

Gate Valve

STAAL 100 AKD/AKDS

Type Series Booklet



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Type Series Booklet STAAL 100 AKD/AKDS

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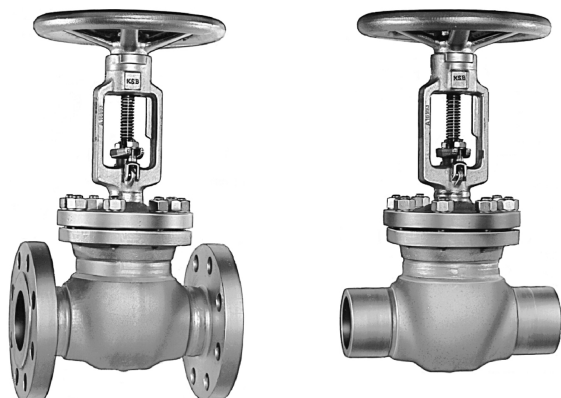
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Gate Valves

Gate valves to DIN/EN with bolted bonnet

STAAL 100 AKD/AKDS



Main applications

- Chemical industry
- Boiler feed applications
- Boiler recirculation
- Condensate transport
- Petrochemical industry
- Process engineering
- Sugar industry
- Mining
- Descaling units
- Fossil-fuelled power stations
- Paper industry / pulp industry
- Shipbuilding
- Snow-making systems
- Nuclear power stations

Fluids handled

- Water
- Steam
- Other non-aggressive fluids such as gas or oil on request.

Operating data

Table 1: Operating properties

Characteristic	Value
Nominal pressure	PN 63 - 100
Nominal size	DN 50 - 600
Max. permissible pressure [bar]	100
Min. permissible temperature [°C]	≥ -10
Max. permissible temperature [°C]	≤ +530

Selection as per pressure/temperature ratings (⇒ Page 6)

Valve body materials

Overview of available materials DN 50/50 - 250/250

Table 2: Overview of available materials

Material	Material number	Temperature limit
P 250 GH	1.0460	≤ 450 °C
13 CrMo 4-5	1.7335	≤ 530 °C

Overview of available materials DN 300/300 - 600/600

Table 3: Overview of available materials

Material	Material number	Temperature limit
P 265 GH	1.0425	≤ 450 °C
16 Mo 3	1.5415	≤ 500 °C
13 CrMo 4-5	1.7335	≤ 530 °C

Design details

Design

- Body of forged or welded steel construction
- Bolted cover
- Non-rotating stem with external screw
- Split wedge
- Yoke head suitable for mounting electric and pneumatic actuators (DIN ISO 5210)

Variants

- Stem protecting tube
- Stem protecting tube with position indicator
- Limit switch(es)
- Bypass
- Drain branch
- Hard-faced back seat
- Threaded bush free from non-ferrous metals
- Electric actuators
- Pneumatic actuators
- Spur gear
- Bevel gear
- Actuating bush for remote actuation
- Other flange designs or butt weld end designs
- Inspections to technical codes such as TRD/TRB/AD2000 – German Steam Boiler / Pressure Vessel Regulations – or to customer specification
- Die-forged model for DN 300/250 on request.
- DN 600 and above on request.

Product benefits

- Additional features ensure safe sealing to atmosphere:
 - Serrated bonnet gasket, fully confined to prevent creep.
 - Graphite gland packing with packing end rings (male/female joint)
- Reliable, tight shut-off and service-friendly design
 - Wedge holder with flexibly mounted split wedge. Precise alignment of wedge discs with body seats; wedge discs are easy to replace.
 - Actuating moments are absorbed by the wedge holder guided in the body. No additional loads on the wedge discs and the seat/disc interface.
 - Straightforward actuator mounting due to standard bayonet connection (up to and including DN 250) or DIN/ISO top flange (from DN 300) at the yoke head.
- Additional safety and blow-out protection by standard back seat.
- Long service life and high functional reliability
 - Stop nut as standard. Limited wedge action prevents jamming in closed position and ensures reliable opening of the gate valve even in the event of temperature transients.
 - Of the gland packing due to non-rotating stem with burnished shank.
 - Threaded bush runs in ball bearings for smooth actuation.
 - Hard-faced seat/disc interface made of wear-resistant and corrosion-proof 17 % chrome steel or Stellite.

