

Operating and Maintenance Instructions Progressive Cavity Pump

Range

MD

Non binding Operating and Maintenance Instructions

seepex operating and maintenance instructions are individually compiled for each pump. These operating instructions are non binding and give only an overview. Binding operating instructions can be requested using the email address om@seepex.com. For this purpose, please also indicate the relevant pump comm. number.

This operating and maintenance instruction includes important safety information and instructions for installation, commissioning, operating and maintenance of the **seepex** machinery. It is essential therefore, that the responsible specialist refers to it before starting any work on the machinery as well as prior to commissioning. Furthermore, this instruction must always be available on site.



Operating and Maintenance Instructions Progressive Cavity Pump

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1. General

1.1 Application

These operating instructions contain basic information on the installation, commissioning and maintenance of **seepex** machines. Compliance with the work steps described in the individual sections is essential.

1.2 Details of the seepex machines

1.2.1 Operating Instructions

The Commission Number (comm. no) assigns the operating instructions to a particular **seepex** machine. The operating instructions are produced in relation to a specific job/commission and are valid only for the machine whose comm. no. is identical with that indicated on the cover sheet and possessing the associated data sheet, Point 9.

1.2.2 Manufacturer

The machines were manufactured by **seepex**.

1.2.3 Range, Size, Version

of the machines are stated in the appended data sheet, Point 9.

1.2.4 Machine Comm. No. and Year of Construction

are stated on the type plate at the machine.

1.2.5 Release Date of the Operating Instructions

is stated on the cover sheet of the operating instructions.

1.2.6 Modifications, Notes of Modification

If modifications to the machines are carried out in agreement with **seepex**, a new set of operating instructions will be provided, or the existing operating instructions will be supplemented by an additional sheet together with a new cover sheet. The date of modification and modification index will be noted on the new cover sheet.

1.2.7 EEC Machine Directive

1.2.7.1 Manufacturer's Declaration

seepex Manufacturer's Declaration as required by the EEC Machine Directive 89/392/EEC, Appendix II B:

The **seepex** machines delivered in accordance with our design are intended to be fitted in one machine or assembled together with other machines to form one machine/plant. The commissioning of the machine is forbidden until such a time as has been established that the entire machine/plant satisfies the requirements of the EEC Directive for Machines as amended 91/368/EEC and 93/44/EEC.

Particular attention must be paid to the safety requirements specified in EN809 (s and Equipment for Fluids) as well as the information in these operating instructions.

1.2.7.2 Declaration of Conformity

seepex machines possessing no safety accessories do not fulfill the requirements of the EEC Machine Directive 89/392/EEC as amended 91/368/EEC and 93/44/EEC.

For this reason, no Declaration of Conformity as required by the EEC Machine Directive 89/392/EEC, Appendix IIA can be issued before appropriate safety devices have been installed/mounted on the machine and/or plant with due regard to the information given in these operating instructions.

The following harmonized standards are particularly applicable:
EN 809, EN292T1, EN292T2
Applicable national standards and specifications must be taken into consideration.

Following assessment of the conformity of the machine/plant with the EEC Machine Directive, customers may on their own initiative place on the full machine/plant the EEC symbol 'CE' as defined in Identification Directive 93/68/EEC.

CAUTION

This documentation must be kept available for at least 10 years.



1.2.8 Copyright and Industrial Property Rights

These operating instructions are copyrighted. The reproduction, in particular by photocopying, of these instructions is not permitted (§§ 54, 54 UrhG) and constitutes a criminal offence (§ 106 UrhG). Proceedings will be instituted if the copyright is violated.

1.2.9 Specifications Required for Inquiries and Orders

The following information must be included when inquiring about replacement parts or placing orders:

- comm. no.
- / machine type

This information is given on the type plate mounted the machine.

1.2.10 Technical Data Sheet

see Point 9.

1.2.11 Performance Data, Load Index, Power Consumption

are indicated in the associated data sheet, Point 9.

1.2.12 Sound Pressure Level

The sound pressure level and/or noise characteristics of the **seepex** machines are ascertained in accordance with DIN 45635. The measuring guidelines are largely identical with the international standards ISO 3740-1980 and ISO 3744-1981.

1.2.13 Operating Range

Employment of the machine is not permissible for purposes other than those stated in the data sheet, see Point 9. **seepex** cannot accept liability for damage arising through failure to comply with this operating range.

1.3 Supplementary Information

1.3.1 Accessories, Optional Extras

Please refer to the data sheet, Point 9.

1.3.2 Company Address, Service Addresses

see Point 11

2. Safety

These operating instructions contain basic requirements to be observed during the installation, operation and maintenance of the machine. Therefore, the instructions must be read by the mechanical fitter and by the technical personnel/operator responsible for the machine prior to assembly and commissioning, and kept available at the operating site of the machine/plant at all times.

Compliance is required not only with the general safety instructions given in this section but also with the detailed instructions, e.g. for private usage, given under the other main headings in these operating instructions.

2.1 Labeling of Advice in the Operating Instructions

In these operating instructions safety advice whose non-observance could lead to danger for life or limb is labeled with the following general hazard symbol:



safety symbol acc. to ISO 3864 - B.3.1

Warnings regarding electric power are labeled with:



safety symbol acc. to ISO 3864 - B.3.6

Safety instructions whose non-observance could jeopardize the machine and its functions are labeled by the word

CAUTION

Always comply with instructions mounted directly on the machine, e.g.

- rotational direction arrow
- fluid connection indicators

and ensure that the information remains legible.

2.2 Personnel Qualifications and Training

Personnel charged with operation, maintenance, inspection and assembly must be in possession of the appropriate qualifications for the tasks. The company operating the machine must define exact areas of responsibility, accountabilities and personnel supervision schemes. Personnel lacking the required skills and knowledge must receive training and instruction. If necessary, the operating company may commission the manufacturer/ supplier to conduct these training courses. Further-more, the operating company must ensure that the personnel fully understand the contents of the operating instructions.

2.3 Dangers Resulting from Failure to Observe Safety Instructions

Failure to comply with the safety instructions may lead to hazards to life and limb as well as dangers for the environment and the machine. Non-observance of safety instructions can invalidate the right of claim to damages.

The following are just some **examples** of possible dangers resulting from failure to comply with the safety instructions:

- Failure of important machine/plant functions
- Failure of prescribed methods of service and maintenance
- Danger to life and limb due to electrical, mechanical and chemical influences
- Danger to the environment due to the leakage of hazardous substances

2.4 Safety-conscious Working

Always comply with the safety instructions listed in this document, the existing national accident prevention regulations and any company-internal work, operating and safety rules.

2.5**Safety Instructions for the Operating
Company/Machine Operator**

- Any potentially hazardous hot or cold machine parts must be provided with protection against accidental contact at the customer's premises.
- Protective guards for moving parts (e.g. coupling) must never be removed while the machine is in operation.
- Leakages (e.g. in the shaft seal) of hazardous conveying liquids (e.g. explosive, toxic, hot) must be drained in such a way that no danger arises for persons or for the environment. Always observe the relevant statutory requirements.
- The risk of exposure to electrical power must be eliminated (for details, see the VDE regulations, for example, or those of the local power supply company).

2.6**Safety Instructions for Maintenance, Inspection
and Assembly Work**

The operator must ensure that all maintenance, inspection and assembly tasks are carried out by authorized and qualified personnel who have studied the operating instructions closely and become sufficiently familiar with the machine.

As a basic rule, the machine must be brought to a standstill before work is carried out. Always comply with the de-commissioning procedure described in this document.

Any machines or assemblies conveying media that are detrimental to health must be decontaminated.

Immediately following completion of work, all safety and protective devices must be replaced in position and, where applicable, re-activated.

Before re-starting the machine, observe the points listed under the heading "Initial Startup".

2.7**Unauthorized Modification and Manufacture of
Replacement Parts**

Conversions or modifications of the machine are permissible only in consultation with the manufacturers. Original manufacturer replacement parts and manufacturer-approved accessories enhance the operational safety of the machine. The usage of unauthorized parts may lead to the nullification of the manufacturer's liability for any resultant damages.

2.8**Impermissible Modes of Operation**

The operational safety of the machines supplied is warranted only for employment in accordance with the intended use as defined in Section 1 - General - of these operating instructions. Never allow the threshold values specified in the data sheet to be exceeded.



3. Transport and Intermediate Storage

3.1 Safety Precautions

Employ appropriate transport means, hoists and tools when transporting and storing the machine, always observing the safety instructions.

3.2 Transport

Depending on its weight, the **seepex** machine must be transported manually or with appropriate transport means. Comply with the transport instructions on the packing.

3.3 Unpacking

The design of the packing is such that the equipment can be removed manually or, if demanded by the weight, by means of appropriate hoists.

Any screw fittings between the machine and the packing must be undone. Comply with the attached information notices and symbols.

3.4 Intermediate Storage/Preservation

Unless otherwise indicated in the data sheet, **seepex** machines are provided with preservation only for the duration of transport. If a long period of intermediate storage is foreseen before the machine is commissioned, it is necessary to provide supplementary preservation. If necessary, the appropriate measures should be drawn up in consultation with **seepex**.

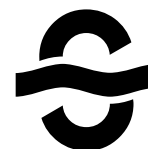
Intermediate storage in extreme climatic conditions is permissible only for machine whose design is appropriate to the circumstances. If necessary, **seepex** must be consulted.

CAUTION

Pumps of the range MAP
If the period from supply and subsequent storage until the commissioning is more than 4 weeks, the hoses should be dismantled, refer to Point 7.

3.5 Protection against Environmental Influences

To afford protection against environmental influences, the intermediate storage location must be dry, enclosed and free from frost.



4. Description of the seepex Progressive Cavity Pump and Accessories

4.1 General Description, Design and Mode of Operation

Like all progressive cavity pumps, **seepex** pumps belong to the rotating positive-displacement pump family. The characteristic attribute of these pumps is the special formation and arrangement of the two conveying elements, namely the rotor and the stator.

The difference in the number of threads possessed respectively by the rotor and stator produces a chamber that opens and closes alternately in line with the constant turning motion of the rotor, effecting the continuous transportation of the conveying product from the suction side to the pressure side.

The geometrical formation of the two conveying elements combined with the constant contact that exists between them result in sealing lines that effect an airtight seal between the suction and pressure side in every position of the eccentric screw, even when the pump is stationary. The pump owes its high suction capacity to this sealing between the suction and pressure sides.

4.2 Mechanical Design

Please consult the sectional drawing, Point 9, for the mechanical design of the pump. The data sheet, Point 9, gives information on the design of the pump housing, stator, rotor and rotating components.

Refer to document OM. SEA. ____, Point 9 for information on the design of the shaft seal.

The data sheet, Point 9, specifies details of the design of the drive engine. Further details are given in the appended manufacturer's documents, Point 10.

4.3 Accessories

Consult the data sheet in Point 9 for information.

4.4 Dimensions, Weight

Consult the appended dimensional drawing, Point 9.

4.5 Design Variants

Refer to the data sheet, Point 9, for the design of the **seepex** progressive cavity pump. Other design variants are possible, whereby **seepex** must first check whether a particular pump is suitable for the intended purpose.

4.6 Operating Site Specifications

Operating site specifications are listed in the data sheet, Point 9. Details of the space required for installation, operation and maintenance are given in Point 5.2.1.

5. Assembly / Installation

5.1 Mounting Tools / Hoists

No special tools are required for the assembly and installation of the pump.

The customer must check the dimensions and weight of the **seepex** progressive cavity pump to ascertain whether the available hoisting apparatus is sufficient for the assembly and fitting of the pump.

5.2 Initial Assembly

5.2.1 Inspection Prior to Commencement of Assembly

5.2.1.1 Location

The place of installation for the pump must conform with the site stated in the data sheet in Point 9. Any change of location must be checked and approved by **seepex**.

5.2.1.2 Space Requirements

Customers are responsible for determining the space requirements; the following factors must be taken into consideration:

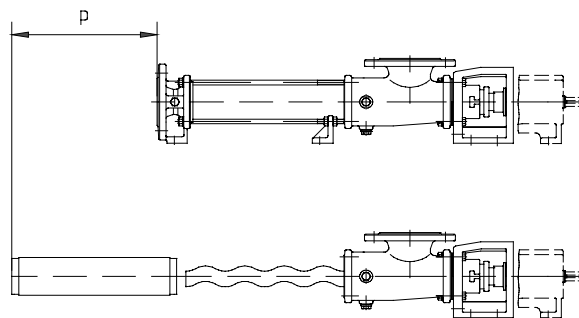
- dimensions and weight of the machine
- required transport and hoisting equipment
- possible piping layout with allowance for the space allowing disassembly of the rotor as defined in 5.2.1.3
- freedom of movement to:
 - operate the drive / speed regulation
 - read speed and pressure indicators
 - adjust a stator retensioning device, if fitted
 - operate a buffer fluid supply unit, if fitted
- space required for lubrication / renewal of lubricants
- disassembly of mechanical protective devices, e.g. V-belt or coupling protection
- space required for handling the mounting tools, e.g. sufficient wall clearance

5.2.1.3 Space Allowing Disassembly of Stator P

A specific space must be allowed for exchanging the stator. The required dimension "P" is indicated in the index of these operating instructions or in the appended dimensional drawing, Point 9.

CAUTION

Ensure also that the pipe work can be dismantled at this location too.



5.2.2 Installation of the Fully Assembled Pump

- Installation in conformity with data sheet
 - Installation of the pump is permissible only in accordance with the data sheet specifications and the associated basic drawing, see Point 9. Any change in the position must be checked and approved by **seepex**.
- Tension-free mounting of pump
 - This rule applies to pumps with and without drives, to versions with and without baseplate, for mounting on the foundation or other bearing elements. The entire area of all bearing surfaces of the machine must rest on the ground. Any unevenness must be corrected by appropriate supports.
- Correct seating of drives
 - All drives have been aligned ready for operation and mounted by **seepex**. However, displacements may occur during transport or installation. For this reason, check that the alignment and fastening of the drive and coupling are correct.
- Protective devices
 - On completion of the assembly and installation work, immediately mount all safety and protective devices in their proper locations and set them in operation.



5.2.3 Protective and Controlling Equipment

Information on equipment of this nature, where fitted, is provided in the data sheet, Point 9. Consult the attached manufacturer's specifications, Point 10, for instructions on assembly and installation.

5.2.4 Electric Connection of Electric Motor and Frequency Converter

The electric connections must be established in accordance with the manufacturer's specifications, Point 10, as well as the safety specifications applying at the installation site. The mains voltage and frequency must match the ratings indicated on the type and rating plates.



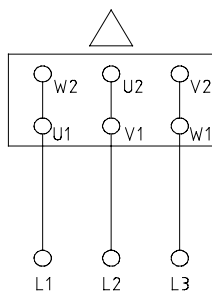
- Switch on electric motor „direct-on-line“

CAUTION

An increased starting torque is necessary due to the clamping between the rotor and stator conveying elements. This means the electric motors that drive the progressive cavity pumps must always be switched on directly. As a rule, star-delta startup is not possible unless special arrangements have been made with **seepex**.

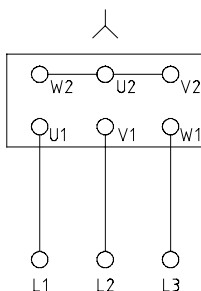
Three-phase cage motor

Delta connection



low . . .
. . . voltage indicated on rating plate

Star connection



high . . .

- Speed regulation via frequency inverter
When progressive cavity pumps with frequency-controlled drives are started up problems may occur due to unsuitable or wrongly set frequency inverters. For this reason we recommend the purchase of the complete drive, including frequency inverter, from **seepex**, so that the frequency inverter can be tuned on the **seepex** test field along with a trial run.

