



## Type 01b · PFA-lined Globe Control Valve

Single-seated globe valve · DIN and ANSI version



### Application

PFA-lined control valve for corrosive media, especially suitable for high requirements in chemical plants and other industries.

- Valve size DN 15 to 150/NPS ½ to 6
- Pressure rating PN 10 and 16/Class 150
- Temperatures -10 to +200 °C

The control valve consists of a single-seated globe valve with PFA lining and either a pneumatic actuator or hand-operated actuator. The valve is designed according to the modular-assembly principle and has the following features:

- Valve body of EN-JS 1049/A395 as standard, with 3-5 mm thick PFA lining
- Exchangeable PTFE/TFM seat and PTFE plug
- Stem sealed by a PTFE bellows and a backup, spring-loaded PTFE V-ring packing
- Test connection for monitoring
- Exchangeable actuator
- Additional equipment and mounting parts available according to IEC 60534 and NAMUR recommendations
- Face-to-face dimensions for DIN version according to DIN EN 558, Series 1
- Face-to-face dimensions for ANSI version according to DIN EN 558, Series 37
- DN 15/NPS ½ and DN 150/NPS 6 available on request

### Versions

The Type 01b Globe Valve is available optionally in the following versions:

- With SAMSON pneumatic actuator
- With SAMSON hand-operated actuator
- With actuators of other manufacturers on request

### Special versions

- Lining made of conductive PFA
- Lining for -40 °C
- Flange with groove
- SSB bellows for special applications
- We recommend our Type 1a Control Valves to meet special requirements

