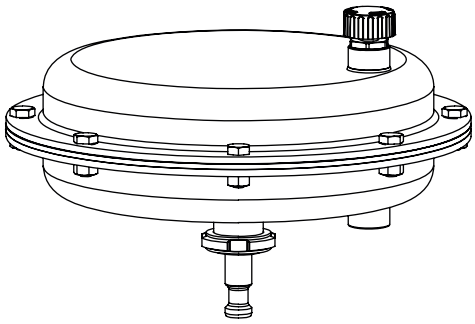
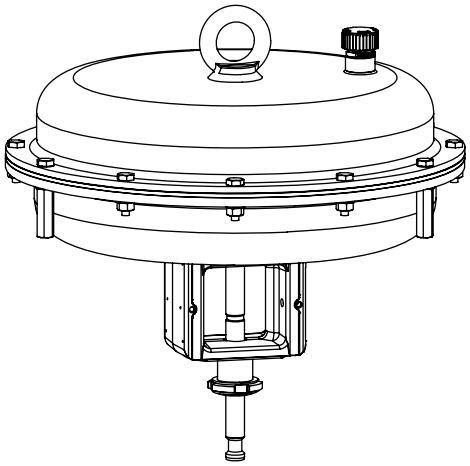
MOUNTING AND OPERATING INSTRUCTIONS

EB 8310-6 EN

Translation of original instructions



Type 3271



Type 3277

Type 3271 and Type 3277 Pneumatic Actuators

Actuator area: 240[1)], 350 and 700[1)] cm²

[1)] This documentation still applies to actuators with these actuator areas that are already in use.

Edition May 2026

Note on these mounting and operating instructions

These mounting and operating instructions (EB) assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices. The images shown in this document 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 additional questions not related to the contents of this document, contact SAMSON's After-sales Service (aftersalesservice@samsongroup.com).

Documents relating to the device, such as the mounting and operating instructions, are available on our website:
▶ https://www.samsongroup.com/en/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

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1 Safety instructions and measures

Intended use

The SAMSON Type 3271 and Type 3277 Actuators are designed for operating a mounted globe valve. In combination with the valve, the actuator is used to shut off the flow of liquids, gases or vapors in the pipeline. Depending on the version, the actuator is suitable for throttling or on/off service. The actuator can be used in processing and industrial plants.

The actuator is designed to operate under exactly defined conditions (e.g. thrust, travel). Therefore, operators must ensure that the actuator is only used in operating conditions that meet the specifications used for sizing the actuator at the ordering stage. In case operators intend to use the actuator in applications or conditions other than those 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 actuator 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 accessories connected to the actuator

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

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

Qualifications of operating personnel

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

Personal protective equipment

SAMSON recommends wearing the following personal protective equipment when handling the pneumatic actuator:

- Protective gloves and safety footwear when mounting or removing the actuator
- Eye protection and hearing protection while the actuator is operating

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

Revisions and other modifications

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

Safety devices

The Type 3271 and Type 3277 Pneumatic Actuators do not have any special safety equipment.

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 actuator by the signal pressure, stored spring energy or moving parts by taking appropriate precautions. Plant operators and operating personnel must observe all hazard statements, warning and caution notes in these mounting and operating instructions.

Responsibilities of the operator

Operators are responsible for proper use and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions as well as the referenced documents to the operating personnel and to instruct them in proper operation. Furthermore, operators must ensure that operating personnel or third parties 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, operating personnel must be familiar with the applicable health, safety and accident prevention regulations and comply with them.

Referenced standards, directives and regulations

The pneumatic actuators are partly completed machinery as defined in the Machinery Directive 2006/42/EC.

Devices with an EAC marking fulfill the requirements of the following regulations for the Eurasian Economic Union (EAEU):

– TR CU 012/2011
(depending on version, see certificate)

The declarations of conformity are included in Chapter 14.

According to the ignition hazard assessment performed in accordance with Clause 5.2 of DIN EN ISO 80079-36, the non-electrical actuators 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 ATEX Directive 2014/34/EU.

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

Referenced documents

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

– Mounting and operating instructions for mounted valve accessories (positioner, solenoid valve etc.)

– Mounting and operating instructions for the mounted valve

– ▶ AB 0100 for tools, tightening torques and lubricants

– Associated Safety Manual (SH 8310) for use in safety-instrumented systems

– If a device contains a substance listed as a substance of very high concern (SVHC) on the candidate list of the REACH regulation, the document "Additional Information on Your Inquiry/Order" is added to the SAMSON order documents. This document includes the SCIP number assigned to the devices concerned. This number can be entered into the database on the European Chemicals Agency (ECHA) website (▶ https://www.echa.europa.eu/scip-database) to find out more information on the SVHC contained in the device.
Further information on material compliance at SAMSON is available at
▶ www.samsongroup.com > About SAMSON > Environment, Social & Governance > Material Compliance

1.1 Notes on possible severe personal injury

⚠ DANGER

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

Pneumatic actuators are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or components can cause serious injury or even death.

⇨ Before starting any work on pressure-bearing or pressure-retaining parts of the actuator, depressurize all plant sections affected as well as the actuator. Release any stored energy.

1.2 Notes on possible personal injury

⚠ WARNING

Crush hazard arising from moving parts.

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

⇨ Do not touch the actuator stem or insert hands or finger into the yoke or beneath the actuator stem while the air supply is connected to the actuator.

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

⇨ Do not impede the movement of the actuator stem by inserting objects into the yoke.

⇨ Before unblocking the actuator stem after it has 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 Chapter 11.2.

⚠ WARNING

Risk of personal injury when the actuator vents.

The actuator is operated with air. As a result, air is vented during operation.

⇨ Install the control valve and mount the actuator in such a way that vent openings are not located at eye level and the actuator does not vent at eye level in the work position[1)].

⇨ Use suitable mufflers and vent plugs.

⇨ Wear eye and hearing protection when working near the actuator.

1) If not described otherwise in the valve documentation, the work position for the control valve is the front view looking onto the operating controls (including valve accessories).

⚠ WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. These actuators can be identified by several longer bolts with nuts protruding from the bottom diaphragm case. These bolts allow the spring compression to be relieved evenly on disassembling the actuator. Actuators with considerably preloaded springs are also labeled correspondingly (see Chapter 1.4).

⇨ Before starting any work on the actuator, which requires the actuator to be opened, or when the actuator stem has become blocked, relieve the compression from the preloaded springs (see Chapter 11.2).

⚠ WARNING

Risk of personal injury due to incorrect operation, use or installation as a result of information on the actuator being illegible.

Over time, markings, labels and nameplates on the actuator 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 actuator damage due to incorrectly attached slings.

700 cm² actuator: The lifting eyelet/eyebolt or swivel hoist on the top diaphragm case is only intended for mounting and removing the actuator as well as lifting the actuator without the valve. Do not use the lifting eyelet/eyebolt and the swivel hoist to bear the load of the entire control valve assembly.

⇨ Do not attach load-bearing slings to the handwheel or travel stop.

⇨ Observe lifting instructions (see Chapter 4.3.2).

NOTICE

Risk of actuator damage due to over- or undertorquing.

Observe the specified torques when tightening actuator parts. Over-torquing leads to parts wearing out more quickly. Parts that are not tightened far enough may loosen.

⇨ Observe the specified tightening torques (▶ AB 0100).

NOTICE

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

Certain tools are required to work on the actuator.

⇨ Only use tools approved by SAMSON (▶ AB 0100).

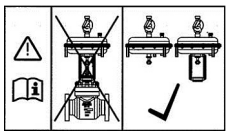
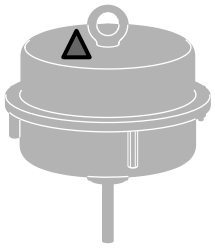
NOTICE

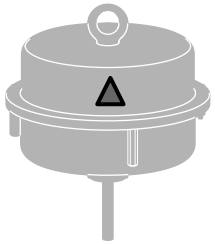
Risk of actuator damage due to the use of unsuitable lubricants.

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

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

1.4 Warnings on the device

Warning symbols	Location on the device
	
Meaning of the warning	
Warning against the incorrect use of the lifting eyelet/eyebolt or swivel hoist on SAMSON actuators. Only attach load-bearing slings to them to vertically lift the actuator on its own (without the valve). Do not use the lifting eyelet/eyebolt or the swivel hoist to vertically lift the entire control valve assembly.	

Warning symbols	Location on the device
	
Meaning of the warning	
Warning to indicate that the springs in the actuator are preloaded. Actuators with preloaded springs are under tension. Incorrect opening of the actuator can lead to personal injury due to the sudden and uncontrolled projection of parts. Before starting any work on the actuator, relieve the compression from the preloaded springs (see Chapter 11.2).	

2 Markings on the device

2.1 Actuator nameplate

The nameplate shown was up to date at the time of publication of this document. The nameplate on the device may differ from the one shown.

The nameplate is stuck to the diaphragm casing. The nameplate includes all details required to identify the device.

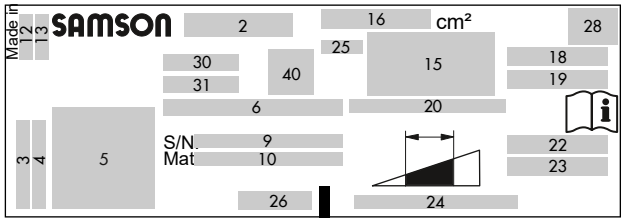


Fig. 1: *Inscriptions on the nameplate of Type 3271/3277 Actuators with >120 cm² actuator area or Type 3371/Type 3372 Actuators with 350 cm² actuator area*

Item	Inscription meaning
2	Type designation
3	Company name
4	Company address (ZIP/postal code and city)
5	Identification code (scannable)
6	Device designation
9	Serial number
10	Material number
12	Country of origin
13	Month and year of manufacture
15	Symbol indicating fail-safe action: Actuator stem extends (FA) Actuator stem retracts (FE)
16	Actuator area in cm²
18	Bench range in bar
19	Bench range in psi
20	Actuator travel in mm
22	Operating range in bar
23	Operating range in psi
24	Permissible operating pressure $p_{max.}$ in bar and/or psi
25	Diaphragm material
26	Type of connecting thread
28	Symbol for manual override: (optional)
30	Version (optional), e.g. SAM001
31	Version (optional), e.g. HW xx.xx.xx
40	Other certification (optional)

3 Design and principle of operation

The SAMSON Type 3271 and Type 3277 Actuators with 175v2 to 750v2 cm² actuator areas are primarily mounted on SAMSON Series 240, 250, 280, 290 and SMS Valves (globe valves).

The actuators mainly consist of two diaphragm cases, a rolling diaphragm with diaphragm plate and internal springs. Several springs may be fitted into one another.

The signal pressure p_{st} creates the force $F = p_{st} \cdot A$ at the diaphragm surface A, which is opposed by the springs in the actuator. The bench range is determined by the number of actuator springs used and their compression, taking into account the rated travel. The travel H is proportional to the signal pressure p_{st}. The direction of action of the actuator stem depends on how the springs are installed in the actuator and the location of the signal pressure connection.

The v1 actuator construction has a clamped-in diaphragm.

The stem connector clamps connect the actuator stem with the plug stem of the valve.

The travel of the version with an adjustable travel stop can be permanently limited by up to 50 % in both directions (actuator stem extends or retracts).

In contrast to the construction of the Type 3271 Actuator, the Type 3277 Actuator is fitted with an additional yoke on the bottom diaphragm case. The yoke allows the direct attachment of a positioner and/or limit switch. The benefit of this design is that the travel pick-off located inside the yoke is protected against external influences. Refer to the mounting and operating instructions of the valve accessories to be mounted for more details on their attachment and the parts required.

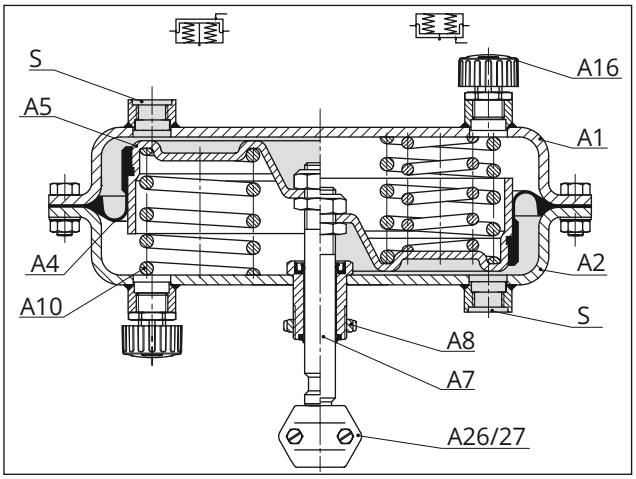


Fig. 2: *Type 3271 Actuator, drawing showing an example with 350 cm² actuator area*

A1	Top diaphragm case	A8	Ring nut
A2	Bottom diaphragm case	A10	Spring
A4	Diaphragm	A16	Vent plug
A5	Diaphragm plate	A26/27	Stem connector clamp
A7	Actuator stem	S	Signal pressure connection

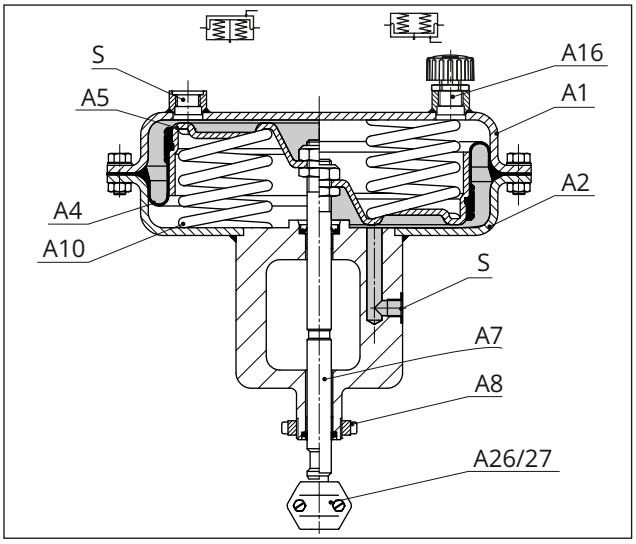


Fig. 3: *Type 3277 Actuator, drawing showing an example with 350 cm² actuator area*

A1	Top diaphragm case	A8	Ring nut
A2	Bottom diaphragm case	A10	Spring
A4	Diaphragm	A16	Vent plug
A5	Diaphragm plate	A26/27	Stem connector clamp
A7	Actuator stem	S	Signal pressure connection

3.1 Direction of action and signal pressure routing

Direction of action

The direction of action is determined by how the springs and diaphragm plate are arranged in the actuator.

With “actuator stem extends” direction of action, the compressed air is applied to the signal pressure connection on the bottom diaphragm case.

