Flow control
Level control
Backflow prevention
Particle separation
Monitoring
Shut-off

Pioneerer i regnvannshåndtering

FluidCon SUn

Conical wet-installed vortex flow regulator

Installation and Maintenance

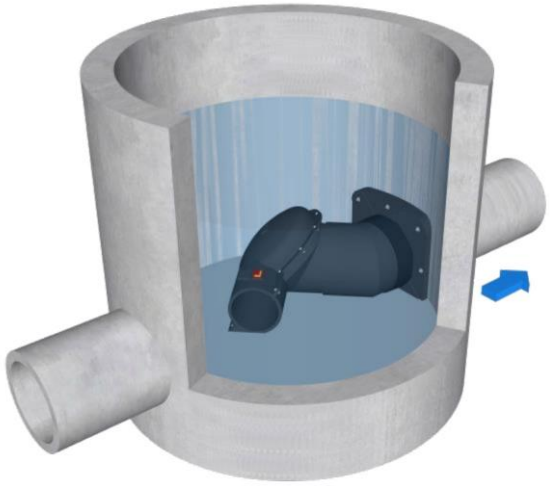


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1. Introduction

The vortex flow regulator must only be used for the purpose for which it is intended, or as agreed when ordering. The customer cannot make a warranty claim if:

- The installation instructions have not been followed
- The product is used for a purpose other than that agreed, or if repairs, improvements, modifications or other work not agreed with MFT are carried out.

2. Inspection on receipt

On receipt of the vortex flow regulator, the recipient should check for transport damage. If any damage is found, this must be reported to MFT as soon as possible.

3. Documentation

The following documentation is normally supplied with FluidCon SUn and should be available during installation:

- Drawing of the vortex flow regulator
- Installation and O&M instructions.
- Data sheet

In addition, a project drawing showing the interface with the existing facility and the correct level for installation and positioning of the vortex flow regulator should be available (not provided by MFT).

⚠ Safety

Any work in manholes must be carried out in accordance with the applicable safety regulations and HSE rules.

Particular attention is drawn to the following:

- **NB Risk of poisoning.** Before entering the manhole, check that there is sufficient oxygen in the manhole and that no toxic/flammable gases are present.
- With large volumes of water, the **risk of drowning** should be given special consideration. Great care must be taken in the event of any upstream blockage. Any upstream water pressure must be relieved before entering the manhole.
- Necessary safety and **protective equipment** must be used.
- There should always be **at least 2 people** present when staying and working in a manhole.
- Tools and equipment should never be placed on the edge of manhole openings/access shafts. They can pose a danger to anyone down in the manhole/overflow.

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4. Preparations

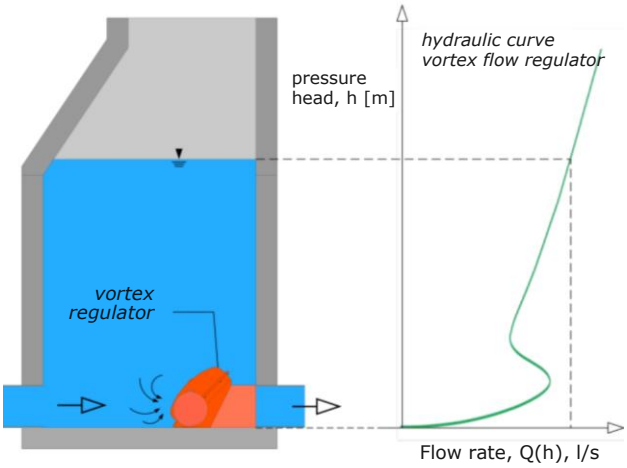
FluidCon SUn is a vortex flow regulator that controls the flow rate (flow regulator). *FluidCon SUn* is installed on the outlet of a manhole or detention storage, either on the manhole floor or above it. It is supplied ready-adapted to the flow and level requirements of the facility. As the flow rate varies with the water pressure, the vortex flow regulator and the surrounding pipework must be installed at the same relative levels as those used for sizing.

