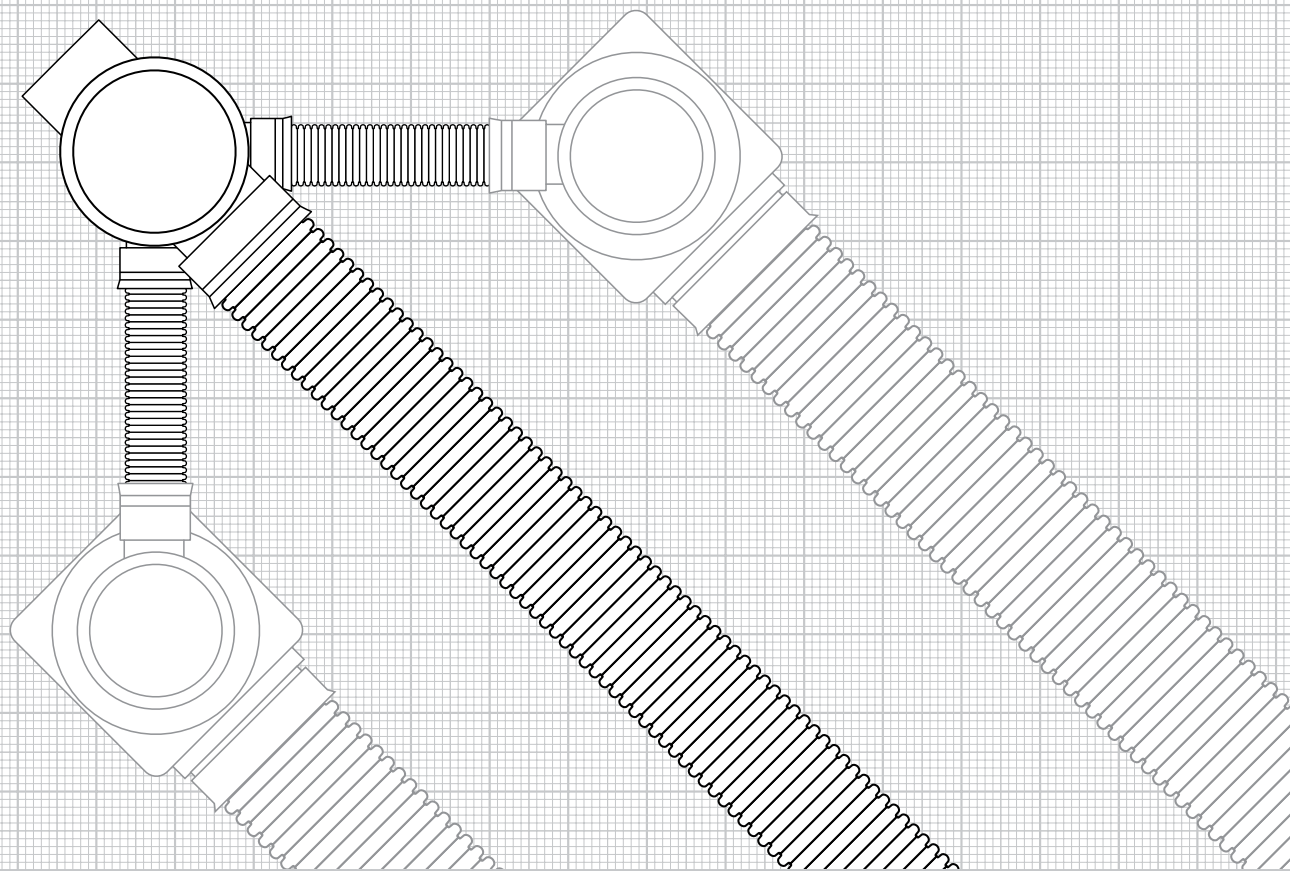


Installation and maintenance manual

Distribution shaft



For two SediPipe® level treatment systems

Contact

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

Technology

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

Julia Möller +49 9525 88-2394
julia.moeller@fraenkische.de

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

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

Fax +49 9525 88-2522



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NB

Please read this installation manual carefully and follow our instructions.

The recommendations are based on DIN EN 1610, DWA-A 139, and DWA-A 127. They apply in addition to the following information.

