

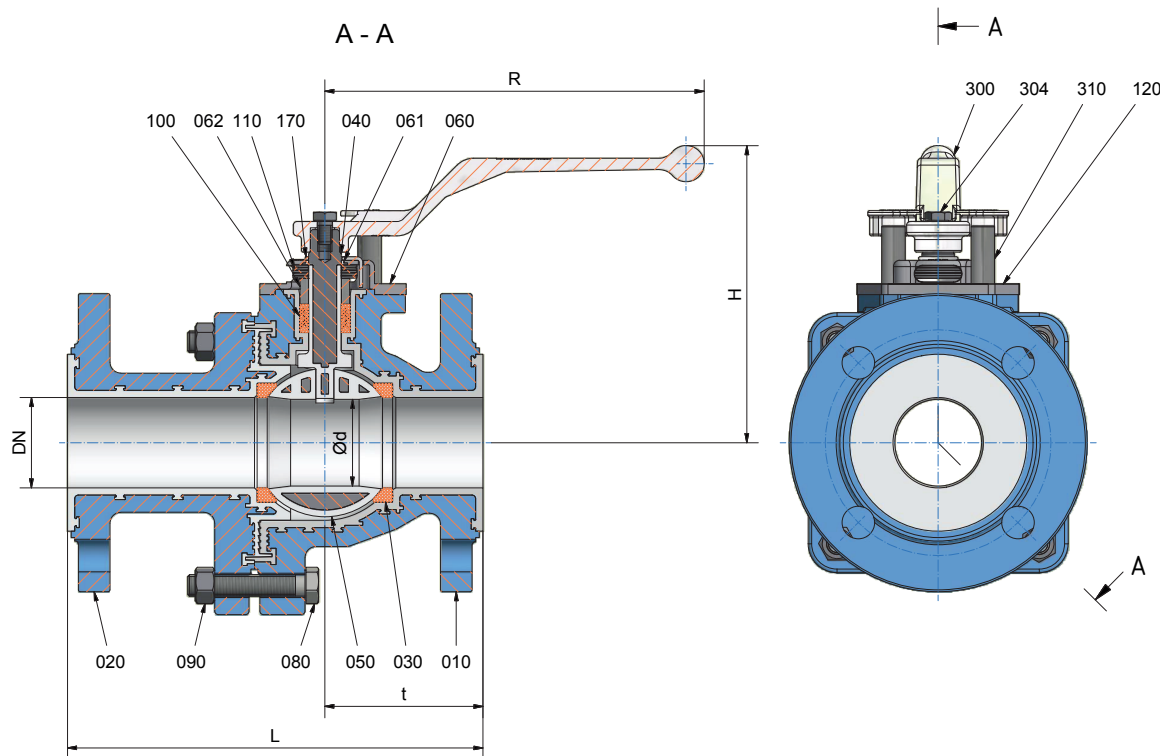
Register 12

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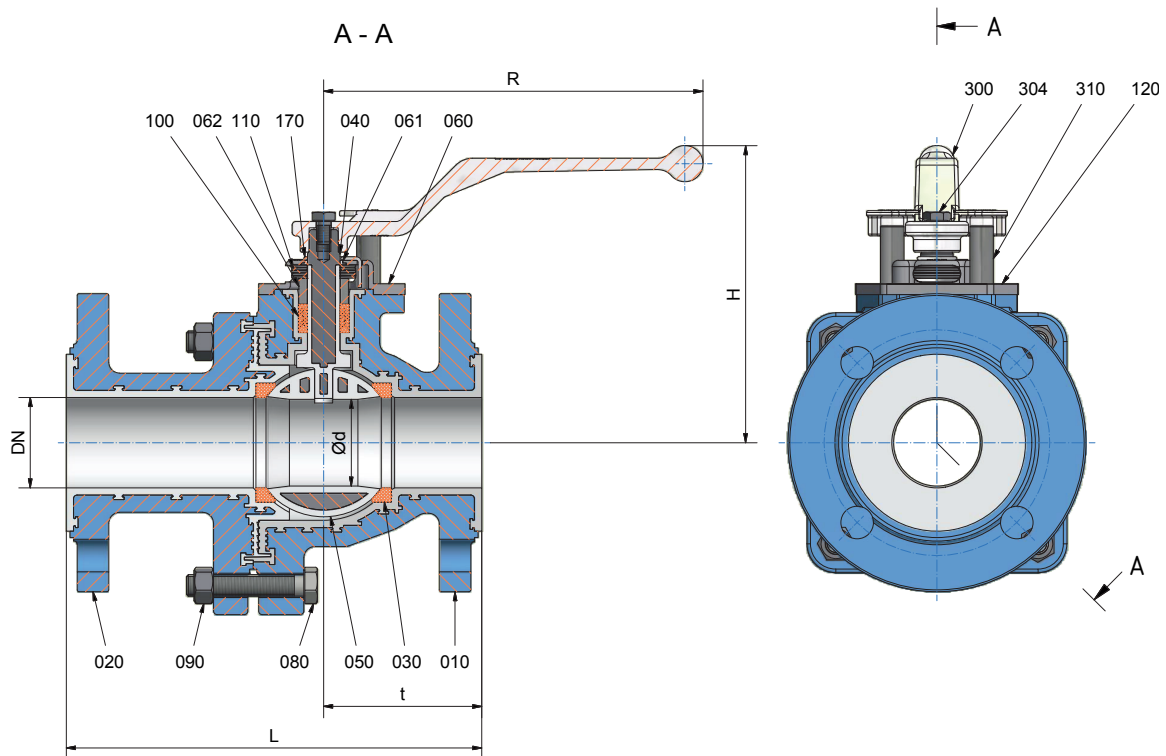
Technical Data AKH2.2 (DIN)



Face to Face Dimensions DIN EN 558 (Basic series 1)
Flange Connection DIN EN 1092-2 PN 16

DN / DIN		L	H	R	t	Ød	weight	
015	mm	130	121	160	59,5	15	kg	4,0
	inch	5,12	4,76	6,3	2,34	0,59	lbs	8,8
020	mm	150	121	160	69,5	20	kg	4,8
	inch	5,91	4,76	6,3	2,74	0,79	lbs	10,6
025	mm	160	124	160	65,5	24	kg	5,4
	inch	6,3	4,88	6,3	2,58	0,94	lbs	11,9
032	mm	180	150	210	81	32	kg	10,2
	inch	7,09	5,91	8,27	3,19	1,26	lbs	22,5
040	mm	200	150	210	80	38	kg	10,7
	inch	7,87	5,91	8,27	3,15	1,50	lbs	23,6
050	mm	230	165,5	210	87,5	48	kg	14,1
	inch	9,06	6,5	8,27	3,44	1,89	lbs	31,1
065	mm	290	205	313	108	65	kg	24,0
	inch	11,42	8,07	12,32	4,25	2,56	lbs	52,9
080	mm	310	212	313	118	80	kg	31,0
	inch	12,2	8,35	12,32	4,65	3,15	lbs	68,3
100	mm	350	227	313	140	100	kg	47,5
	inch	13,78	8,94	12,32	5,51	3,94	lbs	104,7

Technical Data AKH2.2 (ANSI)



Flange Connections ASME B 16.5 Cass 150,
 Min. flange thickness acc.
 to ASME B 16.5 Cass 150,
 Table 9 (Flanged Fittings)

