



# Vortex Fine Filter WFF 300

## for fine filtration of water

EN

### INSTALLATION AND OPERATING INSTRUCTIONS

- Mesh size 0.38 mm
- Automatic separation of dirt particles
- For installation in horizontal underground pipes, in utility rooms, basements or outdoors
- Rugged design, available with pedestrian-duty or vehicle-duty cover
- Easy maintenance access for removal of filter insert
- Complete drainage safety in accordance with DIN EN 752, DIN EN 12056. Complies with DIN 1989.
- Extremely low maintenance
- Oxygen enrichment of filtered water



 made  
 in  
 Germany



WFF 300 with steel Cover  
for roof areas up to 3.000 m<sup>2</sup> (32,280 sq. ft.)

**60t** vehicle-duty capacity  
 ATV-tested vehicle-duty capacity  
 up to 60 t (vehicles as defined  
 by DIN 1072/SLW 30)

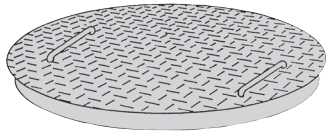
WFF 300 with plastic Cover  
for roof areas up to 3.000 m<sup>2</sup> (32,280 sq. ft.)

# WISY

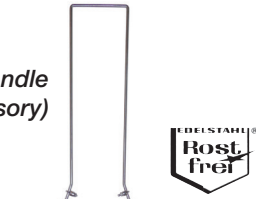
## Rainwater Harvesting

# Guide to components

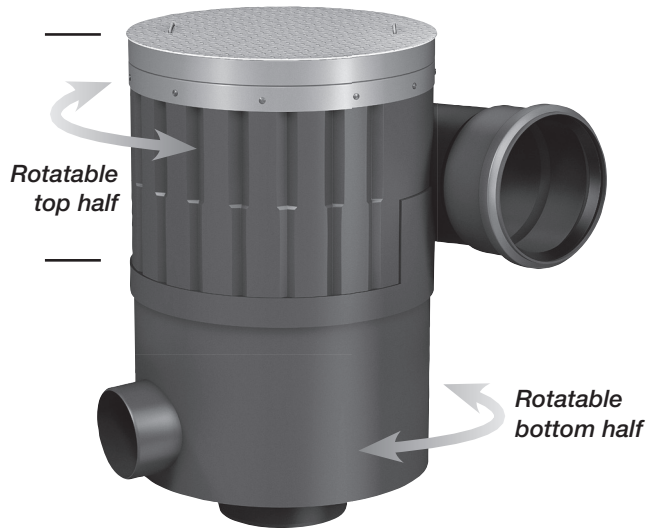
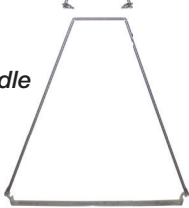
Housing cover (zinc coated steel)



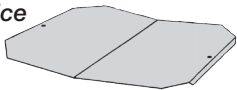
Extension handle  
(accessory)



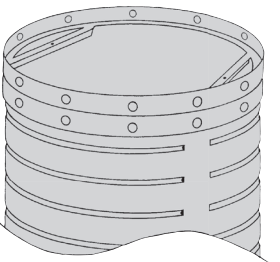
Lifting handle



Child safety device  
(not for plastic Cover)

