Self-operated Pressure Regulators

Pressure Reducing Valve Type M 44-2

SAMSON

Applications

Pressure regulators for set points from **0.005** to **20 bar** · **K_{VS} 0.15 to K_{VS} 18** · Valve sizes **DN 15** to **DN 50** · **G ¼** to **G 2** · Suitable for liquids and gases up to **130 °C**, steam up to **190 °C/200 °C** · Nominal inlet pressure **PN 16, PN 40, PN 160** [1] and **PN 315** [2]

The valve closes when the downstream pressure rises

Special features

- Diaphragm-controlled, spring-loaded P-regulators requiring no auxiliary energy
- Particularly favorable control properties, while the remaining system deviation remains small
- All parts made of CrNiMo steel with a smooth surface

Versions

Pressure reducing valves with pressure balancing[3] to regulate the downstream pressure p_2 to the adjusted set point. The valve closes when the downstream pressure rises.

K_{VS} 0.15 · Set points from 0.3 to 20 bar:
Connection G ¼ · Plug with soft sealing · Suitable for liquids and gases up to 130 °C · Unbalanced · Without external control line · For liquids Δp_{max} = 25 bar

K_{VS} 4 to K_{VS} 18 · Set points from 0.02 to 12 bar:
Connection DN 15, 25, 32, 40 and 50 or G ½, G 1, G 1¼, G 1½ and G 2 · Plug with soft sealing · Suitable for liquids and gases up to 130 °C · Steam up to 190 °C · Pressure balanced With external control line · For liquids Δp_{max} = 25 bar

K_{VS} 0.15, 0.4, 0.9 and 1.5 · Set points from 0.005 to 12 bar:
Connection DN 15 and DN 25 or G ½ · Plug with metal sealing · Suitable for steam up to 200 °C · Unbalanced · With external control line · For liquids Δp_{max} = 25 bar

K_{VS} 0.15, 0.4 and 0.9 · Set points from 0.005 to 20 bar:
Plug with soft sealing · Suitable for liquids and gases up to 130 °C · DN 15 and DN 25 or G ½ · Unbalanced · Without external control line · For liquids Δp_{max} = 25 bar

Special versions

– Version free of oil and grease for oxygen or high-purity gas
– Version for sterilized steam on request
– Flanges with raised face, ANSI Class 150 or Class 300
– Special connections according to customer specifications
– NPT connections for pressure and control lines

Fig. 1 · Type M 44-2, connection G ¼, K_{VS} = 0.15

Fig. 2 · Type M 44-2, connection G 1, K_{VS} = 6

[1] G ½ only: K_{VS} = 0.15 and 0.9
[2] G ¼ only: K_{VS} = 0.15
[3] Connection G ¼ (K_{VS} = 0.15) and G ½/DN 15/DN 25 (K_{VS} = 0.15 to 1.5): Unbalanced

Principle of operation

The medium flows through the valve as indicated by the arrow. The position of the valve plug (2) determines the flow rate across the area released between the plug and seat (3). The valve is open when it is relieved of pressure ($p_1 = p_2$).

If there is pressure drop across the valve, the medium flows from the inlet through the valve seat into the body. The downstream pressure p_2 to be regulated is transmitted to the diaphragm where it is converted into a positioning force and balanced against the force of the positioning spring (7). The positioning force is used to adjust the valve plug depending on the spring force, which is adjustable at the set point adjuster (8). If the force resulting from p_2 exceeds the value adjusted at the set point adjuster, the valve plug move towards the seat, reducing the flow rate and the valve closes.

To keep the influence of disturbance variables relatively small, the force created by the upstream pressure p_1 acting on the plug is compensated for by the balancing bushing (5) [1].