Product information

Product information as per Regulation No. 1907/2006 (REACH)

For information as per European chemicals regulation (EC) No. 1907/2006 (REACH) see <https://www.ksb.com/en-global/company/corporate-responsibility/reach>.

Product information as per Directive 2014/34/EU (ATEX)

The valves do not have a potential internal source of ignition and can be used in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zone 2+22) to ATEX 2014/34/EU.

Product information as per Pressure Equipment Directive 2014/68/EU (PED)

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 2014/68/EU (PED) for fluids in Groups 1 and 2.

Product information as per UK Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016

The valves do not have a potential internal source of ignition and can be used in accordance with the UK's Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 in potentially explosive atmospheres, Group II, category 2 (zones 1+21) and category 3 (zone 2+22).

Product information as per UK Pressure Equipment (Safety) Regulations 2016

The valves satisfy the safety requirements of the UK Pressure Equipment (Safety) Regulations 2016 (PER) for fluids in Groups 1 and 2.

Related documents

Table 4: Information/documents

Document	Reference number
STAAL 100 AKK/AKKS type series booklet (swing check valves with bolted cover)	7371.1
Operating manual	0570.81

Purchase order specifications

Please specify the following information in all enquiries or purchase orders:

1. Type
2. Nominal pressure
3. Nominal size
4. Operating pressure
5. Differential pressure
6. Operating temperature
7. Material
8. Fluid handled
9. Flow rate
10. Pipe connection
11. Variants
12. Reference number

Always indicate the original serial number and the year of construction when ordering spare parts.

Pressure/temperature ratings

Table 5: Permissible operating pressure [bar] (to EN 1092-1) ¹⁾

PN	Material		[°C]																
	Designation	Number	RT ²⁾	100	150	200	250	300	350	400	450	460	470	480	490	500	510	520	530
63	P 250 GH	1.0460	63,0	58,5	55,5	52,5	48,0	43,5	40,5	37,5	20,7	-	-	-	-	-	-	-	-
	P 265 GH	1.0425	63,0	58,5	55,5	52,5	48,0	43,5	40,5	37,5	20,7	-	-	-	-	-	-	-	-
	16 Mo 3	1.5415	63,0	63,0	63,0	63,0	61,5	54,0	51,0	47,1	43,5	40,3	37,2	34,1	31,0	27,9	-	-	-
	13 CrMo 4-5	1.7335	63,0	63,0	63,0	63,0	63,0	63,0	60,0	56,7	53,1	50,5	47,9	45,4	42,8	41,1	34,8	28,2	23,4
100	P 250 GH	1.0460	100,0	92,8	88,0	83,3	76,1	69,0	64,2	59,5	32,8	-	-	-	-	-	-	-	-
	P 265 GH	1.0425	100,0	92,8	88,0	83,3	76,1	69,0	64,2	59,5	32,8	-	-	-	-	-	-	-	-
	16 Mo 3	1.5415	100,0	100,0	100,0	100,0	97,6	85,7	80,9	74,7	69,0	64,0	59,1	54,2	49,2	44,2	-	-	-
	13 CrMo 4-5	1.7335	100,0	100,0	100,0	100,0	100,0	100,0	95,2	90,0	84,2	80,2	76,1	72,0	68,0	65,2	55,2	44,7	37,1

¹⁾ Operating pressures to DIN 2401 are also permissible.

²⁾ RT: room temperature (-10 °C to +50 °C)

