Not Binding Operating and Assembly Instruction
Progressive Cavity Pump

This operating and assembly instruction is only for general information.

Type
BN 5-6LS up to 35-6LS
1 Safety
   1.1 Notes on these instructions
   1.2 Safety-related Information
   1.3 Designated use
   1.4 Foreseeable misuse
   1.5 Structure of warning notes
      1.5.1 Warning levels
      1.5.2 Warning symbols
   1.6 Qualification of the personnel
   1.7 Tasks, notes for the owners, operators and technicians
   1.8 Personal protective equipment
   1.9 Safety and protective devices

2 Description of the machine
   2.1 General description
   2.2 Mode of action and pumping principle of the machine
   2.3 Constructive design

3 Technical Data

4 Transport, Intermediate storage, Disposal
   4.1 Safety
   4.2 Transport
      4.2.1 Dimensions, weight and centre of gravity
      4.2.2 Symbol
      4.2.3 Lashing points (AP) for lifting devices
      4.2.4 Unpacking the machine
   4.3 Temporary storage/corrosion protection
   4.4 Disposal

5 Assembly / Installation
   5.1 Mounting tools / lifting gear
   5.2 Space requirement
   5.3 Assembly of the complete mounted machine
   5.4 Power supply of the machine
   5.5 Pipelines

6 Commissioning / De-Commissioning
   6.1 Commissioning report
6.2 Measures before commissioning
6.2.1 Checking pipelines
6.2.2 Protective devices on the pump
6.2.3 Electrical / hydraulic connections
6.2.4 Direction of rotation check
6.2.5 Additional devices - optional
6.3 Initial commissioning/repeated commissioning
6.3.1 Avoiding dry running of the pump
6.3.2 Pressure in the suction and pressure connection
6.4 De-commissioning
6.4.1 Switching off the pump
6.4.2 Emptying the pump
6.4.3 Dismantling the pump
6.4.4 Preservation/storage of the pump

7 Maintenance
7.1 Preventative measures
7.1.1 Machine down-time
7.2 Lubrication
7.2.1 Joint grease
7.3 Inspection

8 Malfunctions, causes, rectification

9 Dismantling / Reassembly
9.1 Dismantling
9.2 Reassembly
9.4 Mechanical seal
9.4.1 Safety
9.4.2 Application conditions and material version

10 Spare parts
10.1 Order template for spare parts

11 Special tools

12 Associated documents

13 Appendix
13.1 Manufacturer's documents / suppliers

Subsidiaries
1. Safety

1.1 Notes on these instructions

1.1.1 General notes

- Always keep the operating and maintenance instructions close by the machine.
- If problems cannot be solved with reference to the operating and maintenance instructions, please contact SEEPEX.

Observe the following points in addition to these operating and maintenance instructions:

- Prohibition, warning and mandatory signs, warning notes on the machine
- Relevant laws and ordinances
- Statutory provisions on accident prevention
- Corresponding harmonised standards and regulations

1.1.2 Validity of these instructions

- These operating and assembly instructions are valid exclusively for machines with the commission no. specified on the cover sheet.
- The operating and assembly instructions are correlated with the SEEPEX machine by means of the commission no. on the type plate (TYS).

Figure similar
1.1.3 Symbols, notes and abbreviations

1.1.3.1 Information symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>➢</td>
<td>Instruction/measure</td>
</tr>
<tr>
<td>–</td>
<td>supplementary instruction/measure</td>
</tr>
<tr>
<td>•</td>
<td>List item</td>
</tr>
<tr>
<td>!</td>
<td>Information</td>
</tr>
<tr>
<td>→</td>
<td>Cross-reference</td>
</tr>
</tbody>
</table>

1.1.3.2 Abbreviations

Abbreviations facilitate readability in drawings. Abbreviations are explained below:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Designation</th>
<th>Abbreviation</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANT</td>
<td>Drive</td>
<td>K</td>
<td>Terminal</td>
</tr>
<tr>
<td>AP</td>
<td>Lashing points</td>
<td>KF</td>
<td>Kinetic ring grease</td>
</tr>
<tr>
<td>ATG</td>
<td>Drive casing</td>
<td>KUL</td>
<td>Crank</td>
</tr>
<tr>
<td>CBH</td>
<td>Feed hopper screw fitting</td>
<td>P</td>
<td>Dimension for stator replacement</td>
</tr>
<tr>
<td>CFL</td>
<td>Flanged connection</td>
<td>RTE</td>
<td>Rotating unit</td>
</tr>
<tr>
<td>CTH</td>
<td>Threaded connection</td>
<td>S</td>
<td>Support</td>
</tr>
<tr>
<td>DFL</td>
<td>Flange seal</td>
<td>SCH</td>
<td>Screw fitting</td>
</tr>
<tr>
<td>ELT</td>
<td>Feed hopper</td>
<td>SCL</td>
<td>Holding band loop</td>
</tr>
<tr>
<td>ERD</td>
<td>Earth connection</td>
<td>SEA</td>
<td>Shaft sealing</td>
</tr>
<tr>
<td>FCO</td>
<td>Flange cover</td>
<td>SH</td>
<td>Protective cover</td>
</tr>
<tr>
<td>FLS</td>
<td>Flange bearing surface</td>
<td>SHL</td>
<td>Cutting lever</td>
</tr>
<tr>
<td>GC</td>
<td>Anti-seize graphite petroleum</td>
<td>SSU</td>
<td>Flush connection</td>
</tr>
<tr>
<td>GF</td>
<td>Joint grease</td>
<td>TSE</td>
<td>Dry-running protection device</td>
</tr>
<tr>
<td>GM</td>
<td>Lubricant</td>
<td>TYS</td>
<td>Type plate</td>
</tr>
<tr>
<td>GS</td>
<td>Soft soap</td>
<td>ZA</td>
<td>Sealing -/- centering surface</td>
</tr>
<tr>
<td>HBD</td>
<td>Holding band</td>
<td>ZD</td>
<td>Centering surface</td>
</tr>
<tr>
<td>HS</td>
<td>Label</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Safety

1.2 Safety-related Information

SEEPEX machines are built in accordance with the state of the art. Nevertheless, there is a residual risk, because the machine works with:

- Mechanical movements that pose a danger
- Electrical voltages and currents

1.3 Designated use

SEEPEX machines are individually configured. The machine is allocated to the operating and assembly instructions based on the commission no. The commission no. is indicated on the type plate of the machine and on the cover sheet of the operating and assembly instructions.

Observe the following points to ensure compliance with the intended use:

- Use the machine only for conveying media in accordance with the technical data (→ chapter 3)
- Use the machine only within the performance data as specified in the technical data (→ chapter 3)
- Make alterations and modifications to the machine only after obtaining the approval of SEEPEX
- Use the machine only in commercial and industrial areas
- Do not use the machine in explosive areas

1.4 Foreseeable misuse

Any use other than the intended use or any different use of the machine will be considered as improper use and can cause serious physical injury and damage to property.

In particular, the following is not admissible:

- Conveyance of conveying products other than those specified in the technical data (→ chapter 3)
- Operating the machine outside of the performance data specified in the technical data (→ chapter 3)
- Operating the machine without safety and protection devices
- Mechanical or electrical bypassing of machines or machine parts
- Use of parts other than the original parts
- Alterations, modification and manipulation
- Non-compliance with instructions and prescribed operating, maintenance and servicing conditions
- Non-compliance with the rules and regulations in the country of use and the statutory provisions and accident prevention regulations when handling the machine
- Operating the machine in explosive areas

1.5 Structure of warning notes

For the protection of personnel and for the safe and efficient use of the machine, observe warning notes.

Preceding warning notes

Preceding warning notes are placed at the beginning of each chapter or sequence of actions, and relate to the instructions following directly after.
1. Safety

**Preceding warning notes with warning or mandatory signs**
Specific dangers are identified with additional warning or mandatory signs.

*Example:*

**DANGER**

Type and source of danger.
Possible consequences.
➢ Measures to avert the danger.

**Embedded warning notes**
Embedded warning notes describe immediately relevant dangers, and are shown within a sequence of actions. They are placed immediately before the danger.

*Examples:*

➢ **WARNING** Type and source of danger. Possible consequences. Measures to avert the danger.

➢ **WARNING** Type and source of danger. Possible consequences. Measures to avert the danger.

1.5.1 **Warning levels**

Warning notes are identified by coloured warning symbols and signal word fields. The different warning levels are identified by additional signal words, and describe the extent of the danger.

*Personal injury*

**DANGER**

DANGER indicates a dangerous situation which, if not avoided, will result in death or serious injury.

