

MOUNTING AND OPERATING INSTRUCTIONS



EB 3015 EN

Translation of original instructions



Type 42-36 Flow Regulator

Self-operated Regulators

Edition October 2022



Note on these mounting and operating instructions

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

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



The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at www.samsongroup.com > **Service & Support** > **Downloads** > **Documentation**.

Definition of signal words

DANGER

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

WARNING

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

NOTICE

Property damage message or malfunction

Note

Additional information

Tip

Recommended action

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1 Safety instructions and measures

Intended use

The SAMSON Type 42-36 Regulator is a flow regulator. It consists of a Type 2423 Valve and a Type 2426 Actuator. The regulator is delivered as an assembled unit or the components of the regulators are delivered separately.

The self-operated regulator is used to control the flow rate in pipelines. Liquids, gases and vapors in 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.

Safety instructions and measures

Personal protective equipment

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

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

- Protective clothing, 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 when working at height
 - Safety footwear, ESD (electrostatic discharge) footwear, if necessary
- ➔ Check with the plant operator for details on further protective equipment.

Revisions and other modifications

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

Warning against residual hazards

To avoid personal injury or property damage, plant operators and operating personnel must prevent hazards that could be caused in the regulator by the process medium, the operating pressure or by moving parts by taking appropriate precautions. Plant operators and operating personnel must observe all hazard statements, warning and caution notes in these mounting and operating instructions.

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

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

▶ GESTIS (CLP) hazardous substances database).

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

These mounting and operating instructions deals 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 documents listed under 'Referenced documentation').

Safety features

The Type 42-36 Regulator does not have any special safety features. When relieved of pressure, the regulator is opened by the force of the set point springs.

Responsibilities of the operator

Operators are responsible for proper use and compliance with the safety regulations. Operators are obliged to provide these mounting and operating instructions as well as the referenced documents to the operating personnel and to instruct them in proper operation. Furthermore, operators must ensure that operating personnel or third parties are not exposed to any danger.

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

Responsibilities of operating personnel

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

Referenced standards, directives and regulations

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

According to the ignition risk 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).

Safety instructions and measures

Referenced documentation

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

- Mounting and operating instructions for
 - e.g. **Type 2 N or NI Strainer** ▶ EB 1015
- Data sheets for
 - e.g. **Accessories · Differential pressure and flow regulators** ▶ T 3095

 - e.g. **Type 2 N or NI Strainer** ▶ T 1015
- Mounting and operating instructions as well as data sheets for additional fittings (e.g. shut-off valves, pressure gauges etc.).

1.1 Notes on possible severe personal injury

DANGER

Risk of bursting in pressure equipment.

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

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

1.2 Notes on possible personal injury

WARNING

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

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

- Keep all relevant markings and inscriptions on the device in a constantly legible state.
- Immediately renew damaged, missing or incorrect nameplates or labels.

Risk of hearing loss or deafness due to loud noise.

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

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

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

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

- Do not loosen the control line while the valve is pressurized.
- Do not start up the regulator until all parts have been mounted.

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.

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.

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

Damage to health relating to the REACH regulation.

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

- Information on safe use of the part affected ► www.samsongroup.com/en/about-samson/material-compliance/reach-regulation/.

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 information under 'Lifting the regulator' in the 'Shipment and on-site transport' section).

Risk of regulator damage due to unsuitable medium properties.

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

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

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

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

- Flush the pipelines before start-up.

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

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

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

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

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

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

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

Certain tools are required to work on the regulator.

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

NOTICE

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.

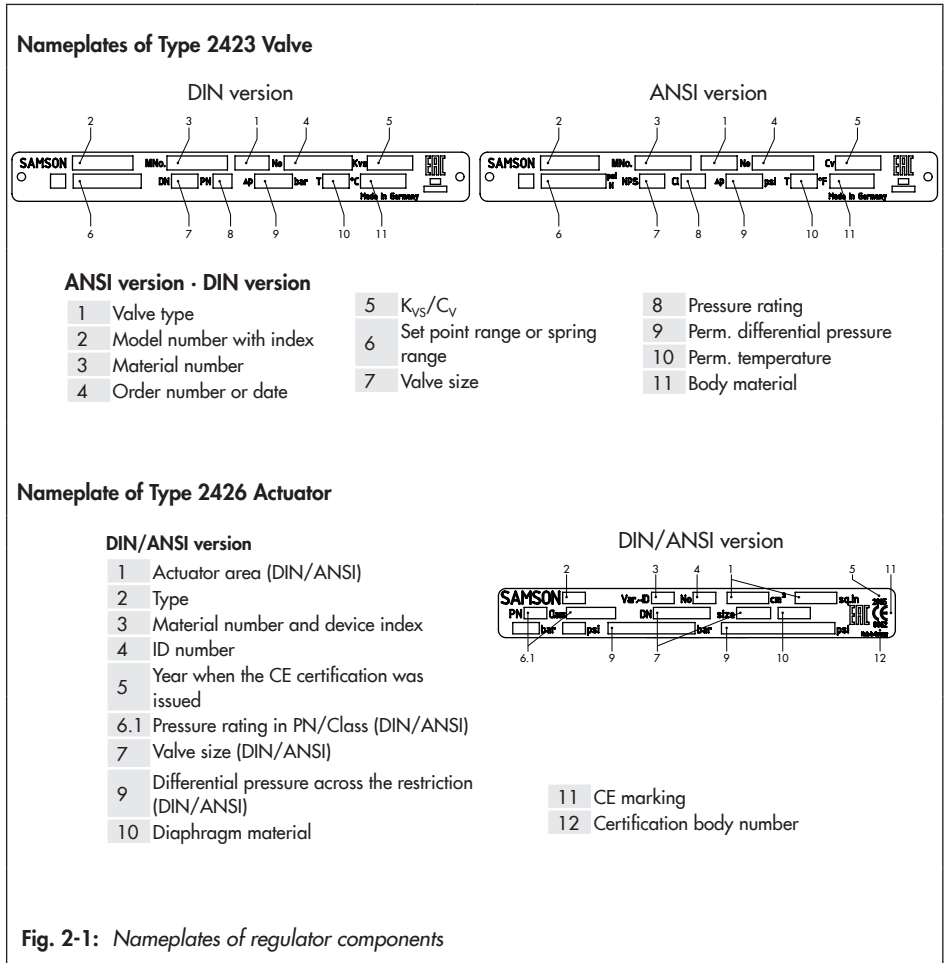
Note

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

2 Markings on the device

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

2.1 Nameplates



2.2 Location of the nameplates

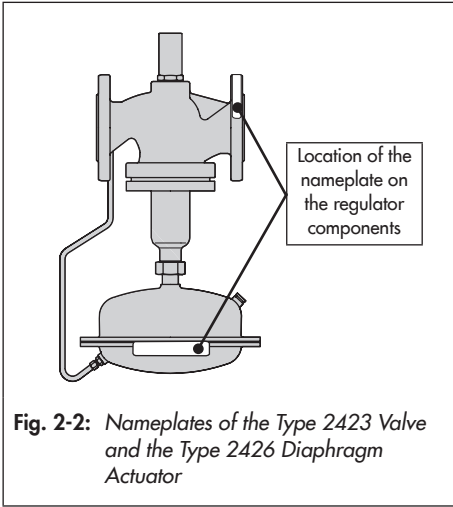


Fig. 2-2: Nameplates of the Type 2423 Valve and the Type 2426 Diaphragm Actuator

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 section 2.1.

2.3.2 Type 2426 Actuator

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

3 Design and principle of operation

→ See Fig. 3-1 and Fig. 3-2

Type 42-36 · The flow regulator is used to limit the flow rate in the pipeline. The set point is adjusted at the restriction.

The regulator basically consists of a Type 2423 Valve with seat, plug and set point adjuster as well as a Type 2426 Actuator (closing) with operating diaphragm.

Valve and actuator are delivered separately and must be fastened together on site using a coupling nut.

Type 42-36 DoT · This version can also control or limit the temperature by mounting a double adapter with thermostat. Read the mounting and operating instructions:

▶ EB 3019 for double adapter DoT and

▶ EB 2231 for Type 2231 to 2234 Control Thermostats

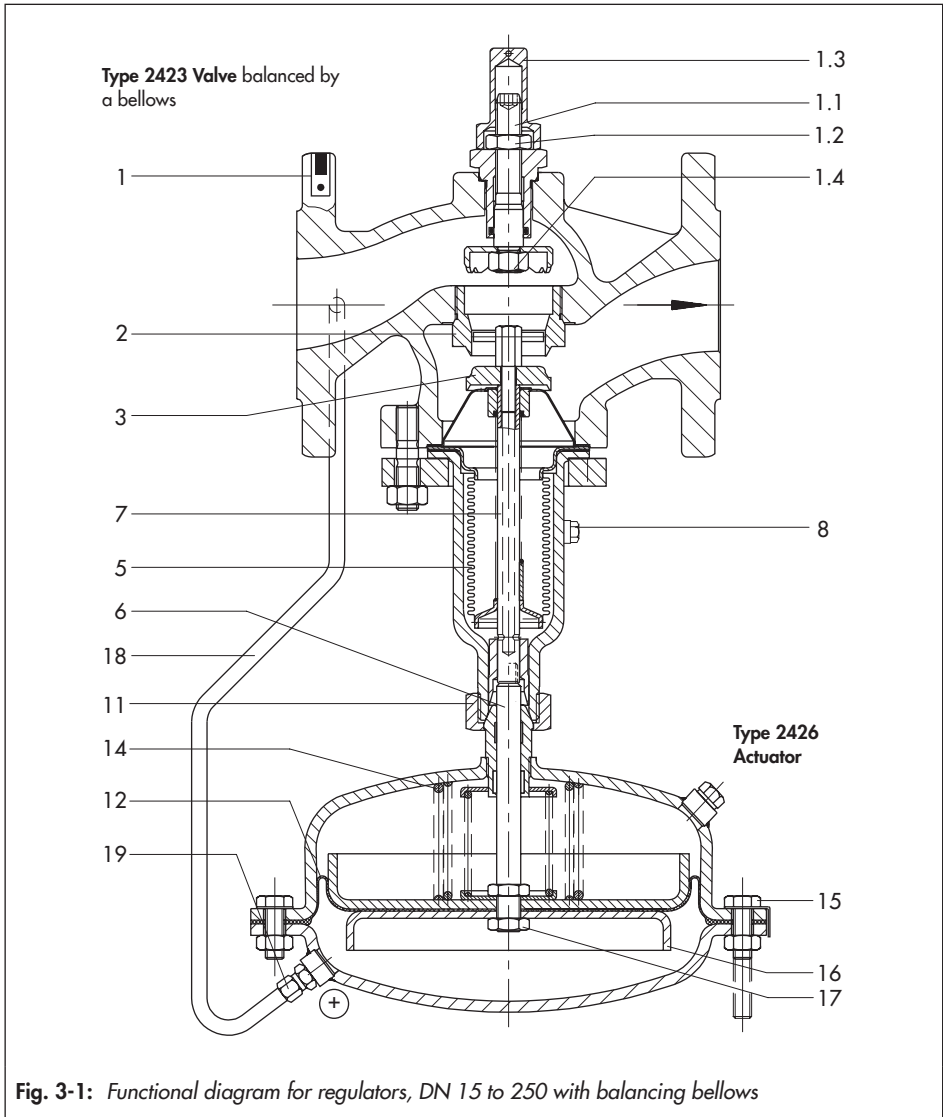
The medium flows through the valve in the direction indicated by the arrow. The areas released by the restriction (1.4) and the valve plug (3) determine the flow rate.

