Application

Self-acting pressure regulators ZSN are used for flow control in heating systems and in industrial and process technology of water and steam (max. 200°C) and non-flammable gases (max. 80°C). They operate through preset downstream pressure (ZSN 1) or upstream pressure (ZSN 3) without auxiliary power (controlled by the transported media).

Versions

ZSN1 Pressure Reducing Regulator
ZSN3 Pressure Relief Regulator

Design

Regulator comprises three main units **Valve (01)**; **Actuator (02)** and **Adjuster (03)** and is executed with a balanced valve plug.

Features

- Nominal Diameters from DN15 up to DN100
- Nominal Pressure from PN10 up to CL300
- Face-to-Face length as per DIN EN 60534-3-1 or ANSI/ISA 75.08
- Maximum allowable Operating Temperature: +200°C
- Maximum allowable Pressure in Actuator Chamber: 20 bar
- Characteristic: linear (proportional)
- Leakage Class IV and Class VI (PTFE or VMQ Einlage)
- Design with Flange ends
- Design as per Pressure Equipment Directive 2014/68/EU
- Conformity CE and EAC
- Optional certification/confirmation according to GOST-R (TR) and AD2000 Merkblatt

Design and technical Specification

Diameters: DN15; 20; 25; 32; 40; 50; 65; 80; 100

Pressure: PN10; 16; 25; 40 as per DIN EN 1092-1:2013 and DIN EN 1092-2:1999
ANSI CL150; 300 and DIN EN 1759-1:2005

Flanges as per DIN EN 1759-1:2005 can be assembled with flanges execution per standards ANSI / ASME B16.5 and MSS SP44. They correspond to the standard DIN EN 7005-1:2002 following pressure ranges: CL150 ≙ PN20 and CL300 ≙ PN50

Table 1 Flange Versions

Material	Nominal Pressure	Flange Facing			
		Raised Face	Groove	Recess	Ring-Joint
		Identification			
Cast Iron	PN10; 16	B [2]	-	-	-
Ductile Iron	PN10; 16; 25; 40		-	-	-
Carbon Steel Stainless Steel	PN10; 16; 25; 40		D	F	-
	CL150		-	-	J (RTJ)
	CL300		DL (D1 [1])	F (F1)	

[1]) only for CL300; [2]) B1 – (Ra = 12,5 mm, concentric surface structure "C"), B2 - (Ra as agreed with the customer); () – as per ASME B16.5

NOTE:

The pressure regulators must be installed in a horizontal pipe. At temperatures > 130°C, the pressure regulator should be installed so that the adjuster (03) is facing down. The impulse line should not exceed the pipe diameter of 6 mm. Also it is to be recommended to use a strainer to guarantee a proper operation of the pressure regulator.

Table 2 Technical Spezification

DN		15	20	25	32	40	50	65	80	100
KVs [m³/h]	full flow	3,2	5	8	12,5	20	32	50	80	125
	reduced flow	1	1,6	2,5	5	8	12,5	20	32	50
		1,6	2,5	3,2						
		2,5	3,2	5						
Z-Coefficient		0,65	0,6	0,55		0,45	0,4		0,35	
Spring Range [bar]		0,1…0,4	0,2…0,8	0,4…1,6		0,8…3,2	1,0…4,0	2,0…8,0	2,8…11,2	
Max. Pressure in Chamber [bar]		20								
Max. allowable Δp [bar]		12						10		
Max. Temperature		Water						200°C [1]		
		Steam								
		Gases						80°C [2]		

Table 3 Components & Materials

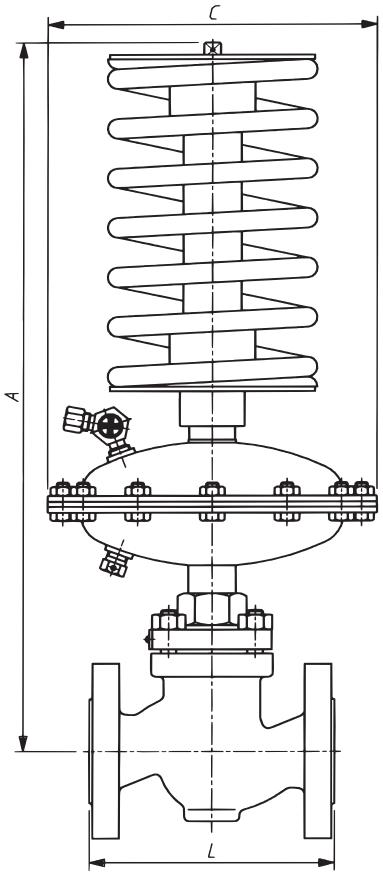
No.	Component	Materials			
01	**Valve Body**	EN-GJL250 (EN-JL 1040)	EN-GJS400-18LT (EN-JS 1025)	GP240GH (1.0619)	GX5CrNiMo19-11-2 (1.4408)
2	**Seat**	X6CrNiMoTi17-12-2 (1.4571) X6CrNiMoTi17-12-2 (1.4571) + PTFE			
5	**Plug**	X6CrNiMoTi17-12-2 (1.4571)			
4	**Guiding Sleeve**				
35	**Packing**	EPDM [3]			
02	**Actuator**	**ZSN1.1; ZSN3.1**		**ZSN1.2; ZSN3.2**	
19	**Actuator Chamber**	S235JRG2C (1.0122)		X6CrNiMoTi17-12-2 (1.4571)	
37	**Stem**	X17CrNi16-2 (1.4057)			
29	**Diaphragm**	EPDM + polyester fabric [3]			
35	**Packing**	EPDM [3]			
03	**Adjuster**	C45 (1.0503)			
60	**Spring**	60Si7			