**WARNING**

WARNING indicates a dangerous situation which, if not avoided, may result in death or serious injury.

**CAUTION**

CAUTION indicates a dangerous situation which, if not avoided, may result in minor or moderate injury.
1. Safety

Property damage

NOTICE

NOTICE is used when the situation is not associated with personal injury.

1.5.2 Warning symbols

In these operating and assembly instructions and on the machine, there are warning symbols.

- Ensure that these warning symbols are complied with.
- Warning symbols on the machine must be fully present and easily legible at all times.

<table>
<thead>
<tr>
<th>Warning symbols</th>
<th>Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Suspended load warning" /></td>
<td>Suspended load warning</td>
</tr>
<tr>
<td><img src="image" alt="Electric voltage warning" /></td>
<td>Electric voltage warning</td>
</tr>
<tr>
<td><img src="image" alt="Hot surface warning" /></td>
<td>Hot surface warning</td>
</tr>
<tr>
<td><img src="image" alt="Warning for automatic start" /></td>
<td>Warning for automatic start</td>
</tr>
</tbody>
</table>
Detailed technical knowledge is essential for performing any work on the machine, in order to be able to independently recognise and avoid potential dangers.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Person</th>
<th>Proven knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction of personnel</td>
<td>Owner</td>
<td>Knowledge of safety regulations</td>
</tr>
<tr>
<td>Definition of responsibilities</td>
<td></td>
<td>Knowledge of these operating and assembly instructions</td>
</tr>
<tr>
<td>Definition of responsibilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring of adequate qualification of personnel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>Operator</td>
<td>Instruction for the machine</td>
</tr>
<tr>
<td>Operational monitoring</td>
<td></td>
<td>Before starting any activity, the operating and assembly instructions must be read and understood</td>
</tr>
<tr>
<td>Easy maintenance work and troubleshooting</td>
<td></td>
<td>Knowledge of safety devices and regulations</td>
</tr>
<tr>
<td>Electrical installation</td>
<td>Electrical technician</td>
<td>Technical training, knowledge and experience with the machine in relation to electrical components</td>
</tr>
<tr>
<td>Commissioning</td>
<td></td>
<td>Knowledge of the relevant standards and regulations</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td>Safe handling of tools</td>
</tr>
<tr>
<td>Repair</td>
<td></td>
<td>Knowledge of these operating and assembly instructions</td>
</tr>
<tr>
<td>Decommissioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assembly and dismantling</td>
<td>Mechanical technician</td>
<td>Technical training, knowledge and experience with the machine in relation to mechanical components</td>
</tr>
<tr>
<td>Commissioning</td>
<td></td>
<td>Knowledge of the relevant standards and regulations</td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
<td>Safe handling of tools</td>
</tr>
<tr>
<td>Repair</td>
<td></td>
<td>Knowledge of these operating and assembly instructions</td>
</tr>
<tr>
<td>Decommissioning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assembly and dismantling</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Safety

1.7 Tasks, notes for the owners, operators and technicians

- Do not work on the machine or plant unless it is at a standstill and depressurised.
- Switch off the main switch and pull out the power plug before starting work on live components.
- Observe the procedure for shutting down the machine (→ chapter 6).
  - Follow decommissioning procedure.
  - Secure the machine against recommissioning.
- On completion of all work, attach all safety and protective devices and make sure they are functioning.
- Refer to chapter Commissioning before recommissioning the machine (→ chapter 6).

1.8 Personal protective equipment

- Wear personal protective equipment and/or additional equipment for your own safety.

<table>
<thead>
<tr>
<th>Sign</th>
<th>Meaning</th>
<th>Scope of application</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Safety Shoes" /></td>
<td>Wear safety shoes</td>
<td>Work in the area of the machine</td>
</tr>
<tr>
<td><img src="image2" alt="Eye Protection" /></td>
<td>Wear eye protection</td>
<td>Work on the machine during which parts may be ejected at speed and parts may be pressurised</td>
</tr>
<tr>
<td><img src="image3" alt="Gloves" /></td>
<td>Wear protective gloves</td>
<td>Possible contact with aggressive media, hot surfaces or sharp edges</td>
</tr>
<tr>
<td><img src="image4" alt="Ear Protection" /></td>
<td>Wear ear protection</td>
<td>Sustained sound pressure level &gt; C 75 dB (A)</td>
</tr>
</tbody>
</table>
1. Safety

1.9 Safety and protective devices

- Before commissioning, bolt SEEPEX machines to a suitable foundation to ensure stability.
- Start-stop equipment must be clearly recognisable. In order to avoid errors, the operator must arrange corresponding measures.

Protective devices protect those persons who are attempting to reach danger areas without additional help and under the conditions defined for various situations of reaching up, reaching under or reaching through.

- Equip pump with a protective device
  - In order to prevent contact with hot surfaces
  - In order to prevent contact with moving parts
    - Use finger probe to check protective device.

<table>
<thead>
<tr>
<th>Sign</th>
<th>Meaning</th>
<th>Scope of application</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="https://example.com/helmet.png" alt="Helmet" /></td>
<td>Wear safety helmet</td>
<td>Work with suspended loads and overhead work</td>
</tr>
<tr>
<td><img src="https://example.com/clothing.png" alt="Clothing" /></td>
<td>Wear protective clothing</td>
<td>Possible contact with aggressive media</td>
</tr>
</tbody>
</table>
2.1 General description

seepex pumps are members of the group of rotating displacement pumps.

- Characteristic features
  - Special configuration/arrangement of the rotor and stator pumping elements.
  - Motion sequence

2.2 Mode of action and pumping principle of the seepex pump

- Sealing bands are produced through geometric design/contact of both conveying elements.
- Sealing bands ensure a perfect fit between the suction and pressure side.

Result:
- Increased pump suction.
- Higher pressure build-up independent of speed possible.

2.3 Constructive design

<table>
<thead>
<tr>
<th>No.</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANT</td>
<td>Drive</td>
</tr>
<tr>
<td>200</td>
<td>Lantern</td>
</tr>
<tr>
<td>307</td>
<td>Plug-in shaft</td>
</tr>
<tr>
<td>400</td>
<td>Coupling rod</td>
</tr>
<tr>
<td>SEA</td>
<td>Shaft seal</td>
</tr>
<tr>
<td>500</td>
<td>Suction casing</td>
</tr>
<tr>
<td>600</td>
<td>Rotor</td>
</tr>
<tr>
<td>RTE</td>
<td>Rotating unit</td>
</tr>
<tr>
<td>601</td>
<td>Stator</td>
</tr>
<tr>
<td>700</td>
<td>Pressure branch</td>
</tr>
</tbody>
</table>
3.1 Data sheet

3.2 Characteristic Curves

3.3 Declaration

- Data sheet, characteristic curves and declarations are commission specific documents and not part of this not binding operating and assembly instruction.
4.1 Safety

**CAUTION**

Damage to property/injuries due to incorrect transport
Slight injury or damage to property can occur

- Comply with the safety notes and transport notes on the packaging.
- Use suitable means of transport, lifting devices and tools.
- Use protective equipment.

4.2 Transport

4.2.1 Dimensions, weights and center of gravity

- Note the dimensional drawing (→ chapter 5.6).

4.2.2 Symbols

- Meaning of symbol

Top  
Fragile item  
Against moisture protect  
Centre of gravity  
Lashing points

4.2.3 Sling points (AP) for lifting devices

**WARNING**

Warning of suspended load.
Death of serious injury can occur.

- Use the lashing points (AP) for lifting devices.
- Note the centre of gravity (→ dimensional drawing, chapter 5.6).

Lifting machine  
Industrial trucks

4.2.4 Unpacking the machine

- Comply with the symbols and notices on the packaging.
- Remove the screwed connection between the machine and packaging.
- Remove the machine with a lifting machine/industrial truck.

4.3 Temporary storage/Corrosion protection

- All seepex machines have corrosion protection applied as standard prior to transport.
4.4 Disposal

**NOTICE**

**Damage to property if corrosion protection is missing**

Property damage can occur due to corrosion.
- Temporary storage must be in a dry, enclosed, frost-free room in order to provide protection against ambient influences.
- Contact seepex regarding the necessary corrosion protection for temporary storage.

**NOTICE**

**Environmental protection**

Material damage can occur.
- Drain the pumping medium and dispose of it in accordance with the regulations.
- Dispose of the machine with regard to its composition and existing regulations.
5.1 Mounting tools / lifting gear

**CAUTION**

Pump falling over.
Slight injury or damage to property can occur.

