MOUNTING AND
OPERATING INSTRUCTIONS

EB 3017 EN

Translation of original instructions

Type 42-37 Flow and Differential Pressure Regulator
Type 42-39 Flow and Differential Pressure or Pressure Regulator

Self-operated Regulators

Edition March 2025

Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices.

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

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

The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at ***www.samsongroup.com > 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 42-37 Regulator is a flow and differential pressure regulator.
The SAMSON Type 42-39 Regulator is a flow and differential pressure or pressure regulator. They consist of a Type 2423 Valve and a Type 2427 Actuator (Type 42-37) or a Type 2429 Actuator (Type 42-39). The valve and actuator (except for tested regulators) are delivered separately and must be assembled together according to this document

The self-operated regulators are used to control the flow rate and the differential pressure or pressure in pipelines. Liquids, gases and vapors in district heating systems as well as processing and industrial plants can be controlled by the regulator.
The regulators are designed to operate under exactly defined conditions (e.g. operating pressure, process medium, temperature). Therefore, operators must ensure that the regulators are only used in operating conditions that meet the specifications used for sizing the devices at the ordering stage. In case operators intend to use the regulators in applications or conditions other than those specified, contact SAMSON.

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

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

Reasonably foreseeable misuse

The regulators are not suitable for the following applications:

– Use outside the limits defined during sizing and by the technical data
– Use outside the limits defined by the additional fittings mounted on the regulator

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

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

Qualifications of operating personnel

The regulator must be mounted, started up, serviced and repaired by fully trained and qualified personnel only; the accepted industry codes and practices must be observed. According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible

hazards due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.

Personal protective equipment

SAMSON recommends checking the hazards posed by the process medium being used (e.g. ▶ GESTIS (CLP) hazardous substances database). Depending on the process medium and/or the activity, the protective equipment required includes:

- Protective clothing, safety gloves and eye protection in applications with hot, cold and/or corrosive media
- Wear hearing protection when working near the valve. 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 the regulator 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 (CLP) 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 device. Components of the device 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').

Safety features

The Types 42-37 and 42-39 Regulators do not have any special safety features. When relieved of pressure, the regulators are 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 product defined in the technical data are observed. This also applies to the start-up and shutdown procedures. Start-up and shutdown procedures fall within the scope of the operator's duties and, as such, are not part of these mounting and operating instructions. SAMSON is unable to make any statements about these procedures since the operative details (e.g. differential pressures and temperatures) vary in each individual case and are only known to the operator.

Responsibilities of operating personnel

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

Referenced standards, directives and regulations

The regulators comply with the requirements of the European Pressure Equipment Directive 2014/68/EU and the Machinery Directive 2006/42/EC. Regulators with a CE marking have a declaration of conformity which includes information about the applied conformity assessment procedure. The declaration of conformity is included in the 'Certificates' chapter.

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

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

Referenced documents

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

– Mounting and operating instructions for

e.g.	**Type 2 N or 2 NI Strainer**	▶ EB 1015

– Data sheets for

e.g.	**Accessories · Differential pressure and flow regulators**	▶ T 3095
e.g.	**Type 2 N or 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.

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

➔ Observe the maximum permissible pressure for regulator and plant.

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

➔ Before starting any work on the regulator, depressurize all plant sections affected as well as the regulator.

➔ Drain the process medium from the plant sections affected as well as from the regulator.

➔ Wear personal protective equipment.

1.2 Notes on possible personal injury

⚠ 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.

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

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

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

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

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

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

Risk of personal injury due to loaded springs.

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

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

Risk of hearing loss or deafness due to loud noise.

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

➔ Wear hearing protection when working near the valve. Follow the instructions given by the plant operator.

⚠ WARNING

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

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

➔ Allow components and pipelines to cool down or warm up to the ambient temperature.

➔ Wear protective clothing and safety gloves.

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

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

➔ If possible, drain the process medium from the plant sections affected and from the regulator.

➔ Wear protective clothing, safety gloves and eye protection.

Damage to health relating to the REACH regulation.

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

➔ Information on the safe use of the part affected. ▶ https://www.samsongroup.com/en/about-samson/environment-social-governance/material-compliance/reach-regulation/

Risk of personal injury due to process medium escaping after an operating diaphragm/bellows rupture.

When using the Type 42-39 Regulator as a pressure regulator, residual process medium can escape after a rupture of the operating diaphragm and, depending on its properties, lead to personal injury, e.g. (chemical) burns.

➔ Depressurize plant sections concerned.

➔ Wear protective clothing, safety gloves and eye protection.

⚠ 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 regulator may become covered with dirt or become illegible in some other way. As a result, hazards may go unnoticed and the necessary instructions not followed. There is a risk of personal injury.

➔ Keep all relevant markings and inscriptions on the device in a constantly legible state.

➔ Immediately renew damaged, missing or incorrect nameplates or labels.

1.3 Notes on possible property damage

NOTICE

Risk of regulator damage due to incorrectly attached slings.

➔ Do not attach load-bearing slings to the actuator housing (see section 'Lifting the regulator' in the 'Shipment and on-site transport' chapter).

Risk of regulator damage due to unsuitable medium properties.

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

➔ Only use the process medium specified for sizing the equipment.

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

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

➔ Flush the pipelines before start-up.

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

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

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

NOTICE

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

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

➔ Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).

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

Certain tools are required to work on the regulator.

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

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

➔ Keep the regulator and the tools used free from solvents and grease.

➔ Make sure that only suitable lubricants are used.

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.

Incorrect control due to the formation of ice 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 the 'Installation' chapter).

NOTICE

Risk of damage due to process medium escaping after an operating diaphragm rupture.

When using the Type 42-39 Regulator as a pressure regulator, residual process medium can escape after a rupture of the operating diaphragm and, depending on its properties, lead to device damage or peripheral damage.

➔ When a regulator is fitted with a leakage line connection, discharge any vapors or gases that escape through a leakage line to the atmosphere and in a safe place.

➔ Catch any liquids or gases that escape and may be harmful to the environment in a tank. Dispose of them in accordance with the applicable regulations.

Note

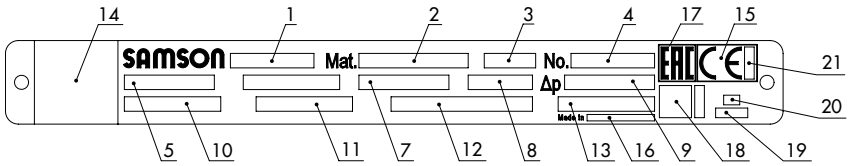
SAMSON's After-sales Service can support you concerning lubricant, tightening torques and tools approved by SAMSON.

2 Markings on the device

Several nameplates are affixed to the device. The nameplates 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 regulator components (see Chapter 2.1).

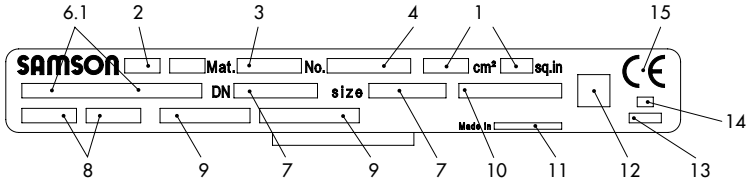
2.1 Nameplates

Nameplate for Type 2423 Valve



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	Type	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
7	Nominal size	13	TÜV registration no.	20	Month of manufacture
		14	DataMatrix code	21	ID of the certification body

Nameplate of Type 2427 and Type 2429 Actuators



1	Actuator area	6.1	Max. perm. pressure at actuator	10	Diaphragm material
2	Actuator model	7	Nominal size	11	Country of origin
3	Material number and device index	8	Differential pressure across the restriction	12	UKCA, if applicable
4	ID number	9	Set point range	13	Year of manufacture
				14	Month of manufacture
				15	CE marking

Fig. 2-1: *Nameplates of regulator parts*

2.2 Location of the nameplates

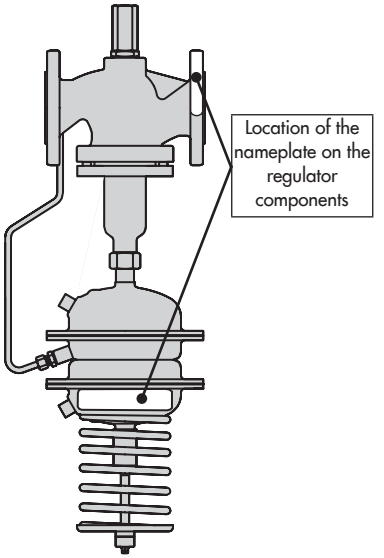


Fig. 2-2: *Sample nameplates of the Type 2423 Valve and the Type 2427 or Type 2429 Diaphragm Actuator*

2.3 Material identification number

2.3.1 Type 2423 Valve

See the nameplate (11 for DIN/ANSI version, body material) for the material used. For more details on the nameplate, see Chapter 2.1.

2.3.2 Type 2427 and Type 2429 Actuators

Specifying the material number, you can contact SAMSON to find out which material is used. It is specified on the nameplate in the 'MNo.' field (3 for DIN/ANSI). For more details on the nameplate, see Chapter 2.1.

3 Design and principle of operation

➔ See Fig. 3-1 to Fig. 3-3

The regulators restrict the flow rate in the pipeline to a set point adjusted at the restriction. The set point for the differential pressure or downstream pressure is adjusted at the diaphragm actuator. The largest signal is always used to control the regulator.
The regulators basically consist of a Type 2423 Valve with seat, plug and restriction as well as a closing actuator (Type 2427 or Type 2429) with an operating diaphragm. Valve and actuator are delivered separately and must be assembled on site using a coupling nut.

The medium flows through the valve in the direction indicated by the arrow. The areas released by the restriction (1.1) and the plug (3) determine the flow rate and the differential pressure Δp across the plant.

In balanced valves, the forces acting on the plug created by the upstream and downstream pressures are balanced by a balancing bellows (5) or balancing diaphragm (5.1, balanced by a diaphragm, DN 65 to 250).

Regulators balanced by a bellows or a diaphragm only differ in the pressure balancing principle applied. Valves balanced by a diaphragm have a balancing diaphragm (5.1) instead of the balancing bellows (5). The downstream pressure p2 acts on the bottom of the diaphragm and the upstream pressure p1 on the top of the diaphragm. In both cases, the forces created by the upstream and downstream pressures that act on the plug are balanced out.

Type 42-37: The high pressure of Δp acts on the bottom diaphragm chamber D over the control line (18). The high pressure of the flow rate upstream of the restriction (1.1) is transferred over the control line (19) to the middle diaphragm chamber B and C. It is the same as the low pressure of Δp. The low pressure of $\dot{V}$ downstream of the restriction is transferred over holes in the plug and diaphragm stems to the top diaphragm chamber A.

For example, if the differential pressure rises, the resulting positioning force at the bottom operating diaphragm (13.2) rises as well. The diaphragm stems (12.1 and 12.2) push the plug stem with plug in the closing direction until the flow rate reaches the set point adjusted at the set point spring (16).

If the flow rate increases, the differential pressure at the restriction (1.1) and the resulting positioning force at the top operating diaphragm (13.1) increase. The top diaphragm stem (12.1) pushes the plug stem with plug in the closing direction until the flow rate reaches the adjusted flow set point. The largest signal is always used to move the plug.

An overload protection (force limiter with internal excess pressure limiter) (15) protects the seat (2), plug (3) and plant from overload during exceptional operating conditions.

Type 42-39: The principle of operation is almost the same as for Type 42-37. However, in the Type 2429 Actuator, the high pressure

of the flow rate is separate from the low pressure of the differential pressure Δp. The diaphragm chambers have their own control line connections.

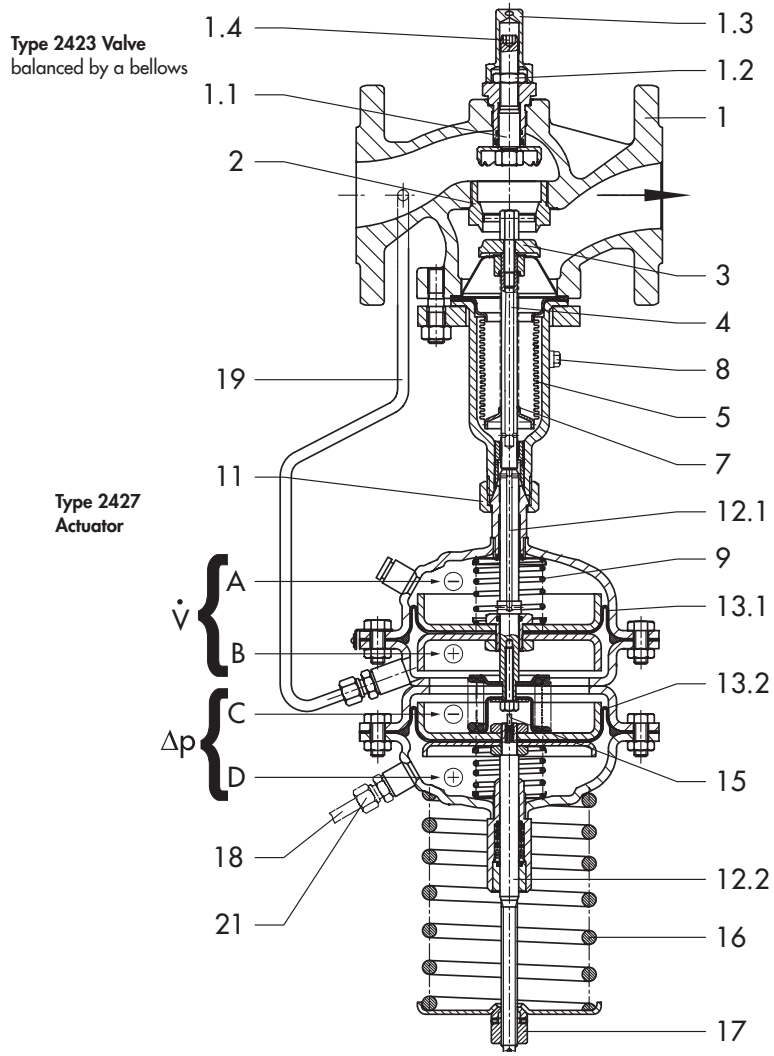


Fig. 3-1: *Functional diagram of Type 42-37 Regulator, DN 15 to 250 with balancing bellows*

