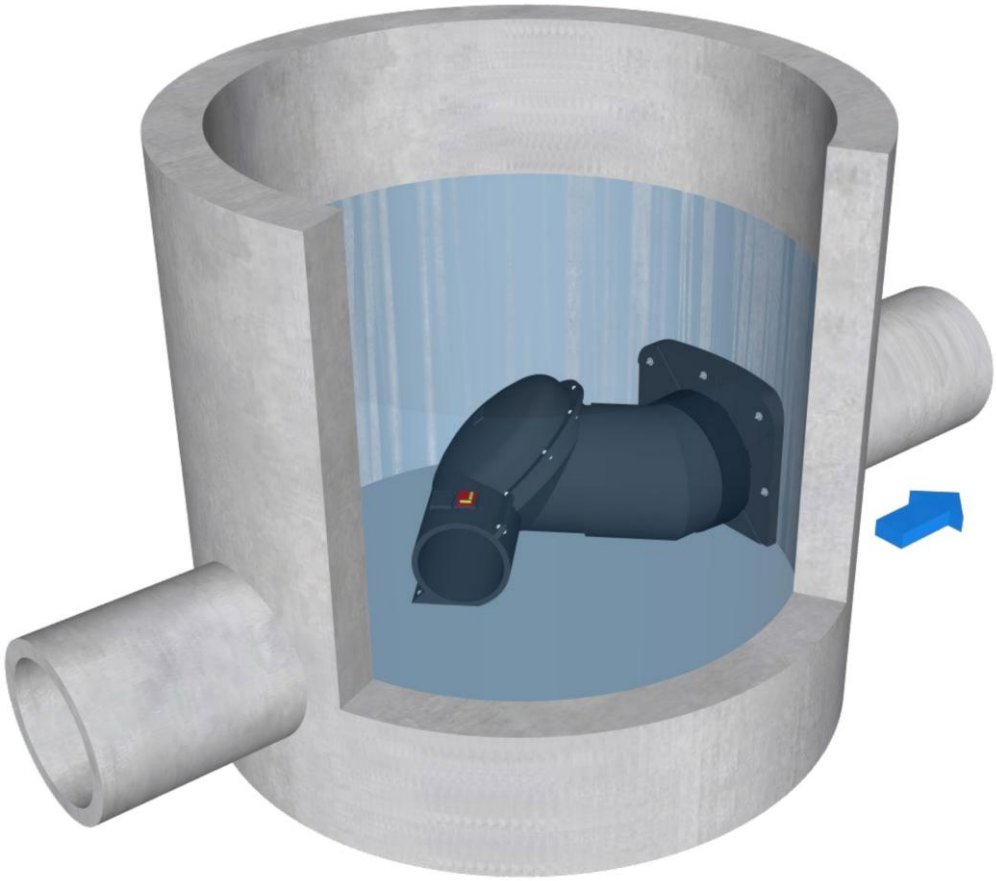
Pionerer i regnvannshåndtering

FluidCon SUn

Conical wet-installed vortex flow regulator

Product information











Miljø- og Fluidteknikk AS accepts no liability for any errors in its product information, data sheets, instructions, brochures or other printed material, and reserves the right to revise printed material and to modify its products without prior notice. This also applies to products included in confirmed orders, provided that the agreed specifications are not changed. Revised editions of the product information are published at www.mft.no

Applications

An overloaded sewer network leads to basement flooding and pollution through overflow discharges. A suitable flow regulator provides good control of water volumes and flow rates (hydraulic control), and helps to reduce the risk of overloading.

Detention facilities: Balancing the inflow of stormwater to the sewer network during rainfall and snowmelt requires the outflow from the storage to be regulated. The characteristics of the flow regulator are crucial to the function and operation of the facility.

Sedimentation facilities: A good flow regulator prevents overloading, provides optimum settling conditions and increases efficiency.

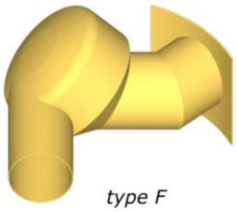
Features

FluidCon SUn is an accurate, custom-designed and wet-installed vortex flow regulator for stormwater, specially developed for medium to large flow rates. FluidCon SUn has a large flow cross-section. The opening is typically 4-5 times larger than a conventional throttled outlet under the same conditions. This reduces the risk of clogging and ensures reliable operation. *FluidCon SUn* is hydraulically tested and supplied with a capacity guarantee. The vortex flow regulator is tailored to the flow and head requirements of the project. FluidCon is a horizontal vortex flow regulator that can be installed at the bottom of the manhole.

