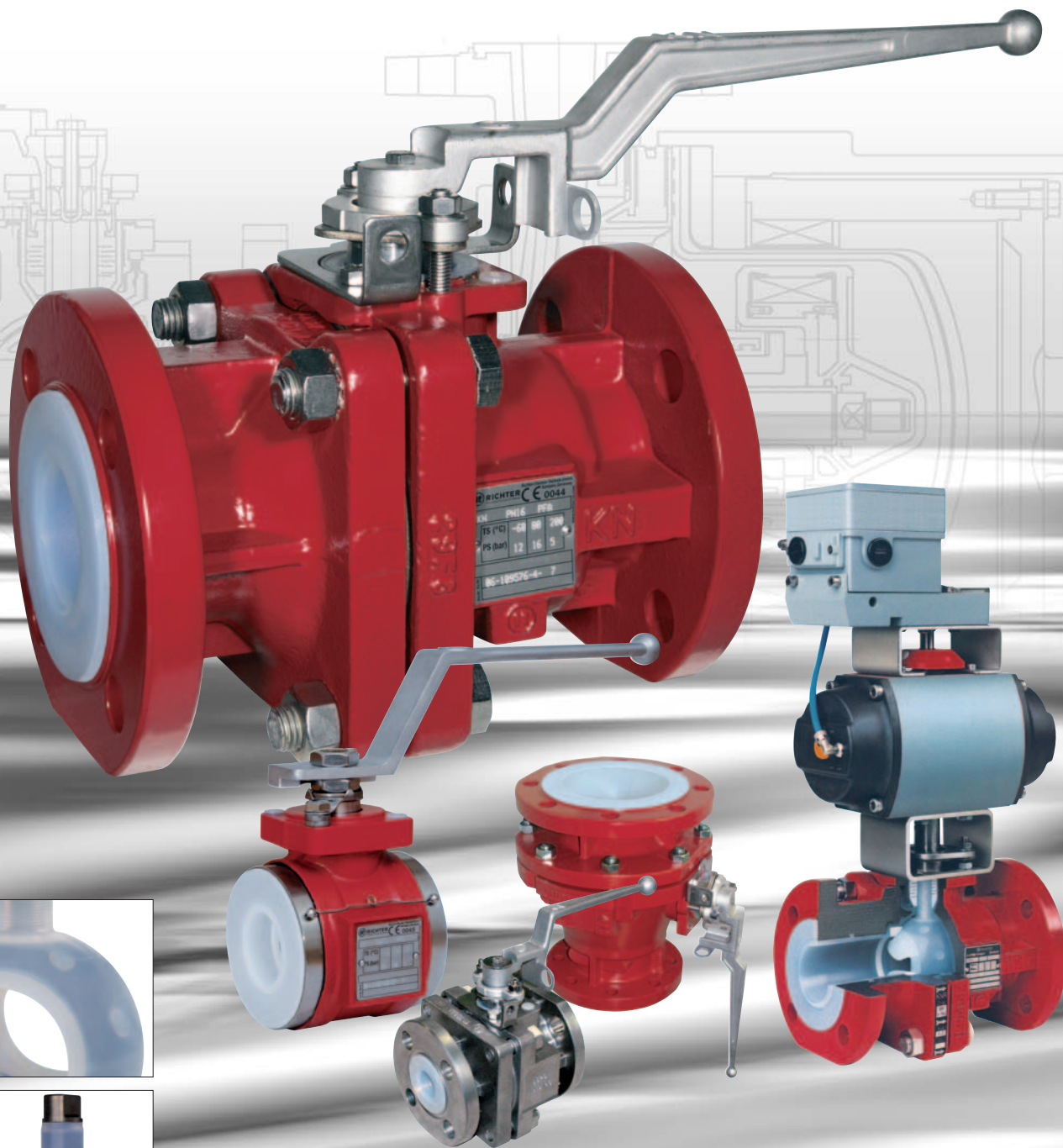


Richter heavy-duty ball valves

– shut-off, control and drain valves –

KN, KNA, KNR, KA-N, KK



ISO/DIN, ASME/ANSI

Lining PFA,
optionally PFA-P, PFA-L

Maintenance-free
ENVIPACK stem sealing

-60 to +200 °C (-75 to +400 °F)



RICHTER
Process Pumps & Valves

IDEX
FLUID & METERING

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, 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 ISO/DIN + 1 ASME/ANSI body, 3 lining materials,
1 universal stem sealing, 4 standard ball versions.