[1] for steam applications a condensation tank L130 is needed; [2] no burnable gases; [3] Other materials on request

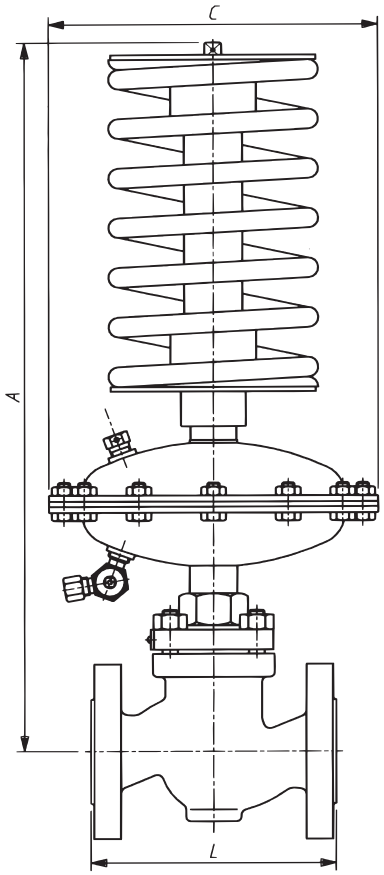
Table 4 Dimensions [mm] & Weight [kg]

01 VALVE					
DN	**A** [mm]	DIN	**L** [mm] CL150	CL300	**Weight** [kg]
15	470	130	184	190	4,0
20		150		194	5,1
25		160		197	5,6
32	485	180	200	213	8,5
40	490	200	222	235	10,6
50	495	230	254	267	14
65	605	290	276	292	23
80		310	298	318	29
100	615	350	352	368	44

02 ACTUATOR				03 ADJUSTER	
Spring Range	**C** [mm]	**Diaphragm** eff.area [cm²]	**Weight** [kg]	DN15…50 [kg]	DN65…100 [kg]
0,1…0,4	215	160	4,4	3,2	3,6
0,2…0,8					
0,4…1,6					
0,8…3,2				5,6	7,1
1,0…4,0					
2,0…8,0	150	80	2,4	6,8	8,35
2,8…11,2					



Pressure Regulator Type **ZSN1**



Pressure Relief Regulator Type **ZSN3**

Fig. 1.1 Executions and Dimension

No.	Component
01	**Valve Body**
2	**Seat**
5	**Plug**
4	**Guiding Sleeve**
35	**Packing**
02	**Actuator**
19	**Actuator Chamber**
37	**Stem**
29	**Diaphragm**
35	**Packing**
03	**Adjuster**
60	**Spring**

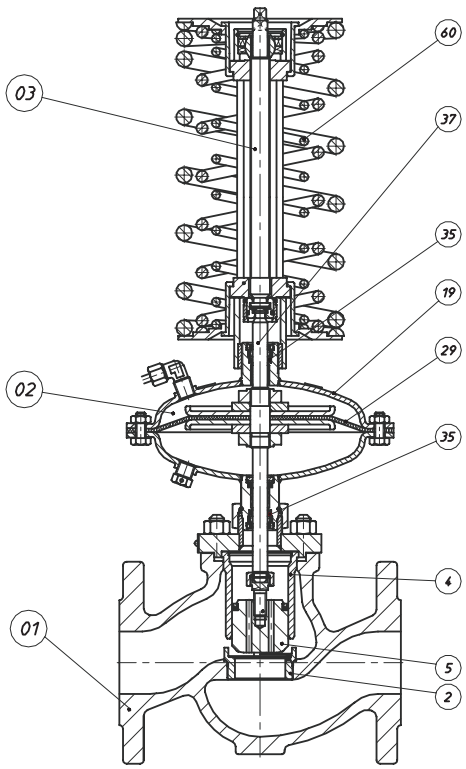


Fig. 1.2 Details and Components

Table 5a...5d Allowable Operating Pressure (DIN)