DN / ANSI		L	H	R	t	Ød	weight	
1/2" *	inch	5,12	4,76	6,3	2,34	0,59	lbs	9,5
	mm	130	121	160	59,5	15	kg	4,3
3/4" *	inch	5,9	4,76	6,3	2,74	0,79	lbs	10,1
	mm	150	121	160	69,5	20	kg	4,6
1"	inch	6	4,88	6,3	2,58	0,94	lbs	11,0
	mm	152,4	124	160	65,5	24	kg	5,0
1 1/2"	inch	7	5,91	8,27	3,15	1,5	lbs	18,5
	mm	178	150	210	80	38	kg	8,4
2"	inch	8	6,52	8,27	3,44	1,89	lbs	28,2
	mm	203	165,5	210	87,5	48	kg	12,8
3"	inch	9,49	8,35	12,32	4,65	3,15	lbs	64,2
	mm	241	212	313	118	80	kg	29,1
4"	inch	11,5	8,94	12,32	5,51	3,94	lbs	95,9
	mm	292	227	313	140	100	kg	43,5

* Face-to-Face Dimensions acc. to DIN EN 558 (Basic series 1)

Material specification AKH2.2

No.	Designation	Quantity	Material	Material-No. / DIN	ASTM / AISI
010	body	1	ductile iron / PFA	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
		1	ductile iron / PFA conductive	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
020	side piece	1	ductile iron / PFA	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
		1	ductile iron / PFA conductive	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
030	seat ring	2	PTFE		
		2	PTFE conductive		
040	stem	1	stainless steel / PFA	1.4470 / DIN EN 10283	A 890 CD3MN
		1	stainless steel / PFA conductive	1.4470 / DIN EN 10283	A 890 CD3MN
		1	Hastelloy C4 / PFA °°	2.4610 / DIN 17744	
050	ball				
		1	cast steel / PFA	1.0619 / DIN EN 10213-2	A 216 Grade WCB
		1	cast steel / PFA conductive	1.0619 / DIN EN 10213-2	A 216 Grade WCB
		1	ductile iron / PFA	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
		1	ductile iron / PFA conductive	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
		1	ceramic Al ₂ O ₃ *		
060	top cap	1	steel casting	1.4308 / DIN EN 10283	A 743 CF-8
061	bushing	1	PTFE		
062	spacer	1	stainless steel	1.4104 / DIN EN 10088-3	A430 F
080	stud bolt				
		1 set	stainless steel	1.4301-K70 / DIN EN 10088-3	A 193 B8
	hexagon bolt				
	DN 25, 40, 50, 65, 80, 100	1 set	stainless steel	1.4301-K70 / DIN EN 10088-3	A 193 B8
090	hexagon nut	1 set	stainless steel	1.4301-K70 / DIN EN 10088-3	A 194 8
100	packing material (chevron)	1 set	PTFE °		
			PTFE-graphite °		
110	belleville washer	5	stainless steel	1.4310 / DIN EN 10270-3	AISI 301
120	countersunk head screw	1 set	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8
170	grounding device				
		1	stainless steel	1.4310 / DIN EN 10270-3	AISI 301
	curved spring washer				
	DN 15, 20, 32, 40, 1/2", 3/4", 1 1/2"	1	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8
300	hand lever	1	die cast metall (galvanized)	ZP0410 / DIN EN 12844	
304	hexagon bolt	1	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8
310	stop	2	stainless steel	1.4301 / DIN EN 10088-3	AISI 304

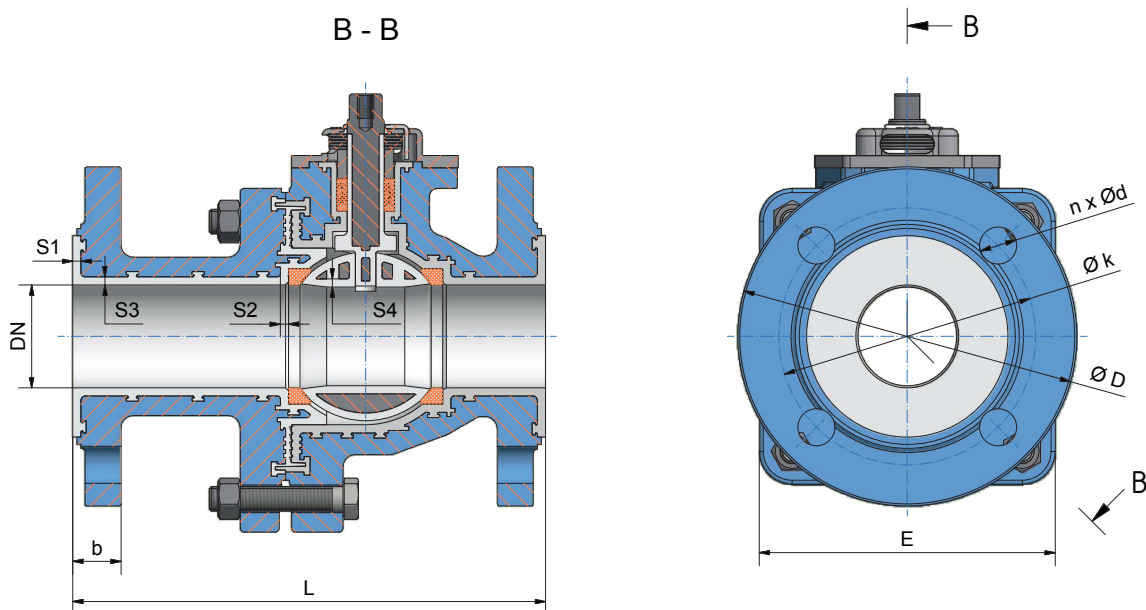
Valves with conductive lining only contain components with conductive materials

* ceramic ball on request

°° Hastelloy stem on request

° optional

Dimensions AKH2.2 (DIN)