And, in addition, Richter's speciality: customised special solutions.

The ball valves of the KN/KNA family are

- Shut-off and globe 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
- Of particularly rugged design and certified to the German Clean Air Act ("TA Luft") German Dangerous Goods Regulation (ADR/RID)

Product features

- 1-piece, PFA-lined ball/stem, optionally Al_2O_3 ball and special versions
- DN 15-200 and 1/2"-8", full bore (apart from DN 200 and 8")

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

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 temp. up to 150 °C/200 °C	•/•	•/•	•/•	•/•	•/•	•/-
Operating temp. down to -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, 3,5 mm/5 mm	•/•	•/•	•/•	•/•	•/•	•/-
Lining antistatic PFA-L	•	•	•	•	•	•
Lining highly permeation-resistant PFA-P	•	•	•	•	•	•
One-piece PFA-lined ball/stem	•	•	•	•	•	
PFA-lined ball, separate stem						•
Al_2O_3 ceramic ball, separate stem	•	•			•	•
Body ductile cast iron/stainless steel (DN 1"-2")	•/-	•/•	•/-	•/•	•/-	•/-

① 3.5 mm thick lining made of pure PFA

- High permeation resistance
- Vacuum-proof anchoring
- Transparent, optimum quality assurance,
5 mm wall thickness option ($\geq$ DN 25)

② Body made of ductile cast iron

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

③ Permanently tight body connection

- Also with frequent temperature changes
- Sealing surface ③a with full lining
- Labyrinth-like sealing ③b:
maximum surface pressure between the body halves
- Body halves centre themselves exactly to each other owing to the fit ③c.
- **Almost metallic stop ③d** absorbs pipe forces

④ Different ball versions (see left table)

- Standard one-piece ball/stem with 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
- Optionally aluminium oxide ball (Al_2O_3 , 99.7 %), cavity-free TF ball and V-control ball (see page 3)
- Optionally zirconium, stainless steel etc.

⑤ Resilient PTFE seat rings

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

⑥ Richter ENVIPACK stem sealing with active stainless steel packing gland follower ⑥a (see left table)

- Certified to the 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

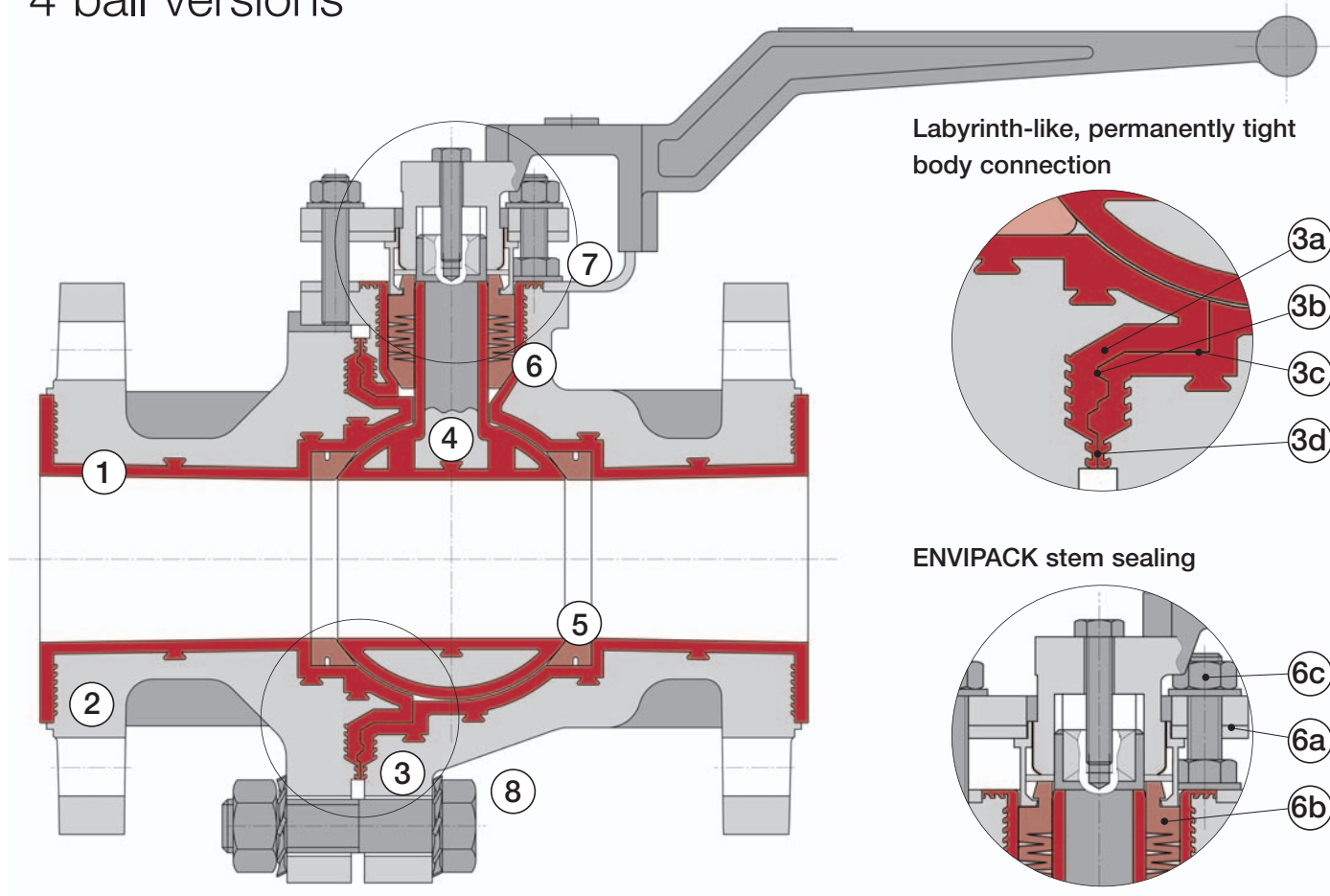
② Special face to face, see tables on page 6

