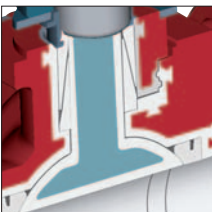
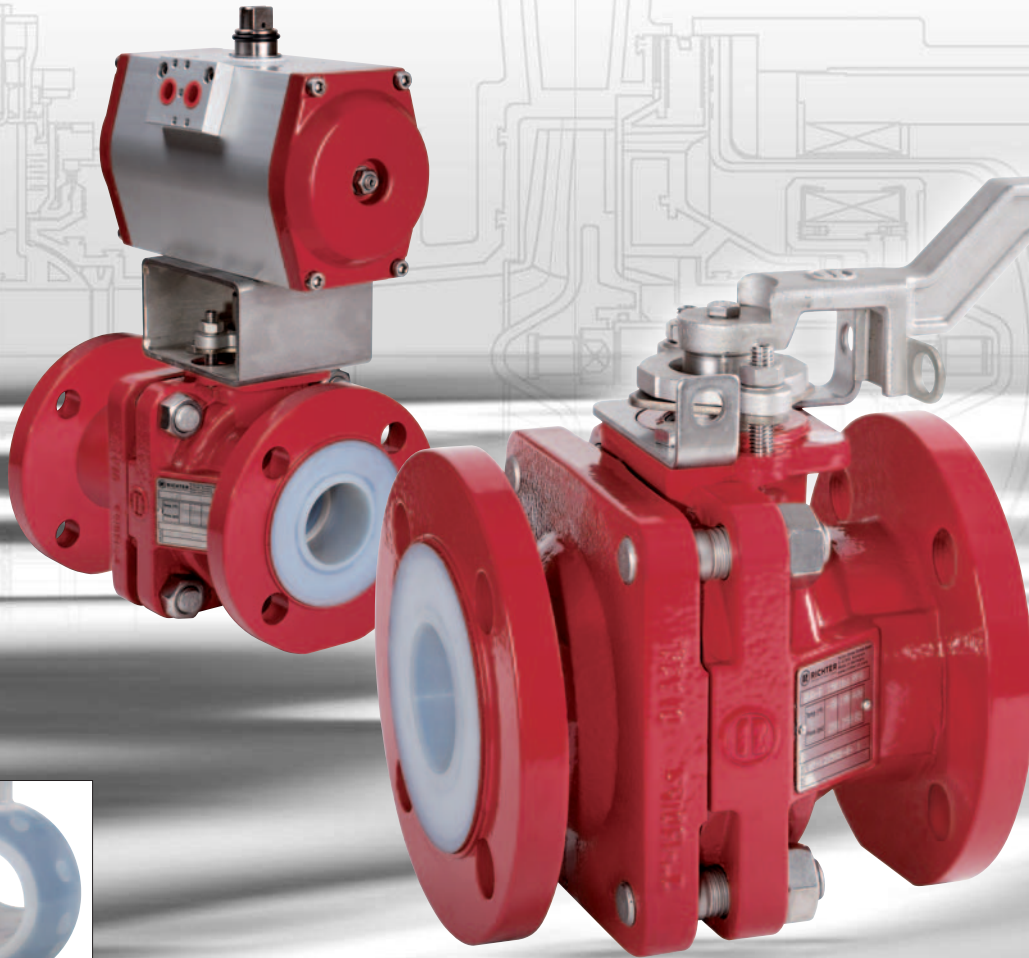


# Richter Lined Manual and Automated Standard ASME and ISO Ball Valves

BVA, BVI



Lining virgin PFA

One-piece ball/stem design,  
 $Al_2O_3$  ball option

Time-tested maintenance-free  
stem seal

Low torque, high flow rate



**RICHTER**  
Process Pumps & Valves

**IDEX**  
FLUID & METERING

# Lined Standard ASME/ANSI and ISO/DIN Ball Valves

## Fields of applications

The design of the standard ball valves series BVA and BVI is based on more than 30 years of Richter application experience with lined ball valves. They provide an excellent ratio of economic and operational performance in a wide variety of process applications.

