

PTFE - lined Globe Control Valve Series 1a

Application:

PTFE-lined control valve for severely aggressive or corrosive media, especially for chemical processes:

- Nominal sizes DN 25 to DN 150 and 6"
- Nominal pressure PN 10/16
- Temperatures to 200°C

Globe valve series 1a is also available in DN 1" up to DN 4" acc. to ANSI 150 lbs. Details on request.

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

- Streamlined valve body of spheroidal graphite iron EN-JS 1049 (GGG40.3), as standard with 5-8 mm thick PTFE-liner.
- Exchangeable PTFE seat and PTFE plug.
- Stem sealed by PTFE bellows.
Secondary seal by additional safety packing.
- Test connection for monitoring of the bellow 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 558-1, basic series 1 (DIN 3202, F1).

Versions:

The Series 1a Globe Valve is available optionally in the following versions:

- Samson pneumatic actuator.
- Pfeiffer hand-operated actuator .
- Samson hand-operated actuator.
- Actuators of other manufacturers on request.

Special designs:

- Tracement: valve body with heating jacket.
- Lining made of special compounds, e.g. conductive PTFE.
- Valve plug and seat made of special materials (e.g. tantalum, HC4, titanium, aluminium oxide) for erosive media.
- Bellows and Plug stem made of special material (e.g. hastelloy).
- Further components made of special material.



Fig. 1 - Control Valve Series 1a



Fig. 2 - Control Valve Series 1a

Globe Control Valve Series 1a

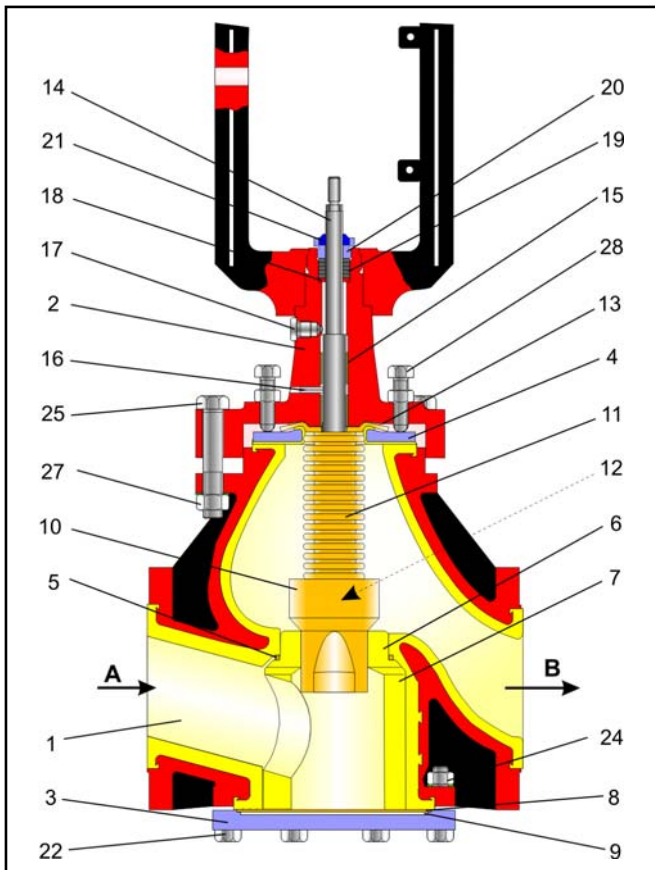


Fig. 3 – Sectional diagram of Series 1a Globe Valve

Item	Description	Item	Description
1	Valve body	14	Stem connector
2	Bonnet flange	15	Bearing
3	Bottom flange	16	Grooved pin
4	Bordered flange	17	Locking screw
5	O-ring	18	Washer
6	Seat	19	PTFE-graphite packing
7	Spacer	20	Stuffing box
8	Washer	21	Wiper ring
9	Inlay	22	Screw
10	Plug	24	Nut
11	Bellows	25	Screw
12	Cord	27	Nut
13	Washer	28	Screw

Table 1 – List of parts

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 blocks

Further accessories are available on request for customer specifications

Principle of operation:

The process medium flows through the Globe Valve in the flow-to-open direction. The valve plug position determines the cross-sectional area of flow between the seat (6) and the plug (10). The plug is connected over the stem connector (14) to the actuator stem.

The PTFE bellows (11) seals the area between the valve body (1) and stem connector (14). The safety packing (19) is used as a backup stem sealing. A test connection port (17) allows the bellows (11) to be monitored for leakage, e.g. by connecting a suction line or inert gas line.

The plug (10) is easily exchanged thanks to its tongue and groove connection to the PTFE bellows which is secured by a strong PTFE cord (12).

Bottom flange (3), PTFE-disc (8), elastomer inlay (9) and PTFE spacer (7) are fixing the seat (6) in it's position.



Note : 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 $p_2 < \Delta p$, !



Note: Before using the valve in hazardous areas, check whether this is possible according to ATEX 94/9/EG by referring to the Operating Instructions < BA 01a > .