The relevant safety

provisions of the building

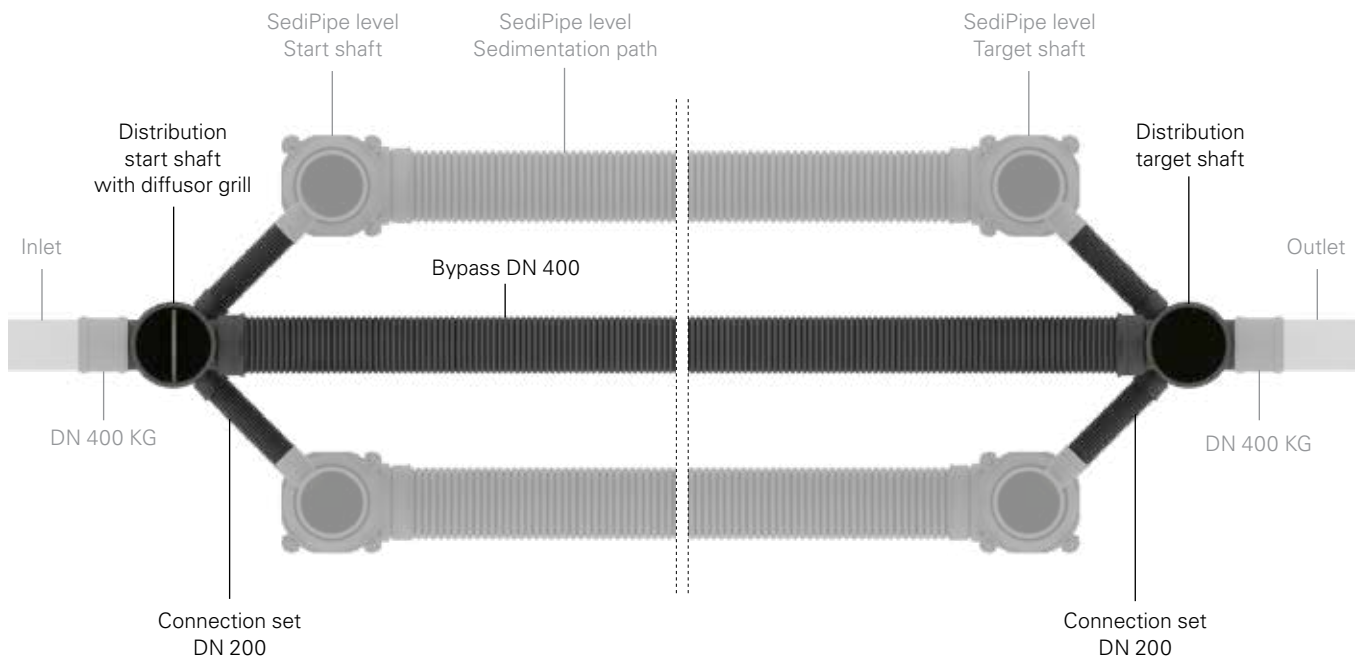
industry apply.

2 System description

- Designed for two SediPipe level treatment systems
- Inlet and/or outlet DN 400 KG
- Diffusor grill in the distribution start shaft
- 2 connections DN 200 for treatment systems
- Bypass DN 400

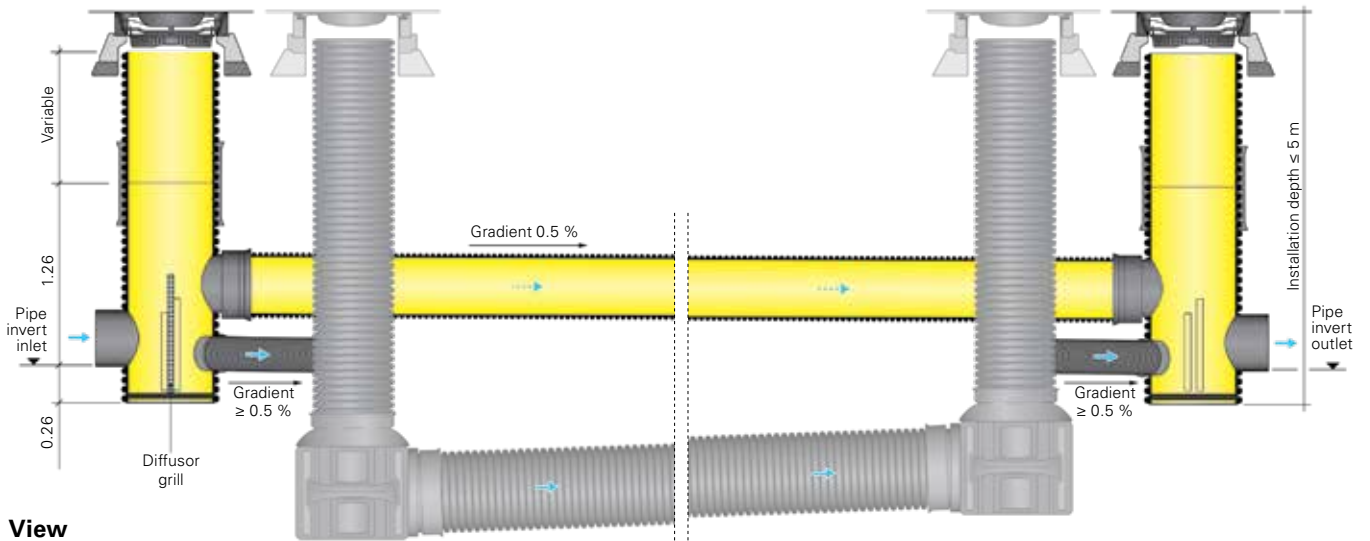
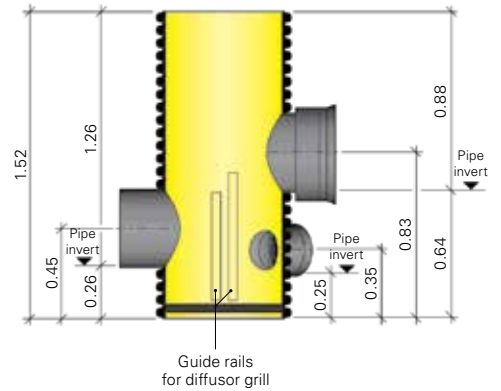
Installation depths

