

# Self-operated Regulators Series 42

## Flow Regulator Type 42-36



### Application

Regulators for district heating supply systems and large heating systems.

Valves in nominal size **DN 15 to 250**<sup>1)</sup> · Nominal pressure **PN 16 to PN 40** · Suitable for liquids, gases and vapors from **5 °C to 150 °C**<sup>2)</sup>

The valve **closes** when the flow rate increases.

The flow regulators are used to restrict the flow rate in the pipeline. The set point is adjusted at the restriction.

### Special features

- Low-noise, self-operated P-regulators requiring little maintenance
- Valve body available in cast iron, spheroidal graphite iron or cast steel
- Suitable for circuit water, water/glycol mixtures up to 30 %, steam and air as well as other liquids, gases and vapors, provided these do not affect the characteristics of the operating diaphragm
- Special version for oil
- Single-seated valve with a plug balanced by a stainless steel bellows or by a balancing diaphragm

### Versions

**Type 42-36** (Fig. 1) · Regulators for nominal sizes DN 15 to DN 250<sup>1)</sup> · Type 2423 Valve with integrated restriction for adjusting the flow rate set point · Type 2426 Actuator with high-pressure control line · Flange connection · Balancing bellows made of CrNiMo steel or balancing diaphragm made of EPDM (DN 125 or 250)

The set point ranges for the flow rate based on water listed in Table 2 apply to an upper differential pressure at the restriction of either 0.2 or 0.5 bar.

### Special versions

- Oil-resistant internal parts made of FKM
- ANSI and JIS versions
- Liquids and vapors up to max. 220 °C

<sup>1)</sup> Valves in sizes larger than DN 250 as well as version for steam and gases available on request

<sup>2)</sup> Other temperature ranges on request



Fig. 1 · Type 42-36 Flow Regulator (balanced by a bellows)

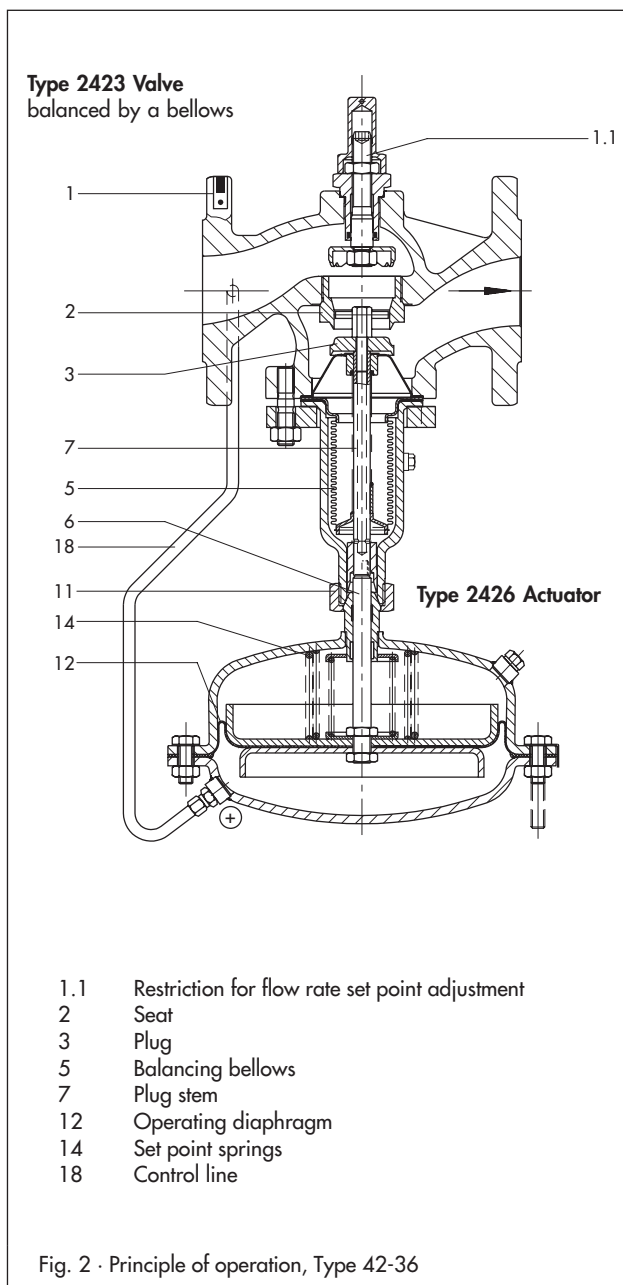
### Principle of operation (Fig. 2)

