MOUNTING AND OPERATING INSTRUCTIONS

EB 2512 EN

Translation of original instructions

Type 41-23 Universal Pressure Reducing Valve
Self-operated Pressure Regulators

Edition June 2025

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 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:
▶ 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

Recommended action

1 Safety instructions and measures

Intended use

The SAMSON Type 41-23 Regulator is a pressure regulator. It consists of a Type 2412 Valve and a Type 2413 Actuator. The valve and actuator (except for tested devices) are delivered separately and must be assembled together according to this document.

The self-operated regulator is used to control the downstream pressure p_2 in the pipeline to the adjusted set point. Liquids, gases and vapors in processing and industrial plants can be controlled by the regulator.

The regulator is designed to operate under exactly defined conditions (e.g. operating pressure, process medium, temperature). Therefore, operators must ensure that the regulator is only used in operating conditions that meet the specifications used for sizing the regulator 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 regulator 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 device

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

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

Qualifications of operating personnel

The Type 41-23 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.

Welding operations are to be performed only by personnel who has the necessary qualification to perform the applied welding procedure and handle the materials used.

Personal protective equipment

SAMSON recommends checking the hazards posed by the process medium being used (e.g. ▶ GESTIS hazardous substances database.

Depending on the process medium and/or the activity, the protective equipment required includes:

- Protective clothing, gloves, eye protection and respiratory protection in applications with hot, cold and/or corrosive media
- Wear hearing protection when working on the device. Follow the instructions given by the plant operator.
- Hard hat
- Safety harness, e.g. when working at height
- Safety footwear, if applicable ESD (electrostatic discharge) footwear

⇨ 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, warnings and caution notes in these mounting and operating instructions.

Hazards resulting from the special working conditions at the installation site of Type 41-23 must be identified in a risk assessment and prevented through the corresponding standard operating procedures drawn up by the operator.

SAMSON also recommends checking the hazards posed by the process medium being used (e.g. ▶ GESTIS hazardous substances database).

⇨ Observe safety measures for handling the device as well as fire prevention and explosion protection measures.

These mounting and operating instructions deal with the standard version of the regulator. Components of the regulator that differ to those used for the standard version described in this document can be exchanged with other certain SAMSON components. The residual hazards of these components are described in the associated mounting and operating instructions (see section 'Referenced documents' in this chapter).

Safety features

The Type 41-23 Regulator does not have a safety valve. If necessary, a suitable overpressure protection must be installed on site. This prevents the pressure regulator or plant from being damaged due to excess pressure.

When relieved of pressure, the regulator is opened by the force of the set point springs.

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 regulator 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 Type 41-23 complies with the requirements of the European Pressure Equipment Directive 2014/68/EU and the European Machinery Directive 2006/42/EC. Regulators with a CE marking have a declaration of conformity, which includes information about the applied conformity assessment procedure.

Chapter 14 contains this declaration of conformity.

According to the ignition hazard assessment performed in accordance with Clause 5.2 of DIN EN ISO 80079-36, the non-electrical devices 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 …
  e.g. **Type 2 NI Strainer** ▶ EB 1015
- Data sheets for …
  e.g. **Accessories: Compensation chamber · Screw fittings · Control line connection · Control line** ▶ T 2595
  e.g. **Type 2 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

⚠ DANGER

Risk of bursting in pressure equipment.

The pressure reducing valve and pipelines are pressure equipment. Excessive pressurization or improper opening can lead to device components bursting.

⇨ Observe the maximum permissible pressure for the pressure reducing valve and plant.

⇨ If necessary, a suitable overpressure protection must be installed on site in the plant section.

⇨ Before starting any work on the pressure reducing valve, depressurize the plant sections and components affected.

⇨ To prevent uncontrolled excess pressure, make sure that suitable overpressure protection is installed on site in the plant section.

⇨ Wear personal protective equipment.

1.2 Notes on possible personal injury

⚠ WARNING

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

Depending on the process medium, the device 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.

⚠ WARNING

Damage to health relating to the REACH regulation.

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

⇨ Observe information on safe use of the part affected ▶ www.samsongroup.com > About SAMSON > Environment, Social & Governance > Material Compliance > REACH > Material Compliance > REACH.

⇨ Wear eye protection when working in close proximity to the device.

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

⇨ Wear hearing protection when working near the device. Follow the instructions given by the plant operator.

⚠ WARNING

Exposure to hazardous substances poses a serious risk to health.

Certain lubricants and cleaning agents are classified as hazardous substances. These substances have a special label and a material safety data sheet (MSDS) issued by the manufacturer.

⇨ Make sure that an MSDS is available for any hazardous substance used. If necessary, contact the manufacturer to obtain an MSDS.

⇨ Inform yourself about the hazardous substances and their correct handling.

⚠ WARNING

Crush hazard arising from moving parts.

The regulator contains moving parts (set point springs), which can injure hands or fingers if inserted into the regulator.

⇨ Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.

⇨ Do not insert hands or fingers between the set point springs while the regulator is in operation.

⇨ Do not insert hands or fingers between the pillars and set point springs while the regulator is in operation.

⇨ Do not insert hands or fingers between the spring plate and crossbeam while the regulator is in operation.

⇨ Before performing any work on the regulator, depressurize the plant. Disconnect or shut off the control line.

⚠ WARNING

Risk of personal injury due to preloaded springs.

The set point springs of regulators with adjusted set point are preloaded and are under tension.

⇨ Before starting any work on the regulator, relieve the compression from the preloaded springs.

⚠ WARNING

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

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

⚠ WARNING

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

While working on the device, 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 the plant sections affected and from the device.

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

⚠ WARNING

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

⇨ Do not unscrew the control line while the regulator is pressurized.

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

⇨ Wear goggles when working near the system. Follow the instructions given by the plant operator.

1.3 Notes on possible property damage

NOTICE

Risk of damage due to unsuitable medium properties.

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

⇨ Only use the process medium specified for sizing the device.

NOTICE

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

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

⇨ Do not use the strainer to permanently filter the process medium.

⇨ Flush the pipelines before start-up.

NOTICE

Risk of damage due to the use of unsuitable lubricants.

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

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

NOTICE

Risk of damage due to incorrectly attached slings.

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

NOTICE

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

Observe the specified torques when tightening components. Over-torquing leads to parts wearing out more quickly. Under-torquing may cause leakage.

⇨ Observe the specified tightening torques (see Chapter 15.1).

NOTICE

Risk of damage due to the use of unsuitable tools.

Certain tools are required to work on the device.

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

NOTICE

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

⇨ If necessary (e.g. for applications with water intended for human consumption), keep Type 41-23 and the tools used free from solvents and grease.

⇨ Make sure that only suitable lubricants are used.

NOTICE

Risk of excess pressure damaging plant sections due to construction-related seat leakage through the regulator.

⇨ Always install a safety device (e.g. safety excess pressure valve or safety relief valve) in the plant.

NOTICE

Risk of excess pressure damaging plant sections due to ice forming on the regulator.

Medium temperatures below 0 °C may cause ice to form on the regulator, depending on the air humidity. This may affect, in particular, the functioning of the plug or diaphragm stem guide.

⇨ Prevent the formation of ice by taking appropriate precautions (e.g. enclosure, trace heater etc.). The plant operator is responsible for selecting and implementing appropriate precautions (see Chapter 5).

NOTICE

Risk of damage due to the installation of solenoid valves.

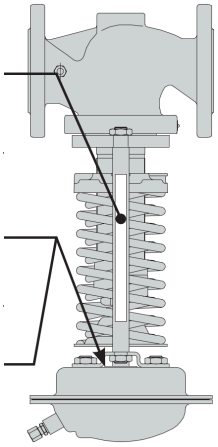
If solenoid valves are installed downstream of the regulator when the regulator is used to control liquids, pressure peaks may occur when the solenoid valves close quickly. These pressure peaks can damage the regulator.

⇨ The installation of solenoid valves downstream of the regulator is not permitted when the regulator is used to control liquids.

Note

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

1.4 Warnings on the device

Warning symbols	Meaning of the warning	Location on the device
Caution! Do not disassemble the valve before relieving the tension from the set point spring.	**Warning to indicate that the set point springs are loaded.** There is a risk of serious head or face injury due to the sudden release of the set point springs while unscrewing the crossbeam when the set point springs are loaded.	
Completely relieve the tension from the set point springs before unthreading the two nuts.	**Warning to indicate that the set point springs are loaded.** There is a risk of injury to hands or fingers due to the sudden release of the actuator stem if they are inserted between the crossbeam and set point springs while exchanging the actuator.	
Unlock/unlock the plug stem.	**Warning to indicate property damage at the bellows seal.** There is a risk of damage to the bellows seal due to the incorrect mounting or removal of the plug stem.	

2 Markings on the device

Several nameplates are affixed to Type 41-23. The nameplates shown were up to date at the time of publication of this document. The nameplates on the device may differ from the ones shown. The nameplates are used to identify the separate device components.

2.1 Nameplate

Valve

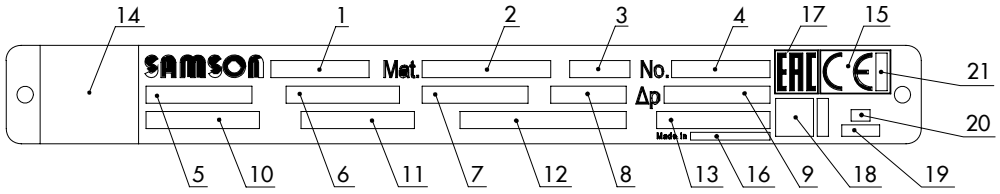


Fig. 1: *Valve nameplate*

1	Model number with index	8	Pressure rating	15	CE marking
2	Material number/configuration ID	9	Perm. differential pressure	16	Country of origin
3	Valve model	10	Perm. temperature	17	EAC, if applicable
4	Production number	11	Body material	18	UKCA, if applicable
5	K_{VS}/C_V	12	Serial number	19	Year of manufacture
6	Set point range or spring range	13	TÜV registration no.	20	Month of manufacture
7	Nominal size	14	DataMatrix code	21	ID of the certification body

Actuator

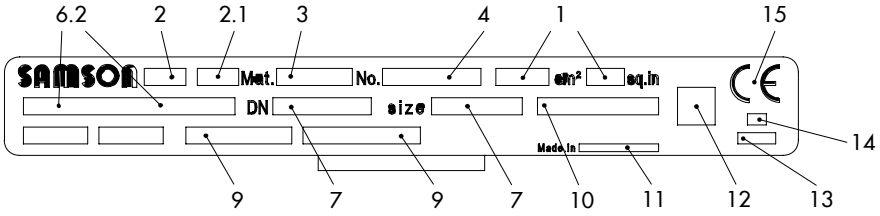


Fig. 2: *Actuator nameplate*

1	Actuator area	6.2	Max. perm. pressure at the actuator, based on the max. adjustable set point	12	UKCA, if applicable
2	Actuator model			13	Year of manufacture
2.1	Valve model	7	Nominal size	14	Month of manufacture
3	Material number and device index	9	Set point range	15	CE marking
4	ID number	10	Diaphragm material		
		11	Country of origin		

2.2 Location of the nameplate

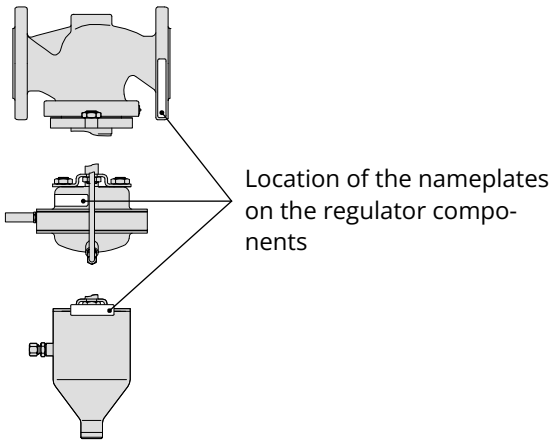


Fig. 3: *Location of nameplate on Type 2412 Valve and Type 2413 Actuator (diaphragm or bellows)*

Tip

Fig. 1, Fig. 2 and the associated inscription tables list all possible characteristics and options that may appear on a valve nameplate. Only the inscriptions relevant to the ordered Type 41-23 Valve actually appear on the nameplate.

2.3 Material identification

2.3.1 Type 2412 Valve

The material is specified in the 'Body material' field (DIN/ANSI, Fig. 1/11). For more details on the nameplate, see Chapter 2.1.

2.3.2 Type 2413 Actuator

Specifying the material number, you can contact SAMSON to find out which material is used. It is specified on the nameplate in the 'Mat.-No.' field (DIN/ANSI, Fig. 2/3). For more details on the nameplate, see Chapter 2.1.

3 Design and principle of operation

⇨ See Fig. 4

The Type 41-23 Pressure Reducing Valve consists of a Type 2412 Closing Valve and a Type 2413 Actuator. The valve and actuator (as well as the control line in certain cases) are delivered separately or assembled depending on the order. Regulator components that are delivered separately must be assembled according to the instructions in Chapter 5. Fig. 6 shows the location of the connections on the actuator.

The regulator is used to maintain the pressure downstream of the valve to an adjusted set point.