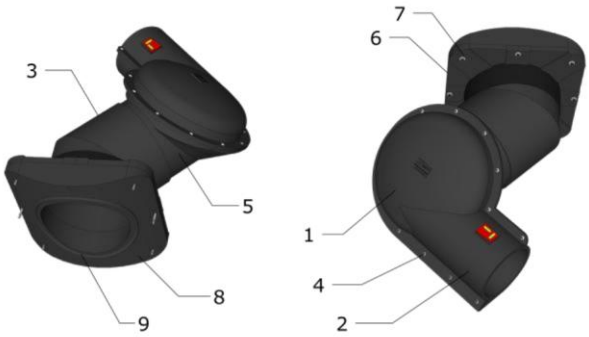
Type:	vortex flow regulator
Mode:	wet-installed
Medium:	stormwater
Dimensions (outlet):	D200-D1000
Capacity (at 1,5m head):	Approx. 6-750 l/s

- Reliable operation (no moving parts and low risk of clogging)
- Accurate (capacity guarantee +/- 10% at design point)
- High capacity

For flow rates up to approx. 250 l/s, FluidCon SUn is available in a PUR version (type P). These are partly prefabricated and can be delivered quickly. Models with greater capacity are custom-made in GRP.



type F



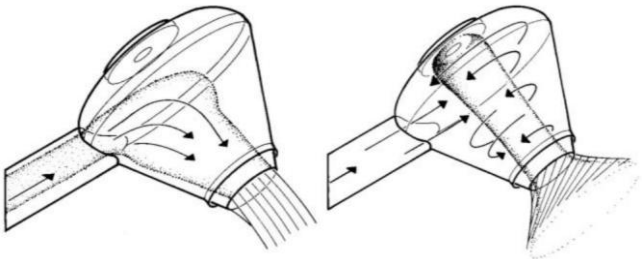
type P

	Description	Type P	Type F
1	Vortex housing	Polyurethane	GRP
2	Inlet	Polyurethane	GRP
3	Outlet	Polyurethane	GRP
4	Bolts	316 stainless	-
5	Nozzle cone	Polyurethane	GRP
6	Mounting plate	Polyurethane	GRP
7	Mounting bolts (exp.)	316 stainless	316 stainless
8	Filler piece	PE	-
9	Gasket	Cellular foam	Cellular foam

Function

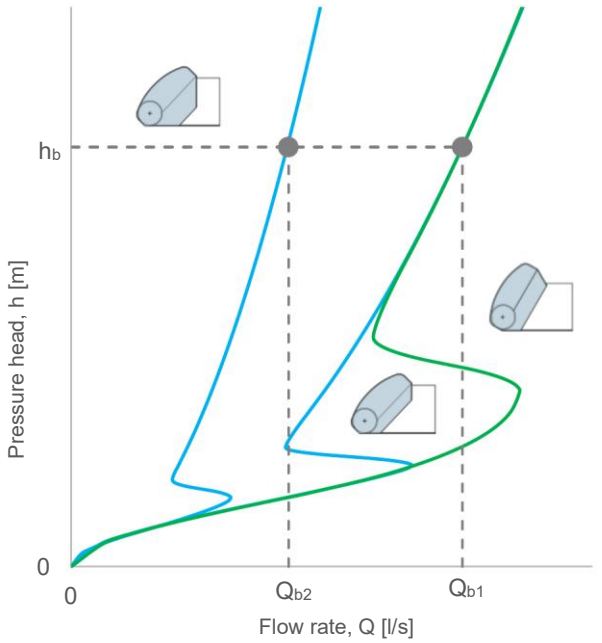
The vortex flow regulator consists of a circular chamber (volute) with a tangential inlet. The outlet is horizontal and oriented perpendicular to the volute. *FluidCon SUn* is mounted on the outlet of the storage tank or manhole.

At water levels below the inlet invert, no water passes through the vortex flow regulator. At partial filling, the water flows through with little resistance. As soon as the water level reaches the top of the vortex housing, a vortex with an air-filled core forms in the volute. The flow resistance is now high and stable.



The size and inclination of the vortex housing, the size of the inlet and the nozzle opening determine the capacity and hydraulic characteristics of the vortex flow regulator (see the figure on the right). We offer a wide range of models.

This provides great flexibility and allows us to tailor the vortex flow regulator to the required design flow rate (Q_b) at the design pressure head (h_b).



Sizing and specification

We offer a range of models with different capacities and sizes (see the overview and guide in the last part of this product information).

Design point

To select the right vortex flow regulator, the design point is defined as follows:

- Design flow rate, Q_b (l/s)
- Design pressure head, h_b (mVs).

Normally, the design flow rate, Q_b, is set equal to the discharge permit, and the design water level, h_1, equal to the level of the full detention storage. The flow rate increases as the water pressure rises, and reaches Q_b when the storage is full. Note that at water levels higher than h1, the flow rate will exceed Q_b. Alternatively, h1 can be set equal to the emergency overflow level (see the figure below).

