

STÜBBE X-CLASS

Chemical centrifugal pump made of plastic in vertical orientation VCX

Original operating manual

Series VCX



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Subject to technical modifications.
Read carefully before use.
Save for future use.

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1 About this document

This manual

- are an integral part of the pump
- applies to all series referred to
- describes safe and proper operation during all operating phases

1.1 Target groups



Operating company

- Responsibilities:
 - Always keep this manual accessible where the device is used on the system.
 - Ensure that employees read and observe this document, particularly the safety instructions and warnings, and the documents which also apply.
 - Observe any additional country-specific rules and regulations that relate to the system.

Qualified personnel, fitter






- Mechanics qualification:
 - Qualified employees with additional training for fitting the respective pipework
- Electrical qualification:
 - Qualified electrician
- Transport qualification:
 - Qualified transport specialist
- Responsibility:
 - Read, observe and follow this manual and the other applicable documents, especially all safety instructions and warnings.

1.2 Other applicable documents

Document/purpose	Where found
Installation drawing <ul style="list-style-type: none"> • Dimensions when installed, fitting dimensions, etc. 	Documentation included
Resistance lists <ul style="list-style-type: none"> • Resistance of materials used to chemicals • www.stuebbe.com/pdf/300051.pdf 	
CE declaration of conformity <ul style="list-style-type: none"> • Conformity with standards 	(→ 9.5 Declaration of conformity in accordance with EC machinery directive, Page 32).
Data sheet (302 409) <ul style="list-style-type: none"> • Technical specifications, operating conditions, dimensions • www.stuebbe.com/pdf/302409.pdf 	
Spare parts list <ul style="list-style-type: none"> • Ordering spare parts 	Documentation included
Sectional drawing <ul style="list-style-type: none"> • Sectional drawing, part numbers, component designations 	Documentation included
Supplier documentation <ul style="list-style-type: none"> • Technical documentation for parts supplied by subcontractors 	Documentation included


Tab. 1 Other application documents, purpose and where found

1.3 Warnings and symbols

Symbol	Meaning
 DANGER	<ul style="list-style-type: none"> • Immediate acute risk • Death, serious bodily harm
 WARNING	<ul style="list-style-type: none"> • Potentially acute risk • Death, serious bodily harm
 CAUTION	<ul style="list-style-type: none"> • Potentially hazardous situation • Minor injury
NOTE	<ul style="list-style-type: none"> • Potentially hazardous situation • Material damage
	<p>Safety warning sign</p> <ul style="list-style-type: none"> ▶ Take note of all information highlighted by the safety warning sign and follow the instructions to avoid injury or death.
▶	Instruction
1., 2., ...	Multiple-step instructions
✓	Precondition
→	Cross reference
	Information, notes

Tab. 2 Warnings and symbols

2 Safety

 The manufacturer accepts no liability for damages caused by disregarding any of the documentation.


2.1 Intended use

- Only use the pump with suitable media (→ resistance lists).
- Do not use pump for combustible or explosive fluids.
- Adhere to the operating limits and size-dependent minimum flow rates.
- Avoid cavitation: Do not open the pressure-side fitting beyond the agreed operating point.
- Avoid overheating:
 - Do not operate the pump while the pressure-side fitting is closed.
 - Note minimum flow (→ Data sheet).
- Avoid damage to the motor:
 - Do not open the pressure-side fitting beyond the agreed operating point.
 - Note the maximum permissible number of times the motor can be switched on per hour (→ manufacturer's specifications).
- Consult with the manufacturer regarding any other use of the device.
- If pumps are delivered without motors, then final assembly as a pump assembly must take place in accordance with the provisions of the Machinery Directive 2006/42/EC.

Prevention of obvious misuse (examples)

- Observe pump limits of use regarding temperature, pressure, flow and speed (→ data sheet).
- The power consumption of the pump increases as the specific gravity of the pumped fluid increases. Adhere to the permissible specific gravity in order to eliminate the possibility that the pump, coupling and motor become overloaded (→ data sheet).
A lower specific gravity is permissible. Adapt the auxiliary systems accordingly.
- Pumps used with water as the pumped liquid must not be used for foodstuffs or drinking water. Use for food or drinking water only if specified in the data sheet.
- The type of installation should be selected only in accordance with these operating instructions. For example, the following are not allowed:
 - Hanging base plate pumps in the pipe
 - Overhead installation
 - Installation in the immediate vicinity of extreme heat or cold sources
 - Installation too close to a wall

2.2 General safety instructions

 Observe the following regulations before carrying out any work.

2.2.1 Product safety

The pump has been built according to state-of-the-art technology and the recognized technical safety regulations. Nevertheless, operation of the pump can still put the life and health of the user or third parties at risk or damage the pump or other property.

- Operate the pump only if it is in perfect technical condition and use it only as intended, staying aware of safety and risks, and in adherence to the instructions in this manual.
- Keep this manual and all other applicable documents complete, legible and accessible to personnel at all times.
- Refrain from any procedures and actions that would pose a risk to personnel or third parties.
- In the event of any safety-relevant faults, shut down the pump immediately and have the fault corrected by appropriate personnel.
- In addition to the entire documentation for the product, comply with statutory or other safety and accident-prevention regulations and the applicable standards and guidelines in the country where the pump is operated.

2.2.2 Obligations of the operating company

Safety-conscious working

- Operate the pump only if it is in perfect technical condition and use it only as intended, staying aware of safety and risks, and in adherence to the instructions in this manual.
- Ensure that the following safety aspects are observed and monitored:
 - Intended use
 - Statutory or other safety and accident-prevention regulations
 - Safety regulations governing the handling of hazardous substances
 - Applicable standards and guidelines in the country where the pump is operated
 - Applicable guidelines of the operator
- Make personal protective equipment available.

Qualified personnel

- Make sure all personnel tasked with work on the pump have read and understood this manual and all other applicable documents, especially the safety, maintenance and repair information, before they start any work.
- Organize responsibilities, areas of competence and the supervision of personnel.

- Ensure that all work is carried out by specialist technicians only:
 - Installation, repair and maintenance work
 - Transportation
 - Work on the electrical system
- Make sure that trainee personnel only work on the pump under supervision of specialist technicians.

Safety equipment

- Provide the following safety equipment and verify its functionality:
 - For hot, cold and moving parts: pump safety guarding provided by the customer
 - For potential electrostatic charging: provide suitable grounding

Warranty

- Obtain the manufacturer's approval prior to carrying out any modifications, repairs or alterations during the warranty period.
- Only use genuine parts or parts that have been approved by the manufacturer.

2.2.3 Obligations of personnel

- All directions given on the pump must be followed (and kept legible), e.g. the arrow indicating the sense of rotation and the markings for fluid connections.
- Pump, coupling guard and components:
 - Do not step on them or use as a climbing aid
 - Do not use them to support boards, ramps or beams
 - Do not use them as a fixing point for winches or supports
 - Do not use them for storing paper or similar materials
 - Do not use the hot pump or motor components as a heating point
 - Do not de-ice the pump using gas burners or similar tools
- Do not remove the safety guarding for hot, cold or moving parts during operation.
- Use personal protective equipment if necessary.
- Only carry out work on the pump while it is not running.
- Before all installation and maintenance work, disconnect the motor from the mains and secure it against being switched back on again.
- Never reach into the suction or discharge flange.
- Following all work on the pump, refit safety devices in accordance with the instructions and bring into service.
- Do not make any modifications to the device.

2.3 Specific hazards

2.3.1 Hazardous pumped liquids

- When handling hazardous fluids, observe the safety regulations for the handling of hazardous substances.
- Use personal protective equipment when carrying out any work on the pump.
- Collect leaking pumped liquid and residues in a safe manner and dispose of in accordance with environmental regulations.

