



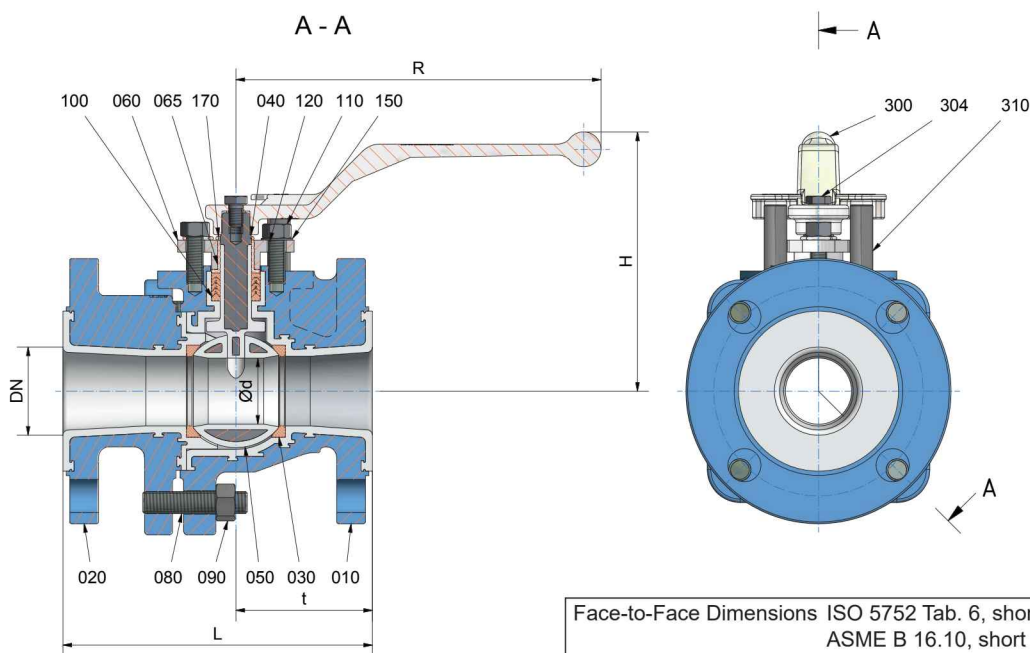
For further information
please contact CRP Ltd.
Tel. +44(0)1706 756 400
web. www.crp.co.uk
email. enquiry@crp.co.uk

Register 3 CONTENTS - AKH3

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Technical Data AKH3



Face-to-Face Dimensions ISO 5752 Tab. 6, short
 ASME B 16.10, short
 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"	inch	5	4,78	6,3	2,2	0,79	lbs	9,7
	mm	127	121,5	160	56	20	kg	4,4
1½"	inch	6,5	4,88	6,3	3,05	0,94	lbs	13,7
	mm	165	124	160	77,5	24	kg	6,2
2"	inch	7	5,91	8,27	3,09	1,5	lbs	23,4
	mm	178	150	210	78,5	38	kg	10,6
3"	inch	8	6,52	8,27	3,70	1,89	lbs	35,5
	mm	203	165,5	210	94	48	kg	16,1
4"	inch	9	8,39	12,32	4,13	3,15	lbs	66,6
	mm	229	213	313	105	80	kg	30,2
6"	inch	10,5	8,94	12,32	5,28	3,94	lbs	110,7
	mm	267	227	313	134	100	kg	50,2
8"	inch	11,5	12,44	13,27°	5,08	5,79	lbs	235,0
	mm	292	316	337°	129	147	kg	106,6
10"	inch	13	14,69	17,72°	6,1	7,68	lbs	382,9
	mm	330	373	450°	155	195	kg	173,7
12"	inch	14	14,72	17,72°	6,95	7,68	lbs	522,5
	mm	356	374	450°	176,5	195	kg	237,0
14"*	inch	15	--	--	7,5	9,65	lbs	705,5
	mm	381	--	--	190,5	245	kg	320,0

°° pass-through handlelever Ø 26,54 inch standard

° pass-through handlelever Ø 35,43 inch standard

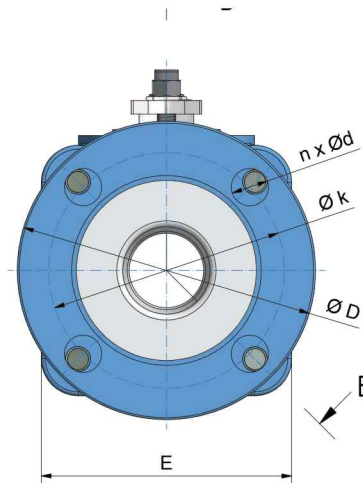
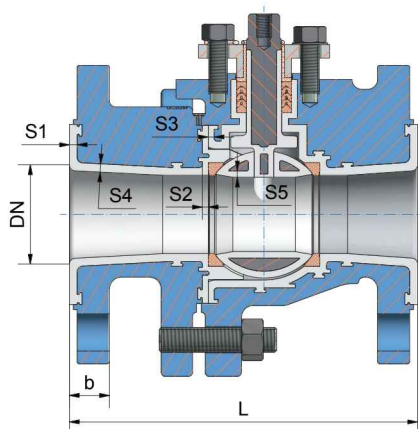
* ball valve only manual actuator (weight without actuator)

Material specification AKH3

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 DN 1" - 3"	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
	DN 4" - 14"	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 *		
		1	MG-PSZ DN 8"		
060	gland follower	1	stainless steel	1.4308 / DIN EN 10283	A 743 CF-8
065	gland insert	1	PTFE-graphite		
080	stud bolt	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	hexagon nut	2	stainless steel	1.4301 / DIN EN 10088-3	A 194 8
120	stud bolt	2	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8
150	serrated lock washer	2	stainless steel	1.4301 / DIN EN 10088-3	AISI 304
170	grounding device	1	stainless steel	1.4310 / DIN EN 10270-3	AISI 301
300	hand lever DN 1" - 6"	1	die cast metall (galvanized)	ZP0410 / DIN EN 12844	
	T - hand lever DN 8" - 12"	1	steel (chromated)	1.0037 / DIN EN 10025-2	A 283 B
304	hexagon bolt	1	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8
310	stop				
	DN 1" - 6"	2	stainless steel	1.4301 / DIN EN 10088-3	AISI 304
	DN 8" - 12"	2	stainless steel	1.4104 / DIN EN 10088-3	AISI 430 F