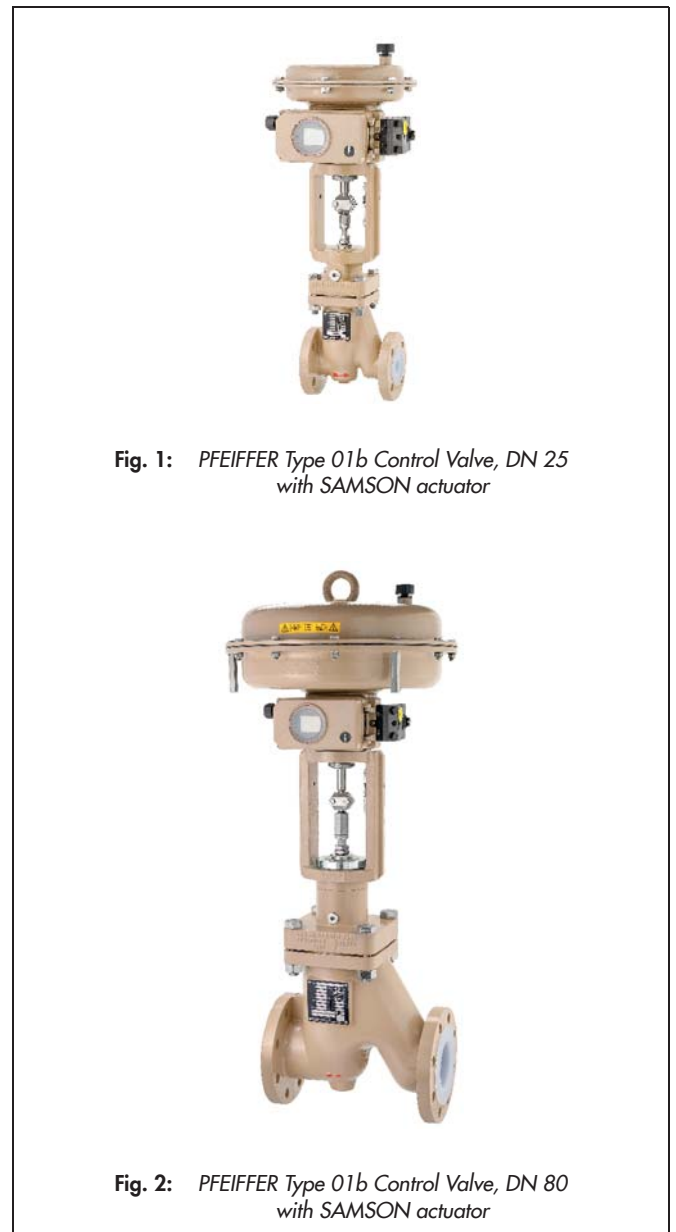


Fig. 1: PFEIFFER Type 01b Control Valve, DN 25 with SAMSON actuator

Fig. 2: PFEIFFER Type 01b Control Valve, DN 80 with SAMSON actuator

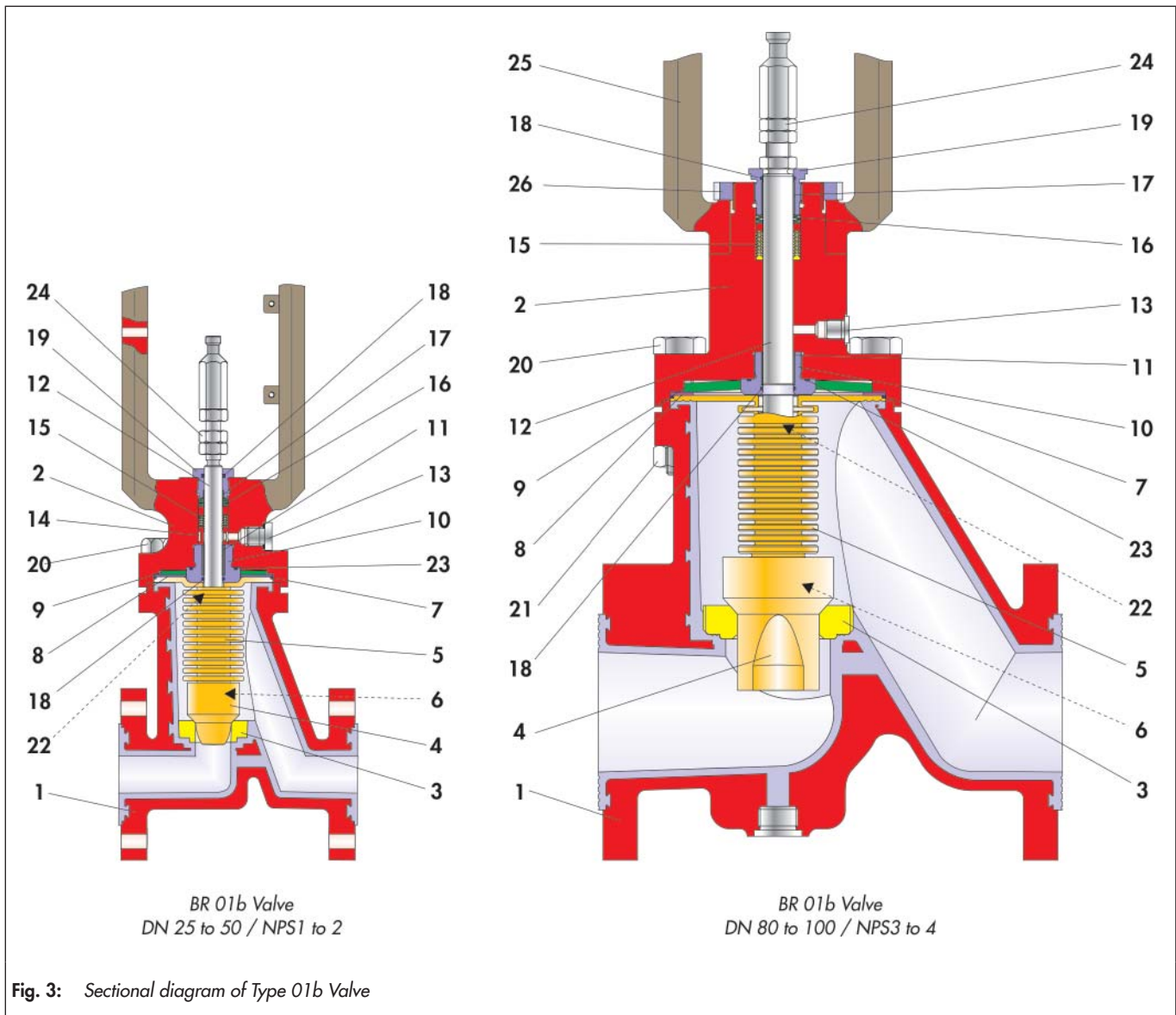


Fig. 3: Sectional diagram of Type 01b Valve

Table 1: Parts list

Item	Description
1	Valve body
2	Bonnet flange
3	Seat
4	Plug
5	Bellows
6	Cord
7	O-ring
8	Thrust washer
9	Spring washer
10	Guide bushing
11	Bearing bushing
12	Stem
13	Screw plug (test connection)

Item	Description
14	Distance bushing
15	V-ring packing
16	Set of spring washers
17	Bearing bushing
18	O-ring
19	Packing
20	Bolt
21	Nut
22	Retainer ring
23	O-ring
24	Nut
25	Yoke
26	Slotted nut

## Principle of operation

The process medium flows through the Type 01b Control Valve in the flow-to-open direction. The valve plug position determines the cross-sectional area of flow between the plug ( 4 ) and seat ( 3 ).