3 Layout and function

3.1 Marking

3.1.1 Name plate

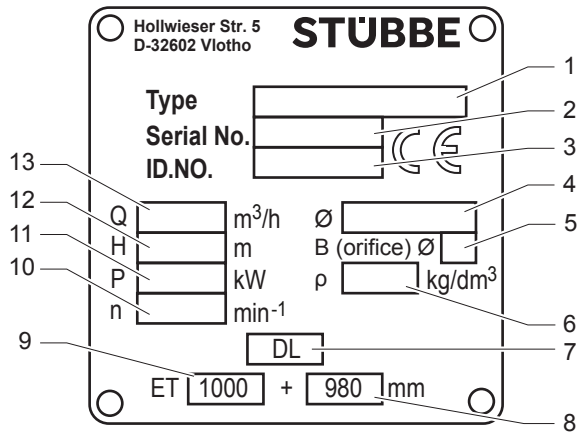


Fig. 1 Name plate (example)

- 1 Pump type
- 2 Serial number
- 3 Identification number
- 4 Impeller diameter (main vanes, back vanes) [mm]
- 5 Diaphragm diameter
- 6 Specific gravity
- 7 Sealing lip
- 8 Extension
- 9 Immersion depth
- 10 Rotational speed
- 11 Power consumption of pump/motor
- 12 Differential head
- 13 Flow rate

3.1.2 Pump type code

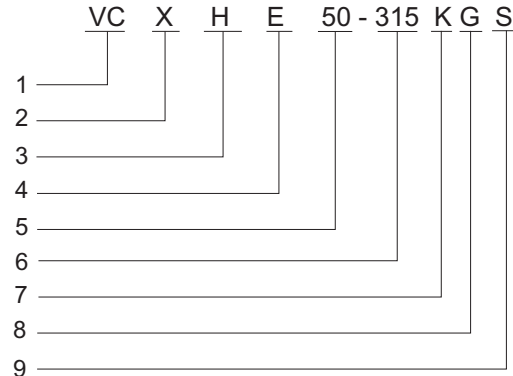


Fig. 2 Pump type code (example)

- 1 Pump series
 - **VC** – Vertical Cantilever Pump
- 2 Series
 - **X** – Heavy-Duty Plastic Pump
- 3 Impeller profile
 - **H** - Half-open impeller
 - **F** – 3-channel free-flow impeller
- 4 Material
 - **E** - UHMW-PE (ultra-high molecular weight low-pressure polyethylene)
 - **D** - PVDF (polyvinylidene fluoride)
- 5 Discharge nozzle diameter [mm]
- 6 Impeller nominal diameter [mm]
- 7 Immersion depth
 - **K** – Short (500 mm)
 - **S** – Standard (1000 mm)
 - **L** – Long (1500 mm)
- 8 Material of the suspension pipe
 - **D** – PVDF
 - **GD** – Rubberized steel PVDF
 - **GP** – Rubberized steel PP-H
 - **H** – Halar coated steel
 - **P** – PP-H
- 9 Deviations
 - **S** - Special version
 - **T** – For dry installation

3.1.3 Shaft seal type code

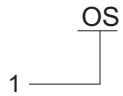


Fig. 3 Shaft seal code (example)

- 1 Shaft seal
- **OS** – Without flushing
 - **ST** – Flushing with hose connector as flushing connection
 - **SG** – Flushing with internal thread as flushing connection

3.2 Description

Non self-priming, vertical centrifugal pump.
Use in open or closed unpressured containers or pits/trenches.
The pump is dry-running safe.

3.3 Assembly

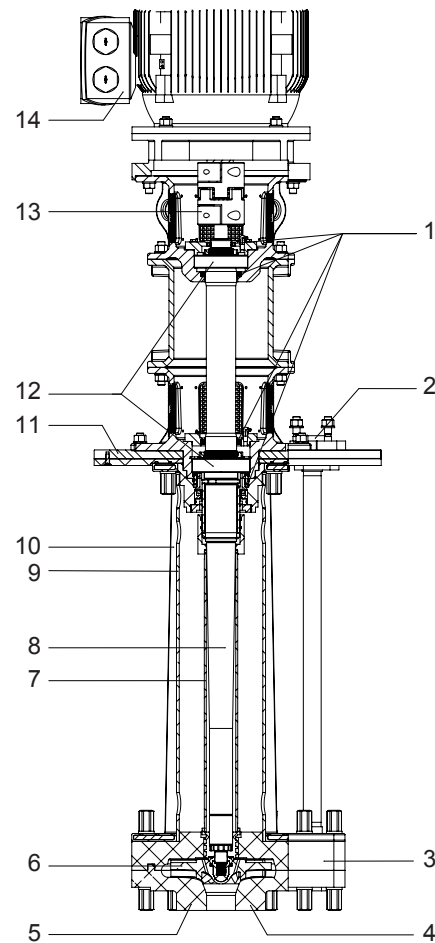




Fig. 4 Assembly

- 1 V-ring seal
- 2 Discharge flange
- 3 Volute casing
- 4 Strainer (optional)
- 5 Suction extension (optional)
- 6 Impeller
- 7 Shaft protection tube
- 8 Shaft
- 9 Protection tube
- 10 Support frame
- 11 Sole plate
- 12 Shaft bearing
- 13 Coupling
- 14 Motor

4 Transport, storage and disposal


4.1 Transport

 The user/owner is responsible for the transport of the pump.

 Weight specifications (→ documents for the particular order)

4.1.1 Unpacking and inspection on delivery

1. Unpack the pump/pump assembly upon delivery and inspect it for transport damage.
2. Check completeness and accuracy of delivery.
3. Ensure that the information on the name plate agrees with the order/design data.
4. Report any transport damage to the manufacturer immediately.
5. Dispose of packaging material according to local regulations.

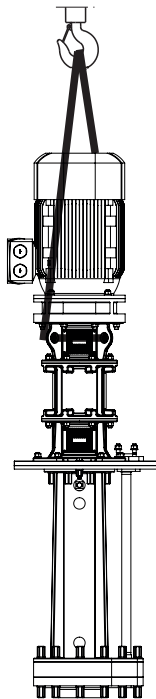
 Retain the transport frame for horizontal storage (recommended).

4.1.2 Lifting

 **DANGER**

Death or limbs crushed as a result transported items falling over!

- ▶ Use lifting gear appropriate for the total weight to be transported.
- ▶ Attach lifting gear in accordance with the following diagrams.
- ▶ Never use the lifting eye of the motor as the attachment point for lifting the entire pump (the lifting eye of the motor may be used for securing a pump assembly with a high center of gravity against being knocked over).
- ▶ Do not stand under suspended loads.



1. Attach lifting gear in accordance with the above diagram.
2. Lift the pump/pump assembly appropriately.

4.2 Storage

DANGER

Death or limbs crushed as a result of the pump overturning!

- ▶ For vertical storage:
 - Place pump on a horizontal underground and secure against overturning.

NOTE

Material damage due to inappropriate storage!

- ▶ Store the pump properly.
1. Seal all openings with blind flanges, blind plugs or plastic covers.
 2. Make sure the storage room meets the following conditions:
 - Dry
 - Frost-free
 - Vibration-free
 - UV protected
 3. For horizontal storage:
 - Protect pump against sagging by means of proper support.
 4. Rotate the pump shaft twice a month.
 5. Make sure the shaft and bearing change their rotational position in the process.

4.3 Disposal



Plastic parts can be contaminated by poisonous or radioactive pumped liquids to such an extent that cleaning will be insufficient.

WARNING

Risk of poisoning and environmental damage by the pumped liquid or oil!

- ▶ Use personal protective equipment when carrying out any work on the pump.
 - ▶ Prior to the disposal of the pump:
 - Collect and damage any escaping pumped liquid or oil in accordance with local regulations.
 - Neutralize residues of pumped liquid in the pump.
 - ▶ Remove plastic parts and damage them in accordance with local regulations.
-
- ▶ Dispose of the pump in accordance with local regulations.

5 Setup and connection

NOTE

Material damage due to distortion or passage of electrical current in the bearing!

- ▶ Do not make any structural modifications to the pump assembly or pump casing.
- ▶ Do not carry out any welding work on the pump assembly or pump casing.

NOTE

Material damage caused by dirt!

- ▶ Do not remove the transport seals until immediately before installing the pump.
- ▶ Do not remove any covers or transport and sealing covers until immediately before connecting the pipes to the pump.

