FLAP VALVES

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

AN INTRODUCTION TO FLAP VALVES

INTRODUCTION

Good flap valves work in the background without being noticed. Only at times of high water or flooding do people realise the importance of such non-return valves. On these critical occasions you must be able to rely on the flap valves you have installed.

Basically, flap valves allow for the removal of excess water and prevent back flow.

This function has to be performed over long periods. At the same time the valves must not be sensitive to rust, corrosion or clogging.

TRADITIONAL DESIGN

Traditional metal flap valves suffer from a number of problems.

They are made of cast iron, which is heavy. This results in high head losses and all manner of rubbish can accumulate behind the door before it opens to discharge the water build-up. This can result in complete blockage of the valve. Thus regular checking, maintenance and cleaning is essential.

Methods of reducing the high opening pressures required for metal valves are hollow doors filled with oil or counter weights added above the valve. This in turn makes the valve more complex to mount and takes up more space in the construction.

Corrosion is also a big problem, especially when the valves are exposed to seawater. Coatings are required to provide protection.

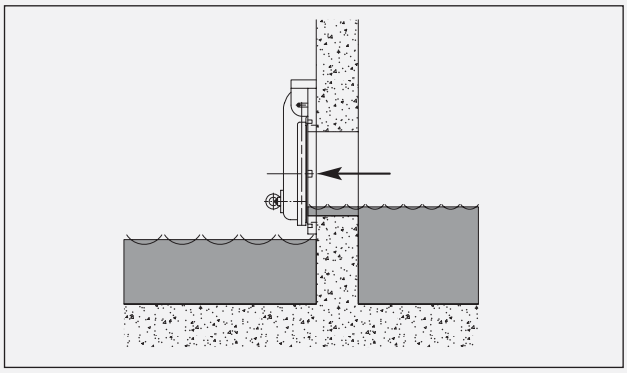
HDPE

Our HDPE flap valves provide the customer with much improved characteristics:

- no corrosion
- good chemical resistance against acids, salts and alkalis in aqueous solutions, many solvents, oils, etc
- high UV protection by addition of carbon to the material to stabilise for outside use
- use between -50°C and +70°C (constructive values)
- low density and lightweight
- a material as easy to machine as wood
- dimensional stability
- no rotting
- no material fatigue
- impact resistance
- high flexibility
- economic design and material

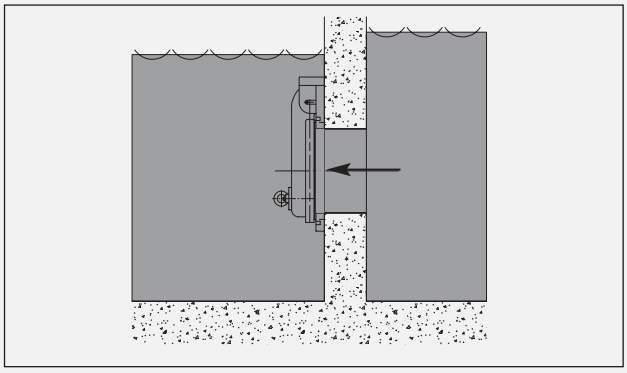
These characteristics result in the following customer benefits:

- long service life because the material does not corrode
- no coatings needed in aggressive environments
- very low opening pressures compared to metal flap valves
- low head losses



Flap valve above the water line

Our HDPE flap valves have opening pressures that are measured in mm instead of centimetres as normal.



Flap valve in submerged situation

HDPE has a lower density than water and floats. The specific weight is increased to approx. 1100 kg per m3 by the addition of ballast. This ensures that the flap valve will do its job under any circumstances, and at the same time ensures much lower head losses compared to traditional flap valves.

AN INTRODUCTION TO FLAP VALVES

When the valve is completely submerged, the differential opening pressure is not more than 10 mm water column!
- minimal maintenance. As the material remains smooth, it is much more difficult for dirt to stick to the surface.
- lightweight construction - easy to install and handle.
- HDPE is a solid material. Possible damage to the outside will not result in corrosion inside.
- flexibility in design. The unique CAD/CAM production system enables TBS SOEST bv to make special designs and provide tailor made solutions with short project lead times. Products can be adapted to a specific (opening) pressure or installation situation.

  More than 50 % of the products made are special tailor made designs.

TBS flap valves are made for both gravitational flow / free flow (PTK) and pumping stations (PWK) and from 150 mm up to 2000 mm diameter and even larger.

Selection considerations

We provide a checklist that takes numerous factors into account to help establish what exactly is required. There are different flap valves for various applications:
- permanently submerged or flood prevention / emergency
- gravitational flow or pressure pipes
- different mounting situations, such as wall mounting, flange, PVC and concrete tubes

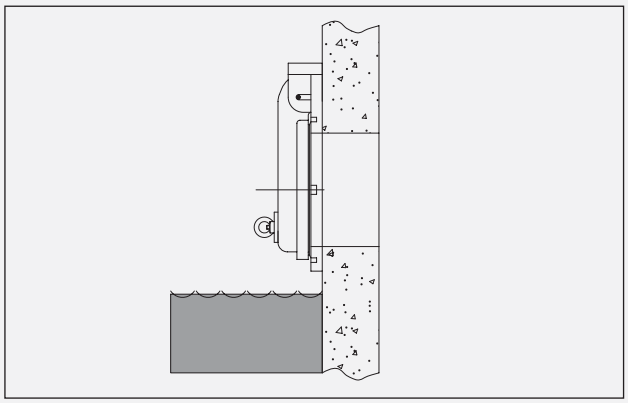
We can provide the best solution for every situation.

To determine which product is suitable for which situation the following have to be taken into consideration:

1) dimensions of the opening
2) application
3) type of flow: gravity or pressure pipe?
4) maximum water pressure on the front in metres water column? Is it permanent or temporary?
5) what is the installation situation?

Application

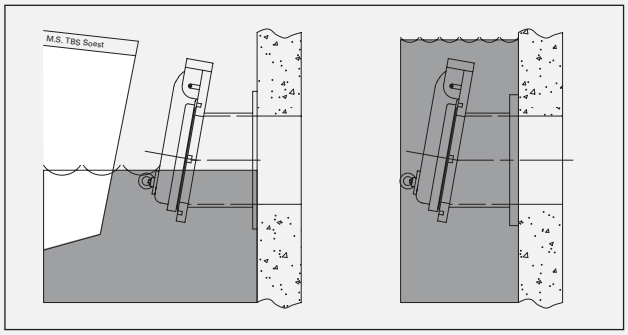
If the flap valve will only be used in emergency situations to protect against and prevent flooding during a specific period of extreme conditions, flap valve type PTK-G is advised.



Use of PTK-G above water level

The model PTK-G is normally installed above the water line. It prevents back flow only in times of sudden increases in water levels due to heavy rain and flooding.

Its compact dimensions also enable this flap valve to be installed in small concrete chambers where other, more traditional designs do not fit.



Application of PTK-A

When the flap valve will be exposed to waves / tidal movement or will be permanently submerged, a flap valve with an inclination of 10 degrees is advised: PTK-A or PWK-F.

This inclination will ensure watertight operation. The door is always pushed onto the seating.

AN INTRODUCTION TO FLAP VALVES

GRAVITATION VERSUS PRESSURE PIPE SITUATIONS

The flow situation is also important for determining the type of flap valve needed.

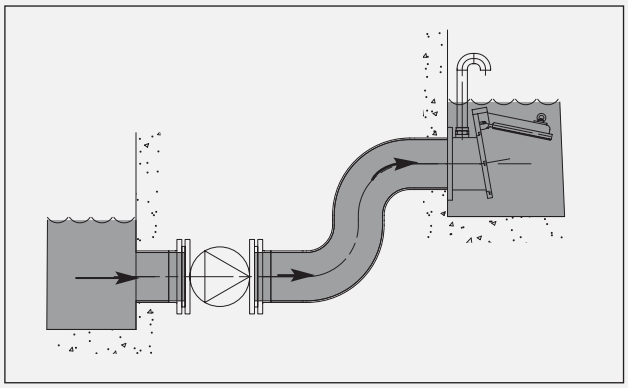
A flap valve of type PTK is used for free flow. Flow is achieved by gravity at low velocities.

When the flap valve is situated at the end of a pressure pipeline / pumping station, the flap valve type PTK cannot be used; you will require a flap valve type PWK.

Using a standard valve in this type of pumping situation will result in serious damage to the seal and hinges.

AIR VENT FUNCTION

When the flap valve operates in combination with a pump, the function of the air vent is not obvious during operation.



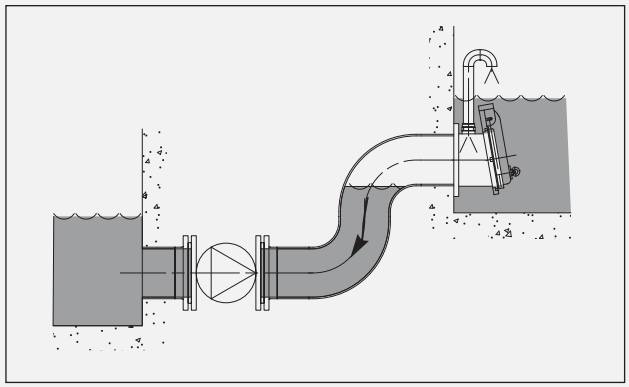
Pump in operation

It only becomes clear when the pump stops: then the air vent operates.

As the pump stops, the flow reverses and the flap valve must prevent this. In the very short time span between the pump stopping and the flap valve closing, the flow returning into the pipe can result in very high pressures. This is the result of a vacuum inside the pipe.

The vacuum will result in serious damage to the seal, hinge points and seating.

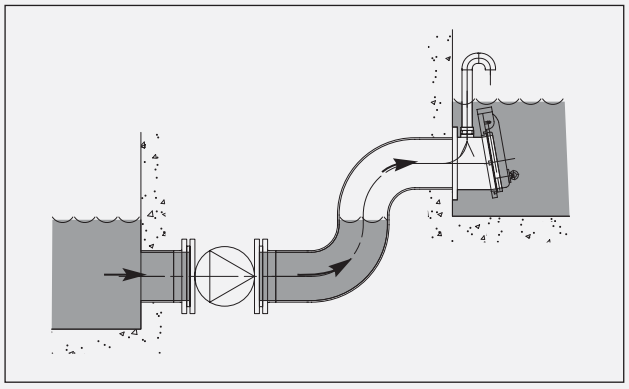
The aerator prevents vacuum formation by allowing air to enter via the air vent and thus preventing damage to the flap valve.



Pump stops

In this way the valve closes slowly and in a controlled manner.

When the pump starts up it compresses the air remaining in the pipe. The compressed air can leave the pipe through the air vent.



Pump starts to operate

The size of the aerator is approx. 10% to 15% of the flap valve passage.

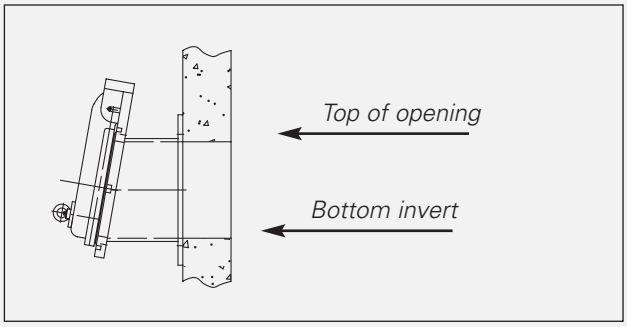
Small flap valves up to and including 400 mm diameter are equipped with a threaded opening measured in inches. With bigger diameters the air vent will be equipped with a flange.

