# MOUNTING AND OPERATING INSTRUCTIONS



# EB 3009 EN

#### Translation of original instructions



# **Type 42-10 RS Check Valve (backflow protection)** Self-operated Regulators

Edition August 2024

#### Note on these mounting and operating instructions

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

- ➔ For the safe and proper use of these instructions, read them carefully and keep them for later reference.
- → If you have any questions about these instructions, contact SAMSON's After-sales Service (aftersalesservice@samsongroup.com).



Documents relating to the device, such as the mounting and operating instructions, are available on our website at *www.samsongroup.com* > *Service & Support* > *Downloads* > *Documentation*.

#### Definition of signal words

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

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

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Property damage message or malfunction

i Note

Additional information

∹∑: Tip

Recommended action

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# 1 Safety instructions and measures

#### Intended use

The Type 42-10 RS Check Valve is suitable for backflow protection in networks containing water, steam, nitrogen or compressed air up to 220 °C. It consists of a Type 2421 RS Valve and a Type 2420 RS Actuator.

The Type 42-10 RS Check Valve is mainly used in industrial plants.

The regulator is designed to operate under exactly defined conditions (e.g. operating pressure, process medium, temperature). Therefore, operators must ensure that the regulators are only used in operating conditions that meet the specifications used for sizing the devices at the ordering stage. In case operators intend to use the regulators 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 regulators are 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 additional fittings mounted on the regulator

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 regulator 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

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

▶ GESTIS (CLP) hazardous substances database). Depending on the process medium and/

or the activity, the protective equipment required includes:

- Protective clothing, safety gloves and eye protection in applications with hot, cold and/or corrosive media
- Wear hearing protection when working near the valve
- Hard hat
- Safety harness when working at height
- Safety footwear, ESD (electrostatic discharge) footwear, if necessary
- → Check with the plant operator for details on further protective equipment.

#### **Revisions and other modifications**

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

#### 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 regulator by the process medium, the operating pressure or by 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.

Hazards resulting from the special working conditions at the installation site of the regulator must be identified in a risk assessment and prevented through the corresponding safety instructions drawn up by the operator.

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

- ▶ GESTIS (CLP) hazardous substances database).
- → Observe safety measures for handling the device as well as fire prevention and explosion protection measures.

#### Safety features

The Type 42-10 RS Check Valve is a valve with a safety function. When relieved of pressure, the regulator is closed by the force of the set point springs in the actuator.

#### 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.

Operators are additionally responsible for ensuring that the limits for the product defined in the technical data are observed. This also applies to the start-up and shutdown procedures. Start-up and shutdown procedures fall within the scope of the operator's duties and, as such, are not part of these mounting and operating instructions. SAMSON is unable to make any statements about these procedures since the operative details (e.g. differential pressures and temperatures) vary in each individual case and are only known to the operator.

#### Responsibilities of operating personnel

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

#### Referenced standards, directives and regulations

The regulators comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. Regulators with a CE marking have an EU declaration of conformity, which includes information about the applied conformity assessment procedure. This EU declaration of conformity is included in the 'Certificates' chapter.

According to the ignition hazard assessment performed in accordance with Clause 5.2 of ISO 80079-36, the non-electrical control valves do not have their own potential ignition source even in the rare incident of an operating fault. As a result, they do not fall within the scope of Directive 2014/34/EU.

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

#### **Referenced documentation**

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

- Mounting and operating instructions for

e.g.	Type 2 N or NI Strainer	► EB 1015
Data s	heets for	
e.g.	Accessories · Differential pressure and flow regulators	► T 3095
e.g.	Type 2 N or NI Strainer	► T 1015

 Mounting and operating instructions as well as data sheets for additional fittings (e.g. shut-off valves, pressure gauges etc.).

# 1.1 Notes on possible severe personal injury

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#### Risk of bursting in pressure equipment.

Regulators and pipelines are pressure equipment. Impermissible pressure or improper opening can lead to regulator components bursting.

- → Observe the maximum permissible pressure for regulator and plant.
- → If necessary, a suitable overpressure protection must be installed on site in the plant section.
- ➔ Before starting any work on the regulator, depressurize all plant sections affected as well as the regulator.
- ➔ Drain the process medium from all the plant sections affected as well as the regulator.
- → Wear personal protective equipment.

# 1.2 Notes on possible personal injury

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

Over time, markings, labels and nameplates on the regulator 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.

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

The noise emissions depend on the valve version, plant facilities and process medium.

→ Wear hearing protection when working near the valve.

# Risk of personal injury due to pressurized components and process medium being discharged.

Incorrect opening of pressure equipment or mounting parts may lead to the process medium escaping to the atmosphere.

→ Do not loosen the control line while the valve is pressurized.

#### Risk of burn injuries due to hot or cold components and pipelines.

Depending on the process medium, regulator components and pipelines may get very hot or cold and cause burn injuries.

- → Allow components and pipelines to cool down or warm up to the ambient temperature.
- → Wear protective clothing and safety gloves.

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#### Risk of personal injury due to residual process medium in the regulator.

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

- → If possible, drain the process medium from all the plant sections affected and the regulator.
- → Wear protective clothing, safety gloves and eye protection.

#### Damage to health relating to the REACH regulation.

If a SAMSON device contains a substance which is listed as being a substance of very high concern on the candidate list of the REACH regulation, this circumstance is indicated on the SAMSON delivery note.

→ Information on safe use of the part affected ▶ www.samsongroup.com/en/ about-samson/environment-social-governance/material-compliance/.

# 1.3 Notes on possible property damage

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#### Risk of regulator damage due to incorrectly attached slings.

→ Do not attach load-bearing slings to the actuator housing.

#### Risk of regulator damage due to unsuitable medium properties.

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

→ Only use the process medium specified for sizing the valve.

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

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

→ Flush the pipelines before start-up.

#### Risk of regulator damage due to the use of unsuitable lubricants.

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

→ Only use lubricants approved by SAMSON. When in doubt, consult SAMSON.

# Risk of leakage and regulator damage due to excessively high or low tightening torques.

Observe the specified torques when tightening regulator components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.

→ Observe the specified tightening torques (see 'Tightening torques' in Annex).

