

Vortex Fine Filter WFF 300 for fine filtration of water

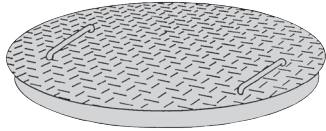
INSTALLATION AND OPERATING INSTRUCTIONS

- Mesh size
380 micron
(0.38 mm)
- Automatic separation
of dirt particles
- For installation
in horizontal under-
ground 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
- Extremely low
maintenance
- Oxygen enrichment of
filtered water



Guide to components

Housing cover
(polyethylene or steel)



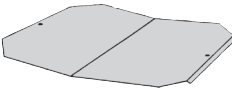
Extension handle
(accessory)



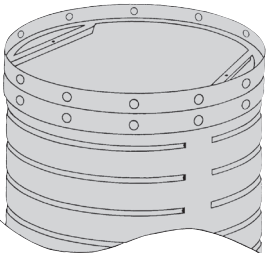
Lifting handle



Child safety device (not for Plastic Cover)



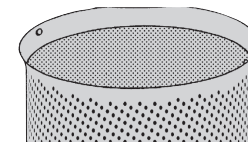
Intermediate ring



Extension tube (accessory)

Cutting lines

Filter insert



Housing top half

Top half support collar

Collar with seal

Housing bottom half

End or intermediate ring

Rainwater inlet

Outlet to storage tank

Outlet to storm drain

Baseplate

Rotatable top half

Rotatable bottom half

Rainwater inlet 12" (DN 300)

Sealing ring

Inflow level

Collection and outflow area

Filtered water outlet to storage tank 8" (DN 200)

Dirty water outlet to storm drain or soakaway 12" (DN 300)

WFF 300 with Poly-Sealed Lid



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 32,280 ft² (3000 m²). (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 discolor the harvested rainwater. Asbestos-cement roofs are not suitable and must be decontaminated before a rainwater harvesting system is connected.

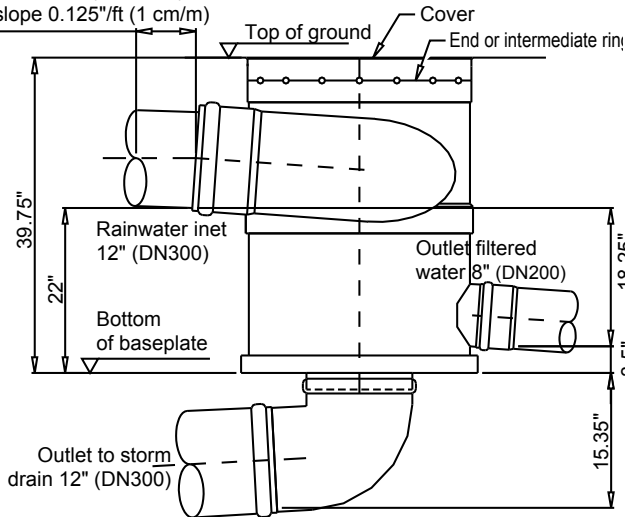
The vortex fine filter is generally designed to separate solids from water. It can also be used, for example, to treat water from industrial production processes.

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 380 micron (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 ARCSA/ASPE/ANSI Standard 63 for Rainwater Catchment Systems. Also meets 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. 59 - 118" (1.5 - 3 m)
1% slope 0.125"/ft (1 cm/m)



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 aluminium
- Baseplate and lifting handle.
- The WFF 300 is packed and shipped on a standard-size pallet (1.20 m x 0.80 m).
- PVC Sewer and Drain Pipe for inlet/outlet connections (SDR35)

Technical data

Drainage surface: Up to approx. 3000 m² (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:

Filter mesh size: 380 micron (0.38 mm)

Rainwater inlet (collar): 12" (DN 300) (Di = 11.5")*

Outlet to rainwater tank: 8" (DN 200) (Di = 7.4"; Da = 7.8")**

Outlet to storm drain: 12" (DN 300) (Di = 11.4"; Da = 12.4")***

Lifting handle: Stainless steel 1.4301

Weight with 60 t cover: 238 lbs dry weight (108 kg)

