TBS SOEST bv
SPECIALISED IN WATER MANAGEMENT PRODUCTS

AN INTRODUCTION TO WATER LEVEL REGULATION

THIS SECTION IS INTENDED TO ASSIST USERS TO SELECT THE MOST SUITABLE REGULATION DEVICES.

HISTORY

The Netherlands is a land of water, whose character is to a large extent determined by rivers, lakes, ditches and canals. This water must be clean and healthy if we wish to keep our country hospitable. Moreover the water level should be neither too high nor too low, as this would threaten both people and their environment.

The Dutch water boards have been responsible for water management since the thirteenth century. The development of HDPE water management and control devices originated from close co-operation with these regional water authorities. The water boards have always been on the look out for cost effective and innovative materials to help them regulate and control water levels in The Netherlands economically.

These developments formed the basis of the product range that TBS supplies today. New products are still being developed and tested in the most challenging environment possible, the Dutch *polder areas,* where water regulation and control is essential for survival. Almost half The Netherlands is situated below sea level and would be flooded if there were no defences. Without proper use of water-management products The Netherlands would be inundated.

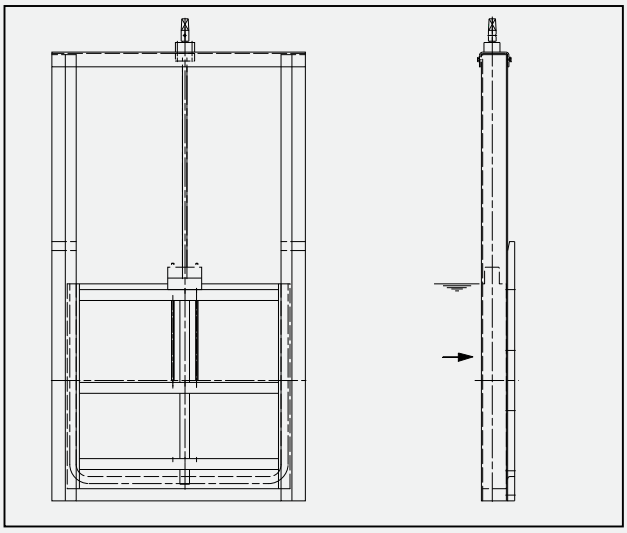
The flexibility of HDPE proved to be a major advantage in creating and providing tailor made solutions. Once put in place these products do not require any maintenance and are reliable and economical solutions.

Today we divide the regulation programme into three different sub-programmes.
A) to block the flow to the height of the door
B) to regulate water level upstream
C) to regulate water level downstream

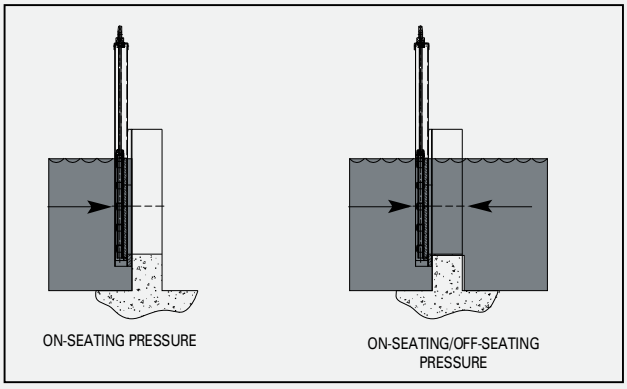
TO BLOCK THE FLOW

SLUICE GATE PKS

A normal application in channels is to block the flow to the height of the door.



Sluice gate sealing to height of door / type PKS.



In this kind of application the water level will not exceed the height of the door. In most cases the door height will be equal to maximum water level + 100 mm as safety.

Closing the door blocks the water in the channel. The sluice gate is operated like a penstock with a spindle opening / closing the door. Sluice gates can be operated by T keys, hand wheels, gearboxes and can also be fully electrically actuated.

Modifications reserved.