Ensure that customer-supplied frequency inverters comply with the starting torque and running power specified in the appended data sheet, Point 9.

CAUTION

Consult the appended document T1.FRU.01, see Point 9, for further information on the electric connection and the setting of frequency inverter and variable-speed motor.

5.2.5 Piping

5.2.5.1 Suction and Pressure Flanges

The position, nominal width and standard of the suction and pressure flange of the progressive cavity pump are specified in the dimension drawing, Point 9, and data sheet, Point 9. Always observe the rotational direction and flow direction defined in Point 6.2.5.

5.2.5.2 Piping Dimensioning

CAUTION

The pipe diameters on the suction and pressure sides must be dimensioned in accordance with the customer's pressure-loss calculation in such a way that the pressures specified in the data sheet, Point 9, are not exceeded. The nominal width of the suction pipe should at least match that of the pump suction flange.

5.2.5.3 Residue-free Piping

CAUTION

Prior to starting up the pump, ensure that all pipelines are free from foreign bodies. Installation residues (such as weld spatter, screws, steel chips etc.) will lead to damage of the **seepex** pump for which guarantee claims will not be accepted.

5.2.5.4 Tension-free Mounting

CAUTION

Pipelines and other components requiring to be connected with the pump must be mounted without stresses.

5.2.5.5 Fluid Connections for Optional Extras

Consult the data sheets, Point 9, for information regarding the optional extras, if any, that are fitted. The technical description is given under Point 9.

6. Commissioning/De-commissioning

6.1 Engineering Data

Details regarding all technical specifications and operating conditions are given in these operating instructions together with the data sheet, Point 9.

To guarantee the correct assignment of documentation to pump, the commission number on the

- cover sheet
- and data sheet of these operating instructions must match the commission number stated on
- the nameplate of the pump.

6.1.1 See Point 7.2.2 for Lubricant Chart

6.2 Preparation for Operation

6.2.1 Bearing

6.2.1.1

See Point 7.2.1.4 for pump bearing.

6.2.1.2

See manufacturer's documents, Point 10, for drive bearings.

6.2.2 Shaft Sealing

See document OM.SEA.____.

6.2.3 Filling Up of Suction Side to Avoid Dry Running at Startup

6.2.3.1 General

CAUTION

Before switching on the pump, fill the suction-sided pump casing with fluid so that the first rotations will lubricate the conveying elements immediately. A small quantity of fluid is sufficient for lubrication; the subsequent operation of the pump is self-priming, even if an air column up to the liquid level remains.

6.2.3.2 Pump with plastic rotor Pump with plastic rotating unit

CAUTION

Important information about commissioning can be taken from the document OM.ROT.01.

6.2.4 Electric/Hydraulic Connections

The connections are listed in the appended manufacturer's documents, Point 10.

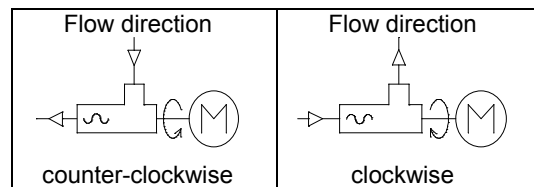


The risk of exposure to electrical hazards must be ruled out. Always observe the safety regulations valid at the site of installation.



6.2.5 Checking Direction of Rotation

The rotational direction of the pump determines the flow direction of the conveying medium.



Prior to commissioning the rotational direction of the pump must be checked for compliance with the data sheet specification and the rotational direction arrow on the type plate of the pump.

6.3 Control and Monitoring Equipment

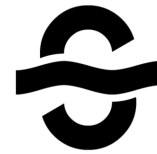
Where applicable, please refer to the associated documents, Point 10, for information on commissioning.

6.3.1 Performance Check

Any optional extras must be subjected to a performance check in conformity with the specifications by **seepex** or other manufacturers, see manufacturer's documents.

6.3.2 Setting

Unless already performed in the factory, setting must be carried out in accordance with the appended manufacturer's specifications. Pay attention to the operating specifications in the data sheet.



6.4 Equipment for Protection of Persons

Machines must be fitted with mechanical protective devices complying with DIN EN 809.

- Moving or working parts must be protected against accidental contact.
- However, safety considerations demand it be possible at all times to check without hindrance whether the shaft seal is fully functional. A protective guard is necessary in this area only if components are mounted on the rotating, smooth shaft.
- If pumps are operated with an open suction flange/feed hopper, a suitable protective guard complying with DIN EN 294 must be mounted.
- Country-specific protective regulations must be observed at the site of installation. Prior to activation of the pump, check the proper function of all protective equipment.



6.5 Commissioning

6.5.1 Initial Startup/Re-starting

CAUTION

Every **seepex** progressive cavity pump is designed for the specific operating conditions documented in the data sheet. Commissioning is permissible only if the operating conditions conform with those indicated in the data sheet. Although the potential usages of the **seepex** pump are not confined to the specified operating conditions, any change in the original conditions must be checked and approved by **seepex**.

The right to make claims under the warranty agreement will be annulled if operating conditions are changed without prior approval by **seepex**.

6.5.2 Avoid Dry Running of Pump

CAUTION

The dry running of a pump increases the friction between rotor and stator, quickly causing an unacceptably high temperature to develop on the inner surface of the stator. This overheating leads to burning of the stator material and the total failure of the pump.

For this reason it is necessary to ensure that the suction-sided flow never dries up completely. If a continuous flow cannot be guaranteed for the plant, it is essential to fit the **seepex** dry running protection device TSE, available as an optional accessory.

6.5.3 Check Pressure at Suction and Pressure Flanges

6.5.3.1 Safeguard Pump Against Excessive Pressure at the Suction Flange

The **seepex** pump is designed to operate with the pressure at the suction flange (suction head or inlet pressure) specified in the data sheet. Deviating pressure conditions may lead to the failure and/or destruction of the shaft seal or entire pump.



For this reason the suction pressure specified in the data sheet must be guaranteed. Appropriate monitoring devices are oil-filled contact manometers that deactivate the pump.

6.5.3.2 Safeguard Pump Against Excessive Pressure at the Pressure Flange

The **seepex** pump operates according to the positive displacement principle. Operation of the pump against an excessive pressure caused by closed valves, by high pressure losses in the piping or by product sedimentation will lead to the destruction of the pump, drive, pipe work and/or downstream equipment. Every progressive cavity pump must therefore be protected against overpressure. Safety valves with bypass pipes or oil-filled contact manometers that deactivate the pump are appropriate protective devices.



6.5.4 Drive Engine

Consult the attached manufacturer's operating instructions, Point 10, for information on commissioning the drive engine.



**6.5.5
Establish Clear Passage Through Pipelines**

CAUTION

To prevent damage to the pump the unhindered flow of liquid must be guaranteed between the points of entry to and exit from the pipeline. For this reason, open all relevant valves etc. prior to activation of the pump.

**6.6
De-commissioning**

**6.6.1
De-activation**

The electric connections must be switched off and protected against accidental re-activation. Observe the safety regulations applying to the plants.



**6.6.2
Stationary Pump**

The pump and all optional equipment must be provided with the following protection modes while at a standstill:

- Frost protection
- Protection against solid particle deposits
- Protection against sedimentation of the medium
- Corrosion protection for parts in contact with the medium

We recommend that the pipeline and pump be emptied for the duration of the plant standstill. Following evacuation, the pump should be preserved.

**6.6.3
Evacuation of the Pump**

The pipeline must be evacuated on the suction and pressure side or shut-off directly behind the pump connections. Drain any residual liquid in the pump casing by opening/ removing the screwed sealing plugs (705) and (502), sealing rings (706) and (503).



CAUTION

Coated casings or housings without screw plug have to be drained by the connection branch (SAG and DRS).

Refer to the data sheet and the sectional drawing of the associated operating instruction for information on the pump design.

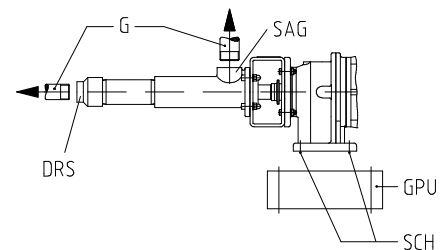
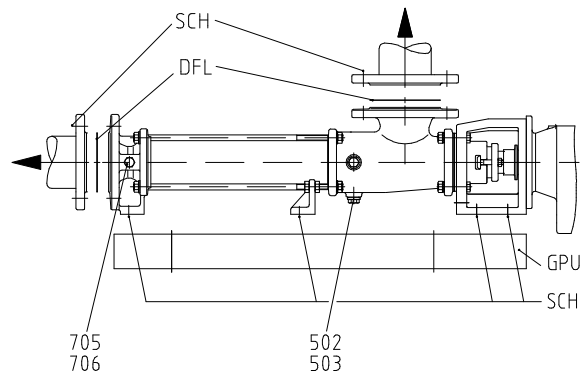
Conveying medium residues always remain in the rotor/ stator chambers and may run out during transport or disassembly of the pump. When conveying aggressive or hazardous media, therefore, wear appropriate protective clothes during all installation work.

**6.6.4
Disassembling the Pump**

Dismantle the pipe work by removing the flange bolts (SCH) and flange seals (DFL) or the threaded connections (G).

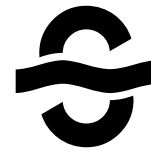
Disassemble the pump together with the baseplate (GPU) or, as applicable, without the baseplate (GPU) following removal of the bolts (SCH) at the pump feet.

Block-design pumps with direct flange-mounted drive engine are liable to become unstable during disassembly. Stability can be restored by propping up the drive engine.



**6.6.5
Preservation/Storage**

The pump must be preserved prior to storage. Appropriate preservation measures must be agreed with **seepex**. Always state the pump commission number when making inquiries.



**These operating instructions are valid for
range MD (stainless steel-design)
size 0015-24 to 012-24**

**7.
Service and Maintenance**

Contents

- 7.1 General Instructions
- 7.2 Service and Inspection
- 7.3 Dismantling
- 7.4 Re-assembly

The sectional drawing and parts list relevant for Points 7.3 and 7.4 can be found in Point 9.

**7.1
General Instructions**

A requirement for the reliable operation of any pump is service and maintenance in compliance with instructions. Maintenance personnel must therefore have access to these operating instructions and adhere to them meticulously. **seepex** will accept no liability for damages arising through non-observance of these operating instructions.

**7.2
Maintenance and Inspection**

**7.2.1
Lubrication**

**7.2.1.1
Rotor and Stator**

The rotor and stator are lubricated by the conveying medium.

**7.2.1.2
Shaft Sealing**

Consult document OM.SEA. ____ Point 9 for information on lubricating the shaft seal.

**7.2.1.3
Pin Joint**

The pin joints are filled with special grease and lubricated for the expected duration of service. The **seepex** joint grease specified in the index of these operating instructions should be used exclusively for any required maintenance work.

CAUTION

Usage of other grease types will lead to premature joint failure and render invalid any right to claims under guarantee.

**7.2.1.4
Bearing of the Pump/Drive Engine**

The bearing of the rotating pump parts is effected by the drive engine. Lubrication instructions are therefore included in the appended drive engine operating instructions, Point 10.

**7.2.2
Lubricant Filling Levels**

Details are specified in the index.

**7.2.3
Drives and Optional Extras**

For maintenance and inspection specifications, see the appended manufacturer's documents, Point 10.



**7.2.4
Supervision during Operation**

**7.2.4.1
Shaft Sealing**

See document OM.SEA. ____ Point 9.

**7.2.4.2
Optional Extras**

These must be monitored in accordance with the separate documents, Point 9/Point 10.

**7.2.4.3
Drive Engines**

These must be monitored in accordance with the separate manufacturer's documents, Point 10.

**7.2.5
Preventive Measures**

To avoid the expenses incurred by lengthy stop periods of the pump, **seepex** recommends the acquisition of a set of wearing parts and a set of gaskets. The contents are listed in the document OM.WPS.40e, Point 9.

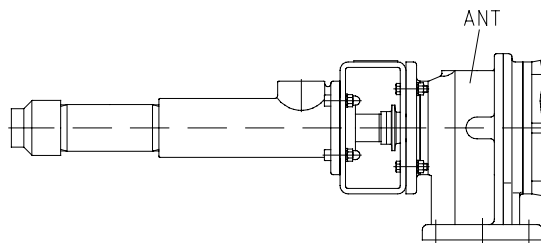
7.3

Dismantling the seepex Progressive Cavity Pump

Tools are required for dismantling and re-assembly. These tools are listed in Point 9 of the document OM.SPT.01.

The stator (601) and the rotating pump parts can be exchanged in site. The rotating pump parts can be dismantled as a complete rotating unit (RTE) (Point 7.3.4) or as individual components (Point 7.3.5).

Before commencing the dismantling of pump parts, safeguard the pump against tipping over or falling down by fastening it at the drive (ANT).



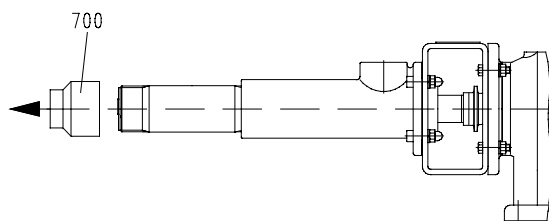
7.3.1

Pressure Flange (700) - Dismantling

Prior to dismantling see Point 7.3.2

CAUTION

Pressure branch (700) is glued in place with an adhesive of medium strength. Therefore, to break the seal / adhesive compound it is recommended to heat upto a maximum of 80 °C.



7.3.2

Stator (601) - Dismantling

- Maintenance tip:
Disassembly of the stator can be made considerably easier by first moistening the inner surface of the stator with antiseize agent (soft or liquid soap). Before removing the pressure flange (700), pour the antiseize agent into the opening between rotor and stator on the pressure flange side. Several clockwise (see Point 6.2.5) revolutions of the rotor will then distribute the antiseize agent over the inner surface of the stator and reduce the friction between rotor and stator considerably.

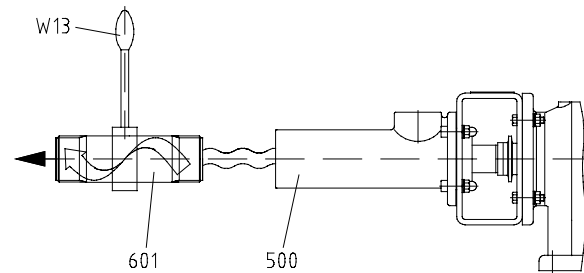
- Lock drive shaft against rotation.

CAUTION

Stator (601) is glued in place with an adhesive of medium strength.

Therefore, to break the seal / adhesive compound it is recommended to heat upto a maximum of 80 °C.

Dismantling the stator (601) with tool (W13/see Point 9.).



7.3.3

Suction Casing (500), Casing Gasket (501) - Dismantling

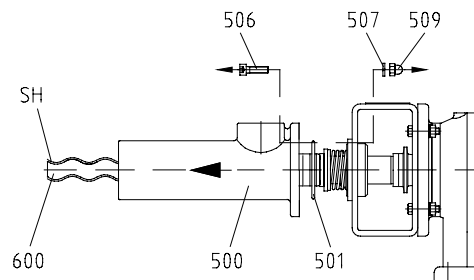
Fit the rotor (600) with a protective cover (SH).