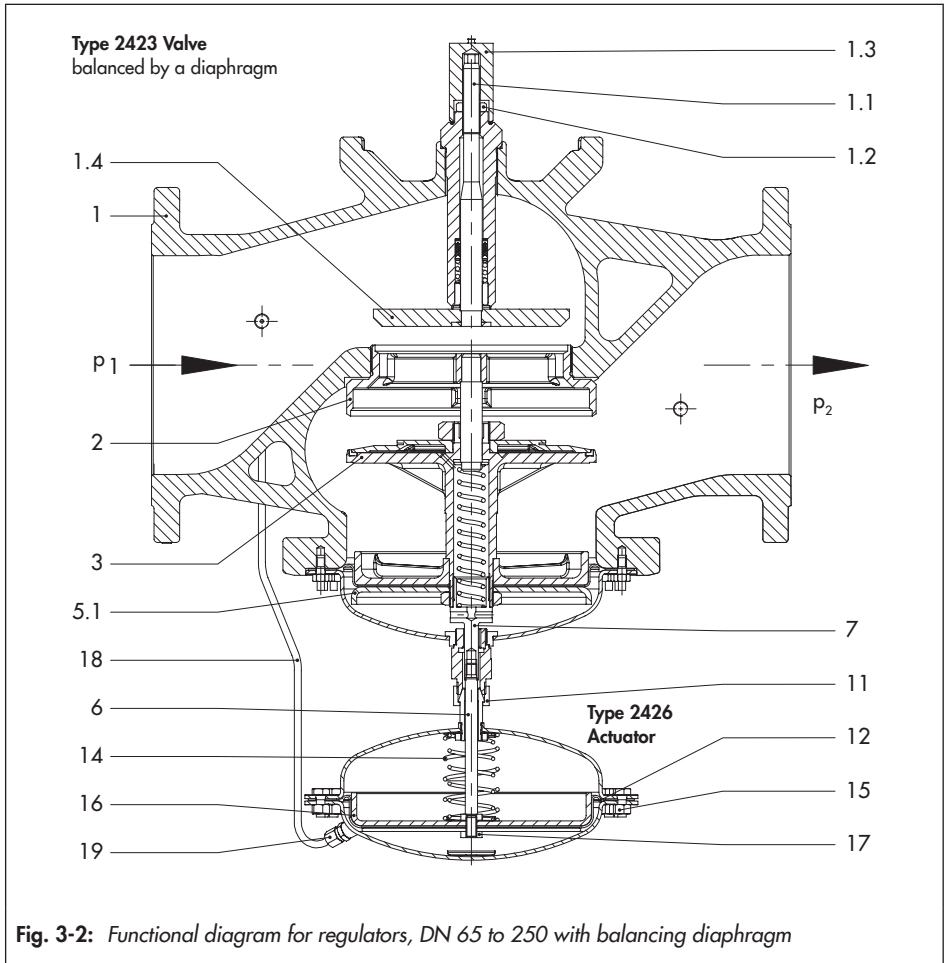
In fully balanced valves, the forces acting on the valve plug created by the upstream and downstream pressures are balanced by a balancing bellows (5) or balancing diaphragm (5.1) (DN 65 to 250, balanced by a diaphragm).

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 p_2 acts on the bottom of the diaphragm and the upstream pressure p_1 on the top of the diaphragm. As a result, the forces created by the upstream and downstream pressures acting on the plug are balanced out.

The pressure upstream of the restriction (1.4) is transferred over the control line (18) to the bottom diaphragm chamber and the pressure downstream of the restriction (1.4) is transferred through the hollow plug stem (7) past the diaphragm stem (6) to the top diaphragm chamber of the actuator. This differential pressure creates a positioning force at the operating diaphragm (12), which moves the valve plug depending on the force of the differential pressure springs (14). For example, if the flow rate increases, the differential pressure (at the restriction) increases as well. The actuator and plug stems move in the closing direction, causing the flow rate to decrease until it reaches the set point adjusted at the restriction (1.4). When the flow rate starts to drop, the described procedure is reversed.

Design and principle of operation





Legend for Fig. 3-1 and Fig. 3-2

1 Valve body	2 Seat	8 Vent plug (DN 125 and larger)	15 Screws
1.1 Set point adjuster for flow rate	3 Plug	11 Coupling nut	16 Diaphragm plate
1.2 Lock nut	5 Balancing bellows	12 Operating diaphragm	17 Nut
1.3 Cap	5.1 Balancing diaphragm	14 Differential pressure springs	18 High-pressure control line
1.4 Restriction	6 Diaphragm stem	19 Control line connection	
	7 Plug stem		

3.1 Additional fittings

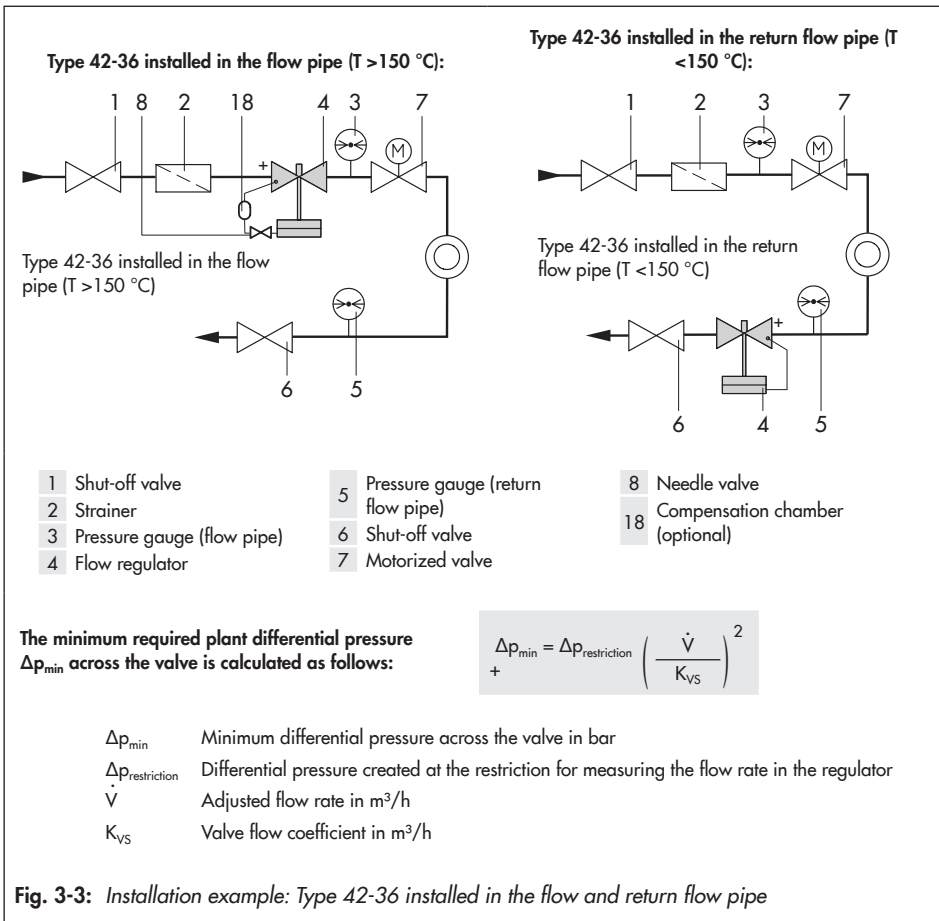
→ See Fig. 3-3

Pressure gauges

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

Bypass and shut-off valves

We recommend installing a shut-off valve (1 and 6) both upstream of the strainer and downstream of the regulator and installing a bypass line. The bypass ensures that the plant does not need to be shut down for service and repair work on the regulator.



Strainer

We recommend 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 pressure reducing valve (▶ EB 1015).

Insulation

Regulators can be insulated to reduce heat energy transfer.

Refer to the instructions in the 'Installation' section.

i Note

The Type 42-36 Regulator is not a safety valve. If necessary, a suitable overpressure protection must be installed on site in the plant section.

3.2 Technical data

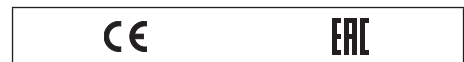
The valve and actuator nameplates provide information on the valve and actuator versions (see the 'Markings on the device' section).

i Note

More information is available in Data Sheet ▶ T 3015.

Conformity

The Type 42-36 Regulator bears both the CE and EAC marks of conformity.



Process medium and scope of application

The Type 42-36 Flow Regulator is designed to maintain the flow rate in a plant to the adjusted set point.

- For **liquids, gases and vapors**
- Max. temperature **150 °C/220 °C**¹⁾
- Set points from **0.05 to 520 m³/h**
- Valve 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 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.

¹⁾ Valve balanced by a bellows

Design and principle of operation

Temperature range

Depending on how the regulator is configured, 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 3015).



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 3-10.

Table 3-1: Technical data · All pressures in bar (gauge)

Type 2423 Valve · Balanced by a bellows			
Valve size		DN 15 to 100	DN 125 to 250
Pressure rating		PN 16, 25 or 40	
Max. permissible temperature	Valve body	180 °C Special version for steam: 220 °C	220 °C
	Actuator	See pressure-temperature diagram in ► T 3000 With compensation chamber: steam and liquids up to 220 °C Without compensation chamber: liquids up to 150 °C, air and nitrogen up to 150 °C ¹⁾	
Set point (differential pressure at restriction)		0.2 bar · 0.5 bar	
Leakage class according to IEC 60534-4		≤0.05 % of K_{VS} coefficient	
Conformity			
Refer to Fig. 3-4 for the assignment of actuator and valve			
Type 2423 Valve · Balanced by a diaphragm			
Valve size		DN 65 to 250	
Pressure rating		PN 16, 25 or 40	
Max. permissible temperature	Valve body	See pressure-temperature diagram in ► T 3000	
	Actuator	Liquids 150 °C, air and gases 80 °C	
Set point (differential pressure at restriction)		0.2 bar · 0.5 bar	
Leakage class according to IEC 60534-4		≤0.05 % of K_{VS} coefficient	
Conformity			
Refer to Fig. 3-4 for the assignment of actuator and valve			

¹⁾ Special version: valve with orifice stem seal and operating diaphragm made of FKM

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														
Valve 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 m ³ /h														
Diff. press. 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
	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. diff. pressure Δp	25 bar						20 bar		16 bar		12 bar	10 bar		
Type 2423 Valve, balanced by a diaphragm														
Valve 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 m ³ /h														
Diff. press. 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						
	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. diff. 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)

Design and principle of operation

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	Sph. 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 · Balanced by a diaphragm					
Pressure rating	PN 16	PN 25	PN 16, 25 and 40		
Valve body	Cast iron EN-GJL-250	Sph. 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 1.0332 · EPDM balancing diaphragm, max. 150 °C or NBR diaphragm, max. 80 °C				
Type 2426 Actuator					
Diaphragm cases	1.0332			1.4301	
Diaphragm	EPDM with fabric reinforcement · Special version for mineral oils: FKM				
Max. perm. temperature at the diaphragm	Air and gases 80 °C; liquids 120 °C · 150 °C ⁶⁾				
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

⁶⁾ Only with the actuator in the suspended position (see 'Installation conditions' in the 'Installation' section).