With “actuator stem retracts” direction of action, the compressed air is applied to the signal pressure connection on the top diaphragm case.

Reversal of the direction of action

The direction of action for both Type 3271 and Type 3277 can be reversed (see Chapter 9).

Signal pressure routing of Type 3271

In the “actuator stem extends” version, the signal pressure is routed through the bottom signal pressure connection to the bottom diaphragm chamber and moves the actuator stem upward opposing the spring force.

In the “actuator stem retracts” version, the signal pressure is routed through the top signal pressure connection to the top diaphragm chamber and moves the actuator stem downward opposing the spring force.

Signal pressure routing of Type 3277

In the “actuator stem extends” version, a signal pressure connection is located on the side of the yoke which is connected to the bottom diaphragm chamber over an internal hole. The signal pressure moves the actuator stem upward opposing the spring force. A positioner can be connected using a connection block at this point. No additional piping to the actuator is required. Refer to the associated positioner documentation for more details.

In the “actuator stem retracts” version, similar to Type 3271, the signal pressure is routed through the top signal pressure connection to the top diaphragm chamber and moves the actuator stem downward opposing the spring force.

3.2 Fail-safe action

i Note

The listed fail-safe actions apply to SAMSON globe valves.

When the signal pressure is reduced or the air supply fails, the fail-safe position of the control valve depends on whether the springs are installed in the top or bottom diaphragm chamber.

Version with handwheel: In the active manual mode (the handwheel is not in the neutral position), the valve is not moved to the fail-safe position even upon failure of the air supply.

3.2.1 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 globe valve. The valve opens when the signal pressure is increased enough to overcome the spring force.

3.2.2 Actuator stem retracts (FE)

When the signal pressure is reduced or the air supply fails, the springs move the actuator stem upward and open a mounted globe valve. The valve closes when the signal pressure is increased enough to overcome the spring force.

3.3 Accessories

Vent plug

Vent plugs are screwed into the exhaust air ports of pneumatic and electropneumatic devices. They ensure that any exhaust air that forms can be vented to the atmosphere (to avoid excess pressure in the device). Furthermore, the vent plugs allow air intake to prevent a vacuum from forming in the device (▶ AB 07).

Lifting fixture

A special lifting tool is available to lift small Type 3271/3277 Pneumatic Actuators with actuator areas between 120 and 355 cm² (▶ AB 0100).

Feedback connection (travel pick-off interface) according to DIN EN 60534-6-1

Various valve accessories according to DIN EN 60534-6-1 and NAMUR recommendation can be mounted on SAMSON control valves designed according to the modular principle (see associated valve documentation). The travel pick-off interface for these mounted devices can be ordered (accessories):

Type … Actuator	Actuator area in cm²	Item/material number (accessories) for	
		Attachment on one side	Attachment on both sides
3271	240	1400-6816 (included in scope of delivery of the actuator)	100029690
3271	350 700	100029695 (included in scope of delivery of the actuator)	1400-5529
3277	240 350 700	100029695	1400-5529

3.4 Versions

- **Standard version**
  The top and bottom diaphragm cases are made of painted sheet steel.
- **Corrosion-resistant version**
  The top and bottom diaphragm cases are optionally available made of stainless steel 1.4301.
- **Version with travel stop**
  The Type 3271 and Type 3277 Actuators can be fitted with a mechanically adjustable travel stop in a special version. The travel is reduced by up to 50 % in both directions of action (stem extends or retracts).
- **Version with handwheel**
  The Type 3271 and Type 3277 Actuators can be fitted with an additional handwheel. It is used to adjust the travel manually.
- **Version with side-mounted handwheel**
  The Type 3271 and Type 3277 Actuators can be combined with a Type 3273 Side-mounted Handwheel with max. 30 mm travel (▶ T 8312).

3.5 Technical data

The nameplate provides information on the actuator version (see Chapter 2).

i Note

More information is available in the following Data Sheet:

- *▶ T 8310-1 · Type 3271 and Type 3277 Pneumatic Actuators up to 750v2 cm² actuator area*

Temperature range

The permissible temperature range is determined to a large extent by the diaphragm material.

Diaphragm material	Type of service	Temperature range
NBR	Throttling service	-35 to +90 °C -31 to +194 °F
NBR	On/off service	-20 to +90 °C -4 to +194 °F
EPDM	Throttling service	-50 to +120 °C -58 to +248 °F
EPDM	On/off service	-40 to +120 °C -40 to +248 °F

Supply pressure

The maximum permissible supply pressure is specified in the order confirmation for the control valve. However, the supply pressure must not exceed 6 bar in throttling service.

See Chapter 7 for restrictions in on/off service.

Conformity

The actuators bear the EAC mark of conformity.

EAC

Table 1: *Dimensions[1] in mm · Type 3271*

Actuator area in cm²			**350**
Height	H[2]		–
	H'		82
	Ha		15
	H1	Only with handwheel	320
		With handwheel and travel stop	420
	$H2_{max}$	Only with handwheel	365
		With handwheel and travel stop	465
	$H4_{rated}FA$		75
	$H4_{max}FA$		78
	$H4_{max}FE$		85
	H6		34
	H7[3]		–
Travel stop	$H8^{4)}_{max}$		85
Diameter	ØD		280
	ØD1		250
	ØD2		16
Ød (thread)			M30x1.5
Connection (a optionally)	a		G ⅜
			⅜ NPT

1) The specified dimensions are theoretical maximum design values for a specific standard device configuration. They do not reflect every possible case of use. The actual values for individual devices may differ depending on the device configuration and the specific application.

2) H' and H are identical for versions on which the lifting eyelet is welded directly onto the housing. The value H' applies in this case.

3) Height of eyebolt according to DIN 580. Height of the swivel hoist may differ.

4) Travel stop on both sides

Table 2: *Dimensions[1] in mm · Type 3277*

Actuator area in cm²			**350**
Height	H[2]		–
	H'		82
	Ha		15
	H1	Only with handwheel	420
		With handwheel and travel stop	520
	$H2_{max}$	Only with handwheel	465
		With handwheel and travel stop	565
	$H4_{rated}FA$		75
	$H4_{max}FA$		78
	$H4_{max}FE$		101
	H5		101
	H6		34
	H7[3]		–
Travel stop	$H8^{4)}_{max}$		85
Yoke width	L		70

Actuator area in cm²		350
Diameter	ØD	280
	ØD1	250
	ØD2	16
Ød (thread)		M30x1.5
Connection (a optionally)	a	G ⅜
		⅜ NPT
	a2	G ⅜[5]

1) The specified dimensions are theoretical maximum design values for a specific standard device configuration. They do not reflect every possible case of use. The actual values for individual devices may differ depending on the device configuration and the specific application.

2) H' and H are identical for versions on which the lifting eyelet is welded directly onto the housing. The value H' applies in this case.

3) Height of eyebolt according to DIN 580. Height of the swivel hoist may differ.

4) Travel stop on both sides

5) An adapter G ⅜ to ⅜ NPT is available for the a2 connection. It can be ordered separately using the following article number: 100160362

Dimensional drawings for Type 3271

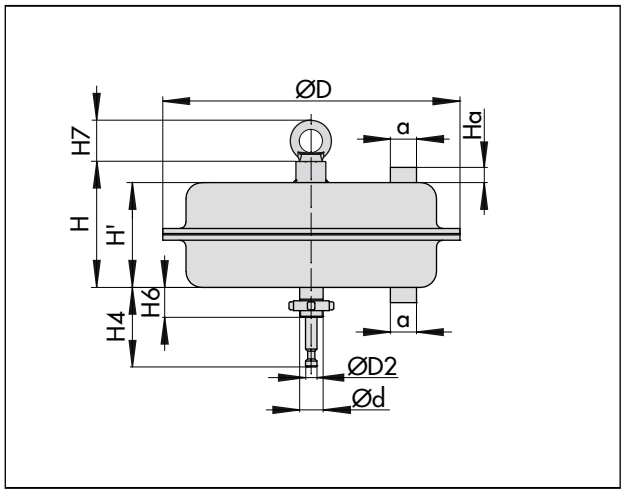


Fig. 4: *Type 3271 with 750v2 cm² actuator area*

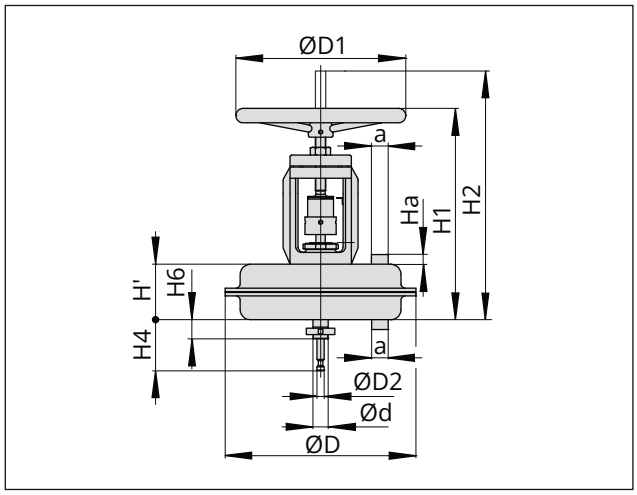


Fig. 5: *Type 3271 with additional handwheel*

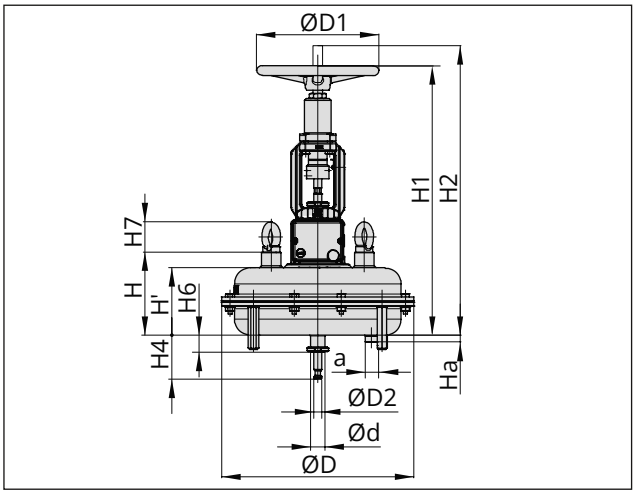


Fig. 6: *Type 3271 Pneumatic Actuator with handwheel and travel stops on both sides*

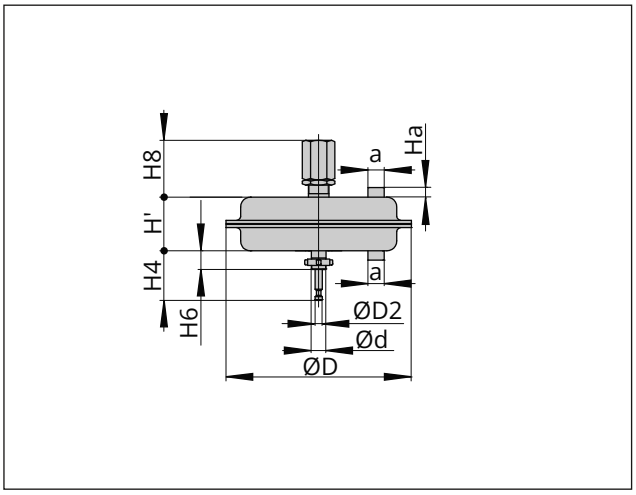


Fig. 7: *Type 3271 with travel stop*

Dimensional drawings for Type 3277

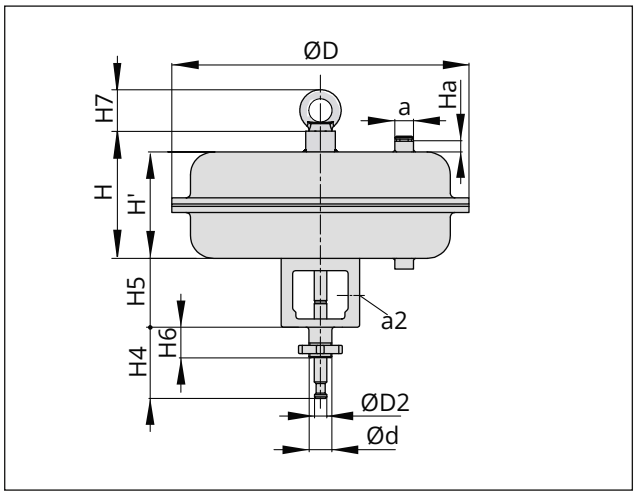


Fig. 8: *Type 3277 with yoke for direct attachment of accessories · 750v2 cm² actuator area*

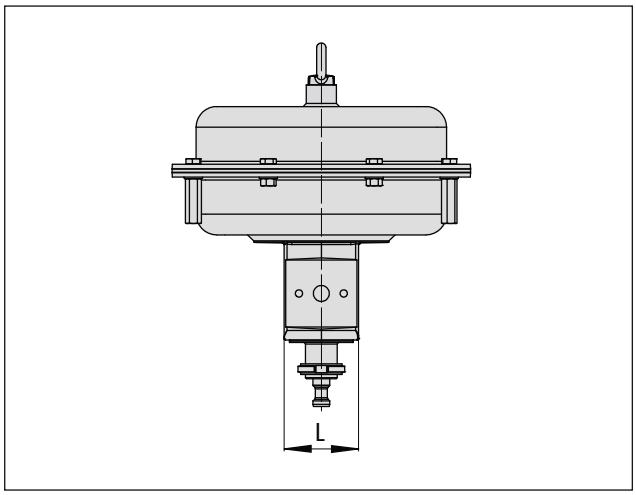


Fig. 9: *Type 3277 with yoke (side view) · 750v2 cm² actuator area*

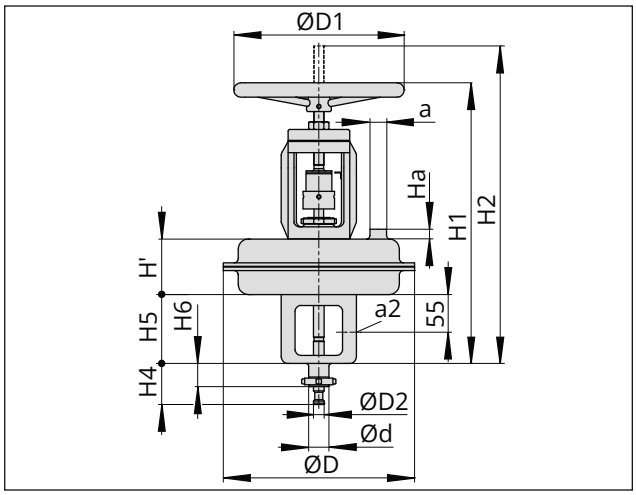


Fig. 10: *Type 3277 with additional handwheel*

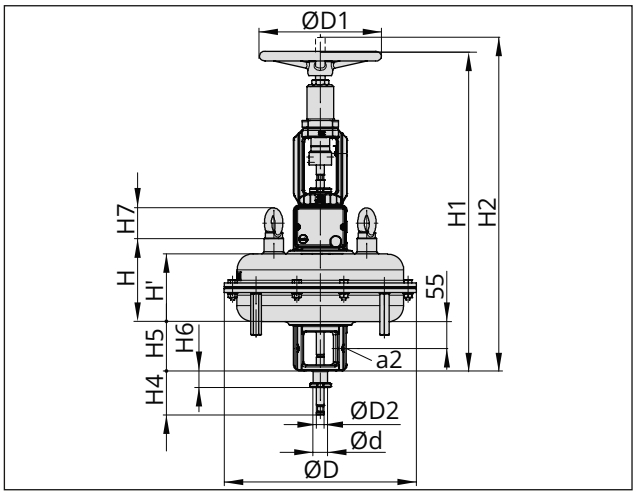


Fig. 11: *Type 3277 Pneumatic Actuator with handwheel and travel stops on both sides*