#### Risk of regulator damage due to the use of unsuitable tools.

Certain tools are required to work on the regulator.

→ Only use tools approved by SAMSON. When in doubt, consult SAMSON.

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

- $\rightarrow$  Keep the regulator and the tools used free from solvents and grease.
- → Make sure that only suitable lubricants are used.

# i Note

SAMSON's After-sales Service can support you concerning lubricant, tightening torques and tools approved by SAMSON.

# 2 Markings on the device

Several nameplates are affixed to the device. The nameplates are used to identify the separate regulator components (see Chapter 2.1 and Chapter 2.2).

# 2.1 Valve nameplate



# 2.2 Actuator nameplate





# 2.3 Location of the nameplates

# 2.4 Material identification number

# 2.4.1 Type 2421 RS Valve

See the nameplate (11, body material). For more details on the nameplate, see Chapter 2.1.

# 2.4.2 Type 2420 RS Actuator

Specifying the material number, you can contact us to find out which material is used. This is specified on the nameplate in the 'MNo.' field (3). For more details on the nameplate, see Chapter 2.2.

# 3 Design and principle of operation

→ See Fig. 3-1 and Fig. 3-2

The regulator prevents flowback from directly connected systems. Observe the pressure and temperature limits on the nameplate.

The regulator is open, provided the upstream pressure is at least 0.2 bar/3 psi greater than the downstream pressure. It closes automatically when the downstream pressure rises to or above the value of the upstream pressure.

The regulator basically consists of the valve (1) with seat (2) and plug (3) as well as the opening actuator (10) with two diaphragms (11).

The medium flows through the valve in the direction indicated by the arrow. The position of the valve plug (3) determines the differential pressure over the cross-sectional area released between the plug and seat (2).

At a differential pressure of 0.2 bar/3.0 bar, the valve begins to open; at

0.35 bar/0.55 bar, the valve is completely open. At this point, the upstream pressure  $p_1$ must be greater than the downstream pressure  $p_2$ . The regulator closes automatically when the downstream pressure rises to or above the value of the upstream pressure. The standard plug is soft-seated to ensure tight shut-off and to prevent backflow from the plant into the supply network. The mounted control lines (14) transmit the upstream and downstream pressures to the actuator.

The actuator with two diaphragms (11) offers increased safety and reliability of functions. The operating diaphragm for upstream pressure (11.1) is connected to the valve input pressure, whereas the operating diaphragm for downstream pressure (11.2) is connected to the valve output pressure. A bore with a mechanical diaphragm rupture indicator (12) is located in the intermediate ring located between the two diaphragms. The pressure of response of the diaphragm rupture indication is approximately 1.5 bar/22 psi.

In the event of a diaphragm rupture, the pressure in the space between the two operating diaphragm starts to increase. This causes the pin in the diaphragm rupture indicator to be pushed outwards and a red ring appears, indicating the diaphragm rupture. The intact operating diaphragm takes on the control task of the ruptured diaphragm.

A pressure switch (18) can be optionally mounted to the actuator to trigger an alarm.





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Legend for Fig. 3-1 and Fig. 3-2		12	Diaphragm rupture indicator
1	Valve body	13	Set point springs
2	Seat	13.1	Force limiter
3	Plug	14	Control line 8x1 mm
4	Plug stem	15	Spacer bushing including seal
5	Threaded connection for diaphragm actuator	16	Housing bolts (two long bolts opposite each other, DN 15 to 25/NPS ½ to 1 only)
6	Actuator stem	16.1	Top housing bolts
7	Diaphragm stem	16.2	Bottom housing bolts
10	Actuator housing	17	Diaphragm plate nut
10.1	Distance ring	18	Pressure switch (optional)
11	Two diaphragms	19	Compensation chamber (optional)
11.1	Operating diaphragm for upstream pressure	20	Filler plug
11.2	Operating diaphragm for downstream pressure	21	Screw fitting (control line)

# 3.1 Additional fittings

→ See Fig. 3-3

#### Pressure gauges

Install a pressure gauge (3 and 5) at suitable points to monitor the pressures prevailing in the plant.

#### Shut-off valves

SAMSON recommends installing a shut-off valve (1 and 6) both upstream of the strainer and downstream of the regulator.

#### Insulation

Regulators can be insulated to reduce heat energy transfer.

Refer to the instructions in the 'Installation' chapter.

#### Strainer

SAMSON recommends installing a SAM-SON strainer (2) upstream of the valve. It prevents solid particles in the process medium from damaging the regulator.

- ➔ Do not use the strainer to permanently filter the process medium.
- ➔ Select a strainer (mesh size) suitable for the process medium.

#### i Note

Any impurities carried along by the process medium may impair the proper functioning of the regulator. We recommend installing a strainer (e.g. SAMSON Type 2 NI) upstream of the pressure reducing valve (> EB 1015).



# 3.2 Technical data

The valve and actuator nameplates provide information on the valve and actuator versions (see the 'Markings on the device' chapter).

# i Note

More information is available in Data Sheet T 3009.

# Conformity

The Type 42-10 RS Regulator bears both the CE and EAC marks of conformity.

CE

EAC

### Process medium and scope of application

The Type 42-10 RS Check Valve is used to prevent the backflow protection of a medium.

- For liquids, gases and vapors
- Compressed air and nitrogen up to 80 °
   C 150 °C <sup>1</sup>/175 °F 300 °F <sup>1</sup>)
- Saturated steam with compensation chamber up to 220 °C/430 °F
- Liquids up to 80 °C/175 °F
- Differential pressure set point Δp = 0.2 bar/3 psi
- Nominal sizes DN 15 to 150/NPS ½ to 6
- Pressure rating PN 16 to 40/ Class 150 · 300

The regulator is closed when relieved of pressure. The regulator is **open** when the upstream pressure is **greater** than the **downstream pressure**. The regulator **closes** when the downstream pressure **rises**.

### Leakage class

The soft-seated regulator has the leakage class VI according to IEC 60534-4.

### Temperature range

Depending on how the regulator is configured, it can be used up to temperatures of 220 °C/430 °F (see Table 3-1). The minimum temperature is limited by the accessories used and the actuator's diaphragm material (▶ T 3009).

