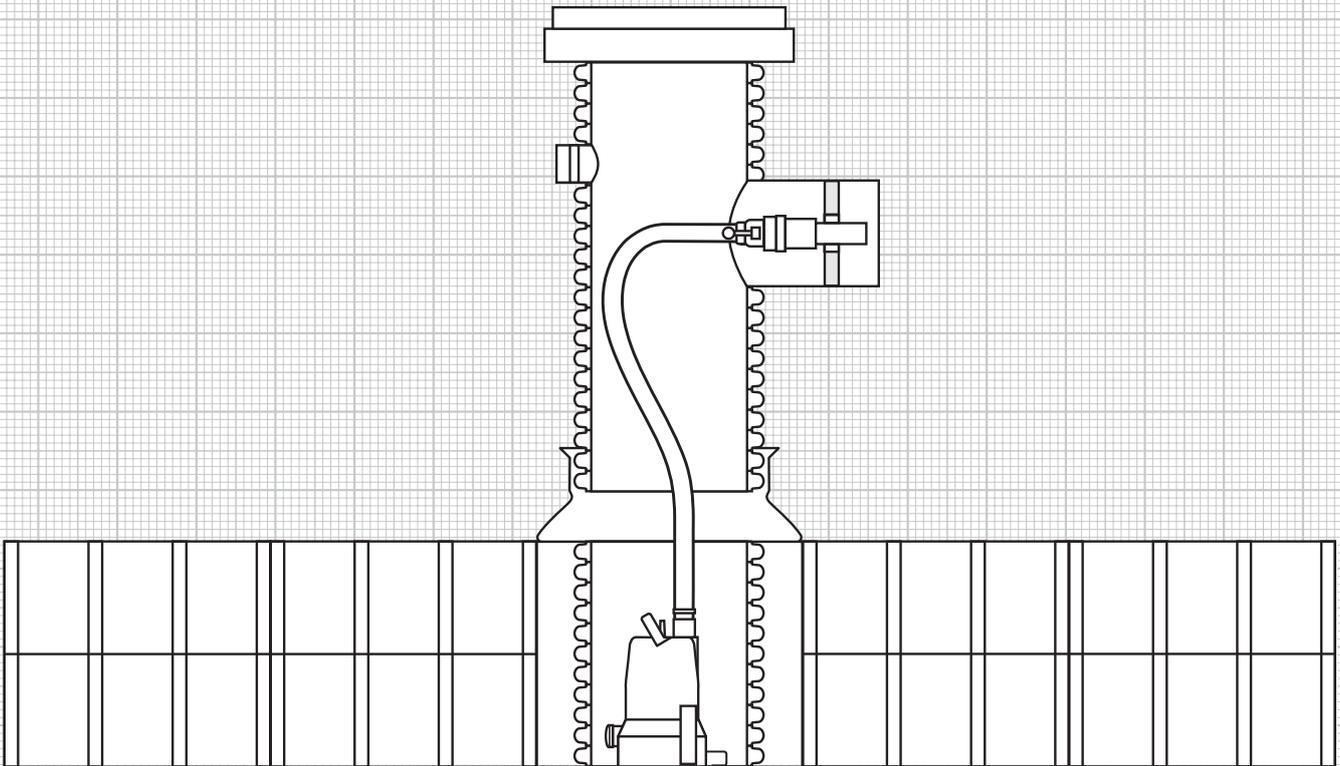


Installation manual

Quadro® Lift – pump shaft



The pump shaft in the Rigofill modular block type structure

Contact

Contact persons Königsberg headquarters

International Sales Director

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

International Sales

Dinah Wächter +49 9525 88-8155
dinah.waechter@fraenkische.de

Technology

Pedro Simões +49 9525 88-8360
pedro.simoes@fraenkische.de

European Sales Director

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

European Sales

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

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

Carolin Diem +49 9525 88-2229
carolin.diem@fraenkische.de

Fabian Thiergärtner +49 9525 88-2197
fabian.thiergaertner@fraenkische.de

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

Fax +49 9525 88-2522



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Note

Please read this installation manual carefully and follow our instructions.



2 Shaft design / function

2.1 Quadro[®]Lift design

QuadroLift is a versatile and modular pump shaft D_o 600. You can integrate the system pump shaft into the Rigofill system.

Maintenance does not require entering the shaft – the pump unit can be easily removed for maintenance and re-inserted at any time.

Installation is a breeze as well: Depending on the design, the prefabricated shaft is placed in the intended position in the modular block type structure before or during the installation of the system.

You can monitor the pump unit and the filling level of the tank locally (QuadroLift basic) or web-based (QuadroLift smart). The operating instructions are included in the scope of delivery of the control and pump equipment.

