DATA SHEET TB 21a

BR 21a · PTFE-lined Drain ball valve

DIN-Version

CE

Applications

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

- **Nominal size DN 50 to DN 150**
- **Nominal pressure PN 16**
- **Temperatures -10°C to +200°C (14°F to 392°F)** (others on request)

The controlling device consists of a PTFE-lined drain ball valve with a pneumatic quarter-turn actuator, a manual gear or a lever.

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

- Full bore, high KV values
- Body of EN-JS 1049 (0.7043 / A395) with PTFE-liner (min. 5 mm wall thickness)
- Exchangeable PTFE seat rings
- 1 pcs ball/stem of stainless steel (1.4313) with PTFE liner (min. 5 mm wall thickness)
- Hysteresis-free, perfect for control applications
- Shaft sealed by a self-adjusting PTFE V-ring packing, supported by disc springs, maintenance-free
- On/off operation with leakage rate A acc. to DIN EN 12266-1, bubble-tight version
- Blowout-proof shaft
- Connecting flange for actuators acc. to DIN ISO 5211
- High-quality 2-component PU coating (RAL 1019) as protection against corrosive atmosphere and corrosive formation

Fig. 1: *BR 21a Drain ball valve with Lever*

Fig. 2: *BR 21a Drain ball valve with BR 31a Quarter-turn actuator*

Versions

BR 21a Drain ball valve are optionally available in the following versions:

- Drain ball valve with lever (DN 50 to 100)
- Drain ball valve with manual gear
- Drain ball valve with pneumatic quarter-turn actuator (see associated data sheet for details)
- Acc. to customer specifications

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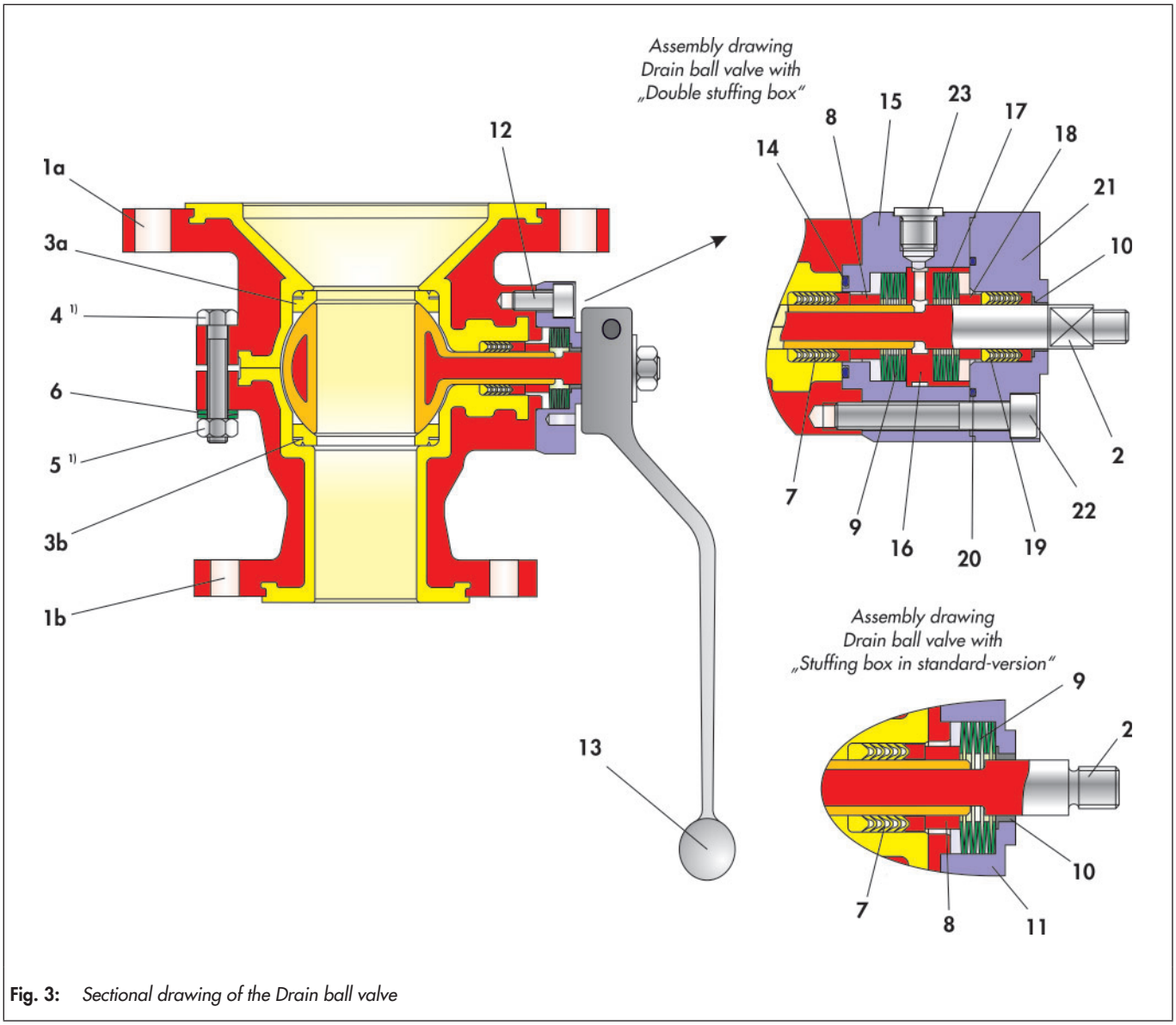

