

# Self-operated Regulators



Type 42-37 Flow and Differential Pressure Regulator

Type 42-39 Flow and Differential Pressure or Pressure Regulator



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Translation of original instructions

## Mounting and Operating Instructions

**EB 3017 EN**

Edition October 2016



## Note on these mounting and operating instructions

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

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



The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website ([www.samson.de](http://www.samson.de)) > Product documentation. You can enter the document number or type number in the [Find:] field to look for a document.



### **WARNING!**

*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, see ► <http://www.samson.de/reach-en.html>.*

## 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 General safety instructions

- The device must be mounted, started up, or serviced by fully trained and qualified personnel only; the accepted industry codes and practices are to be observed. Make sure employees or third persons are not exposed to any danger.
- All safety instructions and warnings given in these mounting and operating instructions, particularly those concerning installation, start-up, and maintenance, must be strictly 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 dangers due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.
- The devices comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. Devices with a CE marking have an EU declaration of conformity, which includes information about the applied conformity assessment procedure. This declaration of conformity can be provided on request.
- To ensure appropriate use, only use the device in applications where the operating pressure and temperatures do not exceed the specifications used for sizing the device at the ordering stage.
- The manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.
- Any hazards that could be caused in the regulator by the process medium, operating pressure or by moving parts are to be prevented by taking appropriate precautions.
- Proper transport, storage, installation, operation, and maintenance are assumed.

**Note:** according to the ignition risk assessment performed in accordance with EN 13463-1: 2009, section 5.2, the non-electrical actuators do not have their own potential ignition source even in the rare incident of an operating fault. As a result, they do not fall within the scope of Directive 2014/34/EU.

For connection to the equipotential bonding system, observe the requirements specified in section 6.4 of EN 60079-14: 2011 (VDE 0165 Part 1).

## 2 Process medium and scope of application

Regulators for flow rate and differential pressure control or flow rate and pressure control in district heating systems or large heating networks · Differential pressure or pressure set point from 0.1 to 5 bar · Valves DN 15 to 250 · Nominal pressure PN 16 to 40 · Suitable for liquids from 5 to 150 °C

### 2.1 Transportation and storage

The regulator must be carefully handled, transported, and stored. Protect the regulator against adverse influences, such as dirt, moisture or frost, during storage and transportation.



**Note:**

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

*Torque: 50 Nm for G 1/4, 70 Nm for G 3/8*

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When regulators are too heavy to be lifted by hand, fasten the lifting equipment to a suitable place on the valve body.



**WARNING!**

*Incorrectly attached lifting slings or rigging equipment.*

*Risk of injury and property damage due to valve falling.*

*Securely fasten slings or rigging equipment to the valve body and secure against slipping.*

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## 3 Design and principle of operation

See Fig. 1 and Fig. 2 · Functional drawings of the regulators

The regulators restrict the flow rate in the pipeline with set point adjustment at the restriction. The set point for the differential pressure or downstream pressure is adjusted at the diaphragm actuator. The largest signal is always used to control the regulator.

The regulators basically consist of a Type 2423 Valve with seat, plug, and restriction as well as a closing actuator (Type 2427 or Type 2429) with an operating diaphragm. Valve and actuator are delivered separately and must be assembled on site using a coupling nut.

The medium flows through the valve in the direction indicated by the arrow. The areas released by the restriction (1.1) and the valve plug (3) determine the flow rate and the differential pressure  $\Delta p$ .

In 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 (balanced by a diaphragm, DN 65 to 250).

The principle of operation of the regulator balanced by a bellows or diaphragm only differs concerning the pressure balancing. Valves balanced by a diaphragm have a balancing diaphragm (5 in Fig. 2) 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. In both cases, the forces created by the upstream and downstream pressures that act on the plug are balanced out.

**Type 42-37:** The high pressure of  $\Delta p$  acts on the bottom diaphragm chamber D over the control line (18). The high pressure of the flow rate upstream of the restriction (1.1) is transferred over the control line (19) to the middle diaphragm chamber B. It is the same as the low pressure of  $\Delta p$ . The low pressure

of  $V$  downstream of the restriction is transferred over holes in the plug and diaphragm stems to the top diaphragm chamber A.

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

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

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

**Type 42-39:** The principle of operation is almost the same as for Type 42-37. However, in the Type 2429 Actuator, the high pressure of the flow rate is separate from the low pressure of the differential pressure  $\Delta p$ . The diaphragm chambers have their own control line connections.

