

Competence brochure

Discharging stormwater



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TRANSPORT

2

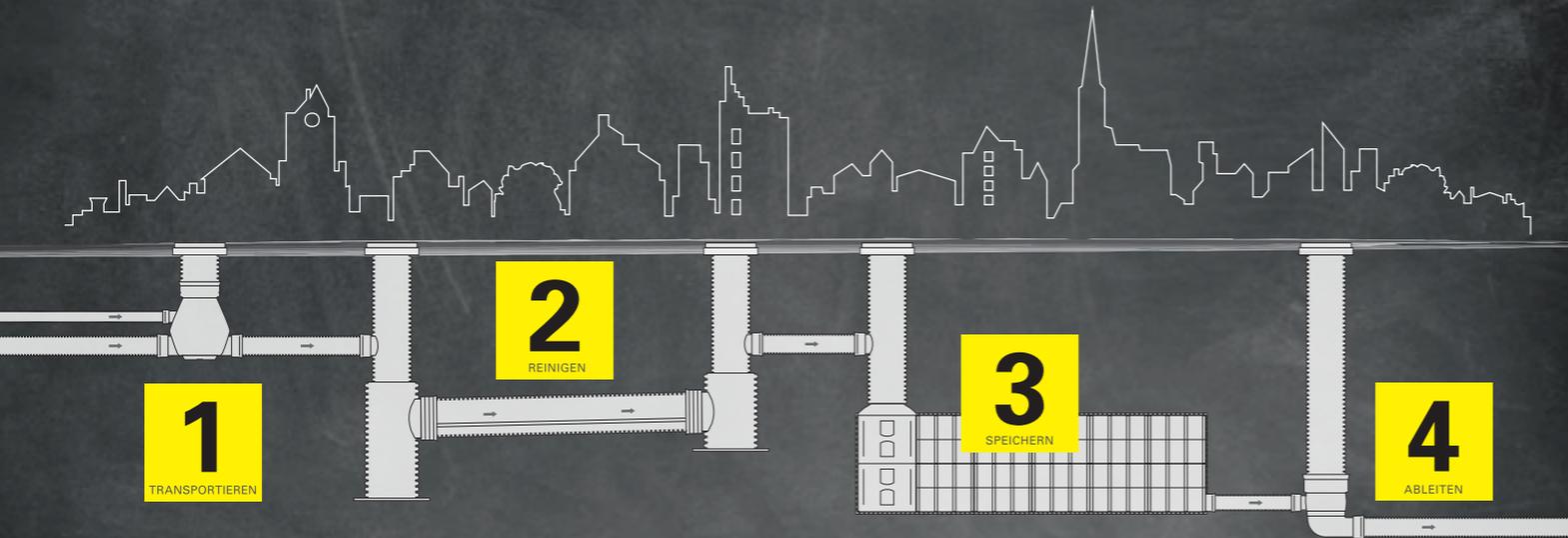
TREATMENT

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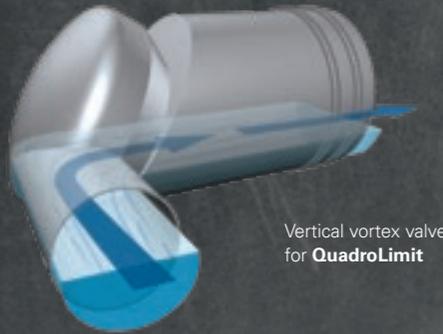
4 CHALLENGES – 1 SOLUTION
STORMWATER IS OUR COMPETENCE.

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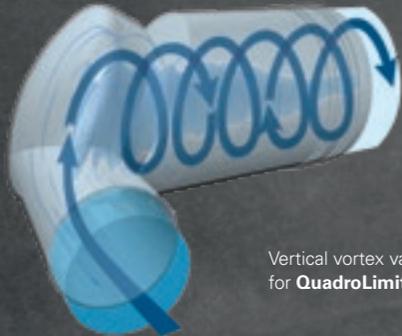
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Free discharge