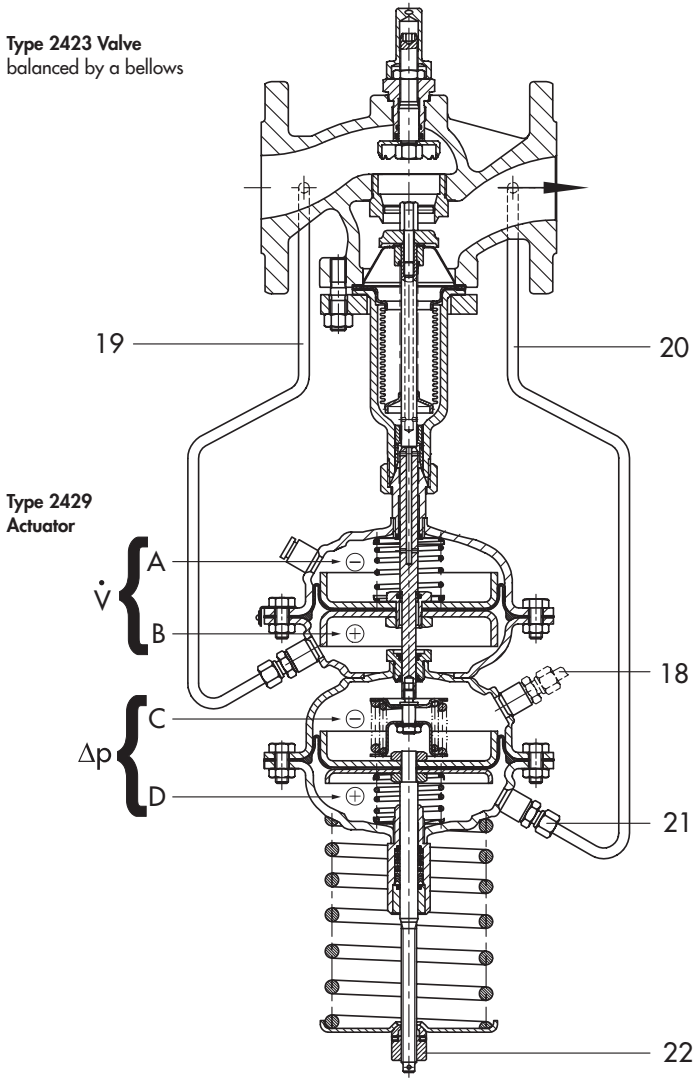


Fig. 3-2: *Functional diagram of Type 42-39 Regulator, DN 15 to 250 with balancing bellows*

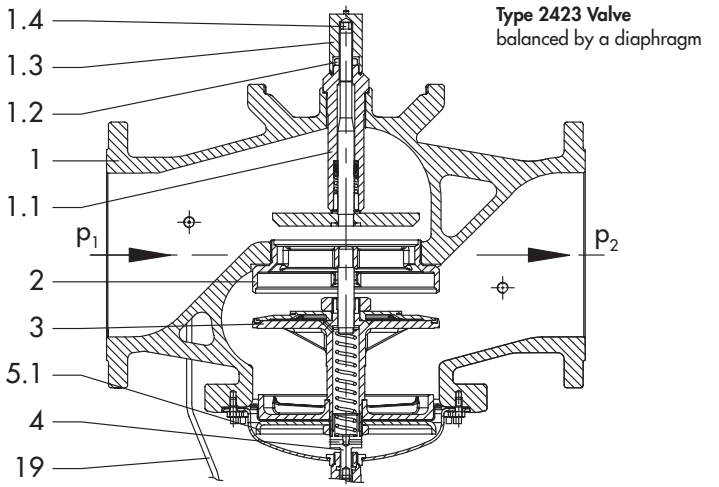


Fig. 3-3: *Functional diagram of Type 2423 Valve, DN 65 to 250 with balancing diaphragm*

Legend for Fig. 3-1 to Fig. 3-3

1	Valve body
1.1	Restriction
1.2	Lock nut
1.3	Cap
1.4	Set point adjuster for flow rate
2	Seat
3	Plug
4	Plug stem
5	Balancing bellows
5.1	Balancing diaphragm
7	Spring
8	Vent plug (DN 125 and larger)
9	Differential pressure spring
11	Coupling nut
12.1	Top diaphragm stem
12.2	Bottom diaphragm stem
13.1	Top operating diaphragm
13.2	Bottom operating diaphragm
15	Overload protection
16	Set point spring
17	Set point adjuster (differential pressure)
18	Control line (to be provided on site)
19	Control line (+) $\forall$
20	Control line (+) Δp
21	Restriction to dampen signal
22	Set point adjuster (pressure)

3.1 Additional fittings

➔ See Fig. 3-4

Pressure gauges

Install a pressure gauge (3 and 6) at suitable points to monitor the pressures prevailing in the plant.

Bypass and shut-off valves

We recommend installing a shut-off valve (1 and 9) both upstream of the strainer and downstream of the regulator to ensure that the entire plant does not need to be shut down for service or repair work. An optional bypass (7) can be used to achieve the maximum flow rate during regulator start-up when adjusting the flow set point.

Strainers

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

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

➔ Select a strainer (mesh size) suitable for the process medium.

i Note

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

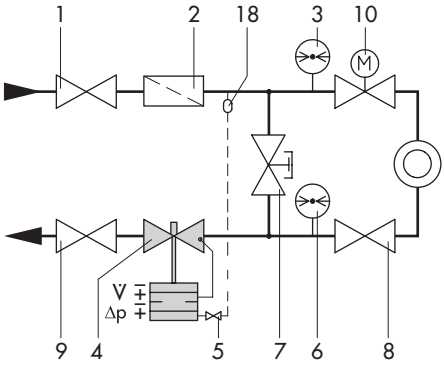
Insulation

Regulators can be insulated to reduce heat energy transfer.
Refer to the instructions in the 'Installation' chapter.

i Note

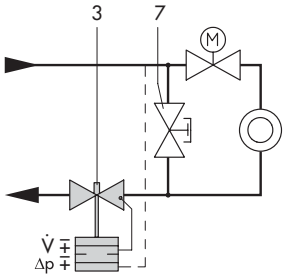
The Type 42-37 and Type 42-39 Regulators are not safety valves. If necessary, a suitable overpressure protection must be installed on site in the plant section.

Sample application (Type 42-37):

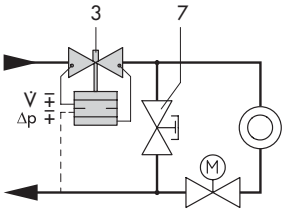


1	Shut-off valve
2	Strainer
3	Pressure gauge
4	Flow and differential pressure or pressure regulator
5	Needle valve
6	Pressure gauge
7	Bypass with capped valve (recommended)
8	Shut-off valve
9	Shut-off valve
10	Motorized valve
18	Compensation chamber (optional)

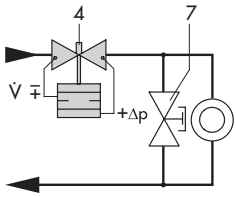
Type 42-37 in the return pipe
Differential pressure and flow control:



Type 42-39 in the flow pipe
Differential pressure and flow control:



Type 42-39 in the flow pipe
Flow rate and pressure control:



The minimum required plant differential pressure Δp_{min} across the valve is calculated as follows:

$$\Delta p_{min} = \Delta p_{restriction} + \left(\frac{\dot{V}}{K_{VS}} \right)^2$$

Δp_{min}	Minimum differential pressure across the valve in bar
$\Delta p_{restriction}$	Differential pressure created at the restriction for measuring the flow rate in the regulator
$\dot{V}$	Adjusted flow rate in m³/h
K_{VS}	Valve flow coefficient in m³/h

Fig. 3-4: *Installation example: Type 42-37 and Type 42-39 installed in the flow or return pipe*

3.2 Technical data

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

i ***Note***

More information is available in Data Sheet ▶ T 3017.

Conformity

The Types 42-37 and 42-39 Regulators bear the CE mark of conformity.

CE

Process medium and scope of application

The Type 42-37 and Type 42-39 Flow and Differential Pressure or Pressure Regulators are designed to maintain the flow rate and differential pressure or pressure in a plant to an adjusted set point.
The Type 42-37 Regulator can be used in district heating systems. The Type 42-39 Regulator can be used in district heating systems as well as industrial applications.

- Suitable for **liquids,** max. temperature **150 °C · 220 °C** [1)]
- Suitable for **vapors,** max. temperature **220 °C** [2)]
- Suitable for **gases,** max. temperature **80 °C**
- Differential pressure or pressure set points from **0.1 to 10 bar**
- Flow rate set points from **0.05 to 520 m³/h**
- Nominal size **DN 15 to 250**
- Pressure ratings from **PN 16 to 40**

The regulator is open when relieved of pressure. The valve **closes** when the differential pressure/pressure or flow rate **rises**.

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.

Temperature range

Depending on how the regulator is configured and the process medium used, it can be used up to temperatures of 220 °C (see Table 3-1). The minimum temperature is limited by the accessories used and the actuator's diaphragm material (▶ T 3017).

Noise emissions

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

Dimensions and weights

Table 3-4 and Table 3-5 provide an overview of the dimensions and weights. The lengths and heights in the dimensional drawings are shown on page 3-13.

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1) With compensation chamber
2) Type 42-39 only with compensation chamber

Table 3-1: *Technical data · Types 42-37 and 42-39 · All pressures in bar (gauge)*

Type 2423 Valve · Balanced by a bellows		
Nominal size		**DN 15 to 250**
Pressure rating		PN 16, 25 or 40
Pressure at which internal excess pressure limiter responds (Type 42-37 only)	for 160 cm²	1.2 bar
	for 320 cm²	0.6 bar
Max. permissible temperature	Valve body	See pressure-temperature diagram in ▶ T 3000
	Actuator [1]	With compensation chamber: liquids up to 220 °C · Without compensation chamber: 150 °C
Differential pressure or pressure set point ranges		0.1 to 0.6 bar · 0.2 to 1 bar · 0.5 to 1.5 bar · 1 to 2.5 bar 2 to 5 bar [2] · 4.5 to 10 bar [2]
Leakage class according to IEC 60534-4		≤0.05 % of K_{VS} coefficient
Conformity		CE
Type 2423 Valve · Balanced by a diaphragm		
Nominal size		**DN 65 to 250**
Pressure rating		PN 16, 25 or 40
Pressure at which internal excess pressure limiter responds (Type 42-37 only)	for 160 cm²	1.2 bar
	for 320 cm²	0.6 bar
	for 640 cm²	0.3 bar
Max. permissible temperature	Valve body	150 °C
	Actuator [1]	Liquids 150 °C
Differential pressure or pressure set point ranges		0.1 to 0.6 bar · 0.2 to 1 bar · 0.5 to 1.5 bar · 1 to 2.5 bar · 2 to 5 bar [2]
Leakage class according to IEC 60534-4		≤0.05 % of K_{VS} coefficient
Conformity		CE

[1] Higher temperatures on request
[2] On request

Table 3-2: *K_{VS} coefficients, x_{FZ} values, flow rate set point ranges for water and max. permissible differential pressures Δp*

Type 2423 Valve balanced by a bellows													
Nominal size DN	**15**	**20**	**25**	**32**	**40**	**50**	**65**	**80**	**100**	**125**	**150**	**200**	**250**
Valve travel	10 mm						16 mm			22 mm			
K_{VS} coefficient	4	6.3	8	16	20	32	50	80	125	190	280	420	500
x_{FZ} value	0.65	0.6	0.55		0.45	0.4		0.35				0.3	
Flow rate set point ranges for water in m³/h													
Diff. pressure across restriction $\Delta p_{restriction}$ 0.2 bar	0.05 to 2	0.15 to 3	0.25 to 3.5	0.4 to 7	0.6 to 11	0.9 to 16	2 to 28	3.5 to 35 [1]	6.5 to 63	11 to 80	18 to 120	20 to 180	26 to 220
Diff. pressure across restriction $\Delta p_{restriction}$ 0.5 bar	0.15 to 3	0.25 to 4.5	0.4 to 5.3	0.6 to 9.5	0.9 to 16	2 to 24	3.5 to 40	6.5 to 55	11 to 90	18 to 120	20 to 180	26 to 260	30 to 300
Max. perm. differential pressure Δp	25 bar						20 bar		16 bar		12 bar	10 bar	

Type 2423 Valve balanced by a diaphragm							
Nominal size DN	**65**	**80**	**100**	**125**	**150**	**200**	**250**
K_{VS} coefficient	50	80	125	250	380	650	800
x_{FZ} value	0.4	0.35				0.3	
Flow rate set point ranges for water in m³/h							
Diff. pressure across restriction $\Delta p_{restriction}$ 0.2 bar	2 to 28	3.5 to 35 [1]	6.5 to 63	11 to 120	18 to 180	20 to 320	26 to 350
Diff. pressure across restriction $\Delta p_{restriction}$ 0.5 bar	3.5 to 40	6.5 to 55	11 to 90	18 to 180	20 to 260	26 to 450	30 to 520
Max. perm. differential pressure Δp	12 bar		10 bar	12 bar		10 bar	

[1] 7 to 35 m³/h (160 cm² actuator), 7 to 40 m³/h (320 cm² actuator)

Table 3-3: *Materials · Material numbers according to DIN EN*

Type 2423 Valve · Balanced by a bellows						
Pressure rating		**PN 16**	**PN 25**	**PN 16, 25 and 40**		
Valve body		Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400-18-LT	Cast steel 1.0619	Cast stainless steel 1.4408	Forged stainless steel 1.4404 [1]
Seat		1.4104, 1.4006			1.4404	
Plug	Up to DN 100	1.4104, 1.4006			1.4404	
	DN 125 to 250	1.4301, 1.4404 with PTFE seal				
Plug stem		1.4301				
Metal bellows		1.4571 · DN 125 and larger: 1.4404				
Bottom section		P265GH			1.4571	
Body gasket		Graphite on metal core				
Type 2423 Valve · Balanced by a diaphragm						
Pressure rating		**PN 16**	**PN 25**	**PN 16, 25 and 40**		
Valve body		Cast iron EN-GJL-250	Spheroidal graphite iron EN-GJS-400-18-LT	Cast steel 1.0619	Cast stainless steel 1.4408	–
Valve seat		Red brass [3] [4]				
Plug (standard version)		Red brass [3] [5] · With EPDM soft seal, max. 150 °C or with PTFE soft seal, max. 150 °C				
Pressure balancing		Balancing cases made of sheet steel DD11 · EPDM balancing diaphragm, max. 150 °C or FKM, version with two balancing diaphragms				
Type 2427 and Type 2429 Actuators						
Diaphragm cases		1.0332			1.4301	
Diaphragm		EPDM with fabric reinforcement · Special version for mineral oils: FKM				
Guide bushing		DU bushing			PTFE	
Seals		EPDM/PTFE [2]				