The Richter ball valves BVA and BVI are designed

- as shut-off and automated valves for corrosive and hazardous media,
- where stainless steel is not sufficiently corrosion-resistant,
- as alternative to valves made of exotic special metals and
- serve as reliable alternative to lined plug valves due to higher flow rates, much lower torques and minimum maintenance need and cost.

## Product features

- **Standard PFA-lined one-piece ball/stem unit** with stainless steel core, optional Al<sub>2</sub>O<sub>3</sub> ceramic ball for handling erosive corrosive services
- **High flow rates and minimum pressure losses**
- **Compact design** with small valve body envelope, **low weight** and **lowest possible torque** for economic power actuation
- **Product options** include lever extension, gear operators, etc.
- **AAR** – Association of America Railroad Certified
- All sizes full port except BVA 3" to 6" which are standard port

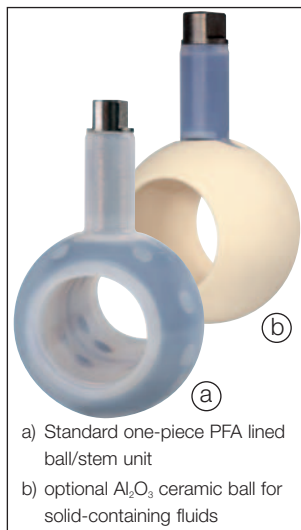
## Type code

**manual actuation**      **remote actuation**

- |                            |         |          |
|----------------------------|---------|----------|
| • ASME/ANSI ball valve     | BVA/... | BVAP/... |
| • ISO/DIN ball valve       | BVI/... | BVIP/... |
| • Lining PFA fluoroplastic | .../F   |          |

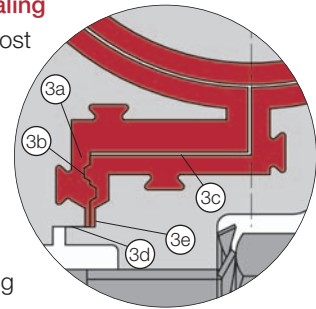
## Efficient alternative to plug valves

- Plug valves provide some 2/3 of full port ball valve flow only. Thus full port ball valves would allow for downsizing of pipeline system by at least 1 size. Standard port ball valves provide flows equal to plug valves.
- Plug valves require 100-350 % more torque, thus in most cases larger actuator needed.
- A plug valve shut-off element is seated in the body lining. Wear and tear requires body or complete valve („throw away valve“) to be exchanged unlike with ball valves where low cost seat rings can be replaced.
- Plug valves have conventional stem sealing, not self-adjusting, not maintenance-free. Uneven adjusting of bolts results in uneven pressure on stem packing.
- Plug valves do neither offer ceramic shut-off nor reliable control options.
- Cavity volume underneath plug
- Plug core usually made of standard ductile iron unlike ball valves with SS ball core



# Reliable body and seat sealing, minimum maintenance.

- ① **1/8" (3 mm) thick virgin PFA body lining**
  - High permeation resistance
  - Vacuum-proof anchored by dovetail grooves
  - Translucent, optimum quality assurance
- ② **Pressure-bearing body made of ductile cast iron ASTM A395/EN-JS 1049 (0.7043),** absorbs system and pipe forces.
- ③ **Permanent body flange sealing**
  - Effective even under the most frequent thermal cycle conditions
  - Body sealing zone (3a) with **full lining thickness**
  - **Labyrinth-like sealing** (3b) maximizes surface contact between the mating components.
  - Body pieces **position themselves properly** by means of the cup and cone shapes (3c) of each piece.
  - **Metal centering** (3d) withstands lateral and angular pipe forces.
  - **Almost metal-to-metal flange contact** (3e) in the circumference area controls the effects of temperature variations.



