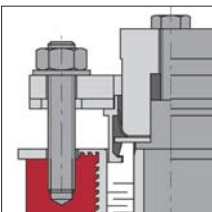
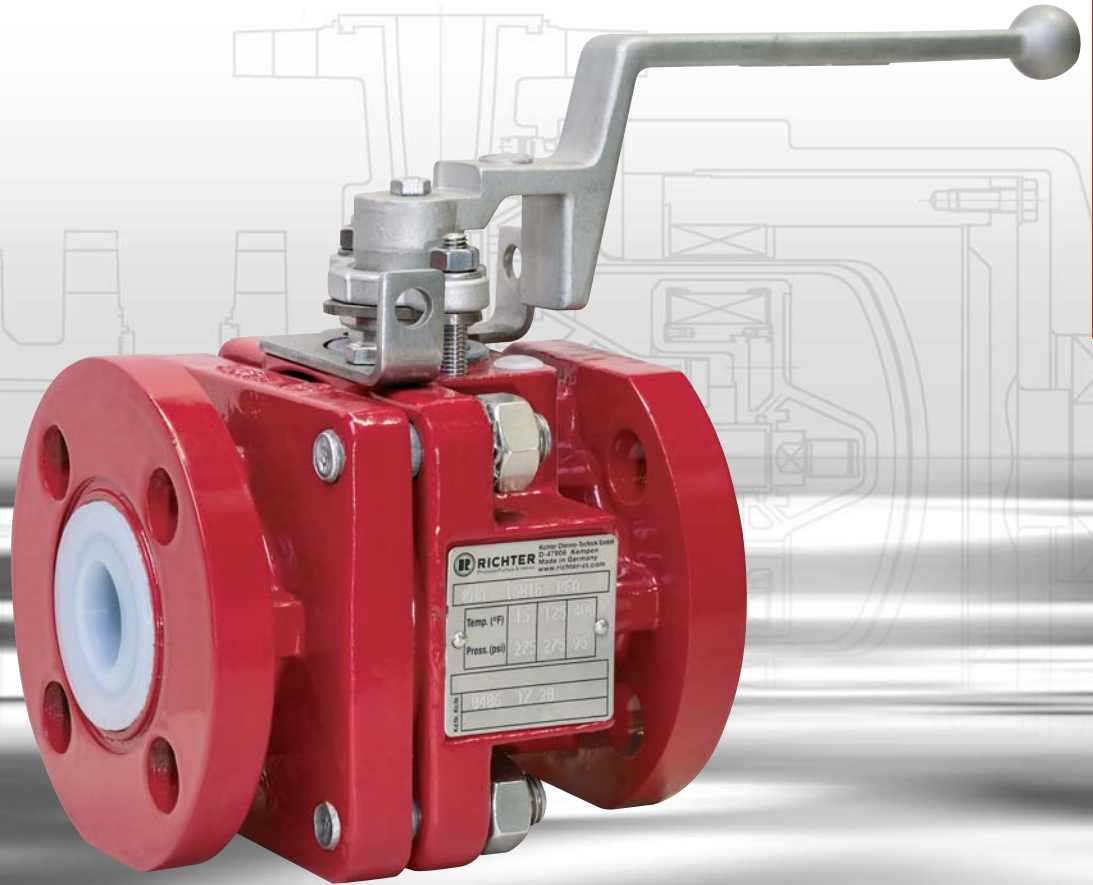


# Richter Manual and Automated Full Bore Ball Valves



- Lining PFA/PTFE
- PFA-P highly permeation-resistant
- PFA-L antistatic lining
- ENVIPACK stem packing

## Richter Manual and Automated Full Bore Ball Valves

### Fields of applications

Richter ball valves have proved successful in a wide variety of process plants.

### The Richter ball valves are designed

- as shut-off and automated valves for corrosive and hazardous liquids
- for media where stainless steel is not sufficiently corrosion-resistant
- as an alternative to valves made of exotic special metals

### Product features

- **Full port flow path** increases the Cv of the valve and decreases pressure loss, resulting in a more efficient piping system.
- **Minimum 1/8" lining thickness** provides a greater barrier against permeation of the lining and an increased resistance to chemical attack.
- **One-piece ball/stem design** eliminates individual plastic lined mating components, resulting in higher pressure/temperature ratings and reducing the potential of ball or stem failure.
- **Specially manufactured PTFE seat rings** provide a spring load on the ball.
- **Dovetail and fishhook grooves** machined in the valve casting ensure locking of the plastic lining to the body and reduce the effect of liner loading at the flanges.
- **Standard epoxy coated body** and stainless steel hardware provide maximum atmospheric corrosion protection.
- **Universal ISO 5211 mounting dimensions** and quarter-turn design simplify valve actuation.
- **Multiple product options** include locking devices, gear operators, and a ceramic ball for handling erosive/corrosive services.
- Locking device standard.