1) DN 15, 25, 40 and 50 only
2) Special version for mineral oils: FKM
3) Special version 1.4409
4) DN 65 to 100: 1.4006
5) DN 65 to 80: 1.4104, DN 100: 1.4006, with metal seal

Table 3-4: *Dimensions in mm and weights · Type 2423 Valve* **balanced by a bellows**

Nominal size DN		15	20	25	32	40	50	65	80	100	125	150	200	250
Length L		130	150	160	180	200	230	290	310	350	400	480	600	730
Height H1		225						300		355	460	590	730	
Height H2 [1]	Forged steel	113	–	130	–	170	176	–						
	Other materials	115			150			175	180	200	250	280	400	
Set point ranges [3]														
0.1 to 0.6 bar	Height H [1] [5]	675						770		825	–			
	Actuator	ØD = 225 mm, A = 160 cm²						ØD = 285 mm, A = 320 cm²			–			
	Weight [2], approx. kg	20.5	21	22	28.5	29	31.5	56	61	71	–			
0.2 to 1 bar	Height H [1] [5]	675						770		825	1130	1160	1240	
	Actuator	(ØD = 225 mm, A = 160 cm²) [4]									ØD = 285 mm, A = 320 cm²			
	Weight [2], approx. kg	20.5	21	22	28.5	29	31.5	45	50	63	130	180	420	480
0.5 to 1.5 bar	Height H [1] [5]	705						780		835	1130	1160	1240	
	Actuator	(ØD = 225 mm, A = 160 cm²) [4]									ØD = 285 mm, A = 320 cm²			
	Weight [2], approx. kg	20.5	21	22	28.5	29	31.5	45	50	63	135	185	425	485
1 to 2.5 bar	Height H [1] [5]	705						780		835	1130	1160	1240	
	Actuator	ØD = 225 mm, A = 160 cm²									ØD = 285 mm, A = 320 cm²			
	Weight [2], approx. kg	20.5	21	22	28.5	29	31.5	45	50	63	135	185	425	485
2 to 5 bar	Height H [1] [5]	615						690		745	–			
	Actuator	ØD = 225 mm, A = 160 cm²									–			
	Weight [2], approx. kg	20.5	21	22	28.5	29	31.5	45	50	63	–			

1) Type 42-39: add 50 mm to total height H.
2) The weight applies to the version with the material specifications EN-GJL-250/PN 16 (GG-25). Add +10 % for spheroidal graphite iron EN-GJS-400-18-LT/PN 25, cast steel 1.0619/PN 40 and 1.4404/1.4408.
3) Δp = 4.5 to 10 bar on request
4) Optionally with 320 cm² actuator (DN 65 to 100). For regulators with double adapter Do2 (▶ T 3019) for DN 65 to 100, actuator 320 cm² recommended.
5) Minimum clearance required to remove the actuator: +100 mm

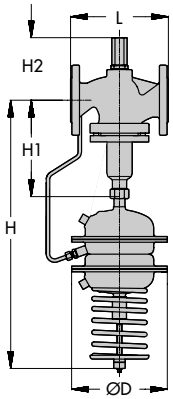
Table 3-5: *Dimensions in mm and weights · Type 2423* **Valve balanced by a diaphragm**

Nominal size **DN**	**65**	**80**	**100**	**125**	**150**	**200**	**250**
Length L	290	310	350	400	480	600	730
Height H [2]	660		685	910	935	1020	
Height H2	195		220	295	325	345	375
Weight for PN 16 [1] in kg (approx.)							
Type 2423 Valve	34	39	49	65	85	248	268
Type 2427 Actuator	16			27		35	

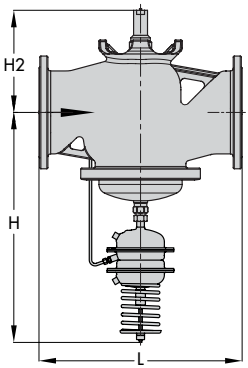
[1] PN 25/40: +10 %
[2] Minimum clearance required to remove the actuator: +100 mm

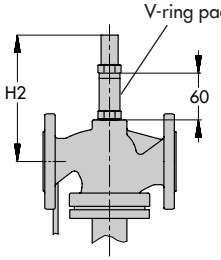
Dimensional drawings

Type 2423 Valve balanced by a bellows



Type 2423 Valve, balanced by a diaphragm





For the version with a V-ring packing (e.g. for steam) in DN 15 to 100, add 60 mm to the specified dimension for H2.

Fig. 3-5: *Dimensions of Type 42-37 and Type 42-39*

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

4.2 Removing the packaging from the regulator

The components (valve, actuator and, if applicable, control line) of the regulator are delivered separately. A tested regulator is delivered as an assembled unit.

Proceed as follows to lift and install the valve:

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

➔ Leave the regulator components in its transport container or on the pallet to transport it on site.

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

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

4.3 Transporting and lifting the regulator

⚠ DANGER

Danger due to suspended loads falling.

➔ *Stay clear of suspended or moving loads.*

➔ *Close off and secure the transport paths.*

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

➔ *Observe the guideline weight for manual handling: 15 to max. 55 kg taking into account age, gender and physical fitness.*

➔ *When the actuator is filled with medium, take the weight of the medium also into account.*

➔ *Refer to the 'Design and principle of operation' chapter for the weights of the regulator and actuator.*

⚠ WARNING

Risk of personal injury due to the regulator tipping.

➔ *Observe the regulator's center of gravity.*

➔ *Secure the regulator against tipping over or turning.*

⚠ 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 the 'Design and principle of operation' chapter for the weights.*

Tip

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

4.3.1 Transporting the regulator

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

➔ Leave the regulator in its transport container or on the pallet to transport it.

➔ Observe the transport instructions.

Transport instructions

➔ Protect the regulator against external influences (e.g. impact).

➔ Protect the regulator against moisture and dirt.

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

➔ Protect the piping and any mounted valve accessories against damage.

➔ The permissible ambient temperature of standard regulators is –20 to +80 °C.

4.3.2 Lifting the regulator

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

Lifting instructions

➔ Use a hook with safety latch to secure the slings from slipping off the hook during lifting and transporting (see Fig. 4-1).

➔ Secure slings against slipping.

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

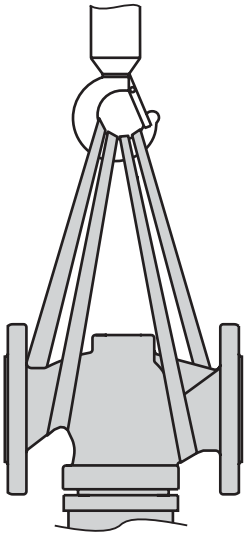


Fig. 4-1: *Schematic drawing of lifting points on the regulator*

4.4 Storing the regulator

NOTICE

Risk of regulator 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 the regulator and the prevailing storage conditions during long storage periods.

Storage instructions

➔ Protect the regulator against external influences (e.g. impact).

➔ Secure the regulator in the stored position against slipping or tipping over.

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

➔ Protect the regulator against moisture and dirt. Store it at a relative humidity of less than 75 %. In damp spaces, prevent condensation. If necessary, use a drying agent or heating.

➔ Make sure that the ambient air is free of acids or other corrosive media.

➔ The permissible storage temperature of standard regulators is –20 to +65 °C.

➔ Do not place any objects on the regulator.

Special storage instructions for elastomers

Elastomer, e.g. operating diaphragm

➔ To keep elastomers in shape and to prevent cracking, do not bend them or hang them up.

➔ Store elastomers away from lubricants, chemicals, solutions and fuels.

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

Tip

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

5 Installation

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

5.1 Installation conditions

Work position

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

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

Pipeline routing

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

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

➔ Observe the inlet and outlet lengths (see Table 5-1). Contact SAMSON if the regulator conditions or state of the process medium are different from those specified.

➔ Install the regulator free of stress and with the least amount of vibrations as possible. Read sections "Mounting position" and "Support or 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 regulator 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:

➔ Standard mounting position: install the actuator housing suspended downward in horizontal pipelines (see Fig. 5-1).

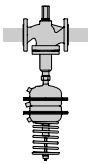
➔ Make sure the direction of flow matches the direction indicated by the arrow on the body.

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

NOTICE

Damage due to freezing.

Protect the regulator from icing up when controlling media that can freeze. Unless the regulator is installed in locations where no frost occurs, remove the regulator from the pipeline when the plant is shut down.

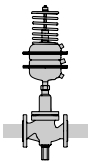


Standard mounting position, suspended

Balanced by a bellows or diaphragm
All versions
– Air and gases up to 80 °C
– Liquids up to 150 °C

Balanced by a bellows
– All media above 80 °C
– Steam applications

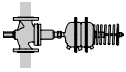
Alternative mounting position, actuator on top



Balanced by a diaphragm · DN 65 to 80
– Air and gases up to 80 °C
– Liquids up to 120 °C

Balanced by a bellows · DN 15 to 80
All versions plus:
– Air and gases up to 80 °C
– Liquids up to 120 °C

Alternative mounting position in riser pipes · Balanced by a bellows



Version with fixed plug guide plus:
– Air and gases up to 80 °C
– Liquids up to 120 °C

Fig. 5-1: *Mounting position*

Support or suspension

i ***Note***

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

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

! ***NOTICE***

Risk of regulator damage due to incorrect support.

➔ *Do not attach supports to the valve, to moving parts on the actuator or to the control lines.*

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

Control line

– Control line (Type 42-37)

Attach the supplied low-pressure control line to the regulator (see the 'Design and principle of operation' chapter).

Route the high-pressure control line with 8 mm (standard), 10 mm or 12 mm pipe diameter at the site of installation from the bottom diaphragm chamber to the high-pressure line (flow pipe) of the plant.

– Control line (Type 42-39)

Mount the control lines (supplied with the regulator) to the regulator (see the 'Design and principle of operation' chapter).
When used as a differential pressure and flow regulator, additionally route a control line on site from diaphragm chamber C to the low-pressure line (return pipe) of the plant. When used as a pressure and flow regulator, the connection of the diaphragm chamber C remains open.

– Control lines to be installed on site (Type 42-37 and Type 42-39)

Route the control line on site preferably using a 8x1 mm (stainless) steel pipe.

The control line for tapping pressure from the pipeline (for Type 42-37) must be installed upstream of the consumer. The pressure tapping point must at least three times the nominal size (DN) away from any pipe fittings (e.g. restrictions, bends or branches), that may cause turbulence in the flow (see Fig. 5-2). How the lines are routed generally depends on the installation site.
The same conditions apply to routing the control line of Type 42-39 on site (connection downstream of the consumer).

➔ Preferably connect the control line to the side of the main pipe (see Fig. 5-3).

➔ Do not change the pipe diameter of the main pipeline with an eccentric reducer.

Control line kit

Ready-made control line kits for direct pressure tapping at the valve body are optionally available from SAMSON. They are optimized to handle the pressure and flow conditions in the valve and are available as accessories from SAMSON (▶ T 3095).

Compensation chamber

A compensation chamber (18) is required for liquids above 150 °C as well as for steam. Install the compensation chamber at the highest point of the pipeline. 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.
Before start-up, fill the compensation chamber with the process medium. This prevents hot medium coming into direct contact with the diaphragm (see Fig. 5-2).

Installation near the pressure tapping point in the flow pipe or at the same height as the valve with the control line reaching at least from the mid-axis of the pipeline (valve) to the actuator. This allows the hot medium to cool down sufficiently (see Fig. 5-2).

Depending on the conditions, install the compensation chamber in the the hot control line.

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

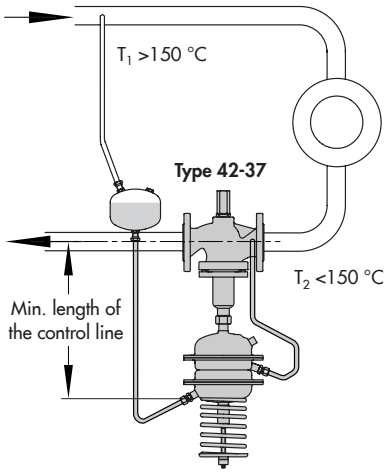
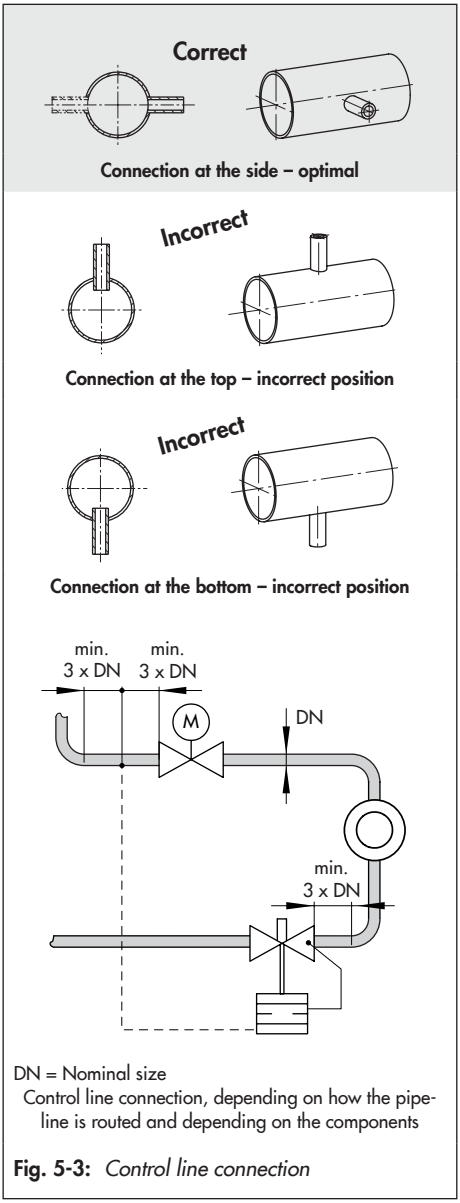


Fig. 5-2: *Type 42-37 with compensation chamber*



DN = Nominal size
Control line connection, depending on how the pipeline is routed and depending on the components

Fig. 5-3: *Control line connection*

Needle valve

If the regulator tends to hunt, we recommend installing a needle valve in the control line in addition to the standard SAMSON screw joint with restriction.