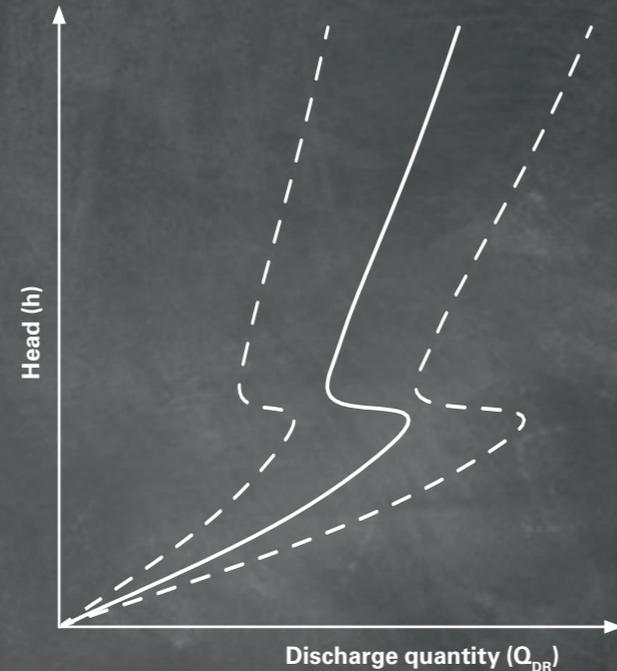
Vertical vortex valve
for **QuadroLimit**

Throttled discharge



Vertical vortex valve
for **QuadroLimit**

Qh-characteristic of vortex throttle



Vortex throttle technology

4

Reliable and controlled discharge of stormwater

Successful and sustainable stormwater management mainly depends on the controlled discharge of stormwater from different structures, e.g., infiltration swales, ground basins and other retention basins.

The objective is to return inflowing stormwater to nature later but continuously, and to avoid damage. Controlled discharge is often essential for flood control at streams and rivers and for flood protection of sewer networks.

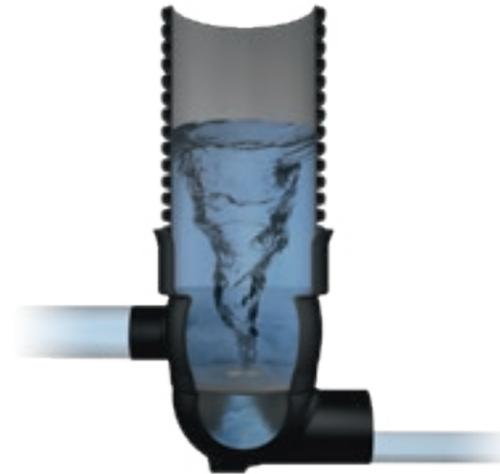
Ready-to-connect shafts featuring vortex throttle technology are used depending on the protection requirements of the waterbody and the requirements regarding maintenance and operation.

Vortex valves achieve throttling by using the flow effects alone and require no mechanically movable parts. They ge-

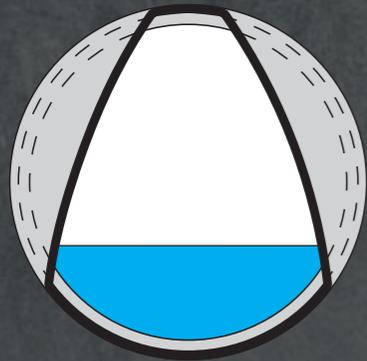
nerate a very high flow resistance even with a large and free passage cross-section to map even small throttle flow rates.

As compared to other throttle variants, the vortex throttle convinces with its low risk of blockages and a high degree of operational reliability associated with it, as well as its wear-resistant and maintenance-friendly functioning thanks to solely hydraulically controlled principle of operation.

Due to its special Qh-characteristic, smaller storage volumes are possible as compared with passive throttle elements, and discharge times are also reduced.

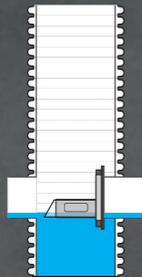


Vortex throttle shaft
RigoLimit V



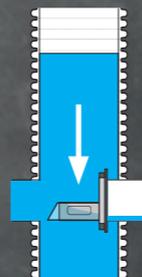
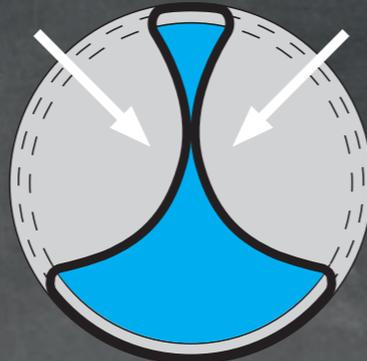
Free discharge

With low water levels, the tube throttle remains in its normal condition and the stormwater can be discharged through the throttle freely.



