

# PTFE - lined Globe Control Valve in ANSI-Version Series 1a

## Application:

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

- Nominal sizes 1" to 4",
- Nominal pressure ANSI Class 150,
- Temperatures up to 200°C

**Globe valve series 1a is also available in DN 25 up to DN 150 acc. to DIN and DN 150 with flanges drilled to ANSI Class 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 has the following features:

- Streamlined valve body of ductile cast iron A 395, as standard with 5-8 mm thick PTFE-lining.
- Exchangeable PTFE seat and PTFE plug.
- Stem sealed by PTFE bellows. Secondary seal by additional safety packing.
- Test connection for monitoring of the primary bellow seal.
- Exchangeable actuator.
- Additional equipment can be mounted acc. to DIN EN 60534 and Namur recommendations.
- For ANSI design Face to Face acc. to DIN EN 558-2, basic series 37 (acc. to IEC 60534-3-1, basic series 37).

## Versions:

The Series 1a ANSI-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.

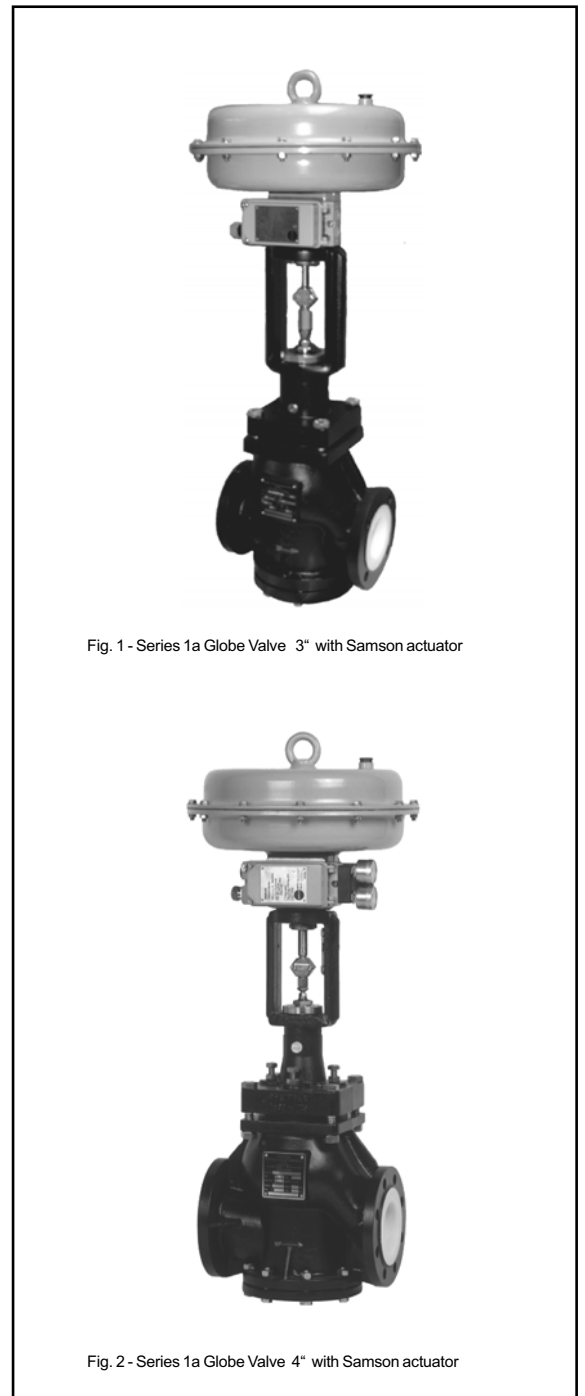


Fig. 1 - Series 1a Globe Valve 3" with Samson actuator

Fig. 2 - Series 1a Globe Valve 4" with Samson actuator

# ANSI - Control Valve Series 1a

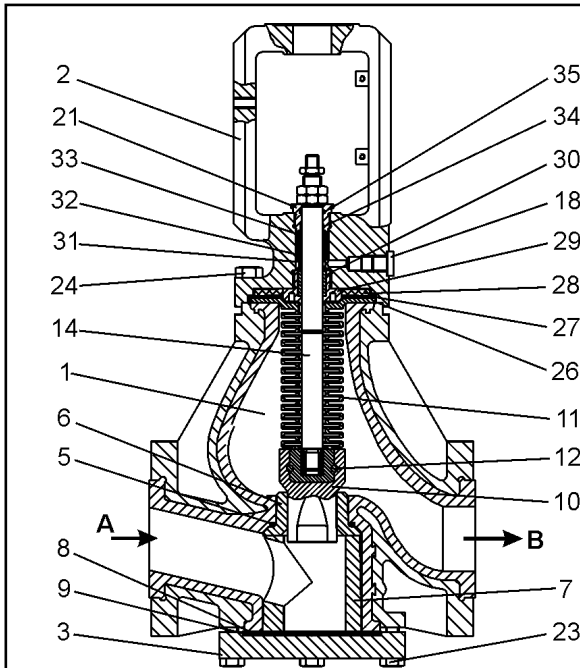