The installation depths of the distribution shaft depend on the installation depths of the connected inlet and/or outlet pipes (e.g., existing storm sewer). The maximum installation depth of the distribution shaft from the top edge of terrain to the shaft bottom, also in case of groundwater, is 5 m depending on installation parameters (soil temperature ≤ 23 °C).



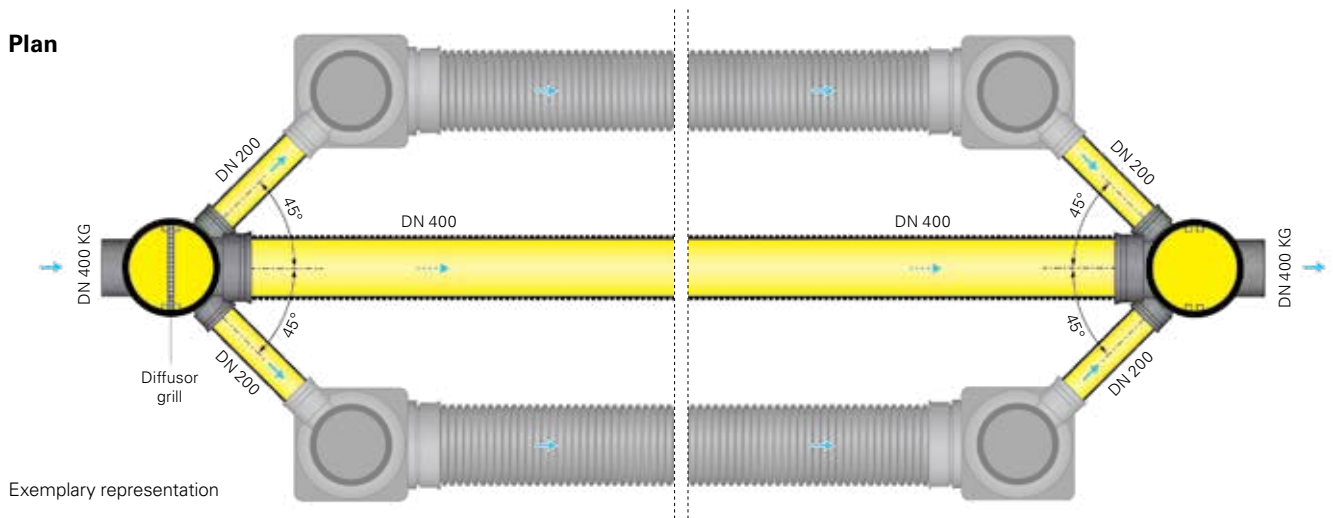
3 Technical specifications

	Technical specifications
Base shaft height [m]	1.52
Inside diameter [mm]	600
Material	PP
Inlet/outlet connection	1 x DN 400 KG
Treatment systems connections	2 x DN 200
Max. flow rate [l/s]	300
Treatment systems connection angle [°]	45
Emergency overflow / bypass connection	1 x DN 400
Max. installation depth from the top edge of terrain to the shaft bottom [m]	5