Throttled discharge

Self-regulating throttling thanks to Bernoulli's principle. Outside pressure and internal pull create a pressure difference which causes the membrane to bulge in.



Tube throttle technology

4

Throttle shaft with integrated tube throttle for smaller discharge values

Tube throttles work without auxiliary energy and operate according to so-called Bernoulli's principle. This principle basically states the following: An increase in the speed of a fluid occurs simultaneously with a decrease in pressure. Rising water leads to a higher flow velocity in the throttle, which creates underpressure (pull). This causes the rubber membrane to contract and reduces the throttle cross-section. Thus, less

water can flow through the throttle. This, therefore, allows the realisation of very small discharge values and/or an almost constant throttle curve. Compared to the orifice, a tube throttle generates a relatively constant discharge, irrespective of the water level in the storage/infiltration system/basin. This ensures that the storage/infiltration system empties within the shortest possible time and is available again for the next rainfall.

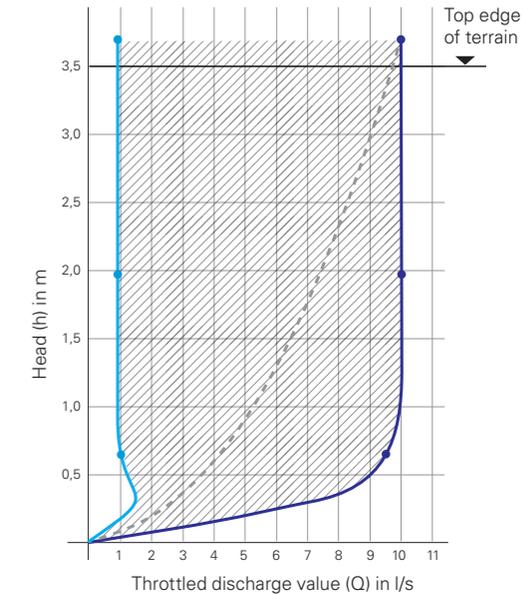


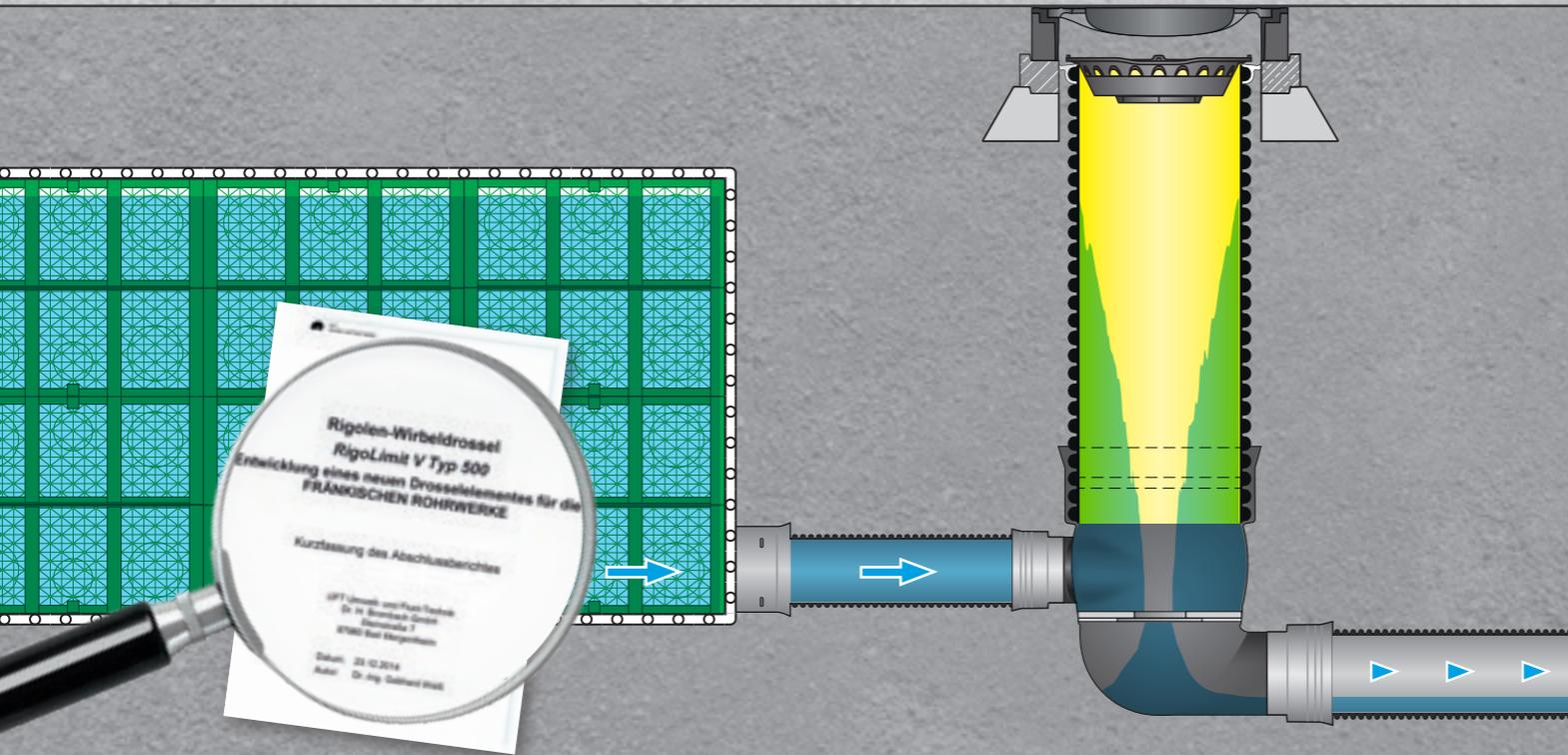
Tube throttle without membrane



Tube throttle with membrane

Qh-characteristic of tube throttle





Rigo[®]Limit V – vortex throttle shaft