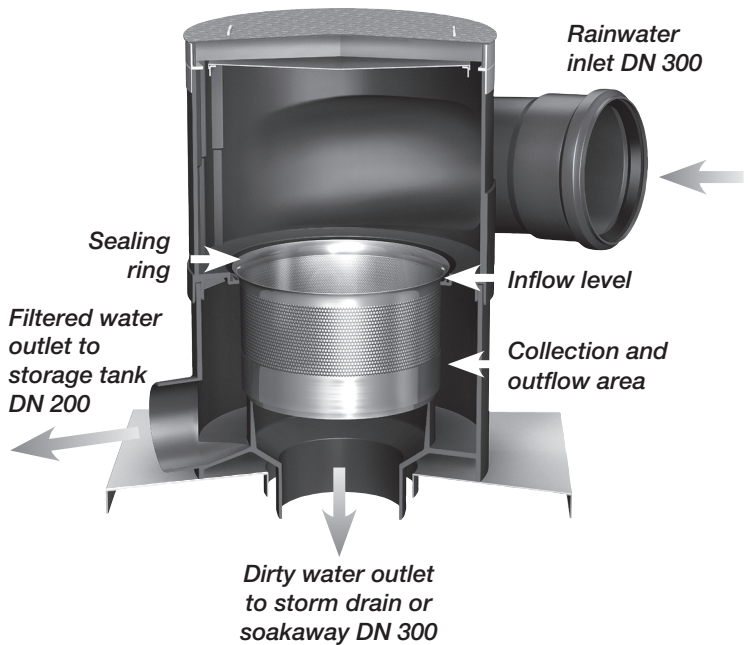


End or  
intermediate  
ring



Cutting lines

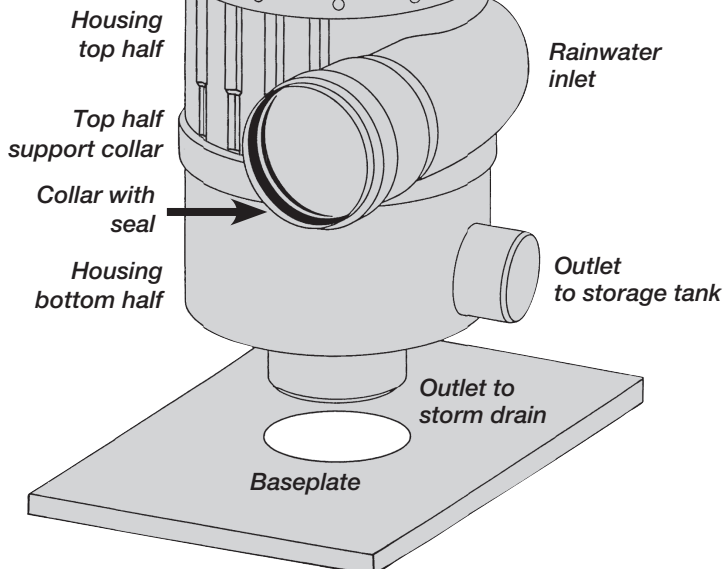
Extension tube  
(accessory)



Filter insert



End or  
intermediate  
ring



WFF 300 with  
plastic Cover



# WISY vortex fine filter (WFF 300)

**for domestic use of harvested rainwater in large buildings and for industrial water treatment. For roof areas up to about 3000 m<sup>2</sup> (32,280 sq. ft.). (The size of roof area that can be connected depends on local average yearly precipitation.)**

## Applications

The WISY Vortex Fine Filter (hereafter referred to as “WFF”) is primarily designed for installation below ground. It is also suitable for installation indoors. Please read the information and warning notices pertaining to indoor installation in the section headed “Indoor installation” in this document.

Connected to a horizontal rainwater drain pipe, the WFF filters rainwater harvested from the roof and then feeds the filtered rainwater into a tank. The best roof areas are pitched roofs of slate, clay tiles, concrete tiles or membrane and sheet metal roofs.

It must be taken into account that “green roofs” retain rainwater. We recommend that a pure, mineral-based substrate is installed beneath the growing medium layer of green roofs connected to a rainwater harvesting system. Substances washed out of roofs covered with bitumen felt can discolour the harvested rainwater. Asbestos-cement roofs are not suitable and must be decontaminated before a rainwater harvesting system is connected.