The process medium flows through the valve between seat (2) and plug (3) in the direction indicated by the arrow on the body. The position of the valve plug determines the flow rate and, as a result, the pressure ratio across the valve. The plug stem is sealed by a frictionless bellows (5.1). The downstream pressure p_2 is transmitted over the compensation chamber (18) (for liquids above 150 °C and for steam) and the control line (17) to the operating diaphragm (12) (operating bellows (12.1) in the version with bellows actuator) where it is converted into a positioning force. This force is used to move the valve plug depending on the force of the set point springs (7). The spring force is adjustable at the set point adjuster (6). The valves with K_{VS} 4 and higher have a balancing bellows (4). The upstream pressure acts on the outside of the bellows and the downstream pressure on the inside of the bellows. As a result, the forces produced by the upstream and downstream pressures acting on the plug are balanced out.

Depending on the valve and actuator used, the regulator can be upgraded to create a pressure reducing valve for low flow rates, a steam pressure reducing valve or a pressure reducing valve with increased safety (actuator with two diaphragms).

The valve closes when the downstream pressure rises.

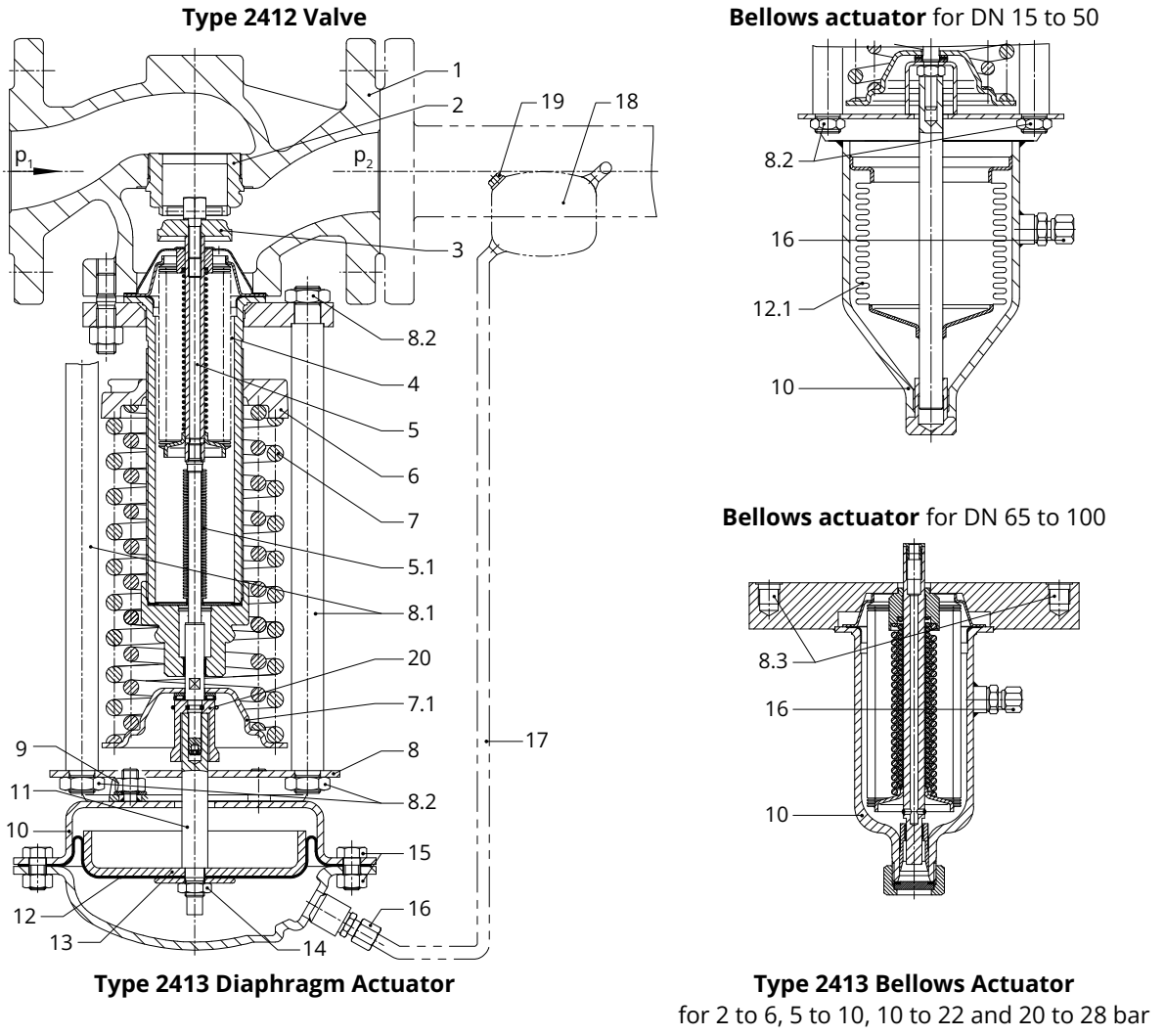


Fig. 4: *Functional diagram for regulators, DN 32 to 100 with balancing bellows*

1 Valve body (Type 2412)
2 Seat (exchangeable)
3 Plug
4 Balancing bellows
5 Plug stem
5.1 Bellows seal
6 Set point adjuster
7 Set point springs
7.1 Spring plate
8 Crossbeam
8.1 Pillar
(view drawn turned by 90°)
8.2 Nuts for pillars
8.3 Tapped holes
9 Fastening nuts
10 Actuator housing of Type 2413 · Diaphragm actuator/bellows actuator
11 Actuator stem
12 Operating diaphragm
12.1 Operating bellows
13 Diaphragm plate
14 Diaphragm plate nut
15 Nuts and bolts
16 Control line connection G ¼
(with screw joint with restriction when used with steam)
17 Control line installed on site
(control line kit available for tapping the pressure directly at the valve body, ▶ T 2595)
18 Compensation chamber
19 Filler plug
20 Travel stop cap with cotter pin

3.1 Additional fittings

⇨ See Fig. 5

Strainer

SAMSON recommends installing a SAMSON strainer 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 Type 41-23. Therefore, SAMSON recommends installing a strainer (e.g. SAMSON Type 1 NI with threaded connections or Type 2 NI with flanges). See ▶ T 1010 or ▶ T 1015.

Pressure gauges

Install a pressure gauge both upstream and downstream of Type 41-23 to monitor the pressures prevailing in the plant.

Bypass and shut-off valves

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

Insulation

Type 41-23 can be insulated to reduce heat energy transfer. If applicable, read the instructions in Chapter 5.

Noise emissions

Trims with flow dividers can be used to reduce noise emission (▶ T 2512).

! *NOTICE*

The Type 41-23 Regulator is not a safety valve.

⇨ *If necessary, a suitable overpressure protection must be installed on site in the plant section.*

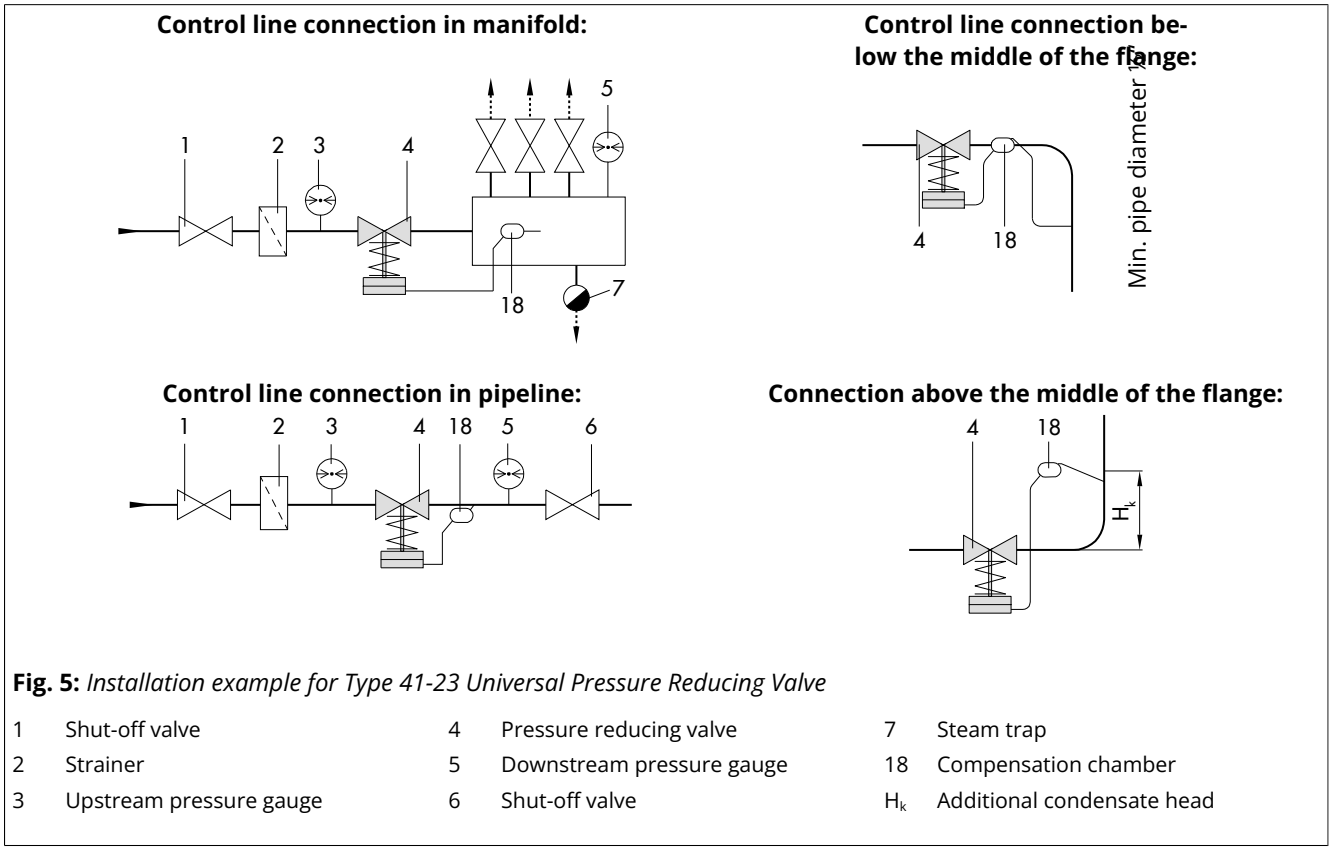


Fig. 5: *Installation example for Type 41-23 Universal Pressure Reducing Valve*

1	Shut-off valve	4	Pressure reducing valve	7	Steam trap
2	Strainer	5	Downstream pressure gauge	18	Compensation chamber
3	Upstream pressure gauge	6	Shut-off valve	H_k	Additional condensate head

3.2 Technical data

The nameplates on the individual components (valve, actuator, pilot valve etc.) provide information on the component version (see Chapter 2).

i *Note*

More information is available in Data Sheet ▶ T 2512.

Conformity

Type 41-23 bears the CE mark of conformity.

CE

Process medium and scope of application

The Type 41-23 Pressure Reducing Valve is used to maintain the pressure downstream of the valve to an adjusted set point.

- Suitable for **liquids, gases and vapors**
- Max. temperature **350 °C**
- Set points **0.05 to 28 bar**
- Nominal size **DN 15 to 100**
- Pressure rating **PN 16 to 40**

The regulator is open when relieved of pressure. The valve **closes** when the **downstream** pressure rises.

Temperature range

Depending on how the regulator is configured, it can be used up to temperatures of 350 °C (see Table 1 and Table 2). The minimum temperature is limited by the accessories used and the actuator's diaphragm material (▶ T 2595).

Leakage class

The metal-seated regulator has the leakage class I according to IEC 60534-4.

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

Noise emissions

SAMSON is unable to make general statements about noise emissions. The noise emissions depend on the version of Type 41-23, plant facilities, process medium and operating conditions.

Dimensions and weights

Table 6 provides a summary of the dimensions and weights. The lengths and heights are shown in the dimensional drawings (Fig. 7).

Table 1: *Technical data of the valve · All pressures in bar (gauge)*

Valve		**Type 2412**		
Nominal size		DN 15 to 50	DN 65 to 80	DN 100
Pressure rating		PN 16, 25 or 40		
Max. perm. differential pressure Δp		16 bar [2] · 25 bar	16 bar [2] · 20 bar	16 bar
Max. permissible temperature [1]	Valve	See ▶ T 2500 · Pressure-temperature diagram		
	Valve plug	Metal seal: 350 °C · PTFE soft seal: 220 °C EPDM or FKM soft seal: 150 °C · NBR soft seal: 80 °C		
Leakage class according to IEC 60534-4		Metal seal: leakage rate I (≤0.05 % of K_{VS}) Soft seal: leakage rate IV (≤0.01 % of K_{VS})		
Conformity		CE		

[1] FDA version: Max. permissible temperature 60 °C

[2] For PN 16 only

Table 2: *Technical data of diaphragm or bellows actuator · All pressures in bar (gauge)*

Diaphragm actuator	**Type 2413**				
Actuator area	640 cm²	320 cm²	160 cm²	80 cm²	40 cm²
Set point range	0.05 to 0.25 bar 0.1 to 0.6 bar	0.2 to 1.2 bar	0.8 to 2.5 bar [2]	2 to 5 bar	4.5 to 10 bar 8 to 16 bar
Max. permissible temperature [3]	Gases 350 °C, however, max. 80 °C at the actuator · Liquids 150 °C, with compensation chamber 350 °C · Steam with compensation chamber 350 °C				
Set point spring	1750 N	4400 N			8000 N
Bellows actuator	**Type 2413**				
Actuator area	33 cm²		62 cm²		
Set point range	10 to 22 bar 20 to 28 bar		2 to 6 bar [1] 5 to 10 bar		
Max. permissible temperature [3]	350 °C				
Set point spring	8000 N				

[1] Set point spring 4400 N

[2] Version with actuator with two diaphragms: 1 to 2.5 bar

[3] FDA version: Max. permissible temperature 60 °C

Table 3: *Max. perm. pressure at actuator*

	Set point ranges	**Max. perm. pressure above the set point adjusted at the actuator**
Diaphragm actuator	0.05 to 0.25 bar · 0.1 to 0.6 bar	0.6 bar
	0.2 to 1.2 bar	1.3 bar
	0.8 to 2.5 bar	2.5 bar
	2 to 5 bar	5 bar
	4.5 to 10 bar · 8 to 16 bar	10 bar
Bellows actuator	2 to 6 bar · 5 to 10 bar	6.5 bar
	10 to 22 bar	8 bar
	20 to 28 bar	2 bar

i Note

The maximum permissible pressure at the actuator depends on the currently adjusted set point. Add the value listed in the table to it.