Fig. 3 - Sectional diagram of Series 1a ANSI-Control valve, 1" to 3"

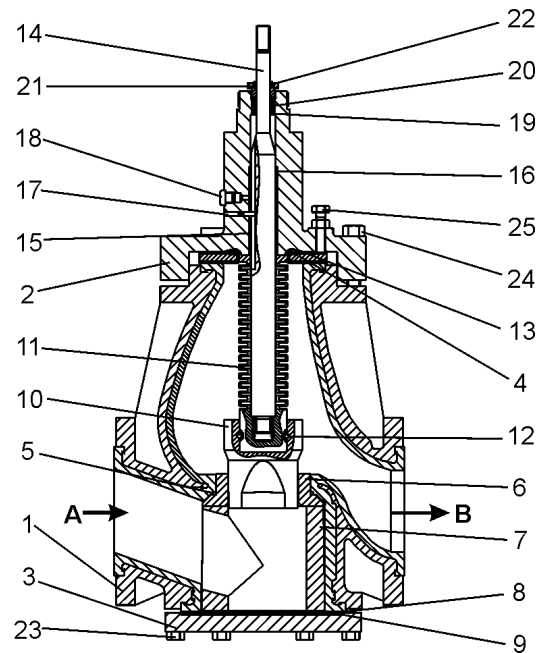


Fig. 4 - Sectional diagram of Series 1a ANSI-Control valve, 4"

Item	Description	Item	Description
1	Valve Body	19	Washer
2	Bonnet flange	20	PTFE-graphite packing
3	Bottom flange	21	Stuffing box
4	Bordered flange	22	Wiper ring
5	O-ring	23	Screw
6	Seat	24	Screw
7	Spacer	25	Screw
8	Washer	26	O-ring
9	Inlay	27	Thrust washer
10	Plug	28	Disc spring
11	Bellows	29	Guide bushing
12	Cord	30	Bearing
13	Washer	31	Distance bushing
14	Stem connector	32	V-ring packing
15	Bearing	33	Set of Belleville washers
16	Bearing	34	Bearing bushing
17	Grooved pin	35	O-ring
18	Locking screw		

Table 1 - List of parts

## Principle of operation:

The process medium flows through the Series 1b 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 ( 20 or 32 ) is used as a backup stem sealing.

A test connection port ( 18 ) allows the bellows 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.

## Additional equipment and add-on pieces:

For the following accessories are optionally available for the valve separately or in combination:

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

Other accessories possible acc. to specifications on request.

