INFORMATION SHEET

T 3000 EN

Series 42 Self-operated Differential Pressure and Flow Regulators

PN 16 to 40

DN 15 to 250

Up to 220 °C

SAMSON AKTIENGESELLSCHAFT · Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507 · samson@samsongroup.com · www.samsongroup.com

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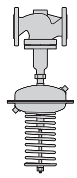
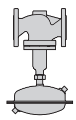
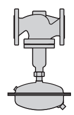
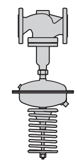
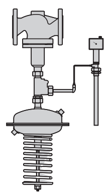
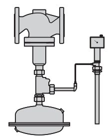
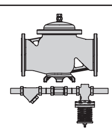
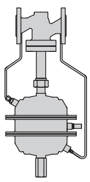
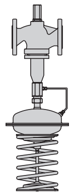
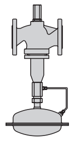
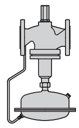
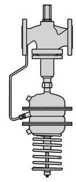
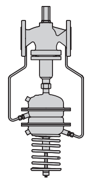
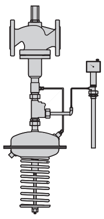
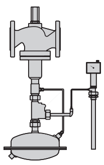
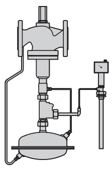
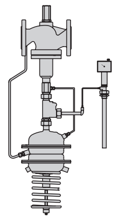
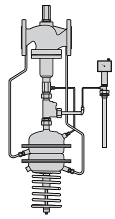
Overview · Series 42 Differential Pressure and Flow Regulators

Valves	Can be used for	Steam	•	•	•	•
		Water and other liquids	•	•	•	•
		Mineral oil	•	•	•	•
		Air and non-flammable gases	•	•	•	•
	Connection	Globe valve with flanges	•	•	•	•
		Valve size DN	15 to 250	15 to 100		15 to 250
		Pressure rating PN	16 to 40			
	Perm. temperature max. °C		350			
	Balanced		•	•	•	•
	Unbalanced		•			
	With force limiter [1]		•	•		
	Body material [2]	Cast iron	•	•	•	•
		Spheroidal graphite iron	•	•	•	•
		Cast steel	•	•	•	•
		Stainless steel [4]	•	•	•	•
Application	Differential pressure Δp		•	•	•	•
	Flow rate	Control				
		Limitation				
	Installation	Flow pipe	•	•	Short circuit or bypass	
		Return flow pipe	•	•		
	Set point [3]	Fixed, not adjustable		•	•	
		Adjustable	•			•
	Δp (bar)	Minimum	0.05	0.2	0.2	0.05
		Maximum	10	0.5	0.5	10
						
Type ...			**42-24**	**42-28**	**42-20**	**42-25**
Details in Data Sheet ...			▶ **T 3003**		▶ **T 3007**	
						
Type ... with additional temperature control			**42-24 DoT**	**42-28 DoT**		
Details in Data Sheet ...			▶ **T 3019**			

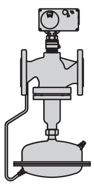
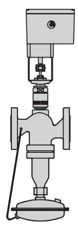
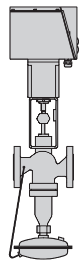
1) The force limiter with internal excess pressure limiter in the actuator protects the seat and plug against damage when the permissible differential pressure is exceeded.
2) EN-GJL-250 (PN 16 only) · EN-GJS-400-18-LT (PN 25 only)
3) Temperature set point is adjustable in all versions (with DoT)
4) Stainless steel forged steel also available with certain valves sizes (see associated data sheet)
5) Optionally also as flow and pressure regulator
6) Max. DN 150 for regulator in DoT version

Type 2334 Pilot-operated Universal Regulator

Application Pressure, differential pressure, flow rate, temperature or combined regulators, optionally with additional electric actuator · For all applications listed	 **Type 2334**
Globe valve balanced by a bellows or diaphragm · Pilot operated by the medium · Maximum three pilot valves	**See Data Sheet ▶ T 3210 for details**

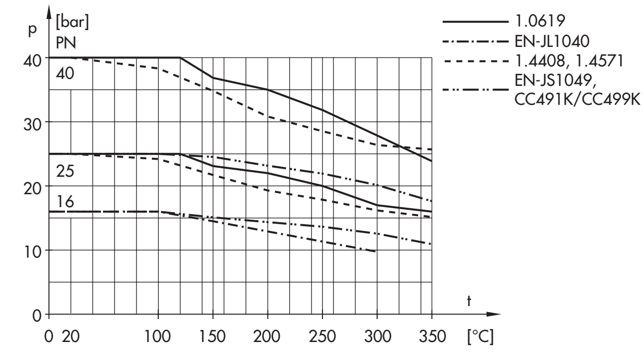
	•	•	•	•	•	•
	•	•	•	•	•	•
	•	•	•	•	•	•
	•	•	•	•	•	•
	•	•	•	•	•	•
	15 to 250	15 to 250 [6]	15 to 100	15 to 250 [6]		
	16 to 40					
	80	220				
		•	•	•	•	•
	•					
		•	•		•	•
	•	•	•	•	•	•
	•	•	•	•	•	•
	•	•	•	•	•	•
	•	•	•	•	•	•
		•	•		•	•
				•	•	• [5]
		•	•			
	•			•		•
		•	•	•	•	
	•		• (Δp)			
		•		•	•	•
	–	0.1	0.2	–	0.1	0.1
	–	1.5	0.5	–	5.0	5.0
						