* Valves with conductive lining only contain components with conductive materials
 ceramic ball on request (available up to DN 8")
 ** Hastelloy stem on request
 ° optional

Dimensions AKH3



DN / ANSI		L	b	ØD	Øk	nxØd	S1	S2	S3	S4	S5
1"	inch	5	0,63	4,25	3,12	4x0,63	0,12	0,10	0,10	0,14	0,10
	mm	127	16	108	79,2	4x16	3	2,5	2,5	3,5	2,5
1½"	inch	6,5	0,77	5	3,88	4x0,63	0,16	0,10	0,11	0,14	0,10
	mm	165	19,5	127	98,5	4x16	4	2,5	2,8	3,5	2,5
2"	inch	7	0,81	6	4,75	4x0,75	0,16	0,12	0,12	0,16	0,12
	mm	178	20,5	152,4	120,5	4x19	4	3	3	4	3
3"	inch	8	0,92	7,5	6	4x0,75	0,16	0,16	0,14	0,2	0,12
	mm	203	23,25	190,5	152,5	4x19	4	4	3,5	5	3
4"	inch	9	1,14	9	7,5	8x0,75	0,16	0,16	0,16	0,2	0,17
	mm	229	29	228,6	190,5	8x19	4	4	4	5	4,25
6"	inch	10,7	1,24	11	9,5	8x0,87	0,16	0,2	0,16	0,2	0,18
	mm	267	31,5	279,4	241,5	8x22	4	5	4	5	4,5
8"	inch	11,5	1,3	13,5	11,75	8x0,87	0,16	0,2	0,16	0,23	0,22
	mm	292	33	342,9	298,5	8x22	4	5	4	6	5,5
10"	inch	13	1,4	16	14,25	12x1	0,16	0,2	0,16	0,23	0,22
	mm	330	36	406,5	361,9	12x25	4	5	4	6	5,5
12"	inch	14	1,69	19	17	12x1	0,16	0,2	0,16	0,23	0,22
	mm	356	43	482,6	431,8	12x25	4	5	4	6	5,5
14"	inch	15	1,56	21	18,76	12x1,12	0,18	0,2	0,18	0,24	0,24
	mm	381	39,5	533,5	476,5	12x28,5	4,5	5	4,5	6	6

stem lining DN 1", 1½" 0,059 inch
 all other sizes at least 0,098 inch

Spare Parts (item n°) - AKH3 Standard Version

ANSI	Ball		Seat Rings
	PFA	Ceramic°	PTFE
1"	0000322	0002316	0000159
1½"	0000323	0002317	0000159
2"	0000325	0002319	0000160
3"	0000326	0002320	0000161
4"	0000328	0002322	0000163
6"	0000329	0002323	0000164
8"	0000330	0002405	0000165
10"	0000331	---	0000166
12"	0000331	---	0000166
14"	0010845	---	0011250

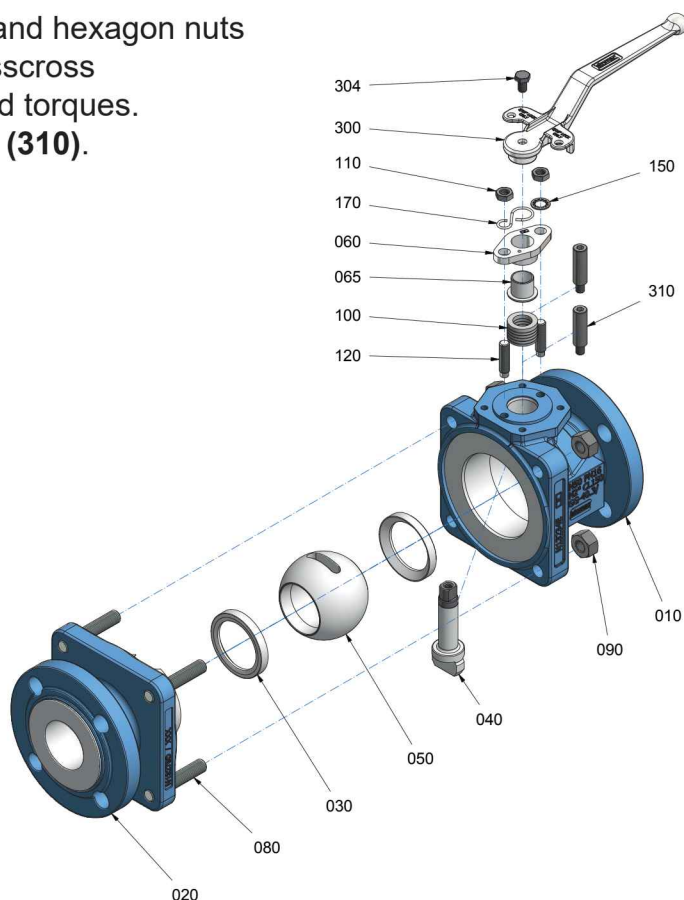
ANSI	Stem		Packing (set)	
	Stainless Steel/PFA	Hastelloy/PFA	PTFE	PTFE / Graphite
1"	0000113	0000114	0000167	0000174
1½"	0000115	0000116	0000167	0000174
2"	0000117	0000118	0000168	0000175
3"	0000119	0000120	0000169	0000176
4"	0000121	0000122	0000170	0000177
6"	0000121	0000122	0000170	0000177
8"	0000123	0000124	0000172	0000179
10"	0000125	0000126	0000173	0000180
12"	0000125	0000126	0000173	0000180
14"	0010843	---	0011251	0011252

° Al₂O₃

Assembly Instructions AKH3

The general installation and maintenance instructions must be observed.