### Type code

Ball valve – manually operated	KNA/...
Ball valve – automated	KNAP/...
Materials	
PFA lining	.../F
PFA lining, antistatic	.../L
PFA-P lining, highly permeation resistant	.../P



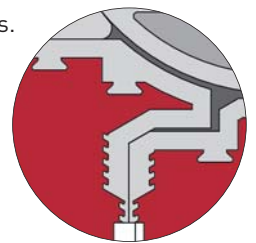
The Richter control ball valve KNAR Equal percentage control in a corrosion resistant valve package (see separate brochure)

## Providing full flow capabilities in an ASME (ANSI) CL. 150 Design

- Designed to **provide service where maximum flow and minimum pressure drop is desired**, the Richter full port ball valve meets the ASME (ANSI) piping system requirements.
- The KNA series features ANSI B.16.10 face-to-face dimensions and ANSI B.16.5 class 150 flanges, making it **suitable for installing into virtually any type of piping**.
- Employing an ASTM A395 cast ductile cast iron outer shell with a **thick walled PFA lining** the KNA **supplies maximum performance** in the most corrosive and high temperature chemical services.
- The KNA series is **available in 1/2" - 8"/6" sizes** and can be supplied with **several ball options** for added application flexibilities. Optional DIN/ISO face-to-face available.

### Permanent body flange sealing

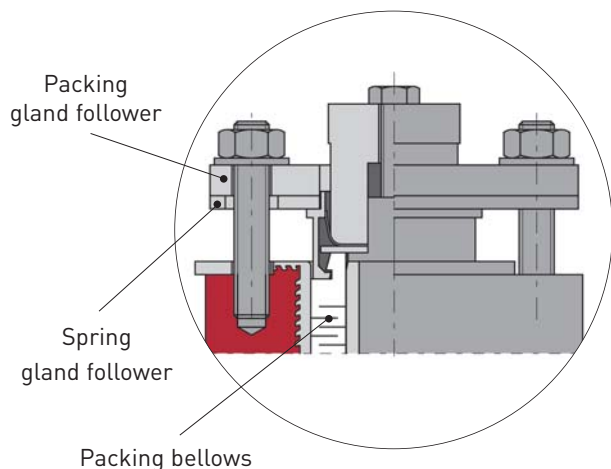
- Concerning to all plastic lined means of obtaining a **tight seal between the two lined body components**.
- The Richter KNA Ball Valve achieves **permanent body flange sealing** even under the most frequent thermal cycling conditions. The body sealing zone is characterized by **full lining thickness and a labyrinth-like flow path** which maximizes the surface contact between the mating components.
- The body pieces **position themselves properly** by means of the cup and cone shapes of each piece.
- The effects of temperature variations are controlled by the **almost metal-to-metal flange contact** in the circumference area close to the flange bolting. With this unique design, **neither retightening of the body bolts nor the use of spring washers is required**.



### Innovative ENVIPACK stem seal design

Since its initial introduction, the Richter series KNA full port ball valve has gained a reputation for **outstanding stem seal performance** under the most challenging conditions of thermal cycling and corrosive chemicals. As illustrated, the KNA stem seal utilizes a **machined PTFE packing insert ENVIPACK**. It is practically free of maintenance even during hot/cold cycles. The

stainless steel spring gland follower, visually displays the loading connection. Controlled manual adjustment is easily possible. With this patented design, **dynamic loading of the stem seal** to compensate for temperature and pressure variables is created by the spring gland follower. 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 preventative maintenance program.



### Optional cavity-free CF-ball

In applications where it is imperative to **prevent process fluid from becoming trapped in the ball or within the body cavity of the valve**, the CF-ball can be specified. Utilizing a large vent port on one side of the ball, this one-pieceball/stem design **prevents media with a high rate of expansion from overpressurizing the valve body**. When installed in a vertical position, this optional ball also functions to drain the valve cavity, **reducing the potential entrapment of contaminating media**.