5.1 Preparing for installation

5.1.1 Check operating conditions

1. Ensure the required operating conditions are met:
 - Resistance of body and seal material to the medium (→ resistance lists).
 - Required ambient conditions (→ 9.2.1 Ambient conditions, Page 26).
2. Ensure necessary dimensions for tank cut-out (→ data sheet).
3. Ensure safe aeration and venting of the container in all operating phases.
4. Ensure required installation dimensions and filling levels (→ 9.2.7 Installation dimensions and filling heights, Page 29).
 - Minimum distances
 - Maximum start-up level
 - Minimum start-up level

5.1.2 Preparing the installation site

- ▶ Ensure the installation site meets the following conditions:
 - Pump is freely accessible from all sides
 - Sufficient space for the installation/removal of the pipes and for maintenance and repair work, especially for the removal and installation of the pump and the motor
 - Pump not exposed to external vibration (damage to bearings)
 - No corrosive exposure
 - Frost protection

5.1.3 Surface preparation

- ✓ Aids, tools, materials:
 - Spirit level
- 1. Make sure the surface meets the following conditions:
 - level and horizontal
 - Clean (no oil, dust or other impurities)
 - **Capable of bearing the weight of the pump assembly and all operating forces**
 - **The stability of the pump unit is ensured on a solid supporting substructure**
 - Resonance-free
- 2. Clean containers, basins or pits carefully and protect from further contamination, e.g. by installing overflow wall in front of the container or pit inlet.

5.2 Setting up

1. Remove the suction-side cover if present.
2. Lift pump/pump assembly (→ 4.1 Transport, Page 10).
3. Place pump/pump assembly on the contact surface of the container/pit.
4. Attach sole plate to the contact surface.
 - Pump must not be mechanically under stress as a result of being attached
5. Screw on the sole plate

5.3 Planning pipelines

- ⓘ Water hammer may damage the pump or the system. Plan the pipes and fittings as far as possible to prevent water hammer occurring.

5.3.1 Specifying supports and flange connections

NOTE

Material damage due to excessive forces and torques on the pump!

- ▶ Ensure pipe connection without stress.
1. Plan pipes safely:
 - No pulling or thrusting forces
 - No bending moments
 - Adjust for changes in length due to temperature changes (compensators, expansion shanks)
 2. Support pipes in front of the pump.
 3. Ensure the pipe supports have permanent low-friction properties and do not seize up due to corrosion.

5.3.2 Specifying nominal widths



Keep the flow resistance in the pipes as low as possible.

1. Make sure the suction extension is not smaller than the nominal width of the suction branch.
2. Make sure the nominal pressure line width is not smaller than the nominal discharge flange width.
 - Ensure the flow velocity is less than 3 m/s.

5.3.3 Designing pipelines

- ▶ Plan pipes safely:
 - No pulling or thrusting forces
 - No bending moments
 - Adjust for changes in length due to temperature changes (compensators, expansion shanks)

5.3.4 Optimizing changes of cross section and direction

1. Avoid radii of curvature of less than 1.5 times the nominal pipe diameter.
2. Avoid abrupt changes of cross-section along the piping.

5.3.5 Providing safety and control devices (recommended)

Avoid reverse running

1. Install a non-return valve between the discharge flange and stop valve, to ensure that the medium does not flow back after the pump is switched off.
2. In order to enable venting, include vent connection between discharge flanges and non-return valve.

Make provisions for isolating and shutting off the pipes



For maintenance and repair work.

- ▶ Provide shut-off devices in the pressure pipe.

Allow measurements of the operating conditions

1. Provide a pressure gauge in the pressure line for pressure measurement.
2. Provide pressure measurement on the pump side.

5.4 Connecting the pipes

NOTE

Material damage due to excessive forces and torques on the pump!

- ▶ Ensure pipe connection without stress.

5.4.1 Keeping the piping clean

NOTE

Material damage due to impurities in the pump!

- ▶ Make sure no impurities can enter the pump.

1. Clean all piping parts and fittings prior to assembly.
2. Flush all pipes carefully with neutral medium.
3. Ensure no flange seals protrude inwards.
4. Remove any blind flanges, plugs, protective foils and/or protective paint from the flanges.

5.4.2 Installing the pressure pipe

1. Remove the transport and sealing covers from the pump.
2. Fit the pressure line stress-free and sealed ([→ 9.2.2 Flange tightening torques, Page 26](#)).
3. Ensure no seals protrude inwards.

5.4.3 Inspection for stress-free pipe connections


- ✓ Piping installed and cooled down
1. Disconnect the pipe connecting flanges from the pump.
 2. Check whether the pipes can be moved freely in all directions within the expected range of expansion:
 - Nominal width < 150 mm: by hand
 - Nominal width > 150 mm: with a small lever
 3. Make sure the flange surfaces are parallel.
 4. Reconnect the pipe connecting flanges to the pump.
 5. If present, check support foot for stress.

5.5 Planning the electrical system

- ▶ Ensure the following in the electrical supply to the pump unit:
 - Provide a device for isolating from the power supply.
 - The device for isolating from the power supply must be capable of their actuated during normal operation and also in an emergency (emergency stop switch). The emergency stop switch must satisfy ISO 13850.
 - If the pump unit stops due to a power failure it must be protected against automatic restarting (on restoration of power).
 - Install a motor protection switch to act as a cut-out in the event of overheating and adjust it in accordance with the particulars on the motor nameplate.
 - If a frequency inverter is to be used at low speeds, check whether an external cooler may be necessary.
 - The encapsulation of the control systems must satisfy the protection classes specified in EN 60529.

5.6 Connecting the pump

5.6.1 Making the electrical connections to the motor

 Follow the instructions of the motor manufacturer.

DANGER

Risk of electrocution!

- ▶ All electrical work must be carried out only by qualified electricians.
- ▶ Before all work on the electrical system, disconnect the motor from the mains and secure against being switched back on again.

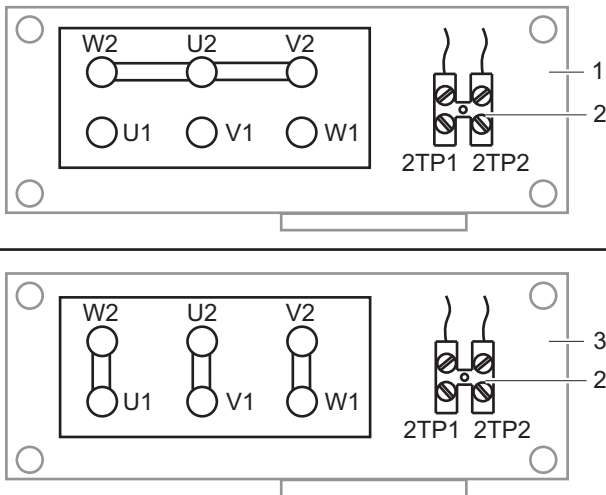
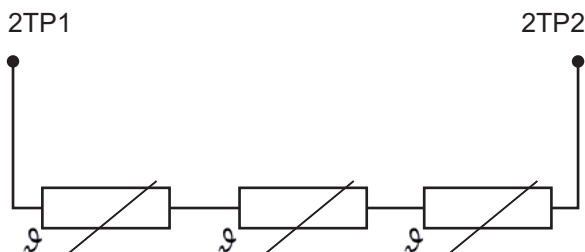


Fig. 5 Connecting the motor

- 1 Star connection
- 2 Connecting the PTC thermistor
- 3 Delta connection

1. Connect the motor as shown in the circuit diagram, as a delta connection (1) or a star connection (3).
2. Make sure no danger arises due to electric power.
3. Install an EMERGENCY STOP switch.



4. Connect the PTC thermistor (2) to the motor protector:
 - Test voltage 2.5 V
5. Connect the optional standstill heating for the motor. When making the electrical connections, make sure that the voltage matches that on the name plate (motor) and work to the terminal diagram provided.

5.6.2 Check direction of rotation

DANGER

Risk of electrocution!

- ▶ All electrical work must be carried out only by qualified electricians.
- ▶ Before all work on the electrical system, disconnect the motor from the mains and secure against being switched back on again.

DANGER

Danger to life from rotating parts!

- ▶ Use personal protective equipment when carrying out any work on the pump.
- ▶ Maintain an adequate distance from rotating parts.
- ▶ After testing disconnect the motor and secure it against reconnection.
- ▶ When checking the direction of rotation, ensure that the protective grille is installed.

NOTE

Damage to the hydraulics as a result of the wrong direction of rotation!

The impeller will become detached from the shaft.

- ▶ Make sure that the motor is disconnected from the pump.
1. Switch on motor for max. 2 seconds and switch it off again immediately.
 2. Check whether the sense of rotation of the motor matches the direction of rotation on the fan impeller.
 3. If the sense of rotation is different: Change over the two phases (→ 5.6.1 Making the electrical connections to the motor, Page 14).
 4. Disconnect the motor from the mains and secure it against being switched back on again.

