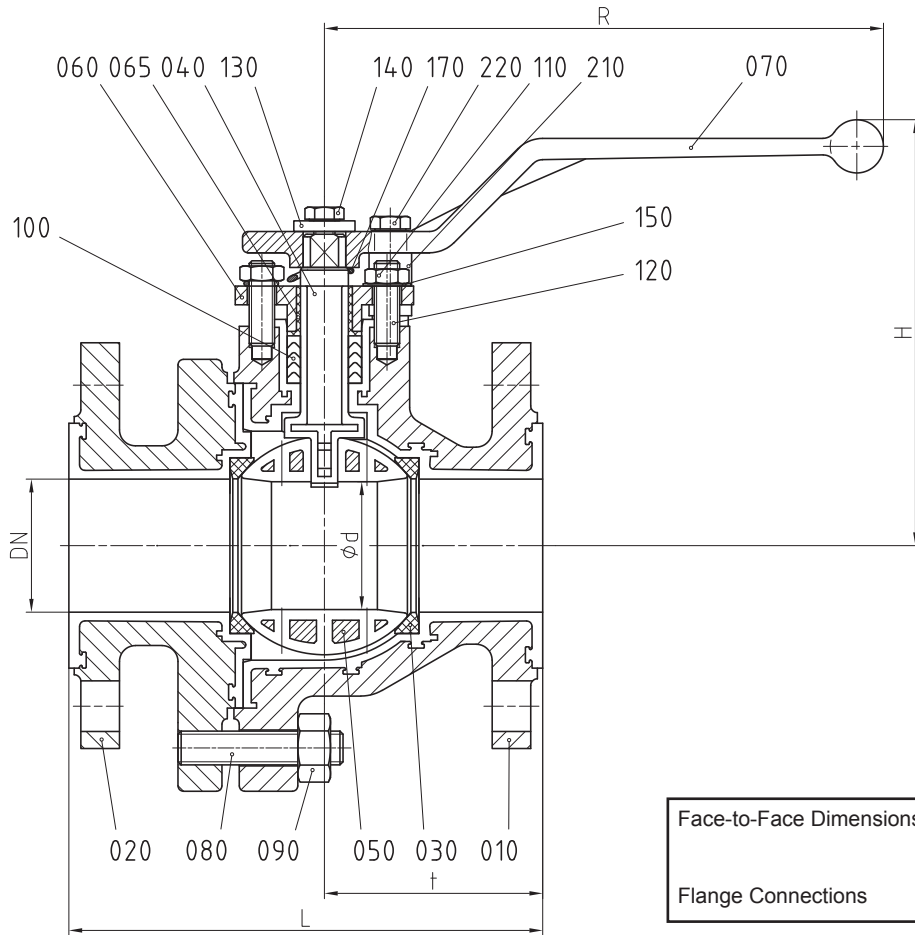


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Technical Manual

Technical Data AKH2A



DN / ANSI		L	H	R	t	Ød	weight
1"	inch	5	4,72	6,3	2,26	0,94	lbs 9,1
	mm	127	120	160	57,5	24	kg 4,2
1½"	inch	6,5	5,71	8,27	2,95	1,5	lbs 17,2
	mm	165	145	210	75	38	kg 7,8
2"	inch	7	6,3	8,27	3,23	1,89	lbs 25,4
	mm	178	160	210	82	48	kg 11,6
3"	inch	8	8,07	12,32	3,96	2,83	lbs 56,5
	mm	203	205	313	100,5	72	kg 25,7
4"	inch	9	8,66	12,32	4,37	3,74	lbs 81,2
	mm	229	220	313	111	95	kg 36,9
6"	inch	10,5	11,77	13,27*	5,28	5,12	lbs 171,6
	mm	267	299	337*	134	130	kg 78,0

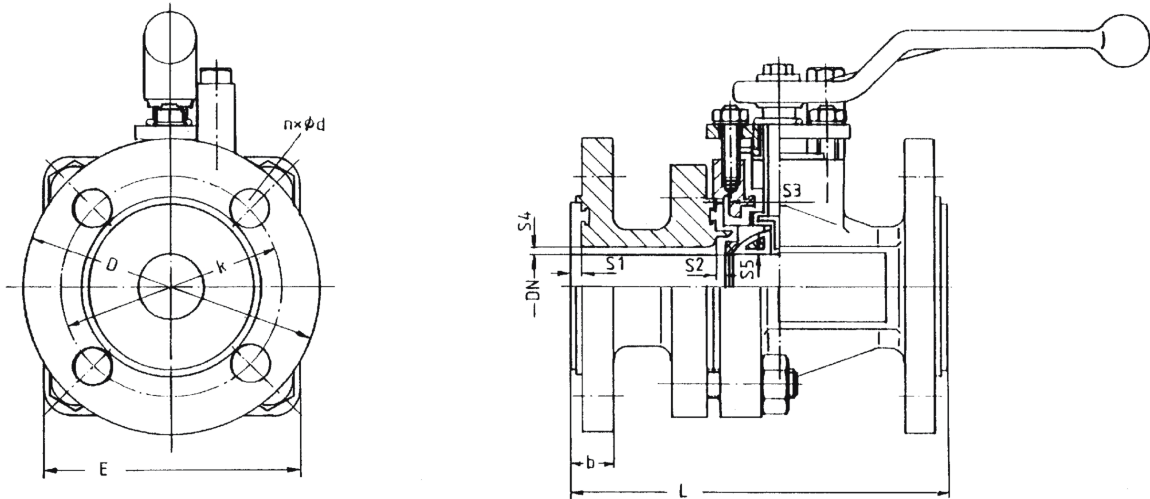
* pass-through handlelever Ø 26,54 inch standard

Material specification AKH2A

No.	Designation	Pieces	Material	Material-No. / DIN	ASTM / AISI
010	body	1	ductile iron / PFA ductile iron / FEP °	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
020	side piece	1	ductile iron / PFA ductile iron / FEP °	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
030	seat ring	2	PTFE	pure - PTFE	
040	stem	1	stainless steel / PFA Hastelloy C4 / PFA °°	1.4470 / DIN EN 10283 2.4610 / DIN 17744	A 890 CD3MN
050	ball				
	DN 1" - 2"	1	cast steel / PFA cast steel / FEP°	1.0619 / DIN EN 10213-2	ASTM A216 Grade WCB
	DN 3" - 6"	1	ductile iron / PFA ductile iron / FEP ° ceramic Al ₂ O ₃ *	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
060	gland follower	1	stainless steel	1.4308 / DIN EN 10283	A 743 CF-8
065	gland insert	1	PTFE-graphite		
070	hand lever				
	DN 1" - 2"	1	die cast metall	ZP0410 / DIN EN 12844	
	DN 3" - 4"	1	malleable cast iron (galvanizing)	EN-GJS-50-7 (GGG-50)	
	DN 6": adapter; level	1	stainless steel; steel (chromated)	1.4308 / DIN EN 10283; 1.0037 / DIN EN 10025-2	A 743 CF-8 A283 B
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
130	lock washer	1	stainless steel	1.4301 / DIN EN 10088-3	AISI 304
140	hexagon bolt	1	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8
150	serrated lock washer	1	stainless steel	1.4301 / DIN EN 10088-3	AISI 304
170	grounding device	1	stainless steel	1.4310 / DIN EN 10270-3	AISI 301
210	stop				
	DN 1" - 4"	1	steel (galvanizing)	1.0037 / DIN EN 10025-2	A 283 B
	DN 6"	1	stainless steel	1.4104 / DIN EN 10088-3	AISI 430 F
220	hexagon bolt**	1	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8

