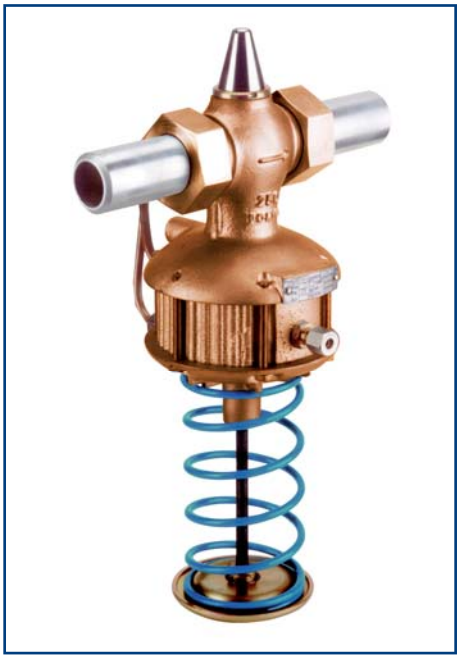
POLNA®

SELF-ACTUATING DIFFERENTIAL PRESSURE AND FLOW REGULATORS **TYPE ZSG 9**

APPLICATIONS AREA:
Regulators ZSG 9 are used to control preset pressure difference and flow rate in process installations connected to valve inlet or outlet. Regulators are applied in heating systems, in industrial processes with cold and hot (up to 150°C) water and non-flammable gases (up to 80°C), at nominal pressures up to PN25. Using with other media subject to consulting with manufacturer.

CHARACTERISTICS:
- compact and rigid design, small size,
- high control precision,
- wide range of flow ratios K_{VS},
- variety of end connections, easy installation,
- protected against hydraulic overloads,
- guaranteed internal and external tightness,
- low-noise operation,
- high durability.



DESIGN:
Regulator comprises control valve (01) and two serially connected hydraulic actuators: flow actuator (06) and pressure difference actuator (07). Inside the actuator (06) there is a pressure drop preset value spring (07), situated on adjustable valve flap (04). Outside the actuator (02) there is a controlled pressure difference adjuster unit (03) installed.
Valve - single-ported, with pressure balanced plug and tight closure, and gradual flow rate setting.
Actuators - diaphragm type, high strength diaphragm (effective area 40 cm^2), protected against hydraulic overload.
End connections – welding, threaded or flanged end connections, as per PN, DIN, ISO, for pressure PN16 or PN25, and CL150 (available execution with no end-connections).

OPERATING PRINCIPLE:
Regulator valve is open when no supply. Impulse of higher pressure is transferred to chamber further from the valve and lower pressure impulse to chamber nearer the valve. Impulses are collected from both sides of flap (04) to actuator (06), and from reduced pressure difference locations in installation to actuator (02). Regarding the designation of regulator – supply or return-mounted – majority of connections is executed permanently, using external duct or internal ducts of regulator. Increase in flow rate causes increase in pressure difference in actuator (02), and when such difference exceed preset value for spring (07), i.e. 20 or 50 kPa, it causes a pro rata closure of valve plug until flow rate value reaches preset value. Increase in controlled pressure difference above the preset value of adjuster (03), causes closure of valve plug until controlled pressure difference reaches preset value. Both control systems – flow rate and pressure difference – operate independently. Valve plug position is controlled by controlled value which deviates more from preset value.

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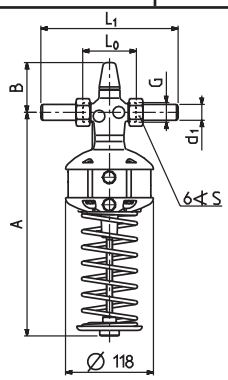
VARIANTS:

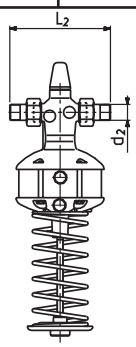
ZSG 9.1 - supply-mounted,
ZSG 9.2 - return mounted.