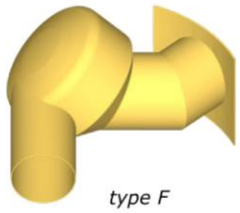
FluidCon SUn is available in two versions (type P and type F) and is installed on the manhole outlet as follows (model type and installation method are shown on the product drawing supplied):

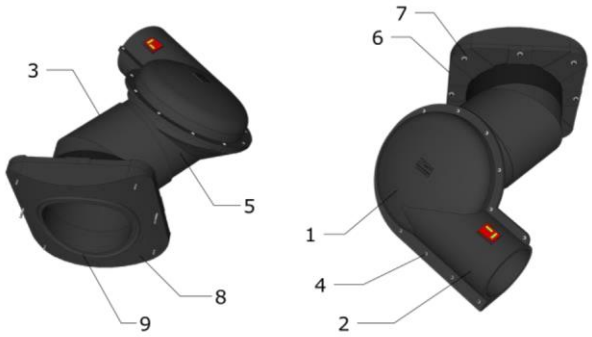
Installation on a socket (type P, smaller models)
The vortex flow regulator is supplied with a standard (PVC size) spigot at the outlet. A standard manhole connector is installed, with a stub available on the outlet pipe and socket. The vortex flow regulator is mounted on the PVC socket.

Mounting plate (accessory for smaller models, standard for larger type P models and all type F models)
The vortex flow regulator is supplied with mounting plate, gasket and expansion bolts for installation against the manhole wall. A standard manhole connector is installed, with the outlet pipe ending flush with the inner manhole wall. The mounting plate (supplied with gasket) surrounds the outlet pipe opening.

	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




type F



type P

5. Installation on a socket

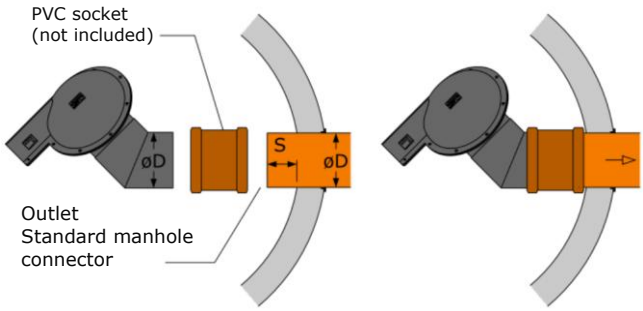
The vortex flow regulator can be supplied with or without a 45-degree bend at the outlet, type P2 and P1 respectively. The installation procedure is the same. The figures on the right show a model with a bend (P2). For practical reasons, some larger P2 models are supplied with the 45° bend not fitted. See chapter 7 for fitting the bend to the vortex housing.

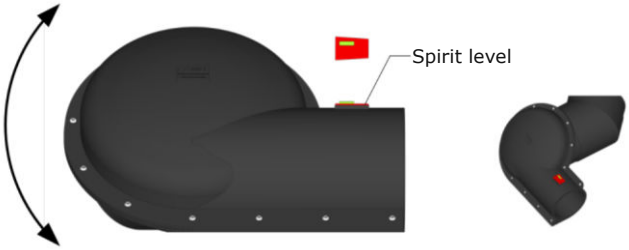
1. Complete the manhole connector. Make sure there is a stub available on the outlet pipe for fitting the socket (alternatively, an outlet pipe with an integrated socket can be used). Maintain the recommended minimum stub length "S" (see table on the next page).

2. Fit the PVC spigot end of the vortex flow regulator into the socket/double socket of the outlet pipe. Use silicone spray in the joint.

   Note: Fit by hand only. Impact tools must not be used.

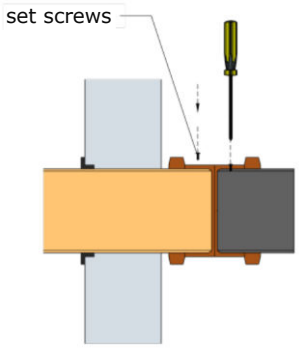
3. Rotate the vortex flow regulator around the outlet so that the tangential inlet is oriented horizontally along the length of the inlet. Check the orientation using the spirit level fitted on the inlet.





