DATA SHEET TB 01d

BR 01d · PTFE-lined 3-Way Valve

Diverting valve · DIN and ANSI-Version

CE

Applications

PTFE diverting valve for serverly aggressive or corrosive media, especially for chemical processes:

- **Nominal size DN 25 to DN 150 and NPS1 to NPS6**
- **Nominal pressure PN 10, PN 16 and cl150**
- **Temperatures -10°C to +200°C**

The 3-way control valve consists of a valve body with PTFE lining and a pneumatic gear operated actuator. The valve is of modular construction and has the following features:

- Streamlined valve body of spheroidal iron EN-JS 1049 / A 395 with 5 to 8 mm thick liner in PTFE
- Seat and plug exchangeable for various Kv values
- Primary stem sealing by PTFE bellows. Secondary seal by additional safety packing
- Test connection for monitoring of the bellows primary seal
- Exchangeable actuator
- Additional equipment can be added in acc. to DIN EN 60534 and Namur recommendations
- Face to Face acc. to DIN EN 558, basic series 1 and 37 (NPS1 to NPS4)

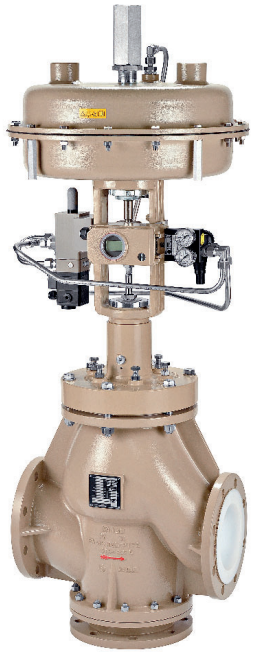

Fig. 1: *BR 01d 3-Way valve with SAMSON Actuator*

Versions

The BR 01d 3-Way valve is available optionally in the following versions:

- SAMSON pneumatic actuator (absolutely with double-sided stroke limitation)
- SAMSON hand-operated actuator
- Actuators of other manufacturers on request

Special designs

- Heating of the valve body with heating jacket
- Lining made of special compounds, e.g. conductive PTFE
- Valve plug and seat made of special materials (e.g. HC4, titanium, tantalum, aluminium oxide) for erosive media
- Bellows and Plug stem made of special material (e.g. Hastelloy)
- Other components made of special material
- Version for process media with intense permeation
- Version for process media that crystallize out
- Version for -40°C

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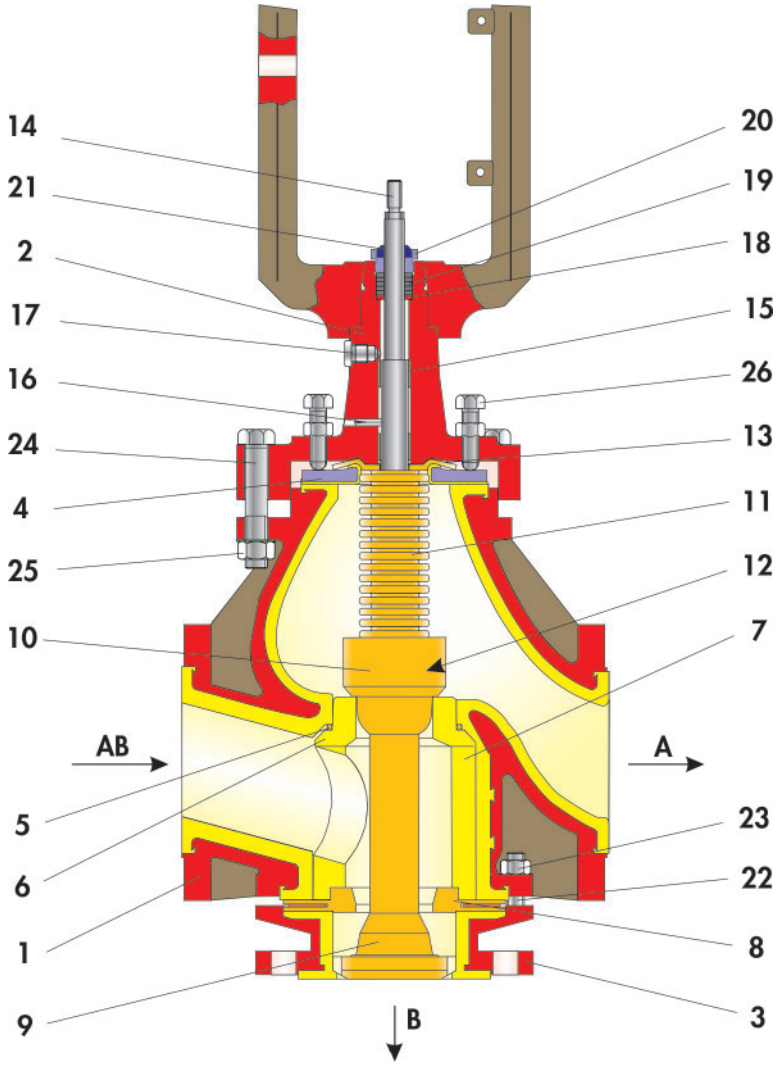