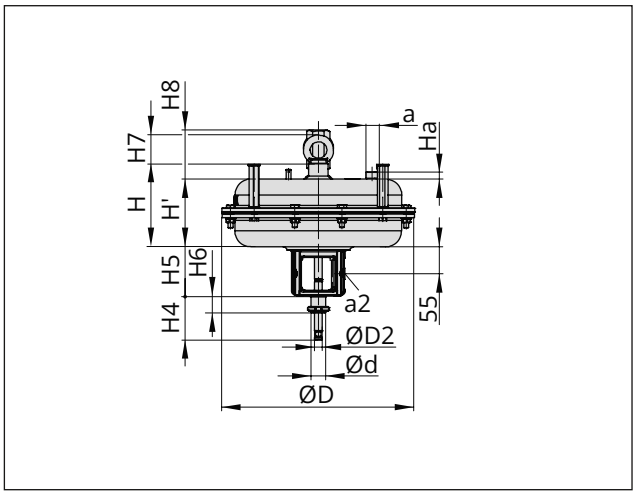


Fig. 12: *Type 3277 with travel stop*

Table 3: *Weights[1] for Type 3271 and Type 3277 Pneumatic Actuators*

Type ... Actuator	Actuator area in cm²		350
3271	Without handwheel	kg	8
3271	With handwheel	kg	13
3277	Without handwheel	kg	12
3277	With handwheel	kg	17

1) The weights specified apply to a specific standard device configuration. Weights of other actuator configurations may differ depending on the version (material, number of actuator springs etc.).

4 Shipment and on-site transport

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

4.1 Accepting the delivered goods

After receiving the shipment, proceed as follows:

1. Check the scope of delivery. Check that the specifications on the actuator nameplate match the specifications in the delivery note. See Chapter 2 for more details on the nameplate.
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 Chapter 3.5.

4.2 Removing the packaging from the actuator

Observe the following sequence:

⇨ Do not open or remove the packaging until immediately before mounting the actuator.

⇨ Leave the actuator in its transport container or on the pallet to transport it on site.

⇨ Dispose and recycle the packaging in accordance with the local regulations.

4.3 Transporting and lifting the actuator

⚠ DANGER

Danger due to suspended loads falling.

⇨ *Stay clear of suspended or moving loads.*

⇨ *Close off and secure the transport paths.*

⚠ WARNING

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

⇨ *Only use approved lifting equipment and accessories whose minimum lifting capacity is higher than the weight of the actuator (including any packaging).*

⚠ WARNING

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

Lifting the device or the item being transported without the use of lifting equipment may lead to injuries (back injuries in particular) depending on its weight.

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

❗ *NOTICE*

Risk of actuator damage due to incorrectly attached slings.

700 cm² actuator: The lifting eyelet/eyebolt or swivel hoist on the top diaphragm case is only intended for mounting and removing the actuator as well as lifting the actuator without the valve. Do not use the lifting eyelet/eyebolt and the swivel hoist to bear the load of the entire control valve assembly.

⇨ *Do not attach load-bearing slings to the handwheel or travel stop.*

⇨ *Observe lifting instructions (see Chapter 4.3.2).*

💡 *Tip*

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

4.3.1 Transporting the actuator

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

⇨ Leave the actuator in its transport container or on the pallet to transport it.

⇨ Observe the transport instructions.

Transport instructions

– Protect the actuator against external influences (e.g. impact).
– Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
– Protect the actuator against moisture and dirt.
– Observe permissible temperatures (see section 'Technical data' in Chapter 3).

4.3.2 Lifting the actuator

Due to the low service weight, lifting equipment is not absolutely necessary to lift actuators up to and

including 355v2 cm² actuator area (e.g. to mount it onto a valve).

If lifting equipment (e.g. crane or forklift) is to be used, SAMSON has a gripping device available for the actuator (see section 'Accessories' in Chapter 3).

To mount large actuators onto the valve, lifting equipment (e.g. crane or forklift) can be used to lift the actuator.

Lifting instructions

- Use a hook with safety latch to secure the slings from slipping off the hook during lifting and transporting.
- Secure slings on the object to be transported against slipping.
- Make sure that the slings can be removed from the actuator once it has been mounted on the valve.
- Prevent the actuator from tilting or tipping.
- Do not leave loads suspended when interrupting work for longer periods of time.

a) Lifting actuator (without valve) using the lifting eyelet, eyebolt or swivel hoist

1. Open the eyebolt cover by lightly pressing the side clips and remove it (see Fig. 13).
2. Attach a sling to the lifting eyelet/eyebolt or swivel hoist of the actuator and to the rigging equipment (e.g. hook) of the crane or forklift.
3. Carefully lift the actuator. Check whether the lifting equipment and accessories can bear the weight.
4. Move the actuator at an even pace to the mounting site.
5. Mount the actuator onto the valve (see Chapter 5).
6. Remove slings after mounting and replace the cover on the eyebolt (see Fig. 13).

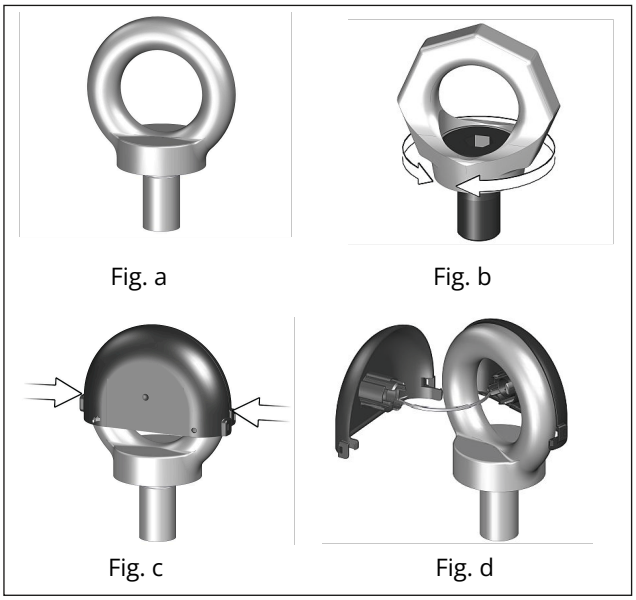


Fig. 13: *Strap on eyebolt/swivel hoist*

Fig. a	Eyebolt
Fig. b	Swivel hoist
Fig. c	Closed cover
Fig. d	Open cover with strap

b) Lifting the entire control valve assembly

A swivel hoist can be screwed into versions with a female thread on the top diaphragm case of the actuator in place of the eyebolt (see section 'Accessories' in Chapter 3). In contrast to the eyebolt, the swivel hoist may be used for setting a control valve assembly upright.

In order to lift an entire control valve assembly, the slings attached to the valve body must bear the entire load. The sling between the lashing point on the actuator and rigging equipment (hook, shackle etc.) must not bear any load. The sling only protects the control valve from tilting while being lifted. Before lifting the control valve, tighten the sling.

i *Note*

See valve documentation for more information on lifting the entire control valve assembly.

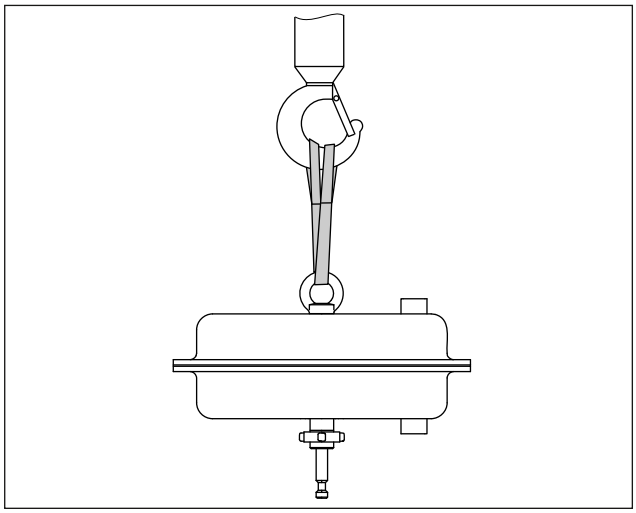


Fig. 14: *Lifting point on the actuator*

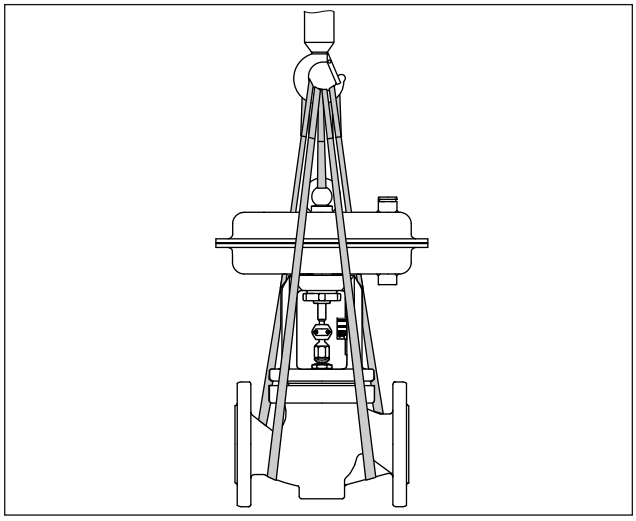


Fig. 15: *Lifting points on the control valve (example shown)*

4.4 Storing the actuator

NOTICE

Risk of actuator damage due to improper storage.

⇨ *Observe the storage instructions.*

⇨ *Avoid longer storage periods.*

⇨ *Contact SAMSON in case of different storage conditions or longer storage times.*

Note

We recommend to regularly check the actuator and the prevailing storage conditions during long storage times.

Storage instructions

- When the valve and actuator are already assembled, observe the storage conditions for control valves (see associated valve documentation).
- Protect the actuator against external influences (e.g. impact).
- Secure the actuator in the stored position against slipping or tipping over.
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
- Protect the actuator 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.
- Observe permissible temperatures (see section 'Technical data' in Chapter 3).
- Do not place any objects on the actuator.

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.
- SAMSON recommends 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 chapter is to be performed only by personnel appropriately qualified to carry out such tasks.

5.1 Preparation for installation

Before mounting, make sure that the following conditions are met:

– The actuator is not damaged.
– The type designation, material and temperature range of the actuator match the ambient conditions (temperatures etc.). See Chapter 2 for more details on the nameplate.

Proceed as follows:

⇨ Lay out the necessary material and tools to have them ready during mounting.

⇨ Check that the vent plugs to be used are not blocked.

⇨ Check pressure gauges on any mounted valve accessories 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.

5.2 Mounting the device

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. Proceed as follows to mount the actuator and before start-up.

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

The actuator is operated with air. As a result, air is vented during operation.

⇨ *During mounting make sure that vent openings are not located at eye level in the work position of the control valve and the actuator does not vent at eye level in the work position.*

⇨ *Wear eye and hearing protection when working near the actuator.*

⚠ WARNING

Crush hazard arising from moving parts.

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

⇨ *Do not touch the actuator stem or insert hands or finger into the yoke or beneath the actuator stem while the air supply is connected to the actuator.*

⇨ *Before working on the actuator, disconnect and lock the pneumatic air supply as well as the control signal.*

⇨ *Do not impede the movement of the actuator stem by inserting objects into the yoke.*

⇨ *Before unblocking the actuator stem after it has 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 Chapter 11.2.*

❗ NOTICE

Risk of actuator damage due to over- or under-torquing.

Observe the specified torques when tightening actuator parts. Over-torquing leads to parts wearing out more quickly. Parts that are not tightened far enough may loosen.

⇨ *Observe the specified tightening torques (▶ AB 0100).*

❗ NOTICE

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

Certain tools are required to work on the actuator.

⇨ *Only use tools approved by SAMSON (▶ AB 0100).*

5.2.1 Mounting the actuator onto the valve

❗ NOTICE

Risk of valve damage or impaired functioning due to an incorrectly aligned V-port plug.

On mounting the actuator onto valves fitted with a V-port plug, make sure that the V-shaped port uncovered

first faces toward the valve outlet. The same applies to a perforated plug.

⇨ *Read the 'Mounting the actuator onto the valve' chapter in the associated valve documentation.*

Tip

The valve and actuator are assembled with special attention paid to the actuator's bench range and direction of action. These details are specified on the actuator nameplate (see Chapter 2).

a) Valve version without anti-rotation fixture

1. Loosen the lock nut and stem connector nut on the valve.
2. Firmly press the plug together with the plug stem into the seat.
3. Thread down the lock nut and stem connector nut.
4. Remove the clamps of the stem connector (A26/27) and the ring nut (A8) from the actuator.
5. Slide the ring nut (A8) over the plug stem.
6. Place the actuator onto the valve bonnet and fasten tight with the ring nut (A8).
7. Connect the signal pressure (see Chapter 5.2.2).
8. Screw on the stem connector nut by hand until it touches the actuator stem (A7).
9. Turn the stem connector nut a further quarter turn and secure this position with the lock nut.
10. Position the stem connector clamps (A26/27) and fasten tight with screws.
11. Make sure that the dimension a is correctly adjusted (see Table 4).
12. Align the travel indicator scale with the tip of the stem connector clamp.