Fig. 3: *Sectional drawing of the Drain ball valve*

Table 1: *Parts list for the Drain ball valve*

Item	Description
1	Body with lining
2	Ball with coating
3	Seat ring
4	Screw / Stud bolt [1]
5	Nut [1]
6	Disc spring
7	V-ring packing
8	Thrust ring
9	Disc spring set
10	Bearing bush
11	Stuffing box flange
12	Screw

Item	Description
13	Lever
14	O-ring
15	Stuffing box lower part
16	Distance ring
17	Disc spring set
18	Thrust ring
19	V-ring packing
20	O-ring
21	Stuffing box top part
22	Screw
23	Locking screw

[1] Depending on the nominal size, stud bolts with nuts or screws can be installed.

Special versions

- Valve body made of stainless steel 1.4571
- Liner with special PTFE compounds
- Lining PTFE - conductive
- Heating jacket, stainless steel
- Stem sealing with two PTFE V-ring packings and test connection
- Flange groove acc. to DIN EN 1092
- Severals materials for ball and sealing rings
- FDA conform sealing materials
- Acc. to customer specifications

Principle of operation

Please note, normally the drain ball valves of BR 21a is assembled with the bigger sized flange at the bottom flange of the vessel.

The ball (2) with its cylindrical passage slew around the middle axis. The opening angle of the ball determines the flow through between the body (1) and bore. When the ball valve is opened, the entire profile is available.

The ball (2) is sealed by exchangeable seat rings (3).

The ball shaft is sealed by a PTFE V-ring packing (7) which is spring supported by disc springs (9)positioned above the packing.

The shaft is equipped with a lever. Optionally, a pneumatic actuator or gear-operated actuator can be assembled

Fail-safe position

Depending on assembly position of the pneumatic actuator, 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 fail-close actuator:**
  While air failure, the valve is closed. The valve opens when the signal pressure increases, acting against the force of the springs.
- **Ball valve with fail-open actuator:**
  While air failure, the valve opens. The valve closes when the signal pressure increases, acting against the force of the springs.

Note

Before using the valve in hazardous areas, check whether this is possible according to ATEX 2014/34/EU by referring to the operating instructions ▶ BA 20a.

Optional material combinations

For best adaption to process conditions, it is possible to optimize ball valve by modification of materials (eg. body, shaft, ball and sealing).

Additional accessories

The following accessories are available (separately or in combination):

- Locking device
- Shaft extension (100 mm, standard)
- Pneumatic or electric quarter-turn actuators
- Positioner
- Limit switches
- Solenoid valves
- Filter regulator
- Heating jacket

Further accessories are possible on customer request.

Advantages of the live-loaded sealing system

- Maintenance-free and self-adjusting
- Highest tightness, even under extreme pressure and temperature conditions
- High durability

All in all: Extremely economic!