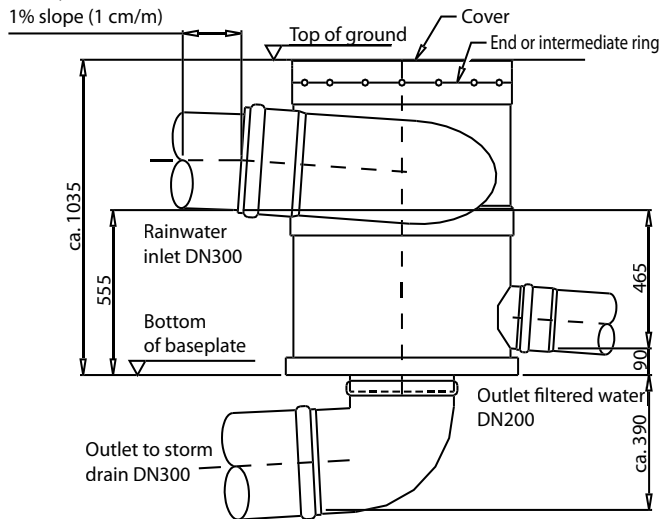
The vortex fine filter is generally designed to separate solids from water. It can also be used, for example, to treat water from industrial production processes.

## Design and operating principle

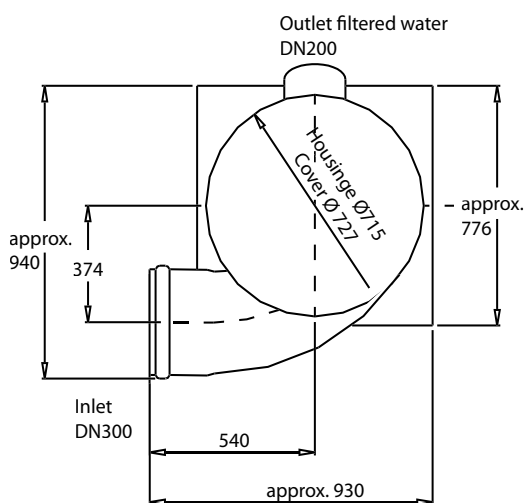
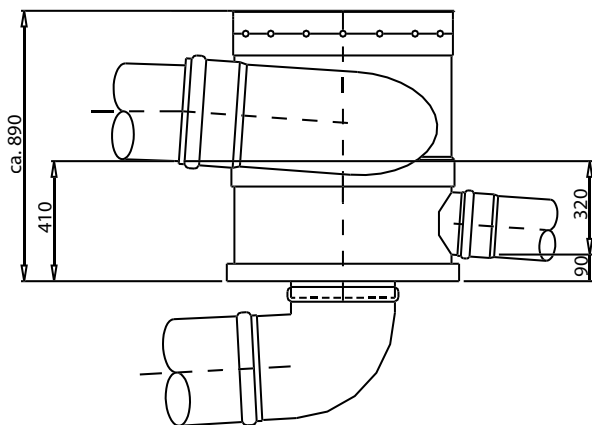
- The harvested rainwater flows out of the horizontal inlet pipe into the WFF and is drawn in a circular (vortex) movement from inflow level down to the filter insert. By exploitation of adhesion forces, the harvested rainwater is drawn through the vertical fine filter and passes through the storage tank outlet into the storage tank. Dirt particles are flushed into the storm drain with the remaining water. This principle is applied to filter over 90% of the annual average rainfall that enters the WFF.
- Particles that are larger than 0.38 mm are flushed directly into the storm drain.
- The cross-sectional area of the roof drainage pipes does not change inside the WFF, i.e. to ensure the free flow of water, the pipe cross section is not restricted at any point. This design feature is especially important when high volumes of water flow into the filter during torrential rainstorms. Any excess rainwater is flushed directly into the storm drain.
- The filter insert cannot develop its adhesive force or reach its maximum efficiency until the filter mesh has become completely saturated with water. This process can take up to 2 minutes after long periods of dry weather. During this period, the first coarse dirt particles from the roof are flushed directly into the storm drain (first flush function).
- The WFF meets the requirements defined by European standards DIN 1986-100 (Drainage systems on private ground), DIN EN 752 (Drain and sewer systems outside buildings), DIN EN 12056 (Gravity drainage systems inside buildings) and DIN 1989-2 (Rainwater harvesting systems - Part 2: Filters).

