Pfeiffer
Chemie-Armaturenbau GmbH

PTFE - lined Globe Control Valve
Series 1z

Application:

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

- Nominal sizes DN 20 to DN 100
- Nominal pressure PN 10/16
- Temperatures up to 150°C

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 and has the following features:

- Valve body of PTFE and a reinforcing casing of ductile iron with a plastic coating.
- Exchangeable 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 mounted according to DIN EN 60534 and Namur recommendations.
- Face-to-face dimensions for DIN version acc. to DIN EN 558, basic series 1.

Fig. 1 - Series 1z Globe Valve with Samson actuator

Fig. 2 - Series 1z Globe Valve with Pfeiffer hand-operated actuator

Versions:

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

- Samson pneumatic actuator (Fig. 1).
- Pfeiffer hand-operated actuator (Fig. 2) .
- Samson hand-operated actuator.
- actuators of other manufacturers on request.

Special designs:

- Connection for heating of valve body and PTFE bellow with a heating medium.
- Lining made of special compounds, e.g. conductive PTFE.
- Valve plug and seat made of special materials (e.g. tantalum or aluminium oxide) for erosive media.
- Guided V-port plug

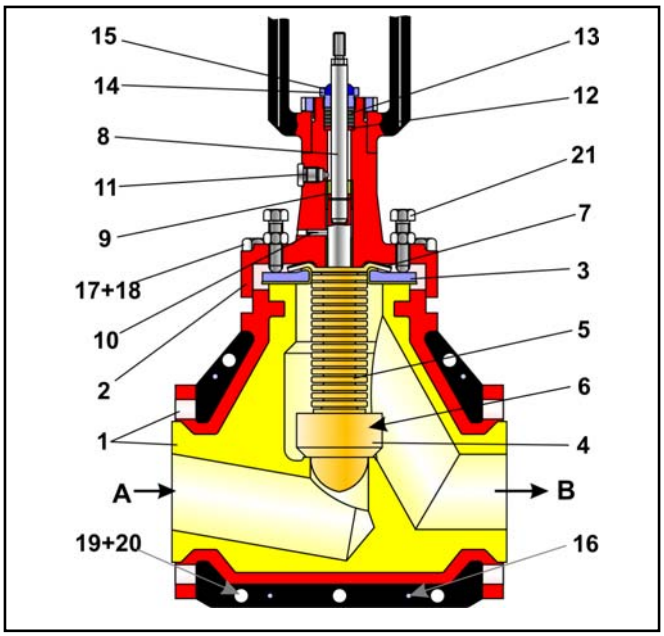

Fig. 3 - Sectional diagram of Series 1z Globe Valve

Item	Description	Item	Description
1	PTFE body with steel casing	12	Washer
2	Bonnet flange	13	PTFE-graphite packing
3	Bordered flange	14	Stuffing box
4	Plug	15	Wiper ring
5	Bellows	16	Grooved pin
6	Cord	17	Screw
7	Washer	18	Nut
8	Stem connector	19	Screw
9	Bushing	20	Nut
10	Grooved pin	21	Screw
11	Locking screw		

Table 1 – List of parts

Principle of operation:

The process medium flows through the Series 1z Globe Valve in the flow-to-open direction. The valve plug position determines the cross-sectional area of flow between the seat and the plug (4). The plug is connected over the stem connector (8) to the actuator stem.
The PTFE bellows (5) seals the area between the valve body (1) and stem connector (8). The safety packing (13) is used as a backup stem sealing. A test connection port (11) allows the bellows to be monitored for leakage, e.g. by connecting a suction line or inert gas line.
The plug (4) is easily exchanged thanks to its tongue and groove connection to the PTFE bellows which is secured by a strong PTFE cord (6).

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 p2 < Δp, !

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 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

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.

