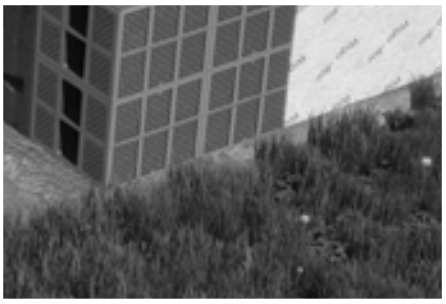
FRÄNKISCHE

SediSubstrator® XL

Installation and maintenance manual
Stormwater treatment system



Last modified: February 2017

DRAINAGE SYSTEMS

ELECTRICAL SYSTEMS

BUILDING TECHNOLOGY

INDUSTRIAL PRODUCTS

1. Safety instructions

ATTENTION

Staff responsible for installation, assembly, operation, maintenance and repair must have appropriate qualifications required for this kind of work.
The builder is responsible for organising in detail authority, responsibility and supervision of staff.

The operational safety of the system components supplied is only guaranteed in case of proper installation and correct use.
Technical threshold values must not be exceeded.

Observe the accident prevention regulations and relevant standards and directives for installation, fitting, operation, maintenance and repair!

This includes (in extracts):

- Accident prevention regulations
  - Construction work BGV C22
  - Technical wastewater systems GUV-V C5
- Safety regulations for working in enclosed spaces of technical wastewater systems GUV-R 126
- Handling biological working materials in technical wastewater systems GUV-R 145
- Directives for working in tanks and narrow spaces BGR 117
- Standards
  - Excavations and trenches - slopes, planking and strutting, breadths of working spaces DIN 4124
  - Construction and testing of drains and sewers DIN EN 1610
- Tool for safety and health protection in technical wastewater systems.

⚠ WARNING

- Hazards from gases and vapours such as risk of suffocation, risk of poisoning and risk of explosion
- Risk of falling
- Risk of drowning
- Germ pollution and wastewater with sewage
- High physical and psychic strain during work in deep, narrow and dark spaces
- and others

⚠ DANGER

Non-compliance with the operating manual may result in considerable property damage, injury or death.

⚠ CAUTION

The system is part of an entire network. During installation, maintenance, service and repair work on one component, always consider the entire system.
Avoid work during rain.

Changes or modifications to the system may only be carried out with the agreement of the manufacturer. For safety reasons, use original spare parts and accessories approved by the manufacturer. The use of other parts voids the liability for any consequences arising therefrom.

Table of contents

2. SediSubstrator® XL at a glance

① Start shaft
② Sedimentation path
③ Target shaft
④ Flow separator
⑤ Mud chamber
⑥ Adsorption filter

ZUGELASSEN DURCH
Deutsches Institut für Bautechnik
DIBt
Z-84.2-11

Hersteller: HeGo Biotec GmbH 14167 Berlin
Herstellwerk: P.U.S. Produktions- und Umweltservice GmbH 02991 Lauta
Z-84.2-11
TÜVRheinland LGA Bautechnik

SediSorp plus

3. System description

3.1 Application

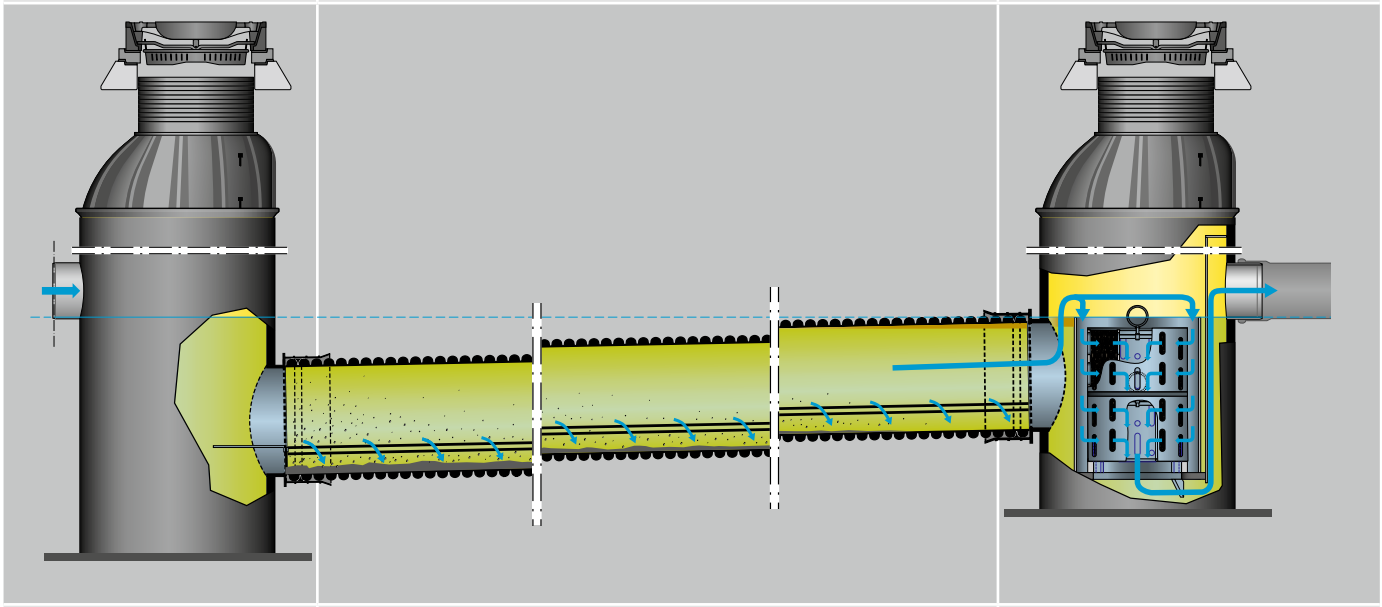
SediSubstrator XL is a stormwater treatment system for heavily polluted stormwater runoff, e.g., from traffic areas. The system separates washed-up solids, particle-bound pollutants, dissolved heavy metals and light liquids (oil) from stormwater and reliably retains these materials in the system.

All sizes of SediSubstrator XL have been tested according to the strict DIBt requirements. This facilitates official approval procedures regarding stormwater infiltration systems and, depending on the country, also discharge into surface waterbodies.

General building authority certification DIBt: Z-84.2-11

3.2 Function description

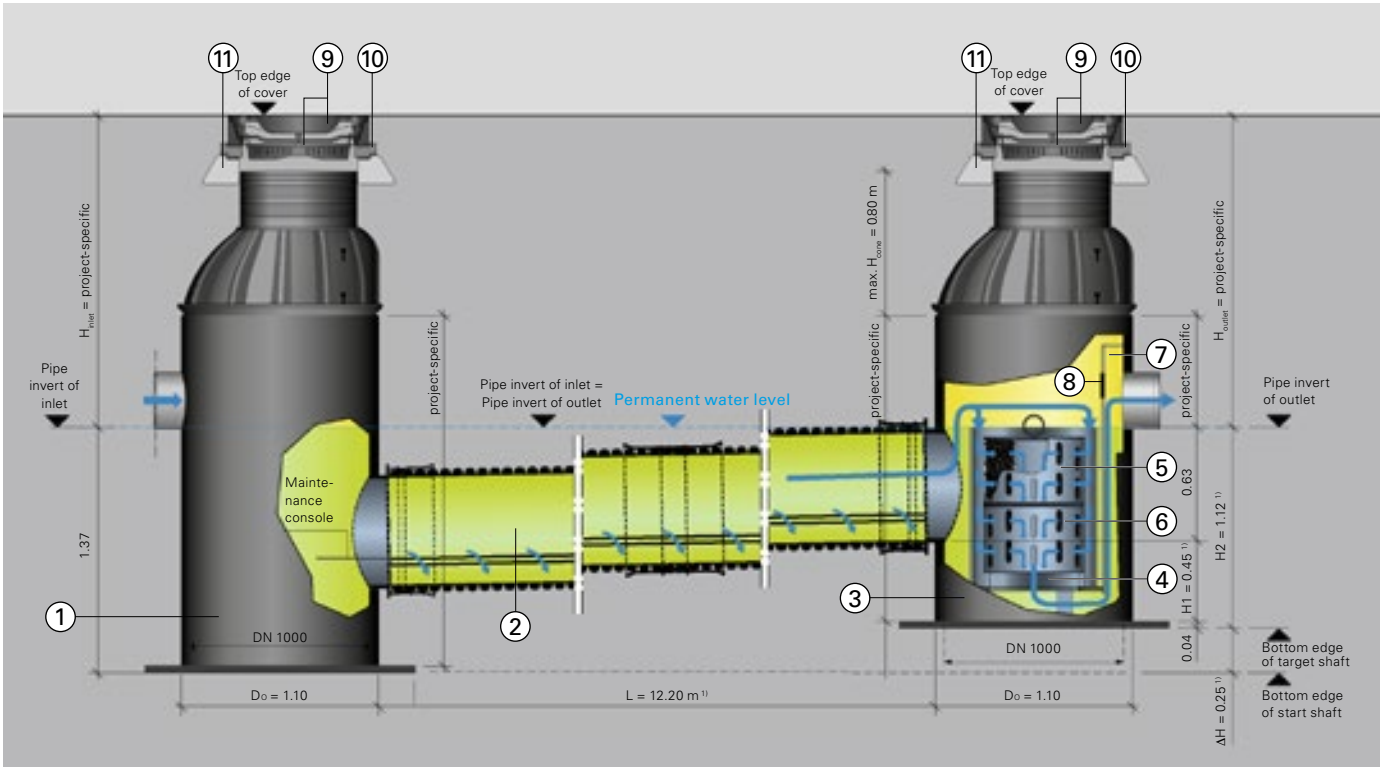
Sedimentation initially retains the coarse particles in the start shaft. The downstream sedimentation path retains fine particles. The flow separator prevents remobilisation and therefore discharge of sediment during heavy rain. Dissolved pollutants such as heavy metals and light liquids are adsorbed in the substrate cartridges (adsorption).