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:

- **Control valve with actuator “ Spring closes “**
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 actuator “ Spring opens “**
Upon air failure, the valve is opened. The valve closes when the signal pressure increases, acting against the force of the springs.

Pressure-temperature diagram:

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

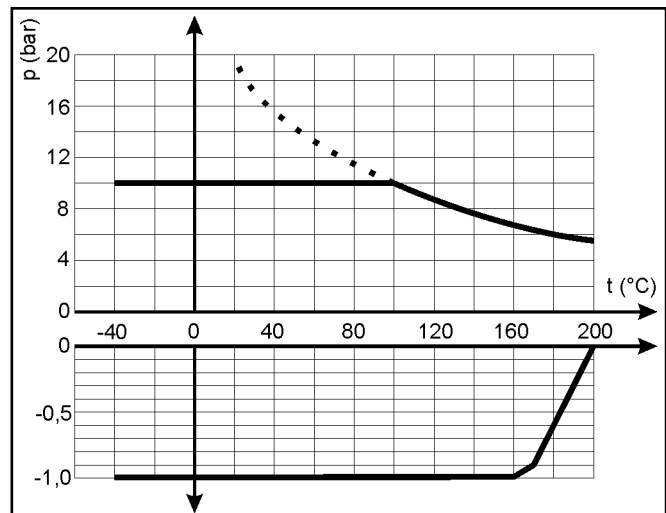


Fig. 4 - pressure-temperature diagram

General Technical Data:

Nominal size	DN 25 - DN 150	6"
Nominal pressure	PN 10 / 16	PN 10 / 16 Flanges ANSI 150lbs
Temperature range	See pressure-temperature diagram	
Characteristic	Equal percentage / linear	
Leakage rate	Leakage rate A acc. to DIN EN 12266-1, P12 (Leakage rate 1 BO acc. to DIN 3230 Part 3)	
Rangeability	20 : 1 (to kvs 0,1) / 50 : 1 (from kvs 0,25)	
End connections	as per DIN EN 1092-2, Form B resp. ANSI 150 lbs	

Table 2 – technical data

Materials:

Body	EN-JS 1049 (GGG 40.3) with PTFE - lining
Bonnet flange	EN-JS 1049 (GGG 40.3)
Valve plug and seat	PTFE ¹⁾ , optionally special materials
Bellows	PTFE, optionally special materials
Spacer	PTFE
Packing	PTFE-graphite packing
Plug stem	1.4571
Coating	2-Components-Pur-Varnish Colour: Black, RAL 9005

Table 3 - materials

¹⁾ when seat diameter 2 mm, only tantalum or other metals

z-values depending on kvs-value and nominal sizes:

DN		25		40	50	80		100		150 / 6"		
Seat-ø in mm		2	13	24	30	38	55	65	65	85	110	120
Travel in mm		10 ²⁾	15			30			50	30	50	
kvs	Cv	Acoustical valve coefficient z										
0.005	0.006											
0.01	0.01											
0.02	0.02											
0.05	0.06											
0.1	0.12											
0.25	0.29											
0.63	0.74											
1.0	1.17											
1.6	1.9											
2.5	2.9											
4	4.7											
6.3	7.4											
10	12											
16	19											
25	29											
35	41											
40	47											
63	74											
80	94											
100	117											
125	146											
150	175											
260	304											
300	351											

Table 4 – acoustically determined valve parameter "z" in acc. with VDMA

²⁾ when seat diameter 2 mm, only linear characteristic line available.

Permissible differential pressures Δp:

Terms for noise level calculation:

according to VDMA 24422.
z = acoustical valve coefficient.

Terms for control valve sizing:

according to DIN EN 60534-2-1:
FL = 0,95 xT = 0,75

Correction terms:

For gases and vapours : ΔLG = 0,
For liquids: ΔLF = 0

Signal pressure range			0.2-1.0 (0.2-0.8)	0.3-1.1	0.4-1.2 (0.4-1.0)	0.4-2.0 (0.4-1.6)	0.6-3.0 (0.5-1.7)	0.2-1.0 (0.4-1.0)		
Required supply pressure			1.3	1.4	1.4	2.3	3.3	1.2	1.4	1.6(1.5)
DN	Seat ø in mm	Actuator in cm ²	Δp with p2 = 0							
25	2	240	> 16	-	-	-	-	> 16	-	-
	13	240	12	> 16	-	-	-	12	> 16	-
	24	240	-	5	9	9	>16	-	9	> 16
350		4	11	>16	>16	-	4	> 16	-	
40	30	240	-	-	5	5	11	-	5	11
		350	-	6	10	10	> 16	-	10	> 16
50	38	240	-	-	-	3	6	-	-	6
		350	-	3	5	5	11	-	5	11
80	55	700	-	4	7	7	12	-	7	12
80-100	65	700	-	-	4	4	8	-	4	8
100	85	700	-	-	-	-	4	-	-	4
150 / 6"	110	1400	-	-	3	3	6	-	3	6
	120	1400	-	-	3	3	5	-	3	5

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

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

The shaded columns of the table show the standard values. The differential pressures in the white columns of table 5a apply to pre-loaded springs. The values in brackets in the column "control pressure range" refer to the differential pressure values in brackets. The permissible differential pressures quoted are only valid for soft-sealing valves.

