

# PFA - lined Ball Valve Series 20c for glass lines

## Application:

Tight-closing PFA-lined ball valve for corrosive media, especially with high process demand in chemical plants:

- nominal diameters DN 25 and DN 50,
- nominal pressure PN 10 / 16,
- temperatures -10°C up to 200°C.

The ball valves consist of a PFA ball valve with a pneumatic quarter-turn actuator or a hand-lever.

The valves, which are of modular construction, have the following features:

- Body of EN-JS 1049 lined with PFA.
- Changeable PTFE seatrings which can be built in the geometry as sandwich version or glasspipe version.
- Ball and integral stem of stainless steel, 1.4313 with PFA coating.
- Stem sealing with a cup spring life-loaded PTFE packing.
- Version as sandwich ball valve with variable mounting direction.
- Very short face to face dimension, therefore usable for narrow and difficult mounting conditions.
- Glass pipe connection and fastenings with screws acc. DIN ISO 3587 or DIN ISO 4704.
- Fixing device suitable for wafer type valves acc. to DIN 3202.
- Two possibilities of fixing at the body to enforce masses or torques against the pipe.
- Connections according to DIN ISO 5211.

## Versions:

PFA ball valve for glass pipes Series 20c, alternatively in the following designs:

- PFA ball valve with hand-lever.
- PFA ball valve with pneumatic quarter-turn actuator, (for details see respective data sheet).



Fig. 1 - ball valve series 20c with pneumatic quarter-turn actuator series 31a

Fig. 2 - ball valve series 20c with hand-lever

# Ball valve Series 20c

## Special designs:

- Two-piece ball and stem with floating ball of  $Al_2O_3$ .
- Higher temperature range is possible.
- Nominal size > DN 50 on request
- Stem sealing with two PTFE V-ring packings and test connection.
- Various materials for ball and sealing rings.

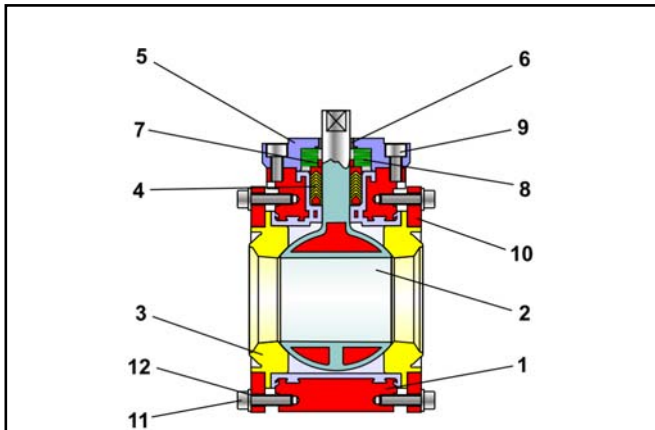


Fig. 3 - Series 20c PFA-lined ball valve

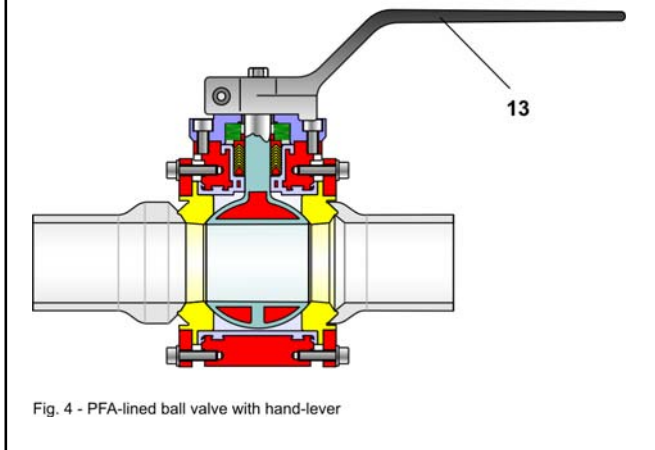


Fig. 4 - PFA-lined ball valve with hand-lever

Pos.	Description	Pos.	Description
1	Body	8	Spring washer
2	Ball	9	Screw
3	Seating	10	Thrust washer
4	PTFE V-ring packing	11	Screw
5	Stuffing box	12	Nut
6	Bearing bushing	13	Hand-lever
7	Bushing		