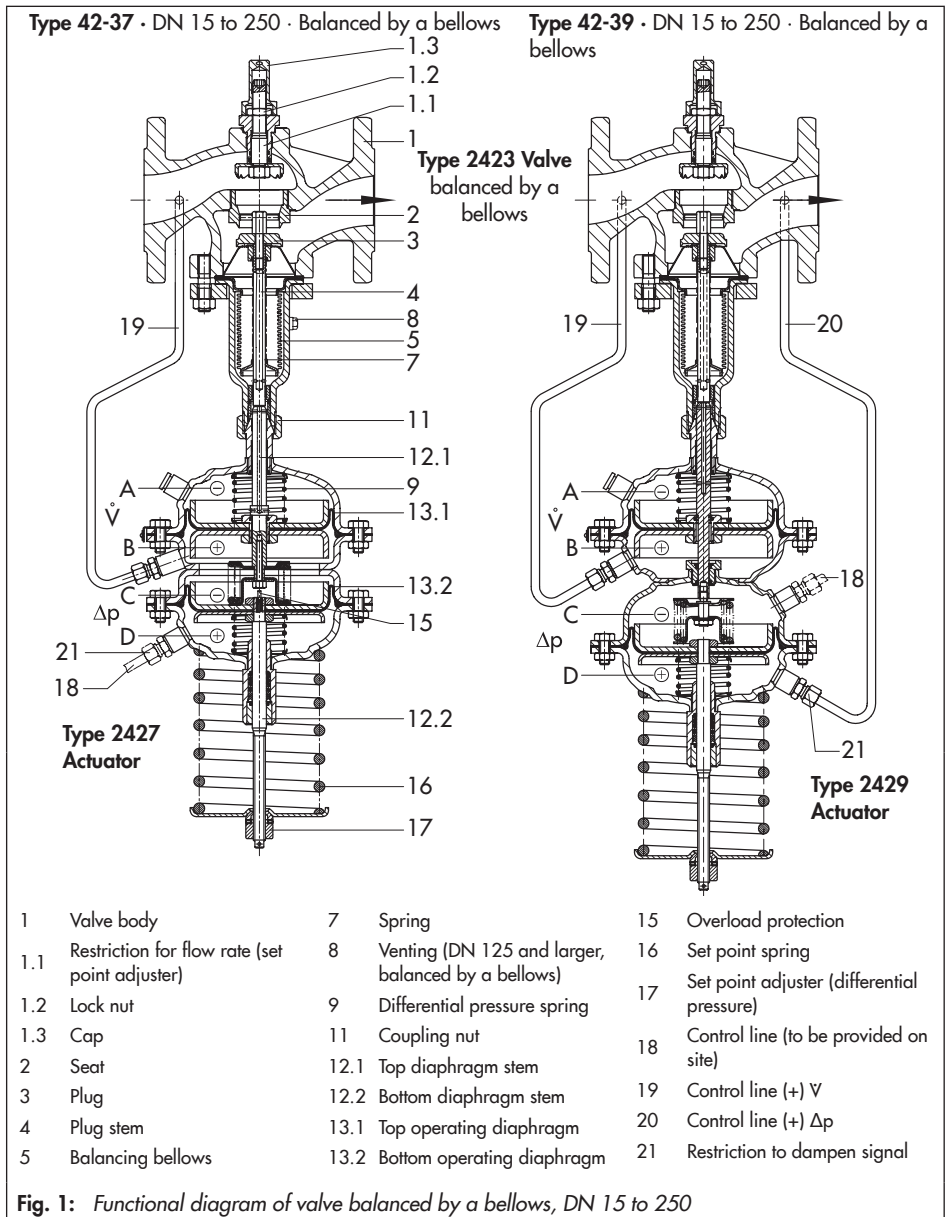
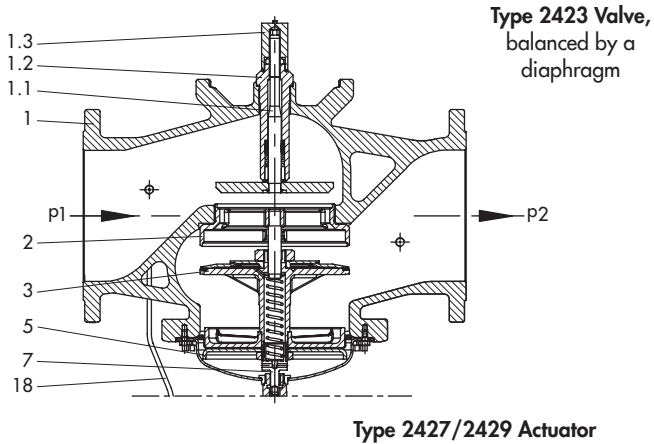


Fig. 1: Functional diagram of valve balanced by a bellows, DN 15 to 250

Type 42-37/Type 42-39 · DN 65 to 250 · Balanced by a diaphragm



1	Valve body	3	Plug
1.1	Restriction for flow rate (set point adjuster)	5	Balancing diaphragm
1.2	Lock nut	7	Plug stem
2	Seat	18	Control line

**Fig. 2:** Functional diagram of valve balanced by a diaphragm, DN 65 to 250

**Note concerning Type 42-37 DoT and Type 42-39 DoT**

By mounting a double adapter (DoT) with Type 2231 Temperature Regulator, these regulators are also suitable for temperature control and limitation.

Refer to the mounting and operating instructions:

- ▶ EB 3019 for double adapter DoT and
- ▶ EB 2231 for Type 2231 to 2235 Control Thermostats



## 4 Installation

See Fig. 1 and Fig. 2 · Functional drawings of the regulators

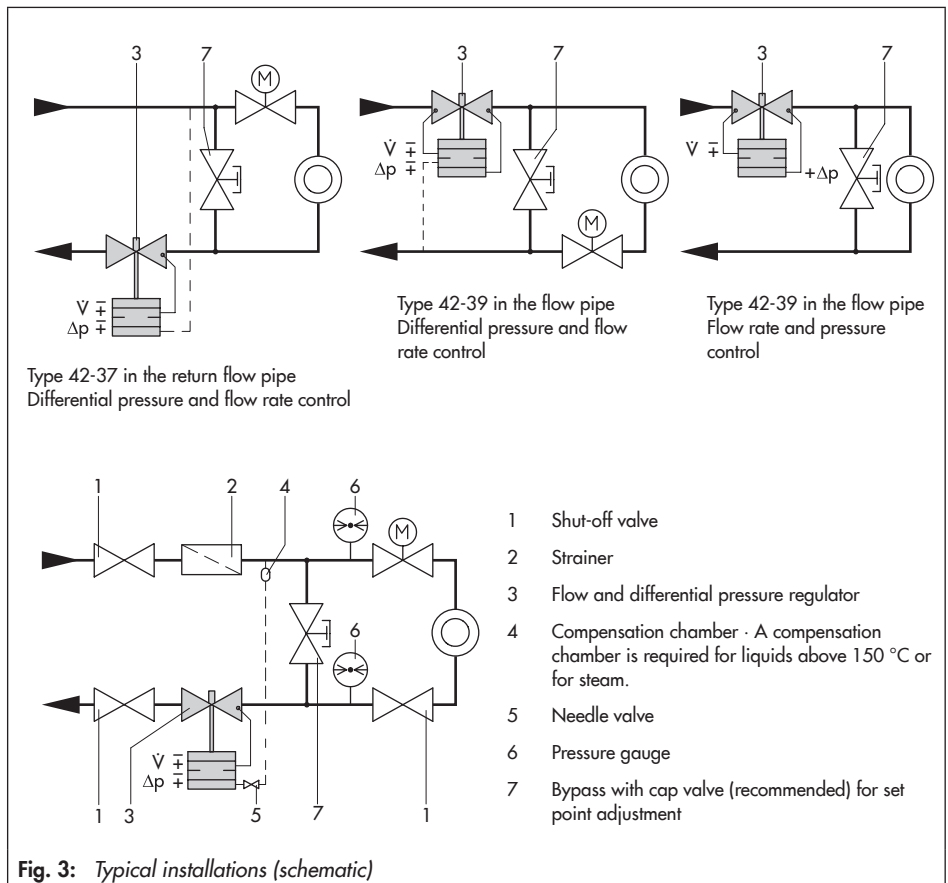
Installation of Type 42-37 Regulators in low-pressure line (return flow pipe)

