

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 / NPS½ to 6**
- **Pressure rating PN 10, PN 16 and cl150**
- **Temperatures -10 to +200 °C (14 °F bis 392 °F)**

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/A 395 as standard, with 3-5 mm thick PFA lining
- Exchangeable PTFE 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

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 BR 01a Control Valves to meet special requirements



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

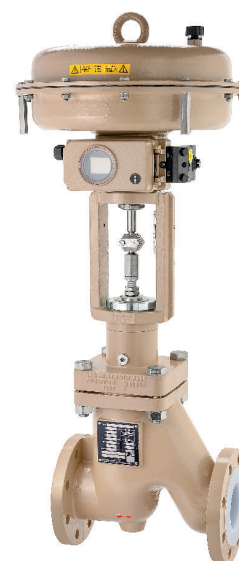


Bild 2: PFEIFFER Type 01b Control Valve, DN 80
with SAMSON actuator

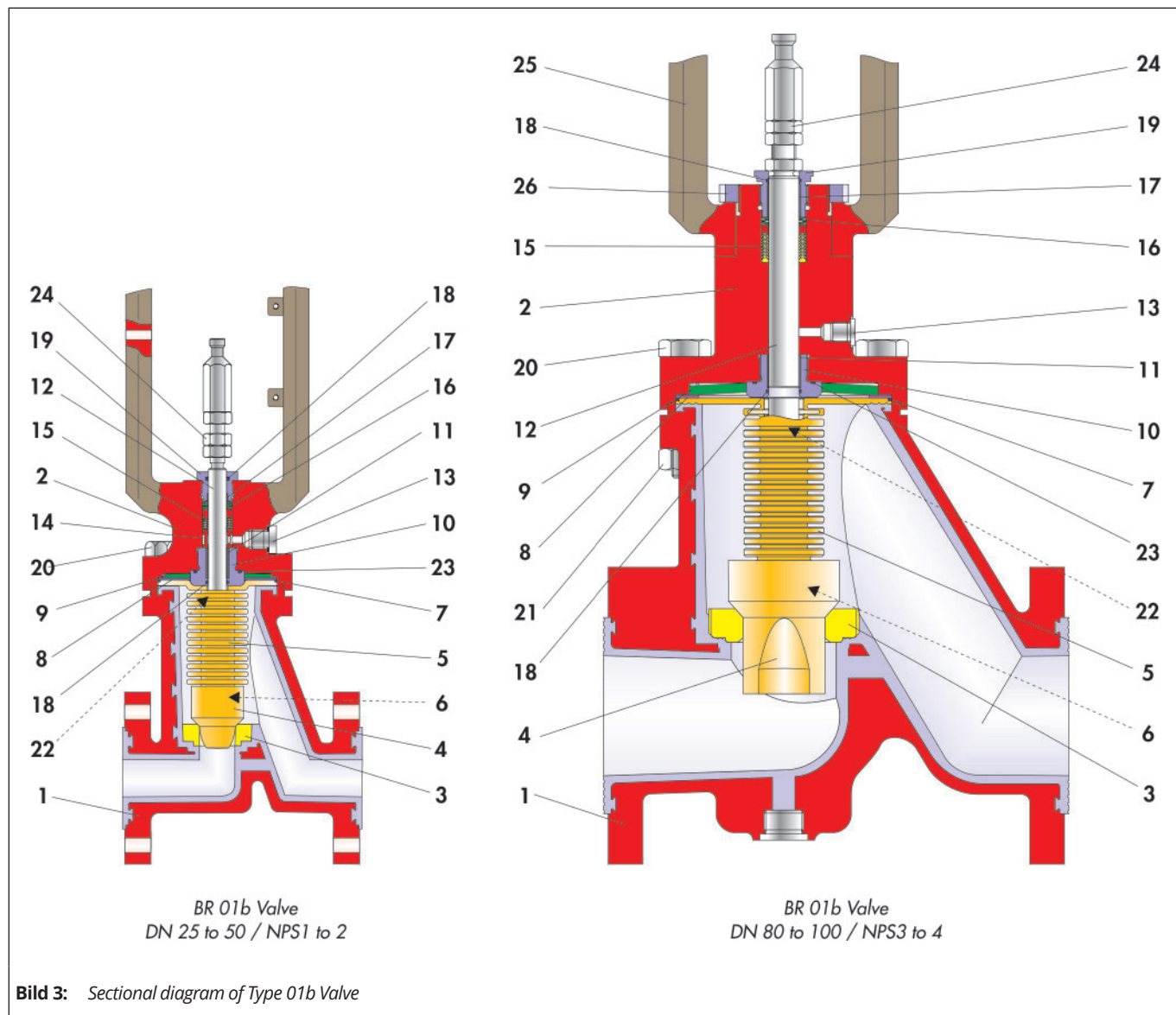


Tabelle 1: Parts list

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

Item	Description
14	Distance bush
15	V-ring packing
16	Disc spring set
17	Bearing bush
18	O-ring
19	Packing
20	Screw
21	Nut
22	Retainer ring
23	O-ring
24	Nut
25	Yoke
26	Lock 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.