Materials

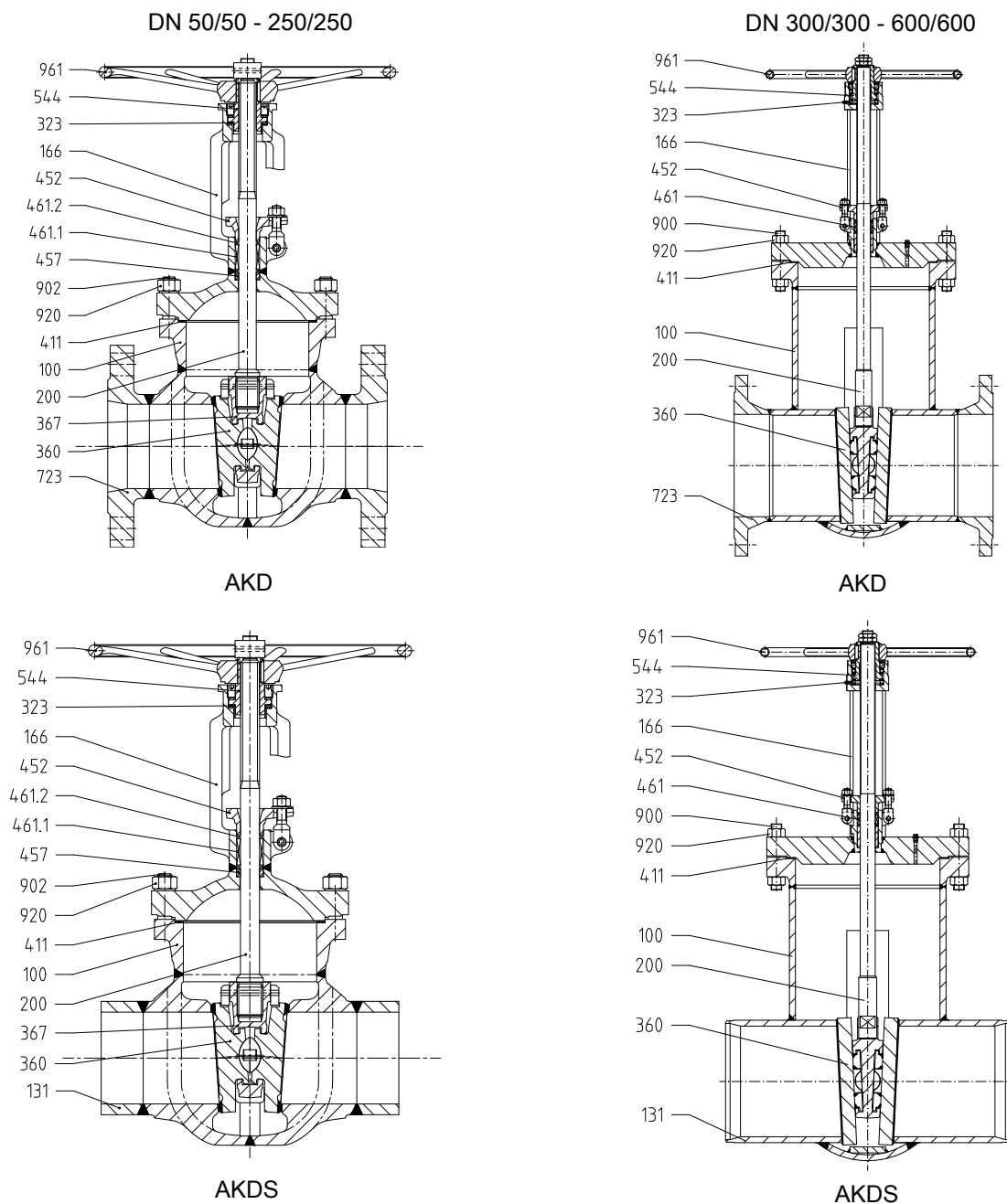


Fig. 1: Sectional drawings of STAAL 100 AKD/AKDS

Table 6: Parts list DN 50/50 - 250/250

Part No.	Description	Temperature [°C]	Material	Material number	Note
100	Body	≤ 450	P 250 GH	1.0460	Body die-forged and welded
		≤ 530	13 CrMo 4-5	1.7335	
723	Flange	≤ 450	P 250 GH	1.0460	-
		≤ 530	13 CrMo 4-5	1.7335	
131.1	Connection branch	≤ 450	P 250 GH	1.0460	Material can be matched to piping material
		≤ 530	13 CrMo 4-5	1.7335	
360 ³⁾	Wedge discs	≤ 450	P 250 GH	1.0460	-
		≤ 530	13 CrMo 4-5	1.7335	

