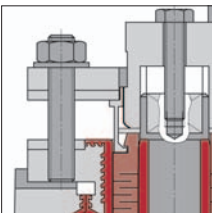
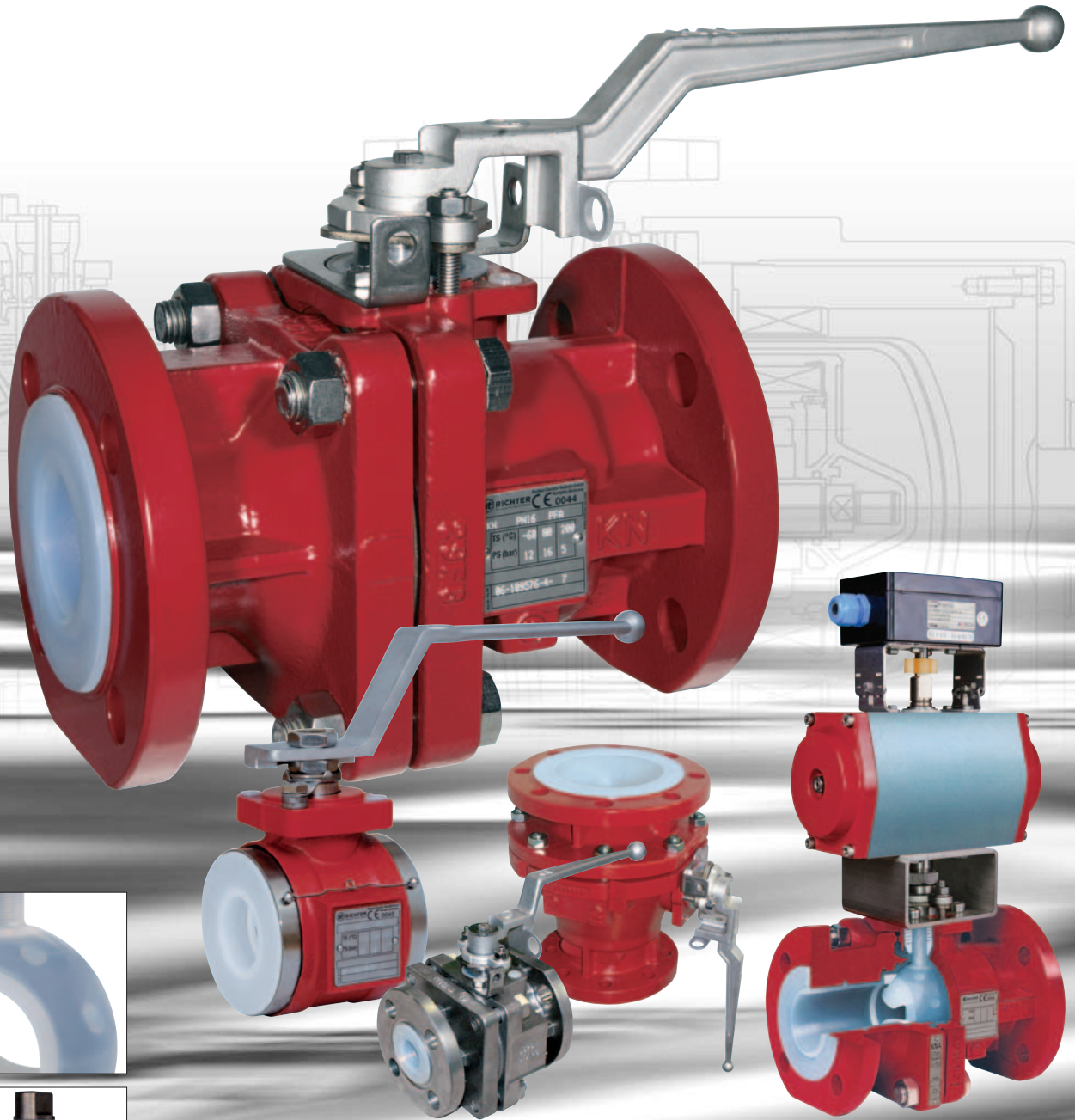


Richter heavy-duty ball valves

– shut-off, control and drain valves –



ISO/DIN, ASME/ANSI

Lining PFA,
optionally
PFA-P, PFA-L, PFA-HP

Maintenance-free
ENVIPACK stem sealing

-75 to +400 °F (-60 to +200 °C)



RICHTER
Process Pumps & Valves



Heavy duty ball valves with ENVIPACK stem sealing

The ball valve family, KN, excels by offering problem solutions from a modular system. The selection of fluoroplastic linings (i.e. PFA), the large temperature/pressure range and the numerous options permit a tailor-made solution for virtually every application involving highly corrosive and ultrapure media – with more or less the same components!

The standard KN/KNA modular system:

1 ASME/ANSI + 1 ISO/DIN body, 4 lining materials, 1 universal stem sealing, 4 standard ball versions. In addition, Richter's speciality: customised special solutions.

The ball valves of the KN/KNA family are

- Shut-off and control valves for highly aggressive fluids
- For applications where stainless steel, special metals and standard plastics are not sufficiently corrosion-resistant
- The lower-cost alternative to special metals
- Suitable for pure, ultrapure and solids-laden media
- AAR Association of American Railroad certified (KA-N, KNA)

Product features

- 1-piece, PFA-lined ball/stem, optionally Al₂O₃ ball and special versions
- 1/2"-8" and DN 15-200, full bore (apart from 8" and DN 200)

Type codes

	manual actuation		remote actuation	
	Shut-off valve	Control valve	Shut-off valve	Control valve
• ISO/DIN	KN/...	KNR/...	KNP/...	KNRP/...
• ASME/ANSI short	KNA/...	KNAR/...	KNAP/...	KNARP/...

