

PTFE-lined Ball Valve Series 20a

Application:

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

- Nominal diameters NPS1 to NPS8 and DN 15 to 200
- Nominal pressure ANSI cl150 and PN 16
- Temperatures 14 to 392 °F (-10 to 200 °C)

The ball valve-unit consist of a PTFE-lined ball valve with a pneumatic quarter-turn actuator, a hand lever or a gear-operated actuator.

The valves are designed according to the modular-assembly. The principle follow below features:

- Body of EN-JS 1049 with PTFE lining
- Exchangeable PTFE seat rings
- Ball and integrated shaft made of stainless steel, PTFE lined
- One piece ball design (integrated shaft)
- Shaft sealed by live-loaded PTFE V-ring packing
- On/off service with a particularly low leakage rate (bubble-tight version)
- Anti-blow-out shaft
- Connections acc. to DIN ISO 5211
- DIN version with face-to-face dimensions acc. to DIN EN 558, Series 1
- ANSI version with face-to-face dimensions acc. to DIN EN 558, Series 3

Versions:

The PTFE-lined ball valve is available in the following versions:

- PTFE-lined ball valve with hand lever (NPS1 to NPS4 or DN 15 to 100)
- PTFE-lined ball valve with gear-operated actuator
- PTFE-lined ball valve with pneumatic quarter-turn actuator (see respective data sheet for details)

Special versions:

- Lined bottom drain ball valve, see Series 21a
- Control ball valve by using seat ring with characteristic curve
- Lining with special PTFE compounds
- Conductive PTFE lining
- Heating jacket
- Shaft sealed by two V-ring packings and leak-off connection (double stuffing box)
- Flange groove acc. to DIN EN 1092
- Various materials for ball and seat rings