#### Noise emissions

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

### **Dimensions and weights**

Fig. 3-4 provides a summary of the dimensions and weights. The lengths and heights in the dimensional drawings are shown on pages 3-8 to 3-9.

<sup>1)</sup> Version with FKM diaphragm

Type 2421 RS Valve	e					
Nominal size		DN 15 to 150/NPS 1/2 to 6				
Pressure rating		PN 16, 25 and 40/	Class 150 and 300			
Max. constant opera	ating pressure	25 bar/	360 psi			
Max. perm. pressur	e acting on one side	45 bar/	650 psi			
	According to IEC 60534-4 1)	Leakage	class VI			
Leakage class According to DIN EN 12266- 1 <sup>2)</sup>		Leakage rate A				
Max. permissible te	mperature	See Type 2420 RS Actuator				
Max. ambient temp	erature	50 °C/	2/120 °F			
Conformity		CEEHL				
Type 2420 RS Actu	ator					
Actuator area		320 cm <sup>2</sup> /50 in <sup>2</sup>	640 cm <sup>2</sup> /100 in <sup>2</sup>			
Differential pressure	e set point Δp, fixed	0.2 bar/3 psi <sup>2)</sup>				
Max. permissible With EPDM diaphragm temperature		80 °C/175 °F for air and gases 150 °C/300 °F for water 220 °C/430 °F for steam with compensation chamber				
	With FKM diaphragm	150 °C/300 °F for air and gases				
Conformity		(	E			

Table 3-1: Technical data · Valves · All pressures in bar

 $^{1)}$  Terms for control valve sizing according to IEC 60534:  $\ F_L$  = 0.95,  $X_T$  = 0.75

2) Special version on request

Table 3-2:	Materials -	Material	number	according	to DIN EN
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Type 2421 RS Valve									
Decouver and a	PN 16, 2	PN 40							
Pressure ranng	Class 1	Class 300							
Valve body	Cast steel 1.0619	Cast stainless steel 1.4408	Forged stainless steel 1.4404 1)						
Seat and plug	Stainless steel 1.4404 with EPDM soft seal								
Plug stem		Stainless steel 1.4301							
Bottom section		Stainless steel 1.4404/1.43	01						

 $^{1)}$   $\,$  DN 15, 25, 40 and 50/NPS  $^{1\!/}_{2}$  , 1, 1 $^{1\!/}_{2}$  and 2 only

<sup>2)</sup> For version free of graphite

Body gasket	novatec <sup>®</sup> PREMIUM · UDP <sup>®</sup> 3620 <sup>2)</sup>						
Type 2420 RS Actuator							
Diaphragm cases 1.0332 Stainless steel 1.4301							
Diaphragm	EPDM with fabric reinforcement · FKM						
Guide bushing	DU bushing PTFE						
Intermediate piece	Stainless steel 1.4301						
Coupling pin	Stainless steel 1.4301						
Seals	EPDM · FKM						

Table 3-2: Materials · Material number according to DIN EN

<sup>1)</sup> DN 15, 25, 40 and 50/NPS ½, 1, 1½ and 2 only

<sup>2)</sup> For version free of graphite

 Table 3-3:
 K<sub>VS</sub> coefficients

Type 2421 RS Valve												
Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150
Nominal size	NPS	1⁄2	3⁄4	1	-	11/2	2	<b>2</b> ½	3	4	-	6
$K_{VS}$ coefficient		4.0	6.3	8.0	16	20	32	50	80	125	190	280
C <sub>v</sub> coefficient		4.5	7.5	9.4	-	24	37	60	94	145	-	330

#### **Dimensions and weights**



#### Fig. 3-4: Dimensions of the regulators

Dimensions in inches and weights · ANSI version										
Nominal size	NPS	1⁄2	3⁄4	1	11/2	2	<b>2</b> ½	3	4	6
Length L	Class 150		7.25		8.75	10	10.9	11.75	13.9	17.75
	Class 300	7.5	7.6	7.75	9.25	10.5	11.5	12.5	14.5	18.6
Height H <sup>1)</sup>		19.7			23	3.6	2	8	32.7	35.4
Height H1		8.6					10		10.6	14.6
Height H2		1.8			2	2.8 3.9			4.65	6.9
Actuator ØD			11.2	in (A = 5	0 in²)		1	5.4 in (A	= 100 in <sup>2</sup>	<sup>2</sup> )
Weight for Cla (approx. lbs)	ss 150	57	58	62	78	87	131	144	165	360
Weight for Class 300 (approx. lbs)		60	61	65	82	91	137	151	173	376

### **Dimensions and weights**

1) Minimum clearance required to remove the actuator: +100 mm

#### Fig. 3-4: Dimensions of the regulators

# 4 Shipment and on-site transport

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

# 4.1 Accepting the delivered goods

After receiving the shipment, proceed as follows:

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

# i Note

Do not remove the packaging until immediately before installation.

# 4.2 Removing the packaging from the regulator

The tested regulator is delivered as an assembled unit.

Proceed as follows to lift and install the valve:

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

# 

# Risk of regulator damage due to foreign particles entering the valve.

The protective caps fitted on the inlet and outlet of the valve with flanged body prevent foreign particles from entering the valve and damaging it.

Do not remove the protective caps until immediately before installation.

# 4.3 Transporting and lifting the regulator

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#### Danger due to suspended loads falling.

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

# 

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

- Only use approved lifting equipment and accessories whose minimum lifting capacity is higher than the weight of the valve (including actuator and packaging, if applicable).
- → Refer to the 'Design and principle of operation' chapter for the weights.

# 

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

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

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

# 

# Risk of personal injury due to the regulator tipping.

- → Observe the regulator's center of gravity.
- → Secure the regulator against tipping over or turning.

# ∹∑- Tip

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

# 4.3.1 Transporting the regulator

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

- → Leave the regulator in its transport container or on the pallet to transport it.
- → Observe the transport instructions.

#### **Transport instructions**

- ➔ Protect the regulator against external influences (e.g. impact).
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
- Protect the piping and any mounted valve accessories against damage.
- ➔ Protect the regulator against moisture and dirt.
- → The permissible ambient temperature of standard regulators is -20 to +80 °C.