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

Valve 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 stainl. steel	113	–	130	–	170	176	–						
	Other materials	115			150			175	180	200	250	280	400	
Height H ^{5) 4)}		390						465	520	625	765	895		
Actuator		$(\text{ØD} = 225 \text{ mm}, A = 160 \text{ cm}^2)^{2)}$									$(\text{ØD} = 285 \text{ mm}, A = 320 \text{ cm}^2)^{3)}$			
Weight for PN 16 ⁴⁾ in kg (approx.)		12	12.5	13.5	20	20.5	23	39	44	59	121	171	425	485

- 1) Version with V-ring packing in DN 15 to 100: +60 mm.
- 2) 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.
- 3) Optionally with 640 cm² actuator
- 4) Valve in PN 25/40: +10 %
- 5) Minimum clearance required to remove the actuator: +100 mm
- 6) Actuator with two diaphragms: Height H +55 mm

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

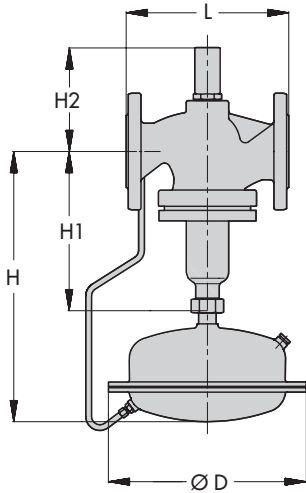
Valve size	DN	65	80	100	125	150	200	250
Length L		290	310	350	400	480	600	730
Height H ^{2) 3)}		355		380	450	475	585	
Height H2		195		220	295	325	345	375
Weight for PN 16¹⁾ in kg (approx.)								
Type 2423 Valve		34	39	56	65	85	250	270
Type 2426 Actuator		9			21		42	

- 1) PN 25/40: +10 %
- 2) Minimum clearance required to remove the actuator: +100 mm
- 3) Actuator with two diaphragms: Height H +55 mm

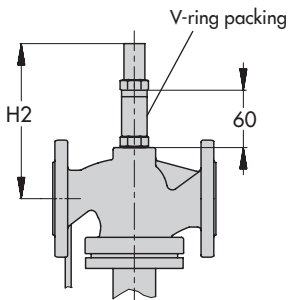
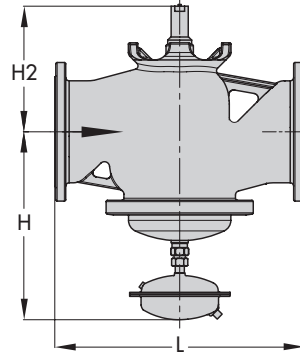
Design and principle of operation

Dimensional drawings

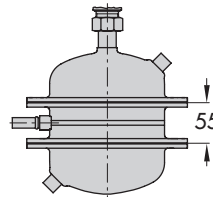
Type 2423 Valve balanced by a bellows



Type 2423 Valve, balanced by a diaphragm



Actuator with two diaphragms



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. 3-4: Dimensions

4 Shipment and on-site transport

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

4.1 Accepting the delivered goods

After receiving the shipment, proceed as follows:

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' section 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' section.

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 injury 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 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' section 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' section 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).
- Do not damage the corrosion protection (paint, surface coatings). Repair any damage immediately.
- Protect the regulator against moisture and dirt.

- 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 after installation.
- Prevent the regulator from tilting or tipping.
- Do not leave loads suspended when interrupting work for longer periods of time.
- Make sure that the axis of the pipeline is always horizontal during lifting and the axis of the plug stem is always vertical.

Lifting

1. Attach one sling to the flange of the body and to the rigging equipment (e.g. hook) of the crane or forklift (see Fig. 4-1).
2. Carefully lift the regulator. Check whether the lifting equipment and accessories can bear the weight.

3. Move the regulator at an even pace to the site of installation.
4. Install the regulator into the pipeline (see the 'Installation' section).
5. After installation in the pipeline, check whether the regulator flanges are bolted tight.
6. Remove slings.

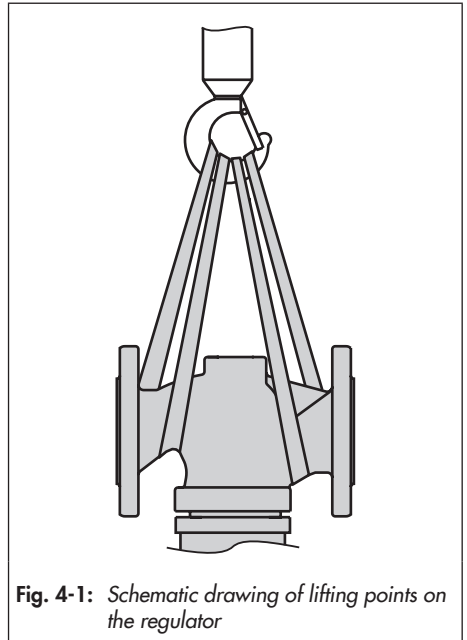


Fig. 4-1: Schematic drawing of lifting points on the regulator

4.4 Storing the regulator

NOTICE

Risk of regulator damage due to improper storage.

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

Note

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

Storage instructions

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

- Do not place any objects on the regulator.

Special storage instructions for elastomers

Elastomer, e.g. operating diaphragm

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

Tip

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

5 Installation

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

5.1 Installation conditions

Work position

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

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

Pipeline routing

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

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

- Observe the inlet and outlet lengths (see Table 5-1). Contact SAMSON if the regulator conditions or state of the medium process deviate.

- Install the regulator free of stress and with the least amount of vibrations as possible. Read information under 'Mounting position' and 'Support or suspension' in this section.
- For media with a tendency to condensate, an automatic drainage must be installed. Install the pipeline with a slight downward slope on both sides of the regulator to prevent condensate from collecting in the valve.
- Install the regulator allowing sufficient space to remove the actuator and valve or to perform service work on them.

Mounting position

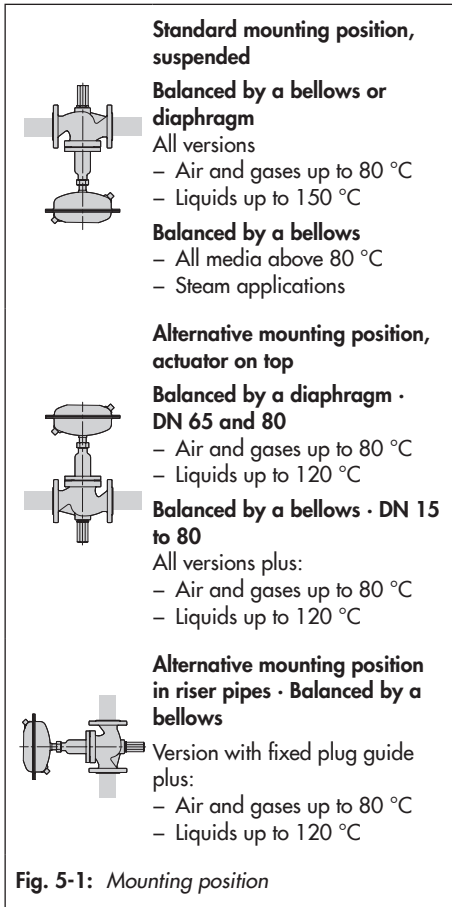
To ensure that the regulator functions properly, proceed as follows:

- 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.



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

Do not attach supports directly to the valve or actuator.

Control line kit

After the actuator has been mounted, attach the supplied high-pressure control line to the regulator (see the 'Design and principle of operation' section).

A control line kit for tapping pressure at the valve body is available as an accessory part from SAMSON (► T 3095).

💡 Tip

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

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

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.

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. We recommend first installing the valve without the actuator into the pipeline.

Before installation, make sure 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, valve size, material, pressure rating and temperature range) match the plant conditions (size and pressure rating of the pipeline, medium temperature etc.). See the 'Markings on the device' section for nameplate details.
- The requested or required additional fittings (see the 'Design and principle of operation' section) have been installed or

prepared as necessary before installing the valve.

Proceed as follows:

- ➔ Lay out the necessary material and tools to have them ready during installation work.
- ➔ Flush the pipeline **before** installing the regulator.
The plant operator is responsible for cleaning the pipelines in the plant.
- ➔ 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.

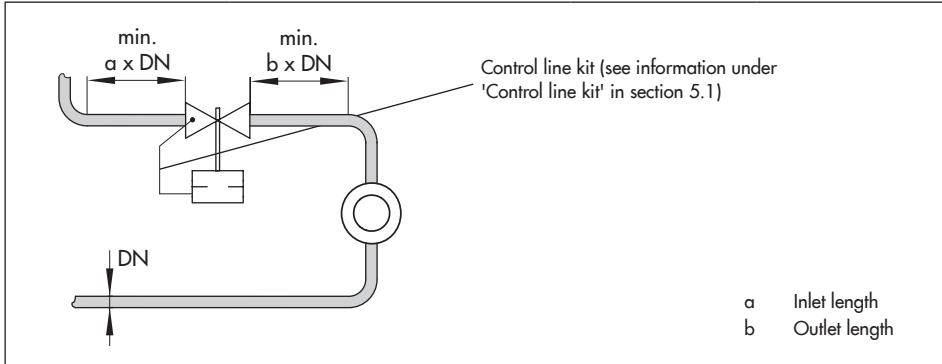
DANGER

Danger due to suspended loads falling.

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

Installation

Table 5-1: Inlet and outlet lengths



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

¹⁾ No saturated steam

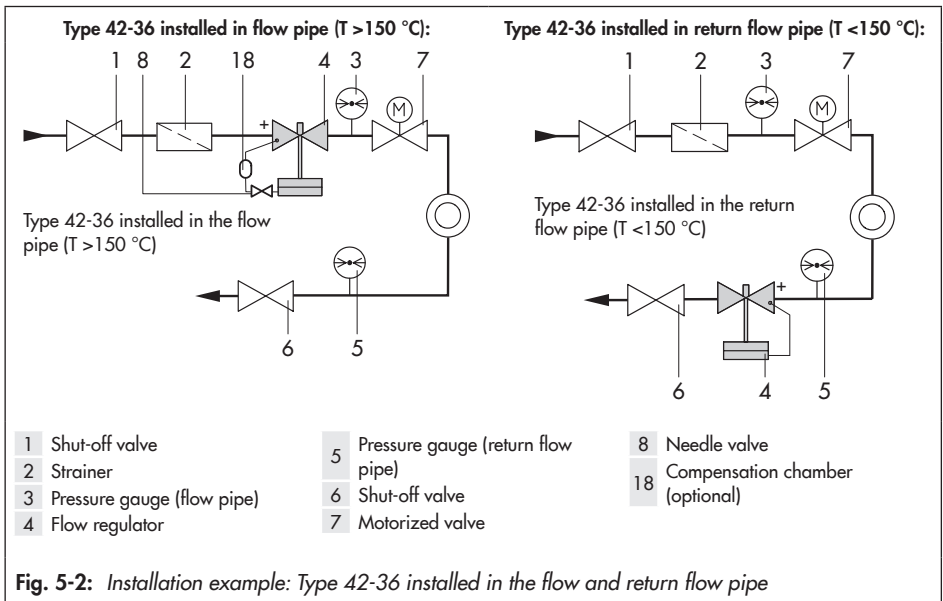


Fig. 5-2: Installation example: Type 42-36 installed in the flow and return flow pipe

⚠ 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 injury 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' section for the weights of the regulator and actuator.
- ➔ 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' section 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 'Tools' in Annex).

ⓘ NOTICE

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

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

ⓘ NOTICE

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

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

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

5.3.1 Installing the regulator

i Note

Before installing the regulator, tighten the blanking plug(s) at the side of the valve body using a suitable box wrench.

Tightening torque:

50 Nm (G ¼), 70 Nm (G ⅜).

The regulator can be installed into the downstream pressure pipe (return flow pipe) or the upstream pressure pipe (flow pipe) of the plant. See installation examples in Fig. 5-2.

1. Close the shut-off valves (1, 6) 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.

→ Procedure for ready-assembled device

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.

→ Procedure for regulator delivered as separate components

1. Lift the valve 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.
2. Make sure that the correct flange gaskets are used.
3. Bolt the pipe to the valve free of stress.
4. 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 'Tightening torques' in Annex).
5. Mount the control line.
 - Mount the control line onto the valve and actuator. Observe the specified tightening torques (see 'Tightening torques' in Annex).
 - For **steam** or **liquids above 150 °C** install the compensation chamber and fill it with the process medium. Observe the specified tightening torques (see 'Tightening torques' in Annex).
6. 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 all the plant sections concerned as well as the valve.

⚠ WARNING

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

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

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

⚠ 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.

The regulator components are delivered by SAMSON 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 Leak test

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



Tip

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

- All required control lines are connected to the actuator and are not shut off.
- 1. Install the regulator into the pipeline (see the 'Installation' section).
- 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



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

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

- Do not loosen the control line while the valve is pressurized.
- Do not start up the regulator until all parts have been mounted.

i Note

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

! NOTICE

*Risk of valve damage due to a sudden pressure increase.
– 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 'Technical data' in the 'Design and principle of operation' section).
- 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. 5-3).