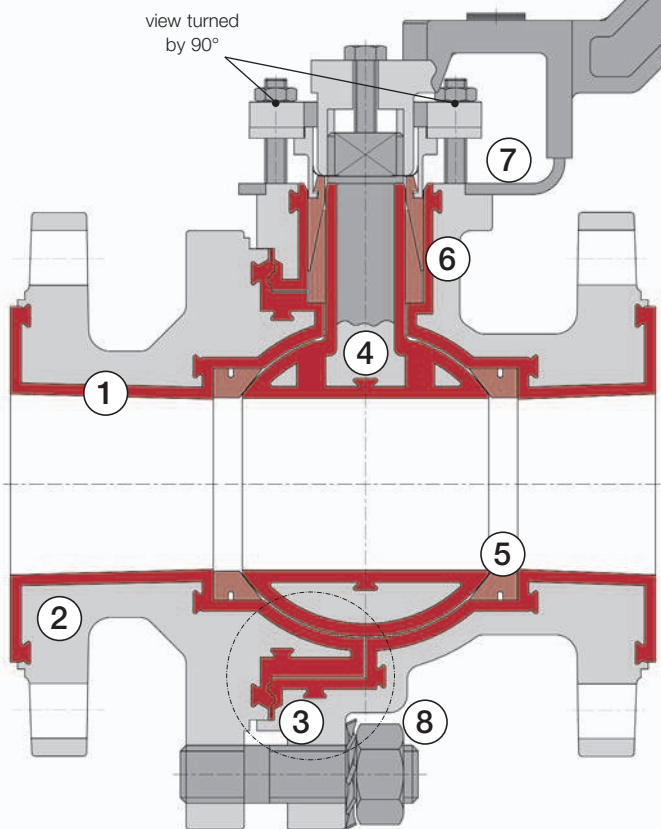
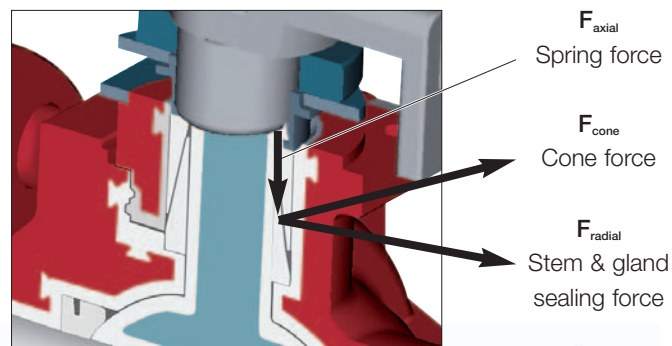
- ④ **One-piece ball/stem design**
  - Stainless steel core
  - Eliminates individual plastic lined mating wear points, resulting in higher pressure/temperature ratings and reducing the potential of ball or stem failure.
  - Al<sub>2</sub>O<sub>3</sub> (99,7 %) ceramic ball option
- ⑤ **Energized PTFE seat rings** provide a permanent spring load onto the ball and ensure of gas-tight sealing.
- ⑥ **Time-tested maintenance-free stem seal**
  - Outstanding long-life seal performance
  - Gastight to EN 12266, leakage rate A
  - Spring gland follower provides permanent life-load and ensures of tightness even in case of pressure and temperature changes.
  - Visual inspection of sealing load
  - Manually adjustable from outside
- ⑦ **Universal ISO 5211 mounting dimensions**
- ⑧ **External corrosion protection**  
Body epoxy coated. Packing gland, lever, lever stop, nuts and bolts stainless steel. Optional ASTM A193/B7M bolting.