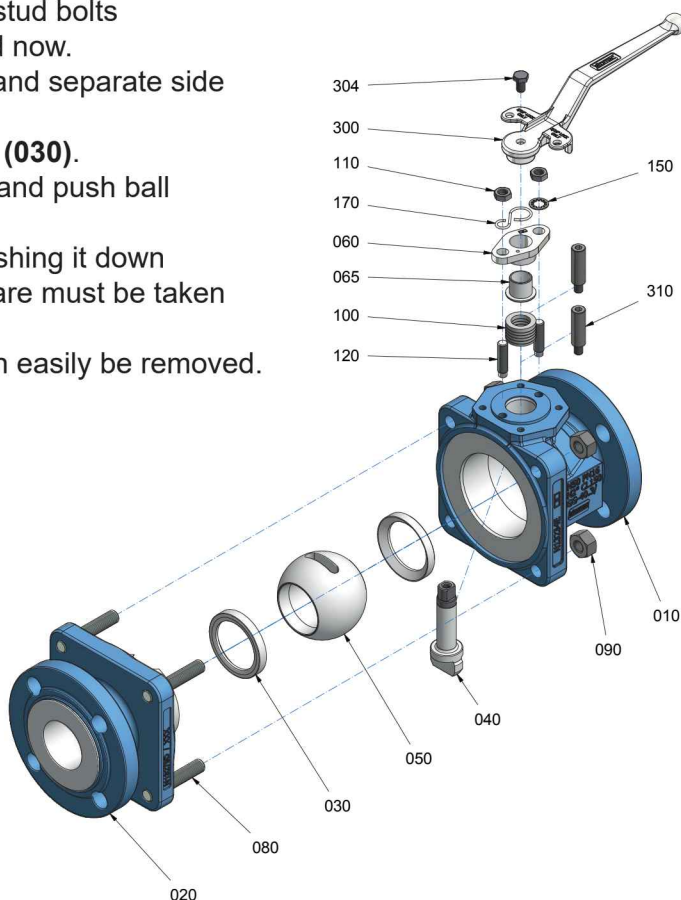
1. Screw stud bolts (120) into body (010).
2. Insert stem (040) from inside of body in such a way that the flat side is parallel to body longitudinal axis.
3. Insert chevron packing (100).
4. Install gland insert (065), gland follower (060), safety washer (150), hexagon nuts (110) and grounding strap (170).
5. Install hand lever (300) on to stem (040) with the hexagon bolt (304).
6. Insert first seat ring (030) into body (010).
7. Insert ball (050) to valve stem by pushing the ball in a downward motion through valve body.
8. Turn hand lever (300) 90° of longitudinal axis of body.
9. Install second ball seat ring (030) on to ball (050).
10. Install side piece (020) on to body (010), making sure that recess for stem is on the correct side.
11. Install body bolts (080) and hexagon nuts (090) and tighten by crisscross method to recommended torques.
12. Assemble the two stops (310).



Disassembly Instructions for AKH3

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 atomac fluorocarbon resin lined valves must be considered.

1. Prior to disassembly, the valve must be cleared of all fluid according to the above-mentioned instructions. Particular care must be taken that during rinsing and draining of the piping, the valve is opened and closed repeatedly. These cycles (opening and closing) are to be repeated during draining of the piping. Only when following this procedure, is it ensured that all remaining pressure inside the body (stem guide and ball seats) is eliminated.
2. For disassembly of the valve, put body on a work bench with a soft cover (rubber mat). If necessary, remove the stops (310). Remove hexagon bolt (110) and lock washer (150) and grounding device (170).
3. Open valve completely. Remove hand lever (300).
4. Disassemble gland follower (060) and gland insert (065). If necessary, stud bolts (120) can also be removed now.
5. Remove body bolts (080) and separate side piece from body.
6. Remove first ball seat ring (030).
7. Put ball in closed position and push ball out of the body.
8. Remove stem (040) by pushing it down through the body (010). Care must be taken not to damage body liner.
9. Chevron packing (100) can easily be removed.



AKH3 - recommended tightening torques*

DN	tie rods (080/090)		connection flange		gland bolts (110/120/150)	
	Nm	lbf · in	Nm	lbf · in	Nm	lbf · in
1"	18	159	16	142	4	35
1½"	18	159	33	292	4	35
2"	35	310	64	566	7	62
3"	47	416	105	929	7	62
4"	70	620	81	717	8	71
6"	113	1000	139	1230	8	71
8"	180	1593	188	1664	12	106
10"	280	2478	223	1972	15	133
12"	280	2478	316	2797	15	133
14"	315	2788	308	2726	15	133

* 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)