Start shaft	**Sedimentation path**	**Target shaft**
		
Retention of **coarse particles**	Retention of **fine particles**	Retention of **heavy metals**
Sedimentation (physical)	**Sedimentation** (physical) Sediment control thanks to flow separator	**Adsorption** (chemical-physical)

3. System description

3.3 System description

Depending on the design, the system is comprised of at least one start shaft and one target shaft. All shafts are manufactured according to each project's needs and delivered ready for installation. The shaft base bodies (DN 1000) are completely factory-welded and furnished with a square base plate. The sedimentation path includes several main pipes (DN 600) with an installation length of 6 m each. The total length of the sedimentation path depends on the system type and varies between 12 m and 24 m. The cartridge elements filled with substrate are located in the target shaft. The number and type of the cartridge elements can be obtained from Table 3.4 Technical data. When installed, inlet and outlet of the system are at the same height and the sedimentation path features a construction-related slope.



Example: SediSubstrator XL 600/12 with shaft cone

1) Dimensions depend on the system type (see Table 3.4)

① **Start shaft** DN 1000 with inlet, maintenance console and mud collector

② **Sedimentation path** DN 600 with flow separator

③ **Target shaft** DN 1000 with outlet and cartridge elements

④ Cartridge holder with sealing surface

⑤ Substrate cartridge cover element

⑥ Substrate cartridge base element

⑦ Outlet chamber

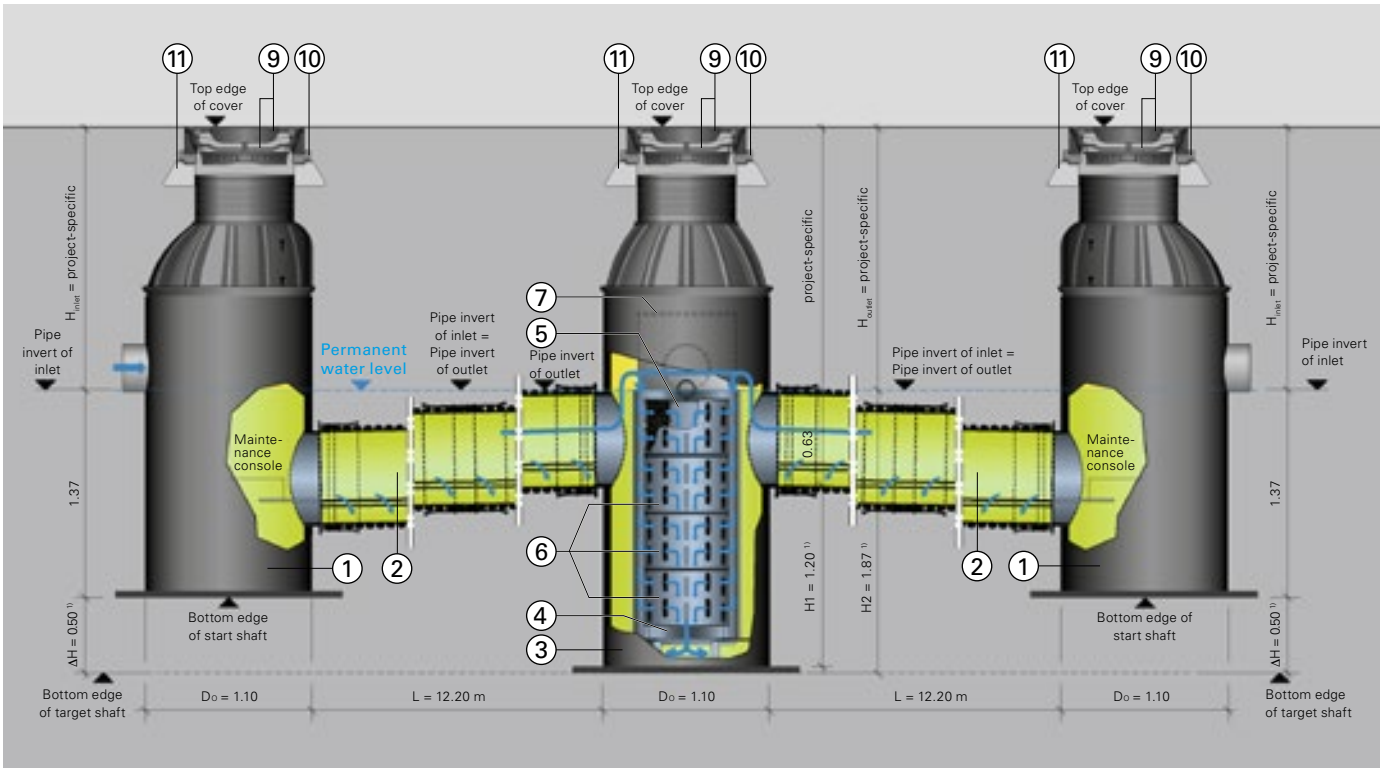
⑧ Maintenance opening

⑨ Shaft cover CW 610 with ventilation openings and dirt trap (to be supplied on site)

⑩ Optionally: concrete support ring acc. to DIN 4034 Part 1 (to be supplied on site)

⑪ BARD ring (concrete support ring) (included in the scope of delivery)

3. System description



Example: SediSubstrator XL 600/12+12 with shaft cone [1] Dimensions depend on the system type (see Table 3.4)

3.4 Technical data

SediSubstrator XL	600/12[1]	600/18	600/24	600/12+12[1]
Length "L" [m]	12.20	18.25	24.30	12.20+12.20
Height "H1" [m]	0.45	0.83	1.20	1.20
Height "H2" [m]	1.12	1.50	1.87	1.87
Height "ΔH" [m]	0.25 [2]	0.13 [3]	0.50 [3]	0.50 [3]
Diameter of the sedimentation path [mm]	600	600	600	600
Length of the sedimentation path [m]	12	18	24	12+12
Number of cartridge elements	2	3	4	4
■ of which cover element	1	1	1	1
■ of which base element	1	2	3	3
Collecting volume of light liquids[4] [litres]	3,800	5,370	6,930	7,520
Collecting volume of the mud chamber[5] [litres]	890	1,100	1,300	1,780
Permanent water level volume[5] [litres]	5,140	7,040	8,940	10,010
Material (sedimentation pipe)	PP	PP	PP	PP

[1] Systems with DIBt approval
[2] Bottom edge of start shaft is lower than bottom edge of target shaft
[3] Bottom edge of start shaft is higher than bottom edge of target shaft
[4] Retention of light liquids in case of spills
[5] Special designs may deviate in terms of collecting volume / volume.
For values please refer to the product drawing.

4. Installation

4.1 Transport and construction site storage

The shafts (max. 500 kg/piece) are factory-fitted with two or three lifting eyes (Ø 40 mm) depending on the shaft depth. Equipment for transport and lifting of the shafts must only be fastened to these eyes.