# 4.3.2 Lifting the regulator

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

#### Lifting instructions

- → Use a hook with safety latch to secure the slings from slipping off the hook during lifting and transporting (see Fig. 4-1).
- → Secure slings against slipping.
- → Make sure the slings can be removed after installation.
- Prevent the regulator from tilting or tipping.
- Do not leave loads suspended when interrupting work for longer periods of time.
- Make sure that the axis of the pipeline is always horizontal during lifting and the axis of the plug stem is always vertical.

#### Lifting

- Attach one sling to the flange of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 4-1).
- 2. Carefully lift the regulator. Check whether the lifting equipment and accessories can bear the weight.
- 3. Move the regulator at an even pace to the site of installation.
- 4. Install the regulator into the pipeline (see the 'Installation' chapter).
- After installation in the pipeline, check whether the regulator flanges are bolted tight.
- 6. Remove slings.



# 4.4 Storing the regulator

#### 

Risk of regulator damage due to improper storage.

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

#### i Note

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

#### Storage instructions

- ➔ Protect the regulator against external influences (e.g. impact).
- → Secure the regulator in the stored position against slipping or tipping over.
- ➔ Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
- → Protect the regulator against moisture and dirt. Store it at a relative humidity of less than 75 %. In damp spaces, prevent condensation. If necessary, use a drying agent or heating.
- → Make sure that the ambient air is free of acids or other corrosive media.
- → The permissible storage temperature of standard regulators is -20 to +65 °C.

 Do not place any objects on the regulator.

#### Special storage instructions for elastomers

Elastomer, e.g. operating diaphragm

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

# ∹∑- Tip

SAMSON's 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 Installation conditions

### Work position

The work position for the regulator is the front view onto all operating controls on the regulator (including any additional fittings) seen from the position of operating personnel.

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

### **Pipeline routing**

The inlet and outlet lengths vary depending on several variables and process conditions and are intended as recommendations. Contact SAMSON if the lengths are significantly shorter than the recommended lengths.

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

- → Observe the inlet and outlet lengths (see Table 5-1). Contact SAMSON if the regulator conditions or state of the medium process deviate.
- → Install the regulator free of stress and with the least amount of vibrations as possible. Read information under "Mounting position" and "Support or suspension" in this chapter.

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

#### Mounting position

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

- → Install the actuator housing suspended downward in horizontal pipelines (see Fig. 5-1).
- Make sure the direction of flow matches the direction indicated by the arrow on the body.
- → Contact SAMSON if the mounting position is not as specified above.

# 

Possible malfunction and damage due to adverse weather conditions (temperature, humidity).

- Do not install the regulator outdoors or in rooms prone to frost.
- Protect the regulator against frost if it is used to control freezing media.
- Either heat the regulator or remove it from the plant and completely drain the residual medium.



<sup>1)</sup> The differential pressure set point is approx. 0.1 bar higher.

#### Support or suspension

### i Note

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

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

### 

# Risk of regulator damage due to incorrect support.

- Do not attach supports to the valve, to moving parts on the actuator or to the control lines.
- Contact SAMSON if the mounting position differs from the standard mounting position.

#### **Compensation chamber**

A compensation chamber (19) is required for liquids above 150 °C as well as for steam.

The mounting position of the compensation chamber is indicated by an adhesive label on the chamber itself as well as by an arrow and the word "top" stamped on the top of the chamber.

This mounting position must be adhered to; otherwise the safe functioning of the regulator cannot be guaranteed.

# 5.2 Preparation for installation

The regulator is delivered ready for connection.

Before installation, make sure the following conditions are met:

- The regulator is clean.
- The regulator and all piping are not damaged.
- Install a strainer upstream of the regulator.
- The valve data on the nameplate (type designation, nominal size, material, pressure rating and temperature range) match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.). See the 'Markings on the device' chapter for nameplate details.
- The requested or required additional fittings (see the 'Design and principle of operation' chapter) have been installed or prepared as necessary before installing the valve.

Proceed as follows:

- → Lay out the necessary material and tools to have them ready during installation work.
- → Flush the pipeline before installing the regulator.

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

 Check any mounted pressure gauges to make sure they function properly.

# i Note

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

# i Note

Any impurities carried along by the process medium may impair the proper functioning of the regulator. Therefore, we recommend installing a strainer (e.g. SAMSON Type 2 NI) upstream of the regulator.

#### Installation

Table 5-1: Inlet and outlet lengths



2) No wet steam



# 5.3 Installation

The regulator is delivered ready for connection.

The activities listed below are necessary for installation and before start-up of the regulator.

### 

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

Observe the specified torques when tightening regulator components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.

 Observe the specified tightening torques (see 'Tightening torques' in Annex).

### 

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

→ Only use tools approved by SAMSON (see 'Tools' in Annex).

### 

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

→ Only use lubricants approved by SAMSON (see 'Lubricants' in Annex).

# 5.3.1 Installing the regulator

- Close the shut-off valves (1, 6) upstream and downstream of the regulator while the regulator is being installed.
- Remove the protective caps from the valve ports before installing the valve.
- Lift the regulator using suitable lifting equipment to the site of installation. Observe the flow direction through the valve. The arrow on the valve indicates the direction of flow.
- 4. Make sure that the correct flange gaskets are used.
- 5. Bolt the pipe to the valve free of stress.
- Slowly open the shut-off valves in the pipeline after the regulator has been installed.

# 5.3.2 Cleaning the pipeline

We recommend additionally flushing the pipeline without the installed regulator before start-up.

# 5.4 Testing the regulator

# 

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

Regulators and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of process medium under pressure can cause serious injury or even death. Before working on the regulator:

- Depressurize all plant sections concerned and the regulator.
- Drain the process medium from all the plant sections concerned as well as the valve.

# 

#### Risk of personal injury due to process medium escaping.

→ Do not start up the regulator until all parts have been mounted.

# 

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

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.

➔ Wear hearing protection when working near the regulator.

# 

# Risk of burn injuries due to hot or very cold components and pipelines.

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

Wear protective clothing and safety gloves.

SAMSON regulators are delivered ready for use. To test the regulator functioning before start-up or putting back the regulator into operation, perform the following tests:

# 5.4.1 Leakage

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

# ∹∑: Tip

SAMSON's After-sales Service can support you to plan and perform a leak test for your plant.