CAUTION

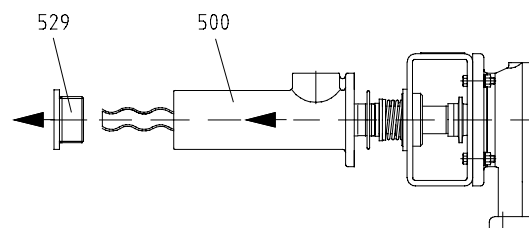
Suction casing (500) with reducing unit (529) is glued in place with an adhesive of medium strength.

Therefore, to break the seal / adhesive compound it is recommended to heat upto a maximum of 80 °C.

Suction casing (500) **without** reducing unit (529)



Suction casing (500) **with** reducing unit (529)



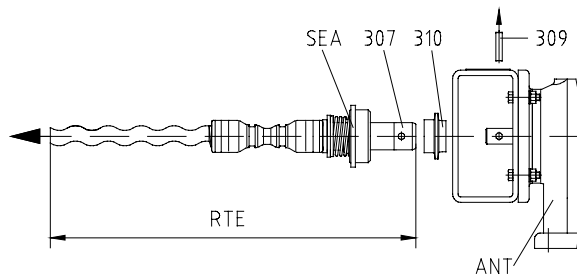
7.3.4

Rotating Unit (RTE) - Dismantling

CAUTION

Before dismantling the rotating unit it is essential to comply with the specifications in document OM.SEA.____ Shaft Seal Dismantling, see Point 9..

- Remove flushing connections at shaft seal housing (SEA).
- Raise/shift splash ring (310) and eject plug-in shaft pin (309) in horizontal direction.
- Remove rotating unit (RTE)/plug-in shaft (307), together with shaft seal (SEA) from output shaft of the drive (ANT). See Document OM.SPT.01, in Point 9 for tool (W10) used for pulling off.
- See in document OM.SEA.____, Point 9, for removal of the shaft seal (SEA) from the plug-in shaft (307).



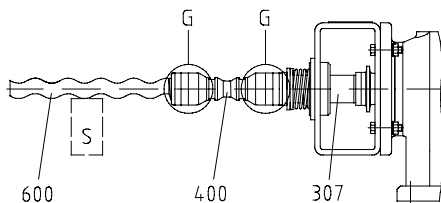
7.3.5

Rotating Pump Parts - Dismantling

7.3.5.1

Rotor (600), Coupling Rod (400)

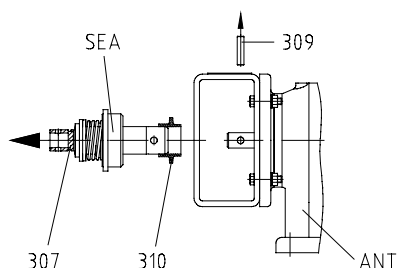
Detach the rotor (600) and coupling rod (400) from the plug-in shaft (307) by dismantling the joint (G) in accordance with Point 7.3.6.



7.3.5.2

Plug-in Shaft (307)

The plug-in shaft (307) is removed in the same way as the rotating unit (RTE), see Point 7.3.4.



7.3.6

Dismantling of Joint

see document OM.PJT.04e Point 1.

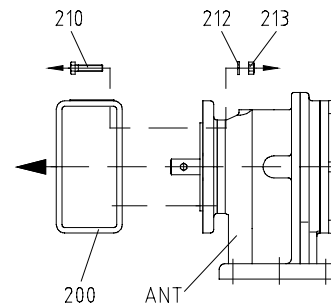
7.3.7

Shaft Sealing

See document OM.SEA.____ Point 9 for information on dismantling the shaft sealing.

7.3.8

Lantern (200)/Drive (ANT) - Dismantling



7.4

Re-assembly

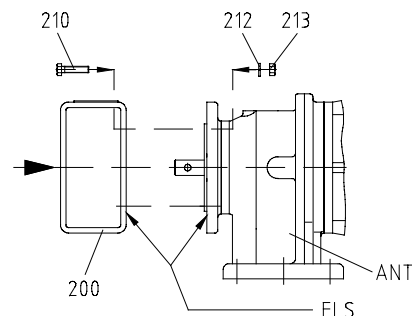
Before commencing the re-assembly, fasten the drive (ANT) in such a way that it cannot tip over or fall down during the re-assembly of the drive and all pump components.



7.4.1

Lantern (200)/Drive (ANT) - Assembly

Clean flange bearing surfaces (FLS), centering diameter and output pivot of the drive (ANT).



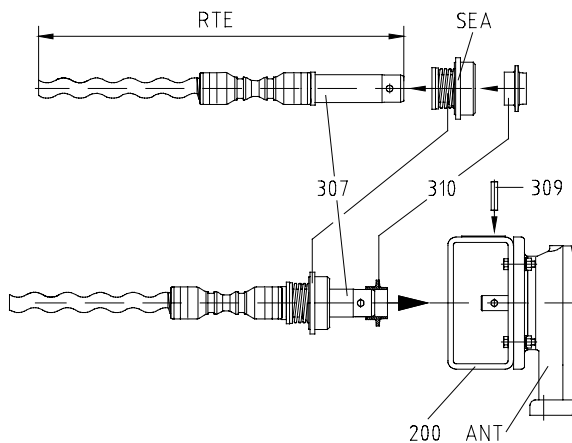
7.4.2

Rotating Unit (RTE) - Re-assembly

The rotating unit (RTE) has been assembled in accordance with the description in document OM.PJT.04e

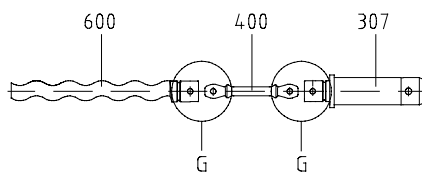
- Mount shaft seal (SEA) on plug-in shaft (307) in the way described in document OM.SEA.____, see Point 9.

- Moisten splash ring (310) and plug-in shaft (307) with joint grease (see index for type) and slide splash ring (310) onto plug-in shaft (307), observing the fitting position of the splash ring, (see lettering on the splash ring).
- Apply antiseize graphite petroleum to the output pivot of the drive (ANT) and slide on the rotating unit (RTE). Insert plug-in shaft pin (309) horizontally.
- Splash ring position (310)
Outer edge of splash ring (310) has to occlude with outer edge of plug-in shaft (309).



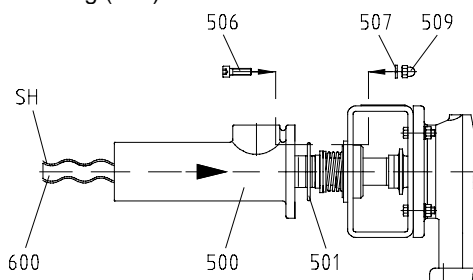
7.4.3 Rotating Pump Parts - Re-assembly

Prepare main components:
Prepare rotor (600), coupling rod (400) and plug-in shaft (307) as described in document OM.PJT.04e Point 2. to 2.3
Joint (G) re-assembly as described in document OM.PJT.04e Point 3.



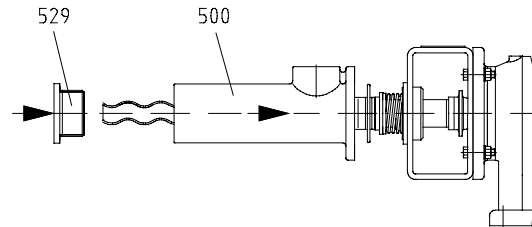
7.4.4 Suction Casing (500), Casing Gasket (501) - Re-assembly

Fit protective cover (SH) on rotor (600).
Assemble casing gasket (501) and suction casing (500).



CAUTION

Install reducing unit (529) to suction casing (500) with an adhesive of medium strength

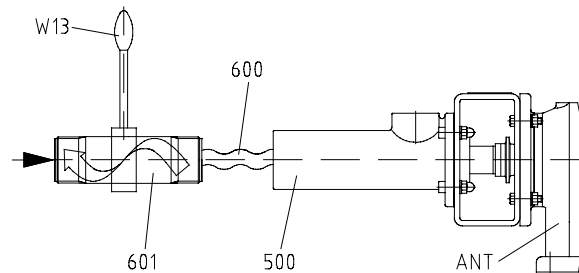


7.4.5 Stator (601) - Assembly / Re-assembly

Maintenance tip:
Disassembly of the stator can be facilitated considerably by first moistening the inner surface of the stator with antiseize agent (soft or liquid soap). Before removing the pressure flanges (700), pour the antiseize agent into the opening between rotor and stator on the pressure flange side. Several clockwise (see Point 6.2.5) revolutions of the rotor will then distribute the antiseize agent over the inner surface of the stator and reduce the friction between rotor and stator considerably
Lock drive (ANT) shaft against rotation.

CAUTION

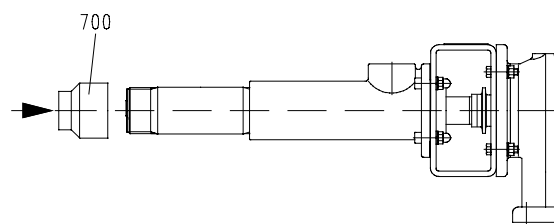
Install external thread of stator (601) with an adhesive of medium strength. Turn stator (601) to the right using a tool (W13/see Point 9), slip it onto rotor (600) and screw it into the suction casing (500) at the same time.

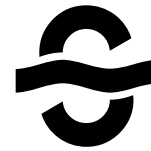


7.4.6 Pressure Flange (700) - Assembly

CAUTION

Install pressure branch (700) with an adhesive of medium strength





**These operating instructions are valid for
range MD (synthetic construction)
size 0015-24 to 025-6L**

**7.
Service and Maintenance**

Contents

- 7.1 General Instructions
- 7.2 Service and Inspection
- 7.3 Dismantling
- 7.4 Re-assembly

The sectional drawing and parts list relevant for Points 7.3 and 7.4 can be found in Point 9.

**7.1
General Instructions**

A requirement for the reliable operation of any pump is service and maintenance in compliance with instructions. Maintenance personnel must therefore have access to these operating instructions and adhere to them meticulously. **seepex** will accept no liability for damages arising through non-observance of these operating instructions.

**7.2
Maintenance and Inspection**

**7.2.1
Lubrication**

**7.2.1.1
Rotor and Stator**

The rotor and stator are lubricated by the conveying medium.

**7.2.1.2
Shaft Sealing**

Consult document OM.SEA.____ Point 9 for information on lubricating the shaft seal.

**7.2.1.3
Pin Joint**

The pin joints are filled with special grease and lubricated for the expected duration of service. The **seepex** joint grease specified in the index of these operating instructions should be used exclusively for any required maintenance work.

CAUTION

Usage of other grease types will lead to premature joint failure and render invalid any right to claims under guarantee.

**7.2.1.4
Bearing of the Pump/Drive Engine**

The bearing of the rotating pump parts is effected by the drive engine. Lubrication instructions are therefore included in the appended drive engine operating instructions, Point 10.

**7.2.2
Lubricant Filling Levels**

Details are specified in the index.

**7.2.3
Drives and Optional Extras**

For maintenance and inspection specifications, see the appended manufacturer's documents, Point 10.



**7.2.4
Supervision during Operation**

**7.2.4.1
Shaft Sealing**

See document OM.SEA.____ Point 9.

**7.2.4.2
Optional Extras**

These must be monitored in accordance with the separate documents, Point 9/Point 10.

**7.2.4.3
Drive Engines**

These must be monitored in accordance with the separate manufacturer's documents, Point 10.

**7.2.5
Preventive Measures**

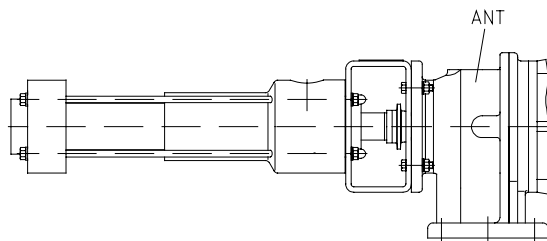
To avoid the expenses incurred by lengthy stop periods of the pump, **seepex** recommends the acquisition of a set of wearing parts and a set of gaskets. The contents are listed in the document OM.WPS.40, Point 9.

7.3 Dismantling the seepex Progressive Cavity Pump

Tools are required for dismantling and re-assembly. These tools are listed in Point 9 of the document OM.SPT.01.

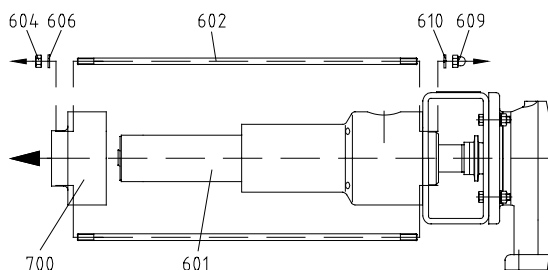
The stator (601) and the rotating pump parts can be exchanged in site. The rotating pump parts can be dismantled as a complete rotating unit (RTE) (Point 7.3.4) or as individual components (Point 7.3.5).

Before commencing the dismantling of pump parts, safeguard the pump against tipping over or falling down by fastening it at the drive (ANT).



7.3.1 Pressure Flange (700) - Dismantling

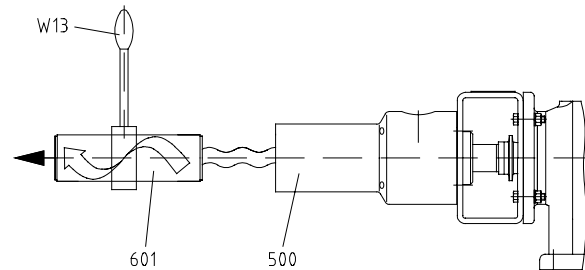
Prior to dismantling see Point 7.3.2



7.3.2 Stator (601) - Dismantling

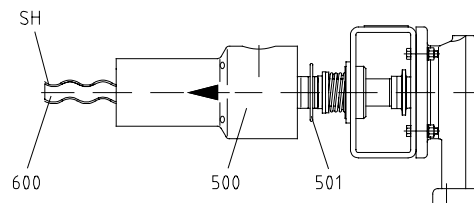
- Maintenance tip:
Disassembly of the stator can be made considerably easier by first moistening the inner surface of the stator with antiseize agent (soft or liquid soap). Before removing the pressure flange (700), pour the antiseize agent into the opening between rotor and stator on the pressure flange side. Several clockwise (see Point 6.2.5) revolutions of the rotor will then distribute the antiseize agent over the inner surface of the stator and reduce the friction between rotor and stator considerably.

- Lock drive shaft against rotation.
Dismantling the stator (601) with tool (W13/see Point 9.).



7.3.3 Suction Casing (500), Casing Gasket (501) - Dismantling

Fit the rotor (600) with a protective cover (SH).

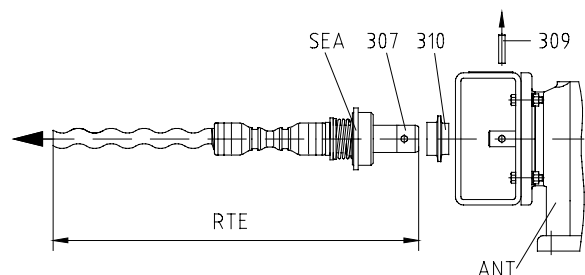


7.3.4 Rotating Unit (RTE) - Dismantling

CAUTION

Before dismantling the rotating unit it is essential to comply with the specifications in document OM.SEA. Shaft Seal Dismantling, see Point 9..