Use appropriate hoisting slings and chain slings to this end. The sedimentation pipes (max. 150 kg/piece) can be suspended between two hoisting slings or round slings for transport. The cartridge elements must be stored in a dry place until their final installation.

⚠ CAUTION

Store all components on plain ground using sleepers and secure against shifting. Damaged parts must NOT be installed. Do NOT throw components!

Transport using appropriate hoisting slings

Lifting eye

Storage on sleepers

4.2 Temporary construction site cover

Make sure that no dirt, e.g., backfill material, enters the system during construction. Additionally protect shaft openings from earth slides until installation of covers is complete. Systems with intended concrete cover include a factory-provided protective cover DN 1000 which is not accessible or trafficable. An on-site standard temporary construction site cover can be used for systems with shaft cone.

Protective cover for shaft with concrete cover

⚠ CAUTION

Shafts must NOT be accessed before the cover is installed.
If necessary, the required load transfer to the native soil must be ensured using a wide steel plate.

4.3 Excavating pit and creating embedding

In addition to the regulations of DIN EN 1610, observe the specifications of DIN 18300 "Earthworks" (*"Erdarbeiten"*) in the latest version available regarding excavating the pit and creating the embedding. The embedding must be 10 cm to 15 cm high and must be created from compactable, stoneless material depending on the in-situ soil. The minimum widths according to DIN EN 1610 must be strictly adhered to when creating pipe swales. Please observe any deviating minimum widths in the area of the shafts according to local specifications.

ATTENTION

The bearing heights of start and target shafts and the required height difference must be created according to design specifications.

4.4 Installing the first shaft

Installation directions:

Depending on on-site conditions, installation of the system can begin either at the start shaft or at the target shaft:

Supply pipe available;
➔ begin at start shaft

Drainage pipe or storage/infiltration system available;
➔ begin at target shaft

ATTENTION

The crown markings of pipe and coupling must match exactly for all pipe installations!

Place the shaft at the appropriate height on the prepared planum and secure it to prevent shifting. Connect supply pipe and drainage pipe according to design specifications. Make sure no backfill material enters the shaft (do NOT remove temporary construction site cover).

Example: target shaft with Rigofill storage/infiltration system

4. Installation

4.5 Installing the sedimentation path

1. Mount profile sealing rings into the first corrugation trough on each side while still outside the excavation pit. The pipe must be clean.

2. Move the sedimentation pipe to the installation position using lifting equipment (see Section 4.1). The crown marking must face upwards! The integrated flow separator faces downwards!

3. Keep the pipe, sealing ring and the coupling clean. Apply a sufficient amount of lubricant to the sealing ring and the coupling. Ensure that the sealing area is free of dirt. In order to prevent the profile sealing ring from resting on the bearing, the pipe end to be installed can rest on square timber.

4. Use a long lever to install the pipe. Place a board or square timber under the unattached pipe end to prevent damage to the pipe. Pipes must be installed horizontally. Mark the insertion depth on the pipe beforehand. Afterwards, create the pipe slope by aligning the pipe.

5. Deepen the embedding in the area of the couplings as required.

Installation of sealing ring onto sedimentation pipe

Sealing ring with lubricant

Installation of sedimentation pipe

4.6 Installing the second shaft

Installation of target shaft

Place the second shaft at the appropriate height on the prepared planum. Afterwards, prepare the coupling connection and mount the shaft onto the sedimentation pipe. Connect supply pipe and drainage pipe according to design specifications (see Section 4.4).

4.7 Lateral and main backfilling

The specifications of the latest version of DIN EN 1610 must be adhered to when creating lateral and main backfilling. If country-specific regulations or deviating specifications conflict with this, these must be agreed upon with FRÄNKISCHE if necessary. Only compactable materials which can be compacted by hand in layers are approved for lateral backfilling. Make sure that the bottom side of the sedimentation pipes rests completely on the compacted foundation. Provide a soil cover of at least 30 cm for the sedimentation path.

The materials for main backfilling must be filled and compacted according to design specifications.

Make sure that the shafts and sedimentation pipes do not shift during backfilling of the excavation pit. Protect the upper shaft end of systems with a concrete cover against deformation when compacting.

ATTENTION

Do NOT remove temporary construction site covers or protective covers before finishing main backfilling!

Compacting of lateral backfilling

Temporary construction site cover

4.8 Tests before backfilling and impermeability test

Before backfilling the excavation pit, check the system for proper installation and leak-tightness.

The following tests must be performed in particular:

1. Height of the shafts according to design specifications. ✓
2. Exact adjustment of the shafts. ✓
3. Check for damage, foreign objects or coarse contamination. ✓
4. Axial direction of the system. ✓
5. Total insertion depths at the couplings. ✓
6. Position and matching of crown markings (top). ✓
7. Impermeability test. ✓

Tip

We recommend having the system approved by the site management before backfilling.

4. Installation

4.9 Installing shaft covers

4.9.1 Design with shaft cone

If necessary, the cone can be shortened at the neck (maximum 20 cm). The cone neck is cut in the corrugation trough by using a jigsaw or a handsaw. The spacing between corrugation troughs is 1 cm. The cut surface must be deburred.

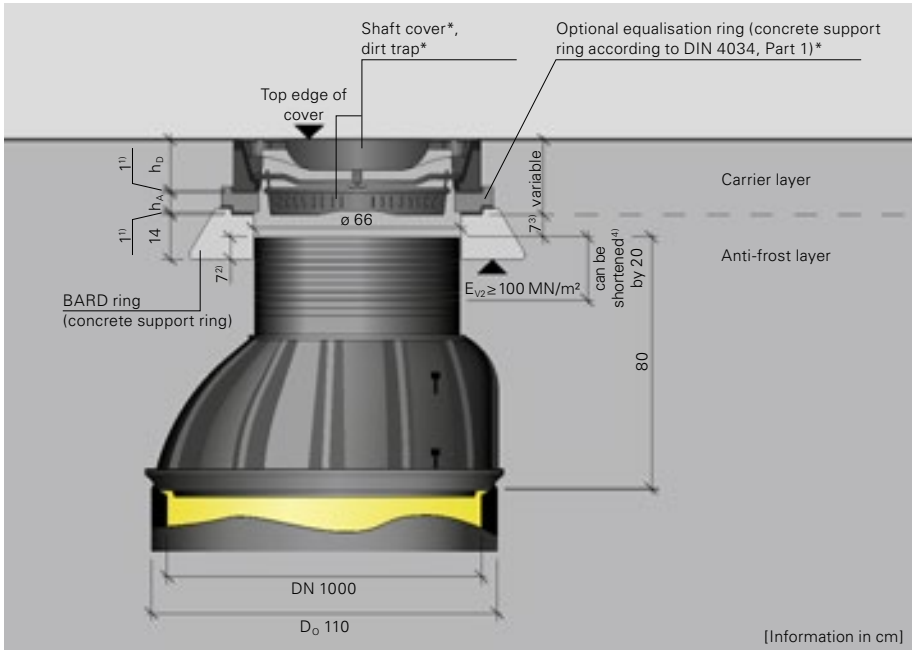
The BARD ring (concrete support ring) transfers traffic loads into the soil. There must be no direct load transfer between BARD ring and shaft/cone. The installation depth of the BARD ring over the cone is 7 cm. The bedding area of the BARD ring must be flat and without stationary loads, and it must achieve an E_{V2} module of at least 100 MN/m². The BARD ring must be placed centrally without affecting the bearing.

Shaft covers, equalisation rings, gully gutters, bucket handles and buckets are not included in the scope of delivery of FRÄNKISCHE Rohrwerke and must be supplied on site.

Install shaft covers according to DIN EN 124, CW 610, installation according to design specifications. Optionally, place equalisation rings according to DIN 4034 under the shaft cover / gully gutter on the BARD ring. The shaft cover and/or equalisation ring(s) must be placed on a 10-mm-thick mortar joint to prevent stationary loads between the BARD ring, the equalisation ring and the shaft cover.

Use common dirt traps under the shaft covers. If the start shaft must feature a gully gutter according to design specifications, a bucket handle (or feed hopper) and a bucket according to DIN 4052-A4 must be installed.

Top edge of the cone up to the top edge of the cover must be approx. 24 cm in the case of a standard class D shaft cover (without equalisation ring).



