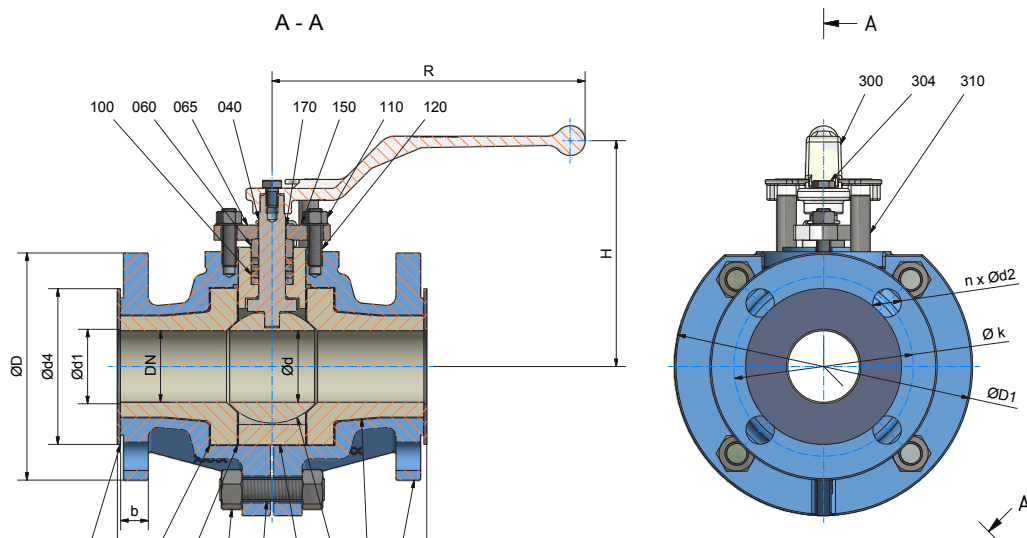


Register 5 CONTENTS - AKH5

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Technical Data AKH5 (DIN)



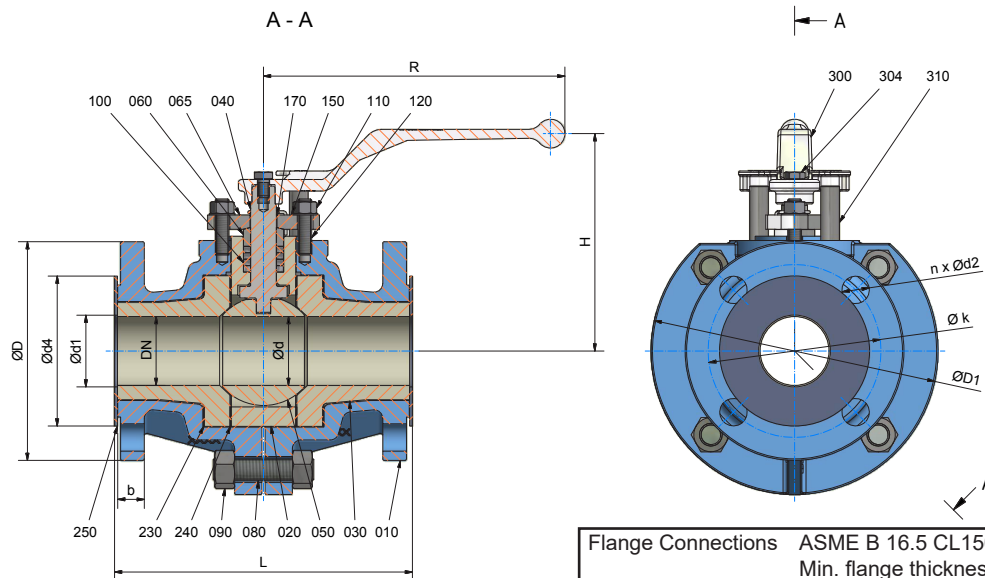
Face-to-Face Dimensions DIN EN 558 (Basic series 1)
 Flange Connections DIN EN 1092-2 PN 16
 Tightness test DIN EN 12266-1 (P11)
 FCI 70-2, Class IV