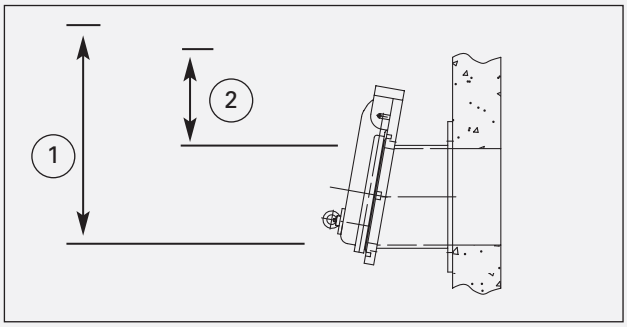
The customer must extend the aerator until it is above maximum water level.

MAXIMUM PRESSURE

The standard flap valves are designed to resist a permanent water pressure of 1 metre water column from the top of the opening and 5 metres water column from the bottom of the opening for only a short duration (up to 72 hours).

AN INTRODUCTION TO FLAP VALVES





The same pressure ratings apply to all TBS flap valves:

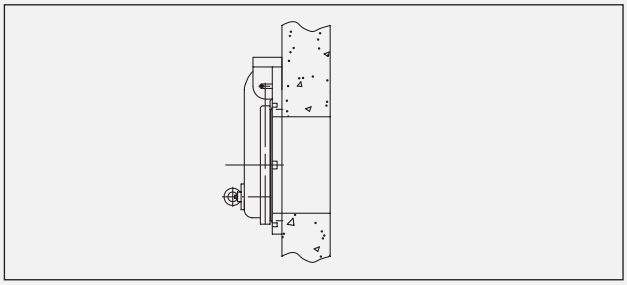
1. 5 metres water column from bottom of invert for short duration (up to 72 hours)
2. 1 metre water column from top of opening permanently.

If the pressure differs from the above situations - especially if it is higher -, it is always advisable to inform TBS. Then the flap valve can be adapted to the required pressure.

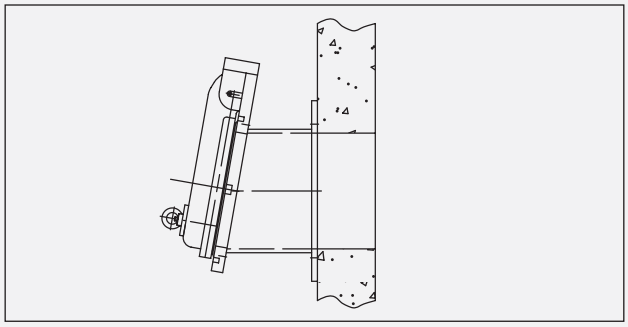
Installation situation

Wall mounting

As most outlets are designed in concrete structures, the most common method of installation is “wall mounting”. The flap valve type PTK–A (with angle of 10 degrees) or PTK-G (vertical) can be installed.



PTK-G wall mounting



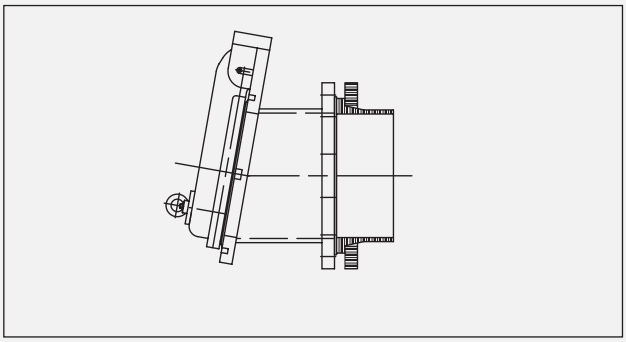
PTK-A wall mounting

A neoprene gasket is included in the delivery to ensure a watertight connection between the wall and the frame plate.

Flange

The flap valve can also be mounted on a counter flange. Our standard flange is in accordance with DIN EN 1092-2 standard PN10. Other flanges (BS, ASTM, DIN PN 16) can be supplied on request.

The connection F for flange will always be used for the PWK flap valve that requires a connection resistant to tensile stresses.



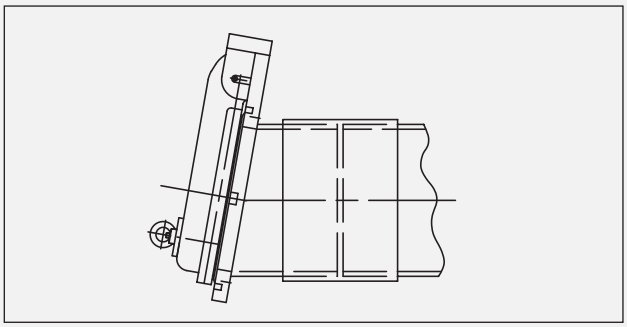
PTK-F with flange

Special flange packing and bolts are not supplied as standard.

PVC tube

The P model can be connected to a PVC / HDPE tube with a socket. As you can see in the table on page 21, the outside diameter of the connection is equal to the outside diameter of the PVC tube. So the flap valve with P connection can be easily mounted to a PVC tube with a socket.

AN INTRODUCTION TO FLAP VALVES

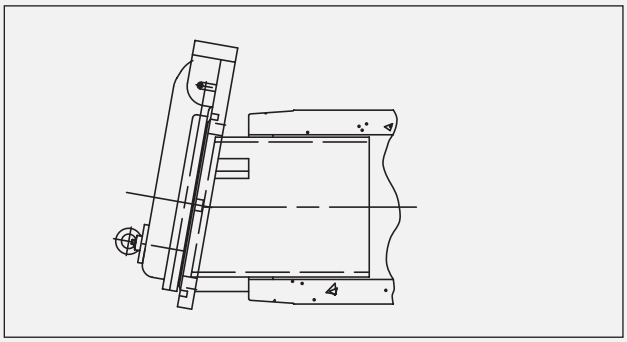


PTK-P for PVC tube

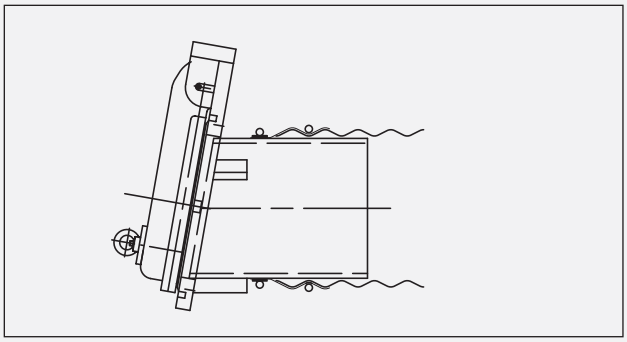
Other diameters/dimensions that are not mentioned in the table are available on request.

CONCRETE / STEEL TUBE

To connect the same flap valve to a concrete or steel tube, a socket is welded to the flap valve and this is inserted into the pipe.



PTK-BS for concrete tube



PTK-BS for steel tube

The flap valve is fixed in place using bolts.

A neoprene gasket is included in the delivery to ensure a watertight connection between the socket and the tube. The neoprene gasket is wrapped around the socket and pushed into the tube. This compresses the gasket and achieves a watertight connection.

Checking out all the above details will help you to ensure that you receive the correct product.

TBS SOEST bv

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TBS FLAP VALVES AROUND THE WORLD

Manjung Powerplant Ipoh Malaysia

Series of flap valves in Holland

YL 50 project Hong Kong

Production of flap valves for Tong Young Project Korea

Production of flap valves for Paju Pumping Station in Korea

PTK A with rounded frame plate in round concrete chamber in Sweden

DID project Malaysia

TBS SOEST bv
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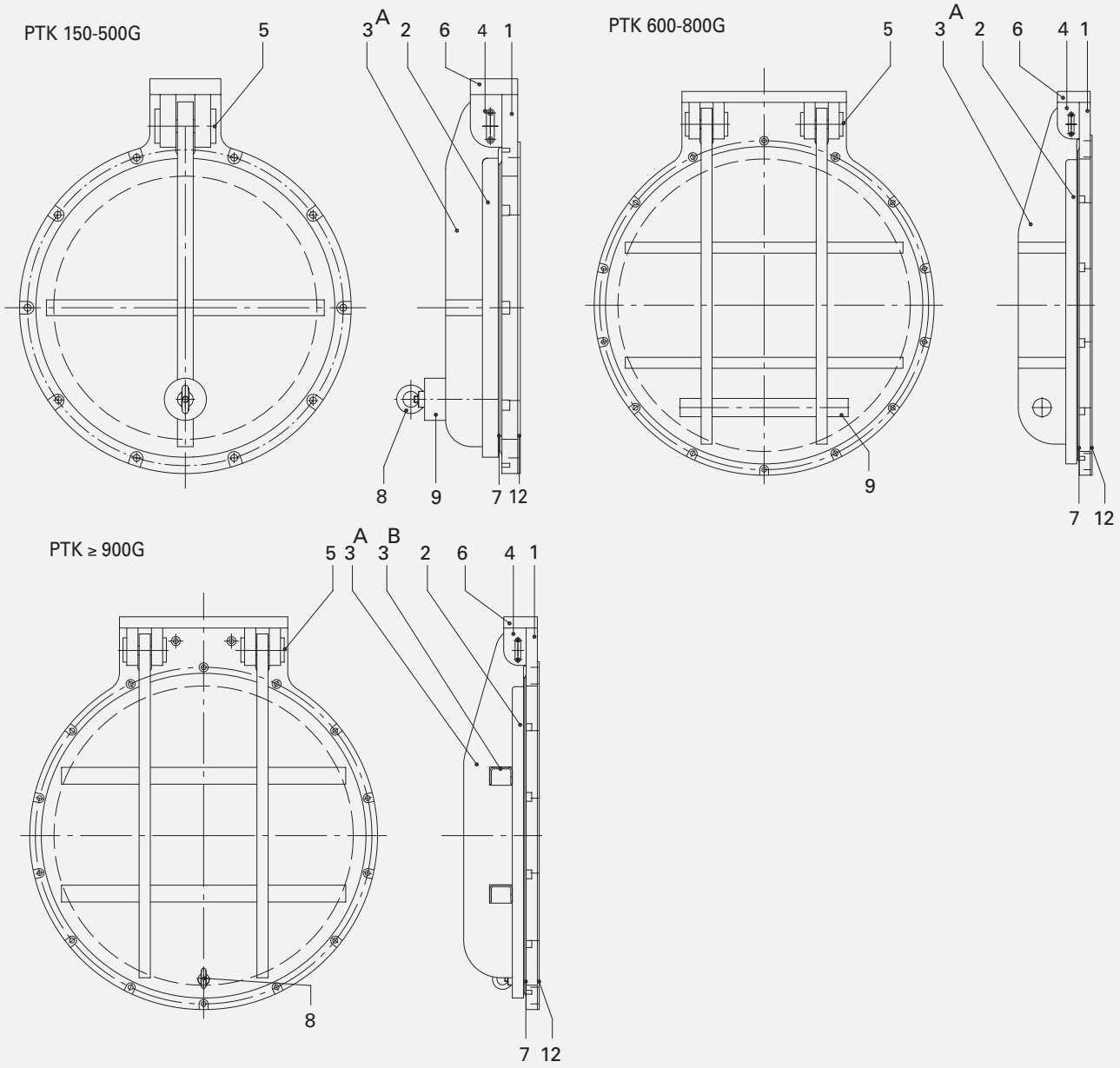
HDPE FLAP VALVE