Shaft cover on cone

*to be supplied on site

h_D = height of shaft cover
h_A = height of support or equalisation ring(s)
[1] 1 cm mortar joint to ensure bearing without stationary loads
[2] 7 cm installation depth of cone SediSubstrator XL into BARD ring
[3] 7 cm compensating area to prevent indirect loads in case of possible settling of the road layout
[4] 20 cm max. shortening area of the cone SediSubstrator XL (delivery to the construction site with the cone not yet shortened)

4.9.2 Design with shaft cover plate

The embedding around the shaft must be designed such that the upper part of the extension pipe is not deformed and the round shape of the extension pipe remains intact. The embedding must extend up to max. 20 cm below the shaft edge.

Create a level concrete C12/15 carrier layer as bearing for the cover plate. The minimum height of the carrier layer is 15 cm, the side length equals the edge length of the cover plus minimum 5 cm.

The spacing between the top edge of the in situ concrete carrier layer and the top edge of the extension pipe is 5 cm. The distance between the cover and the top edge of the extension pipe is therefore approx. 4 cm.

Use two rope loops, which are connected to the cover plate using threaded sleeves, to lift the cover.

Apply an appropriate amount of lubricant to the sealing of the cover plate and the upper inside wall of the extension pipe before installing the reinforced concrete cover plate. Deburr the shaft edge, if required. Place the concrete cover on the level and hardened carrier layer. Check the correct position of the seal afterwards.

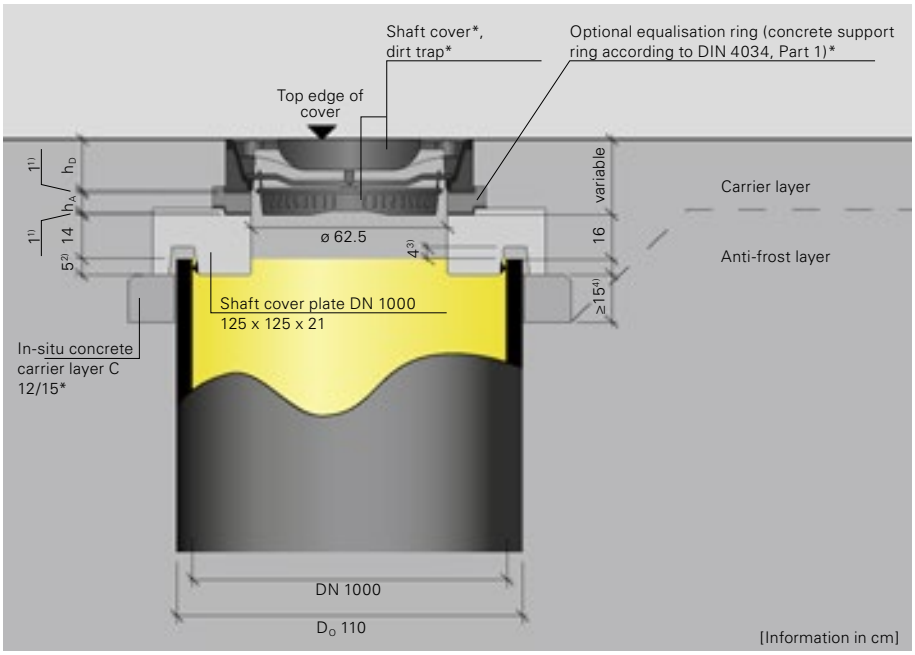
Shaft covers, equalisation rings, gully gutter, bucket handle and bucket are not included in the scope of delivery of FRÄNKISCHE Rohrwerke and must be supplied on site.

Install shaft covers according to DIN EN 124, CW 610, installation according to design specifications. Optionally, place equalisation rings according to DIN 4034 under the shaft cover / gully gutter on the reinforced concrete cover plate. The shaft cover and/or equalisation ring(s) must be placed on a 10-mm-thick mortar joint to prevent stationary loads between reinforced concrete cover plate, equalisation ring and shaft cover.

Use common dirt traps under the shaft covers. If the start shaft must feature a gully gutter according to design specifications, a bucket handle (or feed hopper) and a bucket according to DIN 4052-A4 must be installed.

ATTENTION

Heights must be checked and ensured. The cover plate must not rest on the extension pipe. The carrier layer must be load-separated from the extension pipe.



Shaft cover on shaft cover plate

*to be supplied on site

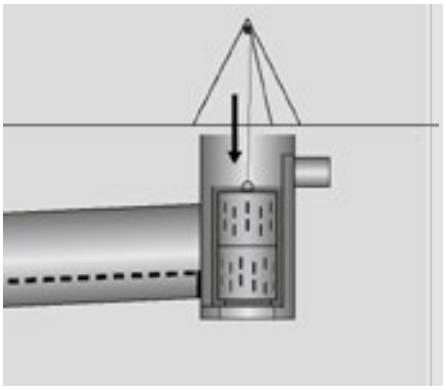
Concrete cover (weight: 580 kg)

h_D = height of shaft cover
h_A = height of support or equalisation ring(s)
[1] 1 cm mortar joint to ensure bearing without stationary loads
[2] 5 cm insertion depth of extension pipe in shaft cover plate
[3] 4 cm compensating area to prevent indirect loads in case of possible settling of the road layout
[4] In-situ concrete carrier layer C12/15 min. H = 15 cm, min. W = bearing width of cover +5 cm from outside edge of shaft cover plate (circumferential)

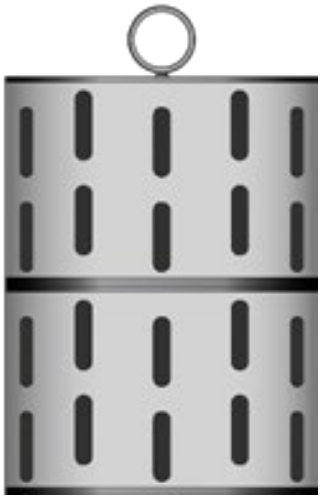
4.10 Inserting substrate cartridge

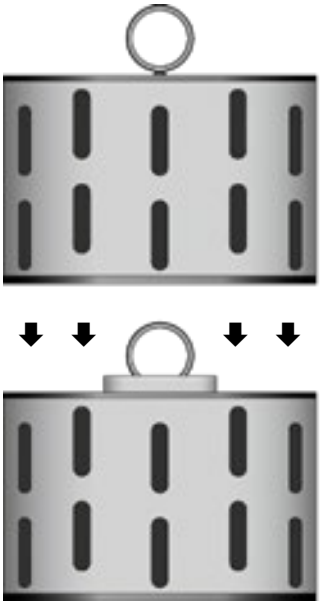
After installation activities and earthworks have been completed, the system must be flushed according to the maintenance manual. The sealing surface of the cartridge holder in the target shaft must be clean. During operation and when inserting the cartridge element, the maintenance opening must be closed.

When the activities have been completed, insert the substrate cartridge elements into the target shaft. The transportation lock situated under the cartridge element in order to protect the sealing must be removed. Make sure that the sealing is in an appropriate condition and has not been damaged. The cartridges must be slowly positioned using suitable lifting equipment (e.g., tripod) and put into the cartridge holder. The cartridge must be placed straight, the sealing is done due to its weight alone. The cover element (closed cover) must face upwards.



