

# PFA-lined Series 20b Ball Valve

## Application:

Tight-closing PFA-lined ball valve for (highly) corrosive media, especially with high process demands in chemical plants:

- Nominal sizes DN 25 to DN 200
- Nominal pressure PN 16
- Temperatures –10 to 200 °C, other temperature ranges possible

The ball valve consists of a PFA-lined ball valve fitted with a pneumatic quarter-turn actuator or a hand lever.

The valves are designed according to the modular-assembly principle have the following features

- Full flow passage and high  $K_v$  coefficients
- Body of EN-JS1049 (0.7043/A395) with PFA lining
- Exchangeable PTFE seat rings
- Ball and integrated shaft made of stainless steel with PFA encapsulation
- Hysteresis free, ideal for throttling service
- Shaft sealed by a self-adjusting PTFE V-ring packing, loaded by spring washers. The packing requires no maintenance.
- Actuator mounting flange according to ISO 5211
- Face-to-face dimensions according to DIN EN 558
- High-grade two-component polyurethane coating (RAL 9005) to protect the valve in corrosive atmospheres and against general corrosion

## Versions:

Series 20b PFA Ball Valve alternatively in the following designs:

- PFA-lined ball valve with hand lever
- PFA-lined ball valve with gear-operated actuator
- PFA-lined ball valve with pneumatic quarter-turn actuator (for details see corresponding data sheet).



Fig. 1 - Series 20b Ball Valve



Fig. 2 - Series 20b Ball Valve with pneumatic quarter-turn actuator

### Special versions and options:

- Valve sizes NPS ½ to 8 (ANSI)
- Lined bottom drain ball valve (see Series 21a)
- Ball valve for throttling service using seat ring with characteristic curve
- Variety of material for ball and seat ring, e.g. two-piece ball and shaft with floating ball made of  $Al_2O_3$
- Conductive PFA lining
- Stainless steel heating jacket
- FDA certification
- Customized versions

### Additional accessories:

The following accessories are available either separately or in combination:

- Positioner
- Limit switch
- Solenoid valve
- Booster
- Air pressure reducing station
- Pressure gauge build-on block

Further accessories are available on request to meet customer specifications.

### Principle of operation:

The Series 20a Ball Valves allow full flow through the valve in both directions.

The ball ( 3 ) 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 full cross-section is released.

The ball ( 3 ) is sealed in the PFA-lined body by exchangeable seat rings ( 3 ).

The ball shaft is sealed to the atmosphere by a maintenance-free live-loaded PTFE V-ring packing ( 5 ).

The packing is loaded by spring washers ( 8 ) located above the packing.

The shaft is fitted with a hand lever. Optionally, a pneumatic quarter-turn actuator can be fitted.



#### Note:

Before using the valve in hazardous areas, check whether this is possible according to ATEX 94/9/EC by referring to the operating instructions <BA 20a>!



#### Fail-safe position:

Depending on how the pneumatic actuator is mounted on 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:

#### • Ball valve with actuator for fail-close

Upon air failure, the valve is closed. The valve opens when the signal pressure increases, acting against the force of the springs.

#### • Ball valve with actuator for fail-open

Upon air failure, the valve opens. The valve closes when the signal pressure increases, acting against the force of the springs.

### Advantages of the live-loaded packing:

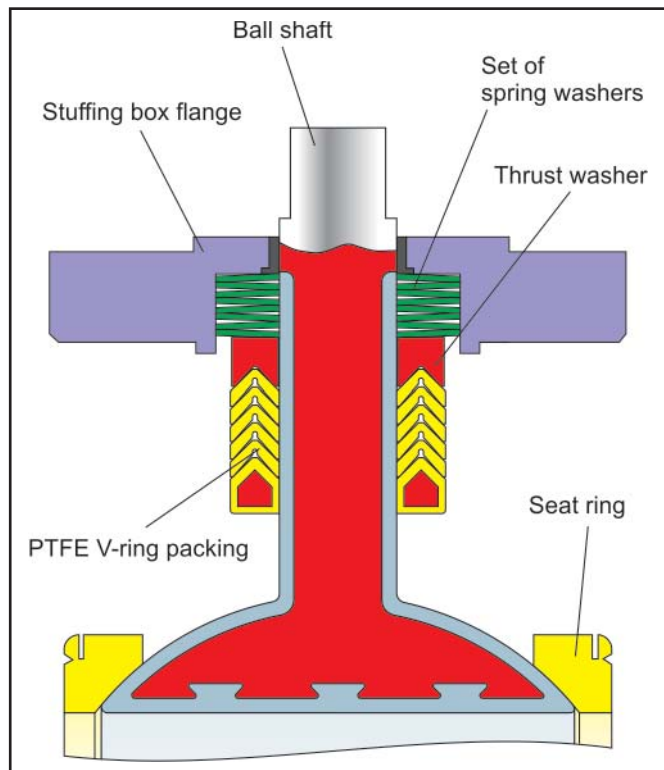


Fig. 3 - Live-loaded packing

- Maintenance-free and self-adjusting
- Highest level of sealing, even under extreme pressure and temperature fluctuations
- Longer service life

**All in all: extremely economic!**



#### Note:

The ball valve can also be used for throttling service. Refer to the data sheet <DB 20a-kd>.