View

Plan



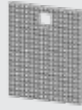
Exemplary representation

4 System components



①

Distribution
start shaft
DN 600

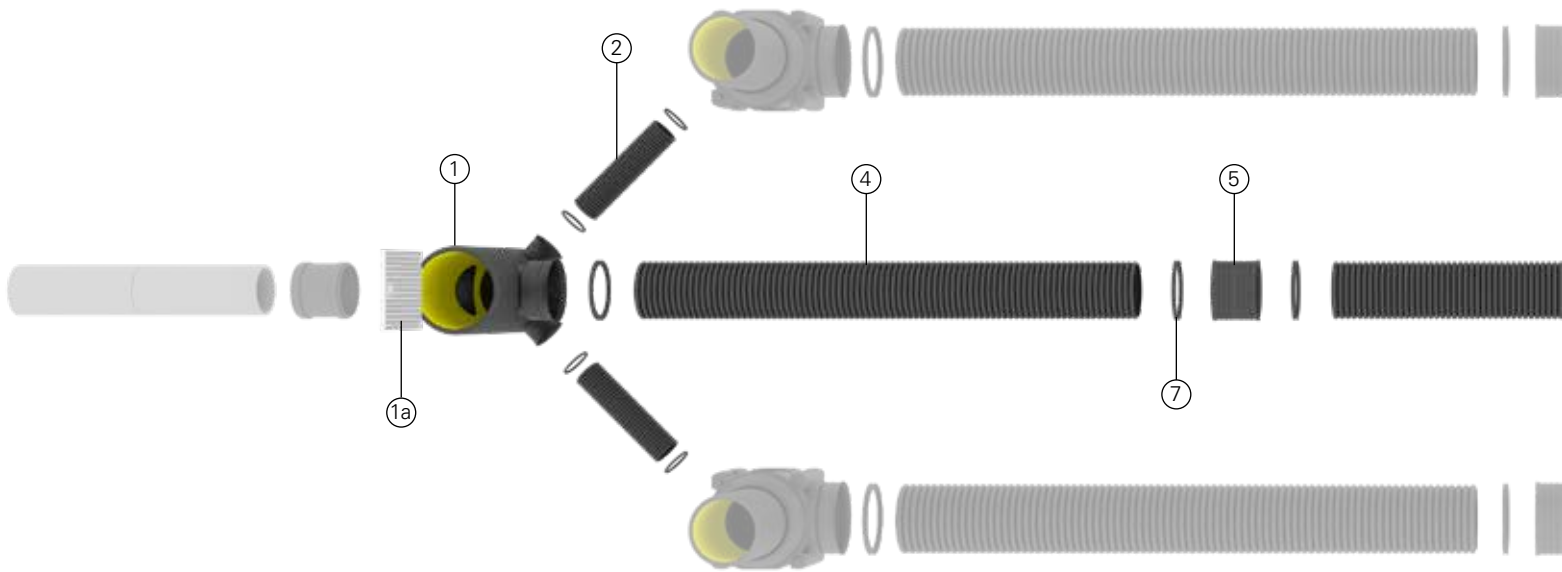


①a

Diffusor grill
for distribution
start shaft



Shaft extension
for start and target shaft
1 m, 2 m, 3 m, 6 m
DN 600



Exemplary representation: Integration of 2 SediPipe level treatment systems connected in parallel into an existing storm sewer