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

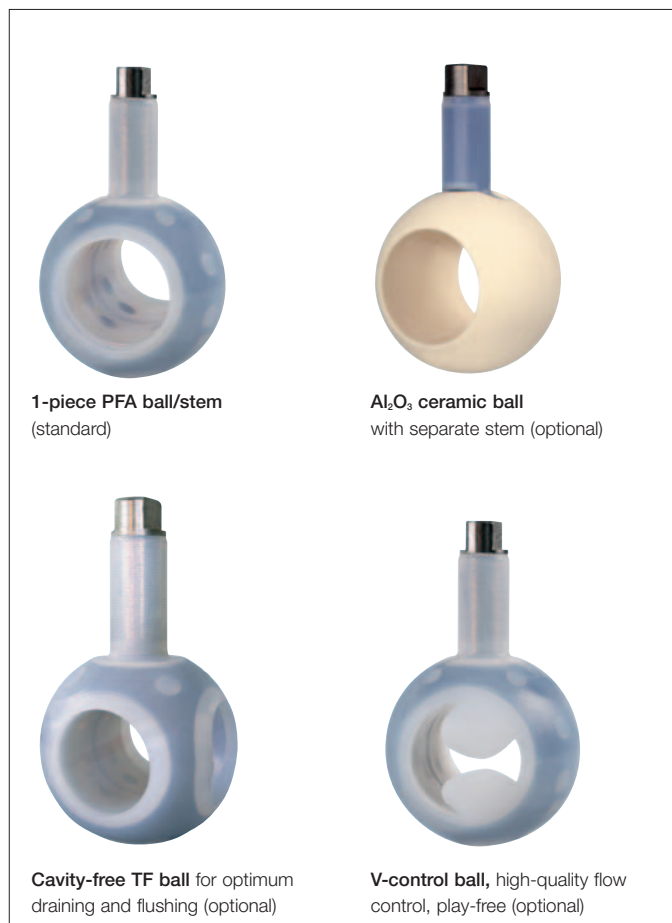
④ Solids: in general, consultation with manufacturer recommended