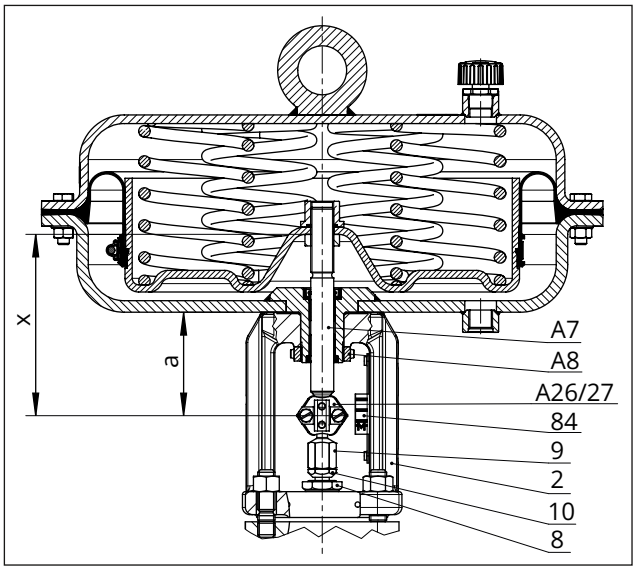


Fig. 16: *Type 3271 Pneumatic Actuator mounted on a globe valve*

2	Bonnet/flange	A7	Actuator stem
8	Threaded bushing	A8	Ring nut
9	Stem connector nut	A26/27	Stem connector clamps
10	Lock nut	a	Dimension a (see Table 4)
84	Travel indicator scale	x	Dimension x (see Table 5 in Chapter 9)

Table 4: *Values for dimension a*

Actuator area	Travel in mm	Dimension a[1] in mm
240[2]	0 (0 %)	75
	15 (100 %)	60
	17 (112.5 %)	58
350	0 (0 %)	75
	15 (100 %)	60
	19 (125 %)	53
700[2]	0 (0 %)	90
	30 (100 %)	60
	38 (125 %)	52

[1] Type 3271: Bottom of the bottom case up to the bottom of the actuator stem

Type 3277: Bottom of the yoke up to the bottom of the actuator stem

[2] Only applies to devices already in use

b) Mounting on valve versions with anti-rotation fixture

See Fig. 17

1. Firmly press the plug together with the plug stem into the seat.
2. **Anti-rotation fixture is not yet mounted on the valve:**
   Follow the instructions described under 'Mounting the external anti-rotation fixture' in the associated valve documentation up to the point where the actuator is to be mounted.
   Anti-rotation fixture is already mounted on the valve:
   Slightly loosen the screws (303) and turn the stem (9) inside the stem connector clamps (301) by a few turns to move it downward.
3. Remove the clamps of the stem connector (A26) and the ring nut (A8) from the actuator.
4. Slide the ring nut (A8) over the plug stem.
5. Place the actuator onto the valve bonnet (2) and fasten tight with the ring nut (A8).
6. Connect the signal pressure (see Chapter 5.2.2).
7. Continue following the instructions described under 'Mounting the external anti-rotation fixture' in the associated valve documentation from the point where the stem (9) is threaded upwards until the head of the stem rests on the extended actuator stem.
8. Align and fasten the travel indicator scale as described in the 'Mounting the actuator onto the valve' chapter in the associated valve documentation.

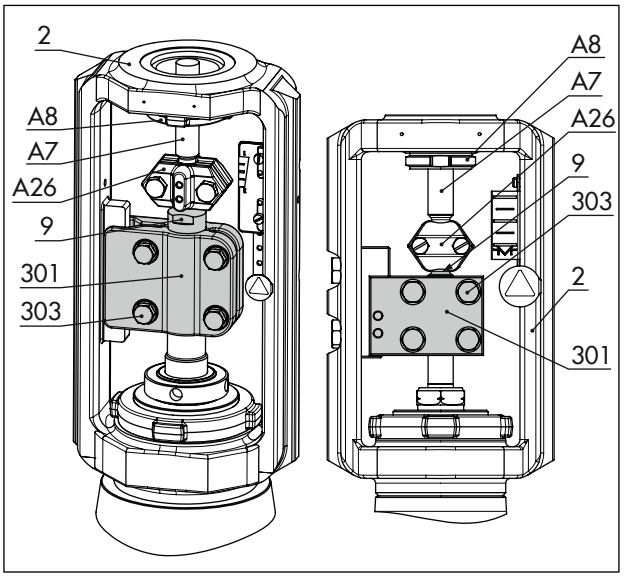


Fig. 17: *Anti-rotation fixture: Standard version (left) and special version (right)*

A7	Actuator stem	9	Stem
A8	Ring nut	301	Clamps
A26	Stem connector clamps	303	Screws
2	Valve bonnet		

5.2.2 Pneumatic connection

The maximum permissible supply pressure is specified in the order confirmation for the control valve. However, the supply pressure must not exceed 6 bar in throttling service. See Chapter 7 for restrictions in on/off service.

Determine the lower and upper signal pressure range values before connecting the air supply:

- The lower signal pressure range value is the same as the minimum value of the bench range or operating range (with preloaded springs).
- The upper signal pressure range value is the same as the maximum value of the bench range or operating range (with preloaded springs).
- For actuator springs that are to be preloaded subsequently, determine the upper and lower signal pressure range values as described in Chapter 6.1.

a) Actuator stem extends

1. Apply a signal pressure that corresponds to the lower signal pressure range value to the connection on the bottom diaphragm case.
2. Screw the vent plug into the connection on the top diaphragm case.

b) Actuator stem retracts

1. Apply a signal pressure that corresponds to the upper signal pressure range value to the connection on the top diaphragm case.
2. Screw the vent plug into the connection on the bottom diaphragm case.

6 Start-up

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

⚠ DANGER

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

Pneumatic actuators are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or components can cause serious injury or even death.

⇨ *Before starting any work on pressure-bearing or pressure-retaining parts of the actuator, depressurize all plant sections affected as well as the actuator. Release any stored energy.*

⚠ WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. These actuators can be identified by several longer bolts with nuts protruding from the bottom diaphragm case. These bolts allow the spring compression to be relieved evenly on disassembling the actuator. Actuators with considerably preloaded springs are also labeled correspondingly (see Chapter 1.4).

⇨ *Before starting any work on the actuator, which requires the actuator to be opened, or when the actuator stem has become blocked, relieve the compression from the preloaded springs (see Chapter 11.2).*

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

The actuator is operated with air. As a result, air is vented during operation.

⇨ *Wear eye and hearing protection when working near the actuator.*

⚠ WARNING

Crush hazard arising from moving parts.

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

⇨ *Do not touch the actuator stem or insert hands or finger into the yoke or beneath the actuator stem while the air supply is connected to the actuator.*

⇨ *Before working on the actuator, disconnect and lock the pneumatic air supply as well as the control signal.*

⇨ *Do not impede the movement of the actuator stem by inserting objects into the yoke.*

⇨ *Before unblocking the actuator stem after it has 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 Chapter 11.2.*

⚠ WARNING

Risk of personal injury due to incorrect operation, use or installation as a result of incorrect information on the actuator.

After any adjustment or conversion work, the details on the actuator nameplate may no longer be correct. This may apply, for example, to the configuration ID or the symbol after reversal of the direction of action.

⇨ *Immediately renew any nameplates or labels with incorrect or outdated information.*

⇨ *Add any new values to the nameplate. If necessary, contact SAMSON to obtain a new nameplate.*

❗ NOTICE

Risk of actuator damage due to over- or under-torquing.

Observe the specified torques when tightening actuator parts. Over-torquing leads to parts wearing out more quickly. Parts that are not tightened far enough may loosen.

⇨ *Observe the specified tightening torques (▶ AB 0100).*

❗ NOTICE

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

Certain tools are required to work on the actuator.

⇨ *Only use tools approved by SAMSON (▶ AB 0100).*

6.1 Preloading the springs

By preloading the springs in the actuator, the following can be achieved:

– The thrust is increased (only actuators with "stem extends")
– In combination with a SAMSON valve: The actuator travel range can be adapted to a smaller valve travel range

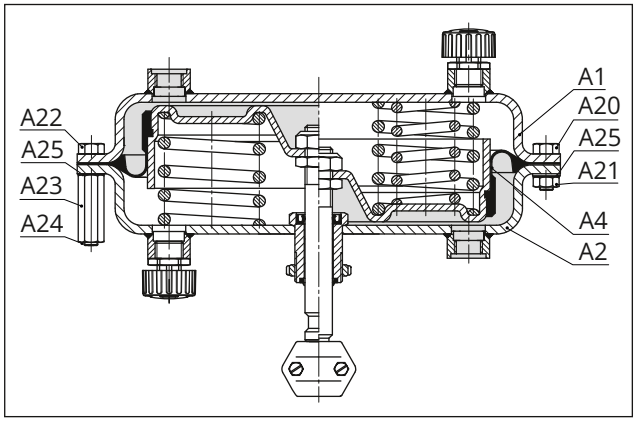


Fig. 18: *Actuator with clamping nuts and bolts*

A1 Top diaphragm case
A2 Bottom diaphragm case
A4 Diaphragm
A20 Hex bolt
A21 Hex nut
A22 Hex bolt (preloaded springs)
A23 Hex nut (preloaded springs)
A24 Stopper
A25 Washer

6.1.1 Tensioning the springs

NOTICE

Risk of actuator damage due to the springs being tensioned unevenly.

⇨ *Distribute clamping bolts and nuts evenly around the circumference.*

⇨ *Tighten the nuts gradually in a crisscross pattern.*

1. Distribute the long bolts (A22) evenly around the circumference.
2. Screw the long nuts (A23) together with washers (A25) onto the clamping bolts (A22) until they rest on the bottom diaphragm case (A2).
3. To tension the springs evenly, tighten the nuts (A23) gradually in a crisscross pattern. Hold the bolt head stationary with a suitable tool and apply the tightening torque to the nuts. Observe tightening torques.
4. Insert the short bolts (A20) through the intended holes in the diaphragm cases (A1, A2).
5. Screw the short nuts (A21) with washers (A25) onto the bolts (A20) and tighten them. Observe tightening torques.

6.1.2 Increasing the actuator thrust

The thrust can only be increased in actuators with "stem extends" direction of action. To achieve this, the springs of the actuators can be preloaded by up to 12.5 % (240 cm²) or by up to 25 % (350 and 700 cm²) of their travel or bench range. (240 and 700 cm² only applies to devices already in use)

Example: Preloading is required for a signal pressure range of 0.4 to 2 bar. 25 % of this span is 0.4 bar. Therefore, the signal pressure range is shifted by 0.4 bar to 0.8 to 2.4 bar. The new lower signal pressure range value is 0.8 bar and the new upper signal pressure range value 2.4 bar.

⇨ Write the new signal pressure range of 0.8 to 2.4 bar on the actuator nameplate as the operating range with preloaded springs.

6.2 Adapting the travel range

In some cases, the valve and actuator have different rated travels. Depending on the direction of action, proceed as follows:

"Actuator stem extends" direction of action

Always use actuators with preloaded springs when the valve's rated travel is smaller than the rated travel of the actuator.

Example: DN 50 valve with 15 mm rated travel and 700 cm² actuator with 30 mm rated travel; 0.4 to 2 bar bench range.

The signal pressure for half the actuator travel (15 mm) is 1.2 bar. Adding it to the lower signal pressure range value of 0.4 bar results in a signal pressure of 1.6 bar required for preloading the springs. The new lower signal pressure range value is 1.6 bar and the new upper signal pressure range value 2.4 bar.

⇨ Write the new signal pressure range of 1.6 to 2.4 bar on the actuator nameplate as the operating range with preloaded springs.

"Actuator stem retracts" direction of action

The springs of actuators with "stem retracts" action cannot be preloaded. When a SAMSON valve is combined with an oversized actuator (e.g. the rated travel of the actuator is larger than the rated trav-

el of the valve), only the first half of the actuator's bench range can be used.

Example: DN 50 valve with 15 mm rated travel and 700 cm² actuator with 30 mm rated travel; 0.2 to 1 bar bench range.

At half the valve travel, the operating range is between 0.2 and 0.6 bar.

6.3 Travel stop

In the version with travel stop, the maximum and minimum actuator travel can be limited.

Actuator area in cm²	Direction of action	Min. stop	Max. stop
240, 350, 700	Stem extends (FA)	0 to 125 %	50 to 125 %
240, 350, 700	Stem retracts (FE)	0 to 100 %	50 to 100 %

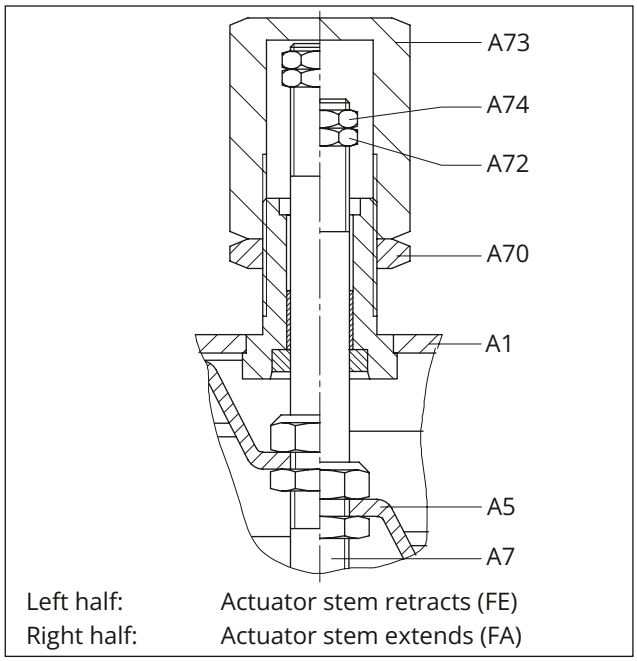


Fig. 19: *Travel stop*

A1 Top diaphragm case
A5 Diaphragm plate
A7 Actuator stem
A70 Lock nut
A72 Adjustment nut
A73 Cover
A74 Lock nut

6.3.1 Bottom travel stop (minimum travel)

1. Loosen the lock nut (A70) and remove cover (A73).
2. Loosen the lock nut (A74) and turn the adjustment nut (A72) to adjust the travel stop.
3. Tighten the lock nut (A74).
4. Attach the cover (A73) and retighten lock nut (A70).

6.3.2 Top travel stop (maximum travel)

1. Loosen the lock nut (A70).
2. Adjust the cover (A73) to the required travel stop.
3. Retighten the lock nut (A70).

6.4 Version with handwheel

The stem connector (A51) connects the actuator stem (A7) with the actuator stem (A50) of the handwheel. The actuator stem position can be adjusted using the handwheel (A60).