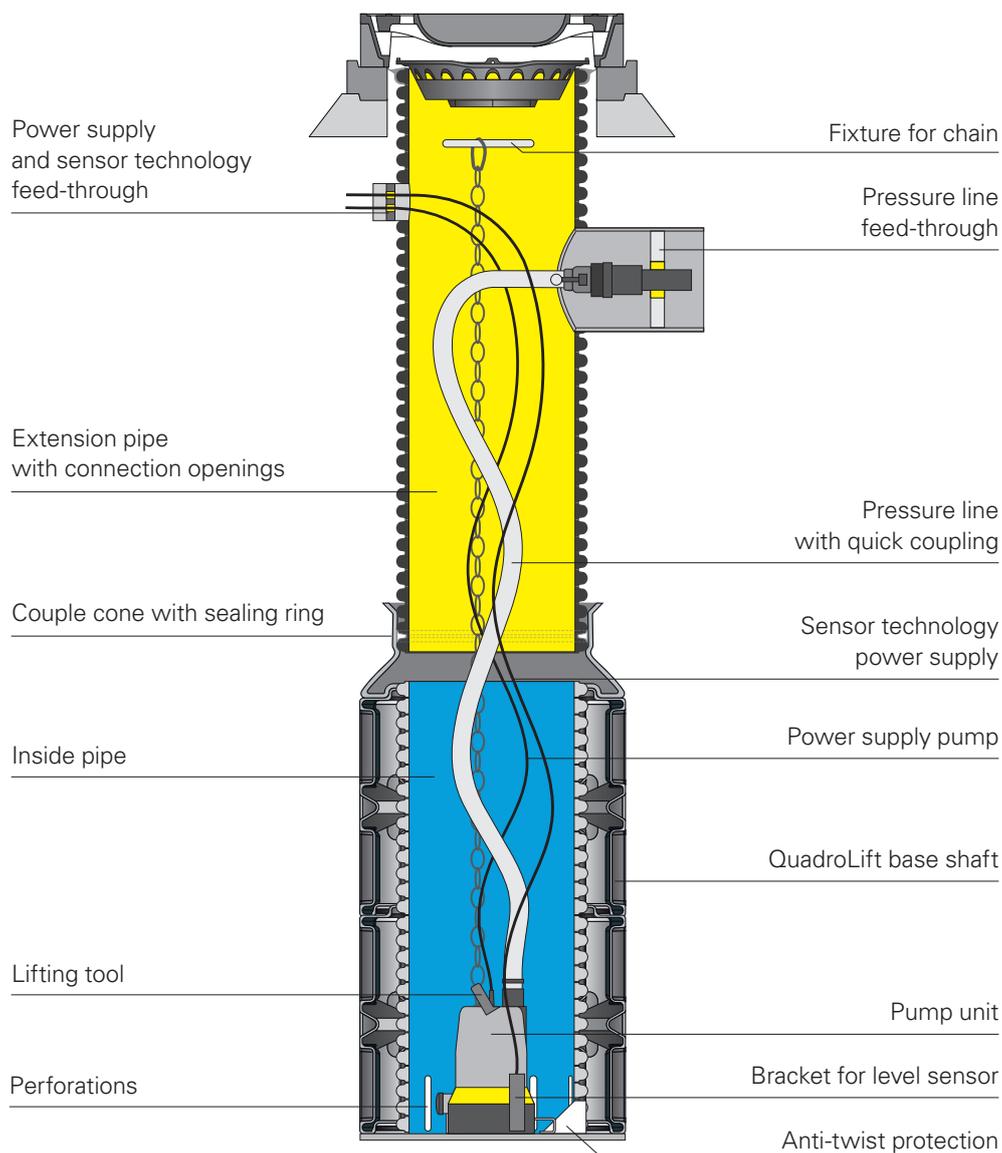
The installation manual only covers the installation of the QuadroLift pump shaft and its components.

NB

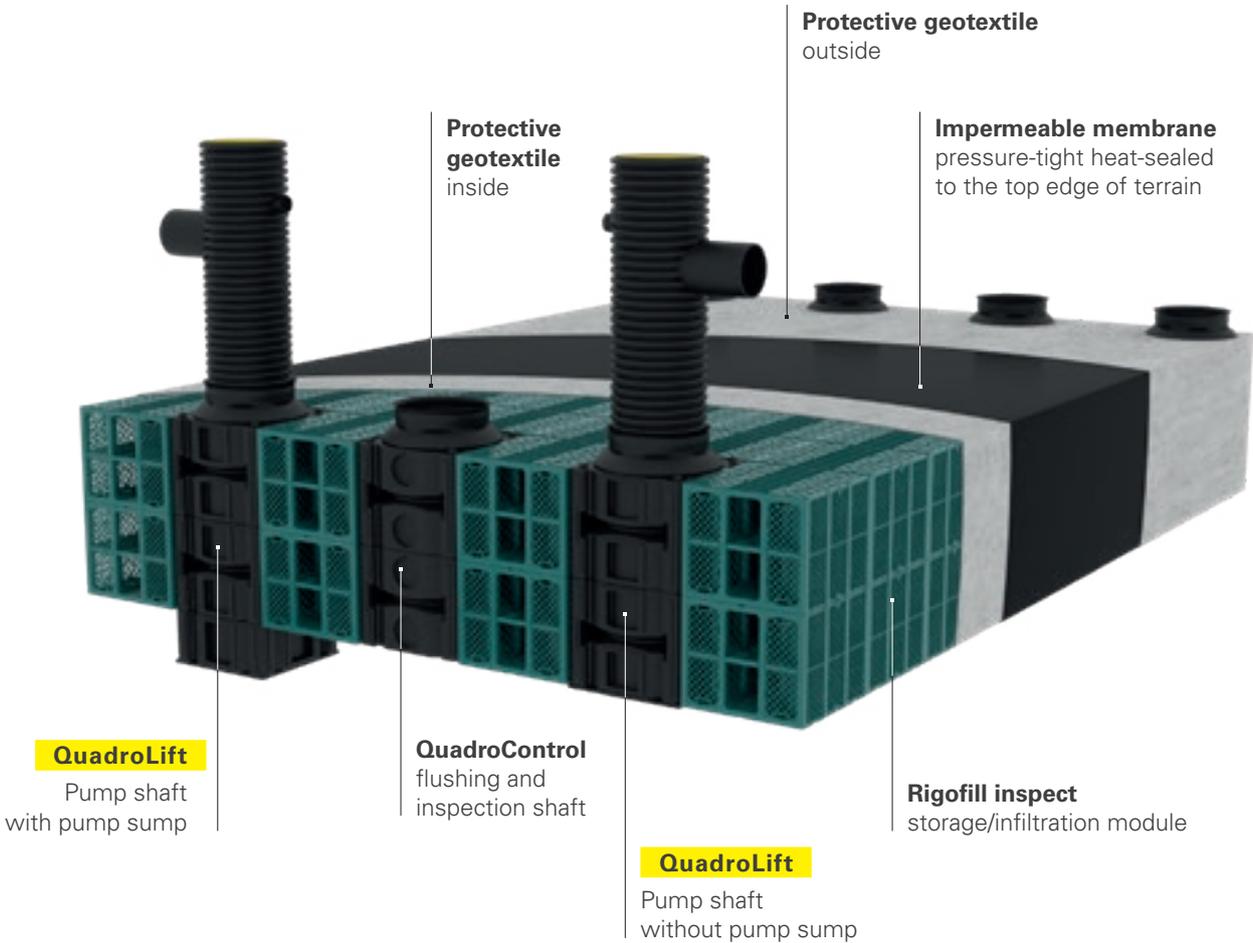
We manufacture and dimension QuadroLift according to each project's needs.

Characteristics

- Plastic shaft D_o 600
- Pump unit included
- Variable height
- 2" pressure line



2.2 Quadro®Lift integrated into tank



Refer to the Rigofill inspect installation manual!

Please observe the respective installation manual for the installation of Rigofill storage/infiltration modules.

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3 Preparatory work

3.1 Incoming material inspection



Included in the delivery

- Shaft base body
- Extension pipe with connection openings
- Optional: shaft extension
- Pump unit (pump, sensor, base)
- Cable, pressure line and feed-throughs
- Control cabinet, incl. control system
- Optional outdoor installation cabinet



3.2 Transport and construction site storage



The pump unit, incl. cable connections, pressure line, feed-throughs, control cabinet and chain, as well as installation material, are delivered together with the corresponding QuadroLift plastic shaft and other project-specific accessories. The shaft components are delivered packaged. Use appropriate means for unloading and construction site transport. Avoid damage during unloading and storage.