- 1. Slowly open the shut-off valve (1) installed upstream of the regulator.
- 2. Apply the required test pressure.
- 3. Check the regulator for leakage to the atmosphere.
- 4. Depressurize the pipeline section and valve.
- 5. Rework any parts that leak and repeat the leak test.

# 5.4.2 Pressure test

# i Note

The plant operator is responsible for performing the pressure test. SAMSON's After-sales Service can support you to plan and perform a pressure test for your plant.

# 

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

- Slowly open the shut-off valves.

During the pressure test, make sure the following conditions are met:

- Do not allow the pressure to exceed the 1.5 times the pressure rating of the valve body.
- → Do not apply a pressure higher than the specified pressure rating or the maximum constant operating pressure (25 bar/360 psi) to the actuator. The lowest pressure always applies and restricts the maximum test pressure.
- → Make sure that the pressure rises simultaneously upstream and downstream of the regulator. To achieve this, fill the system and apply pressure only on the upstream pressure side (not the return flow side).

# 5.5 Proof testing

Detailed test instructions **>** SH 3009

They describe testing in the workshop and in the installed state. The maintenance intervals depend on the intervals between regular testing and the scope of the testing. A fiveyear interval has proven suitable under normal operating and ambient conditions. We recommend replacing parts subject to wear on performing this maintenance work.

# 5.6 Insulation

To insulate cold systems, we recommend first filling the plant and carefully rinsing it. The regulator must not yet be insulated at this stage.

- Start up the plant and adjust the set point (see the 'Start-up' chapter).
- 2. Shut down the plant again and let it heat up until the condensation water has dried off.
- 3. Insulate the regulator and pipes conveying the process medium using insulation material with a water vapor barrier. If a control line is to be routed through the insulation, special care must be taken with the sealing since slight changes in shape may occur. The insulation thickness depends on the medium temperature and the ambient conditions. 50 mm is a typical thickness.

### 

# Risk of regulator damage due to incorrect insulation.

→ Only insulate the regulator up to the actuator for medium temperatures below 0 °C or above 220 °C.
# 6 Start-up

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

### 

#### Risk of personal injury due to process medium escaping.

➔ Do not start up the regulator until all parts have been mounted.

## 

Risk of personal injury due to pressurized components and process medium being discharged.

Do not loosen the control line while the valve is pressurized.

## 

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

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

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- ➔ Wear protective clothing and safety gloves.

## 

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

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.

➔ Wear hearing protection when working near the valve.

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

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

# 6.1 Start-up and putting the device back into operation

- Depending on the field of application, allow the regulator to cool down or warm up to reach ambient temperature before start up.
- 2. Slowly open the shut-off valves in the pipeline. Slowly opening these valves prevents a sudden surge in pressure and high flow velocities which can damage the valve.
- 3. Check the regulator to ensure it functions properly.

# 6.2 Starting up the plant

- ➔ For steam applications, make sure that the pipelines are dry. Moisture will damage the inside of the valve.
- 1. Open the shut-off valves slowly preferably starting from the upstream pressure side. Afterwards, open all the valves on the consumer side (downstream of the regulator).
- 2. Fill the plant **slowly** with the process medium. Avoid pressure surges.
- Make sure that the pressure rises simultaneously upstream and downstream of the regulator to avoid damaging it.
- → Raise the plant pressure in steps of 5 bar/70 psi.
- → Wait several seconds after each rise in pressure before continuing.

# 6.2.1 Regulation of steam

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

Unscrew filler plug (20) on the compensation chamber (19). Use the included plastic funnel or a jug to pour in water until it starts to overflow (see 'Tightening torque' in the Annex). Screw the filler plug (20) back in and tighten it. The regulator is now ready for operation. Open the hand-operated shut-off valves slowly to prevent water hammer.

# 6.2.2 Regulation of liquids

➔ To start up the regulator, open shut-off valves slowly.

Immediately after completing start-up or placing the regulator back into service (see the 'Start-up' chapter), the regulator is ready for use.

### 

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

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

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- Wear protective clothing and safety gloves.

## 

Risk of personal injury due to pressurized components and process medium being discharged.

Do not loosen the control line while the valve is pressurized.

## 

Risk of hearing loss or deafness due to loud noise.

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.

 Wear hearing protection when working near the valve.

# 7.1 Adjusting the set point

The regulator is delivered with a ready adjusted set point of 0.2 bar/3 psi and has been tested.

The regulator is open, provided the upstream pressure is greater than the downstream pressure by at least the ready adjusted set point. It closes automatically when the downstream pressure rises to or above the value of the upstream pressure.

The user cannot adjust the set point.

DN		15	20	25	32	40	50	65	80	100	125	150
K <sub>vs</sub>		4	6.3	8	16	20	32	50	80	125	190	280
		Max	kimum flo	w rate of	nitrogen	in Nm³/h	at 20 °C	• 0.25 ba	r pressure	e drop ac	ross the v	alve
	2	82.19	129.4	164.5	328.8	411.3	658	1028	1645	2160	3907	5758
	3	95.9	151	191.8	383.6	497.7	767.5	1199	1918	2519	4557	6716
bar	4	107.8	169.9	215.8	431.5	539.5	863.3	1349	2158	2833	5126	7554
e) in	5	118.6	186.9	237.4	474.6	593.5	949.5	1483	2374	3116	5638	8309
gaug	6	128.5	202.4	257.1	514.2	642.9	1028	1607	2571	3376	6108	9001
ď	8	146.3	230.5	292.8	585.5	732	1171	1830	2928	3844	6954	10240
sure	10	162.2	255.6	324.6	649.1	811.5	1298	2029	3246	4261	7709	11360
bre	12	176.7	278.4	353.6	707.1	884	1414	2210	3536	4641	8398	12370
Inlet	15	196.5	309.6	393.1	786.2	982.9	1572	2457	3931	5161	9338	13760
	20	225.7	355.6	451.6	903.1	1129	1806	2822	4516	5928	10720	15800
	25	251.7	396.4	503.4	1006	1258	2013	3146	5034	6608	11950	17620