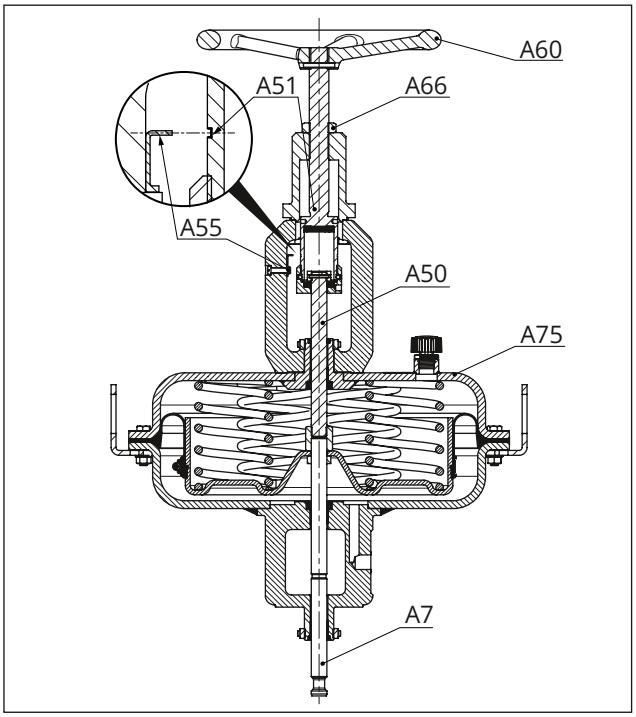


Fig. 20: *Type 3277 Pneumatic Actuator with handwheel*

A7 Actuator stem
A50 Top actuator stem
A51 Stem connector
A55 Pointer
A60 Handwheel
A66 Lock nut
A75 Top diaphragm case

Note

If you want to retrofit a handwheel to an actuator, contact our after-sales service.

6.4.1 Extending the actuator stem manually

1. Loosen the lock nut (A66) to unlock the handwheel (A60).
2. Turn the handwheel clockwise to extend the actuator stem.
3. To change from manual to automatic mode, place the handwheel in the neutral position. To do so, align the pointer (A55) with the groove on the stem connector (A51).
4. Tighten the lock nut (A66) to lock the handwheel.

6.4.2 Retracting the actuator stem manually

1. Loosen the lock nut (A66) to unlock the handwheel (A60).
2. Turn the handwheel counterclockwise to retract the actuator stem.
3. To change from manual to automatic mode, place the handwheel in the neutral position. To do so, align the pointer (A55) with the groove on the stem connector (A51).
4. Tighten the lock nut (A66) to lock the handwheel.

7 Operation

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

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

The actuator is operated with air. As a result, air is vented during operation.

⇨ *Wear eye and hearing protection when working near the actuator.*

⚠ WARNING

Crush hazard arising from moving parts.

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

⇨ *Do not touch the actuator stem or insert hands or finger into the yoke or beneath the actuator stem while the air supply is connected to the actuator.*

⇨ *Before working on the actuator, disconnect and lock the pneumatic air supply as well as the control signal.*

⇨ *Do not impede the movement of the actuator stem by inserting objects into the yoke.*

⇨ *Before unblocking the actuator stem after it has 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 Chapter 11.2.*

⚠ WARNING

Risk of personal injury due to incorrect operation, use or installation as a result of incorrect information on the actuator.

After any adjustment or conversion work, the details on the actuator nameplate may no longer be correct. This may apply, for example, to the configuration ID or the symbol after reversal of the direction of action.

⇨ *Immediately renew any nameplates or labels with incorrect or outdated information.*

⇨ *Add any new values to the nameplate. If necessary, contact SAMSON to obtain a new nameplate.*

7.1 Throttling or on/off service

The maximum permissible supply pressure is specified in the order confirmation for the control valve. However, the supply pressure must not exceed 6 bar in throttling service.

With “actuator stem extends” direction of action and travel stop, the supply pressure must not exceed the upper bench range value by more than 1.5 bar at the maximum.

The following also applies to actuators with 350 cm² actuator area (and devices already in use with 240 and 700 cm²):

– In on/off service, the supply pressure must be limited.
– With “actuator stem retracts” direction of action, the supply pressure must not exceed the upper bench range value by more than 3 bar at the maximum.

Bench range	Fail-safe action	Max. supply pressure
0.2 to 1.0 bar	Actuator stem retracts (FE)	4 bar
0.4 to 2.0 bar		5 bar
0.6 to 3.0 bar		6 bar

7.2 Manual mode (versions with handwheel only)

In the manual mode, the valve is opened and closed by the handwheel. The valve position is independent of the signal pressure or actuator springs. See associated handwheel documentation ▶ EB 8312-X.

The handwheel must be in the neutral position to allow the actuator to move through its entire travel range in throttling or on/off service.

In Type 3271 and Type 3277 Pneumatic Actuators with 700 cm² actuator area with a handwheel, the upper bench range value must not exceed 3.3 bar.

7.3 Additional notes concerning operation

⇨ Label actuators with reduced supply pressure with a sticker (“Max. supply pressure limited to … bar”).

⇨ Only apply the signal pressure to the signal pressure connection (S) on the diaphragm chamber of the actuator which does not contain any springs.

⇨ Only use vent plugs that let air through them (see spare parts drawing, item A16 in Chapter 15.2).

8 Malfunctions

Read hazard statements, warnings and caution notes in Chapter 1.

8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action
Actuator stem does not move on demand.	Actuator is blocked.	Put the actuator out of operation (see Chapter 10) and remove the blockage. **WARNING!** A blocked actuator 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 stem, disconnect and lock the pneumatic air supply as well as the control signal. Before unblocking the actuator, release any stored energy in the actuator (e.g. spring compression). See Chapter 11.2.
	Diaphragm in the actuator defective	See section 'Replacing the diaphragm' in Chapter 9.
	Signal pressure too low	Check the signal pressure. Check the signal pressure line for leakage.
	Signal pressure not connected to the correct diaphragm chamber.	See section 'Direction of action and signal pressure routing' in Chapter 3.
Actuator stem does not stroke through its complete travel range.	Signal pressure too low	Check the signal pressure. Check the signal pressure line for leakage.
	Travel stop active	See section 'Travel stop' in Chapter 6.
	Incorrect setting of valve accessories	Check the actuator without valve accessories. Check the settings of the valve accessories.

i ***Note***

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

8.2 Emergency action

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

9 Servicing and conversion

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

The following documents are also required for servicing the control valve:

– ▶ AB 0100 for tools, tightening torques and lubricants

⚠ DANGER

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

Pneumatic actuators are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or components can cause serious injury or even death.

⇨ *Before starting any work on pressure-bearing or pressure-retaining parts of the actuator, depressurize all plant sections affected as well as the actuator. Release any stored energy.*

⚠ WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. These actuators can be identified by several longer bolts with nuts protruding from the bottom diaphragm case. These bolts allow the spring compression to be relieved evenly on disassembling the actuator. Actuators with considerably preloaded springs are also labeled correspondingly (see Chapter 1.4).

⇨ *Before starting any work on the actuator, which requires the actuator to be opened, or when the actuator stem has become blocked, relieve the compression from the preloaded springs (see Chapter 11.2).*

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

The actuator is operated with air. As a result, air is vented during operation.

⇨ *Wear eye and hearing protection when working near the actuator.*

⚠ WARNING

Crush hazard arising from moving parts.

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

⇨ *Do not touch the actuator stem or insert hands or finger into the yoke or beneath the actuator stem while the air supply is connected to the actuator.*

⇨ *Before working on the actuator, disconnect and lock the pneumatic air supply as well as the control signal.*

⇨ *Do not impede the movement of the actuator stem by inserting objects into the yoke.*

⇨ *Before unblocking the actuator stem after it has 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 Chapter 11.2.*

⚠ WARNING

Risk of personal injury due to incorrect operation, use or installation as a result of incorrect information on the actuator.

After any adjustment or conversion work, the details on the actuator nameplate may no longer be correct. This may apply, for example, to the configuration ID or the symbol after reversal of the direction of action.

⇨ *Immediately renew any nameplates or labels with incorrect or outdated information.*

⇨ *Add any new values to the nameplate. If necessary, contact SAMSON to obtain a new nameplate.*

❗ NOTICE

Risk of actuator damage due to over- or under-torquing.

Observe the specified torques when tightening actuator parts. Over-torquing leads to parts wearing out more quickly. Parts that are not tightened far enough may loosen.

⇨ *Observe the specified tightening torques (▶ AB 0100).*

NOTICE

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

Certain tools are required to work on the actuator.

⇨ *Only use tools approved by SAMSON (▶ AB 0100).*

NOTICE

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

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

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

Note

- *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 actuator at certain intervals to prevent possible failure before it can occur. Plant 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 Preparation for servicing or conversion work

1. Lay out the necessary material and tools to have them ready for the intended work.
2. Put the actuator out of operation (see Chapter 10).
3. Remove the actuator from the valve (see Chapter 11).

Note

To remove an actuator with "stem extends" direction of action and/or with preloaded springs, a certain signal pressure must be applied to the actuator (see Chapter 11).

Once the work is completed, the signal pressure must be removed and the air supply disconnected again and locked.

4. Relieve the spring compression of actuators with preloaded springs (see Chapter 11.2).
5. Unthread and remove the bolts and nuts including washers from around the actuator housing. Keep the parts in a safe place for later use.

The following service and/or conversion work can be performed after preparation is completed:

- Replacing the diaphragm
- Replacing the actuator stem seals
- Reversing the direction of action

9.3 Mounting the actuator after service or conversion work

1. Mount the actuator (see Chapter 5).
2. Adjust the upper or lower signal pressure range value (see Chapter 6).

9.4 Service work

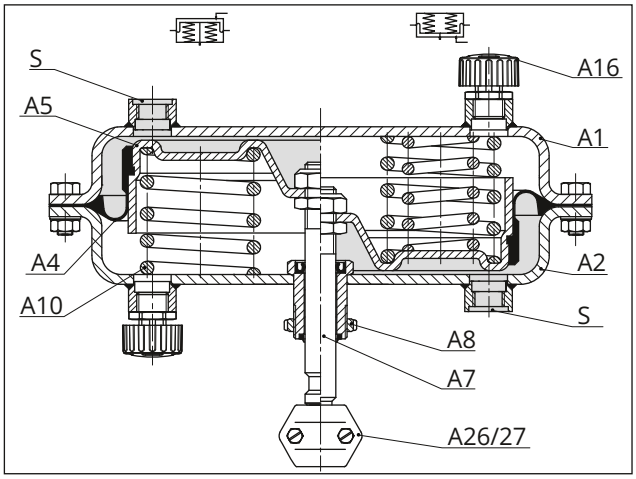


Fig. 21: *Type 3271 Actuator, drawing showing an example with 350 cm² actuator area*

A1	Top diaphragm case	A8	Ring nut
A2	Bottom diaphragm case	A10	Spring
A4	Diaphragm	A16	Vent plug
A5	Diaphragm plate	A26/27	Stem connector clamp
A7	Actuator stem	S	Signal pressure connection

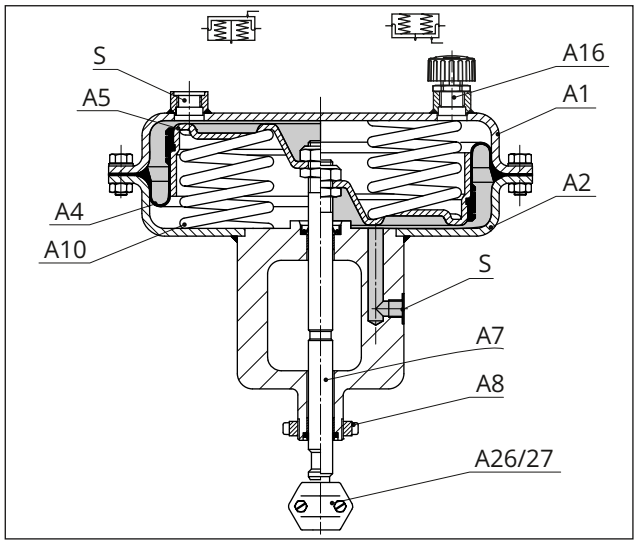


Fig. 22: *Type 3277 Actuator, drawing showing an example with 350 cm² actuator area*

A1	Top diaphragm case	A8	Ring nut
A2	Bottom diaphragm case	A10	Spring
A4	Diaphragm	A16	Vent plug
A5	Diaphragm plate	A26/27	Stem connector clamp
A7	Actuator stem	S	Signal pressure connection

9.4.1 Replacing the diaphragm

NOTICE

Risk of malfunction due to damaged hose clamp.

⇨ *Do not reuse hose clamps.*

⇨ *Use a new hose clamp every time the diaphragm is replaced.*

NOTICE

Risk of property damage and malfunction due to incorrect mounting of the hose clamp.

⇨ *Tighten the hose clamp by hand using a torque wrench. Observe the tightening torque and position it centrically.*

a) "Stem extends" direction of action

1. Lift off the top diaphragm case (A1) and remove springs (A10).
2. Pull the diaphragm plate assembly consisting of the diaphragm plate (A5), diaphragm (A4) and actuator stem (A7) out of the bottom diaphragm case (A2).
3. Clamp the bottom section of the actuator stem (A7) into a vise using protective jaws. Make sure that the actuator stem is not damaged.
4. **240 cm²:** Undo the latch of the hose clamp (A6). Take the hose clamp (A6) and diaphragm (A4) off the diaphragm plate (A5).

   350 and 700 cm²: Undo the latch of the hose clamp (A6). Take the compressor (A19), hose clamp (A6) and diaphragm (A4) off the diaphragm plate (A5).
5. Mount the new diaphragm (A4). Make sure that the diaphragm is correctly aligned with the diaphragm plate. The imaginary line through two opposing recesses for springs on the diaphragm plate must be aligned centrally between two bolting holes in the diaphragm (see Fig. 24).
6. Place the hose clamp (A6) evenly into the groove in the diaphragm (A4) intended for it.
7. **240 cm²:** Turn the screw on the latch of the hose clamp until the hose clamp rests completely in the groove. Tighten the screw of the latch using a suitable tool. Observe tightening torques.

   350 and 700 cm²: Turn the screw on the latch of the hose clamp until only a gap of just a few millimeters remains between the diaphragm (A4) and hose clamp (A6). Place and align the compressor (A19) beneath the clamp's latch (see Fig. 24). Tighten the screw of the latch using a suitable tool. Observe tightening torques.
8. Apply a suitable lubricant to the actuator stem (A7).
9. Place the diaphragm plate assembly consisting of the diaphragm plate (A5), new diaphragm (A4) and actuator stem (A7) into the bottom diaphragm case (A2). Make sure that the sealing elements are not damaged.
10. Place the springs (A10) into the bottom diaphragm case, centering them in the intended recesses.
11. Place on the top diaphragm case (A1).
12. If necessary, preload the springs (see Chapter 6).
13. Fasten the top and bottom diaphragm cases (A1, A2) together using the nuts (A21) and bolts (A20). Observe tightening torques.