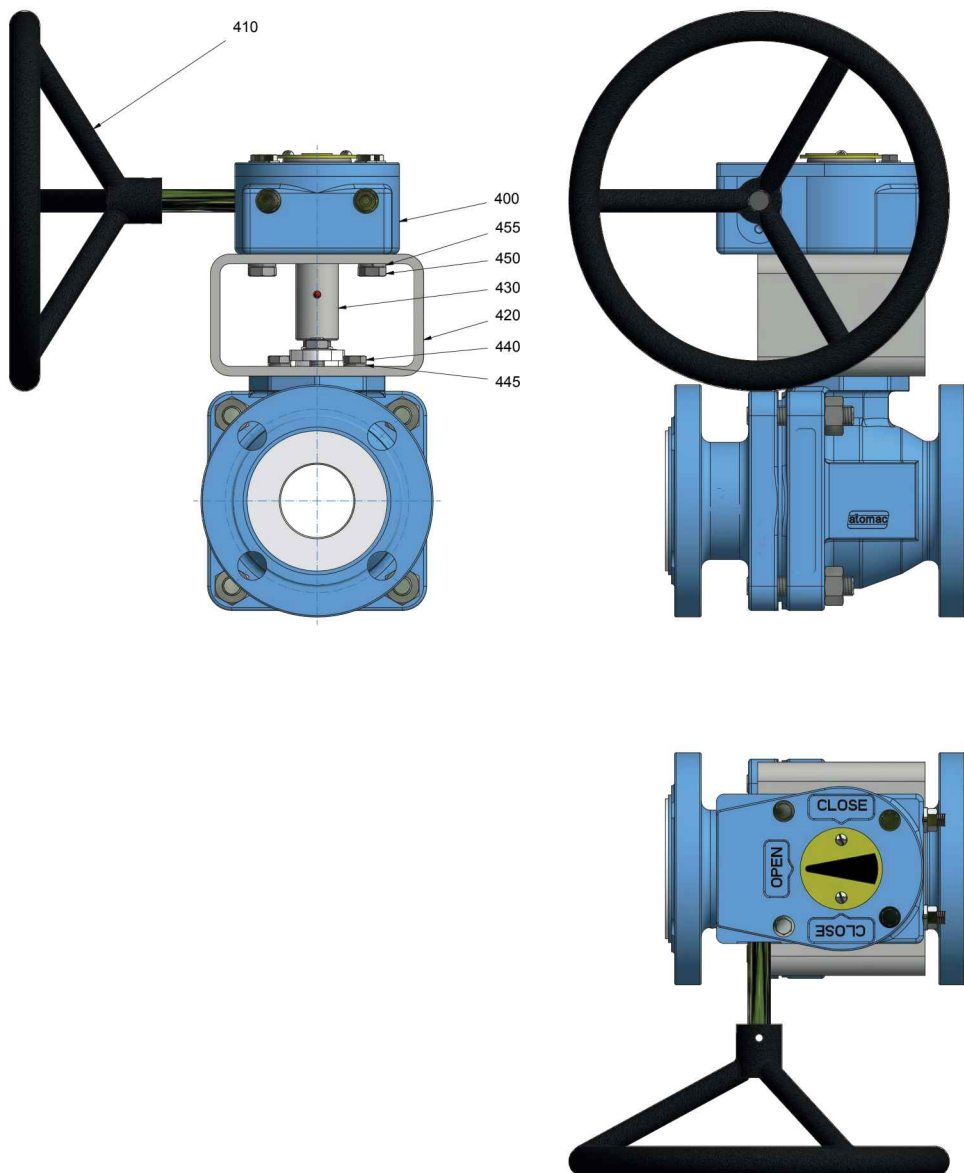
The fully closed, waterproof actuator consists of a body with lid, worm gear, input shaft and hand wheel. For the correct adjustment of the ball position, there are two adjustable stops mounted in the body.

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 - AKH3 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

AKH3 - Actuator Sizing Torques

Packingmaterial: chevron PTFE or PTFE-graphite

• for clean and clear application

Size	0 bar Δ p Nm	0 psi Δ p lbf · in	10 bar Δ p Nm	150 psi Δ p lbf · in	19 bar Δ p Nm	275 psi Δ p lbf · in	MAST	
							Nm	lbf · in
1"	7	62	7	62	8	71	40	354
1½"	7	62	8	71	8	71	40	354
2"	20	177	27	239	34	301	115	1018
3"	27	239	34	301	45	398	130	1151
4"	59	522	85	752	108	956	420	3717
6"	79	699	119	1053	158	1398	420	3717
8"	210	1859	300	2655	360	3186	1107	9798
10"	480	4248	700	6196	900	7966	2180	19295
12"	480	4248	700	6196	900	7966	2180	19295
14"	600	5310	1430	12657	1760	15577	8355	73948