	42-10 RS	**42-34**	**42-38**	**42-36**	**42-37**	**42-39**
	▶ **T 3009**	▶ **T 3013**		▶ **T 3015**	▶ **T 3017**	
						
		42-34 DoT	**42-38 DoT**	**42-36 DoT**	**42-37 DoT**	**42-39 DoT**
		▶ **T 3019**				

Pressure-independent Control Valve (PICV)

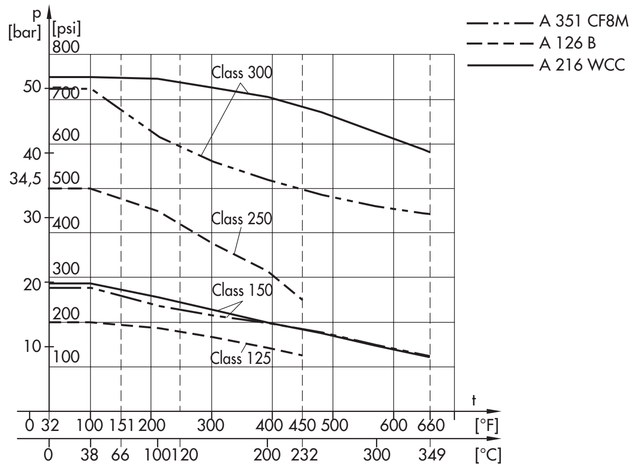
Application for **flow rate control $\dot{V}$** Further details to the regulators with Type 5824/5825, Type 3374 and Type 3274 Actuators can be found in the Data Sheet ▶ **T 3018**	 **Type 42-36 E with Type 5824 or 5825 Electric Actuator**	 **Type 42-36 E with Type 3374 Electric Actuator**	 **Type 42-36 E with Type 3274 Electrohydraulic Actuator**
Type 42/36 as basic regulator	**See Data Sheet ▶ T 3018 for details**		

Pressure-temperature diagram (DIN)

For DIN materials, the diagrams were created based on DIN EN 12516-1. For materials in accordance with US standards, these were created in compliance with ASME B16.1 and ASME B16.34.



Pressure-temperature diagram (ANSI)



The diagram below applies to the use of regulators for district heating (see DIN 4747-1).

Pressure-temperature diagram according to DIN 4747-1 for selected materials

The materials for valves and connecting pieces must be suitable for sizing and the operating conditions.

In this case, material is selected according to DIN 4747-1.

Depending on the valve material, various pressure ratings are also permissible at different temperatures.

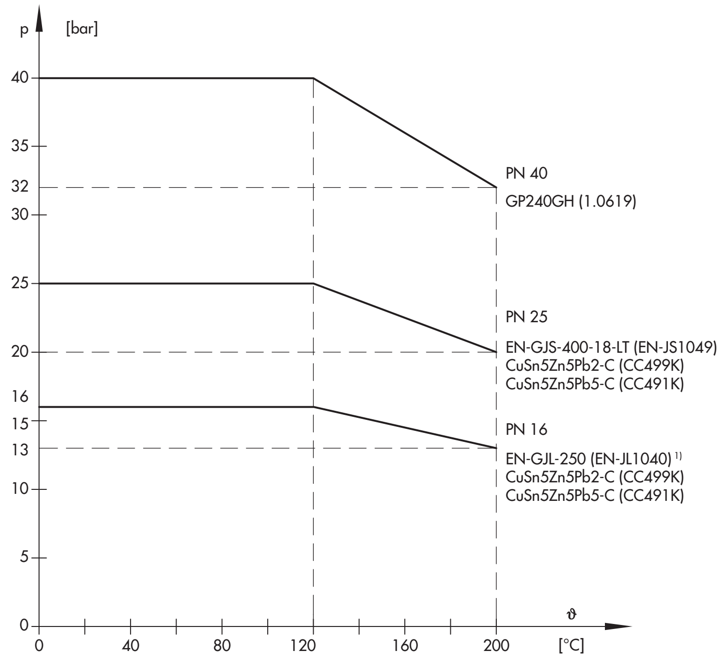


Fig. 1: *Pressure-temperature diagrams (DIN EN material number)*

1) Permissible when network's flow temperature $\vartheta_{VN} \leq 130$ °C · $\vartheta_{VN} > 130$ °C only up to DN 100

Conversion factors

K_{VS} and C_V coefficient

The exact calculation is performed according to IEC 60534, parts 2-1 and 2-2. The ISA-S75.01-1-1985 standard and VDI/VDE directive 2173 are also used. The calculation of the K_V coefficient according to this directive is sufficiently accurate in most cases. The equations are also listed in the Application Notes AB 04.