The plug is connected over the stem ( 12 ) to the actuator stem.

The PTFE bellows ( 5 ) seals the area between the valve body ( 1 ) and stem ( 12 ).

The PTFE V-ring packing ( 15 ) is used as a backup stem sealing.

A test connection port ( 13 ) allows the bellows to be monitored for leakage, e.g. by connecting a suction line or inert gas line.

The PTFE seat ( 3 ) is screwed into the valve body ( 1 ) using a suitable thread for plastic.

### **i** Note

- In the event that cavitation may occur, we recommend the use of a guided plug for differential pressures above 3 bar or differential pressure ratio  $p_2 < \Delta p$ .
- Lined control valves are not suitable for operation with cavitation.
- We recommend using our Type 01a Valve in applications with cavitation noise or flow velocities above 25 m/s in the vena contracta.

### **i** Note

The maximum permissible outlet velocity is 3 m/s. Contact us if higher velocities occur.

### **i** Note

Before using the valve in hazardous areas, check whether this is possible according to ATEX 2014/34/EU. Refer to the Operating Instructions ► BA01a.

## Fail-safe position

Depending on how the pneumatic actuator is mounted onto the valve, the valve has two fail-safe positions which become effective when the air pressure in the actuator is relieved or when the supply air fails:

- **Control valve with fail-close actuator:**  
Upon air failure, the valve is closed. The valve opens when the signal pressure increases, acting against the force of the springs.
- **Control valve with fail-open actuator:**  
Upon air failure, the valve is opened. The valve closes when the signal pressure increases, acting against the force of the springs.

## Additional equipment and mounting parts

The following accessories are optionally available for the valve separately or in combinations:

- Positioner
- Limit switches
- Solenoid valves
- Supply air pressure regulator/filter
- Pressure gauge mounting blocks
- Pneumatic volume booster

Other accessories possible according to specifications on request.

## Pressure-temperature diagram

The range of application is determined by the pressure-temperature diagram. Process data and medium can affect the values in the diagram.