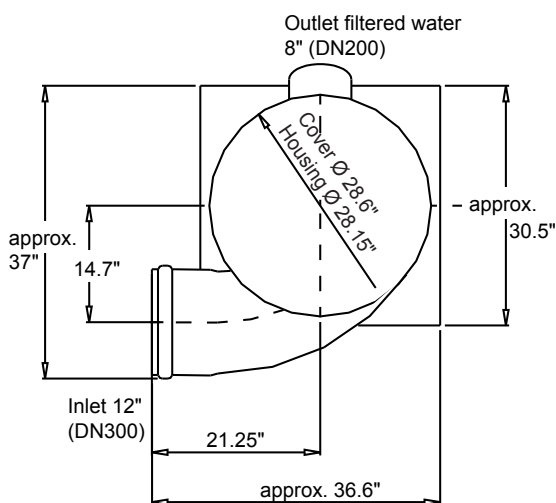
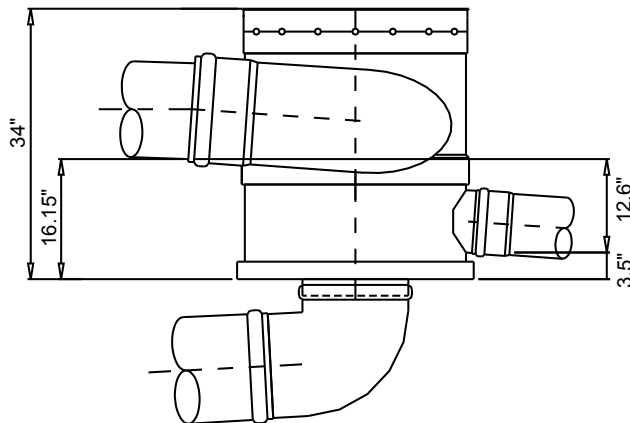
Cover weight-bearing capacity, materials and weights: Steel cover, weight 66 lbs (30 kg) vehicle duty up to 60 t

Plastic Cover, weight 13.75 lbs (6.2 kg) load capacity 1,320 lbs (600 kg)

Acid-resistant: Yes

Harmful to groundwater: No

WFF 300 (short version)



* DN = Diameter Nominal

** D_i = inside diameter; D_a = outside diameter

*** Dimensions of a sewer pipe with DN 300 D_i = 11.8"; D_a = 12.4"

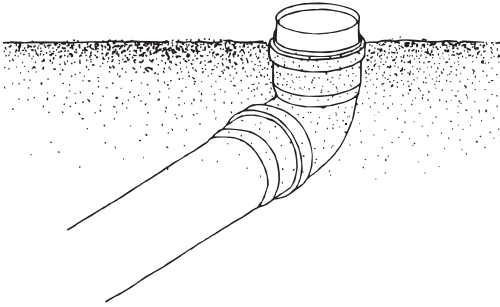
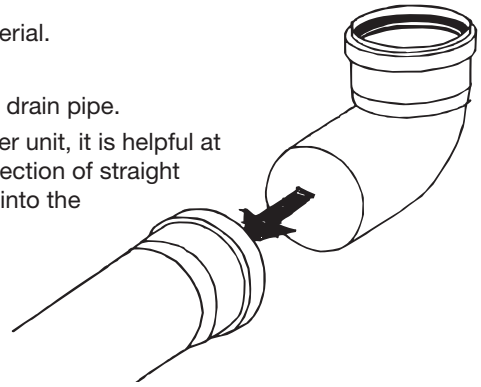
Important information about underground installation

- **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**.
- When a WFF 300 is installed underground, **the inspection opening in the housing can be extended by a maximum of 39"** 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 12" (e.g. from 4" to 6", then to 8" and finally to 12") and providing a longer section of tube for "slowing".
- **A 12" inflow tube for "slowing" the incoming rainwater must be installed in front of the rainwater inlet.** It should be minimum 9'11" 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.**

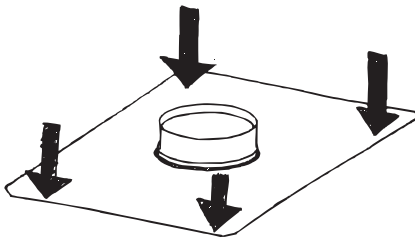
Underground installation

- Remove the steel cover.
- Remove the packaging material.