⑤ Limited suitability

Thick-walled lining, 4 ball versions

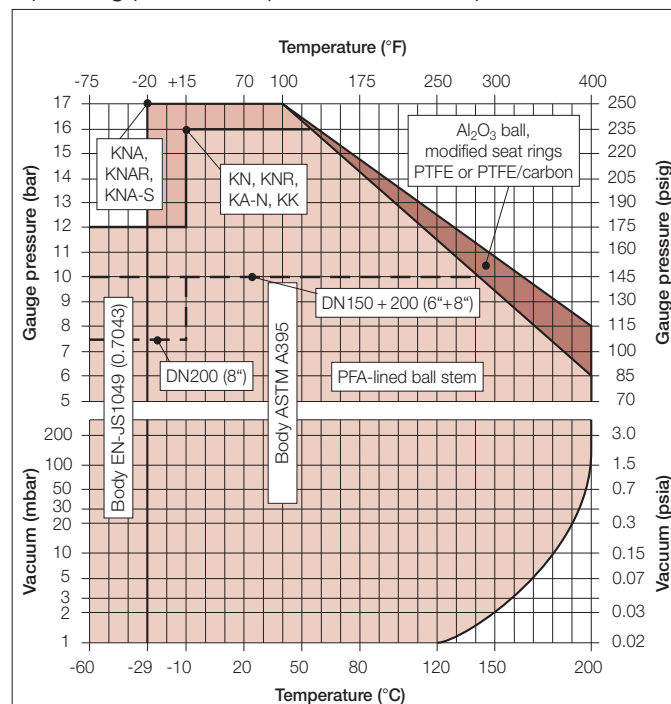


Ball versions



Pressure/temperature range

Operating pressures up to 25 bar on request



Body EN-JS 1049 (0.7043)/PFA:

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

Body ASTM A395/PFA:

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

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

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

Richter drain valves KA-N with ENVIPACK stem sealing

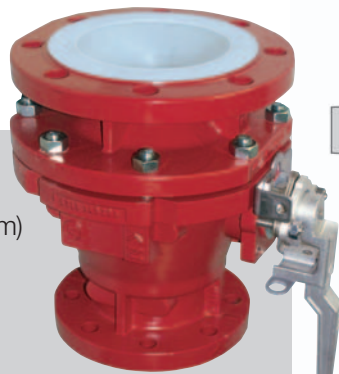
Drain valves are compact, sturdy vessel drain valves and much lower-priced than sliding stem valves.

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.

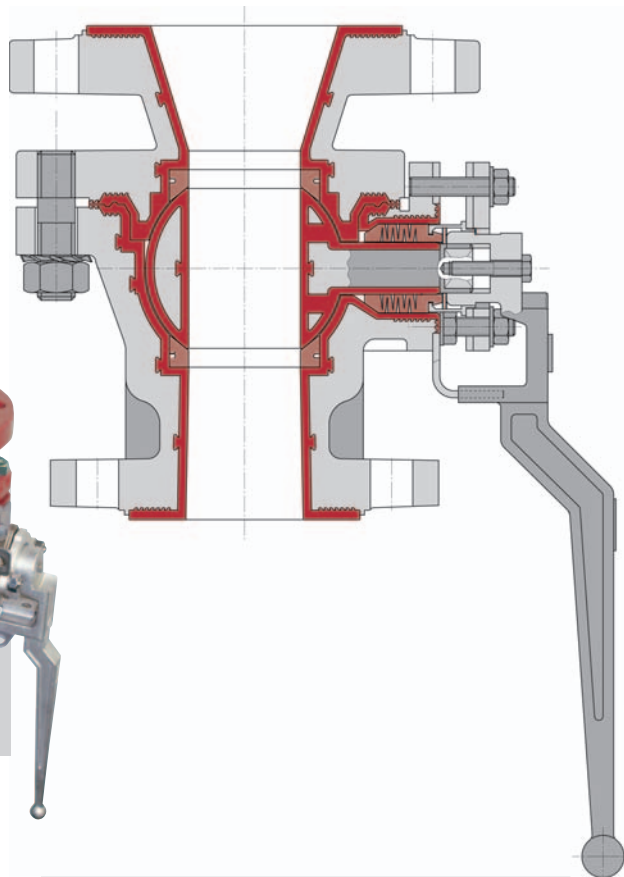
Product features

- Full bore
- DN 50/25 (Ø 25 mm) to 150/100 (Ø 100 mm)
- -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.



Richter 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
- DN 1" (25 mm) to 2" (50 mm), other nominal sizes on request
- -60 to 200 °C, see diagram on page 3
- Very low temperatures down to -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 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
- Certified to 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

