Pioneering for You

Wilo-EMUport CORE

en Installation and operating instructions

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EMUport CORE
https://qr.wilo.com/790

Table of Contents

1 General

1.1 About these instructions

These instructions are a part of the product. Obey the instructions for correct handling and use:

- Read the instructions carefully before all works.
- Keep the instructions easy to access.
- Follow the product specifications.
- Follow the markings on the product.

1.2 Copyright

1.3 Subject to change

Wilo reserves the right to change the listed data without prior notice and is not liable for technical inaccuracies and/or omissions. The illustrations vary from the original and are intended as a sample representation of the product.

1.4 Exclusion from warranty and liability

Wilo accepts no warranty or liability in these cases:

- Wrong configuration because the operator or the customer did not give enough or correct instructions
- Non-compliance with these instructions
- Incorrect use of the product
- Incorrect storage or transport
- Incorrect installation or dismantling
- Not sufficient maintenance
- Non-approved repairs
- Not applicable installation location
- Chemical, electrical or electrochemical causes
- Wear of product components

2 Safety

This section contains safety information for each phase of the product's lifecycle. Disregarding this information leads to:

- Danger to persons
- Danger to the environment
- Damage to property
- Loss of claims for damages

2.1 Safety signs, instructions, and text markups

The safety instructions are structured as below:

- Danger to persons: signal word, safety symbol, text, and shaded grey.
- Property damage: signal word and text.

Signal words

- **DANGER!**
  Disregarding these instructions leads to death or serious injury.
- **WARNING!**
  Disregarding these instructions leads to (serious) injury.
- **CAUTION!**
  Disregarding these instructions leads to property damage or even a total loss.
- **NOTICE!**
  Useful information for handling the product.

Text markups

✓ Precondition

1. Work step/list
   ⇒ Notice/instructions
   ► Result

Cross-references

The name of the section or table is put in quotation marks “ ”. The page number follows in square brackets [ ].

Overview of safety symbols

Danger of death because of electric shock


Danger of death because of explosion


Danger because of bacterial infection


Warning – risk from hot surfaces


Warning – risk from suspended loads


Wear safety helmet.


Wear safety shoes.


Wear safety gloves.


Wear respiratory mask.


Wear safety glasses.


Obey the instructions.


Useful information

2.2 Staff qualifications

- The staff knows the local accident prevention regulations.
- The staff reads and understands these instructions.
- Electrical work: Only a qualified electrician must do the work.
  Necessary knowledge: identification and prevention of electrical hazards
- Installation and dismantling: Only a specialist in sanitary facilities must do the work.
  Necessary knowledge: fastening of buoyancy safeguards, connection of plastic pipes
- Maintenance work: Only a specialist in sanitary installation must do the work.
  Necessary knowledge: EN 12056 standard, awareness of the danger of sewage

This product is not for use by:

- Persons (including children) below the age of 16.
- Persons below the age of 21 without supervision from an expert.
- Persons with reduced physical, sensory, or mental abilities.

2.3 Protective equipment for staff

This protective equipment is the necessary basic equipment. Obey the factory regulations.

Protective equipment: transport, installation, removal, and maintenance

- Safety shoes: Protection class S1 (uvex 1 sport S1)
- Safety gloves: 4X42C (uvex C500 wet)
- Safety helmet (EN 397): conforms to the standard and protects against lateral deformation

(If lifting accessories are used)

Protective equipment: cleaning work

- Safety gloves: 4X42C + Type A (uvex protector chemical NK2725B)
- Safety glasses: uvex skyguard NT
  - Marking of frame: W 166 34 F CE
  - Marking of eyeglass-lens: 0-0.0* W1 FKN CE
    * The safety class for filters is not necessary for this work.
- Respiratory mask: Half mask 3M series 6000 with filter 6055 A2

Article recommendations

The mentioned branded articles are non-binding suggestions. Equivalent products from other brands can also be used. The prerequisite is obeying the standards mentioned.

WILO SE accepts no liability for the articles mentioned regarding their conformity to the applicable standards.

2.4 Electrical work

- Do electrical work only by a qualified electrician.
- Make sure that the product is disconnected from the mains connection. Prevent the product from accidental switching on.
- Obey the local regulations for the mains connection.
- Obey the specifications of the local energy supplier for the mains connection.
- The staff knows the electrical connections.
- The staff knows the shutdown options for the product.
- Follow the technical data on the rating plate and in these instructions.
- Earth the product.
- To prevent switchgears from flooding, install switchgears at a sufficient height.
- Replace damaged cables. Contact customer service for this work.

2.5 Monitoring devices

Provide the monitoring devices listed below on-site:

Circuit breaker

- The type and switching characteristics of the circuit breakers must be compatible with the rated current of the connected product.
- Obey local regulations.

Residual-current device (RCD)

- If persons can touch the device and conductive fluids, install a residual-current device (RCD).
- Obey the regulations of the local energy supplier.

2.6 Pumping of fluids that are hazardous to health

There is a risk of bacterial infection when touching the fluid in the lifting unit.

- Wear protective equipment.
- Clean and disinfect the tank after removal.
- Inform all persons about the pumped fluid and the danger.

2.7 Explosive atmosphere in the collection tank

Sewage containing faeces can lead to gas collections in the tank. These gas collections can come out into the operating space because of incorrect installation or maintenance work. An explosive atmosphere can occur. This atmosphere can ignite and lead to an explosion. To prevent an explosive atmosphere, follow these points:

- Only use undamaged tanks (no cracks, leaks, porous material). Switch off lifting units with damaged tanks immediately.
- Make sure that all connections for the inlet, discharge pipe, and ventilation are sealed tightly. Obey local regulations for these connections.
- Lay the ventilation pipe.
  - For floor-mounted or concealed-wall installation in buildings, lay the ventilation pipe over the roof of the building. Obey the local regulations for the correct length of the pipe above the roof.
  - For concealed-floor installation (underground installation) outside of buildings, lay the ventilation pipe over the surface. Obey the local regulations for the correct length of the pipe above the surface.
- When opening the tank (e.g. during maintenance work), make sure that the operating space is sufficiently ventilated.

2.8 Transport

- Obey local regulations and laws on accident prevention and work safety on-site.
- Move the product with a lifting equipment.
- Fasten the lifting slings at the slinging points.

Packaging guidelines

- Make sure that the packaging is shock-resistant.
- Make sure that the packaging is moisture-resistant.
- Make sure that the packaging permits safety fastening.
- Make sure that the packaging prevents dirt, dust, and oil from going into.

2.9 Installing/dismantling

- Obey local regulations and laws on accident prevention and work safety on-site.
- Make sure that the product is disconnected from the mains connection. Prevent the product from accidental switching on.
- When dismantling, shut off inlet and discharge pipe.
- Ventilate closed rooms.
- Do not work alone in closed rooms. Only do this work with a second person.
- Toxic or asphyxiating gases can collect in closed rooms or buildings. Wear protective equipment (e.g., gas detector). Obey the factory regulations.
- Clean the product thoroughly.
  Risk of fire from static load. Make sure to wear antistatic clothing when cleaning plastic parts. Do not use highly flammable cleaning agents.

2.10 During operation

- Open all shut-off valves in the inlet and discharge pipe.
- The maximum inflow must be less than the maximum output of the system.
- Do not open the inspection opening.
- Make sure that the operating space is sufficiently ventilated.
- The noise level depends on different factors, e.g. fixation type, duty point, etc. Measure the noise level during operation. If the noise level is above 85 dB(A), wear hearing protection and mark the working area.

CAUTION

Property damage through overpressure in the collection tank!

If there is overpressure in the collection tank, the tank can break. To prevent overpressure in the collection tank, follow these points:

- The maximum inflow must be lower than the maximum volume flow at the duty point.
- Maximum tank flooding during operation: 0 m (tank is depressurised)
- The maximum tank flooding in case of system malfunction (measured from tank base) listed in the Technical Data section
- The maximum permitted pressure in the discharge line listed in the Technical Data section

2.11 Cleaning and disinfection

- Wear protective equipment. Obey the factory regulations.
- Use a disinfectant. Follow the manufacturer's instructions:
  - Wear the given protective equipment. If you are not sure, contact your supervisor.
  - Give the staff the necessary information about the disinfectant and its correct use.

2.12 Maintenance tasks

- Maintenance work: Only a specialist for lifting units must do the work.
  Necessary knowledge: sanitary installation
- Make sure that the product is disconnected from the mains connection. Prevent the product from accidental switching on.
- Shut off inlet and discharge pipe.
- Clean the product thoroughly.
  Risk of fire from static load. Make sure to wear antistatic clothing when cleaning plastic parts. Do not use highly flammable cleaning agents.
- Only use original parts from the manufacturer. The use of non-original parts releases the manufacturer from all liability.
- Immediately clean up and remove leaked liquids (fluid, operating fluid). Obey local regulations to dispose of these liquids.

2.13 Operator responsibilities

- Supply these instructions in the language which the staff can read and understand.
- Make sure that staff are trained to do the set tasks.
- Supply protective equipment. Make sure that staff wears protective equipment.
- Make sure that attached safety and warning signs are clearly readable.
- Inform staff how the system operates.
- Mark and close the working area.
- Measure the noise level in operating conditions. For a noise level of 85 dB(A) or higher, wear hearing protection. Mark the working area.

3 Application/use

3.1 Intended use

As a lifting unit for dry installation in buildings, or for underground (concealed-floor) dry installation in a pump chamber outside buildings:

- In cases where sewage cannot be discharged directly into the sewer system through a natural downward slope
- For backflow resistant drainage in cases where the discharge point is below the backflow level

NOTICE! When pumping sewage with oil or grease content, install an oil and grease separator upstream of the lifting unit.

3.2 Fluids

For the collection and pumping of these fluids in commercial areas:

- Sewage with faeces
- Sewage **without** faeces

Sewage pumping according to 12050

The lifting unit follows DIN EN 12050-1.

3.3 Improper use

DANGER

Explosion hazard when pumping explosive fluids!

The lifting unit is not designed to pump highly flammable and explosive fluids. There is a danger of death through explosion.

- Do not pump highly flammable and explosive fluids (e.g., gasoline, kerosene, ...).

Do **not** use for these fluids:

- Sewage from discharge points higher than the backflow level which can be discharged directly into the sewer system through a natural downward slope
- Debris, ash, rubbish, glass, sand, plaster, cement, lime, mortar, fibrous materials, textiles, paper towels, wet wipes (e.g. fleece cloths, moist toilet paper wipes), nappies, cardboard, coarse paper, synthetic resins, tar, kitchen waste, grease, oil
- Slaughterhouse waste, disposal of slaughtered animals and animal waste (liquid manure etc.)
- Toxic, aggressive and corrosive fluids, such as heavy metals, biocides, pesticides, acids, bases, salts, swimming pool water
- Cleaning agents, disinfectants, dishwashing or laundry detergents in excessive quantities, which have a disproportionately high degree of foam formation
- Wastewater from retention tanks (e.g. storm water retention)
- Drinking water

To use the product correctly, follow these installation and operating instructions.

4 Product description

4.1 Design

Fully submersible and automatically operated sewage lifting unit with solids separation system and two submersible sewage pumps in alternating operation without peak load

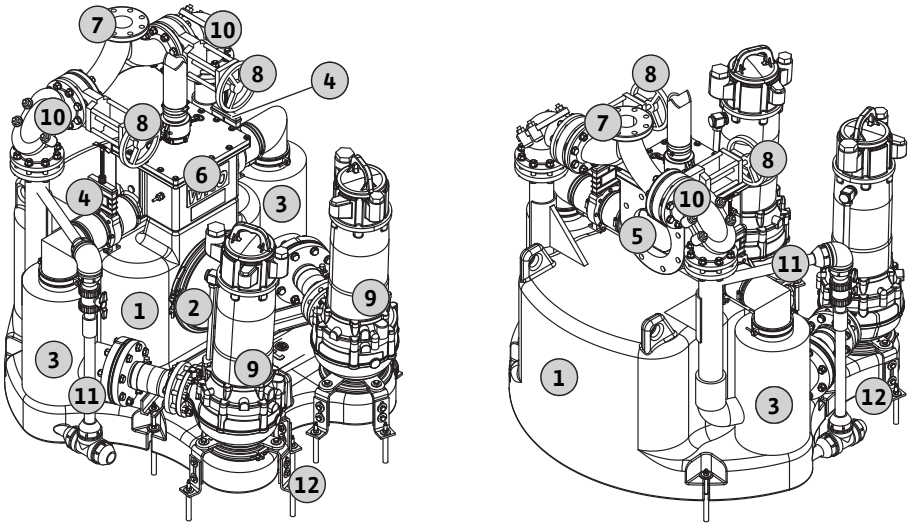

Fig. 1: Overview

1	Collection tank
2	Inspection opening
3	Solids separation tank
4	Shut-off valves for the solids separation tank
5	Inlet
6	Supply box/distributor

7	Discharge port with flange connector
8	Shut-off valves for discharge pipe
9	Sewage pump
10	Non-return valve
11	Manual flushing line for the collection tank
12	Pump support bracket

All-in-one gastight and watertight collection tank:

- Without constructive welded joints
- With an inspection opening
- Rounded edges and sloped floor with the deepest point directly below the pump, preventing deposits and the drying of solids at critical points

Two solids separation tanks:

- Pre-filtering sewage upstream of the collection tank
- Separately lockable

Sewage pump:

- Mounted directly on the collection tank
- Two high-performance submersible sewage pumps run in alternating operation as a redundant double-pump system

WARNING! Operation of the two pumps at the same time is strictly forbidden.

