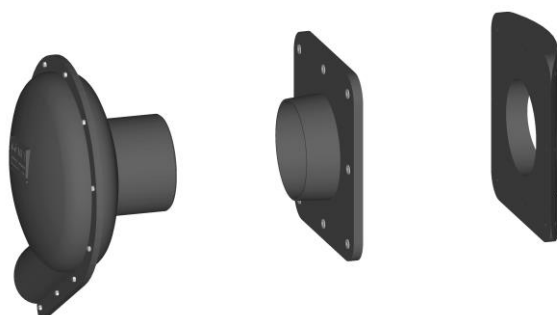
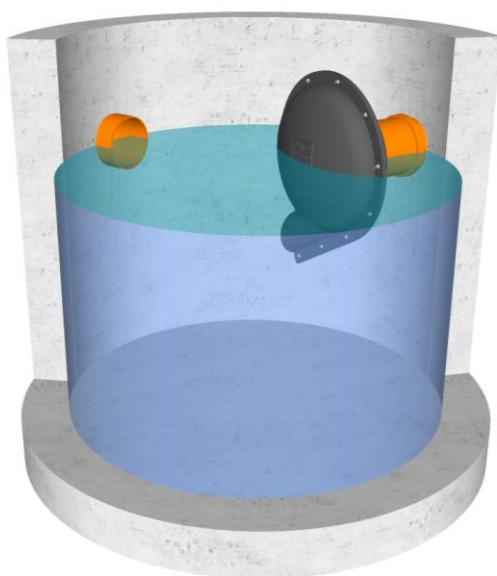


Flow control  
Level control  
Check valves  
Coarse Filtering devices  
Monitoring devices  
Closing Valves  
Gutters



## FluidVertic VSU

Vertically vortex valve



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### Area of use

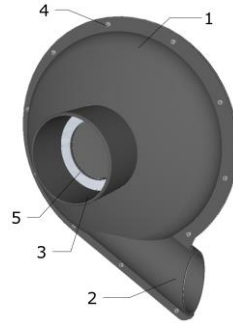
An overloaded storm water network may lead to basement flooding. A suitable flow regulator provides good control of surface water discharge to the drainage network and reduce the risk of overloads and flooding. The properties of the flow controller are crucial for the system's function and operation.

### Characteristics

*FluidVertic VSU* is a flow regulator for separated storm water. It ensures accurate regulation and is aimed for small to medium-sized water flows. *FluidVertic* has a large flow cross-section, typically four times as large as a traditional orifice plate, which significantly reduces the risk of clogging. *FluidVertic VSU* is hydraulically tested and comes with a capacity guarantee. The outlet is shaped as a spigot for easy installation against standard PVC sockets (socket is not included in the delivery)

Type:	vortex valve
Modus:	wet installation
Medium:	Separated Stormwater
Dimensions (outlet):	DN110-DN315 spigot
Capacity (at 1.2 m pressure):	0.4 – 45 [l/s]

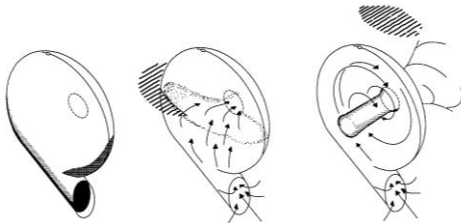
- Reliable (no moving parts, large flow cross section)
- Accurate (+/-10% guaranteed)
- Easy and quick installation



Description	Material
1 Housing,	Polyurethane
2 Inlet	Polyurethane
3 Outlet	Polyurethane
4 Bolts	stainless 316
5 Orifice plate	stainless 316
7 Mounting plate	-
8 Mounting bolts (expansion bolts)	-