### Technical Data:

Nominal size	1" to 4"
Nominal pressure	ANSI Class 150
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	ANSI Class 150

Table 2 - Technical data

### Materials:

Nominal size	1" to 3"	4"
Body, Bonnet flange and Bottom flange	ASTM A395	
Lining	PTFE, optionally PTFE-conductive	
Valve plug and seat	PTFE <sup>1)</sup> , optionally special materials	
Bellows	PTFE, optionally special materials	
Spacer	PTFE	
Packing	PTFE-V-ring packing loaded by Belleville washers	PTFE-graphite packing
Plug stem	1.4571	
Fasteners	A 193-B7	
Coating	2-Components-Pur-Varnish Colour: Black, RAL 9005	

Table 3 - Materials

<sup>1)</sup> when seat diameter 2 mm, only tantalum or other metals

### 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.

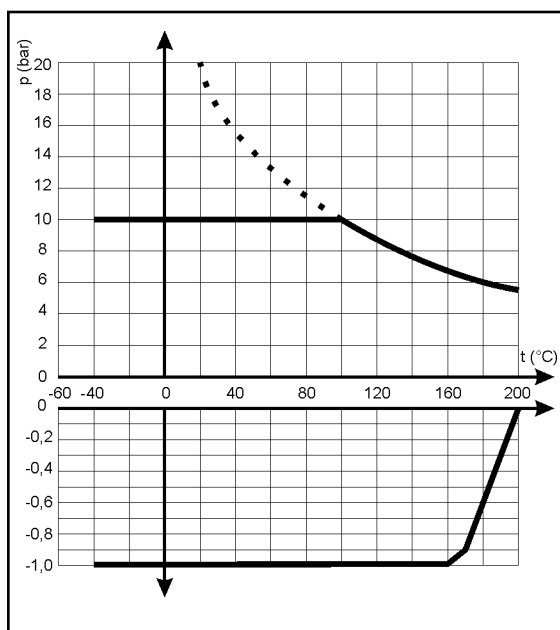


Fig. 5 - Pressure-temperature-diagram

### z - values depending on Kvs value and nominal size

DN		1"			1 1/2"	2"		3"		4"	
Seat-ø in mm		2	13	24	30	38	55	65	65	85	
Travel in mm		10 <sup>2)</sup>			15		30		50		
kvs	Cv	Acoustical valve coefficient z									
0.005	0.006	0.85									
0.01	0.01										
0.02	0.02										
0.05	0.06										
0.1	0.12										
0.25	0.29										
0.63	0.74	0.65									
1.0	1.17										
1.6	1.9										
2.5	2.9	0.6									
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		
35	41							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

Table 4 - Acoustical valve coefficient in accordance with VDMA

<sup>2)</sup> when seat diameter 2 mm, only linear characteristic line available.

### 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:

$$FL = 0,95 \quad xT = 0,75$$

### Correction terms:

For gases and vapours :  $\Delta LG = 0$ ,

For liquids:  $\Delta LF = 0$

### Permissible differential pressures $\Delta p$ :

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)			
Req. 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 <sup>2</sup>	$\Delta p$ with p <sub>2</sub> = 0							
1"	2	240	> 16	-	-	-	-	> 16	-	-
	13	240	12	> 16	-	-	-	12	> 16	-
	24	240	-	5	9	9	> 16	-	9	> 16
11/2"	30	240	4	11	> 16	> 16	-	4	> 16	-
	35	240	-	-	5	5	11	-	5	11
	30	350	-	6	10	10	> 16	-	10	> 16
2"	38	240	-	-	-	3	6	-	-	6
	350	-	3	5	5	11	-	5	11	
3"	55	700	-	4	7	7	12	-	7	12
	65	700	-	-	4	4	8	-	4	8
4"	65	700	-	-	4	4	8	-	4	8
	85	700	-	-	-	-	4	-	-	4

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:

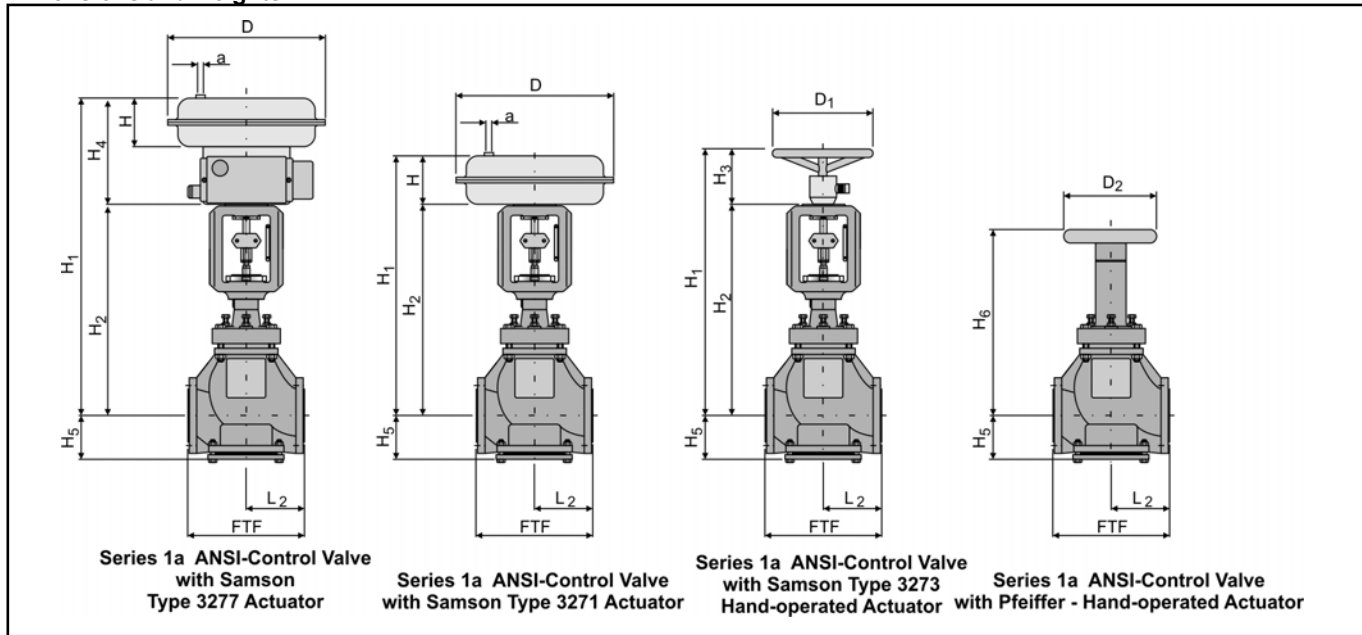


Fig. 6 - Dimensional drawing

DN	1"	1 1/2"	2"	3"	4"
FTF Basic series 37	184	222	254	298	352
L2 Basic series 37	92	111	127	158,5	172,5
H1 Samson Type 3271	H2 + H				
Samson Type 3277	H2 + H4				
Samson Type 3273	H2 + H3				
H2	366	405	461	505	730
H5	68	82	83	100	143
Weight of valvet in kg	16	21	24	45	90
Actuator	240 ccm	x	x	x	
	350 ccm	x	x	x	
	700 ccm			x	x
	1400 ccm				x
D1	180	180	180	250	250
H3	110	110	110	115	115
Weight of Type 3273 in kg	2	2	2	2,5	2,5
D2					250
H6					600
Weight of Type Pfeiffer in kg					7
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

## Selection and sizing of the control valve:

1. Calculation of the appropriate  $k_{vs}$ -value in acc. to DIN EN 60534
2. Selection of DN and  $k_{vs}$ -value in acc. with table 4.
3. Determination of the  $\Delta p$  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 ANSI Valve,  
 DN....., ANSI Class 150 lbs,  $k_{vs}$  .....  
 Basic characteristic curve: equal percentage / linear  
 Body: A 395 / PTFE-white, Flange design: .....  
 Special design  
 Actuator: Samson Type.....cm<sup>2</sup>, 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

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