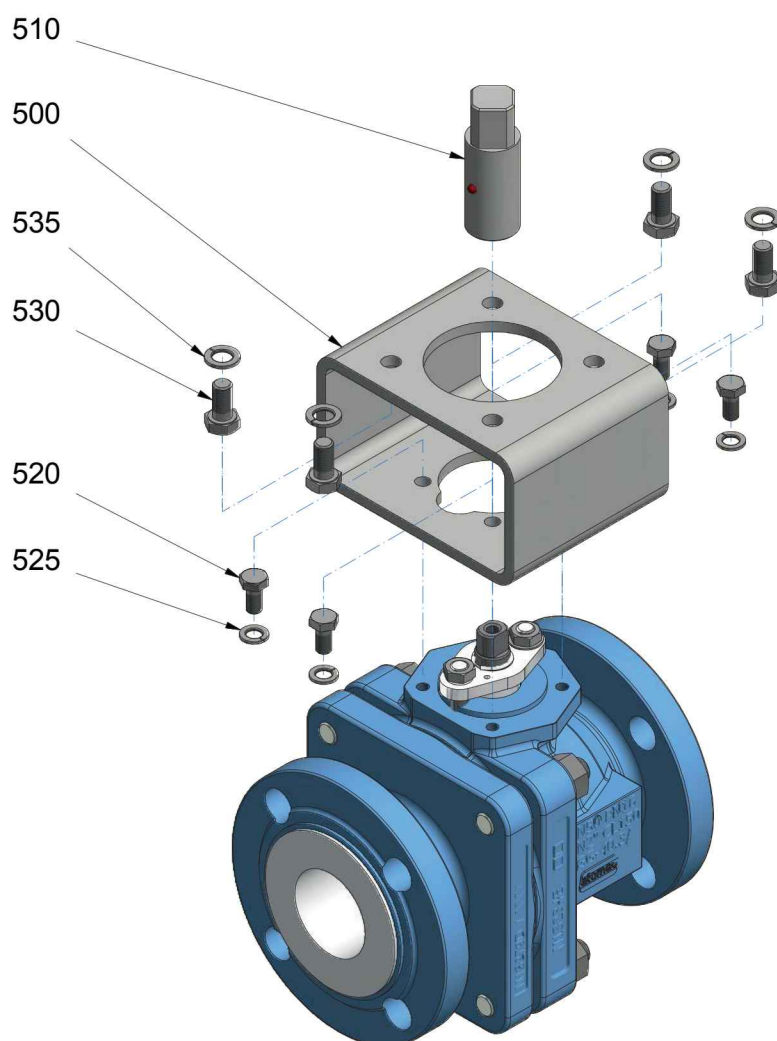
• for dry and slurry application

Size	0 bar Δ p Nm	0 psi Δ p lbf · in	10 bar Δ p Nm	150 psi Δ p lbf · in	19 bar Δ p Nm	275 psi Δ p lbf · in	MAST	
							Nm	lbf · in
1"	9	81	9	81	10	92	40	354
1½"	9	81	10	92	10	92	40	354
2"	26	230	35	311	44	391	115	1018
3"	35	311	44	391	59	518	130	1151
4"	77	679	111	978	140	1243	420	3717
6"	103	909	155	1369	205	1818	420	3717
8"	273	2416	390	3452	468	4142	1107	9798
10"	624	5523	910	8054	1170	10355	2180	19295
12"	624	5523	910	8054	1170	10355	2180	19295
14"	780	6904	1859	16454	2288	20251	8355	73948

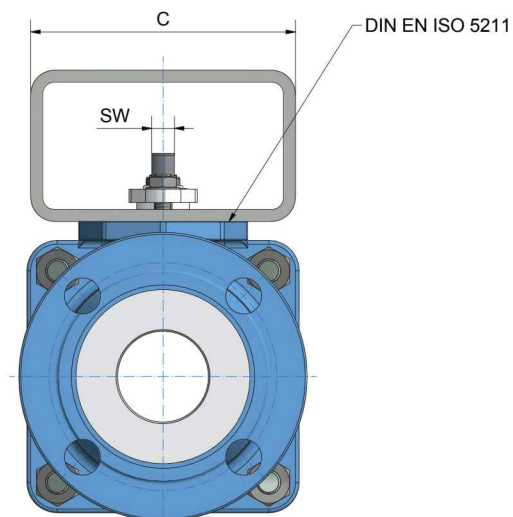
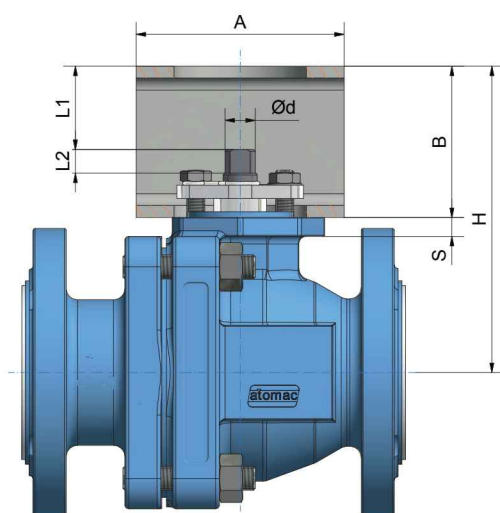
- Stated torques are sizing torques. No further safety factors are to be applied against these torques.
- The use of ceramic balls in lined valves will result in 15% higher sizing torques.
- The use of C-Balls or V-Balls does not result in change in sizing torques.
- Stated sizing torques are „Break-Open“ 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.