Fig. 2: *Sectional diagram through an BR 01d 3-way valve*

Table 1: *List of parts*

Item	Description
1	Valve body
2	Bonnet flange
3	3-way body
4	Bordered flange
5	O-ring
6	Seat
7	Spacer
8	Seat
9	Plug head
10	Plug stem
11	Bellows
12	Cord
13	Washer

Item	Description
14	Stem
15	Bushing
16	Grooved pin
17	Locking screw
18	Washer
19	PTFE-graphite packing
20	Stuffing box
21	Wiper ring
22	Stud bolt
23	Nut
24	Screw
25	Nut
26	Screw

Principle of operation

The BR 01d 3-way valve is designed as a diverting valve. The medium flows through the valve entry AB. The entry flow is splitted into two partial flows at port A and B.

The valve plug (9 and 10) positions determines the cross-sectional area of flow between each seat and plug pair (6 and 8).
The plug stem (14) is connected to the actuator stem via the stem connector and tightly sealed by means of a PTFE-bellow (11), backed up by an additional carbon graphite safety packing (19).

A test connection port (17) allows monitoring of the bellow for leakage, e.g. by connecting a suction line or inert gas line.

The plugs (9 and 10) are easily accessed and exchanged due to the locking to the bellow assembly by means of a PTFE tongue (cord 12) and groove.
The body (3) and the PTFE spacer (7) carry both seats (6 and 8).

Info

In the event that cavitation may occur, we recommend the use of a guided plug for differential pressures over 3 bars and differential pressure ratio p2 < Δp!

Info

Before using the valve in hazardous areas, check whether this is possible according to ATEX 2014/34/EU by referring to the Operating Instructions ▶ EB 01d.

Fail-safe position

Depending on how the pneumatic actuator is mounted to 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:

- **Globe valve with actuator "spring closes port A":**
  Reducing air supply causes valve closing to port A through releasing the springs, respectively in case of air failure.
- **Globe valve with actuator "spring opens port A":**
  Reducing air supply causes valve opening to port A through releasing the springs, respectively in case of air failure.

Additional equipment and add-on pieces

For the control valves, the following accessories are available either individually or in combination:

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

Further accessories are available on request for customer specifications.

Pressure-temperature diagram

The operating range is determined by the pressure-temperature diagram. Process data and media can influence the values of the diagram.