PTK-G WITH PASSAGE ø 150 - 2000 MM

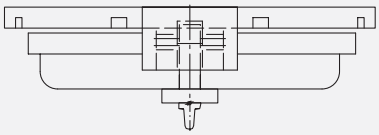


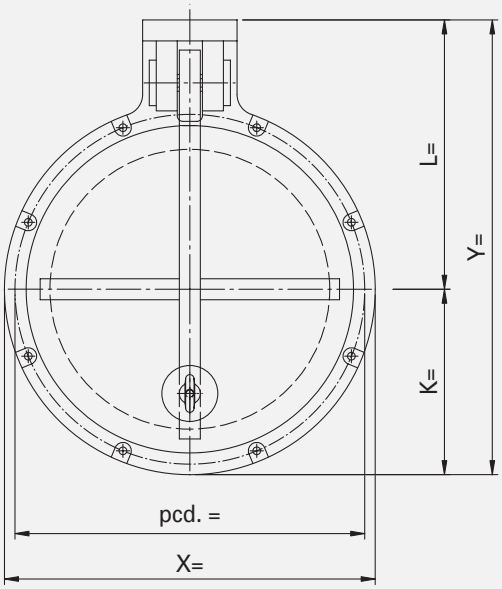
	Part	Material	Remarks
1	frame plate	HDPE	
2	valve door	HDPE	
3 A	reinforcement ribs	HDPE	PTK 150-2000G
3 B	reinforcement profile	Stainless steel AISI 316	PTK 900-2000G
4	hinge	HDPE	
5	hinge pin	Stainless steel AISI 316	
6	hinge cover	HDPE	
7	sealing	EPDM	
8	lifting eye	Stainless steel A4	
9	ballast	Stainless steel AISI 316	PTK 150-500G
		HDPE (filled with steel)	PTK 600-800G
10	--	--	--
11	--	--	--
12	sealing	Neoprene	

HDPE FLAP VALVE

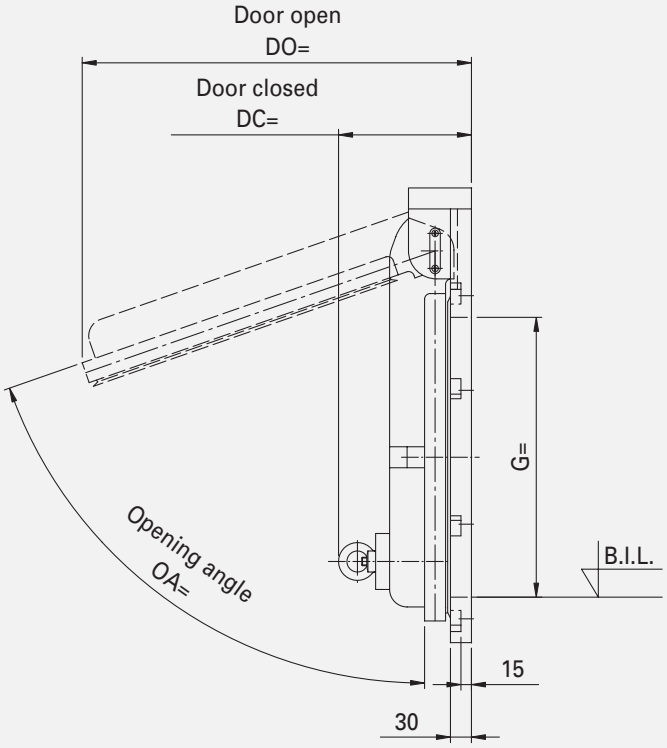
PTK-G WITH PASSAGE Ø 150 - 500 MM

top view





front view



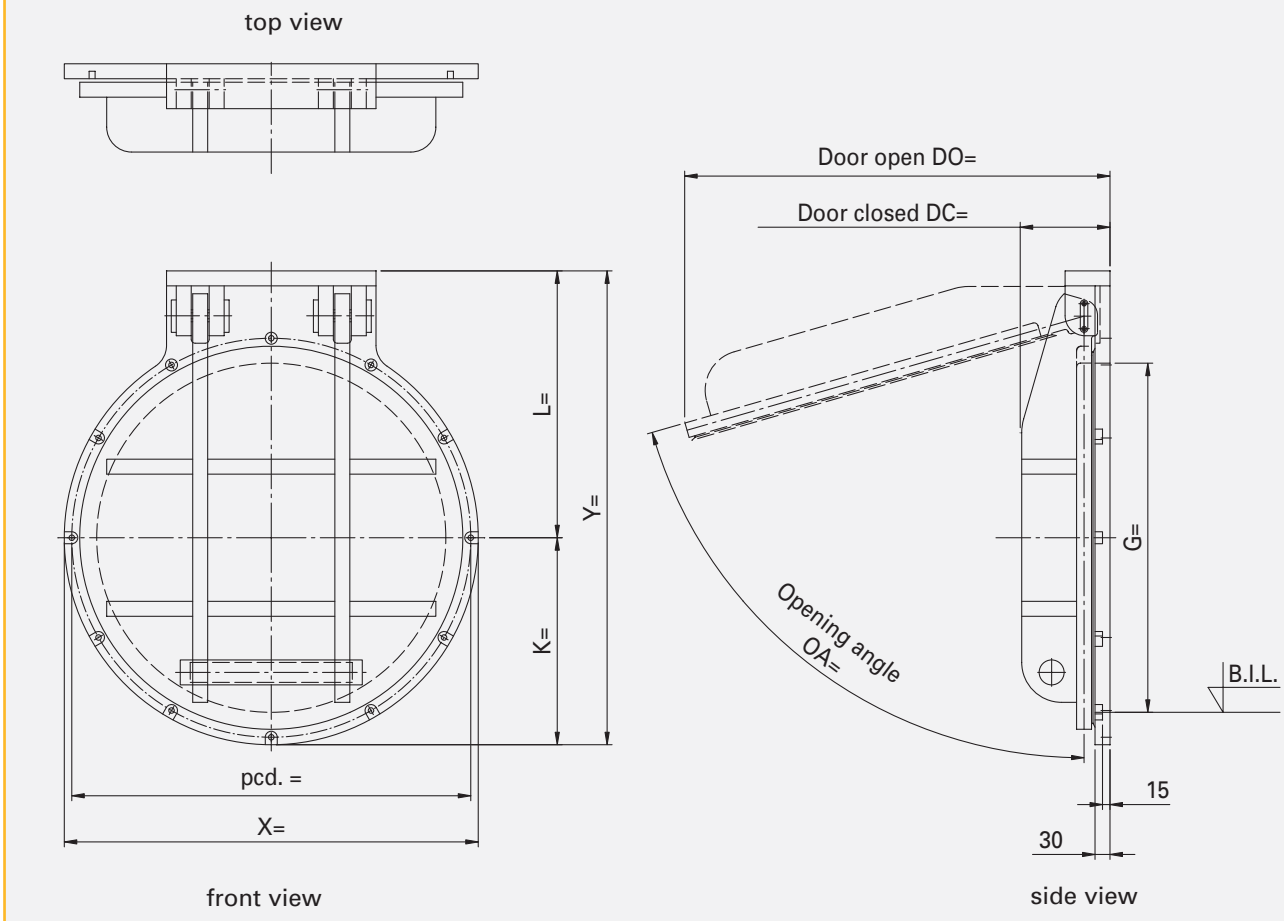
side view

Product	TBS HDPE Flap valve type PTK-G
Application	non-return flap valve suitable for emergency application / flood protection
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request
Installation instructions	see page 2.25

Diameter	Ø 150	Ø 200	Ø 250	Ø 300	Ø 400	Ø 500
X	280	330	380	430	530	630
pcd	250	300	350	400	500	600
K	140	165	190	215	265	315
L	260	285	310	335	385	435
Y	400	450	500	550	650	750
DO	316	362	408	457	556	655
DC	170	170	170	180	190	230
OA	63°	66°	67°	68°	71°	72°
number of chem anchors	6 xM8	6 xM8	6 xM8	6 xM8	8 xM8	10 xM8
weight in kg	4	6	7	8	13	18

HDPE FLAP VALVE

PTK-G WITH PASSAGE Ø 600 - 800 MM

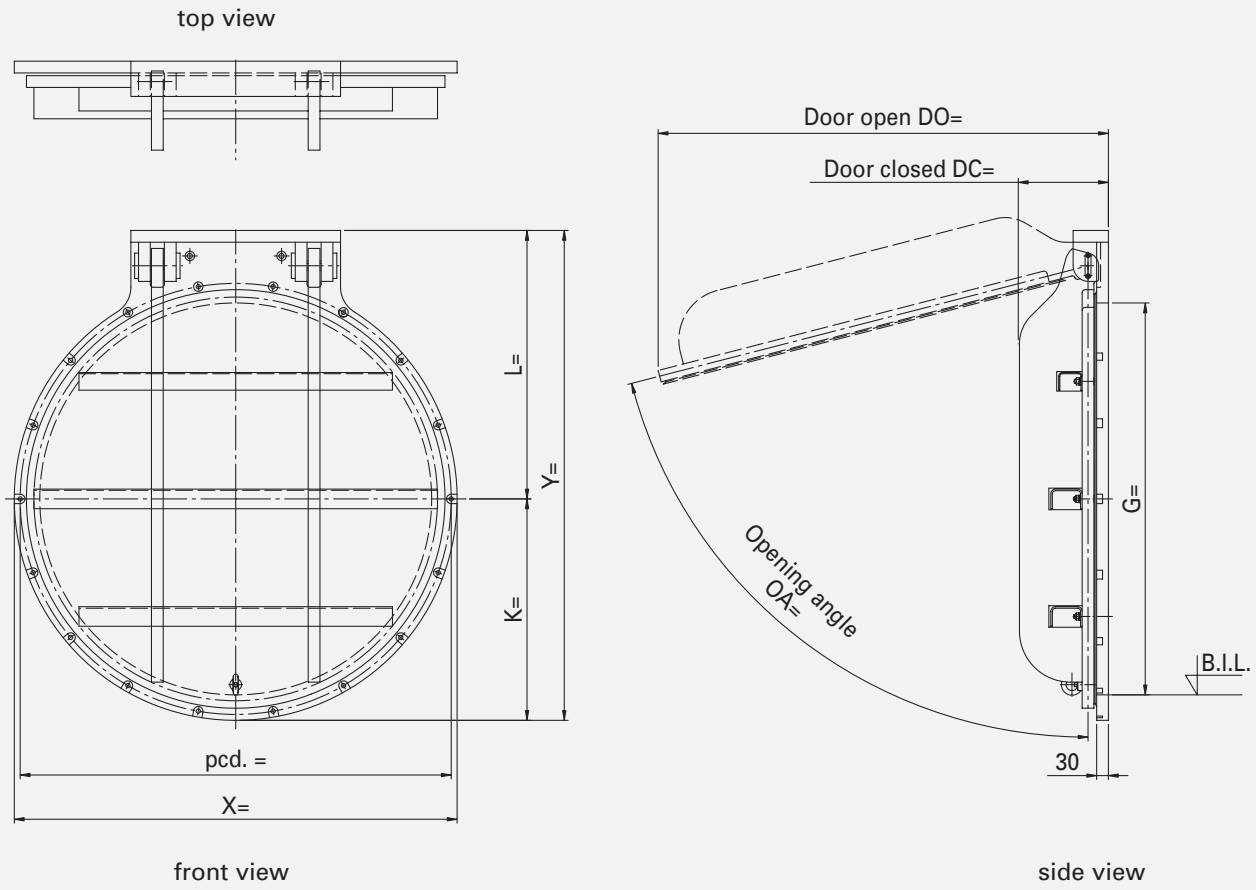


Product	TBS HDPE Flap valve type PTK-G
Application	non-return flap valve suitable for emergency application / flood protection
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request
Installation instructions	see page 2.25

Diameter	Ø 600	Ø 700	Ø 800
X	730	830	930
pcd	700	800	900
K	365	415	465
L	485	535	585
Y	850	950	1050
DO	754	853	951
DC	147	177	197
OA	73°	74°	75°
number of chem anchors	12 xM8	12 xM8	14 xM8
weight in kg	26	33	40

