

Self-operated Regulators Series 42



Differential Pressure Regulator with Type 2421 Valve

Type 42-14 · Type 42-18

Application

Differential pressure regulators for district heating supply networks, large heating systems 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** to **220 °C**, air and other non-flammable gases up to **80 °C**

The valve **closes** when the differential pressure rises

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

Special features

- Low-noise, self-operated P-regulators requiring little maintenance
- Suitable for circuit water, water/glycol mixtures, 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 forged steel
- Especially suitable for district heating supply networks

Versions

Differential pressure regulators for installation in the flow or return flow pipe (see Typical application):

Type 42-14 (Fig. 2) · With Type 2421 Valve for DN 15 to 50 and Type 2424 Actuator with adjustable set point · Sealed off between actuator and valve

Type 42-18 (Fig. 1) · With Type 2421 Valve for DN 15 to 25 and Type 2428 Actuator with fixed set point, adjusted to $\Delta p = 0.2, 0.3, 0.4$ or 0.5 bar · Sealed off between actuator and valve

ANSI or **JIS** versions available on request

Special version with FPM diaphragm for mineral oil (version for other oils on request)

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.

Ordering text

Differential Pressure Regulator **Type 42-14/42-18**

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

Set point/set point range ... bar

On option, special version ...

Accessories ...



Fig. 1 · Type 42-18 Differential Pressure Regulator



Fig. 2 · Type 42-14 Differential Pressure Regulator

Principle of operation (Figs. 3 and 4)

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 area released between the plug 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 according to the force of the set point springs (14).

In Type 42-14, the set point can be adjusted at the set point adjustment (17).

In Type 42-18, the set point spring (14) in the actuator determines the set point.

The Type 2424 and Type 2428 Actuators are equipped with a force limiter with internal excess pressure limiter (21). This limits the force transferred to the plug stem and protects the seat and plug from being overloaded. To protect the consumer, the internal excess pressure limiter opens when, for example, the motorized valve closes in the return flow pipe, creating a vacuum at the heat exchanger.

All versions have control lines to transfer the high pressure and low pressure.

The pressure in the valve is separated from the pressure in the actuator in both versions.

Installation

The valve and actuator are delivered in separate packaging.

The actuator can be easily mounted before or after the valve is installed. A coupling nut is used for attachment.



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: Actuator suspended downwards (see photo)
- All nominal sizes and max. 120 °C: Actuator either suspended or in upright position
- All nominal sizes with fixed plug guide and max. 120 °C: Any position possible
- **Steam applications: Always install actuator suspended downwards**

Refer to EB 3001 EN for more details.

- 2 Seat
- 3 Plug
- 7 Plug stem
- 12 Operating diaphragm
- 13 Control line
- 14 Set point spring(s)
- 17 Set point adjustment
- 21 Force limiter with internal excess pressure limiter

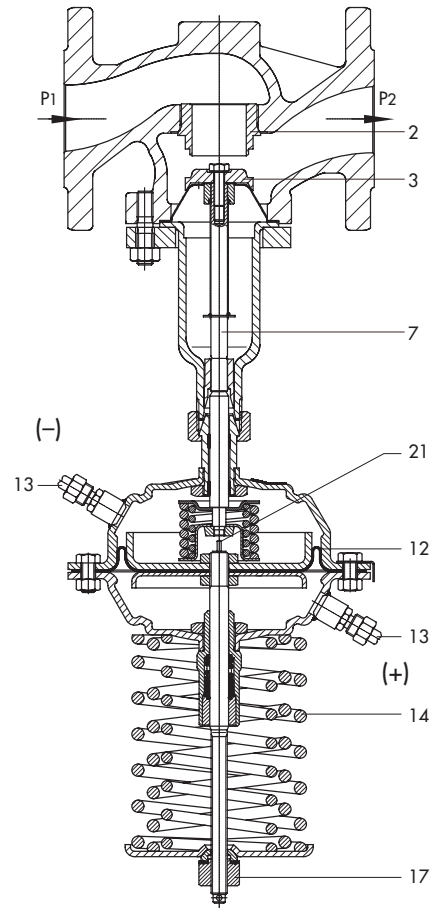


Fig. 3 · Type 42-14 Differential Pressure Regulator with Type 2424 Actuator

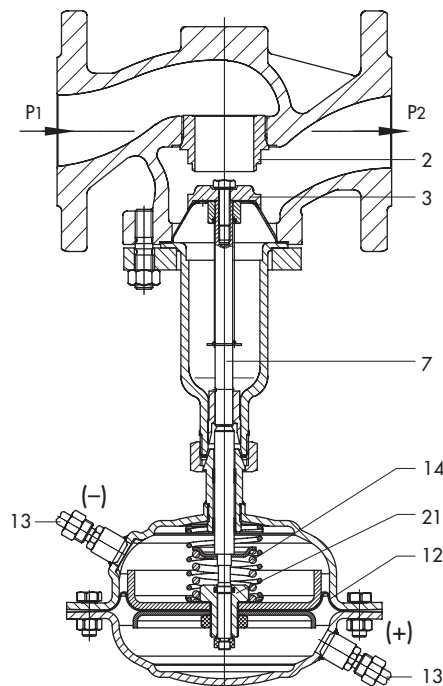


Fig. 4 · Type 42-18 Differential Pressure Regulator with Type 2428 Actuator

Table 1 · Technical data

| Type | 42-14 | | 42-18 |
|--|--|--|-----------------------|
| Nominal size | DN 15 to 50 | | DN 15 to 25 |
| Nominal pressure | PN 16, 25 or 40 (acc. 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 | 320 cm ² | 160 cm ² | 160 cm ² |
| Pressure above adjusted set point at which internal excess pressure limiter responds | 0.6 bar | 1.2 bar | 0.6 bar |
| Set point ranges bar | 0.05 to 0.25 | 0.1 to 0.6 · 0.2 to 1 · 0.5 to 1.5 | 0.2 · 0.3 · 0.4 · 0.5 |
| Max. perm. operating pressure for actuator with two diaphragms | 25 bar | 40 bar | 40 bar |
| Leakage rate acc. to IEC 60534-4 | ≤ 0.05 % of K _{vs} | | |