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

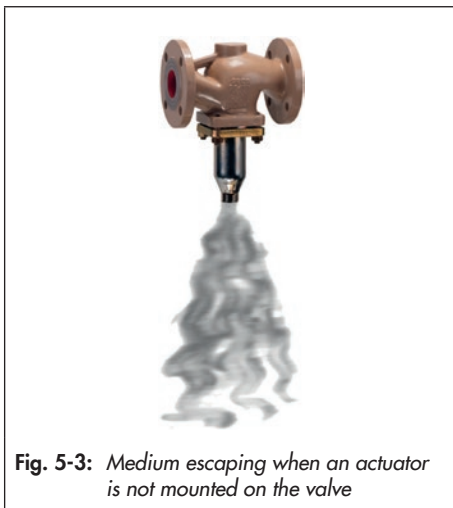


Fig. 5-3: *Medium escaping when an actuator is not mounted on the valve*

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 information under 'Starting up the plant' in the 'Start-up' section.
- A lower set point is adjusted at the controller and all consumers are open to guarantee a high flow rate.

Installation

- 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' section.

5.5 Insulation

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

1. Start up the plant and adjust the set point (see the 'Start-up' section).
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 thick-

ness depends on the medium temperature and the ambient conditions. 50 mm is a typical thickness.

NOTICE

Risk of regulator damage due to incorrect insulation.

- *The actuator must be insulated for medium temperatures below 0 °C.*
 - *The regulator must only be insulated up to the bottom section with balancing bellows or up to the connection of the actuator for medium temperatures above 80 °C.*
-

6 Start-up

The work described in this section is only to be performed 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 process medium being discharged.

- *Do not loosen 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 into the pipeline (see the 'Installation' section).
- The leak and function tests have been completed successfully (see the 'Testing the regulator' section).
- The prevailing conditions in the plant section concerned meet the regulator sizing requirements (see information under 'Intended use' in the 'Safety instructions and measures' section).

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. Open the shut-off valves slowly over a time period of several minutes. Slowly opening these valves prevents a sudden surge in pressure which can damage the regulator parts.
3. Check the regulator to ensure it functions properly (see information under 'Adjusting the flow rate in the 'Operation' section).

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

- The control line is connected correctly.

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 'Regulation of liquids' and 'Regulation of steam' 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 (1.4) is open by turning the adjustment screw counterclockwise (↺) as far as it will go.

i Note

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

6.2.1 Regulation of liquids

- 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 Regulation of steam

- Warm up the plant very slowly. During this procedure, drain off any condensate and vent the plant.
- First fill the compensation chamber with water. Proceed as follows:
1. Unscrew filler plug from the compensation chamber.
 2. Use the included plastic funnel or a jug to pour in 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' section), 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 process medium being discharged.

- Do not loosen 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).

Operation

i Note

Observe the differential pressure across the restriction $\Delta p_{\text{restriction}}$ of 0.2 bar or 0.5 bar. It is determined by the differential pressure springs (14) installed in the actuator (see the 'Markings on the device' section).

- Based on a closed restriction, turn the restriction screw counterclockwise (⤵) to adjust this value. Wait until the plant has settled. If necessary, readjust.
- Check the flow rate at the heat meter and correct it, if necessary.
- 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.
- Close a possibly open bypass valve again.
- Lead-seal the setting, if necessary.

7.2 Adjusting the flow rate

- Unscrew the cap (1.3).
- Undo lock nut (1.2). Turn restriction screw clockwise as far as it will go.
- Find the flow rate set point in the diagram and determine the associated number of turns.

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

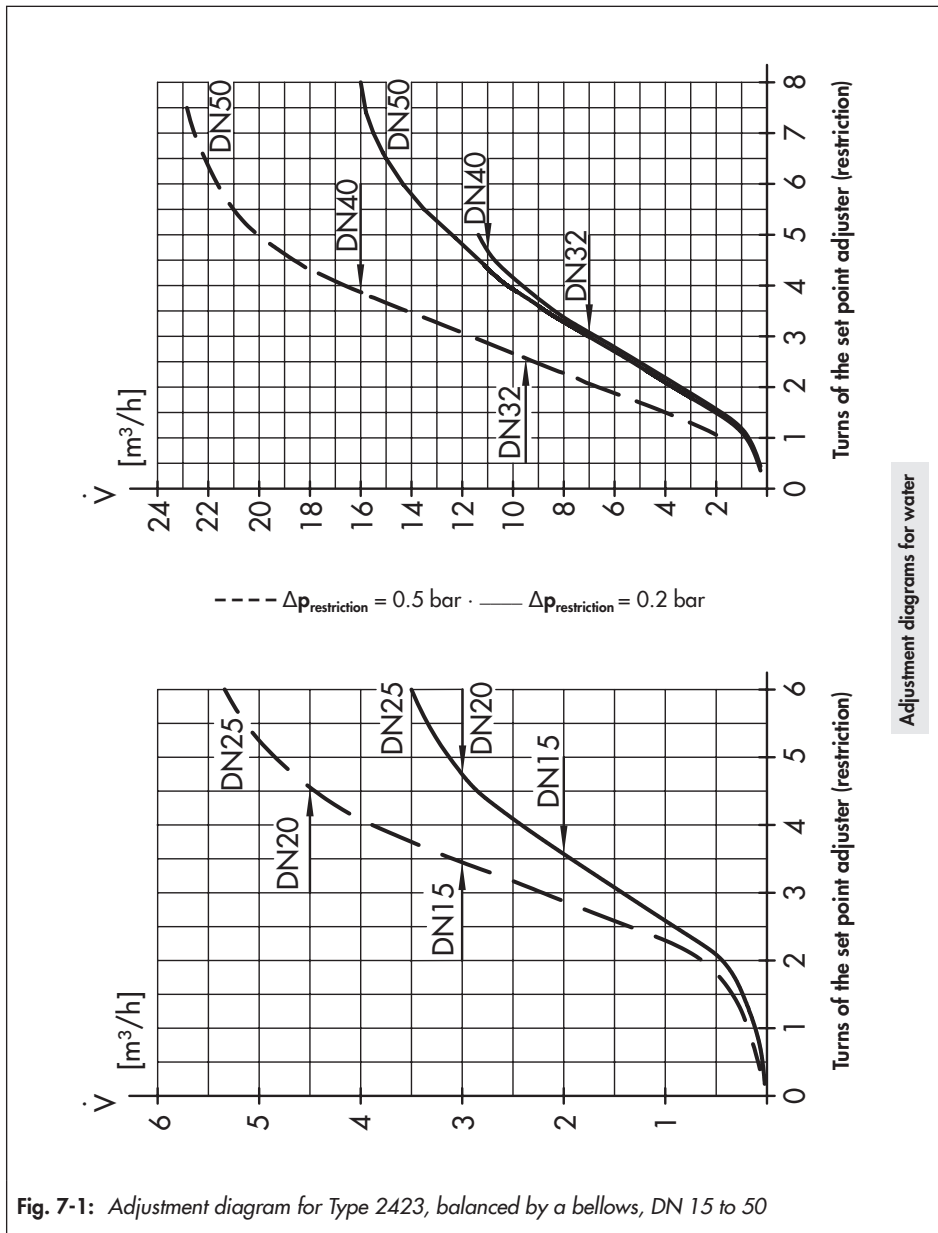
Type 2423 · Balanced by a bellows

Valve size DN	15	20	25	32	40	50	65	80	100	125	150	200	250
Flow rate set point ranges for water in m ³ /h													
Diff. press. across restriction $\Delta p_{\text{restriction}}$ 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. press. across restriction $\Delta p_{\text{restriction}}$ 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. diff. pressure Δp	25 bar						20 bar		16 bar		12 bar	10 bar	

Type 2423 · Balanced by a diaphragm

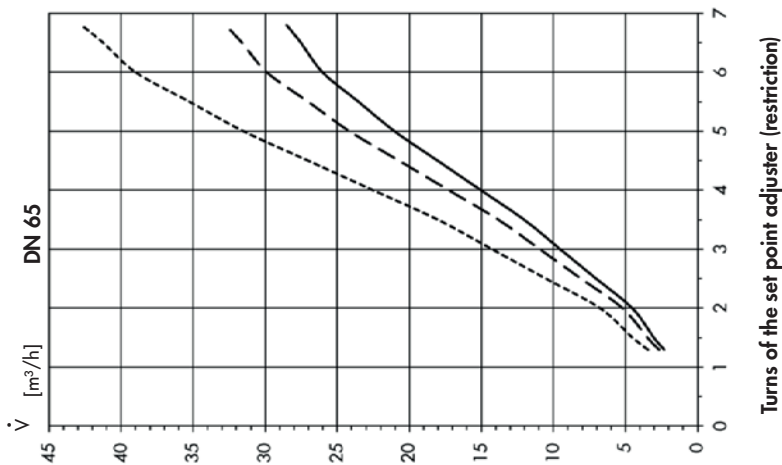
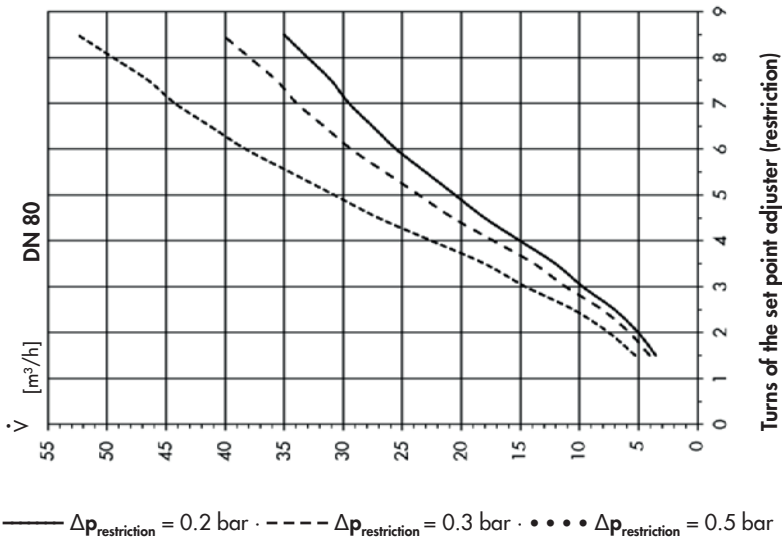
Valve size DN	65	80	100	125	150	200	250
Flow rate set point ranges for water in m ³ /h							
Diff. press. across restriction $\Delta p_{\text{restriction}}$ 0.2 bar	2 to 28	3.5 to 35 ¹⁾	6.5 to 63	11 to 120	18 to 180	20 to 320	26 to 350
Diff. press. across restriction $\Delta p_{\text{restriction}}$ 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. diff. 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)