K_{VS}	=	$0.86 \times C_V$	K_{VS}	[m³/h]
C_V	=	$1.17 \times K_{VS}$	C_V	[US gallon/min]

Pressure

1 pound/square inch [lbs/in² = psi] = 0.06895 bar
1 bar = 14.5 psi

Area

1 square inch [sq.in; in²] = 6.452 cm²
1 cm² = 0.155 in²

Ground

1 pound [lb] = 0.4536 kg
1 kg = 2.2046 lb

Mass flow

1 pound per second [lb/s] = 0.4536 kg/s
1 kg/s = 2.2046 lb/s

Flow rate

1 US gallon per min [US gallon/min] = 0.227 m³/h
1 m³/h = 4.4 US gallon/min

Temperature

°F = 9/5 °C + 32
°C = 5/9 (°F - 32)

Differential pressure and flow control · Regulators and their control methods

The Series 42 Self-operated Differential Pressure and Flow Regulators consist of a valve with flanges and an actuator, which closes or opens the valve when the differential pressure/flow rate increases.

The medium flows through the valve in the direction indicated by the arrow. The areas released by the valve plug determine the differential pressure/flow rate.

In pressure-balanced regulators, the plug is largely unaffected by pressure changes in the medium. This is achieved by using either valves balanced by a bellows or a diaphragm. The valves balanced by a diaphragm have a balancing diaphragm instead of a balancing bellows. In both cases, the forces created by the upstream and downstream pressures that act on the plug are balanced out.

The actuators can be equipped with force limiters to limit the force acting on the plug stem and protect the seat and plug against damage.

A similar effect is achieved by an excess pressure limiter integrated into the actuator. A bypass opens, if necessary and balances the forces which prevents excessive positioning forces.

Differential pressure control

The regulator intended for this purpose is used to keep the differential pressure between the two pipelines constant according to the adjusted set point. They are designed for installation in high-pressure or low-pressure pipe, e.g. flow or return flow pipe of a district heating substation

The differential pressure to be controlled acts on the operating diaphragm where it is transformed into a positioning force. This force is used to move the plug according to the force of the set point spring.

Depending the regulator model, the set point is adjustable at the set point adjuster or it is fixed by the installed set point spring.

External control lines transmit the high pressure and low pressure to the actuator.

Flow control

The flow rate is determined according to the differential pressure method. This is achieved by a standard orifice plate in the pipe through which the medium flows or by an adjustable restriction integrated into the valve.

The areas released by the restriction and the valve plug influence the flow rate. In this case, the high pressure upstream of the restriction is transferred through the control line to the high-pressure side of the diaphragm, whereas the low pressure downstream of the restriction is transferred through a bore in the valve plug to the low-pressure side of the diaphragm.

If the pressure difference acting on the operating diaphragm exceeds the differential pressure set point of the set point spring, i.e. the flow rate increases, the diaphragm moves together with the plug stem and the plug. The cross-sectional area of flow is reduced until the pressure drop created above the restriction and the differential pressure created to measure flow are identical.

Combined regulators applicable for differential pressure/pressure and flow control as well as regulators suitable for one or more of these control tasks are commonly used.

Design · Principle of operation and application (see Fig. 2)

Self-operated differential pressure and flow regulators are medium-controlled proportional regulators. Each deviation from the adjusted set point is assigned to a certain valve plug position.

The medium to be controlled delivers the necessary energy to adjust the valve. The released force moves the plug when the set point differs from the actual value.

The differential pressure Δp to be controlled generates a force F_m at the diaphragm surface of the actuator which is proportional to the actual value (controlled variable x). This force is compared to the spring force F_S (set point w) at the plug stem. It can be adjusted at the set point adjuster. The spring force corresponds to the set point and can be adjusted at the set point adjuster. When the differential pressure Δp and thus the force F_m change, the plug stem is moved until $F_m = F_S$. With a predetermined diaphragm area A, the spring rate of the set point spring determines the rated travel and thus also the proportional-action coefficient K_p and the proportional band x_p.

The flow rate is controlled according to the differential pressure method.

The control accuracy and stability depend on the disturbances that occur. The regulators are designed in such a way that the effect of these disturbances is relatively small. Amongst other things, this is also achieved by balancing the plug with a balancing diaphragm or metal bellows. As a result, the force acting on the plug, which depends on the upstream or differential pressure, is eliminated by an equal opposing force. In unbalanced versions, the disturbance effect is a force resulting from the cross-section of the seat and the differential pressure.

The regulators can be designed to function as:

- Differential pressure regulators
- Flow regulators
- Differential pressure and flow regulators
- Differential pressure regulators with flow limitation
- Differential pressure, flow and temperature regulators
- Pressure-independent control valves (PICV)

Differential pressure regulators with closing actuator (see Fig. A)

This actuator closes the valve when the adjusted differential pressure set point is exceeded. The top of the diagram shows a closing actuator with an adjustable set point, the bottom an actuator with a fixed set point.