[1] Versions with K_{VS} = 0.15 to 1.5: Unbalanced

Installation

Type M 44-2: K_{VS} = 0.15/set points 0.3 to 20 bar: without external control line

Type M 44-2: K_{VS} = 4 to 18/set points 0.02 to 12 bar: with external control line

Type M 44-2: K_{VS} = 0.15 to 1.5/set points 0.005 to 20 bar: external control line only in version for steam with intermediate piece (13) and for $p_2 \leq 1.1$ bar

On installation, the following must be observed

- Install regulator in horizontal pipeline free of stress. Install regulators for steam with a slight downward slope on both sides for drainage of the condensate.
- The direction of medium flow must correspond with the arrow on the valve body.
- With *steam* and *liquids,* install the spring housing (10) with set point adjuster (8) suspended downwards.
  With *gases*, the set point adjuster may point upwards or downwards, if not specified otherwise.
- For *toxic* or *flammable media,* the spring housing must be fitted with a venting bore (9) and an adjusting screw seal (12). The venting bore G 1/8 (9) must be connected to a leakage line for a safe discharge of any medium that may escape.
- The max. perm. downstream pressure p_2 must not exceed the max. adjustable set point by more than 1.5 times.
- The distance between the pressure tapping point of the control line and the regulator must be min. 10 x DN.
- For applications with steam (K_{VS} = 4 to 18/set points 0.02 to 12 bar), the control line must be equipped with an equalizing tank filled with water for downstream pressures up to 1.1 bar.
  For applications with steam (K_{VS} = 0.15 to 1.5/set points 0.005 to 12 bar) without an equalizing tank, the chamber above the diaphragm must be filled with water through the control line connection (refer to EB 2530 EN).

1 Valve inlet
1.1 Valve outlet
2 Valve plug
3 Valve seat
4 Plug stem
5 Balancing bushing
6 Operating diaphragm
7 Positioning spring
8 Set point adjuster
9 Venting bore G 1/8 (leakage line connection)
10 Spring housing
11 Control line connection G ¼
12 Adjusting screw seal
13 Intermediate piece for steam (only versions K_{VS} = 0.15 to 1.5)

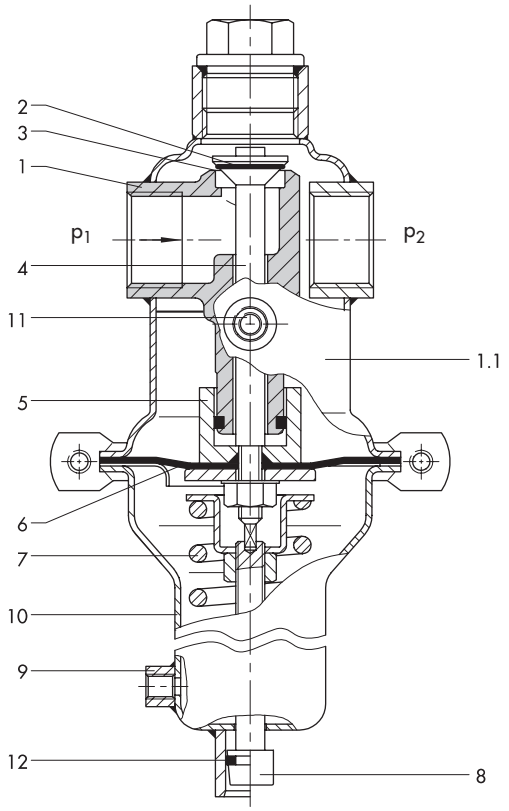


Fig. 3 · Type M 44-2 Pressure Reducing Valve (K_{VS} = 4 to 8)

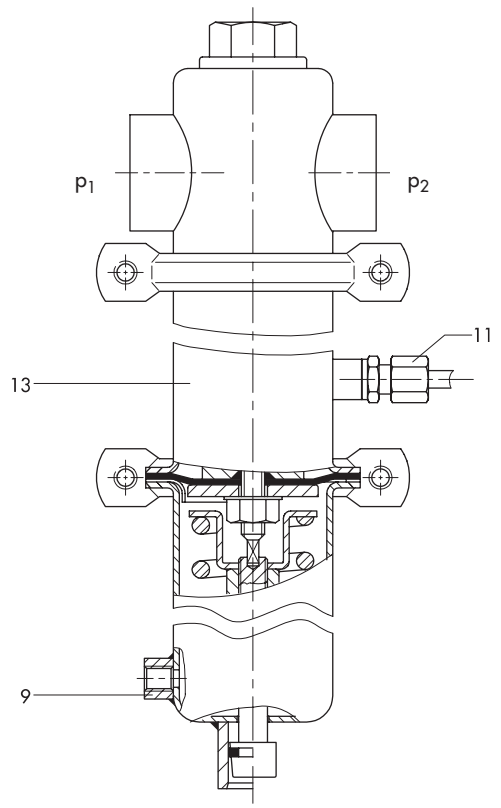
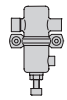
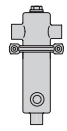