DN / DIN		L	H	R	Ød	Ød1	ØD1	Ød4*
025	mm	160	125,5	160	25	25	145	73
	inch	6,3	4,94	6,3	0,98	0,98	5,71	2,87
040	mm	200	151	210	38	40	180	94
	inch	7,87	5,94	8,27	1,5	1,57	7,09	3,7
050	mm	230	162,5	210	48	50	200	109
	inch	9,06	6,4	8,27	1,89	1,97	7,87	4,29
080	mm	310	206,5	313	77	77	260	144
	inch	12,2	8,13	12,32	3,03	3,03	10,24	5,67
100	mm	350	216,8	313	97	97	290	164
	inch	13,78	8,54	12,32	3,82	3,82	11,42	6,46
150°	mm	356	212	313	97	149,5	290	219
	inch	14,02	8,35	12,32	3,82	5,89	11,42	8,62

DN / DIN		Øk	ØD	nxd2	b	weight	
025	mm	85	115	4X14	13	KG	7,5
	inch	3,35	4,53	4X0,55	0,51	LBS	16,5
040	mm	110	150	4X18	17	KG	14,5
	inch	4,33	5,91	4X0,71	0,67	LBS	31,9
050	mm	125	165	4X18	18	KG	19,1
	inch	4,92	6,5	4X0,71	0,71	LBS	42,2
080	mm	160	200	8X18	22,5	KG	42,5
	inch	6,3	7,87	8X0,71	0,89	LBS	93,7
100	mm	180	220	8X18	25	KG	57,1
	inch	7,09	8,66	8X0,71	0,98	LBS	125,9
150°	mm	240	285	8X22	27	KG	85,0
	inch	9,45	11,22	8X0,87	1,06	LBS	187,4

* Dimensions sealing surface
 reduced port and face to face according to ASME B 16.10

Technical Data AKH5 (ANSI)



Flange Connections ASME B 16.5 CL150
 Min. flange thickness acc.
 to ASME B 16.5 Class 150,
 Table 9 (Flanged Fittings)
 Tightness test DIN EN 12266-1 (P11)
 FCI 70-2 Class IV

DN / ANSI		L	H	R	Ød	Ød1	ØD1	Ød4*
1"	mm	152,4	125,5	160	25	25	145	66,5
	inch	6	4,94	6,30	0,98	0,98	5,71	2,62
1½"	mm	178	151	210	38	38	180	85,5
	inch	7	5,94	8,27	1,5	1,5	7,09	3,37
2"	mm	203	162,5	210	48	48	200	104
	inch	8	6,4	8,27	1,89	1,89	7,87	4,09
3"	mm	241	206,5	313	77	77	260	136
	inch	9,5	8,13	12,32	3	3	10,24	5,35
4"	mm	292	217	313	97	97	290	174,5
	inch	11,5	8,54	12,32	3,82	3,82	11,42	6,87
6" °	mm	356	212	313	97	149,5	290	219
	inch	14	8,35	12,32	3,82	5,89	11,42	8,62

DN / ANSI		Øk	ØD	nxd2	b	weight
1"	mm	79,2	107,9	4X16	13	KG 6,9
	inch	3,13	4,25	4X0,63	0,51	LBS 15,2
1½"	mm	98,4	127	4X16	16	KG 12,5
	inch	3,88	5	4X0,63	0,63	LBS 27,4
2"	mm	120,5	152,4	4X19	18,5	KG 18,5
	inch	4,75	6	4X0,75	0,73	LBS 40,8
3"	mm	152,4	190,5	4X19	22,5	KG 40,0
	inch	6	7,5	4X0,75	0,89	LBS 88,2
4"	mm	190,5	228,6	8X19	26,5	KG 61,1
	inch	7,5	9	8X0,75	1,04	LBS 134,7
6" °	mm	241,5	279,4	8X22,5	28	KG 85,0
	inch	9,51	11	8X0,89	1,11	LBS 187,4

