Self-operated Regulators Series 42

Differential Pressure Regulator with Type 2421 Valve

Type 42-10 · Type 42-15

Application

Differential pressure regulators for large heating networks and industrial plants.

For differential pressure set points (Δp) from **0.05** to **1.5 bar** Valves sizes **DN 15** to **DN 50** · Nominal pressure **PN 16** to **40** Suitable for liquids and vapors from **5 °C** to **220 °C**, air and other non-flammable gases up to **80 °C**

The valve **opens** when the differential pressure rises.

The regulators control the differential pressure according to the set point adjusted.

Special features

- Low-noise, self-operated P-regulators requiring little maintenance
- 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
- Valve body optionally available in cast iron, spheroidal graphite iron, cast steel or stainless forged steel

Fig. 1 · Type 42-10 Differential Pressure Regulator

Versions

Differential pressure regulators for installation in a bypass or short-circuit pipes (see Typical application) · Valve unbalanced

Type 42-10 (Fig. 1) · With Type 2421 Valve for DN 15 to DN 25 · Distance piece and Type 2420 Opening Actuator with fixed set point, adjusted to Δp = 0.2, 0.3, 0.4 or 0.5 bar

Type 42-15 (Fig. 2) · With Type 2421 Valve for DN 15 to DN 50 · Distance piece and Type 2425 Opening Actuator with adjustable set point

Fig. 2 · Type 42-15 Differential Pressure Regulator

Special versions

ANSI versions · Actuator with two diaphragms · Actuator with FPM diaphragm for oils · Special K_{VS} (reduced) · Valve entirely made of corrosion-resistant material (minimum grade 1.4301)

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.

Principle of operation (Figs. 5 and 6)

The medium flows through the valve in the direction indicated by the arrow. The position of the valve plug (3) determines the differential pressure across the free area between the plug (3) and the seat (2).

The differential pressure to be controlled is transmitted to the operating diaphragm (12) where it is converted into a positioning force. This force moves the plug (3) according to the force of the set point springs.

In Type 42-15, the set point can be adjusted at the set point adjustment (17).

In Type 42-10, the set point spring (14) in the actuator determines the set point.

The distance piece (20) ensures a tight seal between the control valve and the actuator. It separates the pressure in the valve from the pressure in the actuator.

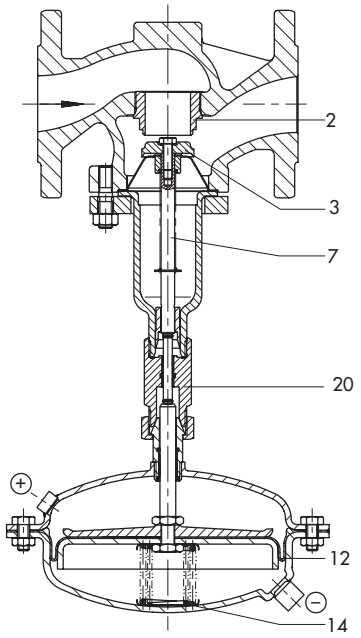
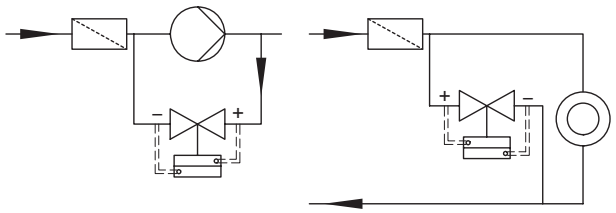