Table 1 - parts list

## Advantages of the cup spring live-loaded sealing system

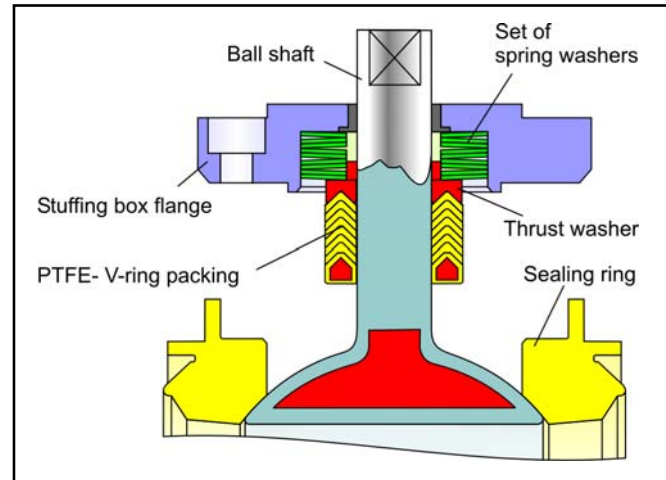


Fig. 5 - cup spring live-loaded packing

- maintenance-free and self-adjustable
- highest level of tightness, even under extreme pressure and temperature changes,
- longer service life
- **all in all: extremely economic!**

## Additional equipment and add-on pieces:

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

- pneumatic and electric actuators.
- exchangeable pneumatic actuator which can be equipped with electric limit switches and solenoid valves.
- positioner.
- limit switch.
- solenoid valves.
- air sets.

Further accessories are available on request for customer specifications

## Principle of operation:

The ball valves of series 20c permit full flow through the valve in both directions.

The ball ( 2 ) with its cylindrical passage rotates around the middle axis. The opening angle of the ball determines the flow through the free area between the body ( 1 ) and passage.

When the ball valve is opened, the entire profile is available. The stem is externally equipped with a hand-lever.

Optionally, a pneumatic quarter-turn actuator can be fitted.

The sealing of the ball ( 2 ) inside the PFA-lined body ( 1 ) is provided by exchangeable seat rings ( 3 ).

The ball stem is sealed by a maintenance-free live-loaded PTFE - V-ring packing ( 4 ).

The live-loading is carried out by cup springs ( 8 ) positioned above the packing.



**Note:** Please, pay attention to the usability acc. to the ATEX 94/9/EG in correspondance to the maintenance sheet before using the ball valve in hazardous area!



**Failure position:** In dependance of mounting position of the actuator there are two failure positions, wich take place by pressure relieving or on failure of air supply:

- **Ball valve with actuator “on failure closing “**  
on failure of air supply the ball valve closes. The opening of the ball valve accures on rising of air supply against the force of the springs.
- **Ball valve with actuator “on failure opening “**  
on failure of air supply the ball valve opens. The closing of the ball valve accures on rising of air supply against the force of the springs

### General Technical Data:

Nominal size	DN 25 and DN 50
Nominal pressure	PN 10 / 16
Temperature range	-10°C to 200°C
Ball seal	soft-sealing
Leakage rate	Leakage rate A acc. to DIN EN 12266-1, P12 (Leakage rate 1 BO acc. to DIN 3230 Part 3)
Connections	acc. to DIN ISO 3587 and DIN ISO 4704
Packing	cup spring live-loaded PTFE-packing
Face-to-face	see table 5

Table 2 – technical data

### Materials:

Body	EN-JS 1049 (GGG 40.3) with PFA-lining
Ball	1.4313 with PFA-casing
Sealing rings	Pure PTFE
Packing	PTFE - V-ring packing with cup springs of 1.8159, Delta Tone
Bearing bushing	PTFE with 25% carbon
Thrust washer	1.0570
Coating	2-Components Pur-Varnish Colour: black, RAL 9005