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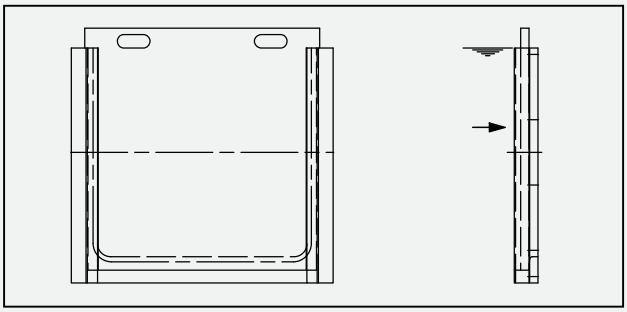
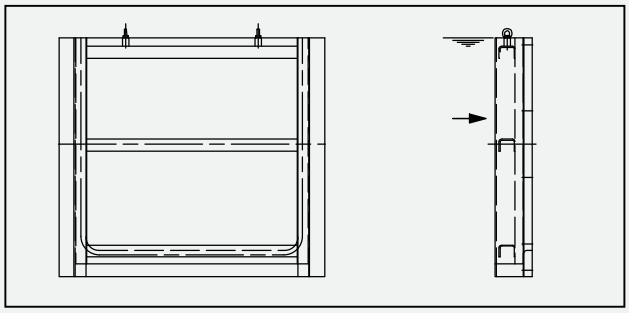
HAND GATE PHS

For small sizes with the same function, hand operated gates provide a simple low budget solution. Direct manual force is required to lift the door. Handgrips are placed on the door to enable direct lifting.



Hand gate for manual lifting type PHS

For larger gates (above 0.6 square meters) the same type of gate can be equipped with lifting eyes, so that the door plate can be lifted with a winch or other lifting devices present on site.



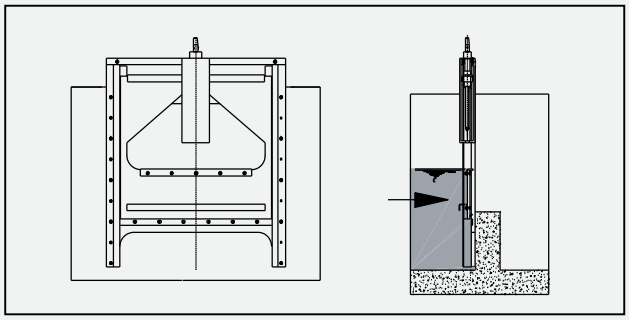
Hand gate with lifting eyes for non-manual lifting type PHS

TO REGULATE UPSTREAM

OVERFLOW GATE VALVE POS

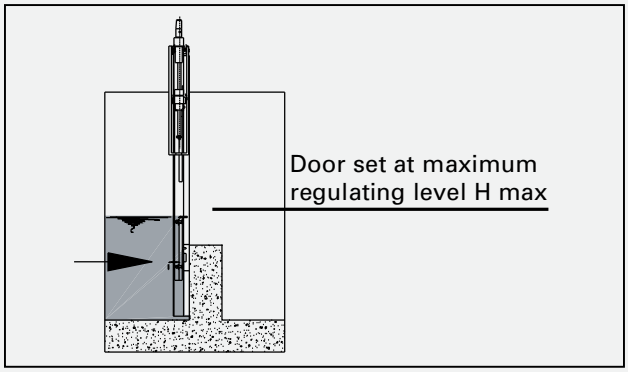
The device used to **continuously** regulate between a minimum and a maximum level **upstream** is called an overflow gate valve.

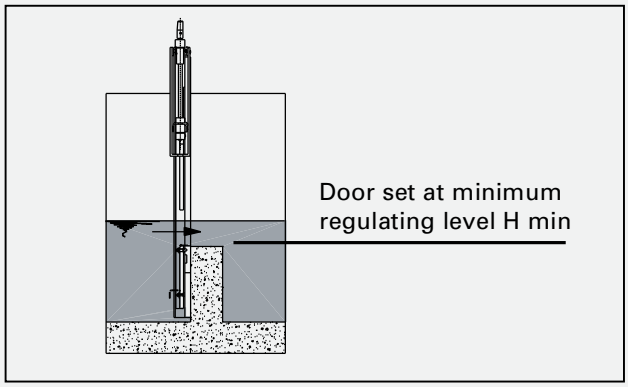
The product is always tailor made depending on the exact installation situation / dimensions for the customer. The customer defines the regulation height (dh) from minimum to maximum level and net width (db).