### Innovative cone shape stem seal design

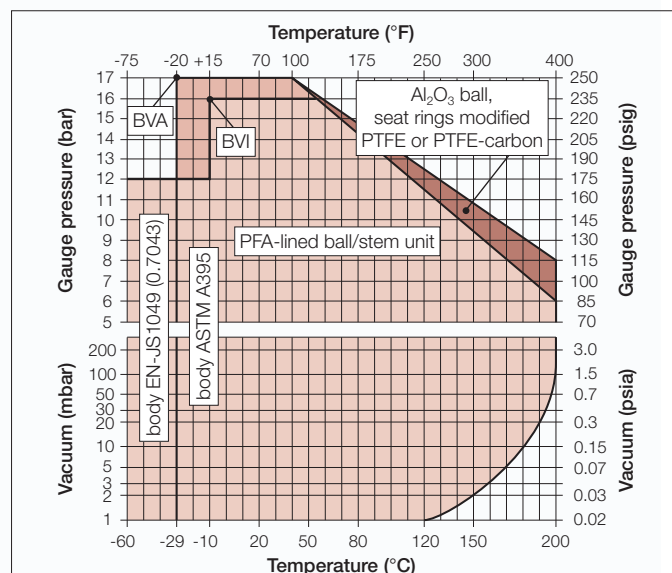
The PTFE packing insert translates a low axial thrust into a higher radial sealing force by means of the law of cone. The packing gland is designed with a diameter as small as possible. The result is an outstanding stem seal performance under the most challenging conditions of thermal cycling and corrosive chemicals. The stainless steel spring gland follower provides a permanent preload. Controlled manual adjustment is easily possible at any time.

An added benefit is the ability to monitor the live loaded condition of the stem seal simply by inspecting the “gap” between the packing followers, thus lending this design to the user’s preventive maintenance program.

### Stem seal design



### Pressure/temperature range



#### Body ASTM A395/PFA:

-20 °F (-29 °C) to 400 °F (+200 °C);  
max. 250 psi (17.2 bar) acc. to ASME B16.42

#### Body EN-JS1049 (0.7043)/PFA:

-75 °F (-60 °C) to 400 °F (+200 °C);  
max. 235 psi (16 bar) acc. to AD 2000

#### For low temperature applications observe local rules!

A special material is used for the metal core of the ball/stem in case of operating temperatures below 15 °F (-10 °C).

### Flow rates

Valve size		Cv (US gpm)	k <sub>v</sub> (m <sup>3</sup> /h)
BVA (inch)	BVI (mm)		
1"	DN 25	70	60
1½"	DN 40	221	190
2" & 3"	DN 50	326	280
4"	DN 80	684	587
6"	DN 100	1456	1250
-	DN 150	3262	2800

conversion:

$$Cv = k_{v100} \cdot 1,165 \text{ (US gpm)}$$

$$k_{v100} \cdot 0,971 \text{ (Imp. gpm)}$$

### Operating torques PFA-lined ball/stem unit

Δp psi (bar)									
45 (3)		85 (6)		145 (10)		250 (17.2)		max. adm.	
in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
71	8	71	8	71	8	89	10	620	70
133	15	133	15	133	15	177	20	1990	225
177	20	177	20	177	20	221	25	1990	225
443	50	443	50	549	62	735	83	4425	500
708	80	708	80	814	92	1062	120	4425	500
1770	200	2036	230	2390	270	2788	315	19470	2200

Torques measured with water 68 °F (20 °C). Depending on the medium, e.g. gases or viscous resp. crystallizing liquids, the torques could increase.

### Operating torques Al<sub>2</sub>O<sub>3</sub> ceramic ball

Δp psi (bar)									
45 (3)		85 (6)		145 (10)		250 (17.2)		max. adm.	
in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
89	10	89	10	89	10	106	12	283	32
177	20	177	20	177	20	221	25	708	80
221	25	221	25	221	25	266	30	1062	120
531	60	531	60	637	72	841	95	2215	250
797	90	1151	130	1328	150	1770	200	3098	350
3098	350	3540	400	5133	580	6815	770	10620	1200

## Dimensions and weights BVA (ASME/ANSI): face-to-face ASME/ANSI B16.10 short, flanges ASME (ANSI) B16.5 Cl. 150 \*\*\*\*