- * ceramic ball on request
- °° Hastelloy stem on request
- ° optional
- ** DN 6" 2 hexagon bolts

Dimensions AKH2A



DN / ANSI		L	E °	b	D	k	nxØd	S1	S2	S3	S4	S5
1"	inch	5	3,82	0,57	4,25	3,13	4x0,63	0,16	0,1	0,13	0,13	0,1
	mm	127	97	14,5	107,9	79,2	4x16	4,0	2,5	3	3	2,5
1½"	inch	6,5	4,65	0,71	5	3,88	4x0,63	0,16	0,13	0,13	0,13	0,13
	mm	165	118	18	127	98,5	4x16	4	3	3	3	3
2"	inch	7	5,51	0,75	6	4,75	4x0,75	0,16	0,13	0,13	0,13	0,13
	mm	178	140	19	152,4	120,5	4x19	4	3	3,0	3	3
3"	inch	8	8,66	0,85	7,5	6	4x0,75	0,16	0,14	0,16	0,14	0,16
	mm	203	220	21,5	190,5	152,5	4x19	4	3,5	4	3,5	4
4"	inch	9	9,65	1,02	9	7,5	8x0,75	0,16	0,14	0,16	0,14	0,16
	mm	229	245	26	228,6	190,5	8x19	4	3,5	4	3,5	4
6"	inch	10,5	12,32	1,14	11	9,5	8x0,87	0,16	0,2	0,16	0,2	0,12
	mm	267	313	29	279,4	241,5	8x22	4	5	4	5	4,5

stem lining DN 1" 0,059 inch
 all other sizes at least 0,098 inch
 ° DN1" to DN2" quadrangular, DN3" to DN6" octagonal

Spare Parts (item n°) - AKH2A Standard Version

ANSI	Ball			Seat Rings
	FEP	PFA	Ceramic [°]	PTFE
1"	0000268	0000323	0002317	0000159
1½"	0000270	0000325	0002319	0000160
2"	0000271	0000326	0002320	0000161
3"	0009170	0009172	--	0009425
4"	0009171	0009173	--	0009426
6"	0009340	0009341	--	0009427

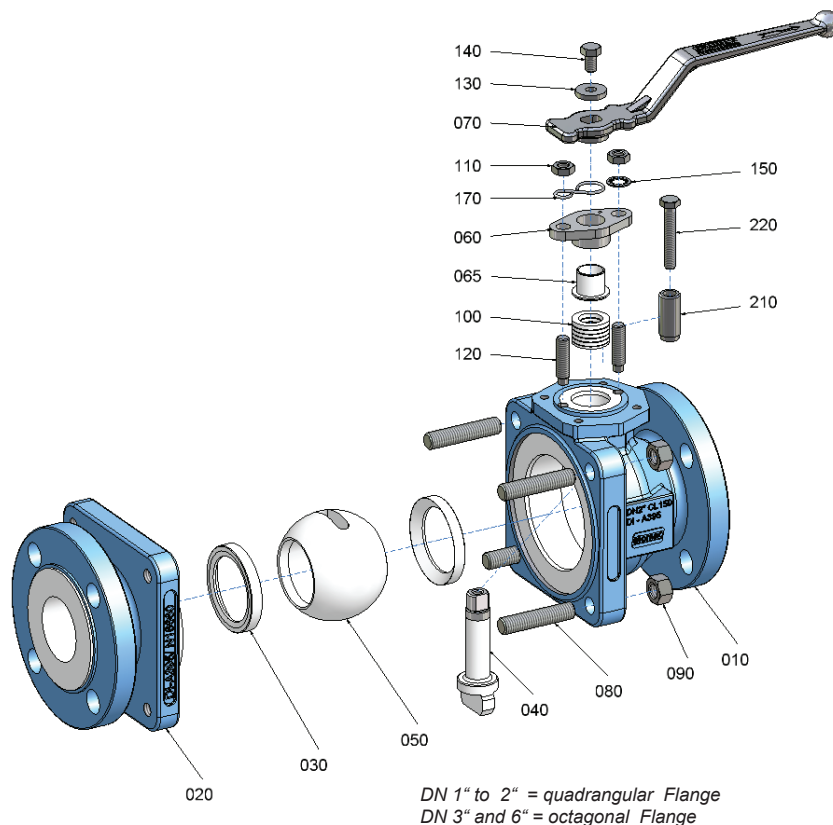
ANSI	Stem		Packing (set)	
	Stainless Steel / PFA	Hastelloy / PFA	PTFE	PTFE / Graphite
1"	0000115	0000116	0000167	0000174
1½"	0000117	0000118	0000168	0000175
2"	0000119	0000120	0000169	0000176
3"	0000121	0000122	0000170	0000177
4"	0000121	0000122	0000170	0000177
6"	0000123	0000124	0000172	0000179

[°] Al₂O₃

Assembly Instructions AKH2A

The general installation and maintenance instructions must be observed.

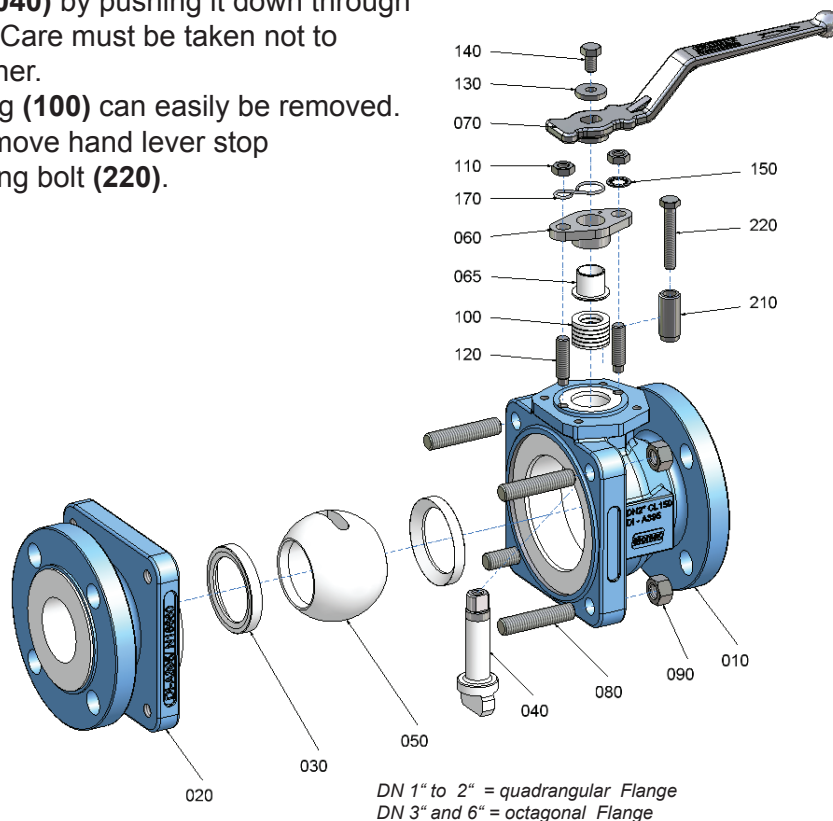
1. Screw stud bolts (120) into body (010).
2. Insert stem (040) from inside of body in such a way that the flat side is parallel to body longitudinal axis.
3. Insert chevron packing (100).
4. Install gland insert (065), gland follower (060), safety washers (150), hexagon nuts (110) and grounding strap (170) also on valves with actuator.
5. Install hand lever (070) on to stem (040) and tighten it using lock washer (130) and hexagon bolt (140).
6. Insert first ball 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 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).
11. Install body bolts (080) and hexagon nuts (090) and tighten by crisscross method to recommended torques.
12. Assemble stop (210) with hexagon bolt (220).