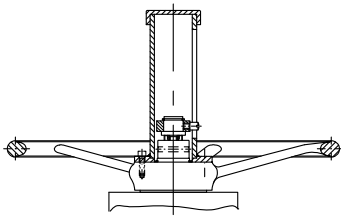
³ Recommended spare parts

Part No.	Description	Temperature [°C]	Material	Material number	Note
367 ³⁾	Disc/wedge holder	≤ 450	P 250 GH	1.0460	-
		≤ 530	13 CrMo 4-5	1.7335	
166	Yoke	≤ 450	P 250 GH	1.0460	-
		≤ 530	13 CrMo 4-5	1.7335	
Seat/disc interface	Body	≤ 450	X 20 CrMo 17-1	1.4115	Hard-faced
	Wedge discs	≤ 530	Stellite		
200 ³⁾	Stem	≤ 530	X 39 CrMo 17-1	1.4122	-
411 ³⁾	Joint ring		1.4541/graphite	-	Serrated gasket
452	Gland follower		P 250 GH	1.0460	-
457 ³⁾	Neck ring		G-X70 CrMo 292	1.4136	-
461.1/.2 ³⁾	Gland packing		Graphite	-	Compression-moulded rings (with packing end rings)
544 ³⁾	Threaded bush		Cu Zn 35 Ni 2	2.0540	On axial needle bearing
902.1	Stud		21 CrMoV 5-7	1.7709	-
920.1	Hexagon nut		25 CrMo 4	1.7218	-
961	Handwheel		GG-25	0.6025	Non-rising

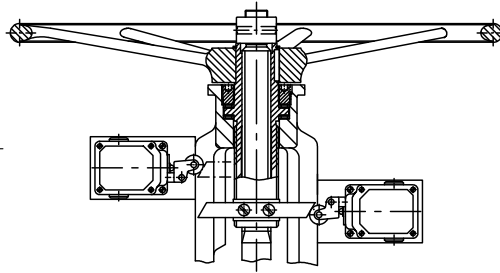
Table 7: Parts list DN 300/300 - 600/600

Part No.	Description	Temperature [°C]	Material	Material number	Note
100	Body	≤ 450	P 265 GH	1.0425	Body of welded steel construction
		≤ 500	16 Mo 3	1.5415	
		≤ 530	13 CrMo 4-5	1.7335	
723	Flange	≤ 450	P 250 GH/P 265 GH	1.0460/1.0425	-
		≤ 500	16 Mo 3	1.5415	-
		≤ 530	13 CrMo 4-5	1.7335	-
131.1	Connection branch	≤ 450	P 265 GH	1.0425	Material can be matched to piping material
360 ³⁾	Wedge discs	≤ 500	16 Mo 3	1.5415	
367 ³⁾	Disc/wedge holder	≤ 530	13 CrMo 4-5	1.7335	
166	Yoke				-
Seat/disc interface	Body	≤ 450	X 20 CrMo 17-1	1.4115	Hard-faced
		≤ 530	Stellite	-	
	Wedge discs	≤ 450	X 8 CrTi 18	1.4502	
		≤ 530	Stellite	-	
200 ³⁾	Stem	≤ 530	X 39 CrMo 17-1	1.4122	-
411 ³⁾	Joint ring	≤ 530	1.4541/graphite	-	Serrated gasket
452	Gland follower		P 250 GH/P 265 GH	1.0460/1.0425	-
461 ³⁾	Gland packing		Graphite	-	Compression-moulded rings (with packing end rings)
544 ³⁾	Threaded bush		Cu Zn 35 Ni 2	2.0540	On thrust bearing
900	Bolt/screw	≤ 450	25 CrMo 4	1.7218	-
		≤ 530	21 CrMoV 5-7	1.7709	-
920	Hexagon nut	≤ 450	25 CrMo 4	1.7218	-
		≤ 530	25 CrMo 4	1.7218	-
961	Handwheel	≤ 530	Steel	-	Non-rising

