilization-in-place)

SIP can be performed using steam briefly at a temperature up to 180 °C.

→ Observe the applicable hygiene regulations.

8 Malfunctions

8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action
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 ¹⁾ : packing not tightened correctly	Tighten the packing correctly (see information under Adjusting the packing in section 5.4).
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.
	Plug has become detached.	Fasten plug and plug stem together (see section 9.4.1). Observe tightening torques.
	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 the plug (see section 9.4.1) or contact our after-sales service.

Malfunctions

Malfunction	Possible reasons	Recommended action
The valve leaks to the atmosphere (fugitive emissions).	Defective packing	Replace packing (see section 9.4.2) or contact our after-sales service.
	Version with adjustable packing ¹⁾ : packing not tightened correctly	Adjust the packing (see information under Adjusting the packing in section 5.4). Contact our after-sales service when it continues to leak.
	Diaphragm not correctly clamped into position.	Check that the diaphragm is correctly seated. If necessary, replace the diaphragm (see section 9.4.1). Check the tightening torque of the joint between plug and plug stem. Check the tightening torque of the joint between body and bonnet/flange.
	Diaphragm damaged.	Replace the diaphragm (see section 9.4.1).

¹⁾ See section 2.

i Note

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

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.

Putting the valve back into operation after a malfunction

See the 'Start-up' section.

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 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 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.

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 and eye protection.

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).

NOTICE

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

- Only use lubricants approved by SAMSON (▶ AB 0100).

! NOTICE

Risk of contamination of the process medium through the use of unsuitable lubricants and/or contaminated tools and components.

- Keep the valve and the tools used free from solvents and grease.
- Make sure that only suitable lubricants are used (▶ AB 0100).

i Note

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

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

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.

9.2 Preparing the valve for service work

Standard version

1. Put the control valve out of operation (see section 10).
2. Remove the actuator from the valve. See associated actuator documentation.
3. Unthread the lock nut (6.2) and stem connector nut (6.1) from the plug stem (6).
4. Undo the clamp connection between the valve body (1) and valve bonnet (5).
5. Lift the valve bonnet (5) together with the plug stem (6), plug (3) and diaphragm (6.3) off the body (1).
6. Pull the plug (3) with plug stem (6) and diaphragm (6.3) out of the valve bonnet (5).

Special version

1. Put the control valve out of operation (see section 10).
2. Remove the actuator from the valve. See associated actuator documentation.
3. Unthread the lock nut (6.2) and stem connector nut (6.1) from the plug stem (6).
4. Undo the hex screws (5.4).

Servicing

5. Lift the valve bonnet (5) together with the plug stem (6), plug (3) and diaphragm (6.3) off the body (1).
6. Unscrew the threaded bushing (5.2).
7. Unscrew screw or pressure sensor out of the test connection (4.4).
8. Pull the plug (3) with plug stem (6) and diaphragm (6.3) out of the valve bonnet (5).

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

- Replacing the diaphragm and plug (see section 9.4.1)
- Replacing the packing (see section 9.4.2)

9.3 Mounting the valve after service work

Standard version

1. Push the plug (3) together with plug stem (6) and diaphragm (6.3) into the valve bonnet (5).
2. Apply the lubricant suitable for foodstuffs (order no. 8150-9002) to the clamp (5.6) and the flanges of the valve bonnet (5) and valve body (1).
3. Carefully place the valve bonnet (5) together with the plug stem (6), plug (3) and diaphragm (6.3) onto the valve body (1).
4. Place the clamp (5.6) in position and tighten the clamp screw. Hit the clamp lightly with a plastic hammer and tighten the clamp screw again.

5. Repeat this procedure several times to tighten the clamp as far as it will go.
6. Screw the lock nut (6.2) and stem connector nut (6.1) onto the plug stem (6).
7. Mount actuator. See associated actuator documentation.
8. Adjust lower or upper signal bench range. See associated actuator documentation.
9. Put the control valve back into operation (see section 6). Make sure the requirements and conditions for start-up or putting the valve back into operation are met.