Fig. 4 · Type M 44-2 Pressure Reducing Valve (K_{VS} = 0.15 to 1.5) version for steam up to 200 °C

Table 1 · Technical data · All pressures in bar (gauge)

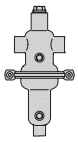


Connection	**G ¼ · Female thread**
K_{VS} coefficient	0.15
Nominal inlet pressure	PN 315
Set point ranges in bar	0.3 to 1.5 · 1 to 6 · 5 to 20
Leakage rate	< 0.05 % of K_{VS}
Max. perm. temperature	130 °C



Connection	**DN ...**	**15**	**25**
	G ... Female thread	**G ½**	
K_{VS} coefficient		0.15 · 0.4 · 0.9 · 1.5	
Nominal inlet pressure		PN 160 [1] · PN 40	
Set point ranges in bar		0.005 to 0.025 · 0.02 to 0.12 · 0.1 to 0.5 · 0.2 to 1.1 · 1 to 5 · 4 to 12 · 10 to 20	
Leakage rate		< 0.05 % of K_{VS}	
Max. perm. temperature	Liquids/gases	130 °C	
	Steam	200 °C	

[1] Only in version with connection G ½ for liquids and gases



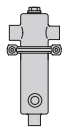
Connection	**DN ...**	**15**	**25**	**32**	**40**	**50**
	G ... Female thread	**G ½**	**G 1**	**G 1¼**	**G 1½**	**G 2**
K_{VS} coefficient		4	6	12	16	18
Nominal inlet pressure		PN 40 · PN 16				
Set point ranges in bar		0.02 to 0.12 · 0.1 to 0.5 · 0.3 to 1.1 · 0.8 to 2.5 · 2 to 5 · 4 to 8 · 6 to 12				
Leakage rate		< 0.05 % of K_{VS}				
Max. perm. temperature	Liquids/gases	130 °C				
	Steam	190 °C				

Table 2 · Max. permissible upstream pressures in bar · Max. perm. differential pressures for liquids Δp_{max} = 25 bar

K_{VS} = 0.15 · Nominal inlet pressure PN 315

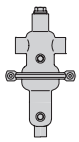
Set point range in bar	**0.3 to 1.5**	**1 to 6**	**5 to 20**
Nominal outlet pressure	PN 2.5	PN 10	PN 25
Max. perm. p_1 in bar	20 × set point	20 × set point	20 × set point (max. PN 315)

K_{VS} = 0.15, 0.4, 0.9 and 1.5 · Nominal inlet pressure PN 40 or PN 160; outlet pressure PN 1, PN 2.5, PN 10, PN 25 or PN 40



Set point range in bar	**0.005 to 0.025**	**0.02 to 0.12**	**0.1 to 0.5**	**0.2 to 1.1**	**1 to 5**	**4 to 12**	**10 to 20**
Nominal outlet pressure	PN 1	PN 1	PN 1	PN 2.5	PN 10	PN 25	PN 25
Max. perm. p_1 in bar	1000 × set point	1000 × set point	280 × set point	125 × set point	27 × set point	27 × set point	27 × set point