#### Table 7-2: Flow rates for Type 2421 RS Valve

#### 0.25 bar pressure drop across the valve for nitrogen

#### 0.25 bar pressure drop across the valve for air

DN		15	20	25	32	40	50	65	80	100	125	150
K <sub>vs</sub>		4	6.3	8	16	20	32	50	80	125	190	280
		٨	<b>Aaximum</b>	flow rate	of air in I	Nm³/h at	20 °C · 0	.25 bar p	ressure d	rop acros	s the valv	e
	2	80.95	127.5	161.8	323.4	404.5	647.2	1011	1618	2125	3843	5663
	3	94.32	148.5	188.7	377.3	471.8	754.8	1179	1887	2478	4482	6605
par	4	106.1	167.1	212.2	424.4	530.7	849.1	1326	2122	2787	5042	7430
e) in	5	116.7	183.8	233.4	466.8	583.7	933.9	1459	2335	3065	5545	8172
gung	6	126.4	199.1	252.9	505.8	632.4	1011	1581	2529	3320	6008	8853
b' (ö	8	143.9	226.7	288	575.9	720	1152	1800	2880	3780	6840	10080
sure	10	159.6	251.4	319.2	638.5	798.2	1277	1995	3193	4191	7583	11170
bres	12	173.8	273.5	347.8	695.5	869.5	1391	2174	3478	4565	8261	12170
Inlet	15	193.3	304.5	386.7	774	966.9	1547	2417	3867	5076	9185	13530
	20	222.1	349.8	444.2	888.5	1110	1777	2776	4442	5831	10550	15550
	25	247.8	390	495.3	990.6	1238	1981	3095	4953	6501	11760	17330

















# 8 Malfunctions

# 8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action				
	Insufficient pressure pulses on the operating diaphragm (downstream pressure)	→ Clean the control line and screw fittings.				
The valve does not close. The differential pressure drops below	Foreign particles blocking the plug	<ul> <li>→ Remove foreign particles.</li> <li>→ Contact SAMSON's After-sales Service when parts are damaged.</li> </ul>				
the set point.	Seat and plug are worn or leak.	→ Contact SAMSON's After-sales Service when parts are damaged.				
	Two diaphragms defective (check the diaphragm rupture indicator).	→ Contact SAMSON's After-sales Service when parts are damaged.				
	Two diaphragms defective (check the diaphragm rupture indicator).	→ Contact SAMSON's After-sales Service when parts are damaged.				
	Insufficient pressure pulses on the operating diaphragm (upstream pressure)	→ Clean the control line and screw fittings.				
The valve does not	Regulator installed against the flow	→ Install the regulator so that the direction of flow matches the direction indicated by the arrow or the body.				
fully open. The differential pressure exceeds the set point.	Regulator or K <sub>vs</sub> /C <sub>v</sub> coefficient too small	<ul> <li>→ Check the sizing.</li> <li>→ Change K<sub>VS</sub>/C<sub>V</sub> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>				
	Foreign particles blocking the plug	<ul> <li>→ Remove foreign particles.</li> <li>→ Contact SAMSON's After-sales Service when parts are damaged.</li> </ul>				
	Strainer blocked	→ Clean the strainer.				
Slow control response	Restriction in the screw joint of the actuator dirty	→ Clean the restriction.				
	Dirt in the control line	→ Clean the control line.				
Jerky control response	Increased friction, e.g. due to foreign particles between seat and plug	<ul> <li>Remove foreign particles.</li> <li>Contact SAMSON's After-sales Service when parts are damaged.</li> </ul>				

#### Malfunctions

Malfunction	Possible reasons	Recommended action
Control loop hunts	Regulator or $K_{VS}/C_V$ coefficient too large	<ul> <li>→ Check the sizing.</li> <li>→ Change K<sub>VS</sub>/C<sub>V</sub> coefficient, if necessary or install a different sized regulator.</li> <li>→ Contact SAMSON's After-sales Service.</li> </ul>
Loud noises	High flow velocity, cavitation	<ul> <li>→ Check the sizing.</li> <li>→ Install larger regulator, if necessary.</li> </ul>
Red mark appears on the diaphragm rupture indicator	Defective operating diaphragm	→ Contact SAMSON's After-sales Service to replace the damaged diaphragm.

#### i Note

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

The malfunctions listed in Chapter 8.1 are caused by mechanical faults and incorrect regulator sizing. In the simplest case, the functioning can be restored following the recommended action. Special tools may be required to rectify the fault.

Exceptional operating and installation conditions may lead to changed situations that may affect the control response and lead to malfunctions. For troubleshooting, the conditions, such as installation, process medium, temperature and pressure conditions, must be taken into account.

### ∹∑- Tip

SAMSON's After-sales Service can support you in drawing up an inspection and test plan for your plant.

# 8.2 Emergency action

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

We recommend removing the regulator from the pipeline before repairing it.

In the event of a regulator malfunction:

- Close the shut-off valves upstream and downstream of the regulator to stop the process medium from flowing through the regulator.
- 2. Perform troubleshooting (see Chapter 8.1).
- Rectify those malfunctions that can be remedied based on the instructions provided here. Contact SAMSON's After-sales Service in all other cases.

# Putting the regulator back into operation after a malfunction

See the 'Start-up' chapter.

# 9 Servicing

The regulator does not require any maintenance. Nevertheless, it is subject to natural aging, particularly at the seat, plug and operating diaphragms. Depending on the operating conditions, check the regulator at regular intervals to avoid possible malfunctions. Plant operators are responsible for drawing up an inspection and test plan. Details on faults and how to remedy them can be found in the 'Malfunctions' chapter.

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

We recommend removing the regulator from the pipeline before performing any maintenance or service work.

## 

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

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

- → Allow components and pipelines to cool down or warm up to the ambient temperature.
- → Wear protective clothing and safety gloves.

## 

# Risk of personal injury due to residual process medium in the regulator.

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

→ Wear protective clothing, safety gloves and eye protection.

### 

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

Observe the specified torques when tightening regulator components. Excessive tightening torques lead to parts wearing out more quickly. Parts that are too loose may cause leakage.

 Observe the specified tightening torques (see 'Tightening torques' in Annex).