The medium flows through the valve in the direction indicated by the arrow. The flow rate is determined by the free area between the restriction (1.1) and the valve plug (3).

The differential pressure created at the restriction (orifice)  $\Delta p$  operates the actuator. The pressure upstream of the restriction (1.1) is transmitted through the control line (18) to the lower diaphragm chamber. The pressure downstream of the restriction passes through the hollow plug stem (7) to the actuator stem and then into the top diaphragm chamber.

If the flow rate increases, the differential pressure ( $\Delta p_{\text{restriction}}$ ) increases at the restriction and also at the operating diaphragm (12). This additional force causes the set point springs (14) to be pressed together until the forces are balanced out again. The plug starts to close. The cross-section of flow is reduced and the flow rate drops until it reaches the adjusted set point.

The principle of operation of the regulator with a valve balanced by a bellows or by a diaphragm only differ concerning their pressure balancing. The pressure directly downstream of the restriction acts on the outer surface of the metal bellows or balancing diaphragm and the downstream pressure on the inside of the bellows or diaphragm. As a result, the forces created by the upstream and downstream pressures acting on the valve plug are equally balanced. The position of the plug of the balanced valve is unaffected by pressure changes in the medium.



### Installation

The valve and actuator are delivered in separate packaging. The actuator can be easily mounted before or after the valve is installed using a coupling nut (11).

The following points need to be observed:

- Install valves in horizontal pipelines
- The medium must flow through the valve in the direction indicated by the arrow on the valve body.
- Install a strainer upstream of the valve (e.g. SAMSON Type 2 NI)



### Permissible mounting positions

- All nominal sizes: Install the actuator suspended downwards (see photo)
- DN 15 to DN 80 and max. 120 °C: Install the actuator either suspended or upright
- All nominal sizes with fixed plug guide and max. 120 °C: Any position possible
- Steam applications: Always install actuator suspended downwards

Further details can be found in EB 3015 EN.

### Accessories

Refer to the Data Sheet T 3095 EN for any required accessories, e.g. compression-type fittings, needle valves, equalizing tanks and control lines.

**Table 1 · Technical data**

**Type 42-36 Flow Regulator · Suitable for liquids, gases and vapors**

Type 2423 Valve · Balanced by a bellows		
Nominal size	DN 15 to 250	
Nominal pressure	PN 16, 25 or 40 (acc. to DIN EN 12516-1)	
Max. perm. temperature	Valve body	See pressure-temperature diagram
	Actuator	With equalizing tanks: Vapors and liquids up to 220 °C Without equalizing tanks: Liquids up to 150 °C · Air and gases up to 80 °C
Differential pressure at restriction	0.2 bar 0.5 bar	
Refer to "Dimensions in mm and weights in kg" for the assignment of actuators and valves		

Type 2423 Valve · Balanced by a diaphragm		
Nominal size	DN 125 to 250	
Nominal pressure	PN 16, 25 or 40 (acc. to DIN EN 12516-1)	
Max. perm. temperature	Valve body	See pressure-temperature diagram
	Actuator	Liquids up to 150 °C · Air and gases up to 80 °C
Differential pressure at restriction	0.2 bar 0.5 bar	
Refer to "Dimensions in mm and weights in kg" for the assignment of actuators and valves		

**Table 2 · K<sub>VS</sub> coefficients, z values, flow rate set point ranges for water and max. permissible differential pressures**