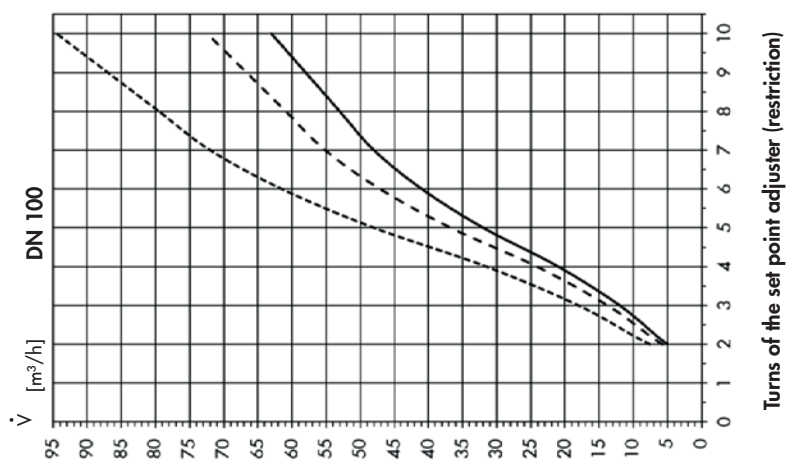
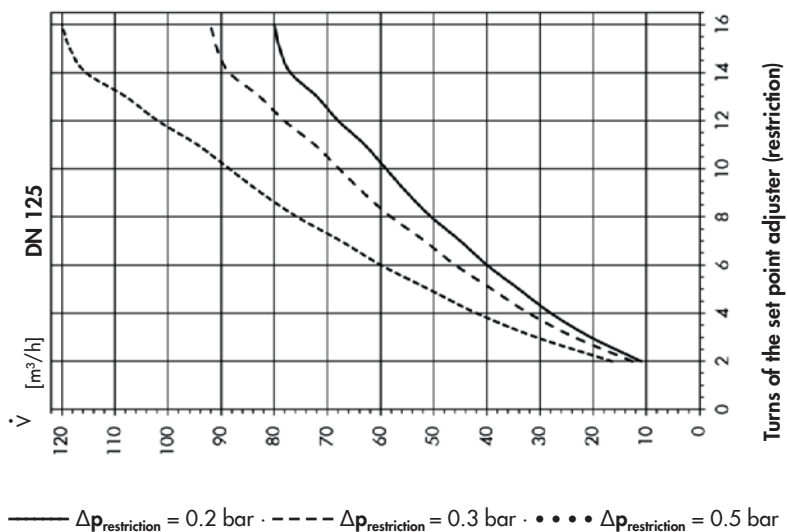
Adjustment diagrams for water

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



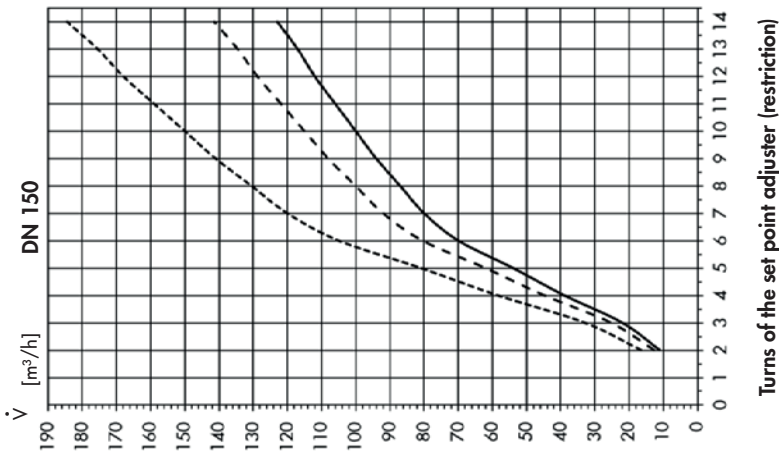
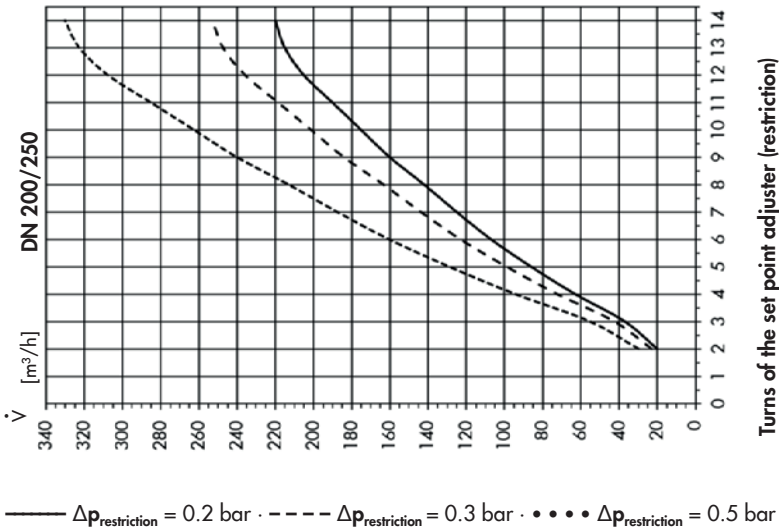
Adjustment diagrams for water

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



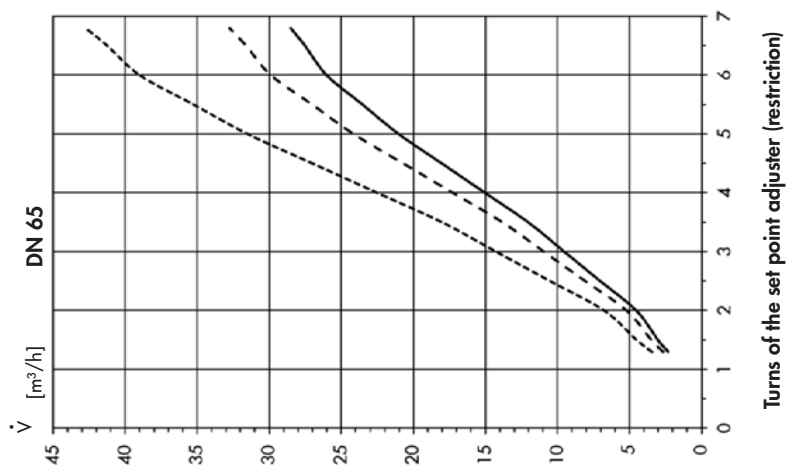
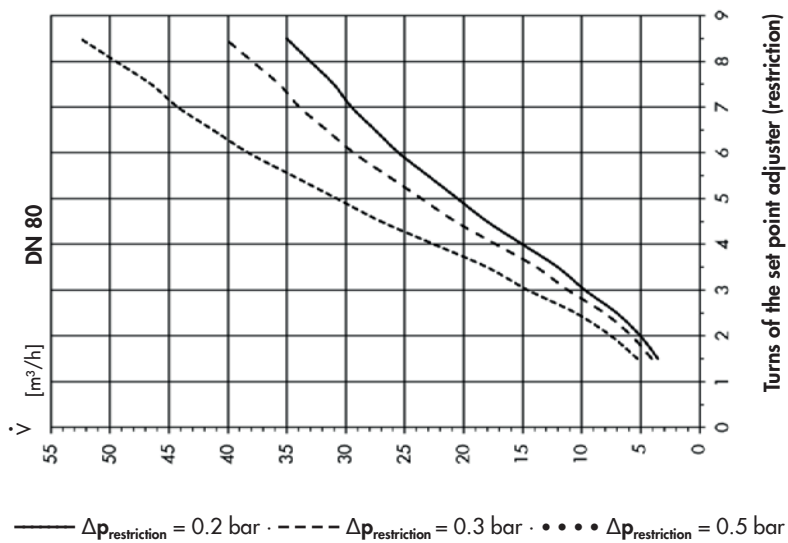
Adjustment diagrams for water

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



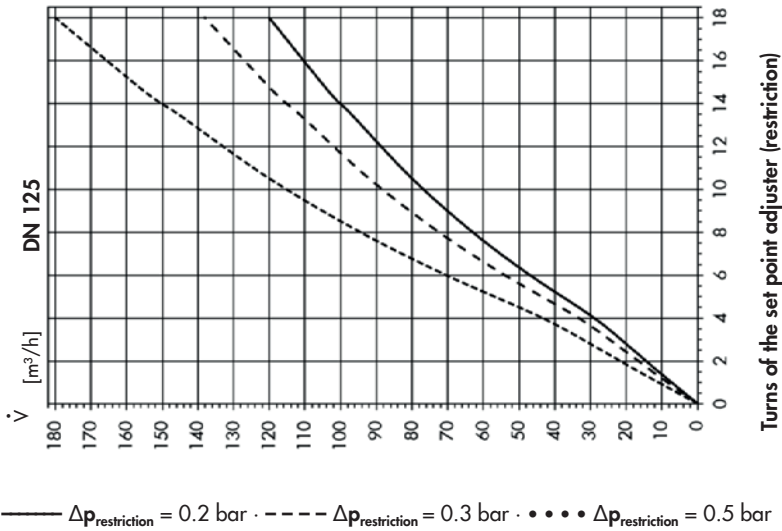
Adjustment diagrams for water

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



Adjustment diagrams for water

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



Adjustment diagrams for water

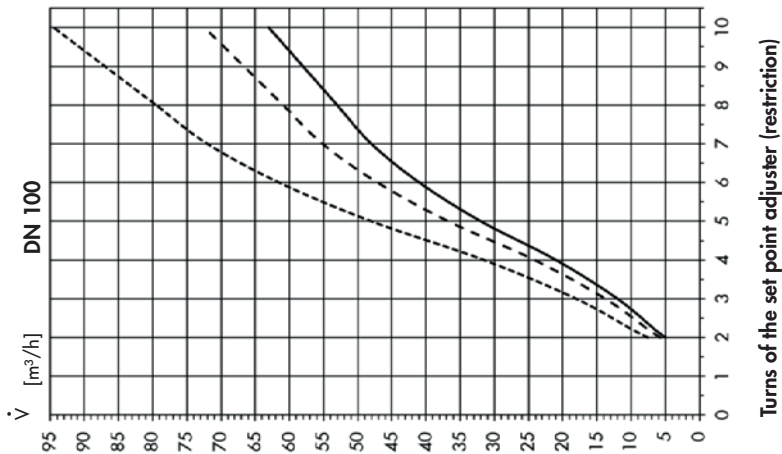
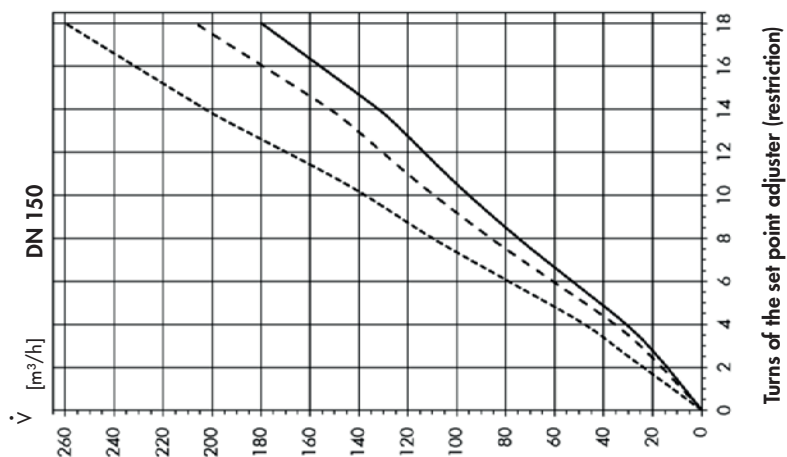
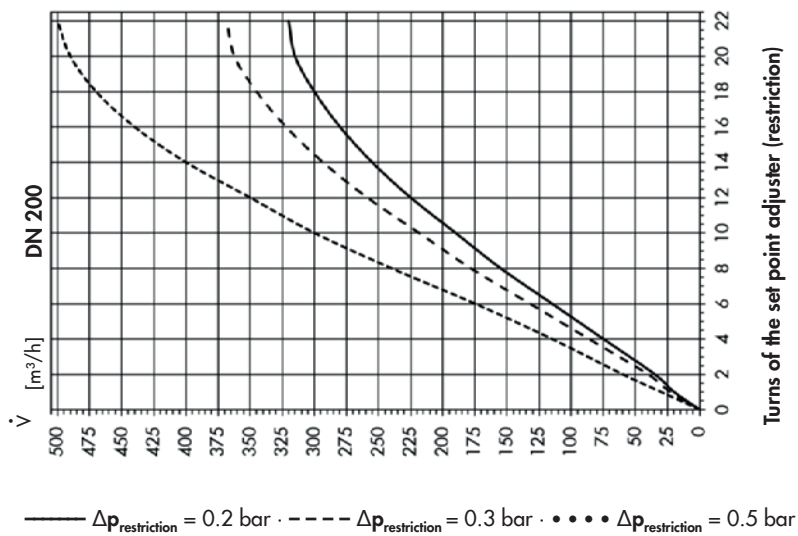