Supply box/distributor:

- For connection to the inlet pipe
- With transparent cover

Manual flushing line for the collection tank

Make sure that the customer supplies the switchgear. Make sure the necessary control of a lifting unit with solids separation system is available.

4.2 Materials

- Collection tank: PE
- Solids separation tank: PE
- Supply box/distributor: PUR
- Pipework: PE
- Pumps: Grey cast iron
- Shut-off valve: Grey cast iron
- Discharge connection: PUR

4.3 Safety device

Overflow channel

The supply box/distributor is directly connected to the collection tank through an overflow channel. In case of overflow, the sewage is channelled directly into the collection tank after being filtered.

4.4 Monitoring devices

	P13	FK 17.1	FK 202	FKT 20.2	Trigger action of warning	Trigger action of deactivation
Motor compartment leakage detection						
Internal moisture probe	•	–	–	•	–	•
Motor winding temperature monitoring						
Bimetallic sensor	•	•	•	–	–	•
PTC sensor	o	o	o	•	–	•
Motor bearings leakage detection						
Internal moisture probe	–	–	–	•	•	o*
Sealing chamber leakage detection						
Internal moisture probe	•	–	–	•	•	o*
External moisture probe	•	•	•	–	•	o*
	Key • = as standard, o = optional, – = not available * Recommended triggering status					

The exact details of the monitoring devices are shown in the respective configuration.

***Operating principle of temperature monitoring**

- Temperature limiter – monitoring of one temperature level
  When the threshold is reached, the motor switches off. When the motor has cooled down, the motor can restart automatically.
  Automatic restart depends on local necessities (e.g. explosive atmosphere, local regulations, etc.) It can be necessary to switch off the motor **with a reactivation lock**. Obey the local necessities.
- Temperature control – monitoring of two temperature levels
  When the **lower** threshold is reached, the motor switches off. When the motor has cooled down, the motor restarts automatically.
  When the **higher** threshold is reached, the motor switches off with a reactivation lock. Automatic restart is **not permitted**.

4.5 Operating principle

The sewage flows through the inlet pipe into the supply box/distributor and from there into one of the two solids separation tanks. The solids separation tanks align upstream with the discharge ports of the sewage pumps and filter out large solids.

In this procedure, only “pre-treated sewage” goes through the standby sewage pump into the shared collection tank. When the water level in the collection tank comes to the switch-on level, the related sewage pump is switched on by the level control device.
WARNING! The sewage pumps run alternately. Parallel operation is not permitted.

The flow from the working sewage pump opens the separation system of the solids separation tank, and pumps all the solids kept in the solids separation tank into the discharge pipe.

The inlet of the affected solids separation tank is closed with a shut-off ball during this procedure.

4.6 Operation with frequency converter

Operation with the frequency converter is not permitted.

4.7 Type key

Example:	**Wilo-EMUport CORE 20.2-10/540 SF S2000**
EMUport	Product family
CORE	Standardised sewage lifting unit with solids separation system
20	Max. inlet volume flow in m³/h
2	Number of installed pumps
10	Max. delivery head in m at Q = 0
5	Mains frequency: • 5 = 50 Hz • 6 = 60 Hz
40	Mains voltage: • 40 = 3~400 V • 38 = 3~380 V
SF	Modified standard article
S	System in a pump chamber
2000	Inner diameter of the pump chamber

4.8 Technical data

Approved field of application	
Max. inlet volume flow	• CORE 20.2: 20 m³/h • CORE 45.2: 45 m³/h • CORE 60.2: 60 m³/h
Max. pressure in the discharge pipe	6 bar
Max. delivery head	See system rating plate*
Max. volume flow	See system rating plate*
Max. tank flooding during operation	0 m (tank is depressurised)
Max. tank flooding in case of system failure (measured at tank base)	• CORE 20.2: 5 m/max. 3 h • CORE 45.2: 6.7 m/max. 3 h • CORE 60.2: 6.7 m/max. 3 h
Fluid temperature	3 … 40 °C (37 … 104 °F)
Ambient temperature	3 … 40 °C (37 … 104 °F)
Motor data	
Mains connection [U/f]	See system rating plate*

Power consumption [P_1]	See system rating plate*
Rated power [P_2]	See system rating plate*
Rated current [I_N]	See system rating plate*
Activation type [AT]	See system rating plate*
Operating mode	See system rating plate* • Operating mode S1 means continuous duty. • Operating mode S3 means intermittent periodic duty, e.g. S3 50%: Operating time 5 min/down-time 5 min
IP rating	IP68
Max. switching frequency	30/h
Cable length	20 m (66 ft)
Connections	
Discharge port	• CORE 20.2: DN 80 • CORE 45.2: DN 100 • CORE 60.2: DN 100
Inlet connection	DN 200, PN 10
Collection tank ventilation connection	DN/OD 75
Dimensions and weights	
Tank volume	• CORE 20.2: 440 l • CORE 45.2: 1200 l • CORE 60.2: 1200 l
Max. usable volume in the tank	• CORE 20.2: 295 l • CORE 45.2: 900 l • CORE 60.2: 900 l
Weight	See system rating plate*
Noise level**	< 80 dB(A)

- * There are three rating plates on the product:
  - 1x system rating plate (the primary one)
  - 2x pump rating plates
- ** The noise level depends on the duty point and changes. Incorrect installation or impermissible operation can increase the noise level.

4.9 Date of manufacture

The date of production is shown according to ISO 8601: YYYYWww (e.g., 2020W53)

- YYYY = year
- W = abbreviation for week
- ww = calendar week

4.10 Scope of delivery

- Solids separation system with two dry-installed submersible pumps
- 2x shut-off valves for the solids separation tanks
- 2x non-return valves at the discharge side
- 2x shut-off valves at the discharge side
- Consolidation of the discharge pipe
- 1x level probe
- 1x floor fixation as cross beam
- 2.5 m ventilation hose
- 1x maintenance kit with a blanking cover for the opening on the collection tank and a blanking cover for the discharge pipe
- Installation and operating instructions

4.11 Accessories

On the discharge side

- Flange connector DN 80
- Flange connector DN 100

On the inlet side

- FFRe piece
- Shut-off valve
- Inlet sets: FFRe piece and shut-off valve
- Flow meter kit
- Flange connectors from flange to pipe connection

General

- Flushing kit for supply box (to automatically flush the supply box)
- Switchgear Control SC-L ... -FTS
- Horn
- Flash light

5 Transportation and storage

5.1 Delivery

- Immediately examine the shipment for defects (damage, completeness ...).
- Write all defects on the freight documentation.
- Tell the manufacturer about the defects on the day of receiving the shipment.
- Later told claims can no longer be asserted.

5.2 Transport

The manufacturer supplies the lifting unit in applicable packaging. This packaging prevents damage during transport and storage.

- To prevent damage to the lifting unit during transport, only remove the outer packaging at the installation site.
- Do not immerse the plug in the fluid.
- Do not pull on the connection cable.
- Use leak-proof packaging for used lifting units, e.g., rip-proof plastic bags.

5.2.1 Removing the transportation lock

Remove the transportation lock after the system is put in the working area.

1	Transportation lock

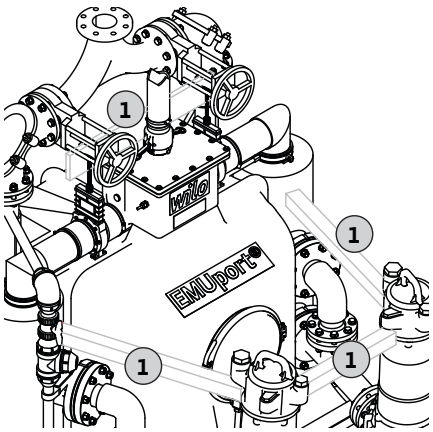

Fig. 2: Transportation lock

5.3 Use of lifting equipment

- Wear a safety helmet according to EN 397.
- Obey local regulations for the use of the lifting equipment.
- The operator is responsible for the technically correct use of the lifting equipment.
- **Lifting accessory**
  - Only use lifting accessories that function correctly.
  - Do not overload the lifting accessory.
  - Make sure that the lifting accessory is stable.
- **Lifting slings**
  - Use only legally permitted lifting slings.
  - Use lifting slings based on local conditions (weather, slinging point, load ...).
  - Only attach the lifting slings to the sling points of the lifting unit, not to the sling points of the pumps.
- **Lifting operation**
  - Do not jam the product when lifting and lowering.
  - Do not overload the lifting accessory.
  - If necessary (e.g., view blocked ...), help from a second person is a must.
  - Do **not stay** below suspended loads. Do **not move** suspended loads over workplaces where persons are on-site.
  - Stay away from the swivel area.
  - If it is no longer safe to work because of the weather conditions, stop working immediately.

5.4 Storage

DANGER

Danger through bacterial infection!

The lifting unit collects and pumps sewage. There can be bacteria and hazardous germs in the tank. Follow these points:

- After removal, disinfect the lifting unit. Especially the inner side of the tank.
- Obey the factory regulations.

CAUTION

Property damage through water ingress in the connection cable!

Water in the connection cable destroys the cable. Water ingress in the connection cable can also cause total loss of the motor.

- Do not immerse the bare cable end in the fluid.
- Seal the bare cable end for storage.

Newly supplied lifting units can be stored for one year. For longer storage time, contact customer service.

When storing the pump, follow these points:

- Put the lifting unit securely on a hard surface and prevent it from slipping and falling over.
- Permitted storage temperature: -15 ... 60 °C (5 ... 140 °F), max. humidity: 90%, non-condensing.
  It is recommended to use frost-proof storage. Storage temperature: 5 ... 25 °C (41 ... 77 °F), relative humidity: 40 ... 50%.
- Drain the collection tank fully.
- Coil up connection cables and attach them to the motor.
- Seal open ends of the connection cables and plugs in a watertight manner.
- Obey the instructions for switchgear storage.
- Tightly seal all open connections.
- Do not keep the lifting unit in spaces where welding work is carried out. The caused gases or radiation can corrode the parts made of plastic and elastomer.
- Prevent the lifting unit from direct sunlight and heat. Very high heat can damage the plastic parts.
- Parts made of elastomer are subject to natural brittleness. Contact the customer service if storage is necessary for more than 1 year.

5.5 Return delivery

Follow these points when returning the lifting units to the factory:

- Clean the lifting units to remove unwanted materials.
- Decontaminate the lifting units used for fluids hazardous to health.

6 Installation and electrical connection

6.1 Staff qualifications

- Electrical work: Only a qualified electrician must do the work.
  Necessary knowledge: identification and prevention of electrical hazards
- Installation and dismantling: Only a specialist in sanitary facilities must do the work.
  Necessary knowledge: fastening of buoyancy safeguards, connection of plastic pipes

6.2 Installation types

- Ground (floor-mounted) dry installation in buildings
- Underground (concealed-floor) dry installation in a pump chamber outside buildings

6.3 Operator responsibilities

- Obey local accident prevention and safety regulations.
- Obey regulations for working below suspended loads when using lifting accessories.
- Supply protective equipment. Make sure that staff wears protective equipment.
- Obey local sewage technology regulations for the operation of sewage systems.
- Make sure there is access to the installation location.
- Structural components and foundations must be sufficiently stable for the device to be fixed in a safe and functional manner. The operator is responsible for supplying the correct structural components and foundations.
- Obey local regulations for the installation work.
- Make sure that the available consulting documents (installation plans, installation location, inflow conditions) are full and accurate.

- Obey the consulting documents to lay and prepare the pipes.
- To prevent the mains connection from flooding, mount the mains connection at a sufficient height.

6.4 Installation

WARNING

Risk of injury without protective equipment!

During work, there is a risk of (serious) injury to feet and hands.

- Wear safety gloves.
- Wear safety shoes.

