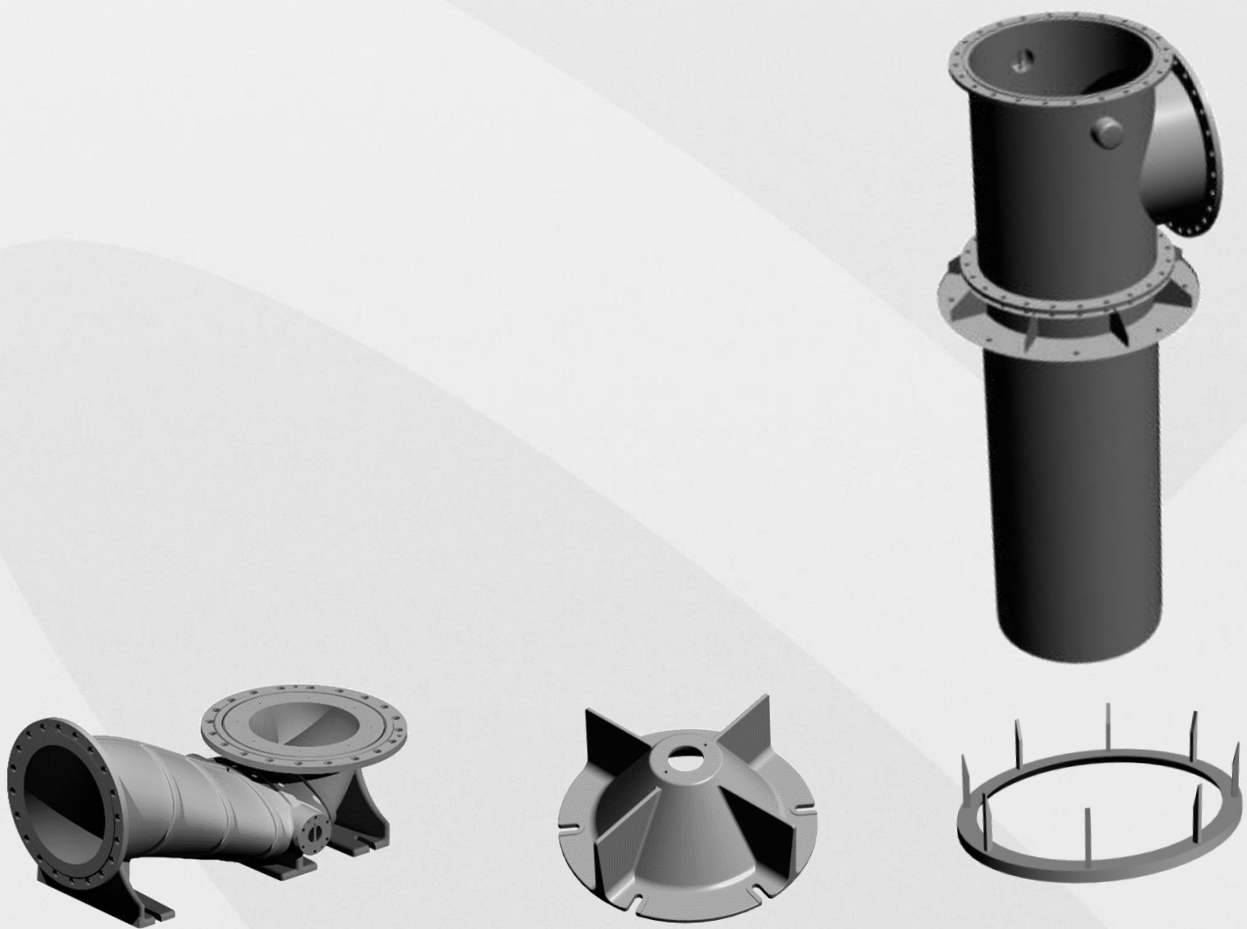


KPL and KWM Pump Accessories

50/60Hz



GRUNDFOS 

Possibility in every drop

Purpose of this book

This book is intended to assist application engineers, designers, planners and users of sewage and storm water systems to set up equipment and to finalize the design of pump stations.

The guidelines in this book and especially the details of design can be used as they are or be adapted to specific requirements and guidelines.

Disclaimer

Items presented in this data booklet are for sales and design purposes. Specifications may feature extra options, not presented in this book. Refer to the specification listed. Not all items in this booklet are in the scope of Grundfos standard deliveries, but for guidance only. Such an example is the column tubes. For solutions not described, please contact to local Grundfos Company.

All technical information has to be reviewed to ensure it is in accordance with local regulations and guidelines.

Grundfos reserves the right to change or improve the specifications of the items without prior notice.

You are therefore requested to check with local Grundfos Company to ascertain whether there have been any changes or modifications since the publication of this data booklet.

Drawing and pictures may vary from the real product.

* The manufacturer reserves the right to alter specifications and design.

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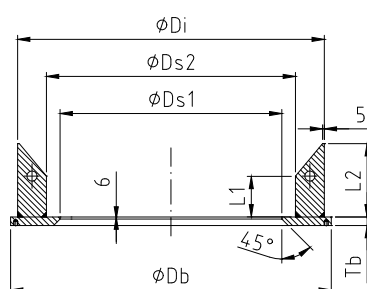
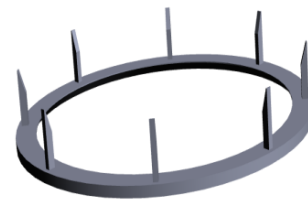
1 Grundfos standard accessories

1.1 Seat ring

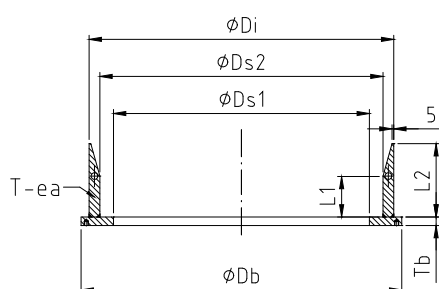
Seat ring can be ordered from Grundfos and delivered from our factory, together with the intended pumps. Optionally, construction drawings can be purchased for local manufacturing of seat ring.

The product numbers for the seat rings can be found in the Data booklet for the pump.

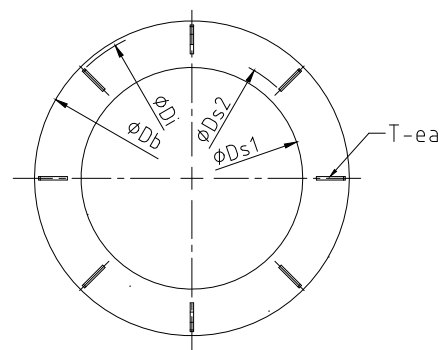
The seat ring is welded to the column pipe.



Seat ring for KPL



Seat ring for KWM



■ Dimension table: KPL pump

(Unit: mm)

Column pipe DN	ϕDi	ϕDb	$\phi Ds1$	$\phi Ds2$	Tb	$L1$	$L2$	t-ea	PN
500	501	525	325	400	15	80	200	8-8ea	99414931
600	601	630	450	530	15	80	200	8-8ea	99414934
650	651	680	450	530	15	80	200	8-8ea	99414936
700	701	735	550	630	20	80	200	8-8ea	99250880
800	801	835	650	730	20	80	200	10-8ea	99356016
900	901	940	650	730	25	120	215	10-8ea	99414937
1000	1001	1040	830	930	25	120	215	10-8ea	99339151
1200	1208	1245	1000	1120	25	120	215	12-8ea	99414938
1400	1408	1450	1200	1310	30	120	215	12-8ea	99247437
1500	1508	1550	1280	1420	30	150	250	15-8ea	99414940
1600	1608	1650	1400	1520	30	150	250	15-8ea	99414942
1800	1808	1855	1600	1720	50	150	250	30-8ea	99414952

■ Dimension table: KWM pump

(Unit: mm)

Column pipe DN	ϕDi	ϕDb	$\phi Ds1$	$\phi Ds2$	Tb	$L1$	$L2$	t-ea	PN
600	601	630	450	530	15	80	200	8-8ea	99290829
700	701	735	550	630	20	80	200	8-8ea	99414974
800	801	835	650	730	20	80	200	10-8ea	99414975
900	901	940	750	830	25	120	215	10-8ea	99414976
1000	1001	1040	830	930	25	120	215	10-8ea	99225235
1200	1208	1245	1000	1120	25	120	215	12-8ea	99414977
1400	1408	1450	1200	1310	30	120	215	12-8ea	99414978
1600	1608	1650	1400	1520	30	150	250	15-8ea	99414980

1.2 Anti-cavitation cone

The patented Anti-Cavitation Cone provides an optimal inlet flow to the pump.
The table below shows the anti-cavitation cone (ACC) dimensions.

Cavitation - the noise and vibrations associated with this harmful process - can be prevented by fitting an anti-cavitation cone below the pump just beneath the suction bowl.

Anti-cavitation Cone can be ordered from Grundfos and delivered from our factory, together with the intended pumps.
Product numbers for the anti-cavitation cone can be found in the data booklet for the pump.

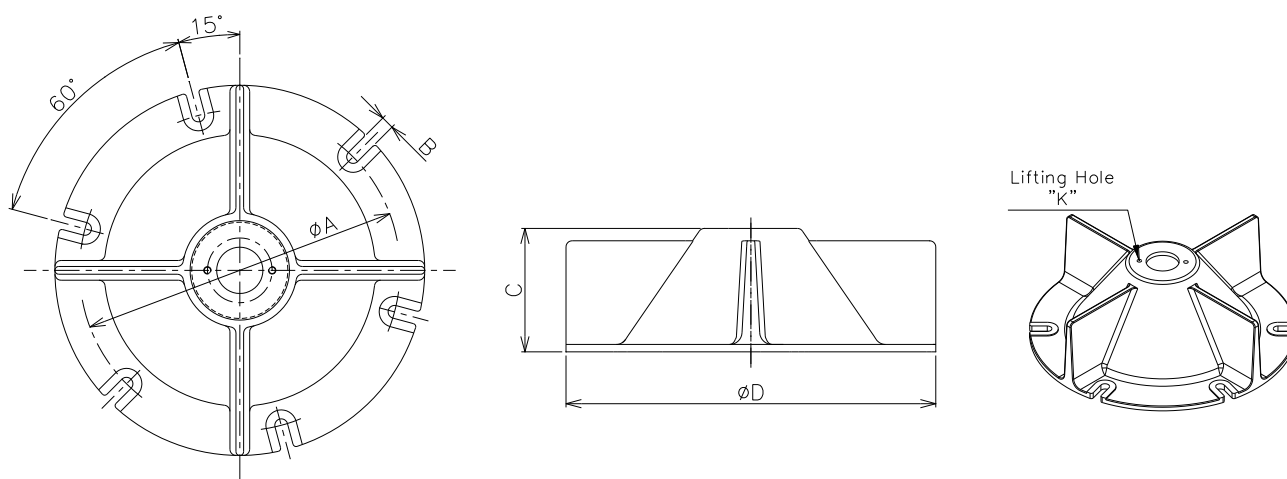
The ACC will prevent:

- Cavitation
- Pre swirl
- Fluid separation phenomenon
- Reduce vortices

Advantages:

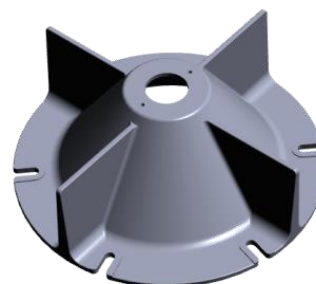
- Reduces noise and vibrations and extends the lifetime of the pump.

Anti cavitation cone (ACC) dimensions.



Type	A [mm]	B [mm]	C [mm]	ϕD [mm]	K [Lifting hole]	Weight [kg]	Foundation L-type anchor	Column diameter (DN)	PN
60 ACC	520	20	205	600	2-M12Tap	65	M16x250L-6ea	500 ~ 800	99250895
100 ACC	870	36	330	1000	2-M16Tap	230	M30x300L-6ea	900 ~ 1100	99339166
120 ACC	1040	42	400	1200	2-M16Tap	380	M36x300L-6ea	1200 ~ 1400	99258997
150 ACC	1300	48	520	1500	2-M20Tap	670	M42x350L-6ea	1500 ~ 1800	99414878

Note: (1) The anti-cavitation cone is made of cast iron EN-GJL-250 (EN-JL-1040) Other materials are available on request.
(2) Recommend L-type anchor bolt (anchor bolt is not included)

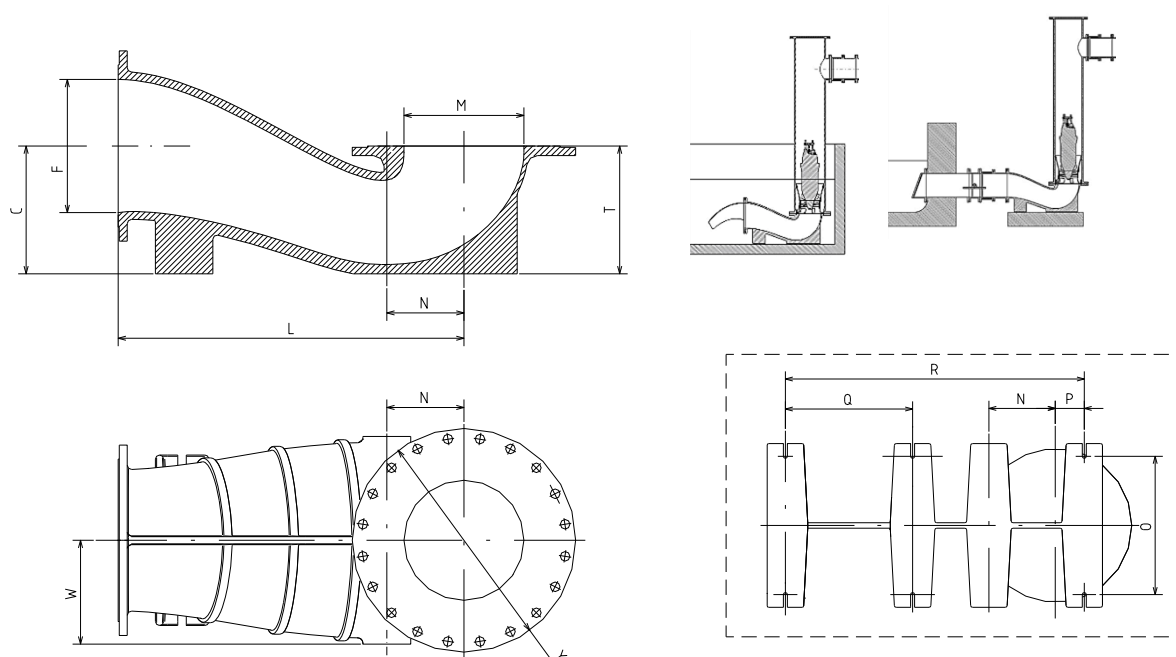


1.3 Compact suction intake (CSI)

The compact suction intake is a specialized and optimized device that ensures ideal flow toward pump's entry against any problematic environment. The CSI is mainly used in connection with vertical pumps which transport large quantities of a fluid like water from a fluid reservoir to a level being higher than the fluid level in the fluid reservoir.