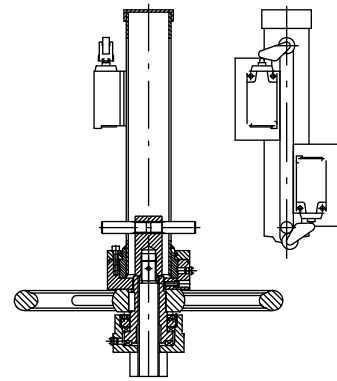
Variants



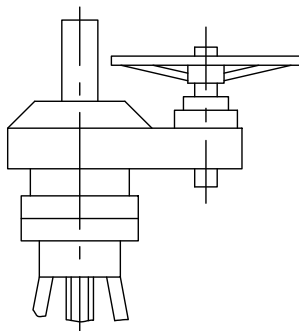
Position indicator



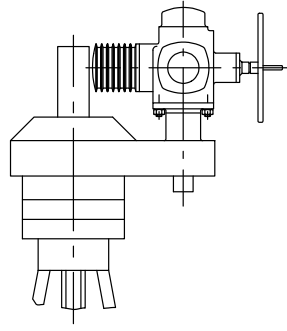
Limit switches
DN 50/50 - 250/250



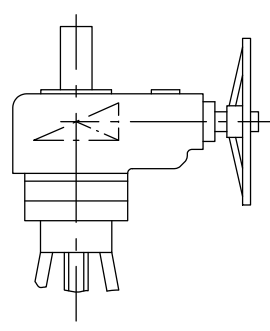
Limit switches
DN 300/300 - 600/600



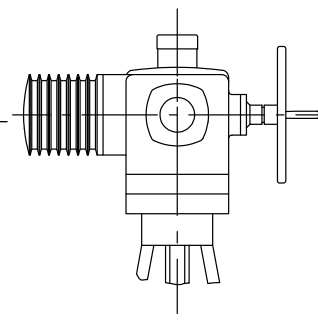
Spur gear



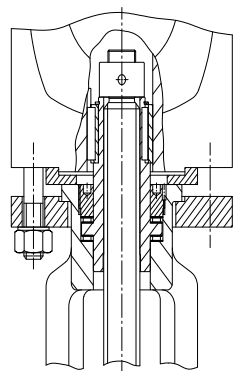
Spur gear and electric
actuator



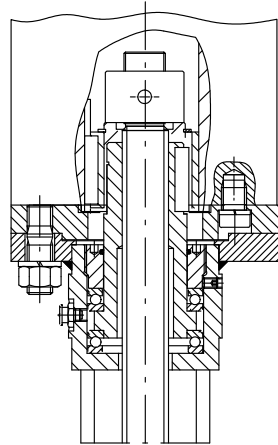
Bevel gear



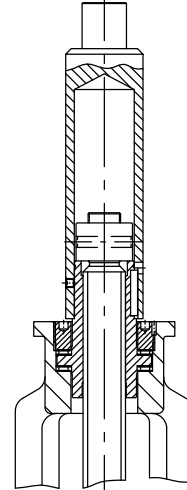
Direct mount electric
actuator



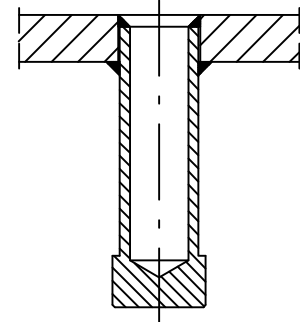
Mounting of electric
actuators
DN 50/50 - 250/250