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With exchangeable orifice

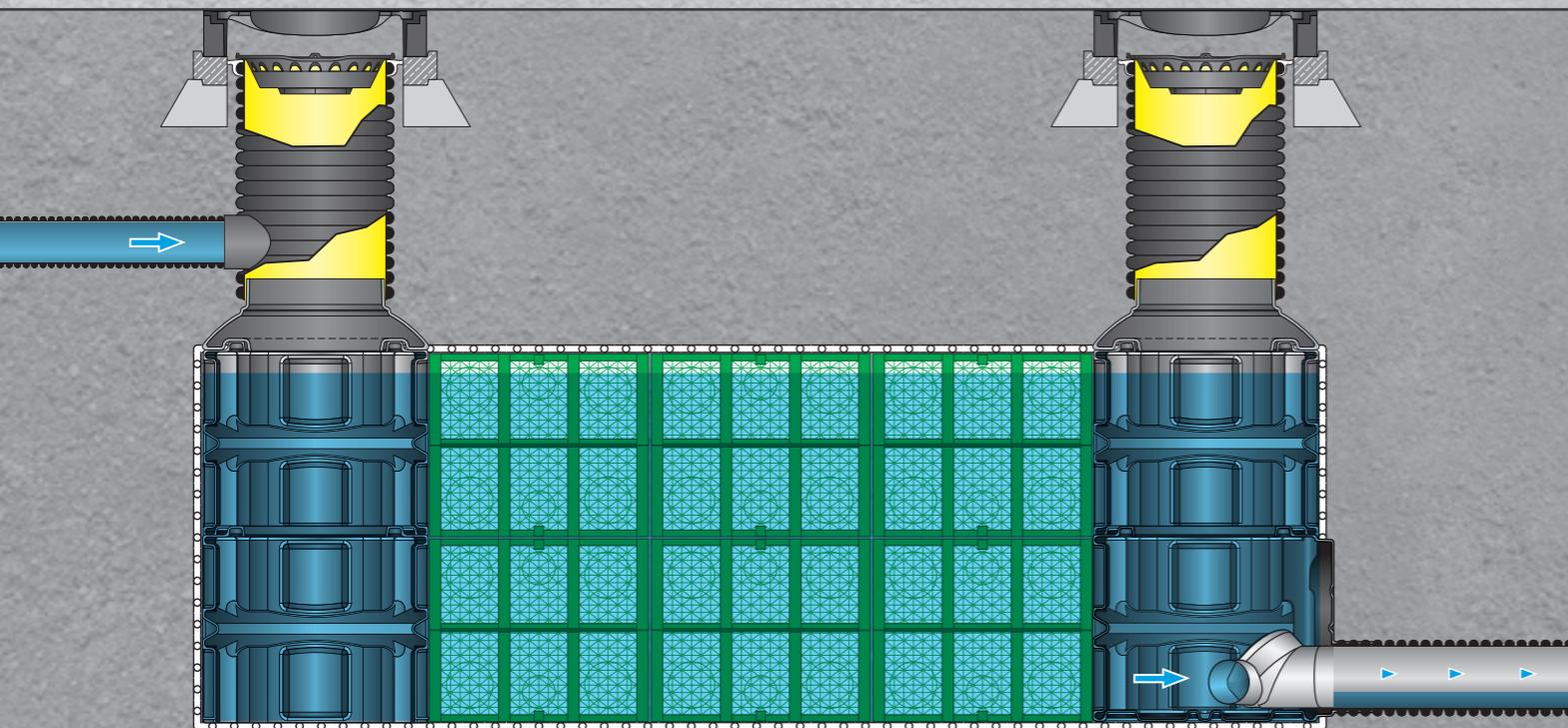
RigoLimit V is so special because the shaft body itself is used as a vortex throttle element. The tangential inflow of water into the shaft body generates a vortex which throttles the discharge in a self-regulating way by hydraulic resistance. The large cross-sectional opening of the orifice minimises the risk of blockages. The energy and cleaning effect of the vortex, too, prevents the outlet from being blocked. In case of small volumes of stormwater, the water can be discharged straight through the large orifice before the vortex forms. RigoLimit V therefore ensures high discharge performance across all operating states.