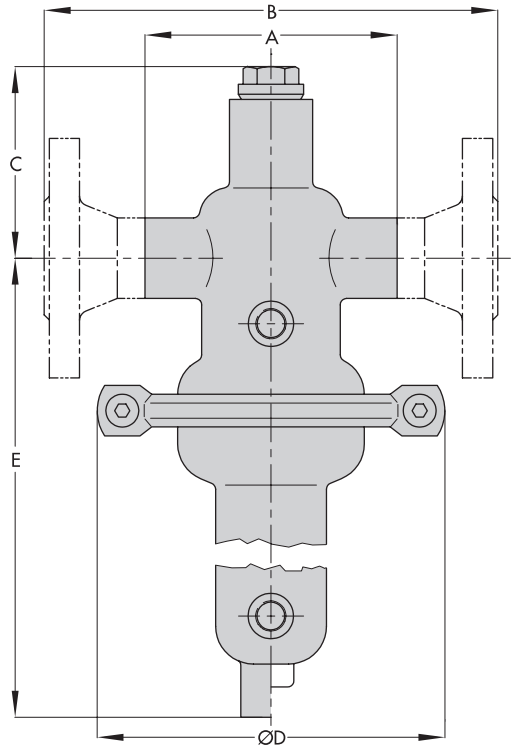
K_{VS} = 4, 6, 12, 16 and 18 · Nominal inlet pressure PN 16 or PN 40; nominal outlet pressure PN 1, PN 2.5, PN 6, PN 10 or PN 16



Set point range in bar		**0.02 to 0.12** [1]	**0.1 to 0.5** [1]	**0.2 to 1.1** [1]	**0.8 to 2.5** [1]	**2 to 5**	**4 to 8**	**6 to 12**
Nominal outlet pressure		PN 1	PN 1	PN 2.5	PN 6	PN 10	PN 16	PN 16
Connection		Max. perm. **upstream pressure p_1** in bar						
DN	**G**							
15	½	80 × set point	40 × set point	30 × set point	20 × set point	20 × set point	20 × set point	20 × set point
25	1	80 × set point	40 × set point	30 × set point	20 × set point	20 × set point	20 × set point	20 × set point
32	1 ¼	50 × set point	25 × set point	18 × set point	12 × set point	12 × set point	12 × set point	12 × set point
40	1 ½	50 × set point	25 × set point	18 × set point	12 × set point	12 × set point	12 × set point	12 × set point
50	2	50 × set point	25 × set point	18 × set point	12 × set point	12 × set point	12 × set point	12 × set point

[1] In the version for steam with a downstream pressure $p_2 \leq 1.1$ bar, an equalizing tank filled with water must be mounted in the control line (refer to T 2595 EN for accessories for pressure regulators)

Dimensions

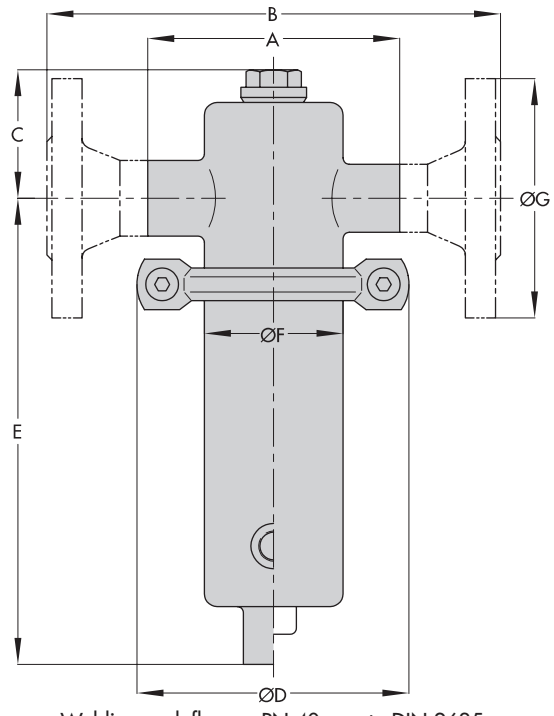


Welding neck flanges
PN 40 acc. to DIN 2635 · PN 16 acc. to DIN 2633

Fig 5 · Version with K_{VS} = 4 to 18,
set point ranges 0.02 to 12 bar

Connection	G	½	1	1 ¼	1 ½	2
	DN	15	25	32	40	50
Set point range in bar	Dimensions in mm					
All ranges	A	85	85	130	145	185
	B	130	160	180	200	230
	C	76	76	90	90	90
0.02 to 0.12	E	300				
	Ø D	360				
Weight in kg, approx.	G	13.5		14.4		
	DN	15.3		18.4		
0.1 to 0.5	E	300				
	Ø D	264/206				
Weight in kg, approx.	G	7.1		8		
	DN	8.9		12		
0.3 to 1.1	E	300				
	Ø D	200/152				
Weight in kg, approx.	G	6.1		7		
	DN	7.9		11		
0.8 to 5	E	235				
	Ø D	138/110				
Weight in kg, approx.	G	3.1		4		
	DN	4.9		8		
4 to 12	E	235				
	Ø D	138/110				
Weight in kg, approx.	G	3.1		4		
	DN	4.9		8		