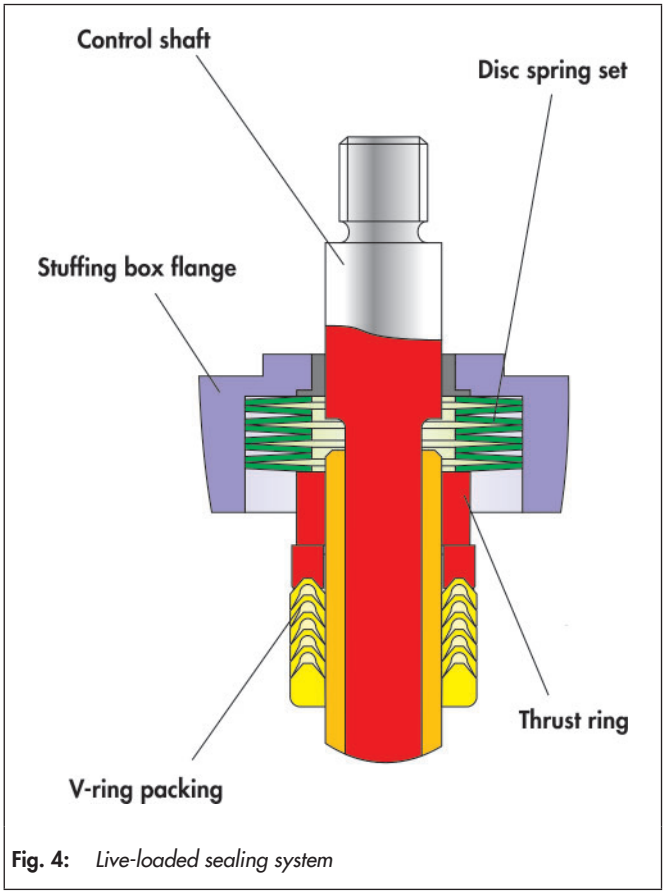

Fig. 4: *Live-loaded sealing system*

Pressure-temperature diagram

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

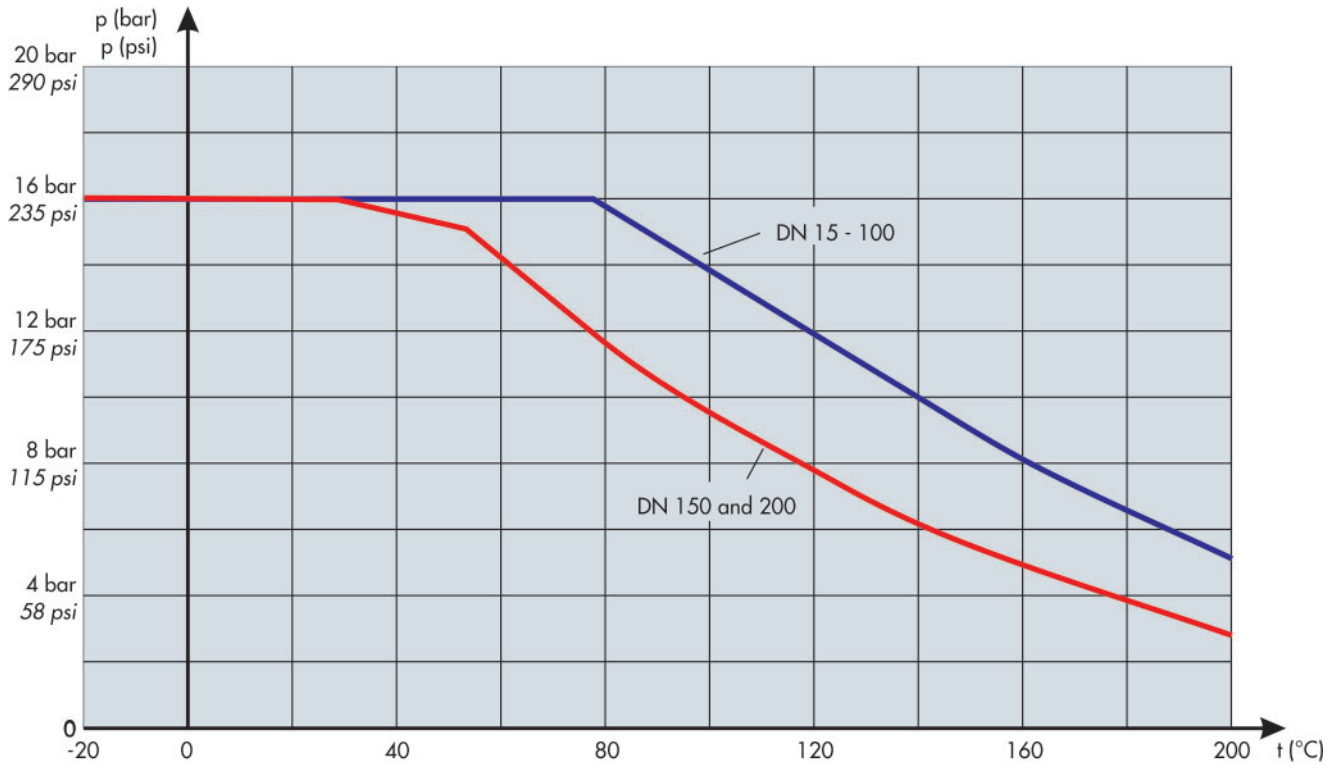

Fig. 5: *Pressure-temperature diagram*

Table 2: *General technical data*

Nominal size	Inlet	DN 65	DN 80	DN 100	DN 100	DN 150	DN 150
	Outlet	DN 50	DN 50	DN 50	DN 80	DN 80	DN 100
Nominal pressure		PN 16					
Temperature range		-10°C ... 200°C (14°F ... 392°F)					
Ball sealing		Virgin PTFE					
Leakage rate		Leakage rate A according to DIN EN 12266-1, P12 (leakage rate 1 BO acc. to DIN 3230 Part 3)					
Flanges		DIN EN 1092-2, Form B					
Packing		PTFE V-ring packing supported by disc springs					

