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## SELF-ACTUATING DIFFERENTIAL PRESSURE RELIEF REGULATORS TYPE ZSN7

### APPLICATION AREA:

Regulators ZSN7 are used to control preset pressure in process installations connected to regulator valve inlet. Regulators are applied in heating systems, in industrial processes with cold and hot water, steam, air and non-flammable gases. Using with other media subject to consulting with manufacturer.

### DESIGN:

Regulator comprises three, temporary fastened main units: valve (01), actuator (02) and adjuster (03). Regulator valve single-ported with balanced plug. Flanged connections of valve body with valve face as per PN-EN 1092-1:2006 and PN-EN 1092-2:1999 for PN10; 16; 25; 40 PN-EN 1759-1:2005 for CL150; CL300.

Body length as per:

PN-EN 60534-3-1:2000 – Series 1 for PN10; 16; 25; 40;

Series 37 for CL150; Series 38 for CL300

Diaphragm actuator (diaphragm effective area 160 cm<sup>2</sup>, 320 cm<sup>2</sup>), with bolted housing.

Control pressure value adjuster with combination of three pre-tensioned springs, fixed coaxially with valve and actuator.

### VARIANTS:

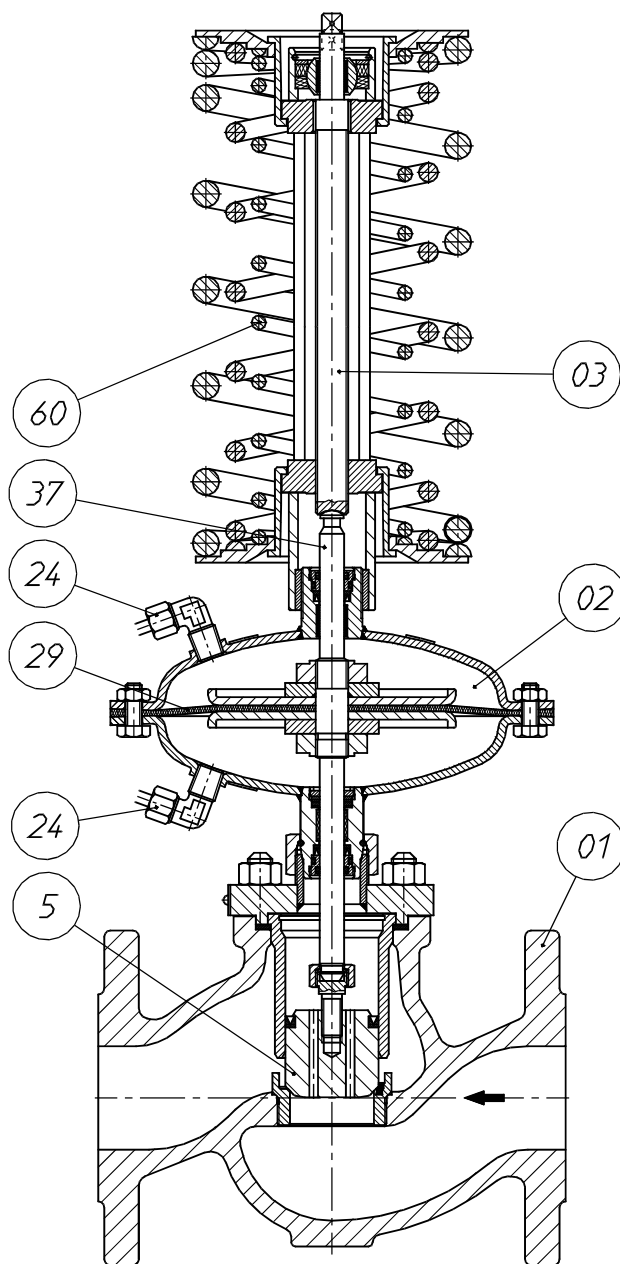
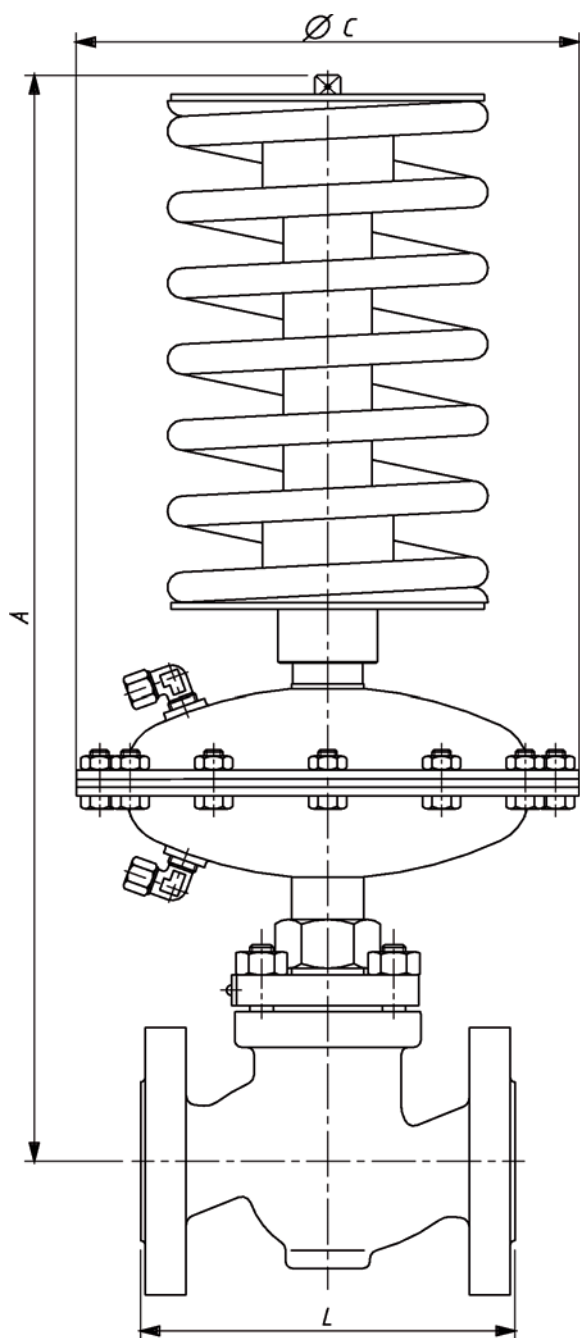
By corrosion-proofness of actuator components:

- standard (ZSN 7.1) - carbon steel with protection coatings,
- special (ZSN 7.2) stainless steel.

### OPERATING PRINCIPLE:

Regulator valve is closed when no supply. Impulse of higher pressure of controlled pressure difference is fed via impulse duct through connection (24) and below diaphragm (29) of actuator (02) from valve (01) side. Impulse of lower pressure of controlled pressure difference is fed via impulse duct through connection (24) and above diaphragm. Increase in control pressure above preset value, set by tensioning of spring (60) in adjuster (03), causes deflection of diaphragm, movement of actuator stem (37) and closure of valve plug (5) until controlled pressure reaches value preset in adjuster. Impulse collection point for impulse of higher pressure of controlled pressure is to be located upstream regulator valve inlet and collection point of lower pressure impulse - downstream regulator valve outlet.

## DIMENSIONS AND WEIGHTS



DN	A	L	Valve weight (01)
	[mm]		[kg]
15	470	130	4,0
20		150	5,1
25		160	5,6
32	485	180	8,5
40	490	200	10,6
50	495	230	14
65	605	290	23
80		310	29

Spring range [kPa]	C [mm]	Weight		
		Actuator (02)	Adjuster (03)	
			DN 15...50	DN 65...100
10...40	282	9,1	2,4	2,8
20...80			3,2	3,6
40...160	215	4,4	5,0	6,3
80...320				

## TECHNICAL SPECIFICATIONS

DN		15	20	25	32	40	50	65	80	100	
$K_{vs}^{1)}$ [m <sup>3</sup> /h]	full flow	3,2	5	8	12,5	20	32	50	80	125	
	reduced flow	1 1,6 2,5	1,6 2,5 3,2	2,5 3,2 5	5	8	12,5	20	32	50	
Noise coefficient Z		0,65	0,6	0,55		0,45	0,4		0,35		
Control characteristics		proportional									
Spring range [kPa] <sup>2)</sup>		10...40;		20...80;		40...160;		80...320			
Maximum pressure in actuator chamber [bar]		20									
Allowed pressure drop in valve [bar]		12						10			
Valve nominal pressure		valve body in grey iron						PN 16			
		valve body in spheroidal iron						PN 16; PN 25; PN 40			
		valve body in carbon steel and stainless steel						PN 16; PN 25; PN 40			
Maximum medium temperature [°C]		steam						150			
		water									
		gases						80			

<sup>1)</sup> other flow ratios  $K_{vs}$  subject to order specification.

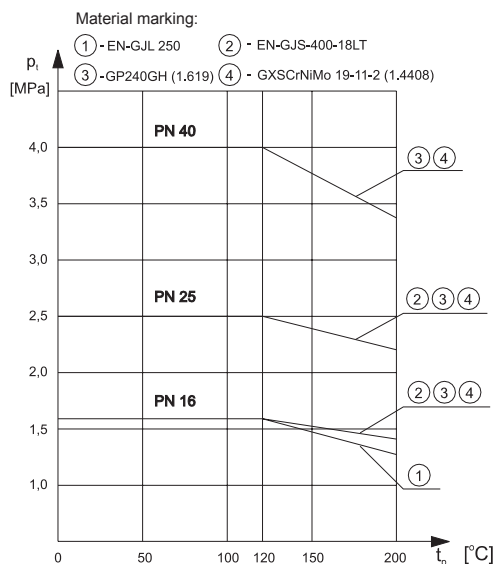
<sup>2)</sup> other ranges subject to order specification.

## MATERIALS as per PN

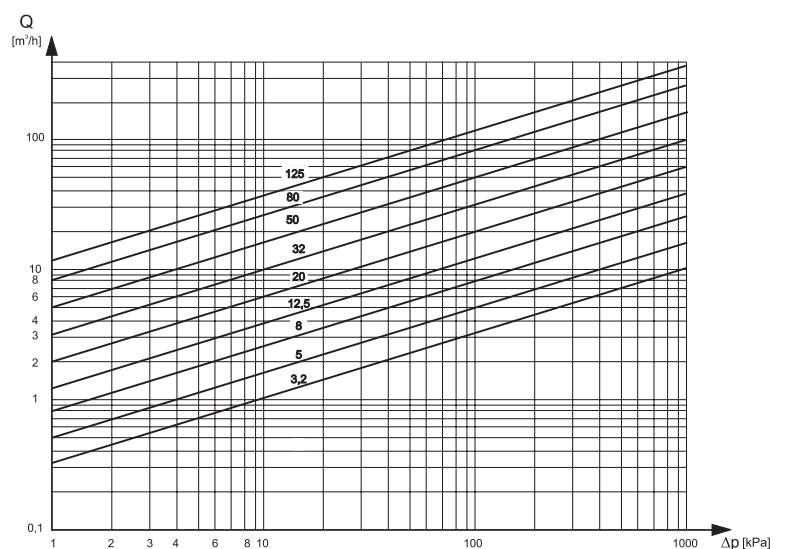
Regulator	ZSN 7.1	ZSN 7.2
	VALVE (01)	
Body	grey iron EN-GJL-250 spheroidal iron EN-GJS-400-178LT carbon steel GP240GH (1.0619) stainless steel GX5CrNiMo 19-11-2 (1.4408)	
Plug and seat	X6CrNiMoTi 17-12-2 (1.4571)	
Guide sleeve		
Packings	EPDM <sup>3)</sup>	
	ACTUATOR (02)	
Housing	carbon steel S235JRG2C (1.0122)	stainless steel X6CrNiTi 18-10 (1.4541)
Stem	X17CrNi 16-2 (1.4057)	
Diaphragm	EPDM + polyester fabric <sup>3)</sup>	
Packing	EPDM <sup>3)</sup>	
	Adjuster (03)	
Adjuster components	carbon steel C45 (1.0503)	
Springs	spring steel 60Si7	