The CSI is provided to create a homogenous flow of the fluid at the upstream side of a suction branch of the vertical pump. The CSI not only delivers liquid of water with minimized dynamic loss, but also tailors pump sumps with customized configurations. The CSI can erase the terminology of pumping station in compliance with HI Standard. Compared to the recommended sump layout by HI standard, the CSI makes it possible to reduce the entire footprint of the sump by more than 30 percent and thereby, customers will no longer get a headache with the limitations that we used to compromise as it is. Therefore, we eventually get a free hand for drawing with customized taste.

The drawings and table below show general information and dimensions of CSI.



(Unit: mm)

Nominal column diameter [DN]	Compact suction intake(CSI)												Weight
ØD	C	F	L	M	N	T	W	O	P	Q	R	Y	[kg]
500	360	400	1,100	325	210	370	270	370	75	-	1,135	715	362
600	480	500	1,300	451	290	480	390	510	100	-	1,360	840	675
650	480	500	1,300	451	290	480	390	510	100	-	1,360	845	698
700	560	600	1,600	550	360	540	450	670	135	-	1,710	910	978
800	630	700	1,900	650	420	620	530	800	140	-	2,020	1,025	1,312
900	630	700	1,900	650	420	620	530	800	140	-	2,020	1,025	1,377
1000	790	900	2,300	832	530	760	660	1,010	220	-	2,090	1,255	2,322
1200	970	1,200	2,800	1,000	620	940	800	1,370	230	-	2,530	1,485	4,125
1400	1,120	1,400	3,500	1,200	720	1,050	1,000	1,570	320	1,400	3,290	1,685	6,988
1500	1,190	1,400	3,600	1,280	800	1,120	1,000	1,570	350	1,420	3,420	1,795	7,200
1600	1,360	1,600	3,800	1,400	850	1,280	1,060	1,670	350	1,510	3,650	1,930	9,982
1800	1,540	1,800	4,400	1,600	1,000	1,490	1,180	1,770	450	1,790	4,290	2,130	12,835

Note: (1) The compact suction intake is made of Ductile cast iron GGG40 (ASTM A536-65-45-12). Other materials are available on request.

(2) Recommend L-type anchor bolt (anchor bolt is not included)

(3) Remember to check NPSH.

1.4 Cable suspension system

Cable protection

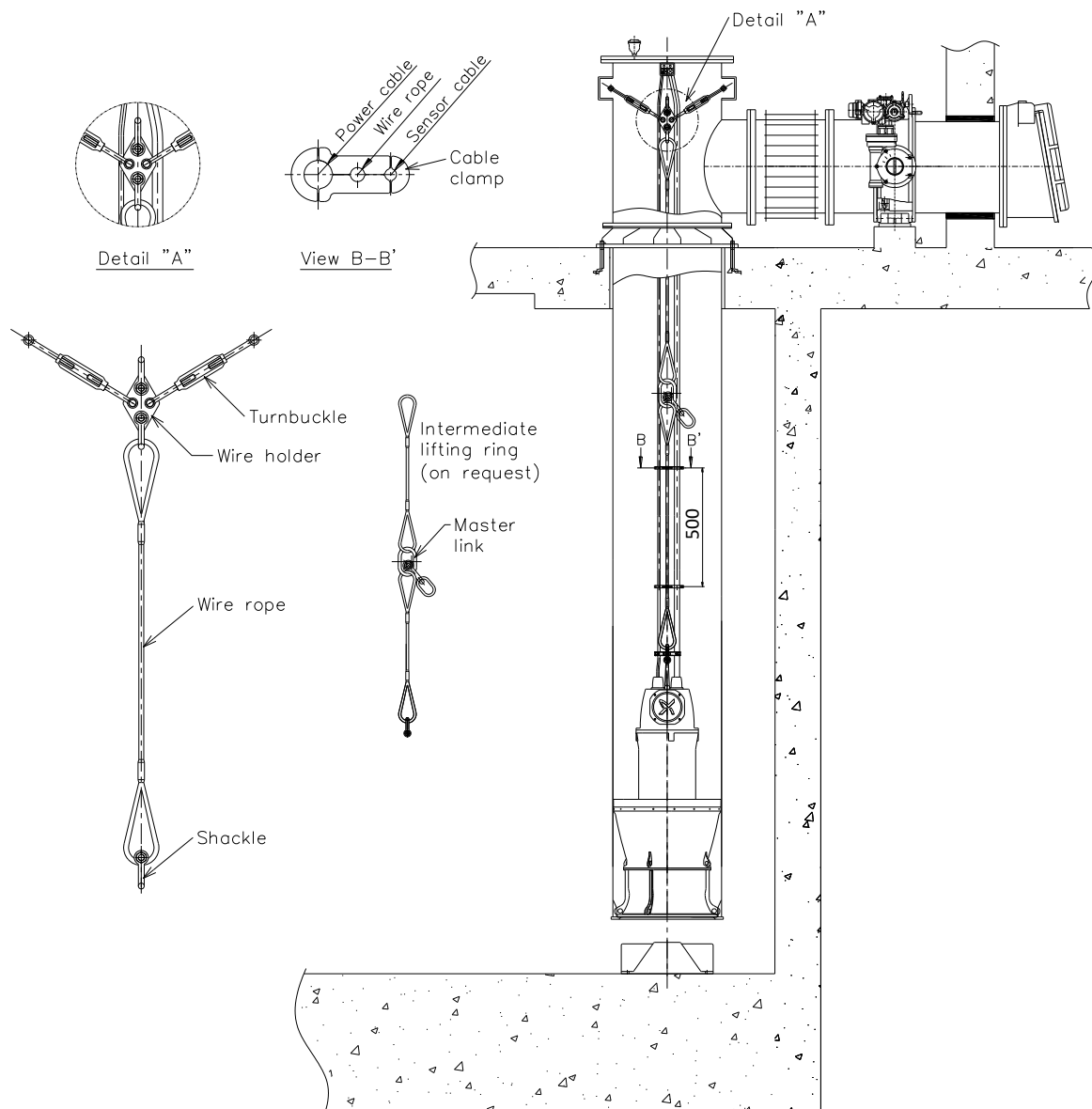
Keeping all chains and cables tight in a pipe installation is essential in order to avoid damage to the cables during operation. Loose cables and chains that move with the flow will be subject to wear and damage and eventually result in premature failure. Therefore, a reliable cable suspension system is crucial.

If the cables are not held correctly, damages may occur which can cause water to leak into the motor.

Cable clamps or fixation to the wire or chain should be placed with a distance suitable for the flow conditions in the column pipe.

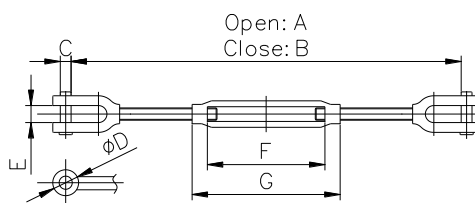
- Cable clamps distance: Every 500mm

For more information, please refer to the KPL and KWM data booklet.



The tables below show the cable suspension system parts dimensions.

1.4.1 Turnbuckle

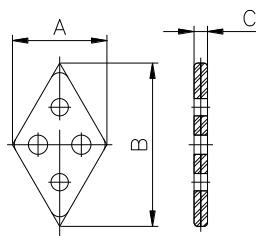


Size [inch]	Load [ton]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]
3/8 x 6	0.4	410	258	8	21	13	152	181
1/2 x 6	0.7	470	292	10	25	16	152	191
5/8 x 6	1.12	509	325	13	33	19	152	200
3/4 x 6	1.6	546	356	16	41	24	152	210
3/4 x 12	1.6	858	505	16	41	24	304	361
7/8 x 12	2.2	892	543	19	48	29	305	371
1 x 12	3.2	933	577	22	54	30	305	381
1-1/4 x 12	4.7	1012	644	28	67	44	305	384
1-1/2 x 12	9.7	1054	673	34	79	52	305	400
1-3/4 x 18	12.7	1356	899	41	89	60	457	569
2 x 24	16.8	1766	1157	51	106	64	610	737

Note: The turnbuckle is made of stainless steel (304)

1.4.2 Wire holder

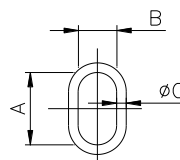
Size [Ton]	A [mm]	B [mm]	C [mm]
0.6	86	127	12
1.0	98	145	17
3.0	160	252	20
4.5	160	252	22
6.0	180	282	35
13.0	236	325	48



Note: The wire holder is made of stainless steel (304)

1.4.3 Master link

Size [inch]	Load [ton]	A [mm]	B [mm]	C [mm]
3/4	3.35	140	70	18
7/8	6.0	160	90	22
1	8.0	178	89	26
1-1/4	12.0	222	111	32
1-1/2	16.0	267	135	36

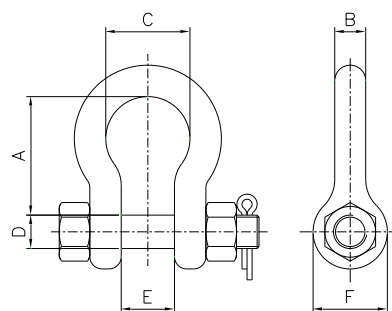


Note: The master link is made of stainless steel (304)

1.4.4 Shackle

Size [inch]	Load [ton]	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
3/8	0.45	37	10	26	11	17	25
1/2	0.6	49	13	34	16	21	30
5/8	1.37	60	16	43	19	27	40
3/4	2.0	73	19	51	22	32	48
7/8	2.7	85	22	58	25	37	54
1	3.58	95	25	68	28	43	60
1-1/4	6.12	119	32	83	35	51	76
1-1/2	8.5	146	38	98	41	60	92

Note: The shackle is made of stainless steel (316)

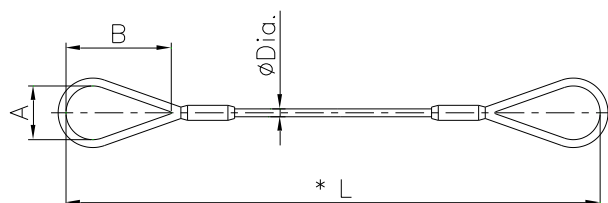


1.4.5 Wire rope

Dia. [φ]	Load [ton]	* (L) [mm]	A [mm]	B [mm]
8	0.6	6000	80	160
10	0.9	6000	100	200
12	1.3	6000	100	200
14	1.8	6000	130	260
16	2.4	6000	130	260
18	3.0	6000	150	300
20	3.8	6000	150	300
22	4.6	6000	150	300
24	5.5	6000	180	360
26	6.4	6000	180	360
28	7.4	6000	200	400
30	8.6	6000	200	400
32	9.7	6000	230	460

Note: The wire rope is made of stainless steel (304)

* (Dim) can be changed base on the site condition.



1.4.6 Cable suspension system selection guide

Nominal column diameter [DN]	Pump weight Max. [kg]	Turnbuckle [inch]	Wire holder [Ton]	Master Link [inch]	Shackle [inch]	Wire rope [φ]
500	450	1/2 x 6	0.6	3/4	1/2	8
600	850	5/8 x 6	1.0	3/4	5/8	10
650	630	5/8 x 6	1.0	3/4	5/8	10
700	1150	5/8 x 6	3.0	3/4	5/8	12
800	2170	3/4 x 6	3.0	3/4	7/8	16
900	2770	3/4 x 12	3.0	3/4	1	20
1000	3740	3/4 x 12	4.5	7/8	1-1/4	22
1200	4970	1-1/4 x 12	6.0	7/8	1-1/4	24
1400	6590	1-1/4 x 12	13.0	1	1-1/2	28
1500	6770	1-1/2 x 12	13.0	1	1-1/2	28
1600	9870	1-3/4 x 18	13.0	1-1/4	(*)	32
1800	11120	1-3/4 x 18	13.0	1-1/4	(*)	(*)

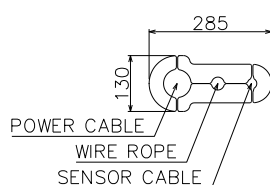
Note: Please contact local Grundfos

1.4.7 Cable clamp

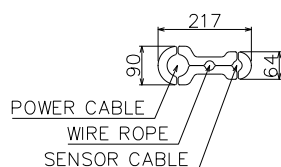
How to select:

- ① Check the number of cable ports for both of power and sensor cable
- ② Check the outside diameter of the wire and cables.
- ③ Cable clamp is needed for approx. every 500mm.

* For over 3 ports, please contact to local Grundfos Company.

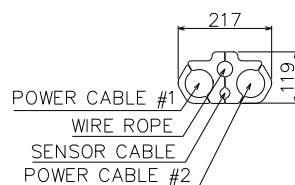


Type "A"

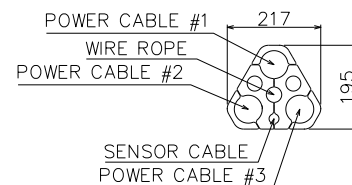


Type "B"

Cable clamp parts (2 port)



Cable clamp parts (3 port)



Cable clamp parts (4 port)

■ Type key

Code	Example	C2	.65 23.	A.	440	.S	0
C2	Cable clamp						
	2 port (Power 1, Sensor 1)						
C3	3 port (Power 2, Sensor 1)						
C4	4 port (Power 3, Sensor 1)						
	Cable outer diameter						
65	Power cable						
23	Sensor cable						
	Cable clamp type						
A	Large size (cable outer dia. 50~72mm)						
B	Small size (cable outer dia. 20~50mm)						
	Product number						
440	Cable clamp						
	Product variant(Material)						
S	Standard						
Z	Custom-built variant						
0	Revision number						

■ Cable and wire rope specifications

Power		Sensor		Wire rope		Type of Cable clamp
Type	Outer Dia.[mm]	Type	Outer Dia.[mm]	Size	Outer Dia.[mm]	
10sq x 4G	27	2.5sq x 11c	23	8	8	B
16sq x 4G	27			10	10	B
25sq x 4G	32			12	12	B
35sq x 4G	36			14	14	B
50sq x 4G	45			16	16	B
70sq x 4G	52			18	18	A or B
95sq x 4G	56			20	20	A
120sq x 4G	65			24	24	A
150sq x 4G	69			26	26	B
6sq x 7G	34			28	28	B
10sq x 7G	34			30	30	B
16sq x 7G	34			32	32	B
25sq x 7G	42					
35sq x 7G	45					

Note: Cable type: 4G - DOL starting, 7G - Star(Y)-Delta(D) starting. Other types are available on request.