Building installation

- Obey EN 12050-1.
- Obey EN 12056.
- Make sure that the operating space is sufficiently ventilated.
- Free space of min. 60 cm (2 ft) around the unit
- In case of an accident:
  Prepare pump sump in the operating space, min. dimensions: 500x500x500 mm (20x20x20 in). Use pump accordingly. Make sure that manual drainage is feasible.
- Make sure that all connection cables are laid correctly. Prevent the connection cables from causing any risk (i.e. tripping, damage during operation). Examine if the cable cross-section and the cable length are sufficient for the selected installation type.

Installation in the pump chamber

DANGER

Danger through lone working!

Working in chambers, narrow rooms, and in areas with a risk of falling can be dangerous. Do not work alone.

- Only do this work with a second person.

WARNING

Risk of injury without protective equipment!

During work, there is a risk of (serious) head injury.

- Wear safety helmet (if a lifting equipment is used).

CAUTION

Property damage through frost!

Frost can cause malfunctions. Frost can also cause property damage.

- Make sure that the pump chamber and the discharge line are outside the frost zone.
- If the pump chamber or the discharge line is in the frost zone, stop operating the system during the time of frost.

To install the lifting unit in a pump chamber, follow these points:

- Obey EN 752.
- Toxic or asphyxiating gases can collect during work.
- If toxic or asphyxiating gases collect, go out of the workplace immediately.
- Be conscious of the diagonal dimension of the lifting unit.
- Install lifting accessory on a flat, clean and hard surface. Make sure to access the storage area and installation location easily.
- Attach transport straps to the slinging points of the lifting unit. Prevent the transport straps from slipping. Only use technically approved lifting slings.
- If it is no longer safe to work because of the weather conditions (e.g. ice formation, strong wind), stop work immediately.

6.4.1 Note on fixation material

The lifting unit can be installed on different constructions (concrete and steel construction, etc.). Use the fixation material which is applicable for the related construction. For correct installation, follow these instructions for the fixation material:

- Prevent tearing or chipping of the construction surface, **follow the minimum edge distances**.
- Make sure that the installation is tight and safe, **follow the given drilling hole depth**.
- Drilling dust decreases holding strength, **always blow out or vacuum out the drilling hole**.
- Only use components (e.g. screws, anchors, mortar cartridges) which are in good condition.

6.4.2 Note on pipework

The pipework has changing pressures during operation. Pressure peaks can occur depending on the operating conditions, for example, when closing the non-return valve. These pressure peaks can be multiple times the pump pressure. These changing pressures apply forces on the piping and the pipe connections. For safe and correct operation, design and examine the piping and pipe connections based on these points:

- Make sure that the pipes are self-supporting: No tensile or compressive forces are applied on the lifting unit.
- Consider the pressure resistance of pipework and pipe connections.
- Consider tensile strength of the pipe connections (= longitudinal force fit connection).
- Consider the pressure rating of the pipes.
- Make sure that pipes are connected without tension and vibrations.
- Install a gate valve on the inlet side and on the discharge pipe side downstream of the non-return valve.

6.4.3 Work steps

Install the lifting unit in these steps:

- Prepare the installation.
- Install the lifting unit.
- Connect the discharge pipe.
- Connect the inlet.
- Connect the ventilation pipe.

6.4.4 Preparing the installation

- Unpack the lifting unit.
- Remove the transportation lock.
- Examine the scope of delivery.
- Examine that all components are in correct working condition. **CAUTION! Do not install defective components. Defective components can lead to system failures.**
- Put accessories aside and keep them for later use.
- Prepare the installation location:
  - Horizontal and flat installation surface
  - Free space of min. 60 cm (2 ft) around the unit
  - Feasible fixation with fastening materials
  - Clean, free of coarse solids
  - Dry
  - Frost-free
  - Sufficiently lit

6.4.5 Installing the lifting unit

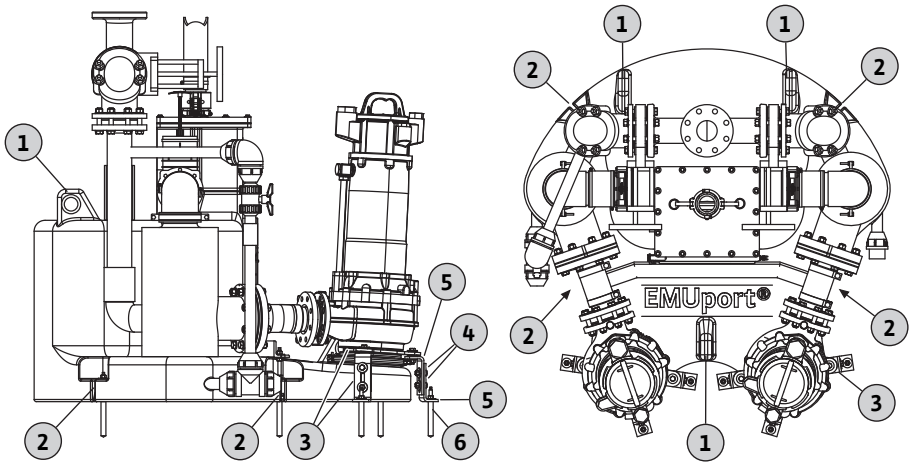

Fig. 3: Installing the lifting unit

1	Slinging point
2	Fastening grooves for floor anchoring
3	Pump support bracket
4	Screw
5	L-bracket
6	Anchor bolt

Install the lifting unit. Prevent the lifting unit from buoyancy and twisting. Anchor the lifting unit to the floor.

✓ Installation preparing work is done.

✓ Installation location is prepared as shown in the consulting documents.

✓ Applicable fixation materials are prepared.

1. Put the lifting unit at the installation location and align it to the pipework. **NOTICE! Lifting unit must be upright. CAUTION! Make sure not to lean against, push or step on the shut-off valves for the solids separation tank, otherwise they can break.**
2. For the lifting unit supplied with pump support brackets, loosen the screws on the upper L-brackets.
3. Adjust the faces of the pump support brackets with the floor. Hand tighten the screws on the support brackets.
4. Mark the drilling holes for the fastening grooves. Mark the drilling holes for the fastening points of the pump support brackets.
5. Put the lifting unit aside.
6. Drill the holes according to the fixation materials used and clean the holes.
7. Put the lifting unit back.
8. Anchor the lifting unit to the floor with the fixation materials. **NOTICE! Follow the information on the fixation materials. NOTICE! Max. tightening torque: 30 Nm**
9. Attach the pump support brackets to the floor with the bounded anchors.
10. Tighten all screws. **NOTICE! Max. tightening torque: 60 Nm**
11. Lay the connection cable. Obey applicable regulations.
    ► The lifting unit is installed. Next step: Connecting the discharge pipe.

6.4.6 Connecting the discharge pipe

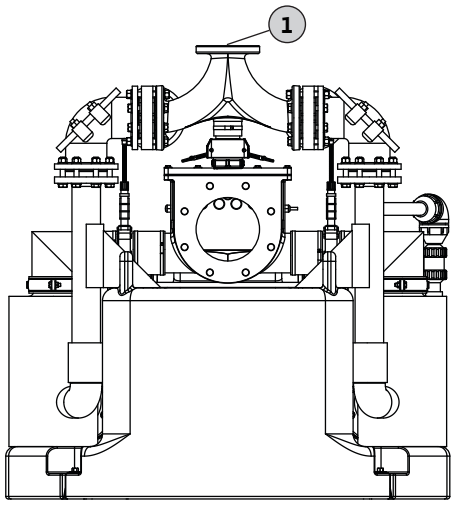

Fig. 4: Fitting discharge connection

1	Discharge port with flange connector

To connect the discharge pipe, follow these points:

- Make sure that the discharge pipe is DN 100.
- Be conscious of the flow rate in the discharge pipe: 0.7 m/s (2.3 ft/s) to 2.3 m/s (7.5 ft/s).
- Do not decrease the pipe diameter.
- Make sure that the pipes are self-supporting: No tensile or compressive forces are applied on the discharge port.
- Make sure that all connections are fully tight.
- Install the discharge pipe as a “pipe loop” to prevent backflow from the primary public sewer.
  At the highest point, the bottom edge of the pipe loop must be above the locally given backflow level.
- To prevent frost, install the discharge line sufficiently deep.

✓ The lifting unit is installed.

✓ The shut-off valves and non-return valves are already built in.

1. Route the discharge pipe to the discharge port. Refer to the consulting documents for the accurate dimensions of the lifting unit.
2. Put a seal between the flange connectors at the discharge pipe side and the discharge port side.
3. Fasten the flange connectors with screws. **Tightening torque: 45 Nm (33.2 ft·lb).**
   ► The discharge pipe is connected. Next step: Connecting the inlet.

6.4.7 Connecting the inlet

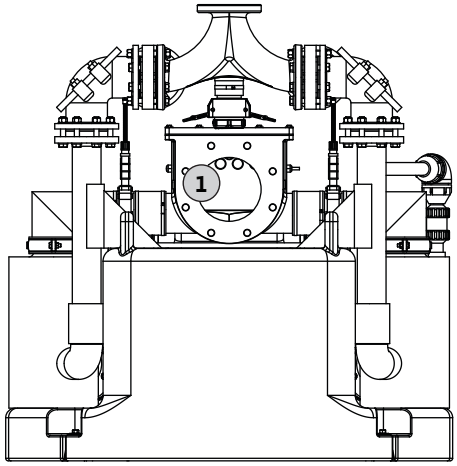

Fig. 5: Connecting the inlet

1	Inlet port

To connect the inlet, follow these points:

- Make the connection at the supply box/distributor.
- To prevent surging inflow or air intake into the collection tank, install the inlet correctly. **CAUTION! Surging inflow or air intake into the collection tank can lead to malfunctions of the lifting unit.**
- Make sure that the pipes are self-supporting: No tensile or compressive forces are applied on the inlet port.
- Make sure that all connections are fully tight.
- Make sure that the inlet pipe has a downward slope to the inlet box/distributor.
- Make sure to install a shut-off valve in the inlet pipe upstream of the supply box/distributor.

✓ The lifting unit is installed.

✓ The inlet pipe is installed as shown in the consulting documents.

1. Route the inlet pipe to the supply box/distributor.
2. Put a seal between the flange connectors.
3. Fasten the flange connectors with screws. **Tightening torque: 45 Nm (33.2 ft·lb).**
   ► The inlet is connected. Next step: Connecting the ventilation pipe.

6.4.8 Connecting the ventilation pipe

The connection of a ventilation pipe is mandatory. Furthermore, ventilation is necessary to make sure that the lifting unit functions correctly. Follow these points to connect the ventilation pipe:

- A 2.5 m ventilation hose with Kamlock coupling is included in the scope of delivery. Make sure to use the ventilation hose to permit the dismantling of the cover of the supply box/distributor if necessary.
- For dry installation in buildings, route the ventilation pipe over the roof of the building.
- For underground dry installation outside buildings, route the ventilation pipe over the surface. Install the ventilation pipe with gauze and a rain cap 60 cm above the ground surface level.
- Make sure that all connections are fully tight.

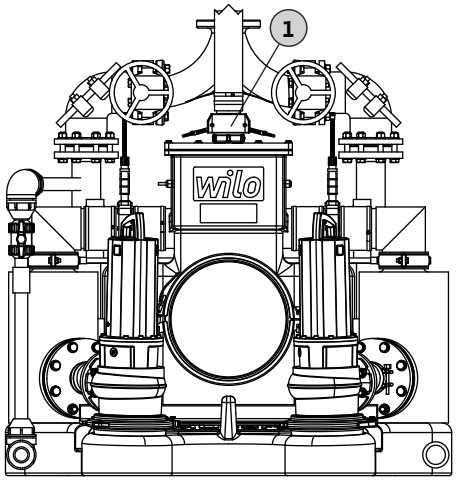

Fig. 6: Collection tank ventilation connection

1	Ventilation connection with hose clamp (Kamlock coupling)

✓ The lifting unit is installed.

✓ The ventilation pipe is laid.

1. Attach the ventilation hose to the hose clamp (Kamlock coupling).
2. Open the handles of the hose clamp (Kamlock coupling) upright.
3. Route the ventilation hose to the stationary ventilation pipe.
4. Attach two clamps on the ventilation hose at the side that is connected to the stationary ventilation pipe.
5. Push the ventilation hose on the stationary ventilation pipe and fasten with the two clamps. **Tightening torque: 5 Nm (3.7 ft·lb).**
   ► The ventilation pipe is connected. Next step: Installing separately delivered sewage pumps.

6.4.9 Installing separately delivered sewage pumps

To install the separately delivered sewage pumps, follow these points:

- Obey the operating and installation and operating instructions for the sewage pumps.
- Support and lift the pump using the handle. Attach the lifting sling to the handle as a slinging point.