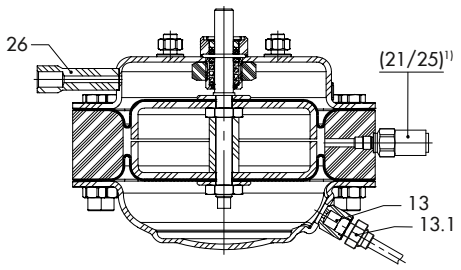
Example:

Set point range: 0.2 to 1.2 bar
Set point adjusted to: 0.8 bar
Max. permissible pressure at the actuator: 0.8 bar + 1.3 bar = 2.1 bar

Table 4: *K_{VS} coefficients and x_{FZ} values · Terms for noise level calculation according to VDMA 24422, edition 1.89*

Nominal size	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
K_{VS}[1] (standard version)	4	6.3	8	16	20	32	50	80	125
x_{FZ}	0.5	0.45	0.4					0.35	
K_{VS}[1] (special version)	0.1 · 0.4 · 1 · 2.5	0.1 · 0.4 · 1 · 2.5 · 4	0.1 · 0.4 · 1 · 2.5 · 4 · 6.3	6.3 · 8	6.3 · 8 · 16	8 · 16 · 20	20 · 32	32 · 50	50
K_{VS}-1[1] (with flow divider ST 1)	3	5	6	12	15	6 · 25	25 · 38	25 · 60	38 · 95
K_{VS}-3[1] (with flow divider ST 3)	–						25	40	60

[1] With K_{VS} 0.001 to 0.04: Valve with micro-trim (DN 15 to 25 only) without balancing bellows



13 Control line connection G ¼ (medium pressure)
13.1 Screw joint with restriction
21 Diaphragm rupture indicator G ¼
25 Leakage line connection G ¼
26 Control line connection (control pressure)

1) Depending on application

Fig. 6: *Connections of Type 2413 Diaphragm Actuator*

i Note

Type 41-23 does not have a safety valve. If necessary, a suitable overpressure protection must be installed on site. This prevents the regulator or plant from being damaged due to excess pressure.

Table 5: *Materials · Material numbers according to DIN EN*

Valve		**Type 2412**					
Pressure rating		PN 16	PN 25	PN 40			
Max. permissible temperature [4]		300 °C	350 °C				
Body		Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400-18-LT	Cast steel 1.0619	Stainless steel 1.4408	Forged steel 1.0460 [1]	Forged stainless steel 1.4571 [1]
Seat		CrNi steel			CrNiMo steel	CrNi steel	CrNiMo steel
Plug	Material	CrNi steel			CrNiMo steel	CrNi steel	CrNiMo steel
	Seal	PTFE with 15 % glass fiber · EPDM · NBR · FKM					
Guide bushing		Graphite					
Balancing bellows and bellows seal		CrNiMo steel					
Actuator		**Type 2413**					
		Diaphragm actuator				**Bellows actuator**	
Diaphragm cases		1.0332 [2]				–	
Diaphragm		EPDM with fabric reinforcement [3] · FKM, e.g. for mineral oils · NBR				–	
Bellows housing		–				1.0460/1.4301 (stainless steel only)	
Bellows		–				CrNiMo steel	

1) DN 15, 25, 40, 50 and 80 only

2) In corrosion-resistant version (CrNi steel)

3) Standard version; see Special versions for others

4) FDA version: Max. permissible temperature 60 °C

Table 6: *Dimensions in mm and weights in kg*

Type 41-23 Universal Pressure Reducing Valve											
Nominal size			**DN 15**	**DN 20**	**DN 25**	**DN 32**	**DN 40**	**DN 50**	**DN 65**	**DN 80**	**DN 100**
Length L			130	150	160	180	200	230	290	310	350
Height H1			335			390			517		540
Height H2	Forged steel		53	–	70	–	92	98	–	128	–
	Other materials		44			72			98		118
Height H4			100								
Version with Type 2413 Diaphragm Actuator											
Nominal size			**DN 15**	**DN 20**	**DN 25**	**DN 32**	**DN 40**	**DN 50**	**DN 65**	**DN 80**	**DN 100**
Set point ranges	0.05 to 0.25 bar	Height H [3)4)]	445			500			627		650
		Actuator	ØD = 380 mm, A = 640 cm²								
		Valve spring force F	1750 N								
	0.1 to 0.6 bar	Height H [3)4)]	445			500			627		650
		Actuator	ØD = 380 mm, A = 640 cm²								
		Valve spring force F	4400 N								
	0.2 to 1.2 bar	Height H [3)4)]	430			480			607		635
		Actuator	ØD = 285 mm, A = 320 cm²								
		Valve spring force F	4400 N								
	0.8 to 2.5 bar [2)]	Height H [3)4)]	430			485			612		635
		Actuator	ØD = 225 mm, A = 160 cm²								
		Valve spring force F	4400 N								
	2 to 5 bar	Height H [3)4)]	410			465			592		615
		Actuator	ØD = 170 mm, A = 80 cm²								
		Valve spring force F	4400 N								
	4.5 to 10 bar	Height H [3)4)]	410			465			592		615
		Actuator	ØD = 170 mm, A = 40 cm²								
		Valve spring force F	4400 N								
	8 to 16 bar	Height H [3)4)]	410			465			592		615
		Actuator	ØD = 170 mm, A = 40 cm²								
		Valve spring force F	8000 N								
Weight for version with Type 2413 Diaphragm Actuator											
Set point ranges	0.05 to 0.6 bar	Weight, based on cast iron [1)], approx. kg	24.8	25.9		32.5	34.7	38.5	56.1	63.8	73.7
	0.2 to 2.5 bar		20.6	22.8		28.9	31.1	34.9	52.5	60.2	70.1
	2 to 16 bar		13.2	14.3		20.4	23.1	26.4	44.0	51.7	61.6

1) +10 % for all other materials

2) Actuator with two diaphragms: 1 to 2.5 bar

3) Actuator with two diaphragms for autoclave regulator: H = +50 mm

4) Actuator with two diaphragms for increased safety: H = +32 mm

Version with Type 2413 Bellows Actuator										
Nominal size			**DN 15**	**DN 20**	**DN 25**	**DN 32**	**DN 40**	**DN 50**	**DN 65**	**DN 80**	**DN 100**
Set point ranges	2 to 6 bar	Height H	550			605			732		755
		Actuator	ØD = 120 mm, A = 62 cm²								
		Valve spring force F	4400 N								
	5 to 10 bar	Height H	550			605			732		755
		Actuator	ØD = 120 mm, A = 62 cm²								
		Valve spring force F	8000 N								
	10 to 22 bar	Height H	535			590			717		740
		Actuator	ØD = 90 mm, A = 33 cm²								
		Valve spring force F	8000 N								
	20 to 28 bar	Height H	535			590			717		740
		Actuator	ØD = 90 mm, A = 33 cm²								
		Valve spring force F	8000 N								
Weight for version with bellows actuator											
Set point ranges	2 to 10 bar	Weight, based on cast iron [1], approx. kg	22.6	23.7	24.2	30.3	32.5	36.3	60.5	68.2	78.1
	10 to 28 bar		18.2	19.3	19.8	25.9	28.1	31.9	48.4	61.6	71.5

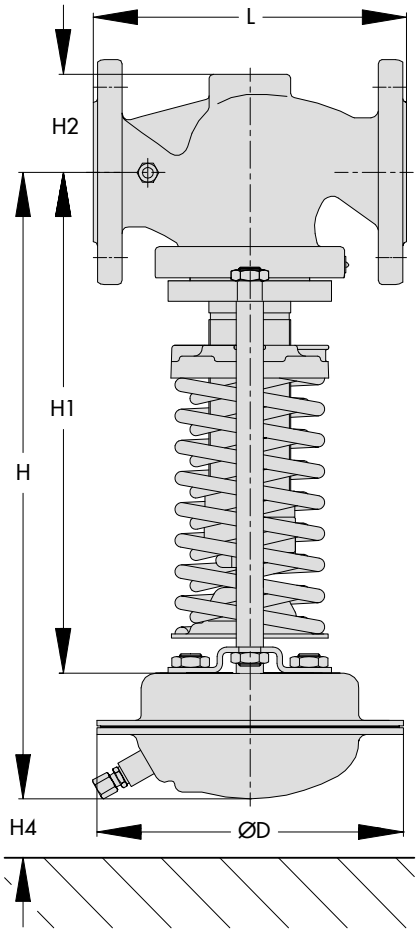
[1] +10 % for all other materials

i ***Note***

The specified dimensions of Type 41-23 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.

Dimensional drawings

Type 41-23 with diaphragm actuator



Type 41-23 with bellows actuator

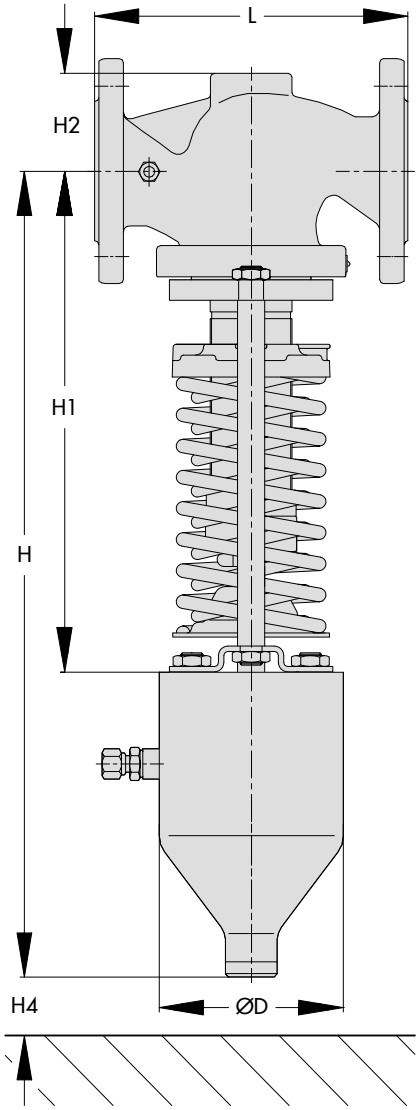


Fig. 7: *Dimensions of Type 41-23*

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 nameplate of Type 41-23 and any individual components 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.

4.2 Removing the packaging from the device

The components (valve, actuator and, if applicable, control line) of Type 41-23 are delivered separately. A tested device is delivered as an assembled unit.

Proceed as follows to lift and install Type 41-23:

⇨ Do not open or remove the packaging until immediately before lifting the device or device components to install it into the pipeline.

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

⇨ Do not remove any protective caps from the inlet and outlet until immediately before installing the device into the pipeline. They prevent foreign particles from entering the device.

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

4.3 Transporting and lifting the device

⚠ DANGER

Danger due to suspended loads falling.

⇨ *Stay clear of suspended or moving loads.*

⇨ *Close off and secure the transport paths.*

⇨ *Wear personal protective equipment.*

⚠ WARNING

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

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

⇨ *Refer to Chapter 3.2 for weights.*

⚠ WARNING

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 injuries in particular) depending on its weight.

⇨ *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.*

⚠ WARNING

Risk of personal injury due to the regulator tipping.

⇨ *Observe the device's center of gravity.*

⇨ *Secure the device 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 device

Type 41-23 can be transported using lifting equipment (e.g. crane or forklift).

⇨ Leave Type 41-23 on the pallet to transport it.

⇨ Observe the transport instructions.

Transport instructions

⇨ Protect Type 41-23 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 Type 41-23 against moisture and dirt.

⇨ The permissible ambient temperature of the standard version of Type 41-23 is –20 to +80 °C.

4.3.2 Lifting the device

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. 8).

⇨ Secure slings against slipping.

⇨ Do not attach slings to any mounted control lines.

⇨ Make sure the slings can be removed from the device once it has been installed into the pipeline.

⇨ 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

1. Attach one sling to each flange of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 8).
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 Chapter 5).
5. After installation in the pipeline, check whether the regulator flanges are bolted tight.
6. Remove slings.

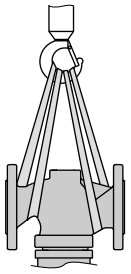


Fig. 8: *Schematic drawing of lifting points on the regulator*

4.4 Storing the device

NOTICE

Risk of 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

SAMSON recommends to regularly check Type 41-23 and the prevailing storage conditions during long storage periods.

Storage instructions

⇨ Protect Type 41-23 against external influences (e.g. impact).

⇨ Secure Type 41-23 in the stored position against slipping or tipping over.

⇨ Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.

⇨ Protect Type 41-23 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 the standard version of Type 41-23 is –20 to +60 °C.