Installation of Type 42-39 Regulators in high-pressure line (flow pipe) of the plant.

See Fig. 3.

Choose a place of installation that allows you to freely access the regulator even after the entire plant has been completed.

➔ Install the regulator free of stress. If necessary, support the pipeline near to the connecting flanges. Do not attach supports directly to the valve or actuator.



- Install a strainer (e.g. SAMSON Type 2 N/2 NI) upstream of the regulator to prevent any sealing parts, weld spatter, and other impurities carried along by the process medium impairing the proper functioning of the valve, above all the tight shut-off.

### 4.1 Mounting position

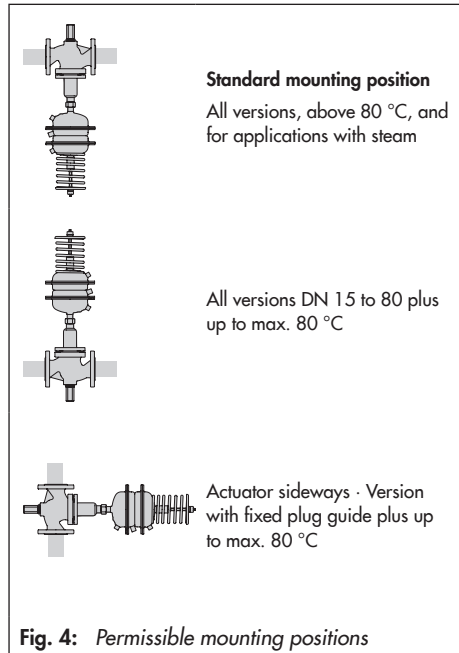
See Fig. 4 for permissible mounting positions.

**Standard mounting position** · Install valve without actuator in a horizontal pipeline with the connection for the actuator facing downward. Make sure the medium flows through the valve in the direction indicated by the arrow. Connect the actuator to the valve connection using the coupling nut (11).



#### NOTICE

*Possible malfunction and damage due to adverse effects of weather conditions (temperature, humidity). Do not install the regulator outdoors or in rooms prone to frost. If such a location cannot be avoided, protect the regulator against freezing up if the process medium flowing through the valve can freeze up. Either heat the regulator or remove it from the plant and completely drain the residual medium.*



### 4.1.1 Insulation

To insulate cold systems, we recommend first filling the plant and carefully rinsing it (see section 5.1). The regulator must not be insulated until the set point is adjusted.

- Start up the plant and adjust the set point. Shut down the plant again and let it heat up until the condensation water has dried off.
- Afterwards, insulate the regulator and pipes conveying the process medium using insulation material with a water vapor barrier. Insulate the valve body and diaphragm actuator together.

If a control line is to be routed through the insulation, special care must be taken with the sealing since slight changes in shape may occur.

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

If the valve has an external spring, it must be protected by a sleeve to allow it to move. The spring-loaded actuator stem must not touch the insulation.

## 4.2 Control line, compensation chamber and needle valve

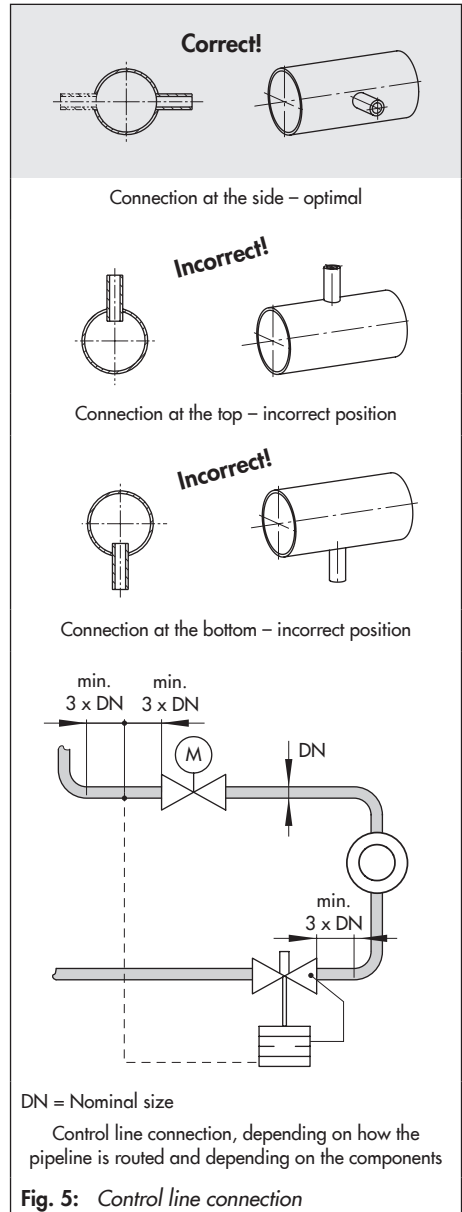
**Control lines** · Route the control line on site preferably using a 8x1 mm (stainless) steel pipe.

