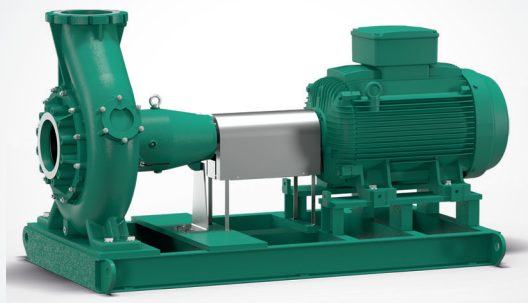


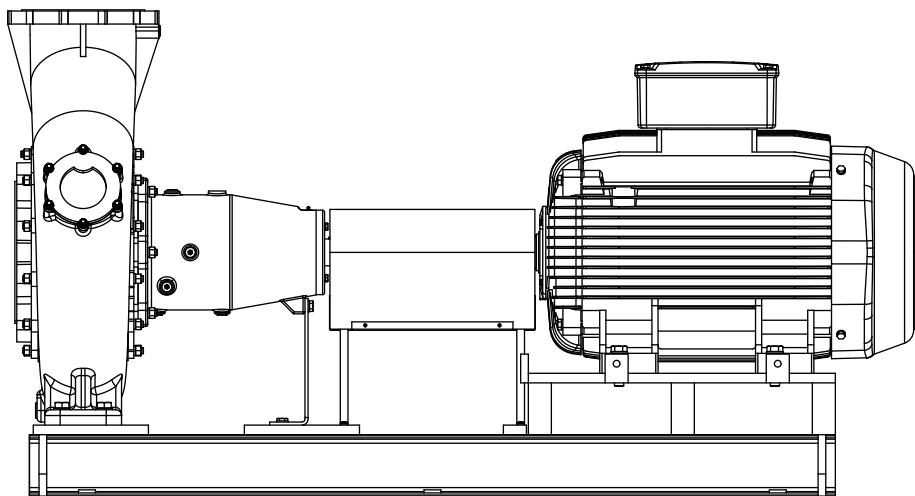
Wilo-Rexa NORM/RexaNorm RE



en Installation and operating instructions

Fig. 1

A



B

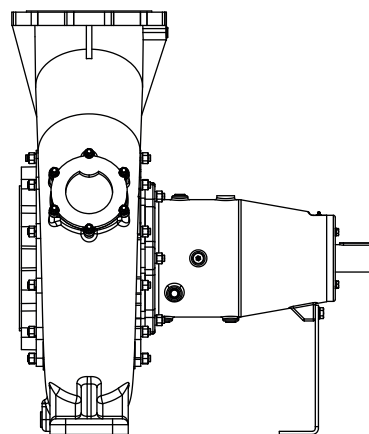
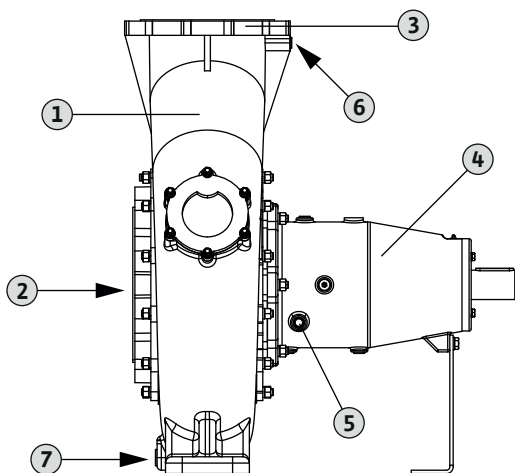
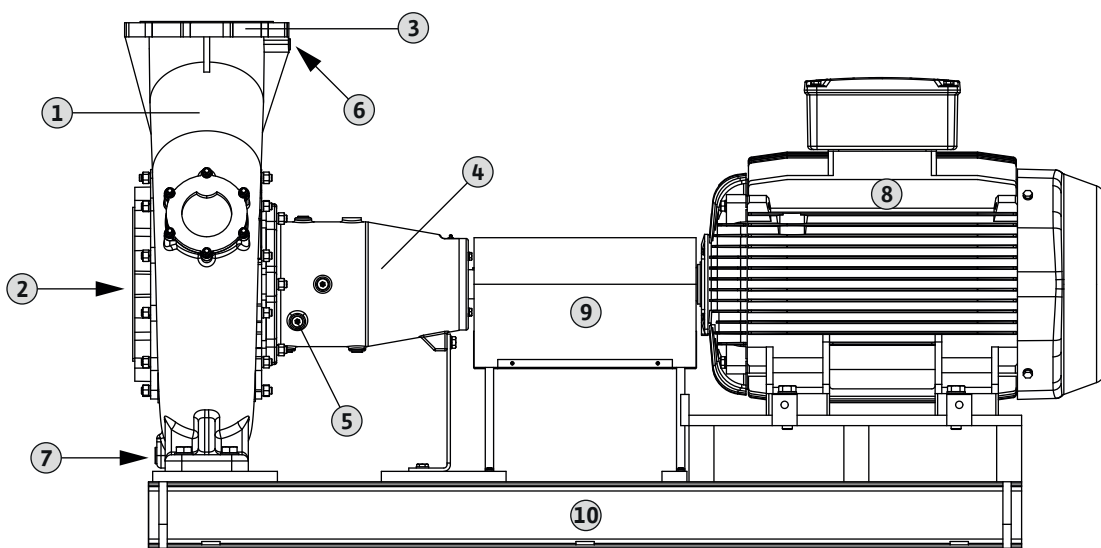


Fig. 2



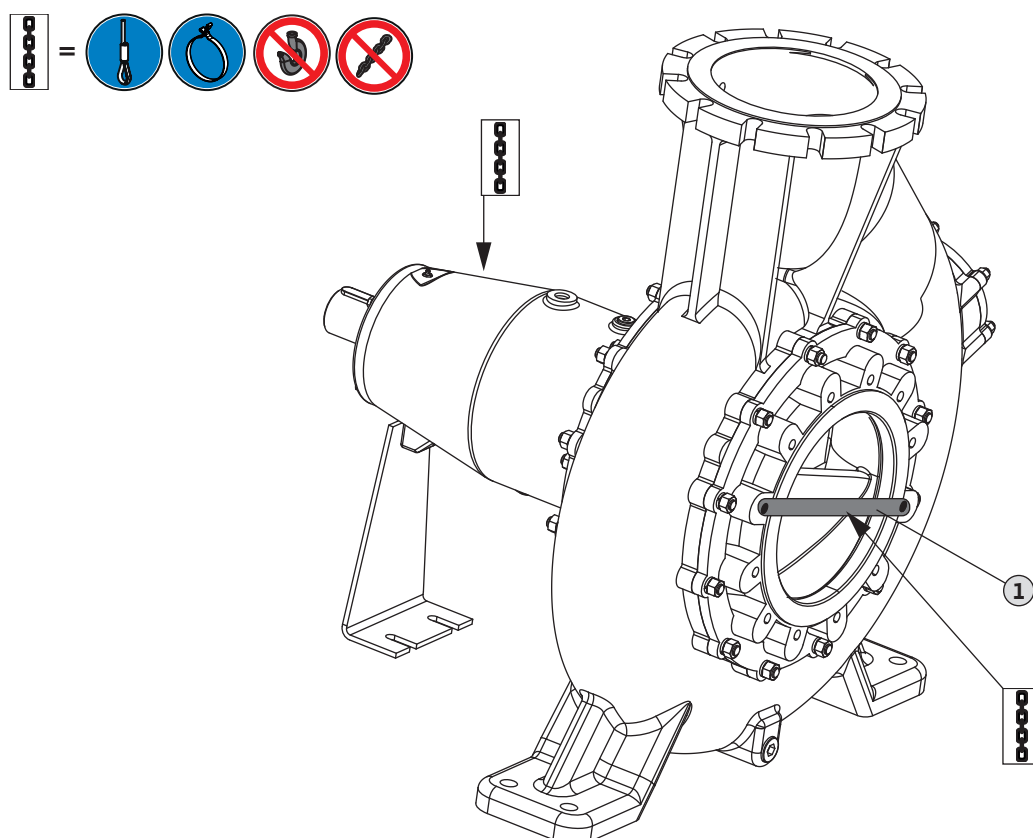
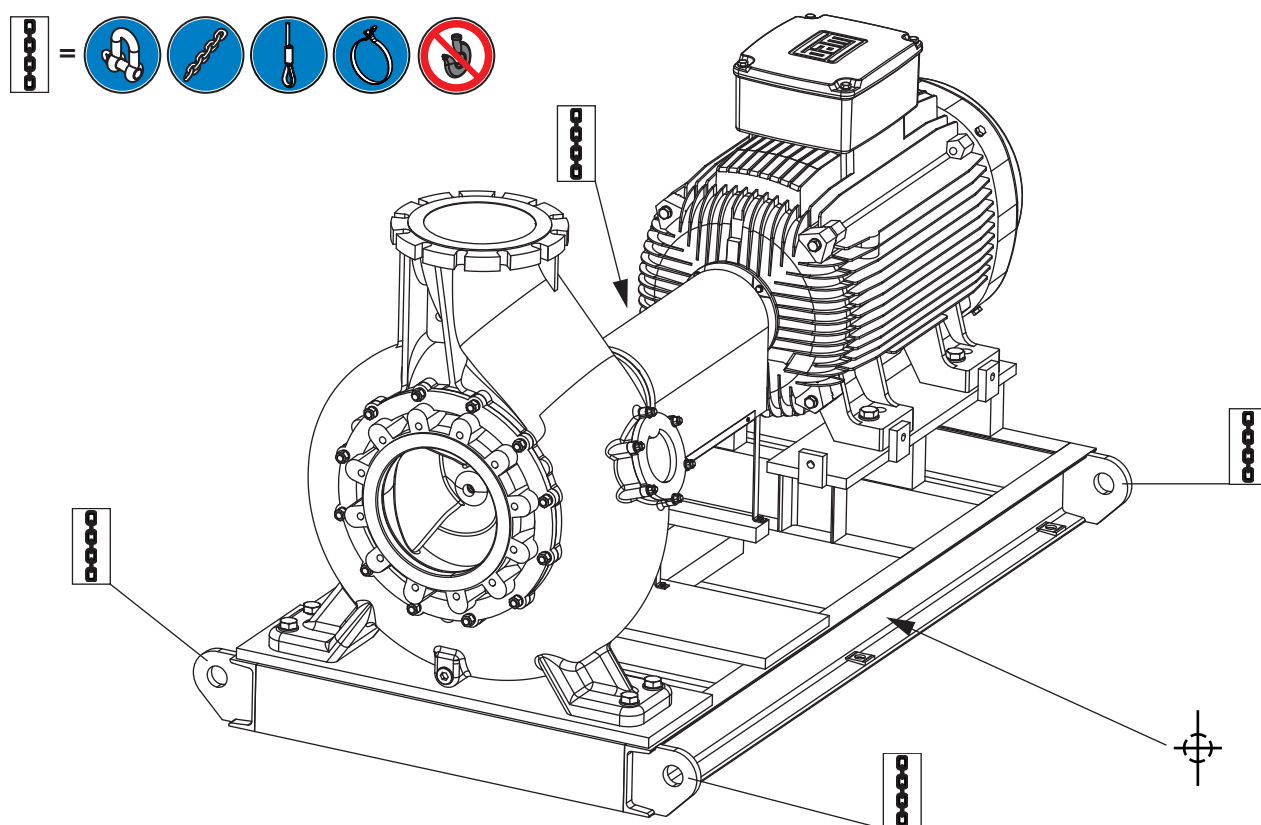