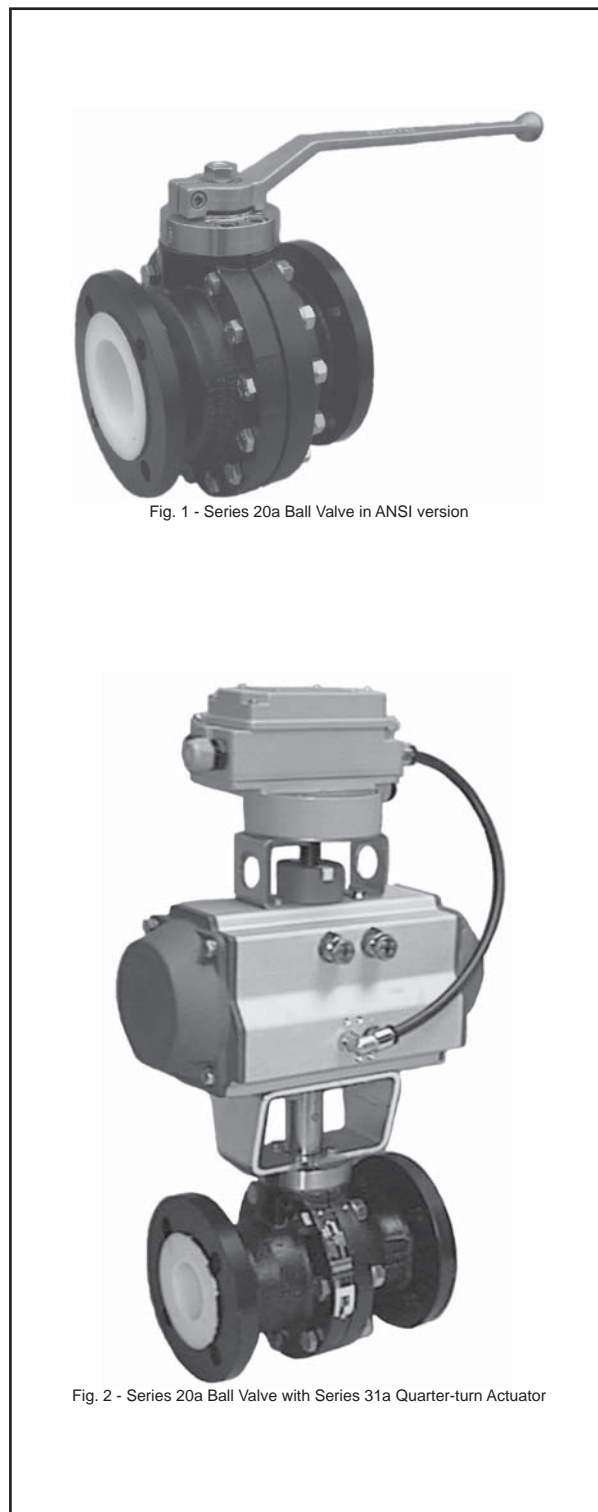
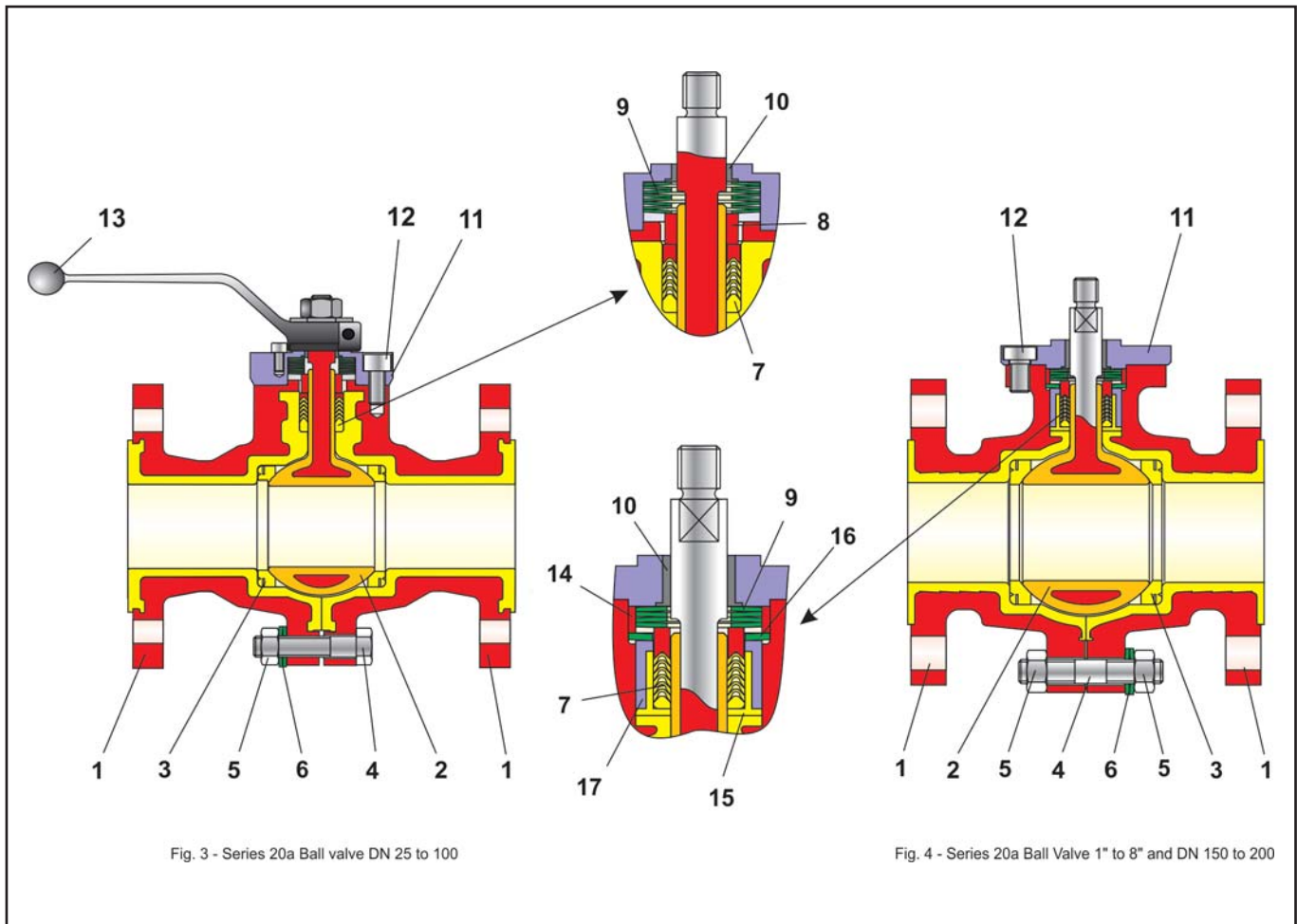


