

# PFA-lined Ball Valve

## Pfeiffer Type BR 20b



### Application

Tight-closing, PFA-lined ball valve for process engineering and plants with industrial requirements, especially suitable for corrosive media

**Nominal size** DN 25 to DN 100  
**Nominal pressure** PN 16  
**Temperatures** -10 to 200 °C

PFA-lined ball valve equipped optionally with:

- Pneumatic rotary actuator
- Lever

Body material:

- Spheroidal graphite iron with PFA lining

### Special features

- TA-Luft (German clean air act) equivalent certification
- Exchangeable PTFE seat rings
- Ball shaft is sealed by a spring-loaded PTFE V-ring packing
- Connection according to DIN/ISO 5211
- Face-to-face dimensions DIN EN 558-1, Series 1 (DIN 3202, F1)

The ball valves with pneumatic actuators can be equipped with positioners, solenoid valves, and other devices in accordance with VDI/VDE 3845.

### Versions

**Standard version** · Pfeiffer Type BR 20b PFA-lined Ball Valve, nominal size DN 25 to DN 100, nominal pressure PN 16 optionally available in the following versions:

- **Type BR 20b** · PFA-lined ball valve with lever (Fig. 1)
- **Type BR 20b** · PFA-lined ball valve with manual gear
- **Type BR 20b/31a** · PFA-lined ball valve with Type BR 31a Pneumatic Rotary Actuator (Fig. 2)

### Further versions

- Nominal sizes DN 15 and DN 150 as well as valve sizes ½" to 6" in ANSI Class 150 (see Type BR 20a Ball Valve in T 9927 EN)
- Lined tank bottom valve (see Type BR 21a)
- Control ball valve with calibrated sealing ring
- Two-pieced ball and ball shaft with floating ball made of Al<sub>2</sub>O<sub>3</sub>
- Spring-loaded body gasket
- Spring-loaded seal rings
- Grooved flanges according to DIN 2512
- Various ball and sealing ring materials
- Conductive PFA lining



Fig. 1 · Type BR 20b PFA-lined Ball Valve



Fig. 2 · Type BR 20b PFA-lined Ball Valve with Type BR 31a Rotary Actuator

### Principle of operation (Fig. 3)

The process medium can flow through the Type BR 20b Ball Valves in either direction.

The ball (3) with its cylindrical bore (ball channel) rotates around the center axis. The rotary angle of the ball determines the flow rate across the free area between the body (1) and the ball channel. When the ball valve is open, the full cross-section is released. The ball shaft, which is guided to the valve exit, can be optionally connected to a pneumatic rotary actuator over an adapter or equipped with a manually operated lever.

The ball (3) is sealed in the PFA lined body by means of exchangeable seat rings (4). The ball shaft is sealed by means of a PTFE V-ring packing (9) which is live-loaded by Belleville spring washers (10) located above the packing.

### Fail-safe position

Depending on the version of the single-acting rotary actuator, the ball valve has two fail-safe positions which become effective when the actuator is relieved of pressure as well as when the supply air fails:

#### Control valve CLOSED without supply air

The ball valve closes when the supply air fails.

#### Control valve OPEN without supply air

The ball valve opens when the supply air fails.

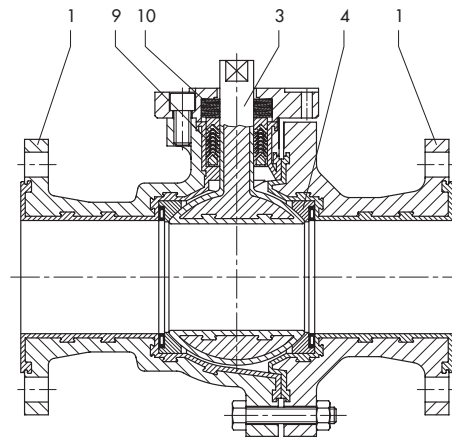
### Note

The ball valve can also be used for throttling service. Refer to the Pfeiffer Data Sheet DB20a-kd in this case.