⇨ Do not place any objects on Type 41-23.

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.

– SAMSON recommends a storage temperature of 15 °C for elastomers.

Tip

Our after-sales service can provide more detailed transport and lifting 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

NOTICE

Risk of damage due to the installation of solenoid valves.

If solenoid valves are installed downstream of the regulator when the regulator is used to control liquids, pressure peaks may occur when the solenoid valves close quickly. These pressure peaks can damage the regulator.

⇨ *The installation of solenoid valves downstream of the regulator is not permitted when the regulator is used to control liquids.*

Work position

The work position for Type 41-23 is the front view onto all operating controls (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 device functions properly, proceed as follows:

⇨ Observe the inlet and outlet lengths (see Chapter 5.2). Contact SAMSON if the regulator conditions or state of the process medium are different from those specified.

⇨ Install Type 41-23 free of stress and with the least amount of vibrations as possible. Read sections 'Mounting position' and 'Support and suspension' in this chapter.

⇨ For media with a tendency to condensate, install the pipeline with a slight downward slope on both sides so that the condensate can drain properly. If the pipeline upstream and downstream of the device run vertically upwards, an automatic drainage is required.

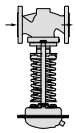
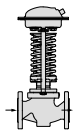
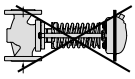
⇨ Install the regulator allowing sufficient space to remove the actuator and valve or to perform service work on them.

Mounting position

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

1. Install the actuator housing with the set point springs suspended downward in horizontal pipelines (see Table 7).
2. Make sure the direction of flow matches the direction indicated by the arrow on the body.
3. Contact SAMSON if the mounting position is not as specified above.

Table 7: *Mounting position*

Mounting positions	
	**Standard mounting position** for gases, liquids and steam
	**Alternative mounting position** for gases and liquids for a medium temperature **up to 80 °C Not for steam**
	**Not permissible** [1]

[1] On request: Permissible for regulators with fixed plug stem guide combined with a medium temperature up to 80 °C. Not for steam

NOTICE

Damage due to freezing.

Protect Type 41-23 from icing up when controlling media that can freeze.

⇨ *Unless the device is installed in locations where no frost occurs, remove it from the pipeline when the plant is shut down.*

i Note

Do not install any instruments (e.g. temperature regulators or shut-off valves) that restrict the cross-section of the pipe between the pressure tapping point and the regulator.

i Note

Make sure that the regulator remains freely accessible after the plant has been completed.

⇨ *Allow sufficient space to remove the regulator components.*

Support and suspension

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

i Note

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

! NOTICE

Risk of damage due to incorrect support.

⇨ *Do not attach supports to the device or any of its components.*

⇨ *Contact SAMSON if the mounting position differs from the standard mounting position.*

Control line

The control line must be provided at the site of installation, e.g. a $^3/_8$" pipe for steam or an 8x1 or 6x1 mm pipe for air/water.

Connect the control line to the downstream line (p_2) at least one meter away from the valve outlet.

Weld the control line at the side in the middle of the pipe, inclining at a ratio of approximately 1:10 up to the compensation chamber (see Fig. 9 and Chapter 5.2).

If a manifold is located downstream of the pressure reducing valve, connect the valve to the manifold, even if it is several meters away.

Control line kit

A control line kit for tapping pressure at the valve body is available as an accessory part from SAMSON.

Compensation chamber

A compensation chamber (18) 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.

Weld the line coming from the pressure tapping point to the ⅜" pipe socket on the compensation chamber. Install the compensation chamber at the highest point of the pipeline. Consequently, the control line between compensation chamber and actuator must also be installed with a downward slope. In this case, use a ⅜" pipe with screw fittings.

If the control line connection is located below the middle of the valve inlet flange, locate the compensation chamber at the same level as the inlet flange. In this case, use a pipe which is at least ½" in size for the control line from the tapping point to the compensation chamber.

If the control line is connected above the middle of the valve inlet flange, install the compensation chamber at the same level as the upstream pressure tapping point. The additional pressure of the condensate head (H_k in Fig. 11) must be compensated for by adjusting the set point.

Needle valve

If the regulator tends to hunt, SAMSON recommends installing a needle valve at the control line connection (16) in addition to the standard SAMSON screw joint with restriction.

Shut-off valve

Install a hand-operated shut-off valve both upstream and downstream of the Type 41-23. (see Fig. 10). This allows the plant to be shut down for cleaning and maintenance, and when the plant is not used for longer periods of time.

Connection at the side:
Optimal for all media

Connection on top:
Incorrect for liquids
Permissible for gases and vapors

Connection at the bottom:
Incorrect for all media

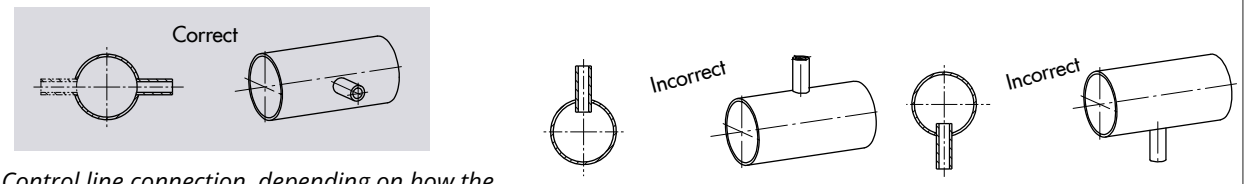


Fig. 9: *Control line connection, depending on how the pipeline is routed*

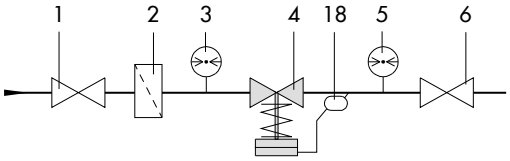


Fig. 10: *Installation example for Type 41-23 Universal Pressure Reducing Valve*

1 Shut-off valve
2 Strainer
3 Upstream pressure gauge
4 Pressure reducing valve
5 Downstream pressure gauge
6 Shut-off valve
7 Steam trap
18 Compensation chamber

5.2 Preparation for installation

Valve and actuator can be assembled before or after the valve has been installed in the pipeline. SAMSON recommends first installing the valve without the actuator into the pipeline.

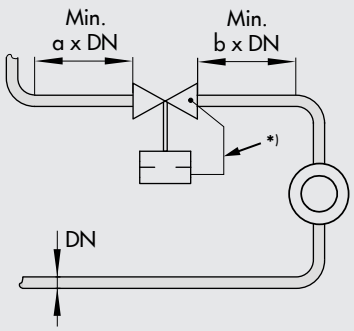
Before installation, make sure that the following conditions are met:

- Ensure that there is no liquid (e.g. condensed water) inside the regulator. If necessary, blow clean compressed air through the connecting parts.
- Type 41-23 is clean.
- None of the components of Type 41-23 are damaged.
- Install a strainer upstream of the regulator.
- The requested or required additional pipe fittings (see Chapter 3) have been installed or prepared as necessary.
- All data on the nameplate (type designation, nominal size, material, pressure rating and temperature range) match the plant conditions. See Chapter 2 for more details on the nameplate.

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

Table 8: *Inlet and outlet lengths*

<table>
<tr><td colspan="2"> 
</td><td colspan="2">*) Control line
(e.g. control line kit,
see section 'Control line' in Chapter 5.1)

a Inlet length
b Outlet length</td></tr>
<tr><td>State of process medium</td><td>Valve conditions</td><td>Inlet length a</td><td>Outlet length b</td></tr>
<tr><td>Gases</td><td>Ma ≤ 0.3</td><td rowspan="4">2</td><td rowspan="4">4</td></tr>
<tr><td>Vapors [1)]</td><td>Ma ≤ 0.3</td></tr>
<tr><td rowspan="2">Liquids</td><td>Free of cavitation/w < 3 $^{m}/_{s}$</td></tr>
<tr><td>Cavitation producing noise/w ≤ 3 $^{m}/_{s}$</td></tr>
</table>

1) No wet steam

Connection above the middle of the flange:

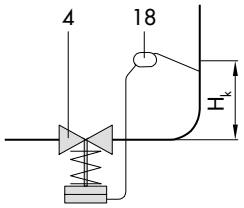


Fig. 11: *Installation example with steam*

4 Pressure reducing valve
18 Compensation chamber
H_k Additional condensate head

Note

The arising condensate head will lower the maximum set point that can be adjusted at the regulator.

Example:
The maximum set point of a regulator with a set point range from 0.05 to 0.25 bar is reduced to 0.15 bar when a condensate head exists in the 1 m control line installed on site. For this reason, the height H_k of the control line installed on site must be kept as short as possible.

5.3 Installation

The components (valve, actuator and, if applicable, control line) of Type 41-23 are delivered separately. A tested device is delivered as an assembled unit. Upon delivery, the separate components must be assembled together. The activities listed below are necessary to install the device and before it can be started up.

NOTICE

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

Observe the specified torques when tightening components. Over-torquing leads to parts wearing out more quickly. Under-torquing may cause leakage.

⇨ *Observe the specified tightening torques (see Chapter 15.1).*

NOTICE

Risk of damage due to the use of unsuitable tools.

Certain tools are required to work on the device.

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

NOTICE

Risk of damage due to the use of unsuitable lubricants.

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

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

5.3.1 Installing the device

Proceed as follows:

Installation

1. Close the shut-off valves upstream and downstream of Type 41-23 while the regulator is being installed.
2. Remove any protective caps from the body ports before installation.
3. Lift the device using suitable lifting equipment to the site of installation. Observe the flow direction through the device. The arrow on the body indicates the direction of flow.
4. Make sure that the correct flange gaskets are used.
5. Bolt Type 41-23 to the pipeline free of stress.
6. Mount the actuator.

⇨ **Diaphragm actuator DN 15 to 100**

– Insert the actuator stem (11) through the hole in the crossbeam (8) into the travel stop cap with cotter pin (20) and fasten the actuator with the nuts (9). Observe the tightening torques specified in Chapter 15.1.

⇨ **Bellows actuator DN 15 to 50**

– Remove the crossbeam (8) from the valve.
– Insert the actuator stem (11) into the travel stop cap with cotter pin (20).
– Align pillars (8.1) and fasten the actuator with the nuts (8.2). Observe the tightening torques specified in Chapter 15.1.

⇨ **Bellows actuator DN 65 to 100**

– Remove the crossbeam (8) from the valve.
– Unscrew the pillars (8.1).
– Screw the pillars (8.1) into the threaded holes (8.3) of the actuator flange as far as they will go.
– Insert the actuator stem (11) into the travel stop cap with cotter pin (20).
– Fasten the pillars (8.1) with the nuts (8.2) onto the valve flange. Observe the tightening torques specified in Chapter 15.1.

7. Lock the cotter pin (20) on the travel stop cap.
8. Mount the control line (17) onto the valve and actuator. Observe the tightening torques specified in Chapter 15.1.

⇨ **Diaphragm actuators**

– For **steam** or **liquids above 150 °C:** Install the compensation chamber and fill it with the process medium. Observe the tightening torques specified in Chapter 15.1.

9. Slowly open the shut-off valves in the pipeline after the device has been installed.

5.3.2 Cleaning the pipeline

SAMSON recommends additionally flushing the pipeline with the regulator installed before start-up.

⇨ Unscrew the control line (17) from the valve body.
⇨ Seal the valve body with G ¼ stoppers (accessories: stopper 8323-0030 and seal 8412-0771).
⇨ Observe the mesh size of the upstream strainer for the maximum particle size. Use strainers suitable for the process medium.
⇨ Check the strainer for dirt each time the pipeline is flushed and clean it, if necessary.

If the regulator malfunctions due to clogging after flushing the pipeline, proceed as described in Chapter 8.

5.4 Testing the device

⚠ DANGER

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

The pressure reducing valve 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 pressure reducing valve:

⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections.*
⇨ *Disconnect the external control lines.*
⇨ *Wear personal protective equipment.*

⚠ DANGER

Risk of bursting in pressure equipment.

The pressure reducing valve and pipelines are pressure equipment. Excessive pressurization or improper opening can lead to device components bursting.

⇨ *Observe the maximum permissible pressure for the pressure reducing valve and plant.*
⇨ *If necessary, a suitable overpressure protection must be installed on site in the plant section.*
⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections and components affected.*
⇨ *To prevent uncontrolled excess pressure, make sure that suitable overpressure protection is installed on site in the plant section.*
⇨ *Wear personal protective equipment.*

⚠ DANGER

Risk of personal injury due to the operating medium being released.

⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections and the components affected.*
⇨ *Do not start up the pressure reducing valve until all parts have been mounted.*
⇨ *Wear personal protective equipment.*

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

⇨ *Wear hearing protection when working near the device. Follow the instructions given by the plant operator.*

⚠ WARNING

Crush hazard arising from moving parts.

The regulator contains moving parts (set point springs), which can injure hands or fingers if inserted into the regulator.

⇨ *Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.*
⇨ *Do not insert hands or fingers between the set point springs while the regulator is in operation.*
⇨ *Do not insert hands or fingers between the pillars and set point springs while the regulator is in operation.*
⇨ *Do not insert hands or fingers between the spring plate and crossbeam while the regulator is in operation.*
⇨ *Before performing any work on the regulator, depressurize the plant. Disconnect or shut off the control line.*

⚠ WARNING

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

Depending on the process medium, the device 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.*

⚠ WARNING

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

⇨ *Do not unscrew the control line while the regulator is pressurized.*

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

⇨ *Wear goggles when working near the system. Follow the instructions given by the plant operator.*

Type 41-23 is delivered by SAMSON ready for use. To test the equipment functioning before start-up or putting back it into operation, perform the following tests:

5.4.1 Leak test

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

Tip

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 installed upstream of Type 41-23.
2. Apply the required test pressure.
3. Check Type 41-23 for leakage to the atmosphere.
4. Depressurize the pipeline section and Type 41-23.
5. Rework any parts that leak and repeat the leak test.