HDPE FLAP VALVE

PTK-G WITH PASSAGE Ø 900 - 2000 MM



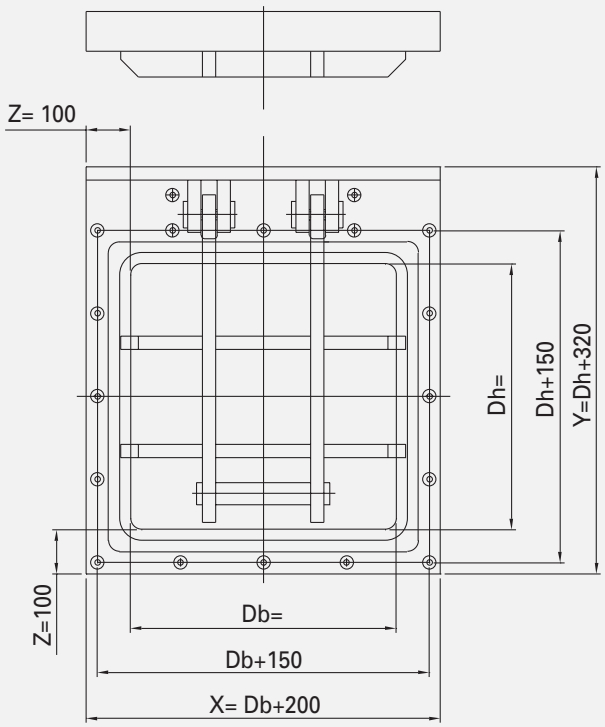
Product	TBS HDPE Flap valve type PTK-G
Application	non-return flap valve suitable for emergency application / flood protection
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request bigger dimensions upon request
Installation instructions	see page 2.25

Diameter	Ø 900	Ø 1000	Ø 1200	Ø 1500	Ø 1600	Ø 1800	Ø 2000
X	1030	1130	1400	1700	1800	2000	2200
pcd	1000	1100	1350	1650	1750	1950	2150
K	515	565	700	850	900	1000	1100
L	635	685	825	975	1025	1125	1225
Y	1150	1250	1525	1825	1925	2125	2325
DO	1050	1149	1413	1703	1784	1977	2180
DC	227	227	227	247	247	307	307
OA	75°	76°	76°	76°	76°	76°	76°
number of chem anchors	18 xM8	20 xM8	24 xM8	28 xM10	28 xM10	32 xM10	36 xM10
weight in kg	51	58	73	128	155	225	275

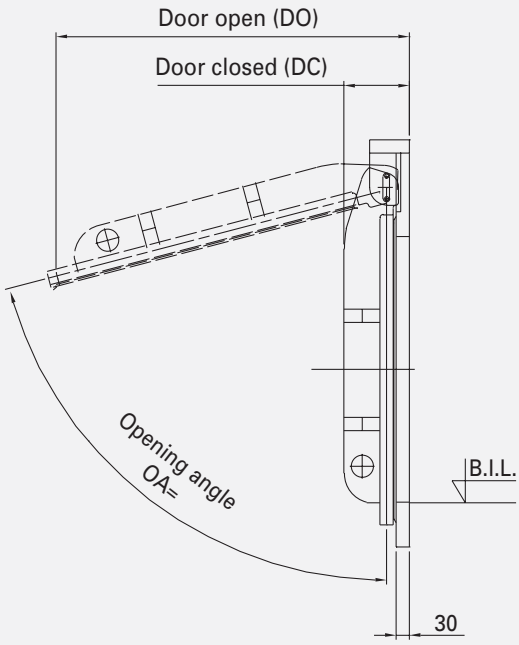
HDPE FLAP VALVE

PTK-G WITH RECTANGULAR PASSAGE DB X DH

top view



front view



side view

Product	TBS HDPE Flap valve type PTK-G with rectangular / square opening
Application	non-return flap valve suitable for emergency application / flood protection
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request depending upon seize door may be reinforced with stainless steel profiles
Installation instructions	see page 2.25

TBS SOEST bv
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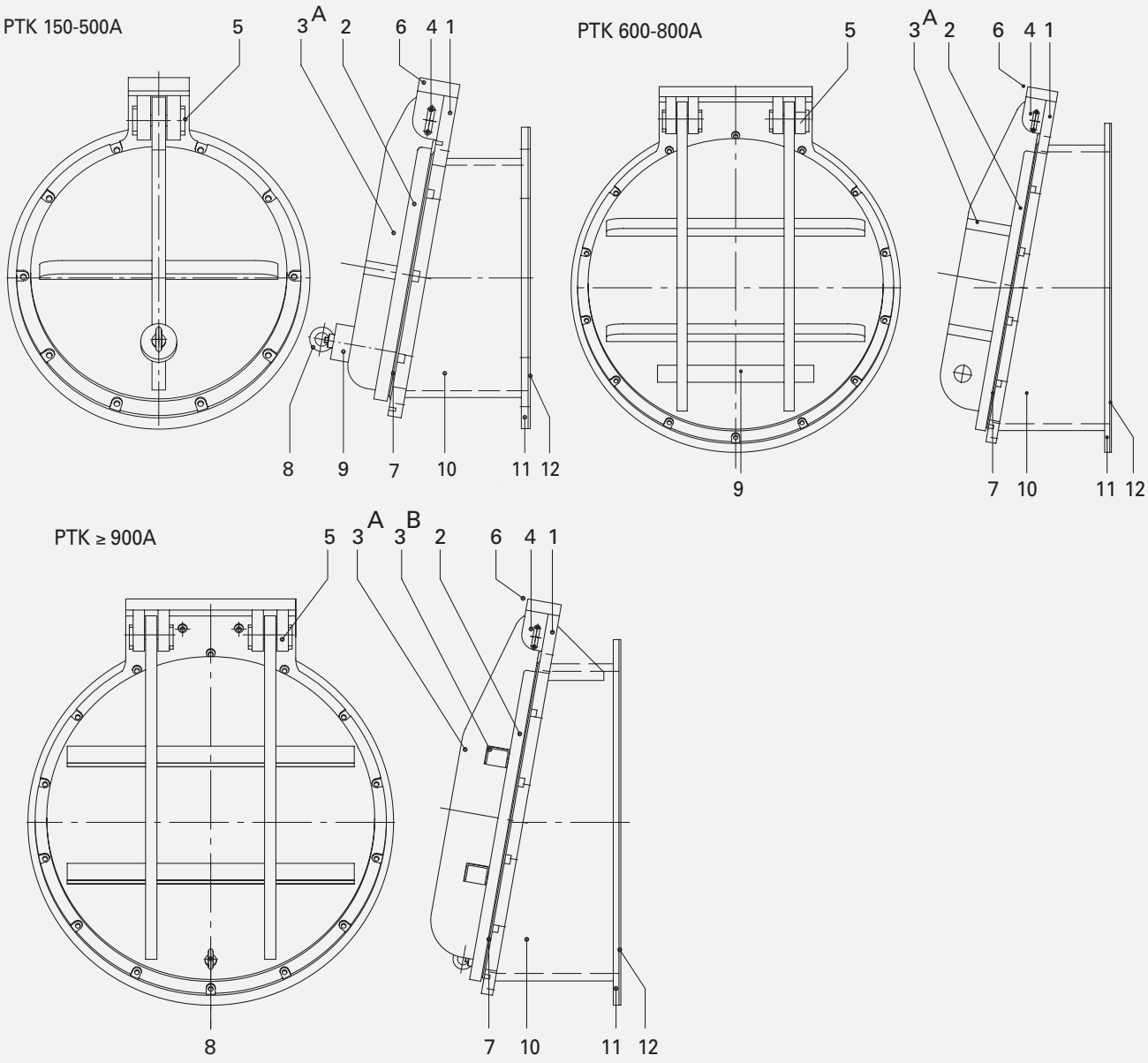
HDPE FLAP VALVE

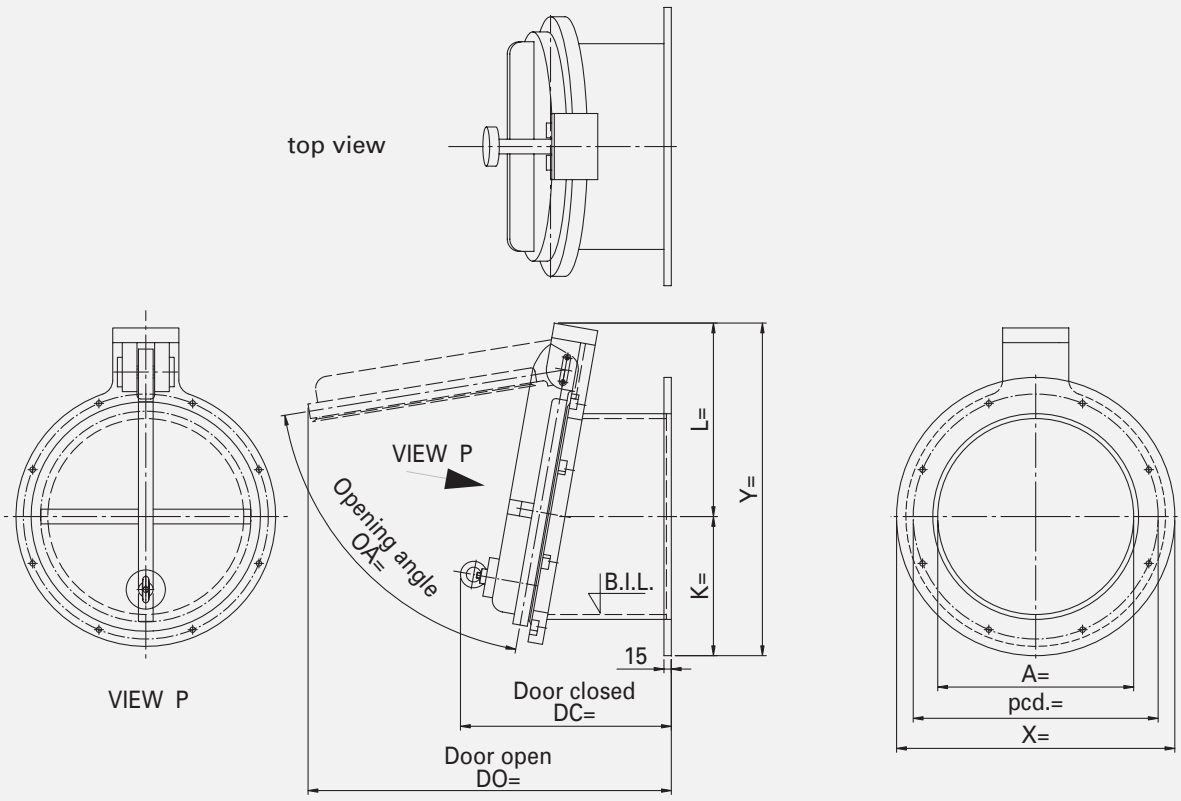
PTK-A WITH PASSAGE ø 150 - 2000 MM



	Part	Material	Remarks
1	frame plate	HDPE	
2	valve door	HDPE	
3 A	reinforcement ribs	HDPE	PTK 150-2000A
3 B	reinforcement profile	Stainless steel AISI 316	PTK 900-2000A
4	hinge	HDPE	
5	hinge pin	Stainless steel AISI 316	
6	hinge cover	HDPE	
7	sealing	EPDM	
8	lifting eye	Stainless steel A4	
9	ballast	Stainless steel AISI 316	PTK 150-500A
		HDPE (filled with steel)	PTK 600-800A
10	tube	HDPE	
11	anchor plate	HDPE	
12	sealing	Neoprene	

HDPE FLAP VALVE

PTK-A WITH PASSAGE Ø 150 - 500 MM



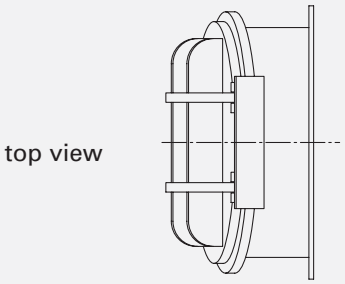
front view | side view | rear view

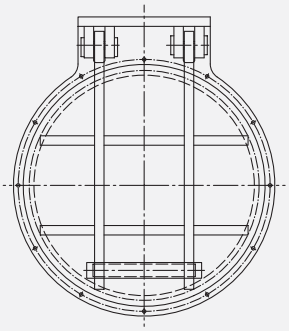
Product	TBS HDPE Flap valve type PTK-A
Application	non-return flap valve suitable for permanent under water use with an anchor plate for wall mounting
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request
Installation instructions	see page 2.25

