SEEPEX.
ALL THINGS FLOW

Operating and Assembly Instruction
Progressive Cavity Pump

Commission No.
XXXXXX

Type
BCSB

Job#
XXXXXXX

Read instructions before beginning any work!

Always keep instructions handy on the worksite.

Issue: 01.14.2016

Operating and Maintenance Instructions
Progressive Cavity Pump

1.0
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 characteris-tics 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

2.0
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 opera-ting company may commission the manufacturer/ supplier to conduct these training courses. Furthermore, 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 machiness 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.

3.0
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 equip-ment 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 pro-vide 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. __, for information on the design of the shaft seal.

The data sheet, 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 for information.

4.4
Dimensions, Weight

Consult the appended dimensional drawing,

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.

5.0
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 con-form 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:

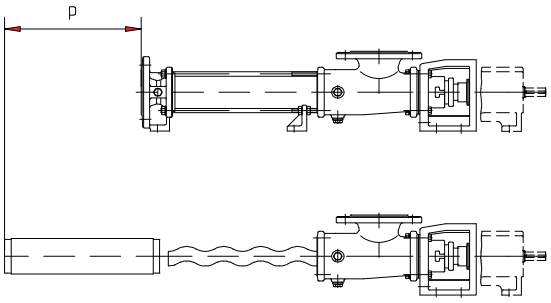
- dimensions and weight of the machine
- required transport and hoisting equipment
- possible piping layout with allowance for the space allowing disassembly of the rotor as defined in 5.2.1.3
- freedom of movement to:
  operate the drive /
  speed regulation
  read speed and pressure indicators
  adjust 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 dismounted 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, displace-ments 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

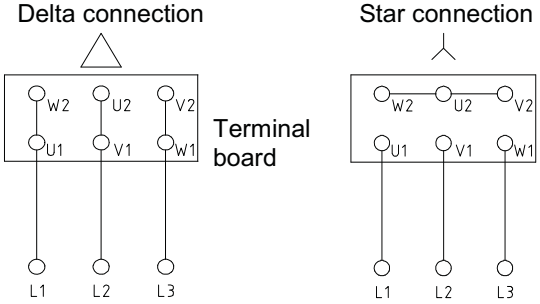
The electric connections must be established in accordance with the manufacturer's specifications, Point 10, as well as the safety specifications applying at the installation site. The mains voltage and frequency must match the ratings indicated on the type and rating plates.

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



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

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 TI.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.

6.0
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

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.

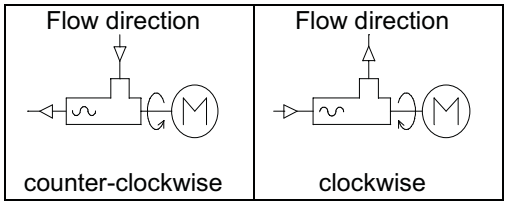
6.2.4
Electric/Hydraulic Connections

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, Point 10. 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 regu-lations 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 disactivate 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

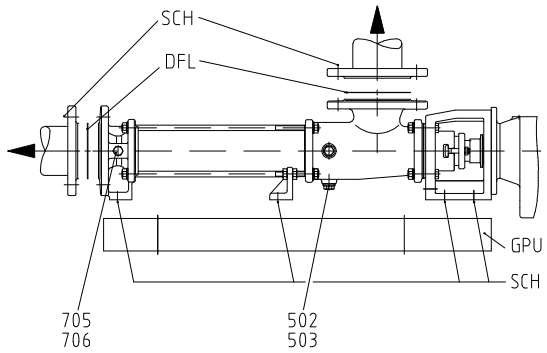
The pipeline must be evacuated on the suction and pressure side or shut-off directly behind the pump connections. Drain any residual liquid in the pump casing by opening/ removing the screwed sealing plugs (705) and (502), sealing rings (706) and (503). Casings without screwed plug must be evacuated by the connection branch (SAG and DRS). Refer to the data sheet and the sectional drawing of the associated operating instruction, Point 9, 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. If conveying aggressive or hazardous media, therefore, wear appropriate protective gear during all installation work.

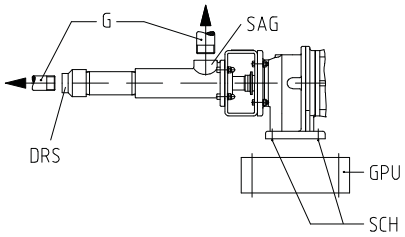
6.6.4
Disassembling the Pump

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 BCSB
size 025-12 to 75-6LT

7.
Service and Maintenance

Contents

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 instruc-tions 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

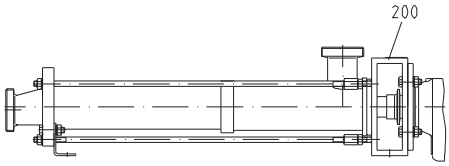
To avoid the expenses incurred by lengthy stop periods of the pump, **seepex** recommends the acquisition of a set of wearing parts and a set of gaskets. The contents are listed in the document OM.WPS.24, Point 9.