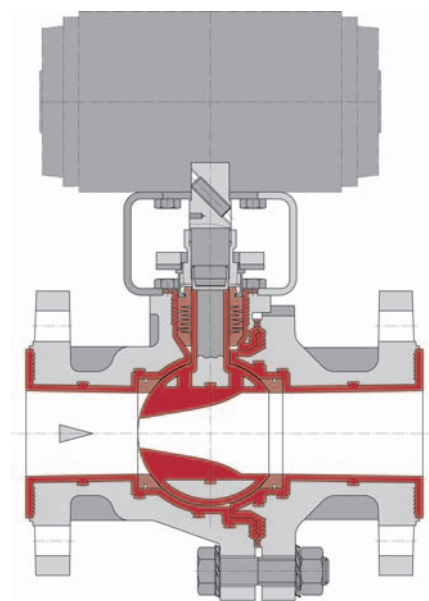


Richter control valves KNR and KNAR with play-free torque transmission



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



Product features

- 3-6 finely graduated k_{v100} values per nominal size
- Equal percentage characteristic acc. to DIN EN 60534, linear by means of positioner
- DN 15–200 ($\frac{1}{2}$ " to 8")
- -60 to 200 °C, see diagram on page 3
- Face to face according to
 - ISO/DIN 5752 R.1 (apart from DN 200)
 - ASME/ANSI B 16.10/8, Cl.150
- Flanges to
 - ISO/DIN 7005-2 PN 16 (DN 200: PN 10), DN 25-80 optionally PN 25 with PB 16 bar,
 - ASME/ANSI B16.5 Cl.150

Other options:

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

For more information, see separate publication.

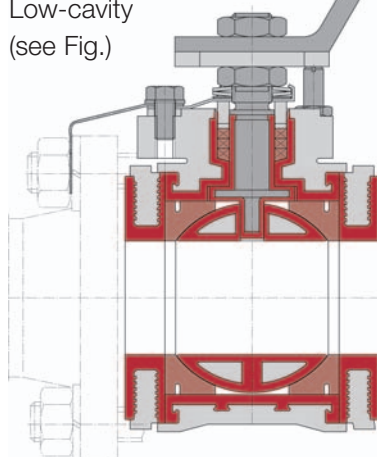
Richter flangeless compact ball valves KK

Product features

- Lining 3.5 mm virgin PFA
- Body of ductile cast iron EN-JS 1049 (ASTM A395)
- DN 25–150, PN 16 (DN 150 = PN 10)
- Full bore with DN 25-50, reduced bore with DN ≥ 65
- -60 to 180 °C
- Flangeless, face to face: DN + 50 mm, e. g. DN 50 = 100 mm
- Self-adjusting, maintenance-free stem sealing
- Resilient seat rings, gas-tight in the seat
- Certified to 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, Al_2O_3 ceramic ball option, blowout-proof
- Stainless steel grounding rope

Other options:

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



advantage especially for confined installation conditions. As a sandwich-type valve, it is fixed between the pipe flanges on both sides.

With the formula "face to face = DN + 50", the KK series offers an extremely short face to face – an

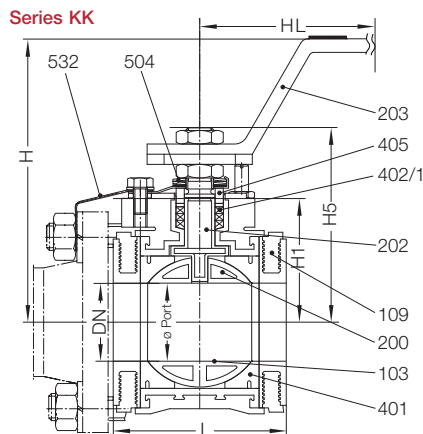
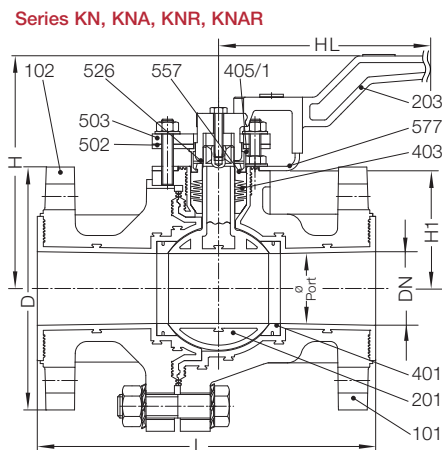
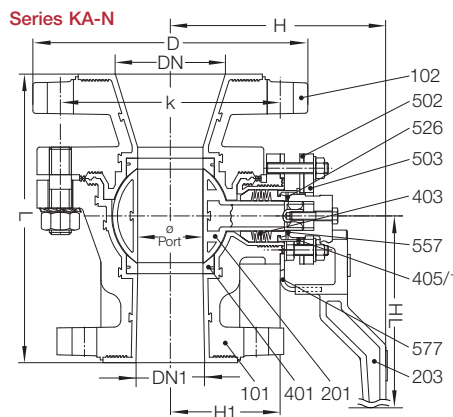