### Standard bolts

Stainless steel.  
Other material on request

### Operating torques ball/stem unit

Inch	Δp in psi (bar)									
	45 (3)		85 (6)		145 (10)		235 (16)		max. adm.	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/2"	71	8	71	8	71	8	89	10	620	70
3/4"	71	8	71	8	71	8	89	10	620	70
1"	106	8	71	8	71	8	89	10	620	70
1 1/2"	133	15	133	15	133	15	177	20	1990	225
2"	177	20	177	20	177	20	221	25	1990	225
3"	443	50	443	50	549	62	708	80	4425	500
4"	708	80	708	80	814	92	974	110	4425	500
6"	1770	200	2036	230	2390	270	2744	310	19470	2200
8" <sup>1)</sup>	1770	200	2036	230	2390	270	2744	310	19915	2250

<sup>1)</sup> Reduced bore 6"

\* Testing based on water 68 °F. Torques may increase depending on media, namely gases, viscous liquids, crystallizing liquids etc.

Consult Richter for specific recommendations on these services.

Nm = Newton Meters

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

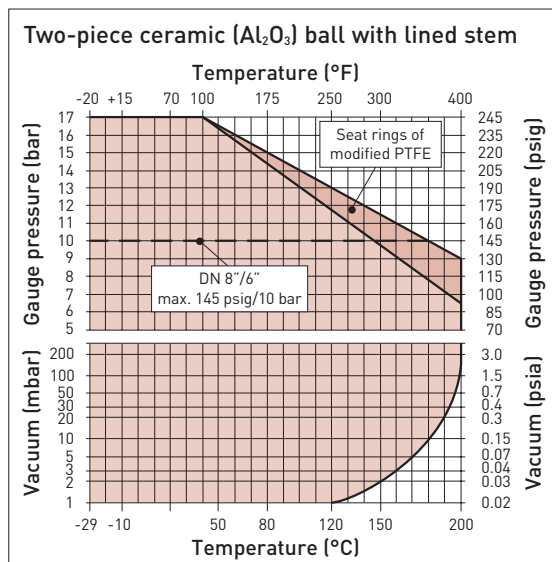
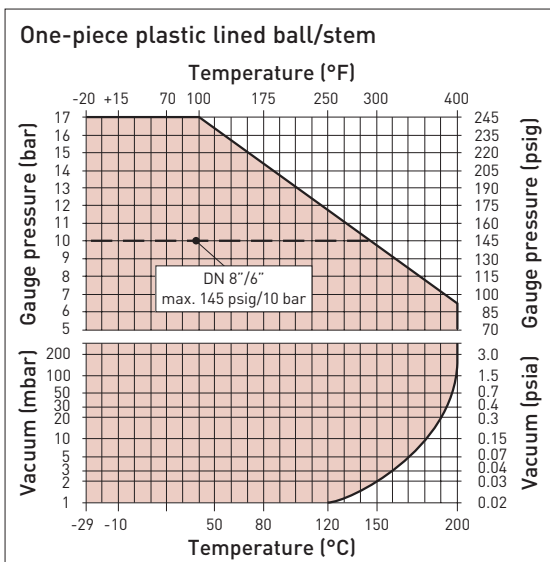
Inch	Δp in psi (bar)									
	45 (3)		85 (6)		145 (10)		235 (16)		max. adm.	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/2"	89	10	89	10	89	10	106	12	248	28
3/4"	89	10	89	10	89	10	106	12	248	28
1"	89	10	89	10	89	10	106	12	248	28
1 1/2"	177	20	177	20	177	20	221	25	708	80
2"	221	25	221	25	221	25	266	30	1060	120
3"	531	60	531	60	637	72	797	90	2215	250
4"	797	90	1151	130	1328	150	1682	190	3100	350
6"	398	350	3540	400	5133	580	6416	725	10620	1200
8" <sup>1)</sup>	1770	200	2036	230	2390	270	2744	310	10620	1200

### Flow Rates

Nom. size (inch)	Cv (US gpm)	k <sub>v</sub> (m <sup>3</sup> /h)
1/2"	20	17.2
3/4"	36	30.9
1"	70	60
1 1/2"	221	190
2"	326	280
3"	684	587
4"	1456	1250
6"	3262	2800
8" <sup>1)</sup>	3728	3200

<sup>1)</sup> Reduced bore 6"

Cv values have been determined based on water (Sg=1) flowing at 68 °F at a pressure drop of 1 psi.