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.

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 ► EB01b.

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.

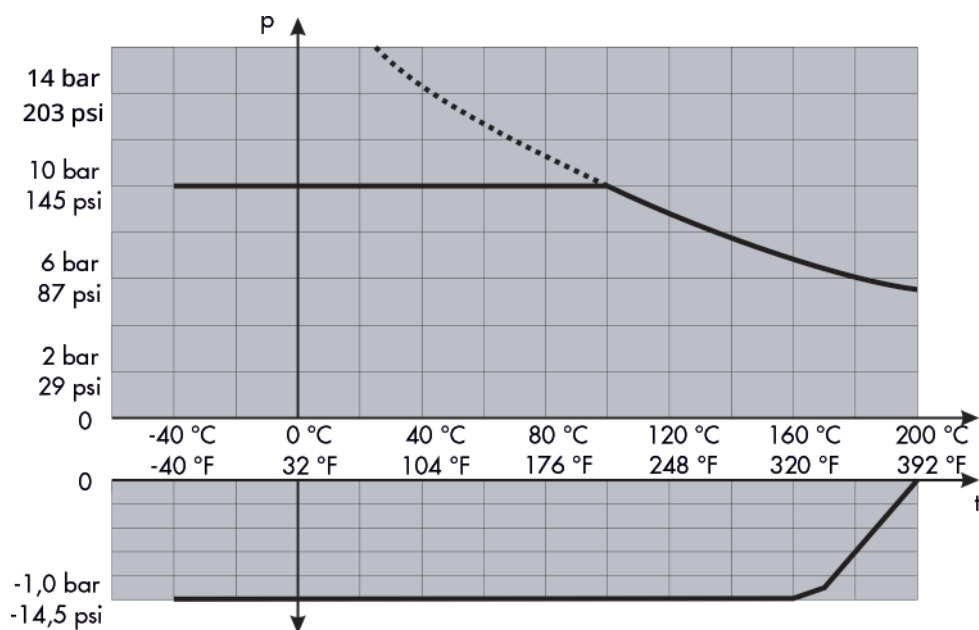


Bild 4: Pressure-temperature diagram

Tabelle 2: General technical data

	DIN	ANSI
Valve size	DN 15 to 150	NPS½ to 6
Pressure rating	PN 10 / 16	flanges according to ANSI c150
Temperature range	See pressure-temperature diagram	
Characteristic	Equal percentage/linear	
Leakage range	Leakage rate A acc. to DIN EN 12266-1, test P12	
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 c150

Tabelle 3: Material

	DIN	ANSI
Body	EN-JS 1049 (GGG 40.3)	ASTM A395
Lining	Thick-walled PFA lining	
Bonnet flange	EN-JS 1049 (GGG 40.3)	ASTM A395
Plug and seat	PTFE ¹⁾ , optionally special material	
Bellows	PTFE, optionally special material	
Packing	PTFE V-ring packing loaded by disc springs	
Stem	Corrosion-resistant steel 1.4571	
Coating	Two-component polyurethane coat, grey beige (RAL 1019)	