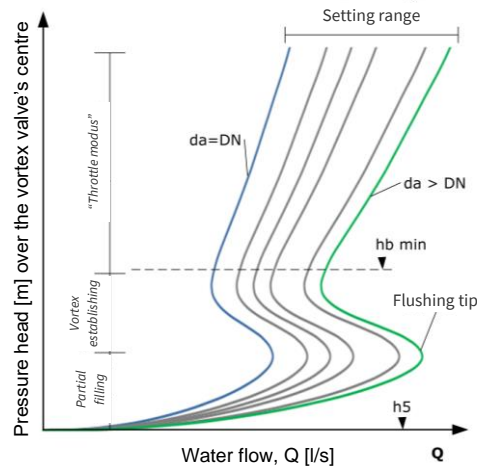
### Function

The vortex valve consists of a circular chamber with a tangential inlet. The outlet is horizontal and oriented normally to the housing. *FluidVertic STD* is mounted on the outlet of the manhole or stormwater detention tank.



When the water level is lower than invert of the orifice, no water will pass through the vortex valve. The inlet is permanently submerged, which enables the withholding of floating particles and low-density fluids (like oil). When partially filled, the water flows through with little resistance. As the water level reaches the top of the chamber, a vortex with an air-filled core is established within the device. The flow resistance is now distinctly stable and predictable.

The dimensions of the vortex chamber, and the nozzle opening ( $d_a$ ), determine the vortex chamber's capacity and hydraulic properties (see figure to the right). *FluidVertic* is adaptable and can be tailored to the desired dimensioning water flow ( $Q_b$ ) at dimensioning pressure ( $h_b$ ).



The smallest models of *FluidVertic VSU* are aimed for small water flows with a relatively small flow cross-section area. To reduce the risk of clogging due to floatables and particles, effective upstream measures should be taken to prevent floating particles from reaching the vortex valve's inlet (submerged outlet from upstream manhole, scum board or similar). Emergency overflows and flood roads are recommended in the event of a blockage and high loads.

### Dimensioning and specification

We offer several models with different capacities and sizes (See the model overview and selection section).

#### Dimensioning criterias

When choosing a vortex chamber, the dimensioning point is defined as follows:

- Design flow,  $Q_b$  (l/s)
- Design pressure head,  $h_b$  (mWc).

Normally,  $Q_b$  corresponds to the discharge permit given by the local authorities. The design water level,  $h_1$ , equals to maximum water level above the submerged vortex valve. Note that at water level higher than  $h_1$ , water flow will exceed  $Q_b$ .

#### Outlet pipe from vortex chamber

The capacity guarantee requires the outgoing pipe is dimensioned for "free flow". This corresponds to a maximum of approx. 60-70% filling of the pipe at design flow. If the outlet diameter of the vortex chamber deviates from the downstream pipe dimension, a transition piece can be installed minimum 1-2 m downstream of the vortex chamber, provided "free outlet" is obtained.

#### Design of manhole

*FluidVertic* has a submerged inlet, and requires a minimum distance to the manhole floor. In subsequent tables, the minimum distance,  $b$ , is specified. If there are no upstream sand traps, further increment of  $b$  should be considered to obtain sufficient sedimentation volume.

Access to the vortex chamber must be ensured to allow for inspection and maintenance. Manhole and openings must be sufficient sized to allow removal of the vortex valve without this requiring removal of the surrounding structure. Ref mounting opening,  $D_m$ . In installations where it is necessary to easily relieve upstream pressure, in the event of a blockage, a by-pass with a valve should be considered.

#### Generally

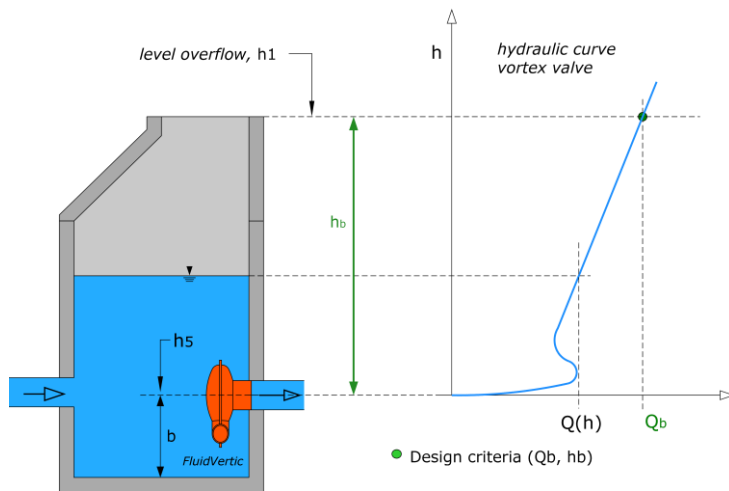
The system should be designed so that the throttling of the water primarily takes place in the vortex chamber, and not in the upstream and downstream pipe system.