* Dimensions sealing surface

° reduced port and face to face according to ASME B 16.10

Material specification AKH5

No.	Designation	Quantity	Material	Material-No./DIN	ASTM / AISI
010	body piece	2	ductile iron	EN-JS1049 (GGG-40.3) / DIN EN 1563	A 395
020	body	1	ceramic	zirconia	MG-PSZ
030	bushing	2	ceramic	zirconia	MG-PSZ
040	stem	1	stainless steel°	1.2316 / DIN EN ISO 4957	~ AISI 431
		1	ceramic°	zirconia	MG-PSZ
050	ball	1	ceramic	zirconia	MG-PSZ
060	gland	1	stainless steel	1.4301 / DIN EN 10088-3	AISI 304
065	gland shaped ring	1	stainless steel	1.4301 / DIN EN 10088-3	AISI 304
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°	up to 392°F / 200°C	
	packing ring	1 Set	Grafseal°	up to 662°F / 350°C	
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
230	flat gasket	2	Gylon°	up to 200°C / 392°F	
		2	Garfite S°	up to 350°C / 662°F	
240	flat gasket	2	Gylon°	up to 200°C / 392°F	
		2	Garfite S°	up to 350°C / 662°F	
250	flat gasket	2	Gylon°	up to 392°F / 200°C	
		2	Garfite S°	up to 662°F / 350°C	
300	hand lever				
	DN 25 - 100, DN 1" - 4"	1	die cast metall	ZP0410 / DIN EN 12844	
	DN 150, DN 6"	1	ductile iron (galvanized)	EN-GJS-50-7 (GGG-50)	
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

° optional

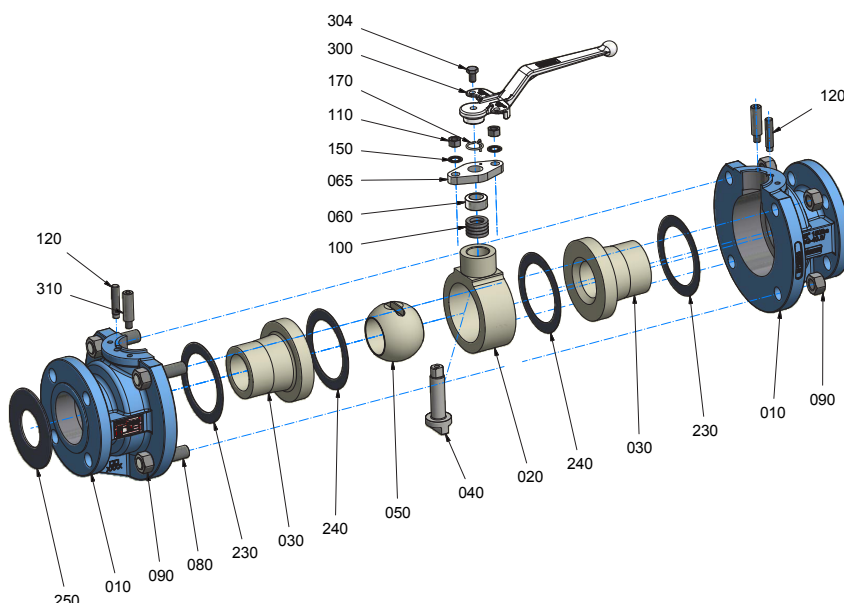
°° grounding device only in combination with stainless steel stem

If special stem materials are necessary, consult Flowserve Ahau GmbH, please.

Assembly Instructions AKH5

The general installation and maintenance instructions must be observed.

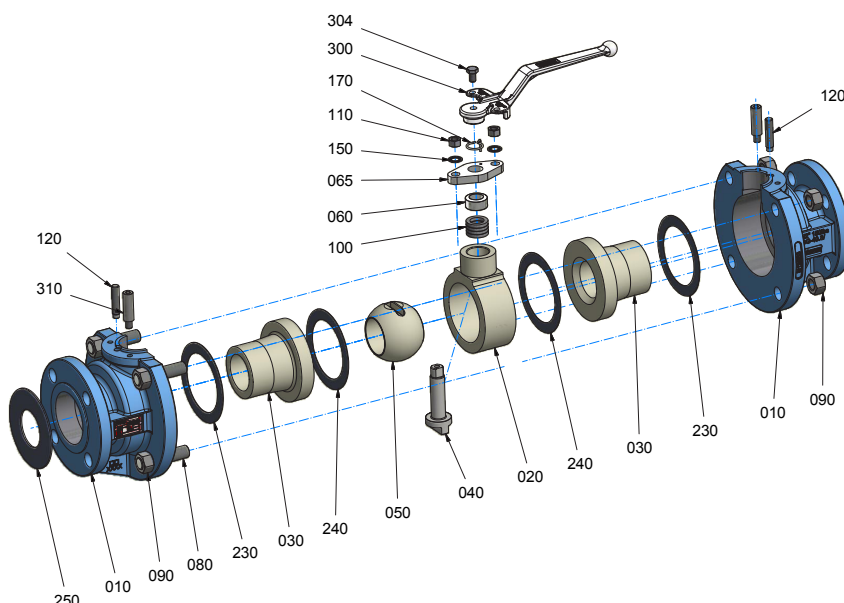
1. Clean carefully body and ceramic parts.
2. Screw stud bolts **(120)** into body pieces **(010)**.
3. Put one body piece **(010)** with connection flange on workbench.
4. Insert flat gasket **(230)**, then push bushing **(030)** into the body piece.
5. Put flat gasket **(240)** on the raised-face of the bushing **(030)**.
6. Insert stem **(040)** into body **(020)**, then put body on flat gasket **(240)**. Please pay attention to the centring shoulder of the bushing.
7. Insert ceramic ball **(050)** to stem **(040)** by pushing the ball in a downward motion through the valve body **(010)**.
8. Put second flat gasket **(240)** on the body **(020)**, then put second bushing **(030)** carefully on body; pay attention to centring shoulder of the bushing.
9. Push flat gasket **(230)** over bushing.
10. Push second body piece **(010)** over bushing and put it on the other body piece.
11. Install stud bolts **(080)** and hexagon nuts **(090)** and tighten by crisscross method to recommended torques; pay attention to the mobility of the ball **(050)**.
12. Install packing material **(100)**.
13. Install gland **(060)**, gland shaped ring **(065)**, grounding device **(170)** (only with stainless steel stem) also on valves with actuator, serrated lock washer **(150)**. Tighten hexagon nuts **(110)**.
14. Assemble stops **(310)**.
15. Install hand lever **(300)** with hexagon nut **(304)**.
16. When installing the valve into the pipe system, the flat gaskets **(250)** must be put on the sealing surface of the connection flanges.