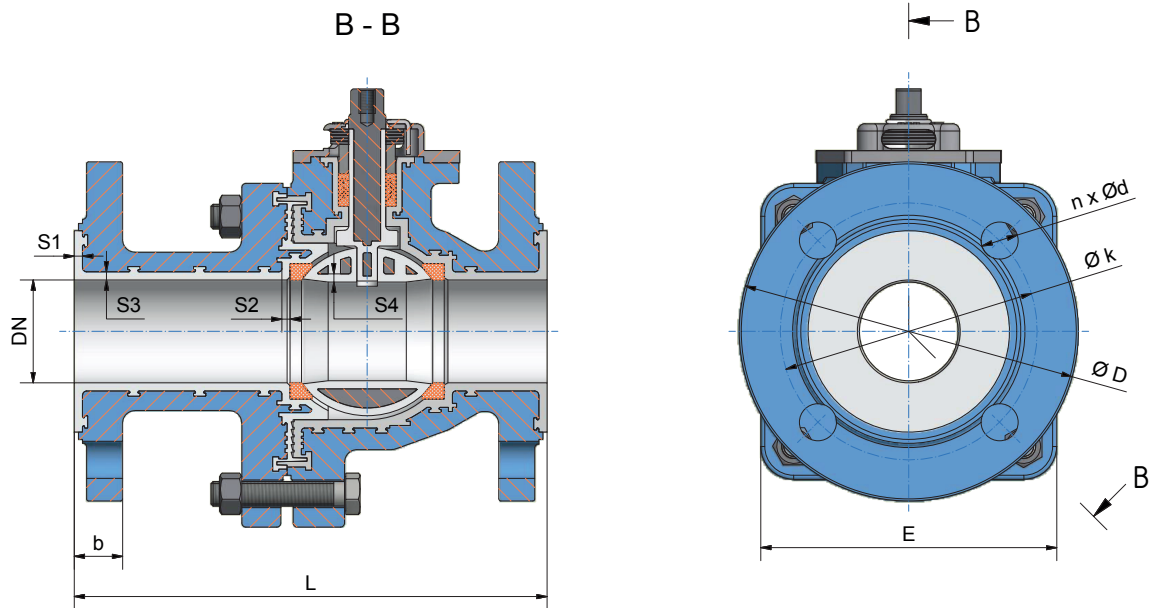


DIN		L	E°	b	ØD	Øk	n x Ød	S1	S2	S3	S4
015	mm	130	107	15	95	65	4 x 14	3,5	3,5	3,5	5
	inch	5,12	4,21	0,59	3,74	2,56	4 x 0,55	0,14	0,14	0,14	0,2
020	mm	150	107	16	105	75	4 x 14	3,5	3,5	3,5	2,5
	inch	5,9	4,21	0,63	4,13	2,95	4 x 0,55	0,14	0,14	0,14	0,1
025	mm	160	106	17	115	85	4 x 14	3	3	3,5	2,5
	inch	6,3	4,17	0,67	4,53	3,35	4 x 0,55	0,12	0,12	0,14	0,1
032	mm	180	124	20,5	140	100	4 x 18	4	3,5	4	3,5
	inch	7,09	4,88	0,81	5,51	3,94	4 x 0,71	0,16	0,14	0,16	0,14
040	mm	200	124	20,5	150	110	4 x 18	4	3,5	4	3
	inch	7,87	4,88	0,81	5,91	4,33	4 x 0,71	0,16	0,14	0,16	0,12
050	mm	230	144	21,5	165	125	4 x 18	4	3,5	4	3
	inch	9,06	5,67	0,85	6,5	4,92	4 x 0,71	0,16	0,14	0,16	0,12
065	mm	290	190	24,5	185	145	4 x 18	4	3,5	4,5	3,5
	inch	11,42	7,48	0,96	7,28	5,71	4 x 0,71	0,16	0,14	0,18	0,14
080	mm	310	230	26,5	200	160	8 x 18	4	4	4,5	4,25
	inch	12,2	9,06	1,04	7,87	6,3	8 x 0,71	0,16	0,16	0,18	0,17
100	mm	350	250	30,5	220	180	8 x 18	4	5	5	4,5
	inch	13,78	9,84	1,2	8,66	7,09	8 x 0,71	0,16	0,2	0,2	0,18

Stem lining DN 15, 20 and 25 is 0,059 inch. All other sizes at least is 0,098 inch.

° DN 080, DN 100 octagonal

Dimensions AKH2.2 (ANSI)



DN / ANSI		L	E°	b	ØD	Øk	n x Ød	S1	S2	S3	S4
½"	inch	5,12	4,21	0,59	3,5	2,38	4 x 0,63	0,14	0,14	0,14	0,2
	mm	130	107	15	88,9	60,5	4 x 16	3,5	3,5	3,5	5
¾"	inch	5,9	4,21	0,63	3,88	2,75	4 x 0,63	0,14	0,14	0,14	0,1
	mm	150	107	16	98,5	70	4 x 16	3,5	3,5	3,5	2,5
1"	inch	6	4,17	0,67	4,25	3,13	4 x 0,63	0,12	0,12	0,14	0,1
	mm	152,4	106	17	107,9	79,2	4 x 16	3	3	3,5	2,5
1½"	inch	7	4,88	0,77	5	3,88	4 x 0,63	0,16	0,14	0,16	0,12
	mm	178	124	19,5	127	98,5	4 x 16	4	3,5	4	3
2"	inch	8	5,67	0,85	6	4,75	4 x 0,75	0,16	0,14	0,16	0,12
	mm	203	144	21,5	152,4	120,5	4 x 19	4	3,5	4	3
3"	inch	9,5	9,06	1,04	7,5	6	8 x 0,75	0,16	0,16	0,18	0,17
	mm	241	230	26,5	190,5	152,5	8 x 19	4	4	4,5	4,25
4"	inch	11,5	9,84	1,2	9	7,5	8 x 0,75	0,16	0,2	0,2	0,18
	mm	292	250	30,5	228,6	190,5	8 x 19	4	5	5	4,5

Stem lining DN ½", ¾", 1" is 0,059 inch. All other sizes at least is 0,098 inch.

° DN 3", 4" octagonal

Spare Parts (item n°) - AKH2.2 Standard Version

DIN	ANSI	Ball		Seat Rings
		PFA	Ceramic°	PTFE
015	1/2"	0000321	0002316	0008221
020	3/4"	0000322	0002316	0008221
025	1"	0000323	0002317	0008221
032	-	0000324	---	0009226
040	1 1/2"	0000325	0002319	0008222
050	2"	0000326	0002320	0008223
065	-	0000327	0002321	0008224
080	3"	0000328	0002322	0008225
100	4"	0000329	0002323	0008226

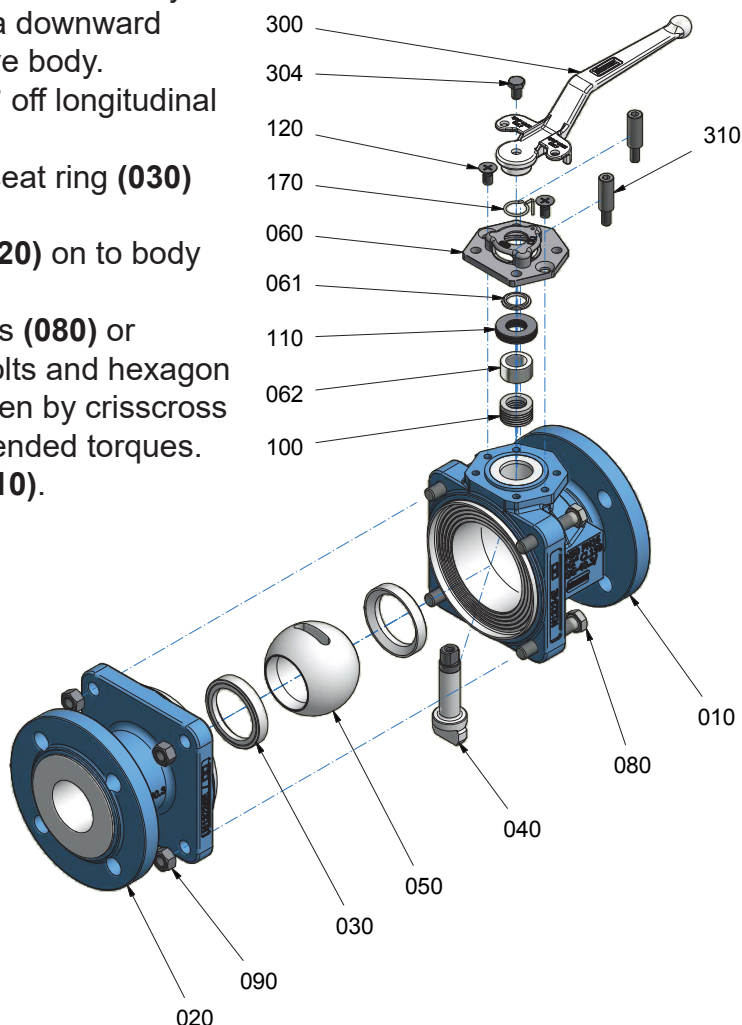
DIN	ANSI	Stem		Packing (set)	
		Stainless Steel / PFA	Hastelloy / PFA	PTFE	PTFE / Graphite
015	1/2"	0000113	0000114	0056974	0068392
020	3/4"	0000113	0000114	0056974	0068392
025	1"	0000115	0000116	0056974	0068392
032	-	0000117	0000118	0000168	0000175
040	1 1/2"	0000117	0000118	0000168	0000175
050	2"	0000119	0000120	0000169	0000176
065	-	0000121	0000122	0010731	0069052
080	3"	0000121	0000122	0010731	0069052
100	4"	0000121	0000122	0010731	0069052