#### Specification text

*Vertically submerged vortex valve, customizable with documented and performance. Made in Polyurethane. Mounting on outlet against PVC socket.*

Design water rate,  $Q_b$  : \_\_\_\_\_ l/s

Design pressure head,  $h_b$  : \_\_\_\_\_ mWc



$h_b = h_1 - h_5$  (design pressure height)

"free flow" (max 60-70% filling at  $Q_b$ )

## Accessories

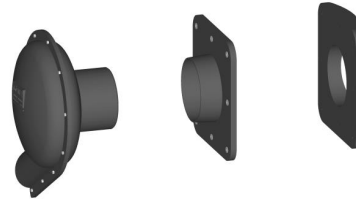
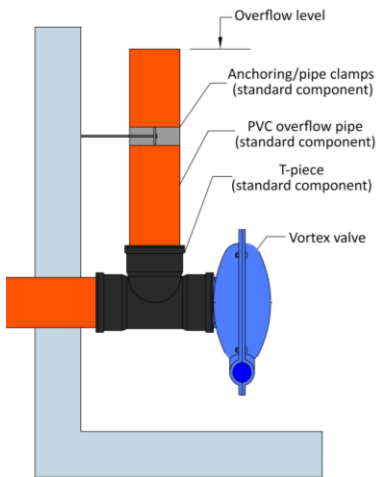
### Mounting plate and filler piece

The vortex valve can be equipped with a mounting plate with gasket and expansion bolts for anchoring to the wall. The mounting plate can be supplied with a suitable filler piece, which allows mounting against a curved wall.

### Integrated emergency overflow

An integrated emergency overflow can be set up by installing a T-piece on the vortex valve outlet. If the water level exceeds the overflow level, the water will bypass the throttle. Anchoring the vertical overflow onto the manhole's wall is recommended. Standard PVC pipe components are used.

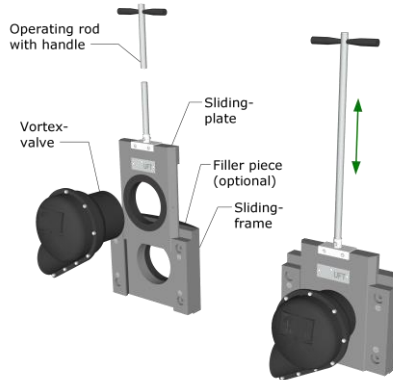
**Note:** During overflow, the vortex valve will not reduce the total flow rate discharged downstream. Make sure this is accepted by the local Authorities, prior to installation



Mounting plate and filler piece

### Slide plate / By-pass

MFT can supply the vortex valve with a sliding frame and sliding plate. This solution permits the valve to be easily elevated to ground level for inspection and maintenance, and to by-pass the vortex valve if required. The sliding frame can be equipped with a filling piece, which allows mounting directly against a curved wall.



## Installation

### With spigot (standard delivery)

FluidVertic STD has a standard PVC sized spigot on the outlet (dimension DN110 or DN160 depending on model). The vortex valve is easily mounted against the corresponding PVC socket. For details, reference is made to Installation and Maintenance Instructions.

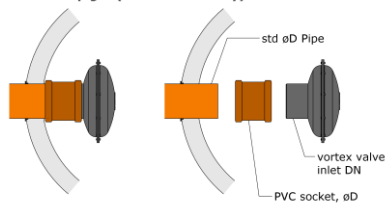
### With mounting plate and filler piece (accessory)

The outlet pipe is terminated edge-to-edge with the internal manhole wall. The mounting plate with gasket surrounds the outlet pipe. A filler piece enables anchoring directly to a curved wall.