Disassembly Instructions AKH5

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. To empty the ball valve, it should be half opened.
2. For disassembly of the valve, put body on a work bench with a soft cover (rubber mat). Remove hexagon bolt (110) and lock washer (150).
3. Put ball valve (position half open) on connection flange, then close valve. Remove hand lever (300) by unscrewing hexagon nut (304).
4. Remove grounding device (170) (only in case of stainless steel stem) as well as gland follower (060). If necessary, stud bolts (120) can also be removed now.
5. Remove stud bolts (080) and separate body pieces (010) and lift carefully. In case that bushing (030) cannot be separated from the body piece, loose is with slight blows (rubber hammer).
6. Push ball out of the body with an upwards motion.
7. Remove stem (040) by pushing it down through the body (010). Care must be taken not to damage body liner.
8. Remove ceramic body (020). In case the body is paste through flat gaskets, loose it with slight blows (rubber hammer). The same applies to second ceramic bushing (030).
9. Chevron packing (100) can easily be removed.



AKH5 - Recommended Tightening torques

DN	tie rods (080/090)		connection flange		gland bolts (110/120/150)	
	Nm	lbf · in	Nm	lbf · in	Nm	lbf · in
025	21	186	29	257	4	35
1"	23	204	16	142	4	35
040	40	354	60	531	7	62
1½"	42	372	31	274	7	62
050	54	478	77	681	7	62
2"	58	513	55	487	7	62
080	76	673	66	584	8	71
3"	82	726	109	965	8	71
100	74	655	79	699	8	71
4"	79	699	82	726	8	71
150	74	655	79	699	8	71
6"	79	699	82	726	8	71

AKH5 - Actuator Sizing Torques

- **circonia ball**
- **circonia stem**

Size		MAST	
		Nm	lbf·in
025	1"	32	283
040	1½"	123	1089
050	2"	132	1168
080	3"	237	2098
100	4"	283	2505