QuadroLift can be stored outside. The storage period outside should, however, not exceed one year. Protect the material from direct sunlight, e.g., by storing in the shade or covering it appropriately. Store the components such that they are not damaged and that they are protected from getting dirty. Store the components on sleepers on plain ground.

Check the components for defects before installation. The impact strength of the material decreases in sub-zero temperatures. Damaged components must not be installed! The relevant safety provisions of the building industry apply.

ATTENTION

Check all components for completeness and intactness upon delivery. Damaged parts must not be installed. Do not throw components, they include breakable parts!

NB

Please observe the respective installation manual for the installation of the Rigofill storage/infiltration modules.

- Create excavation pit and bearing
- Lay the geotextile and impermeable membrane according to specifications, leak-test the seams heat-sealed up to that point.
- Install Rigofill inspect

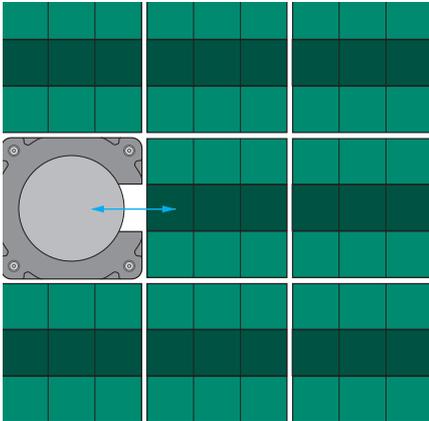
ATTENTION

For multiple-layer systems, we recommend inserting QuadroLift into the modular block type structure before installing the final layer of Rigofill. (Exception: QuadroLift with pump sump – see paragraph 4.1.b)



4 Installation of Quadro[®]Lift

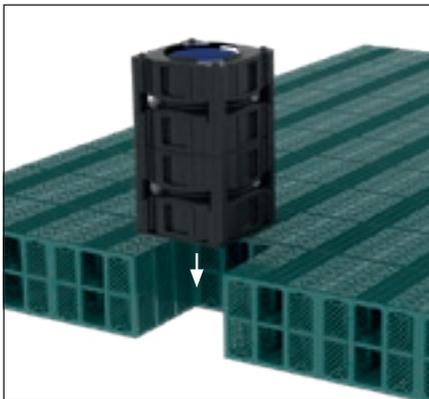
4.1.a Installation of the shaft body for designs without pump sump



For multiple-layer systems, we recommend inserting QuadroLift into the modular block type structure before installing the final layer of Rigofill.

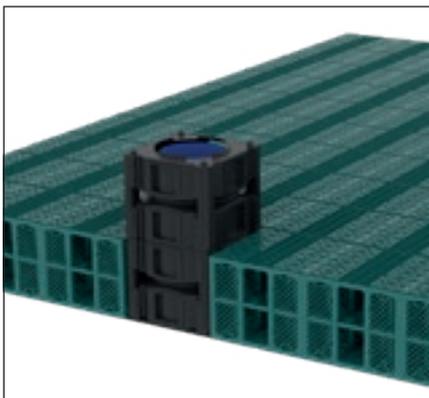
ATTENTION

Install QuadroLift with its openings facing the direction of the tunnel.



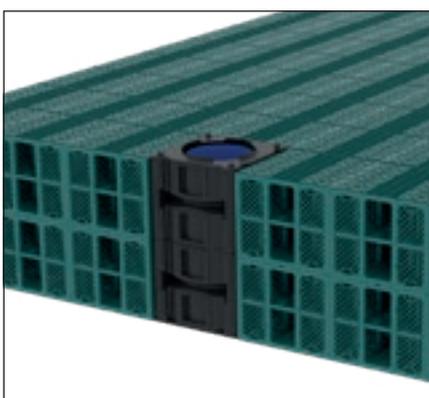
1

Install QuadroLift before completing the final layer. Make sure not to shift the shaft body on the planum to avoid any damage to it. Use suitable lifting equipment to place the shaft in the intended position in the layout.



2

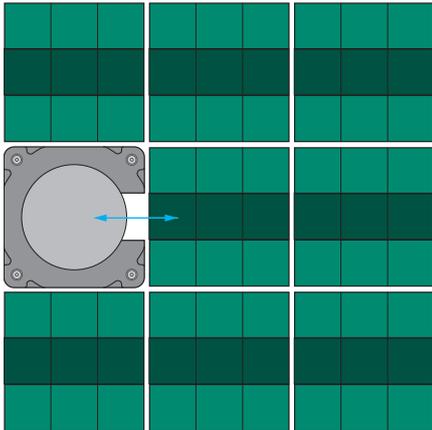
Observe the correct orientation of the shaft openings. The openings must always be orientated towards the modules – under no circumstances must they face away from the storage/infiltration system.



3

The installation of the shaft base element has been completed after the final layer has been installed.

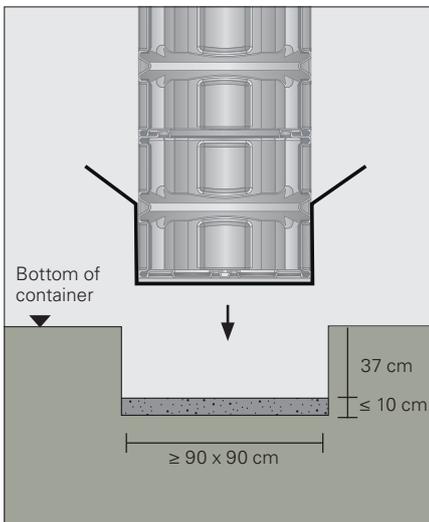
4.1. b Installation of the shaft body for designs with pump sump



QuadroLift with pump sump should be placed as the first component. Carry out the remaining installation starting from this point.

ATTENTION

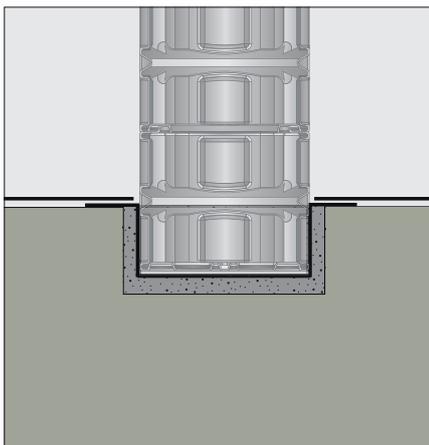
Install QuadroLift with its openings facing the direction of the tunnel.