The control line for tapping pressure from the pipeline (for Type 42-37) must be installed upstream of the consumer. The pressure tapping point must at least three times the nominal size (DN) away from any pipe fittings (e.g. restrictions, bends or branches), that may cause turbulence in the flow (see Fig. 6). How the lines are routed generally depends on the installation site.

The same conditions apply to routing the control line of Type 42-97 on site (connection downstream of the consumer).

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

Do **not** change the pipe diameter of the main pipeline so that it is **off center**.



### Type 42-37

Attach the supplied low-pressure control line to the regulator as shown in Fig. 1.

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

### Type 42-39

Mount the control lines (supplied with the regulator) to the regulator as shown in Fig. 1. When used as a differential pressure and flow regulator, additionally route a control line on site from diaphragm chamber C to the low-pressure line (return flow pipe) of the plant. When used as a pressure and flow regulator, the connection of the diaphragm chamber C remains open.

**Control line kit** · A control line kit for tapping pressure directly at the valve body is available as an accessories part from SAMSON (▶ T 3095).

**Needle valve** · If the regulator tends to hunt, we recommend installing a SAMSON needle valve at the control line installed on site (connection of the actuator).



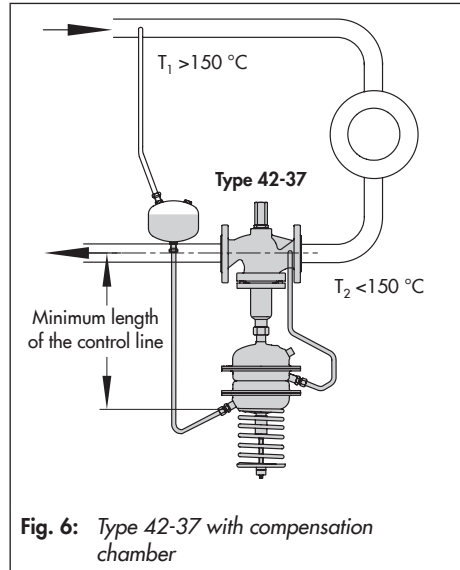
#### Tip:

*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 is required for liquids above 150 °C as well as for steam. Before start-up, fill the compensation chamber with the process medium. This prevents hot medium coming into direct contact with the diaphragm (see Fig. 6).



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

Installation near to the pressure tapping point in the flow pipe or at the same height as the valve (see Fig. 6) with the control line reaching at least from the mid-axis of the

pipeline (valve) to the actuator. This allows the hot medium to cool down sufficiently.



**Note:**

*It is essential to adhere the mounting position and distance, otherwise the safe functioning of the regulator cannot be guaranteed.*

### 4.3 Strainer (filter)

A strainer installed upstream in the flow pipe holds back any dirt or other foreign particles carried along by the medium. For example, the SAMSON Type 2 N/2 NI Strainer is suitable (► T 1010).

Install the strainer upstream of the regulator. The direction of flow must correspond to the arrow on the body. The filter element must be installed to hang downwards or sideways for applications with steam. Remember to leave enough space to remove the filter element.

### 4.4 Shut-off valve

Install a hand-operated shut-off valve both upstream of the strainer and at the outlet of the return flow pipe (see Fig. 3). This allows the plant to be shut down for cleaning and maintenance, and when the plant is not used for longer periods of time.

### 4.5 Pressure gauge

Install a pressure gauge both upstream and downstream of the regulator to monitor the pressures prevailing in the plant. Install the pressure gauge on the downstream side behind the downstream pressure tapping point (not between the tapping point and the valve).

## 5 Operation

### 5.1 Start-up

See Fig. 1 and Fig. 2 · Functional drawings of the regulators



**Note:**

*Do not start up the regulator until all parts have been mounted (e.g. valve, actuator, and control lines).*

Open control lines and before start-up check to ensure they are connected correctly.



**Note:**

*On filling the plant, make sure the restriction (1.1) is open by turning the adjustment screw counterclockwise (↺) as far as it will go.*

- ➔ Open all the valves on the consumer side.
- ➔ Open the shut-off valves preferably starting from the return flow pipe. Slowly open the valves in small steps waiting a few minutes in between.

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

- If needle valves are installed in the control lines, open them before start-up. Fill condensation chambers with the process medium before start-up.

**Rinsing the plant** · After filling the plant, first completely open the consumers. If this is not possible, open the bypass line. Open the restriction for flow rate adjustment with maximum spring compression of the differential pressure set point spring. Rinse out the pipeline at full flow rate for several minutes. Check the installed strainer (e.g. by measuring the pressure drop). Clean the strainer, if necessary.



### NOTICE

*The pressure at the actuator and the valve nominal pressure must not exceed the permissible pressure on testing the pressure of the plant. If necessary, detach the control line and seal the openings with end plugs. Alternatively, install a shut-off valve in the control line.*

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



### Note:

*When Type 42-39 is used as a flow regulator and pressure reducing valve, do not connect the control line to diaphragm chamber C.*

## 5.2 Set point adjustment

### 5.2.1 Flow rate set point

- To adjust the flow rate, first set the set point for differential pressure (pressure) to its maximum value. To do this, tension the set point spring (16) at the set point adjuster (17) by turning it clockwise (↻).
- 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, without a too high differential pressure (pressure) being able to close the valve.
- Set the required flow rate by adjusting the restriction at the set point adjuster (1.1), while watching, for example, the reading of a flow rate measuring unit at the heat meter (see Table 1).



### 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.

For adjustment, use the adjustment diagrams for water (Fig. 7, Fig. 8, and Fig. 9).



### Note:

*Observe the differential pressure across the restriction  $\Delta p_{\text{restriction}}$  of 0.2 bar or 0.5 bar (see section 8). It is determined by the differential pressure spring (9) installed in the actuator.*

Unscrew cap (1.3) and undo lock nut (1.2). Turn set point adjuster (1.1) clockwise (↻) as far as it will go.