BVA		ØPort		L		HL		H		D		k		nxd <sub>1</sub>		EN ISO	H1		H5		H2		Weight** approx.	
inch	DN	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	5211	inch	mm	inch	mm	inch	mm	lbs	kg
1"	25	0.964	24.5	5.0	127	7.0	179	5.12	130	4.25	108	3.125	79.5	4x <sup>5</sup> / <sub>8</sub>	4x16	F05	1.97	50	2.36	60	2.36	60	11	5
1½"	40	1.496	38	6.5	165	10.2	259	6.1	155	5.0	127	3.875	98.5	4x <sup>5</sup> / <sub>8</sub>	4x16	F07	3.03	77	3.70	94	2.36	60	24	10.8
2"	50	1.87	47.5	7.0	178	10.2	259	6.1	155	6.0	152.5	4.75	120.5	4x <sup>3</sup> / <sub>4</sub>	4x19	F07	3.15	80	3.82	97	2.36	60	28.5	13
3"	80	1.87	47.5	8.0	203	10.2	259	6.1	155	7.5	190.5	6.0	152.5	4x <sup>3</sup> / <sub>4</sub>	4x19	F07	3.15	80	3.82	97	2.36	60	37.5	17
4"	100	3.07	78	9.0	229	16.1	410	7.09	180	9.0	229	7.5	190.5	8x <sup>3</sup> / <sub>4</sub>	8x19	F10	4.64	118	5.51	140	3.15	80	79	36
6"	150	3.78	96	10.5	267	16.1	410	7.68	195	11.0	279.5	9.5	241.5	8x <sup>7</sup> / <sub>8</sub>	8x22.5	F10	5.27	134	6.14	156	3.15	80	117	53

## Dimensions and weights BVI (ISO/DIN): face-to-face ISO 5752-Series 1 (DIN 3202 F1), flanges ISO 7005-2 \*\*\*

BVI		ØPort		L		HL		H		D		k		nxd <sub>1</sub>		EN ISO	H1		H5		H2		Weight** approx.	
inch	DN	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	5211	inch	mm	inch	mm	inch	mm	lbs	kg
1"	25	0.964	24.5	6.3	160	7.0	179	5.12	130	4.52	115	3.35	85	4x0.55	4x14	F05	1.97	50	2.36	60	2.36	60	12	5.5
1½"	40	1.496	38	7.87	200	10.2	259	6.1	155	5.9	150	4.33	110	4x0.71	4x18	F07	3.03	77	3.70	94	2.36	60	26	12
2"	50	1.87	47.5	9.05	230	10.2	259	6.1	155	6.5	165	4.92	125	4x0.71	4x18	F07	3.15	80	3.82	97	2.36	60	31	14
3"	80	3.07	78	12.2	310	10.2	259	7.09	180	7.87	200	6.3	160	8x0.71	8x18	F10	4.64	118	5.51	140	3.15	80	66	30
4"	100	3.78	96	13.78	350	16.1	410	7.68	195	8.66	220	7.09	180	8x0.71	8x18	F10	5.27	134	6.14	156	3.15	80	102	46
6"	150	5.71	145	18.9	480	20.2*	513*	10.43	265	11.22	285	9.45	240	8x0.87	8x22	F12	7.24	184	8.46	215	3.94	100	190	86

\* BVI size 6" (150 mm): with Δp > appr. 29 psi (2 bar) a worm gear is recommended instead of hand lever. Details on request.