Overflow gate valve type POS

The regulated level varies between H max, the maximum upstream water level and H min, the minimum upstream water level. This range is defined as Dh, the regulated height.





The door is lowered to regulate the water level. To accommodate the overflow gate door, space is always required below the H min level.

Modifications reserved.

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DOUBLE OVERFLOW GATE VALVE DPOS

The overflow gate valve DPOS has the same function as the overflow gate valve POS.

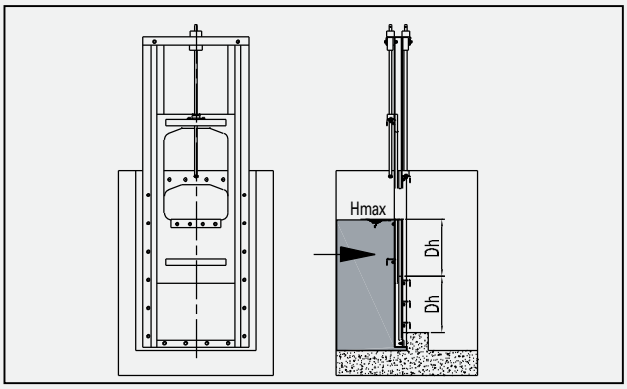
In addition to the above-mentioned POS, the DPOS product has the extra feature that the lower part of the construction is not fixed.

The DPOS has two doors. The upper door regulates between the minimum and maximum levels, just like the POS overflow gate valve. The lower door can be lifted.

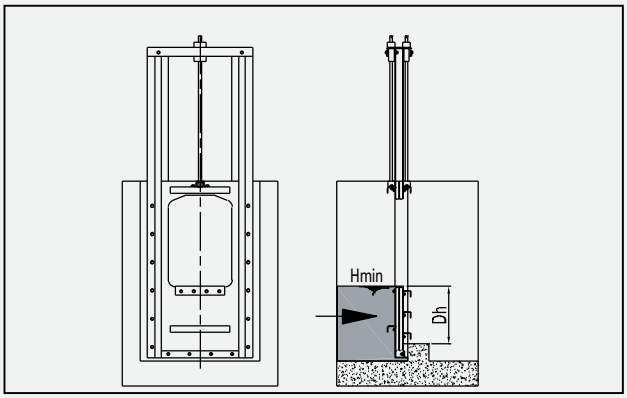
Each door is operated by its own spindle.

Why would you require this DPOS overflow gate valve with two doors?

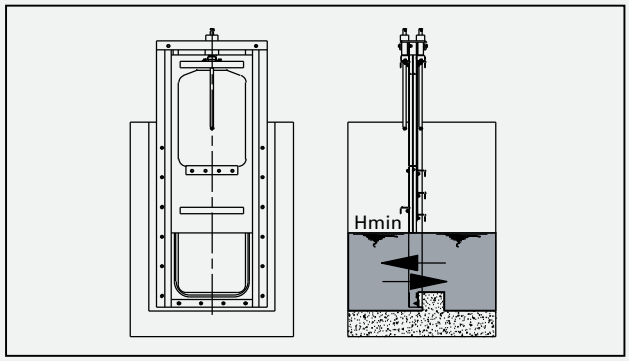
The lower door is used to drain the channel in times of excess water. Following heavy rainfall, so much water could accumulate in the channel, that the overflow gate valve could not handle all the water. To prevent such a situation the lower door can be opened / lifted so that the excess water can be drained.



Lower door closed and upper door in maximum (H max) position.

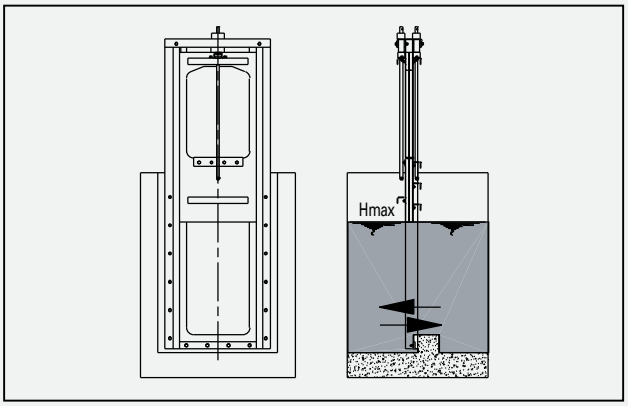


Lower door closed and upper door in minimum (H min) position.