5.4.2 Pressure test

NOTICE

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

⇨ *Slowly open the shut-off valves in the pipeline.*

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.

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

⇨ Do not allow the pressure to exceed **1.5 times the pressure rating** of the body (Type 41-23).

⇨ The regulator must remain open.

⇨ To proceed, **detach the control line.**. Seal the opening on the valve body with G ¼ stopper (accessories: stopper 8323-0030 and seal 8412-0771).

⇨ Make sure that the pressure rises simultaneously upstream and downstream of the regulator to avoid damaging the balancing bellows.

5.5 Insulation

5.5.1 Insulation for medium temperatures above 150 °C

For medium temperatures above 150 °C: Only insulate the valve body up to the set point springs at the most.

NOTICE

Risk of damage due to incorrect insulation.

⇨ *Do not insulate the control lines, compensation chambers or diaphragm actuator.*

⇨ *The actuator must be insulated for medium temperatures below 0 °C.*

⇨ *The regulator must only be insulated up to the bottom section with balancing bellows or up to the connection of the actuator for medium temperatures above 80 °C.*

⇨ *Only insulate the regulator up to the set point springs at the most for medium temperatures above 150 °C.*

5.5.2 Cold insulation

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

NOTICE

Risk of damage due to incorrect insulation.

⇨ *Insulate the regulator according to common practice when the medium temperature is below the dew point of the ambient air.*

⇨ *Install the regulator with the actuator in the upright position above the valve.*

⇨ *Do not pack the regulator in gas-tight insulation since it requires atmospheric pressure to work.*

⇨ *If the valve has an external spring, it must be protected by a sleeve that does not come into contact with it. The spring-loaded actuator stem must not come into contact with the cold insulation.*

⇨ *An installed diaphragm rupture indicator must remain visible after insulation.*

1. Start up the plant and adjust the set point (see Chapter 6).
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.

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 personal injury due to the operating medium being released.

⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections and the components affected.*

⇨ *Do not start up the pressure reducing valve until all parts have been mounted.*

⇨ *Wear personal protective equipment.*

⚠ WARNING

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

Depending on the process medium, the device 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.*

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

⇨ *Wear hearing protection when working near the device. Follow the instructions given by the plant operator.*

⚠ WARNING

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

⇨ *Do not unscrew the control line while the regulator is pressurized.*

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

⇨ *Wear goggles when working near the system. Follow the instructions given by the plant operator.*

⚠ WARNING

Crush hazard arising from moving parts.

The regulator contains moving parts (set point springs), which can injure hands or fingers if inserted into the regulator.

⇨ *Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.*

⇨ *Do not insert hands or fingers between the set point springs while the regulator is in operation.*

⇨ *Do not insert hands or fingers between the pillars and set point springs while the regulator is in operation.*

⇨ *Do not insert hands or fingers between the spring plate and crossbeam while the regulator is in operation.*

⇨ *Before performing any work on the regulator, depressurize the plant. Disconnect or shut off the control line.*

⚠ WARNING

Risk of personal injury due to the operating medium being released.

Depending on the conditions in the plant in operation, it may be necessary to install compensation chambers to protect the regulator.

⇨ *Proceed as described in the section and section for liquids or steam above 150 °C before starting up the plant.*

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

- The regulator is properly installed in the pipeline (see Chapter 5).
- The leak and function tests have been completed successfully (see Chapter 5).
- The prevailing conditions in the plant section affected meet the regulator sizing requirements (see Chapter 1).

6.1 Start-up and putting the device back into operation

1. 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 may damage the valve.
3. Check the regulator to ensure it functions properly.

Before starting up the plant, make sure the following conditions are met:

– The control line is open and correctly connected.

6.2 Filling and starting up the plant

⚠ WARNING

Risk of personal injury due to the operating medium being released.

Depending on the conditions in the plant in operation, it may be necessary to install compensation chambers to protect the regulator.

⇨ *Proceed as described in the section and section for liquids or steam above 150 °C before starting up the plant.*

⇨ **Avoid pressure surges.**

1. The plant (e.g. consumer valve) must be open while the plant is being filled.
2. The control lines are open and correctly connected.
3. Fill the plant as follows:

⇨ **For media that do not reach boiling point at atmospheric pressure as well as for gases:**
Open the shut-off valves **slowly** over a time period of several minutes starting from the upstream pressure side. Fill the plant with the medium. Afterwards, open all the valves on the consumer side (downstream of Type 41-23).

⇨ **For media that reach boiling point at atmospheric pressure:**
Open the shut-off valves **slowly** over a time period of several minutes starting from the downstream pressure side. Fill the plant with the medium. Avoid steam hammering.

4. Make sure that the air contained in the plant escapes as quickly as possible.
5. Make sure that the pressure rises simultaneously upstream and downstream of Type 41-23 to avoid damaging the balancing bellows, plug or diaphragm.

6.2.1 Control applications with liquids

⇨ For liquids with temperatures above 150 °C, first fill the compensation chamber with the process medium. Proceed as follows:

1. Unscrew filler plug from the compensation chamber.
2. Use the included plastic funnel or a jug to pour in the process medium until it reaches the filling opening.
3. Screw the filler plug back in and tighten it.

6.2.2 Control applications with steam

⇨ Warm up the plant very slowly. During this procedure, drain off any condensate and vent the plant.

⇨ First fill the compensation chamber with water. Proceed as follows:

1. Unscrew filler plug from the compensation chamber.
2. Use the included plastic funnel or a jug to pour in the process medium until it reaches the filling opening.
3. Screw the filler plug back in and tighten it.

- All pipes conveying the process medium must be completely drained and dry.
- Air and condensate must be allowed to escape from the plant.
- Allow time for the pipes and valves to heat up.

7 Operation

Immediately after completing start-up or placing Type 41-23 back into service (see Chapter 6), it is ready for use.

⚠ DANGER

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

The pressure reducing valve 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 pressure reducing valve:

- ⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections.*
- ⇨ *Disconnect the external control lines.*
- ⇨ *Wear personal protective equipment.*

⚠ DANGER

Risk of bursting in pressure equipment.

The pressure reducing valve and pipelines are pressure equipment. Excessive pressurization or improper opening can lead to device components bursting.

- ⇨ *Observe the maximum permissible pressure for the pressure reducing valve and plant.*
- ⇨ *If necessary, a suitable overpressure protection must be installed on site in the plant section.*
- ⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections and components affected.*
- ⇨ *To prevent uncontrolled excess pressure, make sure that suitable overpressure protection is installed on site in the plant section.*
- ⇨ *Wear personal protective equipment.*

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

- ⇨ *Wear hearing protection when working near the device. Follow the instructions given by the plant operator.*

⚠ WARNING

Crush hazard arising from moving parts.

The regulator contains moving parts (set point springs), which can injure hands or fingers if inserted into the regulator.

- ⇨ *Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.*
- ⇨ *Do not insert hands or fingers between the set point springs while the regulator is in operation.*
- ⇨ *Do not insert hands or fingers between the pillars and set point springs while the regulator is in operation.*
- ⇨ *Do not insert hands or fingers between the spring plate and crossbeam while the regulator is in operation.*
- ⇨ *Before performing any work on the regulator, depressurize the plant. Disconnect or shut off the control line.*

⚠ WARNING

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

Depending on the process medium, the device 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.*

⚠ WARNING

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

Over time, markings, labels and nameplates on the device 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.*

⚠ WARNING

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

⇨ *Do not unscrew the control line while the regulator is pressurized.*

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

⇨ *Wear goggles when working near the system. Follow the instructions given by the plant operator.*

7.1 Adjusting the set point

⇨ The required downstream pressure is set by turning the set point adjuster (6) using an open-end wrench:

– DN 15 to 50 with width across flats A/F 19
– DN 65 to 100 with width across flats A/F 24
– The set point of the stainless steel version must be adjusted using the rod included.

⇨ Turn the set point adjuster clockwise to increase the pressure set point.

⇨ Turn the set point adjuster counterclockwise to reduce the pressure set point.

The pressure gauge located on the downstream pressure side allows the adjusted set point to be monitored.

An initial adjustment of the set point can also be made by changing the spring tension until the dimension x (see Fig. 12 and Table 9) is reached.

i *Note*

Note during initial set point adjustment that only a rough set point adjustment is performed by turning the set point adjustment until the dimension x is reached. The special properties of the process medium and plant are not taken into account in this case.

Check the pressure at the pressure gauge downstream of the regulator for a precise set point adjustment.

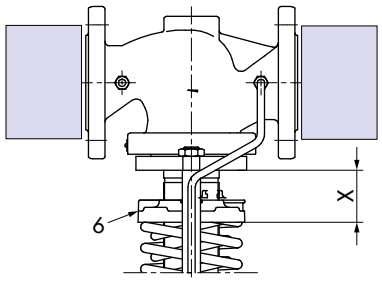


Fig. 12: *Set point adjustment with dimension x*

6 Set point adjuster
X Dimension in mm

Table 9: *Set point adjustment · Dimension x*

Set point range		**Dimension x** for nominal size (DN)		
8 to 16 bar		**15 to 25**	**32 to 50**	**65 to 100**
Set point	10 bar	89 mm	106 mm	133 mm
	12 bar	97 mm	117 mm	150 mm
	14 bar	104 mm	128 mm	168 mm
4.5 to 10 bar				
Set point	5.9 bar	85 mm	100 mm	131 mm
	7.3 bar	93 mm	112 mm	152 mm
	8.6 bar	101 mm	123 mm	172 mm
2 to 5 bar				
Set point	2.8 bar	83 mm	97 mm	126 mm
	3.5 bar	92 mm	110 mm	170 mm
	4.3 bar	100 mm	122 mm	184 mm
0.8 to 2.5 bar				
Set point	1.2 bar	79 mm	92 mm	117 mm
	1.7 bar	89 mm	106 mm	142 mm
	2.1 bar	99 mm	121 mm	167 mm
0.2 to 1.2 bar				
Set point	0.45 bar	71 mm	81 mm	98 mm
	0.7 bar	83 mm	98 mm	127 mm
	1.0 bar	95 mm	117 mm	157 mm
0.1 to 0.6 bar				
Set point	0.23 bar	71 mm	81 mm	98 mm
	0.35 bar	83 mm	98 mm	127 mm
	0.48 bar	95 mm	115 mm	157 mm
0.05 to 0.25 bar				
Set point	0.10 bar	70 mm	80 mm	92 mm
	0.15 bar	81 mm	95 mm	116 mm
	0.20 bar	91 mm	110 mm	139 mm

8 Malfunctions

8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action
Downstream pressure exceeds the adjusted set point	Insufficient pressure pulses on the operating diaphragm	⇨ Connect the control line on site for regulators with external control line. ⇨ Clean the control line and screw fittings.
	Foreign particles blocking the plug	⇨ Remove foreign particles. ⇨ Contact SAMSON's After-sales Service if components are damaged.
	Seat and plug are worn or leak.	⇨ Contact SAMSON's After-sales Service if components are damaged.
	Control line blocked	⇨ Clean the control line and screw fittings.
	Pressure tapped at the wrong place (regulator with external control line)	⇨ Reconnect the control line at another point. ⇨ Do not connect the control line at pipe bends or necks.
	Regulator or K_{VS}/C_V coefficient too large	⇨ Check the sizing. ⇨ Change K_{VS}/C_V coefficient, if necessary, or install a different sized regulator. ⇨ Contact SAMSON's After-sales Service.
	Compensation chamber in the wrong position or too small (with steam)	⇨ Reconnect compensation chamber at a different place or replace it (see Chapter 15.4).
	Defective operating diaphragm	⇨ Replace damaged diaphragm.
Slow control response	Restriction in the screw joint of the actuator dirty or too small	⇨ Clean screw joint or install larger screw joint.
	Dirt in the control line	⇨ Clean the control line.
Downstream pressure drops below the adjusted set point	Regulator installed against the flow	⇨ Install the regulator so that the direction of flow matches the direction indicated by the arrow on the body.
	Regulator or K_{VS}/C_V coefficient too small	⇨ Check the sizing. ⇨ Change K_{VS}/C_V coefficient, if necessary, or install a different sized regulator. ⇨ Contact SAMSON's After-sales Service.
	Pressure tapped at the wrong place (regulator with external control line)	⇨ Reconnect the control line at another point. ⇨ Do not connect the control line at pipe bends or necks.
	Foreign particles blocking the plug	⇨ Remove foreign particles. ⇨ Contact SAMSON's After-sales Service if components are damaged.
	Compensation chamber in the wrong position or too small (with steam)	⇨ Reconnect compensation chamber at a different place or replace it (see Chapter 15.4).
	Control line blocked	⇨ Clean the control line and screw fittings.
	Strainer blocked	⇨ Clean the strainer.
Downstream pressure hunts	Regulator or K_{VS}/C_V coefficient too large	⇨ Check the sizing. ⇨ Change K_{VS}/C_V coefficient, if necessary, or install a different sized regulator. ⇨ Contact SAMSON's After-sales Service.
	Pressure tapped at the wrong place (regulator with external control line)	⇨ Reconnect the control line at another point. ⇨ Do not connect the control line at pipe bends or necks.
	The restriction in the control line for pressure tapping is too large or missing.	⇨ Install a restriction. ⇨ Install a smaller restriction.