AKH3 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



AKH3 - Dimension sheet for actuator mounting acc. to NAMUR - recommendation

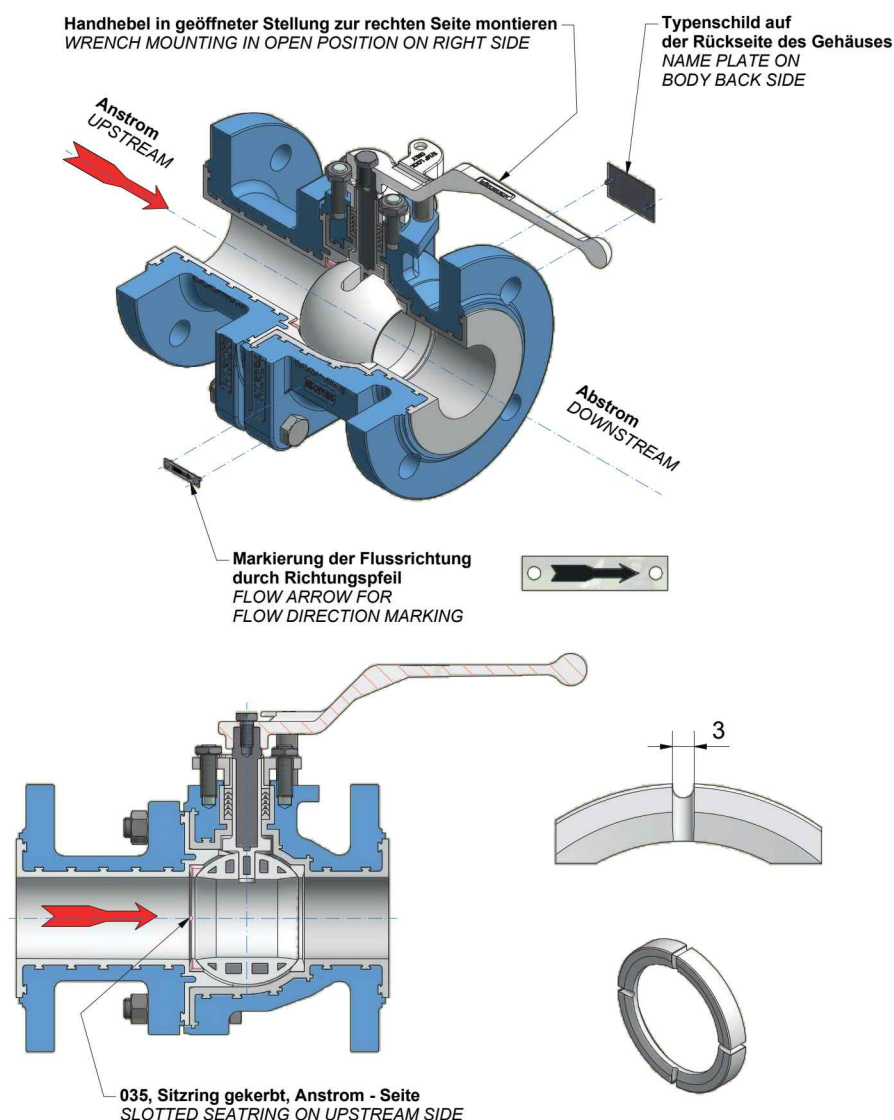


ANSI		H	A	B	C	SW ^{+0,1 -0,1}	Ød ^{+0 -0,1}	S	L1	L2	DIN EN ISO 5211 ISO 5211
1"	mm	107,5	75	60	100	8	10	6	33,5	7,5	F05
	inch	4,23	2,95	2,36	3,94	0,315	0,394	0,24	1,32	0,3	
1½"	mm	109	75	60	100	8	10	6	30,5	9,3	F05
	inch	4,29	2,95	2,36	3,94	0,315	0,394	0,24	1,2	0,4	
2"	mm	129	100	60	100	12	16	10	25,5	12,5	F07
	inch	5,08	3,94	2,36	3,94	0,472	0,63	0,39	1	0,49	
3"	mm	142	100	60	100	12	16	10	23	12,5	F07
	inch	5,59	3,94	2,36	3,94	0,472	0,63	0,39	0,91	0,49	
4"	mm	207	135	80	140	16	22	13	33	15,5	F10
	inch	8,15	5,31	3,15	5,51	0,63	0,866	0,51	1,3	0,61	
6"	mm	222	135	80	140	16	22	13	34	15,5	F10
	inch	8,74	5,31	3,15	5,51	0,63	0,866	0,51	1,34	0,61	
8"	mm	284	135	80	140	20	30	14	23	19,5	F12
	inch	11,18	5,31	3,15	5,51	0,787	1,181	0,55	0,91	0,77	
10"	mm	376	225	120	220	27	40	14	61	19,5	F12
	inch	14,8	8,86	4,72	8,66	1,06	1,575	0,55	2,4	0,77	
12"	mm	376	225	120	220	27	40	14	61	19,5	F12
	inch	14,8	8,86	4,72	8,66	1,06	1,575	0,55	2,4	0,77	
14"	mm	421	225	120	220	36	50	20	32	35	F14
	inch	16,57	8,86	4,72	8,66	1,42	1,97	0,79	1,26	1,38	

AKH3/DA with pressure compensation grooves by slotted seat ring

See material specification AKH2 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 AKH3 page 6.

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 AKH3 page 7

Special cleaning and packaging procedures

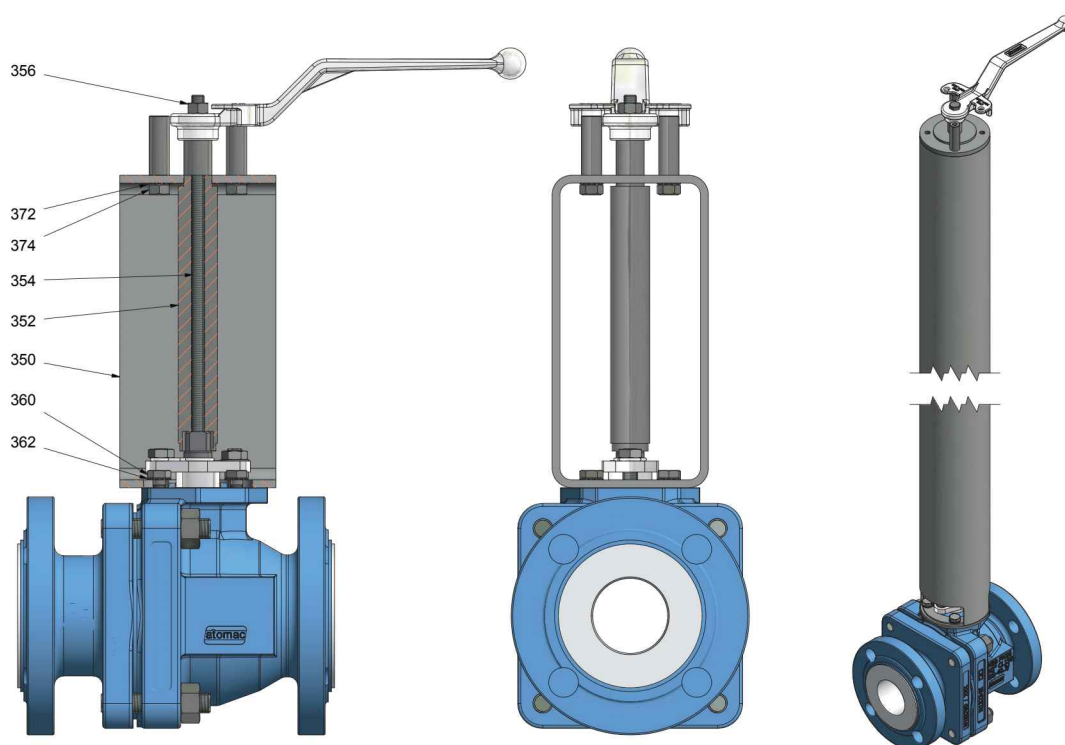
1. Recleaning

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.