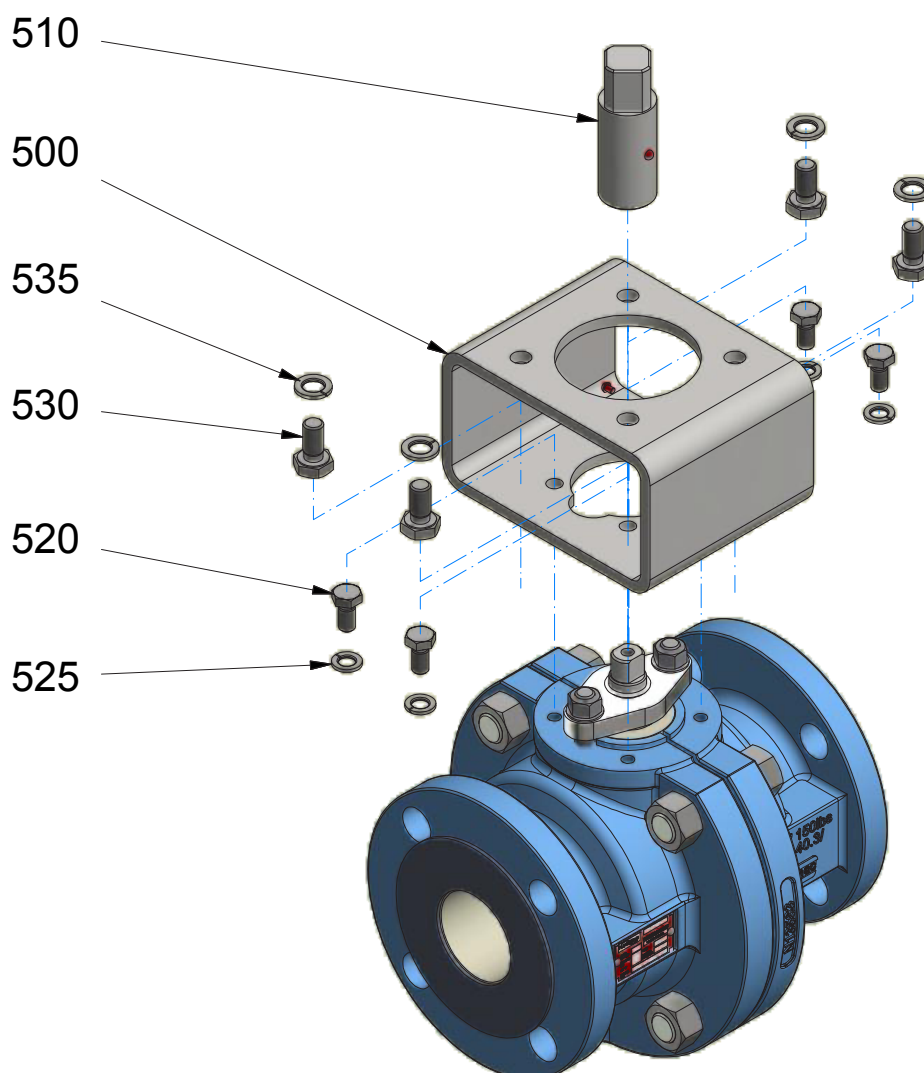
- **circonia ball**
- **stainless steel (1.2316) stem**

Size		MAST	
		Nm	lbf·in
025	1"	52	460
040	1½"	163	1443
050	2"	179	1584
080	3"	325	2876
100	4"	360	3186

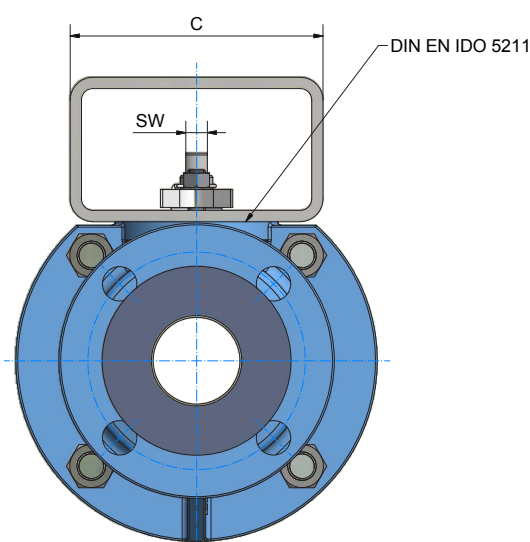
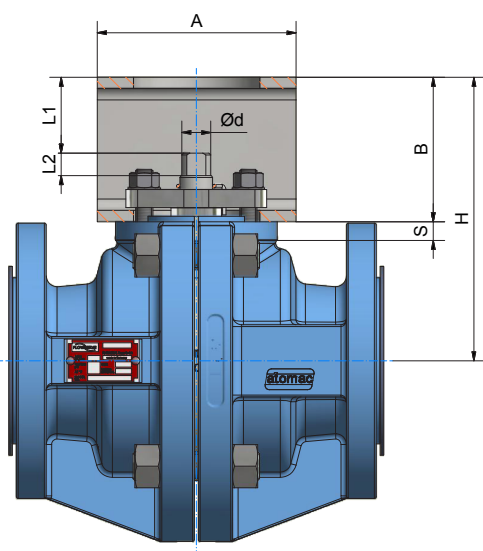
- Stated torques are sizing torques. No further safety factors are to be applied against these torques.
- The use of C-Balls or V-Balls does not result in change in sizing torques.
- The stated „MAST“ value is the Maximum Allowable Stem Torque. Beyond this value permanent deformation /destruction of liner is to be expected.
- Temperature Shocks or abrupt operations can pre-damage ceramic materials. Pre-damages can have negative effect on MAST Values. Valves in delivery condition are not pre-damaged.
- Please note the service conditions of the pressure- / vacuum-temperature-diagrams: register 1, page 13.