## WFF 300 (standard height)

min. 1,5 - 3 m  
1% slope (1 cm/m)



## WFF 300 (short version)



## Scope of supply/basic equipment

- The complete housing
- Filter insert
- End/intermediate ring with certified child safety device
- Non-slip cover made of steel or polyethylene
- Baseplate and lifting handle.
- The WFF 300 is packed and shipped on a standard-size pallet (1.20 m x 0.80 m).

## Technical data

Drainage surface: Up to approx. 3000 m<sup>2</sup> (32,280 sq. ft.)

Filtering efficiency: See chart on page 8, up to 14 l/s (over 90%)

Housing components: Polypropylene (PP)

Sealing rings: EPDM

Filter insert and mesh, end ring and baseplate: Stainless steel 1.4301

Child safety device: Aluminum (not for plastic Cover)

Filter mesh size: 0.38 mm

Rainwater inlet (collar): DN 300\* (Di = 318 mm)\*

Outlet to rainwater tank: DN 200 (Di = 188 mm Da = 198 mm)\*\*

Outlet to storm drain: DN 300 (Di = 300 mm, Da = 314 mm)\*\*\*

Lifting handle: Stainless steel 1.4301

Weight with 12 t cover: 97 kg

Cover weight-bearing capacity, materials and weights:

**Steel cover, weight 30 kg**  
vehicle duty up to 60 t (for vehicles as defined by DIN 1072/SLW60)

**Steel cover, weight 19 kg**  
vehicle duty up to 12 t (for vehicles as defined by DIN 1072/LKW12)

**Plastic Cover, weight 6,2 kg**  
load capacity 600 kg

Acid-resistant: Yes

Harmful to groundwater: No

\* DN = Diameter Nominal

\*\* D<sub>i</sub> = inside diameter; D<sub>a</sub> = outside diameter

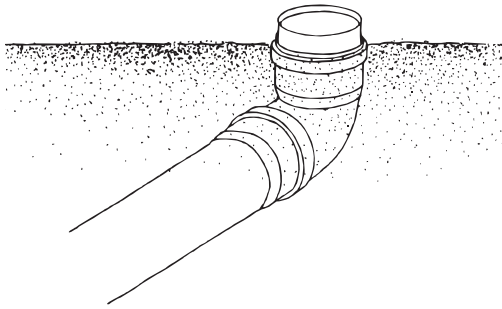
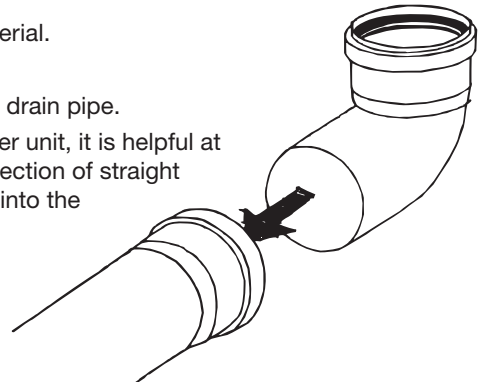
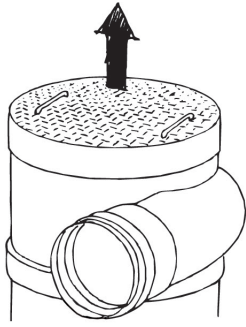
\*\*\* Dimensions of a sewer pipe with DN 300 D<sub>i</sub> = 300 mm; D<sub>a</sub> = 315 mm