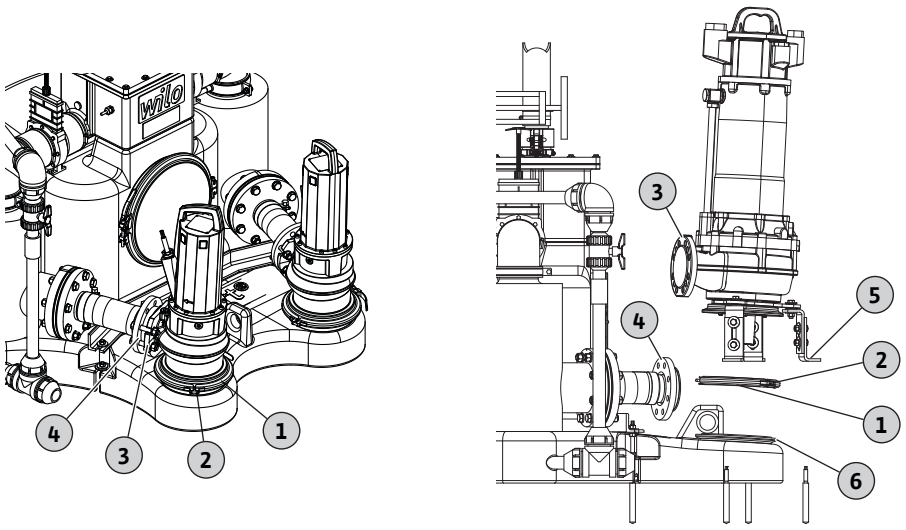

Fig. 7: Installing the sewage pumps

1	Clamp
2	Clamp fastener
3	Pump discharge port with flange
4	Pipework flange
5	Pump support bracket
6	Collection tank opening flange

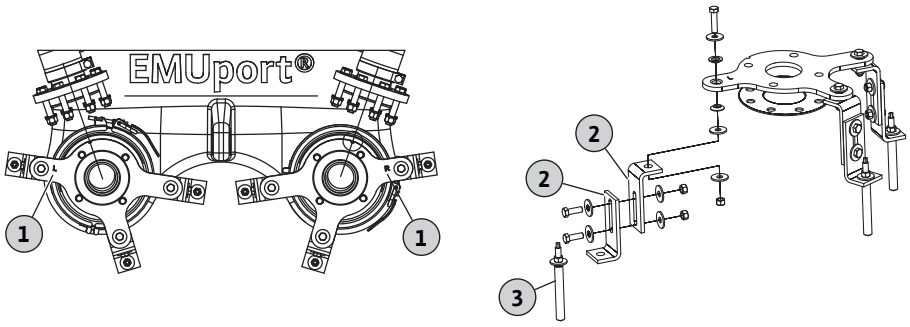

Fig. 8: Pump support brackets

1	Side indication letter
2	L-bracket
3	Bonded anchor

✓ Lifting unit is installed.

✓ Sewage pumps are prepared.

1. Loosen the clamp fastener.
2. Open the clamp.
3. Put the sewage pump on the opening of the collection tank. **NOTICE! For pumps with support brackets, make sure to put the pump on the correct side. NOTICE! Support and lift the pump using the handle. Attach the lifting accessory to the handle as a slinging point.**
4. Align the discharge port of the sewage pump to the pipework.
5. Put the clamp over the two flanges at the pump's suction port and the opening of the collection tank, and lock the clamp fastener. **Tightening torque: 15 Nm (11.1 ft·lb). WARNING! When locking the clamp, hold the handle tightly. There is a risk of injury from the ejected clamp. NOTICE! Make sure that the sewage pump is correctly seated. Put and lock the clamp again if necessary.**
6. Put a seal between the flanges at the pump's discharge port and the pipework, and fasten the flanges with screws. **Tightening torque: 45 Nm (33.2 ft·lb).**
7. For pumps with support brackets, loosen the screws on the L-brackets.
8. Adjust the faces of the pump support brackets with the floor. Hand-tighten the screws on the support brackets.
9. Mark the drilling holes for the fastening points of the pump support brackets.
10. Attach the pump support brackets to the floor with the bounded anchors.

► Sewage pumps are installed.

6.5 Electrical connection

DANGER

Danger of death through electrical shock!

Incorrect behaviour during electrical work results in death by electric shock.

- Only a qualified electrician must do the electrical work.
- Obey local regulations.

6.5.1 Fuse on mains side

Make sure to rate the back-up fuse according to the starting current on the rating plate.

Only use slow-blow fuses or K-type circuit breakers as a back-up fuse.

6.5.2 Mains connection

Set up the mains connection on a switchgear to control the lifting unit. **CAUTION! Obey the installation and operating instructions for the switchgear.**

The lifting unit is flood-proof and can continue to operate even in a disaster situation. Make sure to install electrical connections at a flood-proof height.

6.5.3 Switchgear

Necessary basic functions and connections of the switchgear

For safe operation of the sewage lifting unit, make sure that the switchgear has these functions and connections. **CAUTION! To prevent the switchgear from flooding, install it at a sufficient height.**

Functions

- Control of two pumps in alternating operations with forced switching. **CAUTION! Prevent parallel operation on the hardware-side and software-side.**
- Single pump operation
  During maintenance, the lifting unit can operate with only one pump. Make sure to designate the pump and operate it based on the given operating mode.
- Configurable overload protection
- Direction-of-rotation monitoring
- Adjustable measurement range for different level sensors
- Main switch
- Manual control of pumps
  The pumps can only be switched on if the “Pump ON” level in the collection tank is reached.
- High water alarm
  Make sure to give an alarm signal when the high water level is reached.

Connections

- For each pump:
  - Power connection in direct or star-delta activation, depending on the pump
  - Winding temperature monitoring using bimetallic strip or PTC sensor (FKT 20.2)
  - Moisture probe for the motor compartment monitoring
  - Moisture probe for sealing chamber monitoring
- Signal transmitter for the level control device
  - Level sensor
  - Intrinsically safe electric circuit (depending on local statutory regulations)

6.5.4 Connecting the sewage pumps

Before the connection, examine the insulation resistance of the motor windings and the monitoring equipment. **CAUTION! If the values measured deviate from the specifications, there are two possible reasons: moisture entering the equipment or defects in the monitoring unit. Do not connect the pump and consult customer service.**

Examining the insulation resistance of the motor winding

Examine the insulation resistance with an ohmmeter (measuring voltage = 1000 V). Examine these values:

- At initial commissioning: Make sure that the insulation resistance is no less than 20 MΩ.
- For more measures: Make sure that the value is higher than 2 MΩ.

Examining the temperature sensor of the motor winding

Examine the temperature sensor with an ohmmeter. Examine these values:

- Bimetallic strip: Value = “0” passage
- PTC thermistor sensor: A PTC thermistor sensor has a cold resistance at 20 ... 100 Ω. If there are three sensors in series, the cold resistance is 60 ... 300 Ω.
  If there are four sensors in series, the cold resistance is 80 ... 400 Ω.

Examining the moisture sensor in the motor compartment

Examine the moisture sensor with an ohmmeter. Examine these values:

- This value must approach “infinity”. If the value is low, there is water in the motor compartment.

✓ The sewage pumps are installed.

✓ The insulation resistance of the motor windings and the monitoring equipment is checked.

1. Connect the sewage pumps to the switchgear based on the wiring diagram. **CAUTION! To dismantle the pumps from the lifting unit and set them down nearby at any time without disconnecting the connection cable from the switchgear, put the connection cables of the sewage pumps in a correct way.**

6.5.4.1 Connection of P 13 motor

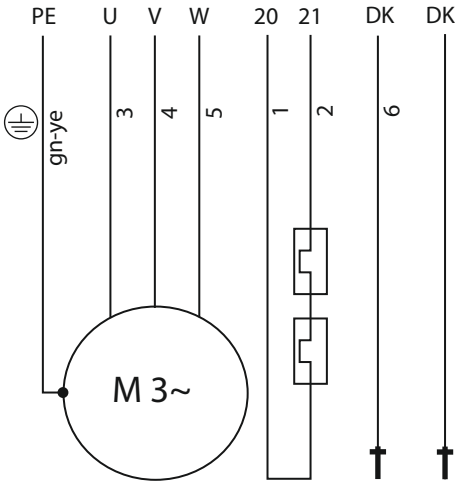

Fig. 9: Connection diagram: P 13, direct starting, bimetallic sensor, with 7-core H07RN-F or TGSH connection cable

Wire number	Wire marking	Description
Motor connection cable		
1	20	Temperature monitoring of motor winding
2	21	
3	U	Mains connection: L1, L2, L3, earth
4	V	
5	W	
Green/yellow (gn-ye)	PE	
6	DK	Leakage detection of motor compartment
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection

- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection

- Connect the bimetallic sensors through an evaluation relay with an approval for explosive atmospheres. Recommendation: relay “CM-MSS”.
- Connection values: max. 250 V~, 2 A, cos φ = 1.
- When the threshold is reached: Switch off the motor with a manual reactivation lock (which can be reset by hand only). **WARNING! An automatic restart is not permitted.**

Leakage detection connection – motor compartment

- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold is reached: Activate an alarm or switch off the motor (recommended).

Leakage detection connection – sealing chamber

- Connect the moisture probe through an evaluation relay with an approval for explosive atmospheres and an intrinsically safe circuit. Recommendation: relay “XR-4...”.
- The threshold is 30 kOhm.

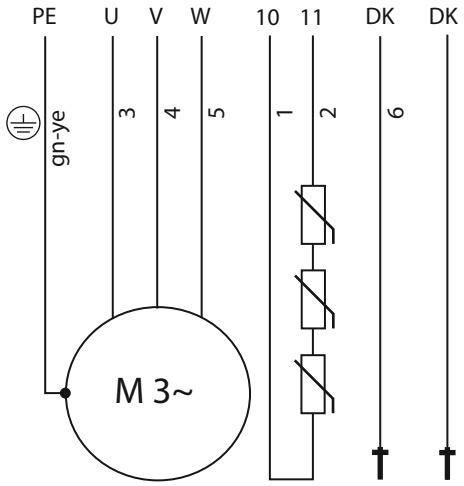

Fig. 10: Connection diagram: P 13, direct starting, PTC sensor, with 7-core H07RN-F or TGSH connection cable

- When the threshold is reached: Activate an alarm or switch off the motor (recommended).

Wire number	Wire marking	Description
Motor connection cable		
1	10	Temperature monitoring of motor winding
2	11	
3	U	Mains connection: L1, L2, L3, earth
4	V	
5	W	
Green/yellow (gn-ye)	PE	
6	DK	Leakage detection of motor compartment
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection
- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection
- Connect the PTC sensors through an evaluation relay with an approval for explosive atmospheres. Recommendation: relay “CM-MSS”.
- Connection values: nominal voltage: 7.5 V=, max. voltage 30 V=.
- When the threshold is reached: Switch off the motor with a manual reactivation lock (which can be reset by hand only). **WARNING! An automatic restart is not permitted.**

Leakage detection connection – motor compartment
- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold is reached: Activate an alarm or switch off the motor (recommended).

Leakage detection connection – sealing chamber
- Connect the moisture probe through an evaluation relay with an approval for explosive atmospheres and an intrinsically safe circuit. Recommendation: relay “XR-4...”.
- The threshold is 30 kOhm.
- When the threshold is reached: Activate an alarm or switch off the motor (recommended).

6.5.4.2 Connection of FK 17.1 motor

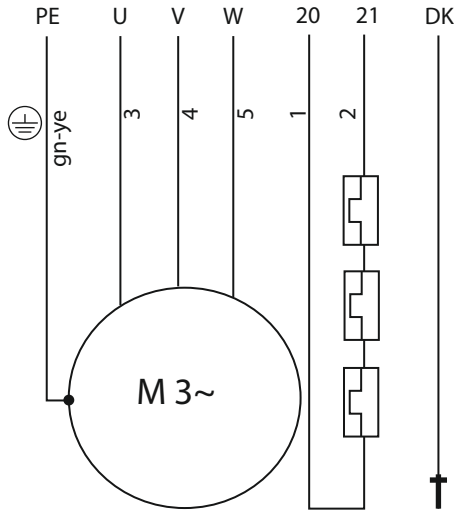

Fig. 11: Connection diagram: FK 17.1, direct starting, bimetallic sensor

Wire number	Wire marking	Description
Motor connection cable		
1	20	Temperature monitoring of motor winding
2	21	
3	U	Mains connection: L1, L2, L3, earth
4	V	
5	W	
Green/yellow (gn-ye)	PE	
6	–	Blank
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection
- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection
- Connect the bimetallic sensors to the switchgear or through an evaluation relay. Recommendation: relay “CM-MSS”.
- Connection values: max. 250 V~, 2 A, cos φ = 1.
- When the threshold value is reached: Switch off the motor.

Leakage detection connection – sealing chamber
- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.