AKH5 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



AKH5 - Dimension for actuator mounting acc. to NAMUR - recommendation

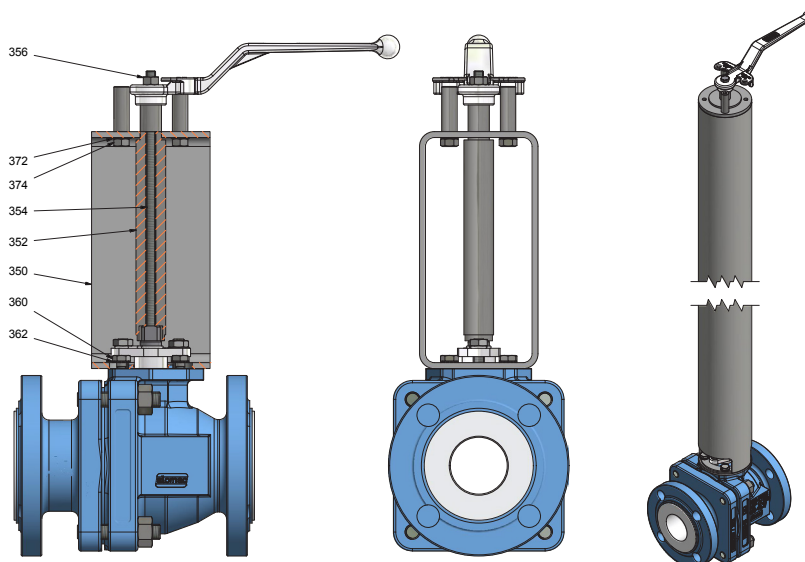


DIN	ANSI		H	A	B	C	SW ⁺⁰ _{-0,15}	ØD ⁺⁰ _{-0,1}
025	1"	mm	109	75	60	100	8	10
		inch	4,29	2,95	2,36	3,94	0,31	0,39
040	1½"	mm	125	100	60	100	12	16
		inch	4,92	3,94	2,36	3,94	0,472	0,63
050	2"	mm	137	100	60	100	12	16
		inch	5,39	3,94	2,36	3,94	0,47	0,63
080	3"	mm	201	135	80	140	16 / 19*	22 / 24*
		inch	7,91	5,31	3,15	5,51	0,63 / 0,748*	0,866 / 0,945*
100	4"	mm	211	135	80	140	16 / 19*	22 / 24*
		inch	8,31	5,31	3,15	5,51	0,63 / 0,748*	0,866 / 0,945*
150	6"	mm	211	135	80	140	16 / 19*	22 / 24*
		inch	8,31	5,31	3,15	5,51	0,63 / 0,748*	0,866 / 0,945*

DIN	ANSI		S	L1	L2	DIN EN ISO 5211
						ISO 5211
025	1"	mm	7,5	29	9,5	F05
		inch	0,30	1,14	0,37	
040	1½"	mm	10	20,5	12,5	F07
		inch	0,39	0,81	0,49	
050	2"	mm	10	21	12,5	F07
		inch	0,39	0,83	0,49	
080	3"	mm	13	33,5	15,5	F10
		inch	0,51	1,32	0,61	
100	4"	mm	13	33,2	15,5	F10
		inch	0,51	1,31	0,61	
150	6"	mm	14	33,2	15,5	F10
		inch	0,55	1,31	0,61	

* Dimensions for ceramic stem

AKH5 with stem extension



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

AKH5 - K_v Data and C_v Data (DIN EN 60534-2-3)

DIN	ANSI	K_v m ³ /h	C_v gal/min
025	1"	43,4	50,4
040	1 1/2"	118,1	137,3
050	2"	195,0	226,6
080	3"	513,5	596,8
100	4"	815,6	948,0
150	6"	815,6	948,0