Mounting of electric
actuators
DN 300/300 - 600/600



Actuating bush



Drain branch

Dimensions and weights

Dimensions and weights of STAAL 100 AKD

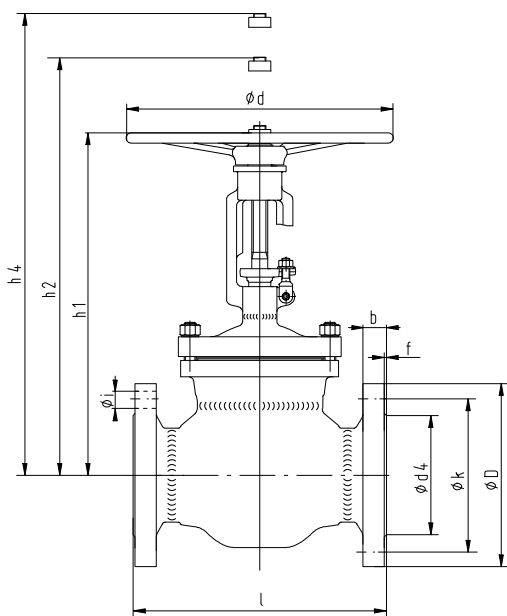


Fig. 2: Sectional drawing of STAAL 100 AKD

Table 8: Dimensions and weights

PN	DN/S ⁴⁾⁵⁾	I	ø D	ø k	No. of bolt holes z	Bolt hole dia. i	ø d ₄ × f	b	h ₁	h ₂ ⁶⁾	h ₄ ⁷⁾	ø d	[kg]
		[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
63	50/50	250	180	135	4	22	102 × 3	26	320	370	450	250	35
	65/50	290	205	160	8	22	122 × 3	26	320	370	450	250	38
	80/80	310	215	170	8	22	138 × 3	28	385	440	650	315	55
	100/100	350	250	200	8	26	162 × 3	30	445	505	750	400	80
	125/125	400	295	240	8	30	188 × 3	34	490	550	850	400	119
	150/150	450	345	280	8	33	218 × 3	36	560	635	950	500	165
	200/200	550	415	345	12	36	285 × 3	42	700	765	1180	630	238
	250/250	650	470	400	12	36	345 × 3	46	895	1255	1505	800	560
	300/300	750	530	460	16	36	410 × 4	52	1270	1600	2045	720	870
	350/350	850	600	525	16	39	465 × 4	56	1345	1745	2250	720	880
	400/400	950	670	585	16	42	535 × 4	60	1570	2000	2535	800	1620
100	500/500	1150	800	705	20	48	615 × 4	68	1890	2410	3080	800	2300
	600/600	1350	930	820	20	56	735 × 5	76	2200	2900	3700	⁸⁾	⁸⁾
	50/50	250	195	145	4	26	102 × 3	28	320	370	450	250	42
	65/50	290	220	170	8	26	122 × 3	30	320	370	450	250	45
	80/80	310	230	180	8	26	138 × 3	32	385	440	650	315	60
	100/100	350	265	210	8	30	162 × 3	36	445	505	750	400	85
	125/125	400	315	250	8	33	188 × 3	40	490	550	850	400	127
	150/150	450	355	290	12	33	218 × 3	44	560	635	950	500	179
	200/200	550	430	360	12	36	285 × 3	52	700	765	1180	630	272
	250/250	650	505	430	12	39	345 × 3	60	895	1255	1505	800	610
	300/300	750	585	500	16	42	410 × 4	68	1305	1630	2080	720	960
	350/350	850	655	560	16	48	465 × 4	74	1450	1810	2310	720	1375
	400/400	950	715	620	16	48	535 × 4	78	1750	2170	2715	800	2230
	500/500	1150	870	760	20	56	615 × 4	94	2060	2570	3250	800	⁸⁾

- ⁴ Nominal size / seat diameter
⁵ Model with reduced bore on request
⁶ Open
⁷ Vertical clearance for removal
⁸ On request

PN	DN/S ⁴⁾⁵⁾	I	ø D	ø k	No. of bolt holes z	Bolt hole dia. i	ø d ₄ × f	b	h ₁	h ₂ ⁶⁾	h ₄ ⁷⁾	ø d	[kg]
		[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	
100	600/600	1350	To be agreed between user and manufacturer										

Mating dimensions as per standard

Face-to-face lengths: EN 558-1/26
 Flanges: DIN EN 1092-1
 Flange facing: Type B

Other flange designs

- For example, undrilled with groove (type D) or recess (type F) to EN 1092-1 at both ends
- Flanges to DIN
- Other flange designs on request