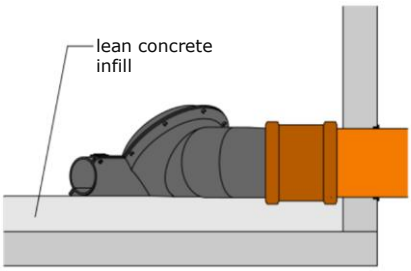
4. To prevent the vortex flow regulator from rotating, insert self-drilling screws (set screws) through the socket, making sure they penetrate the outlet stub of the vortex flow regulator. Recommended number of screws, evenly spaced around the circumference:

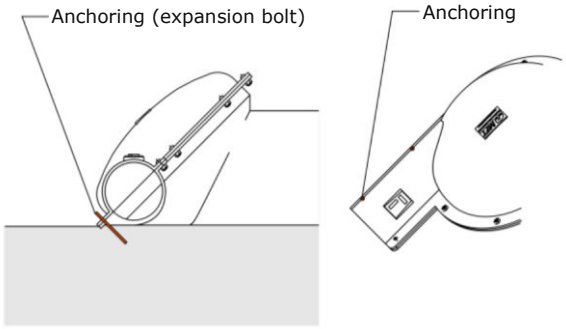
Dim outlet øD [mm]	No. of set screws per circumference	Min. recommended stub
200	2	150
250	3	160
315	3	240
400	3	280



5. **Installation at the bottom of the manhole**
When placing the vortex flow regulator at the bottom of the manhole, a lean concrete infill between the manhole floor and the inlet invert is recommended (see figure).

The vortex flow regulator is anchored to the manhole floor through the inlet bearing surface. Holes are drilled through the bearing surface on site. Position as required. Suitable fixings (expansion bolts) are used.





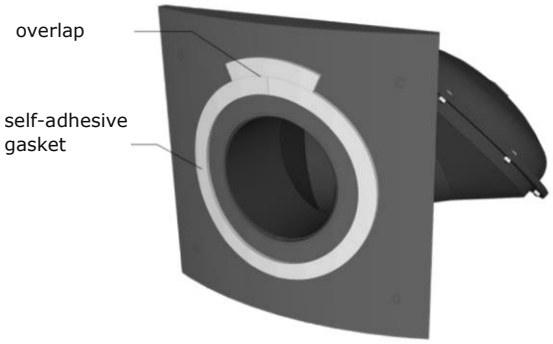
6. Installation with mounting plate

The figures show a type P2 vortex flow regulator with bend, mounting plate and matching filler piece, which allows mounting against a curved wall. The procedure is the same for a straight wall (without filler piece), for models with (P2) or without (P1) 45° bend, and for type F (GRP). For practical reasons, some larger P2 models are supplied with the 45° bend fixed in the mounting plate, but not fitted to the vortex housing. See chapter 7 for fitting the bend.

1. Check the gasket
The gasket seals between the filler piece and the manhole wall. The supplied gasket is self-adhesive and is attached to the filler piece so that it surrounds the outlet opening. We recommend overlapping the joint with a short length of gasket (see figure).

   Note: If the vortex flow regulator is mounted against a straight wall (without filler piece), the gasket must be fitted directly on the mounting plate.

   Note: Mounting plate size øD200 is supplied with the gasket already fitted.

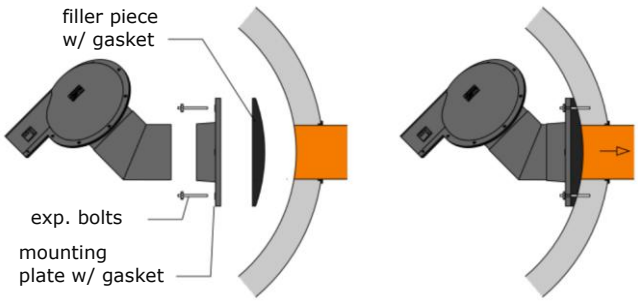


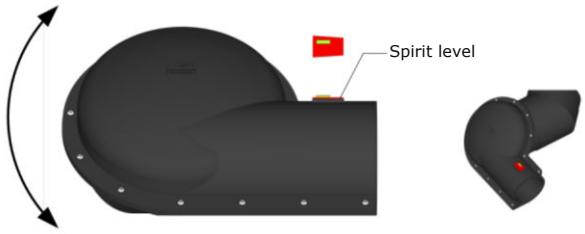
Note: the gasket does not have to be laid in a circular pattern, as long as it is placed between the pipe opening and the mounting bolts, and any joints overlap.