1

Excavate the pump sump according to planning specifications. Depending on the requirements, apply a ≤ 10 -cm-thick levelling layer to the bottom, preferably made of chippings or gravel (without fine particles).

- Line the pump sump with geotextile.
- Use prefabricated impermeable membrane to line the pump sump, incl. internal geotextile.
- Insert QuadroLift using suitable lifting equipment according to design specifications.
- Fill the gap (between native soil and the outside of the pump sump) with suitable, self-compacting material (chippings or similar) up to the lower edge of the container.



2

Cover the excavation pit with protective geotextile and impermeable membrane. Connect the surface sealing with the prefabricated impermeable membrane for the pump sump.

**3**

Afterwards, position the modules.

**4**

The installation of the shaft base element has been finished after the final layer has been installed.

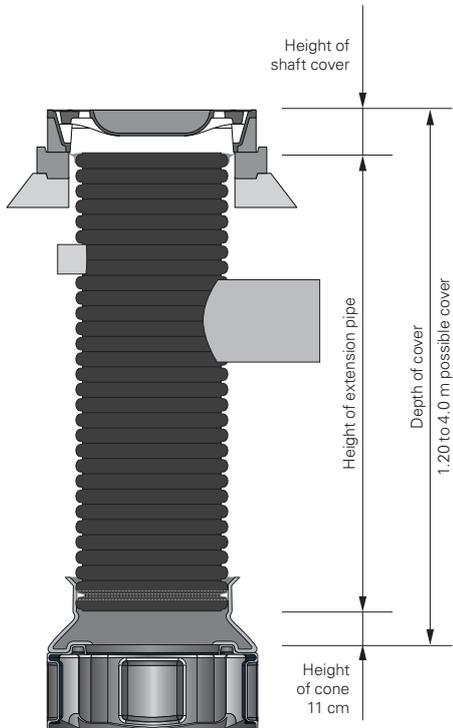
**Note**

Please observe the respective installation manual for the installation of Rigofill storage/infiltration modules.

- Install accessories
- Continue installing the geotextile and impermeable membrane according to specifications, leak-test the seams not yet checked.

4.2 Placement of extension pipe with connection openings

4.2.1 Calculation of the required height



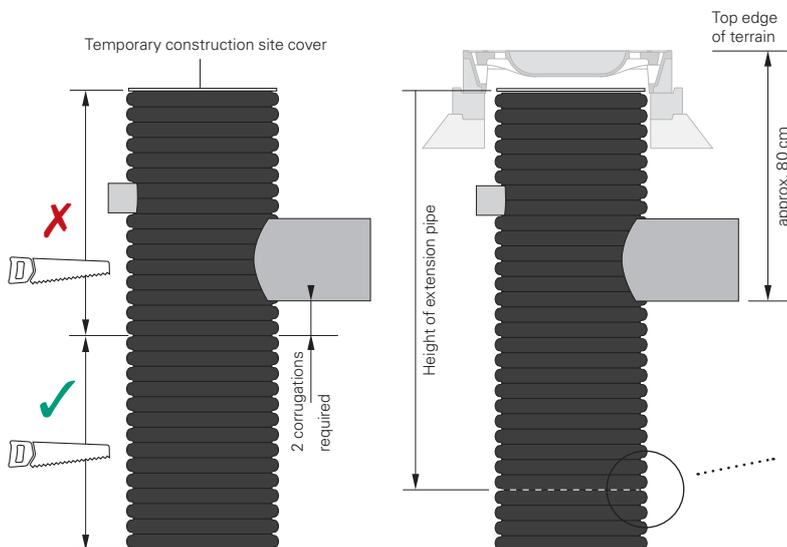
Use the following formula to calculate the height of the extension pipe:

Height of extension pipe =

height of cover – height of shaft cover – height of cone (11 cm)

4.2.2 Cutting the extension pipe (without extension)

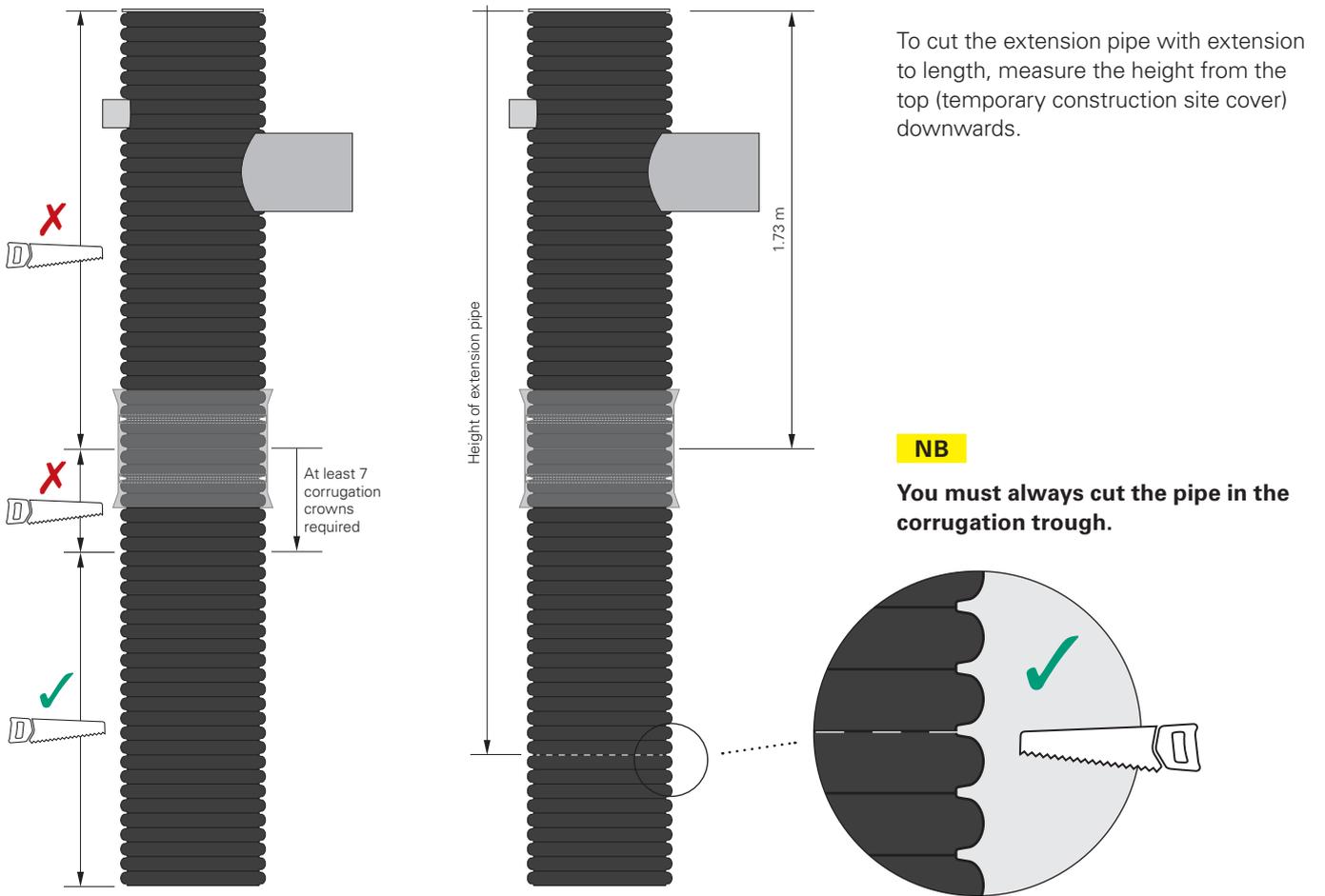
To cut the extension pipe to length, measure the height from the top (temporary construction site cover) downwards.