## Important information about underground installation

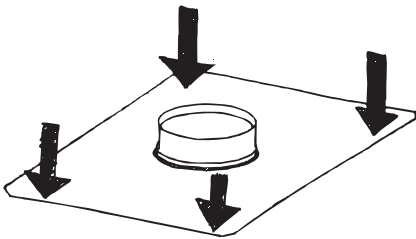
- **Installation of a WFF 300 always requires careful preparatory planning work.** The height of the tube connections required for the product relative to existing or planned pipework must be taken into account. Please refer to the diagrams and descriptive text in these instructions for installation and connection dimensions.
- It may be necessary to install an extension tube in order to raise the inspection opening to ground level.
- An extension tube is generally required if the rainwater pipes (=underground pipes) to be connected to the WFF need to be **protected against frost**. According to DIN 1986-100, underground rainwater pipes must also be frost-protected, i.e. installed at a depth of at least 80 cm, even though rainfall does not occur in frosty conditions (and the pipes are therefore empty).
- When a WFF 300 is installed underground, **the inspection opening in the housing can be extended by a maximum** of 1 meter if the weight-bearing capacity of the cover is to be maintained. If it is necessary to install the WFF 300 at a greater depth, it must be installed in a concrete shaft.
- A suitable foundation for the WFF must be provided to maintain the weight-bearing capacity of its cover without the risk of subsidence or damage.
- **Special measures must be taken if a WFF 300 is to be installed in a pressure (syphonic) roof drainage system.** Since the downspout/downpipe and underground pipes in a syphonic drainage system are completely full and the water is drained at high speed, the rate of water inflow into the WFF must be reduced. This is generally achieved by increasing the pipe diameter (possibly over several sections of pipe) to DN 300 (e.g. from DN 100 to DN 150, then to DN 200 and finally to DN 300) and providing a longer section of „settling“ tube.
- **A DN 300 inflow tube for „settling“ the incoming rainwater must be installed in front of the rainwater inlet.** It should be about 2 to 3 m in length and installed along a downward gradient of 1%.
- Paving can be laid around the end ring. The traffic loading capacity of the cover supported by the ring depends on the cover version.
- **To ensure the free flow of water, the pipe connected between the storm drain outlet on the filter unit and the storm drain must be at least the same nominal size as the rainwater inlet pipe.**

## Underground installation

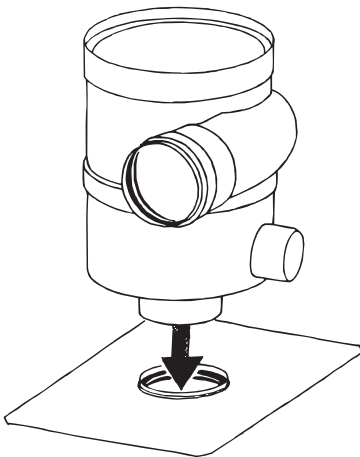
- Remove the steel cover.
- Remove the packaging material.
- Fit a 90° elbow in the storm drain pipe.
- To ease alignment of the filter unit, it is helpful at this point to insert a short section of straight tube (nominal size DN 300) into the vertical end of the elbow.



- Fill and compact the hole around the storm drain pipe with sand, level out the sand surface. The short section of alignment tube should now be visible above the sand surface.

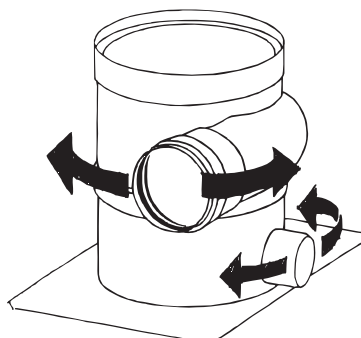
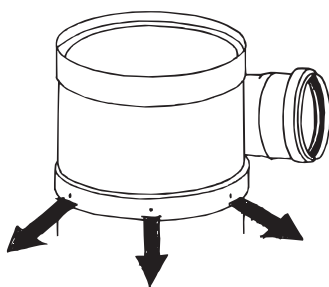


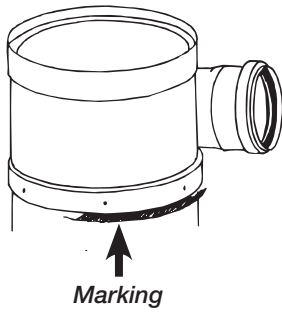
- Place the baseplate over the alignment tube and align it horizontally. Make sure that the baseplate is resting horizontal on the sand and that no voids are left underneath the plate.