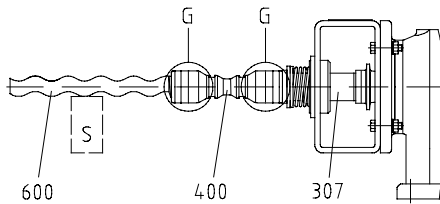
- Remove flushing connections at shaft seal housing (SEA).
- Raise/shift splash ring (310) and eject plug-in shaft pin (309) in horizontal direction.
- Remove rotating unit (RTE)/plug-in shaft (307), together with shaft seal (SEA) from output shaft of the drive (ANT). See Document OM.SPT.01, in Point 9 for tool (W10) used for pulling off.
- See in document OM.SEA., Point 9, for removal of the shaft seal (SEA) from the plug-in shaft (307).



**7.3.5
Rotating Pump Parts - Dismantling**

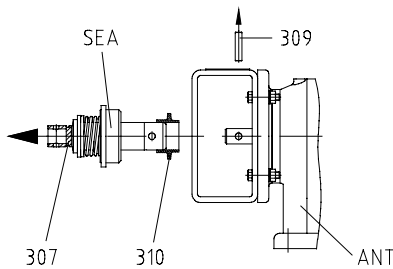
**7.3.5.1
Rotor (600), Coupling Rod (400)**

Detach the rotor (600) and coupling rod (400) from the plug-in shaft (307) by dismantling the joint (G) in accordance with Point 7.3.6.



**7.3.5.2
Plug-in Shaft (307)**

The plug-in shaft (307) is removed in the same way as the rotating unit (RTE), see Point 7.3.4.



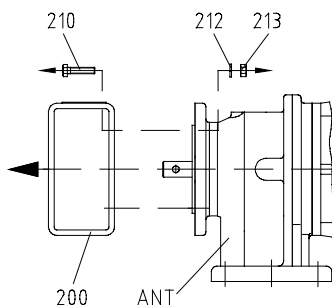
**7.3.6
Dismantling of Joint**

see document OM.PJT.04 Point 1.

**7.3.7
Shaft Sealing**

See document OM.SEA.___ Point 9 for information on dismantling the shaft sealing.

**7.3.8
Lantern (200)/Drive (ANT) - Dismantling**



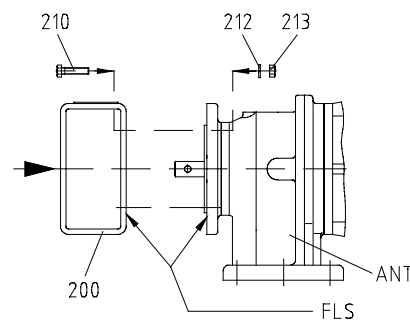
**7.4
Re-assembly**

Before commencing the re-assembly, fasten the drive (ANT) in such a way that it cannot tip over or fall down during the re-assembly of the drive and all pump components.



**7.4.1
Lantern (200)/Drive (ANT) - Assembly**

Clean flange bearing surfaces (FLS), centering diameter and output pivot of the drive (ANT).

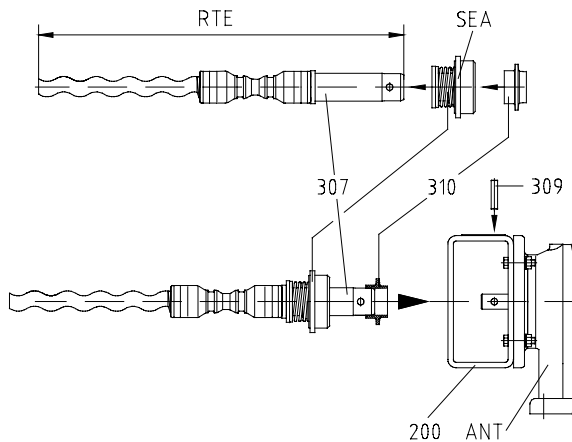


**7.4.2
Rotating Unit (RTE) - Re-assembly**

The rotating unit (RTE) has been assembled in accordance with the description in document OM.PJT.04

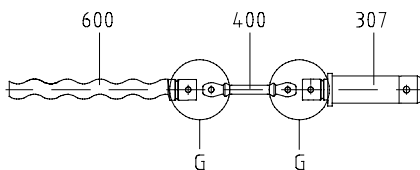
- Mount shaft seal (SEA) on plug-in shaft (307) in the way described in document OM.SEA.___ , see Point 9.
- Moisten splash ring (310) and plug-in shaft (307) with joint grease (see index for type) and slide splash ring (310) onto plug-in shaft (307), observing the fitting position of the splash ring, (see lettering on the splash ring).
- Apply antiseize graphite petroleum to the output pivot of the drive (ANT) and slide on the rotating unit (RTE). Insert plug-in shaft pin (309) horizontally.

- Splash ring position (310)
Outer edge of splash ring (310) has to occlude with outer edge of plug-in shaft (309).



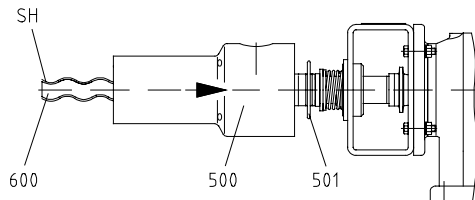
7.4.3 Rotating Pump Parts - Re-assembly

Prepare main components:
Prepare rotor (600), coupling rod (400) and plug-in shaft (307) as described in document OM.PJT.04 Point 2. to 2.3
Joint (G) re-assembly as described in document OM.PJT.04 Point 3.



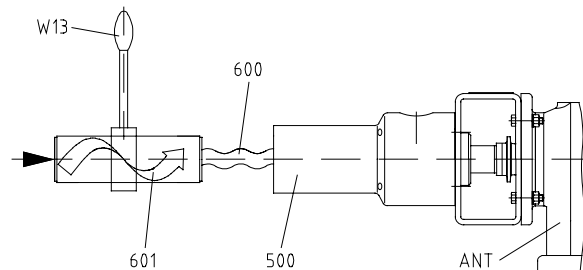
7.4.4 Suction Casing (500), Casing Gasket (501) - Re-assembly

Fit protective cover (SH) on rotor (600).
Assemble casing gasket (501) and suction casing (500).



7.4.5 Stator (601) - Assembly / Re-assembly

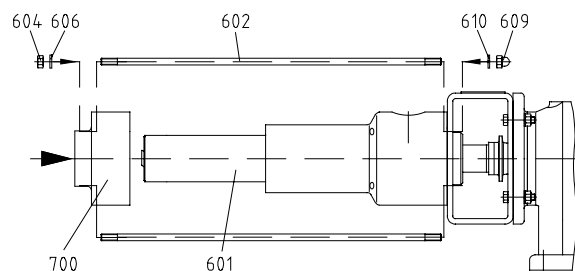
Maintenance tip:
Disassembly of the stator can be facilitated considerably by first moistening the inner surface of the stator with antiseize agent (soft or liquid soap). Before removing the pressure flanges (700), pour the antiseize agent into the opening between rotor and stator on the pressure flange side. Several clockwise (see Point 6.2.5) revolutions of the rotor will then distribute the antiseize agent over the inner surface of the stator and reduce the friction between rotor and stator considerably
Lock drive (ANT) shaft against rotation.
Turn stator (601) to the right using a tool (W13/see Point 9), slip it onto rotor (600) and screw it into the suction casing (500) at the same time.

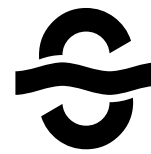


7.4.6 Pressure Flange (700) - Assembly

CAUTION

Tighten tie bolts (602) in equally.





These operating instructions are valid for range MD (stainless steel/tie bolt design) size 0015-24 to 012-24

7. Service and Maintenance

Contents

- 7.1 General Instructions
- 7.2 Service and Inspection
- 7.3 Dismantling
- 7.4 Re-assembly

The sectional drawing and parts list relevant for items 7.3 and 7.4 can be found in item 9.

7.1 General Instructions

A requirement for the reliable operation of any pump is service and maintenance carried out in compliance with instructions. Maintenance personnel must therefore have access to these operating instructions and adhere to them meticulously. **seepex** will accept no liability for damages arising from non-observance of these operating instructions.

7.2 Maintenance and Inspection

7.2.1 Lubrication

7.2.1.1 Rotor and Stator

The rotor and stator are lubricated by the conveying product.

7.2.1.2 Shaft Sealing

Consult document OM.SEA.___ item 9 for information on shaft sealing lubrication.

7.2.1.3 Pin Joint

The pin joints are filled with special grease and are lubricated for the expected duration of service. The **seepex** joint grease specified in the index of these operating instructions should exclusively be used for any required maintenance work.

CAUTION

Usage of other grease types will lead to premature joint failure and excludes any right to claims under guarantee.

7.2.1.4 Bearing of the Pump/Drive Engine

The bearing of the rotating pump parts is effected by the drive engine. Lubrication instructions are therefore included in the appended drive engine operating instructions, item 10.

7.2.2 Lubricant Filling Levels

Details are specified in the index.

7.2.3 Drives and Optional Extras

For maintenance and inspection specifications, see the appended manufacturer's documents, item 10.



7.2.4 Supervision during Operation

7.2.4.1 Shaft Sealing

See document OM.SEA.___ item 9.

7.2.4.2 Optional Extras

To be monitored in accordance with the separate documents, item 9/item 10.

7.2.4.3 Drive Engines

To be monitored in accordance with the separate manufacturer's documents, item 10.

7.2.5 Preventive Measures

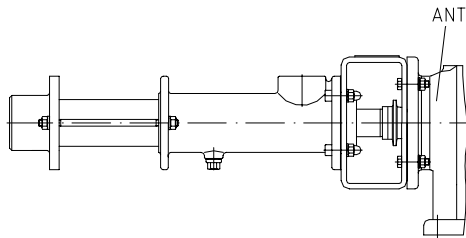
To avoid expenses incurred by lengthy stop periods of the pump, **seepex** recommends the acquisition of a set of wearing parts and a set of gaskets. The scope is listed in document OM.WPS.42, item 9.

7.3 Dismantling the seepex Progressive Cavity Pump

Tools are required for dismantling and re-assembly. These tools are listed in item 9 of document OM.SPT.01.

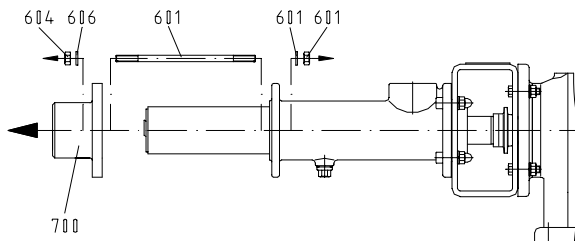
The stator (601) and the rotating pump parts can be exchanged at site. The rotating pump parts can be either dismantled as a complete rotating unit (RTE) (item 7.3.4) or as individual components (item 7.3.5).

Before commencing the dismantling of pump parts, protect the pump against tipping or falling down by fastening it at the drive (ANT).

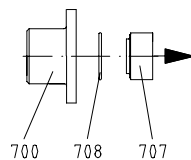


7.3.1 Pressure Branch (700) - Dismantling

Prior to dismantling see item 7.3.2
Pressure branch (700) **without** reducing unit (707)

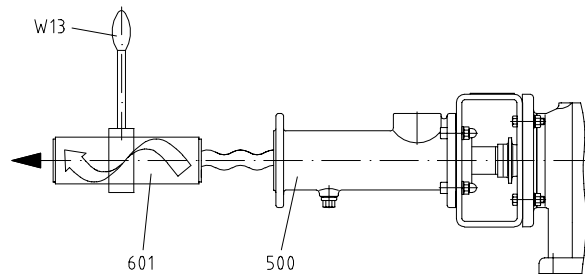


Pressure branch (700) **with** reducing unit (707)



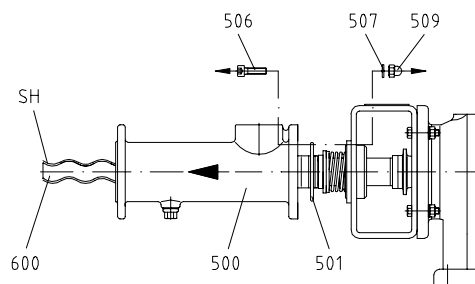
7.3.2 Stator (601) - Dismantling

- Easier assembly:
Disassembly of the stator can be made considerably easier by first moistening the inner surface of the stator with antiseize agent (soft or liquid soap). Before removing the pressure flange (700), pour the antiseize agent into the opening between rotor and stator on the pressure flange side. Several clockwise (see item 6.2.5) revolutions of the rotor will then distribute the antiseize agent over the inner surface of the stator reducing the friction between rotor and stator considerably.
- Lock drive shaft against rotation.
Dismantling of the stator (601) with tool (W13/see item 9.).

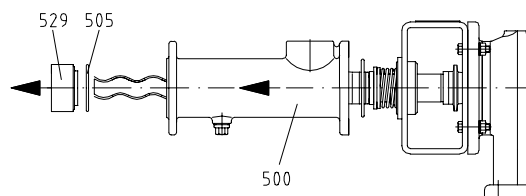


7.3.3 Suction Casing (500), Casing Gasket (501) - Dismantling

Provide the rotor (600) with a protective cover (SH).
Suction casing (500) **without** reducing unit (529)



Suction casing (500) **with** reducing unit (529)

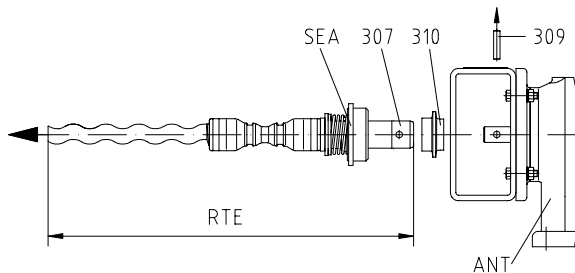


**7.3.4
Rotating Unit (RTE) - Dismantling**

CAUTION

Before dismantling the rotating unit it is essential to observe the specifications in document OM.SEA.__ Shaft Seal Dismantling, see item 9.

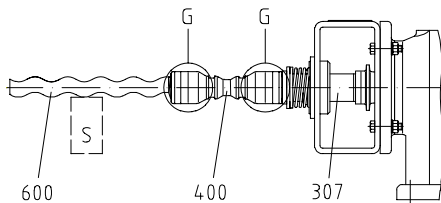
- Remove flushing connections at shaft seal housing (SEA).
- Raise/shift splash ring (310) and eject plug-in shaft pin (309) in horizontal direction.
- Remove rotating unit (RTE)/plug-in shaft (307), together with shaft seal (SEA) from output shaft of the drive (ANT). See Document OM.SPT.01, item 9 for tool (W10) used for pulling off.
- See document OM.SEA.__, item 9, for removal of the shaft seal (SEA) from the plug-in shaft (307).



**7.3.5
Rotating Pump Parts - Dismantling**

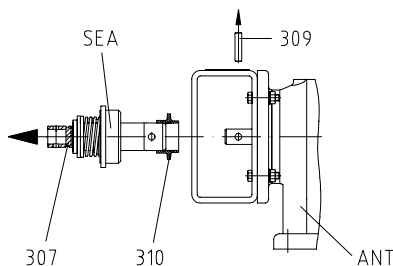
**7.3.5.1
Rotor (600), Coupling Rod (400)**

Detach the rotor (600) and coupling rod (400) from the plug-in shaft (307) by dismantling the joint (G) in accordance with item 7.3.6.



**7.3.5.2
Plug-in Shaft (307)**

The plug-in shaft (307) is removed in the same way as the rotating unit (RTE), see item 7.3.4.



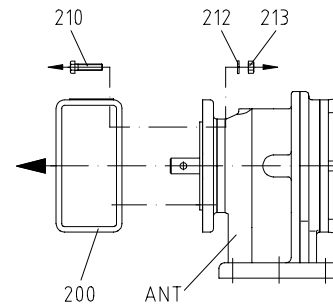
**7.3.6
Dismantling of Joint**

see document OM.PJT.04 item 1.