- Adhere to the lifting tool’s starting point.
- Pay attention to the dimensions, weight and centre of gravity of the pump.
- Use suitable mounting tools/lifting gear.

5.2 Space requirement

The required space should be determined by considering the following factors:
- Dimensions and weight.
- Requisite transport and lifting equipment.
- Pipe routing – dismantling (dimension for stator replacement).

5.2.1 Dimension for stator replacement (P)

<table>
<thead>
<tr>
<th>Range</th>
<th>Dimension (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6LS</td>
<td>320 mm</td>
</tr>
<tr>
<td>10-6LS</td>
<td>350 mm</td>
</tr>
<tr>
<td>17-6LS</td>
<td>405 mm</td>
</tr>
<tr>
<td>35-6LS</td>
<td>510 mm</td>
</tr>
<tr>
<td>52-6LS</td>
<td>570 mm</td>
</tr>
<tr>
<td>70-6LS</td>
<td>605 mm</td>
</tr>
<tr>
<td>100-6LS</td>
<td>605 mm</td>
</tr>
<tr>
<td>130-6LS</td>
<td>720 mm</td>
</tr>
</tbody>
</table>

5.3 Assembly of the complete mounted pump

- Assemble according to technical data (→ chapter 3.).
- Note dimensional drawing.

**Tension-free mounting of the pump**

- Balance unevenness with suitable supports.
- Applies to mounting on foundations/load-bearing elements.
- Total areas of all pump bearing areas are resting on the surface.

**Correct position of the drives**

- All drives are set up ready for operation and mounted.
- Correct displacements of the drive during transport/installation of the pump by adjusting/fixing the drive.

**CAUTION**

Safety protection equipment.
Slight injury or damage to property may result.

- Connect safety protection equipment and activate.
5.4 Power supply of the seepex pump

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply voltage and power frequency.</strong></td>
</tr>
<tr>
<td>Death or serious injury will result.</td>
</tr>
<tr>
<td>➢ Heed type plate on the pump.</td>
</tr>
<tr>
<td>➢ Pay attention to manufacturer’s directions (→ chapter 13.).</td>
</tr>
<tr>
<td>➢ Pay attention to safety regulations.</td>
</tr>
</tbody>
</table>

5.5 Pipelines

5.5.1 Suction and pressure connection

- Refer to the dimensional drawing for the position, nominal width and standard.
- Note direction of rotation/flow direction.

5.5.2 Pipeline dimensions

- Adhere to specifications regarding pressure in the pressure respectively suction connection.
- Note technical data (→ chapter 3.).
- Nominal width of suction pipe = nominal width of suction connection of pumps.

5.5.3 Residue-free pipelines

<table>
<thead>
<tr>
<th>NOTICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Damage to property caused by residues from installation</strong></td>
</tr>
<tr>
<td>Failure to comply invalidates the warranty.</td>
</tr>
<tr>
<td>➢ Keep all pipelines free from foreign bodies.</td>
</tr>
<tr>
<td>➢ Remove welding spatter, bolts, steel chips, etc.</td>
</tr>
</tbody>
</table>

5.5.4 Tension-free assembly

- Assemble pipelines and other components in a tension-free manner on the pump.
6.1 Commissioning report

Send commissioning report online to www.seepex.com

Must be specified with every order!

Commission: __________________________ Model: __________________________

Contact person: .............................................
Tel.: ..........................................................
Fax: ..........................................................
E-mail: ......................................................

Customer Service: 
seepex GmbH
Postfach 10 15 64
D-46215 Bottrop
service@seepex.com

Germany Phone: +49 2041.996-231 Fax: +49 2041.996-431
Rest of Europe Phone: +49 2041.996-224 Fax: +49 2041.996-424
Outside Europe Phone: +49 2041.996-120 Fax: +49 2041.996-432

Address of plant:

Delivery date:
Date of installation:
Assembly check carried out on:

Please enter operational data:
Conveying liquid:
Temperature:
Fuse level/motor protection or power consumption:
Frequency control  □ no □ yes
If yes:
  □ Supplied by seepex
  □ Supplied by customer
  □ Frequency:
  □ Speed:
  □ Power consumption:

Place, date __________________________ Signature / company stamp __________________________
6.2 Measures before commissioning

➢ Note the technical data (→ chapter 3.).

6.2.1 Checking pipelines

➢ Check flange screwed connections (SCH).

➢ Check threaded connections (G).

NOTICE

Ensure the liquid can flow through without obstruction. Malfunction and/or irreparable damage to the pump.
➢ Open all shut-off elements before switching on the pump.

6.2.2 Protective devices on the pump

DANGER

Missing protective device.
Danger of pulling in and crushing.
➢ Equip the pump with a protective device. Protective devices provided for preventing contact with surfaces or moving parts must be regarded as suitable if contact is not possible in a test involving a test finger, with regard to the penetration possibility, strength and shock resistance.
➢ Comply with national protection regulations.
➢ In pumps with an open suction flange/feed hopper, attach touch protection. These safety clearances protect those persons who are attempting to reach danger areas without additional help and under the conditions defined for various situations of reaching up, reaching under or reaching through.
In shaft seals, touch protection is only necessary if there are components on the rotating shaft.

6.2.3 Electrical/hydraulic connections

DANGER

Dangerous voltage.
Death or serious injury can occur.
➢ Note safety regulations.
➢ Disconnect motor from all sources of energy.
➢ Secure electrical connections against restarting.
6.2.4 Direction of rotation check

- The pump direction of rotation determines the flow direction of the pumping medium.
- Note the direction of rotation arrow on the type plate.

6.2.5 Additional devices - optional

- Refer to additional devices (→ chapter 12.1).

6.3 Initial commissioning/repeated commissioning

- Start up the pump.

**NOTICE**

**Dry running of the pump.**
Malfunction and/or irreparable damage to the pump.
- Fill the suction casing with liquid in order to lubricate the pumping elements.

6.3.1 Avoid dry running of the pump

**NOTICE**

**High temperature between rotor and stator.**
Stator material burned. Complete failure of the pump.
- Make sure that the suction-side conveying capacity does not cavitate.
- If this cannot be guaranteed on the machine side, assemble a seepex dry running protection (TSE).

6.3.2 Pressure in the suction and pressure connection

**CAUTION**

**High pressure.**
Malfunction and/or irreparable damage to the shaft seal or pump.
- Maintain pressure in the suction connection in accordance with the technical data (→ chapter 3.).

**Recommendation:**
- Assemble an oil-filled contact pressure gauge to monitor and deactivate the pump.
6.4 De-commissioning

Protect the pump and additional devices against the following:

- Frost
- Deposit of solids
- Sedimentation from the liquid
- Corrosion of parts that come into contact with the medium

6.4.1 Switching off the pump

**DANGER**

Dangerous voltage.
Death or serious injury can occur.

- Note safety regulations.
- Disconnect motor from all sources of energy.
- Secure electrical connections against restarting.

6.4.2 Emptying the pump

**CAUTION**

Liquid draining out.
Minor injury or damage to property can occur.

- Wear suitable protective clothing.
- Refer to the technical data (→ chapter 3.) for the corresponding configuration of the pump housing.

To drain the pump:

- If the pump housing has screwed plugs, remove the screwed plugs.
- Drain using a connection branch (suction casing, pressure branch) if the pump housing is coated or the housing does not have screwed plugs.
- Drain the residual liquid from the pump housing.
- Drain the pipelines on the suction and pressure sides, or shut off behind the pump connections.
6.4.3 Removing the pump

**WARNING**

- Risk of pump tipping or falling. Death or serious injury can occur.
- Support the drive unit to guarantee stability.

**Pipeline dismantling**

- Remove flange bolts (SCH) and flange seals (DFL).
- Remove bolts (SCH) from the pump feet.

**Pipeline dismantling**

- Remove threaded connections (G).
- Remove bolts (SCH) from the pump feet.

6.4.4 Preservation/storage of the pump

**NOTICE**

- Damage to property due to lack of corrosion protection. Property damage can occur due to corrosion.
- Contact Seepex to discuss suitable preservation measures.
  - State the commission number of the pump.
7.1 Preventive measures

The maintenance personnel must have these operating instructions, follow them and also require corresponding qualifications.

DANGER

Dangerous voltage.
Death or serious injury can occur.

- Note safety regulations.
- Disconnect pump from all sources of energy.
- Secure electrical connections against restarting.

7.1.1 Pump down-time

NOTICE

Pump down-time.
Production failure due to wear.

- Acquisition of a set of wearing parts and a set of gaskets.