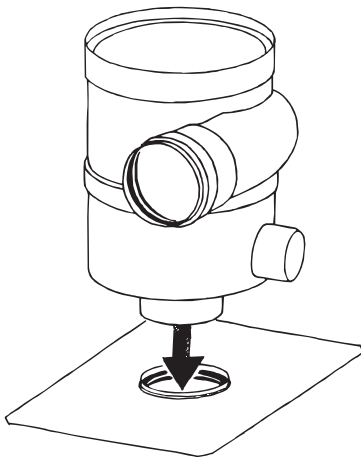
- Fit a 90° elbow in the storm drain pipe.
- To ease alignment of the filter unit, it is helpful at this point to insert a short section of straight tube (nominal size DN 300) into the vertical end of the elbow.



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

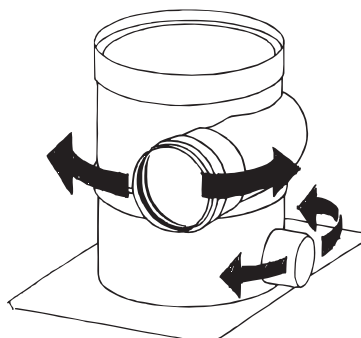
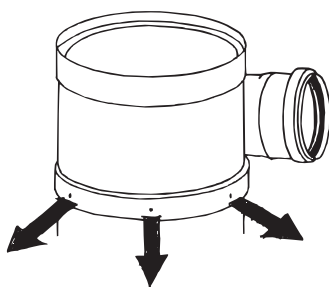


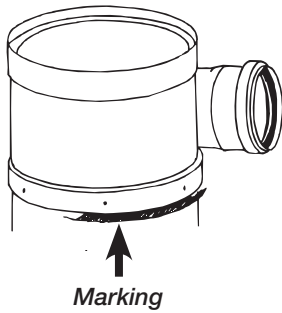
- Place the baseplate over the alignment tube and align it horizontally. Make sure that the baseplate is resting horizontal on the sand and that no voids are left underneath the plate.



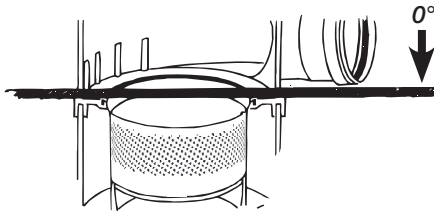
- Once the plate is positioned, remove the alignment tube. Now place the WFF 300 housing into the open collar of the elbow and make sure that the surface pressure on the WFF 300 body is fully absorbed by the baseplate.

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

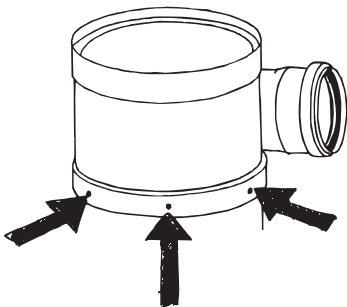




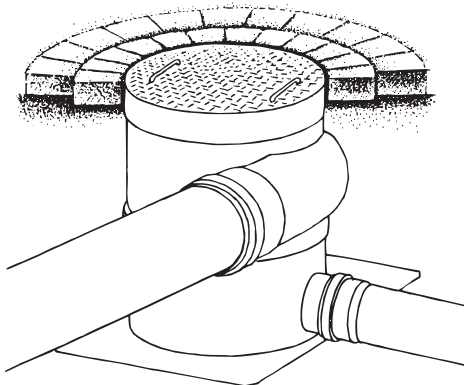
- After the inlet and outlet tubes have been aligned, check that the top half of the housing is resting flush in the bottom half. To do this, check that the marking around the circumference of the bottom half is evenly aligned with the top half all the way round.



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



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



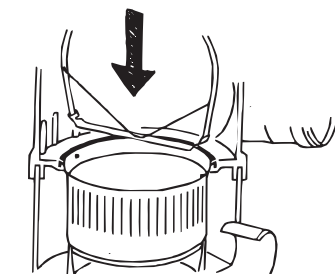
- After these tubes have been connected, backfill all around the WFF 300 unit with fine sand or gravel until it is encased (at least 8" thick). Paving can be laid around the inspection opening of the WFF 300. Ensure lid is never obstructed or buried. Access is necessary for maintenance.