**7.3.7
Shaft Sealing**

See document OM.SEA.__ item 9 for information on dismantling the shaft sealing.

**7.3.8
Lantern (200)/Drive (ANT) - Dismantling**



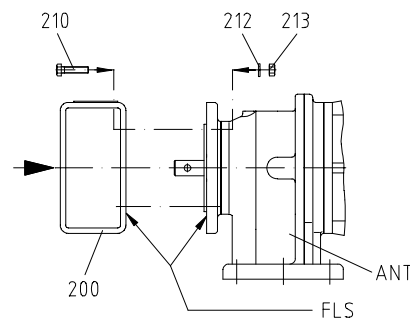
**7.4
Re-assembly**

Before commencing the re-assembly, fasten the lantern (200) in such a way that the drive and the pump components cannot tip or fall down during the re-assembly.



**7.4.1
Lantern (200)/Drive (ANT) - Assembly**

Clean flange bearing surfaces (FLS), centering diameter and output pivot of the drive (ANT).

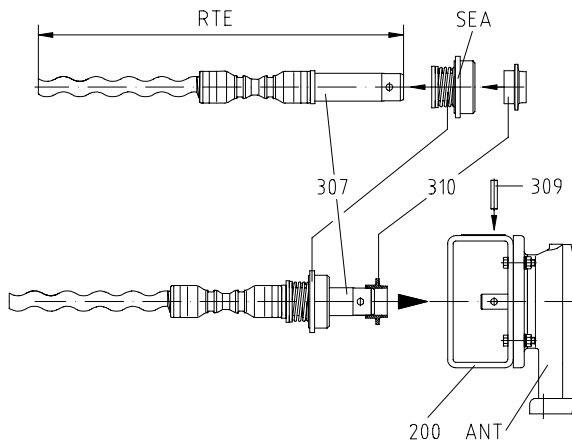


**7.4.2
Rotating Unit (RTE) - Re-assembly**

The rotating unit (RTE) has been assembled in accordance with the description in document OM.PJT.04.

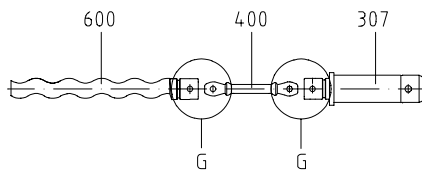
- Mount shaft seal (SEA) on plug-in shaft (307) as described in document OM.SEA.__, see item 9.

- Moisten splash ring (310) and plug-in shaft (307) with joint grease (see index for type) and slide splash ring (310) onto plug-in shaft (307), observing the fitting position of the splash ring, (see lettering on the splash ring).
- Apply antiseize graphite petroleum on the output pivot of the drive (ANT) and slide on the rotating unit (RTE). Insert plug-in shaft pin (309) horizontally.
- Splash ring position (310)
Outer edge of splash ring (310) has to occlude with outer edge of plug-in shaft (309).



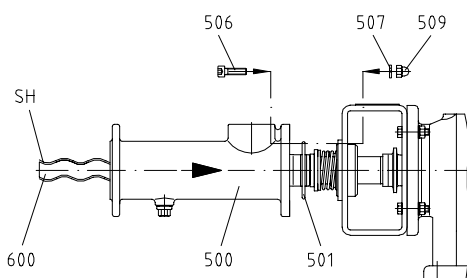
7.4.3 Rotating Pump Parts - Re-assembly

Prepare main components:
Prepare rotor (600), coupling rod (400) and plug-in shaft (307) as described in document OM.PJT.04 item 2 to 2.3
Joint (G) re-assembly as described in document OM.PJT.04 item 3.

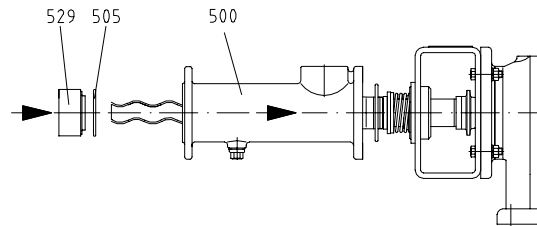


7.4.4 Suction Casing (500), Casing Gasket (501) - Re-assembly

Lay protective cover (SH) over rotor (600).
Assemble casing gasket (501) and suction casing (500).
Suction casing (500) **without** reducing unit (529)

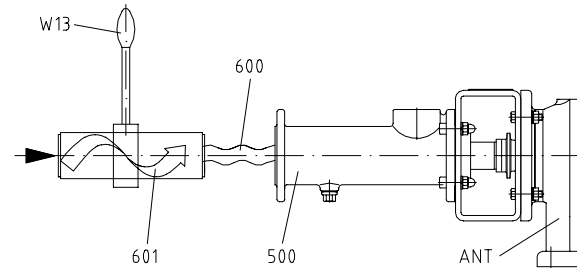


Suction casing (500) **with** reducing unit (529)



7.4.5 Stator (601) - Assembly / Re-assembly

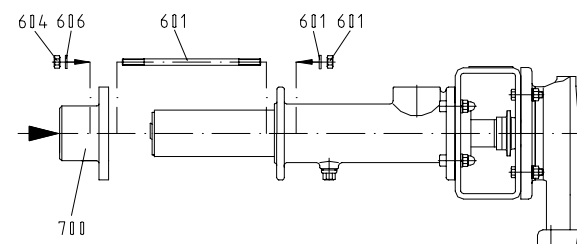
Easier assembly:
Assembly of the stator can be much facilitated by moistening the stator (601) and rotor (600) with an antiseize agent (soft or liquid soap) prior to assembly. The antiseize agent is evenly distributed on the inner surface of the stator and on the rotor. By this, the friction between rotor and stator is considerably reduced.
Lock drive (ANT) shaft against rotation.
Turn stator (601) to the right using a tool (W13/see item 9) and slip it onto rotor (600) at the same time.



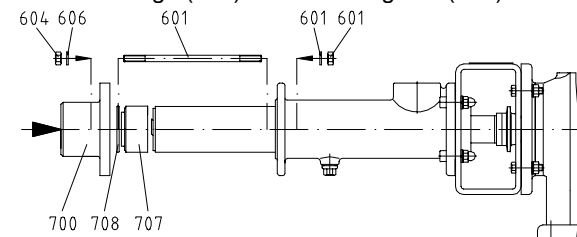
7.4.6 Pressure Flange (700) - Assembly

CAUTION

Tighten tie bolts (602 and 603) equally.
Pressure flange (700) **without** reducing unit (707)



Pressure flange (700) **with** reducing unit (707)



1. Dismantling of Joint

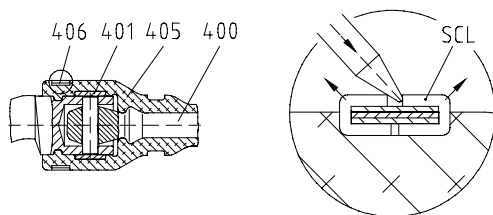
1.1 Holding Band (406) - Dismounting

Cut through loop (SCL) of the holding band (406) with a metal saw.

Wear protective goggles when squeezing out the two halves of the holding band loop (SCL).

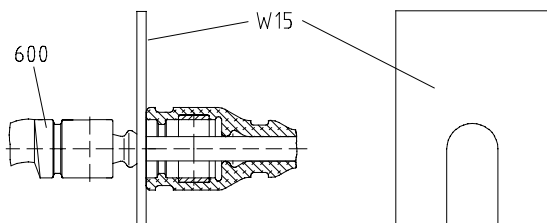


Remove holding band (406).



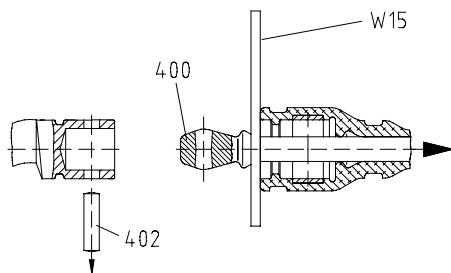
1.2 Rotor (600) - Dismantling

Withdraw universal joint sleeve (405) with retaining sleeve (401) in coupling rod direction and fix it by using a special maintenance tool (W15/see document OM.SPT.01, Point 9)

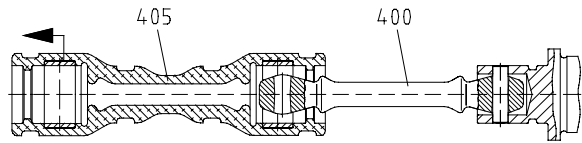


• Separation of Joint

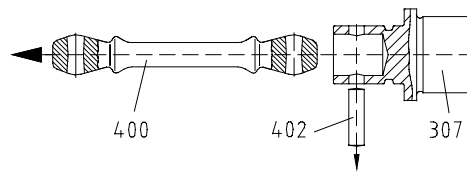
Eject coupling rod pins (402). Pull coupling rod (400) out of joint top.



1.3 Universal Joint Sleeve (405)

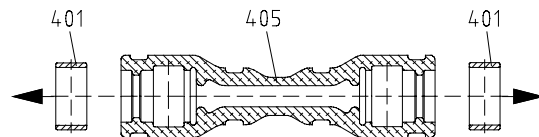


1.4 Coupling Rod (400)



1.5 Retaining Sleeve (401)

Remove retaining sleeve (401) from universal joint sleeve (405).



2. Prepare main components for Re-assembly

2.1 Rotor (600) - Preparation for Joint Assembly

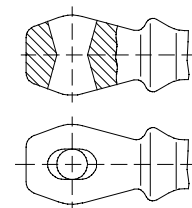
First remove any burr, flaws or similar defects from the rotor, then clean it.
If the hole for the coupling rod pin (402) has worn out, a new rotor (600) has to be installed.

2.2 Coupling Rod (400) - Preparation for the Joint Assembly

Clean coupling rod and check top drilling regarding wear.

CAUTION

If the top drilling shows wear, a new coupling rod will have to be used.



Correct top drilling

**2.3
Plug-in Shaft (307) - Preparation for Joint Assembly**

Remove any burr, flaws or similar defects from the plug-in shaft (307), then clean it.
If the hole for the coupling rod pin (402) has worn out, a new plug-in shaft (307) has to be installed.

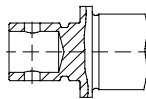
**3.
Joint - Re-assembly**

CAUTION

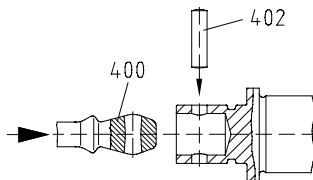
To ensure a perfect operation of the joints, coupling rod pins (402) and coupling rods (400) showing wear should be replaced. Refer to Point 2.2

**3.1
Joint Grease (098)**

Joint head at rotor (600) and plug-in shaft (307)
Fill joint head with joint grease (098).
(Regarding joint grease (098) refer to index of operating instruction)

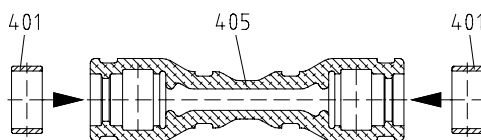


**3.2
Coupling Rod (400)**



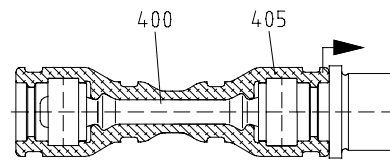
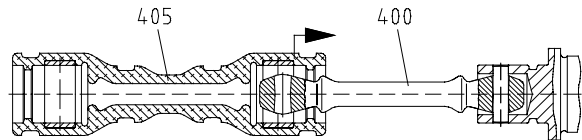
**3.3
Retaining Sleeve (401)**

Moisten both sides of retaining sleeve (401) with joint grease and insert this unit in universal joint sleeve (405).



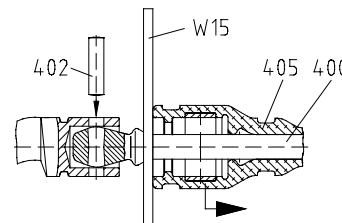
**3.4
Universal Joint Sleeve (405)**

Moisten surface of coupling rod (400) and inner surface of universal joint sleeve with joint grease
Regarding joint grease (098) refer to index of operating instruction.
Slip universal joint sleeve (405) with fitted retaining sleeves (401) onto coupling rod (400) and joint head.



**3.5
Rotor (600)**

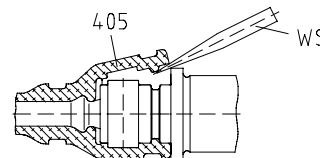
Push back universal joint sleeve (405) at rotor side towards coupling rod (400) and fix it using the relevant tool (W15/refer to document OM.SPT.01, Point 9).



Slip universal joint sleeve (405) onto joint head.

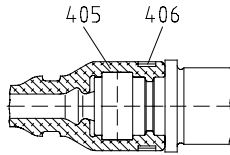
**3.6
Universal Joint Sleeve - Deaeration**

Deaerate interior space of joint at the side of plug-in shaft and rotor using relevant tool/screw driver (WS)



3.7**Holding Band Re-assembly**

Mount holding band (406) using tool (W3/see Point 9) as described in document OM.HBD.01e .



Holding Band (HBD) - Assembly

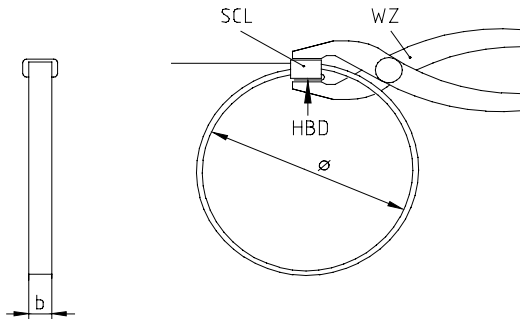
Tools required for the re-assembly, see document OM.STP.01, Point 9.

- Prepare holding band

Only prefabricated double-band holding bands should be used. The diameter (\varnothing) and in particular the breadth (b) of the holding band is matched to the universal joint sleeve.

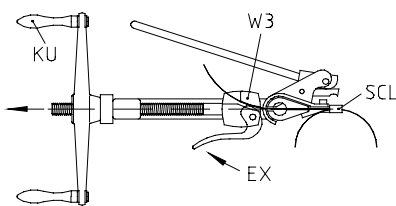
- Test holding band

The bent holding band (HBD) must fit against the holding band loop (SCL), if necessary apply pressure with the tool/pliers (WZ).

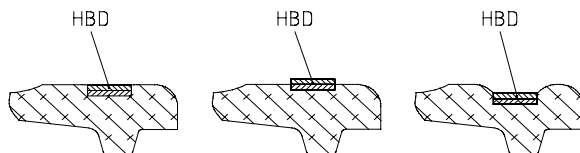


- Assembly of holding band

Insert holding band in tool (W3/ see Point 9). Hold free end of holding band with control lever (EX), turn crank (KU) until the holding band is strained and fitting against the holding band loop (SCL). Carefully contract holding band until it fits inside the circular groove of the universal joint sleeve.



- Correct holding band tension (HBD)



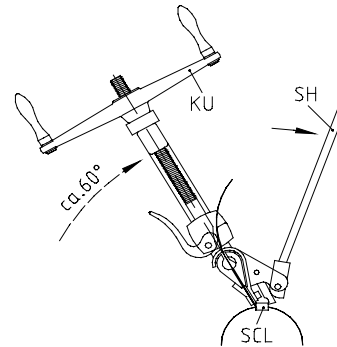
Correct
Holding band (HBD) has slightly contracted outer form of universal joint sleeve and is stuck in position.

Incorrect
Holding band (HBD) is too slack and liable to slip.