Dimensions and weights:

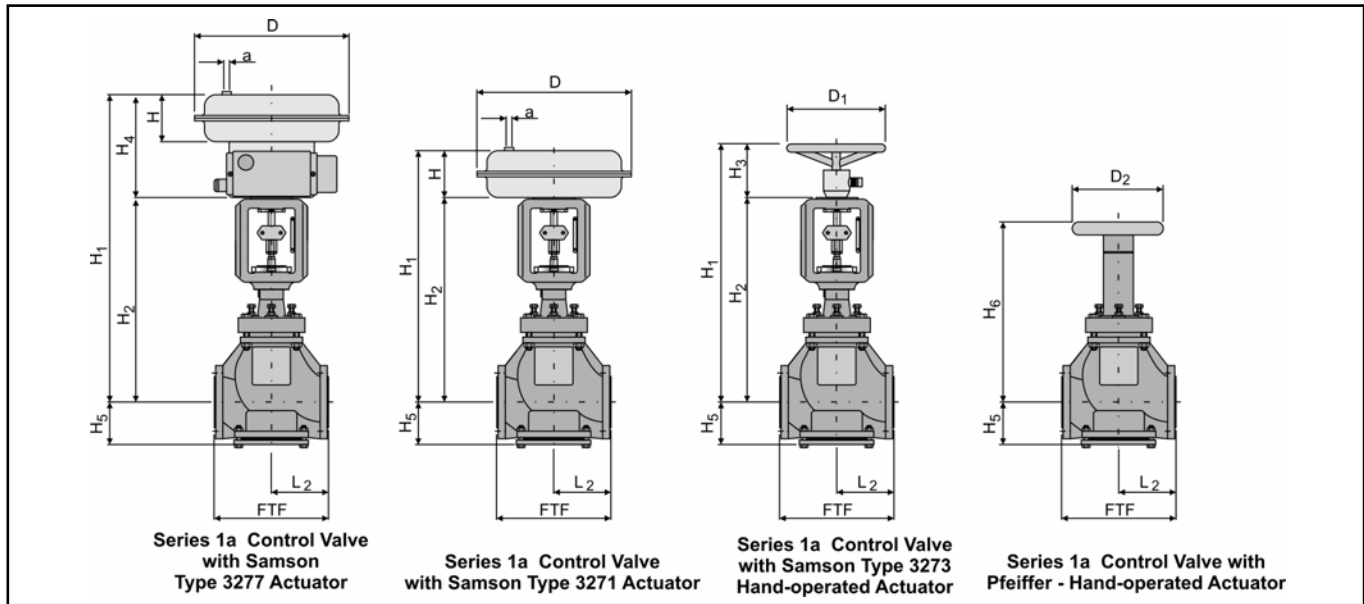


Fig. 5 – dimensional drawing

DN		25	40	50	80	100	150/ 6"
FTF	Basic series 1	160	200	230	310	350	480*
L2	Basic series 1	80	100	115	155	175	240*
H1	Samson Type 3271	H2 + H					
	Samson Type 3277	H2 + H4					
	Samson Type 3273	H2 + H3					
H2		425	475	475	525	730	920
H5		60	80	90	120	150	185
Weight of the valve in kg		14	18	21	45	85	145
Actuator	240ccm	x	x	x			
	350ccm	x	x	x			
	700ccm			x	x	x	x
	1400ccm						x
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
D2		130	130	130	130	250	400
H6		340	375	375	450	600	630
Weight of Type Pfeiffer in kg		1	1	1	1	7	10

Actuator in ccm	240	350	700	1400
Diaphragm D	240	280	390	530
Height H	65	85	135	197
Height H4	166	186	236	-
Signal pressure connection a	G1/4"		G3/8"	
Weight of Actuator Type 3271 in kg	5	8	22	70
Weight of Actuator Type 3277 in kg	9	12	26	-

Table 6 - dimensions in mm and weights in kg *) Face to Face dimension as per DIN

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 4.
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:

Series 1a Control Valve,
DN , PN , kvs

Basic characteristic curve: equal percentage / linear
Body: EN-JS 1049 / PTFE-white, Flange design:
Special design

Actuator: Samson Type..... cm², Control pressure range:... bar,
Connection of a positioner, a limit switch and/or a solenoid valve



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 confirm.

Please contact our technical sales team for your special requirements

Pfeiffer Chemie-Armaturenbau GmbH

Hooghe Weg 41 • 47906 Kempen

Telefon: 02152 / 2005-0 • Telefax: 02152 / 1580

E-Mail: vertrieb@pfeiffer-armaturen.com • Internet: www.pfeiffer-armaturen.com

Specifications subject to change without notice.