④

Bypass
1 m, 3 m, 6 m
DN 400



⑤

Coupling
for bypass
DN 400



⑥

Slide-on coupling
for bypass
DN 400

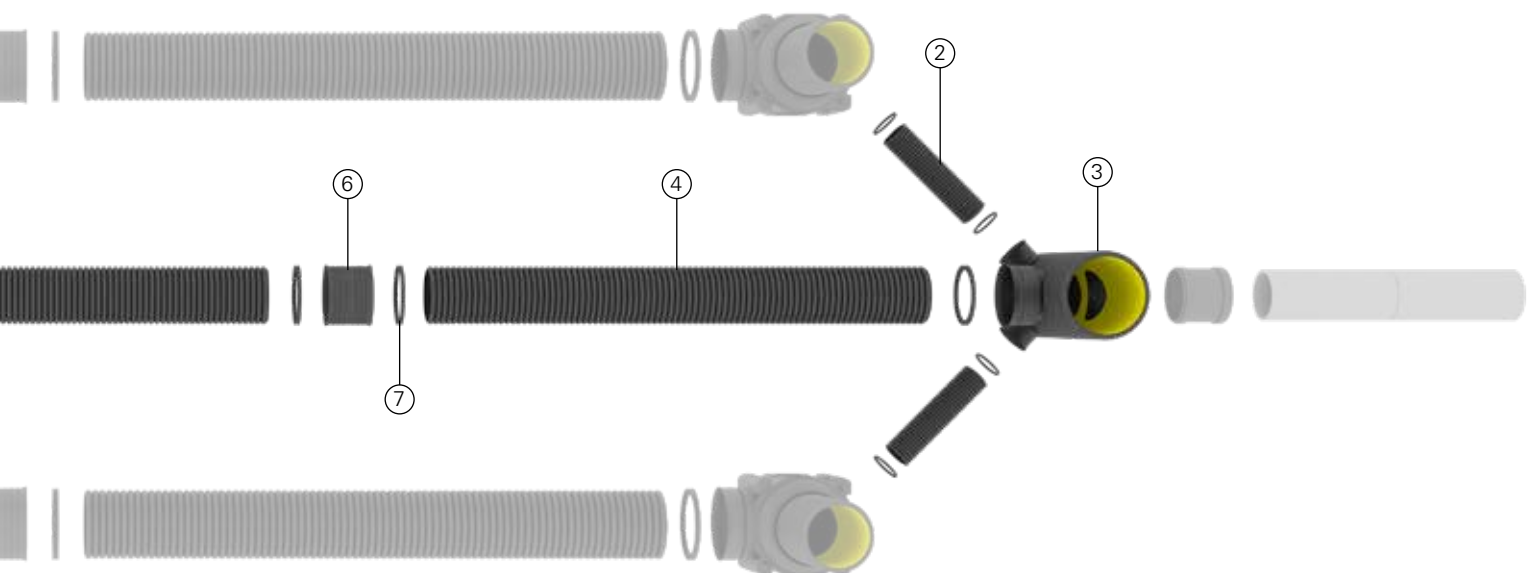
4 System components



②
Connection set
1 m, 3 m, 6 m
DN 200



③
Distribution
target shaft
DN 600



⑦
Sealing ring
for bypass
DN 400

NB

Generally observe the installation and maintenance manuals of the respective system types when installing FRÄNKISCHE treatment systems.

5 Installation

5.1 Incoming material inspection

Check pipes, pipe components, shafts, shaft components and accessories upon delivery to make sure they are labelled sufficiently and comply with the requirements of the customer. Please observe the manufacturer's specifications. Carefully examine all parts both upon delivery and right before installation to make sure that they are free from damage. Reject damaged components and note this down on the delivery note.

5.2 Transport to the construction site

Generally transport pipes, pipe components, shafts, shaft components and accessories using appropriate vehicles; load and unload under professional supervision. Pipes should be largely supported during transport.

5.3 Unloading the lorry

Using excavator and crane

Generally use hoisting slings (e.g., textile slings or similar). Do not use chains and ropes. Avoid dropping, dumping as well as hitting the pipes and shafts hard against each other. The pipes and shafts can be suspended between two hoisting slings or round slings for transport.

ATTENTION

Store all components on plain ground using sleepers and secure against shifting. Damaged parts must NOT be installed. Do NOT throw components! Only install and lift components at temperatures above freezing point.

Using forklifts

Place pallets on forks crossways; ensure largest-possible spacing between the forks.

5.4 Storage at the construction site

Do not dump pipes and shafts with a jerk on hard ground. Store pipes and pallets on even ground that is sufficiently hard to prevent pallets and/or base battens from bogging down. Store shafts on their base on even and solid ground.

Pipes and connecting elements can be stored outside; the storage period outside must, however, not exceed one year. Prevent excessive heating of pipes during summer and resulting damage from UV exposure due to sustained direct sunlight. We recommend that the pipes be stored in the shade or covered with brightly coloured, light-tight tarpaulin.

5 Installation (contd.)

5.5 Temporary construction site cover

Make sure that no dirt, e.g., backfill material, enters the systems and shafts during the construction period. Do NOT remove the temporary construction site covers before installing extension pipes and/or shaft covers. Additionally protect shaft openings from earth slides until final installation of shaft covers.

ATTENTION

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

NB

Generally observe the installation and maintenance manuals of the respective system types when installing FRÄNKISCHE treatment systems.