Actuators with a fixed set point determined by the set point spring are appropriately suitable for closed loops with a constant set point.

Differential pressure regulators with opening actuator (see Fig. B)

This actuator opens the valve when the differential pressure rises. The valve is closed when relieved of pressure ($\Delta p = 0$).

Valve with bellows seal (see Fig. C)

The downstream pressure acts on the inside bellows surface, while the upstream pressure acts on the outside bellows surface. As a result, the forces acting on the plug are balanced, the plug is fully balanced and not affected by any pressure or flow rate changes in the process medium.

The fully balanced valves in the Series 42 Regulators allow these regulators to be used for valve sizes up to DN 250 and flow rates up to 520 m³/h.

Flow regulators (see Fig. D)

Flow regulators are particularly suitable for district heating supply networks. The measuring system is designed for a fixed differential pressure at the restriction of, for example 0.2 bar.

The set point is adjusted at the restriction. As a result, the regulator operates with an adjustable orifice bore, i.e. with an opening ratio which is adapted to the set point.

Principle of flow control (see Fig. E)

Principle of flow control according to the differential pressure method. The differential pressure $\Delta p_{restriction}$ generated across the restriction is transferred to the diaphragm surface of the actuator. The difference between the force at the diaphragm and the spring force of the set point spring causes the plug position to change. For the flow rate, the differential pressure $\Delta p_{restriction}$ acting on the restriction and the force F_m acting on the diaphragm, the following applies:

$$\dot{V} = K \cdot \sqrt{\Delta p_{restriction}} \mathrel{\hat{=}} K \cdot \sqrt{F_m} \quad \text{or} \quad \dot{V}^2 = K' \cdot \Delta p \mathrel{\hat{=}} K' \cdot F_m$$

$$\Delta p_{restriction} = \frac{F_m}{A}$$

$\dot{V}$	=	Flow rate
F_m	=	Force at the actuator area
K, K´	=	Constants
A	=	Actuator area
$\Delta p_{restriction}$	=	Differential pressure created at the restriction for measuring the flow rate

Flow and differential pressure or pressure regulators (see Fig. F and Fig. G)

These regulators are equipped with two diaphragms. The top diaphragm is used to control the flow rate, the bottom diaphragm is used to control the differential pressure or pressure. The largest signal is always used to control the regulator.

Depending on the intended application, these regulators are equipped with the necessary control lines.

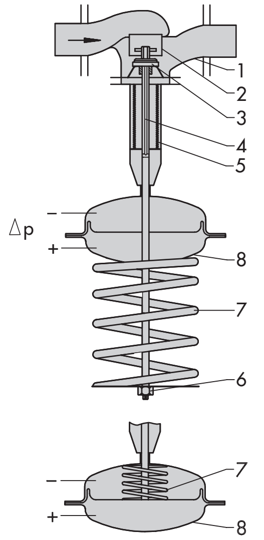


Fig. A: *Differential pressure regulator with closing actuator and adjustable set point (top) and fixed set point (bottom)*

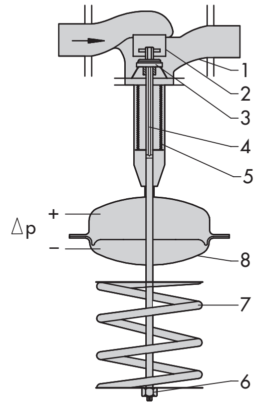


Fig. B: *Differential pressure regulator with opening actuator and adjustable set point*

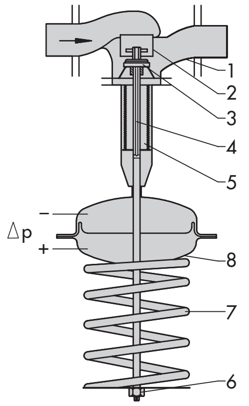


Fig. C: *Differential pressure regulator balanced by a metal bellows*

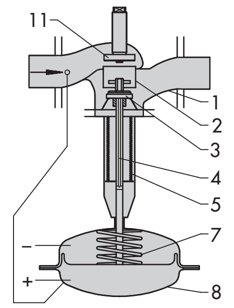


Fig. D: *Flow regulator*

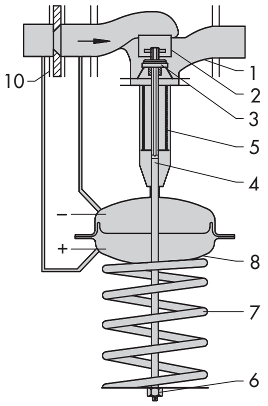


Fig. E: *Differential pressure regulator used as a flow regulator (with external restriction)*