Diameter	Ø 150	Ø 200	Ø 250	Ø 300	Ø 400	Ø 500
X	280	368	380	468	568	668
pcd	250	300	350	400	500	600
A	150	187	234	300	400	500
K	140	184	190	234	284	334
L	272	297	321	346	395	444
Y	412	481	511	580	679	778
DO	487	538	588	640	742	850
DC	370	378	387	403	430	491
OA	63°	66°	67°	68°	71°	72°
number of chem anchors	6 xM8	6 xM8	6 xM8	6 xM8	8 xM8	10 xM8
weight in kg	6	8	10	13	21	29

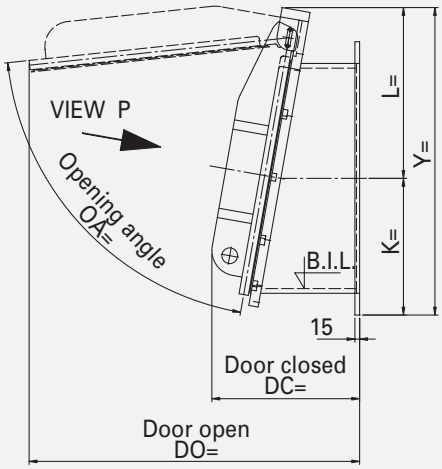
HDPE FLAP VALVE

PTK-A WITH PASSAGE Ø 600 - 800 MM

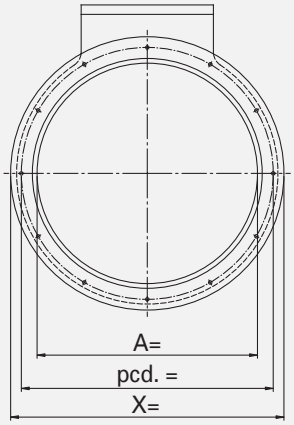




front view



side view



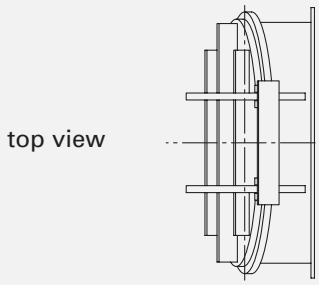
rear view

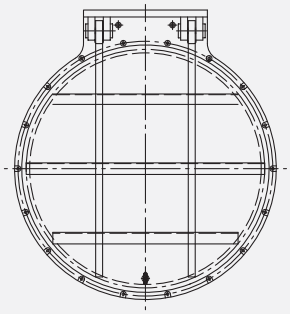
Product	TBS HDPE Flap valve type PTK-A
Application	non-return flap valve suitable for permanent under water use with an anchor plate for wall mounting
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request
Installation instructions	see page 2.25

Diameter	Ø 600	Ø 700	Ø 800
X	768	868	968
pcd	700	800	900
A	600	700	800
K	384	434	484
L	494	543	592
Y	878	977	1076
DO	948	1050	1145
DC	425	469	498
OA	73°	74°	75°
number of chem anchors	12 xM8	12 xM8	14 xM8
weight in kg	45	58	70

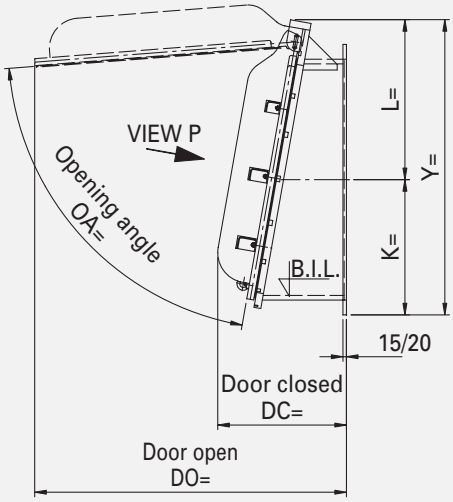
HDPE FLAP VALVE

PTK-A WITH PASSAGE Ø 900 - 2000 MM

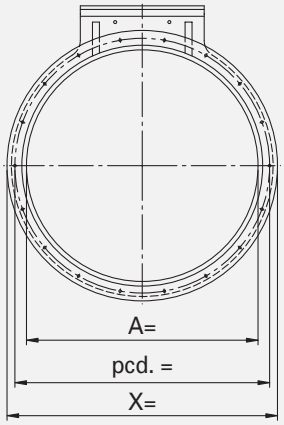




front view



side view



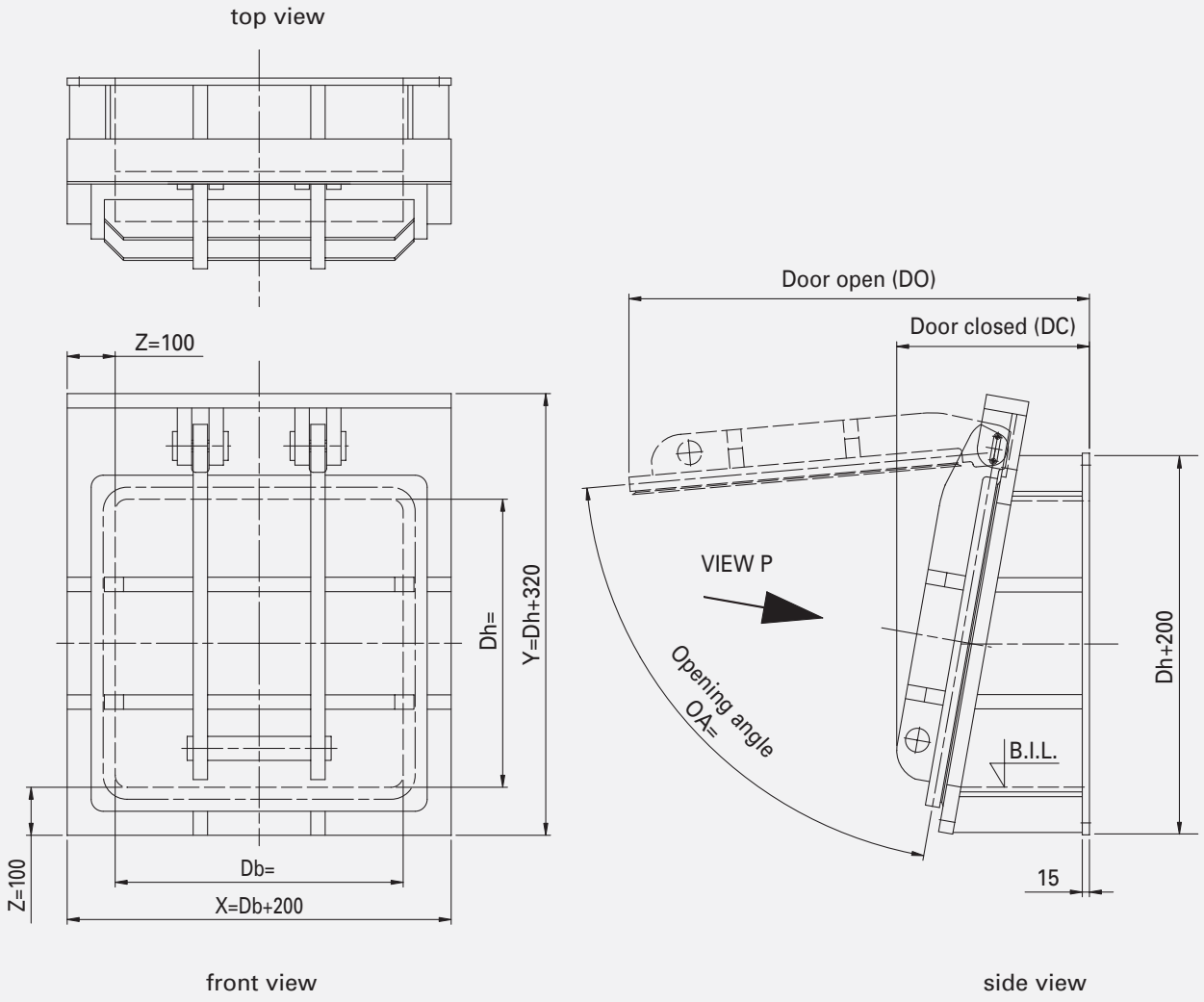
rear view

Product	TBS HDPE Flap valve type PTK-A
Application	non-return flap valve suitable for permanent under water use with an anchor plate for wall mounting
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request bigger dimensions upon request
Installation instructions	see page 2.25

Diameter	Ø 900	Ø 1000	Ø 1200	Ø 1500	Ø 1600	Ø 1800	Ø 2000
X	1068	1168	1400	1700	1800	2000	2200
pcd	1000	1100	1350	1650	1750	1950	2150
A	900	1000	1200	1500	1600	1800	2000
K	534	584	700	850	900	1000	1100
L	641	691	828	964	1017	1110	1211
Y	1175	1275	1528	1814	1917	2110	2311
DO	1226	1346	1706	2003	2060	2260	2520
DC	520	556	687	753	750	779	900
OA	75°	76°	76°	76°	76°	76°	76°
number of chem anchors	16 xM8	18 xM8	22 xM8	26 xM10	28 xM10	30 xM10	34 xM10
weight in kg	96	106	138	224	262	370	488

HDPE FLAP VALVE

PTK-A WITH RECTANGULAR PASSAGE DB X DH



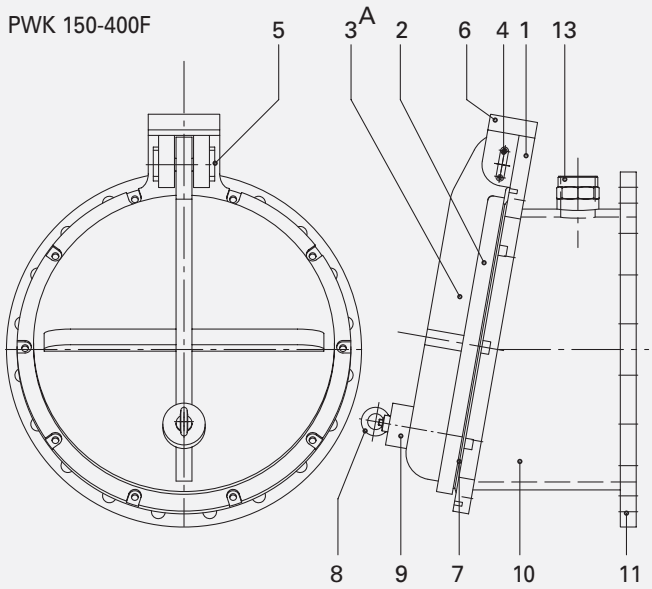
Product	TBS HDPE Flap valve type PTK-A with rectangular / square opening
Application	non-return flap valve suitable for permanent under water use with an anchor plate for wall mounting
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request depending upon seize door may be reinforced with stainless steel profiles
Installation instructions	see page 2.25