Incorrect
Holding band (HBD) is too tight. Universal joint sleeve will be damaged/sheared off.

- Folding back the holding band (HBD)

Slowly swivel mounting tool upward by 60°, at the same time slackening the crank (KU) by approximately one half revolution. Swivel cutting lever (SH) forward until the pressure plate fits against the holding band loop (SCL).

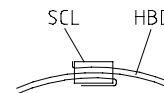


- Shearing off holding band (HBD) made of material AISI 304 and AISI 316

A blow with the palm of the hand against the cutting lever (SH) causes the end of the holding band behind the loop (SCL) to be folded back and sheared off. If the holding band on the sheared off side is slightly raised as a result, it must be straightened carefully.

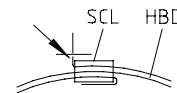
CAUTION

Never tap or hammer against the loop of the holding band (SCL), otherwise damage to the universal joint sleeve may occur.



- Shearing off holding band (HBD) made of Hastelloy C

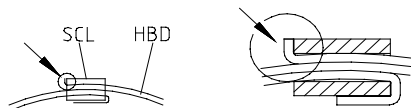
The high strength of this material makes it impossible to shear off the holding band (HBD) with the cutting lever (SH). Once the end of the holding band is folded back, cut off the holding band (HBD), file off projecting edges and remove burr.

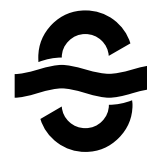


- Check after mounting of holding band

The holding band must run all the way round the groove of the universal joint sleeve.

The holding band (HBD) must be bent back and sheared off at the holding band loop (SCL) in such a way that the holding band (HBD) is unable to slip back through the holding band loop (SCL). If this has not been accomplished, then the holding band (HBD) must be replaced by a new one.





8.

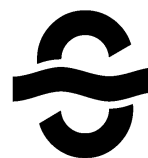
Breakdown, reasons, remedies

Breakdown										Reasons / Remedies	
1	2	3	4	5	6	7	8	9	10		
				○			○			a	Adhesion between rotor and stator excessive (as delivered). Lubricate (soft soap, genuine soap) between stator and rotor. Then turn the pump by means of the tool W2.
○										b	Check rotational direction of the pump per data sheet and nameplate. In case of wrong direction, change wiring of motor.
○	○	○			○	○				c	Suction pipe or shaft sealing leak. Eliminate the leakage.
○	○	○				○				d	Suction head too high (item 6.5.3.1). Check suction head with vacuum gauge. Increase the suction pipe diameter and fit larger filters. Open the suction valve
○	○	○								e	Viscosity of the liquid too high. Check and accommodate per data sheet.
		○		○			○			f	Wrong pump speed. Correct pump speed per data sheet.
	○	○								g	Avoid inclusions of air in the conveying liquid.
		○		○	○		○	○		h	Pressure head too high (point 6.5.3.2). Check pressure head with manometer. Reduce the pressure head by increasing the pressure pipe diameter or by shortening the pressure pipe.
○	○	○			○			○		i	Pump runs partially or completely dry (point 6.5.2). Check flow in the suction chamber. Install dry running protection TSE.
						○	○			j	Check coupling, possibly pump shaft is misaligned to drive. Check whether coupling gear is worn. Realign coupling. The coupling gear has perhaps to be replaced.
○		○								k	Speed too low. Increase the speed when high suction performances are required and when the liquid is very thin.
○	○					○				l	Speed too high. Reduce the speed when pumping products with high viscosities - danger of cavitation.
						○				m	Check the axial play in the coupling rod linkage. Check that the bush has been installed correctly see document OM.PJT. ... e item 2.2
○		○		○	○			○		n	Check for foreign substances in the pump. Dismantle the pump, remove foreign substances and replace worn parts.
○		○	○		○					o	Stator or rotor worn. Dismantle the pump and replace defective parts.
○		○			○	○				p	Joint parts worn. Replace worn parts and fill with special pin joint grease.
○		○			○			○		q	Suction pipework partially or completely blocked. Clean suction pipework.
○				○	○		○	○		r	Temperature of the pumping liquid too high. Excessive expansion of the stator. Check temperature and install rotor with diameter smaller than specified
○		○		○			○		○	s	Gland packing too strongly tightened or worn. Ease or tighten stuffing box. Replace defective packing rings.
○				○	○			○		t	Solid contents and/or size of solids too large. Reduce pump speed and install perhaps a screen with suitable meshes. Increase fluid share.
○				○				○	○	u	When the pump is non operational the solids settle out and become hard. Clear and flush the pump immediately.
○				○	○			○	○	v	The liquid becomes hard when temperature falls below a certain limit. Heat the pump.
				○	○		○	○		w	Stator swollen and unsuitable for the pumped liquid. Select a suitable stator material. Use perhaps rotor with diameter smaller than specified.
						○			○	x	The bearing in the drive casing of the pump or in the drive engine is defective. Replace bearing.
									○	y	Mechanical seal defective. Check seal faces and O-rings. If necessary replace corresponding defective parts.

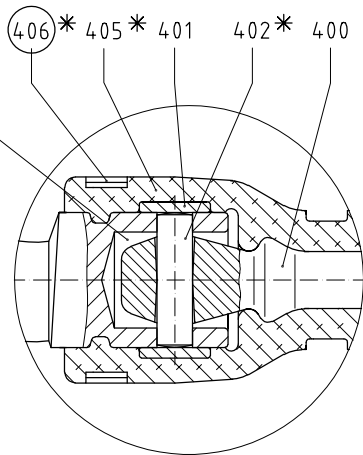
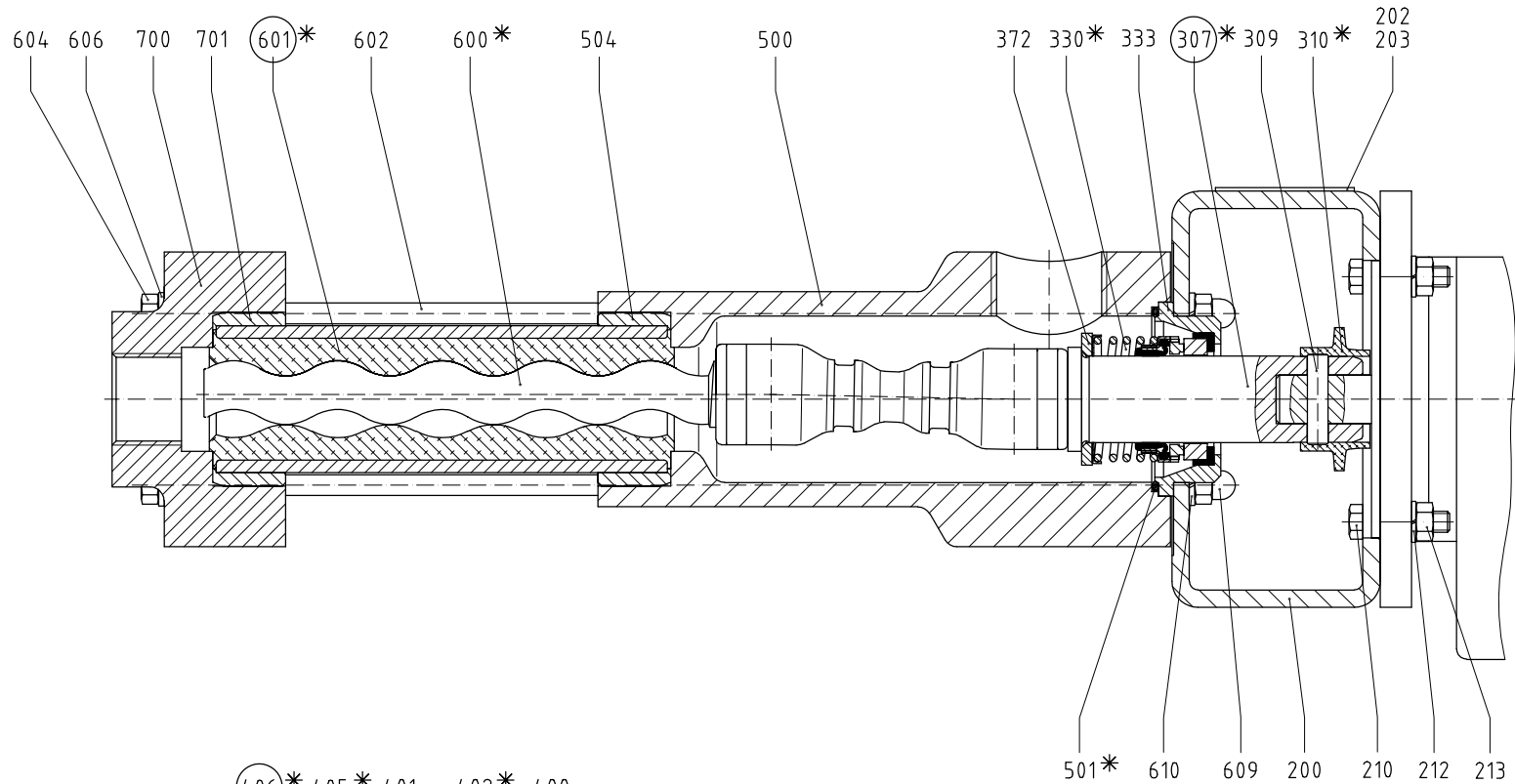
seepex progressive cavity pumps will operate trouble-free if they are used in accordance with our data sheet (see item 9) and our operating and maintenance instructions:



9. Auxiliary seepex documentation



Stck.	Pos.	d	e	f
		Stückliste Baureihe MD Baugrößen Schnittzeichnung Nr.	Parts list range MD sizes sectional drawing No.	Liste des pièces série MD tailles plan no.
		Benennung Stck. / Pos.	denomination Qty. / item	désignation Qté. / Poste
1	200	Laterne	lantern	lanterne
2	202	Halbrundkerbnägel	round head grooved pin	rivet
1	203	Typenschild	type plate	plaque signalitique
1	307	Steckwelle	plug-in shaft	arbre à broche
1	309	Steckwellenbolzen	plug-in shaft pin	cheville pour arbre à broche
1	310	Spritzring	splash ring	bague de projection
1	330	Gleitringdichtung	mechanical seal	garniture mécanique
1	333	Gleitringdichtungsgehäuse	mechanical seal casing	carter de la garniture mécanique
1	372	Stützring	support ring	bague d'appui
1	400	Kuppelstange	coupling rod	barre d'accouplement
2	401	Gelenkhülse	retaining sleeve	douille d'articulation
2	402	Kuppelstangenbolzen	coupling rod pin	axe d'articulation
1	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
1	500	Sauggehäuse	suction casing	carter d'aspiration
1	501	Sauggehäusedichtung	casing gasket	étanchéité du carter d'aspiration
4	506	Zylinderschraube	socket screw	vis à tête cylindrique
4	507	Federring	spring washer	rondelle frein
4	509	Hutmutter	cap nut	écrou borgne
1	529	Reduzierstück / MD	reducing unit / MD range	réducteur / série MD
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
1	700	Druckstutzen	pressure branch	bride de refoulement
	098	seepex Gelenkfett Typ und Füllmenge siehe Angaben im Inhaltsverzeichnis der zur Pumpe gehörenden Betriebsanleitung	seepex joint grease for type and filling quantity refer to index of operating instruction belonging to pump	seepex graisse d'articulations voir sommaire pour type et quantité
		Verschleißteile und Dichtungen: siehe Dokument OM.WPS.40d	Wear parts and sealings refer to document OM.WPS.40e	Pièces d'usure et étanchéités voir document OM.WPS.40f
		Werkzeuge: Für Demontage und Wiedermontage erforderlich siehe Dokument OM.SPT.01	Tools: required for disassembly and reassembly, refer to document OM.SPT.01	Outils: Requis pour le démontage et le rémontage, voir document OM.SPT.01
		ACHTUNG Bei Montagen unbedingt erforderlich: für Pos. 529 und Pos. 601: Klebe- und Dichtmittel Loctite Typ 222	CAUTION Absolutely requested for assembly: for items 529 and 601: adhesive and bonding agent Loctite type 222	ATTENTION Absolument requis pour des montages: pour postes 529 et 601: adhésif et agent d'étanchéité Loctite type 222



seepex Gelenkfett

Typ und Füllmenge
siehe Angaben im
Inhaltsverzeichnis der
zur Pumpe gehörenden
Betriebsanleitung.

seepex joint grease

type and filling quantity
see notes indicated on
the index of the
operating and maintenance
instructions belonging to
the respective pump.

○ Werkzeug

für die Demontage und
Wiedermontage erforderlich
siehe Dokument OM.SPT.01d

tool for the dismantling
and assembly requested
see document OM.SPT.01d

* Verschleißteile und Dichtungen

siehe Dokument OM.WPS.40d

Wearing parts and seals
see document OM.WPS.40e

Werkstoff-Ausführung 7440-,
material-construction 7440-,

Stück Unit	Norm Standard	Pos./Item	Benennung/Denomination Zeichnungs-Nummer/Drawing-Number	Werkstoff/Material	Bemerkung/Remark	Gewicht Weight kg
---------------	------------------	-----------	--	--------------------	------------------	-------------------------

seepex
GmbH + Co KG
Schornhöfstrasse 344
D-46240 Böttrop

seepex.



Allg. einzelne Toleranzangabe DIN ISO 2768-mittel	Änderung Modifikation überarbeitet E	Name Name hof	Datum Date 28.10.1996	Maßstab/Scale % ①	Werkstoff/Material	Gewicht/Weight	Vordruck CAD
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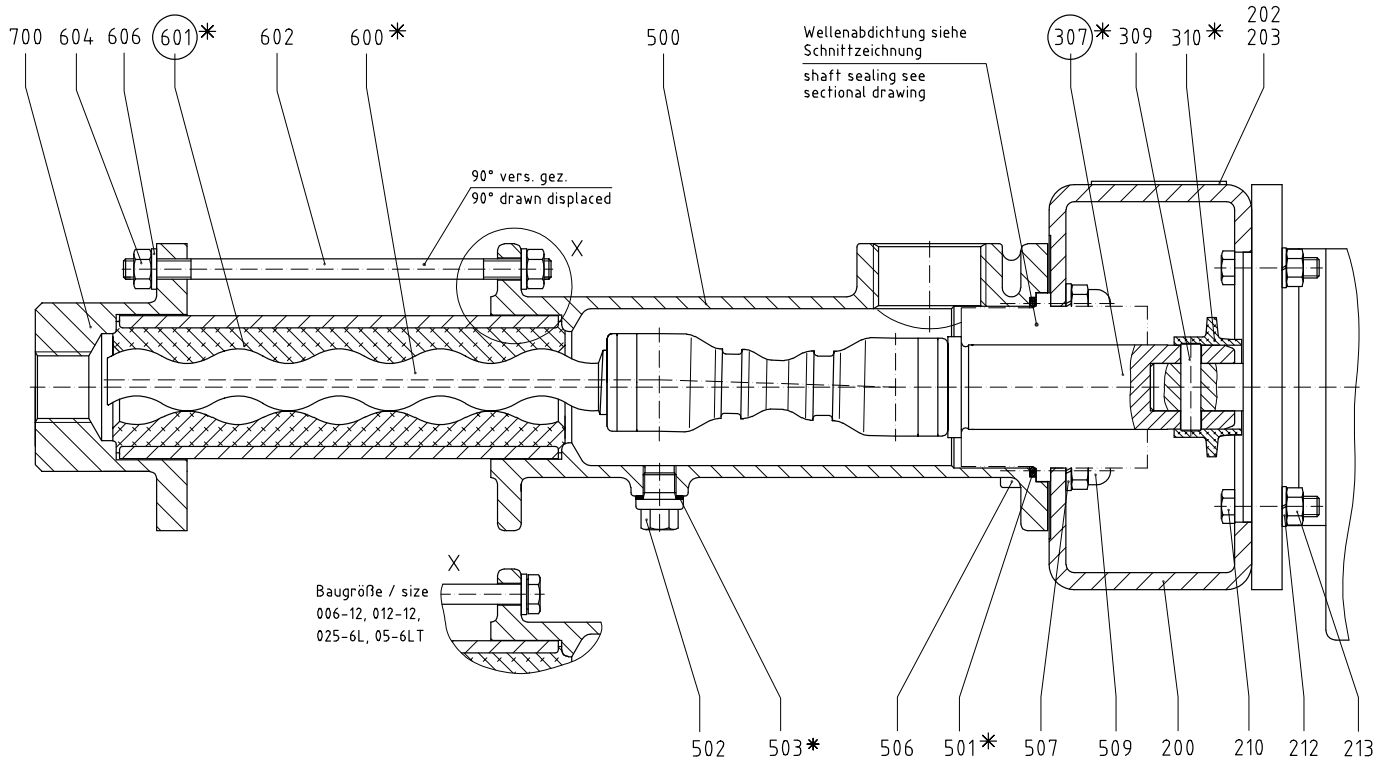
Allgemeintoleranzen für Masse ohne einzelne Toleranzangabe DIN ISO 2768-averge		Bezeichnung/Denomination	
—	—	Schnittzeichnung Baureihe "MD"	
—	—	sectional drawing range "MD"	