Fig. 4

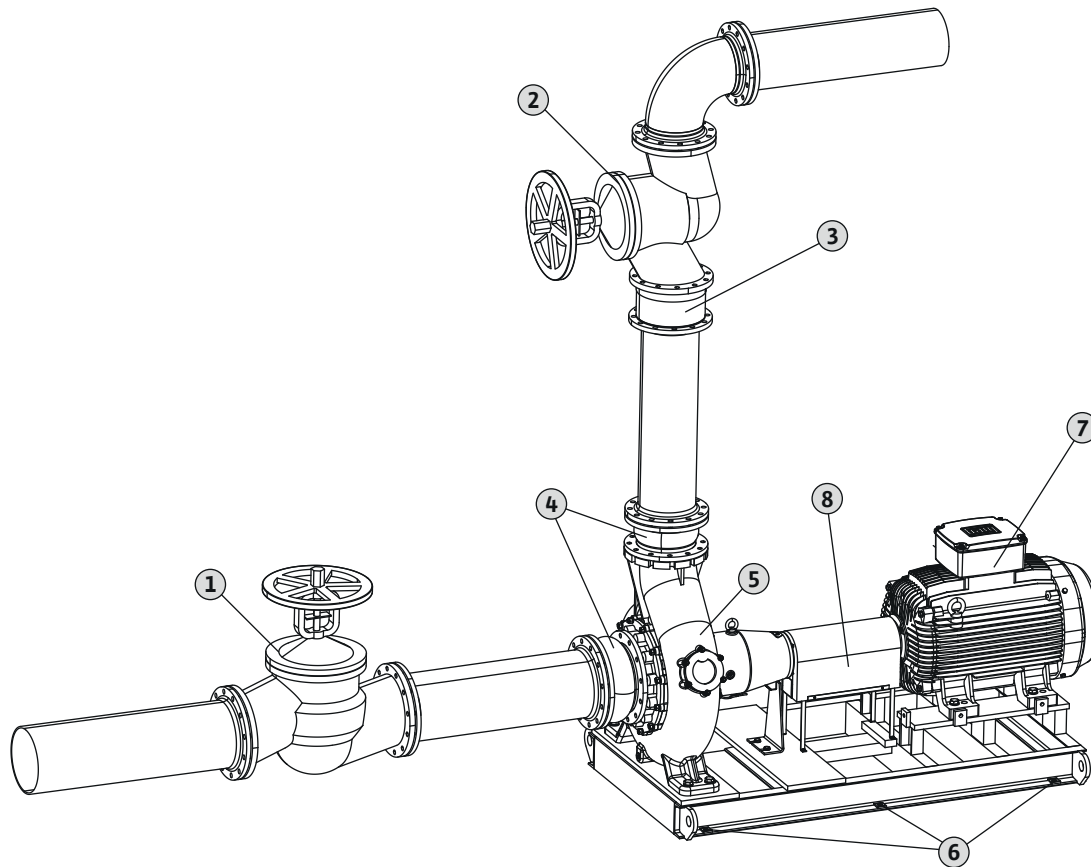


Fig. 5.1: Rexa NORM-M15.77

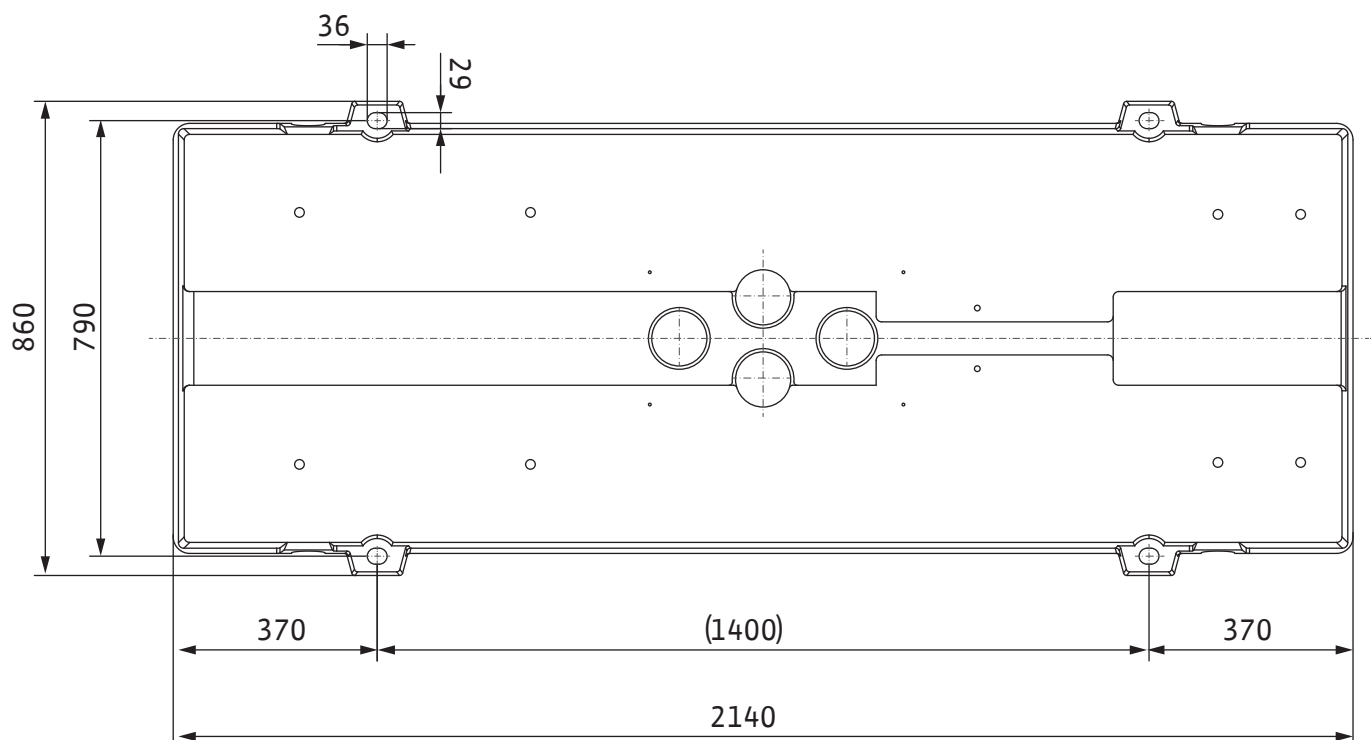


Fig. 5.2: Rexa NORM-M15.84

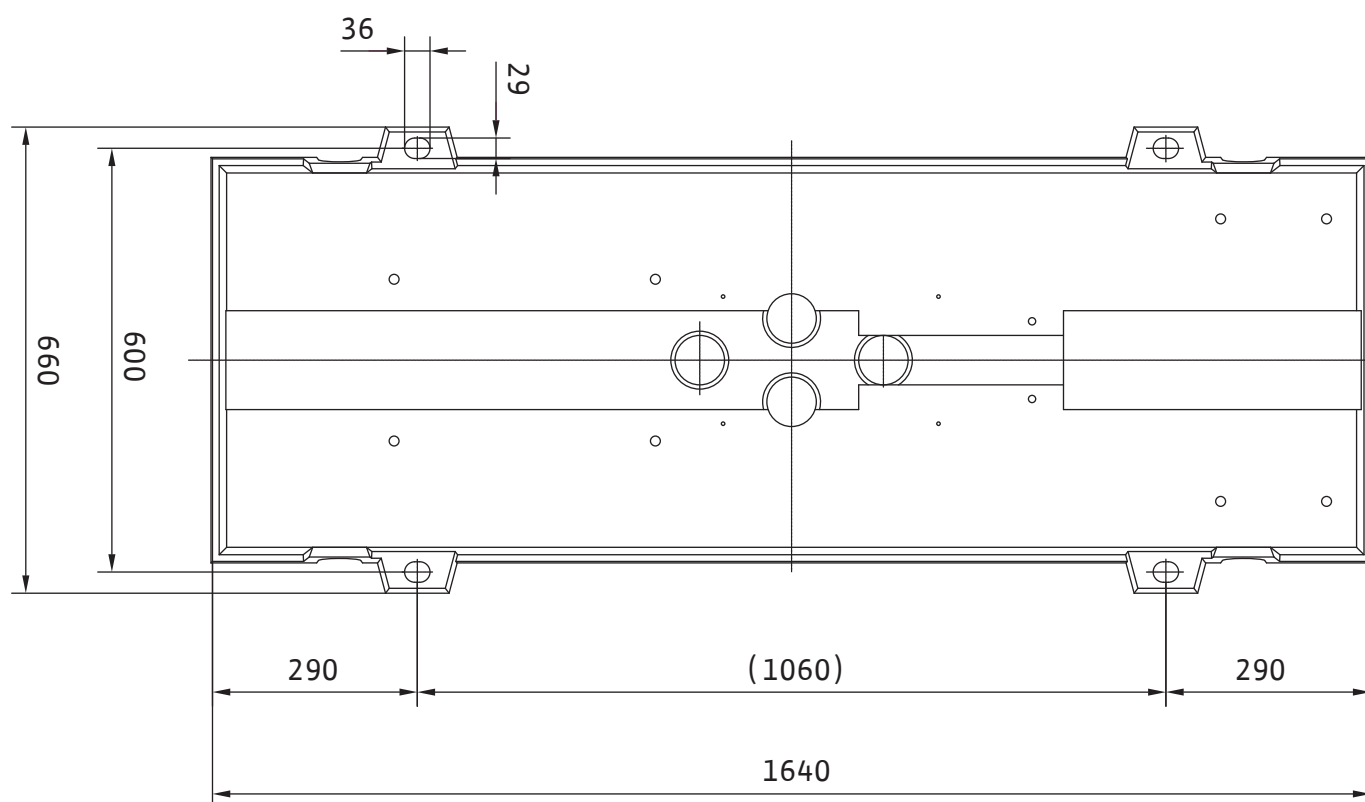


Fig. 5.3: RexaNorm RE 25.74E/RE 25.93D

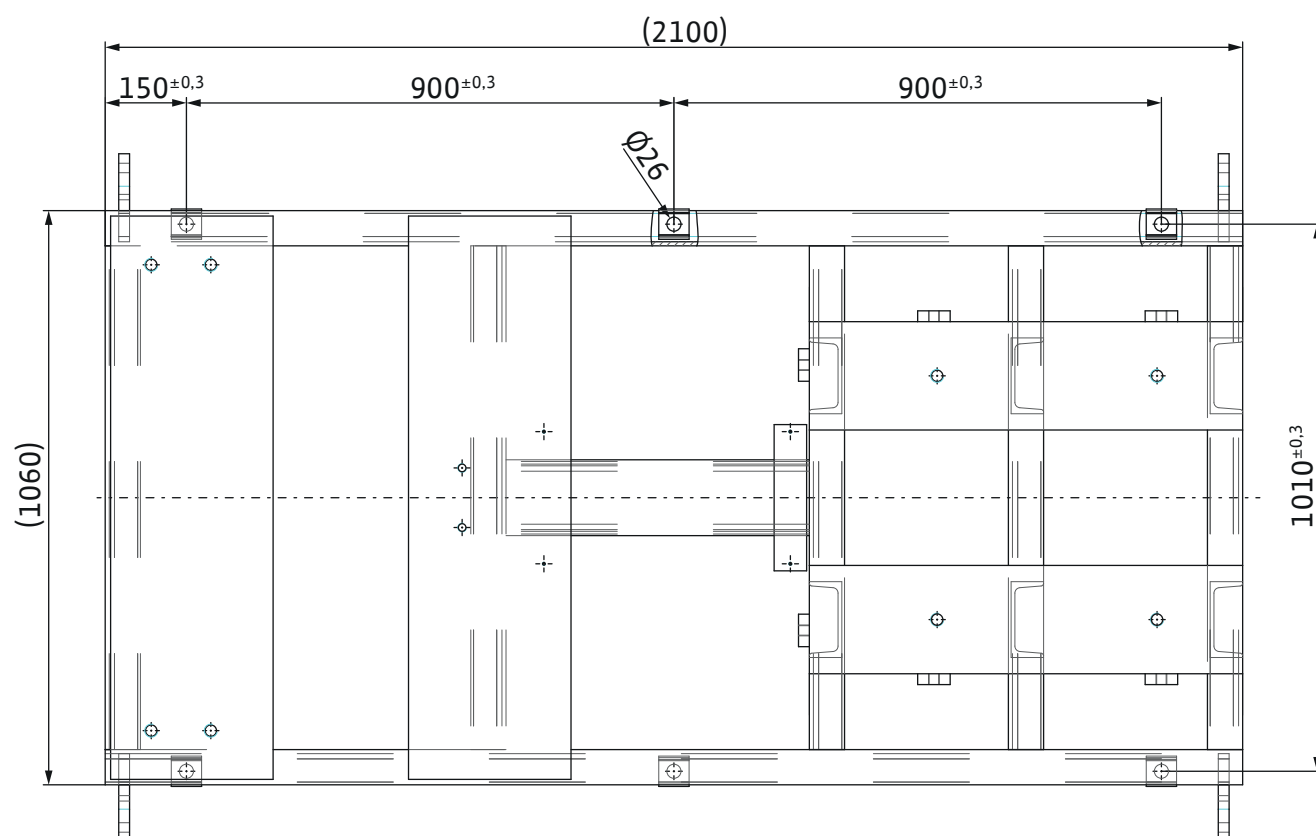


Fig. 5.4: Rexa NORM-M25.61/M30.41

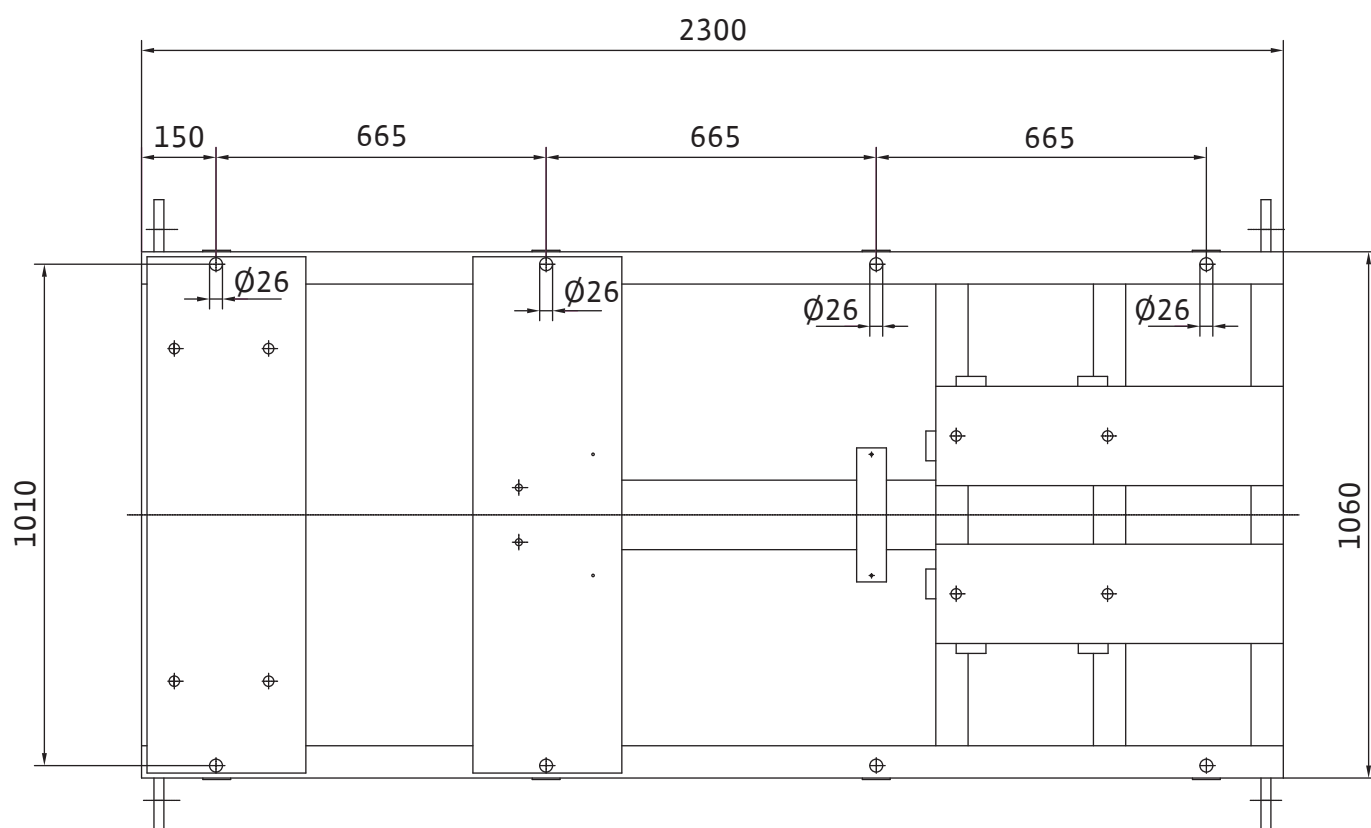


Fig. 5.5: Rexa NORM-M50.21

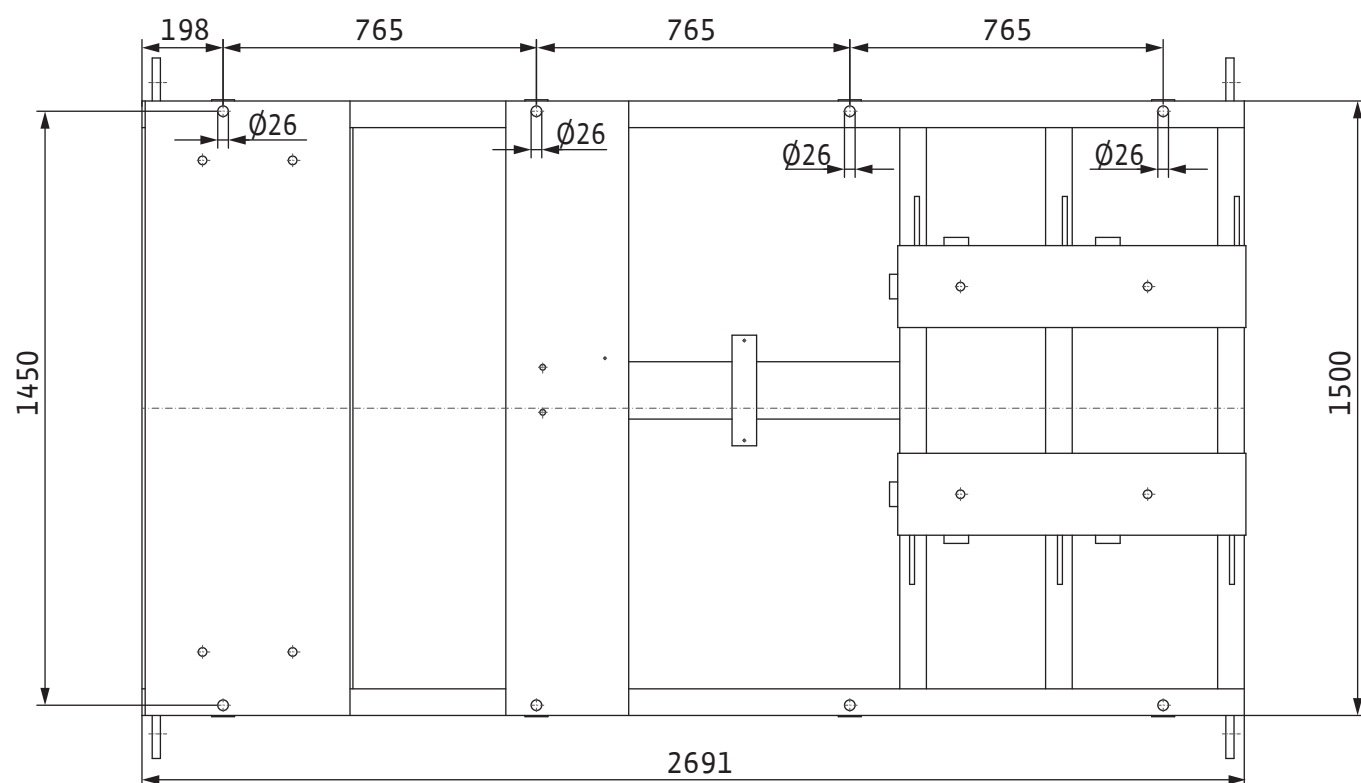


Fig. 6

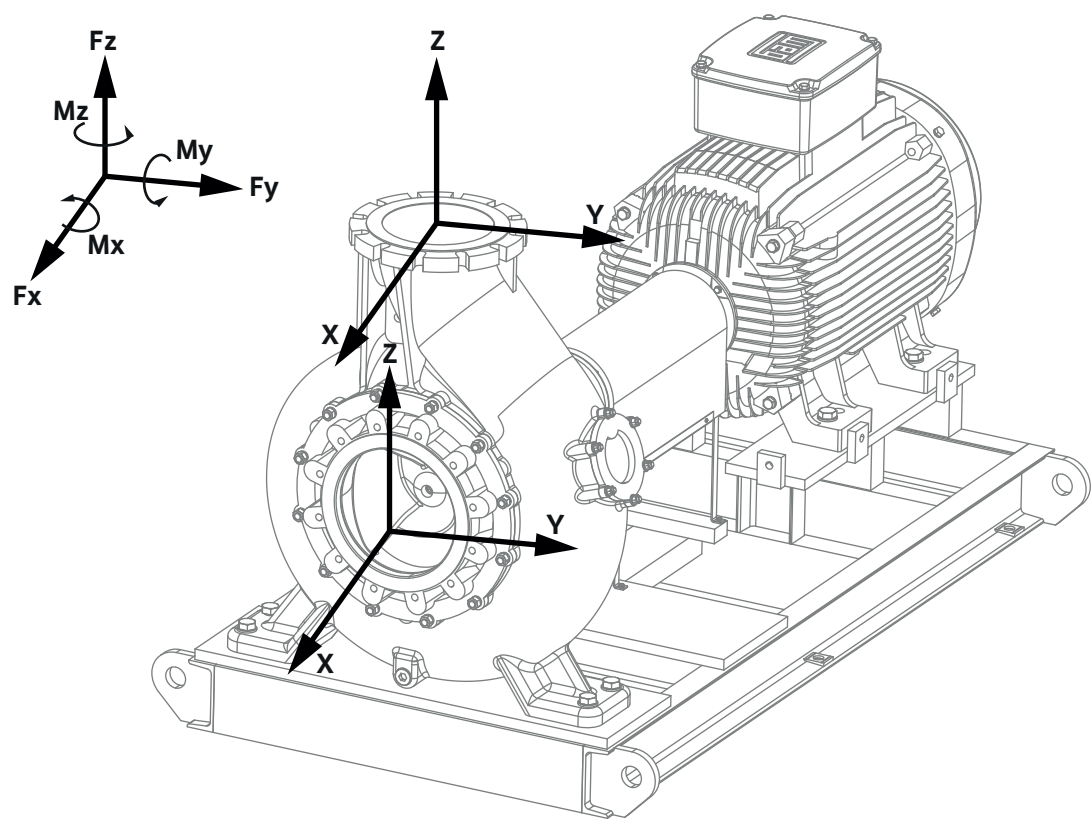


Fig. 7

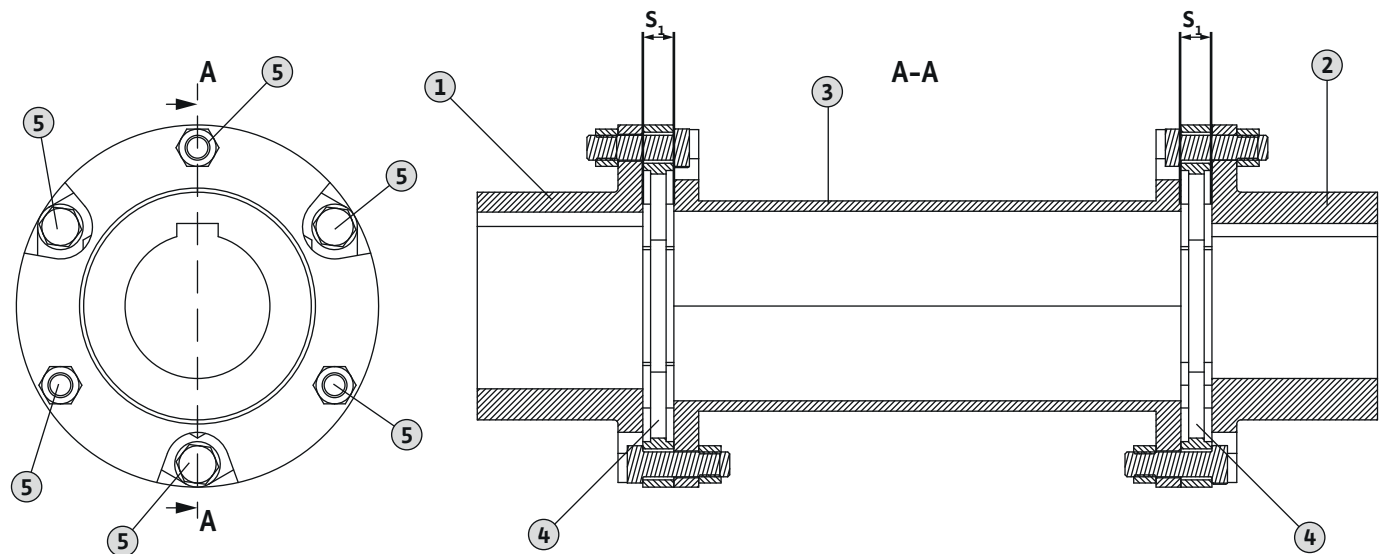


Fig. 8

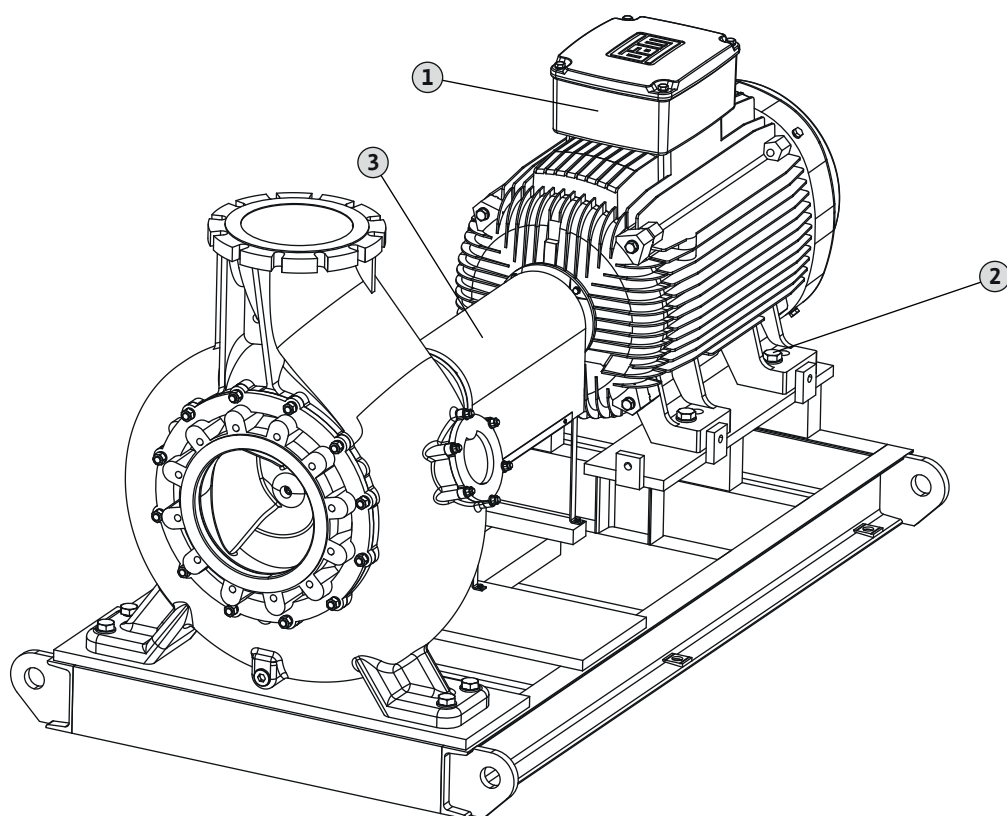


Fig. 9

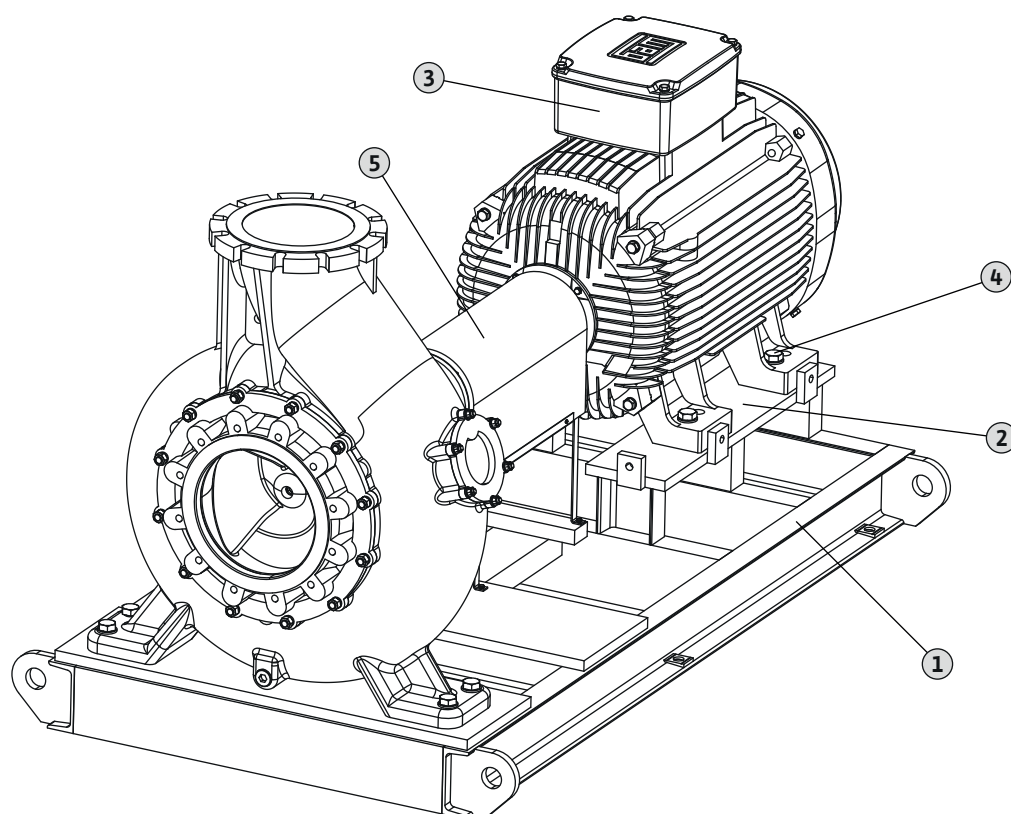


Fig. 10

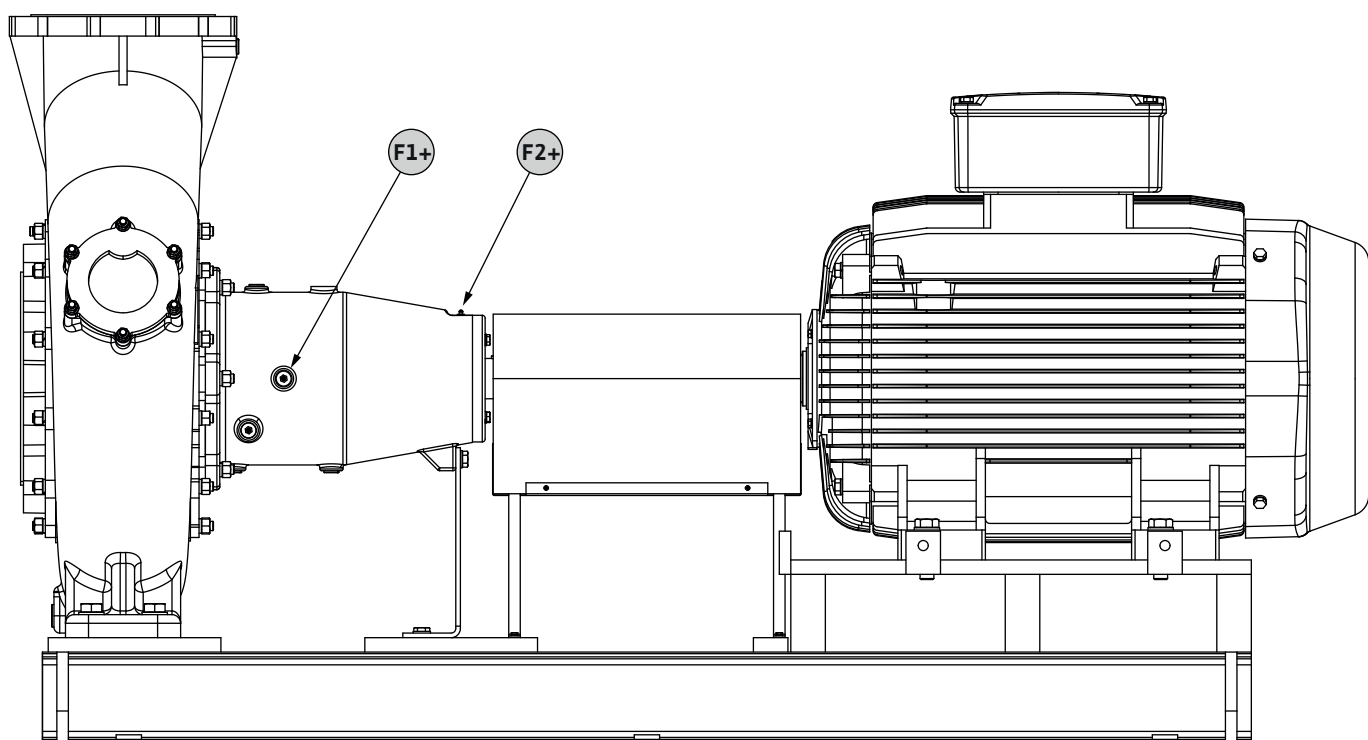


Fig. 11

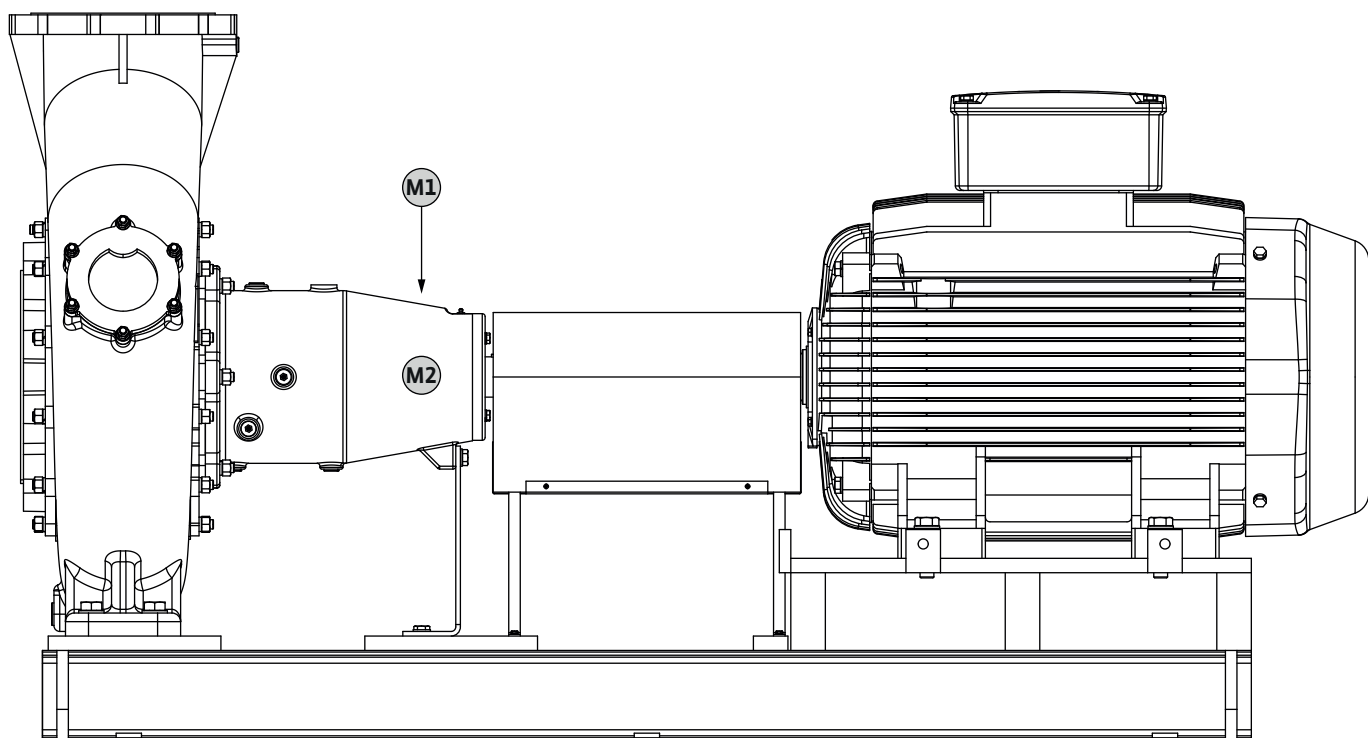


Fig. 12

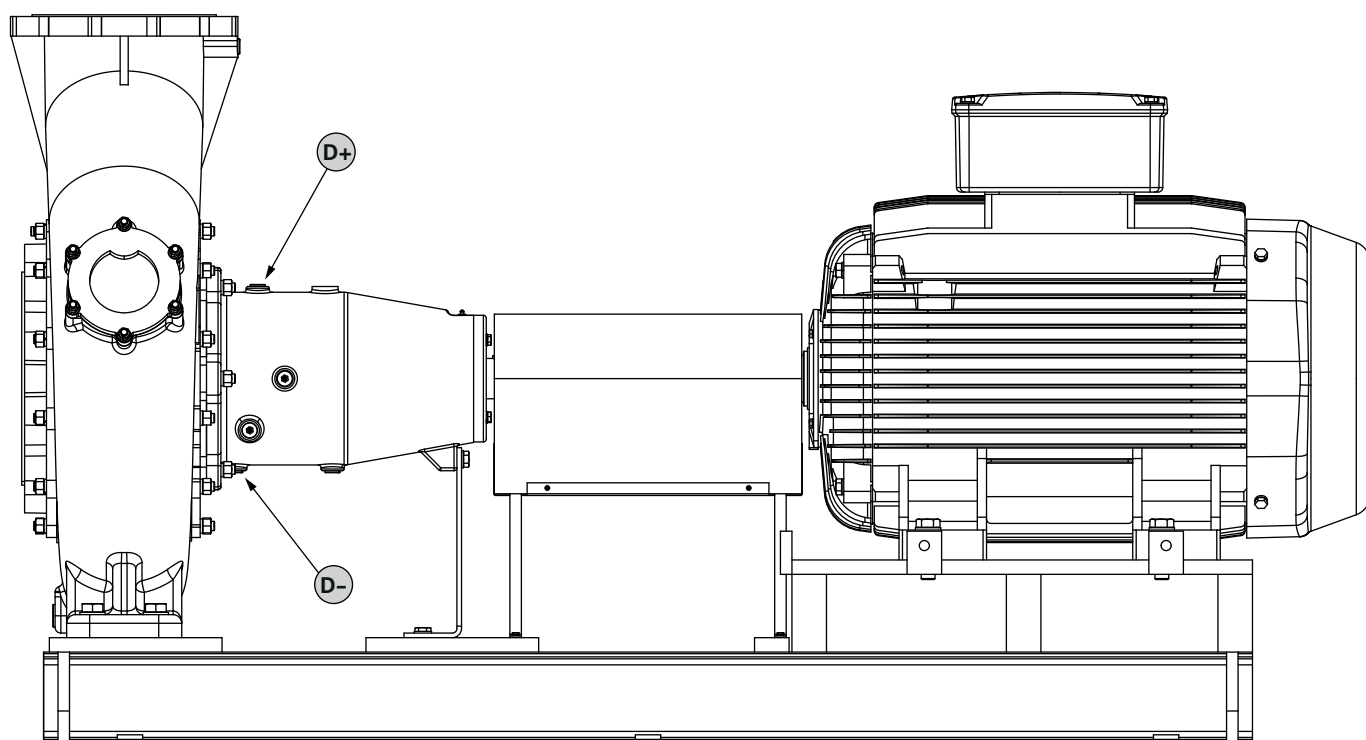
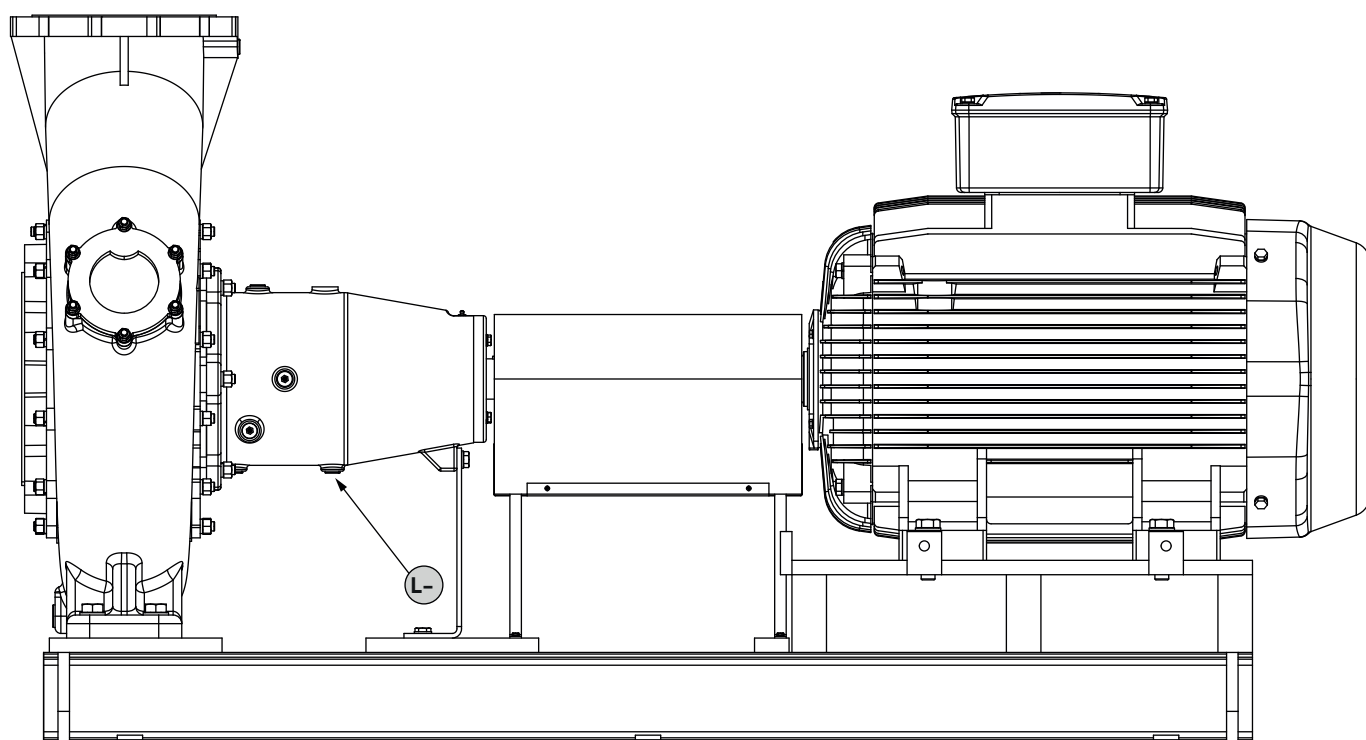


Fig. 13



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1. Introduction

1.1. About this document

These installation and operating instructions are an integral part of the device. Read these instructions before commencing work and keep them in an accessible place at all times.

Strict adherence to these instructions is a requirement for the intended use and correct operation of the device. All specifications and markings on the device must be observed.