Special version

1. Push the plug (3) together with plug stem (6) and diaphragm (6.3) into the valve bonnet (5).
2. Carefully slide the packing parts over the plug stem into the packing chamber using a suitable tool.
3. Tighten the threaded bushing (5.2).
4. Place the valve bonnet (5) together with the plug stem (6), plug (3) and diaphragm (6.3) onto the body (1).
5. Apply a suitable lubricant to the hex screws (5.4).
6. Tighten the hex screws (5.4) on the valve bonnet (5) gradually in a crisscross pattern. Observe tightening torques.
7. Close and seal the test connection (4.4) with the screw or pressure sensor.
8. Screw the lock nut (6.2) and stem connector nut (6.1) onto the plug stem (6).

9. Mount actuator. See associated actuator documentation.
10. Adjust lower or upper signal bench range. See associated actuator documentation.
11. Put the control valve back into operation (see section 6). 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 start-up (see section 5.4).

9.4.1 Replacing the diaphragm and plug

1. Unscrew the grub screw (6.4).
2. Unscrew the plug stem (6) from the plug (3).
3. Remove the diaphragm (6.3).
4. Apply a suitable lubricant (order no. 1400-6991) to the thread of the plug stem (6).
5. Screw a new plug (3) onto the plug stem (6) using a suitable tool. Observe tightening torques.

Valve size		Tightening torque in Nm
DN	NPS	
15 to 25	½ to 1	10
32 to 100	1¼ to 4	70

6. Mark the side mounting position.
7. Remove the plug stem (6) again from the plug (3).
8. Insert a new diaphragm (6.3) into the new plug (3).
9. Screw the new plug (3) back onto the plug stem (6) again using a suitable tool. Align the plug stem with the mounted position mark made earlier. To do this, clamp the plug into a suitable clamping fixture and pull it with a suitable tool.
10. Remove the mounting position mark.
11. Secure the plug (3) with the grub screw (6.4).
12. Clamp the plug stem (6) into a suitable chuck.
13. Check the concentricity of the plug (3) to the plug stem (6). Observe the values listed in Table 4.
14. If the concentricity deviates, use a suitable tool (e.g. plastic hammer) and hit the plug until concentricity is achieved.



Tip
Instead of aligning the plug, the assembly (consisting of plug stem, diaphragm and plug) can be ordered from SAMSON.

Servicing

Table 4: *Concentricity of the plug · Version with Type 3271 or Type 3277 Actuator*

Valve size		Max. deviation in mm
DN	NPS	
15 to 65	½ to 2½	0.04
80 and 100	3 and 4	0.05

9.4.2 Replacing the packing

→ Pull the entire packing out of the packing chamber using a suitable tool. Renew the damaged parts and carefully clean the packing chamber.

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 Annex for details on spare parts.

Lubricant

See document ► AB 0100 for details on suitable lubricants.

Tools

See document ► AB 0100 for details on suitable tools.

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 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 loud noise may briefly occur through the sudden venting of the pneumatic actuator or pneumatic valve accessories not fitted with noise-reducing fittings. Both can damage hearing.

- Wear hearing protection when working near the valve.

⚠ WARNING

Crush hazard arising from actuator and plug stem moving.

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

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 and eye protection.

NOTICE

Diaphragm damage through the use of an incompressible medium.

Closing the valve when the shut-off valves upstream and downstream of the valve are closed may lead to the diaphragm rupturing in plants with liquid media flowing through them.

→ Only close the valve when the shut-off valves upstream and downstream of the valve are open.

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 or heat up.

11 Disassembly

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 and eye protection.

⚠ WARNING

Risk of personal injury due to preloaded springs.

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

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

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

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

11.1 Removing the valve from the pipeline

1. Support the valve to hold it in place when separated from the pipeline (see section 4.3).
2. Cut the pipeline in front of the weld seam.

Special version:

Undo the pipe joint depending on the type of end connection used (see section 5.3.2).