Malfunction	Possible reasons	Recommended action
Jerky control response	Increased friction, e.g. due to foreign particles between seat and plug	⇨ Remove foreign particles. ⇨ Contact SAMSON's After-sales Service if components are damaged.
The set point cannot be adjusted	Liquid column H_k in the control line too high	⇨ Install the control line keeping the liquid column as low as possible. ⇨ Contact SAMSON's After-sales Service.
Loud noises	High flow velocity, cavitation	⇨ Check the sizing. ⇨ Install larger regulator, if necessary. ⇨ Install flow divider with gases and steam.
Leakage at the actuator	Defective operating diaphragm/bellows	⇨ Replace damaged diaphragm/bellows.
Leakage at the bellows seal	Defective bellows seal	⇨ Contact SAMSON's After-sales Service if components are damaged.
Red mark appears at the diaphragm rupture indicator (actuator with two diaphragms)	Defective operating diaphragm	⇨ Replace damaged operating diaphragm.

i *Note*

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

The malfunctions listed in this chapter 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 functioning of Type 41-23 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.

SAMSON recommends removing Type 41-23 from the pipeline before repairing it.

In the event of a product malfunction:

1. Close the shut-off valves upstream and downstream of Type 41-23 to stop the process medium from flowing through it.
2. Perform troubleshooting (see Chapter 8.1).
3. Rectify those malfunctions that can be remedied following the information given in this document. Contact SAMSON's After-sales Service in all other cases.

Putting the device back into operation after a malfunction

⇨ See Chapter 6.

9 Servicing

The regulator does not require much maintenance. Nevertheless, it is subject to natural wear, particularly at the seat, plug and operating diaphragm/bellows. Depending on the operating conditions, check Type 41-23 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 Chapter 8.

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

SAMSON recommends removing Type 41-23 from the pipeline before performing any maintenance or service work.

⚠ WARNING

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

Depending on the process medium, the device 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.*

⚠ WARNING

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

While working on the device, 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 the plant sections affected and from the device.*

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

NOTICE

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

Observe the specified torques when tightening components. Over-torquing leads to parts wearing out more quickly. Under-torquing may cause leakage.

⇨ *Observe the specified tightening torques (see Chapter 15.1).*

NOTICE

Risk of damage due to the use of unsuitable tools.

Certain tools are required to work on the device.

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

NOTICE

Risk of damage due to the use of unsuitable lubricants.

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

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

Note

The device was checked by SAMSON before it left the factory.

- *Certain test results certified by SAMSON lose their validity when Type 41-23 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.*

Tip

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

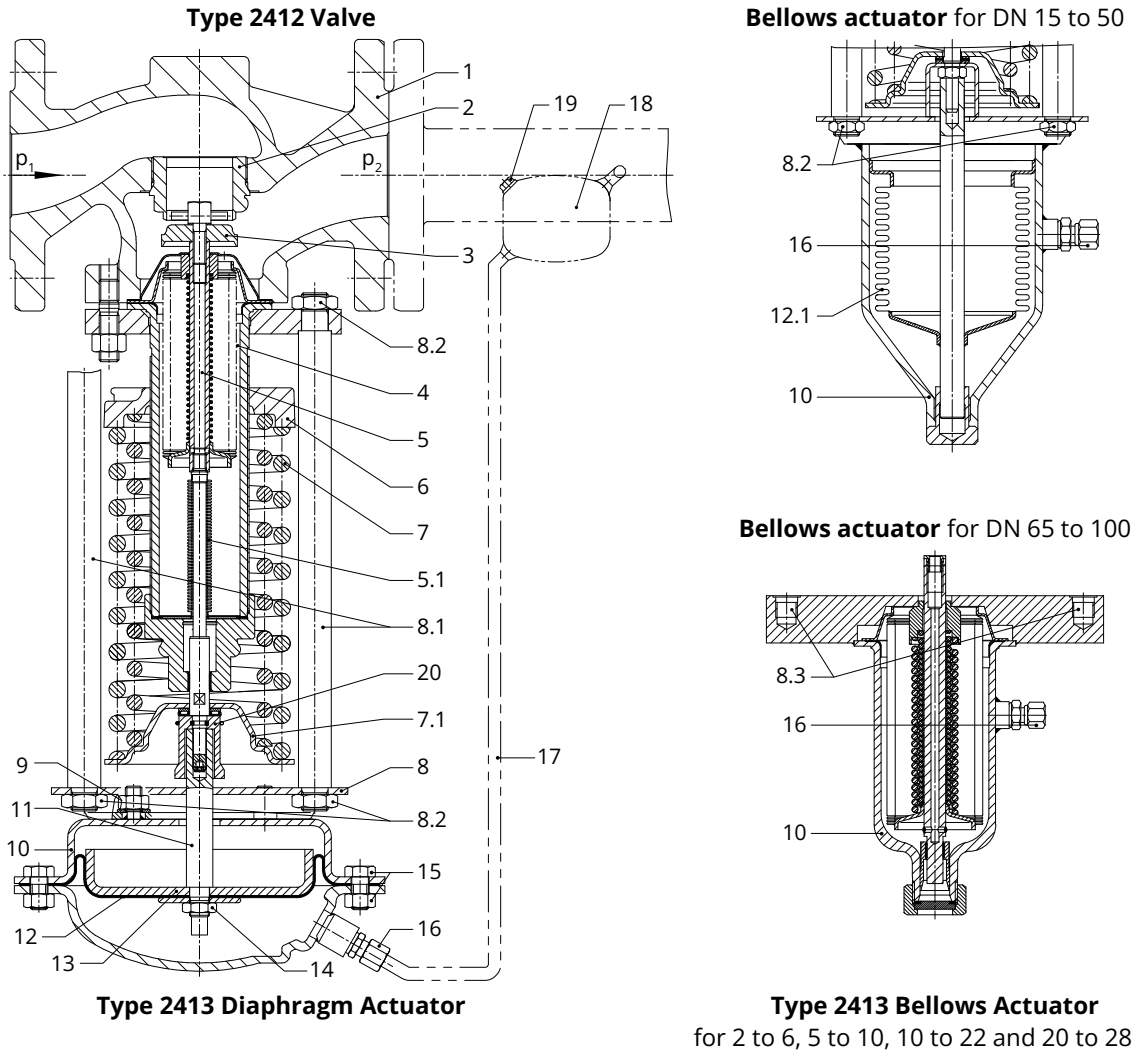


Fig. 13: *Functional diagram for regulators, DN 32 to 100 with balancing bellows*

1 Valve body (Type 2412)
2 Seat (exchangeable)
3 Plug
4 Balancing bellows
5 Plug stem
5.1 Bellows seal
6 Set point adjuster
7 Set point springs
7.1 Spring plate
8 Crossbeam
8.1 Pillar (view drawn turned by 90°)
8.2 Nuts for pillars
8.3 Tapped holes
9 Fastening nuts
10 Actuator housing of Type 2413 · Diaphragm actuator/bellows actuator
11 Actuator stem
12 Operating diaphragm
12.1 Operating bellows
13 Diaphragm plate
14 Diaphragm plate nut
15 Nuts and bolts
16 Control line connection G ¼ (with screw joint with restriction when used with steam)
17 Control line installed on site (control line kit available for tapping the pressure directly at the valve body, ▶ T 2595)
18 Compensation chamber
19 Filler plug
20 Travel stop cap with cotter pin

9.1 Service work preparations

1. Lay out the necessary material and tools to have them ready for the service work.
2. Put the regulator out of operation (see Chapter 8 and Chapter 10).

Tip

SAMSON recommends removing Type 41-23 from the pipeline before performing any service work.

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

- Replace the actuator (see Chapter 9.2.1).
- Replace the set point springs (see Chapter 9.2.2)
- Replace the seat and plug (see Chapter 9.2.3).
- Replace the operating diaphragm (see Chapter 9.2.4).

9.2 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 Chapter 5.4).

9.2.1 Replacing the actuator

See Fig. 13

⚠ WARNING

Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.

Removing the actuator

1. Put the regulator out of operation (see Chapter 10).
2. Unscrew the control line (17).
3. Completely relieve the tension from the set point springs (7) by turning the set point adjuster (6) counterclockwise.
4. Unlock the cotter pin (20) on the travel stop cap.
5. **Diaphragm actuator (DN 15 to 100)**
   Unscrew the nuts (9) from the actuator and remove the actuator.

- **Bellows actuator (DN 15 to 50)**
  Unscrew the nuts (8.2) from the actuator and remove the actuator.
- **Bellows actuator (DN 65 to 100)**
  Unscrew the nuts (8.2) on the pillars (8.1). Unscrew the pillars (8.1) out of the threaded holes (8.3) of the actuator flange and remove the actuator.

Mounting the actuator

1. **Diaphragm actuator (DN 15 to 100)**
   Insert the actuator stem (11) through the hole in the crossbeam (8) into the travel stop cap with cotter pin (20) and fasten the actuator with the nuts (9). Observe the tightening torques specified in Chapter 15.1.

- **Bellows actuator (DN 15 to 50)**
  Insert the actuator stem (11) into the travel stop cap with cotter pin (20). Align actuator on the pillars (8.1) and fasten it with the nuts (8.2). Observe the tightening torques specified in Chapter 15.1.
- **Bellows actuator (DN 65 to 100)**
  Screw the pillars (8.1) into the threaded holes (8.3) of the actuator flange as far as they will go. Insert the actuator stem (11) into the travel stop cap with cotter pin (20). Fasten the pillars (8.1) with the nuts (8.2) onto the valve flange. Observe the tightening torques specified in Chapter 15.1.

2. Lock the cotter pin (20) on the travel stop cap.
3. Screw on the control line (17). Observe the tightening torques specified in Chapter 15.1.
4. Put the regulator into operation (see Chapter 6).

9.2.2 Replacing the set point springs

See Fig. 13

⚠ WARNING

Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.

Removing the set point springs

1. Put the regulator out of operation (see Chapter 10).
2. Unscrew the control line (17).
3. Completely relieve the tension from the set point springs (7) by turning the set point adjuster (6) counterclockwise.
4. Remove the device from the pipeline.
5. Unlock the cotter pin (20) on the travel stop cap.
6. Remove the actuator (10) from the valve (see Chapter 9.2.1).

7. Unscrew the nuts (8.2) on the crossbeam. Remove the crossbeam (8).
8. Remove the travel stop cap with cotter pin (20) and spring plate (7.1).
9. Lift off the set point springs (7).

Mounting the set point spring

10. Place the set point springs (7) on the set point adjuster (6).
11. Place on the spring plate (7.1) and the travel stop cap with cotter pin (20).
    Place the crossbeam (8) on the pillars (8.1) and fasten with the nuts (8.2). Observe the tightening torques specified in Chapter 15.1.
12. Mount the actuator (10) (see Chapter 9.2.1). Observe the tightening torques specified in Chapter 15.1.
13. Lock the cotter pin (20) on the travel stop cap.
14. Install the device into the pipeline.
15. Screw on the control line (17). Observe the tightening torques specified in Chapter 15.1.
16. Put the regulator into operation (see Chapter 6).

Note

Change the nameplate and material number after changing the set point range.

9.2.3 Replacing the seat and plug

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

Further information is available in Chapter 15.6.

9.2.4 Replacing the operating diaphragm

See Fig. 13

WARNING

Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.

NOTICE

Do not exchange the operating diaphragm in an FDA-compliant regulator version.

SAMSON's After-sales Service can support you to perform such service work.

Note

There are no spare parts available for the bellows actuators. The entire actuator must be replaced when it is defective.

Tip

The associated order number is written on the actual operating diaphragm.

Removing the operating diaphragm

1. Put the regulator out of operation (see Chapter 10).
2. Unscrew the control line (17).
3. Completely relieve the tension from the set point springs (7) by turning the set point adjuster (6) counterclockwise.
4. Unscrew the nuts (9) and remove the actuator.
5. Clamp the actuator stem (11) into a suitable fixture. Mark the side of the actuator to avoid reassembling it the wrong way.
6. Unscrew nuts and bolts (15) from the actuator. Remove the actuator case with control line connection (16).
7. Unscrew the diaphragm plate nut (14) and remove the operating diaphragm (12) from the diaphragm plate (13).

Mounting the operating diaphragm

8. Place a new operating diaphragm (12) onto the diaphragm plate (13) (ensuring the pressurized side is facing in the correct direction) and tighten the diaphragm plate nut (14). Observe the tightening torques specified in Chapter 15.1.

9. Place on the actuator case with control line connection (16). Check the correct position of the control line connection nipple (marking made beforehand).
10. Insert nuts and bolts (15) and tighten gradually in a crisscross pattern. Observe the tightening torques specified in Chapter 15.1.
11. Insert the actuator into the travel stop cap with cotter pin (20) and tighten the fastening nuts (9). Observe the tightening torques specified in Chapter 15.1.
12. Screw on the control line (17). Observe the tightening torques specified in Chapter 15.1.
13. Put the regulator into operation (see Chapter 6).

9.3 Mounting the device and putting it back into operation after service work

⇨ Reinstall the regulator into the pipeline (see Chapter 5).

⇨ Put the regulator back into operation (see Chapter 6). Make sure the requirements and conditions for start-up or putting the device back into operation are met.

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

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

Lubricants

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

Tools

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

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.