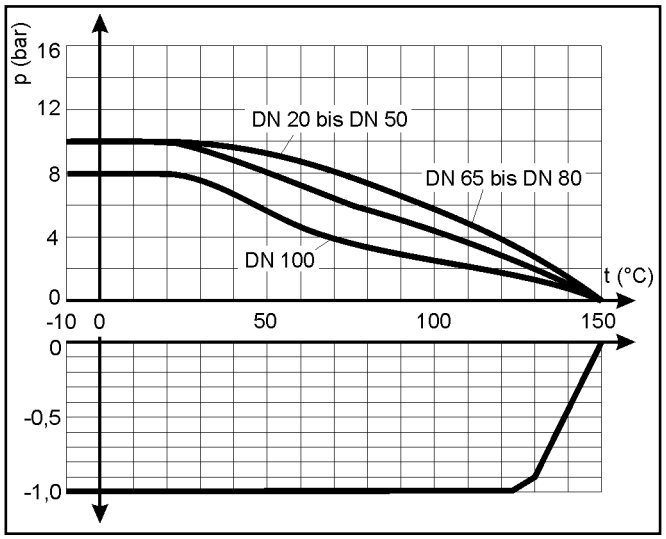

Fig. 4 - pressure-temperature diagram

Technical Data:

Nominal size	DN 20 to DN 100
Nominal pressure	PN 10 / 16
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	30 : 1
Flanges	as per DIN EN 1092-2, Form B
Heating	On request

Table 2 - Technical data

Materials:

Body	Pure - PTFE
Casing and Bonnet flange	EN-JS 1049 (GGG 40.3)
Valve plug	PTFE[1)], optionally aluminium oxide, tantalum or other metals
Bellows	PTFE
Bearing bushing	Glycodur
Packing	PTFE - graphite
Wiper ring	NBR
Stem plug	1.4571 / 1.4301
Coating	2-Components-Pur-Varnish Colour: Black, RAL 9005

Table 3 - Materials

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

Note: Trims with guided plugs partly have reduced kvs value

Terms for noise level calculation:

according to VDMA 24422.
z = acoustical valve coefficient.

Therms 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

z values depending on kvs value and nominal size:

DN		20			25				32			40	50	65	80		100	
Seat-ø in mm		2[2)]	6	13	2[2)]	6	13	24	6	13	24	30	38	50	55	65	65	85
Travel in mm		10	15		10	15			15					30				
kvs	Cv	Acoustical valve coefficient z																
0.01 0.05	0.01 0.06	0.85			0.85													
0.1 0.25 0.63 1.0	0.12 0.29 0.74 1.17		0.65			0.65			0.65									
1.6 2.5	1.9 2.9			0.6			0.6			0.6								
4	4.7			0.55			0.55			0.55		0.55						
6.3	7.4							0.45			0,45	0.5	0.5					
10	12							0.4			0.4	0.45	0,45	0,5				
16	19											0.4	0.4	0.45	0.45			
25	29												0.35	0.4	0.4		0.4	
40	47													0.3	0.35		0.35	
63	74													0.3	0.3		0.3	
80	94															0.25		
100	117																0.25	
125	146																	0.2

Table 4 – acoustically determined valve parameter "z" in accordance with VDMA 24422

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

Permissible differential pressures Δp:

Sinal pressure range				0.2...1.0	0.3...1.1	0.4...1.2	0.4...2.0	0.6...2.2	0.2...1.0		
Required supply pressure				1.3	1.4	1.4	2.3	2.5	1.2	1.4	1.6
DN	kvs	Seat ø mm	Actuator cm²	Δ p with p2 = 0							
20 - 25	0.01-0.05	2	240	> 16	-	-	-	-	> 16	-	-
20 - 32	0.1 - 1.0	6	240	> 16	-	-	-	-	> 16	-	-
20 - 32	1.6 - 4.0	13	240	8	> 16	-	> 16	-	8	> 16	-
25 - 32	6.3 - 10	24	240	-	3.5	-	7.6	15.8	-	7.6	15.8
			350	3.2	-	15.2	15.2	-	3.2	15.2	-
40	4.0 - 16	30	240	-	1.1	-	3.9	9.3	-	3.9	9.3
			350	0.9	-	8.9	8.9	> 16	0.9	8.9	-
50	6.3 - 25	38	240	-	-	-	1.5	4.9	-	1.5	4.9
			350	-	-	4.7	4.7	9.7	-	4.7	9.7
65	10 - 63	50	700	1.9	-	7.9	7.9	-	1.9	7.9	-
80	16 - 63	55	700	1.2	-	5.2	5.2	-	1.2	5.2	-
80-100	25 - 100	65	700	0.5	-	4.1	4.1	7.7	0.5	4.1	7.7
100	125	85	700	-	-	1.9	1.9	4.0	-	1.9	4.0

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.