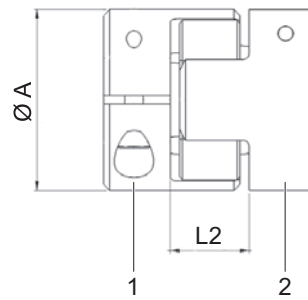
5.7 Install the coupling

The unit (motor/pump) is supplied with the pump-side coupling half on the pump shaft disassembled.

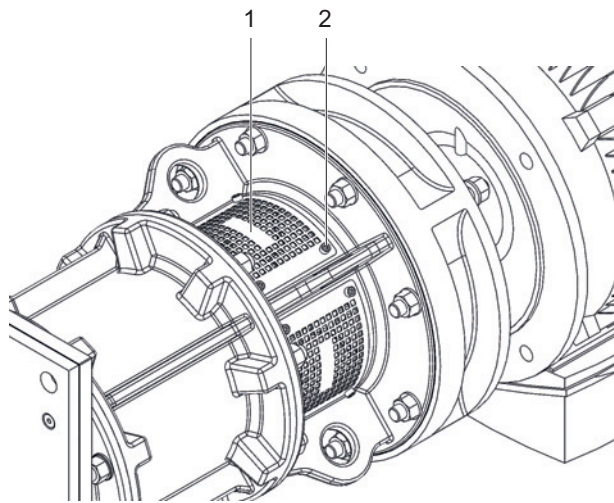
NOTE

Material damage through bangs and knocks!

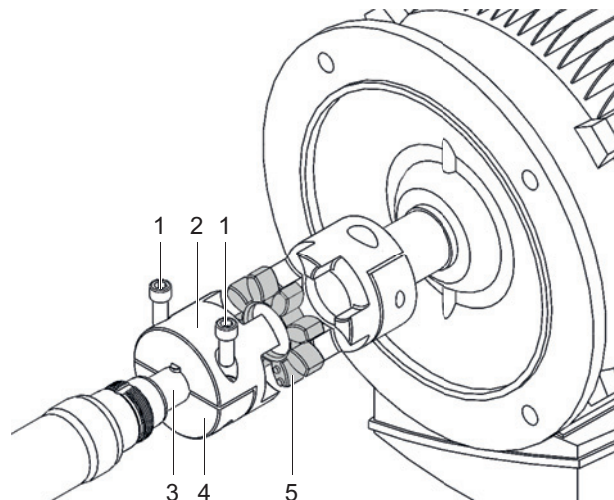
- ▶ When pushing the coupling half on, do not allow it to become skew.
- ▶ Do not bang and knock pump components.



7. Move the pump-side clamping hub (1) in the axial direction until the dimension L2 is reached (→ 9.2.8 Values for adjusting the coupling, Page 30).
8. Secure the clamping hub by tightening the clamping screws alternately. When doing so, comply with the correct torque TA (→ 9.2.8 Values for adjusting the coupling, Page 30).
9. Attach the protective grille with screws.




1. Unscrew all screws (2).
2. Remove the protective grille (1).



3. Remove the half shells (4) from the hub body (2).
4. Assemble the hub body (2) to the gear ring (5).
5. Install the assembly with the half shell (4) on the end of the pump shaft (3).
6. Screw in the clamping screws (1) finger-tight until the hub (2) and half shell (4) lie on the shaft.

5.8 Performing the hydrostatic test

 Only necessary if the entire system needs to be tested under pressure.

NOTE

Material damage due to bursting of pump casing!

- ▶ Testing pressure must not exceed the permissible pump pressure (→ documents for the particular order).
- ▶ Make sure the testing pressure does not exceed the permissible pump pressure.
 - If necessary, do not perform pressure test on the pump.

6 Operation

6.1 Preparing for commissioning

6.1.1 Check downtimes

- ▶ Check downtimes (→ 6.4 Restoring the pump to service, Page 17).

6.1.2 Filling and bleeding

WARNING

Risk of injury and poisoning due to hazardous pumped liquids!

- ▶ Use protective equipment for any work on the pump.
 - ▶ Collect leaking liquid safely and damage fitting in accordance with local regulations.
-
1. Close the pressure-side fitting.
 2. Fill pump and, if present, suction pipe with fluid. When doing so, ensure the minimum start-up level G (→ Tab. 17 Installation dimensions, Page 29).
 3. Verify that no pipe connections are leaking.

6.2 Commissioning

6.2.1 Switching on

- ✓ Pump set up and connected properly
- ✓ Motor set up and connected properly
- ✓ All connections stress-free and sealed
- ✓ All safety equipment installed and tested for functionality
- ✓ Pump prepared, filled and vented correctly
- ✓ Container is filled sufficiently up to the minimum start-up level G (→ 9.2.7 Installation dimensions and filling heights, Page 29).

DANGER

Risk of injury due to running pump!

- ▶ Do not touch the pump when it is running.
- ▶ Do not carry out any work on the pump when it is running.
- ▶ Allow the pump to cool down completely before starting any work.

DANGER

Risk of injury and poisoning due to pumped liquid spraying out!

- ▶ Use personal protective equipment when carrying out any work on the pump.

NOTE

Risk of cavitation if suction flow is restricted!

- ▶ Do not open the pressure-side fitting beyond the operating point.

NOTE

Material damage due to overheating!

- ▶ Do not operate the pump for long periods with the pressure-side fitting closed.
 - ▶ Observe minimum flow (→ order data sheet).
-
1. Close the pressure-side fitting.
 2. Switch on the motor and check it for smooth running.
 3. Once the motor has reached its nominal speed, open the pressure-side fitting slowly until the operating point is reached.
 4. Make sure temperature change is smaller than 5 K/min for pumps with hot fluids.
 5. After the initial stress due to the pressure and operating temperature, check that the pump is not leaking.

6.2.2 Switching off

- ✓ Pressure-side fitting closed (recommended)

WARNING

Risk of injury due to hot pump parts!

- ▶ Use personal protective equipment when carrying out any work on the pump.
-
1. Switch off motor.
 2. Check all connecting bolts and tighten them if necessary (only after initial commissioning).

6.3 Shutting down the pump

DANGER

Risk of injury due to running pump!

- ▶ Do not touch the pump when it is running.
- ▶ Do not carry out any work on the pump when it is running.
- ▶ Before all installation and maintenance work, disconnect the motor from the mains and secure it against being switched back on again.

DANGER

Risk of electrocution!

- ▶ All electrical work must be carried out only by qualified electricians.
- ▶ Before all work on the electrical system, disconnect the motor from the mains and secure against being switched back on again.

WARNING

Risk of injury and poisoning due to hazardous pumped liquids!

- ▶ Use protective equipment for any work on the pump.
- ▶ Collect leaking liquid safely and damage fitting in accordance with local regulations.
- ▶ Take the following measures whenever the pump is shut down:

Pump is	Action
shut down	▶ Take measures appropriate for the fluid (→ Tab. 4 Measures depending on the behavior of the pumped liquid, Page 17).
...emptied	▶ Close suction and pressure-side fitting.
...dismounted	▶ Isolate the motor from its power supply and secure it against unauthorized switch-on.
...put into storage	▶ Note measures for storage.

Tab. 3 Measures to be taken if the pump is shut down

Behavior of the pumped liquid	Duration of shutdown (depending on process)	
	Short	Long
Crystallized or polymerized, solids sedimenting	▶ Flush the pump.	▶ Flush the pump.
Solidifying/freezing, non-corrosive	▶ Heat up or empty the pump and containers.	▶ Empty the pump and containers.
Solidifying/freezing, corrosive	▶ Heat up or empty the pump and containers.	▶ Empty the pump and containers.
Remains liquid, non-corrosive	–	–
Remains liquid, corrosive	–	▶ Empty the pump and containers.


Tab. 4 Measures depending on the behavior of the pumped liquid

6.4 Restoring the pump to service

1. Complete all steps as for commissioning (→ [6.2 Commissioning, Page 16](#)).
2. If the pump is shut down for over 1 year, replace elastomer seals (O-rings, shaft sealing rings).


6.5 Operating the stand-by pump

- ✓ Stand-by pump filled and bled


 Operate the stand-by pump at least once a week.