TECHNICAL SPECIFICATIONS:

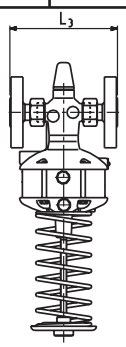
DN nominal diameter		15	20	25	32
K_{VS} flow ratio [m^3/h]	full	3,6	5	7,2	10
	reduced	2,5 1,6 1	3,6	5,7	7,2
Noise coefficient, Z		0,6		0,55	
Body connection diameter, G		G 3/4	G 1	G 1 1/4	G 1 3/4
Pipe external diameter, d_1 [mm]		21,3	26,9	33,7	42,4
End external diameter, d_2		R 1/2	R 3/4	R 1	R 1 1/4
Wrench opening, S		32	41	50	60
Body length	L_0 [mm]	70	75	80	105
	L_1 [mm]	184	199	224	269
	L_2 [mm]	136	151	164	195
	L_3 PN / CL [mm]	130 / 184	150 / 184	160 / 184	180 / 200
Height	A [mm]	289	289	289	306
	B [mm]	69	69	71	82



- welding ends



- threaded ends



- flanged ends

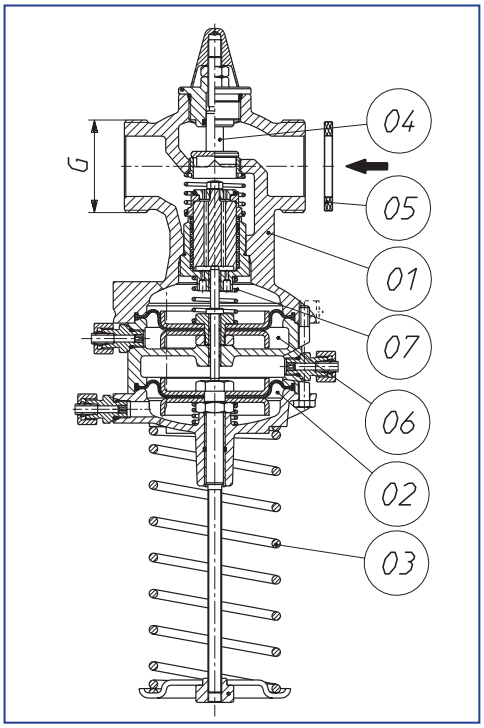
Nominal pressure:
- body – PN25
- flanges – PN16; PN25; CL150

Allowable pressure drop:
- in valve – 16 [bar]
- in actuator – 16 [bar]

Allowable medium temperature:
- fluids – +150 [°C]
- non-flammable gases – +80 [°C]

Pressure difference setting range:
- 10…100 [kPa] (green spring)
- 10…200 [kPa] (yellow spring)
- 20…400 [kPa] (red spring)

Setting range of %K_{VS}	Δp = 20 [kPa]	4…40 %
	Δp = 50 [kPa]	7…70%
Minimum pressure drop on the valve		2 Δp



Leakage class – Class VI as per PN-EN 60534-4

MATERIALS:

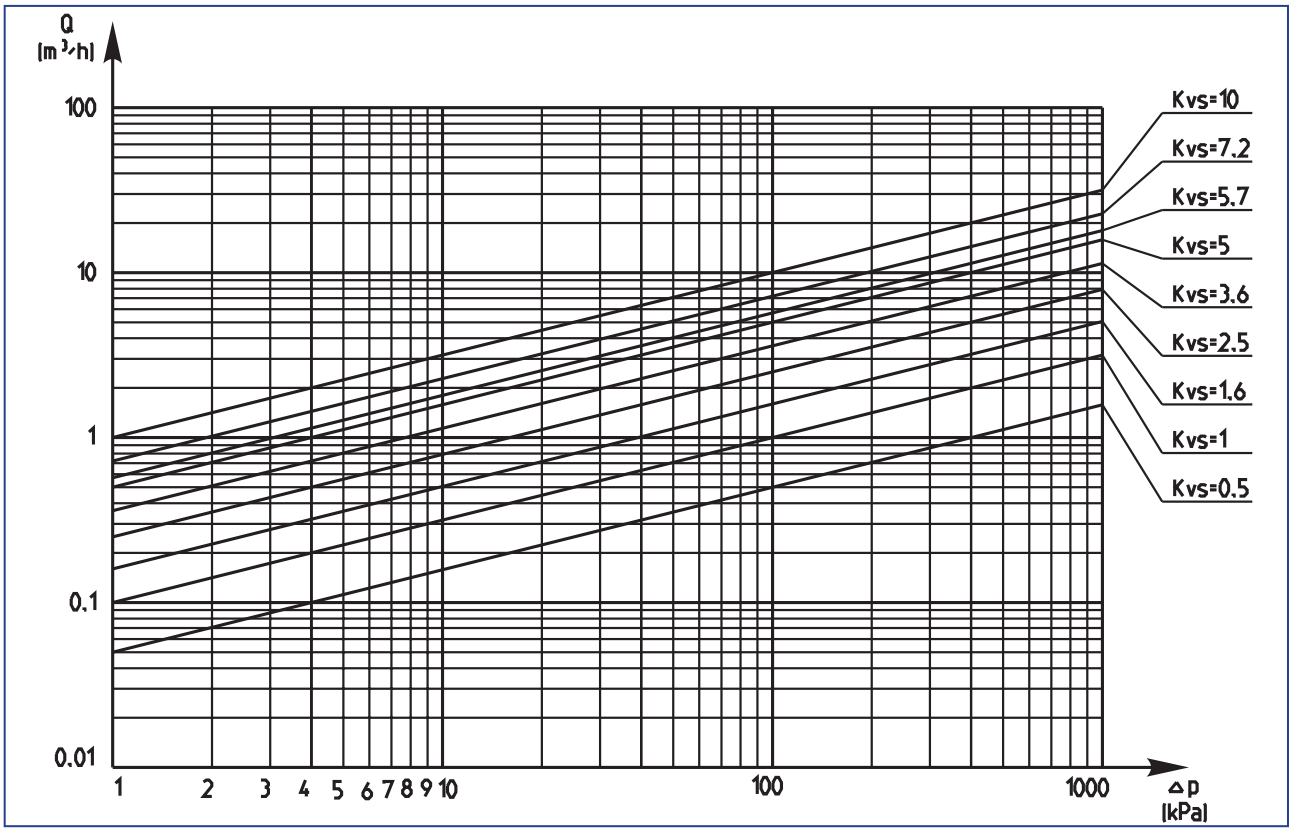
Body, cover – spheroidal iron EN-GJS-400-18LT
Seat – steel K.O.X6CrNiMoTi17-12-2 (1.4571)
Plug – brass CuZn39Pb3
Stem – corrosion-proof steel X17CrNi16-2 (1.4057)
Slide sleeves – PTFE lined steel

Internal springs	–	stainless spring steel 12R10
Adjuster springs	–	spring steel C
Diaphragm	–	EPDM[1)] with polyester fabric
Packing	–	EPDM[1)]
End connections	–	weldable carbon steel S355J2G3 (1.0570)