Lining

- PFA .../F
- Antistatic PFA-L .../F-L
- Highly permeation-resistant PFA-P .../F-P
- Ultrapure (i.e. pharma applications) .../F-HP

Ball valve series selection

Outline of the features that can be configured

Options	KN	KNA	KNR	KNAR	KA-N	KK
ISO/DIN face-to-face, flanges PN 16 ① / ISO/DIN face-to-face, flanges PN 25 (DN 25-80)	•/•		•/•		②	③
ASME/ANSI short face to face, flanges Cl. 150		•		•		
Shut-off/control	•/-	•/-	•/•	•/•	•/-	•/-
ENVIPACK bellows-type packing	•	•	•	•	•	•
Operating temperature up to -20 °F/400 °F (150 °C/200 °C)	•/•	•/•	•/•	•/•	•/•	•/-
Operating temperature down to -20 °F/-75 °F (-30 °C/-60 °C)	•/•	•/•	•/•	•/•	•/•	•/•
Vacuum applications	•	•	•	•	•	•
Solids-containing fluids ④	•	•	⑤	⑤	•	•
Ultrapure media	•	•	•	•	•	
TF ball/stem for optimum drainability	•	•			•	
Low-cavity	•	•	•	•	•	•
Lining pure PFA, 1/2"/1/8" (3,5 mm/5 mm)	•/•	•/•	•/•	•/•	•/•	•/-
Lining antistatic PFA-L	•	•	•	•	•	•
Lining highly permeation-resistant PFA-P	•	•	•	•	•	•
Lining ultrapure PFA-HP	•	•	•	•	•	•
One-piece PFA-lined ball/stem	•	•	•	•	•	
PFA-lined ball, separate stem						•
Al ₂ O ₃ ceramic ball, separate stem	•	•			•	•
Body ductile cast iron/stainless steel (1"-2")	•/-	•/•	•/-	•/•	•/-	•/-

① 1/7" (3.5 mm) Consistent thick lining made of pure PFA

- High permeation resistance
- Vacuum-proof anchoring
- 1/8" (5 mm) wall thickness option (≥ 1"/DN 25)
- Optional antistatic lining PFA-L, PFA-HP ultrapure or PFA-P particularly highly permeation-resistant

② Body made of ductile cast iron

EN-JS 1049/ASTM A395, absorbs the system and pipe forces.

③ Permanently tight body connection

- Allows frequent temperature changes
- Sealing surface ③a with full lining
- Labyrinth-like sealing ③b: maximum surface pressure between the body halves
- Body halves center themselves exactly to each other owing to the fit ③c.
- **Virtual metallic contact ③d** absorbs pipe forces (see page 3)

④ Different ball versions (see page 3)

- Standard one-piece ball/stem with 1/8" (3 mm) lining and stainless steel core
- Eliminates the fits of 2-piece plastic-lined ball/stem versions which are less load-bearing
- Thus optimising operational reliability
- Optional ball versions, see page 3

⑤ Resilient PTFE seat rings; spring loaded

Permanent pre-tension of the ball, gas-tight seal

⑥ Richter ENVIPACK stem sealing with active stainless steel packing gland follower ⑥a

- Conformity with German Clean Air Act (TA Luft), self-adjusting
- Bellows-type packing insert ⑥b, gas-tight to EN 12266 leakage rate A
- Virtually maintenance-free sealing even with frequent hot/cold cycles
- Visual inspection of the pre-tensioning action
- Can be re-adjusted from outside in a controlled manner ⑥c

⑦ Universal ISO 5211 connection

⑧ External corrosion protection

Epoxy coating. Stuffing box, lever, screws/nuts made of stainless steel

① On request, flanges drilled to ASME/ANSI Cl. 150

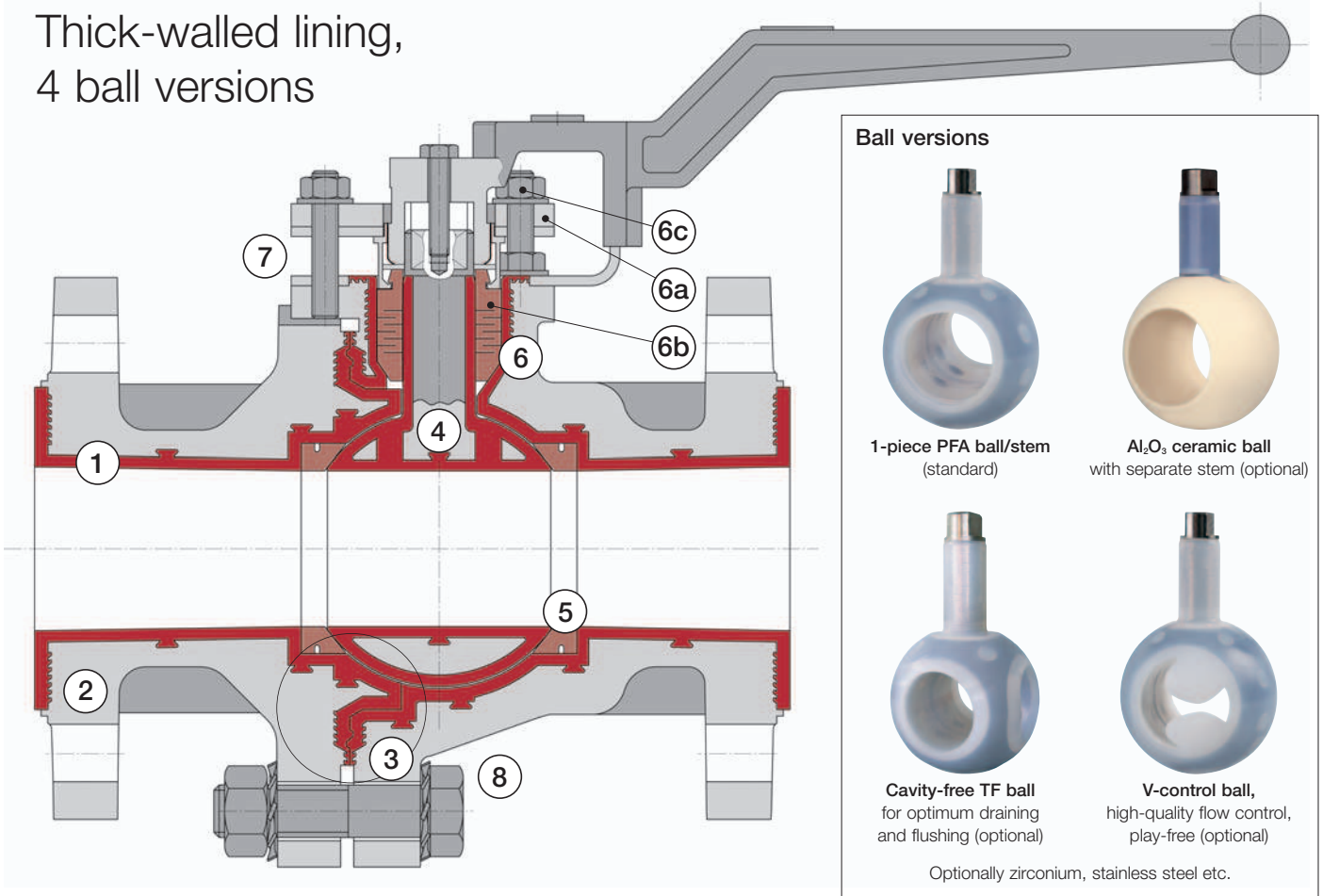
② Special face to face, see tables on page 7