Substrate cartridges in the target shaft





Substrate cartridge element ø 560 mm,
Cover element
55 kg dry weight

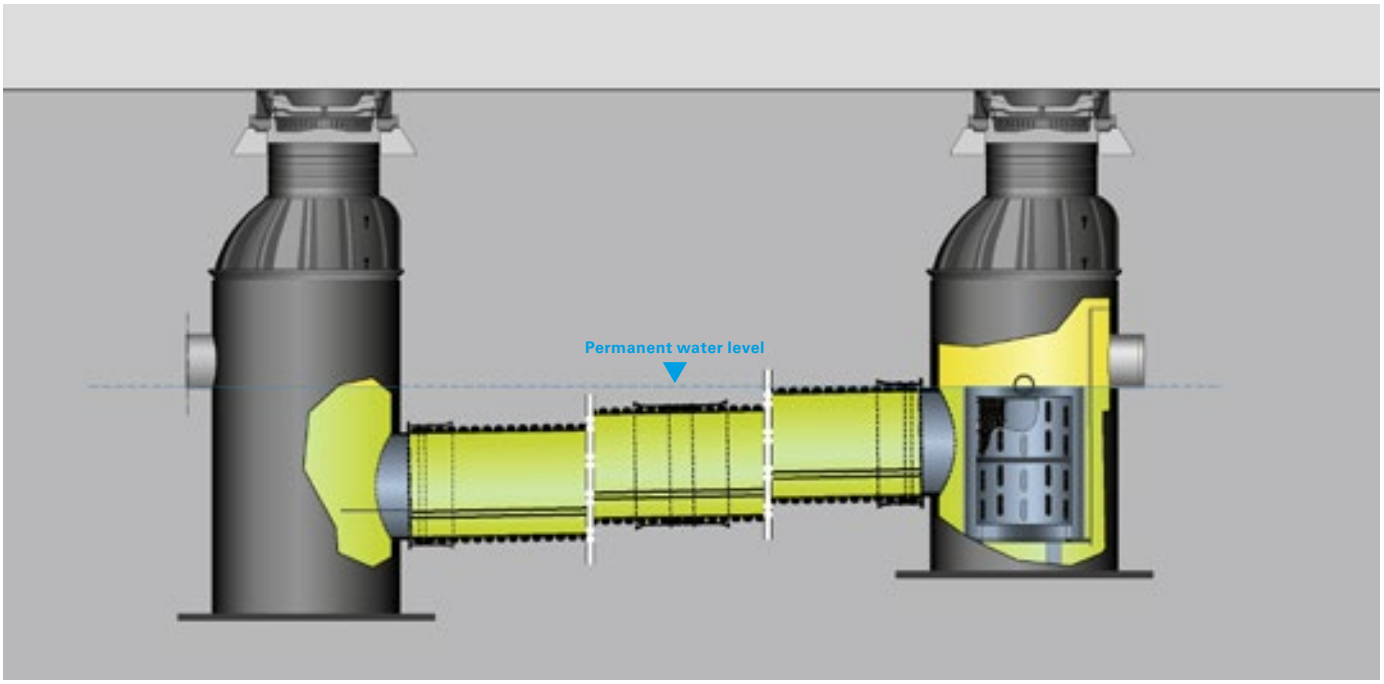
Substrate cartridge element ø 560 mm,
Base element
55 kg dry weight

4.11 Filling the system

After the work has been completed, the system must be refilled with water up to the outlet. This is required to ensure the retention of floatables and light liquids through the immersion wall.

The system must be filled with water (e.g., drinking water, service water, treated wastewater from system cleaning) complying with the local discharge conditions.

(For permanent water level volume, see Section 3.4 Technical data, page 7)



SediSubstrator XL permanent water level

4.12 Arrangement of multiple SediSubstrator XL systems

The above sections of the installation manual describe the standard installation as individual system. The following describes the recommendations for the arrangement of multiple systems and the required minimum distances. These recommendations apply to both systems with standard cone and systems with concrete cover plate.

We draw your attention to the fact that for installation clearances between distribution and combining units and the treatment system, the respective fitting dimensions of the connection pipes and their space requirements must be considered for the installation in addition to the general minimum clearances specified by standards.

ATTENTION

Make sure that the system components are not damaged during backfilling or compacting. Observe the installation instructions for individual systems.

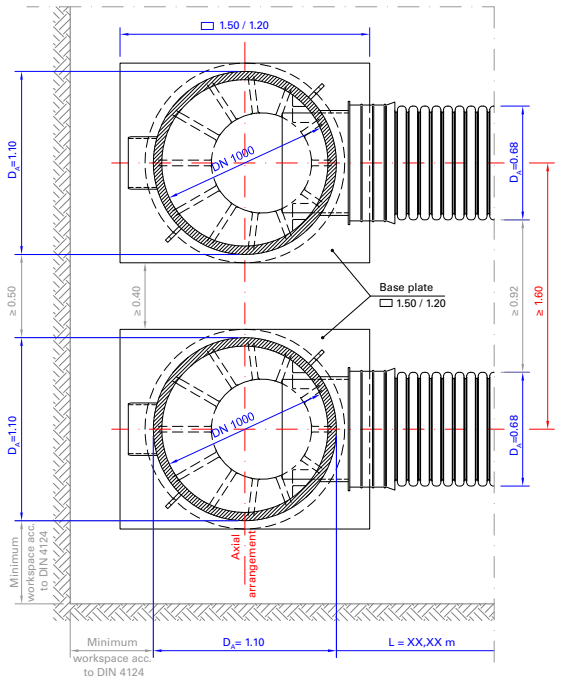


Illustration 12.1 SediSubstrator XL axial arrangement

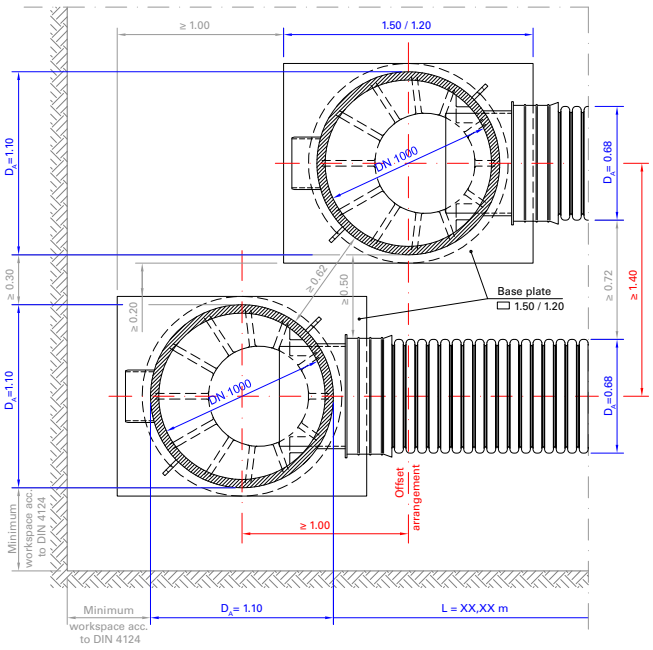


Illustration 12.2 SediSubstrator XL offset arrangement

We recommend a minimum clearance of 1.60 m or more referring to the shaft centres for axial arrangements (Illustration 12.1). We recommend a minimum spacing between the axes of 1.40 m for offset arrangements of shaft constructions (Illustration 12.2). Additionally, pay attention to the offset arrangement of shaft constructions of 1.0 m or more. If the recommended clearances for the respective installation situations are complied with, there is a breadth of workspace of at least 0.5 m between the two shaft constructions or between the shaft construction and the sedimentation path. This is to ensure professional compaction between the system components using light compacting equipment.

4.13 Commissioning

ATTENTION

Observe the safety instructions (page 2).

1 Making system ready for operation

- Clean system of coarse dirt
- Remove auxiliary constructions
- Insert substrate cartridges
- Fill system with water
- Close shaft covers

✓

2 Instruction

1. The following people should be present during handover:

- Persons authorised by the principal to perform the acceptance
- Planner / engineering office
- Construction contractor
- Specialist / expert

We also recommend participation of operating staff.

✓

2. Instruction

- Explain function of system
- Explain maintenance
- Information regarding cleaning and disposal
- Information about FRÄNKISCHE partner companies

✓

3 Documentation / handover

- Declaration of conformity of the contractor
- Handover of maintenance and installation manuals
- Handover of documentation folder including operating log
- Proof of system leak tightness
- Expert test report (commissioning test)
- Optionally: documentation of thorough visual inspection

✓

5. Cleaning

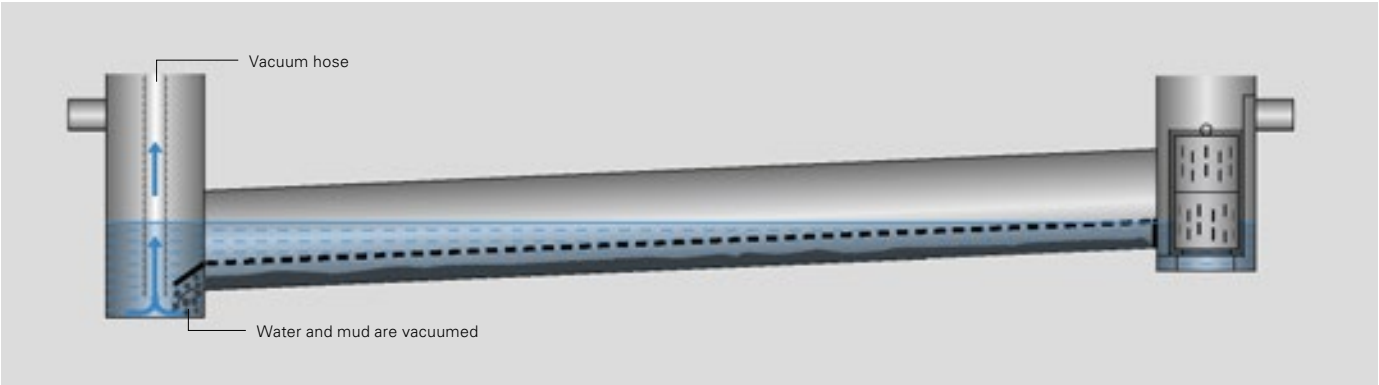
5.1 Emptying and cleaning the system

All the emptying and cleaning work of the system described in this section must generally be made from the start shaft.