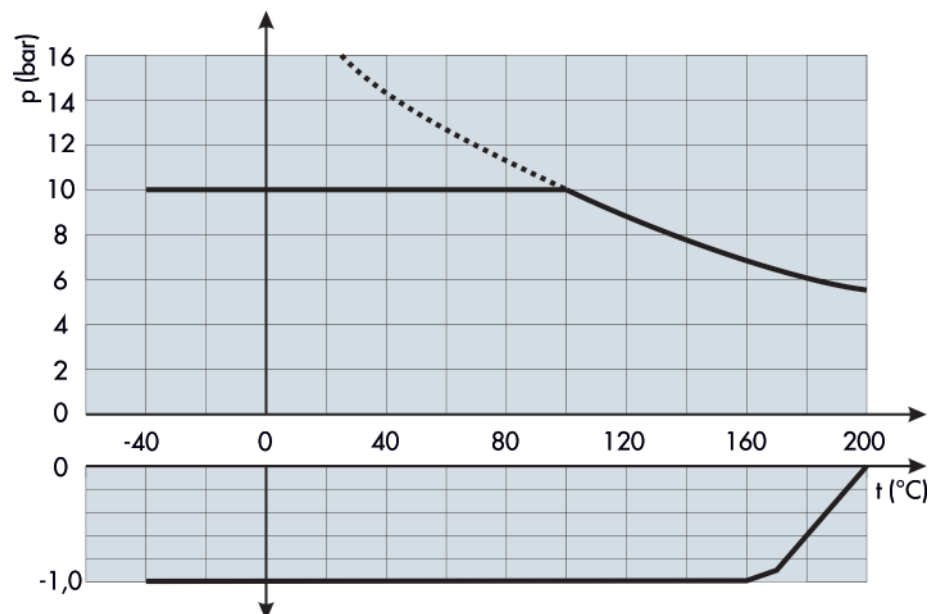


Fig. 4: Pressure-temperature diagram

**Table 2:** General technical data

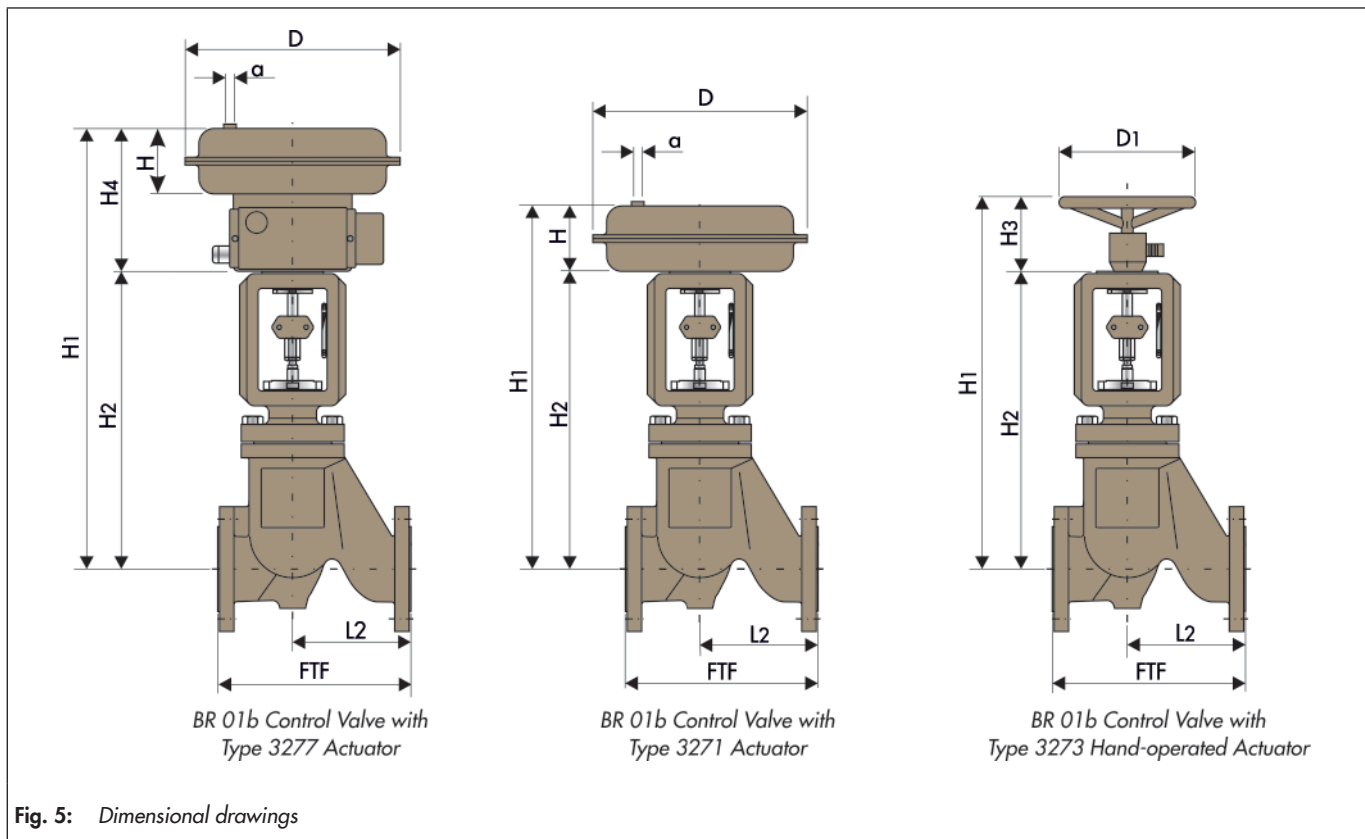
Valve size	DN 15 to 150	NPS ½ to 6
Pressure rating	PN 10/16	PN 10/16 (flanges according to ANSI Class 150)
Temperature range	See pressure-temperature diagram	
Characteristic	Equal percentage/linear	
Leakage range	Leakage rate A acc. to DIN EN 12266-1, test P12 (leakage rate 1 BO according to DIN 3230 Part 3)	
Rangeability	20:1 (up to $K_{VS}$ 0.1) · 50:1 ( $K_{VS}$ 0.25 and higher) · 30:1 (DN 80 and larger)	
End connections	DIN EN 1092-2, Form B	ANSI Class 150

**Table 3:** Material

Body	EN-JS 1049/A 395
Lining	Thick-walled PFA lining
Bonnet flange	EN-JS 1049/A395
Plug and seat	PTFE <sup>1)</sup> , optionally special material
Bellows	PTFE, optionally special material
Packing	PTFE V-ring packing loaded by spring washers
Stem	Corrosion-resistant steel 1.4571
Coating	Two-component polyurethane coat, grey beige (RAL 1019)