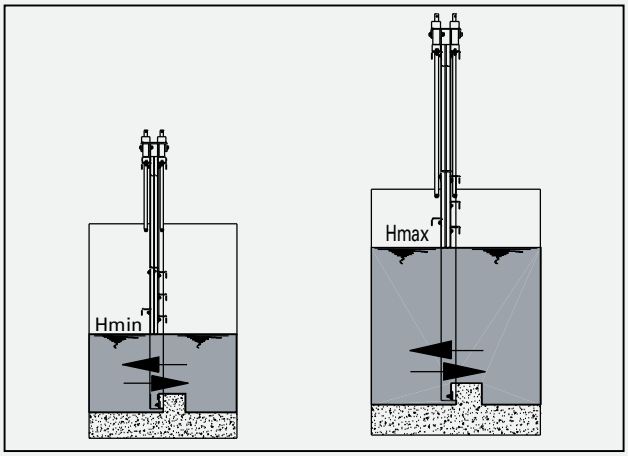
Lower door opened and upper door in maximum position. From bottom to H min there is free flow. No regulation.

When both doors are lifted, the user has the lower door as free flow area. Both doors are lifted to height H min. If there is need for more lifting height you can also lift to H max level.



Lower door opened and upper door above maximum position. From bottom to H max there is free flow.

The consequences of making the DPOS overflow liftable to above H max level can be seen below.



DPOS liftable to (above) H min

DPOS liftable to (above) H max

Modifications reserved.

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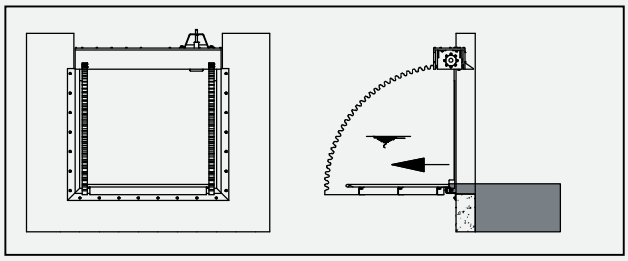
On the left, the lower door of the DPOS can be raised to the upper door at maximum level. The upper door cannot be lifted to a higher level. On the right both doors can be raised to above the maximum water level of H max. As a consequence the total height of the construction increases considerably.

In enquiries it is essential to state the requested lifting height (H min or H max). (See also pages 4.14 and 4.15)

FLAP WEIR PKLS

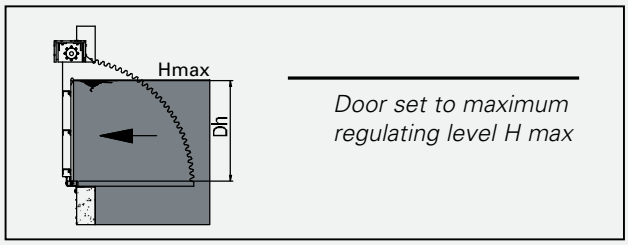
Instead of an overflow gate valve with a vertically moving door, an alternative product can be used that has a rotating door: the flap weir.

As a result the flap weir can regulate from almost the bottom of the channel. The advantage is that this weir does not need space to accommodate the door below the H min level.



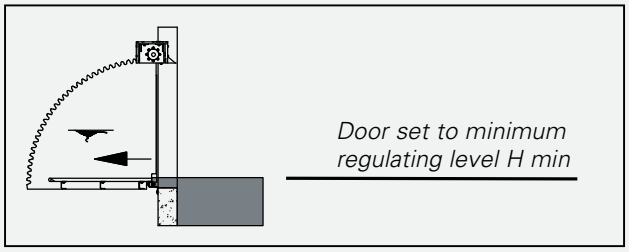
Flap weir type PKLS

The doorplate and segments are made of HDPE. The door can rotate from H max, the maximum regulated water level



Door set to maximum regulating level H max

to H min, the bottom or minimum regulated level.