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

1.2. Copyright

This operating and maintenance manual has been copyrighted by the manufacturer. The operating and maintenance manual is intended for use by installation, operating and maintenance personnel. It contains technical regulations and drawings which may not be reproduced or distributed, neither completely nor in part, or used for purposes of competition, or shared with others without the express consent of the manufacturer. The illustrations used may differ from the original and are only intended as an exemplary representation of the pump.

1.3. Subject to change

The manufacturer reserves the right to make technical modifications to systems and/or components. This operating and maintenance manual refers to the pump shown on the title page.

1.4. Warranty

In general, the specifications in the current "General Terms and Conditions" apply to the warranty. You can find these here:

www.wilo.com/legal

Any deviations must be contractually agreed and shall then be given priority.

1.4.1. General

If the following points have been complied with, the manufacturer undertakes to rectify every qualitative or constructive defect:

- The quality defects were caused by the materials used or the way the device was manufactured and/or designed.
- The defects were reported in writing to the manufacturer within the agreed warranty period.
- The pump was used only according to the intended operating conditions.
- All monitoring devices are connected and were tested before commissioning.

1.4.2. Warranty period

The duration of the warranty period is stipulated in the "General Terms and Conditions".

Any deviations must be contractually agreed!

1.4.3. Spare parts, add-ons and modifications

Only genuine spare parts from the manufacturer may be used for repairs, replacements, add-ons and modifications. Unauthorised add-ons and modifications or the use of non-genuine spare parts can seriously damage the pump and/or injure personnel.

1.4.4. Maintenance

The prescribed maintenance and inspection work should be carried out regularly. This work may only be carried out by qualified, trained and authorised personnel.

1.4.5. Damage to the product

Damage and malfunctions that endanger safety must be eliminated immediately and properly by trained personnel. The pump may only be operated if it is in perfect working order.