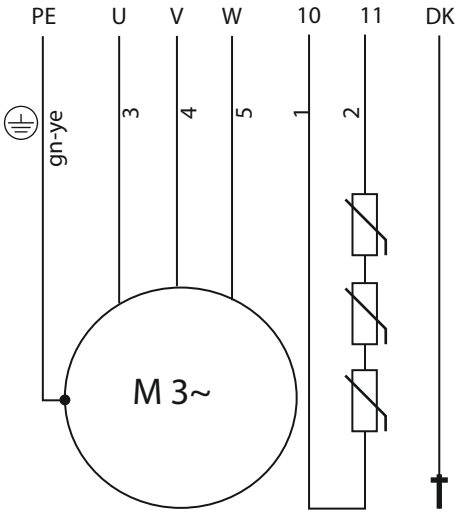

Fig. 12: Connection diagram: FK 17.1, direct starting, PTC sensor, with 7-core H07RN-F connection cable

- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

Wire number	Wire marking	Description
Motor connection cable		
1	10	Temperature monitoring of motor winding
2	11	
3	U	Mains connection: L1, L2, L3, earth
4	V	
5	W	
Green/yellow (gn-ye)	PE	
6	–	Blank
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection
- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection
- Connect the PTC sensors to the switchgear or through an evaluation relay. Recommendation: relay “CM-MSS”.
- Connection values: nominal voltage: 7.5 V=, max. voltage 30 V=.
- When the threshold value is reached: Switch off the motor.

Leakage detection connection – sealing chamber
- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

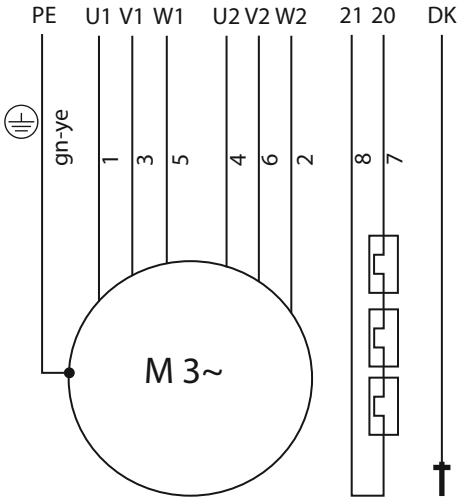

Fig. 13: Connection diagram: FK 17.1, star-delta activation, bimetallic sensor, with 10-core H07RN-F connection cable

Wire number	Wire marking	Description
Motor connection cable		
7	20	Temperature monitoring of motor winding
8	21	
1	U1	Mains connection: L1, L2, L3, start of winding
3	V1	
5	W1	
4	U2	Mains connection: L1, L2, L3, end of winding
6	V2	
2	W2	
Green/yellow (gn-ye)	PE	Earth
9	–	Blank
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection
- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection
- Connect the bimetallic sensors to the switchgear or through an evaluation relay. Recommendation: relay “CM-MSS”.
- Connection values: max. 250 V~, 2 A, cos φ = 1.
- When the threshold value is reached: Switch off the motor.

Leakage detection connection – sealing chamber
- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.

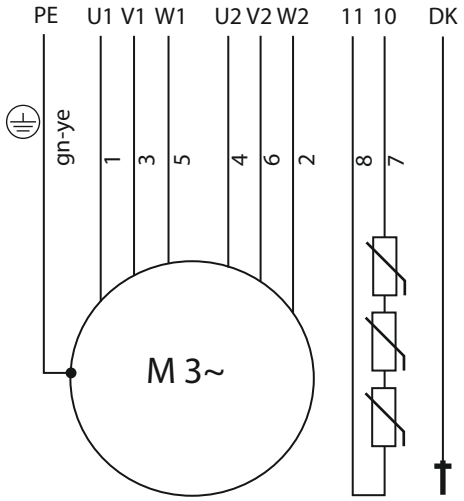

Fig. 14: Connection diagram: FK 17.1, star-delta activation, PTC sensor, with 10-core H07RN-F connection cable

- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

Wire number	Wire marking	Description
Motor connection cable		
7	10	Temperature monitoring of motor winding
8	11	
1	U1	Mains connection: L1, L2, L3, start of winding
3	V1	
5	W1	
4	U2	Mains connection: L1, L2, L3, end of winding
6	V2	
2	W2	
Green/yellow (gn-ye)	PE	Earth
9	–	Blank
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection
- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection
- Connect the PTC sensors to the switchgear or through an evaluation relay. Recommendation: relay "CM-MSS".
- Connection values: nominal voltage: 7.5 V=, max. voltage 30 V=.
- When the threshold value is reached: Switch off the motor.

Leakage detection connection – sealing chamber
- Connect the moisture probe through an evaluation relay. Recommendation: relay "NIV 101/A".
- The threshold is 30 kOhm.
- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

6.5.4.3 Connection of FK 202 motor

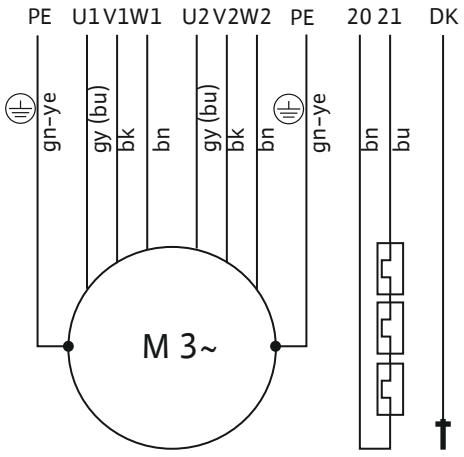

Fig. 15: Connection diagram: FK 202, star-delta activation, bimetallic sensor, with 2x 4-core NSSHÖU-J connection cable and control cable

Wire number	Wire marking	Description
Motor connection cable		
Brown	20	Temperature monitoring of motor winding
Blue	21	
Grey (blue)	U1	Mains connection: L1, L2, L3, start of winding
Black	V1	
Brown	W1	
Grey (blue)	U2	Mains connection: L1, L2, L3, end of winding
Black	V2	
Brown	W2	
Green/yellow (gn-ye)	PE	Earth
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection
- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection
- Connect the bimetallic sensors to the switchgear or through an evaluation relay. Recommendation: relay "CM-MSS".
- Connection values: max. 250 V~, 2 A, cos φ = 1.
- When the threshold value is reached: Switch off the motor.

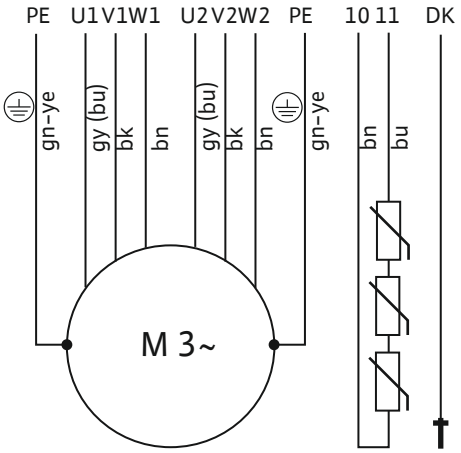

Fig. 16: Connection diagram: FK 202, star-delta activation, PTC sensor, with 2x 4-core NSSHÖU-J connection cable and control cable

Leakage detection connection – sealing chamber

- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

Wire number	Wire marking	Description
Motor connection cable		
Brown	10	Temperature monitoring of motor winding
Blue	11	
Grey (blue)	U1	Mains connection: L1, L2, L3, start of winding
Black	V1	
Brown	W1	
Grey (blue)	U2	Mains connection: L1, L2, L3, end of winding
Black	V2	
Brown	W2	
Green/yellow (gn-ye)	PE	Earth
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection

- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection

- Connect the PTC sensors to the switchgear or through an evaluation relay. Recommendation: relay “CM-MSS”.
- Connection values: nominal voltage: 7.5 V=, max. voltage 30 V=.
- When the threshold value is reached: Switch off the motor.

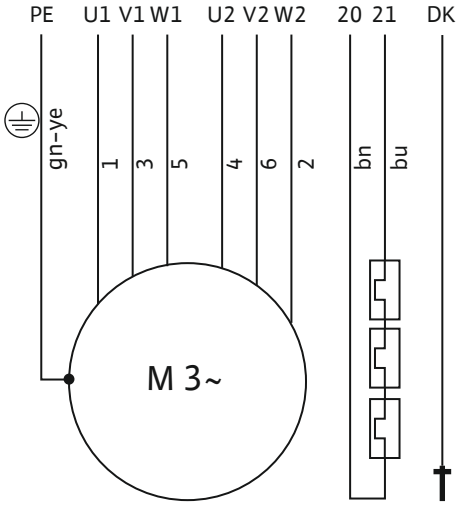

Fig. 17: Connection diagram: FK 202, star-delta activation, bimetallic sensor, with 7-core H07RN-F connection cable and control cable

Leakage detection connection – sealing chamber

- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

Wire number	Wire marking	Description
Motor connection cable		
Brown	20	Temperature monitoring of motor winding
Blue	21	
Grey (blue)	U1	Mains connection: L1, L2, L3, start of winding
Black	V1	
Brown	W1	
Grey (blue)	U2	Mains connection: L1, L2, L3, end of winding
Black	V2	
Brown	W2	
Green/yellow (gn-ye)	PE	Earth
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection

- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection

- Connect the bimetallic sensors to the switchgear or through an evaluation relay. Recommendation: relay “CM-MSS”.
- Connection values: max. 250 V~, 2 A, cos φ = 1.
- When the threshold value is reached: Switch off the motor.

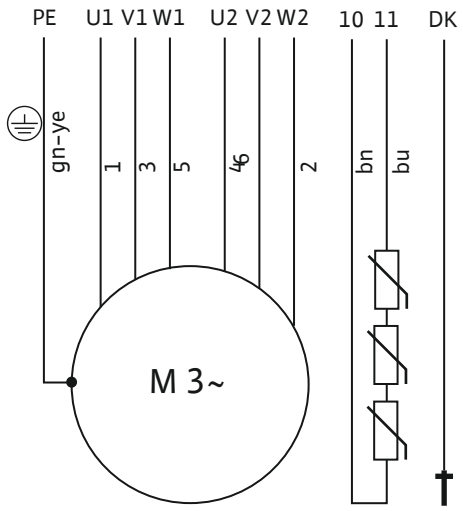

Fig. 18: Connection diagram: FK 202, star-delta activation, PTC sensor, with 7-core H07RN-F connection cable and control cable

Leakage detection connection – sealing chamber

- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

Wire number	Wire marking	Description
Motor connection cable		
Brown	10	Temperature monitoring of motor winding
Blue	11	
Grey (blue)	U1	Mains connection: L1, L2, L3, start of winding
Black	V1	
Brown	W1	
Grey (blue)	U2	Mains connection: L1, L2, L3, end of winding
Black	V2	
Brown	W2	
Green/yellow (gn-ye)	PE	Earth
Moisture probe cable		
–	DK	Leakage detection of sealing chamber

Mains connection

- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection

- Connect the PTC sensors to the switchgear or through an evaluation relay. Recommendation: relay “CM-MSS”.
- Connection values: nominal voltage: 7.5 V=, max. voltage 30 V=.
- When the threshold value is reached: Switch off the motor.

Leakage detection connection – sealing chamber

- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

6.5.4.4 Connection of FKT 20.2 motor

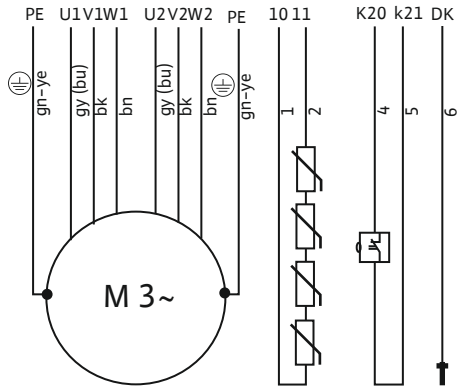

Fig. 19: Connection diagram: FKT 20.2, star-delta activation, PTC sensor, with 2x 4-core NSSHÖU-J connection cable and control cable

Wire number	Wire marking	Description
Motor connection cable		
1	10	Temperature monitoring of motor winding
2	11	
3	Blank	
4	K20	Leakage detection of leakage chamber by leakage float
5	K21	
Grey (blue)	U1	Mains connection: L1, L2, L3, start of winding
Black	V1	
Brown	W1	
Grey (blue)	U2	Mains connection: L1, L2, L3, end of winding
Black	V2	
Brown	W2	
Green/yellow (gn-ye)	PE	Earth
Moisture probe cable		
6	DK	Leakage detection of motor compartment

Mains connection

- Follow the rating plate for the mains connection.
- Make sure that the mains power supply has a clockwise-rotating field.
- Follow the local regulations for earthing.

Temperature monitoring connection

- Connect the PTC sensors to the switchgear or through an evaluation relay. Recommendation: relay “CM-MSS”.
- Connection values: nominal voltage: 7.5 V=, max. voltage 30 V=.
- When the threshold value is reached: Switch off the motor.