2 Recommended accessories (not supplied by Grundfos)

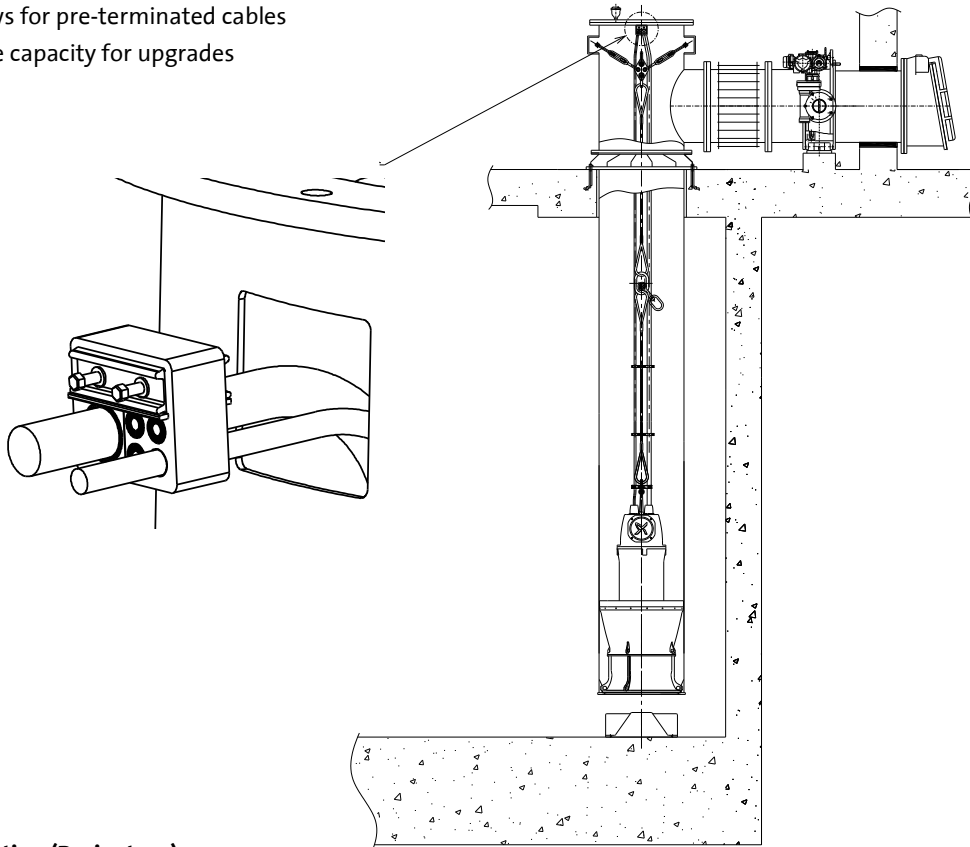
2.1 Column pipe cable entry

The below eight types of adaptable solutions with Roxtec sealing materials are based on rubber modules with removable layers. They allow for a perfect sealing, regardless of the outside dimension of the cable or pipe. This simplifies design, speeds up installation.

If the cables are not held correctly, damages may occur which can cause water to leak into the motor.

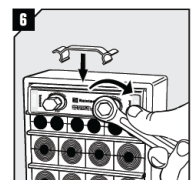
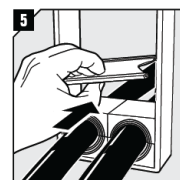
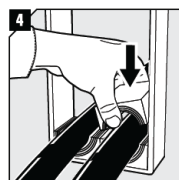
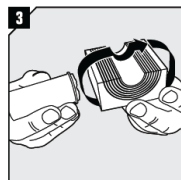
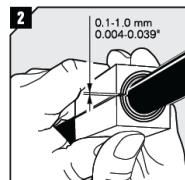
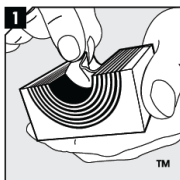
Features

- Certified protection
- Allows for pre-terminated cables
- Spare capacity for upgrades

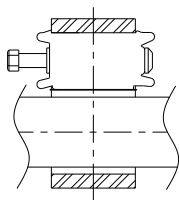
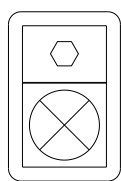


Installation (Basic steps)

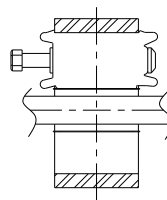
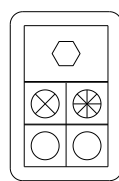
- ① Adapt modules, which are to hold cables or pipes, by peeling off layers until you reach the gap. The halves may not differ by more than one layer.
- ② Achieve a 0.1 ~ 1.0 mm gap between the two halves when held against the cable/pipe.
- ③ Lubricate all modules for the frame thoroughly, both the inside and the outside surfaces.
- ④ Insert the modules according to your installation plan (transit plan). It is recommended to seal cables/pipes at the bottom of the frame and put spare modules on top.
- ⑤ Insert a stay plate on top of every finished row of modules.
- ⑥ Insert the wedge and tighten the screws until full stop. Attach the wedge clip to the wedge bolts to check that the wedge is properly tightened.



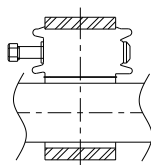
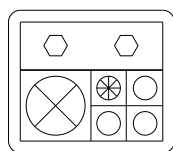
Column pipe cable entry specifications



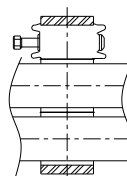
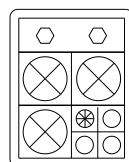
Type 1



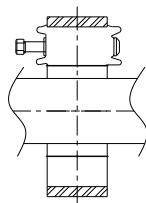
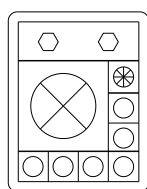
Type 2



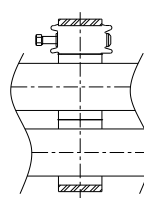
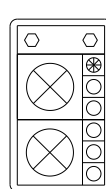
Type 3



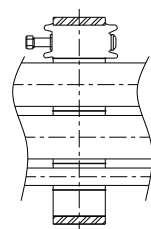
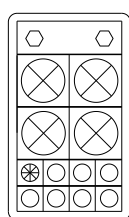
Type 4



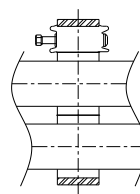
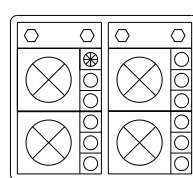
Type 5



Type 6



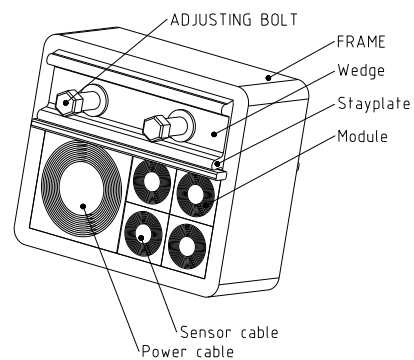
Type 7



Type 8

⊗ POWER CABLE ⊗ SENSOR CABLE ○ BLANK

Type	Size	Power cable			Sensor cable		
		Module	Out. Dia.(φ)	ea	Module	Out. Dia. (φ)	ea
1	121 x 80	RM60	28 ~ 54	1	-	-	-
2	121 x 80	RM30	10 ~ 26	1	RM30	23	1
3	121 x 141	RM60	28 ~ 54	1	RM30	23	1
4	180 x 141	RM60	28 ~ 54	3	RM30	23	1
5	180 x 141	RM90	48 ~ 71	1	RM30	23	1
6	238 x 141	RM90	48 ~ 71	2	RM30	23	1
7	238 x 141	RM60	28 ~ 54	4	RM30	23	1
8	238 x 271	RM90	48 ~ 71	4	RM30	23	1

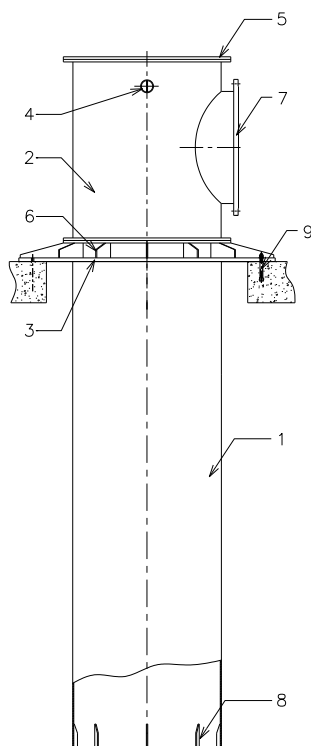


2.2 Column pipe

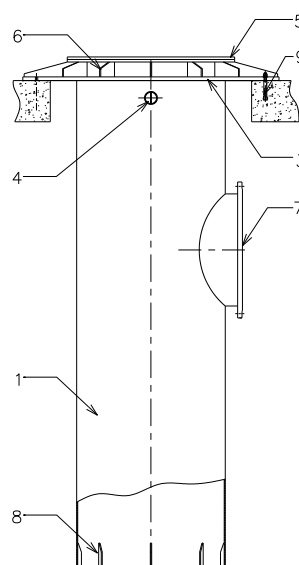
Multiple designs concept and overview of column pipe installations can be found in “Designing Flood Pumping Station handbook” page. 16.

The two most common designs are standardized and presented below.

NOTE: Column pipes are not part of the standard accessory delivery from Grundfos. Only the seat ring, see section 1., which is fixed in the bottom of the column tube is part of the standard accessory supplied from Grundfos.



TYPE "A"

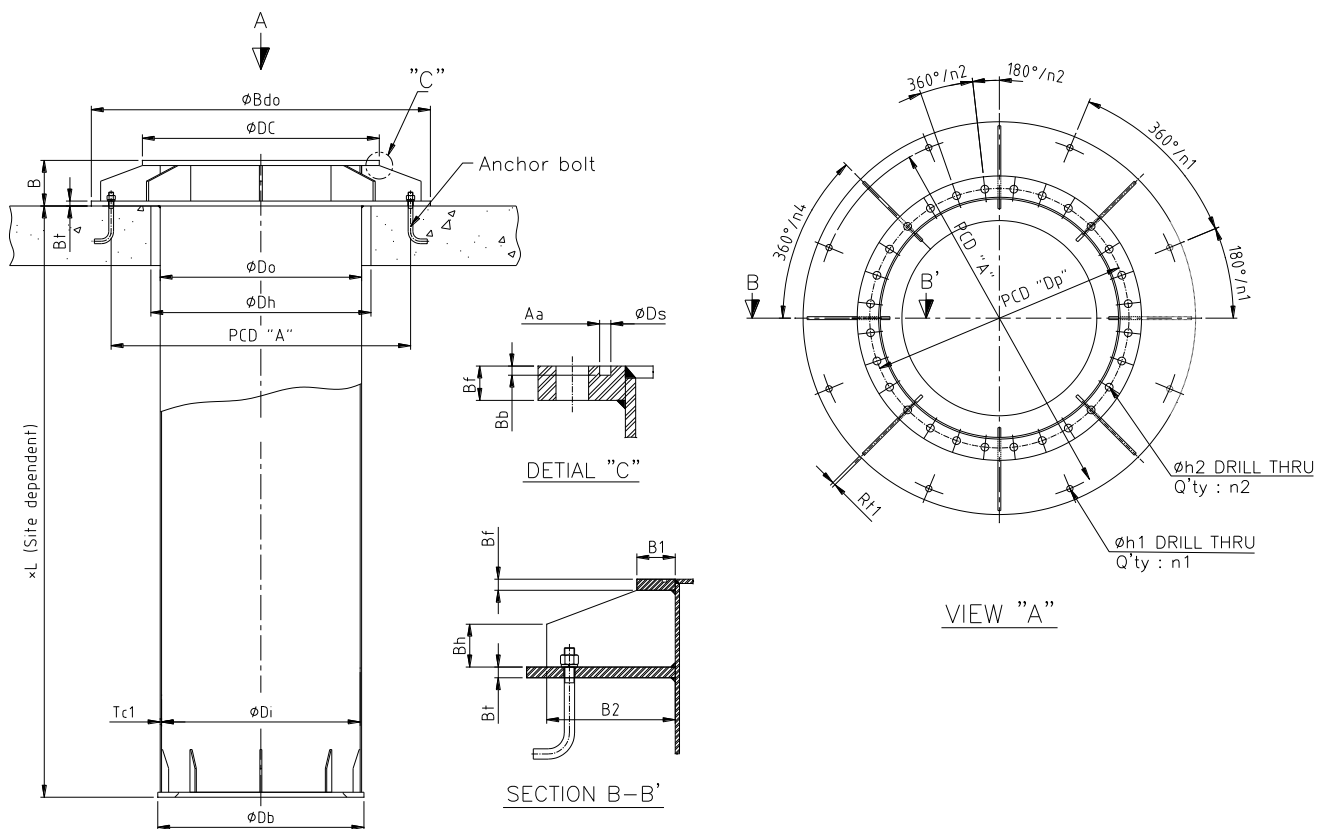


TYPE "B"

No.	Pos. Description	Material	KS	DIN W.-Nr./EN Std.	ASTM/AISI
1	Column pipe	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
2	Discharge tee	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
3	Base plate	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
4	Cable hanger	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
5	Column top cover	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
6	Column rib	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
7	Discharge Flange	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
8	Seat ring	Carbon Steel plate	SS275 (SS400)	DIN 17100 Ust 42-1	A283 Gr.D
9	Anchor bolt	Stainless steel	STS 304	X5CrNi-189-1.4301	A276, 304

The table below is a guidance for the column pipe dimensions

2.2.1 Column pipe: Type "A"



※ ϕDb : Please refer to the seat ring dimension table. (page. 3)

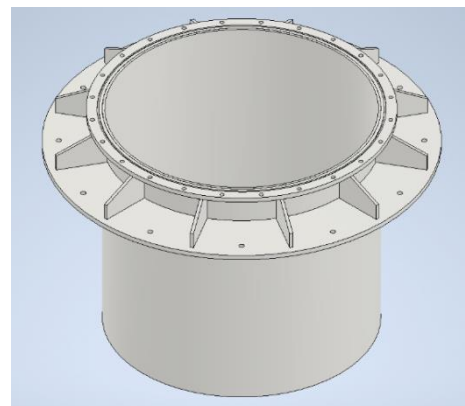
(Unit: mm)