Disassembly Instructions for AKH2A

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). Remove hexagon bolt (110) and serrated lock washer (150).
3. Open valve completely. Remove hand lever (070).
4. Disassemble grounding device (170).
5. Disassemble gland follower (060) and gland insert (065). If necessary, stud bolts (120) can also be removed now.
6. Remove body bolts (080) and separate side piece from body.
7. Remove first ball seat ring (030).
8. Put ball in closed position and push ball out of the body.
9. Remove stem (040) by pushing it down through the body (010). Care must be taken not to damage body liner.
10. Chevron packing (100) can easily be removed.
11. If necessary, remove hand lever stop (210) by releasing bolt (220).



AKH2A - recommended tightening torques*

DN	tie rods (080/090)		connection flange		gland bolts (110/120/150)	
	Nm	in.lbs	Nm	in.lbs	Nm	in.lbs
1"	19	168	15	133	4	35
1½"	38	336	26	230	7	62
2"	66	584	60	531	7	62
3"	116	1027	100	885	8	71
4"	140	1239	76	673	8	71
6"	161	1425	129	1142	12	106

* maximum value

Manual Actuator

(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.

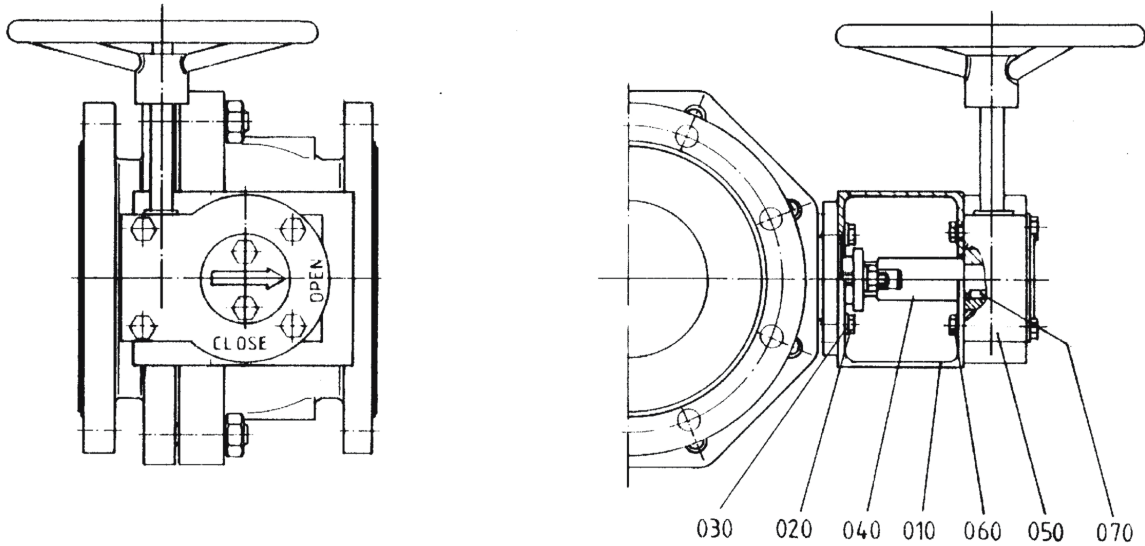
The gear is fully greased and does not need any further lubrication.

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.

Material specification

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

Material specification - AKH2A with manual actuator



No.	Designation	Pieces	Material	Material-No.	DIN	ASTM / AISI
010	actuator	1	steel	1.0037	DIN EN 10025-2	A 283 B
020	hexagon bolt	4	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
030	serrated lock washer	4	stainless steel	1.4301	DIN EN 10088-3	AISI 304
040	adapter	1	stainless steel	1.4104	DIN EN 10088-3	AISI 430 F
050	actuator	1				
060	hexagon bolt	4	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
070	key	1	steel	1.0050	DIN EN 10277-1	A 572 GR 50

AKH2A - Actuator Sizing Torques

Packingmaterial: chevron PTFE or PTFE-graphite

- for clean and clear application

Size	0 bar Δ p Nm	0 psi Δ p in/ lbs	10 bar Δ p Nm	150 psi Δ p in/lbs	19 bar Δ p Nm	275 psi Δ p in/lbs	MAST	
							Nm	in/lbs
1"	7	62	8	71	8	71	40	354
1½"	20	177	27	239	34	301	115	1018
2"	27	239	34	301	45	398	130	1151
3"	54	478	67	593	89	788	420	3717
4"	63	558	97	859	124	1097	420	3717
6"	160	1416	240	2124	310	2744	1107	9798