Table 5a		Material: **EN-GJL250 (EN- JL1040)** as per DIN EN 1561			
		Temperature [°C]			
PN	Standard	-10...+50	100	150	200
		Max. Operating Pressure [bar]			
PN10	DIN EN 1092-2	10	10	9	8
PN16		16	16	14,4	12,8

Table 5b		Material: **EN-GJS400-18 LT (EN-JS1025)** as per DIN EN 1563			
		Temperature [°C]			
PN	Standard	10...+50	100	150	200
		Max. Operating Pressure [bar]			
PN10	DIN EN 1092-2	10	10	9,7	9,2
PN16		16	16	15,5	14,7
PN25		25	25	24,3	23
PN40		40	40	38,8	36,8

Table 5c		Material: **GP240GH (1.0619)** as per DIN EN 10213-2			
		Temperature [°C]			
PN / CL	Standard	-10...+50	100	150	200
		Max. Operating Pressure [bar]			
PN10	DIN EN 1092-1	10	9,2	8,8	8,3
PN16		16	14,8	14	13,3
CL150	DIN EN 1759-1	17,3	15,4	14,6	13,8
PN25	DIN EN 1092-1	25	23,2	22	20,8
PN40		40	37,1	35,2	33,3
CL300	DIN EN 1759-1	45,3	40,1	38,1	36

Table 5d		Material: **GX5CrNiMo19-11-2 (1.4408)** as per DIN EN 10213-4			
		Temperature [°C]			
PN / CL	Standard	-10...+50	100	150	200
		Max. Operating Pressure [bar]			
PN10	DIN EN 1092-1	10	10	9	8,4
PN16		16	16	14,5	13,4
CL150	DIN EN 1759-1	17,9	16,3	14,9	13,5
PN25	DIN EN 1092-1	25	25	22,7	21
PN40		40	40	36,3	33,7
CL300	DIN EN 1759-1	46,7	42,5	38,9	35,3

CAUTION: Maximum allowable pressure in actuator chamber is 20 bar!

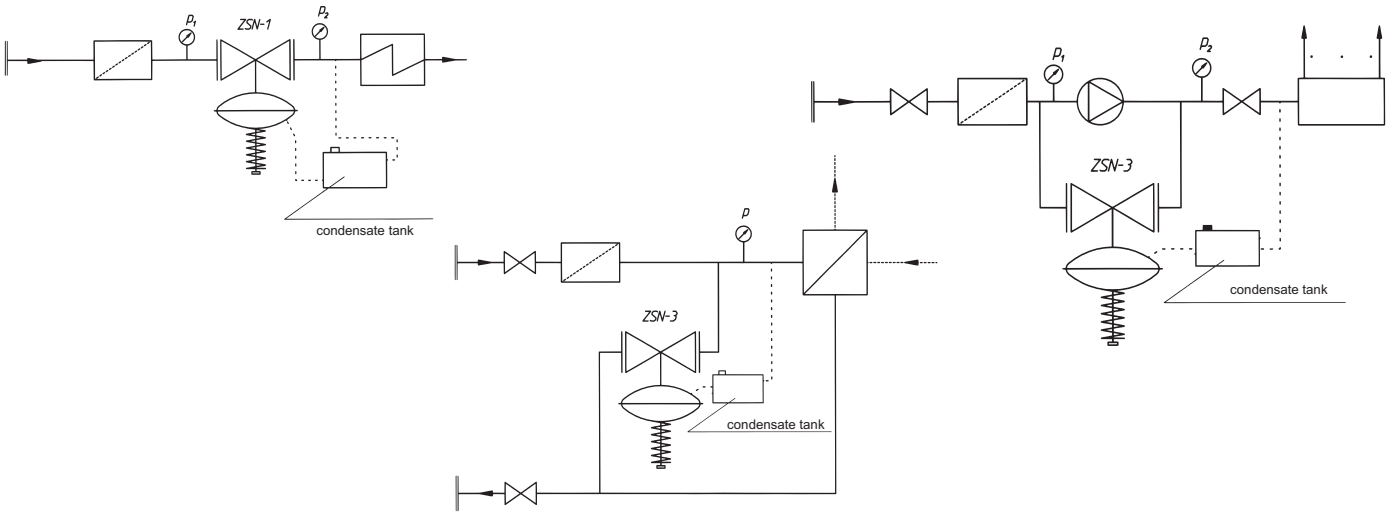


Fig. 2 Example of Application and Installation