Column DN	Column pipe				Column Flange					Base plate					Rib					
	ϕDh	ϕDo	ϕDi	$*(Tc1)$	ϕDc	PCD "Dp"	Bf	ϕDs	n2(ea) - $\phi h2$	ϕBdo	PCD "A"	Bt	n1(ea) - $\phi h1$	Anchor bolt	B	Rt1	n4(ea)	B1	B2	Bh
500	590	514	502	6	655	605	22	540	16 - 19	1000	850	22	8 - 22	M16x250L	180	12	8	70.5	210	65
600	690	616	602	7	770	715	22	645	16 - 19	1160	1000	22	8 - 22	M16x250L	180	12	8	77.0	240	65
650	740	666	652	7	825	770	24	700	16 - 19	1250	1070	24	8 - 22	M16x250L	180	12	8	79.5	250	65
700	790	718	702	8	875	820	24	750	24 - 19	1310	1130	24	8 - 26.5	M20x300L	200	14	8	78.5	250	85
800	910	818	802	8	995	930	24	855	24 - 19	1500	1300	24	8 - 26.5	M20x300L	200	14	8	88.5	280	85
900	1010	922	902	10	1095	1030	24	955	24 - 23	1600	1400	24	8 - 26.5	M20x300L	200	14	8	86.5	300	85
1000	1110	1022	1002	10	1195	1130	26	1055	24 - 23	1710	1510	26	12-26.5	M20x300L	230	16	12	86.5	300	100
1200	1320	1234	1210	12	1420	1350	26	1275	24 - 27	1920	1720	26	12-26.5	M20x300L	230	16	12	93.0	300	100
1400	1520	1434	1410	12	1640	1560	30	1480	24 - 27	2140	1940	30	12 - 33	M24x300L	230	16	12	103.0	300	100
1500	1620	1534	1510	12	1730	1660	30	1580	24 - 27	2240	2040	30	12 - 33	M24x300L	230	20	12	98.0	305	100
1600	1730	1640	1610	15	1830	1770	30	1680	24 - 27	2350	2150	30	12 - 33	M24x300L	260	20	12	95.0	310	100
1800	1930	1840	1810	15	2115	1980	30	1885	24 - 34	2550	2350	30	12 - 33	M24x300L	260	20	12	137.5	310	100

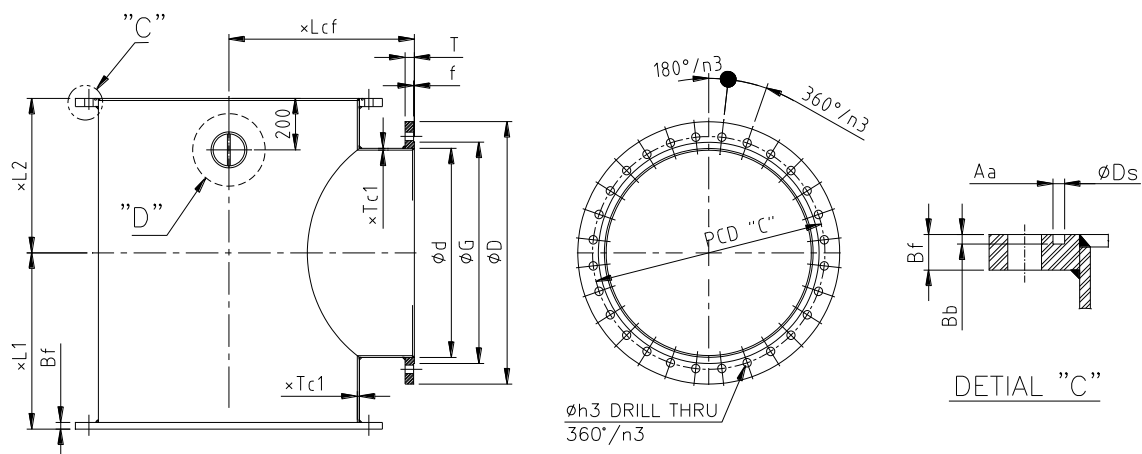
Note: * (Dim.) can be changed based on the site condition.

Column pipe O-ring – Detail "C"

Column DN	Aa	Bb	O-Ring
500 - 900	7.9	6.5	$\phi 8.4$
1000 - 1800	11.3	8.5	$\phi 12$



2.2.2 Discharge tee



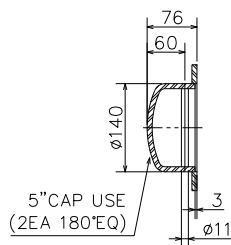
(Unit: mm)

Column DN	Discharge DN	Column Tee						Discharge Flange					O-ring			
		φd	*(Tc1)	*(Lcf)	*(L1)	*(L2)	Bf	ΦD	PCD"C"	ΦG	T x f	n3(ea) - Φh3	φDs	Aa	Bb	Size
500	300	319	6	380	330	300	22	445	400	370	22 x 4	12 - 23	540	7.9	6.5	φ8.4
600	400	406	7	450	390	350	22	565	515	482	22 x 4	16 - 27	645			
650	450	457	7	475	400	380	24	615	565	532	24 x 4	20 - 27	700			
700	500	508	8	500	410	410	24	670	620	585	24 x 4	20 - 27	750			
800	600	610	8	560	470	475	24	780	725	685	24 x 5	20 - 30	855			
900	700	711	10	620	510	560	24	895	840	800	24 x 5	24 - 30	955	11.3	8.5	φ12
1000	800	813	10	700	580	640	26	1015	950	905	26 x 5	24 - 33	1055			
1200	1000	1016	12	800	700	710	26	1230	1160	1110	26 x 5	28 - 36	1275			
1400	1200	1219	12	930	840	860	30	1455	1380	1330	30 x 5	32 - 39	1480			
1500	1350	1372	12	980	890	920	30	1642	1552	1500	30 x 5	36 - 40	1580			
1600	1400	1422	15	1040	1010	960	30	1675	1590	1535	30 x 5	36 - 42	1680	11.3	8.5	φ12
1800	1600	1625	15	1250	1040	1110	30	1915	1820	1760	30 x 5	40 - 48	1885			

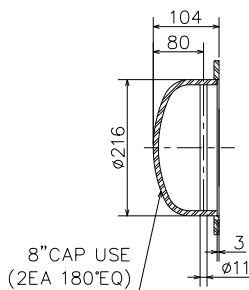
Note: * (Dim.) can be changed based on the site condition.

Cable hanger - Detail "D"

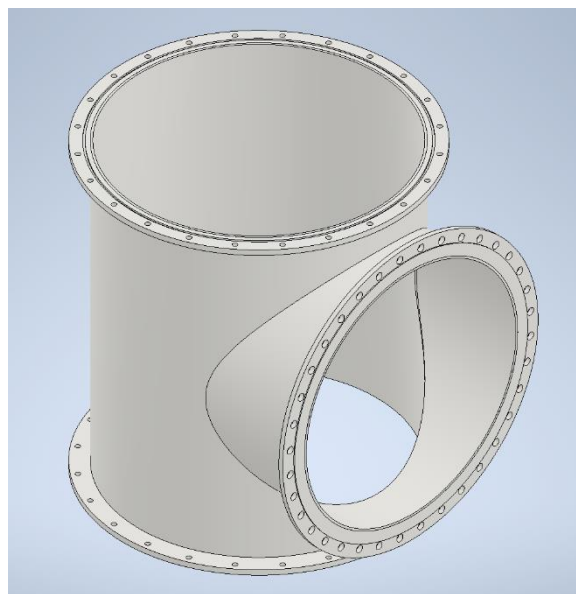
Column DN	Type
500 - 1000	A
1200 - 1800	B



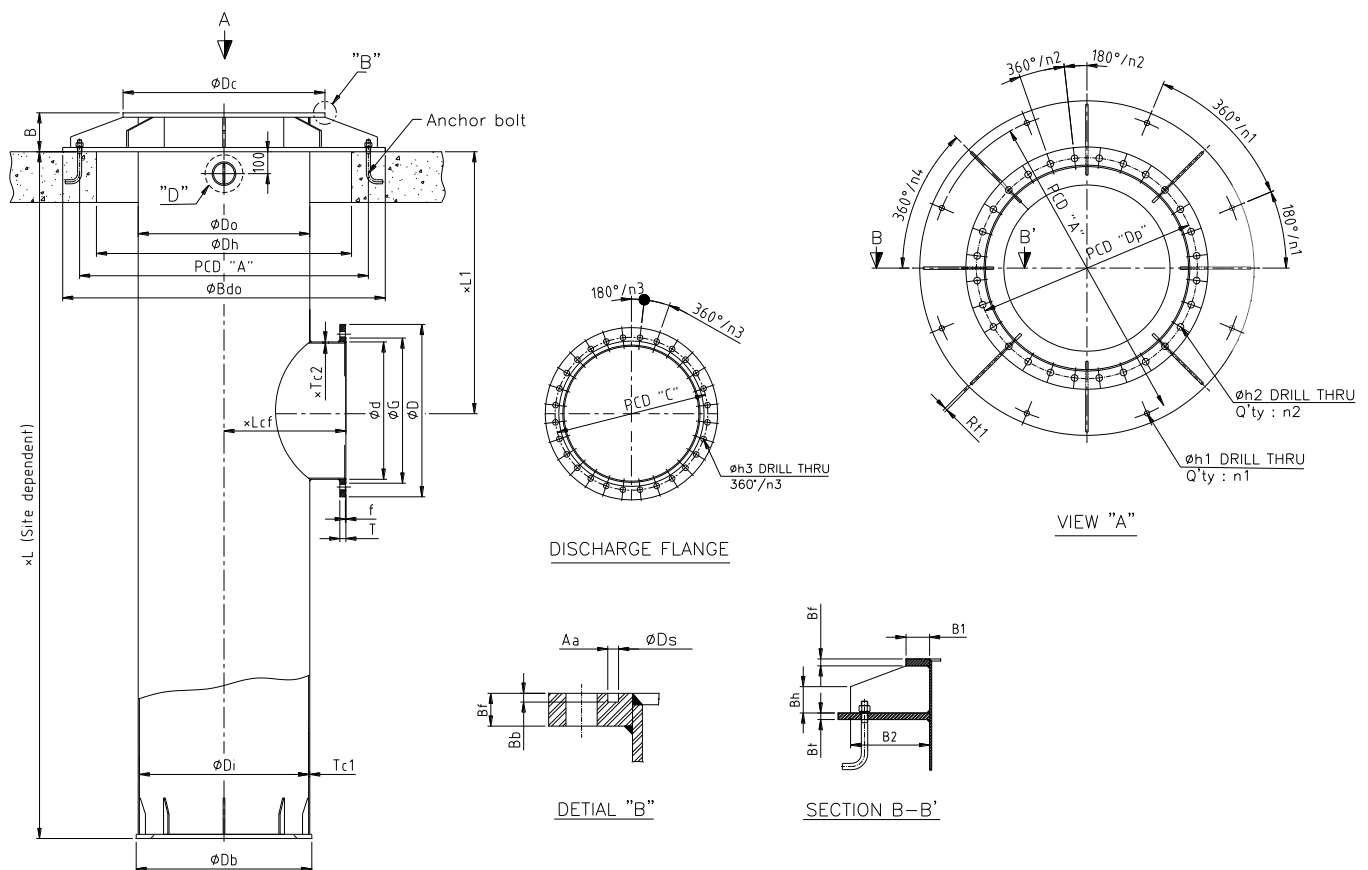
Type "A"



Type "B"



2.2.3 Column pipe: Type "B"



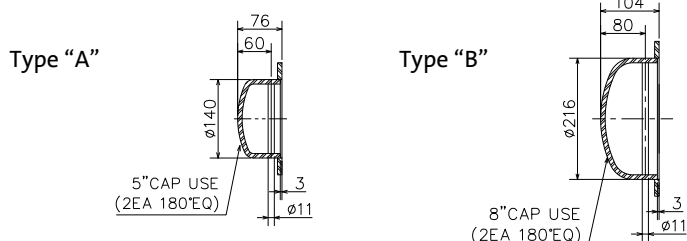
※ ϕD_b : Please refer to the seat ring dimension table. (page. 3)

(Unit: mm)

Column DN	Column pipe				Flange					Base plate				Rib						Cable Hanger	
	φDo	φDi	*(Tc1)	φDh	φDc	PCD "Dp"	Bf	φDs	n2(ea) - φh2	φBdo	φA	Bt	n1(ea)- φ h1	Anchor bolt	B	Rt1	n4 (ea)	B1	B2		Bh
500	514	502	6	850	655	605	22	540	16-19	1300	1070	22	8-22	M16x250L	180	16	8	70.5	370	65	A type
600	616	602	7	950	770	715	22	645	16-19	1450	1270	22	8-22	M16x250L	180	16	8	77.0	395	65	
650	666	652	7	1050	825	770	24	700	16-19	1550	1370	24	8-22	M16x250L	180	16	8	79.5	410	65	
700	718	702	8	1100	875	820	24	750	24-19	1650	1470	24	8-26.5	M20x300L	200	18	8	78.5	420	85	
800	818	802	8	1250	995	930	24	855	24-19	1850	1650	24	8-26.5	M20x300L	200	18	8	88.5	475	85	
900	922	902	10	1400	1095	1030	24	955	24-23	2000	1800	24	8-26.5	M20x300L	200	18	8	86.5	500	85	
1000	1022	1002	10	1600	1195	1130	26	1055	24-23	2200	2000	26	12-26.5	M20x300L	230	20	12	86.5	545	100	B type
1200	1234	1210	12	1900	1420	1350	26	1275	24-27	2500	2300	26	12-26.5	M20x300L	230	20	12	93.0	590	100	
1400	1434	1410	12	2150	1640	1560	30	1480	24-27	2800	2600	30	12-33	M24x300L	230	20	12	103.0	629	100	
1500	1534	1510	12	2300	1730	1660	30	1580	24- 27	3000	2750	30	12-33	M24x300L	230	24	12	98.0	680	100	
1600	1640	1610	15	2450	1830	1770	30	1680	24-27	3150	2850	30	12-33	M24x300L	260	24	12	95.0	700	100	
1800	1840	1810	15	2720	2115	1980	30	1885	24-34	3500	3100	30	12-33	M24x300L	260	24	12	137.5	775	100	

Note: $\ast$ (Dim.) can be changed based on the site condition.