③ Flangeless compact design, face to face = DN + 50 mm

④ Solids: in general, consultation with manufacturer recommended

⑤ Limited suitability

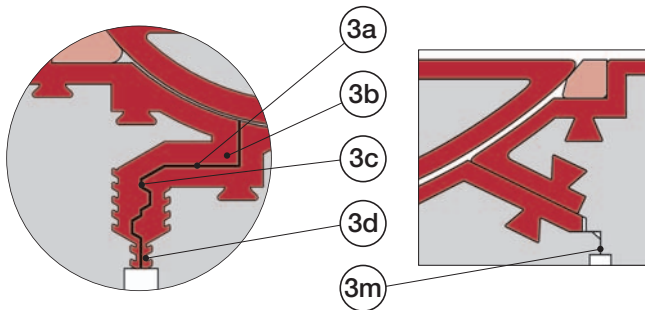
Thick-walled lining, 4 ball versions



Why “Virtual metallic contact” instead of “metallic contact”?

Richter’s “virtual metal-to-metal contact”, permanently tight:

The body lining (3d) tappers to about 0.02” (0.5 mm) permitting the inner flange connection to be retightened. Leakage is highly improbable thanks to the labyrinth-type design (3b) typical of Richter.

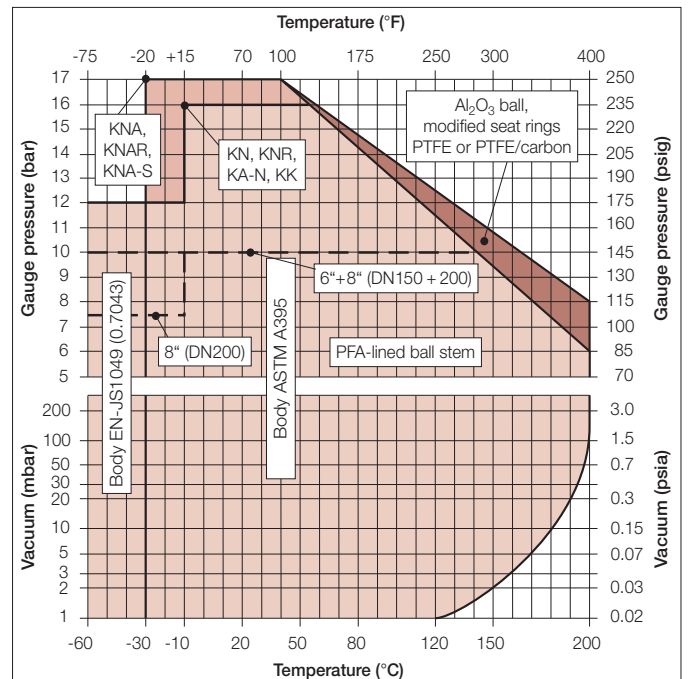


What are the disadvantages of lined valves with “metallic connection”?

The body halves are bolted together with full metallic contact (3m). Retightening is not possible, any leak that occurs cannot be stopped. The cavity between the lining and the metallic contact also prevents the early detection of any leak.

Pressure/temperature range

Operating pressures up to 25 bar on request



Body EN-JS 1049 (0.7043)/PFA:

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

Body ASTM A395/PFA:

-20 °F (-30 °C) to 400 °F (+200 °C); max. 250 psi (17.2 bar) acc. to ASME B16.42

For applications at low temperatures, please observe the local regulations!