- ▶ Open pressure-side fitting far enough so that the stand-by pump operating temperature is achieved and heating is even (→ [6.2.1 Switching on, Page 16](#)).

7 Maintenance

 Trained service technicians are available for fitting and repair work. Submit evidence of conveyed medium on request (DIN safety data sheet or safety certificate).

7.1 Inspections

 The inspection intervals depend on the operational strain on the pump.

DANGER

Risk of injury due to running pump!

- ▶ Do not touch the pump when it is running.
- ▶ Do not carry out any work on the pump when it is running.


WARNING

Risk of injury and poisoning due to hazardous pumped liquids!

- ▶ Use protective equipment for any work on the pump.

1. Check at appropriate intervals:
 - Adherence to the minimum flow rate
 - Normal operating conditions unchanged
 - Filling level of the container
2. For trouble-free operation, always ensure the following:
 - No leaks
 - No cavitation
 - Free and clean filters
 - No unusual running noises or vibrations
 - No inadmissible leaks on the shaft seal

7.2 Servicing

 Operating life of antifriction bearings when operated within the permissible range: >2 years.

Intermittent operation, high temperatures, low viscosities and aggressive ambient and process conditions reduce the service life of antifriction bearings.

DANGER

Risk of injury due to running pump!

- ▶ Do not touch the pump when it is running.
- ▶ Do not carry out any work on the pump when it is running.
- ▶ Before all installation and maintenance work, disconnect the motor from the mains and secure it against being switched back on again.

DANGER

Risk of electrocution!

- ▶ All electrical work must be carried out only by qualified electricians.
- ▶ Before all work on the electrical system, disconnect the motor from the mains and secure against being switched back on again.

WARNING

Risk of injury and poisoning due to hazardous or hot fluid!

- ▶ Use protective equipment for any work on the pump.
- ▶ Allow the pump to cool down completely before commencing any work.
- ▶ Make sure the pump is depressurized.
- ▶ Empty the pump, safely collect the pumped liquid and damage it in accordance with environmental rules and requirements.

7.2.1 Maintenance in accordance with maintenance schedule

- ▶ Perform maintenance work in accordance with the maintenance schedule ([→ 9.3 Maintenance schedule, Page 30](#)).

7.2.2 Cleaning the pump

NOTE

High water pressure or spray water can damage bearings!

- ▶ Do not clean bearing areas with a water or steam jet.
- ▶ Clean large-scale grime from the pump.

7.3 Dismounting

DANGER

Risk of injury due to running pump!

- ▶ Do not touch the pump when it is running.
- ▶ Do not carry out any work on the pump when it is running.
- ▶ Before all installation and maintenance work, disconnect the motor from the mains and secure it against being switched back on again.

DANGER

Risk of electrocution!

- ▶ All electrical work must be carried out only by qualified electricians.
- ▶ Before all work on the electrical system, disconnect the motor from the mains and secure against being switched back on again.

DANGER

Death or limbs crushed as a result of the pump overturning!

- ▶ Place pump on a horizontal underground and secure against overturning.

WARNING

Risk of injury and poisoning due to hazardous or hot fluid!

- ▶ Use protective equipment for any work on the pump.
- ▶ Allow the pump to cool down completely before commencing any work.
- ▶ Make sure the pump is depressurized.
- ▶ Empty the pump, safely collect the pumped liquid and damage it in accordance with environmental rules and requirements.

WARNING

Risk of injury due to heavy components!

- ▶ Pay attention to the component weight. Lift and transport heavy components using suitable lifting gear.
- ▶ Set down components safely and secure them against overturning or rolling away.

WARNING

Risk of injury during disassembly!

- ▶ Secure the pressure-side gate valve against accidental opening.
- ▶ Wear protective gloves, components can become very sharp-edged due to wear or damage.
- ▶ Remove spring-loaded components carefully (e.g. mechanical seal, stressed bearing, valves etc.), as components can be ejected by the spring stress.
- ▶ Observe the manufacturer's specifications (e.g. for the motor, coupling, mechanical seal, blocking pressure system, cardan shaft, drives, belt drive etc.).

NOTE

Material damage due to incorrect dismounting/installation of the pump!

- ▶ Only specialist mechanics should complete dismounting/installation work.

7.3.1 Preparations for dismounting

- ✓ Pump is depressurized
- ✓ Pump completely empty, flushed and decontaminated
- ✓ Electrical connections disconnected and motor secured against switch-on
- ✓ Pump cooled down
- ✓ Pressure gauge lines, pressure gauge and fixtures dismounted
- ▶ When dismounting, observe the following:
 - Mark the precise orientation and position of all components before dismounting them.
 - Dismount components concentrically without canting.
 - Dismount pump (→ sectional drawing).


7.4 Replacement parts and return

1. Have the following information ready to hand when ordering spare parts (→ type plate).
 - Device type
 - ID number
 - Nominal pressure and diameter
 - Body and seal material
2. Please complete and enclose the document of compliance for returns (→ www.stuebbe.com/en/service/download).



3. Use only spare parts from Stübbe.

7.5 Installing

-  Install components concentrically and without tilting in accordance with the markings applied.

WARNING

Risk of injury due to heavy components!

- ▶ Pay attention to the component weight. Lift and transport heavy components using suitable lifting gear.
- ▶ Set down components safely and secure them against overturning or rolling away.

WARNING

Risk of injury during assembly!

- ▶ Install spring-loaded components carefully (e.g. mechanical seal, stressed bearing, valves etc.), as components can be ejected by the spring stress.
- ▶ Observe the manufacturer's specifications (e.g. for the motor, coupling, mechanical seal, blocking pressure system, cardan shaft, drives, belt drive etc.).

NOTE

Material damage due to incorrect dismounting/installation of the pump!

- ▶ Only specialist mechanics should complete dismounting/installation work.

NOTE

Material damage due to unsuitable components!

- ▶ Always replace lost or damaged screws with screws of the same strength where required.
- ▶ Only replace seals with seals of the same material.

NOTE

Material damage, fragile components!

- ▶ Install ceramic parts of the plain bearing and magnets of the magnetic coupling with care, do not strike them or knock them.

1. When installing please observe:
 - Replace worn parts with genuine spare parts.
 - Replace seals, inserting them in such a way that they are unable to rotate.
 - Do not apply synthetic or mineral oil, grease or cleaning agents to elastomer components.
 - Adhere to the prescribed tightening torques (→ 9.2.3 Tightening torques of casing screws, Page 26).
2. Installing the pump:
 - in reverse order to the dismounting (→ 7.3 Dismounting, Page 19).
 - → sectional drawing
3. Installing the pump in the system (→ 5 Setup and connection, Page 12).

8 Troubleshooting

If faults occur which are not specified in the following table or cannot be traced back to the specified causes, please consult the manufacturer.

Possible faults are identified by a fault number in the table below. This number identifies the respective cause and remedy in the troubleshooting list.

Fault	Number
Pump not pumping	1
Pumping rate insufficient	2
Pumping rate excessive	3
Pumping pressure insufficient	4
Pumping pressure excessive	5
Pump running roughly	6
Pump leaks	7
Excessive motor power uptake	8

Tab. 5 Fault/number assignment

Fault number								Cause	Remedy
1	2	3	4	5	6	7	8		
X	-	-	-	-	-	-	-	Pressure pipe closed by fitting	► Open the fitting.
X	X	-	X	-	X	-	-	Pump or suction strainer blocked or encrusted	► Clean intake/suction pipe, pump or suction strainer.
X	-	-	-	-	-	-	-	Transport and sealing cover still in place	► Remove the transport and sealing cover.
-	X	-	X	-	X	-	-	Back pressure of the system is too high, pump selected is too small.	► Consult the manufacturer.
-	X	-	X	-	X	-	-	Suction head too large: $NPSH_{pump}$ is larger than $NPSH_{system}$	► Increase pump inlet pressure. ► Consult the manufacturer.
X	-	-	-	-	X	-	-	Intake/suction pipe and pump not correctly vented or not completely filled	► Completely fill and vent pump and/or pipe.
X	X	-	X	-	X	-	-	Air is sucked in	► Check the filling level of the container.
X	X	-	X	-	X	-	-	Proportion of gas too high: pump is cavitating	► Consult the manufacturer.
-	X	-	X	-	X	-	-	Temperature of fluid is too high: pump is cavitating	► Increase pump inlet pressure. ► Lower temperature. ► Contact the manufacturer.
-	X	-	X	-	-	-	X	Viscosity or specific gravity of the pumped liquid outside the range specified for the pump	► Consult the manufacturer.
X	X	-	X	-	-	-	-	Geodetic differential head and/or pipe flow resistances too high	► Remove sediments from the pump and/or pressure pipe. ► Install a larger impeller and consult the manufacturer.
-	X	-	-	X	X	-	-	Pressure-side fitting not opened wide enough	► Open the pressure-side fitting.
X	X	-	-	X	X	-	-	Pressure pipe blocked	► Clean the pressure pipe.