The RigoLimit V throttle shaft is characterised by especially simple and flexible installation also in existing drainage systems. The shaft is lightweight and does

not have any moveable parts. The product is particularly reliable, wear-free and maintenance-friendly. If the discharge requirements change, for instance, because the size of the collection area changes, the orifice can be exchanged without any problems and thus the discharge performance can be adjusted.

- Delivered ready-to-connect
- Solely hydraulically controlled
- Maintenance-friendly
- Very cost-efficient solution
- Bottom-aligned installation possible





Quadro[®]Limit – throttle shaft with horizontal vortex valve

4

Shaft system with cellular block type structure and project-specific vortex valve

QuadroLimit combines the advantages of the QuadroControl system shaft integrated in the storage/infiltration module with innovative stainless steel vortex valves manufactured by the market leader **UFT Umwelt- und Fluid-Technik Dr. Brombach GmbH**.

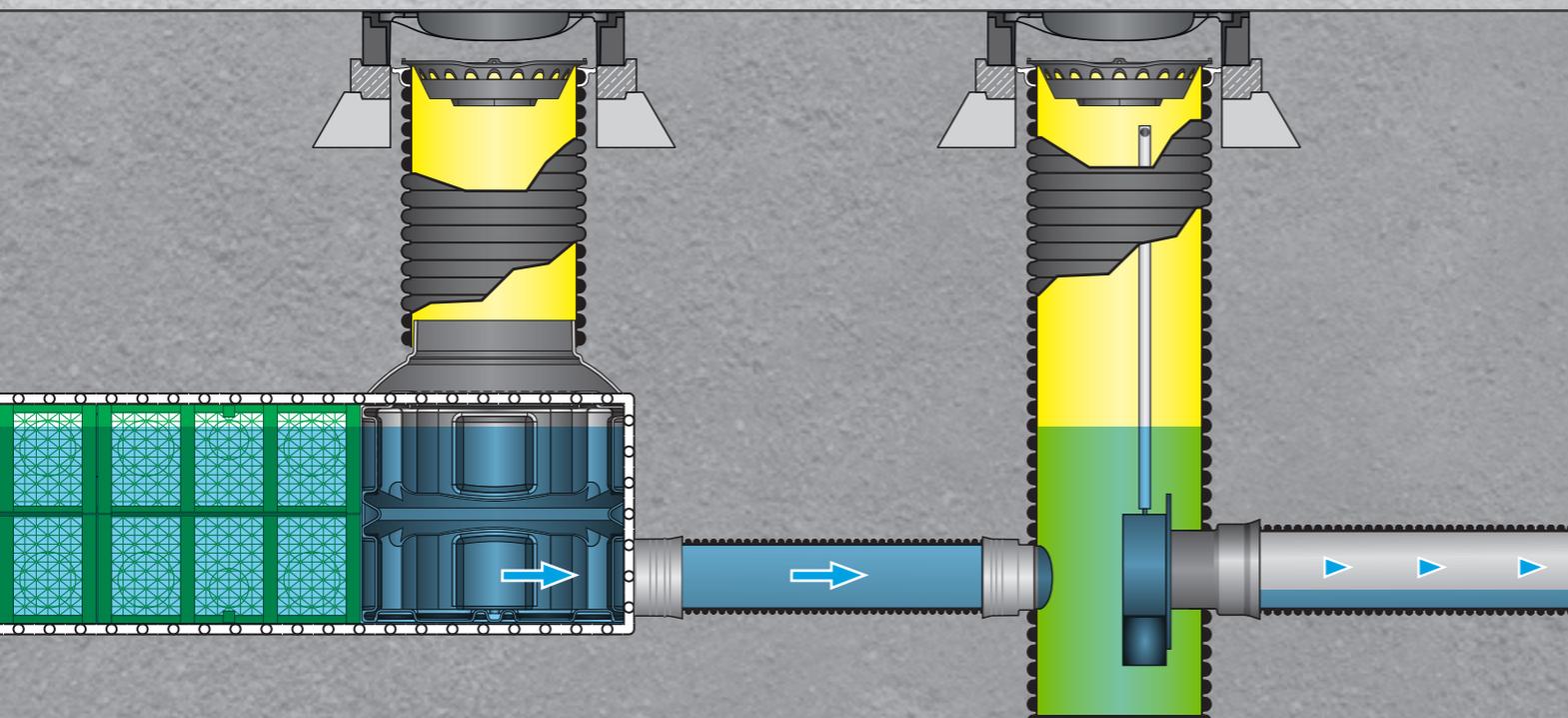
The system design guarantees easy handling. The shaft is delivered to the construction site ready to be connected and with an integrated throttle element. All you have to do is to install it into the excavation pit (no extra excavation required), incorporate it into the layout and connect it. The shaft's bottom-aligned installation allows installation without height loss. The throttle is pre-fabricated to the project needs and does not have to be adjusted on site. This saves money and installation time.

Self-activating vortex valve principle

The vortex valve works according to a simple, all hydraulic operating principle; it is self-activating and does not require any external power supply. The water level in storage/infiltration systems changes depending on the time during or after rainfall from the filling phase to the discharge phase. The vortex valve adapts perfectly to each situation.

- Delivered ready-to-connect
- Solely hydraulically controlled
- Maintenance-friendly
- High operational reliability





AquaLimit – throttle shaft with vertical vortex valve

4

With project-specific vortex valve

An alternative to concrete shafts

AquaLimit is a space-saving, maintenance-friendly alternative to common concrete shafts with separately installed vortex valve in particular in urban drainage, e.g., in residential estates or in traffic areas.