Mean flow rate

A high mean flow rate through the flow regulator gives better use of the storage and can reduce the required detention volume. We can adapt the vortex flow regulators to any requirements for the mean flow rate, Q_m. Contact us for assistance.

Outlet pipe from the vortex flow regulator

The capacity guarantee requires the outlet pipe from the vortex flow regulator to be sized for "free outlet". This corresponds to a maximum of approx. 50-60% pipe filling at the design flow rate. If the outlet diameter of the vortex flow regulator differs from the downstream pipe size, a transition can be installed min. 1-2 m downstream of the vortex flow regulator, provided there is "free outlet".

Manhole design

FluidCon SUn is a horizontal vortex flow regulator designed for installation on the manhole floor (the smaller models can also be mounted higher up on the manhole wall). If the vortex flow regulator manhole is the primary sand trap in the system, the vortex flow regulator must be installed at a distance from the manhole bottom.

Access to the vortex flow regulator must be provided for inspection and maintenance. It is recommended that the size of the manhole shaft and cover allows the vortex flow regulator to be removed without any excavation or removal of the surrounding structure. See installation opening, D_m. At facilities where the upstream pressure must be relieved in the event of clogging of the flow regulator, a bypass solution should be considered. A bypass solution can be designed as an additional outlet from the manhole, fitted with a shut-off valve. FluidCon can be fitted with a 45-degree bend at the outlet. This reduces the required manhole size.

General

The facility should be designed so that the water is throttled mainly in the vortex flow regulator, and as little as possible in the upstream and downstream pipe sections. The pipe sections should therefore be designed with good capacity (NB gradient). This is particularly important where there are long distances between the vortex flow regulator and the upstream detention volume, so that the head loss, h_t, can be neglected. To ensure that the upstream storage volume empties completely, the inlet invert level of the vortex flow regulator, h_5, must be set equal to or lower than the lowest level of the detention volume.
Note: There is a small head loss through the vortex flow regulators. The level difference between the inlet and outlet invert is defined for each model and is between 30-55mm (see the model overview at the end of the document).

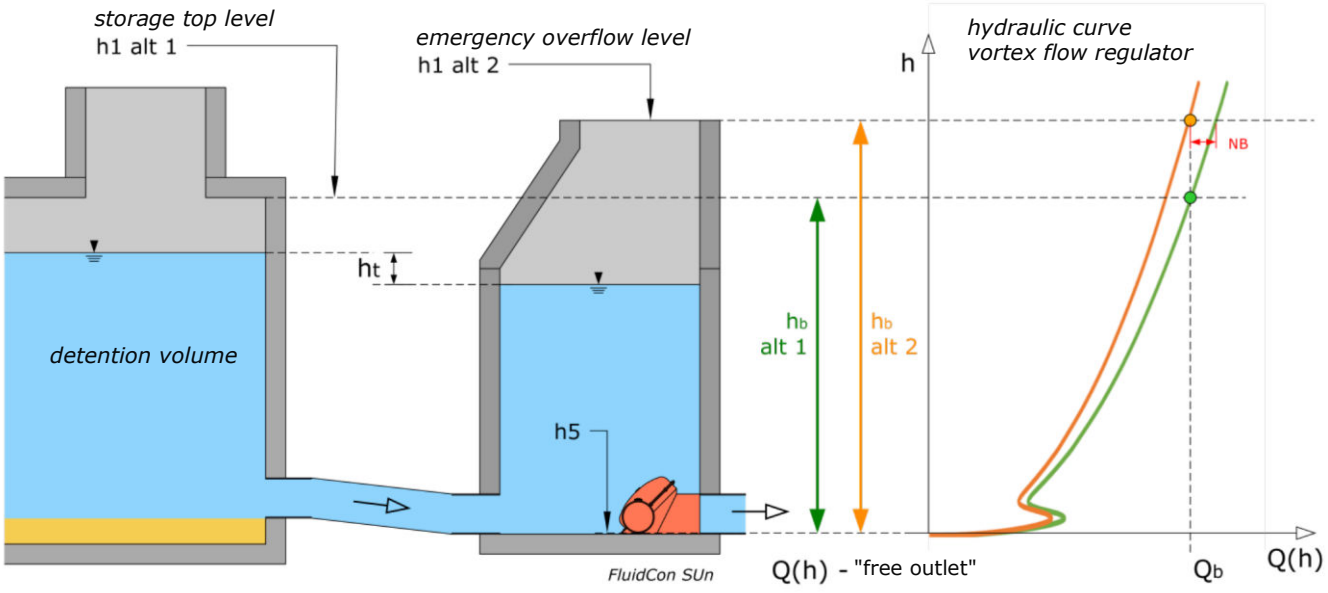
Specification text

Conical wet-installed vortex flow regulator. Custom-designed flow regulator with capacity guarantee and documented performance.