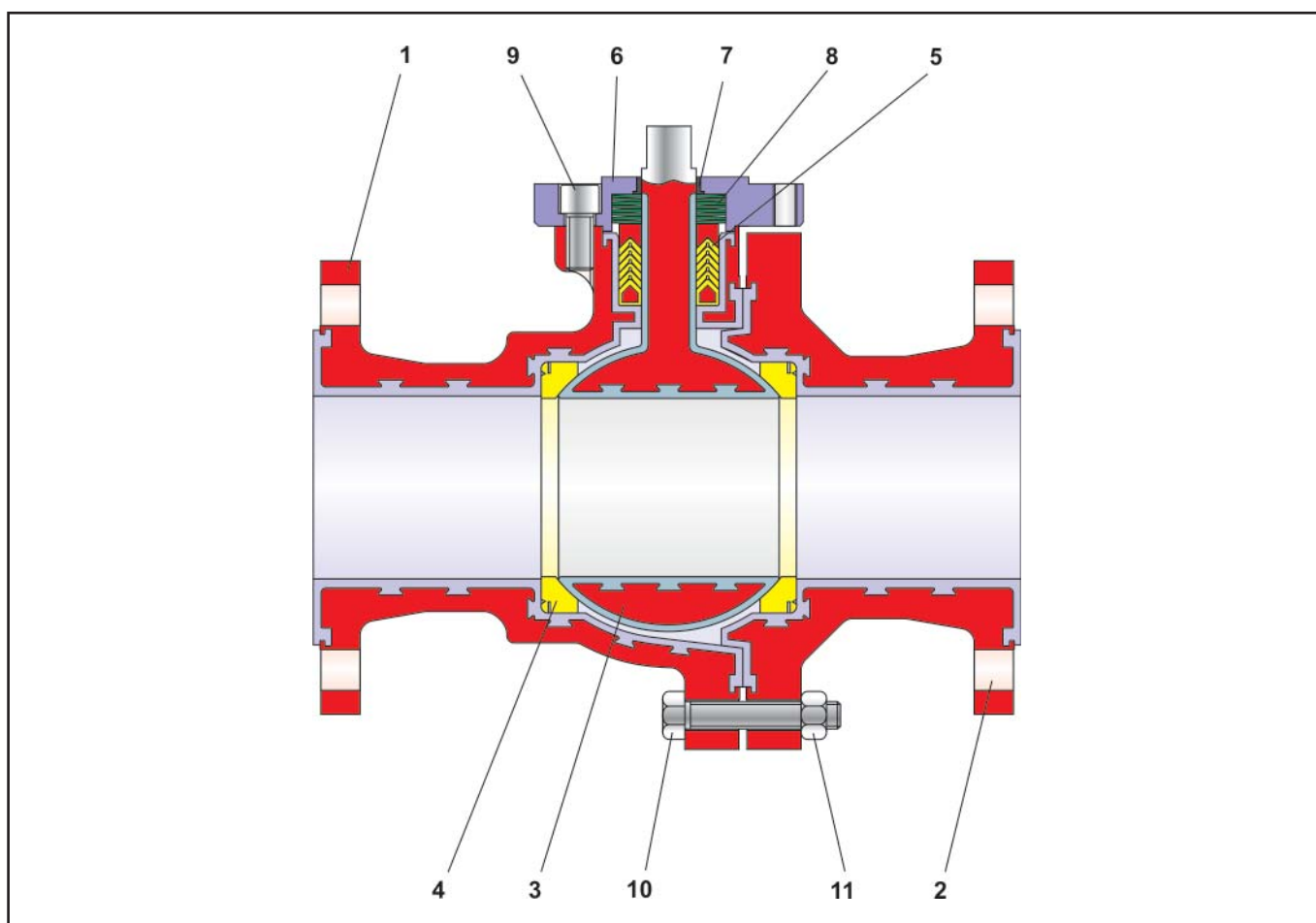


Fig. 4 - Series 20b PFA-lined Ball Valve

Item	Description
1	Body and lining
2	Body
3	Ball with shaft
4	Seat ring
5	PTFE V-ring packing
6	Stuffing box flange

Table 1 – Parts list

Item	Description
7	Bearing bushing
8	Set of spring washers
9	Screw
10	Bolt
11	Nut