Dimensions and weights of STAAL 100 AKDS

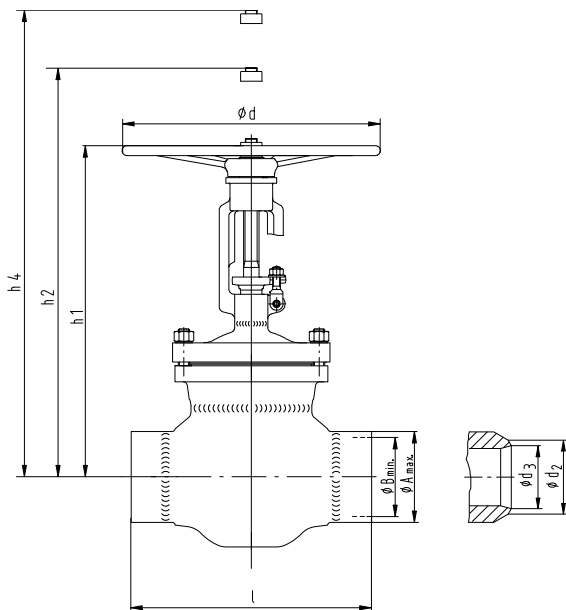


Fig. 3: Sectional drawing of STAAL 100 AKDS

Table 9: Dimensions and weights

PN	DN/ S ⁹⁾¹⁰⁾	I	Butt weld ends, unmachined		Butt weld ends, machined						h ₁	h ₂ ¹¹⁾	h ₄ ¹²⁾	ø d	
			ø A _{max.}	ø B _{min.}	PN 63			PN 100							
					ø d ₂	ø d ₃	Pipe dimensions	ø d ₂	ø d ₃	Pipe dimensions					
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
63/100	50/50	250	64	48	60,3	54,0	60,3 × 3,2	61,0	53,0	60,3 × 3,6	320	370	450	250	42
	65/50	290	82	60	76,1	69,0	76,1 × 3,6	77,0	68,0	76,1 × 4,0	320	370	450	250	45
	65/80	310	95	50	76,1	69,0	76,1 × 3,6	77,0	68,0	76,1 × 4,0	385	440	650	315	48
	80/80	310	95	70	90,0	81,0	88,9 × 4,0	90,0	80,0	88,9 × 4,5	385	440	650	315	51
	100/80	350	117	70	115,0	104,0	114,3 × 5,0	115,0	103,0	114,3 × 5,6	385	440	650	315	55
	100/100	350	117	92	115,0	104,0	114,3 × 5,0	115,0	103,0	114,3 × 5,6	445	505	750	400	72
	125/100	400	145	115	141,0	130,0	139,7 × 5,0	141,5	127,0	139,7 × 6,3	445	505	750	400	85
	125/125	400	145	115	141,0	130,0	139,7 × 5,0	141,5	127,0	139,7 × 6,3	490	550	850	400	106
	150/125	450	172	135	170,0	156,5	168,3 × 5,6	170,5	152,0	168,3 × 8,0	490	550	850	400	110
	150/150	450	172	135	170,0	156,5	168,3 × 5,6	170,5	152,0	168,3 × 8,0	560	635	950	500	149
	175/150	500	200	160	195,0	180,5	193,7 × 6,3	197,0	176,0	193,7 × 8,8	560	635	950	500	162
	200/150	550	225	180	222,0	204,5	219,1 × 7,1	222,0	199,0	219,1 × 10,0	560	635	950	500	170
	200/200	550	225	180	222,0	204,5	219,1 × 7,1	222,0	199,0	219,1 × 10,0	700	765	1180	630	216
	250/200	650	276	230	276,0	255,0	273,0 × 8,8	276,0	247,5	273,0 × 12,5	700	765	1180	630	267
	250/250	650	276	230	276,0	255,0	273,0 × 8,8	276,0	247,5	273,0 × 12,5	895	1255	1505	800	540
63	300/300	750	330	280	323,9	301,0	323,9 × 11,0	-	-	-	1270	1600	2045	720	615
	350/350	850	360	320	355,6	333,0	355,6 × 12,5	-	-	-	1345	1745	2250	720	750
	400/400	950	420	370	406,4	377,0	406,4 × 14,2	-	-	-	1570	2000	2535	800	1370
	500/500	1150	513	453	508,0	474,5	508,0 × 16,0	-	-	-	1890	2410	3080	800	2100
	600/600	1350	625	575	615,0	580,0	615,0 x 17,5	-	-	-	2200	2900	3700	¹³⁾	¹³⁾
100	300/300	750	335	285	-	-	-	323,9	295,5	323,9 × 14,2	1305	1630	2080	720	830
	350/350	850	365	315	-	-	-	355,6	324,0	355,6 × 16,0	1450	1810	2310	720	1065
	400/400	950	420	360	-	-	-	406,4	367,0	406,4 × 20,0	1750	2170	2715	800	1820
	500/500	1150	513	453	-	-	-	508,0	464,0	508,0 × 22,0	2060	2570	3250	800	2200
	600/600	1350	625	545	-	-	-	615,0	565,0	615,0 x 30,0	2200	2900	3700	¹³⁾	¹³⁾

- ⁹ Nominal size / seat diameter
¹⁰ Model with reduced bore on request
¹¹ Open
¹² Vertical clearance for removal
¹³ On request

Mating dimensions as per standard

Face-to-face lengths: EN 12982/26
 Butt weld ends: see table
 Weld groove form: DIN EN ISO 9692-1 (1.3 + 1.5)

Different designs of butt weld ends and weld groove forms are possible, but only within the dimensions $A_{\max.}$ and $B_{\min.}$.

Butt weld ends to EN 12627 are possible.

Installation information

The gate valves are designed for a max. differential pressure equal to the permissible operating pressure.

If a bypass is necessary or requested for other reasons, a NORI 320 ZXSV globe valve as per type series booklet 7640.1 is fitted as bypass valve. The nominal size of the globe valve depends on the nominal size of the gate valve (see table).

Table 10: Nominal size of bypass valve

Nominal size of gate valve	Nominal size of bypass valve
DN 50 - 150	DN 15
DN 200 - 350	DN 25
DN 400 - 600	DN 40



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