7.2 Lubrication

<table>
<thead>
<tr>
<th>No.</th>
<th>Denomination</th>
<th>Lubricant</th>
<th>Lubricant change in operating hours</th>
<th>Fill volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pin joint</td>
<td>seepex special grease *</td>
<td>10000 h</td>
<td>*</td>
</tr>
<tr>
<td>2</td>
<td>Pin joint</td>
<td>seepex special grease *</td>
<td>10000 h</td>
<td>*</td>
</tr>
<tr>
<td>3</td>
<td>Drive</td>
<td>Refer to manufacturer’s documentation (chapter 13_,_)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Lubricant</th>
<th>Fill volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotor/stator</td>
<td>Conveying medium</td>
<td>---</td>
</tr>
<tr>
<td>Shaft seal</td>
<td>Conveying medium</td>
<td>---</td>
</tr>
</tbody>
</table>

* Type and filling quantities are commission specific information.
7.2.1 Joint grease

**NOTICE**

**Other grease types.**
Malfunction and/or irreparable damage to the joints or the pump.
- Exclusively use seepex special grease.

7.3 Inspection

<table>
<thead>
<tr>
<th>Component</th>
<th>Interval</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joints</td>
<td>Every 10,000 operating hours</td>
<td>Renew joint grease</td>
</tr>
<tr>
<td>Stator</td>
<td>Every week</td>
<td>Visual check for leaks</td>
</tr>
<tr>
<td>Shaft seal</td>
<td>Every week</td>
<td>Visual check for leaks</td>
</tr>
<tr>
<td>Drive unit</td>
<td>Every 3000 operating hours, at least every 6 months</td>
<td>Comply with manufacturer's documentation</td>
</tr>
</tbody>
</table>
Refer to technical data (chapter 3.) for application range of the pump.

<table>
<thead>
<tr>
<th>Malfunction</th>
<th>Causes</th>
<th>Rectification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump is not sucking</td>
<td>X X X Static friction between stator/rotor too great.</td>
<td>Apply lubricant (liquid soap) between stator and rotor.</td>
</tr>
<tr>
<td>Pump pumping unevenly</td>
<td>X</td>
<td>In correct direction of rotation.</td>
</tr>
<tr>
<td>Conveying capacity not reached</td>
<td>X</td>
<td>Check direction of rotation and swap over motor connections if necessary.</td>
</tr>
<tr>
<td>Pressure head is not reached</td>
<td>X</td>
<td>Suction pipe or shaft seal leaking.</td>
</tr>
<tr>
<td>Pump does not start up</td>
<td>X X X Suction head too great.</td>
<td>Check suction head, if necessary increase pipe cross section on suction pipe and use a larger filter, open suction-side valve fully.</td>
</tr>
<tr>
<td>Pump does not pump</td>
<td>X</td>
<td>Viscosity of conveying product too great.</td>
</tr>
<tr>
<td>Pump is loud when running</td>
<td>X X X Viscosity of conveying product too great.</td>
<td>Check/adapt (data sheet).</td>
</tr>
<tr>
<td>Motor gets too hot</td>
<td>X X Pump rotation speed incorrect.</td>
<td>Correct rotation speed (data sheet).</td>
</tr>
<tr>
<td>Premature stator wear</td>
<td>X X Pressure head too great.</td>
<td>Check pressure head with pressure gauge, reduce pressure head by using larger pressure pipe crossed section or shortening the pressure pipe.</td>
</tr>
<tr>
<td>Shaft seal is leaky</td>
<td>X X X Pressure head too great.</td>
<td>Check pressure head with pressure gauge, reduce pressure head by using larger pressure pipe crossed section or shortening the pressure pipe.</td>
</tr>
<tr>
<td></td>
<td>X X X Pump running partially/completely dry.</td>
<td>Check there is adequate conveying product available on the suction side. Dry running protection DRP.</td>
</tr>
<tr>
<td></td>
<td>X X Check coupling.</td>
<td>If necessary, move pump in relation to drive, check wear on coupling gear, re-adjust coupling if necessary.</td>
</tr>
<tr>
<td></td>
<td>X X Rotation speed too low.</td>
<td>Increase rotation speed for low-viscosity media/large suction volume.</td>
</tr>
<tr>
<td>Malfunction</td>
<td>Causes</td>
<td>Rectification</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pump is not sucking</td>
<td>X</td>
<td>Rotation speed too high. Reduce rotation speed for high-viscosity media, risk of cavitation.</td>
</tr>
<tr>
<td>Pump pumping unevenly</td>
<td>X</td>
<td>Joint play too large. Check mounting of coupling rod bushing.</td>
</tr>
<tr>
<td>Conveying capacity is not achieved</td>
<td>X</td>
<td>X Foreign objects in pump. Dismantle pump, remove foreign bodies, replace defective parts.</td>
</tr>
<tr>
<td>Pressure head is not reached</td>
<td>X</td>
<td>Stator/rotor worn. Dismantle pump and renew defective parts.</td>
</tr>
<tr>
<td>Pump does not start up</td>
<td>X</td>
<td>Joint parts worn. Renew joint parts, use seepex pin joint grease.</td>
</tr>
<tr>
<td>Pump seized / pump does not pump</td>
<td>X</td>
<td>Suction pipe blocked. Clean the suction pipe.</td>
</tr>
<tr>
<td>Motor gets too hot</td>
<td>X</td>
<td>Temperature of pumping liquid too high. Check temperature, use an undersize rotor.</td>
</tr>
<tr>
<td>Shaft seal is leaky</td>
<td>X</td>
<td>Gland packing too firm/worn. Loosen packing gland or tighten. Renew unusable packing rings.</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Solid content and/or grain size too great. Reduce pump speed, install screen with permitted mesh width. Increase liquid proportion.</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Conveying product hardens when the temperature drops below a certain limit.  Heat the pump.</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Stator swollen and unable to withstand conveying product. Select a suitable stator material, use an undersize rotor.</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Bearings in pump drive housing or drive unit defective. Renew bearings.</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Mechanical seal defective. Check sliprings and O-rings for wear/resistance, renew if necessary.</td>
</tr>
</tbody>
</table>
9.1 Dismantling

All work steps and tools required for dismantling are specified in this chapter.

3-D ANIMATIONS

In addition to your SEEPEX operating and assembly instructions, 3-D animations of the individual dismantling steps are available.

Start animations

For printed operating and assembly instructions, scan the adjacent QR code.
9.1 Dismantling

9.1.1 Keep tools ready for the dismantling

Recommended tools

Keep the listed tools ready (not part of the delivery scope):

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hammer</td>
</tr>
<tr>
<td></td>
<td>Set allen keys</td>
</tr>
<tr>
<td></td>
<td>Set ring spanners size 10 - size 30</td>
</tr>
<tr>
<td></td>
<td>Set fork spanners size 10 - size 30</td>
</tr>
<tr>
<td></td>
<td>Metal saw (WH)</td>
</tr>
<tr>
<td></td>
<td>Screwdriver (WS)</td>
</tr>
<tr>
<td></td>
<td>Chisel (WM)</td>
</tr>
<tr>
<td></td>
<td>Circlip pliers (WZ)</td>
</tr>
</tbody>
</table>

Recommended special tools

Special tools are not part of the delivery scope.

- Order special tools using the order form (→ chapter 11).

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assembly mandrel (W4)</td>
</tr>
<tr>
<td></td>
<td>Drift (W5)</td>
</tr>
</tbody>
</table>
9.1 Dismantling

**Recommended auxiliary materials**

Keep the auxiliary materials listed available (not included in the scope of delivery):

- Lubricant (GM)

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mounting lever (W9)</td>
</tr>
<tr>
<td></td>
<td>Dismantling tool (W10)</td>
</tr>
</tbody>
</table>

**NOTICE**

Damage to property due to inadequate lubricants (GM).
Damage to components. Contamination of the conveying medium.
- Observe resistance to the materials used and the conveying medium.
- Use suitable lubricants (GM) only.

9.1.2 Prepare pump for dismantling

- Follow the instructions in the chapter Shut-down (→ chapter 6).

9.1.3 Dismantle pump

**WARNING** Risk of injury due to lack of stability of pump. Crushing of body parts due to the pump or pump parts tipping or falling down.

- Fasten base plate (GPU) to secure pump.
  - Recommendation: Fasten to suitable base using a screw fitting (SCH).
9.1 Dismantling

9.1.3.1 Dismantle stator (601)

Dismantle dry-running protection device (TSE) (optional)

**NOTICE** Damage to pump sided parts of the dry-running protection device (TSE) during dismantling the stator.

- Before dismantling the stator, remove all pump sided parts of the dry-running protection device (TSE).
  - Observe the chapter Options and additional accessories (→ chapter 12.1).