¹⁾ Control insert made of tantalum or other metals for 2 mm seat diameter

Dimensions and weights

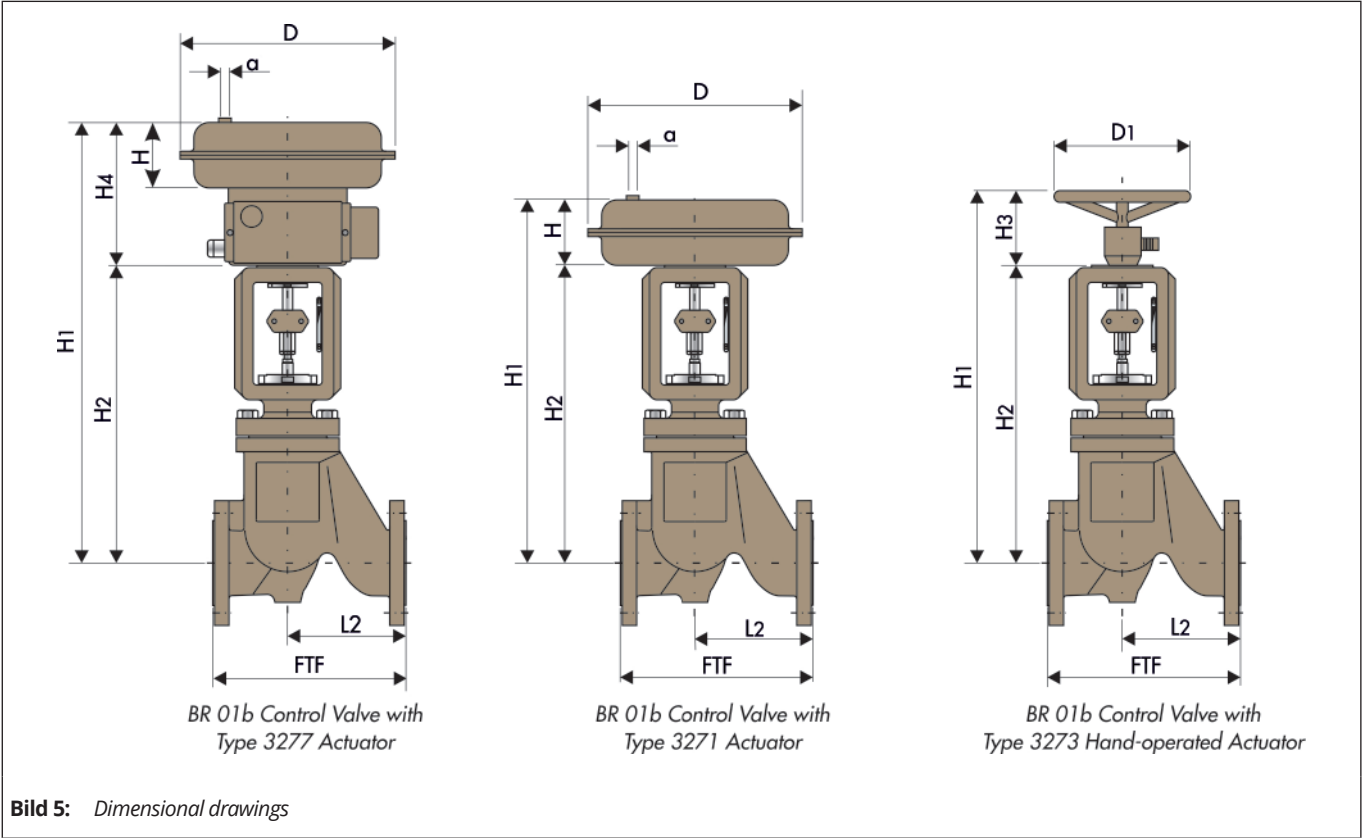


Tabelle 4: Dimensions mm and weights in kg

Valve size		DN 15	DN 25	DN 40	DN 50	DN 80	DN 100	DN 150
FTF	Basic series 1	130	160	200	230	310	350	480
L2	Basic series 1	72	96	121	146	190	239	320
H1	SAMSON Type 3271	H2 + H						
	SAMSON Type 3277	H2 + H4						
	SAMSON Type 3273	H2 + H3						
H2	Actuator 120 cm ²	333.5	334	356	370.5			
	Actuator 175v2 to 750v2 cm ²	346.5	347	369	383.5	544	582	1072
Weight of valve in kg		9.7	11.5	18	21.5	40	57	174
Actuator	120 cm ²	•	•	•	•			
	175v2 cm ²	•	•	•	•			
	240 cm ²	•	•	•	•			
	350 cm ²	•	•	•	•			
	355v2 cm ²				•	•	•	
	700 cm ²				•	•	•	•
	750v2 cm ²				•	•	•	•
	1400 cm ²							•
	2800 cm ²							•
D1		-	180	180	180	250	250	250
H3		-	92	92	92	92	92	92
Weight of Type 3273 in kg		-	2	2	2	2.5	2.5	2.5

Valve size		NPS ½	NPS 1	NPS 1½	NPS 2	NPS 3	NPS 4	NPS 6
FTF	Basic series 37	130	184	222	254	298	352	480
L2	Basic series 37	72	96	121	146	190	239	320
H1	SAMSON Type 3271	H2 + H						
	SAMSON Type 3277	H2 + H4						
	SAMSON Type 3273	H2 + H3						
H2	Actuator 120 cm ²	333.5	334	356	370.5			
	Actuator 175v2 to 750v2 cm ²	346.5	347	369	383.5	544	582	1072
Weight of valve in kg		9.7	11.5	18	21.5	40	57	174
Actuator	120 cm ²	•	•	•	•			
	175v2 cm ²	•	•	•	•			
	240 cm ²	•	•	•	•			
	350 cm ²			•	•			
	355v2 cm ²				•	•	•	
	700 cm ²				•	•	•	•
	750v2 cm ²				•	•	•	•
	1400 cm ²							•
	2800 cm ²							•
D1		-	180	180	180	250	250	250
H3		-	92	92	92	92	92	92
Weight of Type 3273 in kg		-	2	2	2	2.5	2.5	2.5