AKH3 Extension Kit



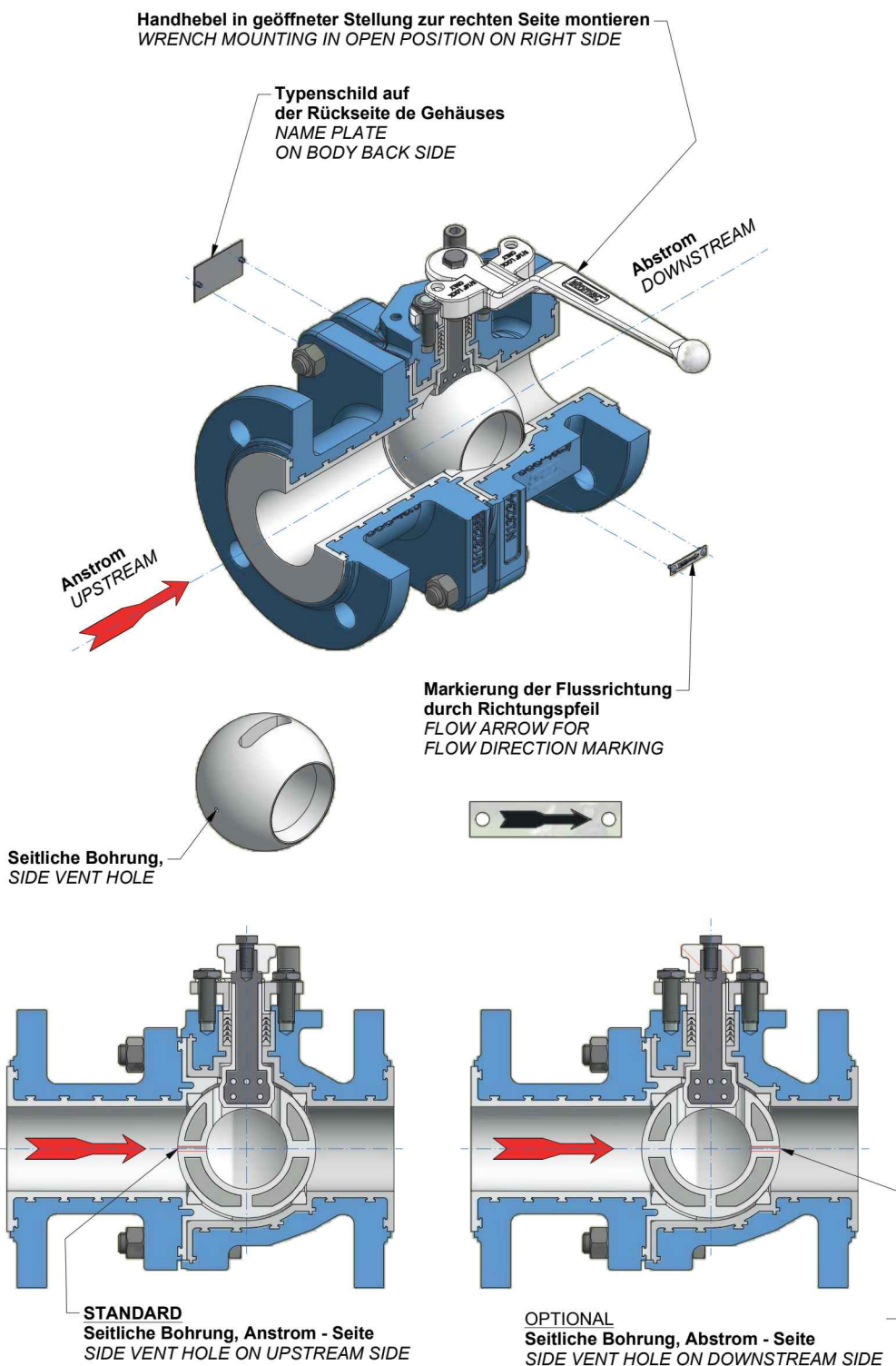
No.	Designation	Pieces	Material	Material-No.	DIN	ASTM / AISI
350	bracket	1	steel, yellow chromated	1.0037	DIN EN 10025-2	A 283 B
352	adapter	1	stainless steel	1.4104	DIN EN 10088-3	AISI 430 F
354	stud bolt	1	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
356	hexagon nut	1	stainless steel	1.4301	DIN EN 10088-3	A 194 8
360	hexagon bolt	2	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
362	serrated lock washer	2	stainless steel	1.4301	DIN EN 10088-3	AISI 304
372	serrated lock washer	2	stainless steel	1.4301	DIN EN 10088-3	AISI 304
374	hexagon nut	2	stainless steel	1.4301	DIN EN 10088-3	A 194 8

AKH3* - K_v DATA and C_v Data (DIN EN 60534-2-3)