<sup>1)</sup> Control insert made of tantalum or other metals for 2 mm seat diameter

## Dimensions and weights



**Table 4:** Dimensions mm and weights in kg

Valve size		DN 15	DN 25	DN 40	DN 50	DN 80	DN 100	DN 150	
FTF	Basic series 1		160	200	230	310	350		
L2	Basic series 1		96	121	146	190	239		
H1	SAMSON Type 3271	H2 + H							
	SAMSON Type 3277	H2 + H4							
	SAMSON Type 3273	H2 + H3							
H2	Actuator 175v2 to 750v2 cm <sup>2</sup>		347	369	383.5	544	582		
Weight of valve in kg			11.5	18	21.5	40	57		
Actuator	175v2 cm <sup>2</sup>		•	•	•				
	240 cm <sup>2</sup>		•	•	•				
	350 cm <sup>2</sup>			•	•				
	700 cm <sup>2</sup>					•	•		
	750v2 cm <sup>2</sup>				•	•	•		
D1			180	180	180	250	250		
H3			92	92	92	92	92		
Weight of Type 3273 in kg			2	2	2	2.5	2.5		

Valve size		NPS ½	NPS 1	NPS 1½	NPS 2	NPS 3	NPS 4	NPS 6	
FTF	Basic series 37		184	222	254	298	352		
L2	Basic series 37		96	121	146	190	239		
H1	SAMSON Type 3271	H2 + H							
	SAMSON Type 3277	H2 + H4							
	SAMSON Type 3273	H2 + H3							
H2	Actuator 175v2 to 750v2 cm <sup>2</sup>		347	369	383.5	544	582		
Weight of valve in kg			11.5	18	21.5	40	57		
Actuator	175v2 cm <sup>2</sup>		•	•	•				
	240 cm <sup>2</sup>		•	•	•				
	350 cm <sup>2</sup>			•	•				
	700 cm <sup>2</sup>					•	•		
	750v2 cm <sup>2</sup>				•	•	•		
D1			180	180	180	250	250		
H3			92	92	92	92	92		
Weight of Type 3273 in kg			2	2	2	2.5	2.5		

Actuator in cm <sup>2</sup>	175v2	240	350	700	750v2
Diaphragm D	215	240	280	390	394
Hight H	78	65	85	135	171
Hight H4	179	166	183	239	272
Signal pressure connection a	G ¼		G ⅜		
Weight of Type 3271	6	5	8	22	36
Weight of Type 3277	10	9	12	26	40

**Table 5: Permissible differential pressures  $\Delta p$**

The permissible differential pressures specified only apply to soft-seated valves.

Signal pressure range				Fail-close								Fail-open <sup>1)</sup>								
				0.2 to 1.0	0.4 to 2.0	0.5 to 2.5	0.6 to 3.0	1.1 to 2.4	1.3 to 2.9	1.4 to 2.3	2.1 to 3.3	0.2 to 1.0								
Supply pressure				Required supply pressure								Max. supply pressure								
				1.4	2.4	2.9	3.4	2.8	3.3	2.7	3.7	1.2	1.4	1.6	2.0	2.7				
DN	NPS	Seat $\phi$ in mm	Actuator in cm <sup>2</sup>	$\Delta p$ when $p_2 = 0$																
25	1	2	175v2	16 <sup>2)</sup>	16 <sup>2)</sup>									16 <sup>2)</sup>						
			240	16 <sup>2)</sup>											16 <sup>2)</sup>					
		6	175v2	16												16				
			240	16												16				
		13	175v2	3	16											3	16			
			240		16												16			
		24	175v2		4	7	10			16						4	10			
			240		9		16									9	16			
			350	4	16											4	16			
		40	1½	30	175v2		1	3	5		16						5	13		
					240		5		11						5	11				
					350		10		16						10	16				
50	2	40	175v2			1	2		11								7	16		
			240		3		6						6							
			350		5		11						5	11						
			750v2 <sup>3)</sup>	5 <sup>3)</sup>	16 <sup>3)</sup>								5	16						
80	3	55	700		7		12							7	12					
			750v2			9				16			7	12						
80-100	3-4	65	700		4		8							4	8					
			750v2			6				16				8	16					
100	4	85	700				4								4					
			750v2							13										

**Table 5a:** Valves with SAMSON fail-close actuator  
Valve closed with signal pressure 0 bar

**Table 5b:** Valves with SAMSON fail-open actuator  
Valve closed with required signal pressure

<sup>1)</sup> We recommended using an actuator with travel stop. In all other cases, the supply air must be limited.