Cable hanger - Detail "D"



Column pipe O-ring – Detail "B"

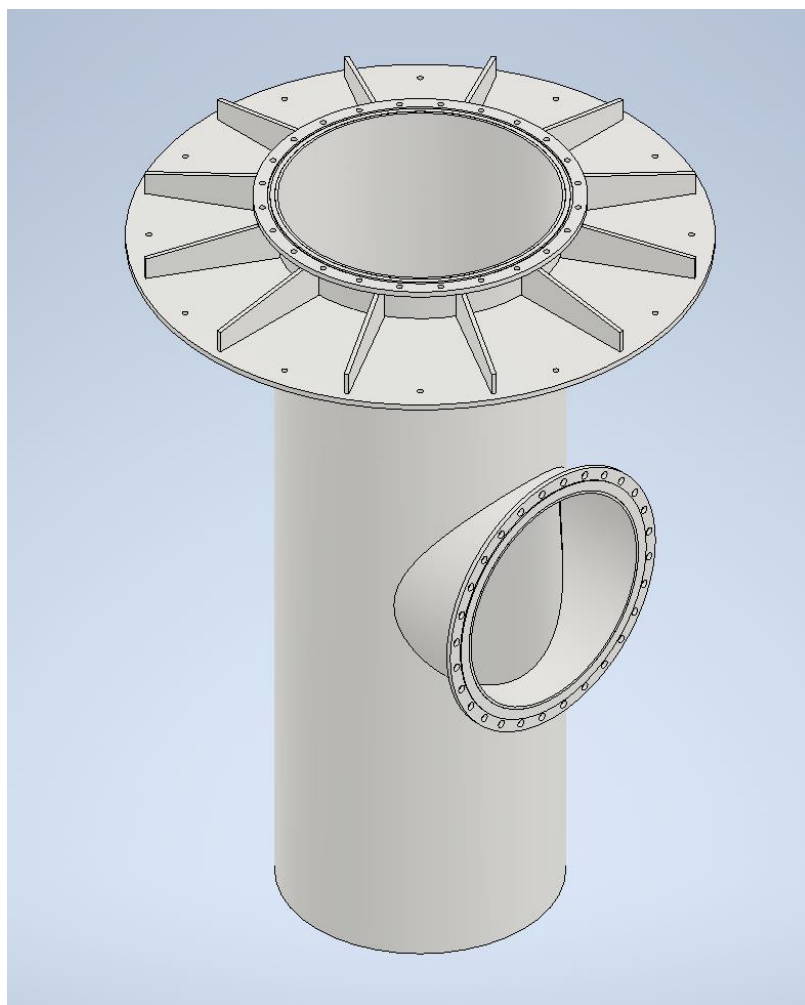
Column DN	Aa	Bb	O-Ring
500 - 900	7.9	6.5	$\phi 8.4$
1000 - 1800	11.3	8.5	$\phi 12$

Column pipe discharge flange for Type "B"

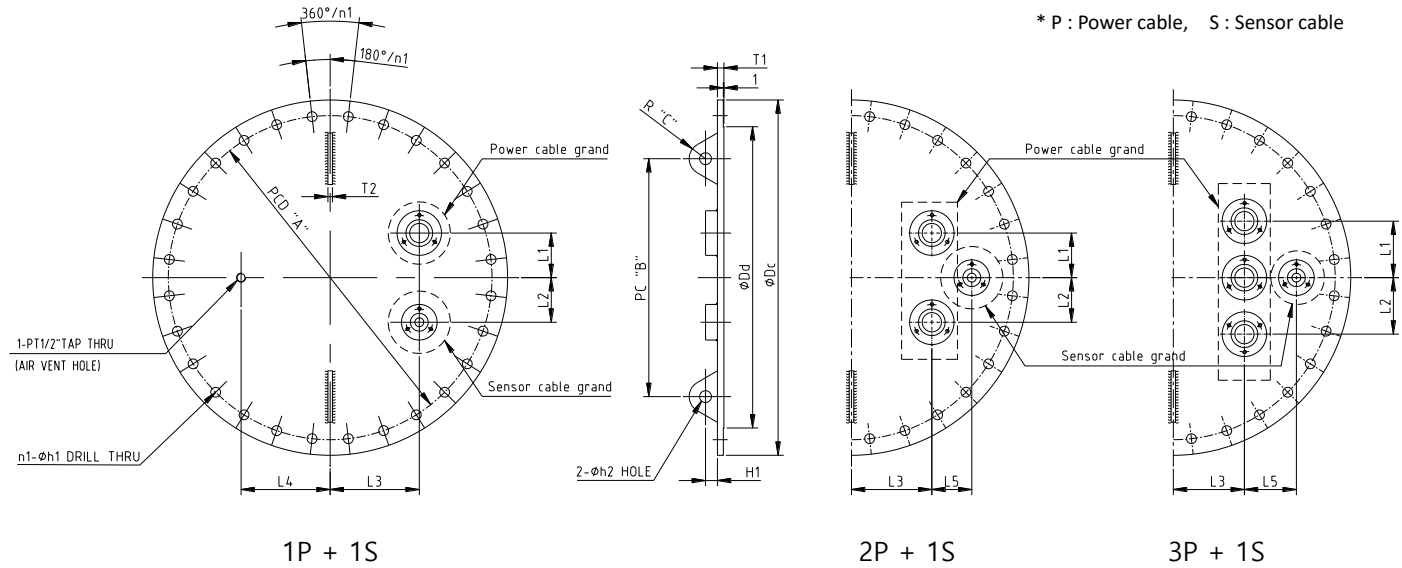
(Unit: mm)

Column DN	Discharge DN	Column Tee				Discharge flange					Cable hanger type	O-Ring		
		Φd	*(Tc2)	*(Lcf)	*(L1)	ΦD	PCD "C"	ΦG	T x f	n3(ea)-Φh3		Aa	Bb	Size
500	300	319	6	380	1100	445	400	370	22 x 4	12-23	A type	7.9	6.5	φ8.4
600	400	406	7	450	1100	565	515	482	22 x 4	16-27				
650	450	457	7	475	1200	615	565	532	24 x 4	20-27				
700	500	508	8	500	1300	670	620	585	24 x 4	20-27				
800	600	610	8	560	1400	780	725	685	24 x 5	20-30				
900	700	711	10	620	1500	895	840	800	24 x 5	24-30				
1000	800	813	10	700	1600	1015	950	905	26 x 5	24-33	B type	11.3	8.5	φ12
1200	1000	1016	12	800	1700	1230	1160	1110	26 x 5	28-36				
1400	1200	1219	12	930	1800	1455	1380	1330	30 x 5	32-39				
1500	1350	1372	12	980	1900	1642	1552	1500	30 x 5	36-40				
1600	1400	1422	15	1040	1900	1675	1590	1535	30 x 5	36-42				
1800	1600	1625	15	1250	2000	1915	1820	1760	30 x 5	40-48				

Note: * (Dim.) can be changed based on the site condition.



2.2.4 Column top cover

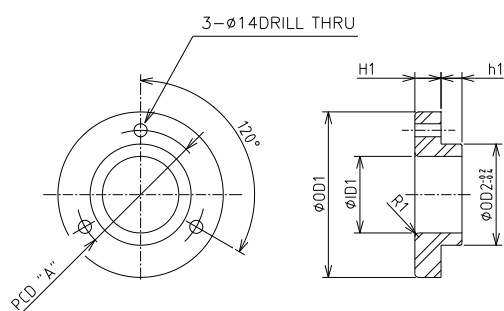


(Unit: mm)

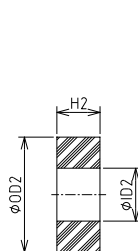
	Column Dia.	ΦDc	ΦDd	PCD"A"	PC"B"	*(T1)	C	H1	Φh2	T2	L1	L2	L3	L4	L5	n1 (ea) x Φh1
1 power + 1 sensor cable	DN500	655	500	605	400	22	30	25	20	15	85	80	160	200	-	16-19
	DN600	770	600	715	500	22	30	25	20	15	85	80	200	250	-	16-19
	DN650	825	650	770	550	24	30	25	20	15	85	80	210	275	-	16-19
	DN700	875	700	820	600	24	35	30	25	20	95	90	230	300	-	24-19
	DN800	995	800	930	700	24	35	30	25	20	125	110	260	325	-	24-19
	DN900	1095	900	1030	800	24	35	30	25	20	125	110	300	350	-	24-23
	DN1000	1195	1000	1130	800	26	45	40	30	25	125	110	330	400	-	24-23
	DN1200	1420	1200	1350	1000	26	45	40	30	25	140	120	400	450	-	24-27
	DN1400	1640	1400	1560	1000	30	55	50	40	30	160	140	460	500	-	24-27
	DN1500	1730	1500	1660	1200	30	55	50	40	30	160	140	500	550	-	24-27
	DN1600	1830	1600	1770	1400	30	55	50	40	30	160	140	550	600	-	24-27
2 power + 1 sensor cable	DN700	875	700	820	600	24	35	30	25	20	110	110	160	300	130	24-19
	DN800	995	800	930	700	24	35	30	25	20	130	130	185	325	130	24-19
	DN900	1095	900	1030	800	24	35	30	25	20	130	130	210	350	130	24-23
	DN1000	1195	1000	1130	800	26	55	40	30	25	130	130	230	400	130	24-23
	DN1200	1420	1200	1350	1000	26	55	40	30	25	140	140	280	450	130	24-27
	DN1400	1640	1400	1560	1000	30	55	50	40	30	160	160	325	500	130	24-27
	DN1500	1730	1500	1660	1200	30	55	50	40	30	160	160	350	550	130	24-27
	DN1600	1830	1600	1770	1400	30	55	50	40	30	160	160	370	600	130	24-27
3 power + 1 sensor cable	DN700	875	700	820	600	24	35	30	25	20	110	110	160	300	130	24-19
	DN800	995	800	930	700	24	35	30	25	20	130	130	185	325	130	24-19
	DN900	1095	900	1030	800	24	35	30	25	20	130	130	210	350	130	24-23
	DN1000	1195	1000	1130	800	26	55	40	30	25	130	130	230	400	130	24-23
	DN1200	1420	1200	1350	1000	26	55	40	30	25	140	140	280	450	130	24-27
	DN1400	1640	1400	1560	1000	30	55	50	40	30	160	160	325	500	130	24-27

Note: *(Dim.) can be changed based on the site condition.

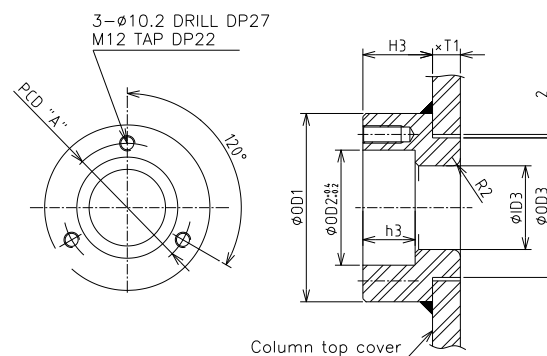
2.2.5 Cable gland



Cable gland cover



Cable bush

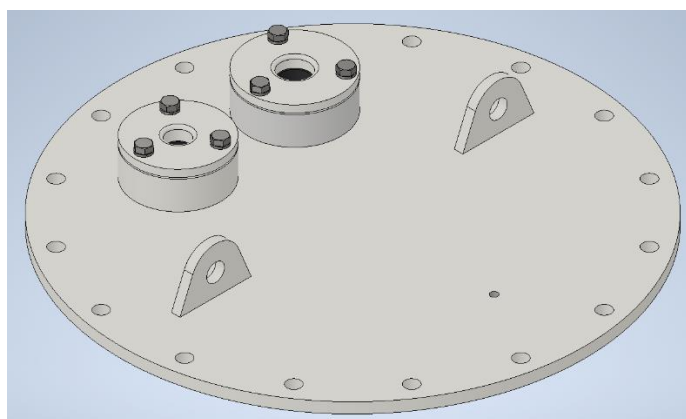


Cable gland body

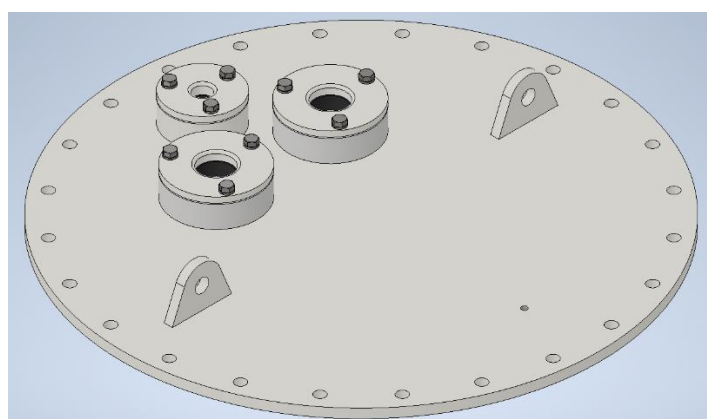
(Unit : mm)

	Cable OD	Cable gland cover						Cable bush			Cable gland body						
		ØOD1	ØID1	H1	h1	R1	PCD"A"	ØOD2	ØID2	H2	ØID3	ØOD3	H3	h3	R2	*(T1)	Bolt size
Sensor Cable	23	120	27	10	8	8	90	55	23	25	31	100	40	29	10	Please refer to the column top cover dimension table	M12x30
	27	120	30	10	8	8	90	55	26	25	34	100	40	29	10		M12X30
Power Cable	26	130	30	10	8	10	105	70	26	28	37	110	40	32	10		M12X30
	32	130	36	10	8	10	105	70	32	28	43	110	40	32	10		M12X30
	34	130	38	10	8	10	105	70	34	28	45	110	40	32	10		M12X30
	36	130	40	10	8	10	105	70	36	28	47	110	40	32	10		M12X30
	42	150	46	10	8	10	125	90	42	23	53	130	40	27	10		M12X30
	45	150	49	10	8	10	125	90	45	23	56	130	40	27	10		M12X30
	50	150	54	10	8	10	125	90	50	23	61	130	40	27	10		M12X30
	52	150	56	10	8	10	125	90	52	23	63	130	40	27	10		M12X30
	56	160	60	10	8	10	135	100	56	23	67	140	40	27	10		M12X30
	62	160	66	10	8	10	135	100	62	23	73	140	40	27	10		M12X30
	65	160	69	10	8	10	135	100	65	23	76	140	40	27	10		M12X30
	68	160	72	10	8	10	135	100	68	23	79	140	40	27	10		M12X30
	73	160	77	10	8	10	135	100	73	23	84	140	40	27	10		M12X30

Note: *(Dim.) can be changed based on the column top cover thickness.