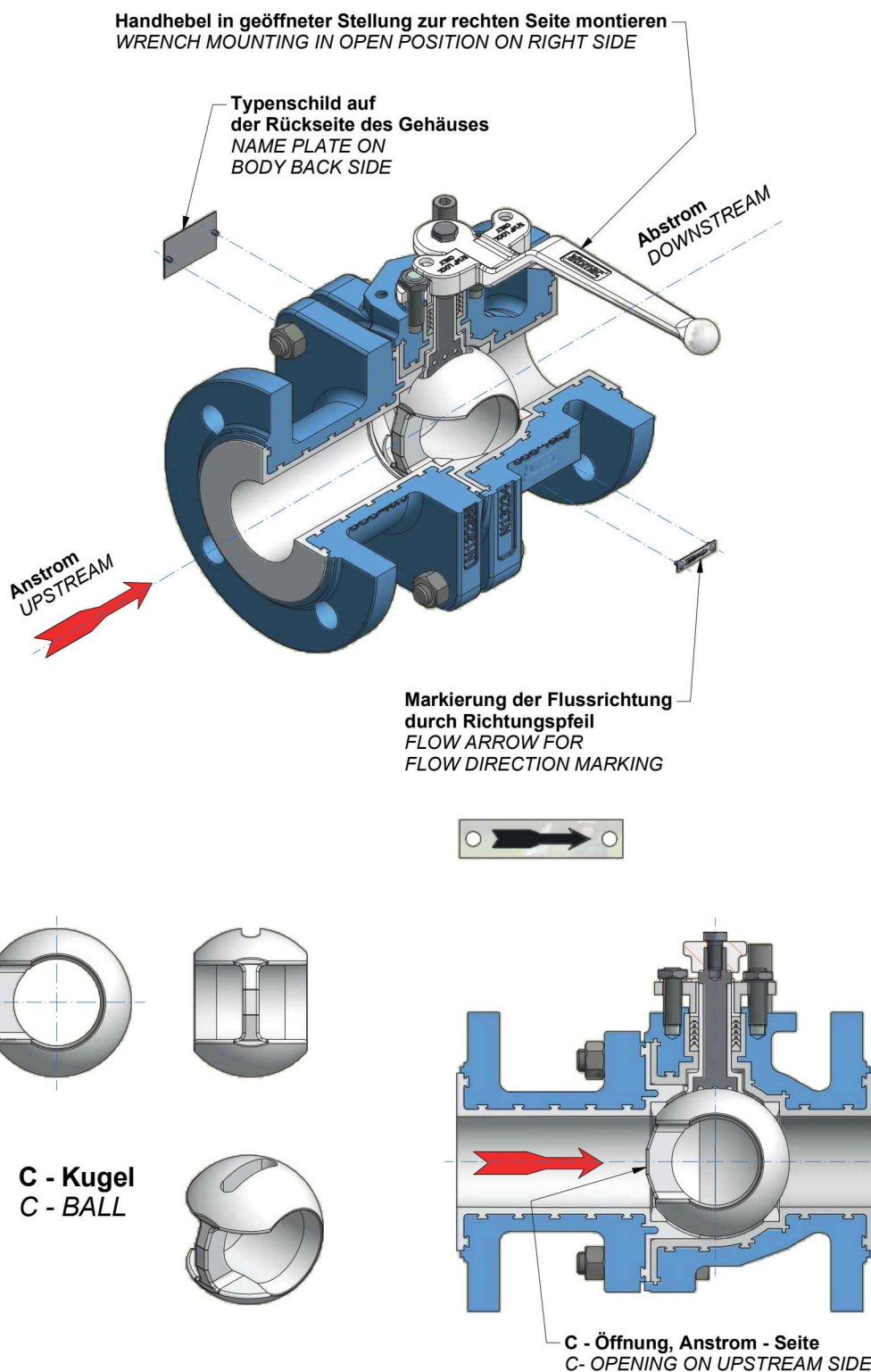
ANSI	K_v m ³ /h	C_v gal/min
1"	31,6	36,7
1 1/2"	44,1	51,3
2"	158,4	184,1
3"	177,5	206,3
4"	580,3	674,5
6"	789,2	917,3
8"	1636,2	1901,6
10"	3652,0	4244,7
12"	2793,0	3246,3
14"	at time not available	

*reduced port

Optional ball with side vent hole



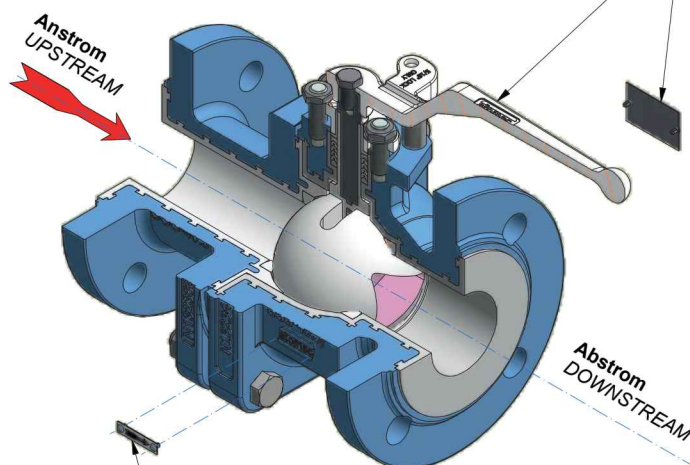
Optional with C-ball



Optional with V-ball or S-ball

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

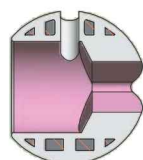
Typenschild auf der Rückseite des Gehäuses
NAME PLATE ON BODY BACK SIDE



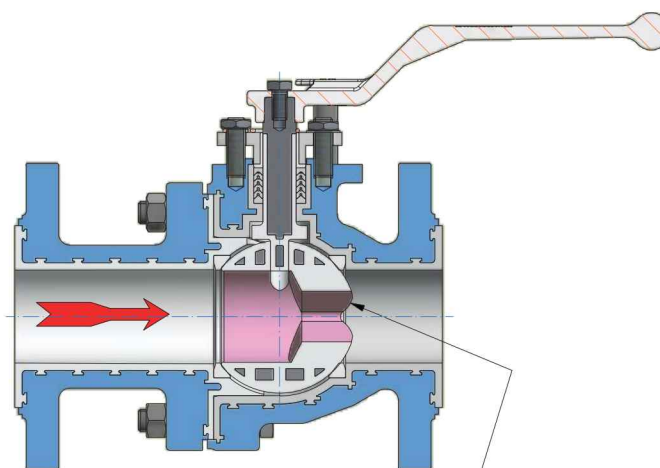
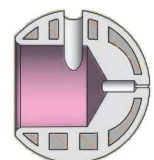
Markierung der Flussrichtung durch Richtungspfeil
FLOW ARROW FOR FLOW DIRECTION MARKING



V - Kugel
V - BALL



S - Kugel
S - BALL



Kleine Öffnung, Abstrom - Seite
SMALL OPENING ON DOWNSTREAM SIDE