A = With threaded connection G ... · B = With welded-on flanges
PN 16 acc. to DIN 2633; PN 40 acc. to DIN 2635 for DN 15 to 50
Ø D = Clamp/diaphragm outer diameter

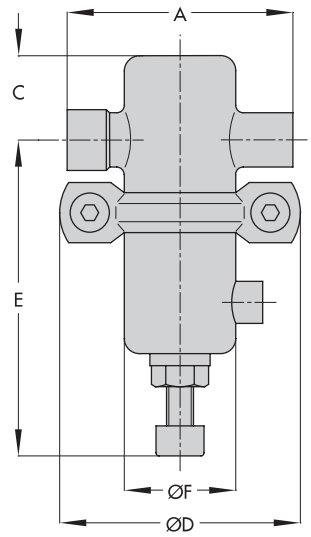


Welding neck flanges PN 40 acc. to DIN 2635

Fig. 6 · Version with K_{VS} = 0.15 to 1.5;
set point ranges 0.005 to 20 bar

Connection		G ½	DN 15	DN 25
			Welding neck flanges PN 40 acc. DIN 2635	
Set point range in bar	Dimensions in mm			
All ranges	A	100	–	
	C	52		
	Ø F	55		
0.005 to 0.025 0.02 to 0.12	B	–	130	160
	Ø D	360		
	E	255 [1]		
Weight [2] in kg, approx.		6	7.5	8
0.1 to 0.5	B	–	130	160
	Ø D	264/210		
	E	255 [1]		
Weight [2] in kg, approx.		5.5	7	7.5
0.2 to 1.1	B	–	130	160
	Ø D	200/155		
	E	255 [1]		
Weight [2] in kg, approx.		4.5	6	6.5
1 to 5 4 to 12 10 to 20	B	–	130	160
	Ø D	108/80		
	E	185 [1]		
Weight [2] in kg, approx.		1.5	3	3.5

A = With threaded connection G ½ · B = With welded-on flanges
PN 40 acc. to DIN 2635 · Ø D = Clamp/diaphragm outer diameter
[1] +130 mm (version for steam) · [2] +1 kg (version for steam)



Leakage line connection G 1/8

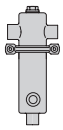
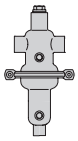
Dimensions in mm

Connection	**G ¼ · Female thread**
A	75
C	28
D	80/55
E	≈ 105
∅ F	37
Weight in kg, approx.	≈ 0.75

Welding neck flanges PN 40 acc. to DIN 2635 · PN 16 acc. to DIN 2633

Fig. 7 · Version K_{VS} = 0.15, set point ranges 0.3 to 20 bar

Table 3 · Materials

Type				
Set point ranges		0.3 to 20 bar	0.005 to 20 bar	0.02 to 12 bar
Body material		CrNiMo steel		
Plug sealing	Liquids/gases	FPM · EPDM · PTFE		FPM · EPDM · FXM · PTFE
	Steam	–	Metal sealing	FXM · PTFE
Diaphragm		FPM · EPDM		
Protective foil (optional)		PTFE		

Ordering text

Pressure Reducing Valve **Type M 44-2**
Nominal inlet pressure PN 315/PN 160/PN 40/PN 16
Set point range ..., K_{VS} ..., max. perm. temperature ...
Connection G … or DN with flanges PN 16 acc. to DIN 2633/PN 40 according to DIN 2635 or flanges with Raised Face ANSI Class 150/Class 300
Plug sealing made of EPDM/FPM/FXM/PTFE/metal sealing
Process medium …
Spring housing standard/with seal and leakage line connection (for toxic, explosive or flammable media)
Special version
External control line, equalizing tank etc.

Specifications subject to change without notice.

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