Use a high-pressure cleaning/vacuum vehicle to empty the system and remove the contained water and mud fractions. For this purpose, initially vacuum the complete contents through the shaft. The valve flap sealing the mud chamber of the sedimentation pipe can now be moved freely. Due to the slope of the sedimentation pipe, most of its mud collector will be emptied of its contents into the start shaft.

ATTENTION

In the event of an oil spill, the system must be immediately maintained by a specialist and the washed matter must be disposed of appropriately! Otherwise, subsequent rain may lead to a discharge of light liquids!



Emptying with vacuum hose using the example of SediSubstrator 600/12

5. Cleaning

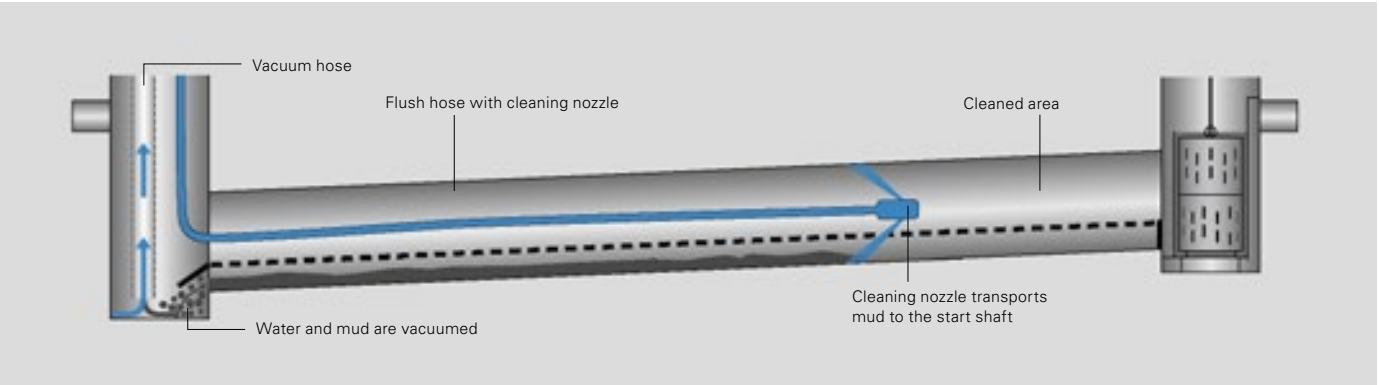
When empty, the maintenance console mounted at the height of the flow separator is visible in the start shaft. The maintenance console facilitates inserting and guiding the flush hose during high-pressure cleaning.

The flush hose is guided through the maintenance console on the flow separator. The cleaning nozzle is guided up to the target shaft during high-pressure cleaning. Make sure that the nozzle does not enter the target shaft. The efficiency of the vehicle and the cleaning and nozzle parameters must be selected depending on the pipe section, pipe material and degree of pollution to be expected.

Use deflection pulleys to avoid damage to the system.

Tip

Combined flushing-vacuum vehicles with water recovery should be used preferably. This minimises disposal expenses and the treated water can be used to refill the system.

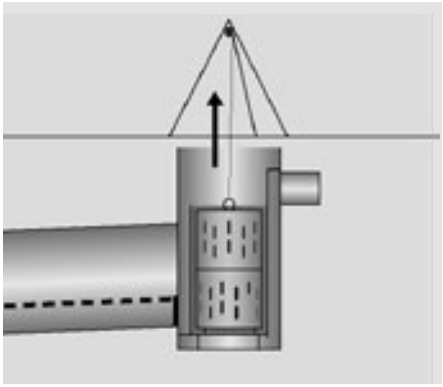


Cleaning with vacuum and flush hose

5.3 Exchanging the substrate in the cartridge elements

1. Removing the substrate cartridge

The substrate in the cover and base elements of the cartridge elements must be exchanged every four years during maintenance. The cover element and the base element situated in the target shaft are removed in order to replace the substrate. Suitable lifting equipment (wire-rope hoist on a vehicle or tripod) must be used. A used, wet cover element or base element weighs approx. 80 kg.



Substrate cartridge in the target shaft

Substrate cartridge consisting of a cover element and a base element

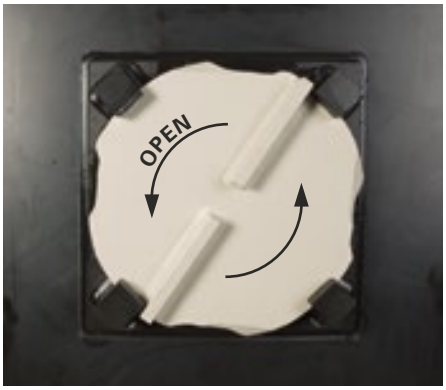
2. Cleaning the target shaft

After the substrate cartridge has been removed, the target shaft must be completely cleaned using a combined flushing-vacuum vehicle, and the remaining mud must be removed.
The outlet chamber must be flushed, if necessary. The maintenance opening is located in the upper section of the outlet chamber which is located in the target shaft. A cover with a sealing ring seals the maintenance opening watertight. It can be opened by a counter-clockwise quarter rotation. The circular opening with a diameter of approx. 28 cm allows direct access to the outlet pipe and outlet chamber. If you want to conduct an impermeability test, you can insert an appropriate seal-off bubble into the outlet pipe through the opening. In case of malfunctions, you can also insert cleaning and maintenance tools into the outlet chamber through the maintenance opening.
Before reclosing, check the sealing ring for damage and, if required, replace it. For closing, rotate the cover clockwise all the way while applying slight pressure. The chamfers in the cover facilitate inserting.

(For position of the maintenance opening, see Section 3.3 System description, page 6)

ATTENTION

Keep the maintenance opening closed during operation of the system to ensure proper operation.



Maintenance opening closed

3. Opening the substrate cartridge

Make a slight turn to open the cover of the base element (bayonet lock) after the safety screws in the middle of the cartridge (see Illustration 1) and at the edge of the cartridge cover (see Illustration 2) have been removed. The cover of the cover element can be removed at the edge of the cover after the centrally aligned retainer ring and the safety screws (8 pcs. TX-Drive 10) have been removed.

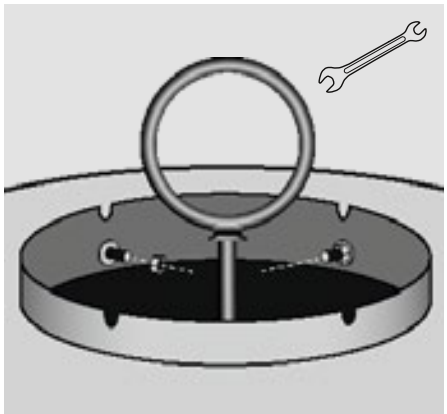


Illustration 1: Releasing the nut (M6)

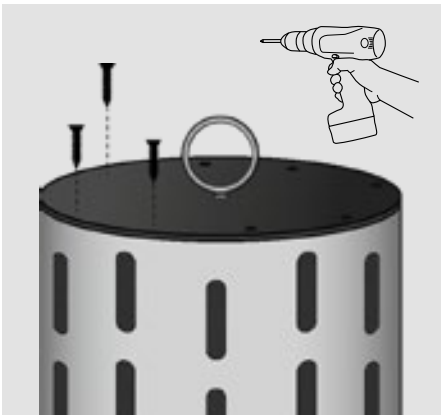


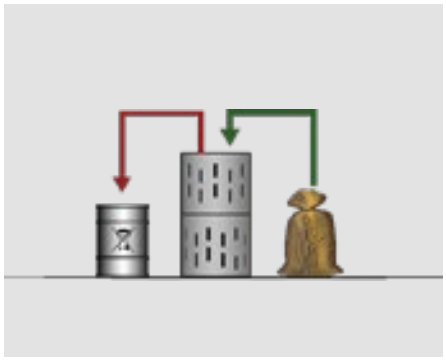
Illustration 2: Removing the safety screws

5. Cleaning

4. Changing the substrate

After the sealing disc under the cover has been removed, the used substrate must be removed and stored in appropriate disposal containers. The housings of the cover element and the base element and the remaining system components must be cleaned and their proper condition must be verified. If damage is detected, the affected parts must be replaced. Use only original spare parts by FRÄNKISCHE for this purpose.
New substrate must then be filled in (SediSorp plus, filling volume approx. 37 kg per cover and base element). The exchange substrate must be purchased in packaging units with a filling volume of 18.5 kg each, and the entire contents of 2 packaging units must be placed into each cover element and base element.