Operating temperatures below 15 °F (-10 °C): special material for ball stem core

Richter drain reduction valves KA-N with ENVIPACK stem sealing

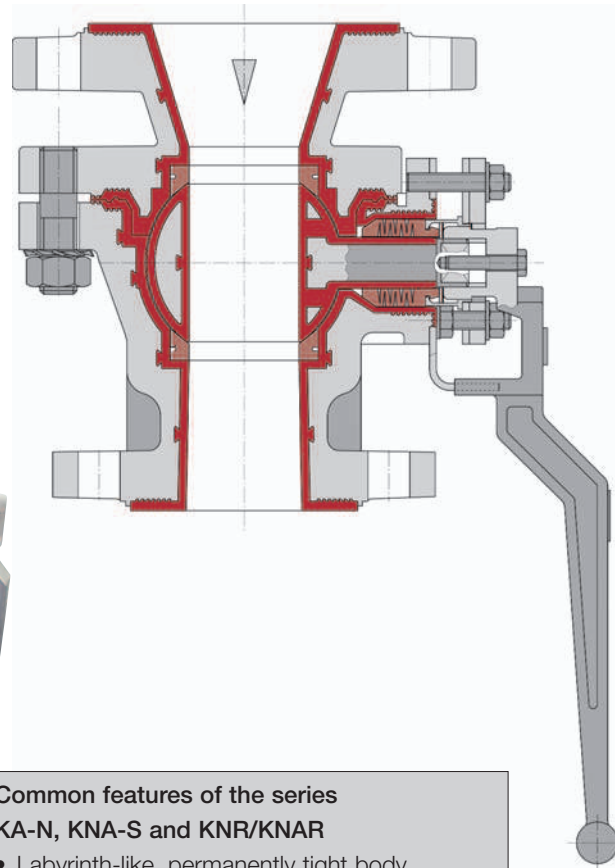
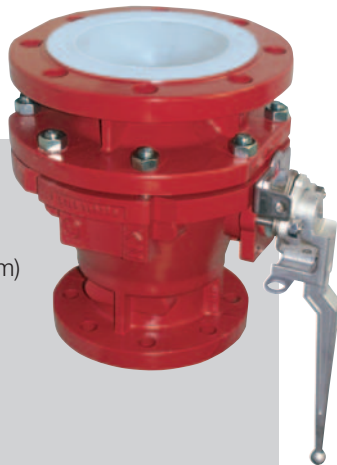
Drain reduction valves are compact, sturdy vessel drain valves and much lower-priced than sliding stem valves.

The KA-N has – apart from the tapered inlet nozzle – the same design as the ball valve series KN.

The pressure/temperature range, design features, material range and the major spare parts are identical.

Product features

- Full bore
- 2" / 1" (Ø 1") to 8" / 6" (Ø 6")
DN 50/25 (Ø 25 mm) to 150/100 (Ø 100 mm)
- -75 to +400 °F (-60 to +200°C),
see diagram on page 3
- Face-to-face: see table on page 7
- Flanges ISO/DIN 7005-2 PN 16,
on request, drilled to ANSI B16.10 Cl.150



Other options:

- High-purity version for pharmaceutical or semiconductor industries
- Body heating jacket, stem extension etc.

PFA lined stainless steel shut-off and control valves to ASME/ANSI

The PFA-lined stainless steel KNA-S is predestined for the shut-off and control of corrosive fluids.

- In clean-room environments where high-quality exterior surfaces without paint are preferred
- In corrosive atmospheres, e.g. in HF, HNO₃ and pickling plants
- In processes where the fluid itself must not come into contact with ductile cast iron if the lining is damaged.

The pressure/temperature range as well as the components balls, seat rings, stem sealing and valve actuation correspond to those of the KN and KNA series, see page 3.

Product features

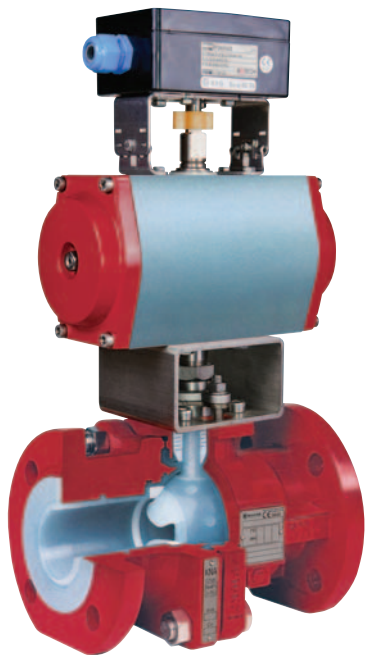
- Precision cast stainless steel 1.4408 (316, CF8M), lining PFA
- Straight-through flow
- 25 mm (1") to 50 mm (2"), other nominal sizes on request
- -75 to +400 °F (-60 to +200 °C), see diagram on page 3
- Very low temperatures down to -400 °F (-200°C) on request
- Face-to-face acc. to ASME/ANSI 16.10/short, face to face ISO/DIN on request
- Flanges ASME/ANSI B 16.10 Cl.150, on request drilled to ISO 7005-2 PN 16.

Common features of the series KA-N, KNA-S and KNR/KNAR

- Labyrinth-like, permanently tight body connection
- Lining 1/7" (3.5 mm) virgin PFA, optionally PFA-L antistatic or PFA-P highly permeation-resistant
- Self-adjusting, maintenance-free ENVIPACK stem sealing
- Resilient seat rings, gas-tight in the seat
- Conformity with the German Clean Air Act
- Lockable stainless steel lever
- Actuator mounting to ISO 5211, optionally head flange to ISO
- Low-cavity as standard feature
- One-piece PFA ball stem, optionally Al₂O₃ ceramic ball with separate stem, cavity-free TF ball, all blowout-proof
- Or V-control ball with high-quality control performance for KNR and KNAR

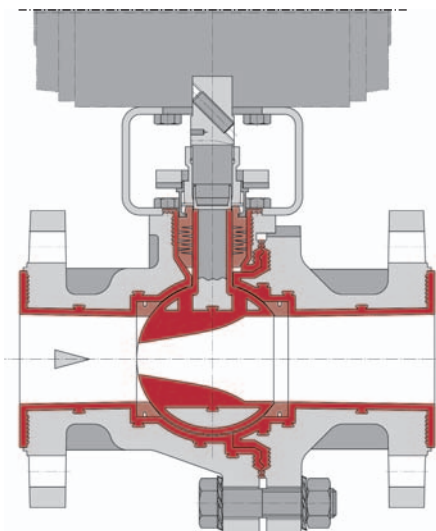


Richter control valves KNR and KNAR with play-free torque transmission



bellows-type, sliding stem valves. Valve bodies, seat rings and the ENVIPACK stem sealing are identical to those of the shut-off valves KN and KNA as are the selection of material and the pressure/temperature range.