---

**WARNING**

Leaking conveying medium.
Personal injury and/or material damage can occur.

- Take safety precautions to protect people and the environment.
- Wear suitable protective clothing.
- When handling hazardous substances, comply with applicable regulations.

- Dismantle screw fitting (637, 639).
- Remove upper adjusting segments (635).

- Remove upper stator half (601).
9.1 Dismantling

- Secure lower adjusting segments (635) to prevent them from falling down.
- Dismantle screw fitting (637, 639).
- Remove adjusting segments (635).

- Remove lower stator half (601).

9.1.3.2 Dismantle rotor (600)

- Prop up rotor (600) with support (S).

- Slide circlip (643) onto rotor (600).
  - Use tool (WZ).
- Slide support ring (682) towards rotor (600).
9.1 Dismantling

- Remove the lock washer (683).
  - Use a suitable tool (WS).

- Remove rotor (600) from rotor head (640).
- Remove support (S).

- Remove circlip (643), support ring (682) and O-ring (642) from the rotor (600).

9.1.3.3 Dismantle pressure branch (700)

- Dismantle screw fitting (SCH).
- Remove pressure branch (700).
9.1 Dismantling

- Dismantle screw fitting (720, 721).
- Remove segment retainer (671).
- Remove O-ring (731) from the centering device of pressure branch (700).

9.1.3.4 Dismantle suction casing (500)

- Remove screw fitting (506, 507, 509).
- Remove suction casing (500) and casing gasket (501).

- Dismantle screw fitting (622, 623).
- Remove segment retainer (672).
- Remove O-ring (561) from the centering device of suction casing (500).

9.1.3.5 Dismantle rotating unit (RTE)

Dismantle flush connection (SSU) (optional)

- Remove flush connection (SSU) from the casing of the shaft sealing (SEA).
9.1 Dismantling

- Raise/reposition splash ring (310) to remove plug-in shaft pin (309).

- Eject plug-in shaft pin (309).
  - Use a suitable tool (WS).

- Assemble tool (W10) as contact surface for mounting lever (W9).

- Pull off rotating unit (RTE) with shaft seal (SEA) from output shaft of drive (ANT).
  - Use tool (W9).
9.1 Dismantling

9.1.3.6 Remove rotor head (640), coupling rod (400), plug-in shaft (307)

Dismantle holding band (406, 407)

- Dismantle tool (**W10**).

- Remove splash ring (310) and shaft seal casing (**SEA**) from plug-in shaft (307).
  - See dismantling of shaft seal (**SEA**) (→ chapter 9.4).

- Parts can be ejected at speed. Risk of injury to eyes. Wear safety goggles.

- Disconnect holding band loop (**SCL**).
  - Use suitable tools (**WH**).

- Press out parts of the holding band loop (**SCL**).

- Remove holding band (**406, 407**).

Separate joint - rotor side

- Pull back universal joint sleeve (**405**).
9.1 Dismantling

- Push retaining sleeve (401) off the rotor head (640).
  - Use a suitable tool (WM).

- Knock out coupling rod pin (402).
  - Use tool (W5).

- Bend rotor head (640).
- Knock out guide bushings (403).
  - Use tool (W5).

- Remove rotor head (640) and retaining sleeve (401) from coupling rod (400).

- For easier dismantling, apply lubricant (GM) to the interior of the universal joint sleeve (405) and the outer surface of the coupling rod (400).
- Remove universal joint sleeve (405) from coupling rod (400).
9.1 Dismantling

Separate joint - drive side

- For easier dismantling, apply lubricant (GM) to the interior of the universal joint sleeve (405) and the outer surface of the coupling rod (400).
- Remove universal joint sleeve (405) from coupling rod (400).

- Push retaining sleeve (401) off the plug-in shaft (307).
  - Use a suitable tool (WM).
- Remove retaining sleeve (401).

- Eject coupling rod pins (402).
  - Use tool (W5).

- Bend the coupling rod (400).
- Knock guide bushing (403).
  - Use tool (W5).

- Remove coupling rod (400) from plug-in shaft (307).
9.1.3.7 Dismantle lantern (200) and drive (ANT)

- Dismantle screw fitting (210, 212, 213).
- Remove drive (ANT) from lantern (200).
- Dismantle screw fitting (SCH).
- Remove lantern (200) from base plate (GPU).
9.2 Reassembly

All work steps and tools required for reassembly are specified in this chapter.

3-D ANIMATIONS

In addition to your SEEPEX operating and assembly instructions, 3-D animations of the individual assembly steps are available.

Start animations

For printed operating and assembly instructions, scan the adjacent QR code.
9.2 Reassembly

9.2.1 Keep tools ready for assembly

**Recommended tools**

Keep the listed tools ready (not part of the delivery scope):

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hammer</td>
</tr>
<tr>
<td></td>
<td>Set allen keys</td>
</tr>
<tr>
<td></td>
<td>Set ring spanners size 10 - size 30</td>
</tr>
<tr>
<td></td>
<td>Set fork spanners size 10 - size 30</td>
</tr>
<tr>
<td></td>
<td>Screwdriver (WS)</td>
</tr>
<tr>
<td></td>
<td>Pliers (WFZ)</td>
</tr>
<tr>
<td></td>
<td>Centre punch (WK)</td>
</tr>
<tr>
<td></td>
<td>Spirit level (WW)</td>
</tr>
<tr>
<td></td>
<td>Circlip pliers (WZ)</td>
</tr>
<tr>
<td></td>
<td>Belt shears (WBS)</td>
</tr>
<tr>
<td></td>
<td>Cartridge gun (WF)</td>
</tr>
</tbody>
</table>

**Recommended special tools**

Special tools are part of the delivery scope.

- Order special tools using the order form (→ chapter 11).
9.2 Reassembly

Recommended auxiliary materials

Keep the auxiliary materials listed available (not included in the scope of delivery):

- Soft soap (GS)
- Anti-seize graphite petroleum (GC)
- SEEPEX joint grease (GF)

**NOTICE**

Damage to property due to inadequate lubricants (GM).
Damage to components. Contamination of the conveying medium.

- Observe resistance to the materials used and the conveying medium.
- Use suitable lubricants (GM) only.

<table>
<thead>
<tr>
<th>Illustration</th>
<th>Denomination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mounting tool (W3)</td>
</tr>
<tr>
<td></td>
<td>Assembly mandrel (W4)</td>
</tr>
<tr>
<td></td>
<td>Drift (W5)</td>
</tr>
<tr>
<td></td>
<td>Mounting lever (W9)</td>
</tr>
<tr>
<td></td>
<td>Dismantling tool (W10)</td>
</tr>
<tr>
<td></td>
<td>Feeler gauge (W30)</td>
</tr>
</tbody>
</table>

9.2.2 Prepare components parts for assembly

9.2.2.1 Prepare rotor head (640) for assembly

- Remove any damage.
- Clean rotor head (640).
9.2 Reassembly

9.2.2.2 Prepare coupling rod (400) for assembly

- Clean coupling rod (400).
- **NOTICE** Malfunction of the joints. Malfunction and/or destruction of the joints.
- Check coupling rod bushings (404) for wear.
  - In the event of wear, replace coupling rod (400), including the coupling rod bushings (404).

9.2.2.3 Prepare plug-in shaft (307) for assembly

- Remove any damage.
- Clean plug-in shaft (307).
- **NOTICE** Malfunction of the joints. Malfunction and/or destruction of the joints. Renew coupling rod pin (402) and guide bushings (403) together.
- Drive in guide bushings (403) (Depth X = 2/3).
  - Use tool (W4).

9.2.2.4 Prepare holding band (406, 407)

- Use prefabricated double-band holding bands only.
9.2.3 Assemble pump

**WARNING** Risk of injury due to lack of stability of the pump. Crushing of body parts due to the pump or pump parts tipping or falling down.

- Check the holding band (406, 407)
  - Bent-over holding band (406, 407) is in contact with holding band loop (SCL) to avoid damaging universal joint sleeve (405).
  - Press on holding band (406, 407) using tool (WFZ) if necessary.

- Fasten base plate (GPU) to secure pump.
  - Recommendation: Fasten to suitable base using a screw fitting (SCH).