\*\* manually operated, PFA lined ball/stem unit

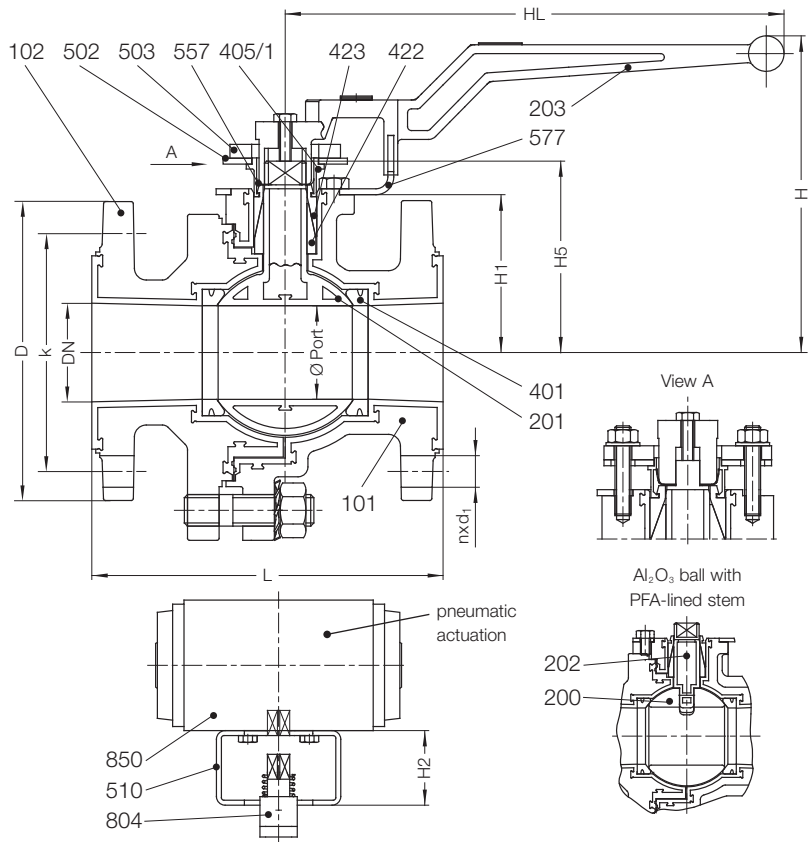
\*\*\* on request drilled to ASME (ANSI) B16.5 Cl. 150, JIS 10K

\*\*\*\* on request drilled to JIS 10K, ISO 7005-2

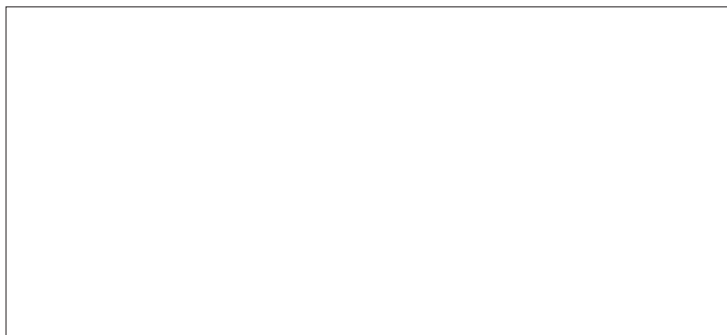
### Components and materials

Item	Designation	Material
101	Main body	Ductile iron ASTM A395/EN-JS1049; PFA lined
102	Body end piece	Ductile iron ASTM A395/EN-JS1049; PFA lined
200	Ball	Al <sub>2</sub> O <sub>3</sub>
201	Ball/stem unit	Stainless steel, PFA lined
202	Stem	Stainless steel, PFA lined
203	Lever	Stainless steel
401	Seat rings	PTFE <sup>1)</sup>
405/1	Thrust ring	Stainless steel
422	Base ring	Modified PTFE
423	Packing insert	PTFE
502	Spring gland follower	Stainless steel
503	Packing gland follower	Stainless steel
510	Bracket	Stainless steel
557	Grounding spring washer	Stainless steel
577	Lever stop	Stainless steel
804	Coupling	Stainless steel
850	Actuator	Customer to specify
w/o No.	Screws and nuts	Stainless steel

<sup>1)</sup> Modified PTFE seat rings supplied with Al<sub>2</sub>O<sub>3</sub> ceramic ball



Presented by:



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