Advantages: minimum stock of spare parts, conversion from shut-off to control valve possible.



With the series KNR (ISO/DIN) and KNAR (ASME/ANSI) compact control valves with high control accuracy are available to plant operators. In many applications the KNR/KNAR are economical alternatives to

Product features

- 3-6 finely graduated k_{vs}/Cv -values per nominal size
- Equal percentage characteristic acc. to DIN EN 60534, linear by means of positioner
- 1/2" to 8" (DN 15-200)
- -75 to +400 °F (-60 to +200 °C), see diagram on page 3
- Face-to-face according to
 - ISO/DIN 5752 R.1 (apart from DN 200/8")
 - ASME/ANSI B 16.10/8, Cl.150
- Flanges to
 - ISO/DIN 7005-2 PN 16 (8" (DN 200): PN 10), 1"-3" (DN 25-80) optionally PN 25 with PB 16 bar,
 - ASME/ANSI B16.5 Cl.150

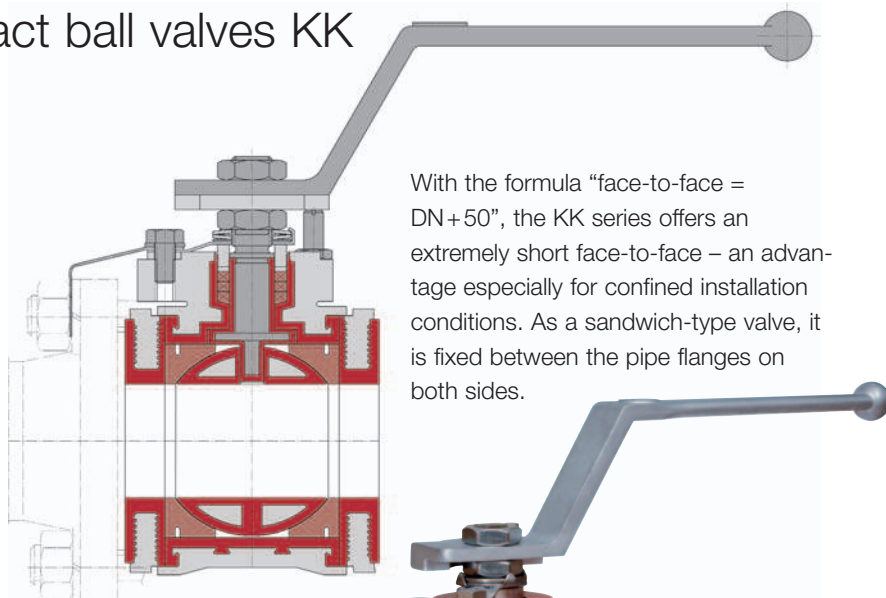
Other options:

- Extra thick body lining: 1/5" (5 mm) PFA for permeating media
- High-purity version for pharmaceutical and semiconductor industries
- Body heating jacket

Richter flangeless compact ball valves KK

Product features

- Lining 1/7" (3.5 mm) virgin PFA
- Body of ductile cast iron EN-JS 1049 (ASTM A395)
- 1" - 6" (DN 25-150), PN 16 (6" (DN 150) = PN 10)
- Full bore with 1" - 2" (DN 25-50), reduced bore with $\geq 2\frac{1}{2}$ " (DN 65)
- -75 to +360 °F (-60 to +180 °C)
- Flangeless, face-to-face: 2" (DN+50 mm), e.g. 2" (DN 50) = 4" (100 mm)
- Self-adjusting, maintenance-free stem sealing
- Resilient seat rings, gas-tight in the seat
- Conformity with German Clean Air Act
- TÜV AGG-certified to "dangerous goods" GGVSE/ADR/RID ch. 6.8
- Stainless steel lever
- Actuator mounting to ISO 5211
- PFA ball with separate stem, Al₂O₃ ceramic ball option, blowout-proof
- Stainless steel grounding rope



With the formula "face-to-face = DN+50", the KK series offers an extremely short face-to-face – an advantage especially for confined installation conditions. As a sandwich-type valve, it is fixed between the pipe flanges on both sides.

Other options:

- Stem extension
- Different ball materials
- Low-cavity (see Fig.)

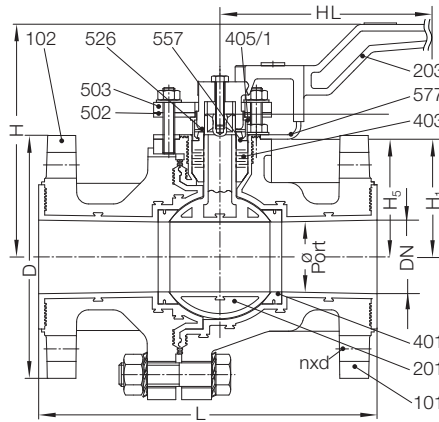
Components and materials, operating torques, k_v/C_v -values