Table 3: *Materials*

Body	EN-JS 1049 / 0.7043 with PTFE-lining (min. 5 mm)
Ball	1.4313 / 1.4317 with PTFE-casing (min. 5 mm)
Seat rings	Virgin PTFE
Packing	PTFE - V-ring packing
Disc spring set	1.8159, Delta Tone
Bearing bush	PTFE with 25% carbon
Body sealing	PTFE
Coating	2-Components Pur-Varnish colour grey beige, (RAL 1019)

Table 4: *kvs and Cv coefficients*

DN	65 / 50	80 / 50	100 / 50	100 / 80	150 / 80	150 / 100
kvs	163	163	163	402	402	587
Cv	190	190	190	467	467	682

Table 5: *Max. permissible torque, required torque and breakaway torque*

Differential pressure		Δp in bar	0	5	10	16
DN	perm. operating torque MDmax. in Nm	required operating torque Md in Nm	Breakaway torque Mdl in Nm			
65 / 50	140	15	22.5	23	28	34
80 / 50						
100 / 50						
100 / 80	608	38	57	62	80	90
150 / 80						
150 / 100	833	60	90	110	130	140

The above listed torques are based on the opening of the ball valve at the differential pressure for water with corrosion inhibitors added at room temperature and with one-day non-actuation. Since temperature, pressure, process medium, switching frequencies and idle times considerably affect the arising torques, corresponding factors need to be taken into consideration on selecting and sizing the actuator. In case of doubt, contact Pfeiffer. The listed maximum permissible torques apply to the standard material listed in Table 3.

Dimensions and weights

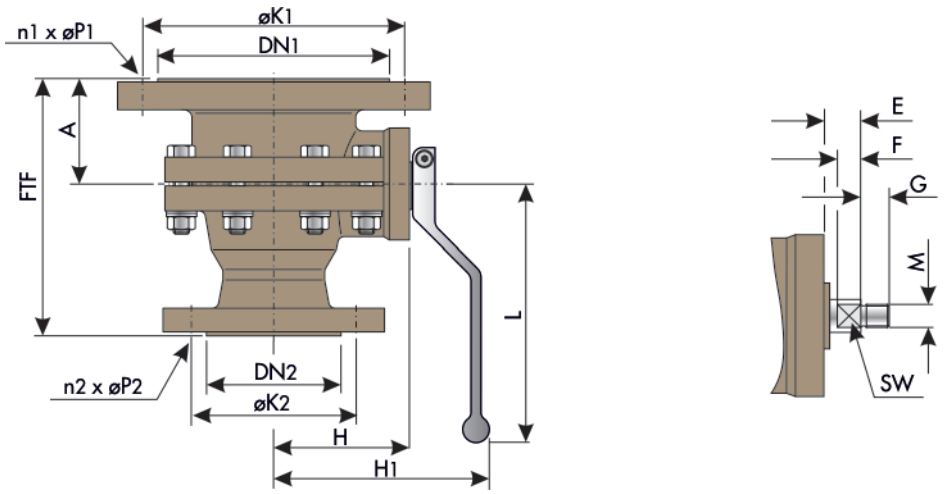

Fig. 6: *Dimensional drawing*

Table 6: *Dimensions in mm and weights in kg*

DN1	65	80	100	100	150	150
DN2	50	50	50	80	80	100
FTF	190	188	190	245	250	270
A	75	73	75	90	95	95
H	103	103	103	138,5	138,5	161
H1	178.5	178.5	178.5	206.5	206.5	229
E	19	19	19	23	23	19
F	12	12	12	16	16	12
G	15	15	15	18	18	18
L	220	220	220	365	365	365
M	M12	M12	M12	M16	M16	M16
SW	12	12	12	16	16	20
DIN ISO Connection	F05	F05	F05	F07	F07	F07
ØK1	145	160	180	180	240	240
n1xØP1	4x18	8x18	8x18	8x18	8x22	8x22
ØK2	125	125	125	160	160	180
n2xØP2	4x18	4x18	4x18	8x18	8x18	8x18
Gewicht	16	18	18	28	31	39

Selection and sizing of the drain ball valve

1. Determine the required nominal size
2. Select valve in accordance with table 2 resp. 3 and by pressure-Temperature diagram
3. Select the appropriate actuator using table 5
4. Select additional equipment

Order text

BR 21a PTFE-drain ball valve
DN . . . . / PN . . . .
optional special version

Lever, resp. actuator (brand name): . . . .
Supply pressure: . . . . bar
Fail-safe position: . . . .

Limit switch (brand name): . . . .
Solenoid valve (brand name): . . . .
Positioner: . . . .

Other: . . . .

Associated data sheets

- for pneumatic Multi-turn actuator ▶ TB 30a
- for pneumatic Quarter-turn actuator ▶ TB 31a

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

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