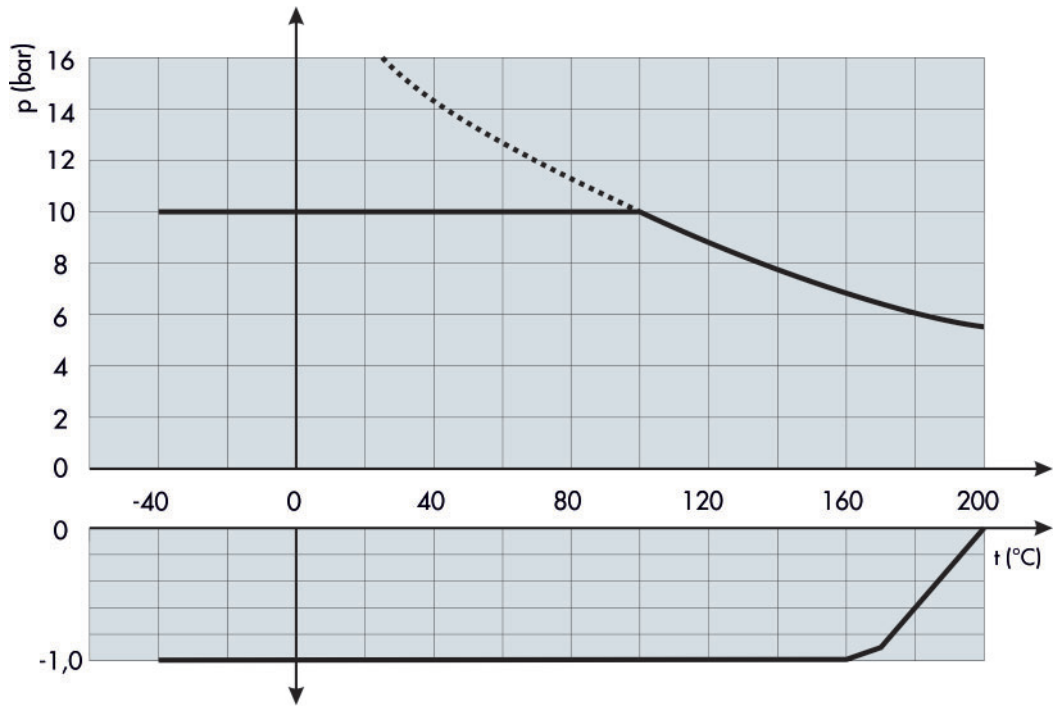

Fig. 3: *Pressure-temperature diagram*

Table 2: *General technical data*

Nominal size		DN 25 ... 150	NPS1 ... 4	NPS6
Nominal pressure		PN 10 / 16	cl150	cl150 (Baulänge 480 mm)
Temperature range		See pressure-temperature diagram		
Characteristic		Linear		
Leakage rate	Direction of flow A	Leakage rate A acc. to DIN EN 12266-1, P12 (Leakage rate 1 BO acc. to DIN 3230 Part 3)		
	Direction of flow B	Leakage rate B acc. to DIN EN 12266-1, P12 (Leakage rate 2 BO acc. to DIN 3230 Part 3)		
Rangeability		30 : 1		
End connections		DIN EN1092-2, Form B	ANSI cl150	

Table 3: *Materials*

Nominal size	DN 25 ... DN 150	NPS1 ... NPS3	NPS4 ... NPS6
Valve body	EN-JS 1049 (GGG 40.3)	ASTM A395	
Liner	PTFE, optionally conductive PTFE		
3-way body	EN-JS 1049 (GGG 40.3)	ASTM A395	
Valve plug, seat	PTFE optionally special material, with DN 25 only a metallic set is possible		
Bellows	PTFE, optionally special material		
Spacer	PTFE		
Packing	PTFE / graphite packing	PTFE v-ring packing loaded by spring washers	PTFE / graphite packing
Plug stem	Corrosion-resistant steel 1.4571, optionally special material		
Coating	Two-component polyurethane coat, grey beige (RAL 1019)		