Components and materials

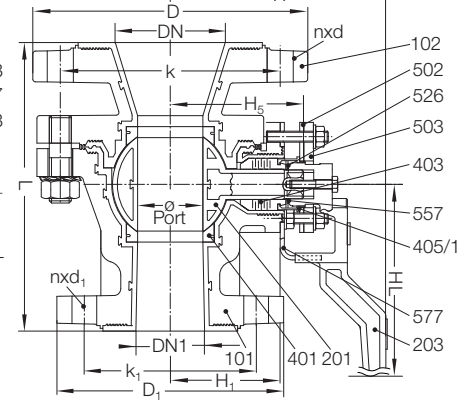
Item	Designation	Material
101	Main body	Ductile cast iron EN-JS1049 (ASTM A395), PFA-lined
102	Body end piece	optionally PFA-L antistatic or PFA-P highly permeation-resist.
109	Transition cover	Stainless steel/PTFE
200	Ball	Al ₂ O ₃ 99,7 %, stainl. steel/PFA (only KK)
201	Ball stem unit	Stainless steel, PFA-lined
202	Stem	optionally PFA-L antistatic or PFA-P highly permeation-resist.
203	Lever	Stainless steel
401	Seat rings	PTFE (Al ₂ O ₃ ball: TFM-PTFE)
402/1	Packing ring	PTFE
403	Packing bellows	PTFE
405/1	Thrust ring	Stainless steel
502	Spring gland follower	Stainless steel
503	Packing gland follower	Stainless steel
504	Cup spring assembly	Stainless steel
510	Bracket	Stainless steel
512	Sleeve nut	Stainless steel
526	Retaining washer	Stainless steel
532	Grounding rope	Stainless steel
557	Grounding spring washer	Stainless steel
577	Lever stop	Stainless steel
804	Coupling, play-free	Stainless steel
850	Actuator	to customer request
904/4	Setscrew	Stainless steel
w/o Nr.	Screws and nuts	Stainless steel

All torques: Test medium water 20 °C, seat rings of pure PTFE. The torques may vary depending on the medium (dry gases, crystallising media, oil contents etc.)

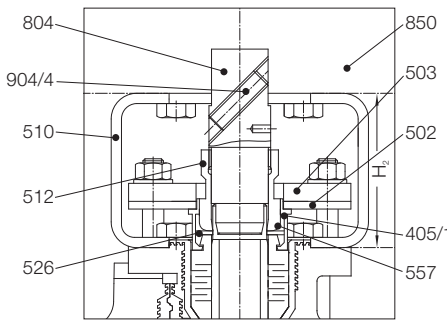
Series KN, KNA, KNR, KNAR



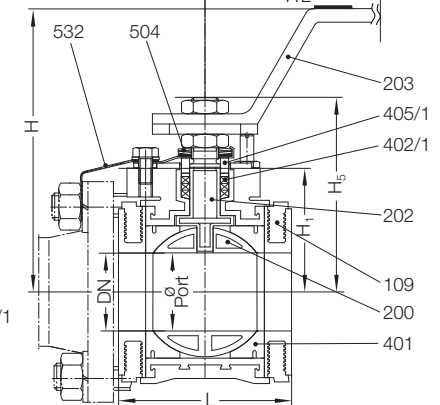
Series KA-N



Play-free coupling for KNR, KNAR



Series KK



KK: Operating torques (incl. breakaway torques) with PFA-lined or with Al₂O₃-ball

KK		Operating torques										k _v /C _v -values*	
DN		Δp 45 psi/ 3 bar		Δp 85 psi/ 6 bar		Δp 145 psi/ 10 bar		Δp 235 psi/ 16 bar		max. admissible		k _{vs}	C _v
inch	mm	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	m ³ /h	USgpm
1"	25	7	62	7	62	7	62	7	62	20	177	51	59
1½"	40	15	133	15	133	15	133	18	159	50	443	150	175
2"	50	15	133	15	133	15	133	18	159	50	443	248	289
2½"	65	15	133	15	133	15	133	18	159	50	443	300	350
3"	80	40	354	40	354	42	372	50	443	120	1062	455	530
4"	100	60	531	60	531	64	566	80	708	250	2213	830	967
6"	150	100	885	113	1000	180	1593	-	-	500	4425	1270	1480

k_v/C_v-values*

KN, KNA, KNR, KNAR, KA-N: Operating torques (incl. breakaway torques) with PFA-lined ball

KN, KNA, KNR, KNAR				KA-N		Operating torques								k _v /C _v -values*	
DN		DN/DN1		Δp 45 psi/3 bar		Δp 85 psi/6 bar		Δp 145 psi/10 bar		Δp 235 psi/16 bar		max. admissible		k _{vs}	C _v
inch	mm	inch	mm	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	m ³ /h	USgpm
½"	15	-	-	8	71	8	71	8	71	10	89	70	620	17,5	20
¾"	20	-	-	8	71	8	71	8	71	10	89	70	620	31	36
1"	25	2"/1"	50/25	12	106	12	106	12	106	12	106	70	620	75	87
1½"	40	-	-	20	177	20	177	20	177	25	221	225	1990	200	233
2"	50	3"/2"+4"/2"	80/50+100/50	25	221	25	221	25	221	30	266	225	1990	310	361
3"	80	-	-	60	531	60	531	65	575	80	708	500	4425	800	932
4"	100	6"/4"	150/100	80	708	80	708	90	797	170	1505	500	4425	1250	1456
6"	150	-	-	200	1770	250	2213	350	3098	-	-	2200	19470	2800	3262
8"	200	-	-	200	1770	250	2213	350	3098	-	-	2250	19913	3200	3728

k_v/C_v-values*

KN, KNA, KNR, KNAR, KA-N: Operating torques (incl. breakaway torques) with Al₂O₃ ball

KN, KNA, KNR, KNAR				KA-N		Operating torques								k _v /C _v -values*	
DN		DN/DN1		Δp 45 psi/3 bar		Δp 85 psi/6 bar		Δp 145 psi/10 bar		Δp 235 psi/16 bar		max. admissible		k _{vs}	C _v
inch	mm	inch	mm	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	m ³ /h	USgpm
½"	15	-	-	10	89	10	89	10	89	12	106	28	248	17,5	20
¾"	20	-	-	10	89	10	89	10	89	12	106	28	248	31	36
1"	25	2"/1"	50/25	12	106	12	106	12	106	12	106	28	248	75	87
1½"	40	-	-	20	177	25	221	30	266	45	398	80	708	200	233
2"	50	3"/2"+4"/2"	80/50+100/50	25	221	30	266	35	310	50	443	120	1062	310	361
3"	80	-	-	60	531	100	885	160	1416	220	1947	250	2215	800	932
4"	100	6"/4"	150/100	80	708	130	1151	200	1770	280	2478	350	3098	1250	1456
6"	150	-	-	350	3098	450	3983	600	5310	-	-	1200	10620	2800	3262
8"	200	-	-	350	3098	450	3983	600	5310	-	-	1200	10620	3200	3728