<sup>2)</sup> Actuator with travel stop

<sup>3)</sup> At travel 30 mm

**Table 6:** z values depending on  $K_{VS}$  coefficient, valve size and seat diameter

Valve size		DN 15/DN 25			DN 25	DN 40	DN 50	DN 80	DN 100	DN 150
		NPS ½/NPS 1			NPS 1	NPS 1½	NPS 2	NPS 3	NPS 4	NPS 6
Seat ø in mm		2 <sup>1)</sup>	6	13	24	30	40	65	95	150
$K_{VS}$	$C_V$	Acoustical valve coefficient z								
0.005	0.006	0.85								
0.01	0.01									
0.025	0.03									
0.05	0.06									
0.1	0.12	0.85	0.65							
0.25	0.29		0.65							
0.63	0.74			0.65						
1.0	1.17									
1.6	1.9			0.6						
2.5	2.9									
4	4.7				0.55	0.55				
6.3	7.4				0.45	0.5	0.5			
10	12				0.4	0.45	0.45			
16	19					0.4	0.4	0.45		
25	29						0.35	0.4	0.4	
28	33						0.35			
30	35						0.35			
40	47							0.35	0.35	
63	74							0.3	0.3	
80	94							0.25	0.25	
100	117								0.25	
125	146								0.2	
150	175								0.2	0.2
260	304									0.2
300	351									0.2

<sup>1)</sup> Linear characteristic is only possible for a 2 mm seat diameter

**Table 7:**  $K_{VS}$  coefficient, travel and seat diameter of parabolic plugs and V-port plugs

Valve size		DN 15/DN 25			DN 25	DN 40	DN 50	DN 80	DN 100	DN 150
		NPS ½/NPS 1			NPS 1	NPS 1½	NPS 2	NPS 3	NPS 4	NPS 6
Seat ø in mm		2	6	13	24	30	40	65	95	150
Travel in mm		10	15				30			60
$K_{VS}$	$C_V$									
0.005	0.006	P <sup>1)</sup>								
0.01	0.01									
0.025	0.029									
0.05	0.06									
0.1	0.12	P <sup>1)</sup>	P							
0.25	0.29		P							
0.4 <sup>2)</sup>	0.47 <sup>2)</sup>		P							
0.63	0.74			T						
1.0	1.17			T						
1.6	1.9			T						
2.5	2.9									
4	4.7				T	T				
6.3	7.4				T	T	T			
10	12				T	T	T			
16	19					T	T	T		
25	29						T	T	T	
28	33						T			
30	35						T <sup>1)</sup>			
35	41							T		
40	47							T	T	
63	74							T	T	
80	94							T	T	
100	117								T	
125	146								T	
150	175									T
260	304									T
300	351									T

P = Parabolic plug, T = V-port plug

<sup>1)</sup> Linear only

<sup>2)</sup> Use parabolic plugs only up to  $K_{VS}$  0.4. Otherwise, contact PFEIFFER.

## Terms for control valve sizing

According to IEC 60534-2-1:

$$FL = 0.95 \quad xT = 0.75$$

### Correction terms

For gases and vapors:  $\Delta LG = 0$

For liquids:  $\Delta LF = 0$

### Selection and sizing of the control valve

1. Calculate the appropriate  $K_{VS}$  according to IEC 60534-2-1.
2. Select valve size and  $K_{VS}$  according to Table 6.
3. Determine the differential pressure and select the suitable actuator from Table 5a and 5b.
4. Check the application against the pressure-temperature diagram.
5. Select additional equipment.

### Ordering text:

BR 01b Control Valve

Valve size: . . . . .

Pressure rating: . . . . .

Flow coefficient:  $K_{VS}$  . . . . .

Characteristic: equal percentage/linear

Body: EN-JS 1049/white PFA

Flange design: . . . . .

Special design: . . . . .

Actuator: SAMSON Type . . . . . cm<sup>2</sup>

Signal pressure range: . . . . . bar

Fail-safe position: . . . . .

Limit switch (brand name): . . . . .

Solenoid valve (brand name): . . . . .

Positioner (brand name): . . . . .

Others: . . . . .

## Associated data sheets

- SAMSON pneumatic actuator

▶ T 8310-x

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### **i** Note

*All relevant details regarding the version ordered, which deviate from the specified version in this technical description data, can be taken, if required, from the corresponding order confirmation.*

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