Design flow rate, Q_b : _____ l/s

Design pressure head, h_b : _____ mVs

Filler piece for mounting plate, manhole diameter, D_{kum} : _____mm



hb=h1-h5 (design pressure head)

ht = head loss between storage and vortex regulator manhole (normally negligible if the pipe section has good capacity)

"Free outlet" recommended. Corresponds to max. approx. 50-60% pipe filling at design flow rate, Qb

- Design point alt 1
- Design point alt 2

Accessories

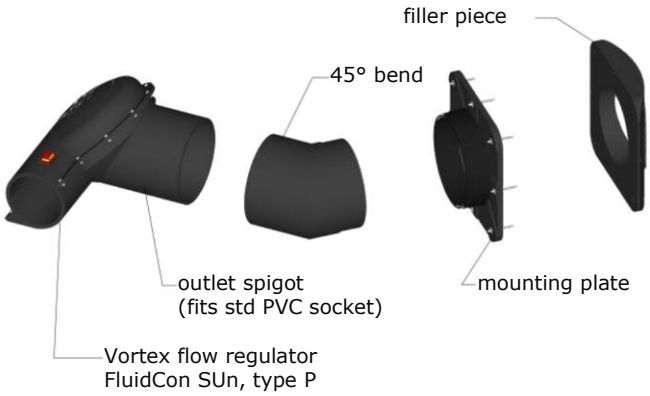
Mounting plate

Type F is supplied with a mounting plate as standard. The mounting plate can be adapted to a curved manhole wall.

The type P models are supplied with a standard spigot end at the outlet. These can be installed using a spigot/socket connection (note: support may be required). For all P models we can also offer mounting plates in PUR. The mounting plate can be supplied with a matching PE filler piece that allows mounting against a curved wall.

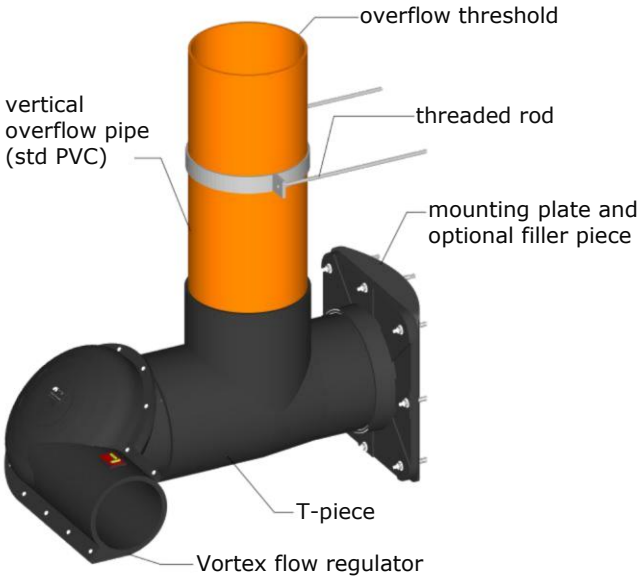
45° Bend Outlet

FluidCon is a horizontal vortex flow regulator. A 45-degree bend at the outlet of the vortex flow regulator makes it more space-efficient and can reduce the required manhole size. The 45° bend is standard equipment on the type F models. For the P models, the 45° bend is supplied as an accessory.



Integrated Emergency Overflow

The emergency overflow is created by fitting the outlet pipe of the vortex flow regulator with a T-piece and a vertical pipe. If the water level exceeds the overflow threshold, the water bypasses the vortex flow regulator. The figure below shows type P. A similar solution is available for type F.



Note: local regulations should be checked to confirm whether an integrated overflow is permitted.

Installation

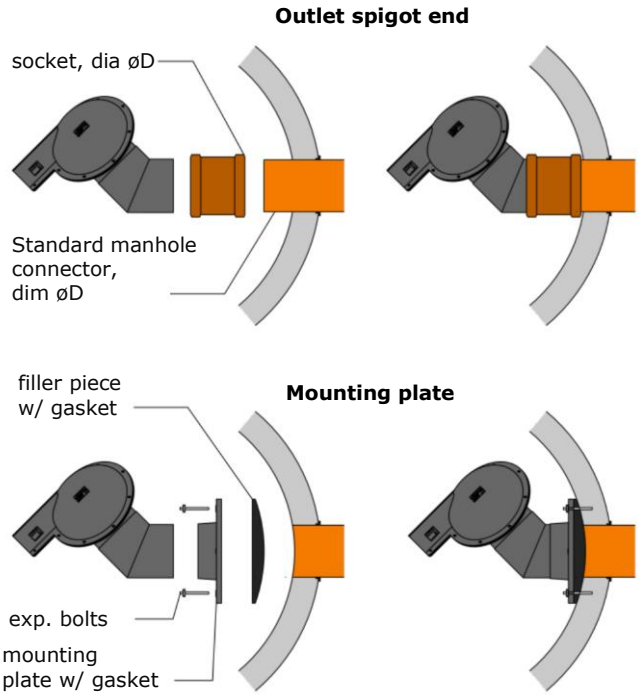
FluidCon SUn is installed on the outlet in a manhole. The vortex flow regulator can be placed at the bottom of the manhole, and for the larger models this is mandatory. See the Installation and Maintenance Instructions for details.