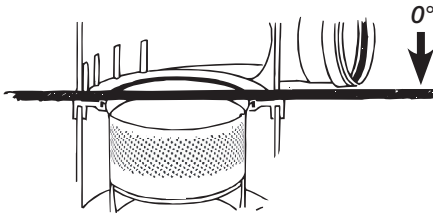
- Once the plate is positioned, remove the alignment tube. Now place the WFF 300 housing into the open collar of the elbow and make sure that the surface pressure on the WFF 300 body is fully absorbed by the baseplate.

- Turn the rainwater inlet and filtered water outlet so that they are correctly aligned. To do this, remove the screws from the support collar.

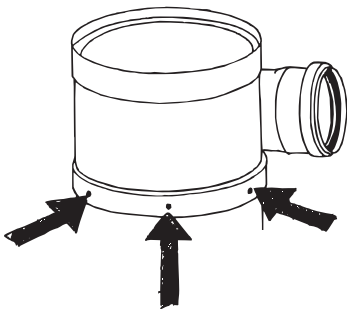




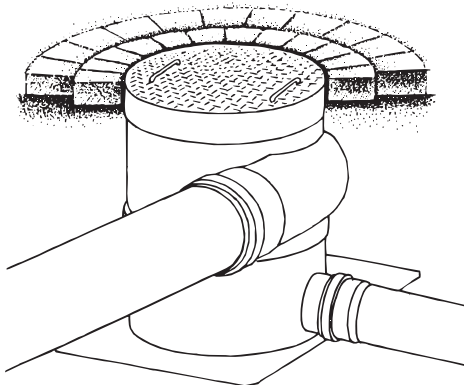
- After the inlet and outlet tubes have been aligned, check that the top half of the housing is resting flush in the bottom half. To do this, check that the marking around the circumference of the bottom half is evenly aligned with the top half all the way round.



- The inflow level with the filter insert must be exactly horizontal.

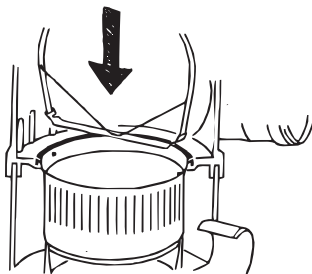


- Now insert the screws back into the predrilled holes and tighten. Then connect up the rainwater inlet tube and the filtered water outlet tube.



- After these tubes have been connected, backfill all around the WFF 300 unit with fine sand until it is encased in a layer of sand (at least 20 cm thick). Paving can be laid around the inspection opening of the WFF 300.

## Maintenance and servicing



Place lifting handle onto filter insert, turn handle clockwise under the pins...



...and pull

- The WFF 300 housing is made of stable, durable plastic. The filter insert mesh is largely self-cleaning since it is virtually impossible for any substance to cling to the vertical mesh. Nonetheless, a thin layer of brownish deposits caused by normal environmental effects may build up over time depending on regional location. These deposits reduce the efficiency of the filter and must be removed. In some regions it may be necessary to clean the filter insert after only 4 weeks, while cleaning at six-monthly intervals is sufficient in other regions. The filter insert should always be cleaned at intervals of at least six months.
- Remove the filter insert.
- A high-pressure cleaner is the ideal tool for cleaning the filter insert, but you can also use a small brush and washing-up liquid.