9.2.3.1 Assemble lantern (200) and drive (ANT)

- Assemble lantern (200) with screw fitting (SCH) on base plate (GPU).
- Clean flange bearing surfaces (FLS), centering surface (ZD) and output shaft of the drive (ANT).
- Assemble drive (ANT) with screw fitting (210, 212, 213) on lantern (200).
9.2 Reassembly

9.2.3.2 Assemble rotor head (640), coupling rod (400), plug-in shaft (307)

Connect rotor head (640) with coupling rod (400)

- Fill rotor head (640) with SEEPEX joint grease (GF).
  - Use tool (WF).
- Slide coupling rod (400) into rotor head (640).
- Push on retaining sleeve (401).

- Insert coupling rod pin (402).

- Knock the guide bushings (403) in.
  - Use tool (W5).

- Slide retaining sleeve (401) onto rotor head (640).
  - Use tool (W4).
9.2 Reassembly

Secure retaining sleeve (401) - rotor-side

- Secure retaining sleeve (401) at a distance of 180° by means of material deformation at the rotor head (640).
  - Use a suitable tool (WK).

Assemble universal joint sleeve (405) - rotor-side

- For simpler assembly of the universal joint sleeve (405), moisten the outer surface of coupling rod (400) with SEEPEX joint grease (GF).
- Fill interior of universal joint sleeve (405) with SEEPEX joint grease (GF).
  - Filling grade SEEPEX joint grease (GF) find in the document Maintenance (→ chapter 7).
  - Use tool (WF).
- Slide universal joint sleeve (405) onto joint.

**NOTICE** Damage of universal joint sleeve due to sharp tools. Leak in universal joint sleeve.

- Ventilate inner area of joint by lifting the universal joint sleeve (405).
  - Use a suitable tool (WS).

Assemble holding band - rotor-side

- Slide holding bands (406, 407) loosely onto universal joint sleeve (405).
9.2 Reassembly

- Tighten holding band (406, 407) - rotor-side
  - Insert holding band (406, 407) into tool (W3).
  - Clamp holding band firmly using eccentric lever (EX).
  - Turn crank (KUL) until the holding band (406, 407) is tensioned and is in contact with holding band loop (SCL).
  - Carefully pull the holding band (406, 407) together until it is in contact with the universal joint sleeve around the circumference.

**Correct**
The holding band (406, 407) has drawn in the outer shape of the universal joint sleeve and is firmly seated.

**False**
Holding band (406, 407) too loose, can slip off.

**Incorrect**
The holding band (406, 407) is too tight, universal joint sleeve will be damaged/sheared off.

- Cant up the holding band (406, 407).
- Swivel mounting tool (W3) approx. 60° upwards.
- Loosen crank (KUL) by a half turn.
- Swivel cutting lever (SH) forward until the pressure piece is lying behind the holding band loop (SCL).
Shear off holding band (406, 407) for material design stainless steel, corrosion-resistant steel

**NOTICE** Universal joint sleeve can be damaged by hammering and striking. Joint grease (GF) can leak out. Avoid hammering or striking the universal joint sleeve.

- Refer to the technical data (→ chapter 3) for the material design.
- Shear off holding band (406, 407) below holding band loop (SCL).
  - Strike cutting lever (SH) with the palm of your hand.
- Straighten the holding band (406, 407) carefully if it lifts up at the sheared-off end.

Cut off holding band (406, 407) for material design stainless steel, heat-resistant steel

**NOTICE** Universal joint sleeve can be damaged by hammering and striking. Joint grease (GF) can leak out. Avoid hammering or striking the universal joint sleeve.

- Refer to the technical data (→ chapter 3) for the material design.
- Cut off holding band (406, 407) below holding band loop (SCL).
  - Use tool (WBS).
- File down and deburr any projecting edges.

- The holding band (406, 407) must lie in the groove of the universal joint sleeve (405).
- Replace the holding band (406, 407) if the holding band (406, 407) slips back through the loop.
9.2 Reassembly

Connect coupling rod (400) and plug-in shaft (307)

- For easier assembly of the universal joint sleeve (405), lubricate the outer surface of coupling rod (400) with SEEPEX joint grease (GF).
- Slide holding bands (406, 407) and universal joint sleeve (405) onto coupling rod (400).

- Fill interior of joint head with SEEPEX joint grease (GF).
  - Use tool (WF).
- Slide the retaining sleeve (401) and plug-in shaft (307) onto the coupling rod (400).

- Insert coupling rod pin (402).

- Knock the guide bushings (403) in.
  - Use tool (W5).
9.2 Reassembly

- Slide retaining sleeve (401) onto plug-in shaft (307).
  - Use tool (W4).

Secure retaining sleeve (401) - drive side

- Secure retaining sleeve (401) at a distance of 180° by means of material deformation at plug-in shaft (307).
  - Use a suitable tool (WK).

Assemble universal joint sleeve (405) - drive side

- Fill the inside of universal joint sleeve (405) with SEEPEX joint grease (GF).
  - For filling grade of SEEPEX joint grease (GF), refer to the maintenance document (→ chapter 7).
  - Use tool (WF).
- Slide universal joint sleeve (405) onto joint.
9.2 Reassembly

**NOTICE** Damage of universal joint sleeve due to sharp tools. Leak in universal joint sleeve.
- Ventilate inner area of joint by lifting the universal joint sleeve (405).
  - Use a suitable tool (WS).

Assemble holding band - drive-side

- Slide holding bands (406, 407) loosely onto universal joint sleeve (405).

- Tighten holding band (406, 407) - drive-side.
  - Insert holding band (406, 407) into tool (W3).
  - Clamp holding band firmly using eccentric lever (EX).
  - Turn crank (KUL) until the holding band (406, 407) is tensioned and is in contact with holding band loop (SCL).
  - Carefully pull the holding band (406, 407) together until it is in contact with the universal joint sleeve around the circumference.

Correct
The holding band (406, 407) has drawn in the outer shape of the universal joint sleeve and is firmly seated.
False
Holding band (406, 407) too loose, can slip off.

Incorrect
The holding band (406, 407) is too tight, universal joint sleeve will be damaged/sheared off.

- Cant up the holding band (406, 407).
- Swivel mounting tool (W3) approx. 60° upwards.
- Loosen crank (KUL) by a half turn.
- Swivel cutting lever (SH) forward until the pressure piece is lying behind the holding band loop (SCL).

Shear off holding band (406, 407) for material design stainless steel, corrosion-resistant steel

NOTICE Universal joint sleeve can be damaged by hammering and striking. Joint grease (GF) can leak out. Avoid hammering or striking the universal joint sleeve.

- Refer to the technical data (→ chapter 3) for the material design.
- Shear off holding band (406, 407) below holding band loop (SCL).
  - Strike cutting lever (SH) with the palm of your hand.
- Straighten the holding band (406, 407) carefully if it lifts up at the sheared-off end.
9.2 Reassembly

**Cut off holding band (406, 407) for material design stainless steel, heat-resistant steel**

**NOTICE** Universal joint sleeve can be damaged by hammering and striking. Joint grease (GF) can leak out. Avoid hammering or striking the universal joint sleeve.

- Refer to the technical data (→ chapter 3) for the material design.
- Cut off holding band (406, 407) below holding band loop (SCL).
  - Use tool (WBS).
- File down and deburr any projecting edges.
- The holding band (406, 407) must lie in the groove of the universal joint sleeve (405).
- Replace the holding band (406, 407) if the holding band (406, 407) slips back through the loop.

**9.2.3.3 Assemble rotating unit (RTE)**

- Slide shaft seal casing (SEA) onto plug-in shaft (307).
  - See chapter Shaft seal reassembly (→ chapter 9.4).

- Moisten inner surface of splash ring (310) and outer surface of plug-in shaft (307) with anti-seize graphite petroleum (GC) for easier assembly of the splash ring (310).
- Slide splash ring (310) onto plug-in shaft (307).
  - Observe fitting position of splash ring (E) (lettering „SEA“).
9.2 Reassembly

- Moisten output shaft of drive (ANT) with anti-seize graphite petroleum (GC) for easier assembly of the rotating unit (RTE).
- Push rotating unit (RTE) onto output shaft of the drive (ANT).

- Moisten plug-in shaft pin (309) with anti-seize graphite petroleum (GC) and insert into the plug-in shaft (307).

- Note position of splash ring (310).
- Insert splash ring collar at a distance of 0.5 mm from the lantern (200).
9.2 Reassembly

Assemble the flush connection (SSU) (optional)

- Assemble flush connection (SSU).

9.2.3.4 Prepare suction casing (700) for assembly

- Clean sealing/centering surface (ZA).
- Moisten O-ring (561) with soft soap (GS) and insert it into the seal face/centering device (ZA) of the suction casing (500).