Components and materials, operating torques, k_v/C_v -values

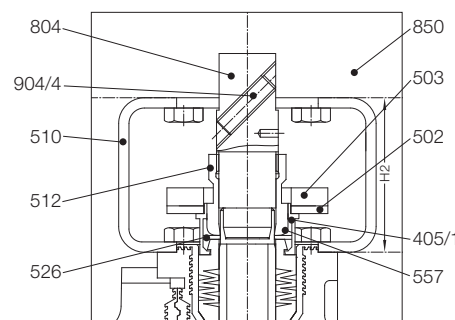
Components and materials

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 high permeation-resistant
109	Transition cover	Stainless steel/PTFE
200	Ball	Al ₂ O ₃ 99,7 % Stainless steel/PFA (only KK)
201	Ball stem unit	Stainless steel, PFA-lined
202	Stem	optionally PFA-L antistatic or PFA-P high permeation-resistant
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
422	Base 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
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.)



Play-free coupling for KNR, KNAR



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

KK		Operating torques									
DN		Δp 3 bar		Δp 6 bar		Δp 10 bar		Δp 16 bar		max. admissible	
mm	inch	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs
25	1"	7	62	7	62	7	62	7	62	20	177
40	1 1/2"	15	133	15	133	15	133	18	159	50	443
50	2"	15	133	15	133	15	133	18	159	50	443
65	2 1/2"	15	133	15	133	15	133	18	159	50	443
80	3"	40	354	40	354	42	372	50	443	120	1062
100	4"	60	531	60	531	64	566	80	708	250	2213
150	6"	100	885	113	1000	180	1593	-	-	500	4425

k_{v100} -values

k_{v100}	C_v
51	59
150	175
248	289
300	350
455	530
830	967
1270	1480

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

KN, KNA, KNR, KNAR		KA-N		Operating torques									
DN		DN/DN1		Δp 3 bar		Δp 6 bar		Δp 10 bar		Δp 16 bar		max. admissible	
mm	inch	mm	inch	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs
15	1/2"	-	-	8	71	8	71	8	71	10	89	70	620
20	3/4"	-	-	8	71	8	71	8	71	10	89	70	620
25	1"	50/25	2"/1"	12	106	12	106	12	106	12	106	70	620
40	1 1/2"	-	-	20	177	20	177	20	177	25	221	225	1990
50	2"	80/50+100/50	3"/2"+4"/2"	25	221	25	221	25	221	30	266	225	1990
80	3"	-	-	60	531	60	531	65	575	80	708	500	4425
100	4"	150/100	6"/4"	80	708	80	708	90	797	170	1505	500	4425
150	6"	-	-	200	1770	250	2213	350	3098	-	-	2200	19470
200	8"	-	-	200	1770	250	2213	350	3098	-	-	2250	19913

k_{v100} -values

KN, KNA, KA-N	
k_{v100}	Cv
m³/h	USgpm
17,5	20
31	36
75	87
200	233
310	361
800	932
1250	1456
2800	3262
3200	3728

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

KN, KNA, KNR, KNAR		KA-N		Operating torques									
DN		DN/DN1		Δp 3 bar		Δp 6 bar		Δp 10 bar		Δp 16 bar		max. admissible	
mm	inch	mm	inch	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs
15	1/2"	-	-	10	89	10	89	10	89	12	106	28	248
20	3/4"	-	-	10	89	10	89	10	89	12	106	28	248
25	1"	50/25	2"/1"	12	106	12	106	12	106	12	106	28	248
40	1 1/2"	-	-	20	177	25	221	30	266	45	398	80	708
50	2"	80/50+100/50	3"/2"+4"/2"	25	221	30	266	35	310	50	443	120	1062
80	3"	-	-	60	531	100	885	160	1416	220	1947	250	2215
100	4"	150/100	6"/4"	80	708	130	1151	200	1770	280	2478	350	3098
150	6"	-	-	350	3098	450	3983	600	5310	-	-	1200	10620
200	8"	-	-	350	3098	450	3983	600	5310	-	-	1200	10620

k_{v100} -values

KN, KNA, KA-N	
k _{v100}	Cv
m³/h	USgpm
17,5	20
31	36
75	87
200	233
310	361
800	932
1250	1456
2800	3262
3200	3728