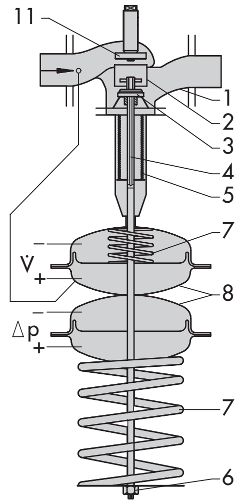


Fig. F: *Flow and differential pressure regulator (flow pipe)*

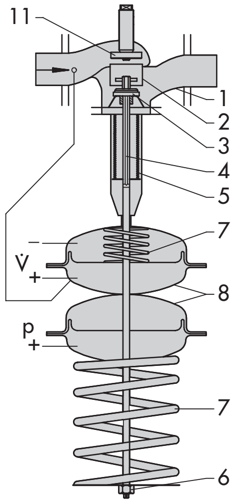


Fig. G: *Flow and pressure regulator*

Legend for Fig. A to Fig. G

1 Valve body
2 Seat
3 Plug
4 Plug stem
5 Balancing bellows
6 Set point adjustment
7 Set point spring
8 Actuator
11 Adjustable orifice

Fig. 2: *Schematic diagrams of differential pressure and flow regulators*

Series 42 Self-operated Regulators

Differential pressure and flow regulators

SAMSON differential pressure and flow regulators are suitable for industrial, public and domestic applications, especially for district heating supply systems, for heating, ventilation and air-conditioning systems, for steam and heat generators, heat exchangers, energy supply units in power plants and chemical plants as well as for large pipeline systems.

- Low-noise, self-operated proportional regulators requiring little maintenance
- Body optionally available in cast iron, spheroidal graphite iron, cast steel, cast stainless steel or forged steel
- Suitable for water, steam, air and other liquids or gases, provided they do not influence the properties of the operating diaphragm
- Special version for mineral oils/heat transfer oils
- Flanges

Backflow protection

Type 42-10 RS · Fixed set point

- Type 2421 RS Valve and Type 2420 RS Actuator
- Differential pressure regulator with opening actuator for installation in the flow pipe
- The regulator closes when the downstream pressure rises to or above the value of the upstream pressure
- Single-seated valve with unbalanced plug

Technical data		**Data Sheet ▶ T 3009**
Valve size		DN 15 to 250 · NPS ½ to 10
Pressure rating		PN 25 and 40 · Class 150 and 300
Differential pressure set point		0.2 bar
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Water	Up to 150 °C · 300 °F
	Steam	Up to 220 °C · 430 °F

Differential pressure regulators

Type 42-24 · With adjustable set point
Type 42-28 · With fixed set point

- Type 2422 Valve and Type 2424/2428 Actuator
- Type 42-24/Type 42-28: Differential pressure regulator with closing actuator
- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows
- Actuator with two diaphragms for increased safety
- Actuator with force limiter and internal excess pressure limiter

Technical data		**Data Sheet ▶ T 3003**
Valve size	Type 42-24	DN 15 to 250 · NPS ½ to 10
	Type 42-28	DN 15 to 100 · NPS ½ to 4
Pressure rating		PN 16 to 40 · Class 125 to 300
Differential pressure set point	Type 42-24	0.05 to 10 bar
	Type 42-28	0.2 · 0.3 · 0.4 · 0.5 bar
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Liquids	Up to 150 °C · 300 °F
	Vapors and liquids	Up to 350 °C · 660 °F

Type 42-10 RS Check Valve (backflow protection)

Differential pressure regulators Type 42-24 · Adjustable set point

Type 42-28 Differential Pressure Regulator Fixed set point

Fig. 3: *Series 42 Differential Pressure Regulators*

Differential pressure regulators

Type 42-20 · With fixed set point
Type 42-25 · With adjustable set point

- Type 2422 Valve and Type 2420/2425 Actuator
- Differential pressure regulators with opening actuator, preferably for installation in a bypass pipe or short-circuit pipe
- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows
- Actuator with two diaphragms for increased safety

Technical data		**Data Sheet ▶ T 3007**
Valve size	Type 42-20	DN 15 to 100 · NPS ½ to 4
	Type 42-25	DN 15 to 250 · NPS ½ to 10
Pressure rating		PN 16 to 40 · Class 125 to 300
Differential pressure set point	Type 42-20	0.2 · 0.3 · 0.4 · 0.5 bar
	Type 42-25	0.05 to 10 bar
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Liquids	Up to 150 °C · 300 °F
	Vapors and liquids	Up to 350 °C · 660 °F

Differential pressure regulators with flow limitation

Type 42-38 · With fixed set point
Type 42-34 · With adjustable set point

- Type 2423 Valve and Type 2424/2428 Actuator
- Actuator with force limiter and internal excess pressure limiter
- Differential pressure regulator with flow limitation with closing actuator for installation in the return flow pipe of an indirect transfer station
- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows

Technical data		**Data Sheet ▶ T 3013**
Valve size	Type 42-38	DN 15 to 100 · NPS ½ to 4
	Type 42-34	DN 15 to 250 · NPS ½ to 10
Pressure rating		PN 16 to 40 · Class 125 to 300
Differential pressure set point	Type 42-38	0.2 · 0.3 · 0.4 · 0.5 bar
	Type 42-34	0.1 to 1.5 bar
Temperature ranges	Liquids	Up to 220 °C · 430 °F

Flow regulators

Type 42-36

- Type 2423 Valve and Type 2426 Actuator
- Flow regulator with closing actuator for installation in high-pressure or low-pressure pipe, e.g. flow or return flow pipe
- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows

Technical data		**Data Sheet ▶ T 3015**
Valve size		DN 15 to 250 · NPS ½ to 10
Pressure rating		PN 16 to 40 · Class 125 to 300
Flow rate set point ranges		0.05 to 520 m³/h
Differential pressure across the restriction		0.2 or 0.5 bar
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Vapors and liquids	Up to 220 °C · 430 °F

Type 42-25 Differential Pressure Regulator

Type 42-36 Flow Regulator

Type 42-34 Differential Pressure Regulator with Flow Limitation

Fig. 4: *Series 42 Differential Pressure and Flow Regulators*

Flow and differential pressure or pressure regulators

Type 42-37 · Type 42-39

- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows

Type 42-37 Flow and Differential Pressure Regulator

- Type 2423 Valve and Type 2427 Actuator
- Flow and differential pressure regulators with closing actuator for installation in the return flow pipe of a district heating station
- Flow rate set point adjustable at a restriction
- Differential pressure set point adjustable at the actuator
- Actuator with force limiter and overload protection

Type 42-39 Flow and Differential Pressure or Pressure Regulator

- Type 2423 Valve and Type 2429 Actuator
- Flow and differential pressure or pressure regulators with closing actuator for installation in the flow pipe of a district heating station
- Flow rate set point adjustable at a restriction
- Differential pressure or pressure set point adjustable at the actuator

Technical data		**Data Sheet ▶ T 3017**
Valve size		DN 15 to 250 · NPS ½ to 10
Pressure rating		PN 16 to 40 · Class 125 to 300
Flow rate set point ranges		0.05 to 520 m³/h
Differential pressure across the restriction		0.2 or 0.5 bar
Differential pressure set point ranges	Type 42-37	0.1 to 5 bar
	Type 42-39	0.1 to 5 bar
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Liquids	Up to 220 °C · 430 °F

Differential pressure and temperature regulators

Type 42-24 DoT · Type 42-28 DoT

- Differential pressure and temperature regulators with closing actuator for installation in the flow or return flow pipe
- Actuator with force limiter and internal excess pressure limiter

Type 42-24 DoT

- Type 2422 Valve and double adapter with Type 2424 Actuator, adjustable set point and Type 2231/2232 Control Thermostat
- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows

Type 42-28 DoT

- Type 2422 Valve and double adapter with Type 2428 Actuator, fixed set point and Type 2231/2232 Control Thermostat
- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows

Technical data		**Data Sheets ▶ T 3003 · ▶ T 3019**
Valve size	Type 42-24	DN 15 to 250 · NPS ½ to 10
	Type 42-28	DN 15 to 100 · NPS ½ to 4
Pressure rating		PN 16 to 40 · Class 125 to 300
Differential pressure set point	Type 42-24	0.05 to 10 bar
	Type 42-28	0.2 · 0.3 · 0.4 · 0.5 bar
Temperature set point ranges		–10 to +250 °C
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Liquids	Up to 220 °C · 430 °F

Type 42-37 Flow and Differential Pressure Regulator

Type 42-39 Flow and Differential Pressure or Pressure Regulator

Type 42-28 DoT Differential Pressure and Temperature Regulators with Type 2232 Control Thermostat

Fig. 5: *Series 42 Differential Pressure, Flow and Temperature Regulators*

Type 42-34 DoT · Type 42-36 DoT · Type 42-37 DoT Type 42-38 DoT · Type 42-39 DoT

- Single-seated valve with a plug balanced by a balancing diaphragm or stainless steel bellows

Type 42-36 DoT Flow and Temperature Regulator

- Type 2423 Valve and double adapter with Type 2426 Actuator and Type 2231/2232 Control Thermostat
- Flow and temperature regulators with closing actuator for installation in the flow or return flow pipe

Type 42-37 DoT Differential Pressure, Flow and Temperature Regulator

- Type 2423 Valve and double adapter with Type 2427 Actuator, adjustable set point and Type 2231/2232 Control Thermostat
- Differential pressure, flow and temperature regulators with closing actuator for installation in the flow or return flow pipe of a district heating station
- Actuator with force limiter and internal excess pressure limiter

Type 42-39 DoT Flow and Differential Pressure or Pressure Regulator

- Type 2423 Valve and double adapter with Type 2429 Actuator, adjustable set point and Type 2231/2232 Control Thermostat
- Regulator for installation in the flow pipe of a district heating substation