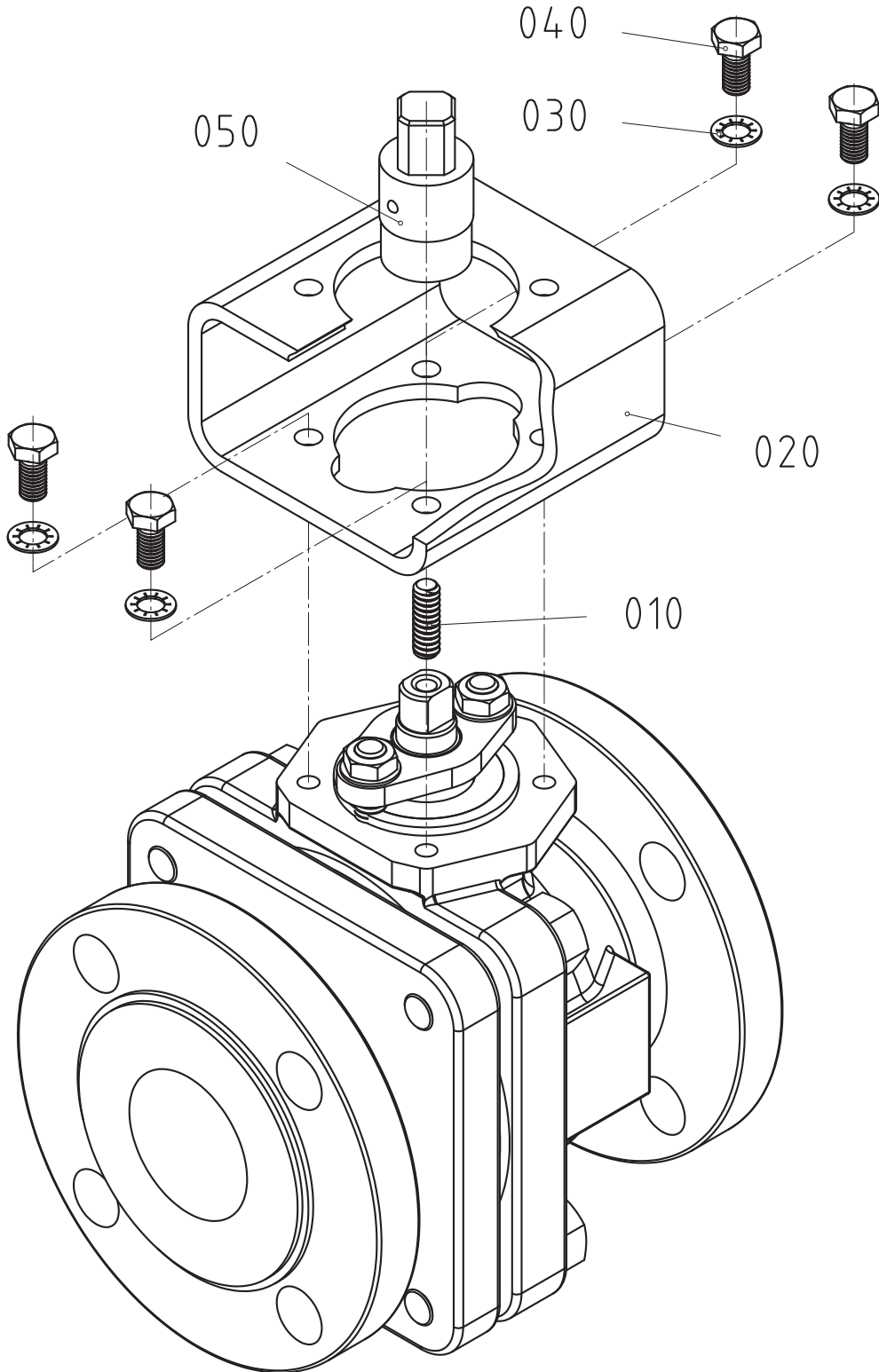
- for dry and slurry application

Size	0 bar Δ p Nm	0 psi Δ p in/ lbs	10 bar Δ p Nm	150 psi Δ p in/lbs	19 bar Δ p Nm	275 psi Δ p in/lbs	MAST	
							Nm	in/lbs
1"	9	81	10	92	10	92	40	354
1½"	26	230	35	311	44	391	115	1018
2"	35	311	44	391	59	518	130	1151
3"	70	621	87	771	116	1024	420	3717
4"	82	725	126	1116	161	1427	420	3717
6"	208	1841	312	2761	403	3567	1107	9798

- 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.



AKH2A with actuator mounting

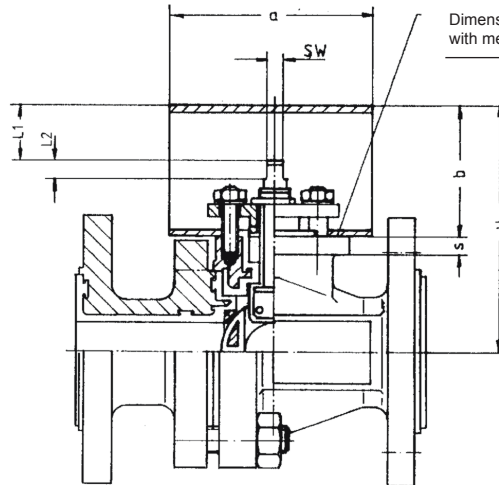
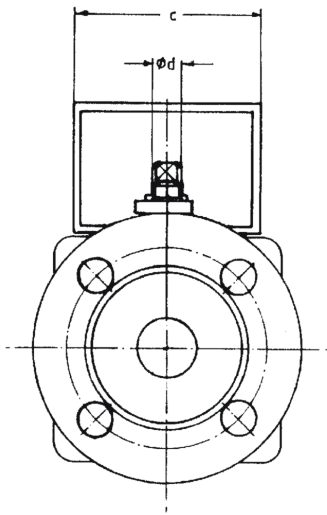


Material specification - AKH2A with actuator mounting

No.	Designation	Pieces	Material	Material-No.	DIN	ASTM / AISI
010	threaded pin	1	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
020	actuator bracket	1	steel (yellow chromated)	1.0037	DIN EN 10025-2	A 283-B
030	serrated lock washer	4	stainless steel	1.4301	DIN EN 10088-3	AISI 304
040	hexagon bolt	4	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
050	adapter	1	stainless steel	1.4304	DIN EN 10088-3	AISI 304F

Item-No. 010 „threaded pin“ is used with sizes DN 1“.

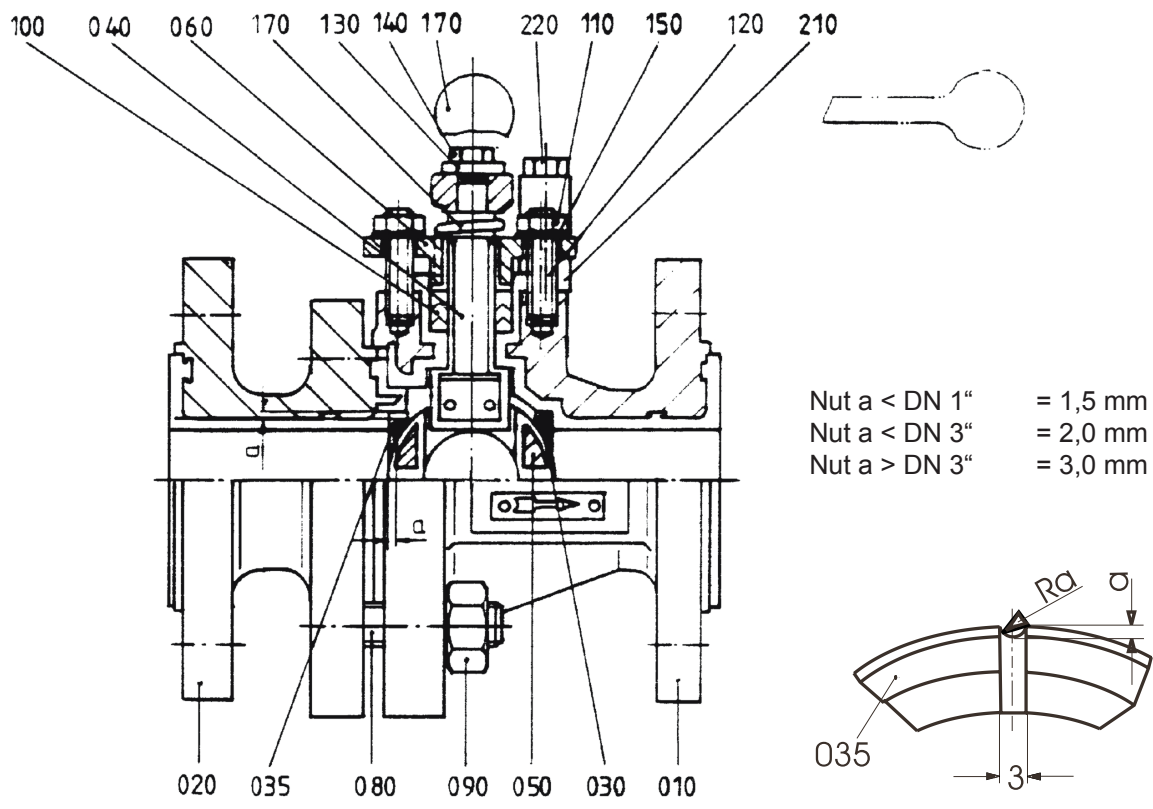
AKH2A - Dimension sheet for actuator mounting acc. to NAMUR - recommendation