* for KNR and KNAR 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 _i		EN ISO	H1		H5		H2		Weight man. act.	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	5211	mm	inch	mm	inch	mm	inch	kg	lbs
15	1/2"	15	0.59	130	5.12	179	7.0	130	5.12	95	3.74	65	2.56	4x14	4x0.55	F05	50	1.97	60	2.36	60	2.36	5.6	12.3
20	3/4"	20	0.79	150	5.91	179	7.0	130	5.12	105	4.13	75	2.95	4x14	4x0.55	F05	50	1.97	60	2.36	60	2.36	6	13.2
25	1"	24.5	0.96	160	6.30	179	7.0	130	5.12	115	4.53	85	3.35	4x14	4x0.55	F05	50	1.97	60	2.36	60	2.36	6	13.2
40	1 1/2"	38	1.50	200	7.87	259	10.2	155	6.10	150	5.91	110	4.33	4x19	4x0.75	F07	77	3.03	94	3.70	60	2.36	14	30.9
50	2"	47.5	1.87	230	9.06	259	10.2	155	6.10	165	6.5	125	4.92	4x19	4x0.75	F07	80	3.15	97	3.82	60	2.36	16	35.3
80	3"	78	3.07	310	12.2	410	16.1	180	7.09	200	7.87	160	6.30	8x19	8x0.75	F10	118	4.65	140	5.51	80	3.15	35	77
100	4"	96	3.78	350	13.8	410	16.1	195	7.68	220	8.66	180	7.09	8x19	8x0.75	F10	134	5.28	156	6.14	80	3.15	55	121
150	6"	145	5.71	480	18.9	513*	20.2*	265	10.4	285	11.2	240	9.45	8x23	8x0.91	F12	184	7.24	215	8.46	100	3.94	104	229
200	8"	145	5.71	457	18	513*	20.2*	265	10.4	340	13.4	295	11.61	8x23	8x0.91	F12	184	7.24	215	8.46	100	3.94	125	276

* DN 150 (6") and 200 (8"): At $\Delta p >$ approx. 2 bar (29 psi) 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 _i		EN ISO	H1		H5		H2		Weight man. act.	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	5211	mm	inch	mm	inch	mm	inch	kg	lbs
15	1/2"	15	0.59	130	5.12	179	7.0	130	5.12	89	3.5	60.5	2.38	4x16	4x5/8	F05	50	1.97	60	2.36	60	2.36	5.6	12.3
20	3/4"	20	0.79	150	5.91	179	7.0	130	5.12	98.5	3.88	70	2.76	4x16	4x5/8	F05	50	1.97	60	2.36	60	2.36	6	13.2
25	1"	24.5	0.96	127	5.0	179	7.0	130	5.12	108	4.25	79.5	3.13	4x16	4x5/8	F05	50	1.97	60	2.36	60	2.36	5.6	12.3
40	1 1/2"	38	1.50	165	6.5	259	10.2	155	6.10	127	5.0	98.5	3.88	4x16	4x5/8	F07	77	3.03	94	3.70	60	2.36	12	26.4
50	2"	47.5	1.87	178	7.0	259	10.2	155	6.10	152.5	6.0	120.5	4.75	4x19	4x3/4	F07	80	3.15	97	3.82	60	2.36	14.5	32
80	3"	78	3.07	203	8.0	410	16.1	180	7.09	190.5	7.5	152.5	6.0	4x19	4x3/4	F10	118	4.65	140	5.51	80	3.15	33.5	74
100	4"	96	3.78	229	9.0	410	16.1	195	7.68	229	9.02	190.5	7.5	8x19	8x3/4	F10	134	5.28	156	6.14	80	3.15	50	110
150	6"	145	5.71	267	10.5	513*	20.2*	265	10.4	279.5	11.0	241.5	9.51	8x23	8x7/8	F12	184	7.24	215	8.46	100	3.94	91	201
200	8"	145	5.71	457	18	513*	20.2*	265	10.4	343	13.5	298.5	11.75	8x23	8x7/8	F12	184	7.24	215	8.46	100	3.94	125	276

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

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

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/DN _i		Ø Port		L		HL		H		D		k		nxd		D1		k1		nxd _i		EN ISO	H1		H5		H2		Weight man. act.	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	5211	mm	inch	mm	inch	mm	inch	kg	lbs
50/25	2"/1"	24.5	0.96	160	6.3	179	7.0	130	5.12	165	6.5	125	4.92	4x19	4x0.75	115	4.53	85	3.35	4x14	4x0.55	F05	50	1.97	60	2.36	60	2.36	8	17.6
80/50	3"/2"	47.5	1.87	210	8.27	259	10.2	155	6.1	200	7.87	160	6.3	8x19	8x0.75	165	6.5	125	4.92	4x19	4x0.75	F07	80	3.15	97	3.82	60	2.36	17	37
100/50	4"/2"	47.5	1.87	210	8.27	259	10.2	155	6.1	220	8.66	180	7.09	8x19	8x0.75	165	6.5	125	4.92	4x19	4x0.75	F07	80	3.15	97	3.82	60	2.36	18	40
150/100	6"/4"	96	3.78	325	12.8	410	16.1	195	7.68	285	11.2	240	9.45	8x23	8x0.91	229	9.02	190.5	7.5	8x19	8x0.75	F10	134	5.28	156	6.14	80	3.15	51.5	114