° Al₂O₃

Assembly instructions AKH2.2

The general installation and maintenance instructions must be observed.

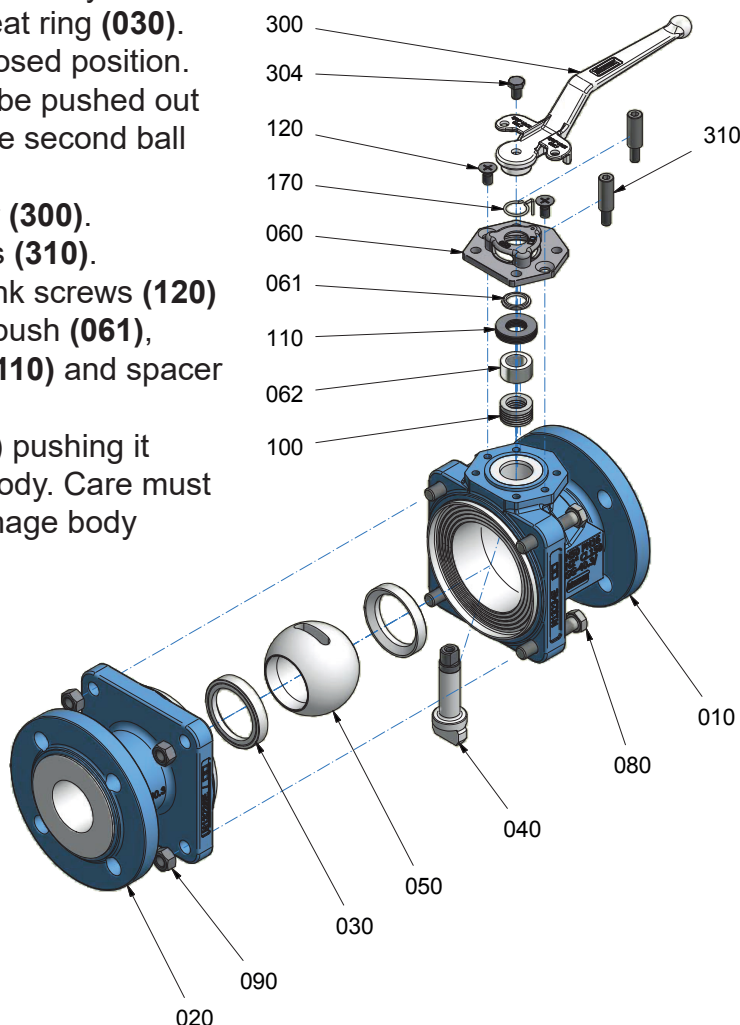
1. Insert stem **(040)** from inside of body in such a way that the flat side is parallel to body longitudinal axis.
2. Insert chevron packing **(100)** and spacer **(062)**.
3. Install belleville washers **(110)** on spacer (in alternating layers).
4. Install top cap **(060)** and bush **(061)** on valve body using countersunk screws **(120)**.
5. Install grounding device **(170)** also on valves with actuator.
6. Install hand lever **(300)** on to stem **(040)** with the hexon screw **(304)**.
7. Insert first ball seat ring **(030)** into body **(010)**.
8. Insert ball **(050)** to valve stem by pushing the ball in a downward motion through valve body.
9. Turn hand lever 90° off longitudinal axis of body.
10. Install second ball seat ring **(030)** on to ball **(050)**.
11. Install side piece **(020)** on to body **(010)**.
12. Install hexagon bolts **(080)** or respectively stud bolts and hexagon nuts **(090)** and tighten by crisscross method to recommended torques.
13. Install lever stop **(310)**.



Disassembly instructions AKH2.2

For all jobs which are to be carried out on an installed valve, the works safety requirements and the general accident prevention instructions must be observed. Moreover, the general installation and maintenance instructions for fluorocarbon resin-lined atomac valves must be considered.

1. Prior to disassembly, the valve must be cleaned from all fluid according to the above mentioned instructions. Particular care must be taken that during the rinsing and draining of the piping, the valve is opened and closed repeatedly. Only when following this procedure, it is ensured that all remaining pressure inside the body is eliminated.
2. Put body on a work bench with a soft cover (rubber mat).
3. If necessary, remove the stops (310). Remove stud bolts (080) and separate side piece (020) from body.
4. Remove first ball seat ring (030).
5. Put hand lever is closed position. The ball can easily be pushed out of the body. Remove second ball seat ring (030).
6. Remove hand lever (300).
8. Remove lever stops (310).
9. Remove countersunk screws (120) and top cap (060), bush (061), belleville washers (110) and spacer (062).
10. Remove stem (040) pushing it down through the body. Care must be taken not to damage body liner.
11. Chevron packing (100) can easily be removed.



AKH2.2 - recommended tightening torques*

DN	tie rods (080/090)		connection flange	
	Nm	lbf · in	Nm	lbf · in
015	24	212,4	10	88
½"	25	221,3	8	71
020	24	212,4	18	160
¾"	25	221,3	11	97
025	26	230,1	25	221
1"	26	230,1	15	133
032	53	469,1	40	354
040	53	169,1	50	442
1½"	60	531	26	257
050	79	699,2	65	575
2"	88	778,8	60	531
065	145	1283,3	90	796
080	83	734,6	55	486
3"	86	761,1	100	885
100	134	1185,9	65	575
4"	143	1265,6	76	673

* maximum value

When bolting together dissimilar materials, always tighten to the lowest recommended torque of the components in the joint. Using higher torques may cause excessive deformation of the „softer“ material in the joint

Gear Operator

(worm gear)