Terms for valve sizing according to IEC 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 16/25/40 | |
| Valve body | Cast iron EN-JL 1040 | Spheroidal graphite iron EN-JS 1049 | Cast steel 1.0619 | Forged stainless steel 1.4571 ¹⁾ |
| Seat and plug | Stainless steel 1.4305 | | | 1.4571 |
| Plug stem | 1.4310 | | | |
| Lower part of body | P265GH (1.0305) | | | 1.4571 |
| Body gasket | Graphite on metal core | | | |
| Type 2424 and Type 2428 Actuator | | | | |
| Diaphragm cases | DD 11 | | | 1.4301 |
| Diaphragm | EPDM ²⁾ with fabric reinforcement | | | |
| Guide bushing | DU bushing | | | PTFE |

¹⁾ DN 15, 25, 40 and 50 only

²⁾ Special version for mineral oil: FPM (FKM)

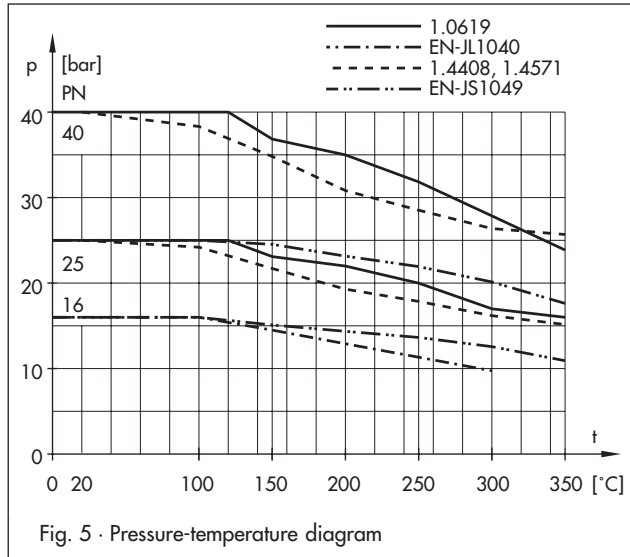
Table 3 · Permissible K_{VS} coefficients, z values and maximum permissible differential pressures

| Nominal size | DN | 15 | 20 | 25 | 32 | 40 | 50 |
|--|------------|---------------------------|-----|------|-----|------|-----|
| Seat diameter | mm | 14 | 19 | 22 | 32 | 32 | 40 |
| Travel | mm | 10 | | | | | |
| K _{VS} ¹⁾ | Normal | 4 | 6.3 | 8 | 16 | 20 | 32 |
| | Reduced | 0.1 · 0.4 · 1.0 · 2.5 · 4 | | | 6.3 | - | |
| z value ²⁾ | | 0.65 | 0.6 | 0.55 | | 0.45 | 0.4 |
| Diff. pressure ²⁾ Δp in bar | Type 42-14 | 25 | 16 | 14 | 6 | | 4 |
| | Type 42-18 | | | | - | | |

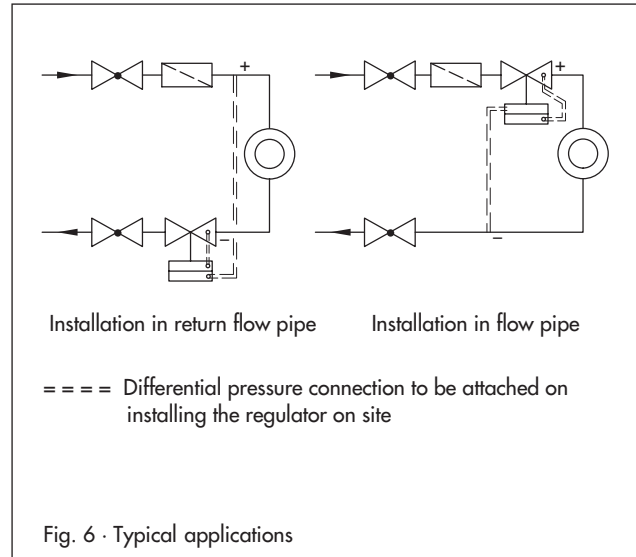
¹⁾ Micro-trim is possible

²⁾ For normal K_{VS} coefficient

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



Typical application



Dimensions

Type 42-14

Type 42-18

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 | | |
| | Forged steel | | | 72 | | |
| Type 42-14 Differential Pressure Regulator | | | | | | |
| Weight for PN 16, EN-JL 1040 ¹⁾ in kg | 20 ²⁾ | 20.5 ²⁾ | 21.5 ²⁾ | 28 ²⁾ | 28.5 ²⁾ | 31 ²⁾ |
| | 16 | 16.5 | 17.5 | 24 | 24.5 | 27 |
| Diaphragm Ø D | 225 mm with A = 160 cm ² 285 mm with A = 320 cm ² | | | | | |
| Type 42-18 Differential Pressure Regulator | | | | | | |
| Weight for PN 16, EN-JL 1040 ¹⁾ in kg | 11.5 | 12 | 13 | - | | |

¹⁾ +10 % with PN 25/40
²⁾ With actuator A = 320 cm²

Fig. 7 · Dimensions

Specifications subject to change without notice.



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