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.

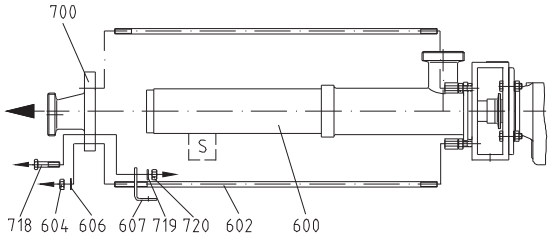
The stator (601) and the rotating pump parts can be exchanged in site. The rotating pump parts can be dismantled as a complete rotating unit (RTE) (Point 7.3.4) or as individual components (Point 7.3.5).

Before commencing the dismantling of pump parts, safeguard the pump against tipping over or falling down by fastening it at the lantern (200).



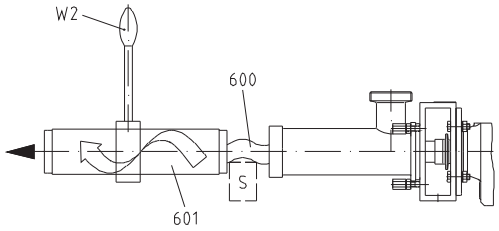
7.3.1
Pressure Flange (700) - Dismantling

Prior to dismantling see Point 7.3.2
Before dismantling the stator (601), provide it with a support (S) to prevent it from falling.



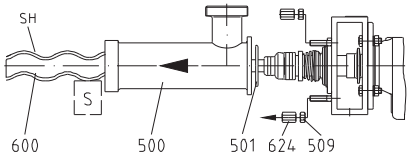
7.3.2
Stator (601) - Dismantling

- 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.
  While dismantling the stator (601) with tool (W2/see Point 9) prop up the rotor (600) with support (S) to prevent it from falling.



7.3.3
Suction Casing (500) - Dismantling

Fit the rotor (600) with a protective cover (SH) and underprop it with support (S) to prevent it from falling down.

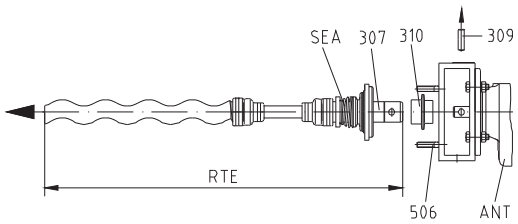


7.3.4
Rotating Unit (RTE) - Dismantling

CAUTION

Before dismantling the rotating unit it is essential to comply with the specifications in document OM.SEA.__ (Shaft Seal Dismantling).

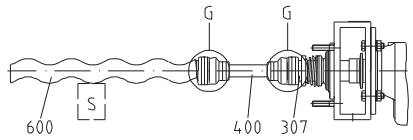
- Remove flushing connections at shaft seal housing (SEA).
- Raise/shift splash ring (310) and eject plug-in shaft pin (309) in horizontal direction.
- Remove rotating unit (RTE)/plug-in shaft (307), together with shaft seal (SEA) from output shaft of the drive (ANT). See Point 9 for tool (W10) used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

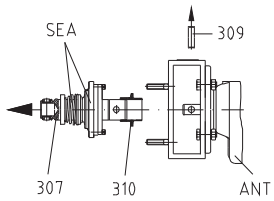
7.3.5.1
Rotor (600), Coupling Rod (400)

Detach the rotor (600) and coupling rod (400) from the plug-in shaft (307) by dismantling the joint (G) in accordance with document OM.PJT.02.



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.



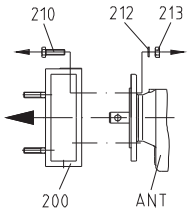
7.3.6
Dismantling of Joint

See document OM.PJT.02

7.3.7
Shaft Sealing

See document OM.SEA.__, Point 9.

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

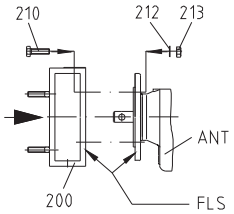


7.4
Re-assembly

Before commencing the re-assembly, fasten the lantern (200) in such a way that 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

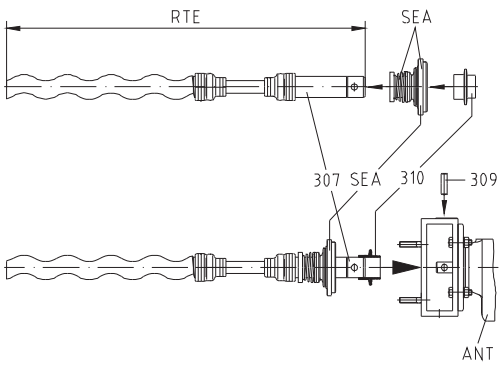
Clean flange bearing surfaces (FLS), centering diameter and output pivot of the drive (ANT).