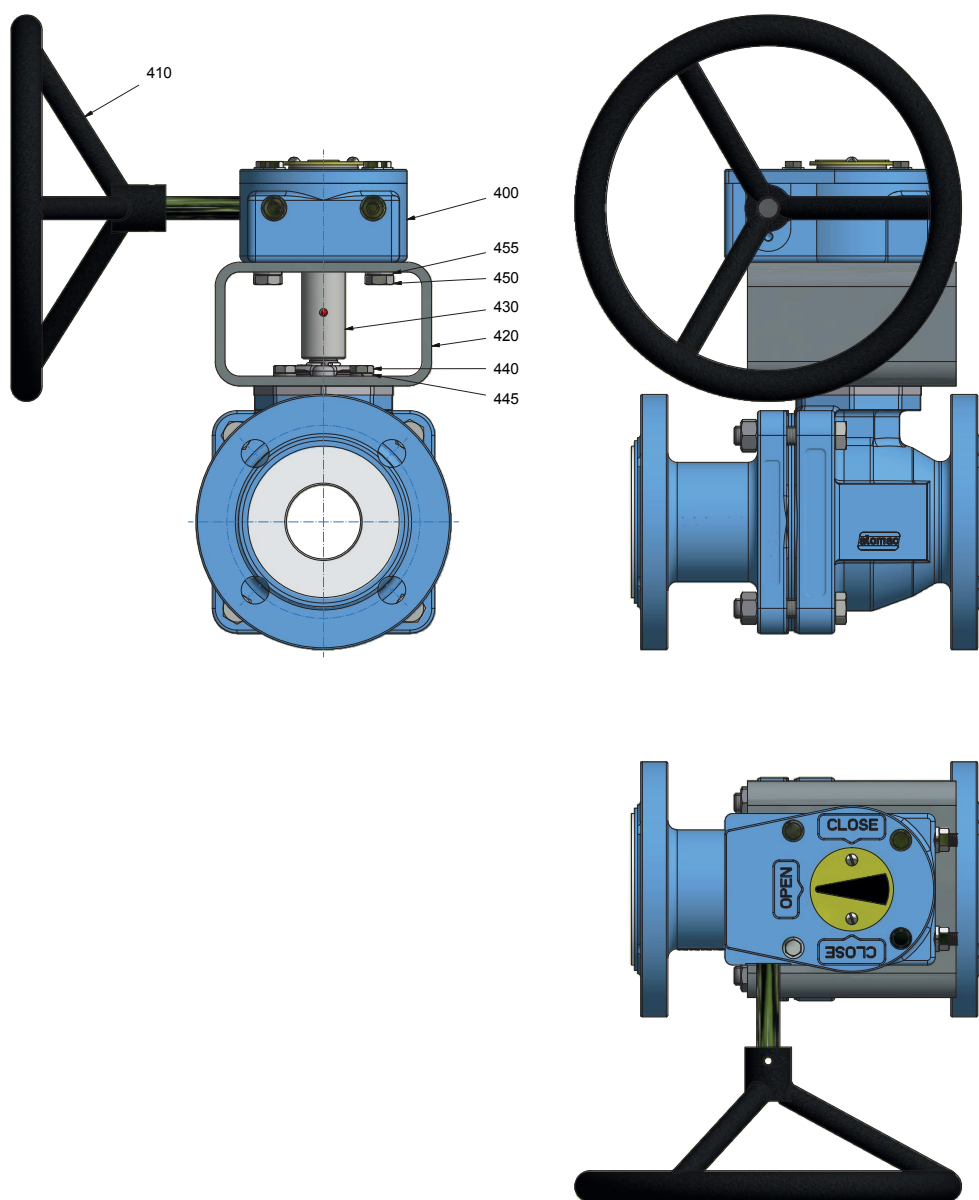
The fully closed, waterproof actuator consists of a body with lid, worm gear, input shaft and hand wheel. For the correct adjustment of the ball position, there are two adjustable stops mounted in the body.

The gear is fully greased and does not need any further lubrication.

The actuator with hand wheel is mounted on a bracket with four stainless steel bolts. The on/off position is indicated through a pointer. The actuator is self-locked.

Designation	Material
Body	Gray Iron
Worm	Spheroidal Graphite Cast Iron
Input Shaft	AISI 410
Hand Wheel	Steel

Material specification - AKH2.2 with manual Gear



No.	Designation	Quantity	Material	Material-No.	DIN	ASTM / AISI
400	gear	1				
410	handwheel	1				
420	bracket	1	steel (yellow chromated)	1.0037	DIN EN 10025-2	A 283 B
430	adapter	1	stainless steel	1.4104	DIN EN 10088-3	AISI 430 F
440	hexagon bolt	4	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
445	serrated lock washer	4	stainless steel	1.4301	DIN EN 10088-3	AISI 304
450	hexagon bolt	4	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
455	serrated lock washer	4	stainless steel	1.4301	DIN EN 10088-3	AISI 304

AKH2.2 - Actuator Sizing Torques

Packingmaterial: chevron PTFE or PTFE-graphite

- for clean and clear application

Size		0 bar Δp	0 psi Δp	10 bar Δp	150 psi Δp	19 bar Δp	275 psi Δp	MAST	
		Nm	lbf · in	Nm	lbf · in	Nm	lbf · in	Nm	lbf · in
015	1/2"	7	62	7	62	8	71	40	354
020	3/4"	7	62	7	62	8	71	40	354
025	1"	7	62	8	71	8	71	40	354
032	-	20	177	27	239	34	301	115	1018
040	1 1/2"	20	177	27	239	34	301	115	1018
050	2"	27	239	34	301	45	398	130	1151
065	-	51	451	73	646	93	426	420	3717
080	3"	59	522	85	752	108	956	420	3717
100	4"	79	699	119	1053	158	1398	420	3717