Leakage detection connection – motor compartment

- Connect the moisture probe through an evaluation relay. Recommendation: relay “NIV 101/A”.
- The threshold is 30 kOhm.
- When the threshold is reached: Activate an alarm or switch off the motor (recommended).

Leakage detection connection – leakage chamber

- Connect the leakage floater (NC contact) through an evaluation relay with an approval for explosive atmospheres. Recommendation: relay “CM-MSS".
- Connection values: max. 150 V~, 0.5 A, max. 10 VA.
- When the threshold value is reached: Activate an alarm or switch off the motor (recommended).

6.5.5 Connecting the level control device

DANGER

Explosion hazard through sparks!

There can be an explosive atmosphere in the collection tank. A spark can cause an explosion. Follow these points:

- Connect the level sensor to an evaluation relay. The evaluation relay must be permitted for use in potentially explosive atmospheres. The relay must also have an intrinsically safe circuit. (e.g., Zener barrier).
- Obey the local regulations.

Connect the level sensor to the related terminals of the switchgear used. Make sure to store these switching points in the switchgear according to the data sheet supplied with the switchgear:

- Pump ON
- Pump OFF
- High water alarm

NOTICE! The given switching points can only be changed after consulting the manufacturer. Obey the installation and operating instructions for the switchgear.

6.5.6 Operation with frequency converter

Operation with the frequency converter is not permitted.

7 Commissioning

WARNING

Risk of injury without protective equipment!

During work, there is a risk of (serious) foot injury.

- Wear safety shoes.

NOTICE

Automatic switching on after power blackout

A switchgear controls the product. The product is automatically switched on and off depending on the application.

The product can start automatically after a power blackout.

7.1 Staff qualifications

- Operation/control: The staff knows how the system works.

7.2 Operator responsibilities

- Supply the installation and operating instructions. Keep the installation and operating instructions easy to access.
- Supply these instructions in the language which the staff can read and understand.
- Make sure that the staff reads and understands the installation and operating instructions.
- Make sure that all system-side safety devices and emergency cut-outs are active and working correctly.
- Make sure that the product is the correct one for the given operating conditions.

7.3 Operation

CAUTION! Malfunction because of incorrect operation of the switchgear. The lifting unit is operated by the switchgear. Obey the installation and operating instructions for the switchgear for correct operation.

7.4 Tasks before commissioning

Complete these tasks before commissioning:

Monitoring the direction of rotation of the sewage pumps

Make sure that the sewage pumps are connected clockwise for correct operation of the lifting unit. Make sure to monitor the direction of rotation through switchgear. **CAUTION! If the direction of rotation is incorrect, the sewage can be pumped into the collection tank in some circumstances. This can cause the tank to break.**

Examining the installation and working area

- Lifting unit is installed correctly in compliance with applicable regulations.
- Connections are checked for correctness.
- System is cleaned, specially of solid materials and readily flammable objects (e.g. cotton waste).
- The working area of the system is identified and shown clearly.
- The switchgear is examined for these points:
  - The basic requirements are reached for the operation of a sewage lifting unit with solids separation system.
  - Pumps and level control device are connected according to the installation and operating instructions and regulations.
  - Switching points are stored in the switchgear.

7.5 Initial commissioning

Do a test run before operating the lifting unit in automatic mode. A test run examines the correct functioning and impermeability of the unit. It is necessary to include a full pump cycle for the two pumps in the test run.

✓ The lifting unit is installed correctly.

✓ All connections are checked for correctness.

1. Switch on the system through the switchgear: Main switch to “ON”.
2. Set automatic mode on the switchgear.
3. Open all the shut-off valves to fill the collection tank slowly:
   1x shut-off valve in the inlet pipe
   2x shut-off valves for the solids separation tanks
   2x shut-off valves in the discharge pipelines
   On-site shut-off valves in the discharge pipe if necessary
4. Switch on and off the two sewage pumps alternately through level control device.
   ⇒ Do no less than two full pumping operations of all pumps for a test run.
   ⇒ To examine the duty point, fill the discharge pipe fully with water. Do more test runs until the discharge pipe is fully filled.
5. Close the shut-off valve in the inlet. In usual case, the lifting unit does not switch on again because no more fluid flows in. **NOTICE! If the lifting unit switches back on again, then the shut-off valve in the inlet or a non-return valve is leaking. Examine the installation and consult customer service.**
6. Examine all screw connections, pipe connections and the collection tank for impermeability.
   ⇒ If there are leaks, tighten the screw connections to the correct torque settings.
   ⇒ If there are no leaks, the lifting unit can run in automatic mode.
7. If the system will not be used immediately in regular operation, switch the switchgear over to standby mode.

NOTICE

Long system off-times

For longer time of shutdown, close the shut-off valves and switch off the switchgear.

8 Operation

The lifting unit operates in automatic mode by default and is switched on and off through the integrated level control device.

The motor housing of the sewage pump can get as hot as100 °C during operation. A dedicated working area must be specified by the end user. No person is permitted in this area during operation and no readily flammable object is permitted to be stored there.
CAUTION! The working area must be shown clearly.

WARNING

Risk of burns from hot surfaces!

During operation, the motor housing can get hot. There is a risk of skin burns if the component is touched.

- Cool down the motor to ambient temperature after switching off.

✓ Commissioning is done.
✓ Test run is done.
✓ The handling and functioning of the lifting unit are known.
✓ The discharge pipe is fully filled with water.

1. Switch on the system through the switchgear: Set the main switch to “ON”.
2. Set automatic mode on the switchgear.
3. Make sure that all shut-off valves are open:
   1x shut-off valve in the inlet pipe
   2x shut-off valves for the solids separation tanks
   2x shut-off valves in the discharge pipelines
   On-site shut-off valves in the discharge pipe if necessary
   ► The lifting unit operates in automatic mode and is controlled depending on the level.

8.1 Application limits

CAUTION

Property damage through overpressure in the collection tank!

If there is overpressure in the collection tank, the tank can break. To prevent overpressure in the collection tank, follow these points:

- The maximum inflow must be lower than the maximum volume flow at the duty point.
- Maximum tank flooding during operation: 0 m (tank is depressurised)
- The maximum tank flooding in case of system malfunction (measured from tank base) listed in the Technical Data section
- The maximum permitted pressure in the discharge line listed in the Technical Data section

8.2 During operation

- Open shut-off valves in the inlet and discharge pipe.
- Make sure that the maximum inflow is lower than the maximum output of the system.
- Do not open inspection opening.
- Make sure that the collection tank is sufficiently ventilated.

8.2.1 Washing the collection tank with the flushing line

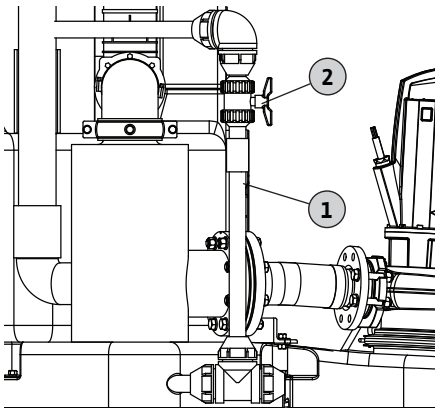

Fig. 20: Flushing line for the collection tank

1	Flushing line for the collection tank
2	Ball valve for the flushing line

1. Wait until the pump on the left side starts the pumping cycle.
2. Close the shut-off valve for the left discharge pipe.
3. Open the ball valve for the flushing line.
4. Permit the flushing to continue for 1 … 2 minutes.
5. Open the shut-off valve for the discharge pipe on the left side.
6. Close the ball valve for the flushing line.

8.3 Emergency operation

8.3.1 Level control failure

If the level control fails, drain the collection tank in manual mode. For all related information on manual mode, refer to the installation and operating instructions for the switchgear.

8.3.2 Lifting unit failure

If a failure occurs, the lifting unit can operate in emergency operation. The lifting unit can continue operating as a single-pump system.

Follow these points if the system is working in emergency operation:

- Close the inlet to the related solids separation tank and switch off the failed pump through the switchgear.
- Make sure to follow the operating mode of the active pump.
- The collection tank continues to be filled in emergency operation. If the pump is dismantled, the sewage is pressed out of the collection tank through the connection port. A maintenance kit is available for emergency operation. Make sure to mount the blanking covers immediately after the pumping procedure.
- When necessary, open the cover of the supply box/distributor, use a self-priming pump to drain the sewage in the collection tank.
- The solids stay in the solids separation tank. Make sure to dispose of these solids when the solids separation tank is opened.

8.3.3 Flooding of the lifting unit (accident)

The lifting unit is flood-proof, and can continue operating even during flooding.

DANGER

Danger through harmful fluid!

In case of an accident, the collected sewage flows into the operating space. There is a risk of a bacterial infection. Follow these points:

- Wear protective equipment:
  - One-time protective suit
  - Sealed safety glasses
  - Respiratory mask
- Clean and disinfect all equipment (e.g., diaphragm hand pump, hoses) after use.
- Disinfect the lifting unit and operating space.
- Dispose of flushing water to the sewer
- Obey local regulations to dispose of protective clothing and cleaning material.
- Obey the factory regulations.

9 Shutdown/dismantling

9.1 Staff qualifications

- Operation/control: The staff knows how the system works.
- Electrical work: Only a qualified electrician must do the work.
  Necessary knowledge: identification and prevention of electrical hazards
- Installation and dismantling: Only a specialist in sanitary facilities must do the work.
  Necessary knowledge: fastening of buoyancy safeguards, connection of plastic pipes

9.2 Operator responsibilities

- Obey local accident prevention and safety regulations.
- Supply protective equipment. Make sure that staff wears protective equipment.
- Ventilate closed rooms.
- Toxic or asphyxiating gases can collect in closed rooms or buildings. Wear protective equipment (e.g., gas detector). Obey the factory regulations.
- Do not work alone in closed rooms. Only do this work with a second person.
- Obey regulations for working below suspended loads when using lifting accessories.

9.3 Shutdown

WARNING

Risk of burns from hot surfaces!

During operation, the motor housing can get hot. There is a risk of skin burns if the component is touched.

- Cool down the motor to ambient temperature after switching off.

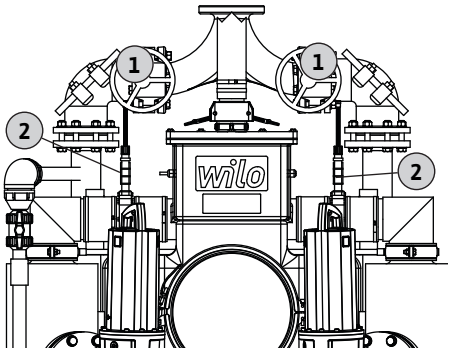

Fig. 21: Overview of the shut-off valves

To take the lifting unit out of service correctly, fully empty the two solids separation tanks. It is necessary to run two full pump cycles.

1	Shut-off valve for discharge pipe
2	Shut-off valve for solids separation tank

1. Wait until the first pumping procedure starts, close the shut-off valve for the solids separation tank related to the running pump.
2. Wait until the second pumping procedure starts, close the shut-off valve in the inlet pipe immediately as soon as the pump is running.
3. Switch the switchgear to standby mode.
4. Switch off the system at the main switch. **CAUTION! Prevent the unit against being unexpectedly switched on.**
5. Close the shut-off valve at the discharge side.
6. The lifting unit is ready for removal, maintenance and storage.
   ► The lifting unit is now decommissioned.

If the lifting unit is decommissioned for a longer time, do a functional check at regular intervals (quarterly). **NOTICE! Do the functional check as described in the "Initial commissioning" section.**

9.4 Removal

DANGER

Danger through harmful fluid!

In case of an accident, the collected sewage flows into the operating space. There is a risk of a bacterial infection. Follow these points:

- Wear protective equipment:
  - One-time protective suit
  - Sealed safety glasses
  - Respiratory mask
- Clean and disinfect all equipment (e.g., diaphragm hand pump, hoses) after use.
- Disinfect the lifting unit and operating space.
- Dispose of flushing water to the sewer
- Obey local regulations to dispose of protective clothing and cleaning material.
- Obey the factory regulations.

DANGER

Danger of death through electrical shock!

Incorrect behaviour during electrical work results in death by electric shock.

- Only a qualified electrician must do the electrical work.
- Obey local regulations.

DANGER

Danger through lone working!

Working in chambers, narrow rooms, and in areas with a risk of falling can be dangerous. Do not work alone.

- Only do this work with a second person.

WARNING

Risk of burns from hot surfaces!

During operation, the motor housing can get hot. There is a risk of skin burns if the component is touched.

- Cool down the motor to ambient temperature after switching off.

✓ The lifting unit is decommissioned.