3. Remove the valve from the pipeline (see section 4.3.2).

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.

i Note

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

13 Disposal

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

14 Certificates

The declaration of conformity in accordance with Pressure Equipment Directive 2014/68/EU is provided on the following two pages:



DECLARATION UE DE CONFORMITE EU DECLARATION OF CONFORMITY EU-KONFORMITÄTSEKTLÄRUNG

1/2

Module A / Modul A

DC014
2019-02

Par la présente, SAMSON REGULATION SAS déclare sous sa seule responsabilité pour les produits suivants :
For the following products, SAMSON REGULATION SAS hereby declares under its sole responsibility:
SAMSON REGULATION SAS erklärt in alleiniger Verantwortung für folgende Produkte:

Appareils / Devices / Geräte	Type / Typ	Exécution / Version / Ausführung
Vanne de décharge / back pressure reducing valve / Überströmventil	2371-0	DIN & ANSI - corps en acier forgé / body of forged steel / Gehäuse Schmiedestahl DN 32 – 100 ¹⁾ P _{max} T=20°C 10 bar NPS 1 ¼ – 4 ¹⁾ P _{max} T=70°F 150 psi Tout type de fluides / all fluids / alle Fluide
Détendeur alimentaire / presseur reducing valve / Druckminderventil	2371-1	
Vanne de régulation passage droit / globe valve / Durchgangsventil	3241	DIN - corps en fonte grise / body of cast iron / Gehäuse Grauguss: GJL-250 DN 65 – 150 ¹⁾ PN16 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3241	DIN - corps en fonte sphéroïdale / body of spheroidal graphite iron / Gehäuse Sphäroguss : GJS-400-18-LT DN 50 ¹⁾ PN25 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3241	ANSI - corps en fonte grise / body of cast iron / Gehäuse Grauguss: A126 B CI 250 NPS 1 ½ - 3 ¹⁾ ; CI 125 NPS 2 ½ - 6 ¹⁾ Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
Vanne de régulation 3 voies / 3-way Valve / Drei-Wege-Stellventil	3244	DIN - corps en fonte grise / body of cast iron / Gehäuse Grauguss: GJL-250 DN 65 – 150 ¹⁾ PN16 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3244	DIN - corps en fonte sphéroïdale / body of spheroidal graphite iron / Gehäuse Sphäroguss : GJS-400-18-LT DN 50 ¹⁾ PN25 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3244	DIN & ANSI - corps en acier moulé / body of cast steel / Gehäuse Gusstahl DN 40 – 100 ¹⁾ NPS 1 ½ - 4 ¹⁾ Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
Vanne aseptique / Aseptic valve / Aseptisches Ventil	3249	DIN & ANSI - corps en acier forgé / body of forged steel / Gehäuse Schmiedestahl DN 32 – 100 ¹⁾ P _{max} T=20°C 10 bar NPS 1 ¼ – 4 ¹⁾ P _{max} T=70°F 150 psi Tout type de fluides / all fluids / alle Fluide
Vanne de régulation passage droit / globe valve / Durchgangsventil	3321	DIN - corps en fonte grise / body of cast iron / Gehäuse Grauguss: GJL-250 DN 65 – 100 ¹⁾ PN16 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3321	ANSI - corps en fonte grise / body of cast iron / Gehäuse Grauguss: A126 B CI 125 NPS 2 ½ - 4 ¹⁾ Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
Vanne de régulation 3 voies / 3-way Valve / Drei-Wege-Stellventil	3323	DIN - corps en fonte grise / body of cast iron / Gehäuse Grauguss: GJL-250 DN 65 – 100 ¹⁾ PN16 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3323	ANSI - corps en fonte grise / body of cast iron / Gehäuse Grauguss: A126 B CI 125 NPS 2 ½ - 4 ¹⁾ Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
Vanne à membrane / Diaphragm valve / Membran-Ventil	3345	DIN & ANSI corps en fonte sphéroïdale, aciers moulé & forgé / body of spheroidal graphite iron, cast & forged steel / Gehäuse Sphäroguss, Gusstahl & Schmiedestahl DN 32 – 100 ¹⁾ NPS 1 ¼ – 4 ¹⁾ Tout type de fluides / all fluids / alle Fluide
Vanne alimentaire / Sanitary valve / Hygienisches Ventil	3347	DIN & ANSI corps en aciers moulé & forgé / body of, cast & forged steel / Gehäuse Gusstahl & Schmiedestahl DN 65 – 125 ¹⁾ P _{max} T=20°C 16 bar NPS 2 ½ – 5 ¹⁾ P _{max} T=70°F 240 psi Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
Vanne aseptique / Aseptic valve / Aseptisches Ventil	3349	DIN & ANSI - corps en acier forgé / body of forged steel / Gehäuse Schmiedestahl DN 32 – 100 ¹⁾ P _{max} T=20°C 10 bar NPS 1 ¼ – 4 ¹⁾ P _{max} T=70°F 150 psi Tout type de fluides / all fluids / alle Fluide
Vanne Tout ou Rien / On-Off Valve / Auf-Zu Ventil	3351	DIN - corps en fonte grise / body of cast iron / Gehäuse Grauguss: GJL-250 DN 65 – 150 ¹⁾ PN16 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3351	DIN - corps en fonte sphéroïdale / body of spheroidal graphite iron / Gehäuse Sphäroguss : GJS-400-18-LT DN 50 ¹⁾ PN25 Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
	3351	ANSI - corps en fonte grise / body of cast iron / Gehäuse Grauguss: A126 B CI 250 NPS 1 ½ - 3 ¹⁾ ; CI 125 NPS 2 ½ - 6 ¹⁾ Fluides groupe 2 / fluids group 2 / Fluide Gruppe 2 ²⁾
Bride de mesure / Measure flange / Messflansch	5090	DIN & ANSI - corps en acier forgé / body of forged steel / Gehäuse Schmiedestahl DN 40 – 500 ¹⁾ NPS 1.5 – 20 ¹⁾
Tube de mesure / Measure tube / Messrohr	5091	DIN & ANSI - corps en acier forgé / body of forged steel / Gehäuse Schmiedestahl DN 40 – 500 ¹⁾ NPS 1.5 – 20 ¹⁾