Tap on the housing in order to compact the substrate until the elements are completely filled. Tap in a circle around the cartridge. Compacting is done layer by layer.

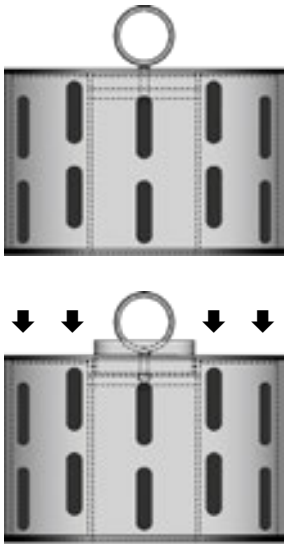


Substrate change

Compacting the substrate

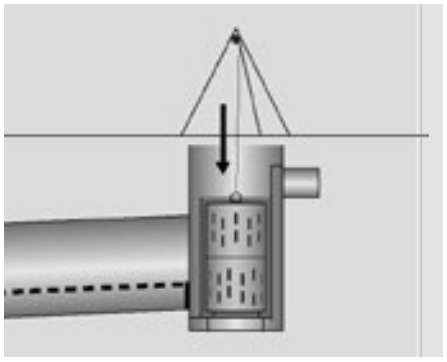
5. Flushing and inserting the substrate cartridge

Assembly of the cover element and the base element is carried out in reverse order. The elements must then be flushed. The flushing water of the cover element and the base element must be collected and disposed of appropriately (e.g., discharge into the wastewater sewer). The newly filled cover element and base element must be re-inserted into the target shaft; the base elements are installed first and the cover element last. Please make sure that the sealing at the bottom of each element is fixed properly and has not been damaged. The cover and base elements must be placed upright in the outlet unit; please ensure that they have not shifted.



ATTENTION

All materials occurring during maintenance and cleaning must be disposed of in accordance with the applicable waste disposal regulations.

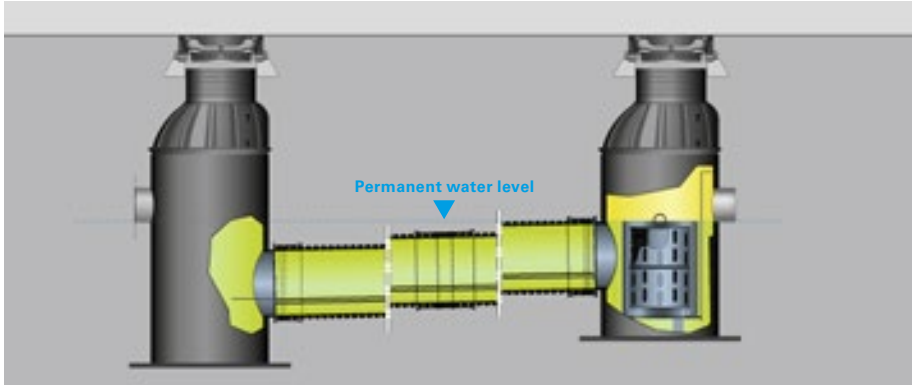


Substrate cartridges in the target shaft

6. Filling the system with water

After maintenance work has been completed, the system must be refilled with water up to the permanent water level. For this purpose, also the water from the system which has undergone the flushing and suction process (filtration during recovery) can be used.

(For permanent water level volume, see Section 3.4 Technical data, page 7)



SediSubstrator XL permanent water level

6. Self-inspection, maintenance and examination

6.1 General information

To ensure functionality of the SediSubstrator XL system, its condition must be ensured through recurring self-inspections, maintenance and examinations. All work and findings must be documented in the operating log. We generally recommend entering a maintenance agreement with an expert (FRÄNKISCHE partner company). Please see www.fraenkische.com / "Drainage systems" / "Find partner companies" for an overview of partner companies trained by FRÄNKISCHE.

ATTENTION

The respective periods and responsibilities are pursuant to the DIBt approval and may differ from authority approvals. In these cases, the authorities' requirements are mandatory and must be observed!

6.2 Self-inspection

The operational capability of the system must be verified by the operator under dry weather conditions at least every three months. For this purpose, open the start shafts and target shafts and visually inspect from the top without accessing the shafts themselves (simple visual inspection).

Check the following:

- Structural condition of the system
- Height of the permanent water level
- Mud level of the start shaft
- Superficial pollution of the filter cartridge

ATTENTION

If a relevant deviation from normal conditions occurs which may impair the operational capability of the system, maintenance must be carried out in order to immediately eliminate the detected deficiencies.

6.3 Maintenance

The system must be maintained by an expert at least every 4 years or more frequently if the system is inundated more often than planned.

The following work must be performed:

- Emptying and cleaning of the system (see 5.1, page 18)
- Exchanging the substrate in the substrate cartridges (see 5.3, page 20 et seq.)
- Refilling the system (see 5.3, item 6, page 21)

6.4 Examination after five years

Prior to commissioning and afterwards at regular intervals of not more than five years, the wastewater treatment system must be inspected by a specialist relating to its appropriate condition and proper operation. Prior to this inspection, the system must be completely emptied and cleaned.

In order to reduce costs, however, FRÄNKISCHE recommends carrying out this inspection every four years as part of maintenance.

At least the following must be inspected and/or recorded:

- Information on the place of inspection, the operator of the system with reference to the stock data, the customer, the examiner and the authority in charge
- Structural condition of the stormwater treatment system
- Proof of proper exchange of filter materials and disposal of the removed mud
- Existence and completeness of required approvals and documents (permits, drainage plans, operating and maintenance manuals, etc.)
- Dimensioning, suitability and performance of the wastewater treatment system with regard to the actual volume of wastewater

ATTENTION

To carry out an inspection, a test report with reference to the stock data and deficiencies, if any, must be prepared. Deficiencies must be eliminated in coordination with the competent authority, if applicable.

6. Self-inspection, maintenance and examination

6.5 Disposal

Materials removed from the system such as mud and substrate as well as the flushing water used to clean the system contain hydrocarbons and heavy metals. Therefore, they must be disposed of in compliance with the applicable legal provisions.

Waste fractions occurring after spills with light liquids must be disposed of professionally as “oil/water separator contents” in compliance with the current waste catalogue. The statutory disposal and acceptance certificates must be included in the operating log together with the entries as evidence of proper disposal.

6.6 Thorough visual inspection

The structural condition of the sedimentation path can be inspected by thorough visual inspection using CCTV inspection technology.
For this purpose, the upper flow area is accessed with a state-of-the-art pan and tilt camera. The lower sedimentation chamber can be inspected visually through the flow separator.

Here, the maintenance console facilitates inserting the dolly and guiding the camera cable. Use appropriate deflection pulleys.

Inspection equipment should be selected according to DWA worksheet and bulletin series DWA-A/M 149 “Conditions and Assessment of Drain and Sewer Systems Outside Buildings” (*„Zustandserfassung und -beurteilung von Entwässerungssystemen außerhalb von Gebäuden“*) and should be adjusted to pipe section and pipe material.