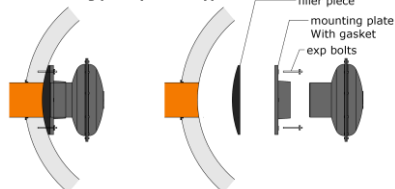
### Operation and maintenance.

FluidVertic has no moving parts and requires little maintenance. The required maintenance interval depends on local conditions and the water quality (content of particles, sediments etc.). Well established routines for emptying sand/mud in the manhole and removal of floating particles are essential to reduce risk of clogging. See also Installation and Maintenance Instructions.

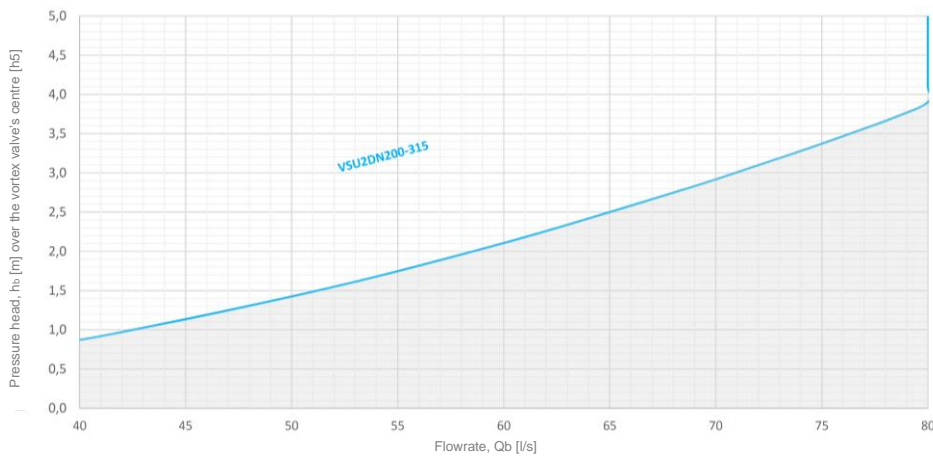
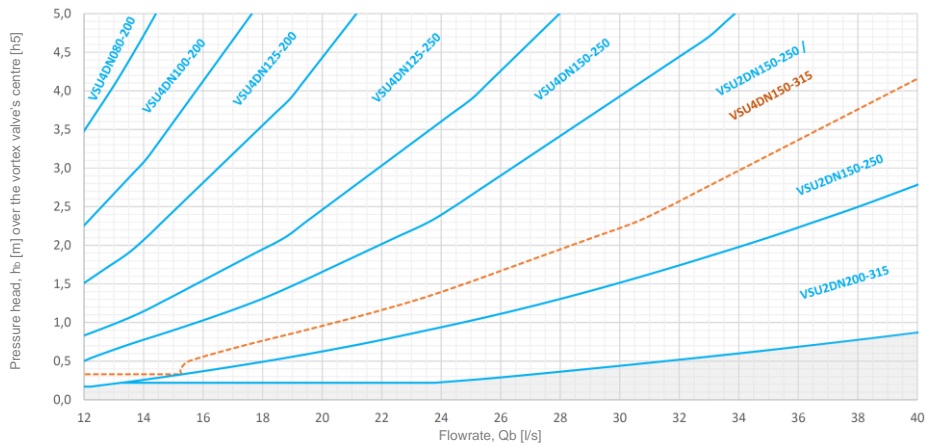
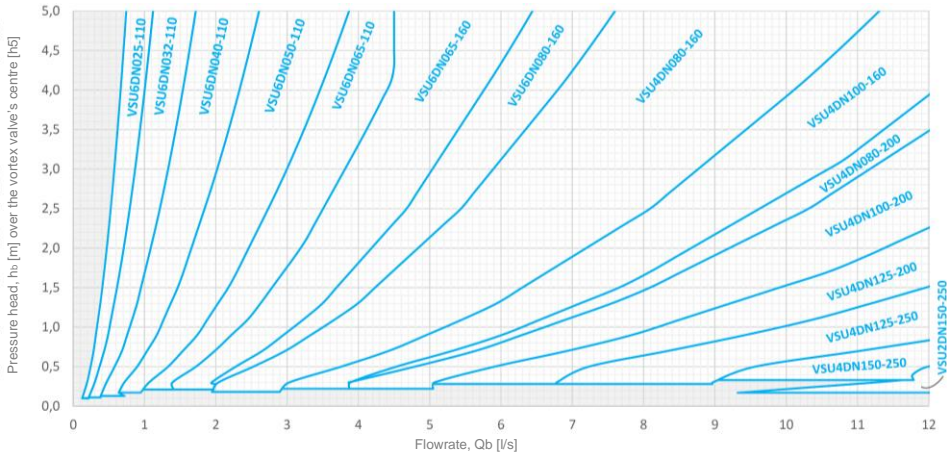
### With Spigot (standard delivery)