Tip

Needle valves, compensation chambers and compression-type screw fittings can be supplied as required. These accessories are listed in ▶ T 3095.

5.2 Preparation for installation

The valve and actuator of regulators that have not yet been assembled or have been tested beforehand 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:

- The valve is clean.
- The valve, actuator and all piping are not damaged.
- Install a strainer upstream of the regulator.
- The valve data on the nameplate (type designation, nominal size, material, pressure rating and temperature range) match the plant conditions (nominal size and pressure rating of the pipeline, medium temperature etc.). See the 'Mark-

ings on the device' chapter for nameplate details.

– The requested or required additional fittings have been installed or prepared as necessary before installing the valve (see the 'Design and principle of operation' chapter).

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, dry the pipelines. Moisture will damage the inside of the regulator.

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

5.3 Installation

Tested SAMSON regulators are delivered as an assembled unit. In all other cases, the separate components (valve, actuator, control line and accessories) of the regulator are delivered separately. Upon delivery, the separate components must be assembled together. The activities listed below are necessary for installation and before start-up of the regulator.

⚠ DANGER

Danger due to suspended loads falling.

➔ *Stay clear of suspended or moving loads.*

➔ *Close off and secure the transport paths.*

⚠ WARNING

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

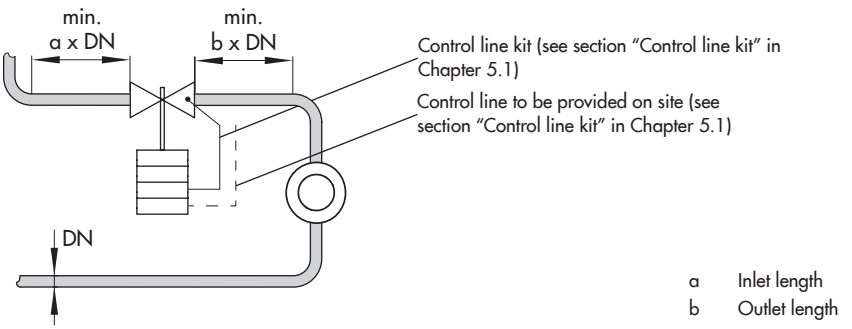
Lifting the regulator without the use of lifting equipment may lead to injuries (back injuries in particular) depending on the weight of the regulator and/or actuator.

➔ *Observe the guideline weight for manual handling: 15 to max. 55 kg per person taking into account age, gender and physical fitness.*

➔ *When the actuator is filled with medium, take the weight of the medium also into account.*

➔ *Refer to the 'Design and principle of operation' chapter for the weights of the regulator and actuator.*

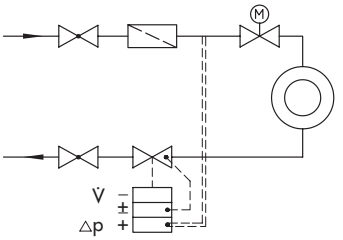
Table 5-1: *Inlet and outlet lengths*



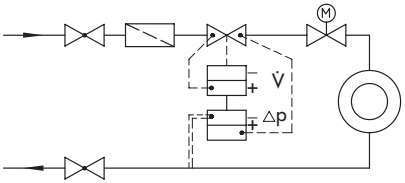
State of process medium	Valve conditions	Inlet length a	Outlet length b
Gas	Ma ≤ 0.3	2	4
Vapors [1]	Ma ≤ 0.3	2	4
Liquid	Free of cavitation/w < 3 m/s	2	4
	Cavitation producing noise/w ≤ 3 m/s	2	4

[1] No wet steam

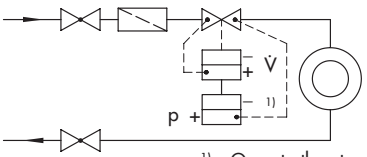
Flow rate and differential pressure control with Type 42-37:



Flow rate and differential pressure control with Type 42-39:



Flow rate and pressure control with Type 42-39:



1) Open to the atmosphere

Fig. 5-4: *Sample applications for Type 42-37 and Type 42-39 Flow and Differential Pressure or Pressure Regulator*

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

⚠ 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 the 'Design and principle of operation' chapter for the weights.*

⚠ WARNING

Risk of personal injury due to the regulator tipping.

➔ *Observe the regulator's center of gravity.*

➔ *Secure the regulator against tipping over or turning.*

NOTICE

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

➔ *Only use tools approved by SAMSON (see the 'Tools' chapter in the Appendix).*

NOTICE

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

➔ *Only use lubricants approved by SAMSON (see the 'Lubricants' chapter in the Appendix).*

NOTICE

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

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

➔ *Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).*

5.3.1 Installing the regulator

Note

Before installing the regulator, tighten the blanking plug(s) at the side of the valve body using a suitable box wrench (see 'Tightening torques' in the Annex).

The regulator can be installed into the downstream pressure pipe (return pipe) or the upstream pressure pipe (flow pipe) of the plant. See installation examples in Fig. 5-4.

1. Close the shut-off valves (1, 9) upstream and downstream of the regulator while the regulator is being installed.

2. Remove the protective caps from the valve ports before installing the valve.
3. Lift the regulator using suitable lifting equipment to the site of installation. Observe the flow direction through the valve. The arrow on the valve indicates the direction of flow.
4. Make sure that the correct flange gaskets are used.
5. Bolt the pipe to the valve free of stress.

➔ **Additional activities required for individual components**

6. Mount the actuator.

– Fasten the actuator on the valve by tightening the coupling nut (11). Observe the alignment of the control line connection. Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).

7. Mount the control line.

– Mount the control line onto the valve and actuator. Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).
– For **steam** or **liquids above 150 °C** install the compensation chamber and fill it with the process medium. Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).

8. Slowly open the shut-off valves in the pipeline after the valve has been installed.

5.4 Testing the regulator

⚠ DANGER

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

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

Before working on the regulator:

➔ *Depressurize all plant sections concerned and the regulator.*
➔ *Disconnect the control line.*
➔ *Drain the process medium from the plant sections affected as well as from the valve.*

⚠ DANGER

Risk of personal injury due to process medium escaping.

➔ *Do not unscrew the control line while the valve is pressurized.*
➔ *Do not start up the regulator until all parts have been mounted.*

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

➔ *Wear hearing protection when working near the valve. Follow the instructions given by the plant operator.*

⚠ WARNING

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

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

➔ *Wear protective clothing and safety gloves.*

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

5.4.1 Leakage

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

Tip

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

➔ All required control lines are connected to the actuator and are not shut off.

1. Install the regulator into the pipeline (see Chapter "Installation").
2. Apply the required test pressure.
3. Check the regulator for leakage to the atmosphere.
4. Depressurize the pipeline section and valve.
5. Rework any parts that leak and repeat the leak test.

5.4.2 Pressure test

⚠ WARNING

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

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

➔ *Do not unscrew the control line while the valve is pressurized.*

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

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.

NOTICE

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

– Slowly open the shut-off valves.

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

Pressure test with mounted diaphragm actuator

➔ All required control lines are connected to the actuator and are not shut off.

➔ Do not allow the pressure to exceed the 1.5 times the pressure rating of the valve body.

➔ Do not apply a pressure higher than the maximum specified pressure rating or maximum operating pressure to the actuator (see section 'Technical data' in the 'Design and principle of operation' chapter).

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

If the **test pressure** of the valve is **higher** than the specified maximum permissible operating pressure of the diaphragm actuator, the pressure test is always performed **without** a mounted diaphragm actuator.

Pressure test without mounted diaphragm actuator

➔ Depressurize the plant and remove the control line. Close any control line connection in the plant by closing the installed shut-off valve or inserting a blanking plug.

➔ Seal the body connections with blanking plugs.

If the valve is not sealed off, the test medium escapes at the connection where the actuator is connected to the valve. It is not possible to perform a pressure test on the valve in this case (see Fig. 5-5).

➔ Seal off the valve using a coupling nut (0250-1037) with seal (0340-1962).

Fig. 5-5: *Medium escaping when an actuator is not mounted on the valve*

5.4.3 Filling the plant

Open the shut-off valves slowly over a time period of several minutes preferably starting from the upstream pressure side to fill the plant (all consumers and control lines are open).

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

NOTICE

Risk of regulator damage due to steam hammering.

Steam hammering is possible when the process medium is a liquid with a boiling point at atmospheric pressure.

➔ *Open the shut-off valves slowly preferably starting from the downstream side to fill the plant over a time period of several minutes.*

5.4.4 Cleaning the pipeline

We recommend additionally flushing the pipeline with installed regulator over a time period of several minutes before start-up.

➔ All required control lines are connected and not shut off.

➔ Before flushing the plant with the process medium, read the section 'Starting up the plant' in the 'Start-up' chapter.

➔ Higher set points for the differential pressure and flow rate are adjusted at the regulator. All consumers are open to guarantee a high flow rate.

➔ Observe the mesh size of the upstream strainer for the maximum particle size. Use strainers to suit 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 the 'Troubleshooting' chapter.

5.5 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.

1. Start up the plant and adjust the set point (see the 'Start-up' chapter).
2. Shut down the plant again and let it heat up until the condensation water has dried off.
3. Insulate the regulator and pipes conveying the process medium using insulation material with a water vapor barrier. If a control line is to be routed through the insulation, special care must be taken with the sealing since slight changes in shape may occur. The insulation thickness depends on the medium temperature and the ambient conditions. A typical value is 50 mm. If the valve has an external spring, it must be protected by a sleeve to allow it to move. The spring-loaded actuator stem must not touch the insulation.

NOTICE

Risk of regulator damage due to incorrect insulation.

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

➔ *Only insulate the regulator up to the actuator for medium temperatures above 220 °C.*

6 Start-up

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

⚠ WARNING

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

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

➔ *Allow components and pipelines to cool down or warm up to the ambient temperature.*

➔ *Wear protective clothing and safety gloves.*

⚠ 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 valve is pressurized.*

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

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

➔ *Wear hearing protection when working near the valve. Follow the instructions given by the plant operator.*

⚠ DANGER

Risk of personal injury due to process medium escaping.

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

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

– The regulator is properly installed in the pipeline (see the 'Installation' chapter).

– The leak and function tests have been completed successfully (see section 'Testing the regulator' in the 'Installation' chapter).

– The prevailing conditions in the plant section concerned meet the regulator sizing requirements (see section 'Intended use' in the 'Safety instructions and measures' chapter).

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 (see section 'Adjusting the flow rate' and 'Adjusting the differential pressure set point' or 'Adjusting the pressure set point' in the 'Operation' chapter).

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

– The control line is open (needle valve) and correctly connected.

6.2 Starting up the plant

⚠ WARNING

Risk of personal injury due to process medium escaping.

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 Chapter 6.2.1 and Chapter 6.2.2 for liquids or steam above 150 °C before starting up the plant.*

1. The plant (e.g. consumer valve) must be open while the plant is being filled.
2. The control lines are correctly connected.
3. **For media that do not reach their boiling point:**
   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.

   For media that reach their boiling point:
   Open the shut-off valves **slowly** starting from the downstream side to avoid steam hammering.
4. Make sure that the pressure rises simultaneously upstream and downstream of the regulator to avoid damaging the balancing bellows.

i *Note*

On filling the plant, make sure the restriction (1.1) is open by turning the set point adjuster for the flow rate (1.4) counterclockwise (↺) as far as it will go.

6.2.1 Control applications with liquids

➔ Vent the bellows housing of valves balanced by a bellows (DN 125 and larger) at the stopper (8) located at the side.

➔ For liquid medium 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 starts to overflow.
3. Screw the filler plug back in and tighten it.

6.2.2 Control applications with steam

➔ Type 42-39 only

➔ 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 water until it starts to overflow.
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 the regulator back into service (see the 'Start-up' chapter), the regulator is ready for use.

⚠ WARNING

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

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

➔ *Allow components and pipelines to cool down or warm up to the ambient temperature.*

➔ *Wear protective clothing and safety gloves.*

⚠ 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 valve is pressurized.*

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

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

➔ *Wear hearing protection when working near the valve. Follow the instructions given by the plant operator.*

7.1 Adjusting the set point

➔ The control and shut-off valves as well as all consumers or a bypass valve (if installed) must be open to ensure that the maximum flow rate is reached.

➔ Set the required flow rate by adjusting the restriction (1.4), while watching, for example the reading of a flow rate measuring unit at the heat meter (see Table 7-1).

i *Note*

Adjustment is always based on the closed restriction.

– Turning it clockwise (↻) closes the restriction; the flow rate drops.

– Turning it counterclockwise (↺) opens the restriction; the flow rate rises.

To adjust the flow rate, use the adjustment diagrams for water (Fig. 7-1 to Fig. 7-8).

i *Note*

Observe the differential pressure across the restriction $\Delta p_{restriction}$ of 0.2 bar or 0.5 bar. It is determined by the differential pressure springs (9) installed in the actuator (see the 'Markings on the device' chapter).

7.2 Adjusting the flow set point

➔ To adjust the flow rate, first set the set point for pressure or differential pressure to its maximum value. To do this, tension the set point spring (16) at the set point adjuster (17 or 22) by turning it clockwise (↻).

1. Unscrew the cap (1.3).
2. Undo lock nut (1.2) and turn the flow set point adjuster (1.4) clockwise as far as it will go.
3. Find the flow rate set point in the diagram and determine the associated number of turns.
4. Based on a closed restriction, turn the set point adjuster for the flow rate (1.4) counterclockwise (↺) to adjust this value. Wait until the plant has settled. If necessary, readjust.
5. Check the flow rate at the heat meter and correct it, if necessary.
6. Lock the restriction screw in place with the nut (1.2) and screw the cap (1.3) back on after the required flow rate is reached.
7. Close a possibly open bypass valve again.
8. Lead-seal the setting, if necessary.