2. Complete the manhole connector. Cut the outlet pipe flush with the inner manhole wall. Mill away any unevenness in the wall where the mounting plate will be fitted.

3. Position the vortex flow regulator so that:
   - the inside bottom edge of the outlet is flush with the inside bottom edge of the outlet pipe.
   - the inlet is level (spirit level fitted).

   Mark the position of the mounting holes in the two upper corners.





4. Drill holes for the expansion bolts (supplied) in the marked positions and fit the bolts. Fix the vortex flow regulator temporarily and check the position (pipe bottoms flush) and orientation (level line level). Adjust if necessary.

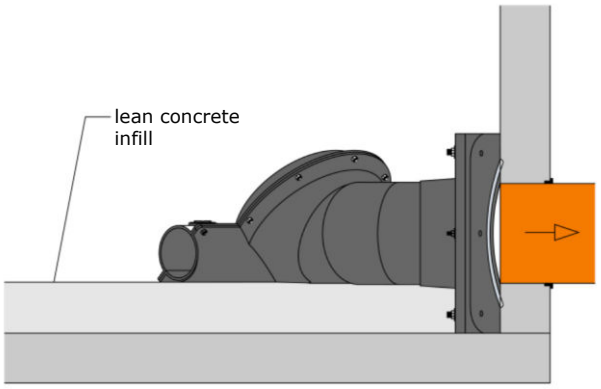
5. Mark the positions of the remaining mounting holes and remove the vortex flow regulator.

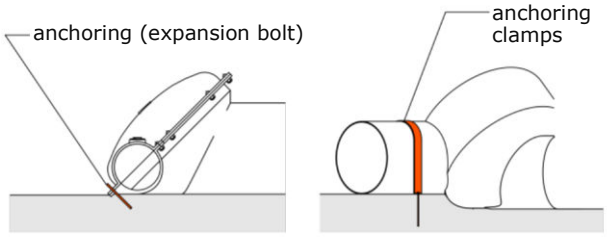
6. Drill holes for the remaining expansion bolts and fit them.

7. Check that the gasket is fitted correctly (see item 1). Hang the vortex flow regulator in place and fix it to the expansion bolts with the supplied washers and nuts.

8. **Installation at the bottom of the manhole**

   When placing the vortex flow regulator at the bottom of the manhole, it is recommended that a lean concrete infill is cast between the manhole floor and the level of the vortex flow regulator inlet invert (see figure).
   a) Type P: The vortex flow regulator is anchored to the manhole floor through the inlet bearing surface.
   b) Type F (GRP): The inlet is anchored to the manhole floor using mounting clamps (supplied)





type P type F

7. Fitting the 45° bend to the vortex housing

For practical reasons, some larger P2 models are supplied with the 45° bend loose (not fitted to the vortex housing).

If the delivery also includes a mounting plate, the bend and mounting plate are normally supplied pre-assembled. It is then recommended that the mounting plate with the bend is anchored to the manhole wall before the vortex housing is fitted.

The bend is fitted to the vortex housing as follows:

1) Apply silicone to the inside of the bend socket. Make sure there is an even bead around the entire circumference. Use Dowsil 796 silicone or equivalent (supplied).

2) Insert the outlet (spigot) of the vortex housing into the bend. To ensure correct orientation of the vortex housing, the stubs are marked. Rotate the vortex housing so that the markings line up correctly.