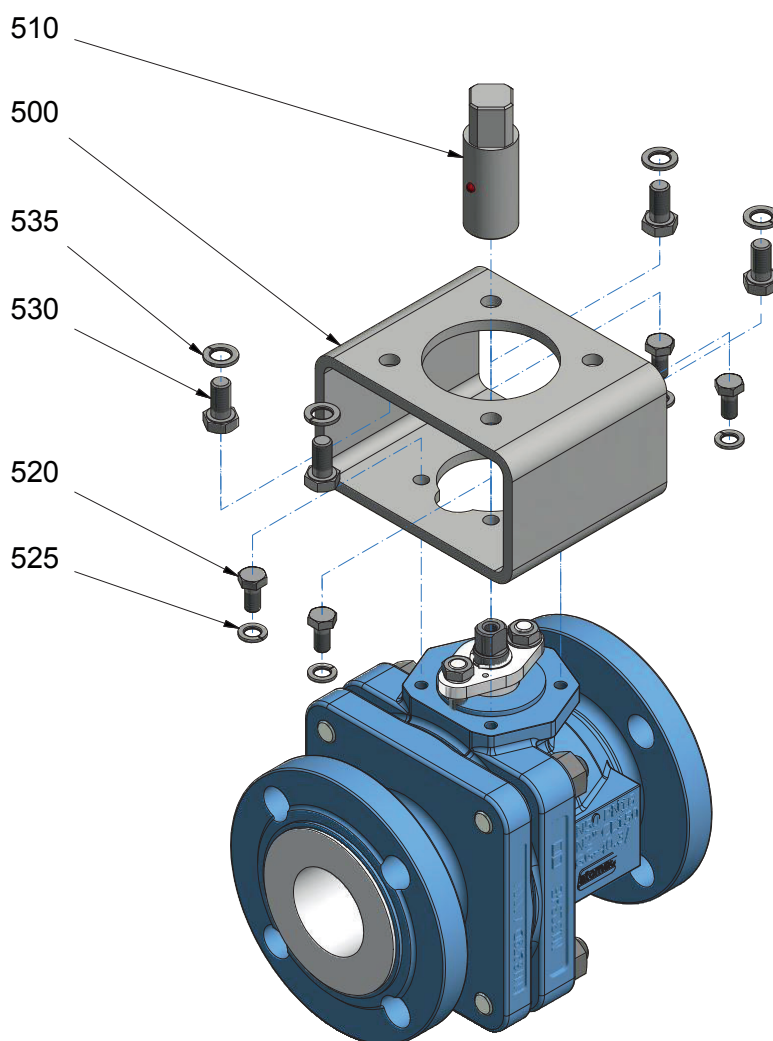
- for dry and slurry application

Size		0 bar Δp	0 psi Δp	10 bar Δp	150 psi Δp	19 bar Δp	275 psi Δp	MAST	
		Nm	lbf · in	Nm	lbf · in	Nm	lbf · in	Nm	lbf · in
015	1/2"	9	81	9	81	10	92	40	354
020	3/4"	9	81	9	81	10	92	40	354
025	1"	9	81	10	92	10	92	40	354
032	-	26	230	35	311	44	391	115	1018
040	1 1/2"	26	230	35	311	44	391	115	1018
050	2"	35	311	44	391	59	518	130	1151
065	-	66	587	95	840	121	1070	420	3717
080	3"	77	679	111	978	140	1243	420	3717
100	4"	103	909	155	1369	205	1818	420	3717

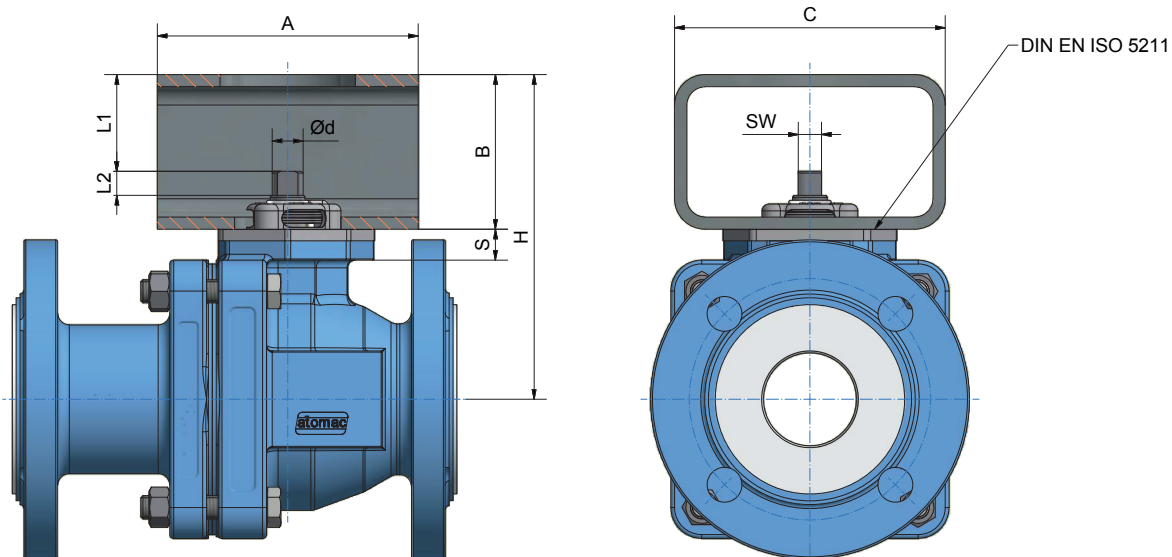
- Stated torques are sizing torques. No further safety factors are to be applied against these torques.
- The use of ceramic balls in lined valves will result in 15% higher sizing torques.
- The use of C-Balls or V-Balls does not result in change in sizing torques.
- Stated sizing torques are „Break-Open“ and „Re-Seating“ torques. Running torques are typically 35% below sizing torques.
- The stated „MAST“ value is the Maximum Allowable Stem Torque. Beyond this value permanent deformation / destruction of liner is to be expected.
- Please note the service conditions of the pressure- / vacuum-temperature-diagrams: register 1, page 13.

AKH2.2 with kit for actuator mounting

No.	Designation	Quantity	Material	Material-No.	DIN	ASTM / AISI
500	bracket	1	steel (yellow chromated)	1.0037	DIN EN 10025-2	A 283-B
510	adapter	1	stainless steel	1.4101	DIN EN 10088-3	AISI 430 F
520	hexagon bolt	4	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
525	serrated lock washer	4	stainless steel	1.4301	DIN EN 10088-3	AISI 304
530	hexagon bolt	1 set	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
535	serrated lock washer	1 set	stainless steel	1.4301	DIN EN 10088-3	AISI 304