## Materials, dimensions, weights

### Components and materials

Item	Designation	Material
101	Main Body	Ductile Iron ASTM A395; PFA Lined <sup>1)</sup>
102	Body End Piece	Ductile Iron ASTM A395; PFA Lined <sup>1)</sup>
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>2)</sup>
403	Packing Bellows	PTFE <sup>3)</sup>
405/1	Thrust Ring	Stainless Steel
502	Spring Gland Follower	Stainless Steel
503	Packing Gland Follower	Stainless Steel
510	Bracket	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> Conductive lining available upon request in PFA
- <sup>2)</sup> Modified PTFE seat rings supplied with ceramic ball for high temperature services
- <sup>3)</sup> Consult factory for optional double packing bonnet materials/dimensions

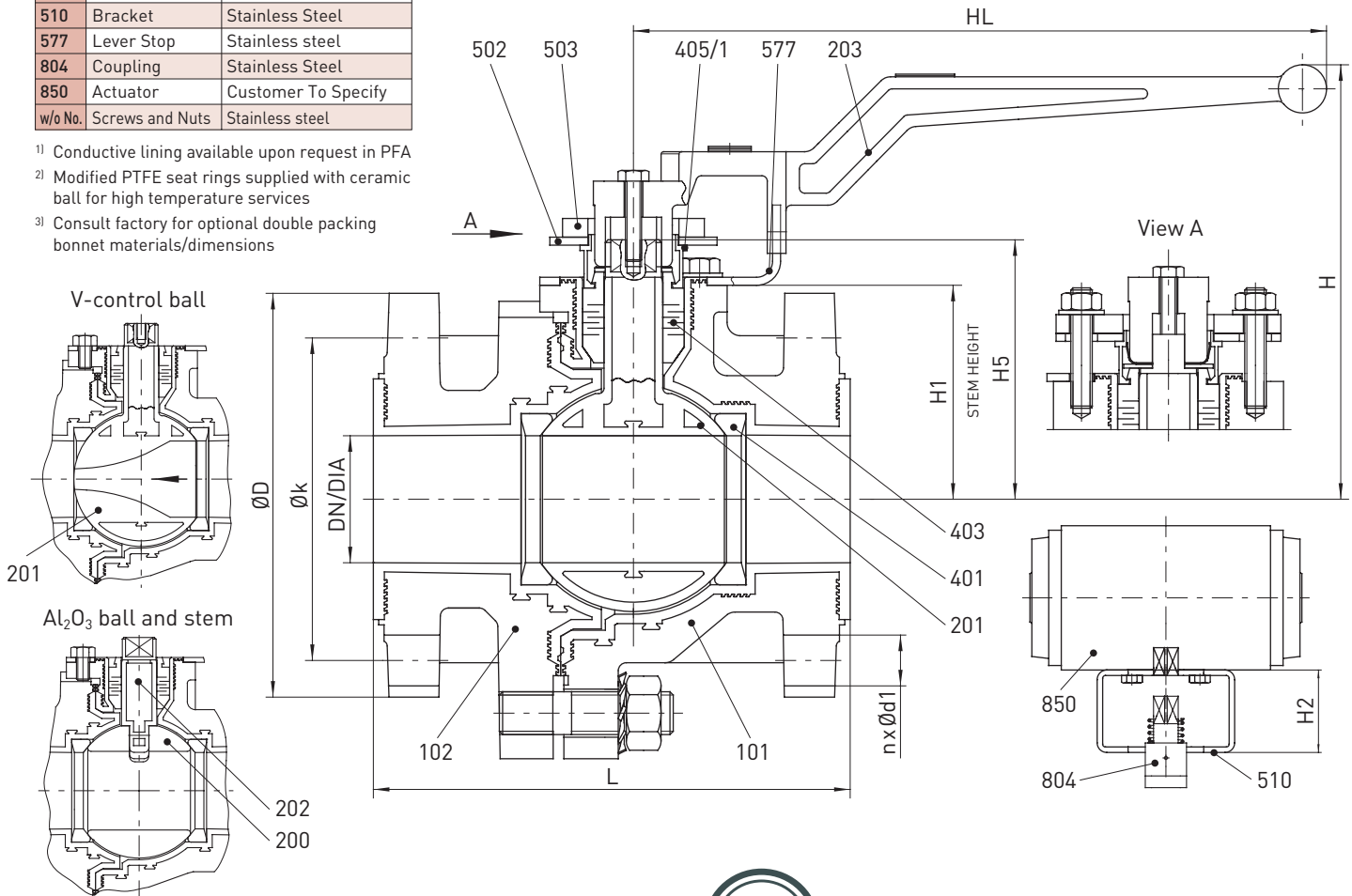
### Dimensions and weights

	L	HL	H	Ø D	Ø k	n x Ø d1	H1	H5	H2	Weight* app.
Inch	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	lbs (kg)
1/2" <sup>1)</sup>	5.1 (130)	7.05 (179)	5.12 (130)	3.50 (89)	2.375 (60.5)	4x5/8 (4x16)	1.97 (50)	2.36 (60)	2.36 (60)	12.3 (5.6)
3/4" <sup>1)</sup>	5.9 (150)	7.05 (179)	5.12 (130)	3.87 (98.5)	2.75 (70)	4x5/8 (4x16)	1.97 (50)	2.36 (60)	2.36 (60)	13.2 (6.0)
1"	5.0 (127)	7.05 (179)	5.12 (130)	4.25 (108)	3.125 (79.5)	4x5/8 (4x16)	1.97 (50)	2.36 (60)	2.36 (60)	12.3 (5.6)