k_v/C_v-values*

* for KNR and KNAR k_v/C_v-values see separate brochure

Dimensions, weights

KN, KNR (ISO/DIN): Installation dimensions and approx. weights

Face-to-face ISO 5752 series 1 (DIN 3202 F1), flanges ISO 7005-2**

DN	Ø Port		L		HL		H		D		k		nxd ₁		EN ISO 5211	H ₁		H ₅		H ₂		Weight man. act.		
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		inch	mm	inch	mm	inch	mm	inch	mm	kg
1/2"	15	0.59	15	5.12	130	7.0	179	5.12	130	3.74	95	2.56	65	4x0.55	4x14	F05	1.97	50	2.36	60	2.36	60	12.3	5.6
3/4"	20	0.79	20	5.91	150	7.0	179	5.12	130	4.13	105	2.95	75	4x0.55	4x14	F05	1.97	50	2.36	60	2.36	60	13.2	6
1"	25	0.96	24.5	6.30	160	7.0	179	5.12	130	4.53	115	3.35	85	4x0.55	4x14	F05	1.97	50	2.36	60	2.36	60	13.2	6
1 1/2"	40	1.50	38	7.87	200	10.2	259	6.10	155	5.91	150	4.33	110	4x0.75	4x19	F07	3.03	77	3.70	94	2.36	60	30.9	14
2"	50	1.87	47.5	9.06	230	10.2	259	6.10	155	6.5	165	4.92	125	4x0.75	4x19	F07	3.15	80	3.82	97	2.36	60	35.3	16
3"	80	3.07	78	12.2	310	16.1	410	7.09	180	7.87	200	6.30	160	8x0.75	8x19	F10	4.65	118	5.51	140	3.15	80	77	35
4"	100	3.78	96	13.8	350	16.1	410	7.68	195	8.66	220	7.09	180	8x0.75	8x19	F10	5.28	134	6.14	156	3.15	80	121	55
6"	150	5.71	145	18.9	480	20.2*	513*	10.4	265	11.2	285	9.45	240	8x0.91	8x23	F12	7.24	184	8.46	215	3.94	100	229	104
8"	200	5.71	145	18	457	20.2*	513*	10.4	265	13.4	340	11.61	295	8x0.91	8x23	F12	7.24	184	8.46	215	3.94	100	276	125

* 6" (DN 150) and 8" (DN 200): At Δp > approx. 29 psi (2 bar) a worm gear is recommended instead of the hand lever. Details on request.

** On request: drilled to ASME/ANSI B16.5 Cl.150, JIS 10K

KNA, KNAR (ASME/ANSI): Installation dimensions and approx. weights

Face-to-face ASME/ANSI B16.10 short, flanges ASME/ANSI B16.5 Cl.150**

DN	Ø Port		L		HL		H		D		k		nxd ₁		EN ISO 5211	H ₁		H ₅		H ₂		Weight man. act.		
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		inch	mm	inch	mm	inch	mm	lbs	kg	
1/2"***	15***	0.59	15	5.12	130***	7.0	179	5.12	130	3.5	89	2.38	60.5	4x5/8	4x16	F05	1.97	50	2.36	60	2.36	60	12.3	5.6
3/4"***	20***	0.79	20	5.91	150***	7.0	179	5.12	130	3.88	98.5	2.76	70	4x5/8	4x16	F05	1.97	50	2.36	60	2.36	60	13.2	6
1"	25	0.96	24.5	5.0	127	7.0	179	5.12	130	4.25	108	3.13	79.5	4x5/8	4x16	F05	1.97	50	2.36	60	2.36	60	12.3	5.6
1 1/2"	40	1.50	38	6.5	165	10.2	259	6.10	155	5.0	127	3.88	98.5	4x5/8	4x16	F07	3.03	77	3.70	94	2.36	60	26.4	12
2"	50	1.87	47.5	7.0	178	10.2	259	6.10	155	6.0	152.5	4.75	120.5	4x3/4	4x19	F07	3.15	80	3.82	97	2.36	60	32	14.5
3"	80	3.07	78	8.0	203	16.1	410	7.09	180	7.5	190.5	6.0	152.5	4x3/4	4x19	F10	4.65	118	5.51	140	3.15	80	74	33.5
4"	100	3.78	96	9.0	229	16.1	410	7.68	195	9.02	229	7.5	190.5	8x3/4	8x19	F10	5.28	134	6.14	156	3.15	80	110	50
6"	150	5.71	145	10.5	267	20.2*	513*	10.4	265	11.0	279.5	9.51	241.5	8x7/8	8x23	F12	7.24	184	8.46	215	3.94	100	201	91
8"	200	5.71	145	18	457	20.2*	513*	10.4	265	13.5	343	11.75	298.5	8x7/8	8x23	F12	7.24	184	8.46	215	3.94	100	276	125

* 6" (DN 150) and 8" (DN 200): At Δp > approx. 29 psi (2 bar) a worm gear is recommended instead of the hand lever. Details on request.