## Accessories/optional components

### Extension tube

- Extension tube (PE) black, for raising inspection opening to ground level, diameter 70 cm (2.3 ft), length optional up to max. 140 cm (4.6 ft), price per 10 cm

### Extension handle

- Extension handle made of stainless steel, length 50 cm (1.64 ft) or 100 cm (3.28 ft)

### Soakaway strainer

- Stainless-steel soakaway strainer (VA) For trapping the fine and coarse dirt from the rinsing and excess water if the water is released into a soakaway system rather than a storm drain. Mesh width 1.6 mm (0.06 in)

### Blind insert

- Stainless-steel blind insert to prevent water inflow to the storage tank. Ensures direct throughflow of water to the storm drain or soakaway system (for use during winter operation or maintenance)

### Cleaning nozzle

- Cleaning nozzle for continuous cleaning of filter mesh during filtration. For filtration of extremely dirty process water or sewage treatment plant water, etc. Not required for rainwater filtration.

## Explanation of the specification

### “Filtering capacity max. 14 l/s”:

The filtering capacity specification states that a maximum of 14 litres of filtered rainwater per second can be fed into the rainwater storage tank in order to achieve a filtering efficiency of 90%, although the total volume of water inflow into the WFF 300 may be much greater.

Most rainfall produces low precipitation levels of between 0.1 and around 4 millimetres or litres per m<sup>2</sup> per hour. This figure applies to nearly 99% of all rainfall events. Heavier rainfall which produces precipitation in excess of 10 l/m<sup>2</sup> per hour is very rare.

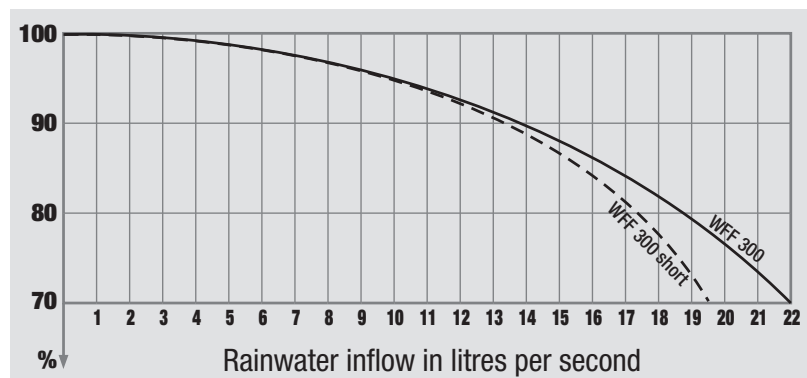
If the components of a roof drainage system (downspout/downpipe, underground pipes and filters, e.g. WFF 300) are dimensioned in accordance with the relevant technical standards, most rainfall events cause a volumetric flow of water that fills an underground pipe to less than 30% (the maximum “pipe fill level” is 70%).

The maximum volumetric flow rate through an underground pipe with a nominal diameter of DN 300 and installed along a 1% gradient is 80.6 l/s.

For the purposes of comparison, the volumetric flow rates for “normal” and “heavy” rainfall events for a connected roof area of 3000 m<sup>2</sup> (32,280 sq. ft.) are given below:

- 8 mm/m<sup>2</sup> per hour (average rainfall) produce a volumetric flow of 6.7 l/s
- 17 mm/m<sup>2</sup> or l/m<sup>2</sup> per hour (heavy rainfall) produce a volumetric flow rate of 13.9 l/s, in other words, where heavy rainfall does not exceed 17 mm/m<sup>2</sup> per hour, the WFF 300 achieves a filtering efficiency of more than 90%. The chart below indicates the filter efficiency once the water inflow rate to the filter exceeds this figure

Efficiency chart for WISY vortex fine filter WFF 300





## Indoor installation

for Indoor Installation the WFF 300 with plastic cover should be preferred, additionally the following safety guidelines must be observed.