[1)] - special NBR variant for oils or oily gases

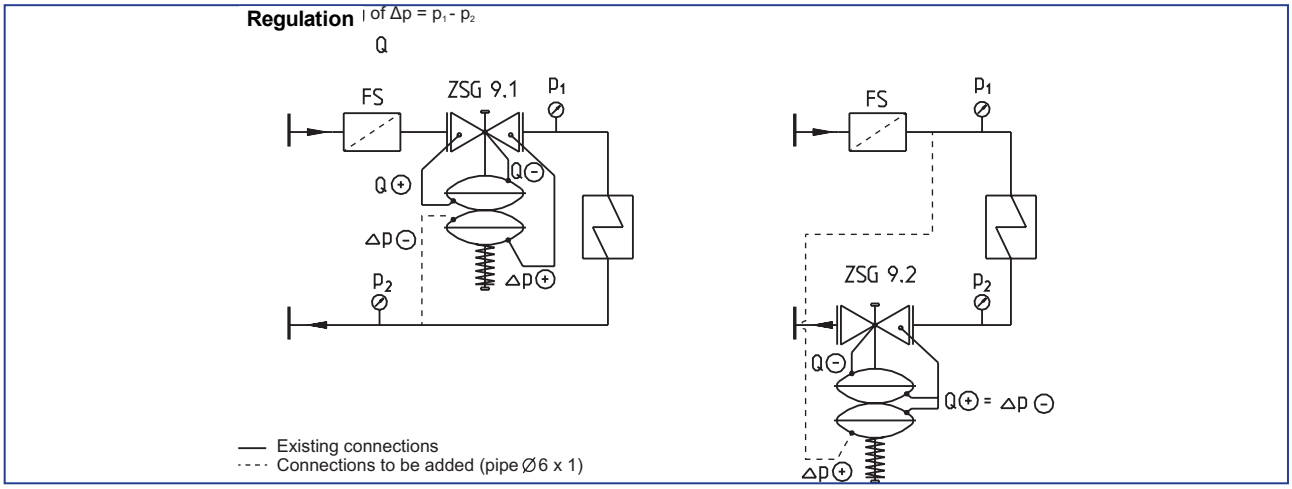
INSTALLATION:

Regulator is to be installed on horizontal pipeline, spring down. Medium flow direction is to conform to arrow on body. Application of mesh filters upstream regulator is recommended. **For low-noise operation medium flow velocity is not to exceed 3 m/s for liquids and 12 m/s for gases.** Regulator design allows establishment of leaden seal on elements used for setting of preset value.



Working temperature [°C]		120	135	150
Working pressure [bar]	PN16	16	15,5	15
	PN25	25	24	23,5

EXAMPLES OF APPLICATION:



ACCESSORIES:

Regulator is delivered with respective couplings for impulse ducts (tubes) ∅ 6x1. Additional, optional, accessories include connections to pipeline installation (e.g. counterflanges).

End connection type		DN15	DN20	DN25	DN32
Welding connection		8520144000	8520145000	8520146000	8520147000
Threaded connection		8520148000	8520149000	8520150000	8520151000
Flanged connection	PN16; PN25	8520136000	8520138000	8520140000	8520142000
	CL150	8520137000	8520139000	8520141000	8520143000
Gasket (item 05)		8121795000	8121796000	8121797000	8121798000

ORDERING:

In your order specify product marking, DN nominal diameter, flow ratio K_{VS}, setting range and accessories.

ZSG ☐ – ☐ – ☐ – ☐ – ☐ – ☐

Variant:
9.1
9.2

Nominal diameter:
DN15
DN20
DN25
DN32

Flow ratio: K_{VS}
1; 1,6; 2,5; 3,6; 5; 5,7; 7,2; 10

Accessories:
1 - no end connections
2 - welding connections
3 - threaded connections
4 - flanged connections PN16; 25
5 - flanged connections CL150

Internal spring preset value:
20; 50 [kPa]

Setting range:
100 - 10…100 [kPa]
200 - 10…200 [kPa]
400 - 20…400 [kPa]

EXAMPLE OF MARKING:

Flow regulator type ZSG, supply-mounted, nominal diameter DN25; K_{VS}=7,2; pressure difference spring range 10…100 [kPa], spring preset value 50 [kPa], welding connections.

ZSG9.1-25-7,2-100-50-2

Revision: ZSG9/08/2007
Valid until the next revision.