#### 

#### Risk of regulator damage due to the use of unsuitable tools.

 Only use tools approved by SAMSON (see 'Tools' in Annex).

### 

# Risk of regulator damage due to the use of unsuitable lubricants.

→ Only use lubricants approved by SAMSON (see 'Lubricants' in Annex).

#### i Note

# The regulator was checked by SAMSON before it left the factory.

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

#### ∹∑́-Тір

SAMSON's After-sales Service can support you in drawing up an inspection and test plan for your plant.

#### Legend for Fig. 9-1

- 1 Valve body
- 2 Seat
- 3 Plug
- 4 Plug stem
- 5 Threaded connection for diaphragm actuator
- 6 Actuator stem
- 7 Diaphragm stem
- 10 Actuator housing
- 10.1 Distance ring
- 11 Two diaphragms
- 11.1 Operating diaphragm for upstream pressure
- 11.2 Operating diaphragm for downstream pressure
- 12 Diaphragm rupture indicator
- 13 Set point springs
- 13.1 Force limiter
- 14 Control line 8x1 mm
- 15 Spacer bushing including seal
- 16 Housing bolts (two long bolts opposite each other, DN 15 to 25/NPS ½ to 1 only)
- 16.1 Top housing bolts
- 16.2 Bottom housing bolts
- 17 Diaphragm plate nut
- 18 Pressure switch (optional, not shown)
- 19 Compensation chamber (optional)
- 20 Filler plug
- 21 Screw fitting (control line)

#### Servicing



# 9.1 Preparing the valve for service work

- 1. Lay out the necessary material and tools to have them ready for the service work.
- 2. Put the regulator out of operation (see the 'Decommissioning' chapter).

#### ∹∑: Tip

We recommend removing the regulator from the pipeline before performing any service work (see the 'Removing the regulator from the pipeline' chapter).

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

- Replace the actuator (see Chapter 9.3.1)
- Replace the seat and plug (see Chapter 9.3.2)
- Replace the actuator's operating diaphragm (see Chapter 9.3.3)

# 9.2 Installing the regulator after service work

→ Put the regulator back into operation (see the 'Start-up' chapter). Make sure the requirements and conditions for start-up or putting the valve back into operation are met.

## 9.3 Service work

- ➔ Before performing any service work, preparations must be made to the regulator (see Chapter 9.1).
- After all service work is completed, check the regulator before putting it back into operation (see the 'Testing the regulator' chapter).

## 9.3.1 Replacing the actuator

To replace the actuator, contact SAMSON's After-sales Service.

# 9.3.2 Replacing the seat and plug

To replace seat and plug, contact SAM-SON's After-sales Service.

# 9.3.3 Replacing the actuator's operating diaphragm

To replace the operating diaphragm, contact SAMSON's After-sales Service.

# 9.4 Ordering spare parts and operating supplies

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

#### Spare parts

See Annex for details on spare parts.

#### Lubricant

Contact SAMSON's After-sales Service for more information on lubricants.

#### Tools

Contact SAMSON's After-sales Service for more information on tools.

# 10 Decommissioning

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

## 

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

Regulators and pipelines are pressure equipment that may burst when handled incorrectly. Flying projectile fragments or the release of process medium under pressure can cause serious injury or even death. Before working on the regulator:

- → Depressurize all plant sections concerned and the regulator.
- ➔ Drain the process medium from all the plant sections concerned as well as the valve.

## 

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

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

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- ➔ Wear protective clothing and safety gloves.

## 

Risk of personal injury due to pressurized components and process medium being discharged.

➔ Do not loosen the control line while the valve is pressurized.

### 

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

Noise emission (e.g. cavitation or flashing) may occur during operation caused by the process medium and the operating conditions.

→ Wear hearing protection when working near the regulator.

# 

# Risk of personal injury due to residual process medium in the regulator.

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

→ Wear protective clothing, safety gloves and eye protection.

#### Decommissioning

To decommission the regulator for service work or disassembly, proceed as follows:

- 1. Close the shut-off valve (1) on the upstream side of the regulator.
- 2. Close the shut-off valve (6) on the downstream side of the regulator.
- 3. Completely drain the pipelines and valve.
- 4. Depressurize the plant.
- 5. If necessary, allow the pipeline and regulator components to cool down or warm up to the ambient temperature.

## 11 Removal

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

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# Risk of personal injury due to residual process medium in the regulator.

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

 Wear protective clothing, safety gloves and eye protection.

#### 

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

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

- Allow components and pipelines to cool down or warm up to the ambient temperature.
- → Wear protective clothing and safety gloves.

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

 The regulator is put out of operation (see the 'Decommissioning' chapter).

# 11.1 Removing the regulator from the pipeline

- Support the regulator to hold it in place when separated from the pipeline (see the 'Shipment and on-site transport' chapter).
- 2. Unbolt the flanged joint.
- Remove the regulator from the pipeline (see the 'Shipment and on-site transport' chapter).

### 11.2 Removing the actuator from the valve

See 'Replacing the actuator' in the 'Servicing' chapter.

# 12 Repairs

If the regulator 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.

#### 

# Risk of regulator damage due to incorrect service or repair work.

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

### 12.1 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

- Exceptions apply concerning some special device models
   www.samsongroup.com > Service & Support > After-sales Service.
- 2. Send an e-mail
  - retouren@samsongroup.com to register the return shipment including the following information:

- Туре
- Material number
- Item numbers of accessories
- Original order
- Completed Declaration on Contamination, which can be downloaded from our website at
  - www.samsongroup.com > Service
  - & Support > After-sales Service.

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

- Attach the RMA (together with the Declaration on Decontamination) to the outside of your shipment so that the documents are clearly visible.
- 4. Send the shipment to the address given on the RMA.

#### i Note

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

www.samsongroup.com > Service & Support > After-sales Service.

## 13 Disposal



SAMSON is a producer registered at the following European institution ▶ https:// www.ewrn.org/nationalregisters/national-registers. WEEE reg. no.: DE 62194439/FR 025665

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

#### i Note

We can provide you with a recycling passport according to PAS 1049 on request. Simply e-mail us at aftersalesservice@samsongroup.com giving details of your company address.