✓ Protective equipment is put on.
✓ All shut-off valves are closed.
✓ The solids separation tanks are cleaned.
✓ The collection tank and supply box/distributor are cleaned.
✓ The pipework and shut-off balls are cleaned by flushing out the lifting unit.
1. Do the maintenance tasks. Refer to the “Maintenance and repair” section.
2. Open the shut-off valves for the solids separation tanks and at the discharge side. **CAUTION! Keep inlet shut-off valve closed.**
3. Remove the cover on the supply box/distributor.
4. Restart the system: Switch on the switchgear and start the “Automatic” mode.
5. Fill the collection tank with clean water using a hose through the distributor.
6. Decommission the system as described in the “Shutdown” section. Flushing the lifting unit with two pumping procedures.
7. Remove the water hose and mount the cover on the supply box/distributor.
8. Remove inlet connection: Loosen the flange connection.
9. Remove discharge pipe connection: Loosen the flange connection.
10. Remove ventilation connection: Pull out the ventilation pipe.
11. Disconnect pump cables and sensor cable.
12. Loosen the floor anchoring.
13. Pull the lifting unit carefully out of the pipework.
14. Thoroughly clean and disinfect the outside of the lifting unit.
15. Clean, disinfect, and tightly seal all connection ports.
16. Clean and disinfect the working area.
    ► Lifting unit is disassembled.

9.5 Cleaning and disinfection

DANGER

Danger through harmful fluids!

Disinfect the lifting unit after disassembly. Wear protective equipment when cleaning:

- Sealed safety glasses
- Respiratory mask
- Safety gloves
  – This protective equipment is the necessary basic equipment.
  – Obey the factory regulations.

✓ The lifting unit is dismantled.
✓ The switchgear is packed watertight.
✓ Washing water is flushed into the sewer complying with local regulations.
✓ A disinfectant complying with factory regulations is available. **NOTICE! Obey the manufacturer’s specifications for use.**
1. Flush the lifting unit with clean water from top to bottom.
2. Open and flush the inspection opening on the collection tank.
3. Flush the inner side of all connection ports.
4. Flush all dirt left on the floor into the sewer.
5. Let the lifting unit dry out.
6. Close the inspection opening on the collection tank and non-return valve again.

10 Maintenance and repair

DANGER

Danger of death through electrical shock!

Incorrect behaviour during electrical work results in death by electric shock.

- Only a qualified electrician must do the electrical work.
- Obey local regulations.

DANGER

Explosion hazard through potentially explosive atmosphere in the collection tank!

There can be an explosive atmosphere in the collection tank. During maintenance work, there is a risk of explosion. Follow these points:

- A potentially explosive atmosphere, zone 2, applies in a 1 m radius around the ventilation pipe. Obey the factory regulations.
- During maintenance work, make sure that the air will change eight (8) times each hour in the operating space.

Maintenance and repair work can **only** be done by a qualified staff (e.g. customer service). Obey EN 12056-4 for the maintenance intervals:

- ¼ year for commercial operations
- ½ year for multi-residential buildings
- One year for detached houses

After ¼ year

- Visual inspection of the inlet pipe, clean it if necessary.

After ½ year

- Examine the connections for impermeability.
- Clean the collection tank and overflow channel. If overflows occur regularly, then make sure to clean the overflow channel monthly.

After 1 year

- Clean the solids separation tanks and screens.

After 2 years

- Change the oil of the sewage pump. If using a pencil electrode for sealing chamber monitoring, change the oil in the sealing chamber according to the display.

Write all maintenance and repair work in a log. The log must be signed by the qualified staff and the operator.

Do a test run after the maintenance work.

10.1 General overhaul

During the general overhaul, the motor bearings, shaft sealings, O-rings and connection cables are checked for wear and damage. Damaged components are replaced with original parts. This makes sure that the operation is correct.

The general overhaul is done by the manufacturer or an approved service centre.

10.2 Staff qualification

- Electrical work: Only a qualified electrician must do the work.
  Necessary knowledge: identification and prevention of electrical hazards
- Maintenance work: Only a specialist for lifting units must do the work.
  Necessary knowledge: sanitary installation
- Lifting work: Only a specialist must do the work.
  Necessary knowledge: use of lifting accessories, lifting slings, and slinging points
- Only do maintenance tasks listed in this installation and operating instructions.
- Two persons must do the work.

10.3 Operator responsibilities

- Supply protective equipment. Make sure that staff wears protective equipment.
- Collect the used operating fluids in applicable tanks.
- Obey local regulations to dispose of the operating fluids.
- Only use original parts from the manufacturer. Using non-original parts releases the manufacturer from any liability.
- Supply the necessary tools.
- When using highly flammable solvents and cleaning agents, open fires, naked flames, and smoking are forbidden.
- Write all maintenance tasks in an inspection protocol.

10.4 Basic tools

- Torque wrench ¼", 1-25 Nm
  - Socket wrench: 7 / 10 / 13 mm
  - Hexagon socket wrench: 6 mm
- Torque wrench 3/8", 10-100 Nm
  - Socket wrench: 19 / 24 / 30 mm
- Open-end or ring wrench in width across flats 19, 22, 24 and 30 mm
- Pliers set

10.5 Operating fluid

Filling quantities

Motor type	Motor compartment	Sealing chamber	Sealing chamber
	White oil	**White oil**	**P35**
P13.1	–	1100 ml (37 US.fl.oz.)	–
P13.2	–	1100 ml (37 US.fl.oz.)	–
FK17.1-.../8KEx	6,000 ml (203 US.fl.oz.)	480 ml (16 US.fl.oz.)	–
FK17.1-.../12KEx	5,200 ml (176 US.fl.oz.)	480 ml (16 US.fl.oz.)	–
FK17.1-.../16KEx	7,000 ml (237 US.fl.oz.)	480 ml (16 US.fl.oz.)	–
FK 202.../12	6,600 ml (223 US.fl.oz.)	1,200 ml (41 US.fl.oz.)	–
FK 202.../17	7,000 ml (237 US.fl.oz.)	1,200 ml (41 US.fl.oz.)	–
FK 202.../22	6,850 ml (232 US.fl.oz.)	1,200 ml (41 US.fl.oz.)	–
FKT 20.2.../30G	–	–	11,000 ml (372 US.fl.oz.)

Oil types

- ExxonMobile: Marcol 52
- ExxonMobile: Marcol 82
- Total: Finavestan A 80 B (NSF-H1 approved)

P35 coolant

The coolant P35 is a water-glycol mixture with 35% “Fragol Zitrec FC” concentrate and 65% drinking water. **NOTICE! To top up or fill the cooling system, only use the given concentrate at the given ratios.**

Lubricating grease

These lubricating greases can be used according to DIN 51818 / NLGI Class 3:

- Esso: Unirex N3
- Tripol: Molub-Alloy-Food Proof 823 FM (USDA-H1 approved)

10.6 Maintenance work

- Only do maintenance tasks listed in this installation and operating instructions.
- Cool down the motor to ambient temperature.
- Do the maintenance work in a clean, dry, and sufficiently lit location.

10.6.1 Checking connections for impermeability

Visually examine all pipe connections. If leakage is found, make sure to connect again or replace these connections immediately.

10.6.2 Cleaning the inlet pipe, collection tank and overflow channel

Examine the inlet and clean it if necessary. Clean the collection tank and the overflow channel in this sequence:

1. Collection tank
2. Overflow channel
   ► The water for the cleaning can be collected in the collection tank and disposed of with the next pumping procedure.

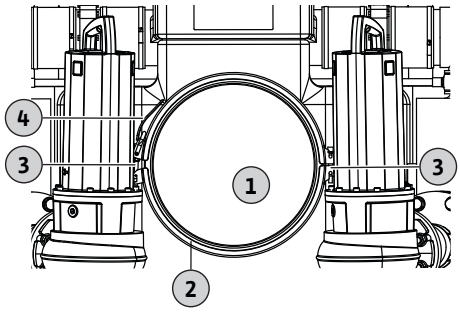

Fig. 22: Cleaning the collection tank

1	Cover of the inspection opening
2	Clamp
3	Fixation of the clamp
4	Locking handle of the clamp

An inspection opening is fitted to the front side of the collection tank. It is possible to clean the collection tank through this opening.

1. Detach the fixation on the clamp.
2. Open the clamp and remove the cover.
3. Clean the collection tank with a water jet. **CAUTION! Make sure not to damage the filling level sensors during cleaning work. Do not point a strong water jet directly at the level sensor.**
4. Attach the cover again and fasten it with the clamp.

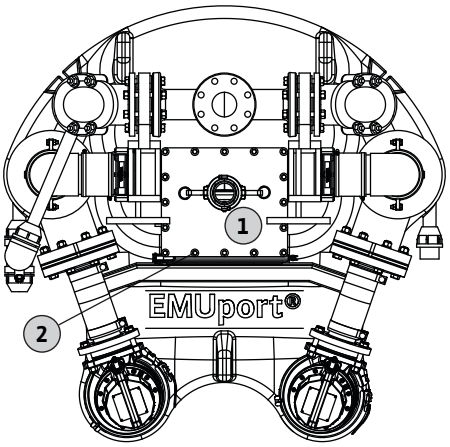

Fig. 23: Cleaning the inlet and overflow channel

5. Tighten the fixation of the clamp. **Max. tightening torque: 15 Nm (11.1 ft·lb)**

1	Cover of the supply box/distributor
2	Screwed connection

The cover on the supply box/distributor can be removed for the cleaning of the inlet pipe and overflow channel.

1. Loosen the screwed connections on the cover of the distributor/supply box.
2. Remove the cover.
3. Clean the inlet with a water jet.
4. Clean the supply box/distributor and the overflow channel with a water jet. **CAUTION! Make sure not to damage the filling level sensors during cleaning work. Do not point a strong water jet directly at the level sensor.**
5. Put the cover back on and screw the bolts back in. **Max. tightening torque: 9 Nm (6.6 ft·lb)**

10.6.3 Cleaning the solids separation tanks

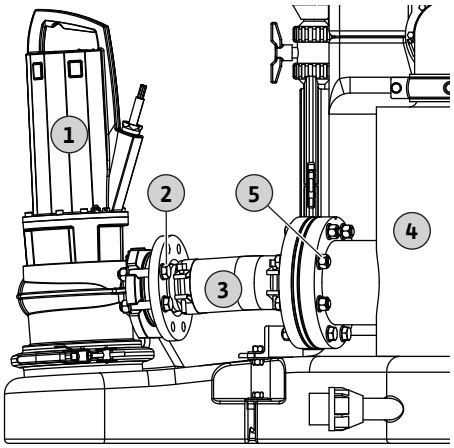

Fig. 24: Cleaning the solids separation tanks

1	Sewage pump
2	Screwed connection at the discharge port of the sewage pump
3	Pump inlet including a screen
4	Solids separation tank
5	Screwed connection at solids separation tank

Each of the solids separation tanks is assembled with a screen. It is necessary to clean the screens regularly. **NOTICE! Make sure to collect and dispose of correctly the water used for flushing the screens and for cleaning the solids separation tanks.**

1. Loosen the screwed connection at the discharge port of the sewage pump.
2. Loosen the screwed connection at the solids separation tank.
3. Pull the pump discharge port out of the pipework.
4. Remove the screen from the connection port of the solids separation tank.
5. Use a water jet to clean the solids separation tank, the pump discharge port, and the screen. **CAUTION! Obey local regulations to collect the sewage and channel it to the sewer system.**
6. Remove the shut-off ball from the solids separation tank and examine them for damage. **CAUTION! A defective shut-off ball leads to malfunctions during operation.** Replace the shut-off ball if:
   The ball is out-of-round.
   There is water in the ball.
   There are indentations from the seal kit.
7. Put the screen back into the connection port of the solids separation tank.
8. Put the pump discharge port back into the pipework between the solids separation tank and the sewage pump.
9. Fasten the pipework to the solids separation tank and to the discharge port of the sewage pump with the screwed connections. **Max. tightening torque: 45 Nm (33.2 ft·lb)**

10.6.4 Replacing the operating fluid of the sewage pump

WARNING

Risk of injury from pressurised operating fluid!

There can be a high pressure in the motor! This pressure is released when the screw plugs are removed. If the screw plugs are removed carelessly, the screw plugs can be thrown out at high speed. Because of the high pressure, hot operating fluid can also splash out. Follow these points:

- Wear protective equipment.
- Cool down the motor to ambient temperature.
- Follow the order of work steps.
- Remove the screw plugs slowly. If pressure is released during removal of the screw plugs (hissing or whistling sound), stop work!
- When the pressure is released, remove the plugs fully.

Make sure to replace specified operating fluid depending on the motor type. **NOTICE! Refer to the pump's rating plate for the motor type.**

EMUport CORE with P 13 motor

The sealing chamber has a hole for draining and filling.