Fig. 5 · Type 42-10 Differential Pressure Regulator

Typical application



Installation in bypass pipe Installation in short-circuit pipe

= = = = To be attached on installing the regulator in the pipeline

Fig. 3 · Typical application

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

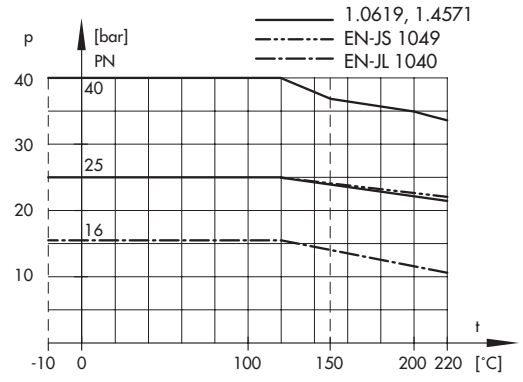


Fig. 4 · Pressure-temperature diagram

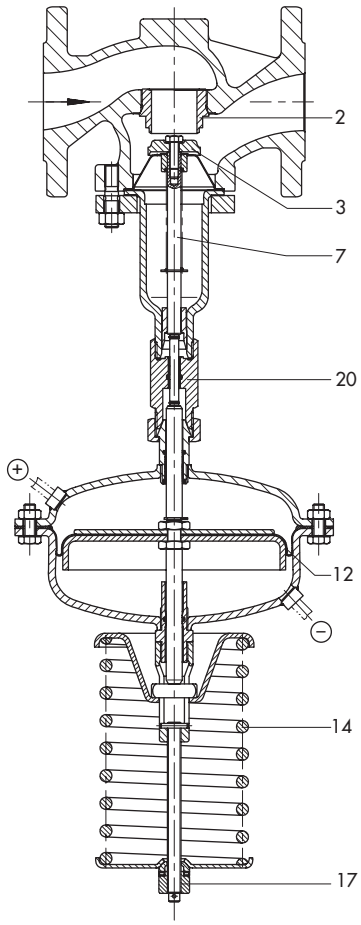


Fig. 6 · Type 42-15 Differential Pressure Regulator

2 Seat
3 Plug
7 Plug stem
12 Operating diaphragm
14 Set point spring(s)
17 Set point adjustment
20 Distance piece

Table 1 · Technical data

Type		42-10	42-15	
Nominal size		15 to 25	15 to 50	
Nominal pressure		16, 25 or 40 (acc. to to DIN EN 12516-1)		
Max. permissible temperature	Body	See Pressure-temperature diagram		
	Actuator	With equalizing tank: Steam and liquids up to 220 °C Without equalizing tank: Liquids up to 150 °C · Air and gases up to 80 °C		
Diaphragm area of actuator	cm^2	160	160	320
Set point ranges	bar	0.2 · 0.3 · 0.4 · 0.5	0.1 to 0.6 · 0.2 to 1· 0.5 to 1.5	0.05 to 0.25
Max. permissible operating pressure for actuator with two diaphragms		12 bar	12 bar	10 bar
Leakage rate		≤ 0.05 % of K_{VS}		

Terms for valve sizing according to DIN EN 60534, Parts 2-1 and 2-2: $F_L = 0.95$; $x_T = 0.75$

Table 2 · Materials · Material number acc. to DIN EN

Type 2421 Valve				
Nominal pressure	PN 16	PN 25	PN 40	
Valve body	Cast iron EN-JL 1040	Spheroidal graphite iron EN-JS 1049	Cast steel 1.0619	Stainless forged steel [1] 1.4571
Seat and plug	Stainless steel 1.4104			1.4571
Plug stem	Stainless steel 1.4310			
Lower part of body	P265GH			1.4571
Body gasket	Graphite on metal core			
Type 2420 and Type 2425 Actuator				
Diaphragm cases	Sheet steel DD1			1.4301
Diaphragm	EPDM with fabric reinforcement [2]			
Guide bushing	DU bushing			PTFE
Distance piece				
Body	CW617N · Special version 1.4301			1.4301
Coupling pin	1.4301			
Seals	EPDM [2]			
Guide bushing	CW617N or DU bushing			PTFE

[1] DN 15, 25, 40 and 50 only · [2] Special version for oils (ASTM I, II, III): FPM (FKM)

Table 3 · Permissible K_{VS} coefficients, z values and maximum permissible differential pressures

Nominal size	**DN**	**15**	**20**	**25**	**32**	**40**	**50**
Seat diameter [1]	mm	14	19	22	32	32	40
Travel	mm	10					
K_{VS} [2]	Normal	4	6.3	8	16	20	32
	Reduced	0.16 · 0.4 · 1.0 · 2.5 · 4		6.3		8	16
z value [1]		0.65	0.6	0.55		0.45	0.4
Δp in bar [1]	Type 42-10	25	16	14	–		
	Type 42-15				6		4

[1] For normal K_{VS} · [2] Micro-trim is possible

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.