9.2.3.5 Assemble suction casing (500)

- Push on suction casing gasket (501).
- Assemble and align suction casing (500) with screw fitting (506, 507, 509) on lantern (200).
  - Use spirit level (WW).
- Tighten screw fitting (506, 507, 509).
9.2 Reassembly

- Assemble and align segment retainer (672) with screw fitting (622, 623) on suction casing (500).
  - Use spirit level (WW).
- Tighten screw fitting (622 623).

9.2.3.6 Prepare pressure branch (700) for assembly

- Clean the sealing / centering surface (ZA).
- Apply soft soap (GS) to the O-ring (731) and place it on the sealing / centering surface (ZA) of the pressure branch (700).

- Assemble and align segment retainer (671) with screw fitting (720, 721) on pressure branch (700).
  - Use spirit level (WW).
- Tighten screw fitting (720 721).

9.2.3.7 Assemble pressure branch (700)

- Align pressure branch (700) on base plate (GPU).
  - Assemble pressure branch (700) with screw fitting (SCH.1) on base plate (GPU).
  - If required, loosen screw fitting (SCH.2) on lantern (200).
  - Use at least 2 adjusting segments (635) opposite each other for the alignment. To secure, gently tighten hexagon nuts (639).
- Tighten screw fittings (SCH.1, SCH.2) on pressure branch (700) and lantern (200).
9.2 Reassembly

9.2.3.8 Assemble rotor (600)

- Dismantle screw fitting (639) and remove adjusting segments (635).

- Insert O-ring (642) into circumferential groove of the rotor (600).

- Slide circlip (643) and support ring (682) onto rotor (600).
  - Observe the fitting position of support ring (682).

- Moisten inner surface of rotor head (640) with anti-seize graphite petroleum (GC).
- Slide rotor (600) into rotor head (640).
  - Note position of the groove (X).
- Prop up rotor (600) with support (S).
9.2 Reassembly

9.2.3.9 Assemble stator (601)

- Press rotor (600) into the rotor head (640).
  - Use tool (W9).
  - Protect segment retainer (671) against possible damage and deformation.

- Insert lock washer (683) into the rotor head (640).

- Slide on support ring (682) onto the rotor head (640).
- Secure support ring (682) with circlip (643).
  - Use tool (WZ).
- Remove support (S) from rotor (600).

**NOTICE**
Moisten stator outer surfaces with soft soap (GS).
Damage to stator halves (601).
- For easier assembly, only coat seal faces, stator internal surfaces of stator halves (601) and rotor (600) with soft soap (GS).
9.2 Reassembly

- Attach the lower half of the stator (601).
- Press the stator half (601) onto the tapered surfaces of the segment retainer (671, 672) and align it.

**NOTICE** Avoid damage to the stator surfaces. The tapered surfaces of stator halves (601) must contact the tapered surfaces of the segment retainers (671, 672).

- Observe the segment order.
  - * = A-A, B-B, C-C, D-D

- Fix the lower adjusting segments (635) with screw fitting (637, 639) to the segment retainers (671, 672).
  - Observe segment allocation (A-A).

- Tighten the screws (637, 639) until the adjusting segments (635) minimal (X) interlock with the guide of the segment retainer (671, 672).
9.2 Reassembly

- Attach the upper stator half (601).

- Align the long side of the upper half of the stator (601.o) to the lower half of the stator (601.u).

- Fix the upper adjusting segments (635) with screw fitting (637, 639) to the segment retainers (671, 672).
  - Observe the segment order (A-A, B-B, C-C, D-D).

- Tighten the screws (637, 639) until the adjusting segments (635) minimal (X) interlock with the guide of the segment retainer (671, 672).
9.2 Reassembly

Assembling the dry-running protection device (TSE) (optional)

- Assemble dry-running protection device (TSE).
  - Refer to chapter Options and Additional accessories (→ chapter 12.1).

9.2.3.10 Smart Stator setting

**NOTICE**

Motor overload due to excessive compression between rotor and stator.
Damage to pump and drive can occur.
- Do not exceed drive power consumption value established with new rotor and stator.
- Observe commissioning report (→ chapter 6.1).

**NOTICE**

Gap between stator halves due to inappropriate setting.
Possible leakage at stator.
- Set stator halves according to specified basic and precision setting.

Adjusting segments (635) - Basic setting

- Tighten adjusting segments (635) by means of hexagon nuts (639) at first in 180° steps.
  - Observe the order: 1-1', 2-2, 3-3', 4-4'.
  - Set identical gap dimensions (SM) on all adjusting segments.
Tighten adjusting segments (635) by means of hexagon nuts (639) in max. 90° steps.
- Observe the order: 1-1’, 2-2, 3-3’, 4-4’.
- Set identical gap dimensions (SM) on all adjusting segments.
- Use tool (W30). Attachment point to be at the centre of the gap.
9.4 / 9.5 Shaft sealing

9.4.1 Safety

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaft seal is leaky. Leakage may escape into the atmosphere.</td>
</tr>
<tr>
<td>➢ Take safety measures to protect persons and the environment.</td>
</tr>
<tr>
<td>➢ Wear suitable protective clothing.</td>
</tr>
<tr>
<td>➢ Dispose of leakage appropriately.</td>
</tr>
<tr>
<td>➢ Note applicable regulations when handling hazardous substances.</td>
</tr>
</tbody>
</table>

9.4.2 Operating conditions and material combination

- Adjust to the relevant application
10.1 Spare parts list

10.2 Sectional drawing and parts list
## Ordering spare parts

### Commission number

The commission number and type are printed on the type plate of your SEEPEX machine.

### Type


### Request

After placing the order, you will receive an order confirmation and deadline before the parts are shipped.

### Order


### Your data

First Name 
Surname 
Company 
Department 
Street 
Postcode, City 
Telephone 
Fax 
E-mail 

### Our contact data

Customer Service
Fax +49.2041.996-5350
service@seepex.com
10. Spare parts

Order spare parts or complete packages tailored to your pump type.

*Spare parts*

**Plug-in shaft and shaft seal**

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>Packing ring (set) *</td>
<td></td>
</tr>
<tr>
<td>307</td>
<td>Plug-in shaft</td>
<td></td>
</tr>
<tr>
<td>309</td>
<td>Plug-in shaft pin</td>
<td></td>
</tr>
<tr>
<td>310</td>
<td>Splash ring</td>
<td></td>
</tr>
<tr>
<td>311</td>
<td>Flushing ring *</td>
<td></td>
</tr>
<tr>
<td>330</td>
<td>Mechanical seal *</td>
<td></td>
</tr>
</tbody>
</table>

**Coupling rod and joint parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>Coupling rod + Coupling rod bushing</td>
<td></td>
</tr>
<tr>
<td>401</td>
<td>Retaining sleeve</td>
<td></td>
</tr>
<tr>
<td>402</td>
<td>Coupling rod pin</td>
<td></td>
</tr>
<tr>
<td>403</td>
<td>Guide bushing</td>
<td></td>
</tr>
<tr>
<td>405</td>
<td>Universal joint sleeve</td>
<td></td>
</tr>
<tr>
<td>406</td>
<td>Holding band</td>
<td></td>
</tr>
<tr>
<td>407</td>
<td>Holding band</td>
<td></td>
</tr>
</tbody>
</table>
### Pumping elements

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>Rotor</td>
<td></td>
</tr>
<tr>
<td>601</td>
<td>Stator half</td>
<td></td>
</tr>
<tr>
<td>640</td>
<td>Rotor head</td>
<td></td>
</tr>
<tr>
<td>642</td>
<td>O-ring</td>
<td></td>
</tr>
<tr>
<td>643</td>
<td>Clirclip</td>
<td></td>
</tr>
<tr>
<td>682</td>
<td>Support ring</td>
<td></td>
</tr>
<tr>
<td>683</td>
<td>Locking plate</td>
<td></td>
</tr>
</tbody>
</table>