Table 7-1: *Flow rate set point ranges for water*

Type 2423 · Balanced by a bellows

Nominal size DN		15	20	25	32	40	50	65	80	100	125	150	200	250
Flow rate set point ranges for water in m³/h														
Diff. pressure across the restriction $\Delta p_{restriction}$	0.2 bar	0.05 to 2	0.15 to 3	0.25 to 3.5	0.4 to 7	0.6 to 11	0.9 to 16	2 to 28	3.5 to 35 [1]	6.5 to 63	11 to 80	18 to 120	20 to 180	26 to 220
	0.5 bar	0.15 to 3	0.25 to 4.5	0.4 to 5.3	0.6 to 9.5	0.9 to 16	2 to 24	3.5 to 40	6.5 to 55	11 to 90	18 to 120	20 to 180	26 to 260	30 to 300
Max. permissible differential pressure Δp		25 bar						20 bar		16 bar		12 bar	10 bar	

Type 2423 · Balanced by a diaphragm

Nominal size DN		65	80	100	125	150	200	250
Flow rate set point ranges for water in m³/h								
Diff. pressure across the restriction $\Delta p_{restriction}$	0.2 bar	2 to 28	3.5 to 35 [1]	6.5 to 63	11 to 120	18 to 180	20 to 320	26 to 350
	0.5 bar	3.5 to 40	6.5 to 55	11 to 90	18 to 180	20 to 260	26 to 450	30 to 520
Max. permissible differential pressure Δp		10 bar			12 bar		10 bar	

[1] 7 to 35 m³/h (160 cm² actuator), 7 to 40 m³/h (320 cm² actuator)

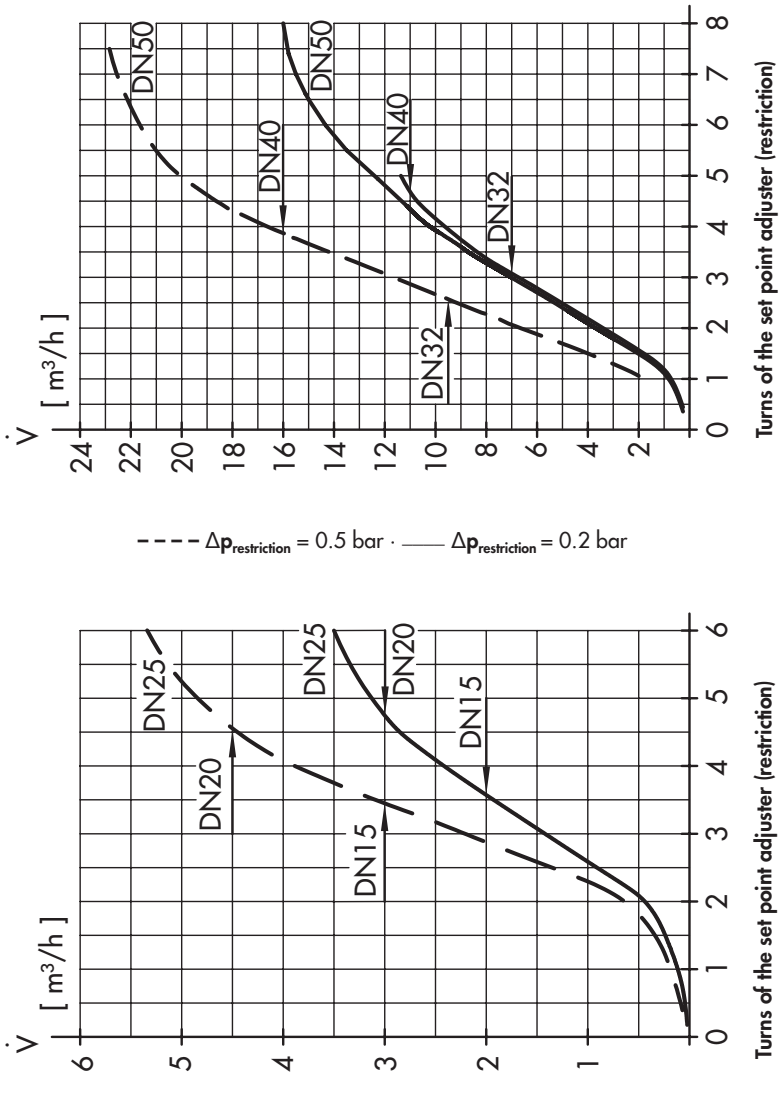


Fig. 7-1: *Adjustment diagram for Type 2423, balanced by a bellows, DN 15 to 50*

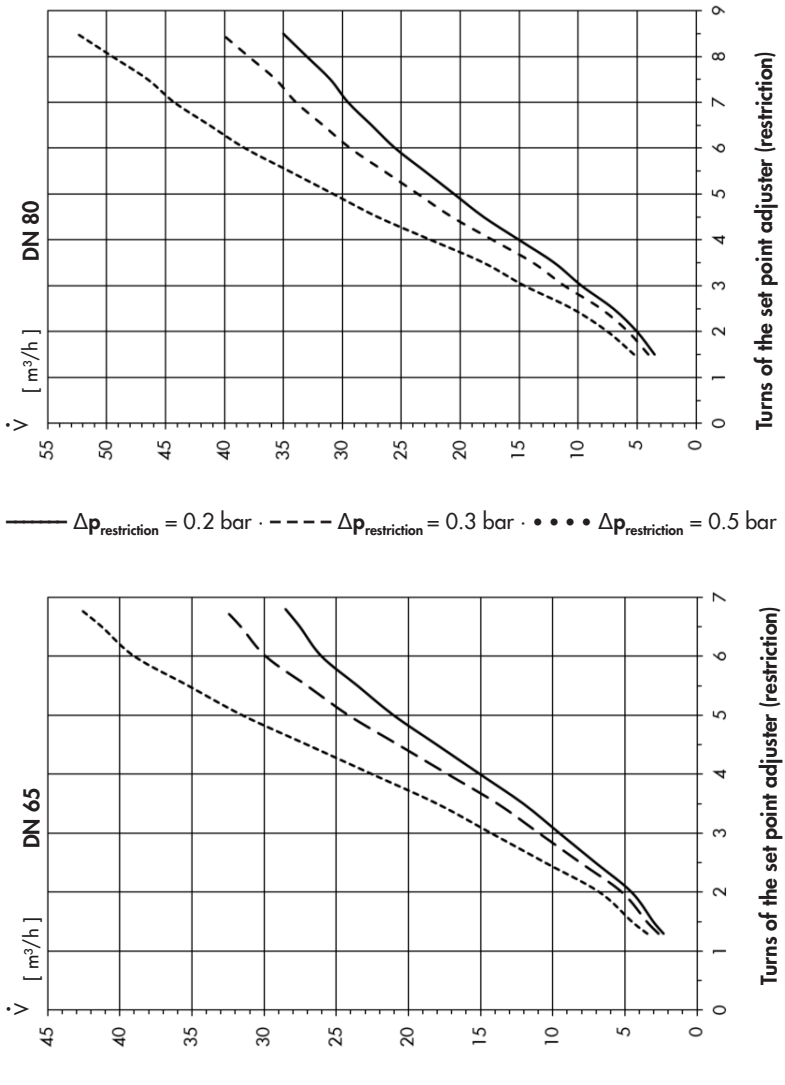


Fig. 7-2: *Adjustment diagram for Type 2423, balanced by a bellows, DN 65 and 80*

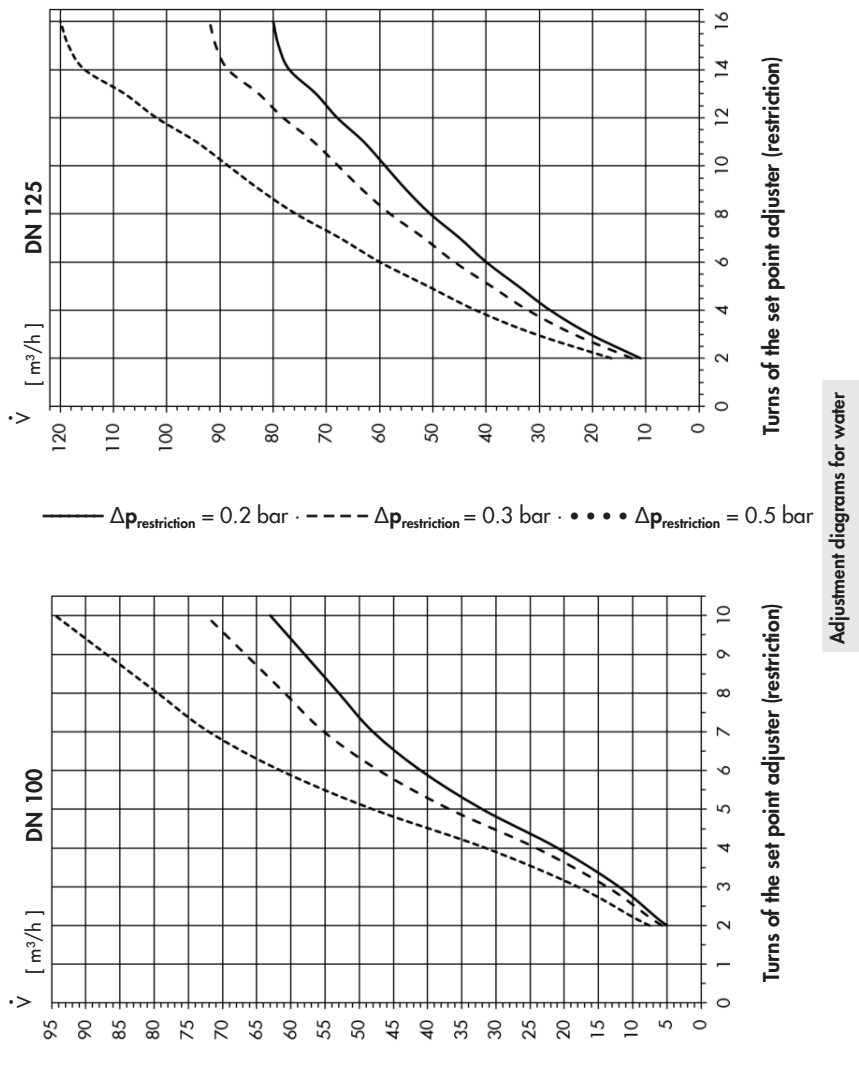


Fig. 7-3: *Adjustment diagram for Type 2423, balanced by a bellows, DN 100 and 125*

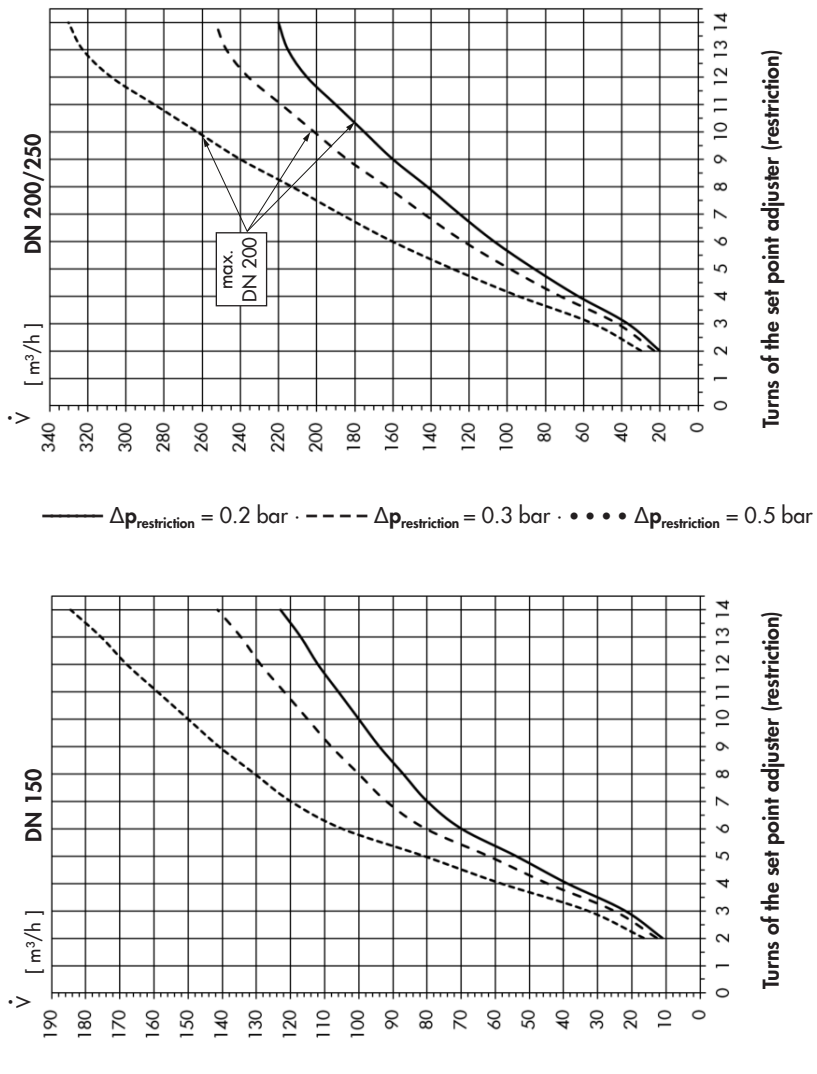


Fig. 7-4: *Adjustment diagram for Type 2423, balanced by a bellows, DN 150 to 250*