In general, repairs should only be carried out by the Wilo customer service!

1.4.6. Exclusion of liability

No warranty claims will be accepted or liability will be assumed for pump damage if any of the following items apply:

- Inadequate configuration by the manufacturer due to the information provided by the operator or customer being insufficient and/or incorrect
- Non-compliance with safety instructions and work instructions as specified in this operating and maintenance manual
- Improper use
- Incorrect storage and transport
- Improper installation/dismantling
- Insufficient maintenance
- Incorrect repairs
- Inadequate construction site or construction work
- Chemical, electrochemical and electrical influences
- Wear

This means the manufacturer's liability also excludes all liability for personal injury, material damage and/or financial losses.

2. Safety

This section lists all the generally applicable safety instructions and technical information. In addition, all the other sections contain specific safety instructions and technical information. All instructions and information must be observed and followed during the various phases of the pump's life cycle (installation, operation, maintenance, transport etc.)! The operator is responsible for ensuring that all personnel follow these instructions and guidelines.

2.1. Instructions and safety instructions

This manual uses instructions and safety instructions for preventing personal injury and material damage. To clearly identify them for personnel, the instructions and safety instructions are distinguished as follows:

- Instructions appear in “bold” and refer directly to the preceding text or section.
- Safety instructions are slightly “indented and bold” and always start with a signal word.

- **Danger**

Serious or fatal injuries can occur!

- **Warning**

Serious injuries can occur!

- **Caution**

Injuries can occur!

- **Caution** (notice without symbol)

Substantial material damage can occur. Irreparable damage is possible!

- Safety instructions that refer to personal injury appear in black and are always accompanied by a safety symbol. Danger, prohibition or instruction symbols are used as safety symbols.

Example:



Danger symbol: general hazard



Danger symbol, e.g. electrical current



Symbol for prohibited action, e.g. “No entry!”



Instruction symbol, e.g. “Wear protective clothing.”

The safety symbols used conform to the generally applicable directives and regulations, such as DIN, ANSI.

- Safety instructions that only refer to material damage are printed in grey, without safety symbols.

2.2. Personnel qualifications

Personnel must:

- Be instructed about locally applicable regulations governing accident prevention.
- Have read and understood the installation and operating instructions.
- Personnel must have the following qualifications:
 - Electrical work must be carried out by a qualified electrician (in accordance with EN 50110-1).
 - Installation/dismantling must be carried out by a qualified technician who is trained in the use of the necessary tools and fixation materials.
 - Maintenance work must be carried out by a technician who is familiar with handling and disposing of the operating fluids used. In addition, the technician must have basic knowledge of mechanical engineering.

Definition of “qualified electrician”

A qualified electrician is a person with appropriate technical education, knowledge and experience who can identify and prevent electrical hazards.

2.3. Operator responsibilities

The operator must:

- Provide the installation and operating instructions in a language which the personnel can understand.
- Make sure that personnel are suitably trained for the specified work.
- Ensure that safety and information signs mounted on the device are always legible.
- Train personnel with regard to the operating principles of the system.
- Eliminate any risk from electrical current.
- Integrate the pump into the existing safety concept and ensure that the pump can be switched off in an emergency using the existing safety shutdowns.
- Ensure the standard motor is deactivated in the event of high water. Standard motors are not overflow-proof! We therefore recommend using an alarm switchgear to record major leakages. In the event of a major discharge of fluid (e.g. faulty piping), the motor can be switched off.
- Equip hazardous components (extremely cold, extremely hot, rotating etc.) with a guard to be provided by the customer.
- Demarcate and cordon off the hazardous area.
- Define personnel responsibilities to ensure safe working practice.

Children and persons younger than 16 years or with reduced physical, sensory or mental capacities or limited experience are prohibited from handling the device! Persons under the age of 18 must be supervised by a technician!

2.4. General safety information

- Do not work alone in closed rooms when installing and/or removing the pump. A second person must always be present for safety reasons.
- Sufficient ventilation must be provided when working in enclosed spaces.
- The pump must always be switched off before any work is performed on it (assembly, dismantling, maintenance, installation). The drive must be disconnected from the electrical system and secured against being switched on again. All rotating parts must have come to a standstill.
- The operator must report any faults or irregularities that occur to a line manager immediately.
- The operator must shut down the equipment immediately if defects occur that represent a safety risk. These include:
 - Failure of the safety and/or monitoring devices
 - Damage to important parts
 - Damage to electrical equipment, cables and insulation
- Tools and other objects should only be kept in their designated places so that safe operation is ensured.

- When welding and/or working with electrical devices, make sure there is no risk of explosion.
- Only use lifting gear which is legally designated as such and officially approved.
- The lifting gear must be suitable for the conditions of use (weather, hooking unit, load etc.).
- Mobile equipment for lifting loads should be used in such a way that it is guaranteed to remain stable during operation.
- When using mobile equipment for lifting non-guided loads, take action to prevent tipping, shifting, sliding etc.
- Measures should be taken to ensure that no person is ever directly beneath a suspended load. Furthermore, it is prohibited to move suspended loads over workplaces where people are present.
- If mobile equipment is used for lifting loads, a second person should be present to coordinate the procedure if required (e.g. if the operator's field of vision is blocked).
- The load to be lifted must be transported so that no-one will be injured if there is a power failure. Furthermore, if such work is being performed outdoors, it must be cancelled if the weather conditions worsen.

These instructions must be strictly observed. Non-observance can result in personal injury and/or substantial material damage.

2.5. Drive

The pump is driven by a standard IEC motor. The connection between the motor and hydraulics is achieved by means of a coupling. See the technical data for the performance data (e.g. size, construction, hydraulic rated power, speed) needed to select a motor.

2.6. Electrical work



DANGER due to electrical current!
Incorrectly performed electrical work can result in fatal injury! This work may only be performed by a qualified electrician.

The motor must be connected in accordance with the information in the operating and maintenance manual for the motor. The governing local directives, standards and regulations (e.g. VDE 0100) as well as the requirements of the local energy supply company must be observed.

The person operating the motor must know where it is supplied with power and how to cut off the supply. A motor protection switch must be installed on-site. It is advisable to install a residual-current device (RCD). If there is a possibility that people can come into contact with the motor and the fluid, the connection **must** be equipped with an additional residual-current device (RCD).

The hydraulics must always be earthed. In a standard system, the hydraulics are earthed through the motor's connection to the mains.

Alternatively, the hydraulics can be earthed through a separate connection.

2.7. Safety and monitoring devices

CAUTION!

Never operate the pump if the built-on monitoring devices have been removed or damaged and/or if they do not work!



NOTICE

Also note all the information in the operating and maintenance manual for the motor!

- The hydraulics are not fitted with monitoring devices as standard. Optionally, the sealing chamber can be monitored with an external pencil electrode.
- In the version as a unit (pump with motor and coupling mounted on baseplate), a contact guard is attached to the coupling. All existing safety and monitoring devices must be installed, connected and checked to ensure that they function correctly before commissioning. The personnel must be informed about the installed systems and how they work.

2.8. Conduct during operation



CAUTION! Risk of burns!

The housing parts can heat up to well above 40 °C. There is a risk of burns!

- **Never touch parts of the housing with your bare hands.**
- **After switching the pump off, let it cool down to ambient temperature first.**
- **Wear heat-resistant protective gloves.**

During pump operation, always follow the locally applicable laws and regulations for work safety, accident prevention and handling electrical machinery. To help ensure safe working practice, the responsibilities of employees should be clearly specified by the operator. All personnel are responsible for ensuring that regulations are observed.

During operation, all gate valves in the inlet line and pressure pipe must be completely open.

If the slide valves on the suction and discharge sides are closed during operation, the fluid in the hydraulics housing is heated up by the pumping movement. This heating creates strong pressure in the hydraulics housing. The pressure can result in the pump exploding! Before switching on the hydraulics, ensure that all the slide valves are open and open any closed slide valves if necessary.

2.9. Pumped fluids

Each fluid differs in respect of composition, corrosiveness, abrasiveness, dry matter content and in many other aspects. Generally, the pumps can

be used for many applications. Please note that if requirements change (density, viscosity or general composition), this can also affect many operating parameters of the pump.

When using and/or replacing the pump to pump a different fluid, observe the following points:

- The fluid can be contaminated by oil from the sealing chamber if the mechanical seal is defective.

Pumping drinking water is not permitted!

- Pumps that have been used to pump contaminated water must be cleaned thoroughly before being used to pump other fluids.
- Pumps that have been used to pump fluids containing faeces and/or fluids that are hazardous to health must generally be decontaminated before being used to pump other fluids.

First clarify whether these pumps may be used to pump other fluids!

2.10. Sound pressure



NOTICE

Also note all the information in the operating and maintenance manual for the motor!



CAUTION: Wear noise protection!

According to applicable laws and regulations, ear protection must be worn if the sound-pressure level is 85 dB (A) or more! The end-user must make sure that this is complied with!

The pump generates a sound-pressure level of approx. 70 dB (A) to 80 dB (A) during operation. However, the actual sound pressure depends on several factors. These include e.g. installation, fixation of accessories and pipe, duty point etc. We recommend that the end-user takes an additional measurement at the workplace once the pump is running at its duty point and under all operating conditions.

2.11. Standards and guidelines used

The pump is subject to various European directives and harmonised standards. Refer to the EC-Declaration of conformity for precise information about this.

In addition, various standards are used as a basis for operating, assembling and dismantling the pump.

2.12. CE marking

The CE marking is attached to the rating plate for the pump.

3. Product description

The pump is manufactured with great care and is subject to constant quality controls. Trouble-free operation is guaranteed if the device is installed and maintained correctly.

3.1. Intended use and fields of application



DANGER due to explosive fluids!

It is strictly prohibited to pump explosive fluids (petrol, kerosene etc.). The pump is not designed for these fluids!

The sewage pumps are suitable for pumping:

- Wastewater
- Sewage containing faeces
- Sludges with up to 8 % dry matter (depending on type)

The sewage pumps must **not** be used for pumping:

- Drinking water
- Fluids containing hard components such as stones, wood, metals, sand etc.
- Highly flammable and explosive fluids in pure form

Intended use also includes compliance with this manual. Any other use is regarded as non-intended use.

3.2. Structure

Sewage pump for stationary dry well installation.

3.2.1. Version

Fig. 1.: Versions

A	Unit
B	Bare shaft

- Unit
Hydraulics with standard motor, connected via coupling, fully mounted on a baseplate.
- Bare shaft
Hydraulics without motor, coupling and baseplate. The operator must provide an appropriate motor with coupling as well as the baseplate and install them on-site.

3.2.2. Hydraulic components

Fig. 2.: Description

1	Hydraulic components	6	Venting screw
2	Suction connection	7	Drainage screw
3	Discharge connection	8	IEC standard motor
4	Bearing bracket	9	Coupling guard
5	Sealing chamber monitoring connection (optionally available)	10	Baseplate

Hydraulics housing and bearing bracket as a self-contained unit, with channel impeller or vortex impeller, axial suction port and radial pressure port. The connections are configured as flange connections.

Bearing bracket with seal on the fluid and motor sides, as well as sealing chamber and leakage chamber for receiving fluid ingress through the

seal. The sealing chamber is filled with environmentally harmless medicinal white oil.
The hydraulics are not self-priming, in other words, the fluid must flow in either automatically or with supply pressure.

3.2.3. Baseplate

All the individual components are mounted on the baseplate. The pump is attached to the foundation via the baseplate. Furthermore, the baseplate contains the motor mount and therefore aligns the motor shaft to the hydraulic shaft.

3.2.4. Coupling

A Flender coupling is used to connect the hydraulics and the motor.

3.2.5. Monitoring devices

As an option, the sealing chamber can be monitored by an external pencil electrode. This signals if there is water ingress into the sealing chamber through the mechanical seal on the fluid side.

3.2.6. Seal

Sealing on the fluid side is achieved by a bidirectional mechanical seal. Sealing on the coupling side is achieved by a rotary shaft seal.

3.2.7. Materials

- Hydraulics housing: EN-GJL-250 (ASTM A48 Class 35/40B)
- Impeller: EN-GJL-250 (ASTM A48 Class 35/40B)
- Bearing housing: EN-GJL-250 (ASTM A48 Class 35/40B)
- Shaft: 1.4021 (AISI 420)
- Static gaskets: NBR (nitrile)
- Seal
 - On the fluid side: SiC/SiC
 - On the coupling side: NBR (nitrile)
- Coupling guard: S235JR (ASTM A252, Grade 1)
- Coupling: See instructions from the manufacturer
- Motor: See instructions from the manufacturer

3.2.8. Drive

The pump is driven by IEC standard motors in “B3” construction. For more information about the motor and the monitoring devices present, see the installation and operating instructions for the motor.

3.3. Operation in an explosive atmosphere

The hydraulics must **not** be operated in an explosive atmosphere!

3.4. Operation with frequency converters

Operation on a frequency converter is possible.



NOTICE
Also note all the information in the operating and maintenance manual for the motor!

3.5. Operating modes

See the rating plate or installation and operating instructions for the motor to see the possible operating modes.

3.5.1. Operating mode S1 (continuous duty)

The motor can operate continuously at the rated load without exceeding the permissible temperature.

3.5.2. Operating mode S2 (short-time duty)

The maximum operating period for the motor is specified in minutes, e.g. S2-15. The pause must last until the machine temperature no longer differs from the temperature of the coolant by more than 2 K.

3.5.3. Operating mode S3 (intermittent periodic duty)

This operating mode defines a combination of periods of operation and standstill of the motor. With S3 operation, the values given are always calculated based on a period of 10 min.

Example: S3 25 %

Operating time 25 % of 10 min = 2.5 min /
standstill time 75 % of 10 min = 7.5 min

3.6. Technical data

The following technical data can be found on the rating plate:

Max. delivery head:	H_{\max}
Max. volume flow:	Q_{\max}
Rated power required from hydraulics:	P_2
Discharge connection:	▲-]
Suction connection:	[-▲
Fluid temperature:	t
Construction size standard motor:	Type key
Standard speed:	n
Weight hydraulics:*	M_{hydr}

* The stated weight includes all components of the respective version **without** the motor.

The total weight must be calculated from the weight of the pump and the weight of the motor (see rating plate on motor).