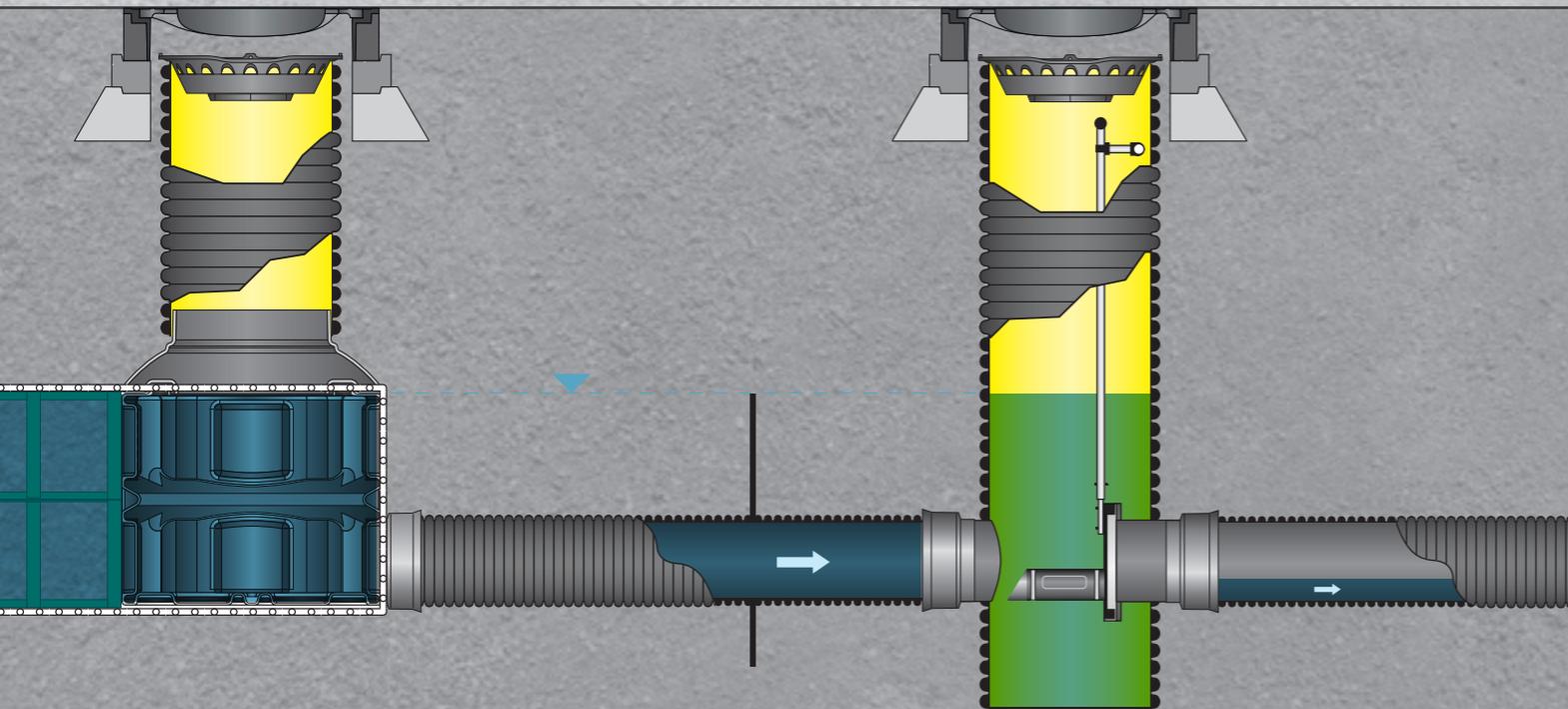
Reliable vortex valve technology

The vortex valves from the manufacturer UFT Umwelt- und Fluid-Technik Dr. Brombach GmbH used for AquaLimit are suitable for high pressure cleaning, robust and chemically resistant. They are self-activated through flow effects and controlled solely hydraulically so that they do not require any external energy supply. Maintenance is reduced to a minimum: The throttle is in the intended stainless steel channel.

For maintenance or emergency emptying of the system, it is removed from above-ground, cleaned and put back in place – without requiring access to the shaft. If the size of the storage/infiltration system or the storage basin and thus the amount of water being discharged changes, the throttle outlet can be subsequently adjusted.

- Delivered ready-to-connect
- Solely hydraulically controlled
- Maintenance-friendly
- Bottom-aligned installation possible





AquaLimit tube – throttle shaft with tube throttle

4

Throttle shaft with integrated tube throttle for smaller discharge values

AquaLimit tube is a modular polypropylene (PP) throttle shaft D_o 600 that is suitable for many applications and features an integrated tube throttle produced by **UFT Umwelt- und Fluid-Technik Dr. Brombach GmbH**. AquaLimit tube combines a strong discharge performance with highest operational reliability.

The modular shaft is characterised by its steep Q(h) characteristics, its short delivery time, and its easy installation. The removable tube throttle can be maintained and the vortex outlet can be adjusted subsequently.

Stormwater retention systems discharge quickly but at the same time in a controlled manner that does not harm the discharge point. Therefore, the entire storage volume is quickly available for the next rainfall.

For maintenance or emergency emptying of the system, the tube throttle is removed from aboveground, cleaned and put back in place – without requiring access to the shaft. If the size of the storage/infiltration system or the storage basin and thus the amount of water being discharged changes, the throttle outlet can be subsequently adjusted.

- Delivered ready-to-connect
- Self-activating and hydraulically controlled – no external power supply
- Same-level
- Small discharge values can be realised
- Bottom-aligned installation possible
- Vertical throttle characteristic



FRÄNKISCHE

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TRANSPORT

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TREATMENT

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STORAGE

4

DISCHARGE

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