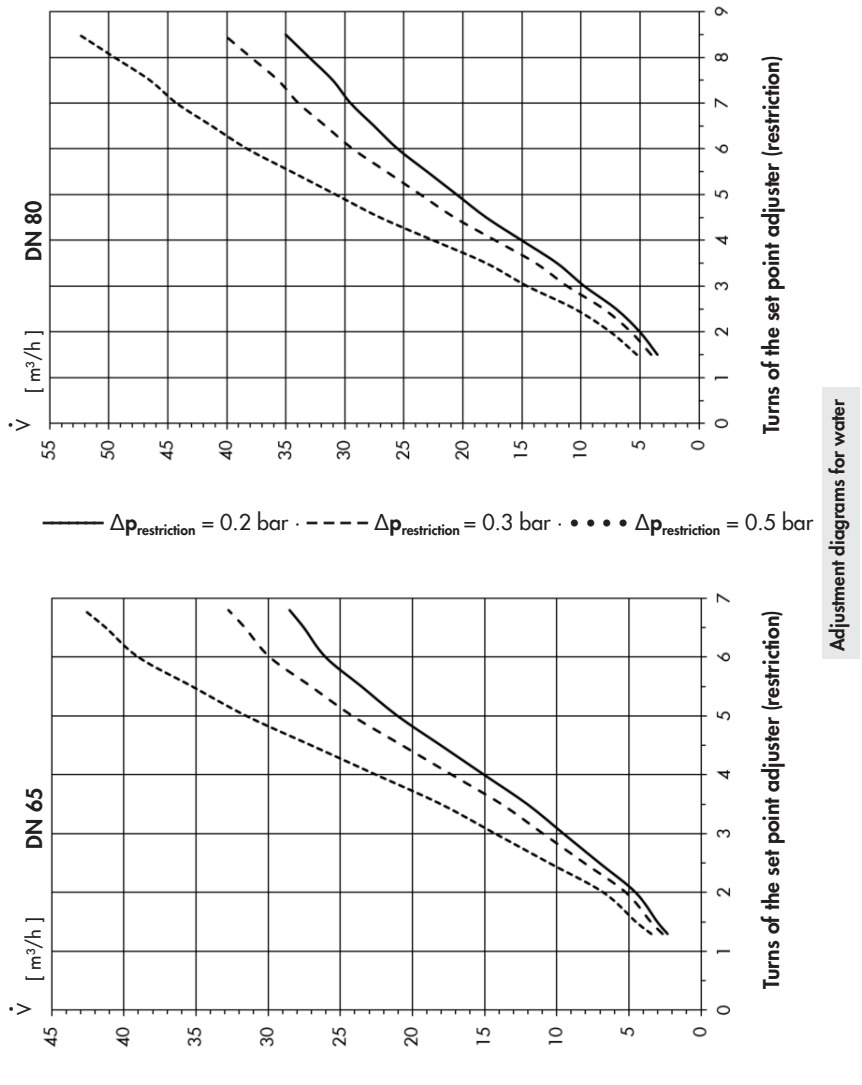


Fig. 7-5: *Adjustment diagram for Type 2423, balanced by a diaphragm, DN 65 and 80*

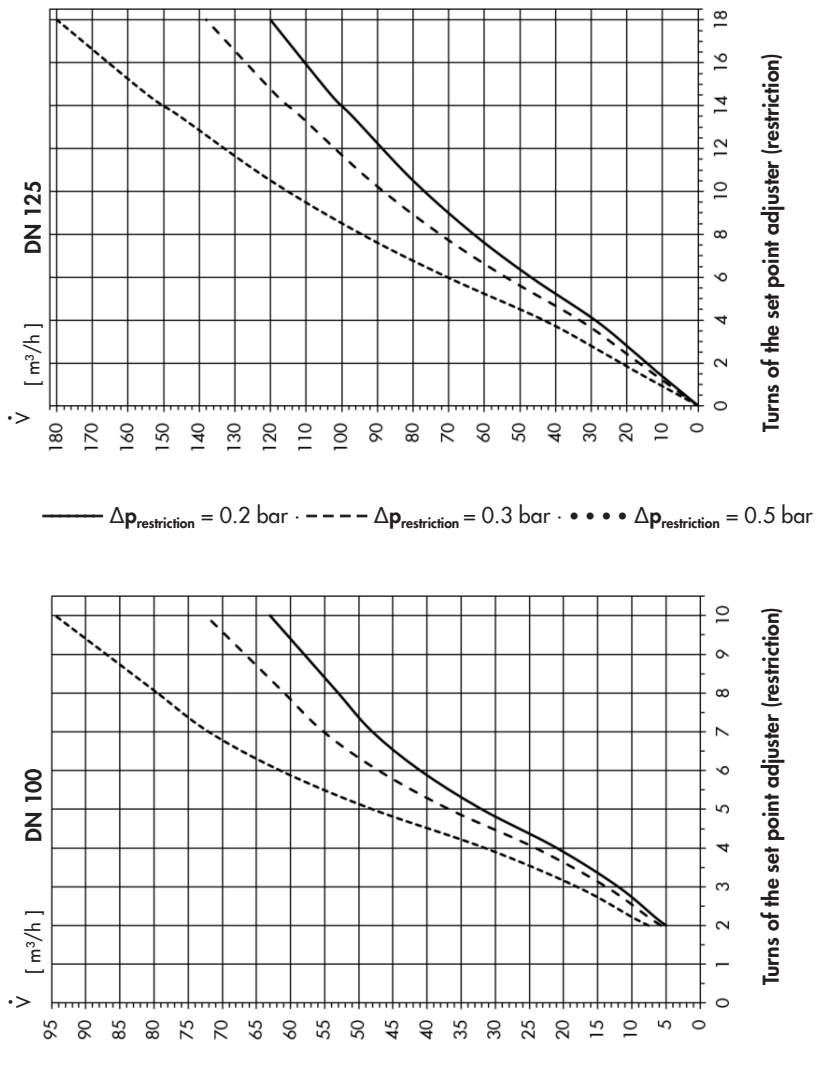


Fig. 7-6: *Adjustment diagram for Type 2423, balanced by a diaphragm, DN 100 and 125*

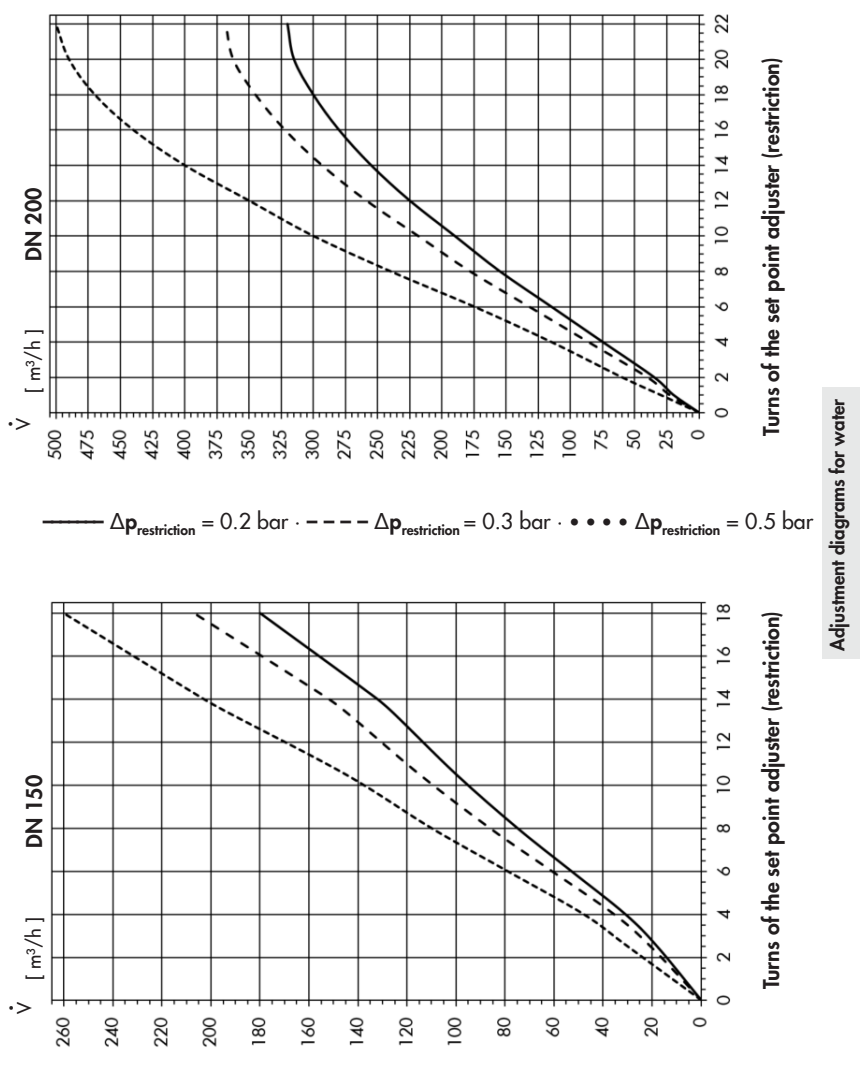


Fig. 7-7: *Adjustment diagram for Type 2423, balanced by a diaphragm, DN 150 and 200*

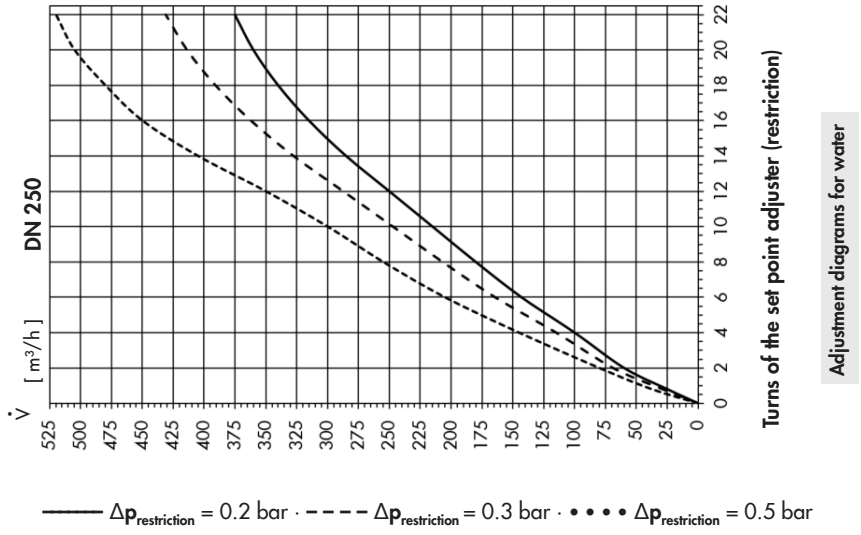


Fig. 7-8: *Adjustment diagram for Type 2423, balanced by a diaphragm, DN 250*

7.3 Adjusting the differential pressure set point of the Type 2427 Actuator (Type 42-37)

➔ Before adjusting the differential pressure, close the shut-off valve on the consumer side or the bypass to reduce the flow rate to approx. 5 %.
If you are using a motorized valve, close it to approx. 10 % of its travel.

➔ Set the differential pressure set point by turning the set point adjuster (17) for differential pressure counterclockwise (↺). To do this, compare the pressures upstream and downstream of the consumer at the reading of the installed pressure gauges. If small differential pressure set points are to be adjusted, we recommend using a differential pressure gauge instead of the two pressure gauges.

Turn the set point adjuster (17) clockwise (↻) to increase the differential pressure set point and counterclockwise (↺) to reduce the differential pressure set point.

7.4 Adjusting the pressure set point of the Type 2429 Actuator (Type 42-39)

Adjust the pressure set point at the set point adjuster for pressure (22). While doing so, observe the downstream pressure at the installed pressure gauge.

Turn the set point adjuster (22) clockwise (↻) to increase the pressure set point and counterclockwise (↺) to reduce the pressure set point.

8 Malfunctions

8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action
Flow rate, differential pressure or pressure exceeds adjusted set point	Insufficient pressure pulses on the operating diaphragm	➔ Clean the control line and screw fittings.
	Foreign particles blocking the plug	➔ Remove foreign particles. ➔ Replace damaged parts. ➔ Contact SAMSON's After-sales Service.
	Seat and plug are worn or leak.	➔ Replace the damaged seat and plug. ➔ Contact SAMSON's After-sales Service.
	Valve too large for control task (flow rate) or too small (differential pressure)	➔ Check the sizing. ➔ Change K_{VS}/C_V coefficient, if necessary or install a different sized regulator. ➔ Contact SAMSON's After-sales Service.
	Defective operating diaphragm	➔ Replace damaged diaphragm.

Malfunction	Possible reasons	Recommended action
Flow rate, differential pressure or pressure set point not reached	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.
	Incorrect set point range selected	➔ Check set point range ➔ Contact SAMSON's After-sales Service.
	Safety device, e.g. pressure limiter, has been triggered	➔ Check plant. If necessary, unlock safety device.
	Plant differential pressure Δp too low	➔ Compare differential pressure in the plant with the plant's drag. Differential pressure across the plant: $\Delta p_{min} = \Delta p_{restriction} + (\dot{V}/K_{VS})^2$
	Foreign particles blocking the plug	➔ Remove foreign particles. ➔ Replace damaged parts. ➔ Contact SAMSON's After-sales Service.
	Control line blocked	➔ Clean the control line and screw fittings.
	Strainer blocked	➔ Clean the strainer.
	Defective operating diaphragm	➔ Replace damaged diaphragm.
Control loop 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.
	The restriction or needle valve in the control line for pressure tapping is too large or missing.	➔ Install a restriction. ➔ Install a smaller restriction. ➔ Do not completely close the needle valve.
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.
Jerky control response	Increased friction, e.g. due to foreign particles between seat and plug	➔ Remove foreign particles. ➔ Replace damaged parts. ➔ Contact SAMSON's After-sales Service.

Malfunction	Possible reasons	Recommended action
Loud noises	High flow velocity, cavitation	➔ Check the sizing. ➔ Install larger regulator, if necessary.
Leakage at the actuator	Defective operating diaphragm	➔ Replace damaged diaphragm.

i ***Note***

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

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

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

Tip

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

8.2 Emergency action

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

SAMSON recommends removing the regulator from the pipeline before repairing it.

In the event of a regulator malfunction:

1. Close the shut-off valves upstream and downstream of the regulator to stop the process medium from flowing through the regulator.
2. Perform troubleshooting (see Chapter 8.1).
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 the 'Start-up' chapter.

9 Servicing

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

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

SAMSON recommends removing the regulator from the pipeline before performing any maintenance or service work.

⚠ DANGER

Danger due to suspended loads falling.

➔ *Stay clear of suspended or moving loads.*

➔ *Close off and secure the transport paths.*

⚠ WARNING

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

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

➔ *Wear protective clothing, safety gloves and eye protection.*

⚠ WARNING

Risk of personal injury due to the regulator tipping.