Fig. 7-6: Adjustment diagram for Type 2423, balanced by a diaphragm, DN 100 to 125



Adjustment diagrams for water

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

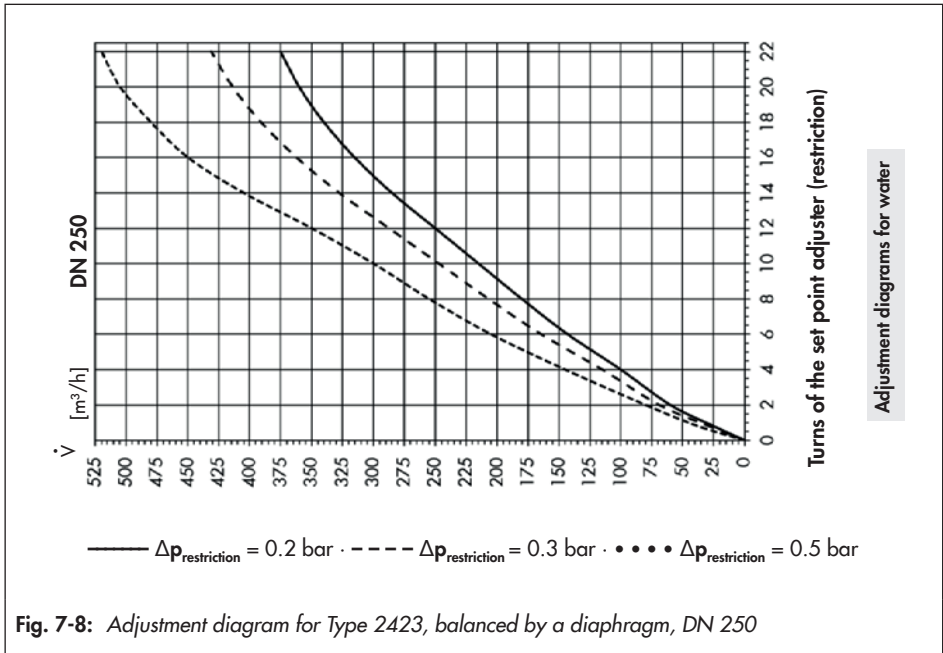


Fig. 7-8: Adjustment diagram for Type 2423, balanced by a diaphragm, DN 250

8 Malfunctions

8.1 Troubleshooting

Malfunction	Possible reasons	Recommended action
Flow rate 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.
Flow 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: $\Delta p_{\min} = \Delta p_{\text{restriction}} + (\dot{V}/K_{VS})^2$
	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.	

Malfunctions

Malfunction	Possible reasons	Recommended action
Flow rate fluctuates	Regulator or K_{VS}/C_V coefficient too large	<ul style="list-style-type: none"> → 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 in the control line for pressure tapping is too large or missing.	<ul style="list-style-type: none"> → Install a restriction. → Install a smaller restriction.
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	<ul style="list-style-type: none"> → Remove foreign particles. → Replace damaged parts. → Contact SAMSON's After-sales Service.
Loud noises	High flow velocity, cavitation	<ul style="list-style-type: none"> → Check the sizing. → Install larger regulator, if necessary.
Leakage at the actuator	Defective operating diaphragm	→ Replace damaged diaphragm.

Note

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

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

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

Tip

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

8.2 Emergency action

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

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

In the event of a regulator malfunction:

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 section 8.1).
3. Rectify those malfunctions that can be remedied based on the instructions provided here. Contact SAMSON's After-sales Service in all other cases.

Putting the regulator back into operation after a malfunction

See the 'Start-up' section.

9 Servicing

The regulator does not require any 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' section.

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

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

⚠ 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' section 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 injury 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' section for the weights of the regulator and actuator.

NOTICE

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

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

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

NOTICE

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

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

NOTICE

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

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

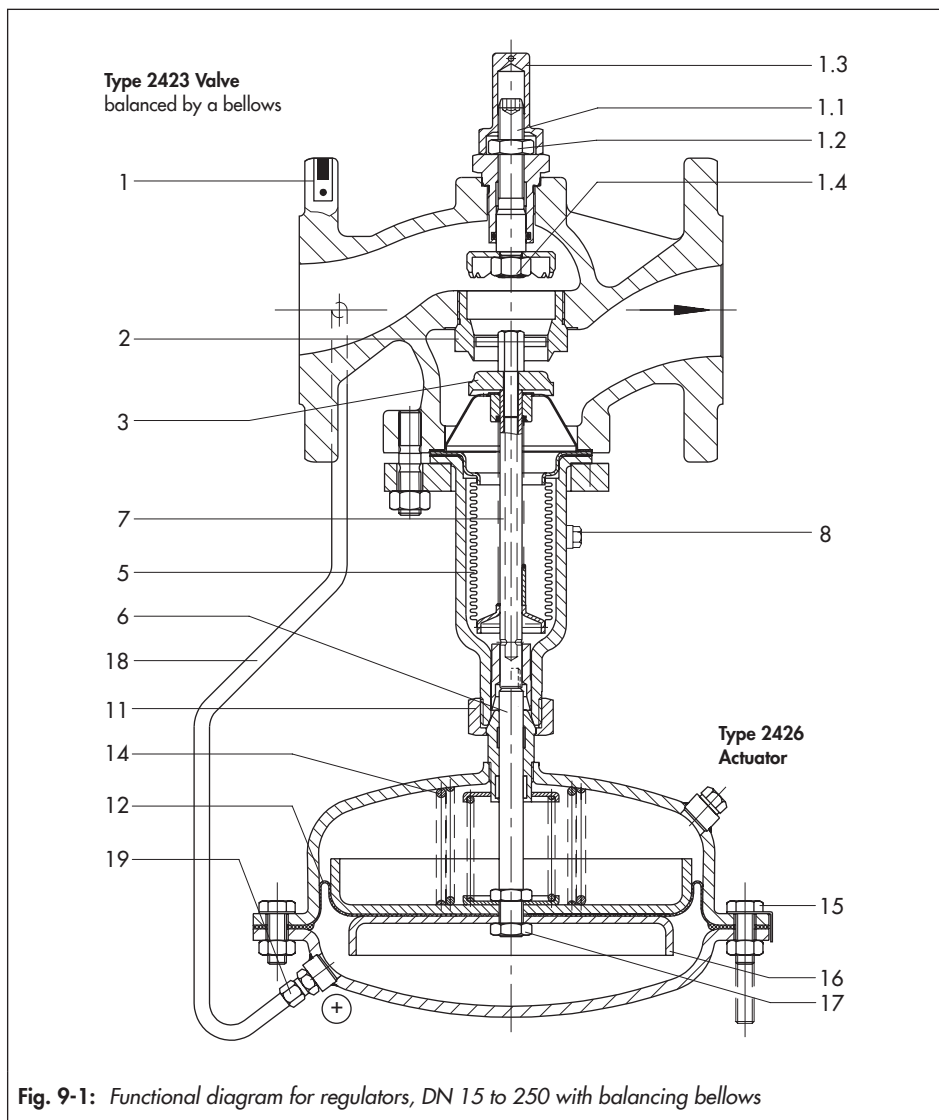
Note

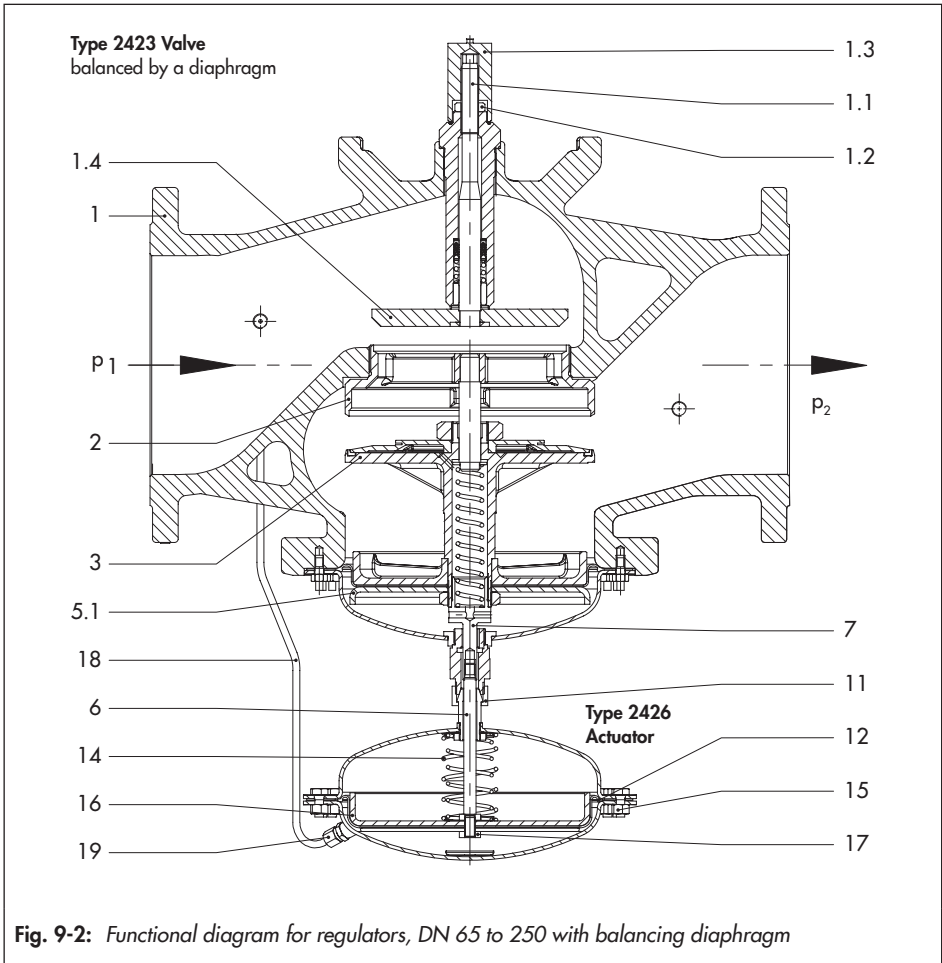
The regulator was checked by SAMSON before it left the factory.

- 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.





Legend for Fig. 9-1 and Fig. 9-2

1 Valve body	5 Balancing bellows	14 Differential pressure springs
1.1 Set point adjuster for flow rate	5.1 Balancing diaphragm	15 Bolts, nuts
1.2 Lock nut	6 Diaphragm stem	16 Diaphragm plate
1.3 Cap	7 Plug stem	17 Diaphragm plate nut
1.4 Restriction	8 Vent plug (DN 125 and larger)	18 High-pressure control line
2 Seat	11 Coupling nut	19 Control line connection
3 Plug	12 Operating diaphragm	

9.1 Preparing the valve for service work

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

**Tip**

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

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

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

9.2 Installing the regulator after service work

- Put the regulator back into operation (see the 'Start-up' section). 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 section 9.1).
- After all service work is completed, check the regulator before putting it back into operation (see the 'Testing the regulator' section).

9.3.1 Replacing the actuator

- See Fig. 9-1 and Fig. 9-2

Removing the actuator

1. Put the regulator out of operation (see the 'Decommissioning' section).
2. Unscrew the control line (18).
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 fasten tight the coupling nut (11). Observe the specified tightening torques (see 'Tightening torques' in Annex).
2. Screw on the control line (18). Observe the specified tightening torques (see 'Tightening torques' in Annex).
3. Put the regulator back into operation (see the 'Start-up' section).

9.3.2 Replacing the seat and plug

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

Further information is available in Annex ('After-sales service').

9.3.3 Replacing the actuator's operating diaphragm

NOTICE

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

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

Tip

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

→ See Fig. 9-1 and Fig. 9-2

Removing the operating diaphragm

1. Put the regulator out of operation (see the 'Decommissioning' section).
2. Unscrew the control line (18).
3. Unscrew the coupling nut (11) of the diaphragm actuator from the valve. Remove the actuator.
4. Clamp the coupling nut (11) into a suitable fixture.
5. Unscrew nuts and bolts (15) from the actuator. Remove the actuator case.
6. Unscrew the diaphragm plate nut (17) and remove the operating diaphragm (12) from the diaphragm plate (16).