Fault number								Cause	Remedy
1	2	3	4	5	6	7	8		
X	X	-	X	-	X	-	-	Pump running in the wrong direction	<ul style="list-style-type: none"> ▶ Check sense of rotation and correct it if necessary (→ 5.6.2 Check direction of rotation, Page 14).
X	X	-	X	-	-	-	-	Motor speed too low	<ul style="list-style-type: none"> ▶ Compare the required motor speed with the specifications on the pump type plate. Replace the motor if necessary. ▶ Increase the motor speed if speed control is available.
-	X	-	X	-	X	-	-	Pump parts worn	<ul style="list-style-type: none"> ▶ Replace the worn pump parts.
-	-	X	X	-	X	-	X	Pressure-side fitting opened too wide	<ul style="list-style-type: none"> ▶ Throttle down at the pressure-side fitting. ▶ Machine the impeller down. Consult manufacturer and modify impeller diameter.
-	-	X	-	-	X	-	X	Geodetic differential head, pipe flow resistances and/or other resistances lower than specified	<ul style="list-style-type: none"> ▶ Throttle down the flow rate at the pressure-side fitting. Observe the minimum flow rate. ▶ Machine the impeller down. Consult manufacturer and modify impeller diameter.
-	-	X	-	X	-	-	-	Viscosity lower than expected	<ul style="list-style-type: none"> ▶ Machine the impeller down. Consult manufacturer and modify impeller diameter.
-	-	X	-	X	X	-	X	Motor speed too high	<ul style="list-style-type: none"> ▶ Compare the required motor speed with the specifications on the pump type plate. Replace the motor if necessary. ▶ Reduce the motor speed if speed control is available.
-	-	X	-	X	X	-	X	Impeller diameter too large	<ul style="list-style-type: none"> ▶ Throttle down the flow rate at the pressure-side fitting. Observe the minimum flow rate. ▶ Machine the impeller down. Consult manufacturer and modify impeller diameter.
X	X	-	X	-	X	-	-	Impeller out of balance or blocked	<ul style="list-style-type: none"> ▶ Clean the impeller.
-	X	-	X	-	X	-	-	Hydraulic parts of the pump dirty, clotted or encrusted	<ul style="list-style-type: none"> ▶ Dismount the pump. ▶ Clean the parts.
-	-	-	-	-	X	-	X	Shaft bearing faulty	<ul style="list-style-type: none"> ▶ Replace shaft bearing.
-	-	-	-	-	X	-	X	Defective antifriction bearing in motor	<ul style="list-style-type: none"> ▶ Replace the antifriction bearing (→ manufacturer's specifications).
-	-	-	-	-	-	X	-	Connecting bolts not correctly tightened	<ul style="list-style-type: none"> ▶ Tighten the connecting bolts.
-	-	-	-	-	-	X	-	Faulty housing seal	<ul style="list-style-type: none"> ▶ Replace the housing seal.
-	-	-	-	-	X	X	X	Pump distorted	<ul style="list-style-type: none"> ▶ Check the pipe connections and pump attachment.
-	X	-	X	-	X	-	X	Motor running on 2 phases	<ul style="list-style-type: none"> ▶ Check the fuse and replace it if necessary. ▶ Check the cable connections and insulation.

Tab. 6 Troubleshooting list

9 Appendix

9.1 Replacement parts

9.1.1 Part numbers and designations

Part no.	Designation
010	Plating for the sole plate
020	Riser pipe adapter
102.01	Volute casing
102.02	Volute casing
132	Motor flange adapter
211	Intermediate shaft
213	Drive shaft
233	Impeller
322	Cylindrical roller bearing
323	Four point bearing
340	Bearing support stand
341	Pump mounting bracket
342	Bearing support stand
360.01	Bearing cap
360.02	Bearing cap
412.01	Radial rotary shaft seal
412.02	Radial rotary shaft seal
412.03	Radial rotary shaft seal
412.04	Radial rotary shaft seal
412.05	Radial rotary shaft seal
412.06	Radial rotary shaft seal
412.07	Radial rotary shaft seal
412.08	Radial rotary shaft seal
412.09	Radial rotary shaft seal
412.10	Radial rotary shaft seal
412.12	Radial rotary shaft seal
412.14	Radial rotary shaft seal
412.15	Radial rotary shaft seal
412.16	Radial rotary shaft seal
421.01	Radial shaft seal
421.02	Radial shaft seal
421.02	Radial shaft seal
421.04	Radial shaft seal
421.05	Lip seal

Part no.	Designation
421.06	Lip seal
441.01	Sealing lid
441.02	Clamping disk
524	Shaft sleeve
525.01	Drive for the shaft sleeve
525.02	Distance ring
543	Spacer
550.14	Supporting disc
550.16	Supporting disc
551	Shim washer
554.01	Washer
554.02	Washer
554.03	Washer
554.04	Washer
554.05	Washer
554.06	Washer
554.07	Washer
554.08	Washer
554.09	Washer
554.10	Washer
636.01	Grease nipple
636.02	Grease nipple
681.01	Guard to prevent reaching in
681.02	Guard to prevent reaching in
709.01	Hose
709.14	Hose
709.16	Hose
711	Riser pipe
713	Suspension pipe
714.01	Shaft protection tube
714.02	Shaft protection tube
723	Flange
731.01	Union
731.02	Union
731.03	Union
731.04	Union
731.05	Union

Part no.	Designation
739.01	Hose nozzle
739.02	Hose nozzle
757	Flow regulator
801	Flange motor
842	Claw coupling
893	Sole plate
901.04	Hexagon head bolt
901.06	Hexagon head bolt
901.09	Hexagon head bolt
901.12	Hexagon head bolt
902.01	Stud bolt
902.02	Stud bolt
902.05	Stud bolt
902.06	Stud bolt
902.08	Stud bolt
902.10	Stud bolt
902.14	Stud bolt
904	Headless setscrew
912	Plug screw
914.03	Cylinder screw
914.07	Cylinder screw
914.11	Cylinder screw
914.13	Countersunk-head head
914.15	Cylinder screw
914.17	Cylinder screw
920.01	Hexagon nut
920.02	Hexagon nut
920.05	Hexagon nut
920.06	Hexagon nut
920.08	Hexagon nut
920.10	Hexagon nut
920.12	Hexagon nut
920.14	Molded hexagon nut
920.16	Molded hexagon nut
921.01	Groove nut
921.02	Groove nut
931.01	Locking washer
931.02	Locking washer
932.01	Circlip