5.6 Excavating pit and creating embedding

In addition to the regulations of DIN EN 1610, observe the specifications of DIN 18300 (*Erdarbeiten*) in the latest version regarding excavating the pit and creating the lower embedding for distribution shaft. If the native soil is not made up of stoneless, compactable material G1 (GE, GW, GI, SE, SW, SI) or G2 (GU, GT, SU, ST), create an embedding according to DIN EN 1610. The embedding shall generally be created with a consistent degree of compaction of $D_{pr} \geq 95\%$ and a load-bearing capacity of $E_{v2} \geq 45 \text{ MN/m}^2$.

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

Create the bearing height for the distribution shafts considering, if necessary, required height differences according to planning provisions. Additionally consider the gradient of the bypass of 0.5 %.

5.7 Installing the distribution shaft

1. Place the shaft base element(s) at the appropriate height on the prepared planum and secure it (them) to prevent shifting. Make sure no backfill material enters the shaft (use temporary construction site cover).
2. Connect the inlet and/or outlet pipe of the storm sewer with the shaft according to planning provisions.
3. Afterwards, install the treatment systems. To do so, please see the respective installation and maintenance manual.
4. Next, install the connection set to the treatment system with a minimum gradient of 0.5 %. Keep the connection pipe, coupling and sealing ring clean. Mount the sealing ring onto the second corrugation trough. Then apply a sufficient amount of lubricant to the sealing ring and coupling. Make sure that the sealing area is free of dirt.
5. Finally, insert the diffusor grill only in the appropriate guide rails of the distribution start shaft.

NB

Generally observe the installation and maintenance manuals of the respective system types when installing FRÄNKISCHE treatment systems.

ATTENTION

Before inserting the diffusor grill into the start shaft, you must make sure that the complete grill surfaces are free from any possible packaging or labelling materials on both sides.

5 Installation (contd.)

5.8 Upper embedding and lateral backfilling

The specifications of the latest version of DIN EN 1610 must be adhered to when creating the upper embedding and lateral backfilling. If country-specific regulations or deviating specifications conflict with these, these must be agreed upon with FRÄNKISCHE, if necessary.

Create the backfilling with stoneless, compactable material G1 (GE, GW, GI, SE, SW, SI) or G2 (GU, GT, SU, ST) according to DIN EN 1610 and create a consistent degree of compaction of $D_{Pr} \geq 95\%$ and a load-bearing capacity of $E_{v2} \geq 45 \text{ MN/m}^2$. Make sure that shafts and sedimentation pipes do not shift during backfilling of the excavation pit.

NB

Install the bypass with a gradient of 0.5 % in the course of creating the upper embedding and lateral backfilling.

ATTENTION

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

5.9 Installing the optional shaft extension

If required, place the shaft extension DN 600 on the base shaft using the coupling. Keep the pipe, the sealing ring and the coupling clean. Mount the sealing rings onto the second corrugation trough. Then apply a sufficient amount of lubricant to the sealing ring and coupling. Make sure that the sealing area is free of dirt.

5.10 Tests before backfilling and impermeability test

Prior to completion of the excavation pit backfilling, check the system for proper installation and leak-tightness.

The following tests must be performed in particular:

- Exact adjustment of the shafts and pipes
- Check for damage, foreign objects or coarse contamination
- Total insertion depth at the couplings

Tip

We recommend approval of the system by site management before backfilling.

5.12 Completing cover and creating main backfilling

Backfilling work is finished after installing the optional shaft extensions. The materials for main backfilling must be filled and compacted according to design specifications. Make sure that shafts and pipes do not shift during backfilling of the excavation pit. Accessing is only permitted after main backfilling has been completed.

ATTENTION

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

5 Installation (contd.)

5.12 Cutting the shaft extension

Cut the pipe such that it reaches the support ring (observe the dimensions). Cut the pipe to length in the middle of the corrugation trough and align upright to the pipe axis using a fine-toothed saw or other appropriate tools. Remove edges and irregularities on the cutting surfaces with a grater, file or another suitable tool.

5.13 Placing shaft covers

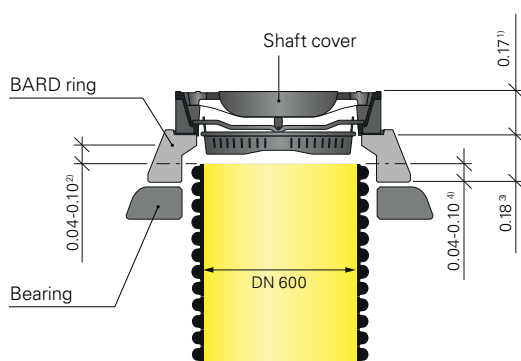
The distribution shaft has been designed for commercially available 625 mm standard covers according to DIN EN 124 (to be supplied on site, not included in the scope of delivery). Use FRÄNKISCHE's BARD ring (class D concrete support ring) as a bearing for the covers.