Fig. 1 - Series 20a Ball Valve in ANSI version

Fig. 2 - Series 20a Ball Valve with Series 31a Quarter-turn Actuator



Item	Description
1	Body with lining
2	Encapsulated ball
3	Set of seat rings
4	Screw / stud bolt
5	Nut
6	Spring washer
7	V-ring packing
8	Clamping ring
9	Set of spring washers

Table 1 - Parts list

Item	Description
10	Bearing bushing
11	Stuffing box
12	Screw
13	Hand lever
14	Centering ring
15	PTFE bushing
16	Spring washer
17	Bushing

Mode of operation:

The Series 20a Ball Valves allow 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 full cross-section is released.

The ball (2) is sealed in the PTFE-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 (7).

The packing is live-loaded by spring washers (9) located on top of the packing.

The shaft is externally equipped with a hand lever (13) for sizes < DN 150 / NPS6.

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



Fail-safe position:

Depending on the pneumatic actuators assembling situation, the valve has two fail-safe positions which become effective when auxiliary energy (pressure / power) fails:

- **Ball valve with actuator for fail-close**
Valve is closed while air failure.
The valve opens by increasing control pressure, acting against spring force
- **Ball valve with actuator for fail-open**
Valve is open while air failure.
The valve closes by increasing control pressure acting against spring force



Note: The Series 20a Ball Valve can also be used for control applications. Refer to the data sheet <DB 20a-kd>.



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!

Additional equipment and mounting parts:

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

- Pneumatic and electric actuator
- Positioner
- Limit switch
- Solenoid valve
- Air pressure reducing station with filter

Further accessories are available on request to meet customer specifications

Advantages of the live-loaded packing:

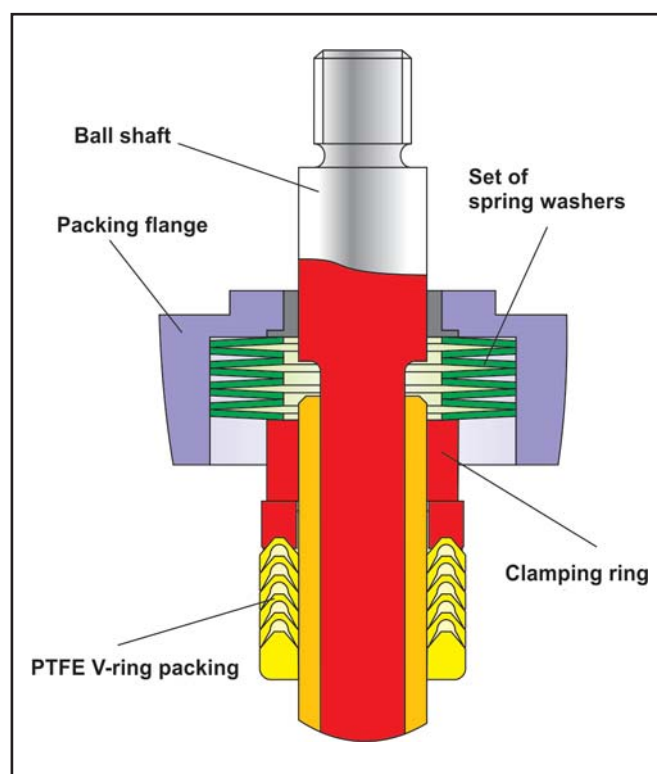


Fig. 6 - Live-loaded packing

- Maintenance-free and self-adjusting
- Highest level of sealing, even under extreme pressure and temperature changes
- Long service life
- **All in all: extremely economic!**

General technical data:

Nominal size	NPS1 to NPS8 and DN 15 to DN 200
Nominal pressure	ANSI cl150 and PN 16
Temperature range	14 to 392 °F (-10 to 200 °C)
Ball seal	PTFE, white
Leakage rate	Leakage rate A acc. to DIN EN 12266-1, P12 (leakage rate 1 BO acc. to DIN 3230 Part 3)
Flanges	DIN EN 1092-2, Form B and ANSI cl150
Packing	PTFE V-ring packing loaded by spring washers
Face to face dimensions	DIN version acc. to DIN EN 558, Series 1, ANSI version acc. to DIN EN 558, Series 3

Table 2 - Technical data

Materials:

Body	EN-JS 1049 / 0.7043 / A395 with PTFE lining
Ball	1.4313 / 1.4317 PTFE lined
Seat rings	PTFE, white
Packing	PTFE V-ring packing
Set of spring washers	1.8159 Delta Tone coating
Bearing bushing	PTFE with 25 % carbon
Paint coating	Two-component polyurethane coat, 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.