### General technical data:

Nominal size	DN 25 to 200
Nominal pressure	PN 16
Temperature range	–10 to 200 °C (optionally –40 °C)
Ball seal	Soft seal
Leakage rate	Leakage rate A acc. to DIN EN 12266-1, P12 (leakage rate 1 BO acc. to DIN 3230 Part 3)
Flanges	Acc. to DIN EN 1092-2, Form B
Packing	Maintenance-free PTFE V-ring packing loaded by spring washers
Face-to-face dimensions	According to DIN EN 558, Series 1 (Series 12 for DN 200)

Table 2 – Technical data

### Materials:

Body	EN-JS1049 (GGG 40.3) with PFA lining
Ball	1.4313 with PFA encapsulation
Seat rings	PTFE, white
Packing	PTFE V-ring packing with spring washers of 1.8159, Delta Tone
Bearing bushing	PTFE with 25 % carbon
Coating	Two-component polyurethane, black, RAL 9005

Table 3 – Materials

### Pressure-temperature diagram:

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

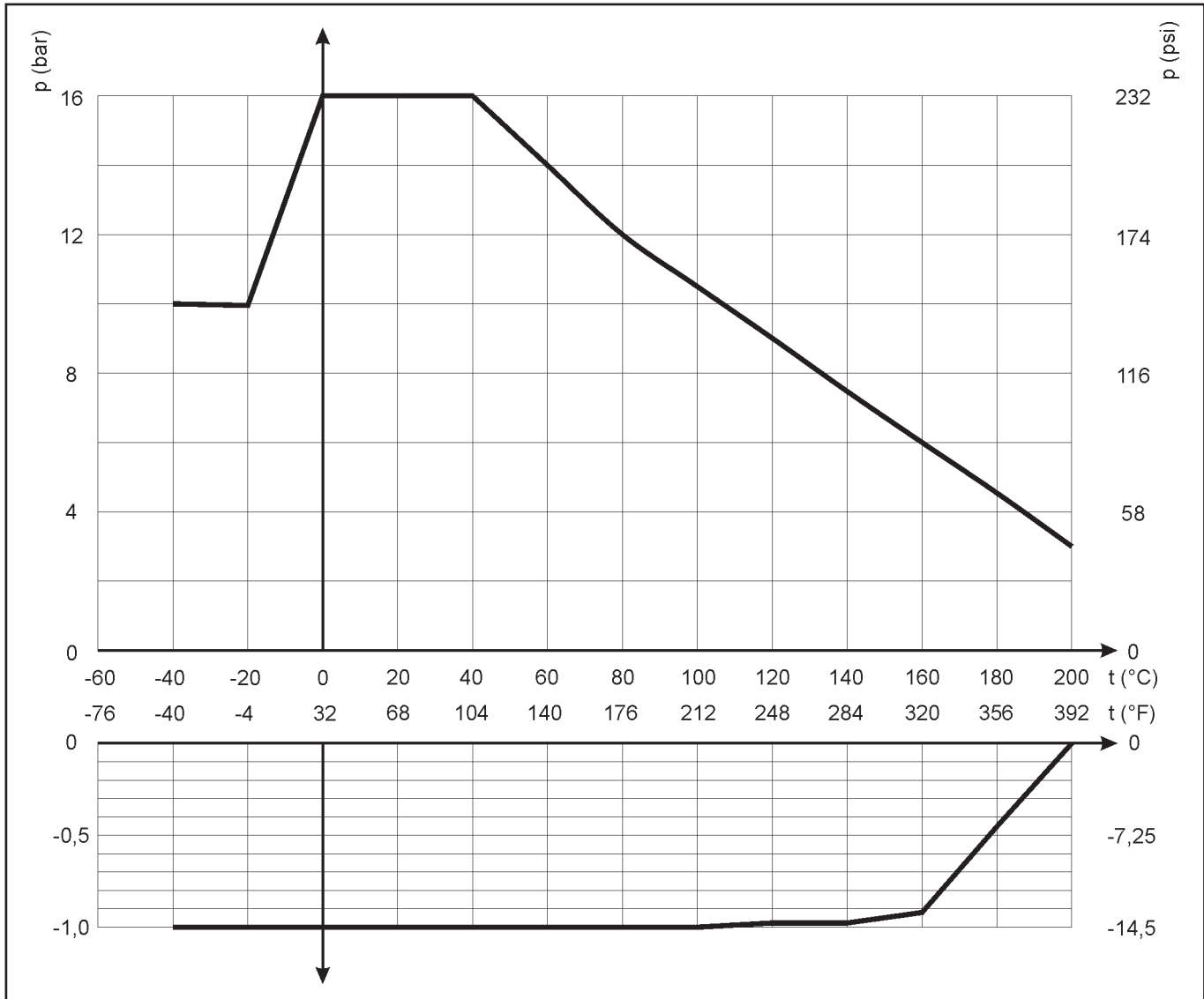


Fig. 5 - Pressure-temperature diagram

## Operating and breakaway torques:

Differential pressure $\Delta p$ in bar			0	3	6	10	16
DN	Perm. operating torque MD <sub>max.</sub> in Nm	Req. operating torque Md in Nm	Breakaway torque Mdl in Nm				
25	130	6	10	11	13	14	17
40	140	12	20	21	23	24	29
50	140	17	30	31	33	34	39
80	608	44	74	77	83	86	101
100	833	70	120	124	132	136	154
150	1570	210	300	340	400	450	540
200	6515	270	380	400	450	505	570

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