<sup>3)</sup> other materials, subject to medium type.

## NOMINAL PRESSURE, WORKING TEMPERATURE AND WORKING PRESSURE



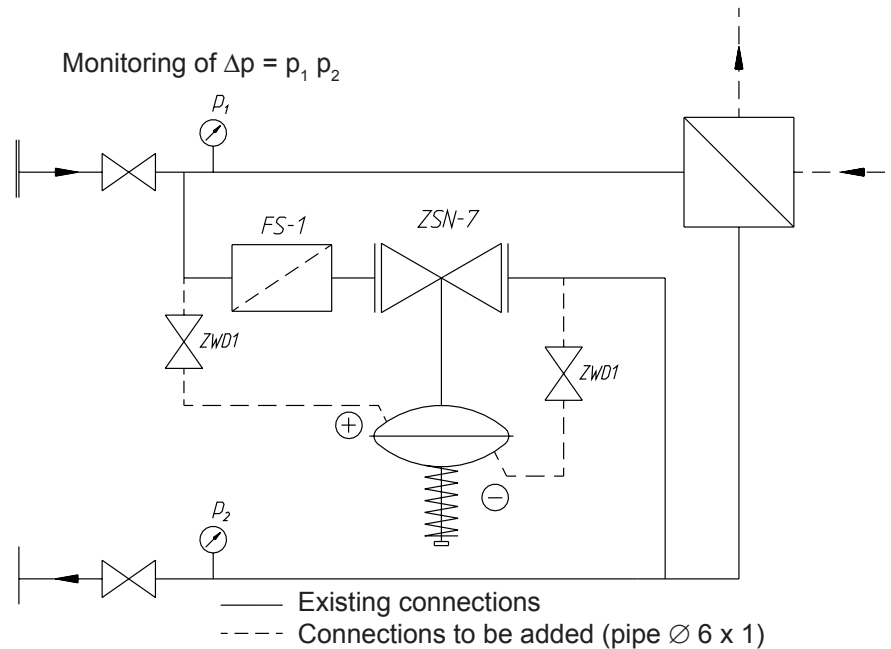
## FLOW DIAGRAM FOR WATER



## INSTALLATION

Regulator is to be installed on horizontal pipeline. Medium flow direction is to conform to arrow on body. At medium temperature lower than 130°C regulator position is optional, at higher temperatures it is recommended to install regulator with adjuster unit (03) down. To ensure reliable operation of regulator apply strainer FS1 upstream and needle valve ZWD 1 at impulse collection point. When applying regulator for steam installation of condensation tank is recommended.

## EXAMPLES OF APPLICATION



## ACCESSORIES

### Delivered:

- nut and cutting ring for impulse tube,

### Optional (ordered separately):

- strainer FS1,
- straight tube connection  $\varnothing 6 \times 1$ ,
- connection stub NPT 1/4"
- impulse tube  $\varnothing 6 \times 1$ ,
- adjustment wrench,
- condensation tank,
- needle valve ZWD 1.

## ORDERING

In your order specify regulator type and marking, ZSN 7.1 or ZSN 7.2, DN nominal diameter, PN nominal pressure, flow ratio  $K_{vs}$ , body material, spring range.

Example of order:

**Pressure regulator ZSN 7.1 – DN 15; PN 16;  $K_{vs}$  32; spheroidal iron; 40...160 kPa.**