Prior to using the ball valve in hazardous areas, refer to the maintenance instructions BA20a concerning its use according to ATEX 94/9/EC.

### Pressure-temperature diagram

The differential pressures specified are limited by the pressure-temperature diagram.



- 1 Body sections
- 3 One-piece PFA-lined ball with shaft
- 4 Sealing ring
- 9 V-ring packing
- 10 Belleville spring washers

Fig. 3 · Type BR 20b PFA-lined Ball Valve

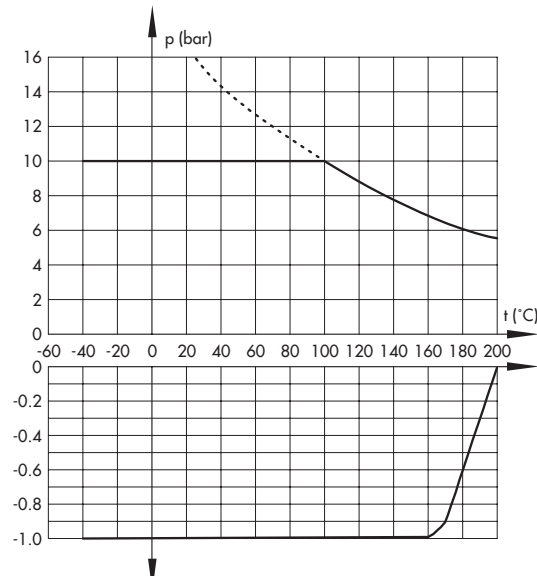


Fig. 4 · Pressure-temperature diagram

**Table 1 • Technical data for Type BR 20b**

Nominal size	DN	15 to 150
Nominal pressure	PN	16
Flanges		DIN EN 1092-1 (DIN 2632/3633)
Face-to-face dimensions		DIN EN 558-1 Series 1 (DIN 3202 Series F1)
Ball seal/seal ring		Soft sealing
Packing		Maintenance-free PTFE V-ring packing loaded with Belleville spring washers
Temperature range		See pressure-temperature diagram in Fig. 4
Leakage DIN EN 12266-1		Test P12, leakage rate "A"

**Table 2 • Materials**

Body	EN-JS1049 (GGG 40.3)
Lining	PFA $\geq 2.5$ mm
Ball	1.4313/1.4317 encapsulated with PFA
Ball shaft sealing	PTFE V-ring packing · Springs made of spring steel 1.8159 Delta Tone coated
Seal rings	White PTFE
Outer coating	Black PVC (RAL 9005)

**Table 3 • Max. permissible torque  $M_{dmax}$ , required operating and breakaway torque  $M_{dlauf}$  und  $M_{dl}$  in Nm**