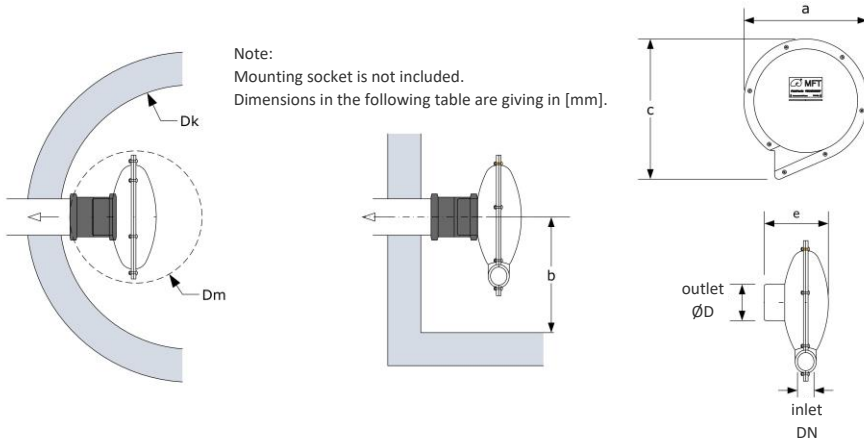
### Mounting plate (accessory)



Model selection



Models overview



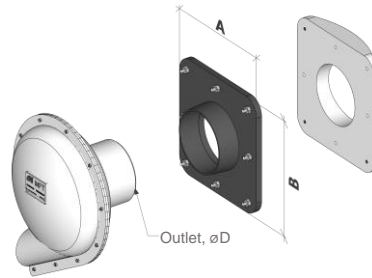
Product nr.	outlet øD	b min <sup>1)</sup>	Dk min	Dm min	inlet DN	a	c	e	Weight [kg]	Reliability note
VSU6DN025P-110	110 pvc	250	1000	400	25	175	210	110	1.5	Small flow cross-section. Measures to prevent particles from reaching the flow regulator and regular operating routines are recommended
VSU6DN032P-110	110 pvc	250	1000	400	30	225	265	135	1.7	
VSU6DN040P-110	110 pvc	250	1000	400	40	320	360	170	2.2	Relatively small flow cross-section. Measures to prevent larger particles from reaching the flow regulator should be considered (foam screen.
VSU6DN050P-110	110 pvc	350	1000	400	50	375	425	195	2.2	
VSU6DN065P-110	110 pvc	400	1000	500	65	460	545	220	5.3	
VSU6DN065P-160	160 pvc	400	1000	500	65	460	545	260	5.3	
VSU6DN080P-160	160 pvc	500	1000	600	80	550	625	310	3.7	
VSU4DN080P-160	160 pvc	420	1000	500	80	400	485	240	3.7	
VSU4DN080P-200	200 pvc	420	1000	500	80	400	485	260	3.7	
VSU4DN100P-160	160 pvc	500	1000	600	100	480	595	280	4.8	
VSU4DN100P-200	200 pvc	500	1000	600	100	480	595	320	4.8	
VSU4DN125P-200	200 pvc	600	1200	650	125	580	720	340	5.7	
VSU4DN125P-250	250 pvc	600	1200	650	125	580	720	340	5.7	
VSU4DN150P-250	250 pvc	700	1200	800	150	680	850	380	7.5	
VSU4DN150P-315	315 pvc	700	1200	800	150	680	850	450	7.5	
VSU2DN150P-250	250 pvc	700	1000	650	150	360	465	330	5.0	
VSU2DN200P-315	315 pvc	700	1000	650	200	480	620	450	9.0	

Commented [DO1]: Where are the values?