The breakaway torques specified 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 may 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 and weights:

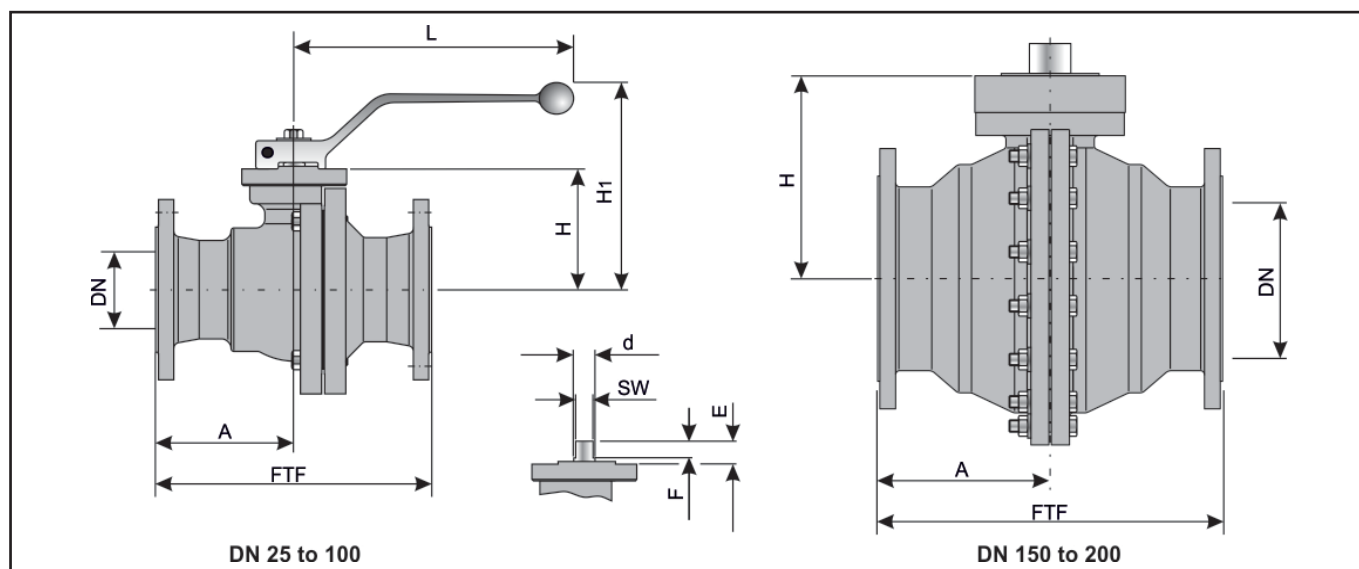


Fig. 6 – Dimensional drawing of ball valve

DN	25	40	50	80	100	150	200
FTF	160	200	230	310	350	480	457
A	80	100	115	155	175	240	228.5
H	76	85	90	133.5	152	210.5	265
H1	142	159	164	200	221	-	-
E	19	19	19	23	27	25	42
F	12	12	12	16	20	18	34
L	152	220	220	365	365	-	-
SW	12	12	12	16	20	24	34
Ø d	16	16	16	24	28	36	55
DIN ISO connection	F05	F07	F07	F10	F12	F14	F16
Weight in kg	7	10.2	13	26.4	37.5	124	162.7

Table 5 - Dimensions in mm and weights in kg

### Selection and sizing of the ball valve:

1. Calculate the required nominal size.
2. Select the valve in accordance with Table 3 and 4 as well as from the pressure-temperature diagram.
3. Select the appropriate actuator using Table 5.
4. Select additional equipment.

### Order text:

PFA-Lined Ball Valve: Series 20b,  
DN . . . / PN . . . ,  
Optionally, special design

Hand lever or actuator: . . . .  
Air supply: . . . . bar,  
Fail-safe position: . . . .

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

Other: . . . .



**Note:** All relevant details regarding the version ordered, which deviate from the specified version in this technical description data, can be taken from the order confirmation.