NB

Cut the extension pipe under no circumstances to length at the top (frost protection depth). You must always cut the pipe in the corrugation trough.

4.2.3 Cutting the extension pipe (with extension)



4.2.4 Installing extension pipe with sealing rings





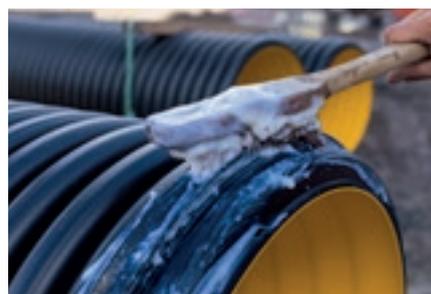
1

The extension pipes are inserted into the cone coupling/coupling by means of sealing rings included in the delivery (please use lubricant). Prior to that, place profile sealing rings into the first or second corrugation trough of the extension pipes.



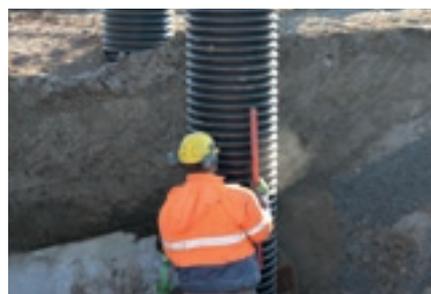
2

Now, apply a sufficient amount of FRÄNKISCHE lubricant to the sealing rings and the inside of the couple cone/coupling (do not use oils and greases).



3

Then, insert the extension pipe into the couple cone/coupling up to the limit stop. Finally, check the vertical alignment of the extension pipe.



ATTENTION

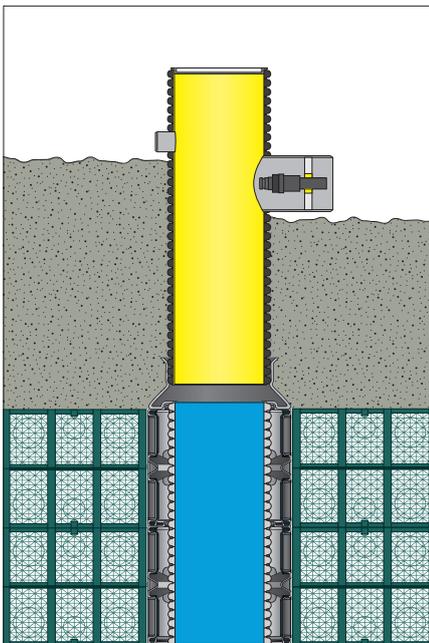
Do not remove the included protective cover from the upper extension pipe.

**NB**

Please observe the respective installation manual for the installation of Rigofill storage/infiltration modules.

- Lateral backfilling
- Cover
- Tests before backfilling

4.3 Backfilling, compacting up to the connection openings



- Backfill the excavation pit according to design specifications.
- Compact the material layer by layer.
- Adhere to the provisions of DIN EN 1610.
- Make sure that the extension pipe is not shifted during compacting.

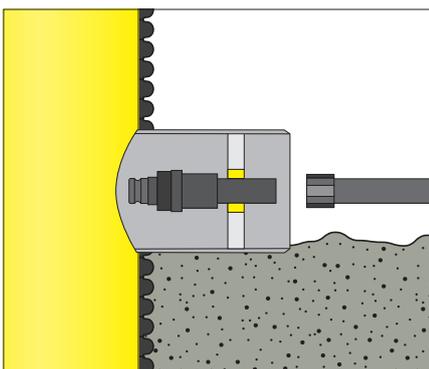
CAUTION

Compacting by means of vibratory rollers and explosion rammers is not permissible.

ATTENTION

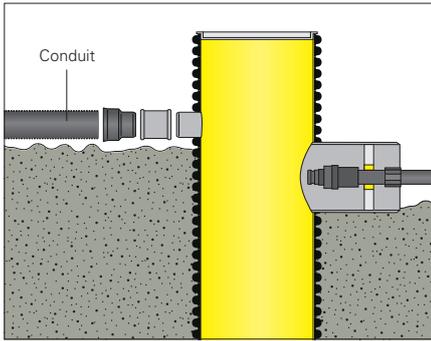
We recommend having the system approved by site management before backfilling. Do not remove included protective covers from shafts during backfilling.

4.4 Installing (connecting) the pressure line



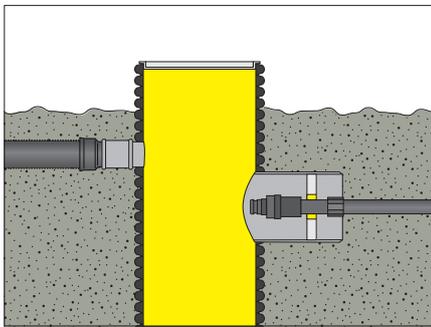
The pressure line/pressure coupling has a 2" thread and must be coupled with the pressure line on site before backfilling.

4.5 Installing the conduit



Connect the conduit to the DN/OD 110 spigot.

4.6 Backfilling up to the lower edge of the shaft cover



ATTENTION

Do not remove included protective covers from shafts during backfilling.