Mounting the operating diaphragm

1. Place a new operating diaphragm (12) onto the diaphragm plate (16) (ensuring the pressurized side is facing in the correct direction) and tighten the diaphragm plate nut (17). Observe the specified tightening torques (see 'Tightening torques' in Annex).
2. Place on the actuator case.
3. Insert nuts and bolts (15) and tighten gradually in a crisscross pattern. Observe the specified tightening torques (see 'Tightening torques' in Annex).
4. Place the diaphragm actuator on the valve and fasten tight the coupling nut (11). Observe the specified tightening torques (see 'Tightening torques' in Annex).
5. Screw on the control line (18). Observe the specified tightening torques (see 'Tightening torques' in Annex).

Servicing

6. Put the regulator back into operation (see the 'Start-up' section).

9.4 Ordering spare parts and operating supplies

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

Spare parts

See Annex for details on spare parts.

Lubricant

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

Tools

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

10 Decommissioning

The work described in this section is only to be performed 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 all the plant sections concerned as well as the valve.

⚠ WARNING

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

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

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

Decommissioning

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

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

11 Removal

The work described in this section is only to be performed 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 the valve, make sure the following conditions are met:

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

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' section).
2. Unbolt the flanged joint.
3. Remove the regulator from the pipeline (see the 'Shipment and on-site transport' section).

11.2 Removing the actuator from the valve

See the 'Servicing' section.

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 repair work.

12.1 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

1. Exceptions apply concerning some special device models
 - ▶ www.samsongroup.com > Service & Support > After-sales Service.

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

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

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

i Note

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

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

13 Disposal



We are registered with the German national register for waste electric equipment (stiftung ear) as a producer of electrical and electronic equipment, WEEE reg. no.: DE 62194439

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

i Note

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

Tip

On request, we can appoint a service provider to dismantle and recycle the product.

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-KONFORMITÄTSERKLÄRUNG EU DECLARATION OF CONFORMITY

Modul H/Module H, Nr./No. / N° CE-0062-PED-H-SAM 001-16-DEU-rev-A

SAMSON erklärt in alleiniger Verantwortung für folgende Produkte:/For the following products, SAMSON hereby declares under its sole responsibility:

Ventile für Druck-, Differenzdruck-, Temperatur- und Volumenstromregler/Valves for pressure, temperature, flowregulators and differential pressure regulators

Typ 2336, 2373, 2375, 44-1B, 44-2, 44-3, 44-4, 44-6B, 44-9, 45-1, 45-2, 45-3, 45-4, 45-6, (Erz.-Nr. 2720), 45-9, 47-4, 2488, 2489, (2730), 2405, 2406, 2421 (2811), 2412 (2812), 2417 (2817), 2422 (2814), 2423 (2823), 2423E (2823)

die Konformität mit nachfolgender Anforderung/the conformity with the following requirement

Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Druckgeräten auf dem Markt. 2014/68/EU vom 15.05.2014

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 (see also Articles 41 and 48). 2014/68/EU of 15 May 2014

Angewandtes Konformitätsbewertungsverfahren für Fluide nach Art. 4(1)(c.i) erster Gedankenstrich.

Modul siehe
Tabelle

durch
certified by
Bureau Veritas
S. A. (0062)

Conformity assessment procedure applied for fluids according to Article 4(1)(c.i), first indent

Nenndruck Pressure rating	DN NPS	15 ½	20 ¾	25 1	32 1¼	40 1½	50 2	65 -	80 3	100 4	125 -	150 6	200 8	250 10	300 12	400 16	
PN 16		ohne/without ⁽¹⁾		A ⁽²⁾⁽³⁾				-	-	-	-	H	-	-	-	-	-
PN 25		ohne/without ⁽¹⁾		A ⁽²⁾⁽³⁾													
PN 40		ohne/without ⁽¹⁾		A ⁽²⁾⁽³⁾													
PN 100 und PN 160		ohne/without ⁽¹⁾		A ⁽²⁾⁽³⁾					H								
Class 150		ohne/without ⁽¹⁾		A ⁽²⁾⁽³⁾								H					
Class 300		ohne/without ⁽¹⁾		A ⁽²⁾⁽³⁾								H					
Class 600 und Class 900		ohne/without ⁽¹⁾		A ⁽²⁾⁽³⁾					H								

(1) Das auf dem Stellgerät aufgebrachte CE-Zeichen hat keine Gültigkeit im Sinne der Druckgeräterichtlinie.
The CE marking affixed to the control valve is not valid in the sense of the Pressure Equipment Directive.

(2) Das auf dem Stellgerät aufgebrachte CE-Zeichen gilt ohne Bezeichnung der benannten Stelle (Kenn-Nr. 0062).
The CE marking affixed to the control valve is valid without specifying the notified body (ID number 0062).

(3) Die Identifikationsnummer 0062 von Bureau Veritas S.A. gilt nicht für Modul A.
The identification number 0062 of Bureau Veritas S.A. is not valid for Modul A.

Geräte, denen laut Tabelle das Konformitätsbewertungsverfahren Modul H zugrunde liegt, beziehen sich auf die „Zulassungsbescheinigung eines Qualitätssicherungssystems“ ausgestellt durch die benannte Stelle.

Devices whose conformity has been assessed based on Module H refer to the certificate of approval for the quality management system issued by the notified body.

Dem Entwurf zu Grunde gelegt sind Verfahren aus:/The design is based on the methods of:

DIN EN 12516-2, DIN EN 12516-3 bzw./or ASME B16.1, ASME B16.24, ASME B16.34, ASME B16.42

Das Qualitätssicherungssystem des Herstellers wird von folgender benannter Stelle überwacht:

The manufacturer's quality management system is monitored by the following notified body:

**Bureau Veritas S.A. Nr./No. 0062, Newtime, 52 Boulevard du Parc, Ile de la Jatte, 92200 Neuilly sur Seine, France
Hersteller/Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**

Frankfurt am Main, 08. Februar 2017/08 February 2017

i.v. Klaus Hirschchen

Klaus Hirschchen
Zentralabteilungsleiter / Head of Central Department
Entwicklung Ventile und Antriebe / R&D, Valves and Actuators

Dr. Michael Heß

Dr. Michael Heß
Zentralabteilungsleiter / Head of Central Department
Product Management & Technical Sales



**EU-KONFORMITÄTSERKLÄRUNG
EU DECLARATION OF CONFORMITY**

Modul H/Module H, Nr./No. / N° CE-0062-PED-H-SAM 001-16-DEU-rev-A

SAMSON erklärt in alleiniger Verantwortung für folgende Produkte:/For the following products, SAMSON hereby declares under its sole responsibility:

Ventile für Druck- Differenzdruck-, Volumenstrom- und Temperaturregler/Valves for pressure, differential pressure, volume flow and temperature regulators

2333 (Erz.-Nr./Model No. 2333), 2334 (2334), 2335 (2335), 2336, 2373, 2375, 44-0B, 44-1B, 44-2, 44-3, 44-6B, 44-7, 44-8, 45-1, 45-2, 45-3, 45-4, 45-5, 45-6, 2468, 2478 (2720), 45-9, 46-5, 46-6, 46-7, 46-9, 47-1, 47-4, 47-5, 47-9, 2487, 2488, 2489, 2491, 2494, 2495 (2730), 2405, 2406, 2421 (2811), 2392, 2412 (2812), 2114 (2814), 2417 (2817), 2422 (2814), 2423 (2823)

die Konformität mit nachfolgender Anforderung/the conformity with the following requirement.

Richtlinie des Europäischen Parlaments und des Rates zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Druckgeräten auf dem Markt. 2014/68/EU vom 15.05.2014

Directive of the European Parliament and of the Council on the harmonization of the laws of the Member States relating of the making available on the market of pressure equipment. 2014/68/EU of 15 May 2014

Angewandtes Konformitätsbewertungsverfahren für Fluide nach Art. 4(1)(c.ii) und (c.i) zweiter Gedankenstrich. Modul siehe Tabelle durch certified by Bureau Veritas S. A. (0062)

Conformity assessment procedure applied for fluids according to Article 4(1)(c.ii) and (c.i), second indent See table for module

Nenndruck Pressure rating	DN NPS	15	20	25	32	40	50	65	80	100	125	150	200	250	300	400	
		½	¾	1	1¼	1½	2	-	3	4	-	6	8	10	12	16	
PN 16		ohne/without (1)						A (2)(3)				H					
PN 25		ohne/without (1)				A (2)(3)				H							
PN 40		ohne/without (1)				A (2)(3)				H							
PN 100 und PN 160		ohne/without (1)				H											
Class 150		ohne/without (1)				A (2)(3)				H							
Class 300		ohne/without (1)				A (2)(3)				H							
Class 600 und Class 900		ohne/without (1)				H											

- (1) Das auf dem Stellgerät aufgebrachte CE-Zeichen hat keine Gültigkeit im Sinne der Druckgeräterichtlinie.
The CE marking affixed to the control valve is not valid in the sense of the Pressure Equipment Directive.
- (2) Das auf dem Stellgerät aufgebrachte CE-Zeichen gilt ohne Bezeichnung der benannten Stelle (Kenn-Nr. 0062).
The CE marking affixed to the control valve is valid without specifying the notified body (ID number 0062).
- (3) Die Identifikationsnummer 0062 von Bureau Veritas S.A. gilt nicht für Modul A.
The identification number 0062 of Bureau Veritas S.A. is not valid for Modul A.

Geräte, denen laut Tabelle das Konformitätsbewertungsverfahren Modul H zugrunde liegt, beziehen sich auf die „Zulassungsbescheinigung eines Qualitätssicherungssystems“ ausgestellt durch die benannte Stelle.
Devices whose conformity has been assessed based on Module H refer to the certificate of approval for the quality management system issued by the notified body.

Dem Entwurf zu Grunde gelegt sind Verfahren aus/The design is based on the procedures specified in the following standards:
DIN EN 12516-2, DIN EN 12516-3 bzw./or ASME B16.1, ASME B16.24, ASME B16.34, ASME B16.42

Das Qualitätssicherungssystem des Herstellers wird von folgender benannter Stelle überwacht:
The manufacturer's quality management system is monitored by the following notified body:

**Bureau Veritas S.A. Nr./No. 0062, Newtime, 52 Boulevard du Parc, Ile de la Jatte, 92200 Neuilly sur Seine, France
Hersteller/Manufacturer: SAMSON AG, Weismüllerstraße 3, 60314 Frankfurt am Main, Germany**

Frankfurt am Main, 08. Februar 2017/08 February 2017

i.v. Klaus Hirschen
Klaus Hirschen
Zentralabteilungsleiter/Head of Central Department
Entwicklung Ventile und Antriebe/R&D, Valves and Actuators

i.v. Michael Heß
Dr. Michael Heß
Zentralabteilungsleiter/Head of Central Department
Product Management & Technical Sales

EU-Konformitätserklärung_Biirt-04_Modul_H_DE-EN_Rev03_2017-02_08.docx

15 Annex

15.1 Tightening torques

Table 15-1: *Tightening torque*

Component	Width across flats	Valve size/actuator area	Tightening torque in Nm
Cap (1.3)	SW 30	DN 15 to 100	20
	SW 36	DN 125 to 250	40
Coupling nuts (11)	SW 36	All	120
Diaphragm plate nut (17)	SW 12	40 to 640 cm ²	40
Nuts and bolts (15)	–	40 to 640 cm ²	25
Control line connection (17)	–	40 to 640 cm ²	22