### Miscellaneous parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>501</td>
<td>Casing gasket</td>
<td></td>
</tr>
<tr>
<td>503</td>
<td>Sealing ring</td>
<td></td>
</tr>
<tr>
<td>511</td>
<td>Seal *</td>
<td></td>
</tr>
<tr>
<td>517</td>
<td>Sealing ring *</td>
<td></td>
</tr>
<tr>
<td>706</td>
<td>Sealing ring</td>
<td></td>
</tr>
<tr>
<td>098</td>
<td>Joint grease (GF) = 300 g (~ 315 cm³)</td>
<td></td>
</tr>
</tbody>
</table>

for the required grease quantity refer to chapter 10

### Complete packages

### Small wearing parts package

<table>
<thead>
<tr>
<th></th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x Rotor (600)</td>
<td></td>
</tr>
<tr>
<td>2 x Stator half (601)</td>
<td></td>
</tr>
<tr>
<td>1 x O-ring (642)</td>
<td></td>
</tr>
<tr>
<td>1 x Clirclip (643)</td>
<td></td>
</tr>
<tr>
<td>1 x Support ring (682)</td>
<td></td>
</tr>
<tr>
<td>1 x Locking plate (683)</td>
<td></td>
</tr>
</tbody>
</table>
10. Spare parts

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 x Packing ring (set) (301) *</td>
</tr>
<tr>
<td></td>
<td>1 x Plug-in shaft (307)</td>
</tr>
<tr>
<td></td>
<td>1 x Splash ring (310)</td>
</tr>
<tr>
<td></td>
<td>1 x Flushing ring (311) *</td>
</tr>
<tr>
<td></td>
<td>1 x Mechanical seal (330) *</td>
</tr>
<tr>
<td></td>
<td>1 x Coupling rod (400)</td>
</tr>
<tr>
<td></td>
<td>2 x Retaining sleeve (401)</td>
</tr>
<tr>
<td></td>
<td>2 x Coupling rod pin (402)</td>
</tr>
<tr>
<td></td>
<td>4 x Guide bushing (403)</td>
</tr>
<tr>
<td></td>
<td>2 x Universal joint sleeve (405)</td>
</tr>
<tr>
<td></td>
<td>2 x Holding band (406)</td>
</tr>
<tr>
<td></td>
<td>2 x Holding band (407)</td>
</tr>
<tr>
<td></td>
<td>1 x Casing gasket (501)</td>
</tr>
<tr>
<td></td>
<td>1 x Rotor (600)</td>
</tr>
<tr>
<td></td>
<td>2 x Stator half (601)</td>
</tr>
<tr>
<td></td>
<td>1 x Rotor head (640)</td>
</tr>
<tr>
<td></td>
<td>1 x O-ring (642)</td>
</tr>
<tr>
<td></td>
<td>1 x Circlip (643)</td>
</tr>
<tr>
<td></td>
<td>1 x Support ring (682)</td>
</tr>
<tr>
<td></td>
<td>1 x Locking plate (683)</td>
</tr>
<tr>
<td></td>
<td>Joint grease (098)</td>
</tr>
</tbody>
</table>

* according to pump design

Place, date

Signature, company stamp
11. Special tools

Ordering special tools

Commission number .................................................................

The commission number and type are printed on the type plate of your SEEPEX machine.

Type .........................................................................................

Request

Order

After placing the order, you will receive an order confirmation and deadline before the parts are shipped.

Your data

First Name ..............................................................................

Surname ................................................................................

Company ...............................................................................

Department ............................................................................

Street .....................................................................................

Postcode, City .........................................................................

Telephone ..............................................................................

Fax ........................................................................................

E-mail ....................................................................................

Our contact data

Customer Service
Fax +49.2041.996-5350
service@seepex.com
11. Special tools

Your order

Order special tools tailored to your pump type.

<table>
<thead>
<tr>
<th>Tool no.</th>
<th>Denomination</th>
<th>For assembly of</th>
<th>Order no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1</td>
<td>Packing puller</td>
<td>Packing*</td>
<td>PKZ</td>
</tr>
<tr>
<td>W3</td>
<td>Mounting tool</td>
<td>Holding band</td>
<td>MHB</td>
</tr>
<tr>
<td>W4</td>
<td>Assembly mandrel</td>
<td>Joint</td>
<td>MTD</td>
</tr>
<tr>
<td>W5</td>
<td>Drift</td>
<td>Joint</td>
<td>DHS</td>
</tr>
<tr>
<td>W9</td>
<td>Mounting lever</td>
<td>General</td>
<td>MHL</td>
</tr>
<tr>
<td>W10</td>
<td>Dismantling tool</td>
<td>Plug-in shaft</td>
<td>AZV</td>
</tr>
<tr>
<td>W29</td>
<td>Hoisting device incl. tension belt</td>
<td>Rotor SST, SCT</td>
<td>MVR</td>
</tr>
<tr>
<td>W30</td>
<td>Feeler gauge</td>
<td>Adjusting segment</td>
<td>ESL</td>
</tr>
</tbody>
</table>

*see sectional drawing and parts list (→ Chapter 10.2)

Place, date

Signature, company stamp
12.1 Accessories/Technical information

- Accessories and technical information are commission specific documents not part of this not binding operating and assembly instruction.
13.1 Manufacturer's and supplier's documents

- Manufacturer's and supplier's documents are commission specific documents and not part of this not binding operating and assembly instruction.
Great Britain
SEEPEX UK Ltd.
3 Armtech Row
Houndstone Business Park
Yeovil Somerset BA22 8RW
Tel +44.1935.472376
Fax +44.1935.479836
sales@seepex.co.uk

Austria
SEEPEX GmbH
Vertriebsbüro Österreich
Obermüllergasse 18
3003 Gailitz
Tel +43.2231.610850
Fax +43.2231.6108520
hfriedl@seepex.com

Belgium
SEEPEX GmbH
Bureau België
Industriekind Klein Gent-Link 21
Wervaartstraat 14-1 bus 15
2200 Herentals
Tel +32.14.501471
Fax +32.14.501481
seepex.be@seepex.com

Denmark
SEEPEX Nordic A/S
Krakasvej 7C
3400 Hillerød
Tel +45.49.192200
Fax + 45.49.193200
info.nordic@seepex.com

France
SEEPEX France SARL
1, Rue Pelletour
77183 Croissy Beaubourg
Tel +33.1.64114450
Fax + 33.1.64114489
info.fr@seepex.com

Hungary
SEEPEX GmbH
Magyarországi iroda
Heckó Tamás okl.vill.mérn.
Eva utca 5.
7632 Pécs
Tel +36.205806134
Fax +36.72952587
theckso@seepex.com

Ireland
SEEPEX UK Ltd.
Branch Office Ireland
29 Lackenfunke
Dungarvan
Co. Waterford
Tel +353.860450439
sales@seepex.co.uk

Poland
SEEPEX GmbH
Przedstawicielstwo w Polsce
ul. Romana Maya 1
61-371 Poznan
Tel +48.61.6469270
Fax +48.61.6469271
info.pl@seepex.com

Sweden
SEEPEX Nordic A/S
Hamndalsvägen 58
61633 Åby
Tel +46.1166940
Fax +46.1166941
info.nordic@seepex.com

The Netherlands
SEEPEX GmbH
Bureau Nederland
Visbystraat 13
7418 BE Deventer
Tel +31.570.516644
Fax +31.570.516077
seepex.nl@seepex.com

Russia
SEEPEX Ltd. Ugreshskaya
Str. 2 Bldg. 23
115088 Moscow
Tel +7.495.2874830
Fax +7.495.2874830
info.cis@seepex.com

USA
SEEPEX Inc.
511 Speedway Drive
Enon
Ohio 45323
Tel +1.937.8647150
Fax + 1.937.8647157
sales@seepex.net

China
SEEPEX Pumps (Shanghai) Co., Ltd.
Xuanzhong Rd. 399, Building 13
Nanhui Industrial Area
201300 Shanghai
Tel +86.21.38108888
Fax +86.21.38108999
info.cn@seepex.com

India
SEEPEX India Pvt. Ltd.
Office No. 305.
Raheja Arcade Building
Sector 11, C.B.D. Belapur
Navi Mumbai 400614
Tel +91.22.40240434/35
Fax +91.22.40240436
info.ind@seepex.com

Japan
日本シーピークス株式会社
5-2-44 Onna, Atsugi-shi,
Kanagawa-ken, 243-0032
Tel +81.46.2595941
Fax +81.46.2595941
info.jp@seepex.com

Malaysia
SEEPEX (M) Sdn. Bhd.
No. 2, Jalan 51/20A
Kaw. Perindustrian Tiong Nam
Secuay 51
46050 Petaling Jaya
Selengor Darul Ehsan
Tel +60.3.88009988
seepex.m@seepex.com

Australia
SEEPEX Australia Pty. Ltd.
Unit 3, 4 Bounty Close
Tuggerah Business Park
NSW 2259
Tel +61.2.43554500
Fax +61.2.43554022
info.au@seepex.com

More SEEPEX sales partners in Europe,
America, Asia, Africa and Oceania
you will find on our website.