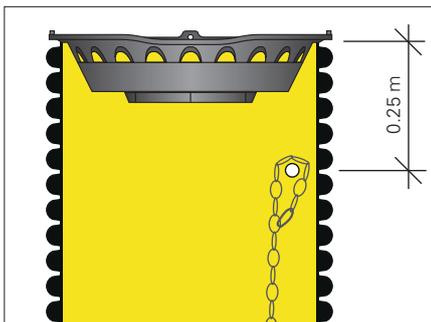
CAUTION

Compacting by means of vibratory rollers and explosion rammers is not permissible.

4.7 Installing the fixture for the chain



Mark a distance of 25 cm from the upper edge of the extension pipe.

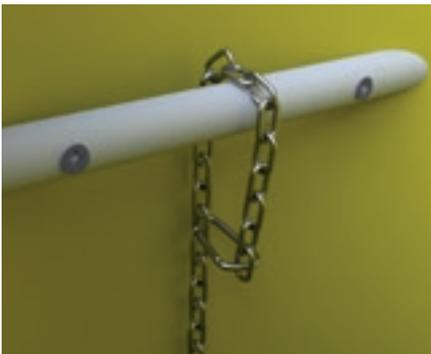


ATTENTION

The distance of 25 cm to the top edge (sediment trap) must be observed by all means.



Position the fixture for the lifting bar vertically and centrally over the stainless steel base plate and screw directly into the shaft wall, no primary drilling required.



NB

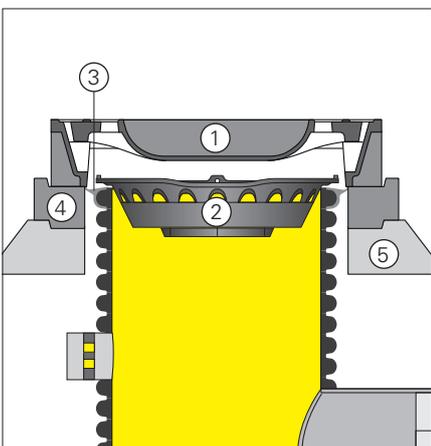
The fixture will later be used to fasten the chain.

4.8 Installing the shaft cover



As soon as the road superstructure is being prepared, the bearing for the shaft covers must be created. Common standard 625 mm covers according to DIN EN 124 with ventilation openings are used. Shaft covers and concrete support rings are not included in the scope of delivery of FRÄNKISCHE and must be supplied on site. Put a support ring $h = 100$ mm according to DIN 4034 under the shaft cover on an appropriate bearing. The shaft cover can be placed on a 10-mm-thick mortar joint to avoid stationary loads between equalisation ring and shaft cover. Create the bearing from in-situ concrete C 16/20. Avoid interlocking of the bearing with the corrugations of the extension pipe by any means (use casing aid!). Vertical loads may only be transferred to the load-bearing underground.

The gap between the support ring and the outside shaft wall can be closed using a DOM sealing ring. This guarantees a tight connection. Mount the sealing ring onto the last corrugation of the extension pipe. Place a sediment trap D_o 600 on the extension pipe.



- ① Shaft cover
(to be supplied on site)
- ② Sediment trap D_o 600
- ③ DOM sealing ring
- ④ Support ring
(to be supplied on site)
- ⑤ Bearing
(to be supplied on site)

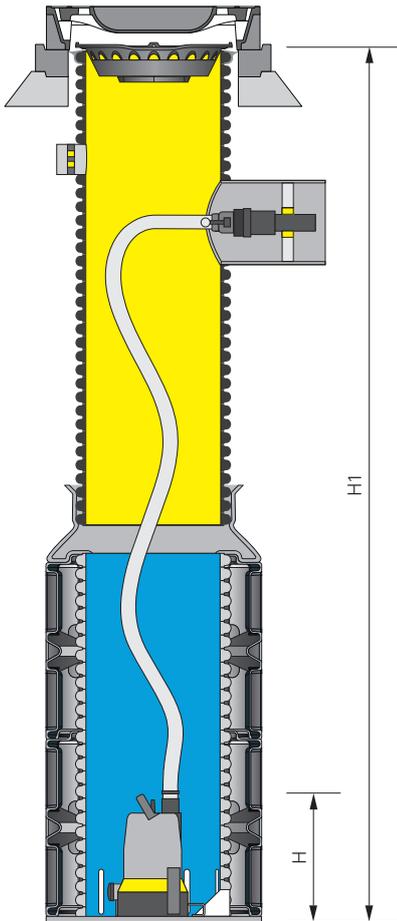
ATTENTION

Shaft covers and concrete support rings are not included in the scope of delivery and must be supplied on site.

5 Installation of pump unit with level gauge

5.1 Preparatory work

5.1.1 Calculating the required length of the pressure line



Before you can connect the pressure line to the pump, you must calculate the required length. Use the following formula to calculate the length of the pressure line:

$$\text{Length of pressure line} = H1 - \text{pump height } H$$

- Multidrain series – smallest total height $H = 41$ cm
- Dominator series – smallest total height $H = 64$ cm

ATTENTION

The pressure line must have sufficient clearance and must not be installed under tension.



Pacemakers

Magnets may affect the function of implanted defibrillators and pacemakers. If you have a device like this, please maintain a sufficient distance from the pump.

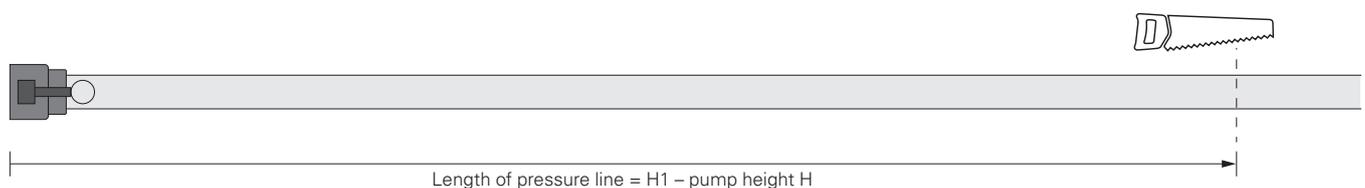


Magnetic field

Magnets generate a strong and long-range magnetic field. The following devices and objects may be damaged, for instance: TV sets, PCs, laptops, hard drives, cash or credit cards, mechanical watches, hearing aid devices, loudspeakers.

5.1.2 Cutting the pressure line to length

The calculated length must be measured from the pre-assembled quick coupling and, if necessary, cut to length using suitable equipment.



5.1.3 Connecting the pump to the pressure line

Use a pipe clamp to connect the pressure line to the pressure outlet of the pump.



5.1.4 Connecting the chain to the pump

Use the provided screw connection to attach the chain to the lifting tool at the pump.

NB

The chain must be at least long enough for the pump to rest completely on the shaft bottom.