Column top cover with cable gland (1 power + 1 sensor cable)



Column top cover with cable gland (2 power + 1 sensor cable)

2.3 Formed suction intake (FSI)

The formed suction intake (FSI) may eliminate the need for the design of sumps with approach channels and appurtenances to provide satisfactory flow to a pump. The FSI design is relatively insensitive to the direction of approach flow and skewed velocity distribution at its entrance. In applying the FSI design, consideration should be given to the head loss in the FSI which will affect to some extent the system curve calculations, and the net positive suction head (NPSH) available to the pump impeller, typically located near the FSI exit.

The formed suction intake is not part of the standard accessory supplied by Grundfos.

Formed suction intake design

According to the US Army corps of engineers (EM 1110-2-3105, Aug. 1994.), the FSI design can be constructed in either concrete or steel.

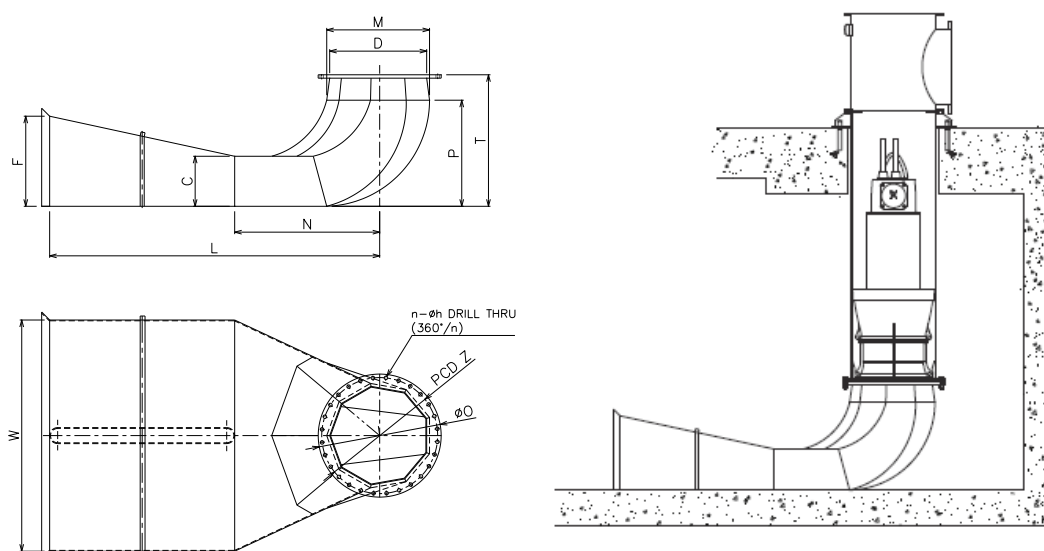
In some applications the formed suction casing is being produced in High Density Polyethylene.

The intake reduces disturbances and swirl in the approaching flow. The inclined front wall is designed to prevent stagnation of the surface flow.

The geometrical features of this intake provide for smooth acceleration and turning as the flow enters the pump. The minimum submergence should not be less than the column diameter.

The table below shows general information of the Formed suction intake (FSI) dimensions.

For the limited space, we can offer reduced and optimized design by CFD simulation.



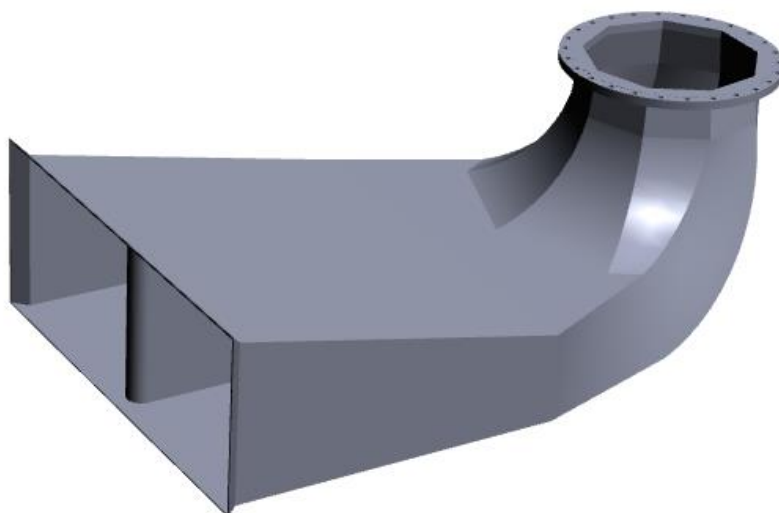
(Unit: mm)

Nominal column diameter [DN]	Formed suction intake(FSI) steel version							
ϕD	C	F	L	M	N	P	T	W
500	250	440	1650	530	725	530	640	1155
600	300	540	1980	636	870	636	768	1386
650	330	580	2145	689	943	689	832	1502
700	350	630	2310	742	1015	742	896	1617
800	400	720	2640	848	1160	848	1024	1848
900	450	810	2970	954	1305	954	1152	2079
1000	500	900	3300	1060	1450	1060	1280	2310
1200	600	1080	3960	1272	1740	1272	1536	2772
1400	700	1260	4620	1484	2030	1484	1792	3234
1500	750	1350	4950	1590	2175	1590	1920	3465
1600	800	1440	5280	1696	2320	1696	2048	3696
1800	900	1620	5940	1908	2610	1908	2304	4158

Note: The formed suction intake is made of steel ASTM A283 Gr.D. Other materials are available on request.

Nominal column diameter [DN]	Formed suction intake(FSI) steel version					
	DIN PN10 flange			KS D 3578-F12		
ϕD	ϕO	ϕZ	n- ϕh	ϕO	ϕZ	n- ϕh
500	670	620	20-26	706	620	20-27
600	780	725	20-30	810	725	20-30
700	895	840	24-30	928	840	24-30
800	1015	950	24-33	1034	950	24-33
900	1115	1050	28-33	1156	1050	28-33
1000	1230	1160	28-36	1262	1160	28-36
1200	1455	1380	32-39	1470	1387	32-36
1400	1675	1590	36-42	-	-	-
1500	-	-	-	1800	1710	36-40
1600	1915	1820	40-48	1915	1820	40-40
1800	2115	2020	44-48	2115	2020	44-49

Note: The formed suction intake is made of steel ASTM A283 Gr.D. Other materials are available on request. Remember to check NPSH.
Remember to check NPSH.



2.4 Butterfly valve

Butterfly valve can be used for isolating or regulating flow. Butterfly valves are generally favored because they are lower in cost to other valve designs as well as being lighter in weight.

This disc is positioned in the center of the pipe, passing through the disc is a rod connected to an actuator on the outside of the valve.

Butterfly valves meet the requirements of AWWA C504 (BS 5165, JIS B 2064 or KS B 2333)

Improved elasticity and restitution completely stop flow. The butterfly valve can be installed in both horizontal and vertical directions.

The valve absorbs stress applied repeatedly to the rubber seat and prevents deformation of the rubber seat. The substantially increased seat life provides efficient long-term water-tightness.

The streamlined disk design minimizes resistance of fluid, reducing head loss.

The butterfly valves are not part of the Grundfos Standard accessory line.



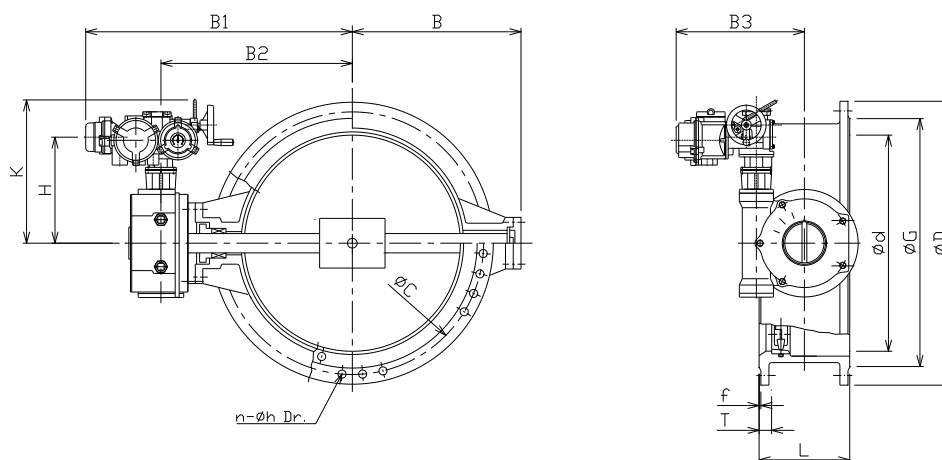
Specification

Size	Horizontal type 300mm ~ 2,000mm
Working pressure	Max. 10kgf/cm ²
Flange rating	DIN 2632 PN10, KS D 3578-F12 ※ Other standards are available on request
Fluid	Pumped media
Main material	Body : Cast iron(GC200), Ductile cast iron(GCD 450) Disk : Cast iron(GC200), Ductile cast iron(GCD 450) Seat : Bronze casting(CAC 406+Rubber), Stainless steel(STS 304+Rubber) ※ Other standards are available on request

Note: The selection of butterfly valve is local responsibility, and all technical information has to be reviewed To ensure it is in accordance with local regulations and guidelines.

The table below shows the butterfly valve dimensions.

2.4.1 Dimension: DN300~DN500



■ DIN flange standard

(unit: mm)

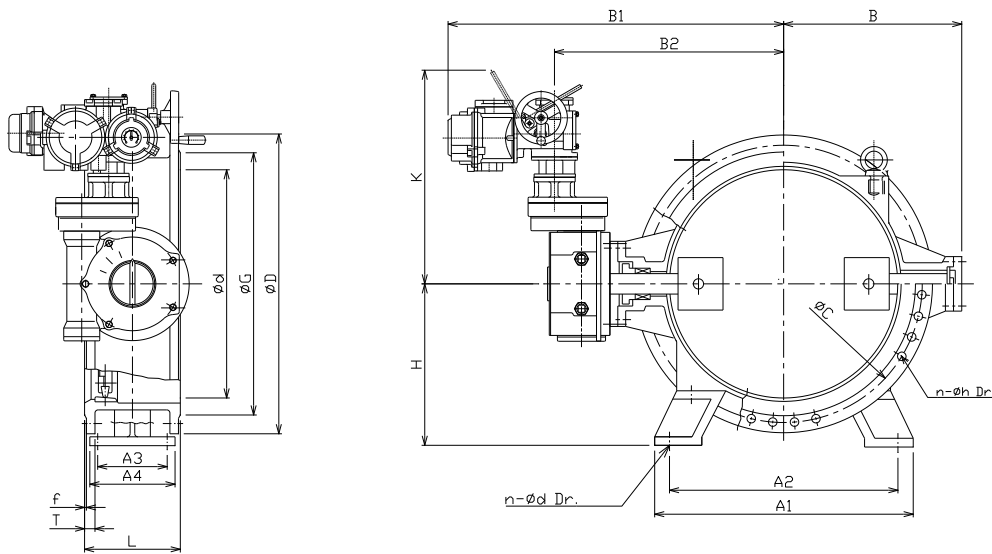
DN (ϕd)	L	DIN PN10 flange					B	B1	B2	B3	K	H
		ϕD	ϕC	ϕG	T x f	n- ϕh						
300	178	445	400	370	26 x 4	12-22	400	850	525	399	420	265
350	190	505	460	430	26 x 4	16-22	400	875	555	405	420	265
400	216	565	515	482	26 x 4	16-26	480	900	610	415	500	300
450	222	615	565	532	26 x 4	20-26	520	995	675	420	500	300
500	229	670	620	585	28 x 4	20-26	580	1020	715	424	500	300

■ KS flange standard

(unit: mm)

DN (ϕd)	L	KS D 3578-F12 flange					B	B1	B2	B3	K	H
		ϕD	ϕC	ϕG	T x f	n- ϕh						
300	178	445	400	367	27 x 4	12-23	400	850	525	399	420	265
350	190	505	460	427	28 x 4	16-23	400	875	555	405	420	265
400	216	565	515	477	29 x 4	16-28	480	900	610	415	500	300
450	222	615	565	527	30 x 4	20-28	520	995	675	420	500	300
500	229	670	620	582	31 x 4	20-28	580	1020	715	424	500	300

2.4.2 Dimension: DN600~DN2000



■ DIN flange standard

(unit: mm)

DN (ϕd)	L	DIN PN10 flange					B	B1	B2	Foot					H	K
		ϕD	ϕC	ϕG	T x f	n- ϕh				A1	A2	A3	A4	n- ϕd		
600	267	780	725	685	28x5	20-30	620	1140	790	700	600	180	260	4-23	450	580
700	292	895	840	800	30x5	24-30	700	1225	875	800	700	200	280	4-23	500	580
800	318	1015	950	905	32x5	24-33	760	1280	935	900	800	230	310	4-23	550	620
900	330	1115	1050	1005	34x5	28-33	820	1485	1135	1000	900	240	320	4-27	600	620
1000	410	1230	1160	1110	34x5	28-36	900	1545	1195	1100	1000	250	350	4-27	700	650
1200	470	1455	1380	1330	36x5	32-39	1050	1730	1425	1300	1200	270	370	4-27	750	650
1400	530	1675	1590	1535	42x5	36-42	1200	1935	1530	1500	1400	290	380	4-33	850	780
1600	530	1915	1820	1760	46x5	40-48	1325	2035	1680	1700	1600	300	400	4-33	1050	780
1800	550	2115	2020	1960	50x5	44-48	1450	2300	1925	1900	1800	300	400	4-33	1075	950
2000	550	2325	2230	2170	54x5	46-48	1550	2400	2025	2100	2000	300	400	4-42	1175	950

■ KS flange standard

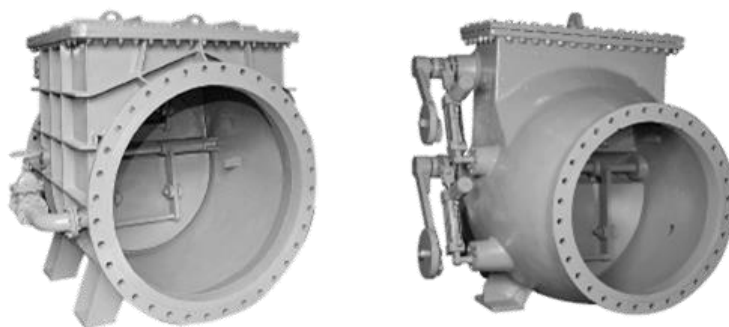
(unit: mm)

DN (ϕd)	L	KS D 3578-F12 flange					B	B1	B2	Foot					H	K
		ϕD	ϕC	ϕG	T x f	n- ϕh				A1	A2	A3	A4	n- ϕd		
600	267	810	725	682	30x3	20-30	620	1140	790	700	600	180	260	4-23	450	580
700	292	928	840	797	32x3	24-30	700	1225	875	800	700	200	280	4-23	500	580
800	318	1034	950	904	34x3	24-33	760	1280	935	900	800	230	310	4-23	550	620
900	330	1156	1050	1004	36x3	28-33	820	1485	1135	1000	900	240	320	4-27	600	620
1000	410	1262	1160	1111	38x3	28-36	900	1545	1195	1100	1000	250	350	4-27	650	650
1100	450	1366	1270	1200	41x3	32-36	970	1730	1380	1200	1100	260	360	4-27	700	650
1200	470	1470	1387	1304	43x3	32-36	1050	1775	1425	1300	1200	270	370	4-27	750	650
1350	530	1642	1552	1462	45x3	36-40	1170	1910	1530	1450	1350	280	380	4-33	825	780
1500	530	1800	1710	1620	48x3	36-40	1270	2010	1630	1600	1500	300	400	4-33	900	780
1650	530	1950	1870	1770	53x3	40-40	1350	2060	1680	1750	1650	300	400	4-33	1050	780
1800	550	2115	2020	1960	55x3	44-49	1450	2300	1450	1900	1800	300	400	4-33	1075	950
2000	550	2325	2230	2170	58x4	48-49	1550	2400	1550	2100	2000	300	400	4-42	1175	950

2.5 Check valve.

A standard Check Valve actuated by counter flow. The valve can be used with by-pass valve or counterweight. On request, dashpot check valve equipped with a dashpot to preclude sudden closure in the event of counter flow.