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

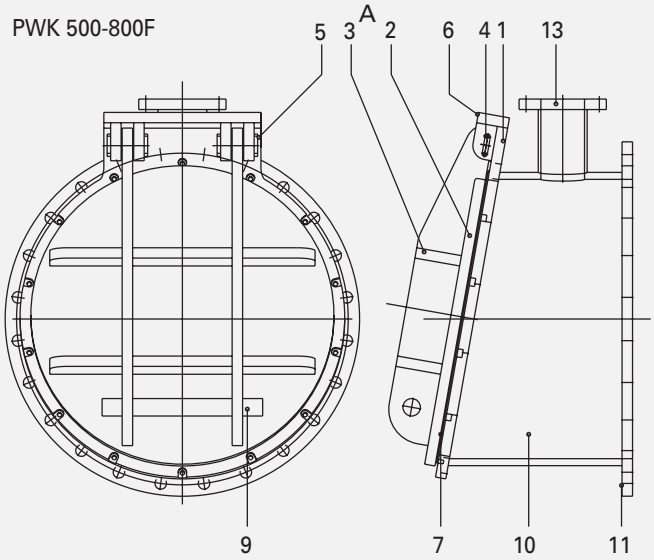
HDPE FLAP VALVE

PWK-F WITH PASSAGE ø 150 - 2000 MM

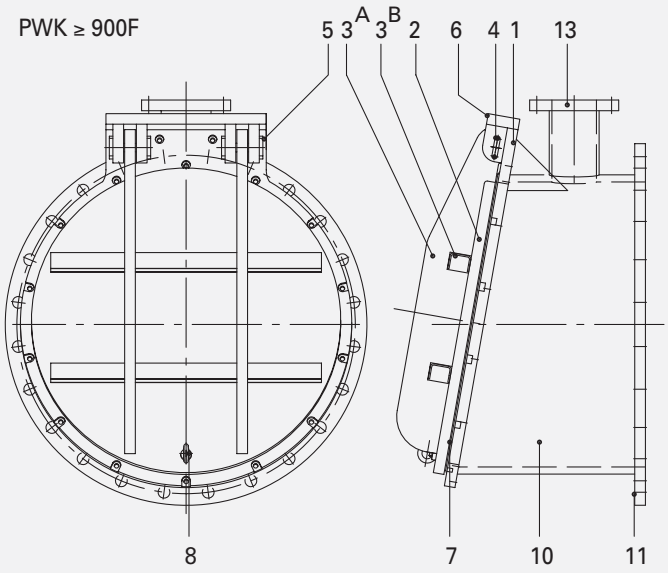
PWK 150-400F



PWK 500-800F



PWK ≥ 900F



Note:
PWK 500 F has a single hinge

Note:
PWK 150 - 400 F aerator equipped with opening with gas thread connection

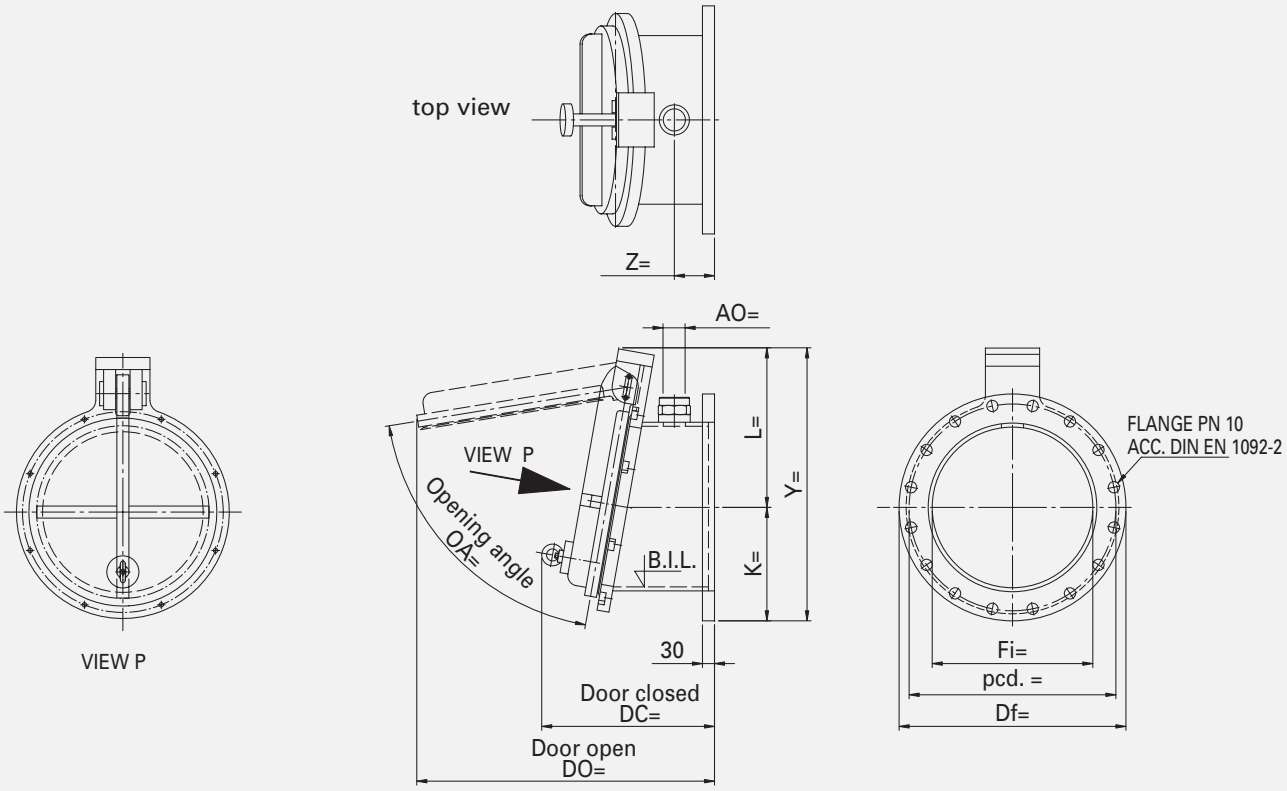
Note:
PWK 500 F will be executed with lifting eye and stainless steel 316 ballast equal to PWK 150 - 400 F

	Part	Material	Remarks
1	frame plate	HDPE	
2	valve door	HDPE	
3 A	reinforcement ribs	HDPE	PWK 150-2000F
3 B	reinforcement profile	Stainless steel AISI 316	PWK 900-2000F
4	hinge	HDPE	
5	hinge pin	Stainless steel AISI 316	
6	hinge cover	HDPE	
7	sealing	EPDM	
8	lifting eye	Stainless steel A4	
9	ballast	Stainless steel AISI 316	PWK 150-500F
		HDPE (filled with steel)	PWK 600-800F
10	tube	HDPE	
11	flange	HDPE	(acc. DIN EN 1092-2 PN 10)
12	--	--	--
13	aerator	HDPE	(acc. DIN EN 1092-2 PN 10)

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

HDPE FLAP VALVE

PWK-F WITH PASSAGE Ø 150 - 400MM



front view | side view | rear view

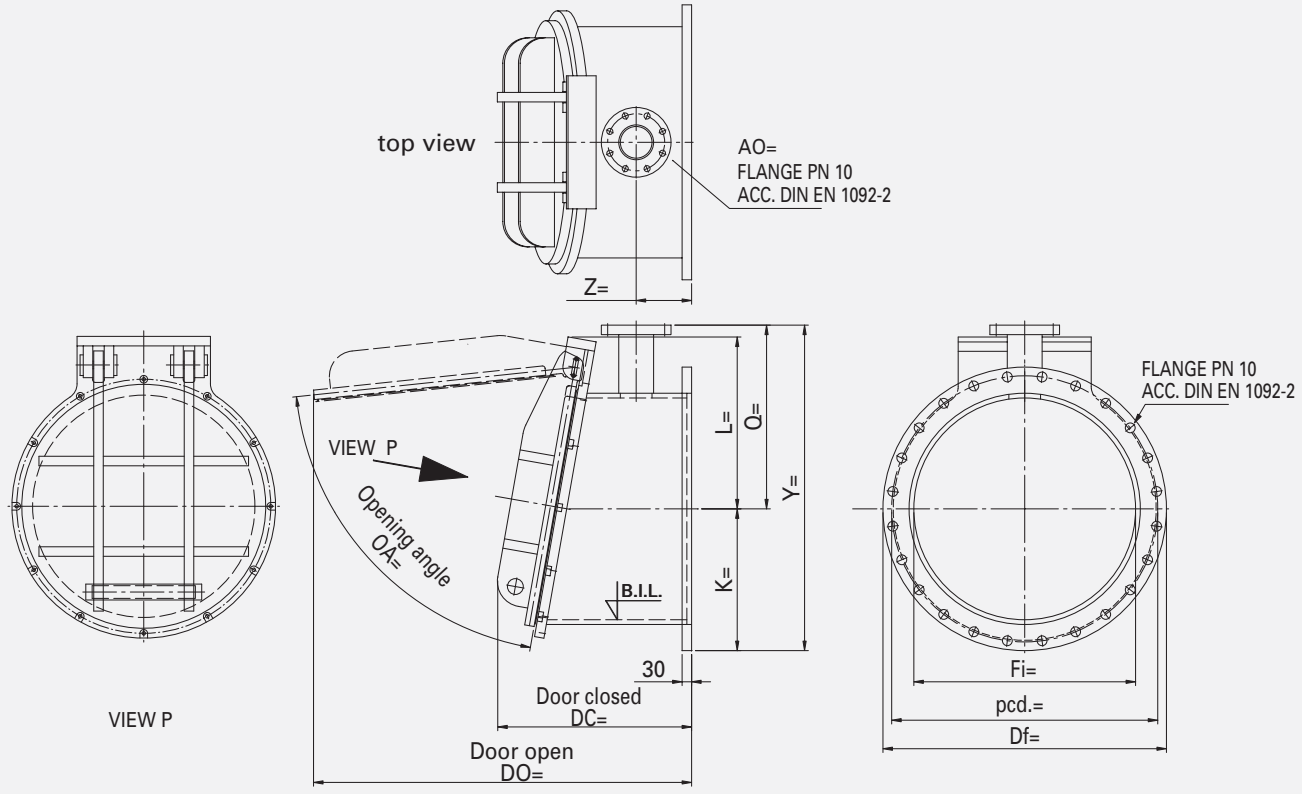
Product	TBS HDPE Flap valve type PWK-F
Application	non-return flap valve suitable for permanent under water use, at the end of pressure pipe lines in pumping stations
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request
Flange	standard according to DIN EN 1092-2 PN 10, other flanges upon request

Diameter	Ø 150	Ø 200	Ø 250	Ø 300	Ø 400
Flange acc DIN EN 1092-2 PN 10	DN150	DN 200	DN 250	DN 300	DN 400
Df	285	340	395	445	565
pcd	240	295	350	400	515
Fi	150	187	234	300	400
K	143	184	198	223	283
L	272	297	321	346	395
Y	415	481	519	569	678
Z	75	80	85	90	100
DO	487	538	588	640	742
DC	370	378	387	403	430
OA	63°	66°	67°	68°	71°
AO	1"	1"	1,5 "	2 "	2 "
number of holes	8 xØ23	8 xØ23	12 xØ23	12 xØ23	16 xØ28
weight in kg	7	11	13	16	24

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

HDPE FLAP VALVE

PWK-F WITH PASSAGE Ø 500 - 800 MM



front view | side view | rear view

Product	TBS HDPE Flap valve type PWK-F
Application	non-return flap valve suitable for permanent under water use, at the end of pressure pipe lines in pumping stations
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request
Flange	standard according to DIN EN 1092-2 PN10, other flanges upon request