¹⁾ les dimensions plus petites répondent à l'article 4 point 3 / smaller dimensions correspond to Article 4 (3) / Die kleineren Abmessungen entsprechen Artikel 4 Nummer 3.

²⁾ Tuyauterie visée à l'article 4 points 1.c) i) et ii) / Acc. to piping article 4 paragraphs 1.c) i) and ii) / Rohrleitung Artikel 4 Nummer 1.c) i) und ii)



DECLARATION UE DE CONFORMITE EU DECLARATION OF CONFORMITY EU-KONFORMITÄTSERKLÄRUNG

2/2

Module A / Modul A

DC014
2019-02

la conformité avec le règlement suivant : / the conformity with the following requirement: / die Konformität mit nachfolgender Anforderung:

La Directive du Parlement Européen et du Conseil d'harmonisation des lois des Etats Membres concernant la mise à disposition sur le marché d'équipements sous pression / Directive of the European Parliament and of the Council on the Harmonization of the laws of the Member States relating of the making available on the market of pressure equipment / Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Druckgeräten auf dem Markt	2014/68/UE 2014/68/EU	Du / of / vom 15.05.2014
Procédure d'évaluation de la conformité appliquée pour les fluides selon l'Article 4 § 1 Applied conformity assessment procedure for fluids according to Article 4 (1) Angewandtes Konformitätsbewertungsverfahren für Fluide nach Art. 4 Abs.1	Module A / Modul A	

Normes techniques appliquées / Technical standards applied / Angewandte technische Spezifikation :
DIN EN 12516-2, DIN EN 12516-3, ASME B16.34, DIN-EN 60534-4, DIN-EN 1092-1

Fabricant / manufacturer / Hersteller : Samson Régulation SAS, 1, rue Jean Corona, FR-69120 VAULX-EN-VELIN