Dimensions acc. to DIN EN ISO 5211 with metric ISO-Threads DIN 13-1

ANSI		H	a	b	c	SW	d	S	L1	L2	ISO 5211
1"	mm	109	75	60	100	8	10	-	30,5	9,3	F05
	inch	4,29	2,95	2,36	3,94	0,315	0,393	-	1,2	0,37	
1½"	mm	129	100	60	100	12	16	-	25,5	12,5	F07
	inch	5,08	3,94	2,36	3,94	0,472	0,63	-	1	0,49	
2"	mm	142	100	60	100	12	16	-	23	12,5	F07
	inch	5,59	3,94	2,36	3,94	0,472	0,63	-	0,91	0,49	
3"	mm	203	135	80	140	16	22	13	34	15,5	F10
	inch	8	5,31	3,15	5,51	0,63	0,866	0,51	1,34	0,61	
4"	mm	218	135	80	140	16	22	13	34	15,5	F10
	inch	8,58	5,31	3,15	5,51	0,63	0,866	0,51	1,34	0,61	
6"	mm	271	135	80	140	20	30	14	23	19,5	F12
	inch	10,67	5,31	3,15	5,51	0,787	1,181	0,55	0,91	0,77	

AKH2A/DA
Seat ring with pressure compensation grooves



Special Recleaning and Packing 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 555474 and a moisture indicator.

Material specification AKH2A/DA

No.	Designation	Pieces	Material	Material-No. / DIN	ASTM / AISI
010	body	1	ductile iron / PFA ductile iron / FEP °	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
020	side piece	1	ductile iron / PFA ductile iron / FEP °	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
030	seat ring	1	PTFE	pure - PTFE	
035	seat ring with pressure compensation grooves	1	PTFE	pure - PTFE	
040	stem	1	stainless steel / PFA Hastelloy C4 / PFA °°	1.4470 / DIN EN 10283 2.4610 / DIN 17744	A 890 CD3MN
050	ball				
	DN 1" - 2"	1	cast steel / PFA cast steel / FEP°	1.0619 / DIN EN 10213-2	ASTM A216 Grade WCB
	DN 3" - 6"	1	ductile iron / PFA ductile iron / FEP ° ceramic Al ₂ O ₃ *	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
060	gland follower	1	stainless steel	1.4308 / DIN EN 10283	A 743 CF-8
065	gland insert	1	PTFE-graphite		
070	hand lever				
	DN 1" - 2"	1	die cast metall	ZP0410 / DIN EN 12844	
	DN 3" - 4"	1	malleable cast iron (galvanizing)	EN-GJS-50-7 (GGG-50)	
	DN 6": adapter; level	1	stainless steel; steel (chromated)	1.4308 / DIN EN 10283; 1.0037 / DIN EN 10025-2	A 743 CF-8 A283 B
080	stud bolt	1 set	stainless steel	1.4301-K70 / DIN EN 10088-3	A 193 B7
090	hexagon nut	1 set	stainless steel	1.4301-K70 / DIN EN 10088-3	A 194 2H
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
130	lock washer	1	stainless steel	1.4301 / DIN EN 10088-3	AISI 304
140	hexagon bolt	1	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
210	stop				
	DN 1" - 4"	1	steel (galvanizing)	1.0037 / DIN EN 10025-2	A 283 B
	DN 6"	1	stainless steel	1.4104 / DIN EN 10088-3	AISI 430 F
220	hexagon bolt**	1	stainless steel	1.4301 / DIN EN 10088-3	A 193 B8

- * ceramic ball on request
- °° Hastelloy stem on request
- ° optional
- ** DN 6" 2 hexagon bolts

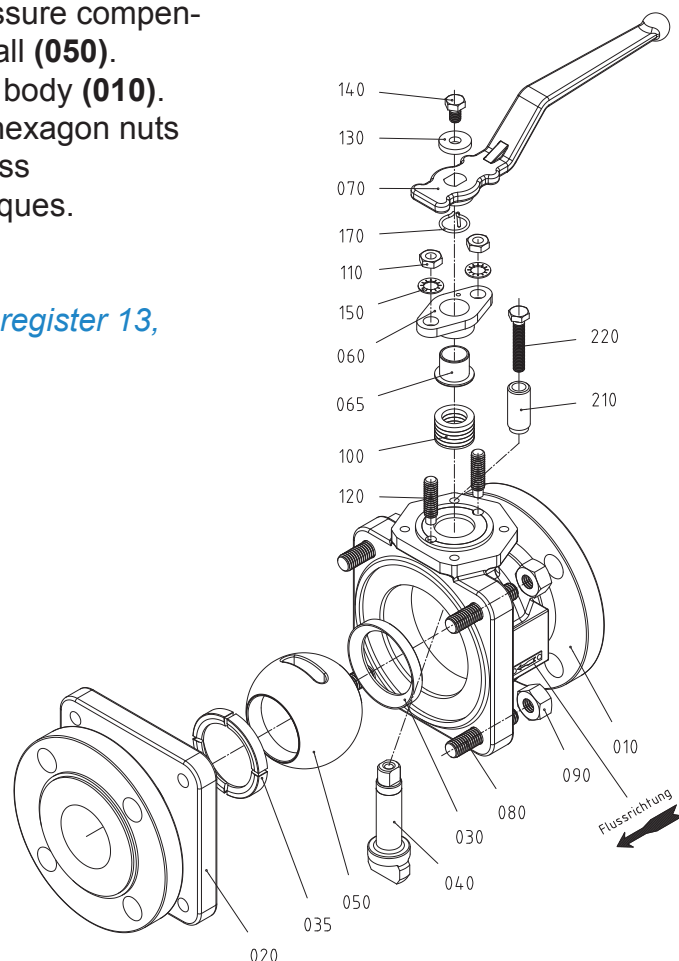
Assembly Instructions AKH2A/DA

The general installation and maintenance instructions must be observed.