➔ *Observe the regulator's center of gravity.*

➔ *Secure the regulator against tipping over or turning.*

⚠ WARNING

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

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

➔ *Allow components and pipelines to cool down or warm up to the ambient temperature.*

➔ *Wear protective clothing and safety gloves.*

⚠ 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 the 'Design and principle of operation' chapter for the 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 the weight of the regulator and/or actuator.

- ➔ *Observe the occupational health and safety regulations valid in the country of use.*
- ➔ *Observe the guideline weight for manual handling: 15 to max. 55 kg per person taking into account age, gender and physical fitness.*
- ➔ *When the actuator is filled with medium, take the weight of the medium also into account.*
- ➔ *Refer to the 'Design and principle of operation' chapter for the weights of the regulator and actuator.*

NOTICE

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

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

- ➔ *Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).*

NOTICE

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

- ➔ *Only use tools approved by SAMSON (see the 'Tools' chapter in the Appendix).*

NOTICE

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

- ➔ *Only use lubricants approved by SAMSON (see the 'Lubricants' chapter in the Appendix).*

Note

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

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

Tip

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

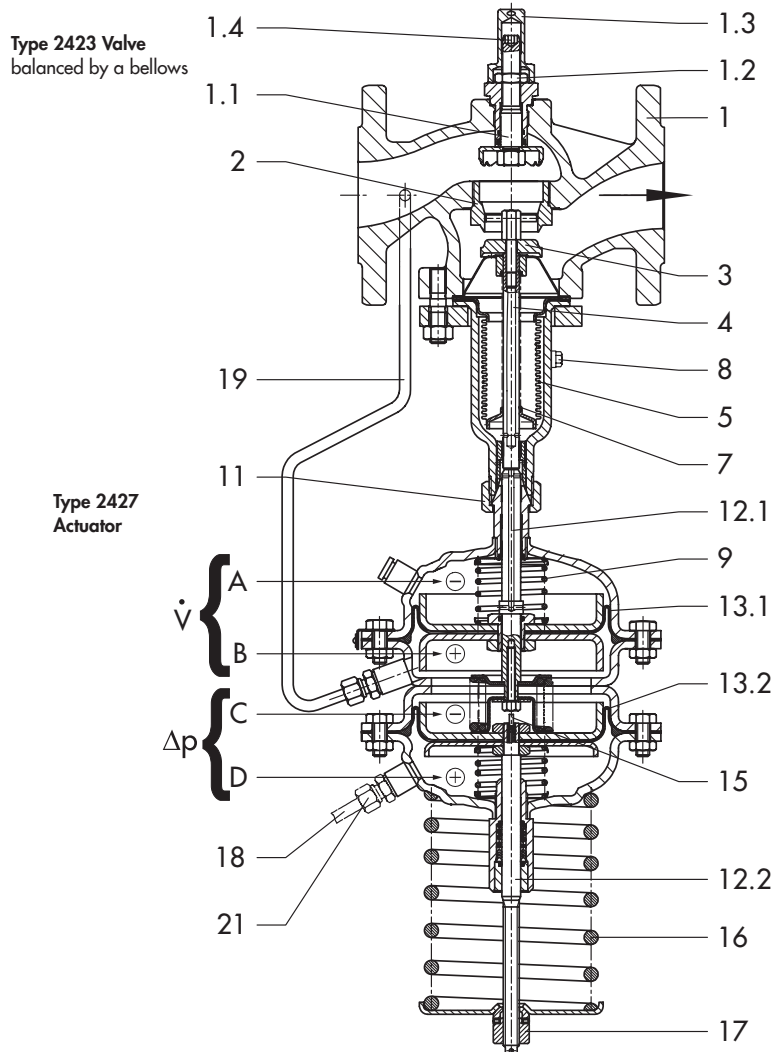


Fig. 9-1: *Functional diagram of Type 42-37 Regulator, DN 15 to 250 with balancing bellows*

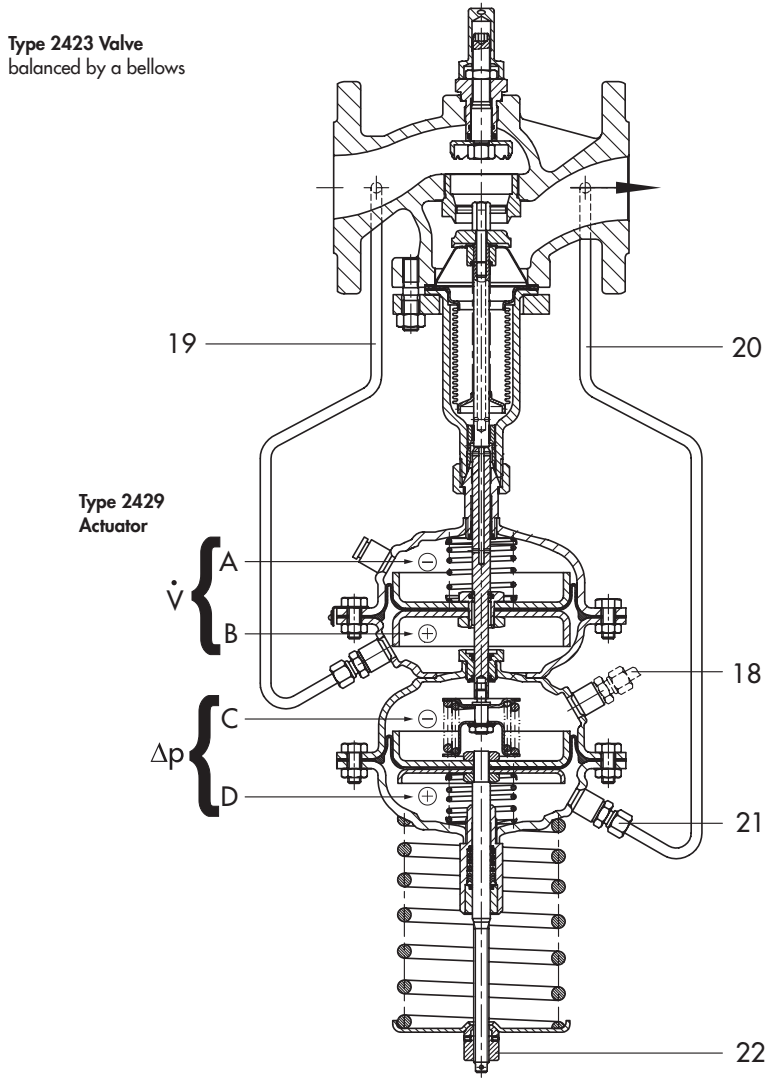


Fig. 9-2: *Functional diagram of Type 42-39 Regulator, DN 15 to 250 with balancing bellows*

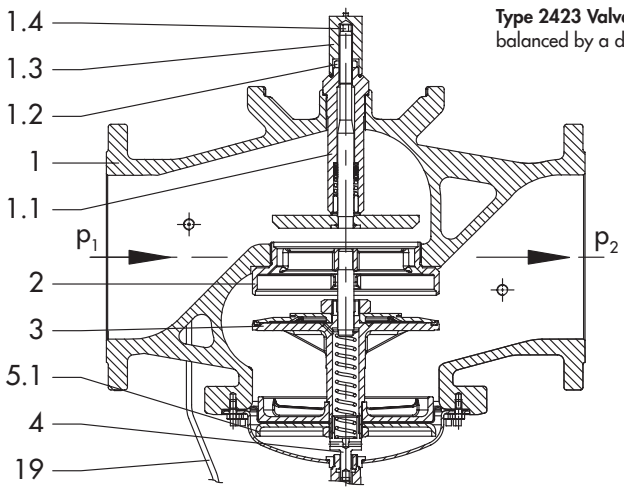


Fig. 9-3: *Functional diagram of Type 2423 Valve, DN 65 to 250 with balancing diaphragm*

Legend for Fig. 9-1 to Fig. 9-3

1	Valve body
1.1	Restriction
1.2	Lock nut
1.3	Cap
1.4	Set point adjuster for flow rate
2	Seat
3	Plug
4	Plug stem
5	Balancing bellows
5.1	Balancing diaphragm
7	Spring
8	Vent plug (DN 125 and larger)
9	Differential pressure spring
11	Coupling nut
12.1	Top diaphragm stem
12.2	Bottom diaphragm stem
13.1	Top operating diaphragm
13.2	Bottom operating diaphragm
15	Overload protection
16	Set point spring
17	Set point adjuster (differential pressure)
18	Control line (to be provided on site)
19	Control line (+) V
20	Control line (+) Δp
21	Restriction to dampen signal
22	Set point adjuster (pressure)

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 the 'Decommissioning' chapter).

Tip

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

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

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

9.2 Installing the regulator after service work

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

9.3 Service work

➔ Before performing any service work, preparations must be made to the regulator (see Chapter 9.1).

➔ After all service work is completed, check the regulator before putting it back into operation (see section 'Testing the regulator' in the 'Installation' chapter).

9.3.1 Replacing the actuator

➔ See Fig. 9-1 to Fig. 9-3

Removing the actuator

1. Put the regulator out of operation (see the 'Decommissioning' chapter).
2. Unscrew the control line (18 to 20).
3. Unscrew the coupling nut (11) of the diaphragm actuator from the valve. Remove the actuator.

Mounting the actuator

1. Place the diaphragm actuator on the valve and tighten the coupling nut (11). Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).
2. Screw on the control line (18 to 20). Observe the specified tightening torques (see the 'Tightening torques' chapter in the Appendix).
3. Put the regulator back into operation (see the 'Start-up' chapter).

9.3.2 Replacing the seat and plug

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

Further information is available in the 'After-sales service' chapter in the Appendix.

9.3.3 Replacing the actuator's operating diaphragm

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

Further information is available in the 'After-sales service' chapter in the Appendix.

9.4 Ordering spare parts and operating supplies

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

Spare parts

See the Appendix for details on spare parts.

Lubricants

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

Tools

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

10 Decommissioning

The work described in this chapter is 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.

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

Before working on the regulator:

➔ *Depressurize all plant sections concerned and the regulator.*

➔ *Drain the process medium from the plant sections affected as well as from the valve.*

⚠ WARNING

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

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

➔ *Allow components and pipelines to cool down or warm up to the ambient temperature.*

➔ *Wear protective clothing and safety gloves.*

⚠ WARNING

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

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

➔ *Do not unscrew the control line while the valve is pressurized.*

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

⚠ WARNING

Risk of hearing loss or deafness due to loud noise.

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

➔ *Wear hearing protection when working near the valve. Follow the instructions given by the plant operator.*

⚠ WARNING

Crush hazard arising from moving parts.

➔ *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 starting any work on the regulator, depressurize plant sections as well as the regulator.*

⚠ WARNING

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

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

➔ *Wear protective clothing, safety gloves and eye protection.*

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. Completely drain the pipelines and valve.
5. Unscrew the control line (18 to 20).
6. If necessary, allow the pipeline and regulator components to cool down or warm up to the ambient temperature.

11 Removal

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

⚠ WARNING

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

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

➔ *Allow components and pipelines to cool down or warm up to the ambient temperature.*

➔ *Wear protective clothing and safety gloves.*

⚠ WARNING

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

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

➔ *Wear protective clothing, safety gloves and eye protection.*

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

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

11.1 Removing the regulator from the pipeline

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

11.2 Removing the actuator from the valve

See the 'Servicing' chapter.

12 Repairs

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

NOTICE

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

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

➔ *Contact SAMSON's After-sales Service for service and repair work.*

12.1 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

1. Exceptions apply concerning some special device models
   ▶ www.samsongroup.com > Service > After-sales Service.
2. Send an e-mail
   ▶ retouren@samsongroup.com to register the return shipment including the following information:
   - Type
   - Material number
   - Item numbers of accessories
   - Original order
   - Completed Declaration on Contamination, which can be downloaded from our website at
     ▶ www.samsongroup.com > Service > After-sales Service.

   After checking your registration, we will send you a return merchandise authorization (RMA).
3. Attach the RMA (together with the Declaration on Decontamination) to the outside of your shipment so that the documents are clearly visible.
4. Send the shipment to the address given on the RMA.

Note

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

13 Disposal

SAMSON is a producer registered in Europe, agency in charge ▶ https://www.samsongroup.com/en/about-samson/environment-social-governance/material-compliance/waste-electrical-and-electronic-equipment-weee-and-its-safe-disposal/.
WEEE reg. no.: DE 62194439

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

Note

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

Tip

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

➔ Observe local, national and international refuse regulations.

➔ Do not dispose of components 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 on page 14-2.
- EU declaration of conformity in compliance with Machinery Directive 2006/42/EC for Type 42-37 and Type 42-39 Regulators on page 14-8.
- Declaration of incorporation in compliance with Machinery Directive 2006/42/EC for the Type 2423 Valve with Type 2427 and Type 2429 Actuator on page 14-10.

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)]

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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

Revision 01

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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

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 42-37 Flow and Differential Pressure Regulator consisting of Type 2423 Valve and Type 2427 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 42-37 Flow and Differential Pressure Regulator: Mounting and Operating Instructions EB 3017

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, 12 May 2022

ppa. Norbert Tollas
Norbert Tollas
Senior Vice President
Global Operations

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

Revision no. 00

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

For the following product:
Type 2423 Valve

We certify that the Type 2423 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 42-34 and Type 42-38 Differential Pressure Regulators with Flow Limitation: Mounting and Operating Instructions EB 3013
- Type 42-36 Flow Regulator: Mounting and Operating Instructions EB 3015
- Type 42-36 E Pressure-independent Control Valve (PICV): Mounting and Operating Instructions EB 3018
- Type 42-37 Flow and Differential Pressure Regulator as well as Type 42-39 Flow and Differential Pressure or Pressure Regulator: Mounting and Operating Instructions EB 3017

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, 10 November 2021

i.V.

Stephan Giesen
Director
Product Management

i. V. P.

Peter Scheermesser
Director
Product Life Cycle Management and ETO
Development for Valves and Actuators

Revision no. 00

DECLARATION OF INCORPORATION
TRANSLATION

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

For the following product:
Type 2427 Actuator

We certify that the Type 2427 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 42-37 Flow and Differential Pressure Regulator: Mounting and Operating Instructions EB 3017

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, 12 May 2022

i.V.