Remarks to tables 5a and 5b:

The shaded columns of the table show the standard values.

The differential pressures in the white columns of table 5a apply to live-loaded springs.

The permissible differential pressures quoted are only valid for soft-sealing valves.

Dimensions and weights:

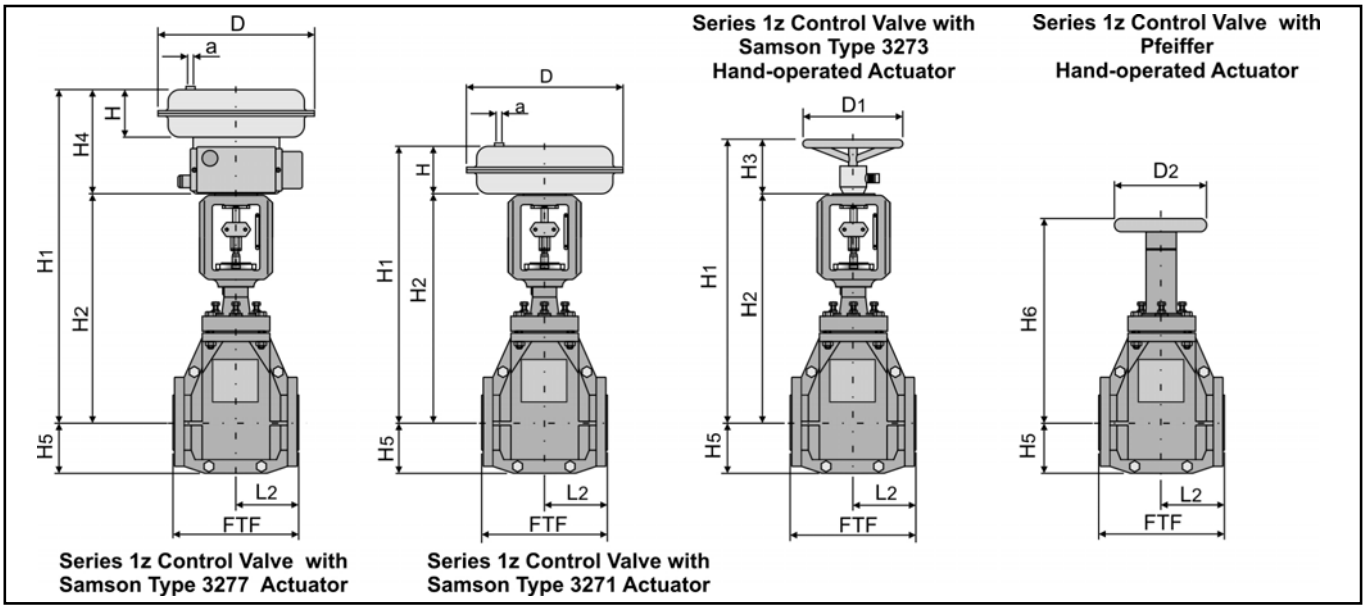

Fig. 5 – Dimensional drawing

DN		20	25	32	40	50	65	80	100
FTF		150	160	180	200	230	290	310	350
L_2		75	80	90	100	115	245	155	175
H_1	Samson Typ 3271	$H_2 + H$							
	Samson Typ 3277	$H_2 + H_4$							
	Samson Typ 3273	$H_2 + H_3$							
H_2		435	435	435	475	475	540	540	680
H_5		60	65	70	80	95	100	125	145
Weight of valve in kg		11	14	15	18	21	40	45	85
Actuator	240ccm	x	x	x	x	x			
	350ccm		x	x	x	x			
	700ccm						x	x	x
D_1		180	180	180	180	180	250	250	250
H_3		110	110	110	110	110	115	115	115
Weight of Type 3273		2	2	2	2	2	2.5	2.5	2.5
D_2		130	130	130	130	130	130	130	250
H_6		335	340	345	375	380	410	410	585
Weight of Type Pfeiffer		1	1	1	1	1	1	1	7

Samson Actuator in ccm	240	350	700
Diaphragm D	240	280	390
Hight H	65	85	135
Hight H_4	166	186	236
Signal pressure connection a	G1/4"	G3/8"	
Weight of Actuator Type 3271	5	8	22
Weight of Actuator Type 3277	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. with DIN EN 60534
2. Selection of DN and k_{VS}-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 1z 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

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