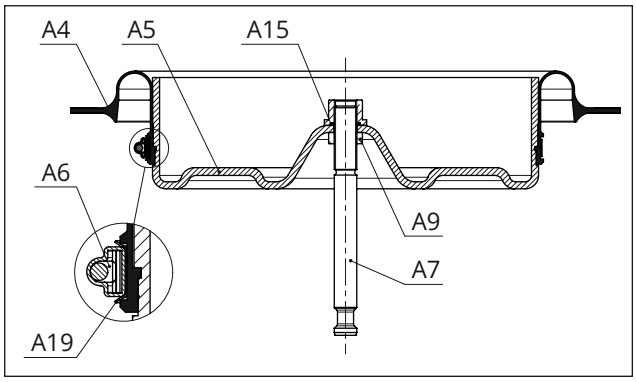


Fig. 23: *Arrangement of parts for "stem extends" direction of action (240, 350, 700 cm²)*

A4	Diaphragm	A9	Hex nut
A5	Diaphragm plate	A15	Collar nut
A6	Hose clamp	A19	Compressor on the hose clamp (A6)
A7	Actuator stem		

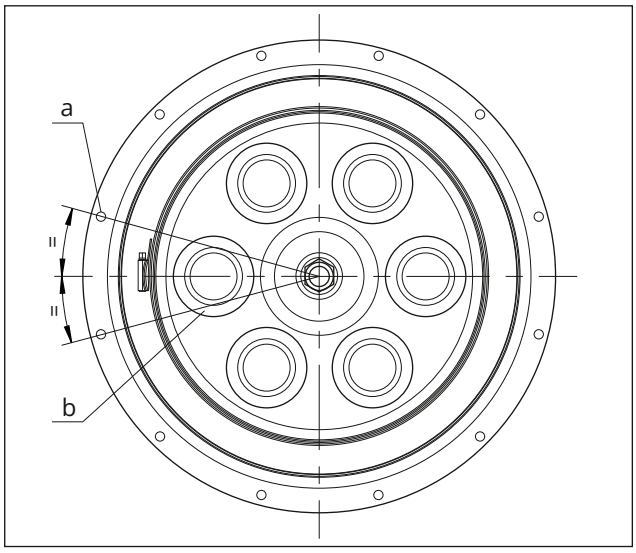


Fig. 24: *Aligning the diaphragm*

a Bolting hole

b Recess for spring

b) "Stem retracts" direction of action

1. Lift off the top diaphragm case (A1).
2. Pull the diaphragm plate assembly consisting of the diaphragm plate (A5), diaphragm (A4) and actuator stem (A7) out of the actuator.
3. Take the springs (A10) out of the bottom diaphragm case (A2).
4. Clamp the bottom section of the actuator stem (A7) into a vise using protective jaws. Make sure that the actuator stem is not damaged.
5. **240 cm²:** Undo the latch of the hose clamp (A6). Take the hose clamp (A6) and diaphragm (A4) off the diaphragm plate (A5).

   350 and 700 cm²: Undo the latch of the hose clamp (A6). Take the compressor (A19), hose clamp (A6) and diaphragm (A4) off the diaphragm plate (A5).
6. Mount the new diaphragm (A4). Make sure that the diaphragm is correctly aligned with the diaphragm plate. The imaginary line through two opposing recesses for springs on the diaphragm plate must be aligned centrally between two bolting holes in the diaphragm (see Fig. 24).
7. Place the hose clamp (A6) evenly into the groove in the diaphragm (A4) intended for it.
8. **240 cm²:** Turn the screw on the latch of the hose clamp until the hose clamp rests completely in the groove. Tighten the screw of the latch using a suitable tool. Observe tightening torques.

   350 and 700 cm²: Turn the screw on the latch of the hose clamp until only a gap of just a few millimeters remains between the diaphragm (A4) and hose clamp (A6). Place and align the compressor (A19) beneath the clamp's latch (see Fig. 24). Tighten the screw of the latch using a suitable tool. Observe tightening torques.
9. Apply a suitable lubricant to the actuator stem (A7).
10. Clamp the top diaphragm case (A1) with the opening facing upward into a suitable clamping fixture.
11. Place the diaphragm plate assembly consisting of the diaphragm plate (A5), new diaphragm (A4) and actuator stem (A7) with the actuator stem pointing upward into the diaphragm case (A1).
12. Place the springs (A10) in the diaphragm plate (A5), centering them in the intended recesses.
13. Carefully guide the bottom diaphragm case (A2) over the actuator stem (A7) and place it on the springs (A10). Make sure that the sealing elements are not damaged. Ensure that the compressed air connections on the cases (A1, A2) are correctly aligned with each other.
14. Fasten the top and bottom diaphragm cases (A1, A2) together using the nuts (A21) and bolts (A20). Observe tightening torques.

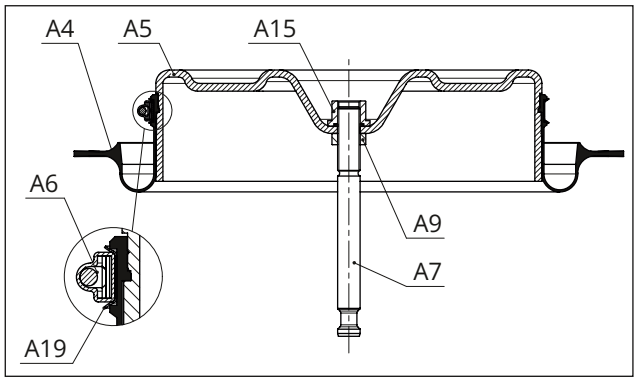


Fig. 25: *Arrangement of parts for "stem retracts" direction of action (240, 350, 700 cm²)*

A4	Diaphragm	A9	Hex nut
A5	Diaphragm plate	A15	Collar nut
A6	Hose clamp	A19	Compressor on the hose clamp (A6)
A7	Actuator stem		

9.4.2 Replacing the actuator stem seals

a) "Stem extends" (FA) direction of action

1. Lift off the top diaphragm case (A1) and remove springs (A10).
2. Pull the diaphragm plate assembly consisting of the actuator stem (A7), diaphragm plate (A5) and diaphragm (A4) out of the bottom diaphragm case (A2).
3. Use a suitable punch to remove the radial shaft seal (A40).
4. Check the dry bearing (A42) and wiper ring (A41) and renew them, if necessary.
5. Apply a suitable lubricant to the seal lip of the new radial shaft seal.
6. Mount the radial shaft seal using a suitable tool. Observe the correct alignment of the radial shaft seal (see Fig. 26).
7. Fill the cavity of the radial shaft seal, in which the spring is seated, with lubricant.
8. Apply a suitable lubricant to the actuator stem (A7).
9. Place the diaphragm plate assembly consisting of the diaphragm plate (A5), new diaphragm (A4) and actuator stem (A7) into the bottom diaphragm case (A2). Make sure that the sealing elements are not damaged. Ensure that the compressed air connections on the cases (A1, A2) are correctly aligned with each other.
10. Place the springs (A10) into the bottom diaphragm case, centering them in the intended recesses.
11. Place on the top diaphragm case (A1).
12. If necessary, preload the springs (see Chapter 6).
13. Fasten the top and bottom diaphragm cases (A1, A2) together using the nuts (A21) and bolts (A20). Observe tightening torques.

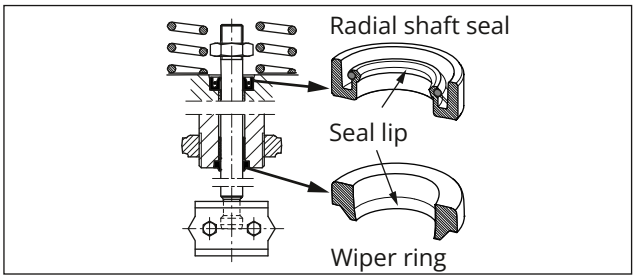


Fig. 26: *Aligning the radial shaft seal and wiper ring*

b) "Stem retracts" (FE) direction of action

1. Lift off the top diaphragm case (A1).
2. Pull the diaphragm plate assembly consisting of the diaphragm plate (A5), diaphragm (A4) and actuator stem (A7) out of the actuator.
3. Take the springs (A10) out of the bottom diaphragm case (A2).
4. Use a suitable punch to remove the radial shaft seal (A40).
5. Check the dry bearing (A42) and wiper ring (A41) and renew them, if necessary.
6. Apply a suitable lubricant to the seal lip of the new radial shaft seal.
7. Mount the radial shaft seal using a suitable tool. Observe the correct alignment of the radial shaft seal (see Fig. 26).
8. Fill the cavity of the radial shaft seal, in which the spring is seated, with lubricant.
9. Apply a suitable lubricant to the actuator stem (A7).
10. Clamp the top diaphragm case (A1) with the opening facing upward into a suitable clamping fixture.
11. Place the diaphragm plate assembly together with the actuator stem (A7) pointing upward into the top diaphragm case (A1).
12. Place the springs (A10) in the diaphragm plate (A5), centering them in the intended recesses.

13. Carefully guide the bottom diaphragm case (A2) over the actuator stem (A7) and place it on the springs (A10). Make sure that the sealing elements are not damaged. Ensure that the compressed air connections on the cases (A1, A2) are correctly aligned with each other.
14. Fasten the top and bottom diaphragm cases (A1, A2) together using the nuts (A21) and bolts (A20). Observe tightening torques.

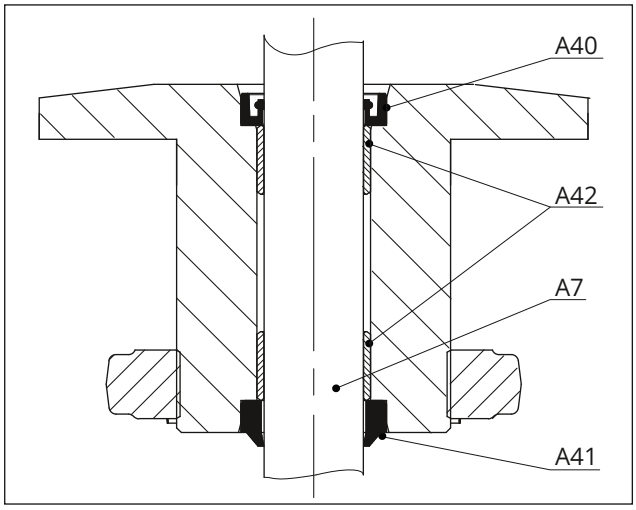


Fig. 27: *Actuator stem seal (Type 3271)*

A7 Actuator stem
A40 Radial shaft seal
A41 Wiper ring
A42 Dry bearing

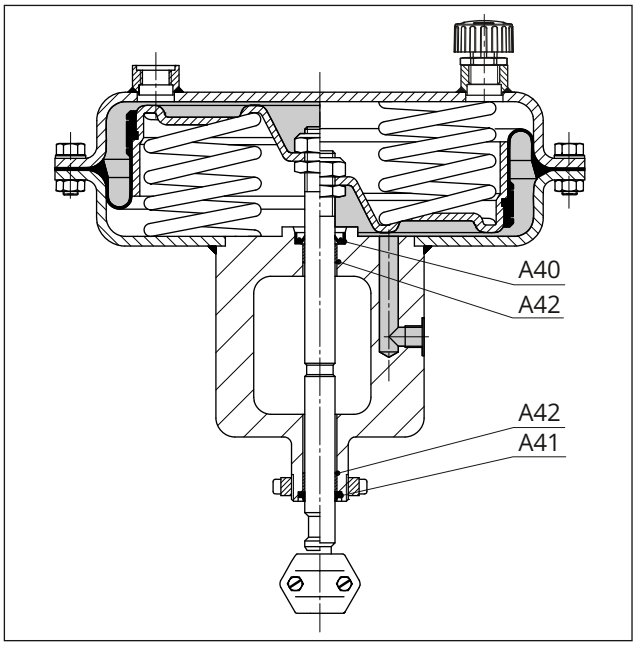


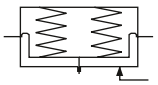
Fig. 28: *Actuator stem seal (Type 3277)*

A7 Actuator stem
A40 Radial shaft seal
A41 Wiper ring
A42 Dry bearing

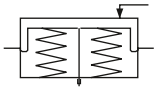
9.5 Conversion work

9.5.1 Reversing the direction of action

The direction of action (and fail-safe action) of pneumatic actuators can be changed. The fail-safe action is indicated on the nameplate by a symbol:



Actuator stem extends



Actuator stem retracts

a) Reversal of the direction of action from "stem extends" to "stem retracts"

1. Lift off the top diaphragm case (A1) and remove springs (A10).
2. Pull the diaphragm plate assembly consisting of the diaphragm plate (A5), diaphragm (A4) and actuator stem (A7) out of the bottom diaphragm case (A2).
3. Clamp the bottom section of the actuator stem (A7) into a vise using protective jaws. Make sure that the actuator stem is not damaged.

4. Unscrew and remove the collar nut (A15) while holding the nut (A9) stationary.

NOTICE

Malfunction due to loosened nut.

The nut (A9) on the actuator stem serves to adjust the dimension x.

⇨ *Do not loosen the nut (A9).*

⇨ *If the nut (A9) has been loosened, readjust the dimension x as specified in Table 5.*

5. Remove the diaphragm plate (A5) with diaphragm (A4) from the actuator stem and place them back on in reverse order.
6. Tighten the collar nut (A15) while holding the nut (A9) stationary. Observe tightening torques.
7. Unscrew the spacer (A87).
8. Apply a suitable lubricant to the actuator stem (A7).
9. Clamp the top diaphragm case (A1) with the opening facing upward into a suitable clamping fixture.
10. Place the diaphragm plate assembly together with the actuator stem (A7) pointing upward into the diaphragm case (A1).
11. Place the springs (A10) in the diaphragm plate (A5), centering them in the intended recesses.
12. Carefully guide the bottom diaphragm case (A2) over the actuator stem (A7) and place it on the springs (A10). Make sure that the sealing elements are not damaged. Ensure that the compressed air connections on the cases (A1, A2) are correctly aligned with each other.
13. Fasten the top and bottom diaphragm cases (A1, A2) together using the nuts (A21) and bolts (A20). Observe tightening torques.
14. Unscrew the vent plug (A16) from the top signal pressure connection and screw it into the bottom connection (S).

    The actuator springs, which now push against the diaphragm plate from below, cause the actuator stem to retract. The signal pressure is connected to the top connection (S) on the top diaphragm case. As a result, the actuator stem extends opposing the spring force as the signal pressure increases.
15. Affix a new nameplate with changed symbol and new configuration ID to the actuator.