- The room in which the WFF 300 is to be installed must have a floor drain.
- The **maximum water flow** rate into the WFF 300 should not exceed 80.6 l/s when the filter has been installed correctly and in accordance with the relevant technical standards. This value is valid in accordance with DIN EN 12056 for downspouts/downpipes and underground pipes at a 1% gradient, a “pipe fill level” of 70% (i.e. 0.7) and a rainwater flow rate of around 1.6 m/s.
- When connected to a storm drain, the WFF must always be installed above the maximum backflow level of the drain. (The backflow level often corresponds to ground level, further information can be obtained from local planning authorities). When the residual dirty water outlet is connected to a soakaway system, the WFF must always be installed above the maximum backflow level of the soakaway system.
- The WFF must be installed **exactly vertical and on a stable foundation** so that it cannot tilt. We urgently recommend that the **WFF with its baseplate is mounted on a metal frame**. When supports (clamps) are placed around the WFF housing in order to prevent it from tilting, they must be installed free of tension so that they do not subject the WFF to deformation pressure.
- The straight piece of tube in front of the rainwater inlet (“**settling length**”) must have a minimum length of 1.5 m (ideally around 3 m).
- If the roof drainage system is syphonic, the syphonic effect must first be broken by a longer section of “settling tube” and by increasing the pipe size at several points. In this instance, a straight “settling tube” length of around 6 m must be installed.
- The joint between the upper and lower parts of the **WFF housing should be sealed with silicone**.
- All **WFF tube connections** must be water-tight. After the system has been installed, all tube connections must be tested for water-tightness under maximum water flow. As the inflow of rainwater can cause impulses of mechanical stress on the connections, the tube connections must be secured against slippage (e.g. by clips).
- Air moisture can condense on the surfaces of the WFF and the tubes at warm indoor temperatures. It is recommended that these parts be insulated against **condensation** or alternatively that measures be taken to safely drain off the condensate.
- Depending on the size of the connected roof surface and on specific attributes of individual installations, an excessive volume of rainwater can flow into the filter in the event of extremely heavy rainfall. As a result, rainwater might flow upwards against the WFF cover and escape through the cover. If this problem occurs, it is urgently recommended that the housing cover be raised by about 0.5 to 1.0 m through the installation of a WISY extension tube which is sealed water-tight.

## **WARNING NOTICE:**

***The vortex fine filter WFF 300 is not a closed system. In the event of exceptionally heavy rainfall, a defect in the drainage pipes, a blockage in the drainage system, etc., it is possible that water flowing into the filter will escape through the filter inspection opening. We do not accept responsibility for any consequential damage.***

## Guarantee

### Period and commencement of the guarantee

The guarantee is valid for a period of 5 years. The guarantee covers all filter materials. The guarantee will remain valid only if the product is properly installed in accordance with these instructions. The guarantee becomes effective on the date of product purchase. Replacement of the product under guarantee will not extend the term of the original guarantee.

### Terms and conditions of the guarantee

WISY shall meet its guarantee obligations for the filter if it can be demonstrated that the following conditions are fulfilled:

1. The product has been purchased from a specialist retailer authorized by WISY in Germany or from a WISY international partner.
2. The product has been installed by a specialist installation company.

### Content and scope of the guarantee

Claims can be made under the guarantee only if WISY receives notification in writing of any defect within 14 days of discovery of the defect.

During the guarantee period, WISY shall repair or replace free of charge any defective part. Additional claims for damages are excluded.

### Limitation of the guarantee

Faults or defects which arise as a result of the following factors are not covered by the guarantee:

- Faulty assembly or installation, e.g. failure to comply with the valid regulations and standards or failure to follow the instructions in this document.
- Failure to provide a floor drain in the installation area or damage caused by water escaping from WFF indoor installations.
- Inappropriate use or exposure to excessive mechanical strain.
- External influences, e.g. shipping damage, damage caused by shock impacts, damage caused by exposure to weather, damage caused by dirt or contaminants, damage caused by other natural phenomena.





**WISY AG**  
D-63699 Kefenrod, Oberdorfstraße 26  
Telefon +49 (0) 60 54-91 21-0

Fax +49 (0) 60 54-91 21-29  
Internet: [www.wisy.de](http://www.wisy.de)  
E-Mail: [info@wisy.de](mailto:info@wisy.de)