Actuator in cm ²	120	175v2	240	350	355v2	700	750v2	1400	2800
Diaphragm D	168	215	240	280	280	390	394	534	770
Hight H	69 / 70	78	65	85	121	135	171	470	585
Hight H4	158	179	166	183	222	239	272	-	-
Signal pressure connection a	G½"	G ¼"		G ¾"				G 1"	
Weight of Type 3271	2.5	6	5	8	15	22	36	175	450
Weight of Type 3277	3.2	10	9	12	19	26	40	-	-

Tabelle 5: Permissible differential pressures Δp

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

Signal pressure range				Fail-close								Fail-open ¹⁾				
				0.2 ... 1.0	0.4 ... 2.0	0.5 ... 2.5	0.6 ... 3.0	1.1 ... 2.4	1.3 ... 2.9	1.4 ... 2.3	1.9 ... 3.1	0.2 ... 1.0				
Supply pressure				Required supply pressure								Max. supply pressure				
				1.4	2.4	2.9	3.4	2.8	3.3	2.7	3.5	1.2	1.4	1.6	2.0	2.7
DN	NPS	Seat ø in mm	Actuator in cm ²	□p when p ₂ = 0												
25	1	2	120	8 ²⁾								8 ²⁾				
			175v2	16 ²⁾	16 ²⁾							16 ²⁾				
			240	16 ²⁾								16 ²⁾				
		6	120	8								8				
			175v2	16								16				
			240	16								16				
		13	120		8								8			
			175v2	3	16							3	16			
			240		16								16			
		24	120		4.5								4.5			
			175v2		4	7	10		16				4	10		
			240		9		16						9	16		
			350	4	16							4	16			
40	1½	30	120		2.5		5.5						2.5	5.5		
			175v2		1	3	5		16					5	13	
			240		5		11						5	11		
			350		10		16						10	16		
50	2	40	120		1.5		3							3		
			175v2			1	2		11						7	16
			240		3		6							6		
			350		5		11						5	11		
			355v2		3		8	16		16	16		5	10	16	
			750v2 ³⁾	5 ³⁾	16 ³⁾							5	16			
80	3	65	355v2				2	7		13	16			3	6	9
			700		4		8						4	7		
			750v2			6				16			4	8	16	
100	4	95	355v2							3	5					4
			700				2							2	6	12
			750v2				3			10	16			3	6	13
150	6	150	1400					9	12			11	13	15	16	
			2800 ²⁾		6	8	11									

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

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

²⁾ Actuator with travel stop

³⁾ At travel 30 mm

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

Valve size		DN 15 / DN 25 NPS½ / NPS1			DN 25 NPS1	DN 40 NPS1½	DN 50 NPS2	DN 80 NPS3	DN 100 NPS4	DN 150 NPS 6
		2 ¹⁾	6	13	24	30	40	65	95	150
Seat ø in mm		Acoustical valve coefficient z								
K_{VS}	C_V									
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
260	304									0.2
300	351									0.2

¹⁾ Linear characteristic is only possible for a 2 mm seat diameter

Tabelle 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
		NPS½ / NPS1			NPS1	NPS1½	NPS2	NPS3	NPS4	NPS6
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 ¹⁾								
0.01	0.01									
0.025	0.029									
0.05	0.06									
0.1	0.12	P ¹⁾	P							
0.25	0.29		P							
0.4 ²⁾	0.47 ²⁾		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 ¹⁾			
35	41							T		
40	47							T	T	
63	74							T	T	
80	94							T	T	
100	117								T	
125	146								T	
150	175									T
160	186								T	
260	304									T
300	351									T

P = Parabolic plug, T = V-port plug

¹⁾ Linear only

²⁾ Use parabolic plugs only up to K_{VS} 0.4. Otherwise, contact PFEIFFER.

Terms for control valve sizing

According to IEC 60534-2-1:
 $FL = 0.95 \times T = 0.75$

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^2
Signal pressure range: bar
Fail-safe position:
Limit switch (brand name):
Solenoid valve (brand name):
Positioner (brand name):
Others:

Associated data sheets

- Associated installation and operating instructions ► EB 01a
- Associated safety manual ► SH 01
- For pneumatic actuator ► T8310-1 to T8310-3 (SAMSON)

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.