Table 3 - materials

### Pressure - Temperature Diagram:

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

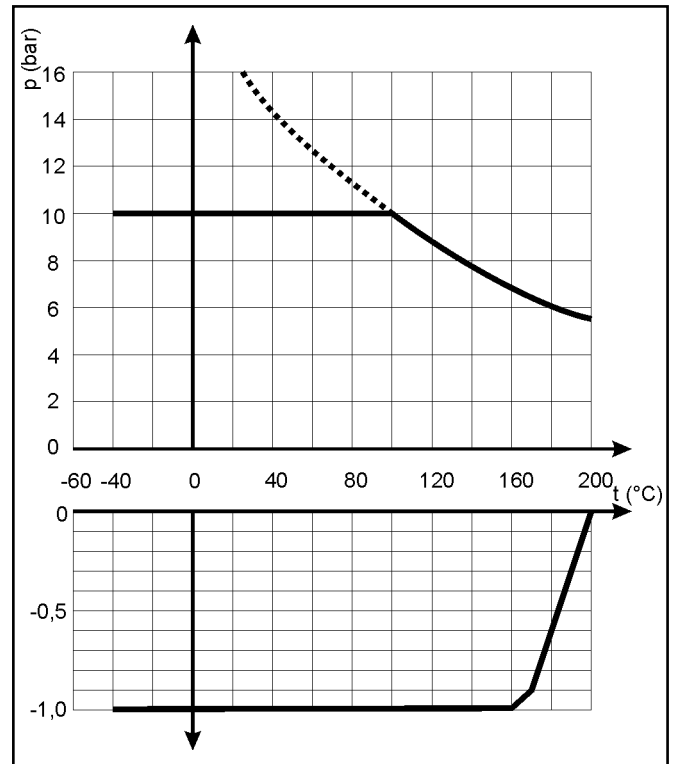


Fig. 6 - pressure-temperature diagram

### Operating and breakaway torques:

DN	Differential pressure $\Delta p$ in bar	perm. operating torque $M_{Dmax}$ in Nm	required operating torque $M_d$ in Nm	breakaway torque $M_{di}$ in Nm			
				0	5	10	15
25		130	6	10	12	14	16
50		140	17	30	32	34	37

Table 4 - max. permissible operating torque, required operating torques and breakaway torques

The breakaway torques indicated are average values which were measured at the appropriate differential pressures with air at 20°C. Operating temperature, medium as well as longer periods of operation can lead to a notable change in breakaway and operating torques.

The listed max. permissible operating torques are valid for the standard materials in table 3.

## Dimensions:

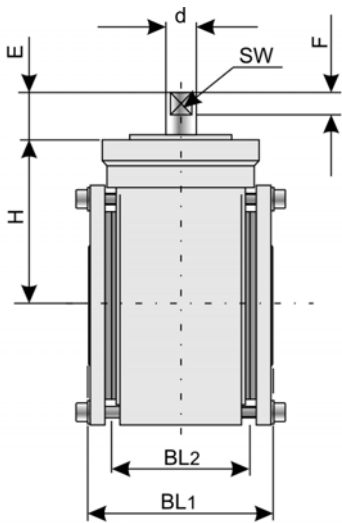


Fig. 7 - Series 20c ball valves

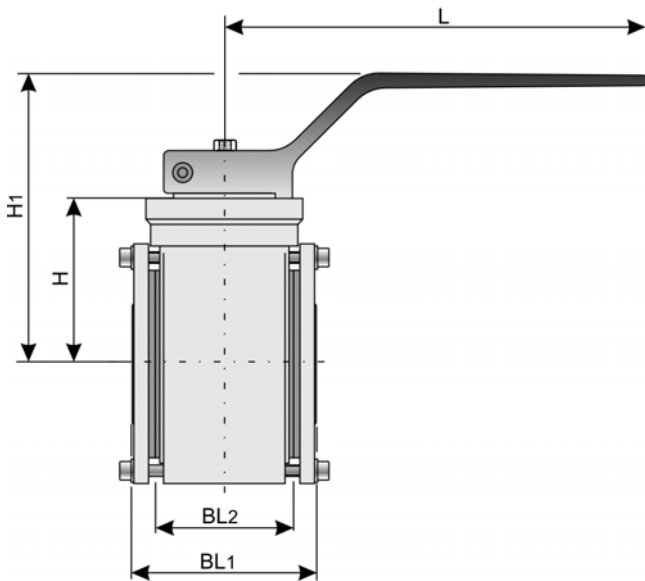


Fig. 8 - Series 20c ball valve with hand-lever

DN	25	50
BL1	75	100
BL2	55	75
H	79	93
H1	146.5	168.5
E	19	19
F	12	12
L	151.5	220
SW	12	12
d	16	16
Connection	F07	F07

Table 5 - dimensions in mm and weights in kg

### Selection and sizing of the ball valve:

1. Calculation of the required nominal diameter
2. Selection of the valve in accordance with table 2, table 3 and the Pressure-Temperature diagram
3. Selection of the appropriate actuator from table 4
4. Additional equipment

### Order text:

PFA – ball valve type: Series 20c,  
DN . . . . / PN . . . . ,  
optional.... special design

Handlever, resp. actuator manufacturer: . . . .  
air supply: . . . . bar,  
safety position: . . . .

Limit switch manufacturer: . . . .  
Solenoid valve manufacturer: . . . .  
Positioner: . . . .

Other: . . . .



**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.

For your special requirements please contact our technical sales department

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Specifications subject to change without notice