Type 2423 Valve · Balanced by a bellows															
Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150	200	250	
Travel		10 mm						16 mm			22 mm				
K <sub>VS</sub> coefficient		4	6.3	8	16	20	32	50	80	125	190	280	420	500	
z value		0.65	0.6	0.55		0.45	0.4		0.35			0.3			
Flow rate set point ranges for water in m <sup>3</sup> /h															
Diff. pressure at 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	6.5 to 63	11 to 80	18 to 120	20 to 180	26 to 220	
Diff. pressure at 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 Valve · Balanced by a diaphragm															
Nominal size	DN	125			150			200			250				
K <sub>VS</sub> coefficient in m <sup>3</sup> /h		22 mm travel			190			290			550			600	
		35 mm travel			250			380			650			800	
z value		0.35						0.3							
Flow rate set point ranges for water in m <sup>3</sup> /h															
Diff. pressure Δp <sub>restriction</sub> = 0.2 bar		22/35 mm trav.			11 to 120			18 to 180			20 to 320			26 to 350	
Max. perm. diff. pressure Δp		12 bar						10 bar							

The minimum required differential pressure Δp<sub>min</sub> across the valve is calculated as follows:

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

- Δp<sub>min</sub> Minimum differential pressure across the valve in bar
- Δp<sub>restriction</sub> Differential pressure created at the restriction to measure the flow rate in bar
- Ṃ Adjusted flow rate in m<sup>3</sup>/h
- K<sub>VS</sub> Valve flow coefficient in m<sup>3</sup>/h

**Table 3 · Materials · Material number according to DIN EN**

Type 2423 Valve · Balanced by a bellows			
Valve body	Cast iron EN-JL1040	Spheroidal graphite iron EN-JS1049	Cast steel 1.0619
Nominal pressure	PN 16	PN 25	PN 25/40 <sup>1)</sup>
Seat	Stainless steel 1.4104 or 1.4006		
Plug	Up to DN 100	Stainless steel 1.4104, 1.4112 or 1.4006	
	DN 125 to 250	1.4571/1.4301, plug with PTFE sealing	
Plug stem	Stainless steel 1.4301		
Metal bellows	Stainless steel 1.4571		
Lower part	P265GH		
Body gasket	Graphite on metal core		

Type 2423 Valve · Balanced by a diaphragm			
Valve body	Cast iron EN-JL1040	Spheroidal graphite iron EN-JS1049	Cast steel 1.0619
Nominal pressure	PN 16	PN 16/25	PN 25/40 <sup>1)</sup>
Seat	Red brass (CC491K)		
Plug Standard version	Red brass (CC491K) with EPDM soft sealing, max. 150 °C		
Plug stem	Red brass (CC491K)		
Pressure balancing	Balancing cases made of sheet steel DD11 Balancing diaphragm made of EPDM with fabric insert, max. 150 °C		

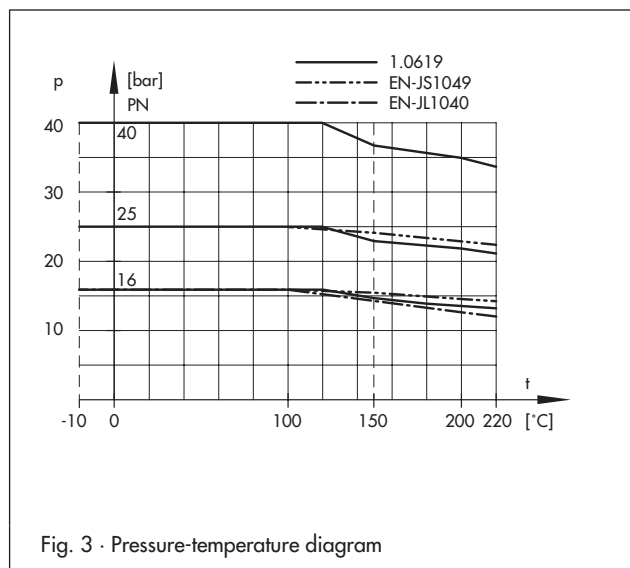
  

Type 2426 Actuator	
Diaphragm cases	Sheet steel DD 11 (StW22)
Operating diaphragm	EPDM with fabric insert <sup>2)</sup>
Guide bushing	DU bushing