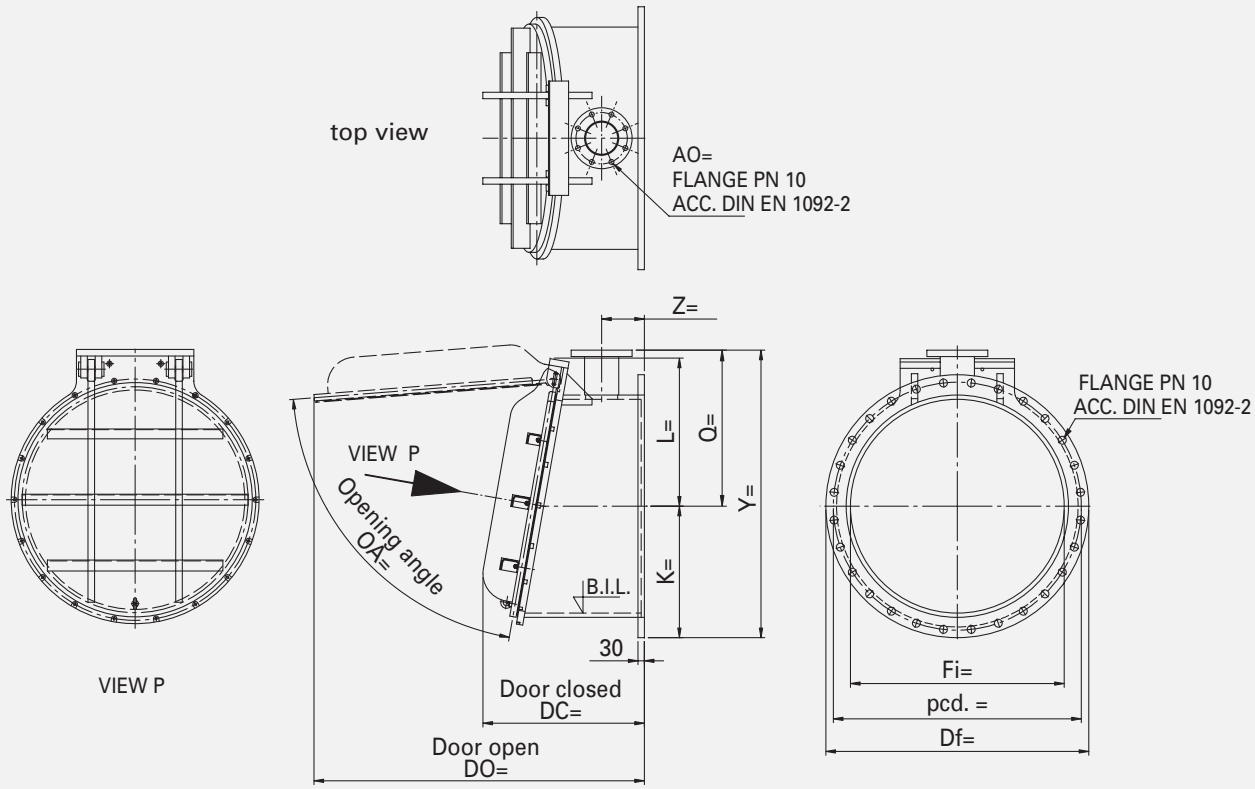
Diameter	Ø 500	Ø 600	Ø 700	Ø 800
Flange acc DIN EN 1092-2 PN 10	DN 500	DN 600	DN 700	DN 800
Df	670	780	895	1015
pcd	620	725	840	950
Fi	500	600	700	800
K	335	390	448	508
L	444	494	543	592
Q	490	530	580	630
Y	825	920	1028	1138
Z	110	150	175	200
DO	893	1044	1194	1345
DC	534	523	612	698
OA	72°	73°	74°	75°
AO	66,4	79,8	97,4	124
Aerator flange acc DIN EN 1092-2 PN 10	DN65	DN80	DN100	DN125
number of holes main flange	20 xØ28	20 xØ31	24 xØ31	24 xØ34
number of holes aerator flange	4 xØ19	8 xØ19	8 xØ19	8 xØ19
weight in kg	32	45	60	77

Note: PWK 500 F will be executed with stainless steel 316 ballast with lifting eye, same as PWK 150 - 400 F

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

HDPE FLAP VALVE

PWK-F WITH PASSAGE Ø 900 - 2000 MM



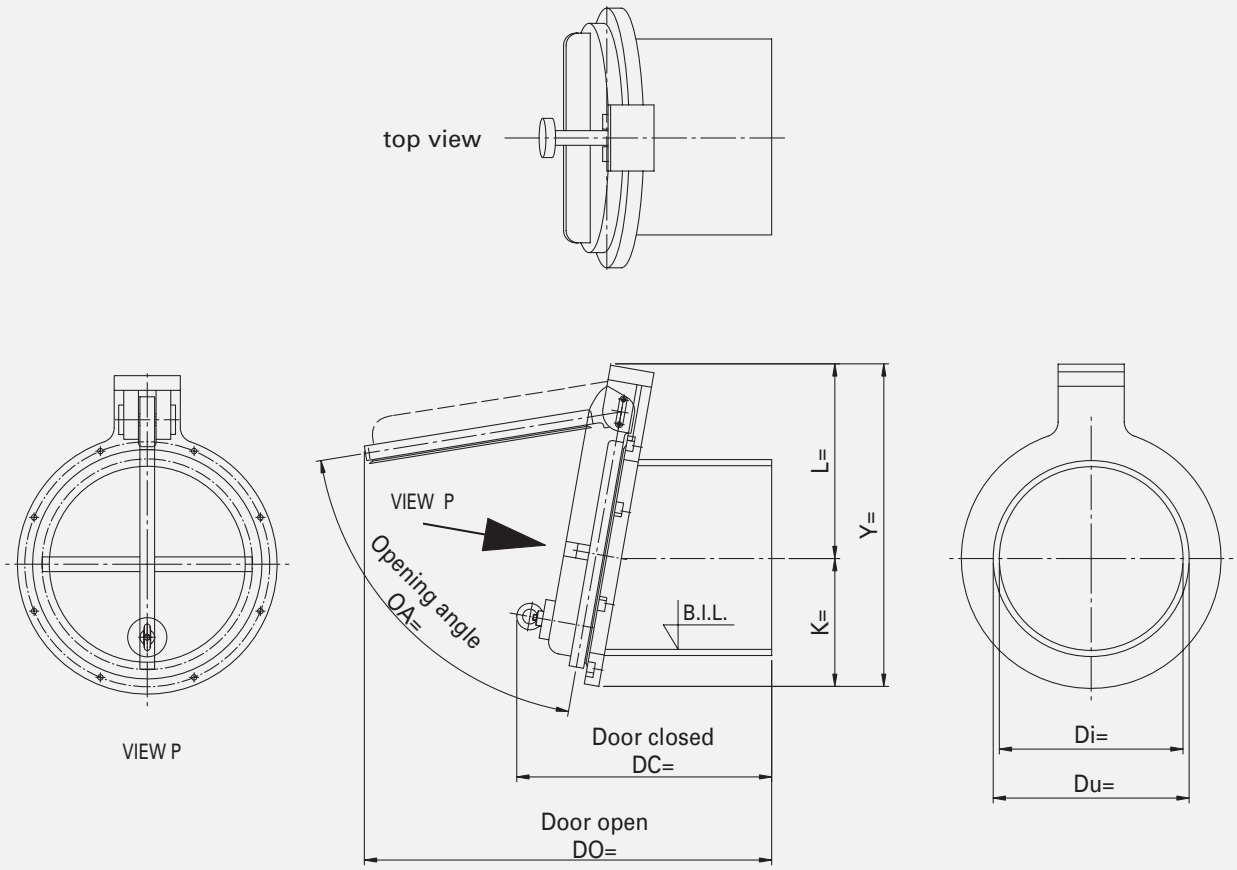
Product	TBS HDPE Flap valve type PWK-F
Application	non-return flap valve suitable for permanent under water use, at the end of pressure pipe lines in pumping stations
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request bigger dimensions upon request
Flange	standard according to DIN EN 1092-2 PN10, other flanges upon request

Diameter	Ø 900	Ø 1000	Ø 1200	Ø 1500	Ø 1600	Ø 1800	Ø 2000
Flange acc DIN EN 1092-2 PN 10	DN 900	DN 1000	DN 1200	DN 1500	DN 1600	DN 1800	DN 2000
Df	1115	1230	1455	1785	1915	2115	2325
pcd	1050	1160	1380	1700	1820	2020	2230
Fi	900	1000	1200	1500	1600	1800	2000
K	558	615	728	893	958	1058	1163
L	641	693	828	964	1016	1108	1210
Q	680	730	850	1050	1100	1210	1250
Y	1238	1345	1578	1943	2058	2268	2412
Z	200	200	245	245	245	290	290
DO	1446	1546	1936	2218	2280	2550	2760
DC	740	755	917	969	970	1070	1139
OA	75°	76°	76°	76°	76°	76°	76°
AO	124	141,8	187,6	234,4	234,4	295,4	295,4
Aerator flange acc DIN EN 1092-2 PN10	DN125	DN150	DN 200	DN 250	DN 250	DN 300	DN 300
number of holes main flange	28 xØ34	28 xØ37	32 xØ41	36 xØ44	40 xØ50	44 xØ50	48 xØ50
number of holes aerator flange	8 xØ19	8 xØ23	8 xØ23	12 xØ23	12 xØ23	12 xØ23	12 xØ23
weight in kg	100	115	148	236	275	388	515

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

HDPE FLAP VALVE

PTK-P WITH PASSAGE ø 160 - 630 MM



front view | side view | rear view

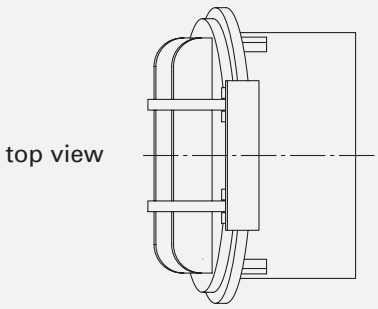
Product	TBS HDPE Flap valve type PTK-P
Application	non-return flap valve suitable for permanent under water use suitable to connect to PVC tube
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request bigger dimensions on request

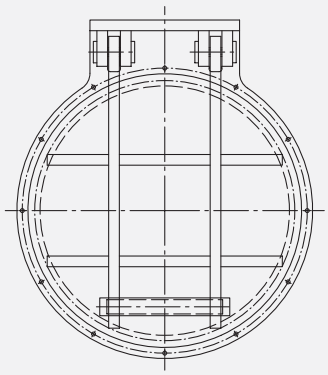
Diameter	Ø 160	Ø 200	Ø 250	Ø 315	Ø 400	Ø 500	Ø 630
Di	150	187	234	295	375	469	600
Du	160	200	250	315	400	500	630
K	138	163	188	212	261	311	359
L	272	297	321	346	397	444	494
Y	410	460	509	558	658	755	853
DO	472	523	573	625	832	935	1064
DC	355	363	372	388	520	575	542
OA	63°	66°	67°	68°	71°	72°	73°
weight in kg	5	10	12	12	23	27	39