Type 42-34 DoT and Type 42-38 DoT Differential Pressure and Temperature Regulators with Flow Limitation

- For installation in the return flow pipe

Type 42-34 DoT

- Type 2423 Valve and double adapter with Type 2424 Actuator, adjustable set point and Type 2231/2232 Control Thermostat
- Actuator with force limiter and internal excess pressure limiter

Type 42-38 DoT

- Type 2423 Valve and double adapter with Type 2428 Actuator, fixed set point and Type 2231/2232 Control Thermostat
- Actuator with force limiter and internal excess pressure limiter

Technical data		**Data sheets ▶ T 3013 · ▶ T 3015 ▶ T 3017 · ▶ T 3019**
Valve size	Type 42-34 DoT	DN 15 to 150 · NPS ½ to 6
	Type 42-36 DoT	DN 15 to 150 · NPS ½ to 6
	Type 42-37 DoT	DN 15 to 150 · NPS ½ to 6
	Type 42-38 DoT	DN 15 to 100 · NPS ½ to 4
	Type 42-39 DoT	DN 15 to 150 · NPS ½ to 6
Pressure rating		PN 16 to 40 · Class 125 to 300
Differential pressure set point ranges	Type 42-34 DoT	0.1 to 1.5 bar
	Type 42-37 DoT	0.1 to 5 bar
	Type 42-38 DoT	0.2 · 0.3 · 0.4 · 0.5 bar
	Type 42-39 DoT	0.1 to 5 bar
Flow rate set point ranges with differential pressure across the restriction of 0.2 or 0.5 bar		0.05 to 260 m³/h
Temperature set point ranges		−10 to +250 °C
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Liquids	Up to 220 °C · 430 °F

Type 42-24 DoT Differential Pressure and Temperature Regulators with Type 2231 Control Thermostat

Type 42-36 DoT Flow and Temperature Regulators with Type 2231 Control Thermostat

Type 42-37 DoT Differential Pressure, Flow and Temperature Regulators with Type 2231 Control Thermostat

Fig. 6: *Series 42 Differential Pressure, Flow and Temperature Regulators*

Pressure-independent control valves (PICV)

- The valve closes when the flow rate or the output signal of the electric controller increases. The largest signal closes the valve. The control accuracy is independent from the differential pressure across the valve.
- Control equipment tested is available. Test number on request.
- The regulators are available with the following electric actuators:
  - **DN 15 to 50**
    Type 5824 or Type 5825 Electric Actuator
  - **DN 65 to 100**
    Type 3374 Electric Actuator
  - **DN 125 to 250**
    Type 3274 or Type 3374-15 Electrohydraulic Actuator without fail-safe action

Type 42-36 E Flow Regulator

- Type 2423 Valve with adjustable restriction and Type 2426 Diaphragm Actuator
- Flow regulator with closing actuator for installation in the flow or return flow pipe

Technical data		**Data Sheets ▶ T 3015 · ▶ T 3018**
Valve size		DN 15 to 250 · NPS ½ to 10
Pressure rating		PN 16 to 40 · Class 125 to 300
Flow rate set point ranges with differential pressure across the restriction of 0.2 or 0.5 bar		0.05 to 360 m³/h
Temperature set point ranges		−10 to +250 °C
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Liquids	Up to 150 °C · 300 °F

Type 5824, Type 5825 and Type 3374 Electric Actuators
Type 3274 Electrohydraulic Actuator

Technical data		Data sheets ▶ T 5824 · ▶ T 8331 ▶ T 8340 · ▶ T 3018	
Type	**5824 - … / 5825 - …**	**3374 - …**	**3274 - …**
For valve size …	DN 15 to 50	DN 65 to 100	DN 125 to 250
Electrical connection	24 V, 50 Hz or 230 V, 50 Hz	230 V, 50/60 Hz 10 %	
Permissible ambient temperature	0 to 50 °C	5 to 60 °C	35 [1] to 60 °C

1) With electric trace heating

Pilot-operated Universal Regulators

Pressure, differential pressure, flow rate, temperature or combined regulators, optionally with additional Type 2334 Electric Actuator

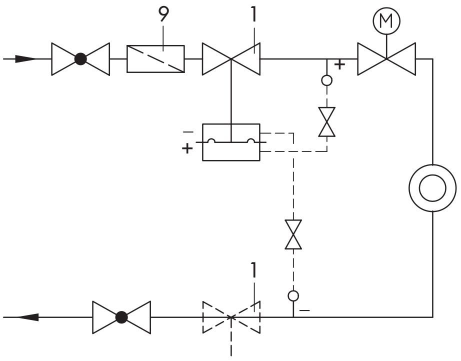
- Single-seated globe valve with flanged end connections
- Wide control range and high useable rangeability at low pressure loss
- Suitable for district heating plants in accordance with DIN 4747-1 (requirements stipulated by AGFW (German District Heating Association) concerning components in house substations)