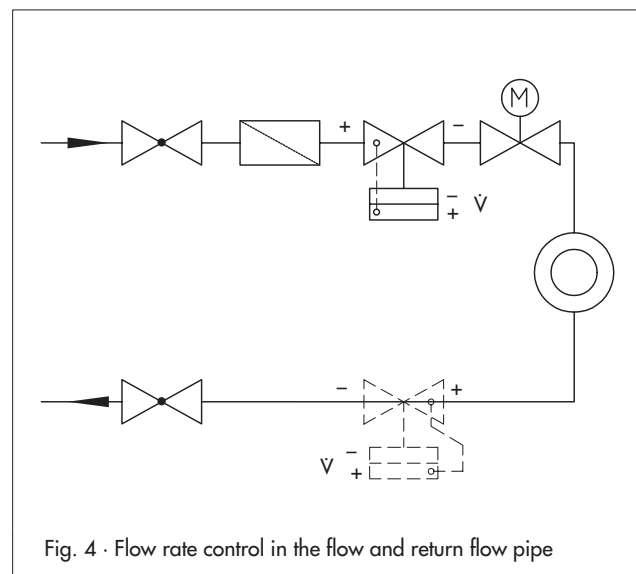
<sup>1)</sup> PN 16 on request

<sup>2)</sup> Special version for oils: FPM (FKM)

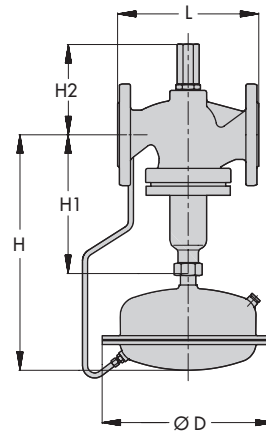
**Pressure-temperature diagram acc. to DIN EN 12516-1**



**Application**



## Dimensions



**Type 42-36 · Type 2423 Valve  
balanced by a bellows**

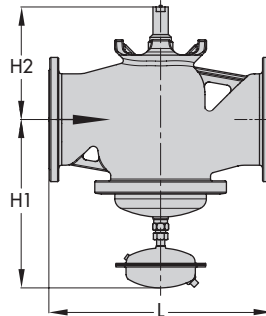
### Type 42-36 · Balanced by a bellows · Dimensions in mm and weights in kg

Nominal size DN	15	20	25	32	40	50	65	80	100	125	150	200	250
Length L	130	150	160	180	200	230	290	310	350	400	480	600	730
Height H1	225						300	355	460	590	730		
Height H2	All materials			135			195	220	265	295	400		
	1.4571	113	-	130	-	155	161	-					
Height H	390						465	520	625	765	895		
Actuator	Ø D = 225 mm · A = 160 cm <sup>2</sup> 2)									Ø D = 285 mm · A = 320 cm <sup>2</sup> 3)			
Weight for PN 16 <sup>1)</sup> in kg, approx.	12	12.5	13.5	20	20.5	23	39	44	59	121	171	425	485

1) For valve in PN 25/PN 40: +10 %

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

3) Optionally with actuator 640 cm<sup>2</sup>



**Type 42-36 · Type 2423 Valve  
balanced by a diaphragm**

### Type 42-36 · Balanced by a diaphragm · Dimensions in mm and weights in kg

Nominal size DN	125	150	200	250
Length L	400	480	600	730
Height H1	450	475	545	
Height H2	295	325	345	375
Height H3	680	710	825	
<b>Weight for PN 16<sup>1)</sup> in kg</b>				
Type 2423 Valve	65	85	250	270
Type 2426 Actuator	20	20	30	30

1) For valve in PN 25/PN 40: +10 %

Fig. 5 · Dimensions

**Ordering text**

Flow Regulator **Type 42-36**

DN ..., PN ..., body material ...

Differential pressure at the restriction 0.2 bar/0.5 bar

Accessories ...

On option, special version ..

Specifications subject to change without notice

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**T 3015 EN**

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