Find the flow rate set point in the diagram and determine the associated number of turns.

Based on a closed restriction, turn the set point adjuster counterclockwise (↻) to adjust this value.

Check the flow rate at the heat meter and correct it, if necessary.

Lock the set point adjuster (1.1) in place with the nut (1.2) and screw the cap (1.3) back on after the required flow rate is reached. Lead-seal the adjusted value, if necessary.

Close a possibly open bypass valve again.

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

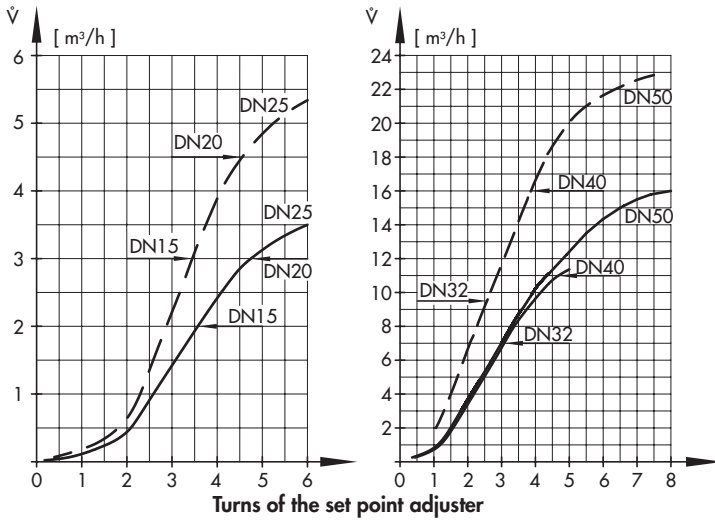
**Type 2423 · Balanced by a bellows**

Nominal size DN	15	20	25	32	40	50	65	80	100	125	150	200	250	
<b>Flow rate set point ranges for water in m<sup>3</sup>/h</b>														
Differential pressure across the 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 <sup>1)</sup>	6.5 to 63	11 to 80	18 to 120	20 to 180	26 to 220	
Differential pressure across the 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. permissible differential pressure $\Delta p$	25 bar						20 bar		16 bar		12 bar		10 bar	

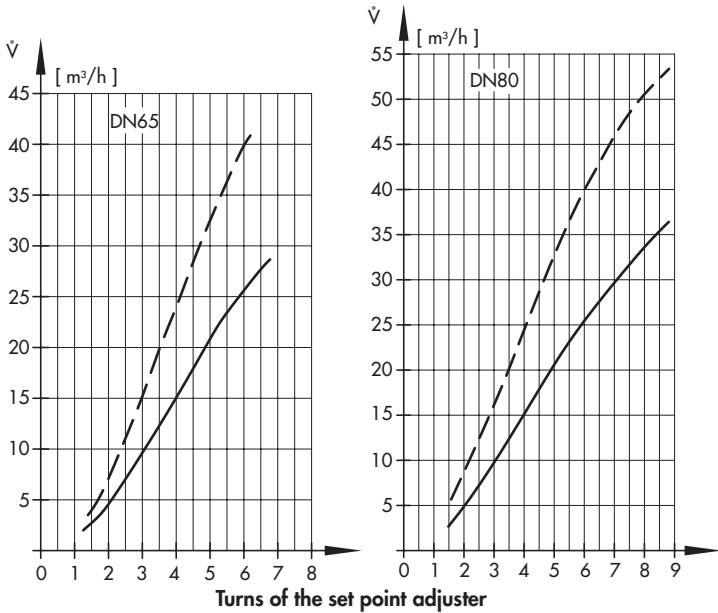
**Type 2423 · Balanced by a diaphragm**

Nominal size DN	65	80	100	125	150	200	250
<b>Flow rate set point ranges for water in m<sup>3</sup>/h</b>							
Differential pressure across the restriction $\Delta p_{\text{restriction}}$ 0.2 bar	2 to 28	3.5 to 35 <sup>1)</sup>	6.5 to 63	11 to 120	18 to 180	20 to 320	26 to 350
Differential pressure across the 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. permissible differential pressure $\Delta p$	10 bar			12 bar		10 bar	

<sup>1)</sup> 7 to 35 m<sup>3</sup>/h with 160 cm<sup>2</sup> actuator, 7 to 40 m<sup>3</sup>/h with 320 cm<sup>2</sup> actuator