Stephan Giesen
Director
Product Management

i. V. P.

Peter Scheermesser
Director
Product Maintenance & Engineered Products

Revision no. 00

15 Appendix

15.1 Tightening torques

Table 15-1: *Tightening torque*

Part	Width across flats	Valve size/actuator area	Tightening torque in Nm
Cap (1.3)	A/F 30	DN 15 to 100	20
	A/F 36	DN 125 to 250	40
Coupling nuts (11)	A/F 36	All	120
Control line connection (18 to 20)	–	40 to 640 cm²	22
Stopper (35, 50, 53)	G ¼	DN 15 to 100	50
	G 3/8	DN 125 to 250	70

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 15-2: *Assignment of compensation chamber (18) to regulator, with item no.*

Type 2426 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	

Table 15-3: *Stopper to seal the control line connection in the valve body*

Type 2423 Valve	**Item number**	
	G ¼	**G ⅜**
Stopper	8323-005200040	8323-0073
Gasket	8412-0771	8412-0782

15.5 Spare parts

Legend for Fig. 15-1 and Fig. 15-2

2	Bellows
5	Restriction
12	Screw
16	Seat
17	Plug
20	Body
21	Guide cap
22	Label
24	Compression spring
26	Guide tube
27	Bottom section
34	Flange
35	Screw plug
46	Graphite seal on metal core
51	Stud
52	Hex nut
81	Cap
82	Hex nut
132	O-ring
171	Clamping ring
172	Seal

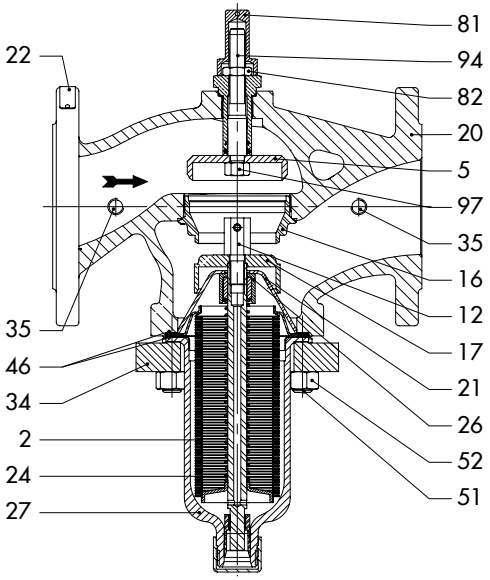

Fig. 15-4: *Type 2423 Valve, DN 15 to 100 · Balanced by a bellows*

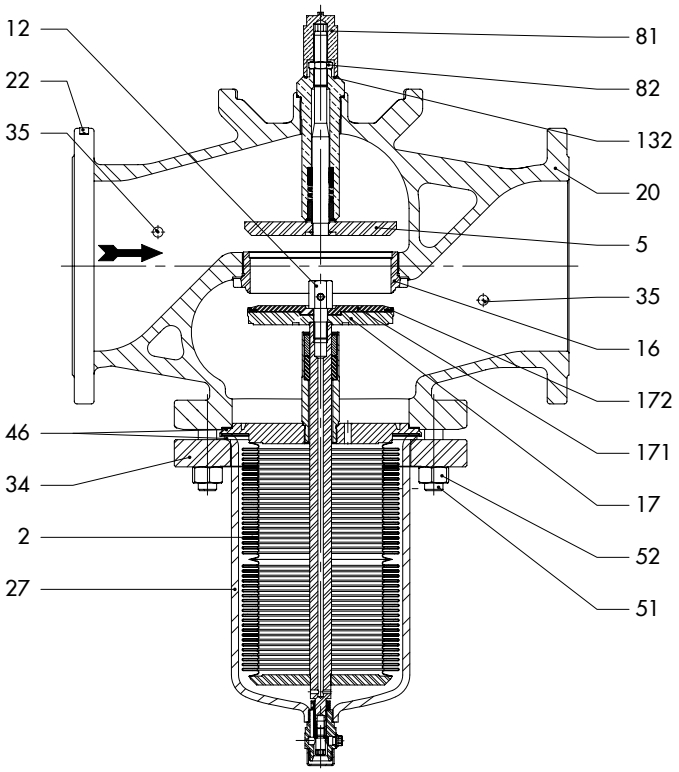

Fig. 15-5: *Type 2423 Valve, DN 125 to 250 · Balanced by a bellows*

Legend for Fig. 15-3	
5	Restriction
8	Compression spring
10	Diaphragm plate
11	Diaphragm
12	Castle nut
13	Washer
14	Plug stem
16	Seat
18	Plug
19	Screw
20	Body
21	Guide cap
22	Label
27	Diaphragm case
34	Ring
46	Gasket
51	Stud
52	Hex nut
53	Screw plug
81	Nut
82	Hex nut
94	Stem
97	Hex nut (self-locking)

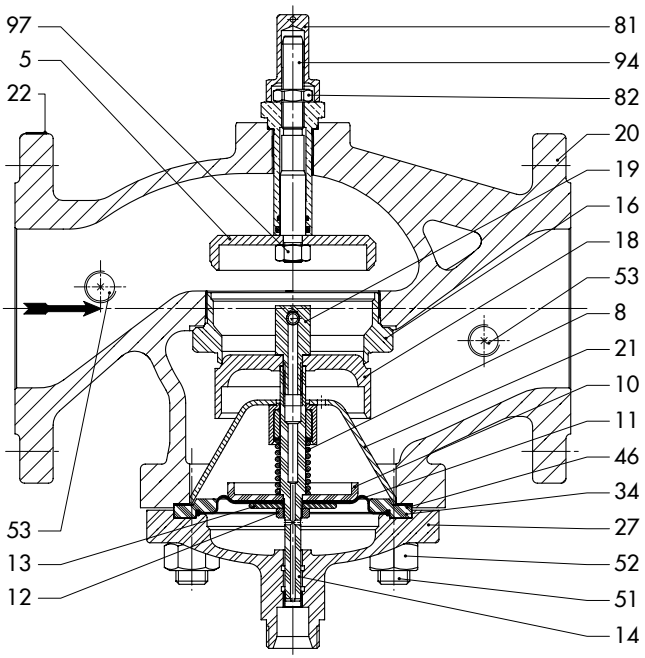

Fig. 15-6: *Type 2423 Valve, DN 65 to 100 · Balanced by a diaphragm*

Legend for Fig. 15-4	
2	Restriction
5	Seat
6	Diaphragm case
11	Cap
12	Body
17	Label
19	Plug
21	Nipple
24	Nut
38	Diaphragm plate
39	Diaphragm plate
42	Clamping disk
46	Seal
47	Diaphragm
49	Screw plug
50	Screw plug
51	Stud
52	Hex nut
53	Hex nut
54	Hex nut
57	O-ring

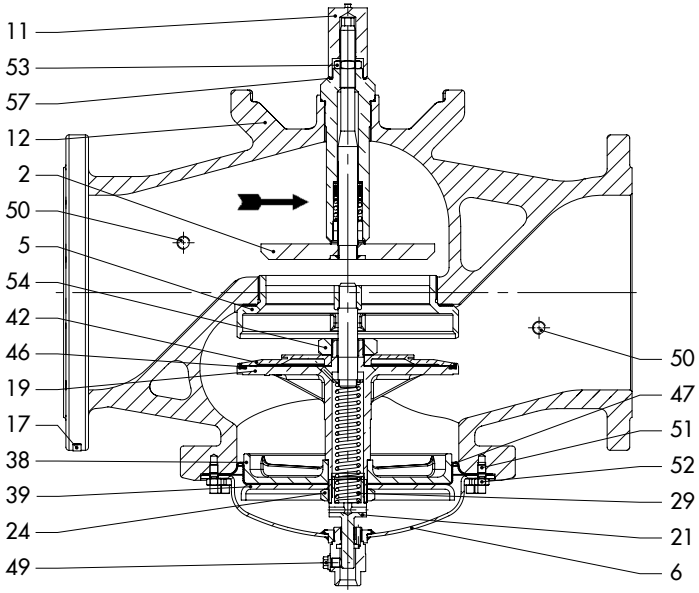

Fig. 15-7: *Type 2423 Valve, DN 125 to 250 · Balanced by a diaphragm*

Legend for Fig. 15-5 and Fig. 15-6	
1	Diaphragm case with guide nipple and coupling nut
2	Intermediate piece
3	Nipple
4	Diaphragm case with guide nipple
5	Diaphragm stem with excess pressure relief and diaphragm
6	Force limiter
7	Screw joint with restriction
8	Diaphragm
10…12	Compression spring
15	Nameplate
18	Nipple
20	Diaphragm plate nut
21	Nut
26…28	Compression spring
29	Diaphragm stem
30	Diaphragm stem
32	Diaphragm plate
39	Spring plate
41	Screw fitting
44	Hex bolt
45	Screw plug
46	Hex nut
47	Screw fitting
49	Axial needle seal with washer

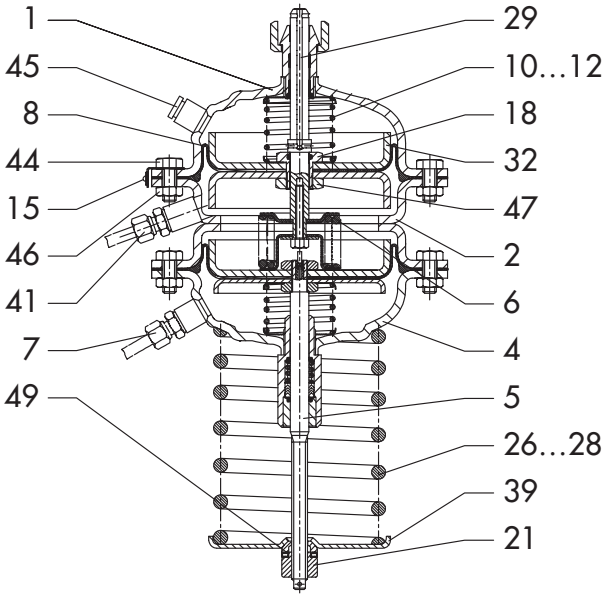

Fig. 15-8: *Type 2427 Diaphragm Actuator, DN 15 to 250 (Type 42-37)*

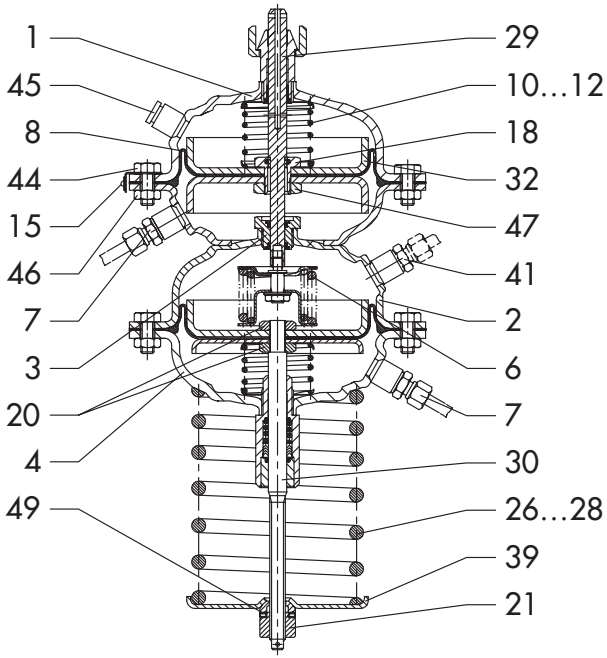

Fig. 15-9: *Type 2429 Diaphragm Actuator, DN 15 to 250 (Type 42-39)*

Legend for Fig. 15-7			
1	Diaphragm stem	4	Washer
2	Diaphragm plate	5	Spring plate
3	Diaphragm	6	Nut

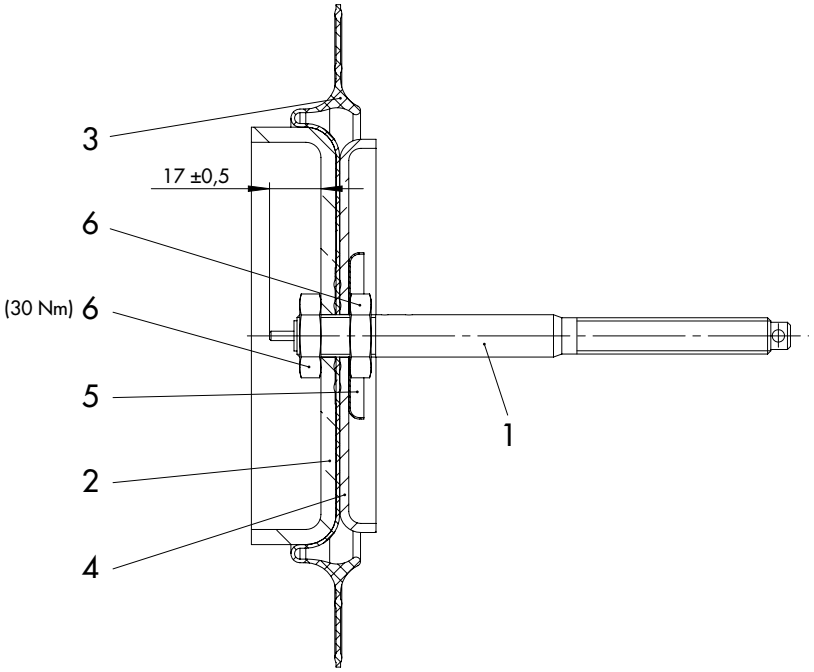

Fig. 15-10: Diaphragm stem, excess pressure limiter and diaphragm · *Type 2424 (DN 15 to 250)*

15.6 After-sales service

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

E-mail address

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

Addresses of SAMSON AG and its subsidiaries

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

Required specifications

Please submit the following details:

- Device type and nominal size
- Valve balanced by a bellows or diaphragm
- Model number or material number
- Upstream and downstream pressure
- Temperature and process medium
- Min. and max. flow rate in m^3/h
- Is a strainer installed?
- Installation drawing showing the exact location of the regulator and all the additionally installed components (shut-off valves, pressure gauge etc.)

EB 3017 EN

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