5.1.5 Mounting the sensor bracket

1

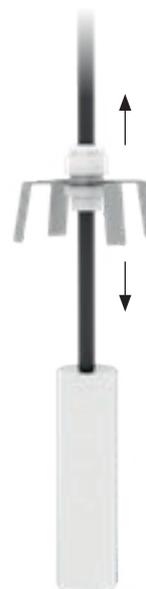
Dismantle the screw terminal and the air valve at the end of the sensor cable.

2

Push the cable gland and sensor bracket onto the cable.

ATTENTION

Do not screw the bracket tightly yet.



3

Insert the sensor bracket into the fixture at the pump.



4

Align the sensor bracket such that the sensor is flush with the lower edge of the fixture.

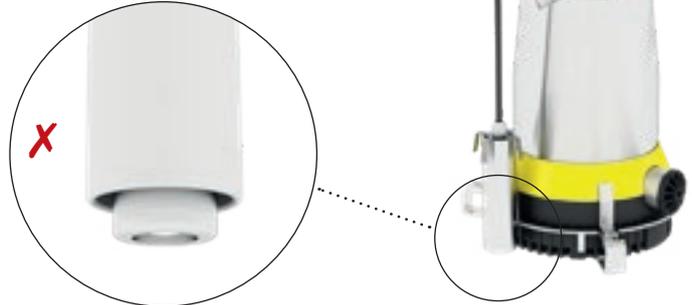


5

Tightly screw together the sensor bracket and the cable gland.

ATTENTION

The sensor must not protrude from the bottom of the fixture.

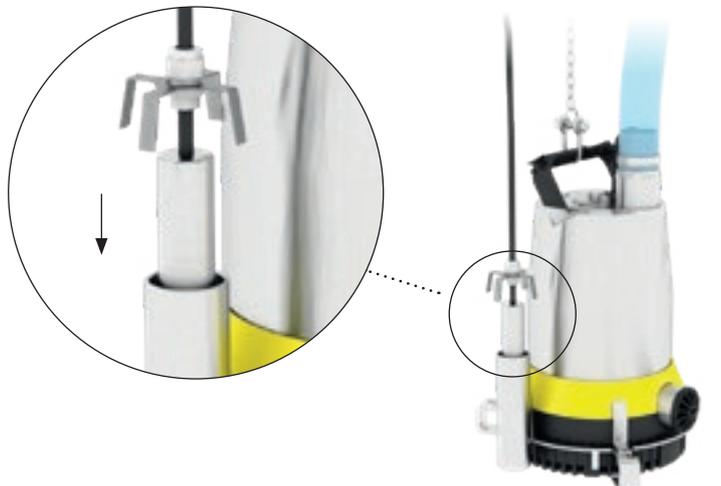


5.1.6 Inserting the sensor into the base

Now insert the sensor and the sensor bracket into the designated fixture at the pump base.

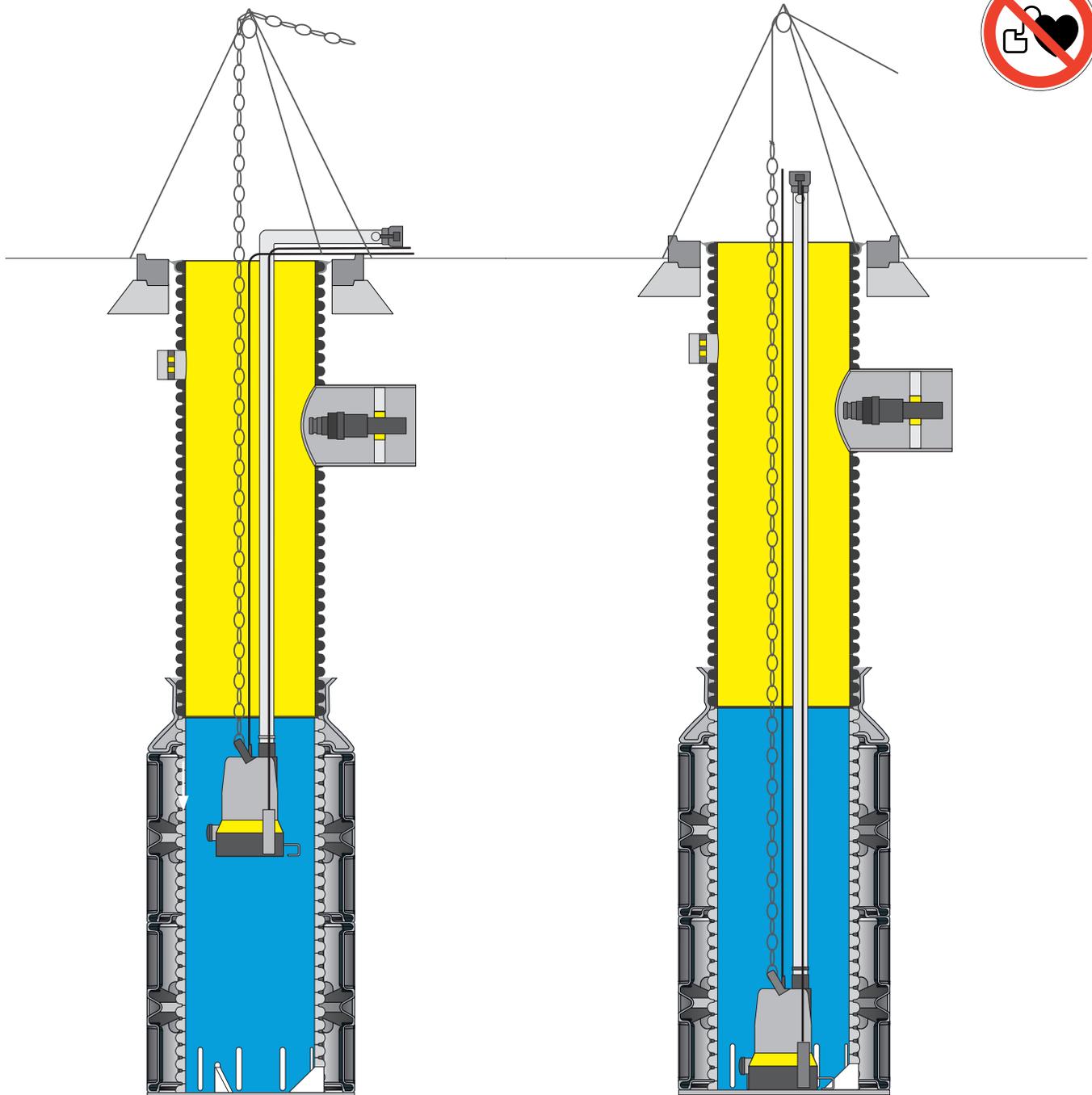
ATTENTION

Make sure that the sensor does not protrude from the bottom of the fixture.