The check valves are not part of the Grundfos Standard accessory line.



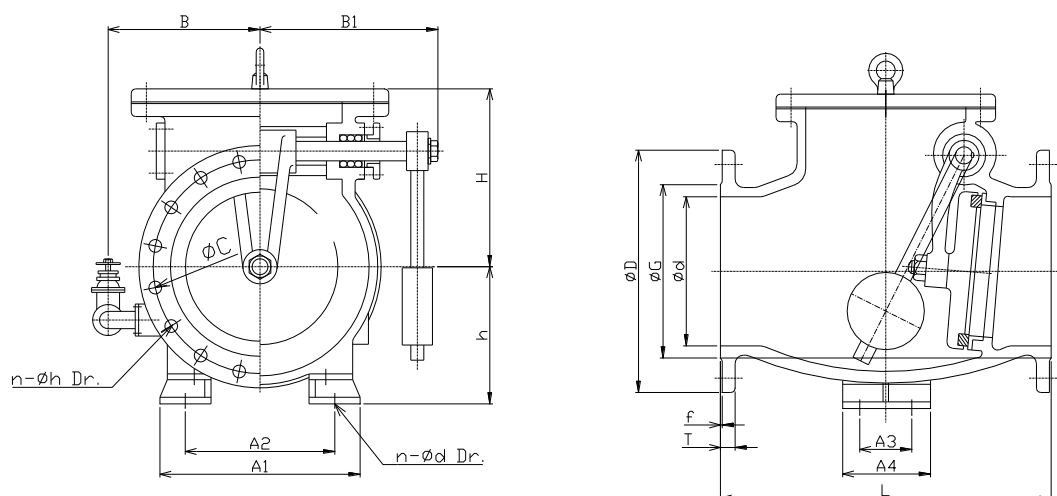
Specification

Size	300mm ~ 900mm
Working pressure	Max. 7.5kgf/cm ²
Flange rating	DIN 2632 PN10, KS D 3578-F12 ※ Other standards are available on request
Fluid	Pumped media
Main material	Body : Cast iron(GC200), Steel casting(SC 450), Ductile cast iron(GCD 450) Disk : Cast iron(GC200), Steel casting(SC 450), Ductile cast iron(GCD 450) Stem : Stainless steel (STS 304, STS 403) Seat : Bronze casting(CAC 406), Stainless steel(STS 304) ※ Other standards are available on request

Note: The selection of check valve is local responsibility, and all technical information has to be reviewed to ensure it is in accordance with local regulations and guidelines.

The table below shows the check valve dimensions.

2.5.1 Check valve (Direct shutter)



■ DIN flange standard

(unit: mm)

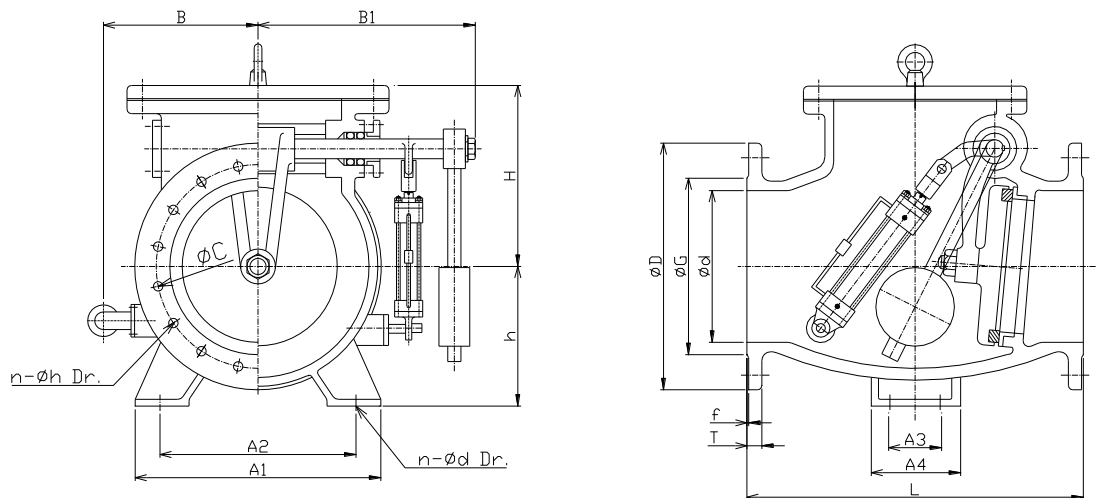
DN (ød)	L	DIN PN10 flange					Height		Cover		Foot				
		øD	øC	øG	T x f	n-øh	h	H	B	B1	A1	A2	A3	A4	n-ød
300	710	445	400	370	26 x 4	12-22	250	380	360	370	500	400	100	155	4-19
350	710	505	460	430	26 x 4	16-22	280	400	380	450	524	425	100	155	4-19
400	820	565	515	482	26 x 4	16-26	360	480	425	475	550	450	150	200	4-23
450	920	615	565	532	26 x 4	20-26	380	480	445	500	600	500	150	200	4-23
500	970	670	620	585	28 x 4	20-26	450	645	475	550	650	550	150	200	4-23

■ KS flange standard

(unit: mm)

DN (ød)	L	KS D 3578-F12 flange					Height		Cover		Foot				
		øD	øC	øG	T x f	n-øh	h	H	B	B1	A1	A2	A3	A4	n-ød
300	710	464	400	367	24 x 3	12-23	250	380	360	370	500	400	100	155	4-19
350	710	530	460	427	26 x 3	16-23	280	400	380	450	524	425	100	155	4-19
400	820	582	515	477	26 x 3	16-27	360	480	425	475	550	450	150	200	4-23
450	920	652	565	518	28 x 3	20-27	380	480	445	500	600	500	150	200	4-23
500	970	706	620	582	28 x 3	20-27	450	645	475	550	650	550	150	200	4-23

2.5.2 Check valve (Slow shutter, DN300~DN500)



■ DIN flange standard

(unit: mm)

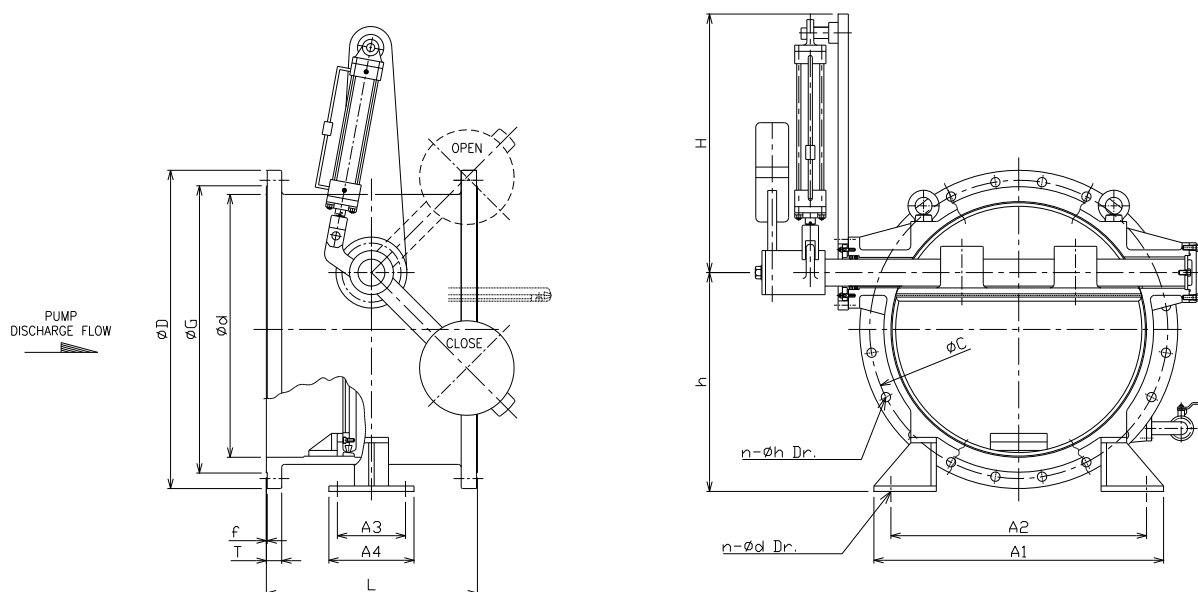
DN (ød)	L	DIN PN10 flange					Height		Cover		Foot				
		øD	øC	øG	T x f	n-øh	h	H	B	B1	A1	A2	A3	A4	n-ød
300	710	445	400	370	26 x 4	12-22	250	380	360	420	500	400	100	155	4-19
350	710	505	460	430	26 x 4	16-22	280	400	380	440	524	425	100	155	4-19
400	820	565	515	482	26 x 4	16-26	360	480	425	485	550	450	150	200	4-23
450	920	615	565	532	26 x 4	20-26	380	480	445	505	600	500	150	200	4-23
500	970	670	620	585	28 x 4	20-26	450	645	475	535	650	550	150	200	4-23

■ KS flange standard

(unit: mm)

DN (ød)	L	KS D 3578-F12 flange					Height		Cover		Foot				
		øD	øC	øG	T x f	n-øh	h	H	B	B1	A1	A2	A3	A4	n-ød
300	710	464	400	367	24 x 3	12-23	250	380	360	420	500	400	100	155	4-19
350	710	530	460	427	26 x 3	16-23	280	400	380	440	524	425	100	155	4-19
400	820	582	515	477	26 x 3	16-27	360	480	425	485	550	450	150	200	4-23
450	920	652	565	518	28 x 3	20-27	380	480	445	505	600	500	150	200	4-23
500	970	706	620	582	28 x 3	20-27	450	645	475	535	650	550	150	200	4-23

2.5.3 Check valve (Slow shutter, DN600~DN900)



■ DIN flange standard

(unit: mm)

DN (ød)	L	DIN PN10 flange					Height		Foot				
		øD	øC	øG	T x f	n-øh	h	H	A1	A2	A3	A4	n-ød
600	1180	780	725	685	28x5	20-30	450	850	700	600	180	260	4-23
700	1200	895	840	800	30x5	24-30	500	850	800	700	200	280	4-23
800	1270	1015	950	905	32x5	24-33	550	950	900	800	230	310	4-23
900	1600	1115	1050	1005	34x5	28-33	600	950	1000	900	240	320	4-27

■ KS flange standard

(unit: mm)

DN (ød)	L	KS D 3578-F12 flange					Height		Foot				
		øD	øC	øG	T x f	n-øh	h	H	A1	A2	A3	A4	n-ød
600	1180	810	725	682	30x3	20-30	450	850	700	600	180	260	4-23
700	1200	928	840	797	32x3	24-30	500	850	800	700	200	280	4-23
800	1270	1034	950	904	34x3	24-33	550	950	900	800	230	310	4-23
900	1600	1156	1050	1004	36x3	28-33	600	950	1000	900	240	320	4-27

2.6 Flap valve

Flap valves are installed mainly at the end of pipe outlets in water purification plant and drainage pump system. The valves are closed automatically by the weight of disks. They are designed to stop back flow more efficiently, the higher the back flow pressure.

In the pump system, the flap valves are normally closed to protect against any foreign substances or animals. They open automatically according to the pressure of flow discharged by the pumps.

The flap valves are not part of the Grundfos Standard accessory line.



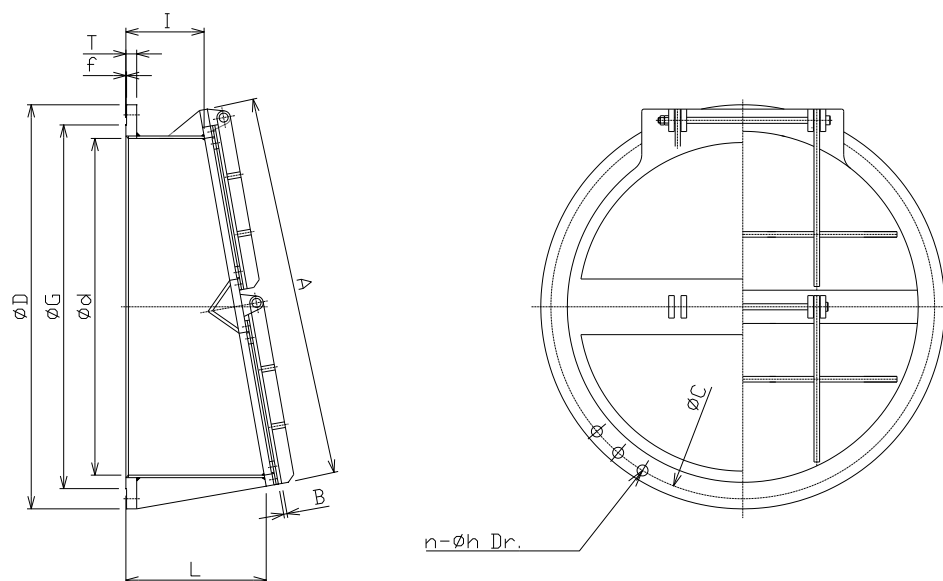
Specification

Size	300mm ~ 2,000mm
Working pressure	Max. 10kgf/cm ²
Flange rating	DIN 2632 PN10, KS D 3578-F12 ※ Other standards are available on request
Fluid	Pumped media
Main material	Body : Steel plate(SS 400), Stainless steel(STS 304) Disk : Steel plate(SS 400), Stainless steel(STS 304) Pin : Stainless steel(STS 304, STS 403) Seat : Rubber ※ Other standards are available on request

Note: The selection of flap valve is local responsibility, and all technical information has to be reviewed to ensure it is in accordance with local regulations and guidelines.