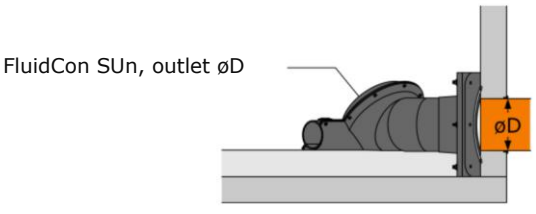
With spigot for connection to std PVC socket

Models with outlets up to D-400 can be connected to a standard PVC socket. A standard manhole connector is installed, with a stub available on the outlet pipe and socket. The vortex flow regulator is connected to the matching PVC socket and locked with "set screws". If required, the fixing can be reinforced with threaded rods anchored in the flanges of the vortex housing.

With mounting plate and filler piece (accessory)

As an accessory, we offer a mounting plate with gasket and expansion bolts for anchoring to the manhole wall. This is mandatory for models with outlets larger than D-400. The mounting plate can be supplied with a matching filler piece, which allows mounting against a curved wall. A standard manhole connector is installed. The outlet pipe ends flush with the inner manhole wall. The mounting plate with gasket surrounds the outlet pipe in the manhole and is adapted to the relevant manhole diameter.

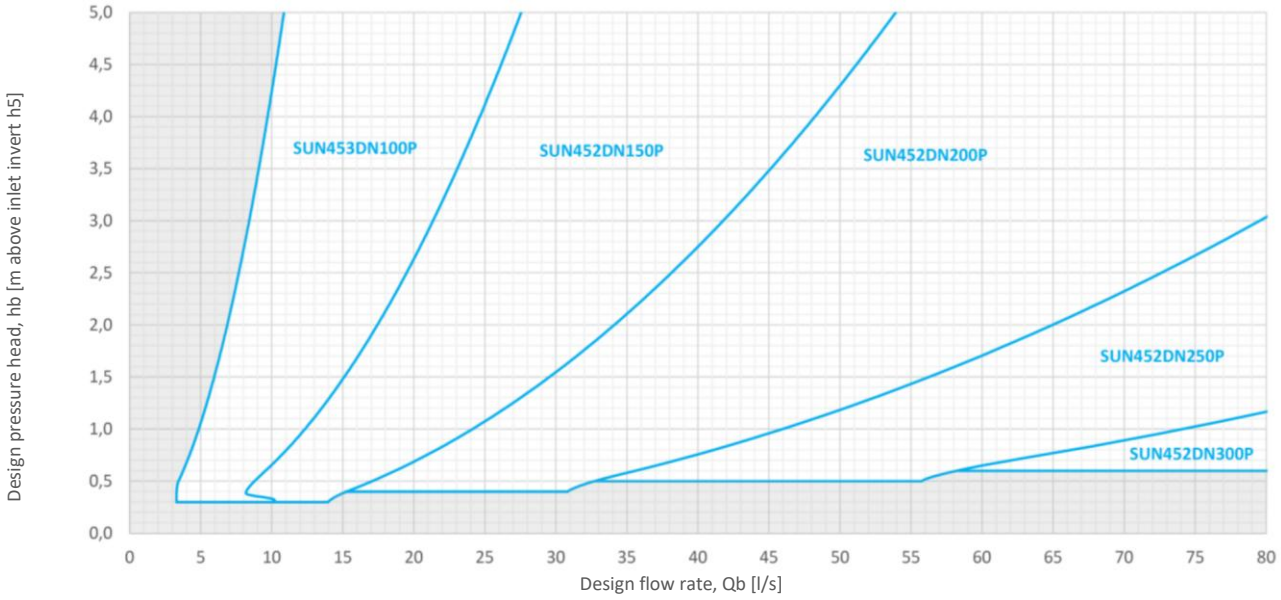


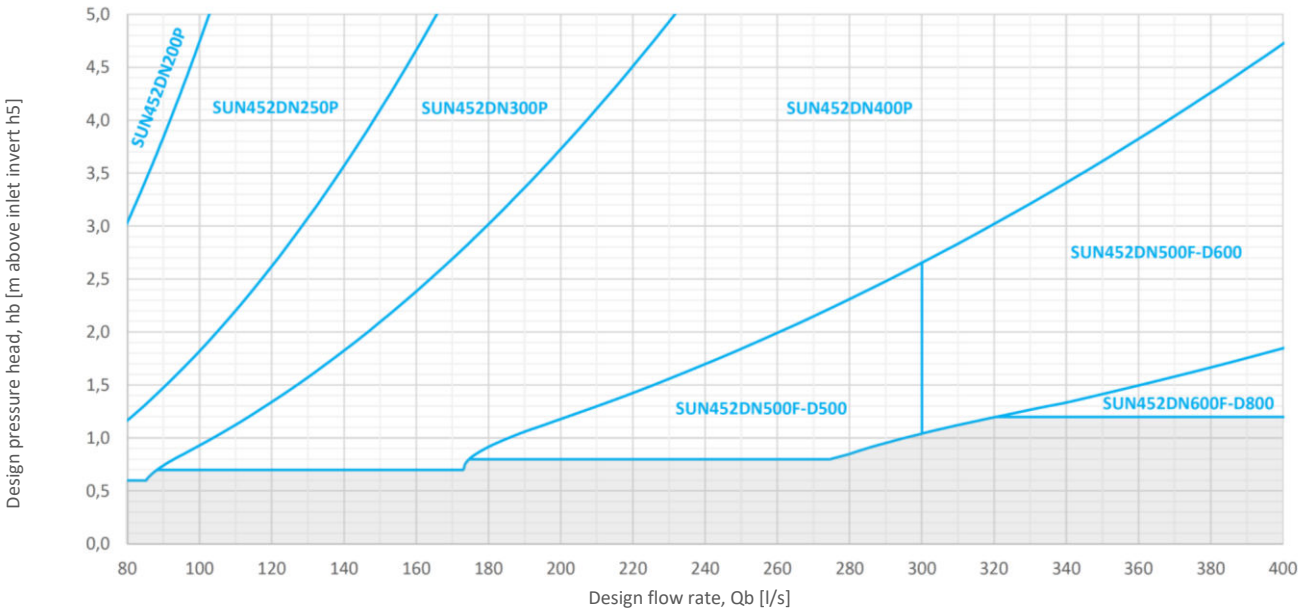


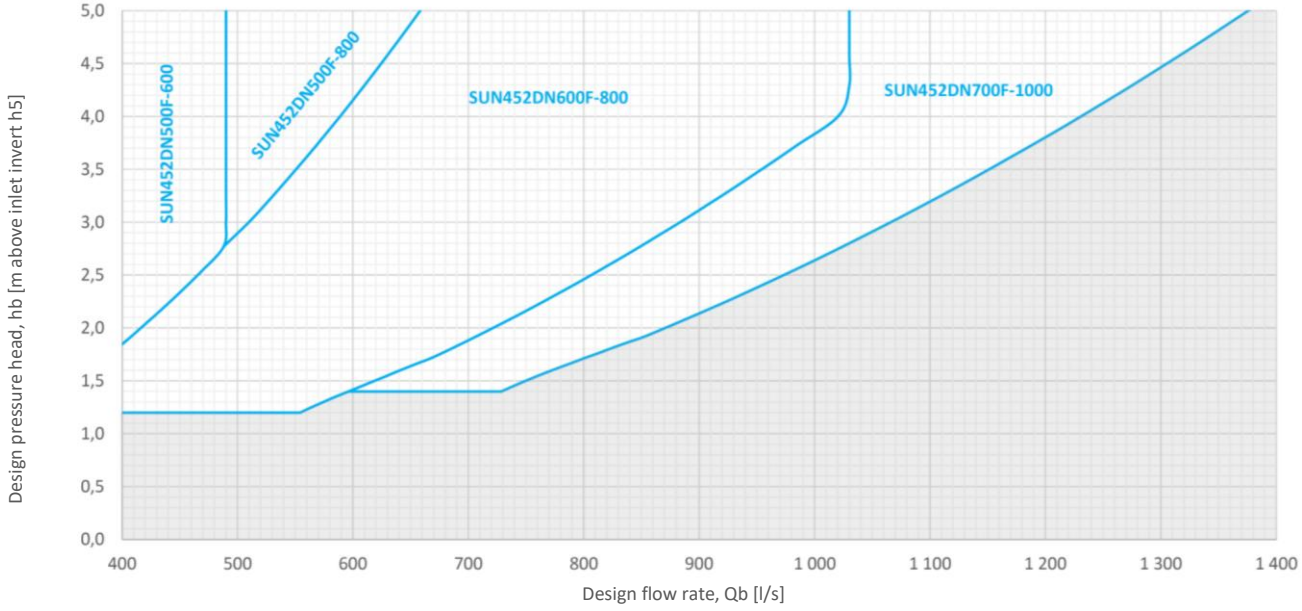
Operation and maintenance

FluidCon SUn has no moving parts and requires little maintenance. Any internal fouling should be removed. However, the need for inspection depends on the water quality (floating matter, fouling, settleable solids) and variations in the inflow. Good routines for emptying sand traps and removing floating debris reduce the risk of clogging. See also the Installation and Maintenance Instructions.