3.7. Type key

Example: Wilo-Rexa NORM-M50.218DAH280M6	
NORM	Series
M	Impeller shape
	V = vortex impeller
	C = single-channel impeller
	M = multi-channel
50	Size discharge connection e.g. 25 = DN 250
21	Performance indicator
8	Characteristic curve number

Example: Wilo-Rexa NORM-M50.218DAH280M6	
D	Flange connections D = DN connection A = ANSI connection
A	Material version A = standard version Y = special version
H	Installation type: horizontal
280M	Construction size of standard motor
6	Number of poles for the necessary hydraulics speed

Alternative type key

Example: Wilo-RexaNorm RE 25.93D-378DAH280M6	
RE	Series
25	Size discharge connection e.g. 25 = DN 250
93	Internal performance coefficient
D	Impeller shape E = single-channel impeller D = three-channel impeller
378	Impeller diameter in mm
D	Flange connections D = DN connection A = ANSI connection
A	Material version A = standard version Y = special version
H	Installation type: horizontal
280M	Construction size of standard motor
6	Number of poles for the necessary hydraulics speed

3.8. Scope of delivery

- Version:
 - Unit: Sewage pump with fitted standard motor mounted on baseplate
 - “Bare shaft” version: Sewage pump without motor and baseplate
- “Bare shaft” version: Transport shackle built onto suction port as attachment point
- Installation and operating instructions:
 - Unit: Separate instructions for hydraulics, motor and coupling
 - Bare shaft: Instructions for hydraulics
 - CE-declaration

3.9. Accessories

- Connection cable, sold by the metre
- External pencil electrode for sealing chamber monitoring
- Level control devices
- Fixation accessories and chains
- Switchgear, relays and plugs

4. Transportation and storage



NOTICE

Also note all the information regarding transportation and storage in the operating and maintenance manual for the motor and the coupling!

4.1. Delivery

Upon delivery, check immediately that the shipment is complete and undamaged. If any parts are damaged or missing, the transport company or the manufacturer must be notified on the day of delivery since claims cannot be made afterwards. Damage to parts must be noted on the freight documentation!

4.2. Transportation

- Only use lifting gear which is legally designated as such and officially approved.
- The lifting gear must have sufficient bearing capacity so that the product can be transported safely.
- The lifting gear must be suitable for the conditions of use (weather, hooking unit, load etc.). When using chains, these must be secured against slipping.
- Mobile equipment for lifting loads should be used in such a way that it is guaranteed to remain stable during operation.
- When using mobile equipment for lifting non-guided loads, take action to prevent tipping, shifting, sliding etc.
- Measures should be taken to ensure that no person is ever directly beneath a suspended load. Furthermore, it is prohibited to move suspended loads over workplaces where people are present.
- If mobile equipment is used for lifting loads, a second person should be present to coordinate the procedure if required (e.g. if the operator's field of vision is blocked).
- The load to be lifted must be transported so that no-one will be injured if there is a power failure. Furthermore, if such work is being performed outdoors, it must be cancelled if the weather conditions worsen.
- The personnel must be qualified for the tasks and must follow all applicable national safety regulations during the work.
- The pump is delivered by the manufacturer or shipping agency in suitable packaging. This normally precludes the possibility of damage occurring during transportation and storage. The packaging should be stored safely for reuse if the product is frequently used at different locations.

Note the additional information in the operating and maintenance manual for the motor regarding transportation

4.3. Storage

Newly delivered pumps are prepared so that they can be stored for the following times:

- Unit: 6 months
- Bare shaft: 12 months

The pump should be cleaned thoroughly before it is put into temporary storage!

Note the additional information in the operating and maintenance manual for the motor and coupling regarding storage.

The following should be taken into consideration for storage:

- Place the pump horizontally on a solid surface. Support the bare shaft versions without baseplate under the bearing housing.
- Secure the pump against falling over and slipping.



DANGER due to risk of falling over!
Never set the pump down if unsecured. If the pump falls over, there is a risk of injury!

- The store room must be dry and frost-free. The minimum temperature must be 3 °C (37 °F), the relative humidity may not be higher than 65 %. We recommend a storage temperature between 5 °C (41 °F) and 25 °C (77 °F).

The pump must be protected from direct sunlight!

- The pump is not allowed to be stored in rooms in which welding work is carried out because the resulting gases or radiation can damage the elastomer components and coatings.
- Suction and discharge connections must be sealed securely.
- The coupling must be protected from dust and sand.
- The impellers should be turned at regular intervals (fortnightly to monthly). This prevents the bearings from jamming and renews the lubrication film on the mechanical seal.



WARNING! Sharp edges!
Sharp edges may form on the impeller and on the openings of the suction and pressure ports. There is a risk of injury! Wear protective gloves.

Please note that elastomer components and coatings become brittle over time. We recommend that if the unit has been in storage for more than 6 months in the case of power packs or more than 12 months in the case of the bare shaft version, it should be checked and replaced if necessary. Please consult the Wilo customer service for details.

4.4. Return delivery

Pumps that are returned to the factory must be properly packaged. This means that impurities have been removed from the pump and that it has been decontaminated if used to pump fluids that are hazardous to health.

For shipping, the parts must be packed in tear-proof plastic bags of sufficient size in such a manner that they are tightly sealed and leak-proof. Furthermore, the packaging must protect the pump from damage during transportation. If you have any questions, please contact the Wilo customer service!

5. Installation

In order to prevent damage to the device or serious injury during installation, the following points must be observed:

- Installation work – assembly and installation of the pump – may only be carried out by qualified persons. The safety instructions must be followed at all times.
- The pump must be inspected for transport damage before any installation work is carried out.

5.1. General

For design and operation of technical sewage systems, observe the pertinent local regulations and directives for sewage technology (such as those of sewage technology associations).

Note that, in stationary installations, pressure surges can occur in cases where water is pumped with longer pressure pipes (especially with steady ascents or steep terrain). Pressure surges can result in destruction of the hydraulics/system and noise pollution due to flap knock. Pressure surges can be prevented by applying suitable measures (e.g. swing check valves with an adjustable closing time or special routing of the pressure pipe).

Never let the pump run dry. Air pockets in the hydraulics or pipeline system must be avoided at all costs and must be removed using a suitable ventilation system.

Protect the pump from frost.

5.2. Installation types

- Horizontal stationary dry well installation

5.3. Installation



NOTICE

Also note all the information regarding installation in the operating and maintenance manual for the motor and the coupling!

The following information should be taken into consideration when installing the pump:

- Assembly work must be carried out by trained specialists, electrical work must be carried out by a qualified electrician.
- Check that the available consulting documents (installation plans, layout of the operating space, intake ratios) are complete and correct.
- Also refer to all regulations, rules and laws for working with heavy and suspended loads. Wear appropriate protective clothing/equipment.
- Please also observe the applicable national accident prevention and safety regulations of professional and trade associations.

5.3.1. Installation site



NOTICE

Note the requirements in the operating and maintenance manual for the motor!

- The installation site must be clean, dry, frost-free and designed for the respective product.
- Appropriate ventilation must be provided to ensure air exchange for heat dissipation.

- Free access to the pump must be ensured for maintenance work. For this purpose, a free space of at least 60 cm (24 in) must be provided around the pump.
- When working in enclosed spaces, a second person must be present for safety reasons. Take the necessary countermeasures if there is a risk of toxic or suffocating gases collecting!
- Ensure that lifting equipment can be installed without any trouble since this is required for assembly/dismantling of the pump. The storage location for the pump must be safely accessible with the lifting equipment and must have a solid base.

5.3.2. Foundation

- The structural components and foundations must be of sufficient stability in order to allow the product to be fixed securely and functionally.
- The operator or the supplier is responsible for provision of the foundations and their suitability in terms of dimensions, stability and strength!




5.3.3. Attachment points

For transportation, the lifting gear must be attached to the specified attachment points. We differentiate here between the unit and the “bare shaft” version.

Fig. 3.: Attachment points

A	Unit
B	“Bare shaft” version
1	Transport shackle

Definition of symbols

	Attach here!
	Centre of gravity marker
	Shackle must be used!
	Lifting equipment: Chain permitted
	Lifting equipment: Wire rope or nylon rope permitted
	Lifting equipment: Transport strap permitted
	Use of a hook for attachment is prohibited!
	Use of chains as lifting equipment prohibited

The following information must be observed when attaching the lifting equipment:

- Unit: The lifting equipment must be attached to the baseplate using shackles. Carrying straps, wire ropes and plastic ropes or chains may be used as lifting equipment.
- Bare shaft version:
 - The lifting equipment must be attached using a loop. Chains may **not** be used here!
 - The transport shackle must be dismantled after positioning is complete.
- The lifting gear used must be technically approved.
- Note the centre of gravity marker on the baseplate.

5.3.4. Maintenance work

After a storage period of more than 6 months, the following maintenance work must be carried out before installation:

- Rotate impeller
- Check oil in the sealing chamber

Rotate impeller

1. Place the pump horizontally on a solid surface.
Make sure that the pump cannot fall over and/or slip!
2. Carefully and slowly reach into the hydraulics housing through the suction port and rotate the impeller.



WARNING! Sharp edges!

Sharp edges can form on the impeller and the opening on the suction port. There is a risk of injury! Wear protective gloves.

5.3.5. Check oil in the sealing chamber (Fig. 12)

The sealing chamber has a separate opening for draining and filling the sealing chamber.

1. Place the pump horizontally on a solid surface.
Make sure that the hydraulics cannot fall over and/or slip!
2. Unscrew screw plug (D+).
3. Place a suitable tank under the screw plug (D-) to collect the operating fluid.
4. Unscrew screw plug (D-) and allow the operating fluid to drain out. If the oil is clear, does not contain any water, and the quantity matches the specification, it can be reused. If the oil is contaminated, it must be disposed of in accordance with the requirements in the “Disposal” chapter.
5. Clean the screw plug (D-), renew the seal ring and screw it back in.
6. Pour the operating fluid in through the opening (D+).
See chapter “Operating Fluid” (8.1.1) and “Filling quantities” (8.3.6)!
7. Clean the screw plug (D+), renew the seal ring and screw it back in.

5.3.6. Stationary dry well installation (version as unit)

In this installation type, the operating space is divided: collector tank and machine room. The fluid is collected in the collector tank, and the pump is installed in the machine room. The operating space must be blocked out as per the manufacturer's configuration or consulting aid. The pump is connected to the suction- and pressure-side pipeline system at the specified point in the machine room. The pump itself is not immersed in the fluid.

The suction- and pressure-side pipeline system must be self-supporting, i.e. it may not be supported by the pump. In addition, the pump connection to the pipeline system must be free of stress and vibrations. We therefore recommend using elastic connection pieces (compensators).

The following operating parameters must be complied with:

- The **max. fluid temperature** is **70 °C (158 °F)**.
- **Motor cooling** – To ensure sufficient motor cooling by the motor fan, the minimum distance to the rear wall must be complied with. See the operating and maintenance manual for the motor!
- **Max. ambient temperature** – see the operating and maintenance manual for the motor.

The pump is not self-priming; therefore, the hydraulics housing must be completely filled with the fluid. Ensure that there is an appropriate inlet pressure. Air pockets are to be avoided at all costs. Appropriate ventilation systems must be provided!

Caution! When draining the pump, make sure that the anchor rods enter exactly into the boreholes of the baseplate.

Caution! The baseplate must lie horizontally and completely on the foundation so that a torsion-free connection of the pipeline system is possible!

3. Check the alignment and distances of the connection ports to the pipeline system. If the connection ports are not exactly level or plumb, or if the distances are not correct, the pump must be aligned accordingly via the baseplate, e.g. with compensating plates or levelling screws.

The deviation must not exceed ± 0.5 mm (0.02 in) on 1 m (40 in)!

4. Attach the pump to the foundation.
Refer to the manufacturer's instructions for the tightening torques of the anchor bolts!
5. Loosen the lifting gear.

Connect the pipeline system

Connect the suction- and pressure-side pipeline system.

To ensure that the pipeline system is connected free of stress and vibrations, we recommend using elastic connection pieces (compensators).

The forces and torques acting on the flanges must not exceed the following values!

Fig. 4.: Stationary dry well installation

1	Gate valve inlet	5	Pump
2	Gate valve pressure pipeline	6	Attachment points for floor fixation
3	Non-return valve	7	Standard motor
4	Compensator	8	Coupling guard + coupling

Preparing the foundation

Fig. 5.: Drilling templates of the different baseplates

1. Check foundation for correct version and sweep the surface clean.
2. Use the drilling template to set the anchor bolts.
Please refer to the manufacturer's instructions for information on concrete quality, edge distances and curing times!

Install the pump

1. Check suction- and pressure-side pipeline system for tight fit.
The pipeline system must be self-supporting, i.e. it may not be supported by the pump!
2. Fasten lifting equipment to the attachment points on the baseplate and position the pump in the planned location.

Fig. 6.: Permissible forces on the suction and discharge ports

Suction port						
Type	Forces (daN)			Torques (daNm)		
	Fy	Fz	Fx	My	Mz	Mx
NORM-M15.77	240	216	268	92	106	130
NORM-M15.84	180	162	200	70	82	100
NORM-M25.61	298	270	334	126	146	178
RE 25.74E	322	400	358	172	198	242
RE 25.93D	322	400	358	172	198	242
NORM-M30.41	418	376	466	220	254	310
NORM-M50.21	718	646	796	576	664	808

Discharge port						
Type	Forces (daN)			Torques (daNm)		
	Fy	Fz	Fx	My	Mz	Mx
NORM-M15.77	162	200	180	70	82	100
NORM-M15.84	162	200	180	70	82	100
NORM-M25.61	270	334	298	126	146	178
RE 25.74E	270	334	298	126	146	178
RE 25.93D	270	334	298	126	146	178
NORM-M30.41	322	400	418	172	198	242
NORM-M50.21	538	664	598	410	472	578

Alignment hydraulics/motor and coupling checking

The pump has been aligned at the factory. During transportation or installation, however, there may be impairments. For the pump to run properly, the alignment of the hydraulics/motor and the coupling must be checked and adjusted if necessary.



NOTICE

The hydraulics are fixed by the connection to the pipeline system. Therefore, the motor must always be aligned with the hydraulics!

Fig. 7.: Check alignment

1	Coupling connection on the hydraulics side
2	Coupling connection on the motor side
3	Coupling spacer
4	Lamellae package
5	Measuring point

1. Dismantle coupling guard
 - Loosen the screws of the floor plate on the coupling guard and remove the floor plate.
 - Loosen the screws of the coupling guard on the baseplate and remove the coupling guard upwards.
2. For checking, the distance between the coupling connections on the motor and hydraulics side must be measured.