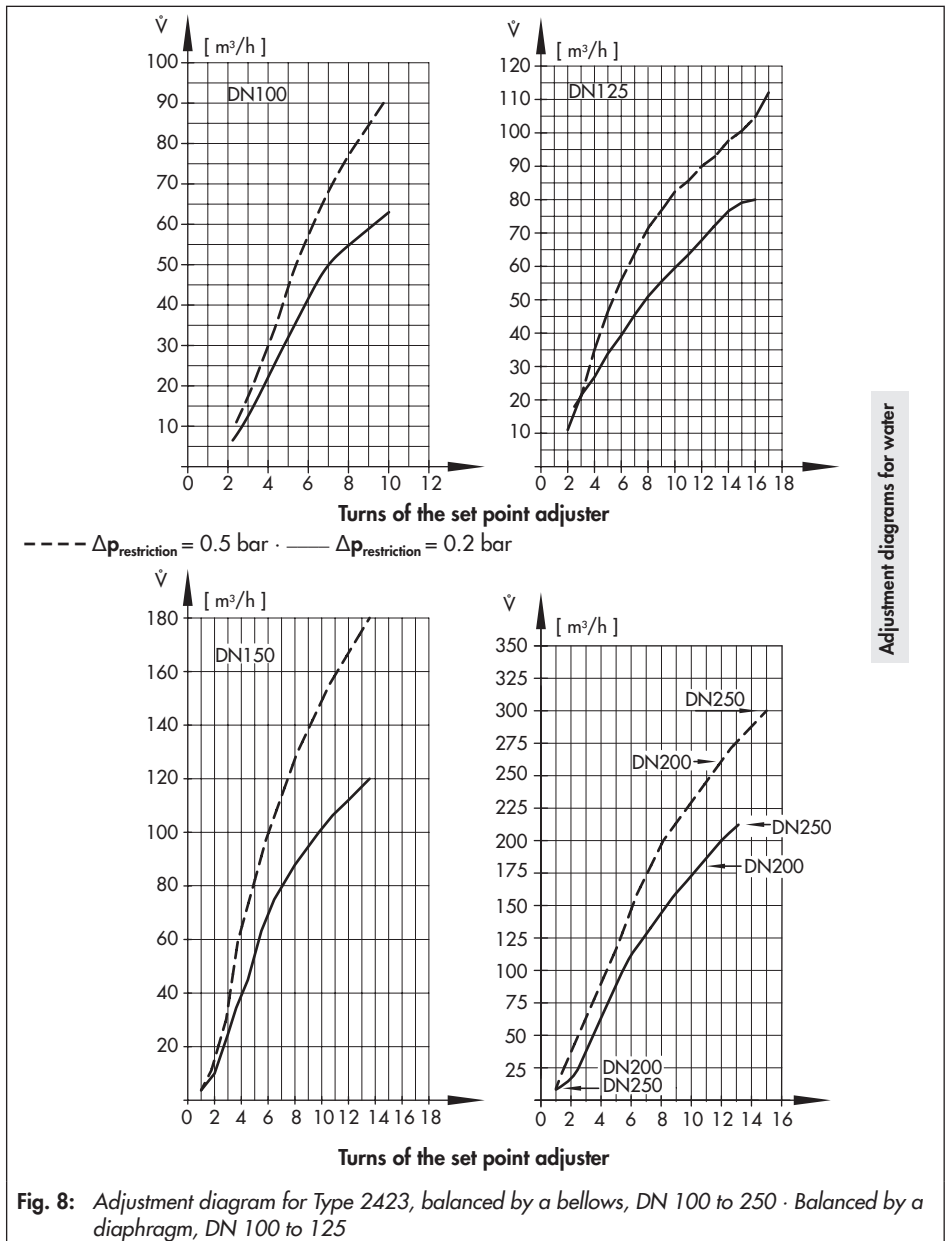
-----  $\Delta p_{\text{restriction}} = 0.5 \text{ bar}$  · ———  $\Delta p_{\text{restriction}} = 0.2 \text{ bar}$



Adjustment diagrams for water

Fig. 7: Adjustment diagram for Type 2423, balanced by a bellows, DN 15 to 80 · Balanced by a diaphragm, DN 65 to 80





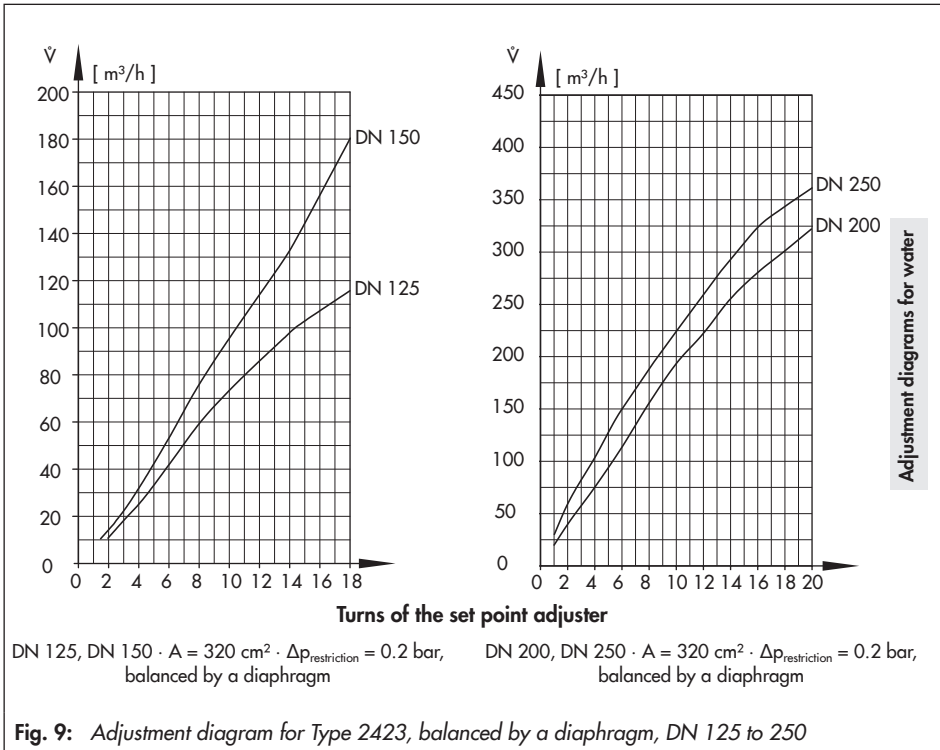


Fig. 9: Adjustment diagram for Type 2423, balanced by a diaphragm, DN 125 to 250

### 5.3 Differential pressure set point

→ Before adjusting the differential pressure, close the shut-off valve on the consumer side or the bypass to reduce the maximum flow rate to approx. 5 %.

If you are using a motorized valve, close it to approx. 10 % of its travel.

→ Set the differential pressure set point by releasing the tension of the set point springs (16) through turning counterclockwise. To do this, compare the pres-

ures upstream and downstream of the consumer at the reading of the installed pressure gauges (see Fig. 3). If small differential pressure set points are to be adjusted, we recommend using a differential pressure gauge instead of the two pressure gauges.

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

### 5.3.1 Pressure set point at Type 42-39 Flow and Pressure Regulator

Adjust the set point at the set point adjuster (17). While doing so, observe the downstream pressure at the installed pressure gauge.