#### ∹∑ Tip

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

# **14 Certificates**

The EU declarations of conformity are included on the next pages:

- EU declaration of conformity in compliance with Pressure Equipment Directive 2014/68/EU on page 14-2.
- EU declaration of conformity in compliance with Machinery Directive for the Type 42-10 RS Regulator on page 14-4.
- Declaration of incorporation in compliance with Machinery Directive 2006/42/EC for the Type 2421 RS Valve and Type 2420 RS Actuator on page 14-5.

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DECLARATION OF	INCORPORATION	samson
Declaration of Incorporation	i in Compliance with Machinery Dir	ective 2006/42/EC
For the following product: Type 2421 RS Valve		
We certify that the Type 2421 RS V 2006/42/EC and that the safety requare observed. The relevant technica	alve is partly completed machinery as define uirements stipulated in Annex I, 1.1.2, 1.1.3, I documentation described in Annex VII, part	d in the Machinery Directive 1.1.5, 1.3.2, 1.3.4 and 1.3.7 B has been compiled.
Products we supply must not be put been declared in conformity with the	into service until the final machinery into whic provisions of the Machinery Directive 2006/4	h it is to be incorporated has I2/EC.
Operators are obliged to install the engineering practice) as well as the precautions to prevent hazards that valve as well as by the signal press	e products observing the accepted industry e mounting and operating instructions. Oper could be caused by the process medium and ure and moving parts.	codes and practices (good ators must take appropriate nd operating pressure in the
The permissible limits of application mounting and operating instruction www.samsongroup.com.	and mounting instructions for the products ar s; the documents are available in electron	e specified in the associated nic form on the Internet at
For product descriptions refer to: - Type 42-10 RS Check Valve:	Mounting and Operating Instructions EB 300	9
Referenced technical standards and - VCI, VDMA, VGB: "Leitfaden [German only] - VCI, VDMA, VGB: "Zusatzdol Armaturen vom Mai 2018" [G	//or specifications: Maschinenrichtlinie (2006/42/EG) – Bedeutu kument zum Leitfaden Maschinenrichtlinie (2( erman onlv), based on DIN EN ISO 1210:20	ng für Armaturen, Mai 2018" )06/42/EG) – Bedeutung für 11-03
Comments: - See mounting and operating i - Also observe the referenced of	nstructions for residual hazards. documents listed in the mounting and operati	ng instructions.
Persons authorized to compile the to	achnical file:	
SAMSON AG, Weismüllerstraße 3, Frankfurt am Main, 7 January 2022	60314 Frankfurt am Main, Germany	
i.V. U.L.	i. V. P. Muni	
Stephan Giesen Director Product Management	Peter Scheermesser Director Product Life Cycle Manageme Development for Valves and A	nt and ETO ctuators

DECLARATION OF IN TRANSLATION	NCORPORATION	SAMSON
Declaration of Incorporation in	Compliance with Machinery Direct	tive 2006/42/EC
For the following product: Type 2420 RS Actuator		
We certify that the Type 2420 RS Actual 2006/42/EC and that the safety requirent observed. The relevant technical docum	ator is partly completed machine as defined nents stipulated in Annex I, 1.1.2, 1.1.3, 1.1. nentation described in Annex VII, part B has	in the Machinery Directiv 5, 1.3.2, 1.3.4 and 1.3.7 at been compiled.
Products we supply must not be put into been declared in conformity with the pro-	o service until the final machinery into which ovisions of the Machinery Directive 2006/42/	it is to be incorporated ha
Operators are obliged to install the pi engineering practice) as well as the m precautions to prevent hazards that coul as well as by the signal pressure and m	roducts observing the accepted industry of oounting and operating instructions. Opera d be caused by the process medium and op oving parts.	codes and practices (goo tors must take appropriat erating pressure in the valu
The permissible limits of application and data sheets as well as the mounting and on the Internet at www.samsongroup.co	d mounting instructions for the products are d operating instructions; the documents are m.	specified in the associate available in electronic for
For product descriptions refer to: - Type 42-10 RS Check Valve: More	unting and Operating Instructions EB 3009	
Referenced technical standards and/or - - VCI, VDMA, VGB: "Leitfaden Mas [German only]	specifications: schinenrichtlinie (2006/42/EG) – Bedeutung	für Armaturen, Mai 2018"
<ul> <li>VCI, VDMA, VGB: "Zusatzdokum Armaturen vom Mai 2018" [Germ</li> </ul>	ent zum Leitfaden Maschinenrichtlinie (200 an only], based on DIN EN ISO 12100:2011	6/42/EG) – Bedeutung für -03
Comments: - See mounting and operating instr - Also observe the referenced docu	uctions for residual hazards. Iments listed in the mounting and operating	instructions.
Persons authorized to compile the techn	nical file:	
Frankfurt am Main, 7 January 2022	14 Franklurt am Main, Germany	
i.V. U.Y.	i. V. P. Ulumen	
Stephan Giesen Director Product Management	Peter Scheermesser Director Product Life Cycle Management Development for Valves and Actu	and ETO lators

# 15 Annex

# 15.1 Tightening torques

Table	15-1:	Tightening	torque
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Component	Width across flats	Nominal size/actuator area	Tightening torque in Nm
Coupling nuts (11)	A/F 36	All	120
Filler plug (20)	A/F 13	All	25
Control line connection (21)	-	All	22

# 15.2 Lubricant

SAMSON's After-sales Service can support you concerning lubricants and sealants approved by SAMSON.

# 15.3 Tools

SAMSON's After-sales Service can support you concerning tools approved by SAMSON.

# 15.4 Spare parts

There are no spare parts available for the Type 42-10 RS Check Valve.

#### Annex

## 15.5 After-sales service

Contact SAMSON's After-sales Service for support concerning service or repair work or when malfunctions or defects arise.

#### E-mail address

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

#### Addresses of SAMSON AG and its subsidiaries

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

#### **Required specifications**

Please submit the following details:

- Device type and nominal size
- Model number or material number
- Upstream and downstream pressure
- Temperature and process medium
- Min. and max. flow rate in m<sup>3</sup>/h
- Is a strainer installed?
- Installation drawing showing the exact location of the regulator and all the additionally installed components (shut-off valves, pressure gauge etc.)
## EB 3009 EN



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