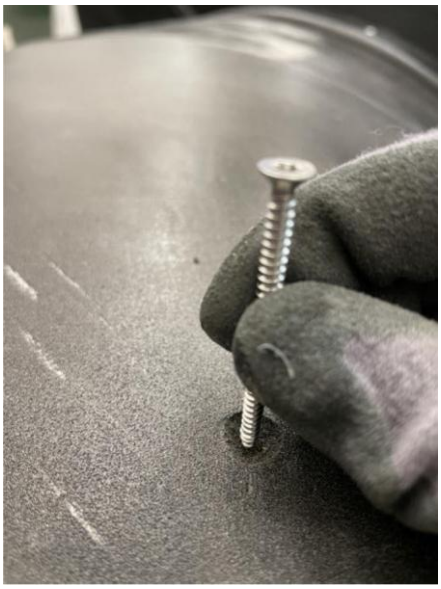
3) Fit screws in all marked positions (countersunk), using the supplied screws. The screws must penetrate the material of the vortex housing stub.



Applying silicone



Markings for correct orientation



Fitting the screws

8. Vortex flow regulator with integrated overflow (accessory)

When installing vortex flow regulators with integrated overflow, a mounting plate is used.

4) Fit the mounting plate of the vortex flow regulator in accordance with chapter 6

5) To establish the integrated overflow, the following components are also fitted:

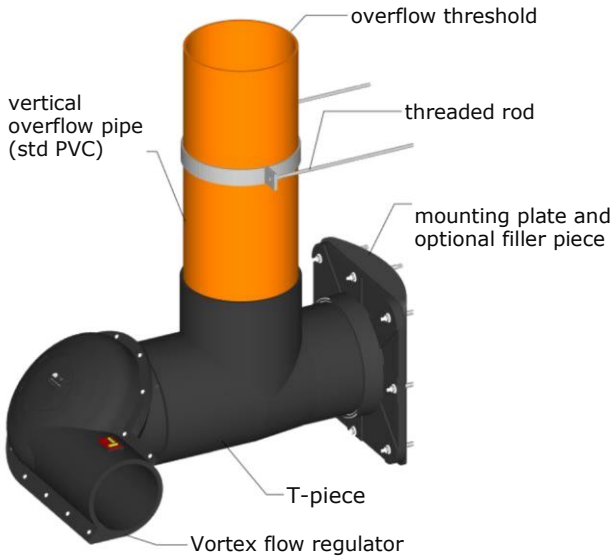
   a) T-piece (MFT component). Fitted between the vortex flow regulator and the mounting plate. Use silicone in the joint (Dow Corning 796 Neutral Silicone PVC-U or equivalent)

   b) Vertical overflow pipe, PVC pipe (standard). Length to suit. Use silicone in the joint (Dow Corning 796 Neutral Silicone PVC-U or equivalent)

   c) Pipe clamps and threaded rods (standard). Quantity to suit.

The length of the vertical overflow pipe is adjusted so that the threshold level (top of the vertical pipe) is as specified (see the supplied drawing of the vortex flow regulator).

The overflow pipe must be anchored to the manhole wall using pipe clamps and threaded rods. A minimum of 2 anchor points is recommended. The number depends on the height of the vertical overflow pipe. Recommended max. distance between anchor points: 1,0m.



9. Final inspection

After installation, carry out a visual inspection:

- Check that the inlet is oriented horizontally (spirit level on the inlet)
- Check that no damage has occurred during installation
- Check the inlet and volute of the vortex flow regulator and remove any foreign objects.
- For vortex flow regulators with integrated overflow:
  - check that the overflow is plumb.
  - check that the top of the overflow (overflow edge) is at the correct level (see project drawing)

10. Operation and maintenance

FluidCon SUn has no moving parts and requires little maintenance. However, the need for inspection depends on the water quality (floating matter, fouling and settleable solids) and variations in the inflow. Good routines for emptying sand traps and removing floating debris are important to reduce the risk of clogging. If required, the volute can be opened by loosening the flange bolts.

Recommended maintenance schedule

	What	When / interval
1	Visual inspection of the vortex flow regulator and manhole. Remove any foreign objects.	After the first rainfall event once the installation has been put into operation
2	Visual inspection of the vortex flow regulator and manhole. Check for clogging. Remove any foreign objects. Empty the sand trap/sludge volume.	After heavy rainfall. At least once a year.
3	Check for internal fouling and flush internally if required.	Every 5 years.