Turn the nut (17) clockwise (↻) to increase the downstream pressure and counterclockwise (↺) to reduce the downstream pressure.

## 5.4 Decommissioning

Close the shut-off valves starting from the flow pipe (high-pressure line).

## 6 After-sales service

Contact SAMSON's After-sales Service department for support when malfunctions or defects arise.

E-mail address: [aftersalesservice@samson.de](mailto:aftersalesservice@samson.de)

The addresses of SAMSON AG, its subsidiaries, representatives and service facilities worldwide can be found on the SAMSON website (▶ [samson.de](http://samson.de)), in all SAMSON product catalogs or on the back of these Mounting and Operating Instructions.

To assist diagnosis and in case of an unclear mounting situation, specify the following details:

- Device type and nominal size
- Model number
- Upstream and downstream pressure
- Flow rate in m<sup>3</sup>/h
- Is a strainer installed?
- Installation drawing showing the exact location of the regulator and all the additionally installed components (shut-off valves, pressure gauge, etc.)



**Note:**

**Conversion from chromate coating to iridescent passivation**

We at SAMSON are converting the surface treatment of passivated steel parts in our production. As a result, you may receive a device assembled from parts that have been subjected to different surface treatment methods. This means that the surfaces of some parts show different reflections. Parts can have an iridescent yellow or silver color. This has no effect on corrosion protection.

For further information go to ▶ [www.samson.de/chrome-en.html](http://www.samson.de/chrome-en.html)

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## 7 Maintenance · Troubleshooting

The regulators do not require any maintenance. Nevertheless, they are subject to natural wear, particularly at the seat, plug, and operating diaphragm. Depending on the operating conditions, check the regulators at regular intervals to avoid possible malfunctions.

**Table 2: Troubleshooting**

Malfunction	Possible reasons	Recommended action
Flow rate or differential pressure exceeds adjusted set point	Leak between seat and plug	Remove valve from the pipeline and clean seat and plug. Replace the plug, if possible. If this is not possible, return regulator to SAMSON for repair.
	Defective top operating diaphragm	Replace diaphragm or return regulator to SAMSON for repair.
	Control line blocked	Remove control line and clean it.
	Valve too large for control task (flow rate) or too small (differential pressure)	Recalculate $K_{VS}$ and contact SAMSON for further action.
Flow or differential pressure set point not reached	Incorrect set point range selected.	Check set point range and contact SAMSON for further action.
	Safety device, e.g. pressure limiter, has been triggered.	Check plant. Unlock safety device.
	Plant differential pressure too low	Compare differential pressure in the plant with the plant's drag. Plant differential pressure $\Delta p_{\min} = \Delta p_{\text{restriction}} + (V/K_{VS})^2$
	Strainer blocked	Drain and clean filter of the strainer.
	Incorrectly installed valve (direction of flow).	Install the valve in such a way that the flow of direction corresponds with the direction indicated by the arrow on the valve body.
	Defective bottom operating diaphragm	Replace diaphragm or return regulator to SAMSON for repair.
Control loop hunts.	Valve too large for control task	Recalculate $K_{VS}$ and contact SAMSON.
	The restriction (or needle valve) in the control line for pressure tapping is missing.	Check the restriction in the connection to chamber D (Type 42-37) or chamber C (Type 42-39). If necessary, install a needle valve into the control line and start to close the needle valve until the control loop becomes stable. <b>NOTICE</b> Do not completely close the needle valve.

If faults cannot be remedied following the recommended action in the table, contact SAMSON (see section 6).

## 8 Nameplates

Nameplates are attached to the valve and the actuator.