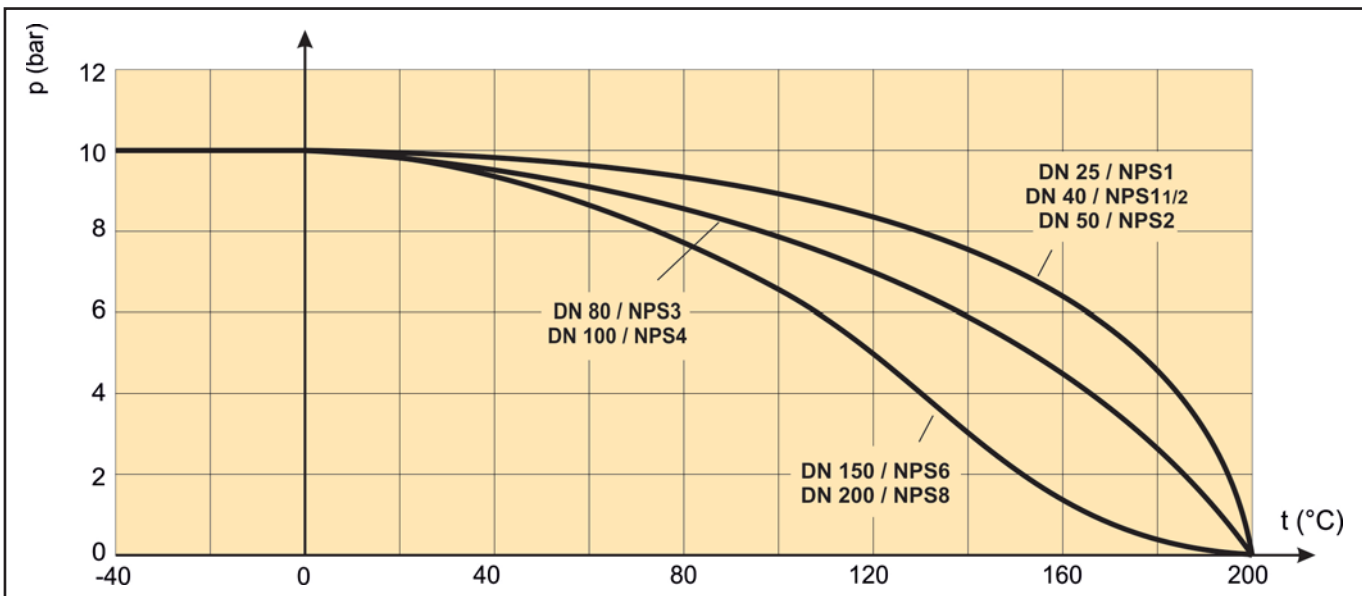


Fig. 7 - Pressure-temperature diagram

Dimensions and wights:

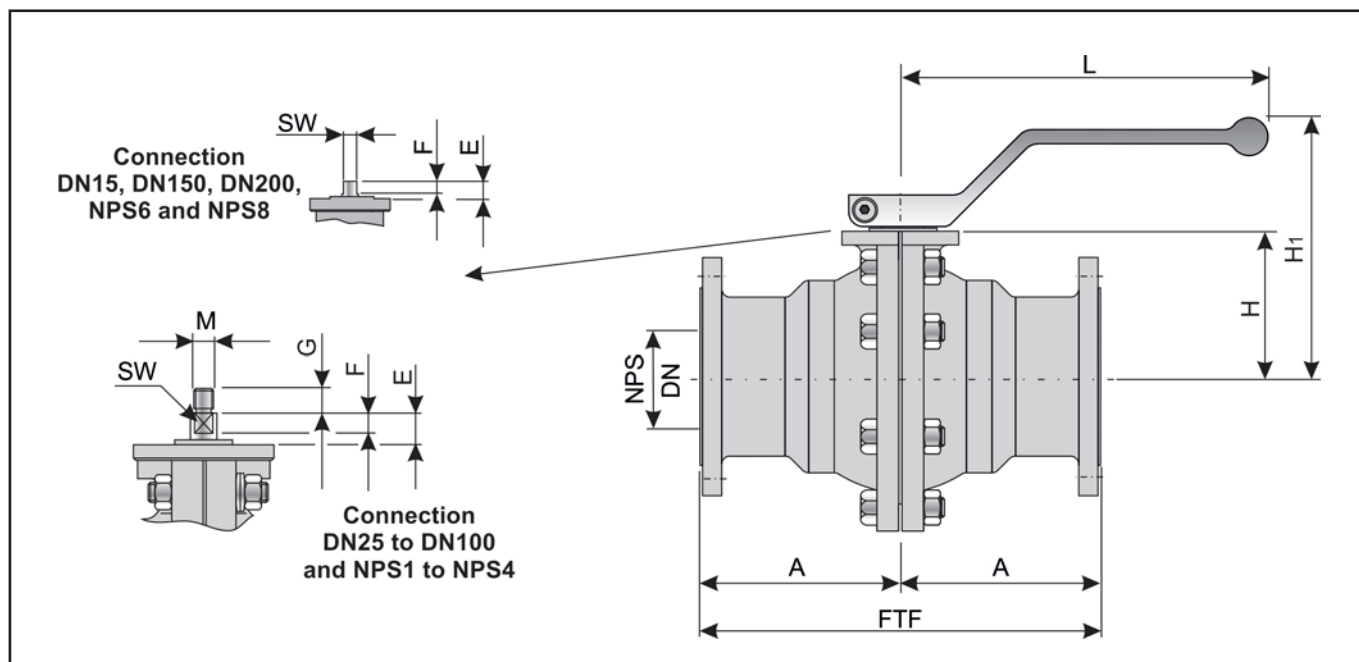


Fig. 8 - Dimensional drawing

DN	15	25	40	50	80	100	150	200
FTF	130	160	200	230	310	350	480	457
A	65	80	100	115	155	175	240	228.5
H	48	82	96	103	138.5	161	189	265
H1	115.5	149.5	171.5	178.5	206.5	229	-	-
E	19	19	19	19	23	19	29	42
F	12	12	12	12	12	12	18	39
G	-	15	15	15	18	18	17	-
M	-	M12	M12	M12	M16	M16	M24	-
L	151.5	151.5	220	220	365	365	-	-
SW	12	12	12	12	16	20	24	34
DIN ISO Connection	F05	F05	F05	F05	F07	F07	F10	F16
Weight	5	6.5	11	14	26	37	65	145

NPS	1/2	1	1 1/2	2	3	4	6	8
FTF	on request	127	165	178	203	229	267	419
A		63.5	82.5	89	101.5	114.5	133.5	209.5
H		82	96	103	138.5	161	174	220
H1		149.5	171.5	178.5	206.5	229	-	-
E		19	19	19	23	19	64	87
F		12	12	12	12	12	24	34
G		15	15	15	18	18	14	-
M		M12	M12	M12	M16	M16	M24	-
L		151.5	220	220	365	365	-	-
SW		12	12	12	16	20	24	34
DIN ISO Connection	F05	F05	F05	F07	F07	F10	F16	
Weight	5.5	9.5	11	18	29	65	120	

Table 4 – Dimensions in mm and weights in kg

Operating and breakaway torques:

Differential pressure				Δp in bar					
				0	2	4	6	8	10
				Δp in lbs					
				0	30	60	90	120	150
DN	NPS	Perm. operating torque MDmax. in Nm	Perm. operating torque Md in Nm	Breakaway torque Mdl in Nm					
15	-	126	6	10	10	10	10	10	10
25	1	139	5	7.5	10	10	10	10	14
40	1 1/2	140	10	15	15	15	15	15	18
50	2	140	15	22.5	23	23	23	23	28
80	3	608	38	57	57	60	65	70	80
100	4	833	60	90	92	99	110	120	130
150	6	1350	300	On request					450
200	8	9968	450						600

Table 5 - 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.

Selection and sizing of the ball valve:

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



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.

Ordering text:

PTFE-lined Ball Valve: Series 20a
 DN / NPS ...
 PN / ANSI Class...
 Optionally, special design

Hand lever or actuator: ...
 Control pressure: ... bar
 Fail-safe position: ...

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