Inspection of flushing results with pan and tilt camera, camera on the maintenance console in the start shaft of a SediSubstrator XL system

Cleaned, residue-free system, here in the area of the flow separator

	Installation	Self-inspection	Maintenance	Disposal	Verification	Repairs
Who	Specialist	Operator	Expert	Waste management service provider	Expert	Specialist
What		Simple visual inspection - Structural condition of the system - Height of the permanent water level - Mud level of the start shaft - Superficial pollution of the filter cartridge	- Emptying and cleaning of the entire system using sewer cleaning vehicle - Exchanging the substrate in the substrate cartridges - Refilling the system with water from water recovery or with water complying with the local discharge conditions	- Disposal of mud and solids - Disposal of substrate compound - Applicable waste disposal regulations must be observed.	- Emptied completely - Cleaning of the system - Information on the place of inspection, the operator of the system with reference to the stock data, the customer, the examiner and the authority in charge; - Structural condition of the stormwater treatment system - Proof of proper exchange of filter materials and disposal of the removed mud - Existence and completeness of required approvals and documents (permits, drainage plans, operating and maintenance manuals, etc.) - Dimensioning, suitability and performance of the wastewater treatment system with regard to the actual volume of wastewater	Original parts or tailored parts explicitly approved by the manufacturer may be used only
When		3 months	- When depot is filled - 4 years	When the retention volume has been used up, after 4 years at the latest	- 5 years - Before first commissioning	Requirement-oriented work
Documentation	Declaration of conformity	Operating log	Operating log	- Operating log - Disposal certificates	- Record - Entry in the operating log	Operating log

8. Substrate cartridge spare parts order form

Name / Company

Street, No. | City, Post code

Contact | Phone

Date | E-mail

During maintenance of SediSubstrator XL, the substrate in the cartridge elements is exchanged; the cartridge elements are refilled and exchanged for this purpose. The procedure is described in the installation and maintenance manual. (Download at www.fraenkische.com)

Use the SediSorp plus substrate only. It is sold in packaging units of 18.5 kg each; you must fill 2 bags of 18.5 kg each into the cover element and the base element respectively. You can obtain SediSorp plus from FRÄNKISCHE Rohrwerke.

We recommend hiring an appropriate expert company for exchanging the filter substrate in the existing cartridge and for proper disposal.

Please refer to www.fraenkische.com for a list of appropriate expert companies (FRÄNKISCHE partner companies) and their contact details.

Spare parts order

☐ Replacement cartridge **base element** (complete)
(filled with 2 x 18.5 kg SediSorp plus)
Labelling: **DE** Cat. no.: **515.98.011** Quantity: _____ pc(s)

☐ Replacement cartridge **cover element** (complete)
(filled with 2 x 18.5 kg SediSorp plus)
Labelling: **DE** Cat. no.: **515.98.012** Quantity: _____ pc(s)

☐ **SediSorp plus** filter substrate(18.5 kg/bag)
Cat. no.: **515.98.013** Quantity: _____ bag

☐ **Bottom seal** for SediSubstrator XL base element or cover element
Cat. no.: **515.98.015** Quantity: _____ pc(s)

☐ **Inside elements** for SediSubstrator XL base element or cover element
(complete set with upper sealing disc, inside/outside drainage layer, inside/outside gauze layer)
Cat. no.: **515.98.012** Quantity: _____ set

Additional notes	Stamp, signature orderer

Fax: +49 9525 88-9290122 | Bestellformular-drainage@fraenkische.de | **Order via local building material supplier!**

Notes

9. Your connection to us

Professional advice by FRÄNKISCHE

International Sales Director

Horst Dörr +49 9525 88-2490
horst.doerr@fraenkische.de

International Sales

Dinah Nigrowics +49 9525 88-8155
dinah.nigrowics@fraenkische.de

Technician

Stefan Weiß +49 9525 88-8824
stefan.weiss@fraenkische.de

Andreas Lang +49 9525 88-8216
andreas.lang@fraenkische.de

European Sales Director

Klaus Lichtscheidel +49 9525 88-8066
klaus.lichtscheidel@fraenkische.de

European Sales

Jennifer Gernert +49 9525 88-2569
jennifer.gernert@fraenkische.de

Carolin Rausch +49 9525 88-2229
carolin.rausch@fraenkische.de

Jessica Ursin +49 9525 88-2441
jessica.ursin@fraenkische.de

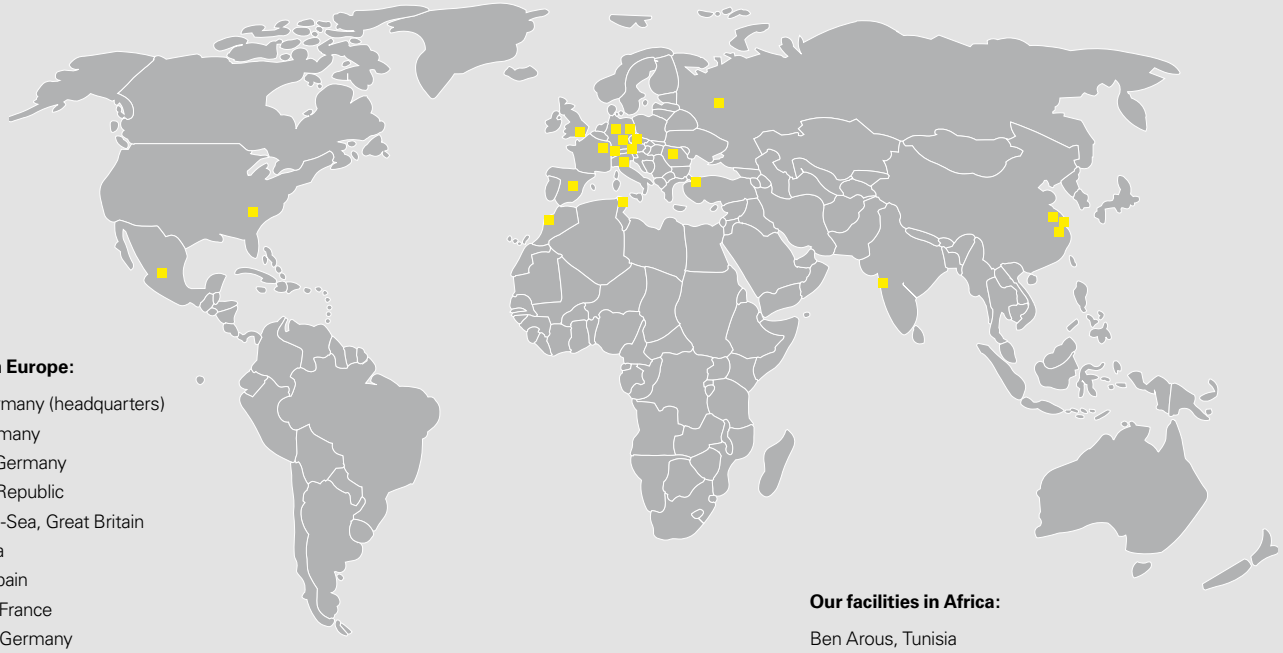
Viktoria Majewski +49 9525 88-2103
viktoria.majewski@fraenkische.de

Fax **+49 9525 88-2522**

FRÄNKISCHE

Rooted in Königsberg –

globally successful!



Our facilities in Europe:

Königsberg, Germany (headquarters)
Bückeburg, Germany
Schwarzheide, Germany
Okříšky, Czech Republic
St.-Leonards-on-Sea, Great Britain
Moscow, Russia
Yeles/Toledo, Spain
Torcy-le-Grand, France
Ebersbach/Fils, Germany
Mönchaltorf, Switzerland
Milan, Italy
Istanbul, Turkey
Cluj, Romania
Wels, Austria

Our facilities in Asia:

Anting/Shanghai, China
Hangzhou, China
Changshu, China
Pune, India

Our facilities in Africa:

Ben Arous, Tunisia
Casablanca, Morocco

Our facilities in North America and Mexico:

Anderson, USA
Guanajuato, Mexico

FRÄNKISCHE is an innovative, growth-oriented, medium-sized family-owned enterprise and industry leader in the design, manufacturing and marketing of technically superior corrugated pipe systems for drainage, electrical, building technology and industrial applications.

We currently employ about 4,200 people worldwide. Both our many years of experience and expertise in plastics processing, our consulting services and the large array of products are highly valued by our customers.

FRÄNKISCHE is a third generation family owned business that was established in 1906 and is now run by Otto Kirchner. Today, we are globally represented with production facilities and sales offices. The proximity to our customers enables us to develop products and solutions that are perfectly tailored to our customers' needs. Our action and business philosophy focus on our customers and their needs and requirements for our products.

FRÄNKISCHE – Your partner for sophisticated and technologically advanced solutions.

FRÄNKISCHE Rohrwerke Gebr. Kirchner GmbH & Co. KG | Hellinger Str. 1 | 97486 Königsberg/Germany
Phone +49 9525 88-2200 | Fax +49 9525 88-92200 | marketing@fraenkische.de | www.fraenkische.com

EN.1474/1.01.19 | Subject to change without notice | Cat. no. 599.13.232