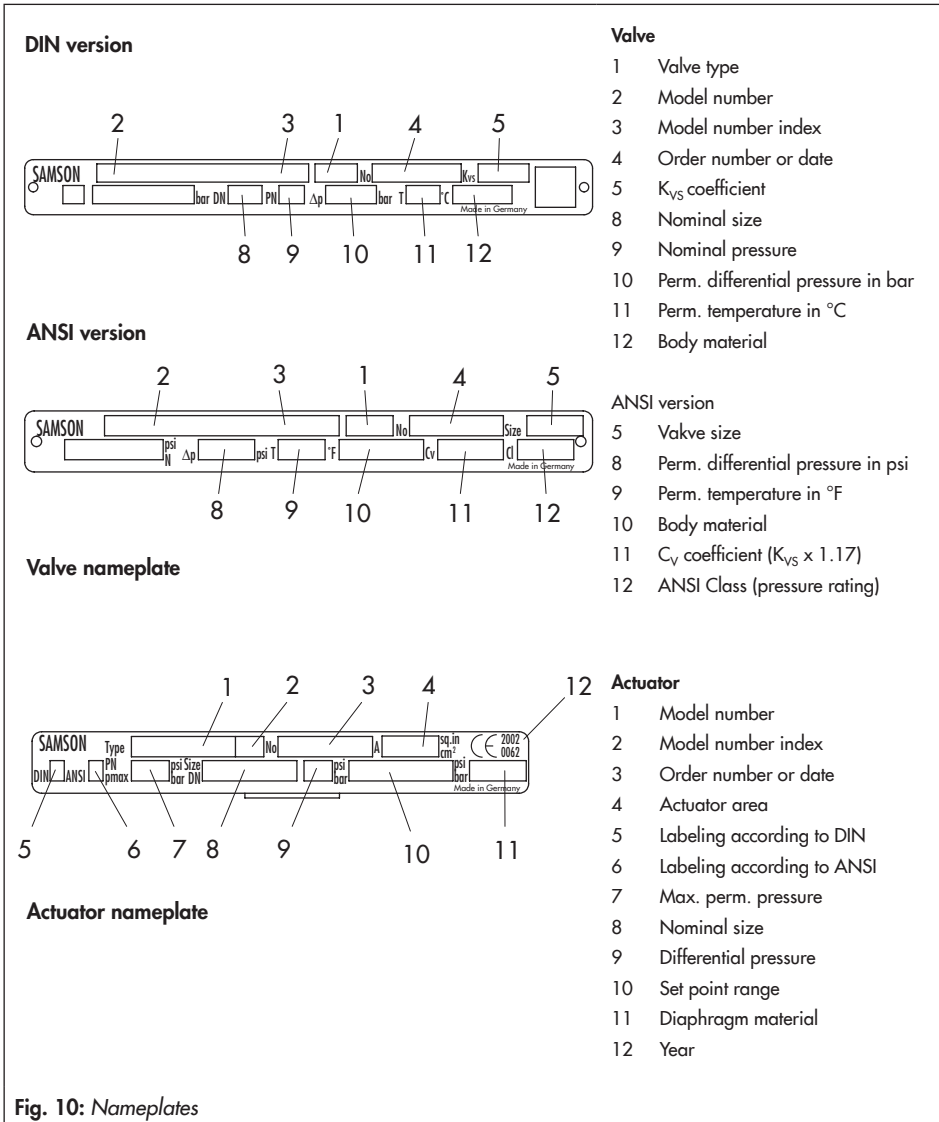




Fig. 10: Nameplates

## 9 Technical data

**Table 3:** *Technical data · Type 42-37 and Type 42-39*

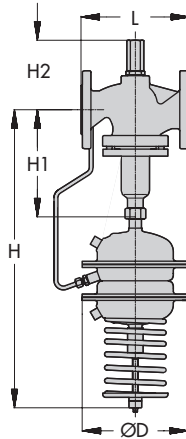
Type 2423 Valve, balanced by a bellows		
Nominal size		DN 15 to 250
Nominal pressure		PN 16, 25 or 40
Pressure at which internal excess pressure limiter responds (Type 42-37 only)	for 160 cm <sup>2</sup>	1.2 bar
	for 320 cm <sup>2</sup>	0.6 bar
Max. permissible temperature	Valve body	See pressure-temperature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

<sup>1)</sup> Higher temperatures on request

<sup>2)</sup> On request

## 10 Dimensions

Dimension diagram · Type 2423 Valve balanced by a bellows



Type 42-37/Type 42-39

Fig. 11: Regulator with Type 2423 Valve balanced by a bellows



**Table 4:** Dimensions in mm and weights in kg · 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	Other materials	115			150			175	180	200	250	280	400		
	1.4571	113	-	130	-	170	176	-							
Set point range <sup>3)</sup>															
0.1 to 0.6 bar	Height H <sup>1)</sup>	675						770		825	-				
	Actuator	ØD = 225 mm, A = 160 cm <sup>2</sup>						ØD = 285 mm, A = 320 cm <sup>2</sup>			-				
	Weight <sup>2)</sup>	20.5	21	22	28.5	29	31.5	51	56	71	-				
0.2 to 1 bar	Height H <sup>1)</sup>	675						770		825	1130	1160	1240		
	Actuator	ØD = 225 mm, A = 160 cm <sup>24)</sup>									ØD = 285 mm, A = 320 cm <sup>2</sup>				
	Weight <sup>2)</sup>	20.5	21	22	28.5	29	31.5	43	48	65	130	180	420	480	
0.5 to 1.5 bar	Height H <sup>1)</sup>	675						770		825	1130	1160	1240		
	Actuator	ØD = 225 mm, A = 160 cm <sup>24)</sup>									ØD = 285 mm, A = 320 cm <sup>2</sup>				
	Weight <sup>2)</sup>	20.5	21	22	28.5	29	31.5	43	48	65	135	185	425	485	
1 to 2.5 bar	Height H <sup>1)</sup>	675						770		825	1130	1160	1240		
	Actuator	ØD = 225 mm, A = 160 cm <sup>2</sup>									ØD = 285 mm, A = 320 cm <sup>2</sup>				
	Weight <sup>2)</sup>	20.5	21	22	28.5	29	31.5	43	48	65	135	185	425	485	
2 to 5 bar	Height H <sup>1)</sup>	615						690		745	-				
	Actuator	ØD = 225 mm, A = 160 cm <sup>2</sup>									-				
	Weight <sup>2)</sup>	20.5	21	22	28.5	29	31.5	43	48	65	-				

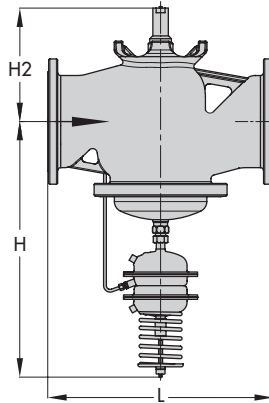
<sup>1)</sup> Type 42-39: add 50 mm to total height H.

<sup>2)</sup> The weight applies to the version with the material specifications EN-GJL-250/PN 16 (GG-25). Add +10 % for spheroidal graphite iron EN-GJS-400-18-LT/PN 25, cast steel 1.0619/PN 40 and 1.4581/1.4571.

<sup>3)</sup> Δp = 4.5 to 10 bar on request

<sup>4)</sup> Optionally with 320 cm<sup>2</sup> actuator (DN 65 to 100). For regulators with double adapter Do2 (▶ T 3019) for DN 65 to 100, actuator 320 cm<sup>2</sup> recommended.

Dimension diagram · Type 2423 Valve balanced by a diaphragm



Type 42-37/Type 42-39

Fig. 12: Regulator with Type 2423 Valve, balanced by a diaphragm

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

Valve size	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250
Length L	290	310	350	400	480	600	730
Height H	660		685	910	935	1020	
Height H2	195		220	295	325	345	375
<b>Weight for PN 16<sup>1)</sup></b>							
Type 2423 Valve	38 kg	43 kg	62 kg	65 kg	85 kg	248 kg	268 kg
Type 2427/2429 Actuator	16 kg			27 kg		35 kg	

<sup>1)</sup> PN 25/40: +10 %





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