** On request: drilled to JIS 10K, ISO 7005-2

*** face-to-face not to ASME/ANSI

KA-N: Installation dimensions and approx. weights

Special face-to-face, flanges ISO 7005-2 (optionally drilled to ASME/ANSI B16.5 Cl.150)

DN/DN1	Ø Port		L		HL		H		D		k		nxd		D ₁	k ₁	nxd ₁		EN ISO 5211	H ₁		H ₅		H ₂		Weight man. act.				
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm			inch	mm		inch	mm	inch	mm	inch	mm	inch	mm	lbs	kg	
2"/1"	50/25	0.96	24.5	6.3	160	7.0	179	5.12	130	6.5	165	4.92	125	4x0.75	4x19	4.53	115	3.35	85	4x0.55	4x14	F05	1.97	50	2.36	60	2.36	60	17.6	8
3"/2"	80/50	1.87	47.5	8.27	210	10.2	259	6.1	155	7.87	200	6.3	160	8x0.75	8x19	6.5	165	4.92	125	4x0.75	4x19	F07	3.15	80	3.82	97	2.36	60	37	17
4"/2"	100/50	1.87	47.5	8.27	210	10.2	259	6.1	155	8.66	220	7.09	180	8x0.75	8x19	6.5	165	4.92	125	4x0.75	4x19	F07	3.15	80	3.82	97	2.36	60	40	18
6"/4"	150/100	3.78	96	12.8	325	16.1	410	7.68	195	11.2	285	9.45	240	8x0.91	8x23	9.02	229	7.5	190.5	8x0.75	8x19	F10	5.28	134	6.14	156	3.15	80	114	51.5

KK: Installation dimensions and approx. weights

Special face-to-face "DN + 50 mm", flangeless sandwich design

DN	Ø Port		L		HL		H		EN ISO 5211	H ₁		H ₅		H ₂		Weight man. act.		
	inch	mm	inch	mm	inch	mm	inch	mm		inch	mm	inch	mm	inch	mm	lbs	kg	
1"	25	0.94	24	2.95	75	5.6	143	4.72	120	F05	1.73	44	2.78	70.5	2.36	60	3.7	1.7
1 1/2"	40	1.50	38	3.54	90	8.9	225	6.5	165	F07	2.72	69	4.13	105	2.36	60	8.2	3.7
2"	50	1.81	46	3.94	100	8.9	225	6.69	170	F07	2.87	73	4.29	109	2.36	60	9.5	4.3
2 1/2"	65	2.28	46	4.53	115	8.9	225	6.69	170	F07	2.87	73	4.29	109	2.36	60	13.2	6
3"	80	3.07	65	5.12	130	8.9	225	7.48	190	F07	4.13	105	5.57	141.5	2.36	60	17.6	8
4"	100	3.07	78	5.91	150	12.8	325	7.48	190	F10	4.45	113	6.3	160	3.15	80	30	13.5
6"	150	4.33	110	7.87	200	15.2	385	9.45	240	F12	6.26	159	8.15	207	3.94	100	72	32.5

Richter's speciality: customised problem solutions

Ask Richter when you are looking for a solution to your problem!

In addition to the selection of common special designs presented here, we also offer many other specialities.

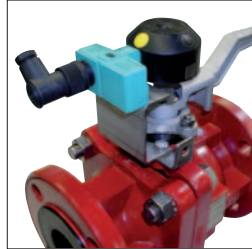
Lever extension

from 4" to 90" (100 mm to 2000 mm)



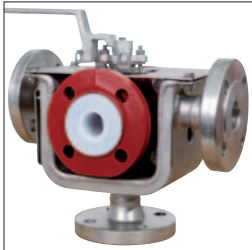
Special manual actuations

e.g. limit switch, locking, oval handwheel, manual gear

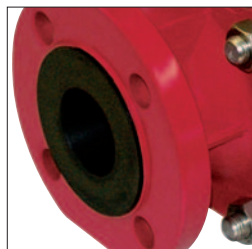
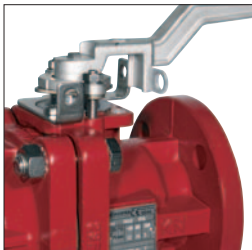


Stainless steel heating jacket

for all standard heat transfer media

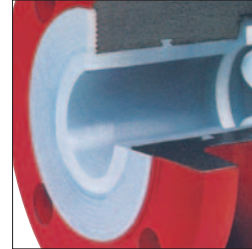


Lockable lever as standard feature (KN, KNA)

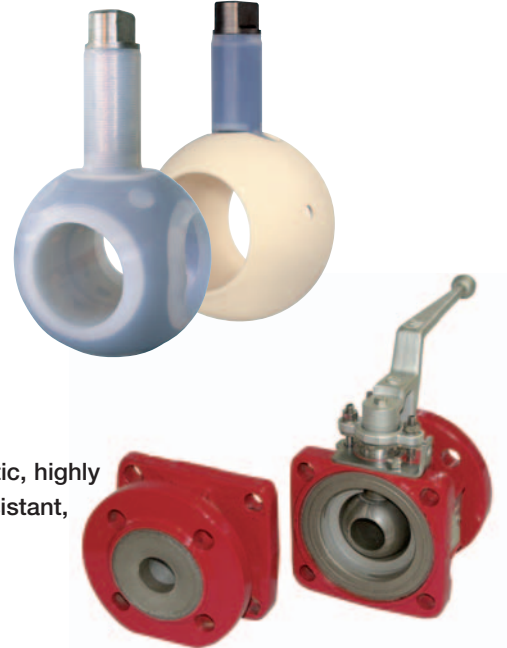


Extra thick-walled lining 1/5" (5 mm)

for highly permeating media

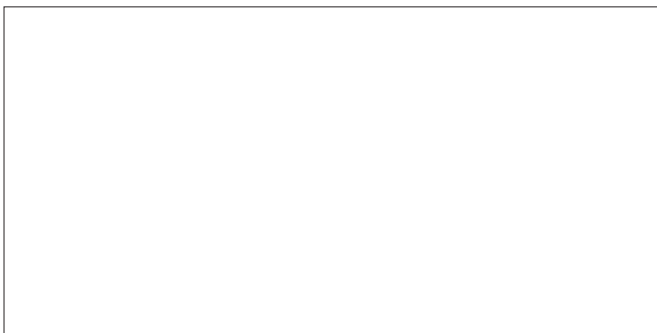


Ball with relief opening for pressure relief of the ball interior in the closed position



Linings antistatic, highly permeation-resistant, FDA-compliant

Presented by:



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