The following points need to be observed:

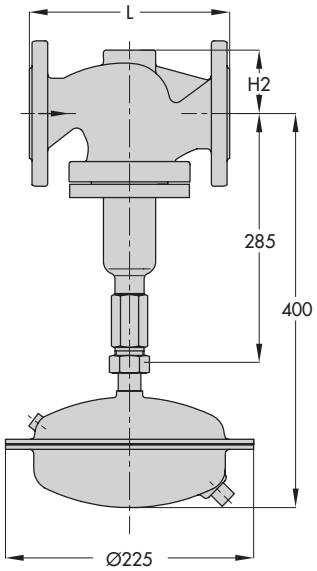
- Install valves in horizontal pipelines
- The medium must flow through the valve in the direction indicated by the arrow on the valve body
- Install a strainer upstream of the valve (e.g. SAMSON Type 2 NI)

Permissible mounting positions

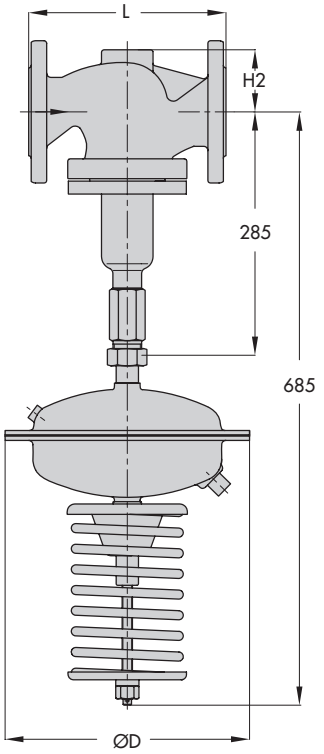
- All nominal sizes: Install the actuator suspended downwards (see photo)
- DN 15 to DN 80/Up to 120 °C: Install the actuator either suspended or upright
- All nominal sizes with fixed plug guide/up to 120 °C: Any position possible
- Steam applications: Always install actuator suspended downwards

Further details can be found in EB 3005 EN.

Dimensions



Type 42-10



Type 42-15

Dimensions in mm and weights in kg

Nominal size DN		**15**	**20**	**25**	**32**	**40**	**50**
Length L		130	150	160	180	200	230
Height H2	Other materials		55			72	
	Forged steel	53	–	70	–	92	98
Type 42-10 Differential Pressure Regulator							
Set point range		Actuator size A and diaphragm Ø D					
0.2 · 0.3 · 0.4 · 0.5 bar		A = 160 cm² · Ø D = 225 mm			–		
Weight [1], approx. in kg		11.5	12	13	–		
Type 42-15 Differential Pressure Regulator							
Set point range		Actuator size A and diaphragm Ø D					
0.05 to 0.25 bar		A = 320 cm² · Ø D = 285 mm					
0.1 to 0.6 bar · 0.2 to 1 bar · 0.5 to 1.5 bar		A = 160 cm² [2] · Ø D = 225 mm					
Weight [1], approx. in kg		16	16.5	17.5	24	24.5	27

[1] The weight applies to the version with material specifications EN-JL 1040/PN 16. Add 10 % for versions in other materials

[2] Optionally with actuator size A = 320 cm²

Fig. 7 · Dimensions of Type 42-10/42-15

Ordering text

Differential Pressure Regulator **Type 42-10/42-15**
DN ...
Body material ..., PN ...
Set point / set point range ... bar
On option, accessories … (refer to T 3095 EN)
On option, special version …

Specifications subject to change without notice.

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