KK: Installation dimensions and approx. weights

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

DN		Ø Port		L		HL		H		EN ISO	H1		H5		H2		Weight man. act.	
mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	5211	mm	inch	mm	inch	mm	inch	kg	lbs
25	1"	24	0.94	75	2.95	143	5.6	120	4.72	F05	44	1.73	70.5	2.78	60	2.36	1.7	3.7
40	1 1/2"	38	1.50	90	3.54	225	8.9	165	6.5	F07	69	2.72	105	4.13	60	2.36	3.7	8.2
50	2"	46	1.81	100	3.94	225	8.9	170	6.69	F07	73	2.87	109	4.29	60	2.36	4.3	9.5
65	2 1/2"	58	2.28	115	4.53	225	8.9	170	6.69	F07	73	2.87	109	4.29	60	2.36	6	13.2
80	3"	78	3.07	130	5.12	225	8.9	190	7.48	F07	105	4.13	141.5	5.57	60	2.36	8	17.6
100	4"	78	3.07	150	5.91	325	12.8	190	7.48	F10	113	4.45	160	6.3	80	3.15	13.5	30
150	6"	110	4.33	200	7.87	385	15.2	240	9.45	F12	159	6.26	207	8.15	100	3.94	32.5	72

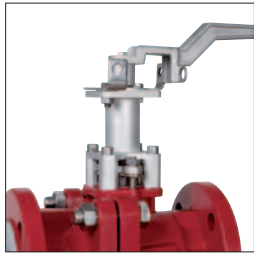
Richter's speciality: Options and special solutions for customers' problems

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.

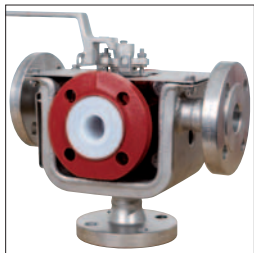
Lever extension

from 100 mm to 2000 mm

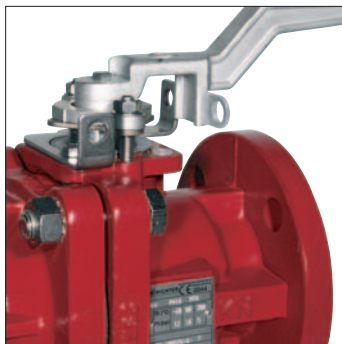


Stainless steel heating jacket

for all standard heat transfer media

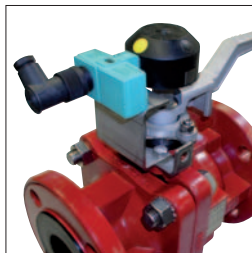


Lockable lever as standard feature (KN, KNA)



Special manual actuations

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

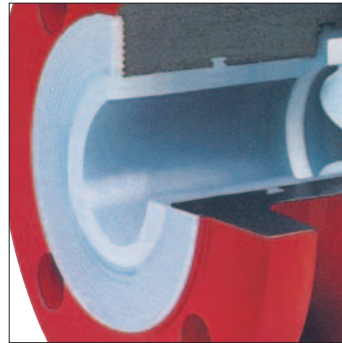


Linings antistatic, highly permeation-resistant, FDA-compliant



Extra thick-walled lining 5 mm

for highly permeating media

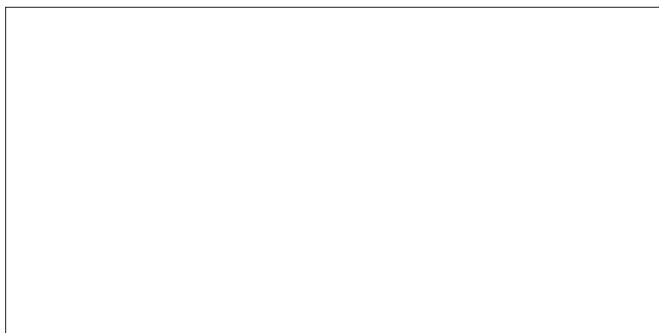


Ball with relief opening

for pressure relief of the ball interior in the closed position



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