**Note 1):** The stated 'b min' is the minimum distance. When determining the height 'b', the expected supply of sand/sludge and the desired emptying frequency should be considered. In the absence of any upstream sand trap, 'b' should be increased beyond the specified 'b min'. A small sludge volume will require more frequent emptying to avoid clogging.

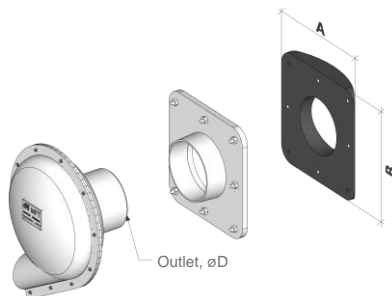
#### Accessories

##### Monting plates (PUR)



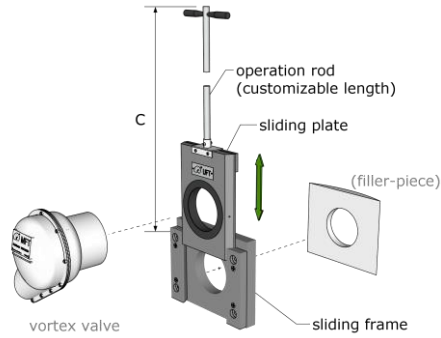
Product no	Dimension (øD) [mm]	A [mm]	B [mm]	Weight [kg]
MP-PUR110	110	300	300	0,9
MP-PUR160	160	350	350	1,3
MP-PUR200	200	400	400	1,7
MP-PUR250	250	450	450	2,2
MP-PUR315	315	500	500	2,8

##### Filler pieces - flexible (PUR)



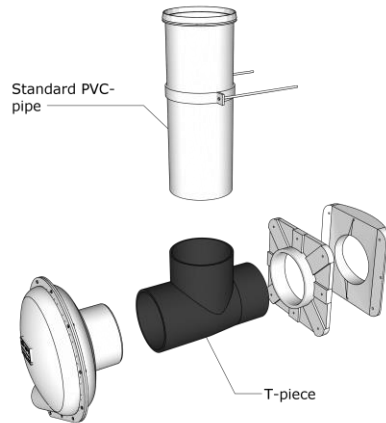
Product no	Dimension (outlet, øD) [mm]	Manhole diameter (min - max) [mm]	A [mm]	B [mm]	Weight [kg]
FS-PUR110-8/24	110	800-2400	300	300	1,4
FS-PUR160-8/24	160	800-2400	350	350	2,3
FS-PUR200-8/20	200	800-2000	400	400	2,5
FS-PUR250-8/24	250	800-2400	450	450	3,5
FS-PUR315-10/24	315	1000-2400	500	500	4,1

### Sliding system



Product no	Dimension (outlet, øD) [mm]	C
VGD-110	110	customizable
VGD-160	160	customizable
VGD-200	200	customizable

### Integrated overflow



Dimension (outlet, øD)	Product no	Description	Weight [kg]	Product no	Description
110	T-MR110	T-piece	0,5	IO-P110	Vertical pipe, including mounting clamp
160	T-MR160	T-piece	1,1	IO-P160	Vertical pipe, including mounting clamp
200	T-MR200	T-piece	2,2	IO-P200	Vertical pipe, including mounting clamp
250	T-MR250	T-piece	3,2	IO-P250	Vertical pipe, including mounting clamp
315	T-MR315	T-piece	5,6	IO-P315	Vertical pipe, including mounting clamp