- An optional extension tube can be used to ensure access to the filter is maintained. The child protection plate must be removed from the ring and moved to the top ring once installed. The extension is then placed in the ring on the top of the filter and secured using stainless steel screws with washers and nuts. An additional top ring will be necessary to support the top of the extension and receive the child protection plate and lid. Once the exact length of the extension is determined, remove the excess.

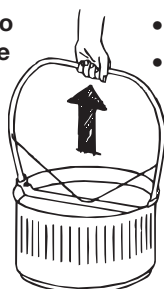
Secure the intermediate ring to the top of the extension ring using stainless steel screw with washers and nuts and attach the child protection plate. The lid can then be placed on the filter and the remaining backfilling can take place.

Maintenance and servicing

- 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.



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



...and pull

- 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 dish washing liquid.

Accessories/optional components

Extension tube
WV 1030
Extension handle
WA 0307 / WA 0309
Soakaway strainer
VS 0310
Blind insert
BE 0306
Cleaning nozzle
SC 3000

- Extension tube (PE) black, for raising inspection opening to ground level, diameter 27.6" (70 cm), length optional up to max. 48" (122 cm), price per 48"
- Extension handle made of stainless steel, length 19.7" (50 cm) or 39.4" (100 cm)
- Stainless-steel soakaway strainer. 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 1,600 micron (1.6 mm; 0.06") Stainless-
- steel blind insert to prevent water inflow to the storage tank. Ensures direct through flow of water to the storm drain or soakaway system (for use during winter operation or maintenance)
- 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. 222 gpm (14 l/s)”:

The filtering capacity specification states that a maximum of 222 gpm 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 up to 0.16" per hour. This figure applies to nearly 99% of all rainfall events. Heavier rainfall which produces precipitation in excess of 2.4 gallons/10 ft² per hour is very rare.

If the components of a roof drainage system (downspout/downpipe, under-ground 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%).

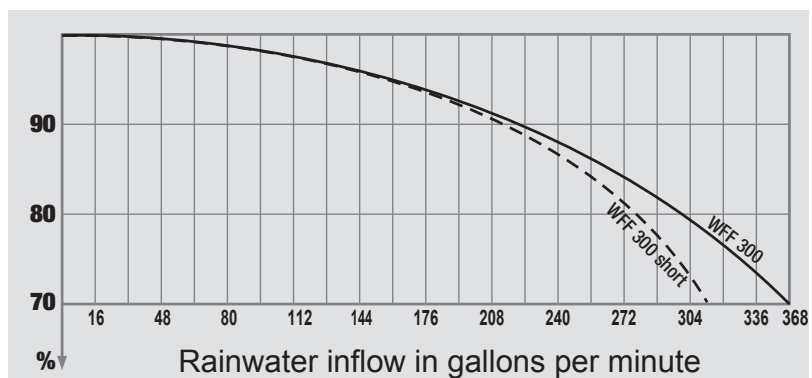
The maximum volumetric flow rate through an underground pipe with a nominal diameter of DN 300 and installed along a 1% gradient is 1,278 gpm (80.6 l/s).

For the purposes of comparison, the volumetric flow rates for “normal” and “heavy” rainfall events for a connected roof area of 32,280 ft² (3000 m²) are given below:

- 0.314"/10.75 ft² per hour (average rainfall) produce a volumetric flow of 106 gpm (6.7 l/s)
- 0.67"/10.75 ft² per hour (heavy rainfall) produce a volumetric flow rate of 220 gpm (13.9 l/s), in other words, where heavy rainfall does not exceed 0.67"/10.75 ft² 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.

100

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 1,278 gpm when the filter has been installed correctly and in accordance with the relevant technical standards. This value is valid in accordance with ARCSA Standard 63 for downspouts/downpipes and underground pipes at a 1% gradient, a "pipe fill level" of 70% (i.e. 0.7) and a rainwater velocity of around 5.25 ft/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 9'11" (3 meters).
- 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 20" (0.5 m) to 40" (1 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.

Period and commencement of the guarantee	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 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.