Dimensions and weights

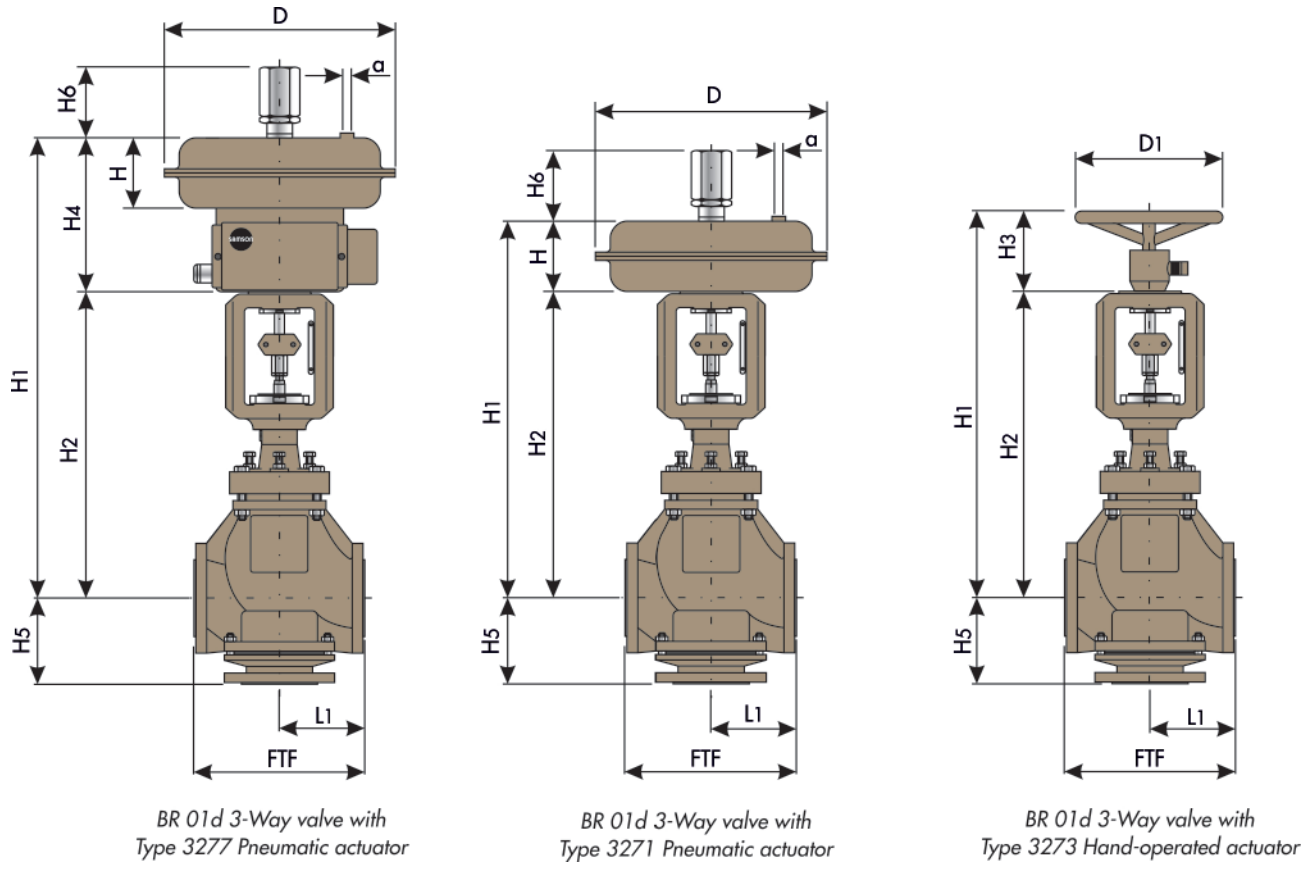

Fig. 4: *Dimensional drawings*

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

Nominal size		DN 25	DN 40	DN 50	DN 80	DN 100	DN 150
FTF	Basic series 1	160	200	230	310	350	480
L1	Basic series 1	80	100	115	155	179.5/170.5	240
H1	Samson Type 3271	H2 + H					
	Samson Type 3277	H2 + H4					
	Samson Type 3273	H2 + H3					
H2	Actuator 240 ... 700 cm²	425	462	464	526	705	719
	Actuator 1400 cm²					795	809
H5		87	129	132.5	155	175 [2]	250
Weight of valve in kg		16	20	24	49	91	155
Actuator	175v2 cm²	•	•	•			
	240 cm²	•	•	•			
	350 cm²	•	•	•			
	700 cm²				•	•	•
	750v2 cm²			•	•	•	•
	1400 cm²					•	•
D1		180	180	180	250	250	250
H3		110	110	110	115	115	115
Weight of Type 3273 in kg		2	2	2	2.5	2.5	2.5

Nominal sice		NPS1	NPS1½	NPS2	NPS3	NPS4	NPS6
FTF	Basic series 37	184	222	254	298	352	480 [1]
L1	Basic series 37	92	111	127	139.5/158.5	172.5	240 [1]
H1	Samson Type 3271	H2 + H					
	Samson Type 3277	H2 + H4					
	Samson Type 3273	H2 + H3					
H2	Actuator 240 ... 700 cm²	366	405	403	535	488.5	719
	Actuator 1400 cm²					794.5	809
H5		87	129	141.5	155	175 [2]	250
Weight of valve in kg		16	20	24	49	91	155
Actuator	175v2 cm²	•	•	•			
	240 cm²	•	•	•			
	350 cm²	•	•	•			
	700 cm²				•	•	•
	750v2 cm²			•	•	•	•
	1400 cm²					•	•
D1		180	180	180	250	250	250
H3		110	110	110	115	115	115
Weight of Typ 3273 in kg		2	2	2	2.5	2.5	2.5