Part no.	Designation
932.02	Circlip
932.03	Safety washer
940	Key

Tab. 7 Designation of components according to part numbers

9.1.2 Sectional drawing

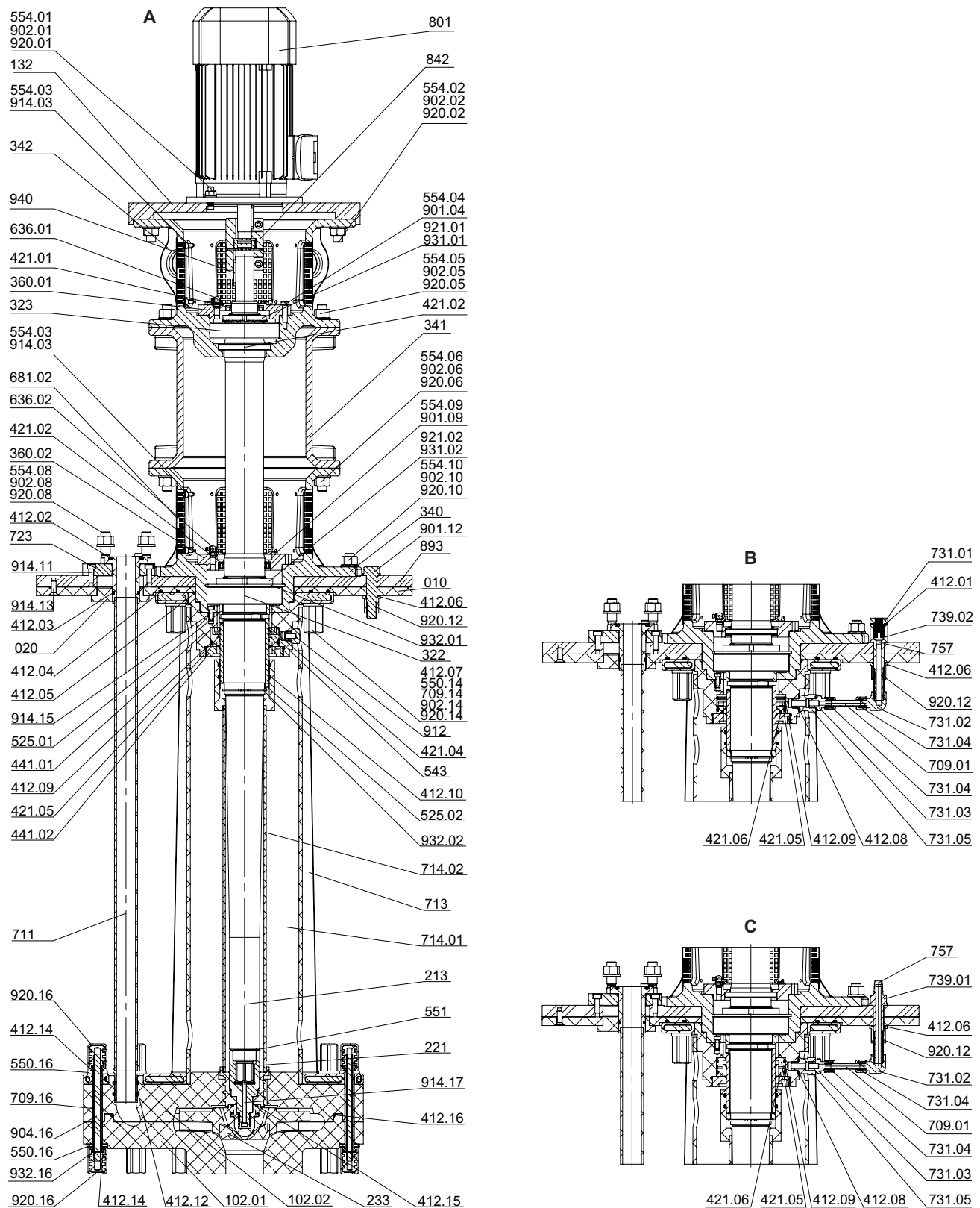



Fig. 6 Sectional drawing

A Shaft seal type OS


B Shaft seal type SG

C Shaft seal type ST

9.2 Technical specifications

 Further technical data (→ data sheet).

9.2.1 Ambient conditions

 Operation under any other ambient conditions should be agreed with the manufacturer.

Material	Temperature [°C]	Relative humidity [%]		Installation height above sea level [m]
		Long-term	Short-term	
PP-H	+5 to +50	≤ 85	≤ 100	≤ 1000
PVDF	-10 to +50	≤ 85	≤ 100	≤ 1000

Tab. 8 Ambient conditions


9.2.2 Flange tightening torques

		Tightening torque ¹⁾ MD [Nm] for the versions		
d [mm]	DN [mm]	Flat sealing ring up to max 10 bar	Profile sealing ring up to max 16 bar	O-ring max. 16 bar
40	32	20	15	15
63	50	30	20	20
90	80	35	20	20
110	100	35	20	20

Tab. 9 Flange tightening torques

1) Use a torque wrench

9.2.3 Tightening torques of casing screws

 Apply graphite paste to metallic connections prior to assembly.

Size	Metal / metal ¹⁾ [Nm]	Drive shaft / Intermediate shaft ²⁾ [Nm]	Metal / plastic ³⁾ [Nm]	Metal in metal inserts / plastic ⁴⁾ [Nm]
M6	9	17	6	5
M8	21	42	7	6
M10	42	83	14	10
M12	73	145	24	25
M16	170	–	63	30
M20	340	–	113	32

Tab. 10 Tightening torques of casing screws

1) Screws made of metal, screwed into nuts made of metal or metal housing parts.

2) Cylinder screws item 914.17 are only permitted with strength class 12.9.

3) Screws and nuts made of metal that tighten the plastic housing.

4) Screws made of metal, screwed into metal inserts in housing parts made of plastic. Inserts screwed-in or insert-molded.

9.2.4 Switching frequency

Motor power rating	Switch on / switch off actions per hour
0.18 kW ≤ motors ≤ 7.5 kW	15
11 kW ≤ motors ≤ 30 kW	12
30 kW < motors ≤ 37 kW	8
37 kW < motors ≤ 55 kW	6

Tab. 11 Switching frequency

9.2.5 Volumetric flow of liquid medium - minimum flow rate

Q _{min}	Short-time operation: 0.1 x Q _{opt} (approx. 5 min.) Continuous operation: 0.15 x Q _{opt}
Q _{max}	See pump capacity curve (→ data sheet)
Q _{opt}	Flow rate in pump capacity curve efficiency optimum

Tab. 12 Volumetric flow of liquid medium

If operating point differs, consult the manufacturer.

9.2.6 Sound pressure level

Maximum noise level LpA for 2-pole and 4-pole 50Hz/60Hz motors, in dB (A)

Noise level for 2-pole motors 2.2 kW to 11.0 kW

Motor power rating (size)	2.2 kW (90 S/L)		3.0 kW (100 L)		4.0 kW (112 M)		5.5 kW (132 S)		7.5 kW (132 S)		11.0 kW (160 M)	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
VCX 32-200	65	68	68	71	69	72	69	72	69	72	71	74
VCX 32-250									69	72	71	74
VCX 50-200							69	72	69	72	71	74
VCX 50-250									69	72	71	74
VCX 80-200									69	72	71	74
VCX 80-250											71	74

Tab. 13 Noise level for 2-pole motors 2.2 kW to 11.0 kW

Noise level for 2-pole motors 15.0 kW to 55.0 kW

Motor power rating (size)	15.0 kW (160 M)		18.5 kW (160 L)		22.0 kW (180 M)		30.0 kW (200 L)		37.0 kW (200 L)		45.0 kW (225 M1)		55.0 kW (225 M1)	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
VCX 32-200	71	74												
VCX 32-250	71	74	71	74	74	77	74	77						
VCX 50-200	71	74	71	74	74	77								
VCX 50-250	71	74	71	74	74	77	74	77	75	78				
VCX 80-200	71	74	71	74	74	77	74	77	75	78	74	77		
VCX 80-250	71	74	71	74	74	77	74	77	75	78	74	77	74	77
VCX 100-250											74	77	74	77

Tab. 14 Noise level for 2-pole motors 15.0 kW to 55.0 kW

Noise level for 4-pole motors 0.75 kW to 5.5 kW

Motor power rating (size)	0.75 kW (80 M)		1.1 kW (80 M)		1.5 kW (90 S/L)		2.2 kW (90 S/L)		3.0 kW (100 L)		4.0 kW (112 M)		5.5 kW (132 S)	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
VCX 32-200	54	57	57	60	57	60	61	64						
VCX 32-250					57	60	61	64	61	64	59	62	65	68
VCX 50-200			57	60	57	60	61	64	61	64	59	62		
VCX 50-250			57	60	57	60	61	64	61	64	59	62	65	68
VCX 50-315									61	64	59	62	65	68
VCX 80-200			57	60	57	60	61	64	61	64	59	62	65	68
VCX 80-250							61	64	61	64	59	62	65	68
VCX 80-315													65	68
VCX 100-250									61	64	59	62	65	68

Tab. 15 Noise level for 4-pole motors 0.75 kW to 5.5 kW

Noise level for 4-pole motors 7.5 kW to 37.0 kW

Motor power rating (size)	7.5 kW (132 S)		11.0 kW (160 M)		15.0 kW (160 M)		18.5 kW (160 L)		22.0 kW (180 M)		30.0 kW (200 L)		37.0 kW (200 L)	
	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
VCX 50-250	65	68	66	69										
VCX 50-315	65	68	66	69	66	69								
VCX 80-200	65	68												
VCX 80-250	65	68	66	69	66	69								
VCX 80-315	65	68	66	69	66	69	66	69	69	72	66	69	66	69
VCX 100-250	65	68	66	69	66	69	66	69	69	72	66	69		