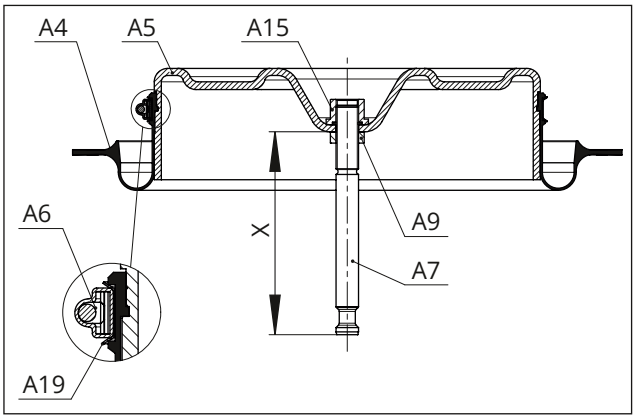


Fig. 29: *Arrangement of parts for "stem retracts" direction of action*

A4	Diaphragm	A9	Hex nut
A5	Diaphragm plate	A15	Collar nut
A6	Hose clamp	A19	Compressor
A7	Actuator stem		

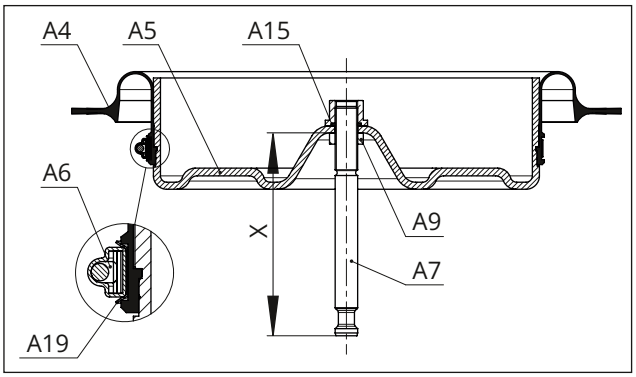


Fig. 30: *Arrangement of parts for "stem extends" direction of action*

A4	Diaphragm	A9	Hex nut
A5	Diaphragm plate	A15	Collar nut
A6	Hose clamp	A19	Compressor
A7	Actuator stem		

b) Reversal of the direction of action from "stem retracts" to "stem extends"

1. Lift off the top diaphragm case (A1).
2. Pull the diaphragm plate assembly consisting of the diaphragm plate (A5), diaphragm (A4) and actuator stem (A7) out of the actuator.
3. Take the springs (A10) out of the bottom diaphragm case (A2).
4. Unscrew and remove the collar nut (A15) while holding the nut (A9) stationary.

NOTICE

Malfunction due to loosened nut.

The nut (A9) on the actuator stem serves to adjust the dimension x.

⇨ *Do not loosen the nut (A9).*

⇨ *If the nut (A9) has been loosened, readjust the dimension x as specified in Table 5.*

5. Clamp the bottom section of the actuator stem (A7) into a vise using protective jaws. Make sure that the actuator stem is not damaged.
6. Remove the diaphragm plate (A5) with diaphragm (A4) from the actuator stem and place them back on in reverse order.
7. Tighten the collar nut (A15) while holding the nut (A9) stationary. Observe tightening torques.
8. Apply a suitable lubricant to the actuator stem (A7).
9. Place the diaphragm plate assembly together with the actuator stem (A7) pointing downward into the bottom diaphragm case (A2). Make sure that the sealing elements are not damaged.
10. Place the springs (A10) into the bottom diaphragm case, centering them in the intended recesses.
11. Place on the top diaphragm case (A1).
12. If necessary, preload the springs (see Chapter 6).
13. Fasten the top and bottom diaphragm cases (A1, A2) together using the nuts (A21) and bolts (A20). Observe tightening torques.
14. Unscrew the vent plug (A16) from the bottom signal pressure connection and screw it into the top connection (S).

    The actuator springs, which now push against the diaphragm plate from above, cause the actuator stem to extend. The signal pressure is connected to the bottom connection (S) on the bottom diaphragm case. As a result, the actuator stem retracts opposing the spring force as the signal pressure increases.
15. Affix a new nameplate with changed symbol and new configuration ID to the actuator.

9.6 Determining the inside dimension

If the nut (A9) has come undone at the actuator stem (A7) during service and conversion work, the dimension x (see Fig. 16) must be readjusted.

Table 5: *Dimension x*

Type	Actuator area	Travel in mm	Dimension x in mm (top of the nut to the bottom of the actuator stem)
3271	240[1)]	15	98.25
3271	350	15	107.25
3271	700[1)]	30	144
3277	240[1)]	15	–
3277	350	15	209
3277	700[1)]	30	246

1) Only applies to devices already in use

9.7 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 Appendix for details on spare parts.

Lubricants

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 chapter is to be performed only by personnel appropriately qualified to carry out such tasks.

⚠ DANGER

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

Pneumatic actuators are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or components can cause serious injury or even death.

⇨ *Before starting any work on pressure-bearing or pressure-retaining parts of the actuator, depressurize all plant sections affected as well as the actuator. Release any stored energy.*

⚠ WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. These actuators can be identified by several longer bolts with nuts protruding from the bottom diaphragm case. These bolts allow the spring compression to be relieved evenly on disassembling the actuator. Actuators with considerably preloaded springs are also labeled correspondingly (see Chapter 1.4).

⇨ *Before starting any work on the actuator, which requires the actuator to be opened, or when the actuator stem has become blocked, relieve the compression from the preloaded springs (see Chapter 11.2).*

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

The actuator is operated with air. As a result, air is vented during operation.

⇨ *Wear eye and hearing protection when working near the actuator.*

⚠ WARNING

Crush hazard arising from moving parts.

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

⇨ *Do not touch the actuator stem or insert hands or finger into the yoke or beneath the actuator stem while the air supply is connected to the actuator.*

⇨ *Before working on the actuator, disconnect and lock the pneumatic air supply as well as the control signal.*

⇨ *Do not impede the movement of the actuator stem by inserting objects into the yoke.*

⇨ *Before unblocking the actuator stem after it has 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 Chapter 11.2.*

To put the actuator out of operation for service work or before removing it from the valve, proceed as follows:

1. Put the control valve out of operation (see associated valve documentation).
2. Disconnect the pneumatic air supply to depressurize the actuator.
3. Release any stored energy.

11 Removal

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

⚠ DANGER

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

Pneumatic actuators are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or components can cause serious injury or even death.

⇨ *Before starting any work on pressure-bearing or pressure-retaining parts of the actuator, depressurize all plant sections affected as well as the actuator. Release any stored energy.*

⚠ WARNING

Risk of personal injury due to preloaded springs.

Actuators with preloaded springs are under tension. These actuators can be identified by several longer bolts with nuts protruding from the bottom diaphragm case. These bolts allow the spring compression to be relieved evenly on disassembling the actuator. Actuators with considerably preloaded springs are also labeled correspondingly (see Chapter 1.4).

⇨ *Before starting any work on the actuator, which requires the actuator to be opened, or when the actuator stem has become blocked, relieve the compression from the preloaded springs (see Chapter 11.2).*

⚠ WARNING

Risk of personal injury due to exhaust air being vented.

The actuator is operated with air. As a result, air is vented during operation.

⇨ *Wear eye and hearing protection when working near the actuator.*

⚠ WARNING

Crush hazard arising from moving parts.

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

⇨ *Do not touch the actuator stem or insert hands or finger into the yoke or beneath the actuator stem while the air supply is connected to the actuator.*

⇨ *Before working on the actuator, disconnect and lock the pneumatic air supply as well as the control signal.*

⇨ *Do not impede the movement of the actuator stem by inserting objects into the yoke.*

⇨ *Before unblocking the actuator stem after it has 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 Chapter 11.2.*

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

– The actuator is put out of operation (see Chapter 10).

11.1 Removing the actuator from the valve

1. Undo the stem connector clamps (A26/27).
2. Loosen the stem connector nut (9) and lock nut (10) on the valve.
3. **Removing actuators with "stem extends" direction of action with/without preloaded springs:** To loosen the ring nut (A8), apply approx. 50 % signal pressure to open the valve.
4. Loosen the ring nut on the valve bonnet.
5. Disconnect the signal pressure again.
6. Separate the actuator from the valve by undoing the ring nut.
7. Fasten tight the lock nut and stem connector nut on the valve.

11.2 Relieving the spring compression in the actuator

The long clamping bolts with long clamping nuts and the short bolts with short nuts are arranged evenly around the circumference of the actuator housing to fasten the diaphragm cases together.

The springs in the actuator are compressed using the long clamping nuts and bolts.

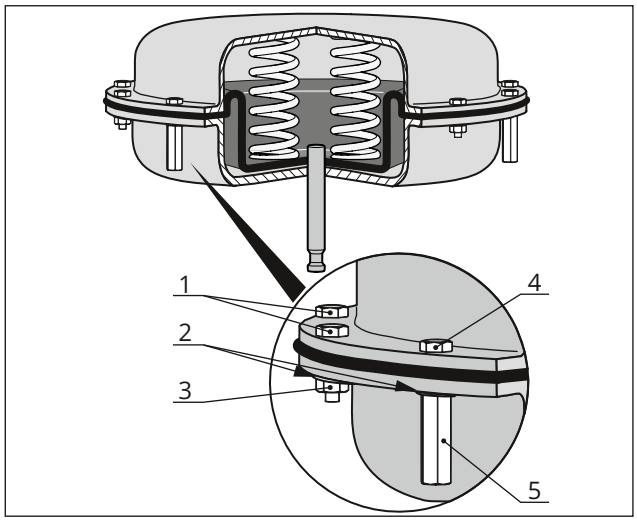


Fig. 31: *Preloaded springs (functional diagram)*

1	Short bolt	4	Clamping bolt
2	Washer	5	Clamping nut
3	Short nut		

To relieve the compression of the preloaded springs in the actuator, proceed as follows:

1. Unthread and remove the short nuts and bolts (including the washers) on the diaphragm cases.
2. Loosen the long clamping nuts and bolts on the diaphragm cases evenly in a crisscross pattern to gradually relieve the spring compression. Hold the bolt head stationary with a suitable tool and apply the torque to the nuts.

12 Repairs

If the actuator 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 actuator damage due to incorrect service or repair work.

⇨ *Do not perform any repair work on your own.*

⇨ *Contact SAMSON's After-sales Service for service and 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 > After-sales Service > Returning goods.
2. Send an e-mail returns-de@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 the Internet at: ▶ www.samsongroup.com > Service > After-sales Service > Returning goods

   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.

Note

Further information on returned devices and how they are handled can be found at:

▶ *www.samsongroup.com > Service > After-sales Service*

13 Disposal

SAMSON is a producer registered in Europe, agency in charge
▶ www.samsongroup.com > About SAMSON > Environment, Social & Governance > Material Compliance > Waste electrical and electronic equipment (WEEE)
WEEE reg. no.: DE 62194439

Information on substances listed as substances of very high concern (SVHC) on the candidate list of the REACH regulation can be found in the document “Additional Information on Your Inquiry/Order”, which is added to the order documents, if applicable. This document includes the SCIP number assigned to the devices concerned. This number can be entered into the database on the European Chemicals Agency (ECHA) website (▶ https://www.echa.europa.eu/scip-database) to find out more information on the SVHC contained in the device.

Note

SAMSON can provide you with a recycling passport on request. Simply e-mail us at aftersalesservice@samsongroup.com giving details of your company address.

Tip

On request, SAMSON can appoint a service provider to dismantle and recycle the product as part of a distributor take-back scheme.

⇨ Observe local, national and international refuse regulations.

⇨ Do not dispose of components, lubricants and hazardous substances together with your other household waste.

14 Certificates

These declarations are included on the next pages:

- Declaration of incorporation in compliance with Machinery Directive 2006/42/EC
- EAC conformity certificate in compliance with TR CU 012/2011 “Safety of equipment in hazardous areas” for the Eurasian Economic Union (EAEU)

The certificates shown were up to date at the time of publishing. The latest certificates can be found on our website:

- ▶ www.samsongroup.com > Products > Actuators > 3271
- ▶ www.samsongroup.com > Products > Actuators > 3277

Other optional certificates are available on request.

DECLARATION OF INCORPORATION
TRANSLATION

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

For the following products:
Type 3271 and Type 3277 Actuators

We certify that the Type 3271 and Type 3277 Actuators 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 signal pressure and moving parts in/on the actuator.

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 www.samson.de.

For product descriptions of the actuators, refer to:
- Types 3271 and 3277 Actuators: Mounting and Operating Instructions EB 8310-X

Referenced technical standards and/or specifications:
- VCI, VDMA, VGB: "Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, Mai 2018" [German only]
- VCI, VDMA, VGB: "Zusatzdokument zum „Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen vom Mai 2018" [German only], based on DIN EN ISO 12100:2011-03

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

i.V.

Dr. Michael Heß
Director
Product Management and Technical Sales

i.V.

Peter Scheermesser
Director
Product Upgrades and ETO Valves and Actuators

Revision no. 00

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ЕАЭС KZ 7500525.01.01.02379

Серия KZ № 0269740

ОРГАН ПО СЕРТИФИКАЦИИ БИН 990940001103, Товарищество с ограниченной ответственностью "Т-Стандарт", аттестат аккредитации: KZ.O.02.0525 от 17.10.2024, юридический адрес: Республика Казахстан, город Алматы, Бостандыкский район, проспект Аль-Фараби 19/1, ПФЦ «Нурлы-Тау», блок 3Б, 2 этаж, почтовый индекс: 050059, фактический адрес: Республика Казахстан, город Алматы, Бостандыкский район, проспект Аль-Фараби 19/1, ПФЦ «Нурлы-Тау», блок 3Б, 2 этаж, почтовый индекс: 050059, телефон: +7(701) 071 63 88, электронная почта: office@tst.kz

ЗАЯВИТЕЛЬ БИН 130640006195, Товарищество с ограниченной ответственностью "НИЦ ГеоСервис". Место нахождения (адрес юридического лица) и адрес места осуществления деятельности: Республика Казахстан, Карагандинская область, город Караганда, район имени Казыбек Би, улица Терешковой, 18, индекс: M02E3T6. телефон: +7(777) 540 50 96, электронная почта: cert_msk2@geomark.kz

ИЗГОТОВИТЕЛЬ «SAMSON AKTIENGESELLSCHAFT», располагающийся по адресу: Германия, Weismüllerstraße 3, 60314 Frankfurt am Main адрес осуществления деятельности: Германия, Weismüllerstraße 3, 60314 Frankfurt am Main, «SAMSON REGULATION S.A.S.», Франция, 1, rue Jean Corona, 69120 Vaulx-en-Velin

ПРОДУКЦИЯ Неэлектрическое оборудование: Пневматические приводы, типов: 3271, 3277, во взрывозащищенном исполнении, маркировка взрывозащиты и описание согласно приложению № 0116238-0116239; Продукция изготавливается в соответствии с ISO 80079-36 Explosive atmospheres – Part 36: Non-electrical equipment for explosive atmospheres – Basic method and requirements; серийный выпуск

КОД ТН ВЭД ЕАЭС 8412390009

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ ТР ТС 012/2011 "О безопасности оборудования для работы во взрывоопасных средах" утвержденного решением Комиссии Таможенного союза от 18 октября 2011 г. № 825;

СЕРТИФИКАТ СООТВЕТСТВИЯ ВЫДАН НА ОСНОВАНИИ протоколов испытаний № ИЛ-11/10-8 от 10.11.2025г., № ИЛ-12/03-7 от 03.12.2025г. выданных аккредитованной Испытательной лабораторией филиала "Атырау" Товарищества с ограниченной ответственностью "Т-Стандарт" (аттестат: KZ.T.06.2232); акта анализа состояния производства от 27.10.2025г. (эксперт-аудитор Жигалина Г.М.), выданного Органом по подтверждению соответствия Товарищества с ограниченной ответственностью "Т-Стандарт" (аттестат: KZ.O.02.0525); пояснительной записки; технической документации; Схема сертификации: 1с

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Периодическую оценку сертифицируемой продукции проводит Орган по подтверждению соответствия Товарищества с ограниченной ответственностью "Т-Стандарт"; Действие сертификата распространяется на продукцию, изготовленную с 10.2025 г.; Условия и срок хранения продукции в соответствии с эксплуатационной документацией. Срок службы – 25 лет; Договор № 01-02/10 от 07.08.2025г.; ГОСТ 31610.0-2019 "Взрывоопасные среды. Часть 0. Оборудование. Общие требования"; ГОСТ 32407-2013 "Взрывоопасные среды. Часть 36. Неэлектрическое оборудование для взрывоопасных сред. Общие требования и методы испытаний"; ГОСТ ISO/DIS 80079-37-2013 "Взрывоопасные среды. Часть 37. Неэлектрическое оборудование для взрывоопасных сред – Неэлектрическое оборудование с видами взрывозащиты «конструкционная безопасность «c», контроль источника воспламенения «b», погружение в жидкость «k»;

СРОК ДЕЙСТВИЯ с 28.01.2026 по 27.01.2031 **ВКЛЮЧИТЕЛЬНО**

М.П.