Model selection and recommended capacities





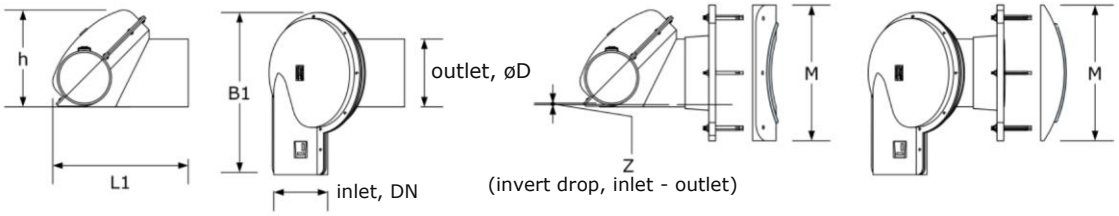


Model overview

Type P - Standard version (without 45° bend)

Without mounting plate

With mounting plate
(accessory)



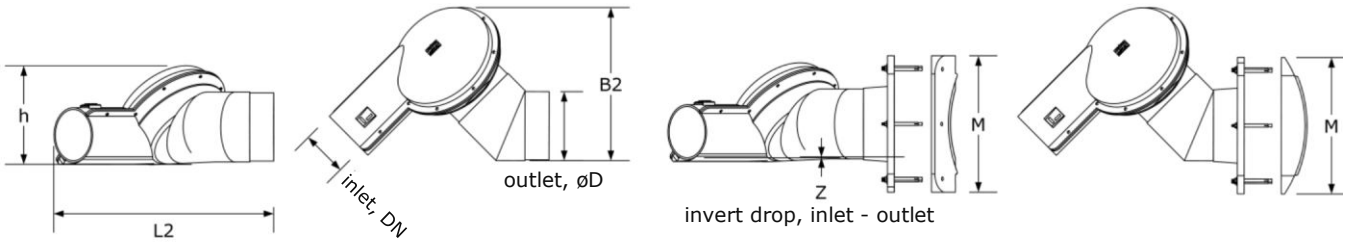
All dimensions in [mm]

Product no.	Inlet DN	outlet øD	Manhole dia. min.	B1	L1	h	M	z	Weight [kg]	Remarks
SUN453DN100P	100	200 pvc	1000	490	390	270	400	30	4,9	
SUN452DN150P	150	200 pvc	1200	480	400	290	400	35	5,9	
SUN452DN200P	200	315 pvc	1400	640	520	370	500	55	9,8	
SUN452DN250P	250	400 pvc	1600	800	620	460	600	55	15,8	
SUN452DN300P	300	500	1800	960	810	570	750	45	24,0	Installation on the manhole floor with mounting plate recommended.
SUN452DN400P	400	630	3000	1290	950	770	1000	55	29,0	

Type P - With 45° bend (accessory)

Without mounting plate

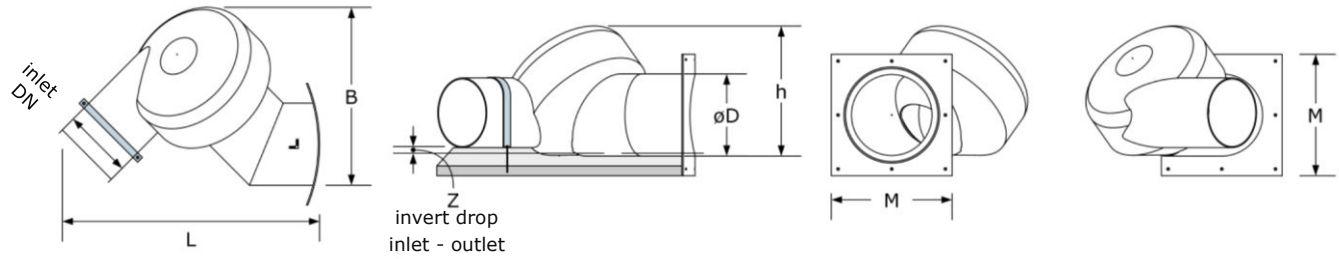
With mounting plate
(accessory)



All dimensions in [mm]