Rauheit für Oberflächenzeichen DIN ISO 1302 Reihe 2	Name Name hof	Datum Date 28.10.1996	Zeichnungs-Nummer/Drawing-Number 103-003E2
Roughness for surface finish indication DIN ISO 1302 Reihe 2	Geprüft/Checked hue	18.11.1996	EDV-Nr./EDP-No. L:\LFDZCHNG\105\10853
—	Normiert/Standard	—	Ersatz für/Replacement for: Ersatz durch/Replacement by:
—	Gedruckt/Printed	—	—

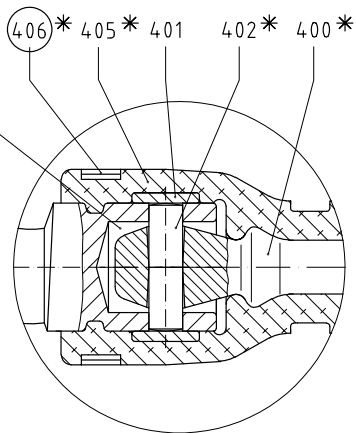
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Stck.	Pos.	d	e	f
		Stückliste Baureihe MD Schnittzeichnung Nr.	Parts list range MD sectional drawing No.	Liste des pièces série MD plan no.
		Benennung Stck. / Pos.	denomination Qty. / item	désignation Qté. / Poste
1	200	Laterne	lantern	lanterne
2	202	Halbrundkerbnägel	round head grooved pin	rivet
1	203	Typenschild	type plate	plaque signalitique
4	210	6kt-Schraube	hexagon bolt	
4	212	Federring	spring washer	
4	213	6kt-Mutter	hexagon nut	écrou
1	307	Steckwelle	plug-in shaft	arbre à broche
1	309	Steckwellenbolzen	plug-in shaft pin	cheville pour arbre à broche
1	310	Spritzring	splash ring	bague de projection
1	330	Gleitringdichtung	mechanical seal	garniture mécanique
1	333	Gleitringdichtungsgehäuse	mechanical seal casing	carter de la garniture mécanique
1	372	Stützring	support ring	bague d'appui
1	400	Kuppelstange	coupling rod	barre d'accouplement
2	401	Gelenkhülse	retaining sleeve	douille d'articulation
2	402	Kuppelstangenbolzen	coupling rod pin	axe d'articulation
1	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
1	500	Sauggehäuse	suction casing	carter d'aspiration
1	501	Sauggehäusedichtung	casing gasket	étanchéité du carter d'aspiration
1	504	Verdrehsicherung	locking pin	dispositif protecteur contre torsion
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
4	602	Spannschraube	tie bold	tirant
4	604	6kt-Mutter	hexagon nut	écrou
4	606	Scheibe	washer	rondelle
4	609	Hutmutter	cap nut	écrou borgne
4	610	Federring	spring washer	rondelle frein
1	700	Druckstützen	pressure branch	bride de refoulement
1	701	Verdrehsicherung	locking pin	dispositif protecteur contre torsion
	098	seepex Gelenkfett Typ und Füllmenge siehe Angaben im Inhaltsverzeichnis der zur Pumpe gehörenden Betriebsanleitung	seepex joint grease for type and filling quantity refer to index of operating instruction belonging to pump	seepex graisse d'articulations voir sommaire pour type et quantité
		Verschleissteile und Dichtungen: siehe Dokument OM.WPS.40d	Wear parts and sealings refer to document OM.WPS.40e	Pièces d'usure et étanchéités voir document OM.WPS.40f
		Werkzeuge: Für Demontage und Wiedermontage erforderlich siehe Dokument OM.SPT.01	Tools: required for disassembly and reassembly, refer to document OM.SPT.01	Outils: Requis pour le démontage et le rémontage, voir document OM.SPT.01



Baugröße / size
006-12, 012-12,
025-6L, 05-6LT



seepex Gelenkfett

Typ und Füllmenge
siehe Angaben im
Inhaltsverzeichnis der
zur Pumpe gehörenden
Betriebsanleitung.

seepex joint grease
type and filling quantity
see notes indicated on
the index of the
operating and maintenance
instructions belonging to
the respective pump.

○ Werkzeug
für die Demontage und
Wiedermontage erforderlich
siehe Dokument OM.SPT.01

tool for the dismantling
and assembly requested
see document OM.SPT.01

* Verschleißteile und Dichtungen

siehe Dokument OM.WPS.42

Wearing parts and sealings
see document OM.WPS.42

Baugröße / size 006-12 bis 05-6LT

Werkstoff-Ausführung 4440-,
material-construction 4440-.

Stück Unit	Norm Standard	Pos./Item	Benennung/Denomination Zeichnungs-Nummer/Drawing-Number	Werkstoff/Material	Bemerkung/Remark	Gewicht Weight kg
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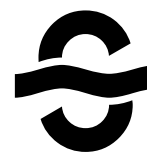
seepex
GmbH + Co KG
Scharnhölzstraße 344
D-46240 Bottrop

seepex.



Allgemeintoleranzen für Masse ohne angabe Toleranzübertragung DIN ISO 2768-mittel	AUF- gabe Modification	Name Name	Datum Date	Massstab/Scale %	Werkstoff/Material	Gewicht/Weight	Vordruck CAD
General tolerances for mass without individual tolerance entry DIN ISO 2768-average					Bezeichnung/Denomination Schnittzeichnung Baureihe "MD" sectional drawing range "MD"		
Rauheit für Oberflächenezeichen DIN ISO 1302 Reihe 2		Name Name	Datum Date		Zeichnungs-Nummer/Drawing-Number 103-011A2		
Roughness for surface finish indication DIN ISO 1302 Reihe 2	Bearbeitet/Drawn hof	14.07.1998			EDV-Nr./EDP-No. L:\LFDZCHNG.290\29265		
	Geprüft/Checked wgr	14.07.1998			Ersatz für/Replacement for:		Ersatz durch/Replacement by:
	Normiert/Standard				Gedruckt/Printed		

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Stck.	Pos.	d	e	f
		Stückliste Baureihe MD Baugrößen Schnittzeichnung Nr.	Parts list range MD sizes sectional drawing No.	Liste des pièces série MD tailles plan no.
		Benennung Stck. / Pos.	denomination Qty. / item	désignation Qté. / Poste
1	200	Laterne	lantern	lanterne
2	202	Halbrundkerbnägel	round head grooved pin	rivet
1	203	Typenschild	type plate	plaque signalitique
4	210	6kt-Schraube	hexagon bolt	vis
4	212	Federring	spring washer	rondelle frein
4	213	6kt-Mutter	hexagon nut	écrou
1	307	Steckwelle	plug-in shaft	arbre à broche
1	309	Steckwellenbolzen	plug-in shaft pin	cheville pour arbre à broche
1	310	Spritzring	splash ring	bague de projection
1	400	Kuppelstange	coupling rod	barre d'accouplement
2	401	Gelenkhülse	retaining sleeve	douille d'articulation
2	402	Kuppelstangenbolzen	coupling rod pin	axe d'articulation
1	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
1	500	Sauggehäuse	suction casing	carter d'aspiration
1	501	Sauggehäusedichtung	casing gasket	étanchéité du carter d'aspiration
3	502	Verschlußschraube	screwed plug	bouchon de vidange
3	503	Dichtring	sealing ring	joint d'étanchéité
4	506	Zylinderschraube	socket screw	vis à tête cylindrique
4	507	Federring	spring washer	rondelle frein
4	509	Hutmutter	cap nut	écrou borgne
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
2	602	Spannsschraube	tie bolt	tirant
4	604	6kt-Mutter	hexagon nut	écrou
4	606	Scheibe	washer	rondelle
2	602	6kt-Schraube	hexagon bolt	vis
2	604	6kt-Mutter	hexagon nut	écrou
2	606	Scheibe	washer	rondelle
1	700	Druckstutzen	pressure branch	bride de refoulement
	098	seepex Gelenkfett Typ und Füllmenge siehe Angaben im Inhaltsverzeichnis der zur Pumpe gehörenden Betriebsanleitung	seepex joint grease for type and filling quantity refer to index of operating instruction belonging to pump	seepex graisse d'articulations voir sommaire pour type et quantité
		Verschleißteile und Dichtungen: siehe Dokument OM.WPS.42d	Wear parts and sealings refer to document OM.WPS.42e	Pièces d'usure et étanchéités voir document OM.WPS.42f
		Werkzeuge: Für Demontage und Wiedermontage erforderlich siehe Dokument OM.SPT.01	Tools: required for disassembly and reassembly, refer to document OM.SPT.01	Outils: Requis pour le démontage et le rémontage, voir document OM.SPT.01
		Wellenabdichtung siehe Schnittzeichnung	shaft sealing see sectional drawing	Dispositif d'étanchéité d'arbre voir vue éclatée
		versetzt gezeichnet	drawn displaced	plan séparé

1.

Safety for Shaft Sealings

(in compliance with DIN EN 809)

Sufficient precautions must be taken to prevent the emergence into the atmosphere of any leakage constituting a hazard due to its toxicity, explosive-ness or combustibility. The leakage must be dis-posed of at a safe location. Always pay due regard to the applicable national standards and specifica-tions.

2.

Shaft Sealing

2.1

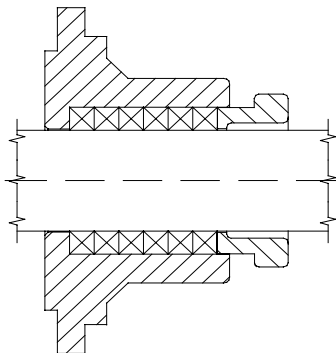
Operating Conditions

The permissible operating conditions and material combination are matched with the particular application in each case and are indicated in the data sheet of the associated pump.

2.2

Design

- standard
- 6 packing rings



associated operating instructions OM.SEA.01e

Gland Packing seepex Code A, C, E, F, S, V

1. Commissioning

1.1 Adjusting the Gland Packing

When commissioned the factory-set gland packing is only slightly tightened. For this reason, the packing must be adjusted on-site to suit the prevailing operating conditions.

1.2 Gland Packing at Overpressure in Suction Chamber

50-100 drops per min. leakage is permissible at startup until the packing material has settled (duration: c. 10-15 min.). Following the settle time, the leakage must be reduced to 1-10 drops per min. by uniformly tightening the gland stuffing box. Leaking fluid drains into the drip pan, lantern and/ or drive housing and carried off via a threaded drilling.

1.3 Gland Packing at Partial Vacuum in Suction Chamber

With the low pre-set tightening level, the gland packing requires c. 10-15 minutes before the packing material settles. After this time, tighten the gland stuffing box uniformly until no more air is drawn in from the atmosphere.

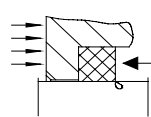
2. Monitoring during Operation

2.1 Checking for Leaks

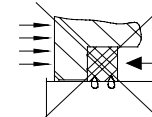
Gland packings must be checked for leaks at regular intervals while the pump is running. In the case of excessive leakage (overpressure in suction chamber) or intake of air (partial vacuum in suction chamber), the gland stuffing box (302) must be tightened until the permissible leakage rate is achieved see Point 1.2 or 1.3. If the gland packing has been tightened to such an extent that the gland stuffing box (302) fits up against the gland housing (300), it is necessary to fit a new packing ring (301). If following tightening of the new packing ring the gland stuffing box again fits up against the gland housing, then it is advisable to replace the entire gland packing. Timely renewal of the packing will largely rule out the incidence of shaft wear.

2.2 Operating Errors and Consequences

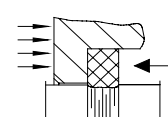
Gland packings are intended to limit, but not pre-vent, the escape of the medium. Some leakage is necessary to reduce friction and carry off the associated friction heat.



Correct:
lubrication by
liquid and
antiseize agent



Incorrect:
no liquid
lubrication due
to excessive
stuffing box
pressure;
impregnation is
squeezed out.



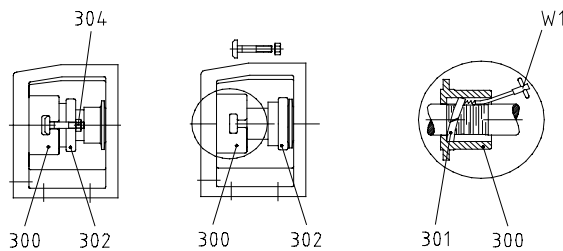
Consequence:
dry running,
burning of the
packing. Severe
shaft wear leading
to heavy leakage.

3. Service and Maintenance

3.1 Renewing Gland Packing

The tool (W1/see Point 9) should be used to remove the individual packing rings (301). Before re-fitting the rings, clean the gland area and replace any damaged shafts.

See Point 4.2 for instructions on re-fitting the packing rings (301).

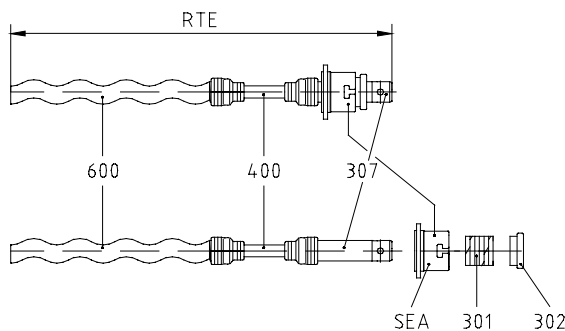


4. Dismantling / Re-mounting

4.1 Dismantling

Following the dismantling of the rotating unit (RTE) in the manner described in OM.MAI.01 Point 7.3.5, clean the plug-in shaft (307) and remove any projecting edges and burring that could damage the shaft sealing elements.

Remove shaft sealing (SEA) from the plug-in shaft.



4.2 Re-assembly

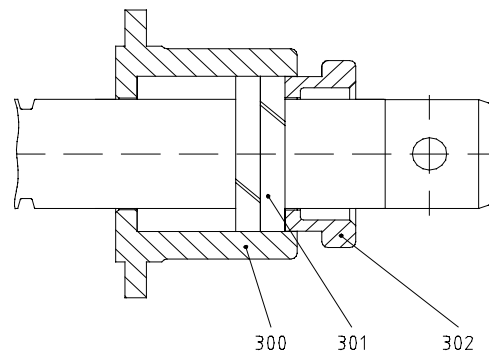
CAUTION

As a basic rule, only packing materials conforming to the operating conditions as well as suitable packing diameters and lengths should be used.