AKH2.2 - Dimension sheet for actuator mounting acc. to NAMUR - recommendation

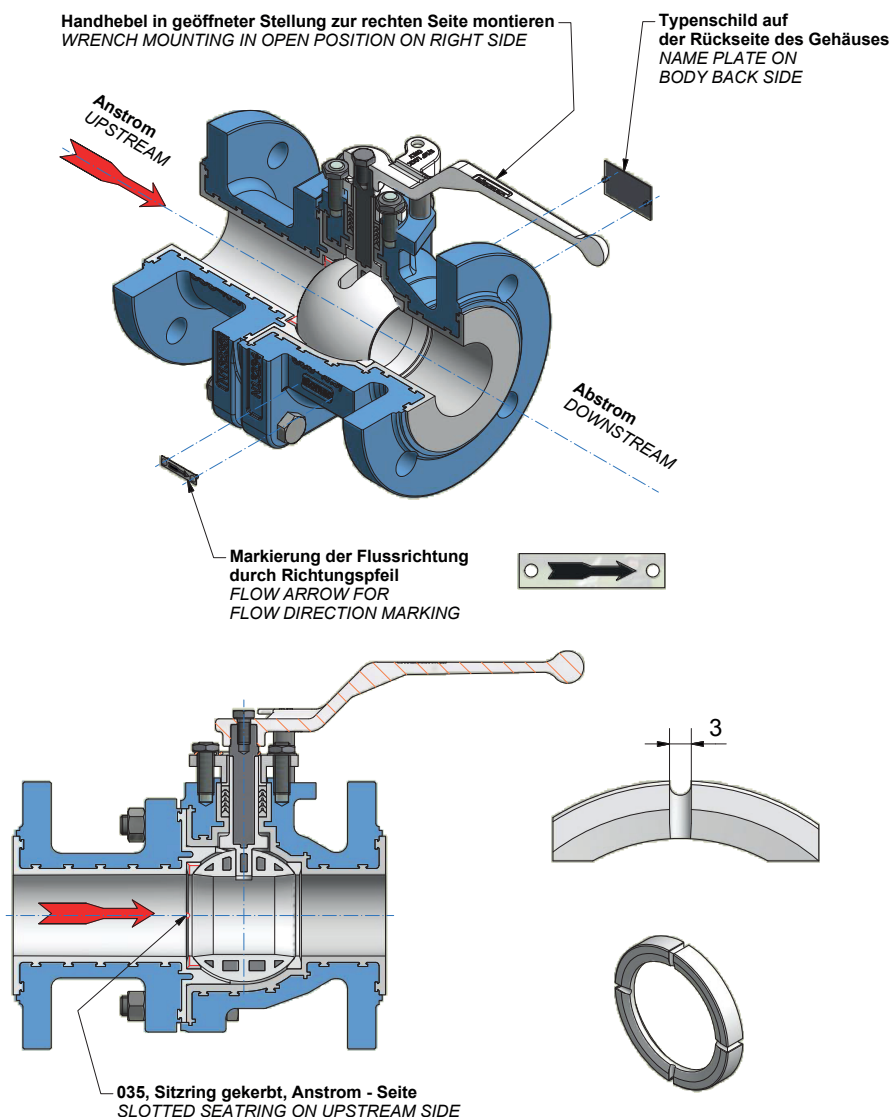


DIN	ANSI		H	A	B	C	SW ^{+0,1 -0,1}	Ød ^{+0 -0,1}	S	L1	L2	DIN EN ISO 5211 ISO 5211
015	½"	mm	112,5	75	60	100	8	10	12,5	39	7,5	F05
		inch	4,43	2,95	2,36	3,94	0,315	0,393	0,49	1,54	0,3	
020	¾"	mm	112,5	75	60	100	8	10	12,5	39	7,5	F05
		inch	4,43	2,95	2,36	3,94	0,315	0,393	0,49	1,54	0,3	
025	1"	mm	114	75	60	100	8	10	12,5	35,5	9,3	F05
		inch	4,49	2,95	2,36	3,94	0,315	0,393	0,49	1,4	0,37	
032	-	mm	135	100	60	100	12	16	16	31,5	12,5	F07
		inch	5,31	3,94	2,36	3,94	0,472	0,63	0,63	1,24	0,49	
040	1½"	mm	135	100	60	100	12	16	16	31,5	12,5	F07
		inch	5,31	3,94	2,36	3,94	0,472	0,63	0,63	1,24	0,49	
050	2"	mm	148	100	60	100	12	16	16	29	12,5	F07
		inch	5,83	3,94	2,36	3,94	0,472	0,63	0,63	1,14	0,49	
065	-	mm	207	135	80	140	16	22	20	41	15,5	F10
		inch	8,15	5,31	3,15	5,51	0,63	0,866	0,79	1,61	0,61	
080	3"	mm	214	135	80	140	16	22	20	41	15,5	F10
		inch	8,43	5,31	3,15	5,51	0,63	0,866	0,79	1,61	0,61	
100	4"	mm	229	135	80	140	16	22	20	41	15,5	F10
		inch	9,02	5,31	3,15	5,51	0,63	0,866	0,79	1,61	0,61	

AKH2.2/DA with pressure compensation grooves by slotted seat ring

See material specification AKH2.2 page 4.

No.	Designation	Quantity	Material	Material-No. / DIN	ASTM / AISI
035	seat ring with pressure compensation grooves	1	PTFE	pure - PTFE	



See Assembly Instructions AKH2.2 page 8.

Attention, please take care of the tight direction of indicator while assembly.

9. Install ball seat ring with pressure compensation grooves **(035)** on to ball **(050)**.
Disassembly instruction see AKH2.2, page 9.

Special cleaning and packaging procedures

1. Recleaning

The ball valve should be thoroughly cleaned with a clean, dry, lint-free towel and blown off with dry nitrogen gas. This will assure that the valve is free from moisture, grease and other media before packing.

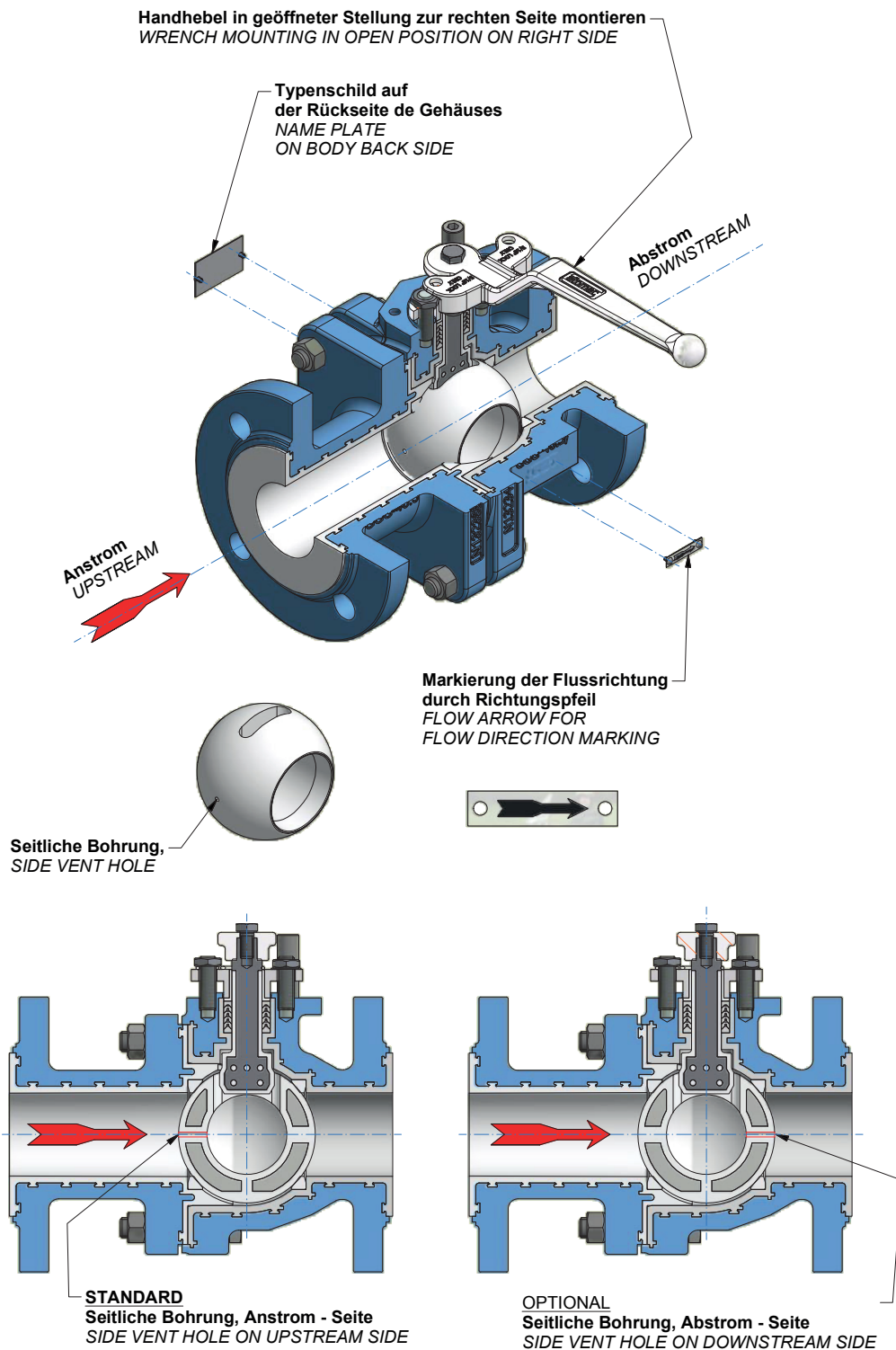
2. Packing

Prior to packing, the ball valve should be jig welded in a PE-foil (0.2 mm thick). The bag contains desiccants acc. to DIN 55473, quantity acc. to DIN 55474 and a moisture indicator.