Vaulx-en-Velin, le 07/02/19

Joséphine SIGNOLES-FONTAINE
Responsable QSE / QSE Manager

15 Annex

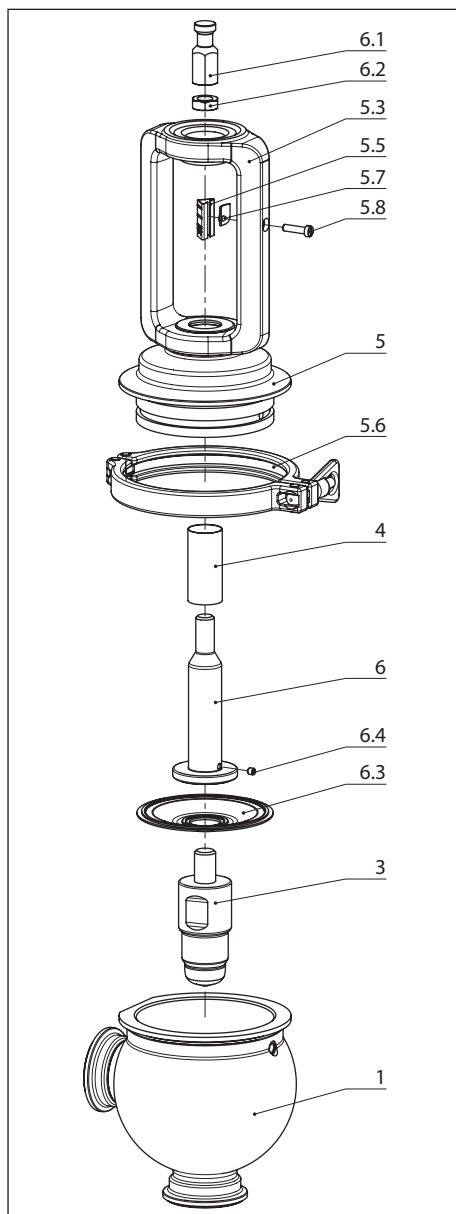
15.1 Tightening torques, lubricants and tools

► AB 0100 for tools, tightening torques and lubricants

15.2 Spare parts

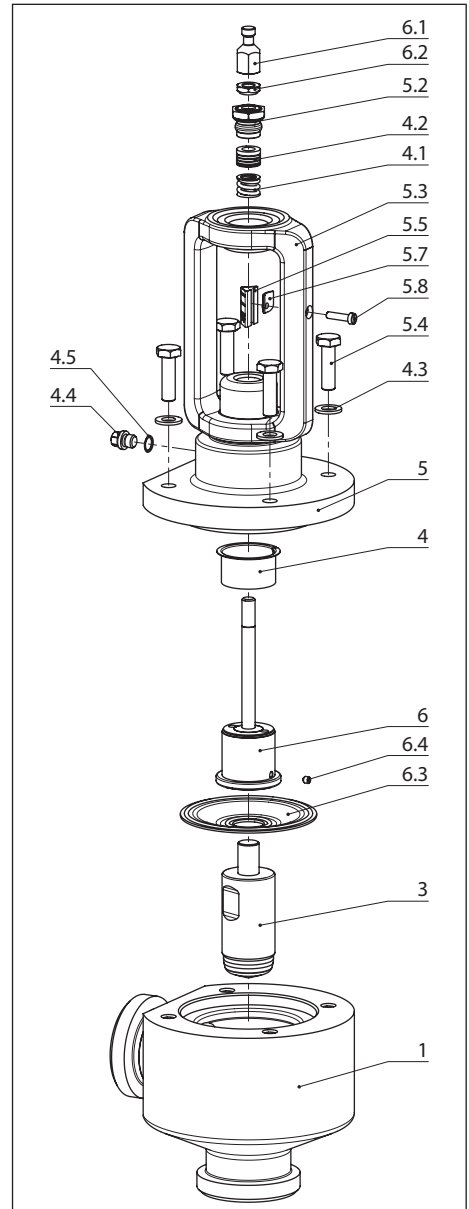
Standard version for Type 3271 and Type 3277 Actuators

- 1 Valve body
- 3 Plug
- 4 Bearing sleeve
- 5 Valve bonnet
- 5.3 Yoke
- 5.5 Travel indicator scale
- 5.6 Clamp
- 5.7 Retaining plate
- 5.8 Screw
- 6 Plug stem
- 6.1 Stem connector nut
- 6.2 Lock nut
- 6.3 Diaphragm
- 6.4 Grub screw



Special version with packing

- 1 Valve body
- 3 Plug
- 4 Bearing sleeve
- 4.1 Spring
- 4.2 Packing
- 4.3 Washer
- 4.4 Test connection
- 4.5 Seal for test connection
- 5 Valve bonnet
- 5.2 Threaded bushing
- 5.3 Yoke
- 5.4 Screws
- 5.5 Travel indicator scale
- 5.7 Retaining plate
- 5.8 Screw
- 6 Plug stem
- 6.1 Stem connector nut
- 6.2 Lock nut
- 6.3 Diaphragm
- 6.4 Grub screw



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

EB 8048 EN



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