5.2 Installing the pump in the Quadro®Lift shaft

5.2.1 Lowering the pump into the shaft



NB

Since the pump unit is very heavy, we recommend using a tripod for lowering.

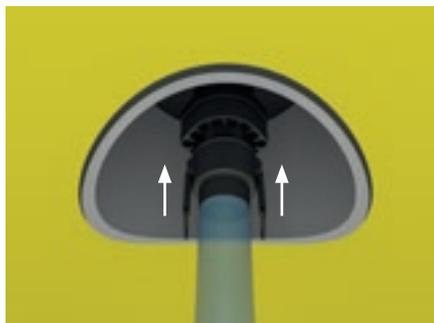
CAUTION

Carefully lower the pump unit into the shaft. The weight should be borne solely by the chain. You must not exert any tension on the cables and the pressure line while lowering.

ATTENTION

The pump must rest flat against the shaft bottom so that the anti-twist protection can be effective during operation. In addition, make sure that the level sensor does not slip out of the fixture while lowering.

5.2.2 Connecting the pressure line to the quick coupling



Connect the quick coupling to the pre-installed connection.

ATTENTION

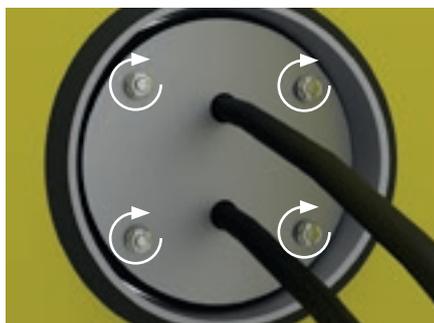
When connecting the pressure line, make sure that the pump still rests flat against the shaft bottom and that the anti-twist protection can be effective during operation.

5.2.3 Running the power supply and sensor cables through the shaft feed-through and conduit to the designated interface



1

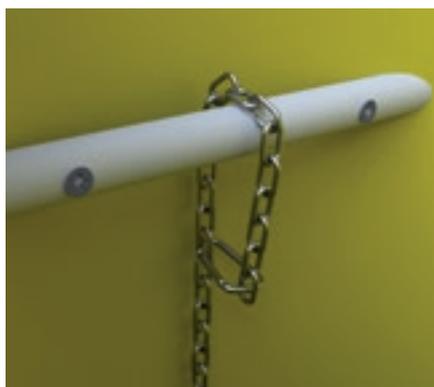
Insert the shaft feed-through and run the cable through.



2

To fit the feed-through watertight into the shaft opening, hand-tighten the four screws clockwise until the feed-through is firmly pressed into the opening.

5.2.4 Attaching the chain



Finally, hook the chain into the upper section of the shaft.

5.3 Installing the control cabinet

NB

Please observe the separate operating instructions for commissioning and handling the control unit. These are enclosed with the delivery.



6 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 (*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
 - 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 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

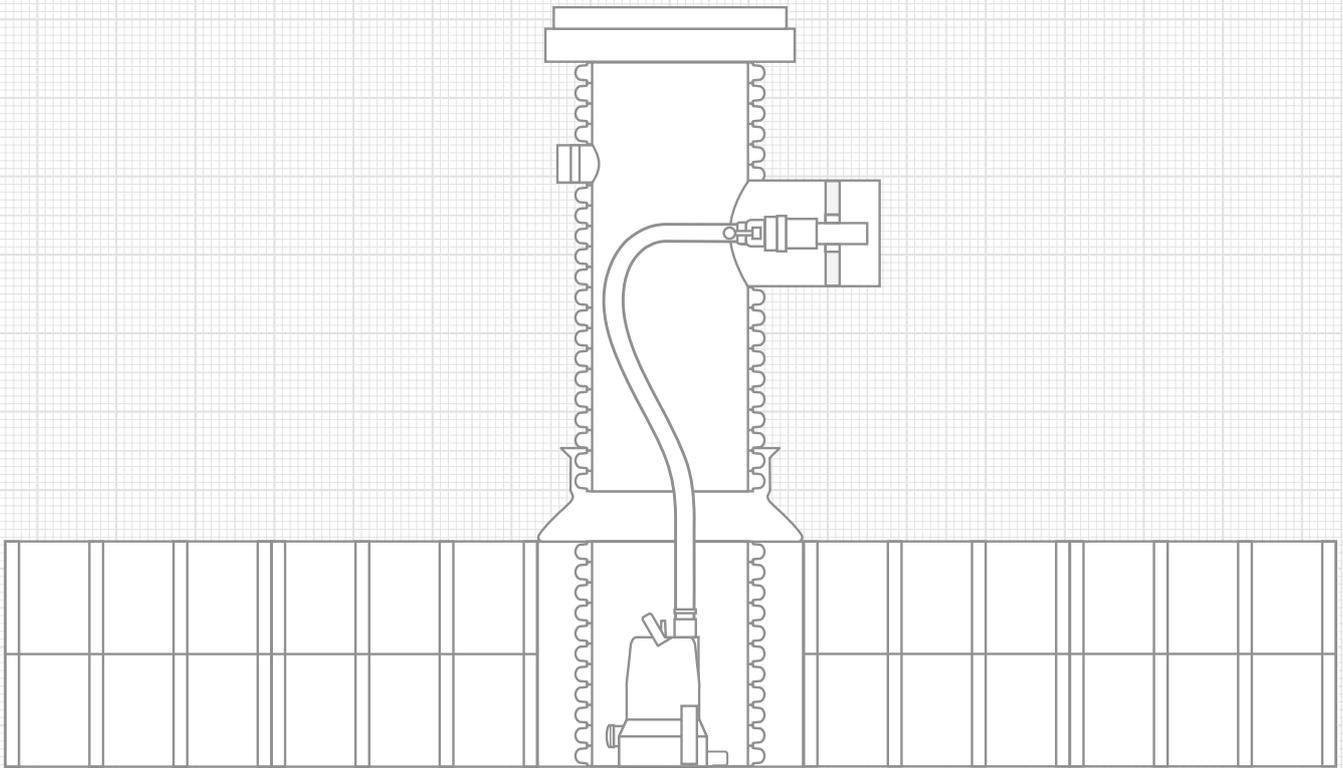
The system is part of an entire network. During installation, maintenance, service and repair work on one component, always consider the entire system. Avoid work during rain.

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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