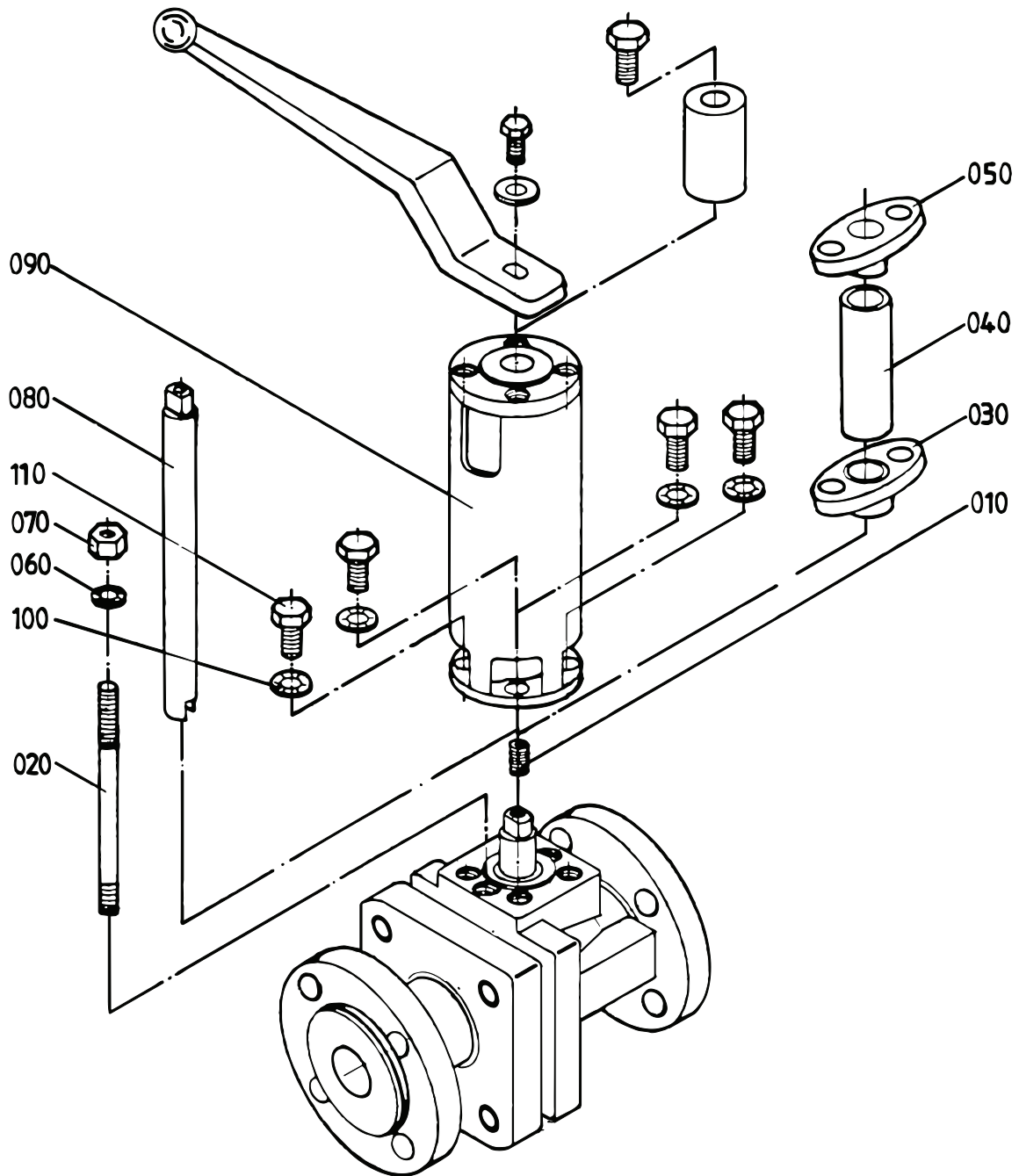
Attention, please take care of the right direction of the indicator while assembly.

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 washers (150), hexagon nuts (110) and grounding strap (170) also on valves with actuator.
5. Install hand lever (070) on to stem (040) and tighten it using lock washer (130) and hexagon bolt (140).
6. Insert first ball 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 90° of longitudinal axis of body.
9. Install ball seat ring with pressure compensation grooves (035) on to ball (050).
10. Install side piece (020) on to body (010).
11. Install body bolts (080) and hexagon nuts (090) and tighten by crisscross method to recommended torques.
12. Assemble stop (210) with hexagon bolt (220).