This transfers the possible traffic loads into the ground. There must be no direct load transfer between BARD ring and shaft. The bearing 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/m^2 . Create the bearing from compacted bearing layer material (E_{v2} module larger than or equal to 100 MN/m^2) or in-situ concrete C 16/20 with similar load-bearing properties. Avoid interlocking of the bearing with the corrugations of the extension pipe. Provide and use a casing aid on site! Vertical loads may only be transferred to the load-bearing underground. The BARD ring must be placed centrally without affecting the bearing.

Shaft covers, equalisation rings, bucket handles, and buckets are not included in the scope of delivery of FRÄNKISCHE 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 on the BARD ring. The shaft cover and/or equalisation ring(s) must be placed on a 1-cm-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.



¹⁾ Height of shaft cover incl. 1 cm mortar joint. The dimension is variable, depending on class B or D shaft cover and use of additional support rings (incl. mortar joint to ensure a bearing without stationary loads).

²⁾ Compensating area: 4 cm to 10 cm

³⁾ BARD ring, inside \varnothing 745 mm, h=180 mm

⁴⁾ Insertion area: extension pipe in BARD ring 4 cm to 10 cm, height adjustment in the insertion area accurate to within the last centimetre possible.

6 Commissioning

ATTENTION

Observe Section 9 Safety instructions.

1 Making system ready for operation

- Clean system of coarse dirt.
- Remove auxiliary constructions.
- 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

We also recommend participation of operating staff.

2. Instruction

- Explanation of the system function
- Explanation of maintenance
- Information regarding cleaning and disposal



3 Documentation/handover

- Handover of the installation manual



7 Self-inspection, maintenance, and examination

To ensure functionality of the entire stormwater treatment system including distribution structure, its condition must be ensured through recurring self-inspections and maintenance.

Generally observe the separate installation and maintenance manual for the SediPipe level systems.

In the course of their inspection, maintenance, and tests, the distribution structure must be inspected as well to ensure proper operation of the entire system.

The operational capability of the distribution structure must be verified by the operator under dry weather conditions at least every three months. To do so, open the covers of the start shafts and target shafts and visually inspect from the top (simple visual inspection).

Check the following:

- Structural condition of the system
- Mud level in the start shaft
- Condition of the diffuser grill in the start shaft

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.

8 Emptying, cleaning, and disposal

Emptying and cleaning

Empty the distribution shaft using a high-pressure cleaning/vacuum vehicle.

The complete contents in the sedimentation area are removed via the generously dimensioned shaft diameter. Afterwards, wash down the diffuser grill integrated in the start shaft and the sedimentation area of the shaft using a high-pressure jetting lance. If required, you can also remove the diffuser grill using appropriate tools.

Afterwards, remove the remaining flushing water and washed matter. If you have removed the diffuser grill in the start shaft, insert it back into the guide rails in the end.

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!

Disposal

Materials removed from the entire system (distribution structure and treatment systems) such as mud and flushing water used to clean the system may 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.

ATTENTION

Applicable waste disposal regulations must be observed when disposing of the matter extracted from the system.

9 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!

These are inter alia (in extracts):

- Accident prevention regulations
 - Construction work BGV C22 (*Bauarbeiten BGV C22*)
 - Technical wastewater systems GUV-V C5 (*Abwassertechnische Anlagen GUV-V C5*)
- Safety regulations for working in enclosed spaces of technical wastewater systems GUV-R 126 (*Sicherheitsregeln für Arbeiten in umschlossenen Räumen von abwassertechnischen Anlagen GUV-R 126*)
- Handling biological working materials in technical wastewater systems GUV-R 145 (*Umgang mit biologischen Arbeitsstoffen in abwassertechnischen Anlagen GUV-R 145*)
- Directives for working in tanks and narrow spaces BGR 117 (*Richtlinien für Arbeiten in Behältern und engen Räumen BGR 117*)
- Standards
 - Excavations and trenches - Slopes, planking and strutting, breadths of working spaces DIN 4124 (*Baugruben und Gräben-Böschungen, Verbau, Arbeitsraumbreiten*)
 - Construction and testing of drains and sewers DIN EN 1610 (*Verlegung und Prüfung von Abwasserleitungen und -kanälen*)
- 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 psychological stress 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