The pressure reducing valve 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 pressure reducing valve:

- ⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections.*
- ⇨ *Disconnect the external control lines.*
- ⇨ *Wear personal protective equipment.*

⚠ DANGER

Risk of bursting in pressure equipment.

The pressure reducing valve and pipelines are pressure equipment. Excessive pressurization or improper opening can lead to device components bursting.

- ⇨ *Observe the maximum permissible pressure for the pressure reducing valve and plant.*
- ⇨ *If necessary, a suitable overpressure protection must be installed on site in the plant section.*
- ⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections and components affected.*
- ⇨ *To prevent uncontrolled excess pressure, make sure that suitable overpressure protection is installed on site in the plant section.*
- ⇨ *Wear personal protective equipment.*

⚠ WARNING

Crush hazard arising from moving parts.

The regulator contains moving parts (set point springs), which can injure hands or fingers if inserted into the regulator.

- ⇨ *Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.*
- ⇨ *Do not insert hands or fingers between the set point springs while the regulator is in operation.*
- ⇨ *Do not insert hands or fingers between the pillars and set point springs while the regulator is in operation.*
- ⇨ *Do not insert hands or fingers between the spring plate and crossbeam while the regulator is in operation.*
- ⇨ *Before performing any work on the regulator, depressurize the plant. Disconnect or shut off the control line.*

⚠ WARNING

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

Depending on the process medium, the device 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.*

⚠ WARNING

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

While working on the device, 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 the plant sections affected and from the device.*
- ⇨ *Wear protective clothing, safety gloves, respiratory protection and eye protection.*

⚠ WARNING

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

⇨ *Do not unscrew the control line while the regulator is pressurized.*

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

⇨ *Wear goggles when working near the system. Follow the instructions given by the plant operator.*

To put the regulator out of operation for service work or before removing it from the pipeline, 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. Depressurize the plant.
4. Shut off or disconnect any external control line.
5. Allow the pipeline and components to cool down or warm up to ambient temperature, if necessary.
6. Completely drain the pipelines and Type 41-23.

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.

The pressure reducing valve 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 pressure reducing valve:

- ⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections.*
- ⇨ *Disconnect the external control lines.*
- ⇨ *Wear personal protective equipment.*

⚠ DANGER

Risk of bursting in pressure equipment.

The pressure reducing valve and pipelines are pressure equipment. Excessive pressurization or improper opening can lead to device components bursting.

- ⇨ *Observe the maximum permissible pressure for the pressure reducing valve and plant.*
- ⇨ *If necessary, a suitable overpressure protection must be installed on site in the plant section.*
- ⇨ *Before starting any work on the pressure reducing valve, depressurize the plant sections and components affected.*
- ⇨ *To prevent uncontrolled excess pressure, make sure that suitable overpressure protection is installed on site in the plant section.*
- ⇨ *Wear personal protective equipment.*

⚠ WARNING

Crush hazard arising from moving parts.

The regulator contains moving parts (set point springs), which can injure hands or fingers if inserted into the regulator.

- ⇨ *Stored energy in the set point springs can cause components to move in an uncontrolled manner resulting in injury to hands or fingers.*
- ⇨ *Do not insert hands or fingers between the set point springs while the regulator is in operation.*
- ⇨ *Do not insert hands or fingers between the pillars and set point springs while the regulator is in operation.*
- ⇨ *Do not insert hands or fingers between the spring plate and crossbeam while the regulator is in operation.*
- ⇨ *Before performing any work on the regulator, depressurize the plant. Disconnect or shut off the control line.*

⚠ WARNING

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

Depending on the process medium, the device 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.*

⚠ WARNING

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

While working on the device, 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 the plant sections affected and from the device.*
- ⇨ *Wear protective clothing, safety gloves, respiratory protection and eye protection.*

⚠ WARNING

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

⇨ *Do not unscrew the control line while the regulator is pressurized.*

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

⇨ *Wear goggles when working near the system. Follow the instructions given by the plant operator.*

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

– Type 41-23 is put out of operation (see Chapter 10).

11.1 Removing the device from the pipeline

1. Support the regulator to hold it in place when separated from the pipeline (see Chapter 4).
2. Undo any externally mounted control line.
3. Unbolt the flanged joint.
4. Remove the regulator from the pipeline (see Chapter 4).

11.2 Removing the actuator from the valve

See Chapter 9.

12 Repairs

If Type 41-23 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 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 to SAMSON:

1. Put Type 41-23 out of operation (see Chapter 10).
2. Decontaminate Type 41-23. Remove any residual process medium.
3. Fill in the Declaration on Contamination. The declaration form can be downloaded from our website at
   ▶ www.samsongroup.com > Service > After-sales Service
   .
4. Continue as described on our website at
   ▶ www.samsongroup.com > SERVICE > After-sales Service > Returning goods
   .

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 assigned SCIP number, which can be entered into the database on the European Chemicals Agency (ECHA) website to find out more information on the SVHC ▶ https://www.echa.europa.eu/scip-database.

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

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

- EU declaration of conformity in compliance with Pressure Equipment Directive 2014/68/EU for Type 41-23
- EU declaration of conformity in compliance with Machinery Directive 2006/42/EC for Type 41-23
- Declaration of incorporation in compliance with Machinery Directive 2006/42/EC for Type 41-23

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

▶ www.samsongroup.com > Products > Self-operated regulators > 41-23

EU DECLARATION OF CONFORMITY
TRANSLATION

Module A

For the following products, SAMSON hereby declares under its sole responsibility:

Devices	Series	Type	Version
Self-operated Regulators	43	2432	DIN EN, body, CC499K and EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
	43	2436	DIN EN, body, CC499K and EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
	43	2437	DIN EN, body, CC499K and EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
	---	2111	DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 40-50, PN 40, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 300, fluids G2, L2, L1[1)]
Three-way valve	---	2119	DIN EN, body, EN-GJL-250 and 1.0619, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619, DN 50-80, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 40-50, PN 40, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-4, Class 150, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½, Class 300, fluids G2, L2, L1[1)]
Control valve	---	3222	DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, CC499K, DN 32-40, PN 25, all fluids
Three-way valve	---	3226	DIN EN, body, CC499K, DN 50, PN 25, fluids G2, L2[2)]
Three-way valve	---	3260	DIN EN, body, EN-GJL-250, DN 65-200, PN 16, fluids G2, L2[2)]
Globe valve Three-way valve	V2001	3531 3535	DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 32-40, PN 25, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids
Control valve	---	3214	DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1[1)]
			ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids
Self-operated Regulators	42	2423	DIN EN, body, EN-GJL-250 and EN-GJS-400-18-LT, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-418-LT, DN 50-80, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 32-50, PN 16, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 32-40, PN 25, all fluids
			ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids
	42	2422	DIN EN, body, EN-GJL-250 and EN-GJS-400-18-LT, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619, 1.4408 and 1.6220+QT, DN 32-50, PN 16, all fluids
			ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC, A351 CF8M and A352 LCC, NPS 1½-2, Class 150, all fluids
Strainers	1N/1NI	2601	DIN EN, body, CB752S, G 2 (DN50), PN25, fluids G2, L2[2)]
Strainers	2N/2NI	2602	DIN EN, body, EN-GJL-250, DN 200-250, PN 10, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 100-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.4408, DN 32-50, PN 16, all fluids
Self-operated Regulators	---	2373/2375	ANSI, body, A995 4A and A995 5A, NPS 1½-2, Class 150, all fluids
	44	2440 (44-0B) 2441 (44-1B) 2446 (44-6B)	DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
		2442 (44-2) 2443 (44-3) 2444 (44-4) 2447 (44-7) 2449 (44-9)	DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1[1)]

EU DECLARATION OF CONFORMITY
TRANSLATION

Devices	Series	Type	Version
Self-operated Regulators	45	2451 (45-1) 2452 (45-2) 2453 (45-3) 2454 (45-4) 2456 (45-6) 2459 (45-9)	DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1[1)]
	46	2465 (46-5) 2466 (46-6) 2467 (46-7) 2469 (46-9)	DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1[1)]
	47	2471 (47-1) 2474 (47-4) 2475 (47-5) 2479 (47-9)	DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1[1)]
	48	2488 2489	DIN EN, body, EN-GJS-400-18-LT and CC499K, DN 50, PN 25, fluids G2, L2, L1[1)]
	40	2405	DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids
		2406	DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 50, PN 25, fluids G2, L2, L1[1)]
			ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids
	41	2412 2417	DIN EN, body, EN-GJL-250, DN 65-100, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 50-80, PN 25, fluids G2, L2, L1[1)]
			ANSI body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-2, Class 150, all fluids
	42	2421 RS	DIN EN, body, 1.0619, 1.4408, 1.4571 and 1.4401/1.4404, DN 32-50, PN 16, all fluids
			DIN EN, body, 1.0619, 1.4408, 1.4571 and 1.4401/1.4404, DN 32-40, PN 25, all fluids
			ANSI, body, A216 WCC, A351 CF8M and A182 F316/A182 F316L, NPS 1½-2, Class 150, all fluids
	---	2331	DIN EN, body, EN-GJL-250, DN 65-200, PN 16, fluids G2, L2[2)]
			DIN EN, body, EN-GJS-400-18-LT, DN 65-150, PN 16, fluids G2, L2[2)]
			DIN EN, body, EN-GJS-400-18-LT, DN 65-125, PN 25, fluids G2, L2[2)]
			DIN EN, body 1.0619, DN 65-200, PN 16, fluids G2, L2[2)]
			DIN EN, body 1.0619, DN 65-100, PN 40, fluids G2, L2[2)]
	---	2337	DIN EN, body 1.0619, DN 250, PN 25, fluids L1[1)]
			DIN EN, body 1.0619, DN 250, PN 40, fluids L1[1)]
	---	2333 2335	DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 65-80, PN 25, fluids G2, L2, L1[1)]
			ANSI body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
	---	2334	DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 65-80, PN 25, fluids G2, L2, L1[1)]
			ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
	---	2404-1	DIN EN, body, EN-GJL-250, DN 65-125, PN16, fluids G2, L2, L1[1)]
			ANSI body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC und A351 CF8M, NPS 1½-2, Class 150, all fluids
	---	2404-2	DIN EN, body, EN-GJL-250, DN 65-125, PN 16, fluids G2, L2, L1[1)]
			ANSI, body, A126 B, NPS 3-4, Class 125, fluids G2, L2, L1[1)]

[1)] Gases according to Article 4(1)(c.i), second indent
Liquids according to Article 4(1)(c.ii)

[2)] Gases according to Article 4(1)(c.i), second indent
Liquids according to Article 4(1)(c.ii), second indent

EU DECLARATION OF CONFORMITY
TRANSLATION

That the products mentioned above comply with the requirements of the following standards:

Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment	**2014/68/EU**	**of 15. May 2014**
Applied conformity assessment procedure for fluids according to Article 4(1)	**Module A**	

Technical standards applied: DIN EN 12516-2, DIN EN 12516-3, ASME B16.34

Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany

Frankfurt am Main, 05. June 2024

ppa. Norbert Tollas
Senior Vice President
Global Operations

i.V. Peter Scheermesser
Director
Product Maintenance & Engineered Products

EU DECLARATION OF CONFORMITY
TRANSLATION

Module H / N° CE-0062-PED-H-SAM 001-22-DEU-rev-A

For the following products, SAMSON hereby declares under its sole responsibility:

Devices	Series	Type	Version
Three-way valve	---	2119	DIN EN, body, EN-GJL-250 and 1.0619, DN 150, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619, DN 100-150, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 65-150, PN 40, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 6, Class 150, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 2-6, Class 300, fluids G2, L2, L1[1)]
Self-operated Regulators	---	3222	DIN EN, body, CC499K, DN 50, PN 25, all fluids
Three-way valve	---	3260	DIN EN, body, EN-GJL-250, DN 250-300, PN 16, fluids G2, L2[1)]
Globe valve Three-way valve	V2001	3531 3535	DIN EN, body, 1.0619 and 1.4408, DN 50-80, PN 25, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-3, Class 150, all fluids
Control valve	---	3214	DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619, DN 32-400, PN 40, all fluids
			ANSI, body, A126 B, NPS 6-10, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC, NPS 2½-10, Class 150, all fluids
			ANSI, body, A216 WCC, NPS 1½-10, Class 300, all fluids
Self-operated Regulators	42	2423	DIN EN, body, EN-GJL-250, DN 150-250, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 150, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 65-250, PN 16, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 50-250, PN 25, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 32-250, PN 40, all fluids
			ANSI, body, A126 B, NPS 6-10, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-10, Class 150, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-10, Class 300, all fluids
	42	2422	DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 16, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 200-400, PN 25, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 32-400, PN 40, all fluids
			DIN EN, body, 1.0460, DN 40-50, PN 40, all Fluids
			DIN EN, body, 1.6220+QT, DN 65-250, PN 16, all fluids
			DIN EN, body, 1.6220+QT, DN 200-250, PN 25, all fluids
			DIN EN, body, 1.6220+QT, DN 32-250, PN 40, all fluids
			ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351CF8M, NPS 2½-16, Class 150, all fluids
			ANSI, body, A216 WCC and A351CF8M, NPS 1½-16, Class 300, all fluids
			ANSI, body, A105, NPS 1½-2, Class 300, all fluids
			ANSI, body, A352 LCC, NPS 2½-10, Class 150, all fluids
			ANSI, body, A352 LCC, NPS 1½-10, Class 300, all fluids
	42	2421RS	DIN EN, body, 1.0619 and 1.4408, DN 65-150, PN 16, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 50-150, PN 25, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 32-150, PN 40, all fluids
			DIN EN, body, 1.4571 and 1.4401/1.4404, DN 50, PN 25, all fluids
			DIN EN, body, 1.4571 and 1.4401/1.4404, DN 32-50, PN 40, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-6, Class 150, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-6, Class 300, all fluids