Actuator in cm2	175v2	240	350	700	750v2	1400
Diaphragm D	215	240	280	390	394	530
Height H	78	65	85	135	171	197
Height H4	179	166	183	236	272	-
Height H6	75	75	85	115	129	180
Signal pressure connection a	G¼"		G⅜"			
Weight of actuator Type 3271 in kg	6	5	8	22	36	70
Weight of actuator Type 3277 in kg	10	9	12	26	40	-

[1] Face to face dimensions according to DIN (basic series 1)

Table 5: *Permissible differential pressures Δp in direction of flow „A“*

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

Signal pressure range				STAF								STEF		
				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	2.1 ... 3.3	0.2 ... 1.0		
Supply pressure				**1.4**	**2.4**	**2.9**	**3.4**	**2.8**	**3.3**	**2.7**	**3.7**	**1.2**	**1.4**	**1.6**
DN	**NPS**	**Seat ø in mm**	**Actuator in cm²**	Δp bei p2 = 0										
25	1	24	175v2		4	7	10		16					
			240		9		16						9	16
			350	4	16							4	16	
40	1½	30	175v2		1	3	5		16					
			240		5		11						5	11
			350		10		16						10	16
50	2	38	175v2			1	2		11					
			240		3		6							6
			350		5		11						5	11
			750v2 3)	5 3)	16 3)									
80	3	55	700		7		12						7	12
			750v2			9				16				
80-100	3-4	65	700		4		8						4	8
			750v2			6				16				
100	4	85	700				4							4
			750v2							13				
			1400		5	7	10					10		
		90	1400		4	6	8					10		
150	6	110	700							7	10			3
			750v2											
			1400			3		6					3	6
		120	700							5	9			2
			1400			3		5					3	5

Table 5a:
Valves with spring closing SAMSON-actuator. Valve with signal pressure 0 bar closed.

Table 5b
Valves with spring opening SAMSON-actuator. Valve with required signal pressure closed.

Note
We strongly recommend using an actuator with double-sided stroke limitation.

Note
Actuators with preloaded springs cannot be used.

Table 6: *z-values depending on kvs – value and nominal diameter, seat diameter and travel*

Nominal size		DN 25	DN 40	DN 50	DN 80	DN 100	DN 150
		NPS1	NPS1½	NPS2	NPS3	NPS4	NPS6
Seat-ø in mm		24	30	38	55 / 65	65 / 85	110 / 120
Travel in mm		15			30		30 / 45
kvs	Cv	Acoustical valve coefficient z					
4	4.7		0.55				
6.3	7.4	0.45	0.5	0.5			
10	12		0.45	0.45			
16	19			0.4	0.45		
25	29				0.4	0.4	
40	47				0.35	0.35	0.4
63	74				0.3	0.3	0.35
80	94					0.25	0.3
100	117					0.25	0.3
125	146						0.2
150	175						0.2

Parameters

For the calculation of flow in acc. with DIN EN 60534-2-1:

FL = 0,95 xT = 0,75

Valve-specific correction terms

For gases and vapours : ΔLG = 0,

For liquids: ΔLF = 0

Selection and sizing of the control valve

1. Calculation of the appropriate kvs-value in acc. with DIN EN 60534
2. Selection of DN and kvs-value in acc. with table 6
3. Determination of the Δp occurring, selection of the appropriate actuator in acc. with tables 5a and 5b
4. Checking the application in view of the pressure-temperature diagram
5. Additional equipment

Order text

BR 01d 3-Way Valve
DN . . . . .
PN . . . . .
kvs . . . . .
Basic characteristic curve: only linear
Body: EN-JS 1049 / PTFE-white
Flange design: . . . . .
Special design: . . . . .

Actuator: Samson Type . . . . . , ... cm^2
Control pressure range: . . . . . bar
Fail-safe position . . . . .

Limit switch (brand name): . . . . .
Solenoid valve (brand name): . . . . .
Positioner (brand name): . . . . .

Others: . . . . .

Associated documents

- Associated installation and operating instructions ▶ EB 01d
- 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.

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