Technical data		**Data Sheet ▶ T 3210**
Valve size		DN 65 to 400 · NPS 2½ to 16
Pressure rating		PN 16 to 40 · Class 125 to 300
Set point ranges		Depending on the pilot valve
Temperature ranges	Air and gases	Up to 80 °C · 175 °F
	Liquids	Up to 150 °C · 300 °F

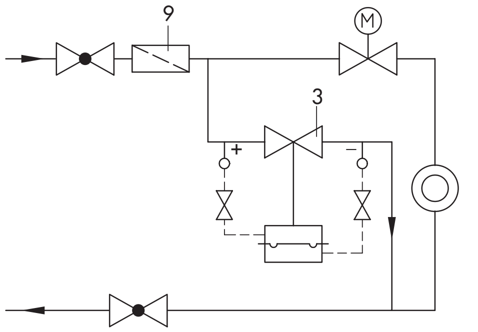
Type 42-36 E Flow Regulator with Type 5825 Actuator

Type 42-36 E Flow Regulator with Type 3374 Actuator

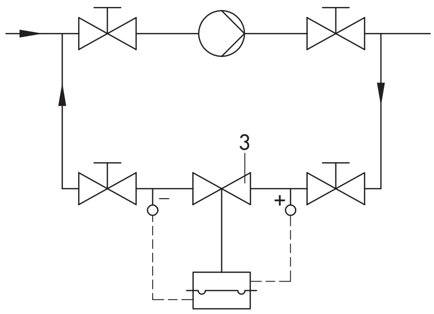
Fig. 7: *Pressure-independent Control Valve (PICV)*



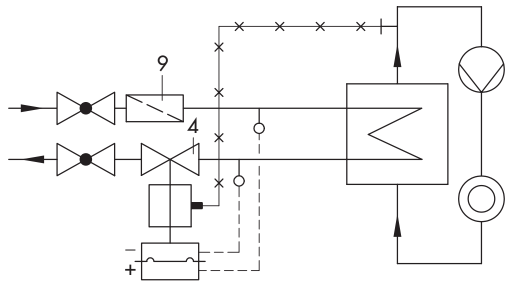
Differential pressure control in the flow or return flow pipe of a heating or cooling supply system



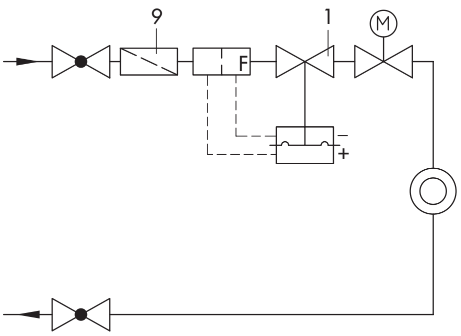
Differential pressure control in the short-circuit pipe of a heating or cooling supply system



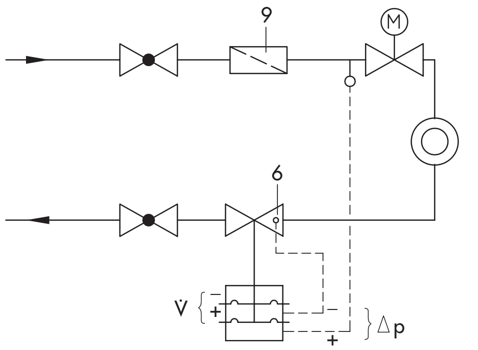
Differential pressure control in the bypass line of a centrifugal pump



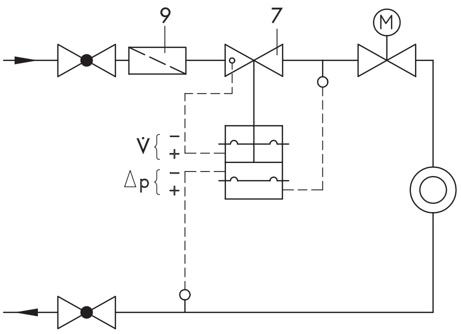
Differential pressure and temperature control



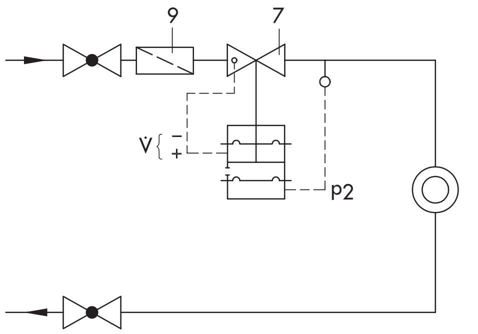
Flow control with external orifice



Combined flow rate and differential pressure control in the return flow pipe of a heating or cooling system



Combined flow rate and differential pressure control in the flow pipe of a heating or cooling system



Combined flow rate and pressure control

Legend for the diagrams

1	Type 42-24 or Type 42-28	6	Type 42-37
3	Type 42-20 or Type 42-25	7	Type 42-39
4	Type 42-24 DoT or Type 42-28 DoT	9	SAMSON strainer

Fig. 8: *Sample applications*