The measured values must not exceed or fall below the following values!

Permissible distances		
S_1	S_{1min}	S_{1max}
11 mm (0.43 in)	10.7 mm (0.42 in)	11.3 mm (0.44 in)

3. If the measured values are out of tolerance, the coupling must be removed, the motor realigned, and the coupling reinstalled.
4. Install the coupling guard
 - Place the coupling guard from above over the coupling on the baseplate and fasten it to the baseplate with 4 screws.
 - Insert the floor plate into the coupling guard from below and fasten it to the coupling guard with the screws.

5.4. Align the motor

Fig. 8.: Align motor

1	Motor
2	Motor fixation
3	Coupling guard
4	Alignment brackets

1. Dismantle coupling guard.
2. Dismantle coupling spacer » **see instructions from manufacturer**
3. Install attachment points on the motor » **see instructions from manufacturer**

4. Fasten the lifting equipment to the attachment points.
5. Loosen the motor fixation on the baseplate.
6. Slowly raise the motor by 1–2 mm (0.04–0.08 in).
7. Place alignment plate underneath
8. Drain motor
9. Check alignment.
10. Reattach the motor to the baseplate and dismantle the attachment points.
11. Reinstall the coupling spacer and align it correctly » **see instructions from the manufacturer**
12. Install the coupling guard.

5.5. Install the motor (if supplied separately)



CAUTION! Centre of gravity extension!

The motor can be installed before the pump. In this case, there is a centre of gravity extension of the entire unit. The attached centre of gravity marker is then no longer valid. Material damage may occur due to the unit tipping over. Do not install the motor until the pump has been mounted at the installation site.

Fig. 9.: Install motor

1	Baseplate
2	Motor mounting
3	Motor
4	Motor fixation
5	Coupling guard
6	Alignment brackets

Depending on the size, the motor may be supplied separately. In this case, the motor must be installed on the baseplate on-site.

1. Dismantle coupling guard
 - Loosen the screws of the floor plate on the coupling guard and remove the floor plate.
 - Loosen the screws of the coupling guard on the baseplate and remove the coupling guard upwards.
2. Attach the lifting equipment to the attachment points on the motor » **see instructions from manufacturer**
3. Lift the motor and position it over the baseplate
4. Align the motor with the motor mounting and lower it slowly.
5. Check the alignment of the motor to the pump with a straight edge. Max. deviation: 0.1 mm (0.04 in).
6. If the deviation is greater, the motor must be aligned with the pump using alignment plates or levelling screws.
7. If the alignment is correct, fix the motor to the baseplate with the fastening screws.
8. Remove the lifting equipment and dismantle the attachment points from the motor. Keep the attachment points on the pump for dismantling the motor later.

9. Install coupling » see instructions from the manufacturer
10. Install the coupling guard
 - Place the coupling guard from above over the coupling on the baseplate and fasten it to the baseplate with the screws.
 - Insert the floor plate into the coupling guard from below and fasten it to the coupling guard with the screws.

5.6. Install, remove and align the coupling

All information regarding the coupling can be found in the manufacturer's instructions!

5.7. Electrical connection



RISK of fatal injury due to electrical current! Improper electrical connections can lead to fatal electric shock. Electrical connections may only be carried out by a qualified electrician approved by the local energy supply company, in accordance with locally applicable regulations.



NOTICE

Also note all the information regarding electrical connections in the operating and maintenance manual for the motor!

- The current and voltage of the mains connection must be designed in accordance with the information in the operating and maintenance manual for the motor. See also the specifications on the rating plate for the motor.
- The power supply cable must be provided by the customer. The cable cross-section and chosen routing option must comply with local standards and requirements.
- Any available monitoring devices, e.g. sealing chamber monitoring, must be connected and tested to ensure that it is working properly.
- Earth the pump in accordance with instructions. Earthing is provided by the motor connection. Alternatively, the pump can be earthed through a separate connection. The cable cross-section for the protective earth conductor connection must comply with local regulations.

5.7.1. Checking the monitoring devices before connecting

If the measured values deviate from the specifications, the monitoring devices may be faulty. Consult the Wilo customer service.

Pencil electrode for sealing chamber monitoring

Before the pencil electrode is connected, it must be checked with an ohmmeter. The following values must be complied with:

- This value must approach “infinity”. If the values are low, there is water in the oil. Please also observe the instructions of the optional evaluation relay.

5.7.2. Connecting the monitoring devices

Pencil electrode for sealing chamber monitoring

- The pencil electrode must be connected via an evaluation relay. We recommend the “NIV 101/A” relay for this. The threshold is 30 kOhm. When the threshold is reached, a warning must be given, or the unit must be switched off.

CAUTION!

If there is only a warning, the hydraulics could be irreparably damaged by water ingress. We always recommend switching the hydraulics off!

5.7.3. Connecting the standard motor

The information for connecting the motor to the mains, the information concerning existing monitoring devices and connecting these devices, and concerning possible activation types can be found in the operating and maintenance manual for the motor!

5.8. Operator responsibilities

5.8.1. Recommended monitoring devices

The pump is driven by a standard motor. Standard motors are not overflow-proof. We therefore recommend using an alarm switchgear to record major leakages. In the event of a major discharge of fluid (e.g. faulty piping), an alarm may sound, and the motor can be switched off.

6. Commissioning



NOTICE

Also note all the information regarding commissioning in the operating and maintenance manual for the motor!

The “Commissioning” section contains all of the important instructions for the operating personnel for safe commissioning and operation of the pump.

The following points must be observed:

- All work only be carried out by qualified and trained personnel.
- All personnel working on or with the pump must have received, read and understood this manual.
- Always keep this manual either at the pump or in a place specially reserved for it, where it is accessible for all operating personnel at all times.
- All safety devices and emergency cut-outs are connected and have been checked to ensure that they work properly.

6.1. Electrical components



RISK of fatal injury due to electrical current! Improper electrical connections can lead to fatal electric shock. Electrical connections may only be carried out by a qualified electrician approved by the local energy supply company, in accordance with locally applicable regulations.

The standard motor is connected to the mains, and the power supply cables are routed in accordance with the operating and maintenance manual for the motor and with locally applicable regulations.

The pump is properly fixed and earthed. All monitoring devices are connected, and their function has been tested.

6.2. Direction of rotation monitoring

If the direction of rotation is incorrect, the hydraulics will not perform as specified and may be damaged. When you look at the hydraulics from the front, they must rotate counter-clockwise (see direction of rotation arrow on the hydraulics). Units delivered from the factory with a built-on standard motor require a clockwise rotating field to ensure the correct direction of rotation. The rotating field can be checked with a rotating field tester by a local electrician.

The hydraulics is not suitable for operation with a counter-clockwise rotating field!

The electrical connection must be completed in accordance with the information in the operating and maintenance manual for the motor.

There must be a test run without fluid and with the slide valve on the suction side closed!

If the direction of rotation is incorrect for motors with direct starting, 2 phases must be swapped. In the case of star-delta motors, the connections of two windings must be swapped, e.g. U1 with V1 and U2 with V2.

6.3. Operation in potentially explosive atmospheres

The hydraulics must **not** be operated in an explosive atmosphere!

6.4. Operation with frequency converters



NOTICE

Also note all the information in the operating and maintenance manual for the motor!

Operation on a frequency converter is possible. The following parameters must be observed:

- The standard speed of the motor must **not be exceeded**.
- Continuous duty with a volume flow of $Q_{opt} < 0.7 \text{ m}^3/\text{s}$ (27 in³/s) should be avoided.



- The circumferential speed of the impeller must **not fall below** a minimum of 13 m/s (42 ft/s).

NOTICE

The circumferential speed can be calculated as follows: $v = n \cdot d \cdot \pi / 60,000$

Key:

- n = speed in rpm
- d = impeller diameter in mm
- v = circumferential speed in m/s

6.5. Commissioning

The hydraulics must have been installed properly as specified in the "Installation" chapter. This must be checked before the system is switched on.

The electrical connection must have been completed in accordance with the information in the operating and maintenance manual for the motor.

6.5.1. Before activating

Check the following points:

- The pump is suitable for use under the specified operating conditions.
- Coupling guard is firmly installed on the base-plate.
- Min./max. temperatures of the fluid
- Min./max. ambient temperature
- Suction- and pressure-side pipeline system is free of deposits and solids
- All slide valves on the suction and pressure side are open

If the slide valves on the suction and discharge sides are closed during operation, the fluid in the hydraulics housing is heated up by the pumping movement. This heating creates strong pressure in the hydraulics housing. The pressure can result in the hydraulics exploding! Before switching on the hydraulics, ensure that all the slide valves are open and open any closed slide valves if necessary.

- The hydraulics housing is completely filled with the fluid.

Caution! There must be no air pockets in the hydraulics. Venting is provided by a venting screw on the pressure port.

- Check to ensure all accessories are firmly and properly fitted

6.5.2. Switching on/off

The standard motor is switched on and off using a separate operating point (on/off switch, switch-gear) provided by the customer.

See also the information in the operating and maintenance manual for the motor!

6.6. Conduct during operation



CAUTION! Risk of burns!

The housing parts can heat up to well above 40 °C (104 °F). There is a risk of burns!

- Never touch parts of the housing with your bare hands.
- After switching the pump off, let it cool down to ambient temperature first.
- Wear heat-resistant protective gloves.

During pump operation, always follow the locally applicable laws and regulations for work safety, accident prevention and handling electrical machinery. To help ensure safe working practice, the responsibilities of employees should be clearly specified by the operator. All personnel are responsible for ensuring that regulations are observed.

During operation, all gate valves in the inlet line and pressure pipe must be completely open.

If the slide valves on the suction and discharge sides are closed during operation, the fluid in the hydraulics housing is heated up by the pumping movement. This heating creates strong pressure in the hydraulics housing. The pressure can result in the hydraulics exploding! Before switching on the hydraulics, ensure that all the slide valves are open and open any closed slide valves if necessary.

6.7. Vibration measurement (Fig. 11)



WARNING! Rotating parts!

During operation, the coupling and the two drive shafts rotate. Danger of serious injuries to legs and arms. A vibration measurement may only be carried out if the coupling guard is firmly installed!



CAUTION! Risk of burns!

The housing parts can heat up to well above 40 °C (104 °F). There is a risk of burns! Wear heat-resistant protective gloves.

Depending on the medium and the duty point, vibrations may occur at the pump. These vibrations act as forces and torques on the connection ports and are dissipated into the foundation via the floor fixation. Furthermore, unacceptable vibrations promote faster wear of the pump bearings, the mechanical seal and the coupling.

The vibration measurement must be carried out at the duty point with the machine running.

1. Place the measuring point on the first measuring point "M1": top side of bearing housing (vertical vibration)
2. Place the measuring point on the second measuring point "M2": laterally on the bearing housing (horizontal vibration)
3. The measured value may not exceed **4.5 mm/s eff.** (0.18 in/s). If the value is higher than this, consult the Wilo customer service.

7. Shutdown/disposal



NOTICE

Also note all the information regarding shutdown/disposal in the operating and maintenance manual for the motor and the coupling!

- All work must be carried out with the greatest care.
- Proper protective clothing is to be worn.
- When working in enclosed spaces, the respective local protection measures must be observed. A second person must be present for safety reasons.
- Only lifting equipment that is in a technically perfect condition and lifting gear that has been officially approved may be used for lowering and raising the pump.



DANGER! Risk of fatal injury due to malfunction!

Lifting gear and lifting equipment must be in perfect technical condition. Work may only commence if the lifting equipment has been checked and is found to be in perfect working order. If it is not inspected, there is a risk of fatal injury!

7.1. Shutdown

1. Switch the pump to manual mode via the electronic control.
2. Close gate valve on suction side.
3. Manually activate the pump to pump the remaining quantity of fluid into the pressure pipe.
4. Switch off the system and secure it against being switched on again by unauthorised persons.
5. Close gate valve on the pressure side.
6. Work on removal, maintenance and storage can now commence.

7.2. Removal



DANGER due to toxic substances!

Pumps that pump liquids hazardous to health must always be decontaminated before undertaking any other work! Otherwise there is a risk of fatal injury! Wear the necessary protective clothing!



CAUTION! Risk of burns!

The housing parts can heat up to well above 40 °C (104 °F). There is a risk of burns!

- Never touch parts of the housing with your bare hands.
- After switching the pump off, let it cool down to ambient temperature first.
- Wear heat-resistant protective gloves.



NOTICE

Note that the residual fluid in the hydraulics housing will escape during removal. Suitable collector tanks should be positioned to collect all of the escaping fluid!

1. Have a qualified electrician disconnect the motor from the mains.
2. Drain the residual fluid through the drainage screw on the hydraulics.
Caution: Collect the fluid in a suitable tank and dispose of it properly.
3. To remove the pump, you have to loosen the screwed connections on the suction and pressure ports as well as the floor fixation on the base-plate.
4. Attach the lifting equipment to the corresponding attachment points.
Bare shaft version: To do this, you first have to attach the enclosed transport shackle to the suction port.
The pump can then be removed from the operating space.
5. The operating space must be cleaned thoroughly after the hydraulics is removed, and any drips must be wiped up.

7.3. Return delivery/storage

For shipping, the parts must be packed in tear-proof plastic bags of sufficient size in such a manner that they are tightly sealed and leak-proof.

For return delivery and storage, please also refer to the "Transport and storage" section!

7.4. Disposal

7.4.1. Operating fluid

Oils and lubricants must be collected in appropriate containers and properly disposed of in terms of EC Directive 75/439/EEC as well as in compliance with the provisions of sections 5a and 5b of the German Waste Act or the applicable local laws.

7.4.2. Protective clothing

Protective clothing worn for cleaning and maintenance work is to be disposed of in accordance with the German Waste Code TA 524 02 and EC Directive 91/689/EEC.

7.4.3. Product

Proper disposal of this product will avoid damage to the environment and risks to personal health.

- Use the services of public or private waste disposal companies, or consult them for the disposal of the product or parts thereof.
- For more information about proper disposal, please contact your local council or waste disposal office or the supplier from where you obtained the product.

8. Maintenance and repair



RISK of fatal injury due to electrical current!

There is a risk of fatal injury from electric shock when working on electrical devices. With all maintenance or repair work, the motor must be disconnected from the mains by a qualified electrician and secured against being switched on again without permission.



NOTICE

Also note all the information regarding maintenance and repair in the operating and maintenance manual for the motor and the coupling!