Tab. 16 Noise level for 4-pole motors 7.5 kW to 37.0 kW

Measuring conditions:

- Distance to the pump: 1 m
- Operation: free of cavitation
- Motor: IEC standard motor
- Tolerance ± 3 dB
- Determination of the sound power by the sound intensity measurement method (DIN EN ISO 9614-2) and Determination of the workplace-related emission value (sound pressure level) LpA to DIN EN ISO 11203

9.2.7 Installation dimensions and filling heights

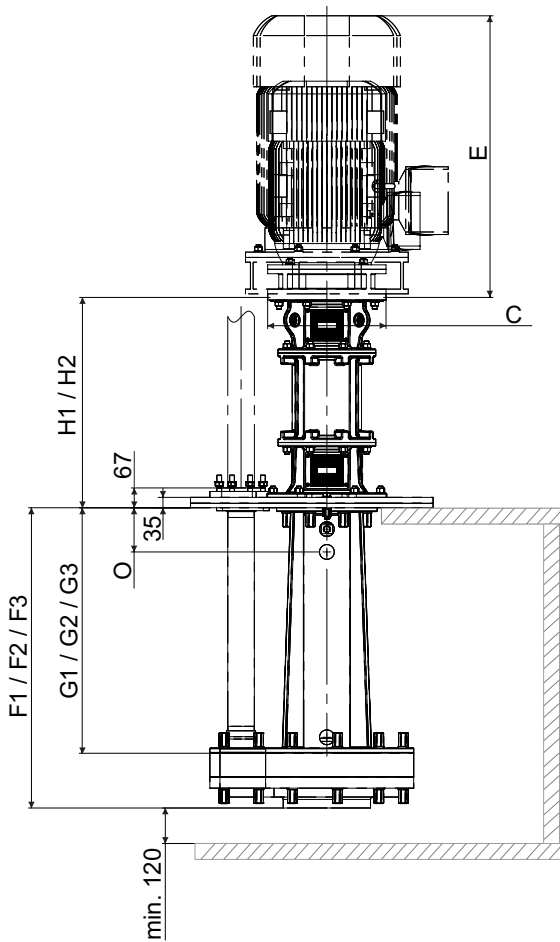


Fig. 7 Installation dimensions and filling heights [mm]

The dimensions of the motor are specified in the table below:

Motor size	C	E
	[mm]	
90 I	400	365
100 I	400	410
112 m	400	395
132 S/M	400	495
160 I	400	655
180 M/L	400	690
200 I	400	735
225 s	450	805
225 M1	540	885
225 M2	450	925
250 m	550	955
280 S1	550	1065

The minimum dimensions specified in the table must not be less than stated, nor the maximum dimensions greater than stated:

Pump size	Bearing carrier size	Immersion depth			Min. start-up level			Height of the bearing carrier/coupling		Max. start-up level
		F1	F2	F3	G1	G2	G3	H1	H2	O
		[mm]								
32-200	1	650	1000	1500	495	830	1330	408	651	150
32-250	1	650	1000	1500	495			408	651	
50-200	1	650	1000	1500	495			408	651	
50-250	2	–	1025	1525	–			–	711	
50-315	2	–	1025	1525	–			–	711	
80-200	2	–	1025	1525	–			–	711	
80-250	2	–	1025	1525	–			–	711	
80-315	2	–	1025	1525	–			–	711	
100-250	2	–	1025	1525	–	–	711			

Tab. 17 Installation dimensions

9.2.8 Values for adjusting the coupling

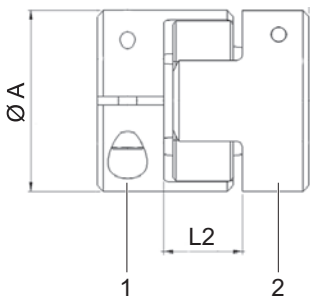


Fig. 8 Values for adjusting the coupling

- 1 Clamping hub, pump-side
- 2 Clamping hub, motor-side

Type WKE/H	A	L2	TA
Size	mm	mm	Nm
28	65	20	18
38	80	24	18
42	95	26	37
48	105	28	65
55	120	30	65
65	135	35	65
75	160	40	161

Tab. 18 Values for adjusting the coupling

9.3 Maintenance schedule

Designation	Interval	Maintenance
Operating temperatures	weekly	<ul style="list-style-type: none"> ▶ Check storage temperature. ▶ Check motor temperature.
Undoable screwed connections	weekly	▶ Check for correct and tight fitting.
Shaft bearing	Monthly	▶ Re-grease shaft bearing (→ 9.4 Lubrication, Page 31).
Coupling and intermediate ring	After the first 2,000 h (max. after 3 months)	▶ Perform a visual inspection.
	Every 4,000 h (max. after 1 year)	
Intermediate ring	3 years	▶ Replace intermediate ring.
	Event: <ul style="list-style-type: none"> • during routine inspections • during repairs to the drive train 	

Tab. 19 Maintenance schedule

9.4 Lubrication

9.4.1 Lubricating points

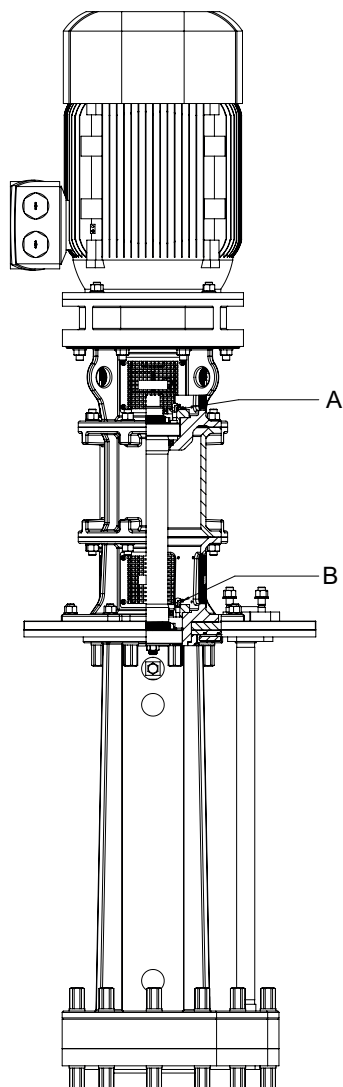


Fig. 9 Lubricating points (bearings A und B)

9.4.2 Lubricant


Manufacturer	Type of lubricant Temperature range -35 °C ... +140 °C
Aral	Aralub HL3
BP	Energraese LS3
Glissando	Glissando FT3 Glissando 30
Esso	Beacon 3
Mobilux	Mobilux EP3
Shell	Alvania R3

Tab. 20 Lubricant

Pump size	Bearing carrier size	Lubricant quantity [g]	
		Bearing A	Bearing B
32-200	1	17	20
32-250	1	17	20
50-200	1	17	20
50-250	2	20	27
50-315	2	20	27
80-200	2	20	27
80-250	2	20	27
80-315	2	20	27
100-250	2	20	27

Tab. 21 Lubricant quantities

9.5 Declaration of conformity in accordance with EC machinery directive

EU Declaration of Conformity	
	
Stübbe GmbH & Co. KG, Hollwieser Straße 5, 32602 Vlotho, Germany, declares on its own authority that the following products	
Description	
Centrifugal pumps with mechanical seal BE, BX, NX, SHB	
Magnetically-coupled pumps SHM	
Sump pumps ETLB, ETLB-E, ETLB-S, ETLB-ST, ETLB-T, ETLBW, VCX	
to which this declaration relates, are in conformity with the following standards:	
	Machinery Directive 2006/42/EC EMC Directive 2014/30/EU ROHS Directive 2011/65/EU With regard to electrical hazards the protective aims of Low Voltage Directive 2014/35/EU have been complied with according to Appendix I no. 1.5.1 of the Machinery Directive 2006/42/EU.
Place and date	Name and signature of authorized person
<u>Vlotho, 01.02.2022</u>	<u>pp Achim Kaesberg, Corporate Data</u>