15.2 Lubricant

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

15.3 Tools

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

15.4 Accessories

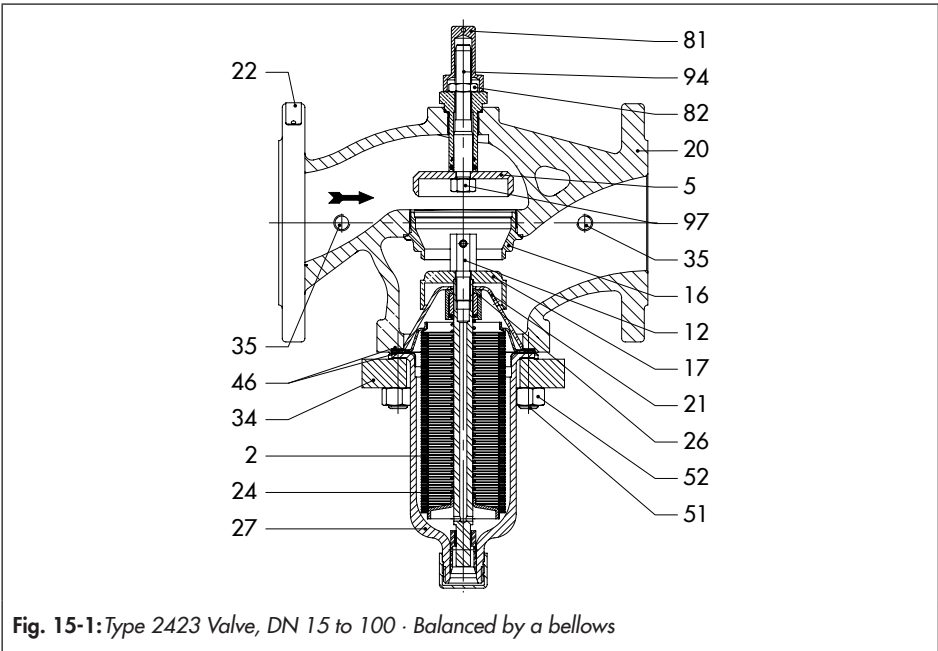
Table 15-2: *Assignment of compensation chamber (18) to regulator, with item no.*

Type 2426 Actuator Actuator area A	Item number · Compensation chamber	
	DN 15 to 50	DN 65 to 100
640 cm ²	1190-8789	1190-8790
320 cm ²	1190-8788	1190-8789
160, 80, 40 cm ²	1190-8788	

15.5 Spare parts

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

2	Bellows	34	Flange
5	Restriction	35	Screw plug
12	Balancing screw	46	Graphite seal on metal core
16	Seat	51	Stud
17	Plug	52	Hex nut
20	Body	81	Cap
21	Guide cap	82	Hex nut
22	Label	94	Set point adjuster
24	Compression spring	132	O-ring
26	Guide tube	171	Clamping ring
27	Bottom section	172	Seal



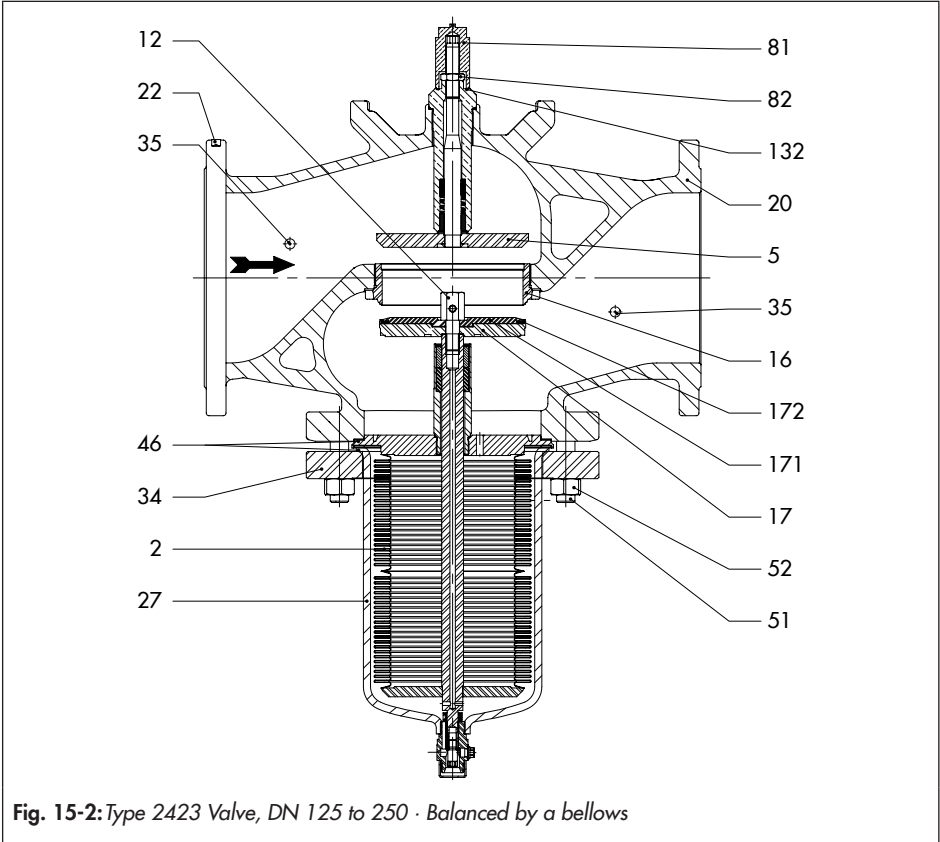
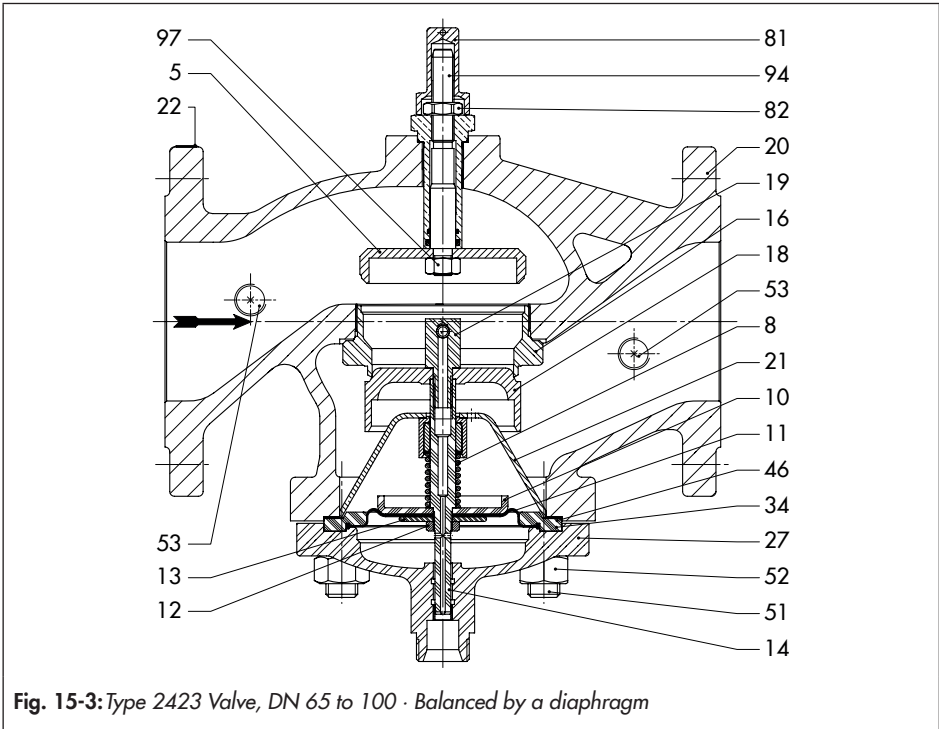


Fig. 15-2: Type 2423 Valve, DN 125 to 250 · Balanced by a bellows

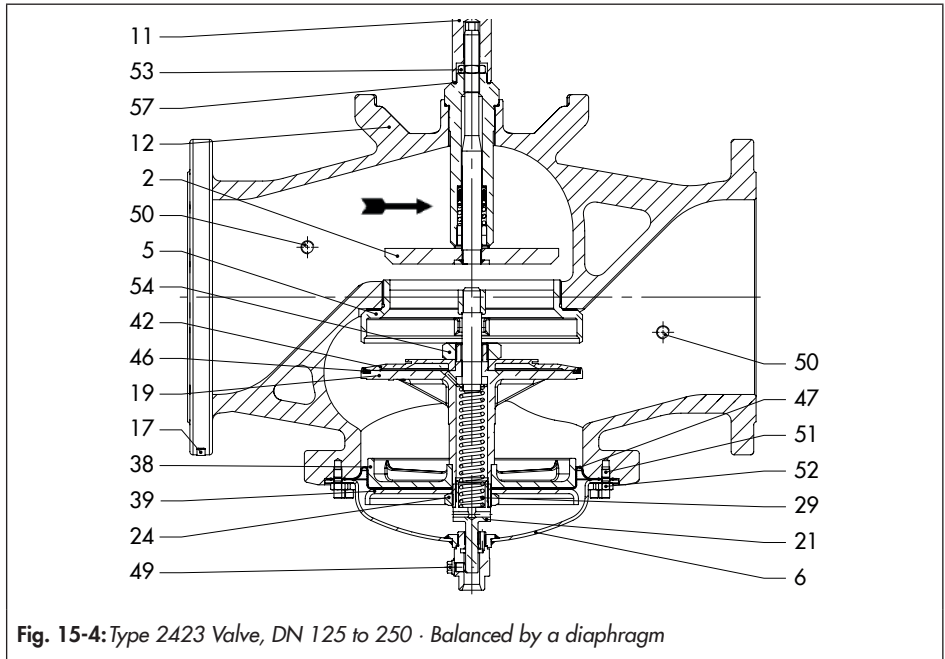
Legend for Fig. 15-3

5	Restriction	22	Label
8	Compression spring	27	Cover
10	Diaphragm plate	34	Ring
11	Diaphragm	46	Seal
12	Castle nut	51	Stud
13	Washer	52	Hex nut
14	Plug stem	53	Screw plug
16	Seat	81	Cap
18	Plug	82	Hex nut
19	Screw	94	Set point adjuster
20	Body	97	Hex nut (self-locking)
21	Guide cap		



Legend for Fig. 15-4

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



Legend for Fig. 15-5

1	Diaphragm case	15	Diaphragm
2	Diaphragm case	17	Hex bolt
3	Screw joint with restriction	19	Hex nut
6	Nut	23	Hanger
8	Diaphragm stem	26	Compression spring
13	Diaphragm plate	27	Compression spring
14	Washer		

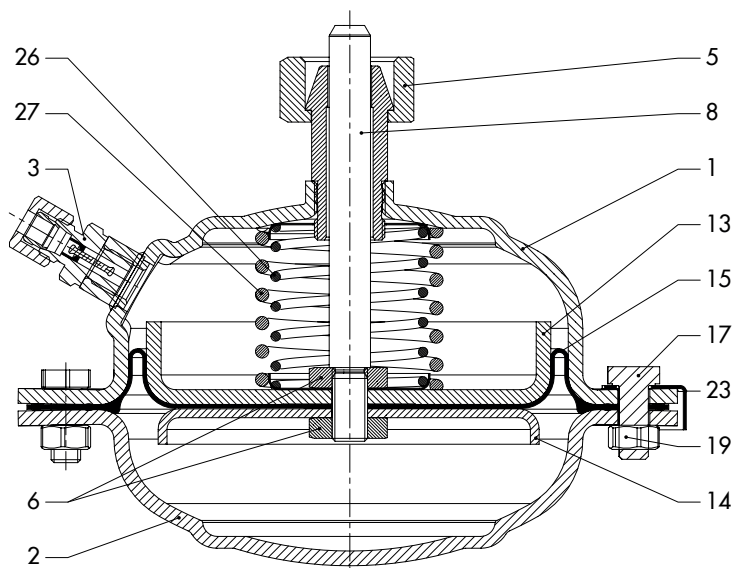


Fig. 15-5: Type 2426 Diaphragm Actuator, DN 15 to 250

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, 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 valve 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 m³/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 3015 EN



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