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

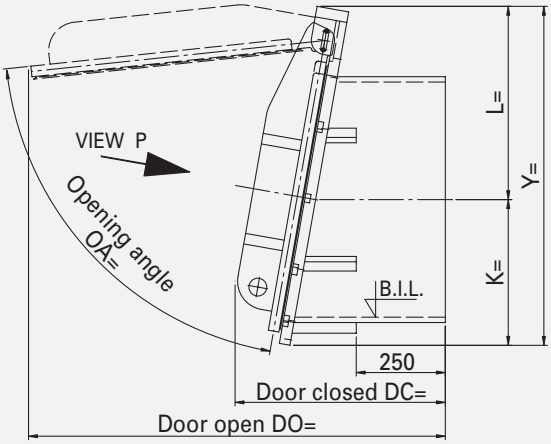
HDPE FLAP VALVE

PTK-BS WITH PASSAGE Ø 300 - 1000 MM

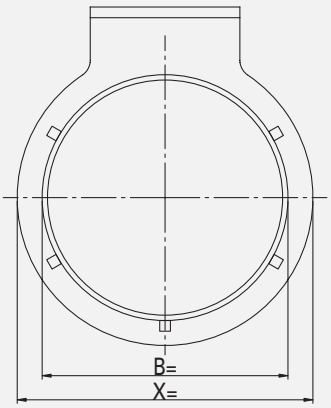




front view



side view



rear view

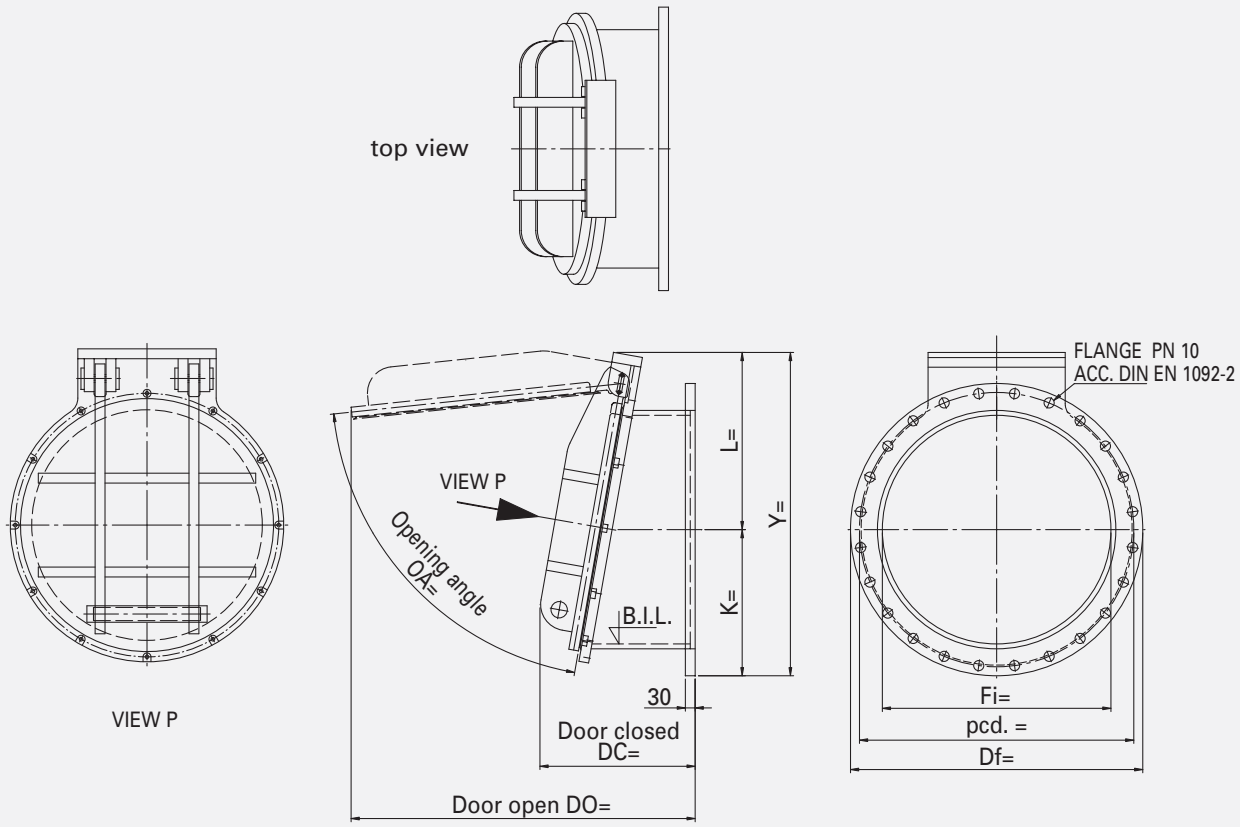
Product	TBS HDPE Flap valve type PTK-BS
Application	non-return flap valve suitable for permanent under water use suitable to connect to concrete/steel tubes
Standard pressure	1 meter water column permanent from top of opening , 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request bigger dimensions on request

Diameter	Ø 300	Ø 400	Ø 500	Ø 600	Ø 700	Ø 800	Ø 900	Ø 1000
X	468	568	668	768	830	930	1030	1130
B	Ø290x10	Ø390x10	Ø490x15	Ø590x15	Ø690x15	Ø790x20	Ø890x20	Ø990x20
K	212	262	311	360	409	458	508	557
L	346	395	444	494	543	592	641	691
Y	558	657	755	854	952	1050	1149	1248
DO	763	859	962	1066	1163	1266	1365	1467
DC	526	547	603	547	582	617	658	677
OA	68°	71°	72°	73°	74°	75°	75°	76°
weight in kg	16	23	36	51	64	77	103	117

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

HDPE FLAP VALVE

PTK-F WITH PASSAGE ø 150 - 1500 MM



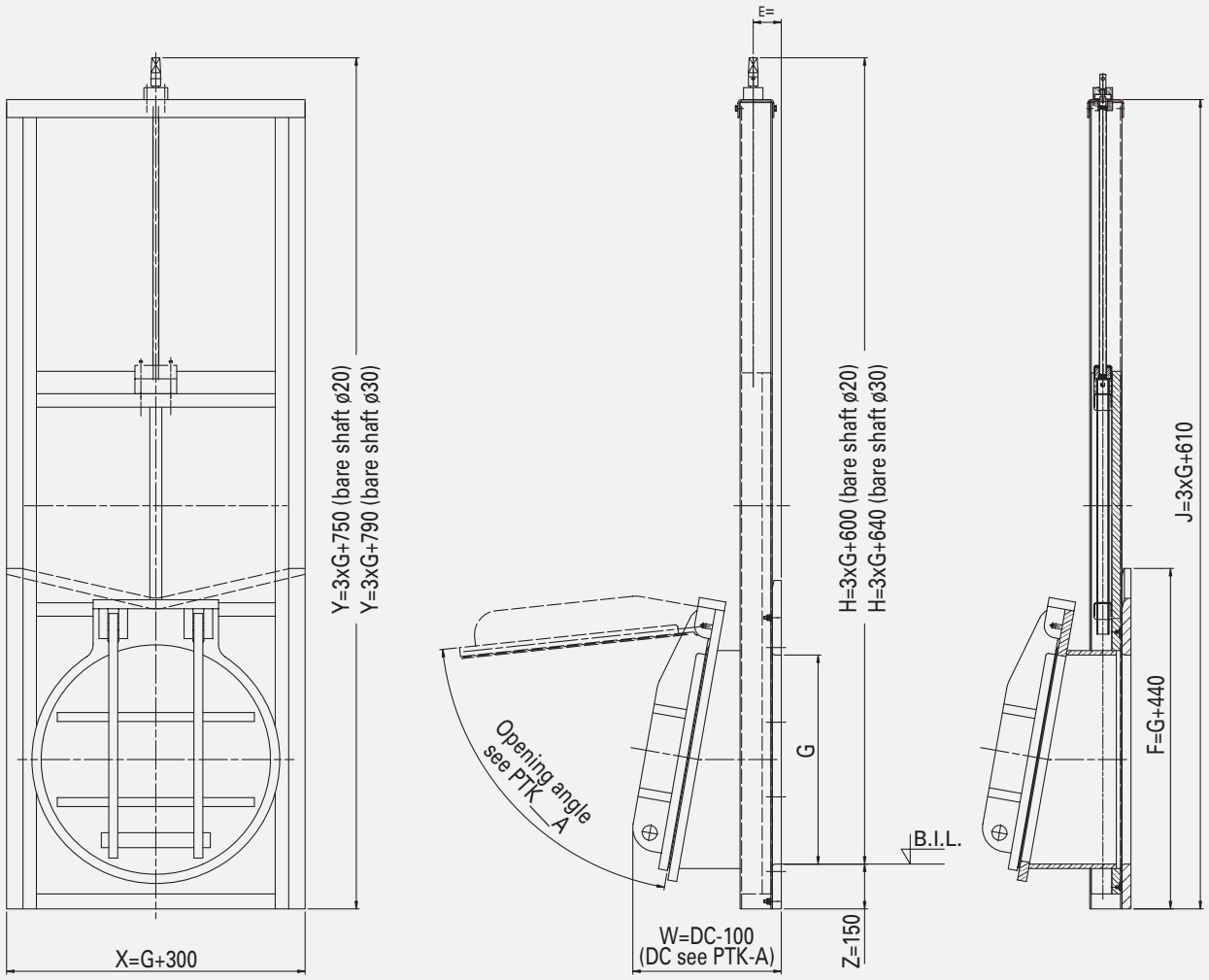
front view | side view | rear view

Product	TBS HDPE Flap valve type PTK-F
Application	non-return flap valve suitable for permanent under water use, with a flange connection
Standard pressure	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request bigger dimensions on request
Flange	standard according to DIN EN 1092-2 PN10, other flanges upon request

Diameter	Ø 150	Ø 200	Ø 250	Ø 300	Ø 400	Ø 500	Ø 600	Ø 700	Ø 800	Ø 900	Ø 1000	Ø 1200	Ø 1500
Flange acc DIN EN 1092-2 PN10	DN 150	DN 200	DN 250	DN 300	DN 400	DN 500	DN 600	DN 700	DN 800	DN 900	DN 1000	DN 1200	DN 1500
Df	285	340	395	445	565	670	780	895	1015	1115	1230	1455	1785
pcd	240	295	350	400	515	620	725	840	950	1050	1160	1380	1700
Fi	150	187	234	300	400	500	600	700	800	900	1000	1200	1500
K	143	184	198	223	283	335	390	448	508	558	615	728	893
L	272	297	321	346	395	444	493	543	592	641	691	828	964
Y	415	481	519	569	678	779	883	991	1100	1199	1306	1556	1857
DO	487	538	588	640	742	853	954	1054	1155	1251	1356	1661	2018
DC	370	378	387	403	430	493	433	475	510	545	565	642	769
OA	63°	66°	67°	68°	71°	72°	73°	74°	75°	75°	76°	76°	76°
number of holes flange	8 xØ23	8 xØ23	12 xØ23	12 xØ23	16 xØ28	20 xØ28	20 xØ31	24 xØ31	24 xØ34	28 xØ34	28 xØ37	32 xØ41	36 xØ44
weight in kg	6	9	12	15	23	31	47	60	76	99	110	142	229

TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

HDPE LIFTABLE FLAP VALVE POTK



Product	TBS HDPE liftable flap valve type POTK
Application	non-return flap valve suitable for permanent under water use mounted on a penstock frame so that the flap valve can be lifted. When the door of the penstock is lowered the product functions as a non-return flap valve In lifted postion the opening is free and flow can go in both directions
Standard pressure for the flap valve	1 meter water column permanent from top of opening, 5 meter water column short duration (72 hours) from bottom of opening higher pressures on request
Operation possibilities	see introduction section of penstocks
Installation instructions	see page 3.26/3.27

FLAP VALVE TYPE PTK-A / G

On delivery the customer must check the goods supplied by TBS for completeness and damage or breakages. If the goods are not complete or are damaged, the customer must respond by return, but at the latest within 1 week after receipt of the goods.

The customer can not claim under guarantee if:
- these installation instructions are not strictly followed.
- on installation of the goods supplied the conditions for installation did not conform with our installation manual.
- a third party has modified the goods supplied by TBS.

PREPARING FOR INSTALLATION

- Before installation use a straightedge to check the smoothness of the wall at the location of the frame plate for the flap valve.
- Also check the concrete wall for small local pits and lumps so that the neoprene tape (which will be fixed to the back plate) can function properly and seal well between the frame plate and the wall.

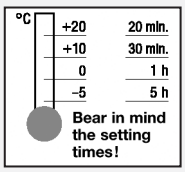
INSTALLATION

- Mark the locations of the two anchor holes (outside the hinges on the frame) for the frame / anchor plate onto the wall.
- Drill these two holes and mount the anchors as instructed by the supplier of the chemical anchors. Note the time required for the hardening of the chemical substance.
- Mount the flap valve by hanging it onto these two anchors, after they have been fixed in place.
- Check that the flap valve is vertical and mark the locations of the remaining mounting holes onto the wall. Remove the flap valve.
- Drill the other holes and place the chemical capsules into the holes but not the anchor studs!!
- Fix the neoprene sealing tape supplied all around the opening and over the anchor holes at the back of the frame / anchor plate.
- Make the holes in the neoprene tape for the anchors.
- Hang the flap valve back on the wall on the two anchor bars.
- Mount the anchor studs as instructed by the supplier of the chemical anchors. Remove all material that comes out of the holes. Note the time required for the hardening of the chemical substance.
- Tighten the anchors gradually one by one so that a good seal to the wall is obtained without deforming the anchor plate. Check the smoothness.
- Check the frame plate is not deformed to the extent that the door of the flap valve does not seal against the rubber seal in the frame plate. (PTK-G)

COMMISIONING

- Remove all protection
- Check the functioning of the flap valve by opening and closing the door several times as there must be a sealing between the anchor / frame plate and the door.

SPECIAL CARE ABOUT CHEMICAL ANCHORS



Installation diagram