Disassembly instruction see register 13, page 7



AKH2A with stem extension

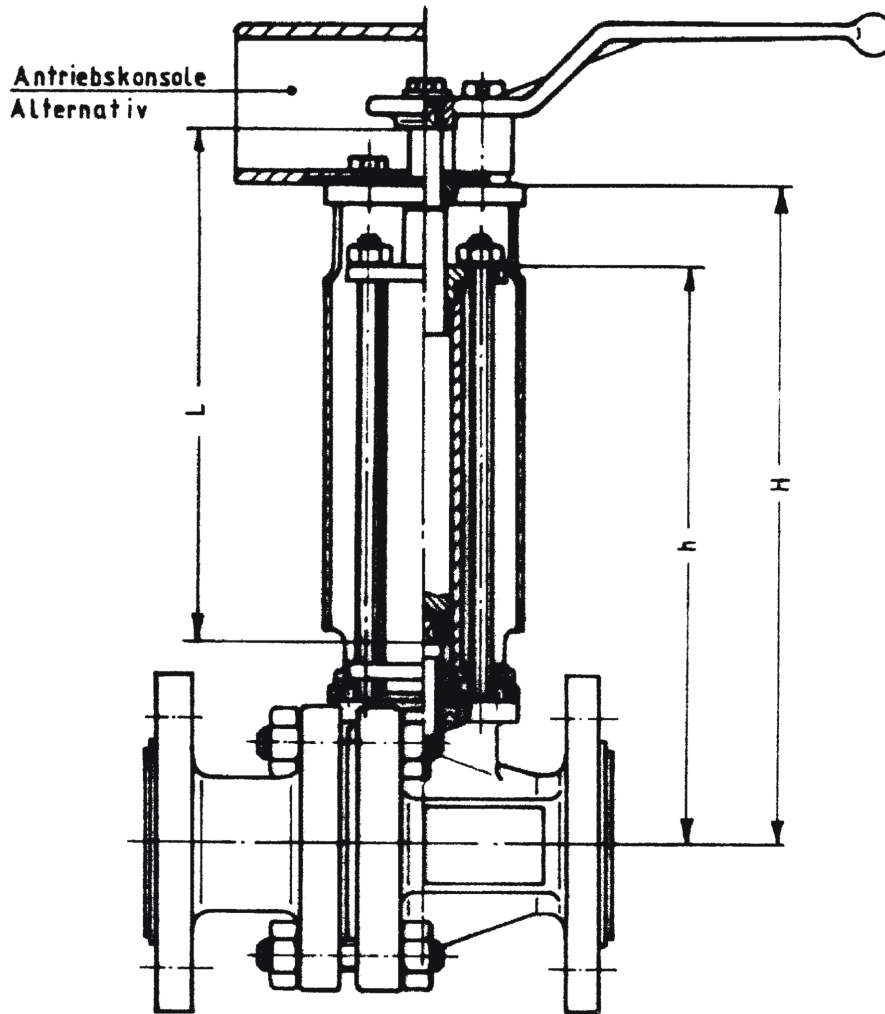


Material specification - AKH2A with stem extension

No.	Designation	Pieces	Material	Material-No.	DIN	ASTM / AISI
010	threaded pin	1	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
020	stud bolt	2	stainless steel	1.4301	DIN EN 10088-3	A 193 B8
030	gland follower	1	stainless steel / PTFE-graphite	1.4308	DIN EN 10283	A 351 CF 8
040	distance pipe	1	steel	1.0305	DIN EN 10216-2	A 192
050	gland	1	stainless steel	1.4308	DIN EN 10283	A 743 CF 8
060	serrated lock washer	2	stainless steel	1.4301	DIN EN 10088-3	AISI 304
070	hexagon nut	2	stainless steel	1.4301	DIN EN 10088-3	A 194 8
080	extended stem	1	stainless steel	1.4104	DIN EN 10088-3	AISI 430 F
090	mounting	1	steel	1.0037	DIN EN 10025-2	A 283 B
100	serrated lock washer	4	stainless steel	1.4301	DIN EN 10088-3	AISI 304
110	hexagon bolt	4	stainless steel	1.4301	DIN EN 10088-3	A 193 B8

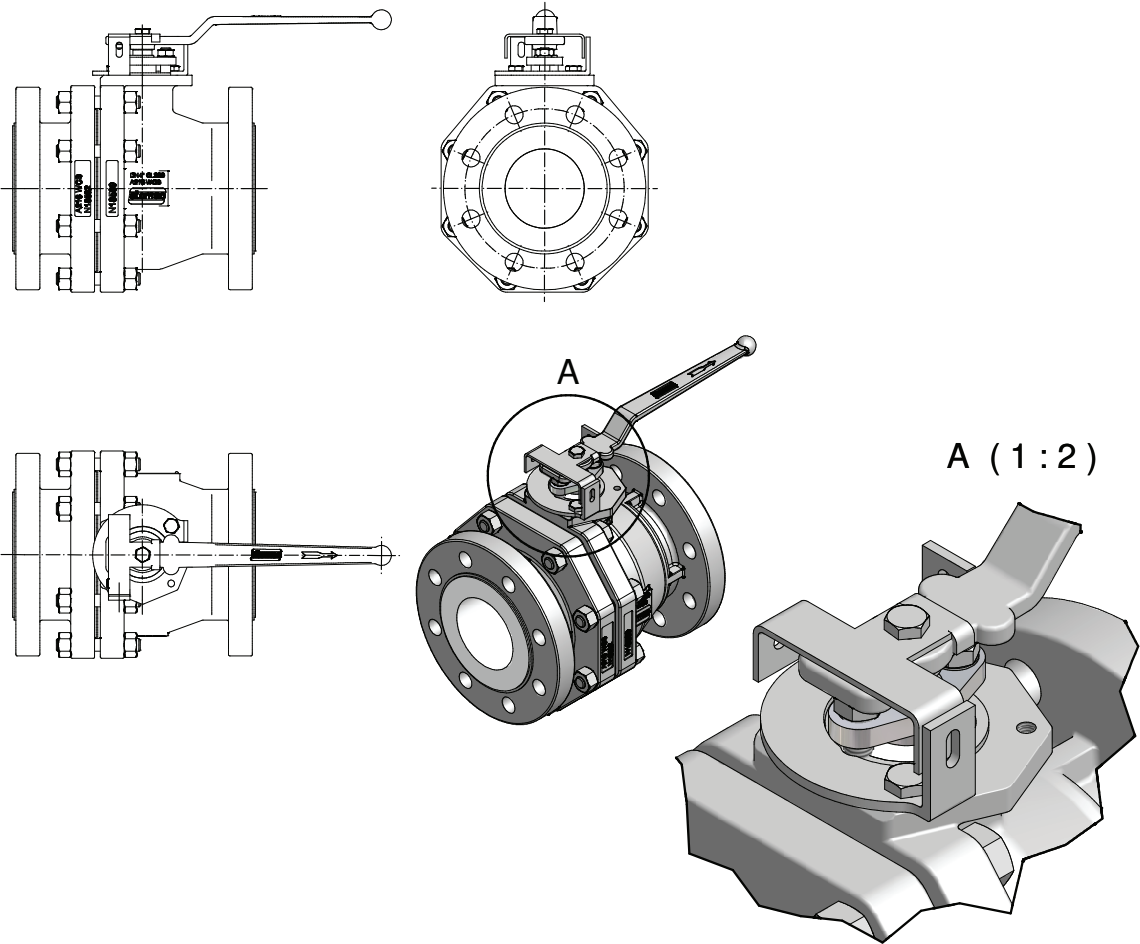
Item - No. 010 „threaded pin“ is used with sized DN 1“ only.

Technical Data - AKH2A with stem extension



ANSI		L	H	h
1"	mm	100	149	126
	inch	3,94	5,87	4,96
1½"	mm	100	169	138
	inch	3,94	6,65	5,43
2"	mm	100	182	151
	inch	3,94	7,17	5,94
3"	mm	130	252	216
	inch	5,12	9,92	8,5
4"	mm	130	267	231
	inch	5,12	10,51	9,09
6"	mm	160	351	307
	inch	6,3	13,82	12,09