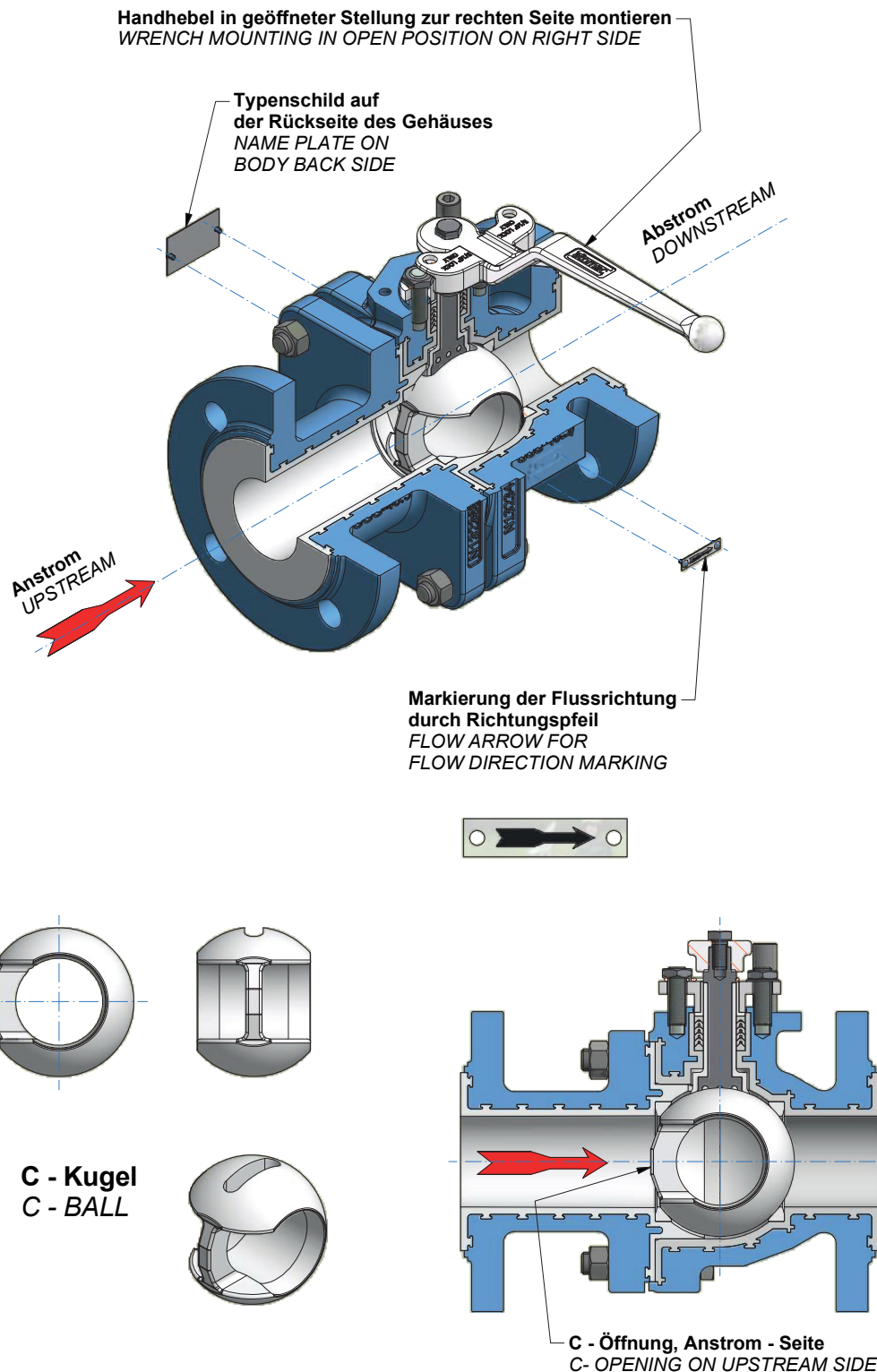
AKH2.2 - K_v DATA and C_v Data (DIN EN 60534-2-3)

DIN	ANSI	K_v m ³ /h	C_v gal/min
015	1/2"	16,9	19,6
020	3/4"	24,4	28,4
025	1"	38,6	44,9
032	-	68,4	79,5
040	1 1/2"	121,4	141,1
050	2"	199,9	232,3
065	-	329,3	382,7
080	3"	525,8	611,1
100	4"	940,2	1092,8

Optional ball with side vent hole



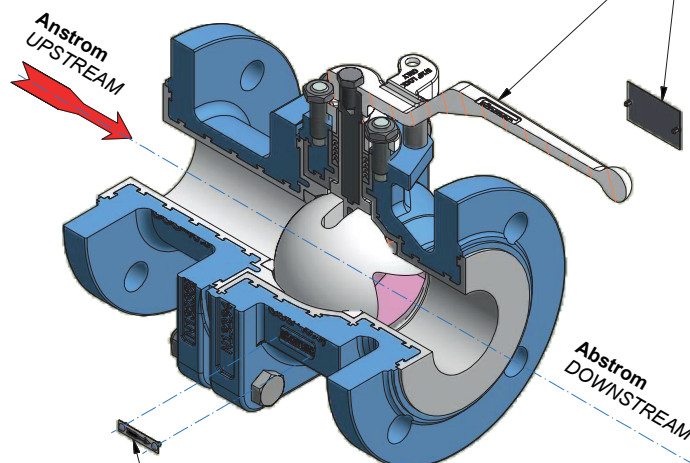
Optional with C-ball



Optional with V-ball or S-ball

Handhebel in geöffneter Stellung zur rechten Seite montieren
WRENCH MOUNTING IN OPEN POSITION ON RIGHT SIDE

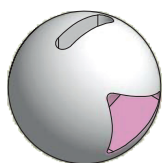
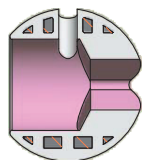
Typenschild auf der Rückseite des Gehäuses
NAME PLATE ON BODY BACK SIDE



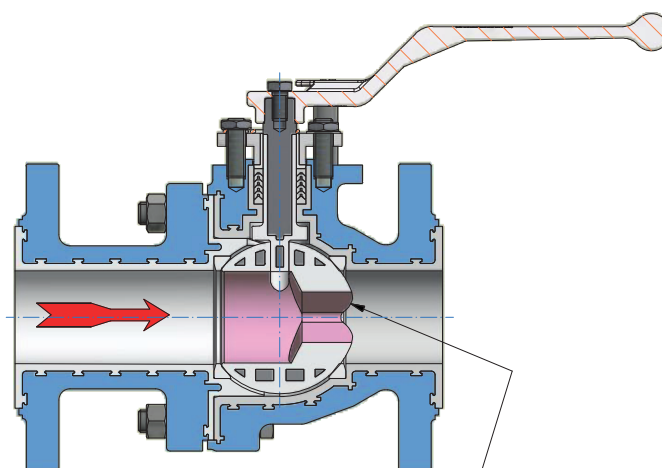
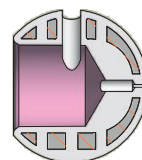
Markierung der Flussrichtung
durch Richtungspfeil
FLOW ARROW FOR
FLOW DIRECTION MARKING



V - Kugel
V - BALL



S - Kugel
S - BALL



Kleine Öffnung, Abstrom - Seite
SMALL OPENING ON DOWNSTREAM SIDE