1 1/2"	6.5 (165)	10.24 (260)	6.1 (155)	5.0 (127)	3.875 (98.5)	4x5/8 (4x16)	3.03 (77)	3.70 (94)	2.36 (60)	26.4 (12.0)
2"	7.0 (178)	10.24 (260)	6.1 (155)	6.0 (152.5)	4.75 (120.5)	4x3/4 (4x19)	3.15 (80)	3.82 (97)	2.36 (60)	31.9 (14.5)
3"	8.0 (203)	12.32 (313)	7.09 (180)	7.5 (190.5)	6.0 (152.5)	4x3/4 (4x19)	4.64 (118)	5.51 (140)	3.15 (80)	73.7 (33.5)
4"	9.0 (229)	12.32 (313)	7.68 (195)	9.0 (229)	7.5 (190.5)	4x3/4 (4x19)	5.27 (134)	6.14 (156)	3.15 (80)	110 (50.0)
6"	10.5 (267)	20.27 (515)	10.43 (265)	11.0 (279.5)	9.5 (241.5)	8x7/8 (8x22.5)	7.24 (184)	8.46 (215)	3.94 (100)	200 (91.0)
8" <sup>2)</sup>	18.0 (457)	17.13 (435)	10.63 (270)	13.5 (343)	11.75 (298.5)	8x7/8 (8x22.5)	7.24 (184)	8.46 (215)	3.94 (100)	275 (125.0)

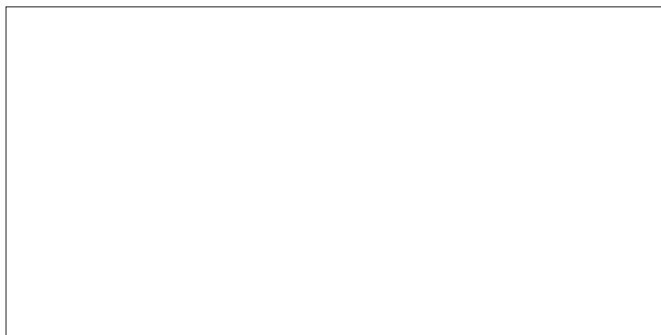
\* Weights shown are applicable to all manual valves. Consult factory for weights of valves with actuators.

<sup>1)</sup> Not according to ASME/ANSI

<sup>2)</sup> Reduced bore 6"



Presented by:



**RICHTER**  
Process Pumps & Valves

**Richter Inc.**

500 Fifth Avenue, Suite 4810, New York, NY 10110

NA Sales: Tel. +1 (0) 225/756-90 50

Fax +1 (0) 225/752-87 70

Headquarter:

**Richter Chemie-Technik GmbH**

Otto-Schott-Str. 2, D-47906 Kempen, Germany

Tel. +49 (0) 21 52/146-0, Fax 146-190

[www.richter-ct.com](http://www.richter-ct.com), [richter-info@richter-ct.com](mailto:richter-info@richter-ct.com)