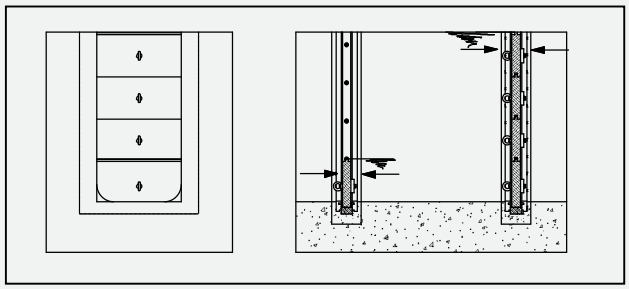


Door set to minimum regulating level H min

Just like the POS overflow gate valve the flap weir regulates continuously between the minimum level (H min) and the maximum level (H max). However its construction is much more compact.

STOP LOG PSS

Besides the possibility of regulating continuously between a minimum and maximum level, a less accurate device can be used. This is a stop log, for regulating flow levels step by step.



Stop log type PSS

Step by step regulation is achieved by just putting the logs into the frame.

This kind of equipment can also be used as an alternative for large sluice gates. The stop log can be an economical alternative to stop the flow occasionally where a sluice gate would perhaps be too expensive for the limited use and/or where a sluice gate would be technically too complicated because of the large dimensions. The construction of the frame will not stick out above deck level. Stop log constructions can also be used in emergency situations and for maintenance purposes.

Modifications reserved.

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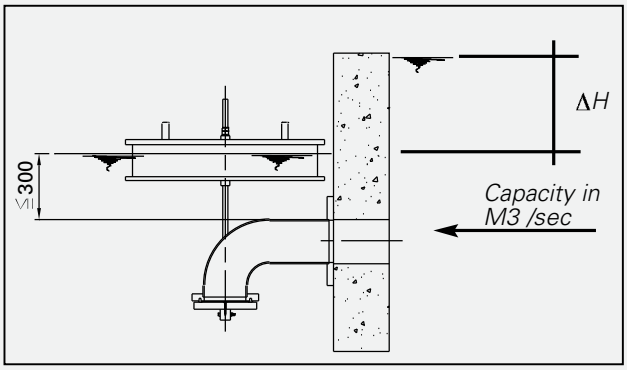
To regulate downstream Float valve type PVI

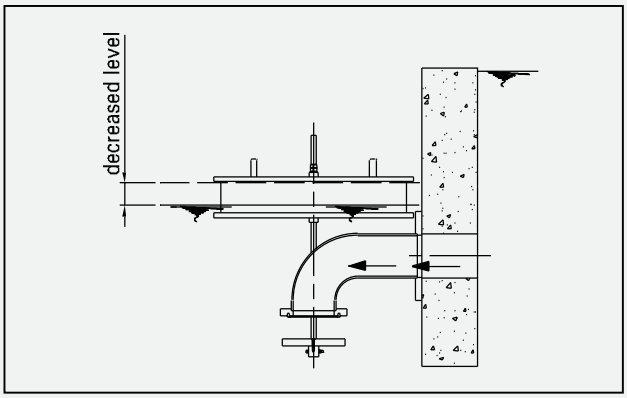
A float valve has been developed to regulate downstream water level. This valve operates independently, without any manual or electric power requirement. The product has a proven track record in the Dutch polders. It is always a custom made product.

We can design this special float valve on the basis of the specific site parameters (difference in water level upstream and down stream - the so-called Δ H value) and the culvert capacity in m3/second.



Float valve type PVI

If the water level downstream remains high enough the float shuts off the opening with a door. Only when the downstream (on the left in the picture) water level drops, will the float be lowered enabling the door to open. The water can enter...



until the water level increases again and the float closes the opening. The PVI float valve reacts automatically to a change in the water level down stream.

Modifications reserved.

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POS overflow gates in Chestnut wwtp Singapore

DPOS overflow gate in Soest Holland

PKLS flap weir in Tin Shui Wai - Hong Kong

PVI float valve for Ireland

PKS sluice gates in Tubli wwtp Bahrain

PKS sluice gates in Balaghaderreen wwtp Ireland

Modifications reserved.