CAUTION

Please refer to the added document OM.SEA.__e "shaft sealing design" for details of the layout of any seal cage, grease lantern and/or thrust collar, if existent, as well as connection possibilities in the gland housing.

Fit the packing rings (301) with cut ends offset by 90°. Using the gland stuffing box (302), insert the individual rings uniformly into the gland packing chamber (never use a pointed implement, otherwise damage to the shaft could result and the packing material become deformed).



1.

General

- Please take the appertaining drawing from respective pump data sheet.
- The mechanical seal is suitable for the operating conditions indicated in the pump data sheet. Modifications are only admissible after the customer has consulted with **seepex**. Additionally, attention must be paid to the manufacturer's operating manual.

2.

Safety

Any mode of operation impairing the operating safety of the mechanical seal has to be avoided.

The operator is advised to consider the possible effects on the environment which could be caused by a defective mechanical seal and what additional measures must be taken to protect the environment and the public.

The pump must be mounted and operated in such a way that operation with a defective mechanical seal will not result in injury or harm to the public and that any leakage can be safely and properly dealt with.

Mechanical seals are often used to seal hazardous material (chemicals, drugs, etc.). It is essential that rules pertaining to the handling of hazardous materials are adhered to.

Modifications effected by the customer himself and changes influencing the safety of the mechanical seal are not allowed.

3.

Emissions

A mechanical seal is a dynamic seal and leakage is unavoidable.

ATTENTION

Components that may contact leakage must be resistant to corrosion or be protected accordingly.

Mechanical seal leakage must be drained in a safe and proper manner.

4.

Flushing or circulation of single-acting mechanical seals

Single-acting mechanical seals contacting the conveying liquid require no additional flushing or a circulation pipe because sufficient flushing and heat exchange occurs around the seal due to the conveying liquid.

However, in particular cases, a direct flushing pipe can be installed into the flushing connection on the mechanical seal housing.

5.

Commissioning

Regardless of the pump's operating status, the conveying medium to be sealed must always be in liquid form at the mechanical seal. This particularly applies to the pump's commissioning and its placing out of service.

6.

Maintenance

When operating the pump according to the instructions, no maintenance is required.

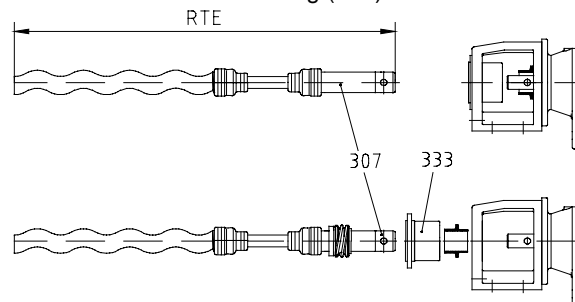
7.

Disassembly / Reassembly

7.1

Disassembly

- Remove flushing connections at shaft seal housing (SAE).
- Lift / displace splash ring (310) and eject plug-in shaft pin (309) horizontally.
- Withdraw rotating unit (RTE) together with shaft seal parallel from output shaft of drive and avoid chocking.
- Clean plug-in shaft (307) and remove burrs etc., which may damage sealing elements. Moisten plug-in shaft (307) with slip additive (diluted fluid soap).
- Loosen axial safety device of mechanical seal (330 or 372) and withdraw mechanical seal (330) from plug-in shaft (307).
- Remove mechanical seal housing (333) from lantern (200).
- Press counter-ring of mechanical seal with o-ring out of mechanical seal housing (333).



7.2

Reassembly

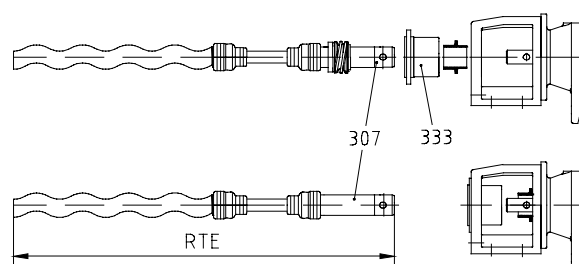
ATTENTION

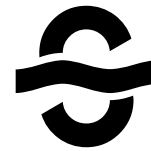
Mechanical seals are precision parts of high quality. Therefore, the installation must be effected with care. Gentle handling and extreme neatness are essential.

- Clean mechanical seal housing (333)
- Evenly press counter-ring with o-ring into mechanical seal housing (333). To facilitate assembly, the o-ring should be moistened with a lubricant (diluted fluid soap).

ATTENTION

- Oil or grease must not be used to facilitate assembly.
- Install mechanical seal housing (333) to lantern (200) and ensure correct position of flushing connections.
- Remove plug-in shaft (307), burrs and roughness and clean the unit.
- Check / adjust set dimension of mechanical seal on plug-in shaft (307). Moisten plug-in shaft (307) and elastomer parts of mechanical seal with lubricant (diluted fluid soap).
- Slip mechanical seal onto plug-in shaft (307) as far as set ring.
- Lubricate drive shaft (ANT) with anticiseize graphite petroleum.
- Moisten splash ring (310) and plug-in shaft (307) with pin joint grease, (for type, please see index) and slip splash ring (310) onto output shaft of drive. Note installing position of splash ring and refer to description on splash ring.
- Move rotating unit (RTE) through mechanical seal housing (333) and splash ring (310) and slip splash ring (310) onto output shaft of drive (ANT). Push in plug-in shaft pin (309) in horizontal position.
- Position of splash ring:
Collar of splash ring shall be fitted in a distance of about 0.5 mm to lantern (200).





Wearing parts and gaskets

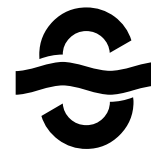
Range: MD, MDF

To avoid the expenses incurred by lengthy stop periods of the pump, **seepex** recommend the acquisition of a set of wearing parts and a set of gaskets. The table below shows the contents of these sets.

Part designation	small set of wearing parts big set of wearing parts set of gaskets			Item number acc. to sectional drawing of pump and parts list
	Number			
Rotor		1		600
Stator 2)	1	1		601
Universal joint sleeve		1		405
Coupling rod pin		2		402
Guide bush 2)		-		-
Coupling rod		1		400
Coupling rod bush 2)		-		-
Casing gasket			1	501
Holding band, small 2)		-		-
Holding band, large 2)		2		406
Packing ring set 2) 3)	1	1		301
Mechanical seal 3)			1	330
Sealing ring			4	571, 726
Splash ring			1	310
O-ring			1	572
Plug-in shaft 2)		1		307
Special joint grease			098	1 cart. 300 gr (c. 315cm ³) grease quantity per pin joint, see tech.
Tool				Essential for assembly, see Point 9, document OM.SPT.01

2) see tools Point 9., document OM.SPT.01

3) Item 330 and item 301 (as an alternative) depend on the pump design. With regard to the pump design, refer to the appertaining data sheet and the sectional drawing. See Point 9.



Wearing parts and gaskets

Range: MD, MDT
Design: stainless steel / tie bolts

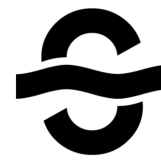
To avoid expenses incurred by lengthy stop periods of the pump, **seepex** recommends the acquisition of a set of wearing parts and a set of gaskets. The table below shows the type and quantity of parts contained in these sets.

Part designation	small set of wearing parts	big set of wearing parts	set of gaskets	Item number acc. to sectional drawing of pump and parts list
	Number			
Rotor		1		600
Stator 2)	1	1		601
Universal joint sleeve		1		405
Coupling rod pin		2		402
Guide bush 2)		-		-
Coupling rod		1		400
Coupling rod bush 2)		-		-
Casing gasket			1	501
Holding band, small 2)		-		-
Holding band, large 2)		2		406
Packing ring set 2) 3)	1	1		301
Mechanical seal 3)			1	330
Sealing ring 4)			4	571, 726
Sealing ring			1	503
Splash ring			1	310
O-ring 4)			1	572
O-ring			1/1	505, 708
Plug-in shaft 2)		1		307
Special joint grease			098	1 cart. 300 gr (c. 315cm³) grease quantity per pin joint, see tech.
Tool				Essential for assembly, see item 9, document OM.SPT.01

2) see tools item 9., document OM.SPT.01

3) Item 330 and item 301 (as an alternative) depend on the pump design. With regard to the pump design, refer to the appertaining data sheet and the sectional drawing. See item 9.

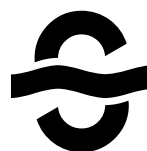
4) for pump with double jacket



Allgemeine normierte Werkzeuge							
Standardized tools							
Werkzeug Nr. tool No.	W1	W2	W5	W6	W9	W11	W13
zur Montage von: tool for mounting of:	Packung packing	Stator stator	Gelenk joint	Lager bearing	allgemein general	Mutter für Teflonmanschette nut for teflon universal joint sleeve	Stator stator 1)
Benennung: denomination:	Packungszieher packing lever	Ketten-Rohrzange + Ersatzkette chain pipe wrench +replacement chain	Durchschlag drift	Bolzen pin	Montierhebel mounting lever	Bandschlüssel strap wrench	Bandschlüssel strap wrench
Baugröße size							
0015-24 003-12/-24 006-12/-24 012-12/-24	PKZ XX 000 0000 0 X35M0	Siehe W 13 see W 13					WKZ SBD 140
025-12 025-24 05-12 1-6L			DHS 00 020 0000 0 00000				
05-24 1-6 1-12 2-6L 1-24 2-6 2-12 5-6L	PKZ XX 000 0000 0 X0FQ0	KRZ XX Z55 0250 0 00000 KEZ XX Z55 0250 0 00000	DHS 00 050 0000 0 00000	BLZ 00 020 0008 0 00000			
2-24 5-6 5-12 10-6L/15-6LT	PKZ XX 000 0000 0 X0HV0		DHS 00 050 0000 0 00000	BLZ 00 020 0010 0 00000			
5-24 10-6 10-12 17-6L/30-6LT			DHS 00 100 0000 0 00000	BLZ 00 020 0010 0 00000	2 Stück 2 pieces MHL XX SA 610	WKZ SBD 140	
26-6L/40-6LT 10-24 17-6 17-12 35-6L/55-6LT 52-6L/75-6LT		KRZ XX Z55 0300 6 00000 KEZ XX Z55 0300 6 00000	DHS 00 120 0000 0 00000	BLZ 00 025 0012 0 00000			
17-24 52-12 35-6 35-12 70-6L/110-6LT	PKZ XX 000 0000 0 XA01A	KRZ XX Z55 0300 8 00000 KEZ XX Z55 0300 8 00000	DHS 00 160 0200 0 00000	BLZ 00 030 0012 0 00000			
35-24 70-6 70-12 130-6L 200-6L			DHS 00 200 0200 0 00000	BLZ 00 035 0012 0 00000			
70-18 70-24 130-6 130-12 202-6L		KRZ XX Z55 0301 2 00000 KEZ XX Z55 0301 2 00000	DHS 00 240 0250 0 00000	BLZ 00 040 0015 0 00000			
130-24 240-12 350-6L				BLZ 00 040 0015 0 00000			

Die Preise sind dem Preisblatt AL.SPTde zu entnehmen / prices are listed on price sheet AL.SPTde

1) Gilt nur für Pumpen in Edelstahl Ausführung / only valid for pumps in special steel design



Empfohlene seepex Werkzeuge Aufgrund der Ausführung für bestimmte Montagen empfohlen, durch allgemeine normierte Werkzeuge bedingt ersetzbar. Recommended seepex tools Due to the design recommended for certain repairs, these tools partially replace the standardized tools.		Spezialwerkzeuge für bestimmte Montagen unbedingt erforderlich Special tools definitely needed for certain repairs						
Werkzeug Nr. tool No.	W4	W7	W8	W10	W12	W14	W15	W3
zur Montage von: tool for mounting of:	Gelenk joint	Lager bearing	Schmiernippel lubrication nipple	Steckwelle plug-in-shaft	Teflonmanschette teflon universal joint sleeve	Kuppelstangenbuchsen coupling rod bushing	Manschette universal joint sleeve	Halteband holding band
Benennung: denomination:	Montagedorn assembly mandrel	Montagehülse mounting sleeve	Einschlag-hülse drive-in sleeve	Demontage Werkzeug dismantling tool	Montage-werkzeug mounting tool	Preßwerkzeug pressing tool	Montage-platte mounting plate	Montagewerkzeug mounting tool
Baugröße size								
0015-24 003-12/-24 006-12/-24 012-12/-24	MTD L2 060 M120 0 XXXXX 2)						MTP A7 703 M120 0 002XX	
025-12 025-24 05-12 1-6L	MTD L2 060 M500 0 XXXXX	MTH M8 060 M500 0 XXXXX		AZV B2 262 M500 0 XXXXX			MTP A7 703 M500 0 002XX	
05-24 1-6 1-12 2-6L 1-24 2-6 2-12 5-6L 2-24	MTD L2 060 0020 0 XXXXX	MTH M8 060 0020 0 XXXXX		AZV B2 262 0020 0 XXXXX	MMT M8 060 0020 0 XXXXX	PWZ C6 060 0020 0 XXXXX		
5-6 5-12 10-6L/15-6LT 5-24	MTD L2 060 0050 0 XXXXX	MTH M8 060 0050 0 XXXXX		AZV B2 262 0050 0 XXXXX	MMT M8 060 0050 0 XXXXX	PWZ C6 060 0050 0 XXXXX		
10-6 10-12 17-6L/30-6LT	MTD L2 060 0100 0 XXXXX	MTH M8 060 0100 0 XXXXX		AZV B2 262 0100 0 XXXXX	MMT M8 060 0100 0 XXXXX	PWZ C6 060 0100 0 XXXXX		
26-6L/40-6LT 10-24	MTD L2 060 0140 0 XXXXX	MTH M8 060 0140 0 XXXXX	ESH N0 000 0000 0 XXXXX	AZV B2 262 0140 0 XF5XX	MMT M8 060 0140 0 XXXXX	PWZ C6 060 1400 0 XXXXX		MHB WH A00 1WHV 0 01000
17-6 17-12 35-6L/55-6LT 52-6L/75-6LT	MTD L2 060 0170 0 XXXXX	MTH M8 060 0170 0 XXXXX		AZV B2 262 0170 0 XG0XX	MMT M8 060 0170 0 XXXXX	PWZ C6 060 0170 0 XXXXX		
17-24 52-12 35-6 35-12 70-6L/110-6LT	MTD L2 060 0350 0 XXXXX	MTH M8 060 0350 0 XXXXX			MMT M8 060 0350 0 XXXXX	PWZ C6 060 0350 0 XXXXX		
35-24 70-6 70-12 130-6L 200-6L	MTD L2 060 0700 0 XXXXX	MTH M8 060 0700 0 XXXXX				PWZ C6 060 0700 0 XXXXX		
70-18 70-24 130-6 130-12 202-6L	MTD L2 060 1300 0 XXXXX	MTH M8 060 1300 0 XXXXX				PWZ C6 060 1300 0 XXXXX		
130-24 240-12 350-6L						PWZ C6 060 2400 0 XXXXX		

Die Preise sind dem Preisblatt AL.SPTde zu entnehmen / prices are listed on price sheet AL.SPTde
2) entfällt ab Pumpen-Herstellungsdatum 01.04.93 / can be omitted as from 01.04.93 (pump manufacturing date)



10. Manufacturer's documents from sub-supplier



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