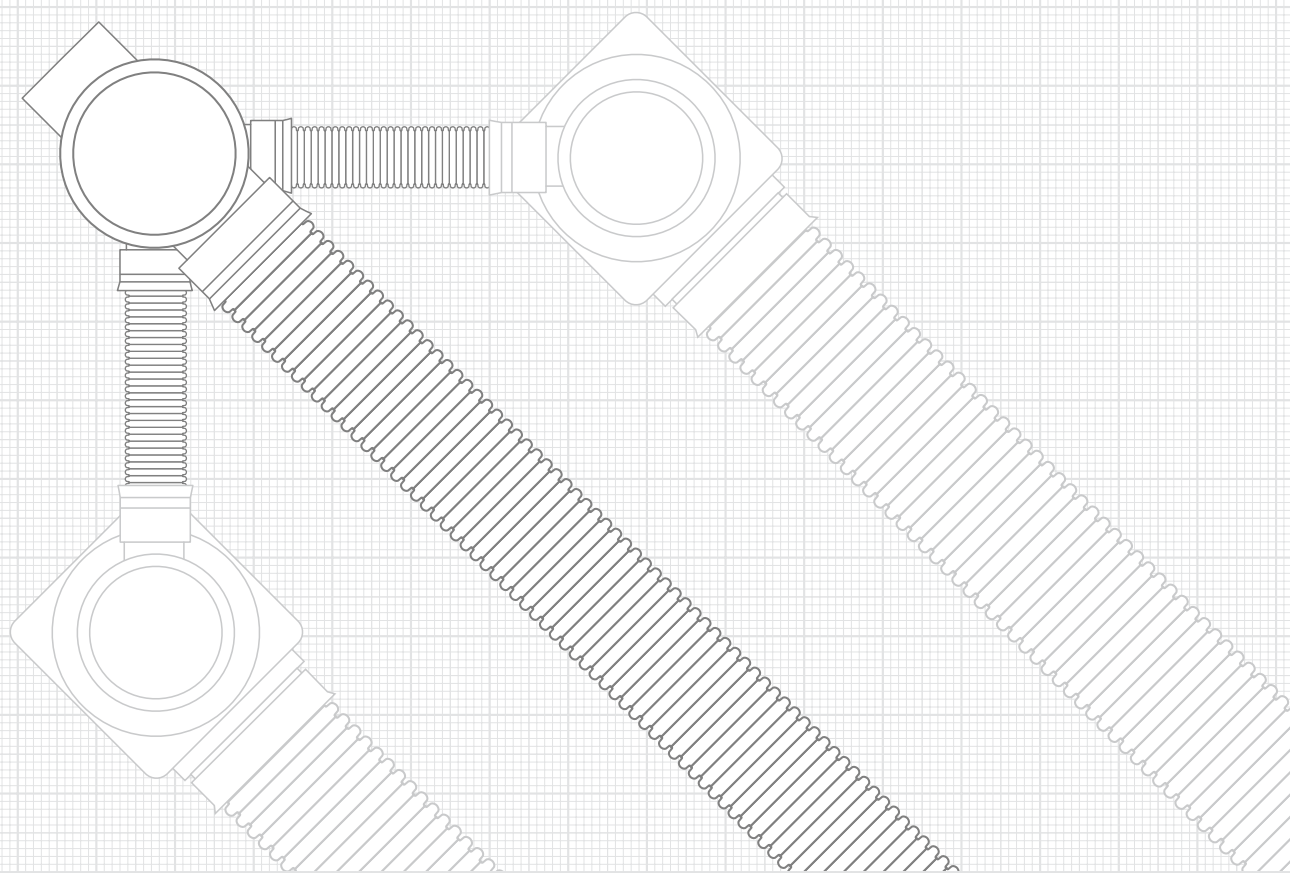
The system is part of an entire network. During installation, maintenance, service and repair work on one component, always consider the entire system. Avoid work during rain.

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.

General information on using our products and systems:

Information about or assessments of the use and installation of our products and systems is exclusively provided on the basis of the information submitted. We do not assume any liability for damage caused by incomplete information. If the actual situation deviates from the planned situation or if a new situation occurs or if different or new installation techniques are applied, these must be agreed upon with FRÄNKISCHE, since these situations or techniques may lead to different conclusions. Notwithstanding the above, the customer is solely responsible for verifying the suitability of our products and systems for the intended purpose. In addition, we do not assume any liability or responsibility for system characteristics and system functionalities when third-party products or accessories are used in combination with FRÄNKISCHE systems. We only assume liability if original FRÄNKISCHE products are used. For use in other countries than Germany, country-specific standards and regulations must also be observed.

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FRÄNKISCHE

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

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