Product no.	Inlet DN	outlet øD	Manhole dia. min	B2	L2	h	M	z	Weight [kg]	Remarks
SUN453DN100P	100	200 pvc	1000	450	640	270	400	30	7,3	
SUN452DN150P	150	200 pvc	1000	450	650	290	400	35	8,3	
SUN452DN200P	200	315 pvc	1200	650	840	370	500	55	13,6	
SUN452DN250P	250	400 pvc	1600	870	1100	460	600	55	22,8	
SUN452DN300P	300	500	1600	1160	1290	570	750	45	33,0	Installation on the manhole floor with mounting plate recommended.
SUN452DN400P	400	630	2400	1460	1650	770	1000	55	50,0	

Type F (only a limited selection shown, contact MFT for alternatives)

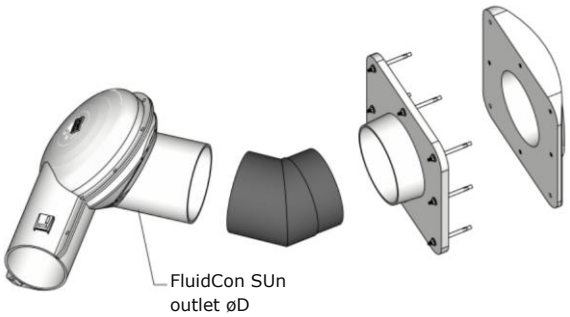


Product no.	Inlet DN	outlet øD	Manhole dia. min	B	L	h	M	z	Remarks
SUN452DN500F-500	500	500	2500	1250	1950	1000	1000		Installation on the manhole floor with mounting plate recommended.
SUN452DN500F-600	500	600	2500	1350	2000	1000	1000		
SUN452DN500F-800	500	800	3000	1400	2100	1000	1100		
SUN452DN600F-800	600	800	3500	1700	2400	1200	1100		
SUN452DN700F-1000	700	1000							

Accessories (type P)

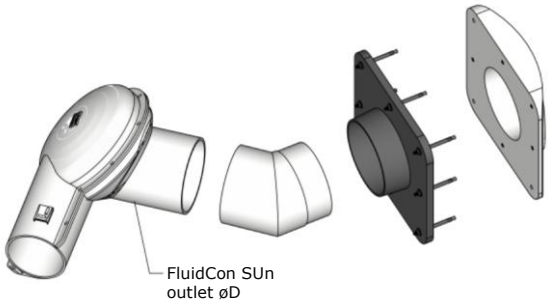
45-degree Bend (PUR)

Product no.	Dim øD	Weight [kg]	
BN-MR200	200	2,4	
BN-MR250	250	2,8	
BN-MR315	315	3,8	
BN-MR400	400	10,8	
BN-MR500	500	15	
BN-MR630	630	21	



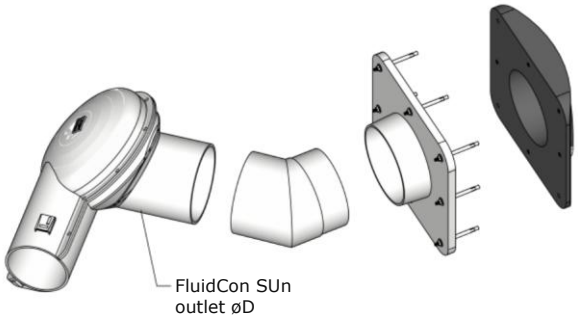
Mounting plates (PUR)

Product no.	outlet øD	Weight [kg]	No. of mtg bolts
MP-PUR200	200	1,7	8
MP-PUR250	250	2,2	8
MP-PUR315	315	2,8	8
MP-PUR400	400	4,5	8
MP-PUR500	500	6,2	8
MP-PUR630	630	11	8



Filler pieces

Product no.	outlet øD	Manhole dia. (from-to)	Mate-rial	Weight [kg]
FS-PUR200-8/20	200	800-2000	PUR	2,5
FS-PUR250-8/24	250	800-2400	PUR	3,5
FS-PUR315-10/24	315	1000-2400	PUR	4,1
FS-PUR400-12/24	400	1200-2400	PUR	7,8
FS-MP500-12/14	500	1200-1400	PE	
FS-MP500-16/25	500	1600-2500	PE	
FS-MP630-14/16	630	1400-1600	PE	
FS-MP630-18/25	630	1800-2500	PE	



Integrated overflow

Product no.	outlet øD	Mate-rial	Weight [kg]	Description
T-MR200	200	PUR	2,2	T-piece
T-MR250	250	PUR	3,2	
T-MR315	315	PUR	5,6	
T-MR400	400	PUR	10,5	
IO-P200	200	PVC	-	Vertical overflow pipe, PVC, incl. clamps
IO-P250	250	PVC	-	
IO-P315	315	PVC	-	
IO-P400	400	PVC	-	