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Devices	Series	Type	Version
Self-operated Regulators	40	2405	DIN EN, body, 1.0619, 1.4571, 1.4404, 1.4408, 1.0460, DN 32-50, PN40, all fluids
			ANSI, body, A105, A182 F316L, A351 CF8M, A216 WCC, NPS 1½-2, Class 300, all fluids
		2406	DIN EN, body, EN-GJL-250, DN 150, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 32-150, PN 40, all fluids
			DIN EN, body, 1.0460 and 1.4404, DN 32-50, PN 40, all fluids
			ANSI, body, A126 B, NPS 6, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-6, Class 150, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-6, Class 300, all fluids
			ANSI, body, A105 and A182 F316L, NPS 1½-2, Class 300, all fluids
	41	2412 2417	DIN EN, body, EN-GJS-400-18-LT, DN 100, PN25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 32-100, PN 40, all fluids
			DIN EN, body, 1.0460, 1.4571 and 1.4404, DN 32-80, PN 40, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-4, Class 150, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 1½-4, Class 300, all fluids
			ANSI, body, A105 and A182 F316L, NPS 1½-3, Class 300, all fluids
	---	2404-1	DIN EN, body, EN-GJL-250, DN 150, PN16, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 und 1.4408, DN 32-150, PN 40, all fluids
			ANSI, body, A126 B, NPS 6, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC und A351 CF8M, NPS 2½-6, Class 150, all fluids
			ANSI, body, A216 WCC und A351 CF8M, NPS 1½-6, Class 300, all fluids
	---	2404-2	DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 und 1.4408, DN 65-400, PN 16, all fluids
			DIN EN, body, 1.0619 und 1.4408, DN 65-400, PN 40, all fluids
			ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC und A351 CF8M, NPS 2½-16, Class 150, all fluids
			ANSI, body, A216 WCC und A351 CF8M, NPS 2½-10, Class 300, all fluids
	---	2331	DIN EN, body, EN-GJL-250, DN 250, PN 16, fluids G2, L2[1)]
			DIN EN, body, 1.0619, DN 250, PN 16, fluids G2, L2[1)]
			DIN EN, body, 1.0619, DN 200-250, PN 25, fluids G2, L2[1)]
			DIN EN, body, 1.0619, DN 125-250, PN 40, fluids G2, L2[1)]
	---	2333 2335	DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 16, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 200-400, PN 25, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 40, all fluids
			ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 150, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 300, all fluids
	---	2334	DIN EN, body, EN-GJL-250, DN 150-400, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 150, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 16, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 200-400, PN 25, all fluids
			DIN EN, body, 1.0619 and 1.4408, DN 65-400, PN 40, all fluids
			ANSI, body, A126 B, NPS 6-16, Class 125, fluids G2, L2, L1[1)]
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 150, all fluids
			ANSI, body, A216 WCC and A351 CF8M, NPS 2½-16, Class 300, all fluids
	---	2373 2375	DIN EN, body, 1.4469 and 1.4470, DN 32-50, PN 40, all fluids
			ANSI, body, A995 5A and A995 4A, NPS 1½-2, Class 300, all fluids
Strainers	2N/2NI	2602	DIN EN, body, EN-GJL-250, DN 150-250, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 150, PN 16, fluids G2, L2, L1[1)]
			DIN EN, body, EN-GJS-400-18-LT, DN 100-150, PN 25, fluids G2, L2, L1[1)]
			DIN EN, body, 1.0619, DN 100-250, PN 16, all fluids

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Devices	Series	Type	Version
Strainers	2N/2NI	2602	DIN EN, body, 1.0619, DN 200-250, PN 25, all fluids
			DIN EN, body, 1.0619, DN 32-250, PN 40, all fluids
			DIN EN, body, 1.4408, DN 65-100, PN 16, all fluids
			DIN EN, body, 1.4408, DN 32-100, PN 40, all fluids

[1)] Gases according to Article 4(1)(c.i), second indent
Liquids according to Article 4(1)(c.ii)

That the products mentioned above comply with the requirements of the following standards:

Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment	**2014/68/EU**	**of 15. May 2014**
Applied conformity assessment procedure for fluids according to Article 4(1)	**Module H**	**by Bureau Veritas 0062**

The manufafacturer's quality management system is monitored by the following notified body:
Bureau Veritas Services SAS, 4 place des Saisons, 92400 Courbevoie, France
Technical standards applied: DIN EN 12516-2, DIN EN 12516-3, ASME B16.34

Manufacturer: SAMSON AG, Weismuellerstrasse 3, 60314 Frankfurt am Main, Germany

Frankfurt am Main, 05. June 2024

ppa. Norbert Tollas
Senior Vice President
Global Operations

i.V. Peter Scheermesser
Director
Product Maintenance & Engineered Products

Revision 01

DECLARATION OF INCORPORATION
TRANSLATION

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

For the following product:
Type 2412 Valve

We certify that the Type 2412 Valve is partly completed machinery as defined in the Machinery Directive 2006/42/EC and that the safety requirements stipulated in Annex I, 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4 and 1.3.7 are observed. The relevant technical documentation described in Annex VII, part B has been compiled.

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

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

The permissible limits of application and mounting instructions for the products are specified in the associated mounting and operating instructions; the documents are available in electronic form on the Internet at www.samsongroup.com.

For product descriptions refer to:
- Type 41-23 Universal Pressure Reducing Valve: Mounting and Operating Instructions EB 2512

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, 08 September 2023

i.V.
Stephan Giesen
Director
Product Management

i. V. P.
Peter Scheermesser
Director
Product Maintenance & Engineered Products

Revision no. 01

DECLARATION OF INCORPORATION
TRANSLATION

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

For the following product:
Type 2413 Actuator

We certify that the Type 2413 Actuator is partly completed machinery as defined in the Machinery Directive 2006/42/EC and that the safety requirements stipulated in Annex I, 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.4 and 1.3.7 are observed. The relevant technical documentation described in Annex VII, part B has been compiled.

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

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

The permissible limits of application and mounting instructions for the products are specified in the associated mounting and operating instructions; the documents are available in electronic form on the Internet at www.samsongroup.com.

For product descriptions refer to:
- Type 41-23 Universal Pressure Reducing Valve: Mounting and Operating Instructions EB 2512
- Type 41-73 Universal Excess Pressure Valve: Mounting and Operating Instructions EB 2517

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, 08 September 2023

i.V.

Stephan Giesen
Director
Product Management

i. V. P.

Peter Scheermesser
Director
Product Maintenance & Engineered Products

Revision no. 01

EU DECLARATION OF CONFORMITY
TRANSLATION

Declaration of Conformity of Final Machinery

in accordance with Annex II, section 1.A. of the Directive 2006/42/EC

For the following product:

Type 41-23 Universal Pressure Reducing Valve consisting of Type 2412 Valve and Type 2413 Actuator

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

For product descriptions refer to:

- Type 41-23 Universal Pressure Reducing Valve: Mounting and Operating Instructions EB 2512

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

Comment:
Information on residual risks of the machinery can be found in the mounting and operating instructions of the valve and actuator as well as in 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, 08 September 2023

ppa.

Norbert Tollas
Senior Vice President
Global Operations

i. V. P.

Peter Scheermesser
Director
Product Maintenance & Engineered Products

Revision no. 01

15 Appendix

15.1 Tightening torques

Table 10: *Tightening torques*

Part	Width across flats	Nominal size or Actuator area	Tightening torque in Nm
Set point adjuster (6)	A/F 19	DN 15 to 50	–
	A/F 24	DN 65 to 100	
Nuts for pillars (8.2)	A/F 24	DN 15 to 100	60
Fastening nuts (9)	A/F 16		25
Diaphragm plate nut (14)	A/F 12	40 to 640 cm²	40
Bolts, nuts (15)	–		25
Control line connection (16)			22

15.2 Lubricants

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.

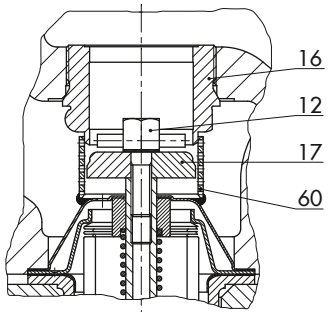
15.4 Accessories

Table 11: *Assignment of compensation chamber (18) to regulator, with item no.*

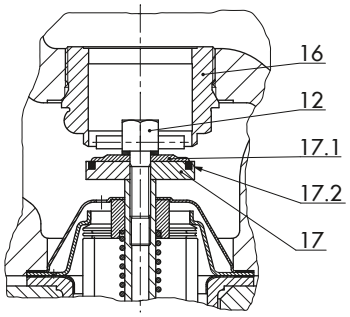
Type 2413 Actuator Actuator area A	Item number # Compensation chamber	
	DN 15 to 50	DN 65 to 100
640 cm²	1190-8789	1190-8790
320 cm²	1190-8788	1190-8789
160, 80, 40 cm²	1190-8788	

15.5 Spare parts

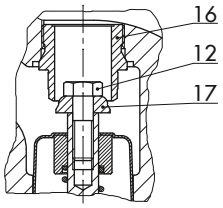
Version (2012 onwards)	
1	Bellows seal
2	Bellows assembly
6	Coupling nut
12	Balancing screw
16	Seat
17	Plug
17.1	Pre-stage of plug
17.2	Seal
20	Body
21	Guide cap
25	Guide (DN 32 to 100)
25, 26	Guide bushing/pipe (DN 15 to 25)
27	Flanged pipe
28	Washer
34	Flange
40	Set point adjuster
42	Retaining washer
44	Pillar
46	Gasket
51	Stud
52	Hex nut
60	Flow divider
70, 71	Spring
73	Travel stop cap with cotter pin
74	Spring plate
75	Gasket
76	Axial needle bearing
77	Lock washer
79	Hex nut
80	Crossbeam
101, 102	Diaphragm case
103	Screw plug
104	Diaphragm stem
105	Diaphragm plate
106	Diaphragm washer
108	Operating diaphragm
111	Hex bolt
112, 113, 114	Hex nut
116	Washer



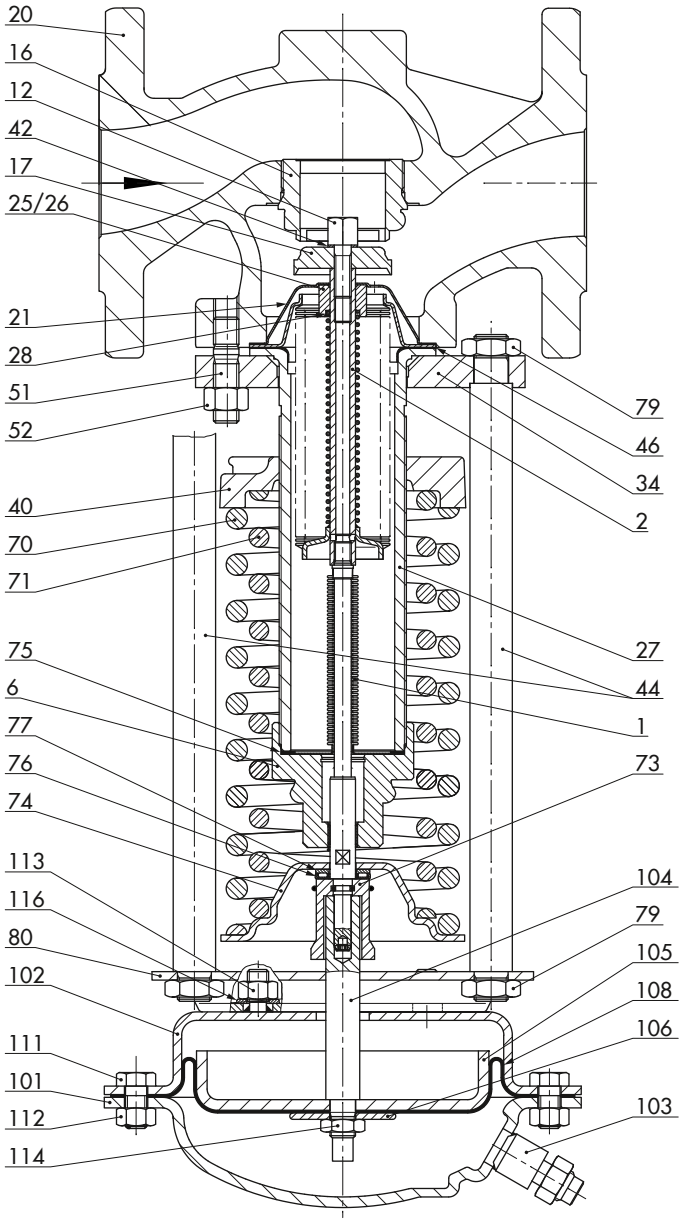
Version with flow divider



Version with soft-seated plug



Standard version (DN 15 to 25)



Standard device

i *Note*

There are no spare parts available for the bellows actuators. The entire actuator must be replaced when it is defective.

15.6 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 on our website (▶ www.samsongroup.com) or in all 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
- Is a strainer installed?
- Installation drawing showing the exact location of the product and all the additionally installed components (shut-off valves, pressure gauge etc.)

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