The table below shows the flap valve dimensions.

2.6.1 DIN Flange Standard

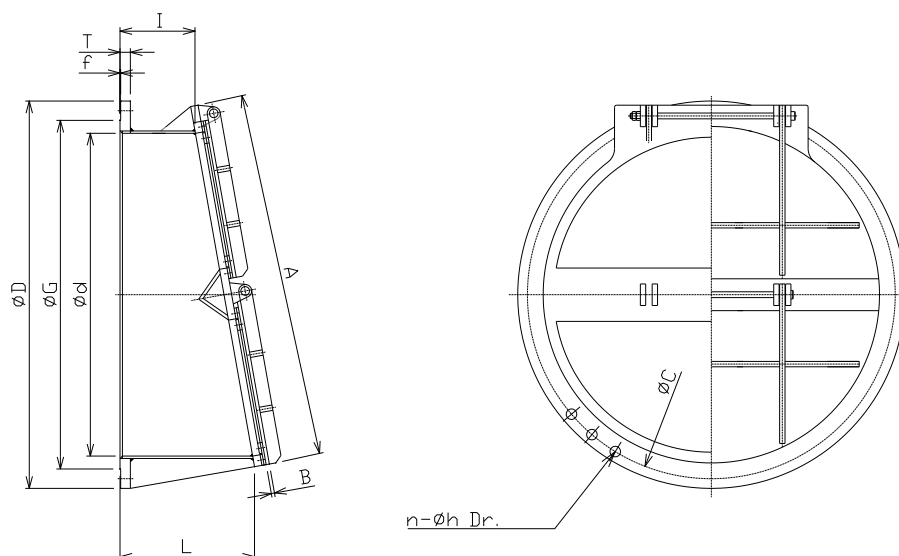


■ DIN flange standard

(unit: mm)

DN (φd)	DIN PN10 flange					Body			Disk		Remark
	φD	φC	φG	T x f	n-φh	L	I	t	A	B	
300	445	400	370	26 x 4	12-22	235	180	6.9	340	6	1 door
350	505	460	430	26 x 4	16-22	265	200	7.9	400	6	
400	565	515	482	26 x 4	16-26	280	210	5	450	6	
450	615	565	532	26 x 4	20-26	300	220	5	500	6	
500	670	620	585	28 x 4	20-26	320	230	5	560	9	
600	780	725	685	28x5	20-30	360	250	5	660	9	
700	895	840	800	30x5	24-30	400	270	5	770	9	
800	1015	950	905	32x5	24-33	425	280	6	880	9	
900	1115	1050	1005	34x5	28-33	450	290	6	980	9	
1000	1230	1160	1110	34x5	28-36	480	300	7	1090	12	2 door
1200	1455	1380	1330	36x5	32-39	525	310	9	1300	12	
1400	1675	1590	1535	42x5	36-42	565	325	12	1450	12	
1600	1915	1820	1760	46x5	40-48	655	360	15	1780	15	4 door
1800	2115	2020	1960	50x5	44-48	700	380	16	1950	15	
2000	2325	2230	2170	54x5	46-48	760	400	18	2150	15	

2.6.2 KS Flange Standard



■ KS flange standard

(unit: mm)

DN (φd)	KS D 3578-F12 flange					Body			Disk		Remark
	φD	φC	φG	T x f	n-φh	L	I	t	A	B	
300	464	400	367	24 x 3	12-23	235	180	6.9	340	6	1 door
350	530	460	427	26 x 3	16-23	265	200	7.9	400	6	
400	582	515	477	26 x 3	16-27	280	210	5	450	6	
450	652	565	518	28 x 3	20-27	300	220	5	500	6	
500	706	620	582	28 x 3	20-27	320	230	5	560	9	
600	810	725	682	30x3	20-30	360	250	5	660	9	
700	928	840	797	32x3	24-30	400	270	5	770	9	
800	1034	950	904	34x3	24-33	425	280	6	880	9	
900	1156	1050	1004	36x3	28-33	450	290	6	980	9	
1000	1262	1160	1111	38x3	28-36	480	300	7	1090	12	2 door
1100	1366	1270	1200	41x3	32-36	500	305	8	1200	12	
1200	1470	1387	1304	43x3	32-36	525	310	9	1300	12	
1350	1642	1552	1462	45x3	36-40	565	325	10	1450	12	
1500	1800	1710	1620	48x3	36-40	610	340	11	1620	15	
1650	1950	1870	1770	53x3	40-40	655	360	15	1780	15	4 door
1800	2115	2020	1960	55x3	44-49	700	380	16	1950	15	
2000	2325	2230	2170	58x4	48-49	760	400	18	2150	15	

2.7 Expansion joint

Expansion joints are normally installed with the valves, absorbing expansion and contraction of pipes, correcting or offsetting up/down transition or eccentricity of pipes caused due to subsidence, and protecting valve and pipe facilities.

Expansion joints are also designed for other criteria, such as noise absorption, anti-vibration, earthquake movement, and building settlement.

Pipe expansion joints are also known as compensators, as they 'compensate' for the thermal movement.

The expansion joints are not part of the Grundfos Standard accessory line.



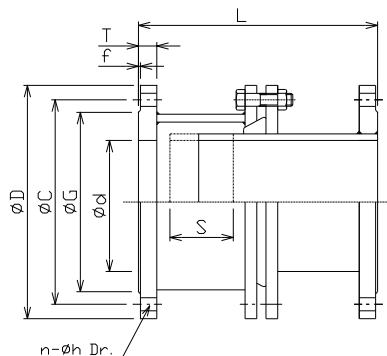
Specification

Size	300mm ~ 2,000mm
Working pressure	Sleeve type: Max. 10kgf/cm ² Free type: Max. 10kgf/cm ²
Flange rating	DIN 2632 PN10, KS D 3578-F12 ※ Other standards are available on request
Fluid	Pumped media
Main material	Sleeve type - Body and Flange : Steel plate(SS 400), Stainless steel(STS 304), Stainless steel(STS 316L), - Pipe : Steel plate(SS 400), Stainless steel(STS 304), Stainless steel(STS 316L), - Gasket : Rubber - Bolt & Nut : Stainless steel(STS 304) Free type - Body and Flange : Stainless steel(STS 304), Stainless steel(STS 316L) - Bellows : Stainless steel(STS 304), Stainless steel(STS 316L) - Bolt & Nut : Stainless steel(STS 304), Stainless steel(STS 316L) ※ Other standards are available on request

Note: The selection of expansion joint is local responsibility, and all technical information has to be reviewed to ensure it is in accordance with local regulations and guidelines.

The table below shows the expansion joint dimensions.

2.7.1 Sleeve type expansion joint

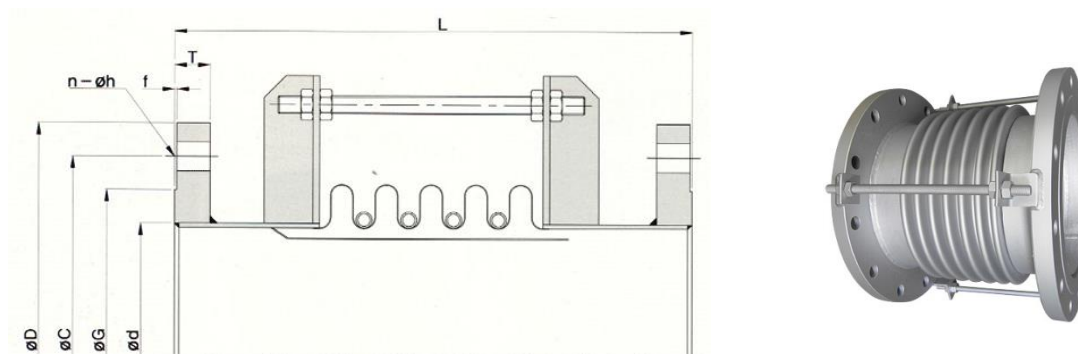


■ Dimensions

(unit: mm)

DN (ød)	DIN PN10 flange					KS D 3578-F12 flange					Face to face L	Stroke S
	øD	øC	øG	T x f	n- øh	øD	øC	øG	T x f	n- øh		
300	445	400	370	26 x 4	12-22	464	400	367	24 x 3	12-23	480	150
350	505	460	430	26 x 4	16-22	530	460	427	26 x 3	16-23	490	150
400	565	515	482	26 x 4	16-26	582	515	477	26 x 3	16-27	530	175
450	615	565	532	26 x 4	20-26	652	565	518	28 x 3	20-27	540	175
500	670	620	585	28 x 4	20-26	706	620	582	28 x 3	20-27	580	200
600	780	725	685	28x5	20-30	810	725	682	30x3	20-30	610	200
700	895	840	800	30x5	24-30	928	840	797	32x3	24-30	665	225
800	1015	950	905	32x5	24-33	1034	950	904	34x3	24-33	670	225
900	1115	1050	1005	34x5	28-33	1156	1050	1004	36x3	28-33	710	250
1000	1230	1160	1110	34x5	28-36	1262	1160	1111	38x3	28-36	730	250
1100	-	-	-	-	-	1366	1270	1200	41x3	32-36	770	275
1200	1455	1380	1330	36x5	32-39	1470	1387	1304	43x3	32-36	775	275
1350	-	-	-	-	-	1642	1552	1462	45x3	36-40	805	275
1400	1675	1590	1535	42x5	36-42	-	-	-	-	-	805	275
1500	-	-	-	-	-	1800	1710	1620	48x3	36-40	810	275
1600	1915	1820	1760	46x5	40-48	-	-	-	-	-	860	300
1650	-	-	-	-	-	1950	1870	1770	53x3	40-40	860	300
1800	2115	2020	1960	50x5	44-48	2115	2020	1960	55x3	44-49	960	350
2000	2325	2230	2170	54x5	46-48	2325	2230	2170	58x4	48-49	975	350

2.7.2 Free type expansion joint



■ Dimensions

(unit: mm)

DN (φd)	DIN PN10 flange					KS D 3578-F12 flange					Face to face
	φD	φC	φG	T x f	n- φh	φD	φC	φG	T x f	n- φh	L
300	445	400	370	26 x 4	12-22	464	400	367	24 x 3	12-23	500
350	505	460	430	26 x 4	16-22	530	460	427	26 x 3	16-23	500
400	565	515	482	26 x 4	16-26	582	515	477	26 x 3	16-27	500
450	615	565	532	26 x 4	20-26	652	565	518	28 x 3	20-27	500
500	670	620	585	28 x 4	20-26	706	620	582	28 x 3	20-27	500
600	780	725	685	28x5	20-30	810	725	682	30x3	20-30	500
700	895	840	800	30x5	24-30	928	840	797	32x3	24-30	500
800	1015	950	905	32x5	24-33	1034	950	904	34x3	24-33	500
900	1115	1050	1005	34x5	28-33	1156	1050	1004	36x3	28-33	500
1000	1230	1160	1110	34x5	28-36	1262	1160	1111	38x3	28-36	500
1100	-	-	-	-	-	1366	1270	1200	41x3	32-36	600
1200	1455	1380	1330	36x5	32-39	1470	1387	1304	43x3	32-36	600
1350	-	-	-	-	-	1642	1552	1462	45x3	36-40	600
1400	1675	1590	1535	42x5	36-42	-	-	-	-	-	600
1500	-	-	-	-	-	1800	1710	1620	48x3	36-40	600
1600	1915	1820	1760	46x5	40-48	-	-	-	-	-	700
1650	-	-	-	-	-	1950	1870	1770	53x3	40-40	700
1800	2115	2020	1960	50x5	44-48	2115	2020	1960	55x3	44-49	700
2000	2325	2230	2170	54x5	46-48	2325	2230	2170	58x4	48-49	700

2.8 Air release valve

Air release valves are suitable for clean or raw water service. Air release valves shall be automatic float operated valves designed to release accumulated air from a piping system while the system is in operation and under pressure. The capacity and pressure rating of the valve is dependent on the diameter of the precision orifice in the cover. A large inlet connection is required for proper air and water exchange.

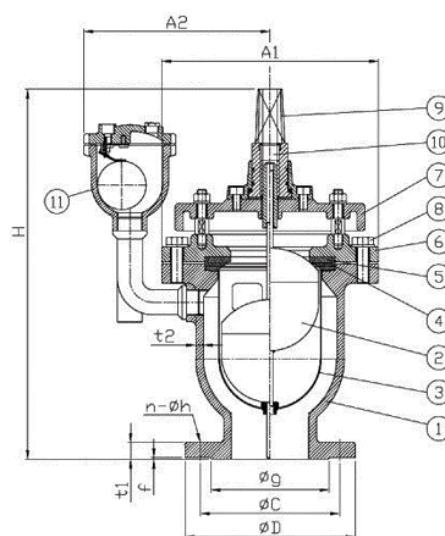
The adjustable cap on top provides a non-clogging function and easy maintenance.

Air release valve is available for KWM models having over 1kg/cm² pressure. In case of lower pressure condition, please contact your local Grundfos Company. **The air release valves are not part of the Grundfos Standard accessory line.**



Materials

No.	Name	Material
1	Body	Ductile cast iron(GCD 450)
2	Float valve	Stainless (STS 304, STS 316)
3	Guide	Stainless (STS 304)
4	Valve seats bay	Bronze casting(CAC 406),
5	Valve seat	EPDM rubber
6	Covering	Ductile cast iron(GCD 450)
7	Cover	Ductile cast iron(GCD 450)
8	Bolt & Nut	Stainless (STS 304)
9	Cap	Ductile cast iron(GCD 450)
10	Stem	Stainless (STS 410)
11	Release valve	25A



Dimensions

Nominal diameter [DN]	Flange						Bolt	t2	A1	A2	H (Max)
	D	C	g	t1	f	n-h					
80	340	264	295	22	2	4-19	M16	10	220	210	120
100	395	319	350	22	2	8-19	M16	10	245	223	120
150	445	367	400	22	2	8-23	M20	12	325	263	150
200	505	427	460	22	2	8-23	M20	14	420	310	150

Note: The selection of air release valve is local responsibility, and all technical information has to be reviewed to ensure it is in accordance with local regulation and guidelines.

Note

[illegible]