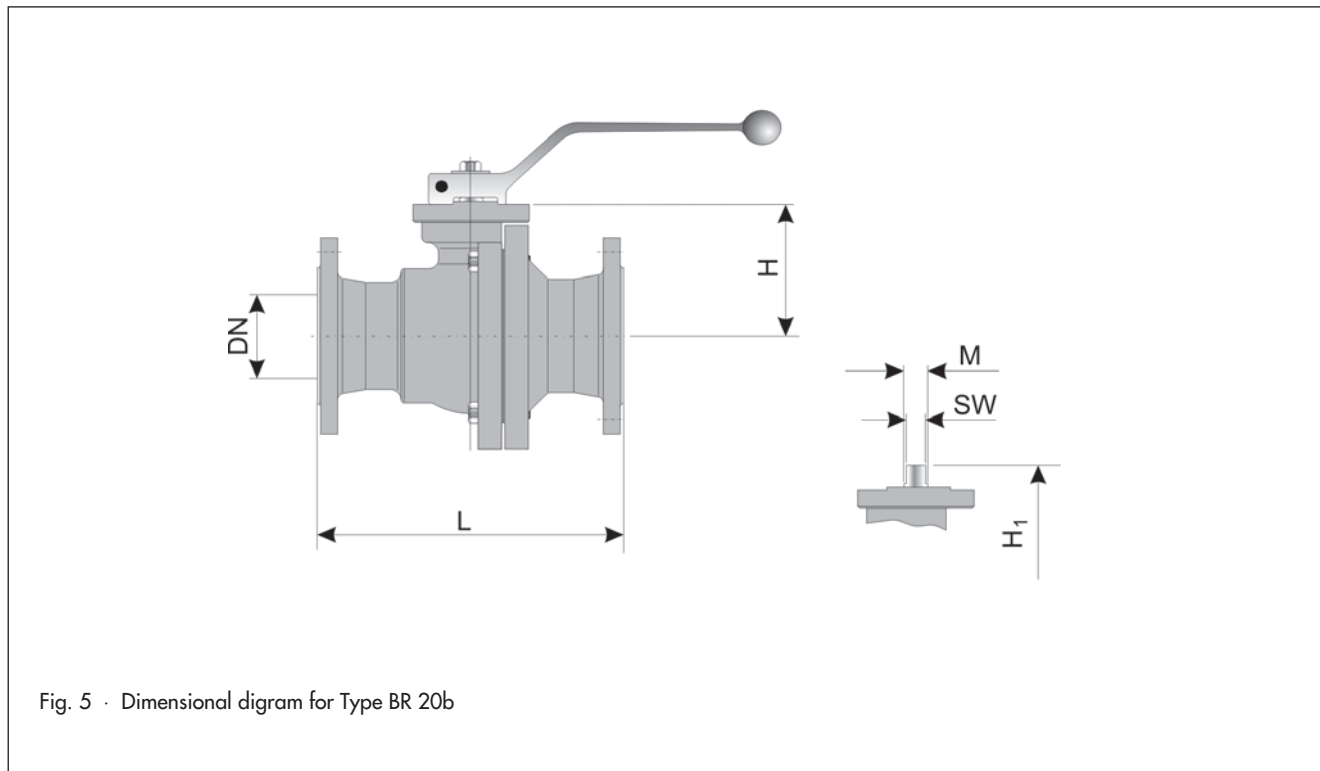
The specified breakaway torque are average values which were measured with air at 20 °C at the corresponding differential pressures. Operating temperature, process medium as well as longer operating times can affect the breakaway torque and operating torque.

Nominal size DN	Perm. torque $M_{dmax}$	Required operating torque (at $t_{max}$ ) $M_{dlauf}$	Differential pressure $\Delta p$			
			0 bar	5 bar	10 bar	15 bar
			Breakaway torque $M_{dl}$			
25	130	6	10	12	14	16
40	140	12	20	22	24	27
50	140	17	30	32	34	37
80	608	44	74	80	86	96
100	833	70	120	128	136	145

**Table 4 • Dimensions in mm and weights**

Nominal size	DN	25	40	50	80	100
L		160	200	230	310	350
H		76	85	90	133.5	152
H1		195	104	109	156.5	180
SW		12	12	12	16	20
M		16	16	16	24	28
Connection for actuator acc. to DIN/ISO 5211		F05	F07	F07	F10	F12
Weight without actuator in kg		7	11	13.5	28.5	36

Refer to Data Sheet T 9929 EN for data concerning the Pfeiffer Type BR 31a Rotary Actuator.



**Ordering text**

PFA-lined ball valve	Type BR 20b
Ball version	PFA-encapsulated ball (one-piece) or Al <sub>2</sub> O <sub>3</sub> ball (two-pieced)
Nominal size	DN ....
Nominal pressure	PN ....
PTFE-lining	
On option, special version	
Rotary actuator	Type ....
Signal pressure	.... bar
Operating pressure	.... bar
Medium temperature	.... °C
Accessories	Positioner and/or limit switches, solenoid valve

Specifications subject to change without notice.