Руководитель (уполномоченное лицо) органа по сертификации _____ (подпись) ОВЧИННИКОВА ВЕРА АЛЕКСАНДРОВНА (Ф.И.О.)

Эксперт (эксперт-аудитор) (эксперты(эксперты-аудиторы)) _____ (подпись) ГОПТАРЕНКО ВЯЧЕСЛАВ ЮРЬЕВИЧ (Ф.И.О.)

Бланк изготовлен «КАОС», г. Астана

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

ПРИЛОЖЕНИЕ

Серия KZ № 0116238

К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС KZ 7500525.01.01.02379

1 лист

1. НАЗНАЧЕНИЕ И ОБЛАСТЬ ПРИМЕНЕНИЯ

Пневматические приводы типов: 3271, 3277 предназначены для перемещения, запирающего или регулирующего элемента арматуры промышленной трубопроводной (клапана), а также для создания усилия и обеспечения требуемой герметичности затвора.

Область применения – взрывоопасные зоны класса 1 и 2 по ГОСТ 31610.10-1-2022 (IEC 60079-10-1:2020) «Взрывоопасные среды. Часть 10-1. Классификация зон. Взрывоопасные газовые среды», зоны класса 21 и 22 по ГОСТ 31610.10-2-2017 (IEC 60079-10-2:2015) «Взрывоопасные среды. Часть 10-2. Классификация зон. Взрывоопасные пылевые среды».

2. ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

2.1. Маркировка взрывозащиты[1] ..... Ex h IIC T* Gb X

2.2. Маркировка защиты от воспламенения горючей пыли[2] ..... Ex h IIIC T* Db X

Степень защиты оболочки по ГОСТ 14254-2015, не ниже[3] ..... IP54 или IP66

2.3. Допустимый диапазон температуры окружающей среды T*

с уплотнением штока привода из NBR[4), 5)] ..... от минус 35 °С до +90 °С

с уплотнением штока привода из EPDM[6)] ..... от минус 50 °С до +120 °С

с уплотнением штока привода из PVMQ ..... от минус 60 °С до +90 °С

2.4. Максимальное давление питающего воздуха, МПа 0,6

[1)] T* - конкретные значения температурного класса, зависят от вида исполнения и указываются в маркировке конкретного прибора

[2)] T* - конкретные значения температуры поверхности, зависят от вида исполнения и указываются в маркировке конкретного прибора.

[3)] в зависимости от степени защиты внешних устройств степень защиты вплоть до IP66 может быть достигнута для привода с облицовкой пружинной камеры.

[4)] в режиме переключения (ОТКР/ЗАКР) нижний температурный предел ограничен до минус 20 °С

[5)] для типоразмера 120 максимальный верхний температурный предел ограничен до +80 °С

[6)] в режиме переключения (ОТКР/ЗАКР) нижний температурный предел ограничен до минус 40 °С

2.5. Типоразмеры и площадь поверхности мембраны пневматических приводов типа 3271

Типоразмеры	120	175	350 350v2	355v2	750v2	1000	1400-60 1400-120 1400-250	2800	2 x 2800
Площадь поверхности мембраны, см²	120	175	350	355	750	1000	1400	2800	2 x 2800

2.6. Типоразмеры и площадь поверхности мембраны пневматических приводов типа 3277

Типоразмеры	120	175	350 350v2	355v2	750v2
Площадь поверхности мембраны, см²	120	175	350	355	750

3. ОПИСАНИЕ КОНСТРУКЦИИ И СРЕДСТВ ОБЕСПЕЧЕНИЯ ВЗРЫВОЗАЩИТЫ

Пневматические приводы изготавливаются из коррозионностойкой стали или из литого алюминия и состоят из корпуса, рабочих пружин, мембраны, соединительного и удлинительного штоков, подшипниковых опор. На торцах цилиндра расположены крышки, закреплённые винтами, а по бокам проходят крепёжные направляющие и посадочные площадки для монтажа на клапан. На верхней части корпуса установлены индикатор положения, площадка для монтажа позиционера или ограничителей хода. Сбоку или сверху размещены пневматические штуцеры для подачи управляющего воздуха, маркированные и ориентированные под стандартные фитинги.

Пневматические приводы исполнения v1 выполнены с зажимной мембраной (значения площади приводов в см² без дополнительного обозначения) и исполнения v2 со сплошной мембраной (в значении площади привода добавляется v2).

Взрывозащищенность пневматических приводов обеспечивается выполнением требований стандартов: ГОСТ 31610.0-2019 (IEC 60079-0:2017); ГОСТ 32407-2013 (ISO/DIS 80079-36); ГОСТ ISO/DIS 80079-37-2013.

М.П.

Руководитель (уполномоченное лицо) органа по сертификации _____ (подпись) Овчинникова Вера Александровна (Ф.И.О.)

Эксперт (эксперт-аудитор) (эксперты(эксперты-аудиторы)) _____ (подпись) Гоптаренко Вячеслав Юрьевич (Ф.И.О.)

Бланк изготовлен «КАОС», г. Нур-Султан

ЕВРАЗИЙСКИЙ ЭКОНОМИЧЕСКИЙ СОЮЗ

ПРИЛОЖЕНИЕ

Серия KZ № 0116239

К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ЕАЭС KZ 7500525.01.01.02379

4. СПЕЦИАЛЬНЫЕ УСЛОВИЯ ПРИМЕНЕНИЯ

Знак «X», стоящий после Ex-маркировки, означает, что при эксплуатации приводов необходимо соблюдать следующие специальные условия применения:

- монтаж, эксплуатацию, техническое обслуживание пневматических приводов и навесного оборудования к ним проводить в соответствии с указаниями производителя по его технической документации, требованиями ГОСТ 31438.1-2011 (EN 1127-1:2007), ГОСТ IEC 60079-14-2013, регламентирующих применение данного оборудования во взрывоопасных зонах;
- температурный класс/максимальная температура поверхности оборудования (T*) устанавливается в зависимости от температуры окружающей среды;
- запрещается эксплуатировать пневматические приводы в условиях, превышающих предельные значения, указанные в техпаспорте и на заводской табличке;
- навесное оборудование должно иметь действующие сертификаты соответствия ТР ТС 012/2011, допускающие возможность их применения во взрывоопасных зонах; необходимо соблюдать специальные условия безопасного применения «X», указанные в сертификатах соответствия и руководствах по эксплуатации для навесного оборудования;
- приводы следует встраивать в локальную систему уравнивания потенциалов во взрывоопасной зоне;
- при эксплуатации приводов, в зонах, опасных по воспламенению горючей пыли, требуется учитывать температуру окружающей среды; температура воспламенения пыли должна превышать температуру поверхности привода и его составных частей более чем в 1,5 раза, а температура тления осевшей пыли (максимальная допустимая толщина слоя пыли – 5 мм) должна быть выше температуры поверхности провода и его составных частей более чем на 75 К.

Специальные условия применения, обозначенные «X», должны быть отражены в сопроводительной документации.

М.П.

Руководитель (уполномоченное лицо) органа по сертификации _____ (подпись) Овчинникова Вера Александровна (Ф.И.О.)

Эксперт (эксперт-аудитор) (эксперты(эксперты-аудиторы)) _____ (подпись) Гоптаренко Вячеслав Юрьевич (Ф.И.О.)

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15 Appendix

15.1 Tightening torques, lubricants and tools

▶ AB 0100 tools, tightening torques and lubricants

15.2 Spare parts

1 Top diaphragm case
2 Bottom diaphragm case
4 Diaphragm
5 Diaphragm plate
6 Hose clamp
7 Actuator stem
8 Ring nut
9 Hex nut
10 Spring (external)
11 Spring (internal)
12 Spring (internal)
15 Collar nut
16 Vent plug
19 Compressor on the hose clamp (6)
20 Hex bolt
21 Hex nut
22 Hex bolt (preloaded springs)
23 Hex nut (preloaded springs)
24 Stopper
25 Washer
26/27 Stem connector clamps
28 Clamp with bracket
29 Hex bolt
30 Hex nut
32 Hanger (accessories)
40 Radial shaft seal
41 Wiper ring
42 Dry bearing
43 Hex bolt
49 Wiper ring[8)]
50 Top actuator stem
51 Stem connector
52 Screwed flange
54 Ring
55 Pointer
56 Hex nut[9)]
57 Coupling nut
58 Sliding washer
59 Yoke
60 Handwheel
61 Dowel pin
62 Dowel pin
63 Threaded pin
64 Cap screw
65 Hex bolt
66 Hex nut
67 Retaining ring
68 Axial needle seal
69 Washer
70 Lock nut
73 Cover
74 Lock nut
75 Top diaphragm case
76 Radial shaft seal
77 Dry bearing
100 Nameplate
101 Label (preloaded springs)
106 Grooved pin
160* Dust shield (option)

8) Only applies to actuators with 240 cm² actuator area already in use

9) Replaces collar nut (15) in version with travel stop or handwheel

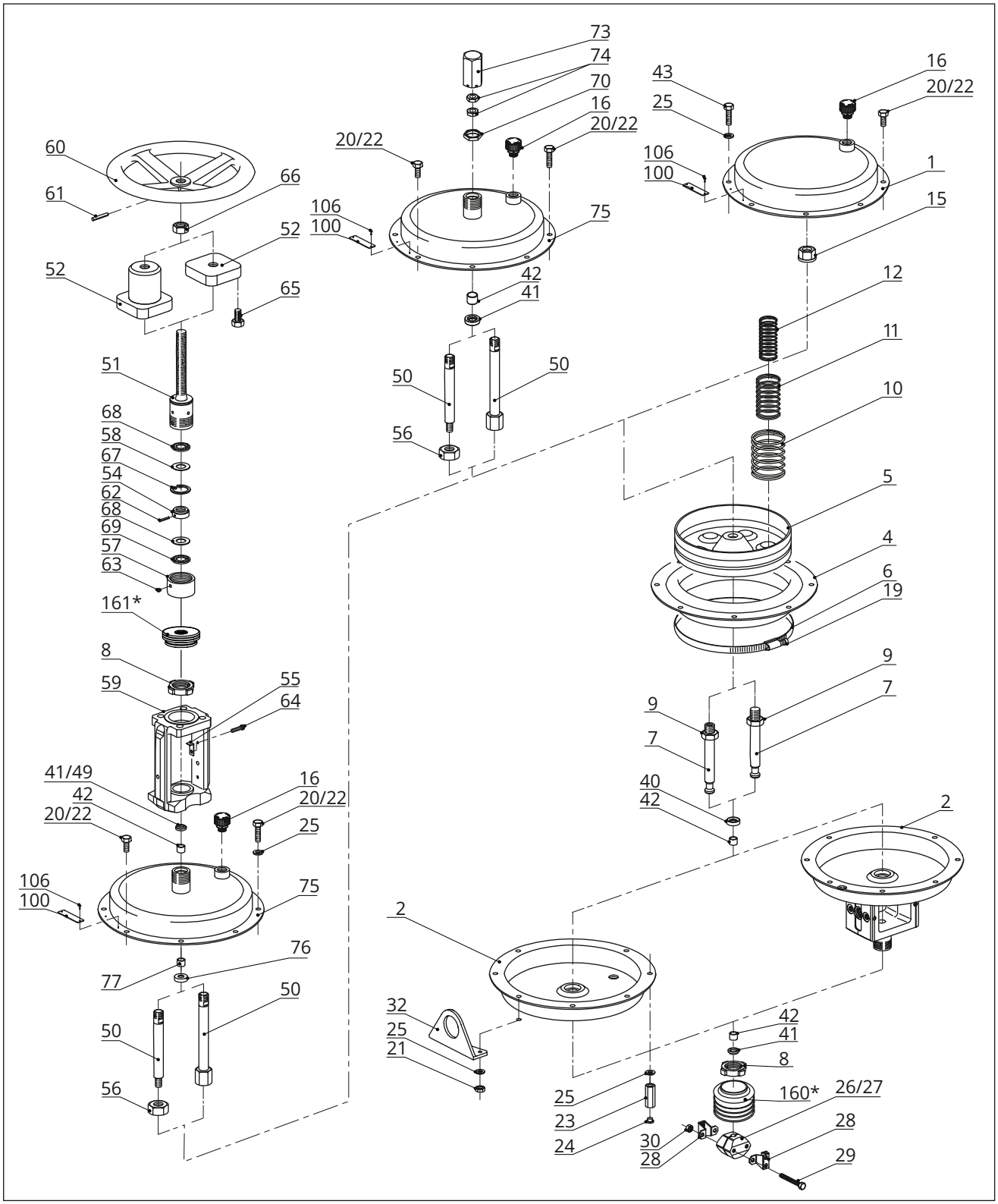

Fig. 32: *Type 3271/3277 Actuator (240/350/700 cm²)*

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 contact

You can reach our after-sales service at the following e-mail address:
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 in all SAMSON product catalogs or on our website (▶ www.samsongroup.com).

Required specifications

Please submit the following details:

- Order number and position number in the order
- Type, model number, actuator area, travel, direction of action and bench range (e.g. 0.2 to 1 bar) or the operating range of the actuator
- Type, model number, nominal size and valve version
- Installation drawing

SAMSON AKTIENGESELLSCHAFT
Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
samson@samsongroup.com · www.samsongroup.com

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