Technical Data - AKH2A with lockable hand lever



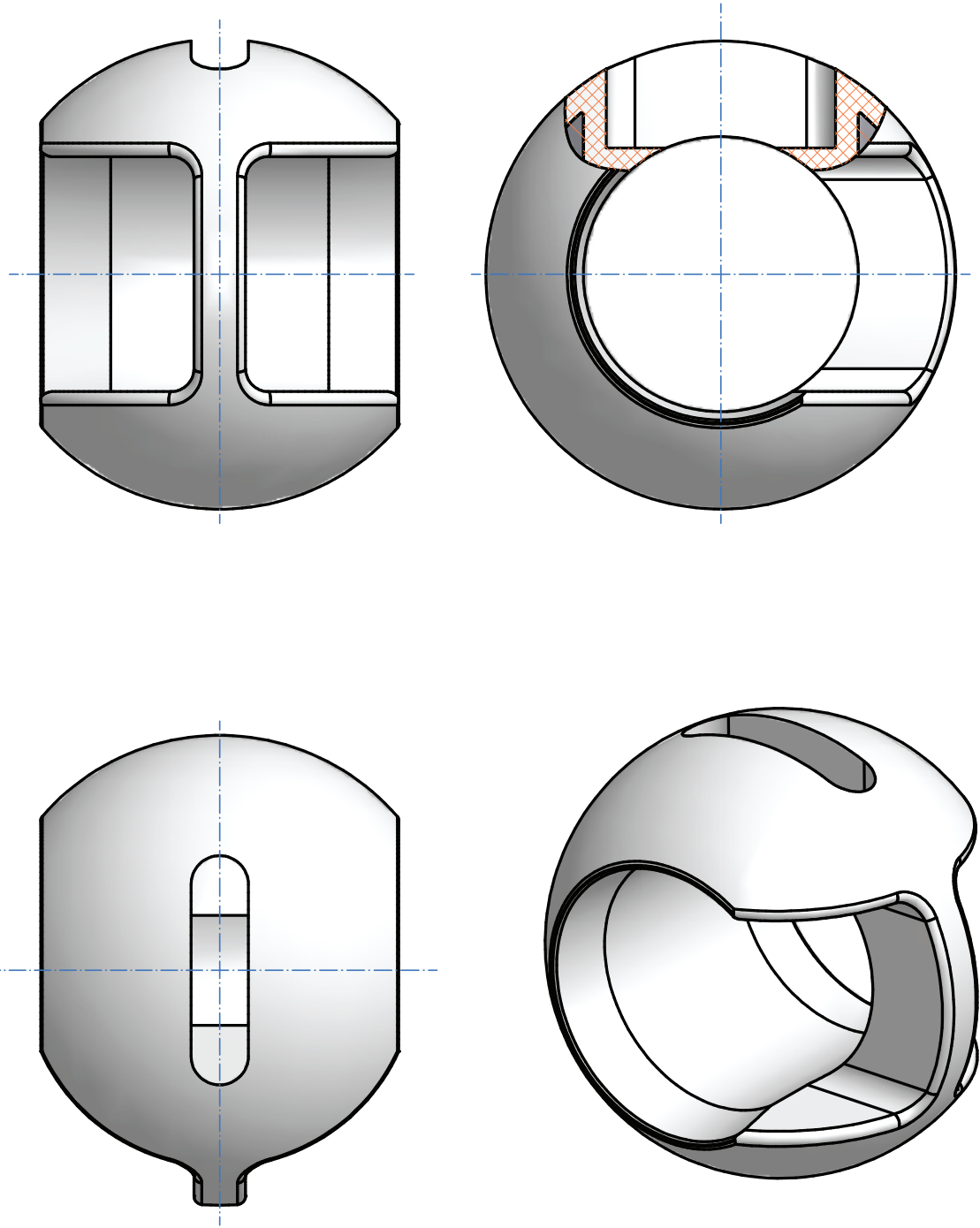
Material specification - AKH2A with lockable hand lever

Designation	Pieces	Material	Material-No.	DIN	ASTM / AISI
lockable hand lever	1	stainless steel	1.4301	DIN EN 10088-3	AISI 304
stop bolt	1	Stainless steel / duroplastic	1.4301	DIN EN 10088-3	AISI 304

AKH2A - K_v DATA and C_v Data (DIN EN 60534-2-3)

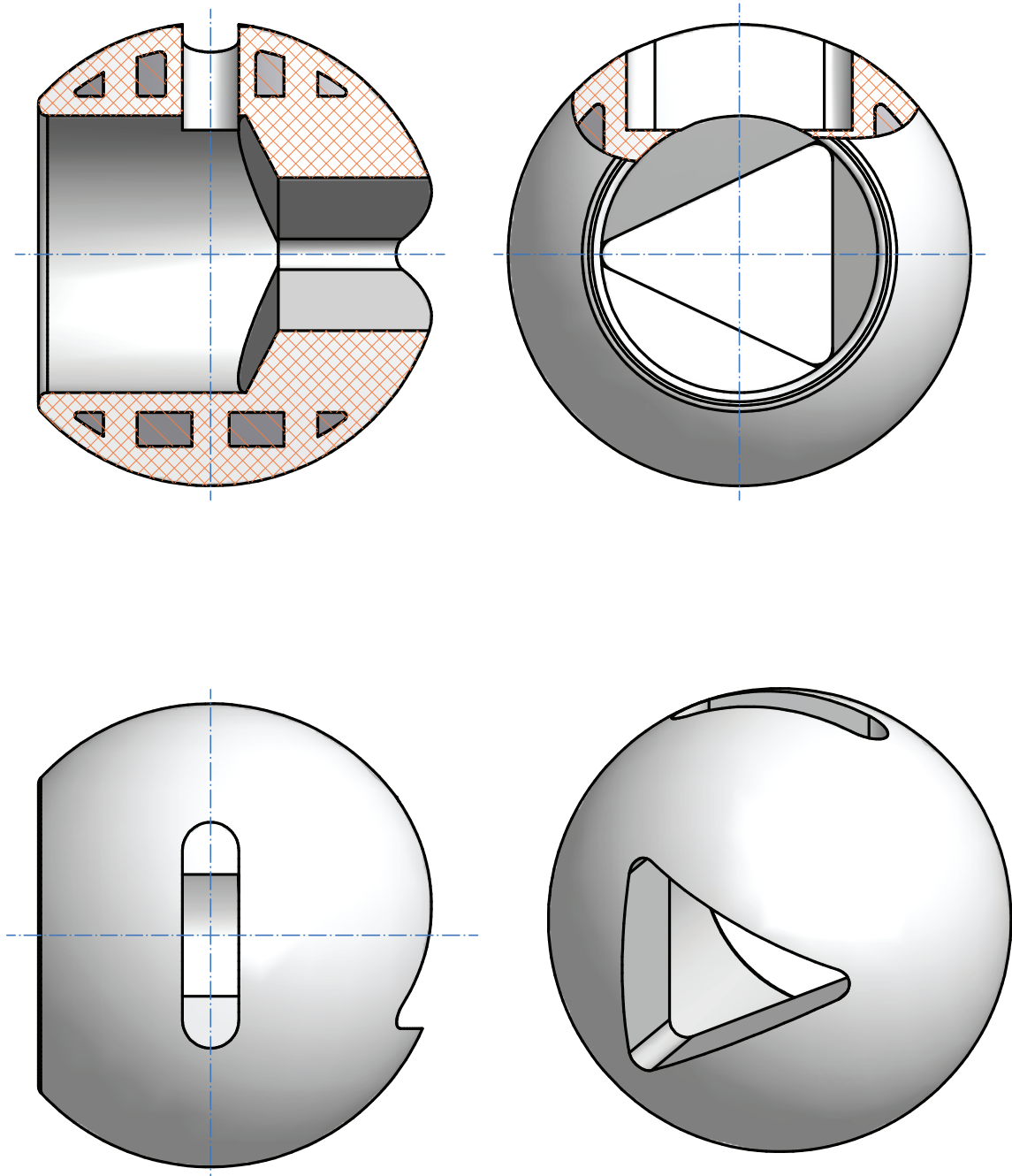
ANSI	K_v m ³ /h	C_v gal/min
1"	46,6	54,1
1 1/2"	126,9	147,5
2"	202,5	235,4
3"	507,8	590,2
4"	953,4	1108,1
6"	1577,7	1833,8

Optional C-ball in ball valves



For details please contact our Sales office at Ahaus, Germany

Optional V-ball in ball valves



For details please contact our Sales office at Ahaus, Germany