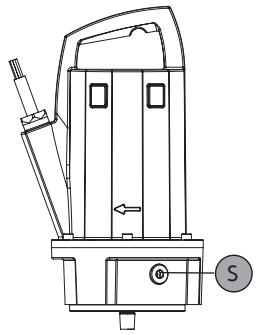

Fig. 25: P 13 motor

S	Sealing chamber draining and filling hole

1. Put a collection pan below the draining screw.
2. Carefully and slowly unscrew the screw plug. **CAUTION! The operating fluid can be pressurised. This can cause the screw to be ejected at speed.**
3. Drain the operating fluid into the collection pan.
4. Flush the sealing chamber with cleaning agent.
5. Obey local regulations to dispose of the operating fluid.
6. Fill the new operating fluid through the opening for the screw plug. Follow the recommended operating fluids and filling quantities.
7. Clean the screw plug, replace the seal and screw it back in.

EMUport CORE with FK 17 motor

The sealing chamber and the motor compartment each have a hole for draining and filling.

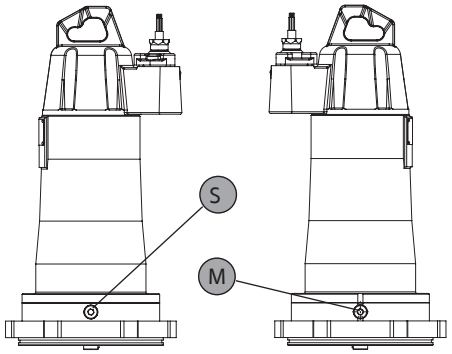

Fig. 26: FK 17.1 motor

S	Sealing chamber draining and filling hole
M	Motor compartment draining and filling hole

1. Put a collection pan below the draining screw.
2. Carefully and slowly unscrew the screw plug. **CAUTION! The operating fluid can be pressurised. This can cause the screw to be ejected at speed.**
3. Drain the operating fluid into the collection pan.
4. Flush the motor compartment and sealing chamber with cleaning agent.
5. Obey local regulations to dispose of the operating fluid.
6. Fill new operating fluid through the opening for the screw plug. Follow the recommended operating fluids and filling quantities.
7. Clean the screw plug, replace the seal and screw it back in.

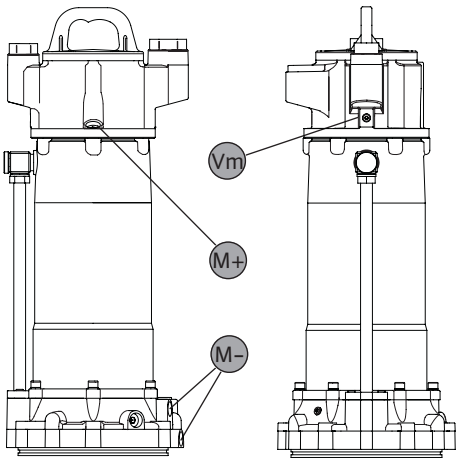

Fig. 27: FK 202 motor compartment oil change

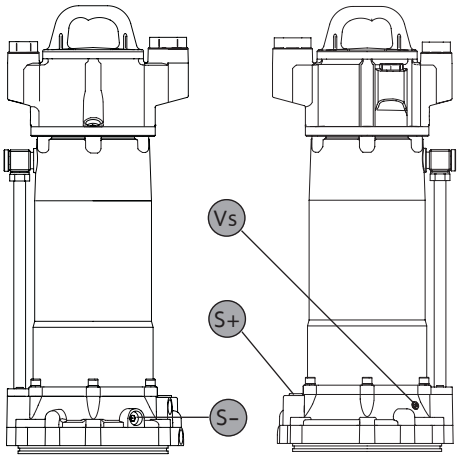

Fig. 28: FK 202 sealing chamber oil change

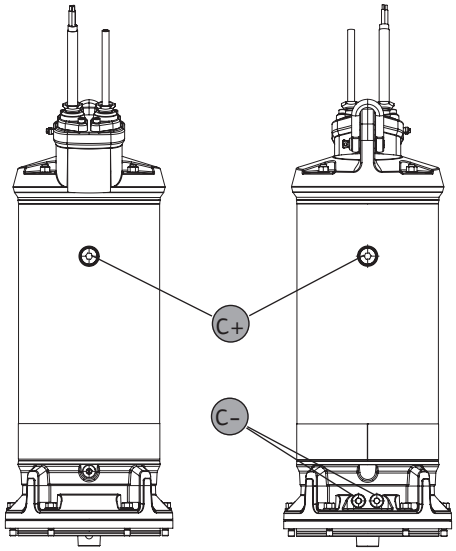

Fig. 29: FKT 20.2 motor

EMUport CORE with FK 202 motor

The sealing chamber and the motor compartment each have a draining hole and a filling hole.

M–	Motor compartment draining hole
M+	Motor compartment filling hole
Vm	Motor compartment ventilation

S–	Sealing chamber draining hole
S+	Sealing chamber filling hole
Vs	Sealing chamber ventilation

1. Put a collection pan below the draining screw.
2. Carefully and slowly unscrew the screw plug of the draining hole. **CAUTION! The operating fluid can be pressurised. This can cause the screw to be ejected at speed.**
3. Unscrew the screw plug from the filling hole. **NOTICE! During the motor compartment oil change, make sure to unscrew the venting screw (Vm).**
4. Drain operating fluid into the collection pan.
5. Flush the motor compartment and sealing chamber with cleaning agent.
6. Obey local regulations to dispose of the operating fluid.
7. Clean the draining hole screw plug, replace the seal and screw it back in.
8. Fill new operating fluid through the opening for the filling hole. Follow the recommended operating fluids and filling quantities.
9. Clean the filling hole screw plug, replace the seal and screw it back in. **CAUTION! After the motor compartment oil change, retighten the venting screw (Vm).**

EMUport CORE with FKT 20.2 motor

The motor has a cooling system. The cooling system is filled with operating fluid P35. The cooling system has two draining holes and two filling holes.

C–	Cooling system draining hole
C+	Cooling system filling hole

1. Put a collection pan below the draining screw.
2. Carefully and slowly unscrew the screw plug of the draining hole. **CAUTION! The operating fluid can be pressurised. This can cause the screw to be ejected at speed.**
3. Unscrew the screw plug from the filling hole.
4. Drain operating fluid into the collection pan.
5. Flush the cooling system with cleaning agent.
6. Obey local regulations to dispose of the operating fluid.
7. Clean the draining hole screw plug, replace the seal and screw it back in.
8. Fill new operating fluid through the opening for the filling hole. Follow the recommended operating fluids and filling quantities.
9. Clean the filling hole screw plug, replace the sealing ring and screw it back in.

10.6.5 Removing the sewage pump

To remove the sewage pump for maintenance or repair, follow these points:

- Obey the operating and installation and operating instructions for the sewage pumps.
- Support and lift the pump using the handle. Attach the lifting sling to the handle as a slinging point.

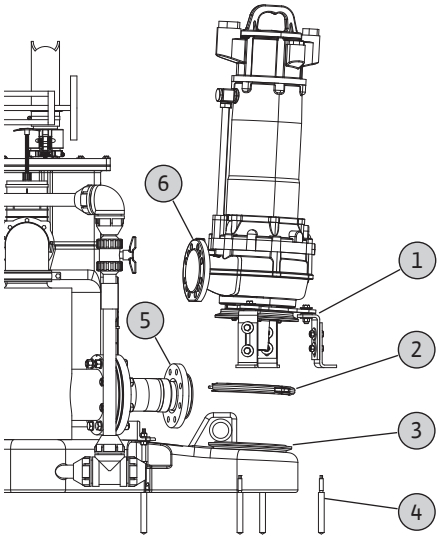

Fig. 30: Removing sewage pumps

1	Pump support bracket
2	Clamp
3	Collection tank opening flange
4	Bonded anchor
5	Pipework flange
6	Pump discharge port with flange

1. Loosen and remove the screw connections at the discharge port of the sewage pump.
2. Loosen the clamp fastener.
3. Open and remove the clamp.
4. For pumps without support brackets, lift the pump by the handle to remove the pump. For pumps with support brackets fixed to the floor, loosen and remove the screw nuts for floor fixation. Lift the pump by the handle to remove the pump.
   NOTICE! Support and lift the pump using the handle. Attach the lifting accessory to the handle as a slinging point.
   ► Sewage pumps are removed.

11 Faults, causes and remedies

- Make sure that staff are trained to do the set tasks.
- Obey the installation and operating instructions.
- Make sure that the product is disconnected from the mains connection. Prevent the product from accidental switching on.
- Non-approved changes to the lifting unit release the manufacturer from any liability.

Overview of possible faults

Fault	Cause and solution
Lifting unit does not pump	1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16
Volume flow is too low	1, 2, 3, 4, 5, 7, 8, 11, 12, 13
Current consumption is too high	1, 2, 3, 4, 5, 7, 13
Delivery head is too small	1, 2, 3, 4, 5, 8, 11, 12, 13
Lifting unit runs roughly/loud noise	1, 2, 3, 9, 12, 13, 14

Possible causes and their solutions

1. Inlet or impeller clogged
   ⇒ Remove deposits from the inlet, tank and/or pump by the customer service.
2. Incorrect direction of rotation
   ⇒ Swap the two phases of the current feed by the customer service.
3. Wear of inner parts (e.g. impeller, bearing)
   ⇒ Replace worn parts by the customer service.
4. Operating voltage too low
   ⇒ A qualified electrician must examine the mains connection.
5. Running on two phases
   ⇒ Replace defective fuse by a qualified electrician.
   ⇒ A qualified electrician must examine the mains connection.
6. Motor start failure because of insufficient voltage
   ⇒ A qualified electrician must examine the mains connection.
7. Motor winding or electric cable defective
   ⇒ Have the motor and electrical connection checked by the customer service.
8. Non-return valve clogged
   ⇒ Have the non-return valve cleaned by the customer service.
9. Too low water level in the tank
   ⇒ The customer must examine the level control device and replace it if necessary.
10. Level control signal transmitter defective
    ⇒ The customer service must examine the signal transmitter and replace it if necessary.

11. Slide valve in the discharge pipe not open or not sufficiently open
    ⇒ Fully open the slide valve.
12. Not permitted quantity of air or gas in the fluid
    ⇒ Consult the customer service.
13. Radial bearing in the motor defective
    ⇒ Consult the customer service.
14. System-related vibrations
    ⇒ Examine elastic connections of the piping, and inform the customer service if necessary.
15. Winding temperature monitoring switched off because of too high winding temperature
    ⇒ The motor switches back on automatically after the winding has cooled down.
    ⇒ For frequent switch-off by the winding temperature monitoring, inform the customer service.
16. Electronic motor protection triggered
    ⇒ Rated current is higher than permitted, reset the motor protection using the reset button on the switchgear.
    ⇒ For frequent switch-off by the electronic motor protection, inform the customer service.

Customer service

If the points listed here do not repair the fault, contact the customer service. Costs can be caused when using customer service support. Contact the customer service for more information.

11.1 Spare parts

Order spare parts through customer service. To prevent return queries and incorrect orders, always supply the serial or article number. **Subject to change without prior notice.**

12 Disposal

12.1 Protective clothing

Obey local regulations to dispose of worn protective clothing.

12.2 Operating fluids

- Collect operating fluids in dedicated tanks.
- Immediately clean up the leaked liquid.
- Obey local regulations to dispose of the operating fluids.

12.3 Information on the collection of used electrical and electronic products

To prevent damage to the environment and human health, make sure to dispose of and recycle this product correctly.

NOTICE

Do not dispose of the product in domestic waste!

This symbol means that the product must not be disposed of in domestic waste. The symbol is applied to the product or its packaging.

Follow these points for a correct disposal of the product:

- Only return the product to a designated and permitted collection point.
- Obey local regulations.

Consult your local municipality, the nearest waste disposal site, or your retailer for a correct disposal. See for more http://www.wilo-recycling.com information about recycling.

13 Appendix

13.1 Suggestions on the pump chamber

Connection cabinet

It is recommended to use a connection cabinet on the wall in the concrete pump chamber. Cable wiring between devices in the pump chamber and the control cabinet can be made through this connection cabinet for easy replacement and maintenance.

Minimum diameter of the pump chamber

The minimum diameter of the concrete pump chamber:

- 1500 mm for EMUport CORE 20.2
- 1600 mm for EMUport CORE 20.2 with Rexa SUPRA pumps
- 2000 mm for EMUport CORE 45.2 and 60.2

Ventilation and illumination

Suggestions on ventilation and illumination in the pump chamber:

- Ventilation:
  - Minimum air change is seven times per hour.
- Illumination:
  - Install the light sources on the side, not on the top of the pump chamber.
  - Recommended colour temperature is 4000 … 5000 Kelvins.

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