- Before any maintenance or repair work, the pump must be deactivated as described in the "Shut-down/disposal" chapter.
- After maintenance or repair work, the hydraulics must be installed and connected as described in the "Installation" chapter.
- The pump must be switched on as described in the "Commissioning" chapter.
Note the following:
- All maintenance and repair work must be carried out by the Wilo customer service, authorised service workshops or qualified personnel with the greatest of care and in a safe workplace. Proper protective clothing is to be worn.
- This manual must be available to and observed by the maintenance staff. Only maintenance and repair work described in this manual may be carried out.

Any other work and/or alterations to the construction must only be carried out by the Wilo customer service!

- When working in enclosed spaces, it's imperative that the respective local protection measures be observed. A second person must be present for safety reasons.
- Only lifting equipment that is in a technically perfect condition and lifting gear that has been officially approved may be used for lowering and raising the pump. The max. permissible bearing capacity must never be exceeded!
Make sure the lifting gear, wire rope and safety devices of the lifting equipment are in perfect working order. Work may only commence if the lifting equipment has been checked and is found to be in perfect working order. If it is not inspected, there is a risk of fatal injury!
- If flammable solvents and cleaning agents are used, fire, naked flames and smoking are prohibited.
- Pumps that pump liquids hazardous to health must always be decontaminated. In addition, make sure that no gases that are hazardous to health form or are present.
If injuries are caused by fluids or gases that are hazardous to health, apply the first-aid

measures specified on the notice at the working premises and notify a doctor immediately!

- Make sure that the necessary tools and materials are available. Order and cleanliness ensure safe and smooth work on the hydraulics. After working on the hydraulics, remove any used cleaning materials and tools from the pump. Store all materials and tools in their proper place.
- Operating fluids should be collected in suitable containers and disposed of properly. Always wear appropriate protective clothing when performing maintenance and repair work. This must also be disposed of properly.

8.1. Operating fluid

8.1.1. Overview of white oil

The sealing chamber is filled with white oil that is potentially biodegradable.

When changing the oil, we recommend the following oil types:

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

8.1.2. Overview of lubricating grease

The following lubricating greases can be used in accordance with DIN 51818 / NLGI Class 3:

- Esso Unirex N3

8.2. Maintenance intervals

To ensure reliable operation, various maintenance tasks must be carried out regularly.

The maintenance intervals must be specified according to the load on the hydraulics! Regardless of the specified maintenance intervals, the hydraulics or installation must be checked if strong vibrations occur during operation.

Also note the maintenance intervals and maintenance work for the motor. See the operating and maintenance manual for the motor!

8.2.1. Intervals for normal operating conditions

NOTICE

Note You should also follow the maintenance intervals specified in the operating and maintenance manual for the motor and coupling!

Annually

- Visual inspection of the coating and housing for wear
- Regrease the pump bearings
- Vibration measurement
- Visual inspection of coupling

2 years

- Functional check of pencil electrode for sealing chamber monitoring (if applicable)
- Oil change in the sealing chamber
- Check the leakage chamber for leaks



NOTICE

If sealing chamber monitoring is installed, the maintenance interval corresponds to the indicator!

15,000 operating hours or after 10 years at the latest

- Complete overhaul

8.2.2. Intervals for harsh operating conditions

Under harsh operating conditions, the specified maintenance intervals must be shortened accordingly. In this case, contact the Wilo customer service. When using the hydraulics under harsh conditions, we also recommend signing a maintenance contract.

Harsh operating conditions include:

- A large proportion of fibrous material or sand in the fluid
- Strongly corrosive media
- Strongly gassing fluids
- Unfavourable duty points
- Operation at risk from water hammers

8.2.3. Recommended maintenance measures to ensure smooth operation

We recommend regular inspections of the current consumption and the operating voltage in all phases. In normal operation, these values remain constant. Slight fluctuations depend on the characteristics of the fluid. Current consumption can provide an early indication of damage and/or malfunctions in the impeller, bearings and/or motor, which can be rectified. Larger voltage fluctuations strain the motor winding and can cause the motor to break down. Regular inspections can therefore largely prevent major secondary damage and reduce the risk of total breakdown. We recommend the use of remote monitoring for regular inspections. Please contact the Wilo customer service.

8.3. Maintenance work

Before carrying out maintenance work:

- Disconnect the motor from the power and secure it against being switched on inadvertently.
- Allow the pump to cool down and clean it thoroughly.
- Make sure that all the operationally relevant parts are in good condition.

8.3.1. Visual inspection of coating and housing for wear

The coatings and housing parts must not show any signs of damage. If there is visible damage to the coatings, repair the coating accordingly. If there is visible damage to the housing parts, contact the Wilo customer service.

8.3.2. Regrease the pump bearings

Grease amounts		
Type	F1	F2
NORM-M15.77	60 g (2 oz)	110 g (4 oz)
NORM-M15.84	40 g (1.5 oz)	70 g (2.5 oz)
NORM-M25.61	60 g (2 oz)	110 g (4 oz)
RE 25.74E	60 g (2 oz)	110 g (4 oz)
RE 25.93D	60 g (2 oz)	110 g (4 oz)
NORM-M30.41	60 g (2 oz)	110 g (4 oz)
NORM-M50.21	70 g (2.5 oz)	180 g (6.5 oz)

Fig. 10.: Grease nipple

F1+	Bearing on pump side
F2+	Bearing on the motor side

1. Use a grease gun to inject the new grease into the grease nipples (F1+ and F2+).
2. Clean grease nipple

8.3.3. Vibration measurement



WARNING! Rotating parts!

During operation, the coupling and the two drive shafts rotate. Danger of serious injuries to legs and arms. A vibration measurement may only be carried out if the coupling guard is firmly installed!



CAUTION! Risk of burns!

The housing parts can heat up to well above 40 °C (104 °F). There is a risk of burns! Wear heat-resistant protective gloves.

Fig. 11.: Illustration of the measuring points

M1	Measuring point vertical vibration, top of bearing housing
M2	Measuring point horizontal vibration, lateral to bearing housing

The vibration measurement must be carried out at the duty point with the machine running.

1. Place the measuring point on the first measuring point: Top side of bearing housing
2. Place the measuring tip on the second measuring point: Lateral to bearing housing
3. The measured value may not exceed **4.5 mm/s eff.** (0.18 in/s). If the value is higher than this, consult the Wilo customer service.

8.3.4. Visual inspection of coupling

Visual inspection of the coupling for wear and damage (see manufacturer's instructions).

8.3.5. Functional check of pencil electrode for sealing chamber monitoring

To check the pencil electrode, the pump has to be cooled to the ambient temperature, and the electrical connection for the pencil electrode

has to be disconnected in the switchgear. The monitoring device can then be checked with an ohmmeter. The following values should be measured:

- This value must approach "infinity". If the values are low, there is water in the oil. Please also observe the instructions of the optional evaluation relay.

If there are larger deviations, please consult the Wilo customer service!

8.3.6. Oil change in the sealing chamber

The sealing chamber has separate openings for draining and filling the chamber.



WARNING! Risk of injury from hot and/or pressurised operating fluid!

After the hydraulics are switched off, the oil is still hot and pressurised. This can cause the screw plug to be ejected and hot oil to escape. There is a risk of injury or burns! First allow the oil to cool down to ambient temperature.

Filling quantities	
Type	Filling quantity
NORM-M15.77	2.3 l (78 US.fl.oz)
NORM-M15.84	0.65 l (22 US.fl.oz)
NORM-M25.61	2.3 l (78 US.fl.oz)
RE 25.74E	2.3 l (78 US.fl.oz)
RE 25.93D	2.3 l (78 US.fl.oz)
NORM-M30.41	2.3 l (78 US.fl.oz)
NORM-M50.21	4.0 l (135 US.fl.oz)

Fig. 12.: Screw plugs

D-	Drain hole screw plug
D+	Filler hole screw plug

1. If you can place a tank beneath the bearing housing to collect the operating fluid, you do not need to remove the pump.
2. Carefully and slowly unscrew the screw plug (D+). **Caution: The operating fluid may be pressurised! This can cause the screw to be ejected at speed.**
3. Place a suitable tank beneath the screw plug (D-) to collect the operating fluid.
4. Carefully and slowly unscrew the screw plug (D-) and allow the operating fluid to drain out. Dispose of the operating fluid in accordance with the requirements in the "Disposal" chapter.
5. Clean the screw plug (D-), renew the seal ring and screw it back in.
6. Pour the new operating fluid in through the hole for the screw plug (D+). Note the recommended operating fluids and filling quantities!
7. Clean the screw plug (D+), renew the seal ring and screw it back in.

8.3.7. Check the leakage chamber for leaks

The leakage chamber is a self-contained chamber and receives the leakage from the sealing chamber in the event of faults. If there are large quantities of water in the leakage chamber, please contact the Wilo customer service.

Fig. 13.: Screw plug

L- Drain hole screw plug

1. If you can place a tank beneath the bearing housing to collect the operating fluid, you do not need to remove the pump.
2. Place a collector tank underneath the screw plug (L-).
3. Carefully and slowly unscrew the screw plug (L-) and allow the operating fluid to drain out. Dispose of the operating fluid in accordance with the requirements in the "Disposal" chapter.
4. Clean the screw plug (L-), renew the seal ring and screw it back in.

8.3.8. Complete overhaul

In a general overhaul, the normal maintenance work is carried out, and in addition, the shaft seals, O-rings and shaft bearings are checked and replaced if necessary. This work may only be performed by the manufacturer or an authorised service centre.

9. Troubleshooting and possible solutions

In order to prevent damage or serious injury while rectifying hydraulics faults, the following points must be observed:

- Only attempt to remedy a fault if you have qualified staff, meaning that each job must be carried out by qualified personnel. Electrical work, for example, must be performed by a trained electrician.
- Always secure the hydraulics against an accidental restart by disconnecting them from the mains. Take appropriate safety precautions.
- Always have a second person on hand to ensure the hydraulics are switched off in an emergency.
- Secure moving parts to prevent injury.
- Unsanctioned changes to the hydraulics are made at the operator's own risk and release the manufacturer from any warranty obligations!

Fault: The unit will not start

1. Tripping of fuses, motor protection switch and/or monitoring devices
 - Check that the impeller runs freely. If necessary, clean it and ensure it runs freely again
2. The sealing chamber monitoring (optional) has interrupted the electric circuit (operator-related)
 - See fault: Mechanical seal leak, sealing chamber monitoring reports a fault or shuts down the unit

Fault: The unit starts, but the motor protection switch triggers shortly after commissioning

1. Incorrect direction of rotation
 - Swap the 2 phases of the mains supply
2. Impeller slowed by accumulation, clogging and/or solid matter, increased current consumption
 - Switch off the hydraulics, secure them against being switched back on again and free the impeller or clear the suction port
3. The density of the fluid is too high
 - Contact the Wilo customer service

Fault: The unit is running, but not pumping

1. No fluid available
 - Open inlet for tank or slide valve
2. Inlet clogged
 - Clean the supply line, slide valve, suction piece, suction port or suction strainer
3. Impeller blocked or slowed
 - Switch off the hydraulics, secure them against being switched back on again and free the impeller
4. Defective piping
 - Replace defective parts
5. Intermittent operation
 - Check switching system

Fault: The unit is running, but not within the specified operating parameters

1. Inlet clogged
 - Clean the supply line, slide valve, suction piece, suction port or suction strainer
2. Slide valve closed in the pressure pipe
 - Fully open the slide valve
3. Impeller blocked or slowed
 - Switch off the hydraulics, secure them against being switched back on again and free the impeller
4. Incorrect direction of rotation
 - Replace 2 phases of the mains supply
5. Air in the system
 - Check the piping and hydraulics, and vent if necessary
6. Hydraulics pumping against excessive pressure
 - Check the slide valve in the pressure pipe and open it completely if necessary, use a different impeller, consult the plant
7. Signs of wear
 - Replace worn parts
8. Defective piping
 - Replace defective parts
9. Inadmissible levels of gas in the fluid
 - Consult the factory
10. 2-phase operation
 - Have a specialist inspect the connection and correct it if necessary

Fault: The unit is not running smoothly and is noisy

1. Hydraulics are operating in an inadmissible range
 - Check the operating data of the hydraulics and correct if necessary and/or adjust the operating conditions

2. Suction port, suction strainer and/or impeller clogged
 - Clean the suction port, suction strainer and/or impeller
3. Impeller stiff
 - Switch off the hydraulics, secure them against being switched back on again and free the impeller
4. Inadmissible levels of gas in the fluid
 - Consult the factory
5. Incorrect direction of rotation
 - Replace 2 phases of the mains supply
6. Signs of wear
 - Replace worn parts
7. Shaft bearing defective
 - Consult the factory
8. Hydraulics are installed under tension
 - Check installation, use rubber compensators if necessary

Fault: Mechanical seal leak, sealing chamber monitoring reports a fault or shuts down the unit

1. Condensation water build-up due to extended storage and/or temperature fluctuations
 - Operate the hydraulics briefly (max. 5 min) without pencil electrode
2. Increased leakage when running in new mechanical seals
 - Change the oil
3. Defective pencil electrode cables
 - Replace pencil electrode
4. Mechanical seal is defective
 - Replace the mechanical seal and contact the plant!

Further steps for troubleshooting

If the points listed here do not rectify the fault, contact the Wilo customer service. They can help you as follows:

- Telephone and/or written support from the Wilo customer service
 - On-site support from the Wilo customer service
 - Inspection or repair of the hydraulics at the plant
- Please note that you may be charged for some services provided by our customer service! For more details, please contact the Wilo customer service.

10. Appendix

10.1. Tightening torques

Rust-free screws (A2/A4)		
Thread	Tightening torque	
	Nm	kp m
M5	5.5	0.56
M6	7.5	0.76
M8	18.5	1.89
M10	37	3.77

Rust-free screws (A2/A4)		
Thread	Tightening torque	
	Nm	kp m
M12	57	5.81
M16	135	13.76
M20	230	23.45
M24	285	29.05
M27	415	42.30
M30	565	57.59

Geomet-coated screws (strength 10.9) with Nord-Lock disc		
Thread	Tightening torque	
	Nm	kp m
M5	9.2	0.94
M6	15	1.53
M8	36.8	3.75
M10	73.6	7.50
M12	126.5	12.90
M16	155	15.84
M20	265	27.08

10.2. Spare parts

Spare parts can be ordered from the Wilo customer service. To avoid return queries and incorrect orders, the serial and/or article number must always be supplied.

Subject to technical modifications without prior notice!







Pioneering for You



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