7.4.2
Rotating Unit (RTE) - Re-assembly

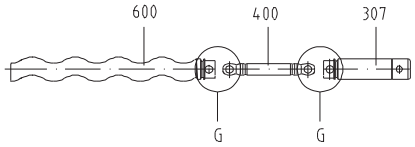
The rotating unit (RTE) has been assembled in accordance with the description in document OM.PJT.02.

- Mount shaft seal (SEA) on plug-in shaft (307) in the way described in document OM.SEA.__, see Poin 9.
- Moisten splash ring (310) and plug-in shaft (307) with joint grease and slide splash ring (310) onto plug-in shaft (307), observing the fitting position of the splash ring, (see writing 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)
  See illustration shown in document OM.SEA.__.



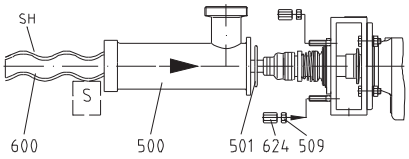
7.4.3
Rotating Pump Parts - Re-assembly

Prepare main components:
Prepare rotor (600), coupling rod (400) and plug-in shaft (307) as described in document OM.PJT.02 Point 2. to 2.3
Joint (G) re-assembly as described in documen OM.PJT.02 Point 3.

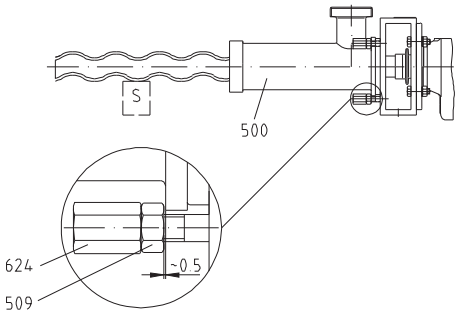


7.4.4
Suction Casing (500), Casing Gasket (501) - Re-assembly

Fit protective cover (SH) on rotor (600) and prop it up with support (S).



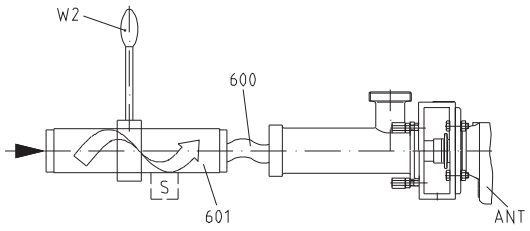
Save guarde suction casing (500) and casing gasket (501) by hexagon nut (509 and 624) against falling down, see detail.



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.

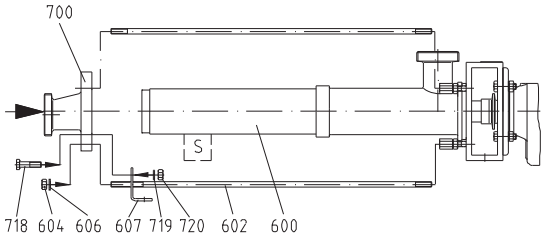
Lock drive (ANT) shaft against rotation. Using tool (W2/see Point 9), turn stator (601) clockwise and simultaneously push it over rotor (600), propping up stator with support (S) at the same time.



7.4.6
Pressure Flange (700) □Assembly

CAUTION

Tighten tie bolts (602 and 603) in equally.



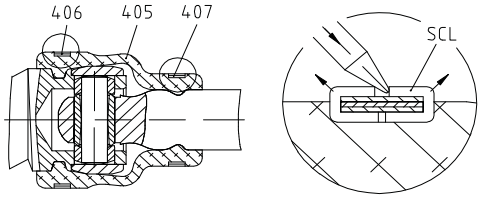
1.0
Dismantling of Joint

1.1
Holding Band (406, 407) and Universal Joint Sleeve (405)

Cut through loop (SCL) of the holding bands (406 and 407) with a metal saw.

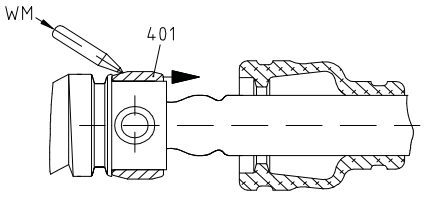
Wear protective goggles when squeezing out the two halves of the holding band loop (SCL).

Remove holding bands (406,407). Pull universal joint sleeve (405) off joint.

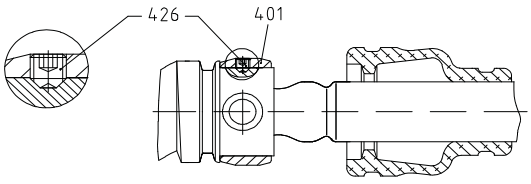


1.2
Retaining Sleeve (401) - Dismantling

- For rotors and plug-in shafts made of hardened and unhardened materials, knock back retaining sleeve (401) with tool/chisel (WM).



- For rotors made of synthetic material, release set screw (426).

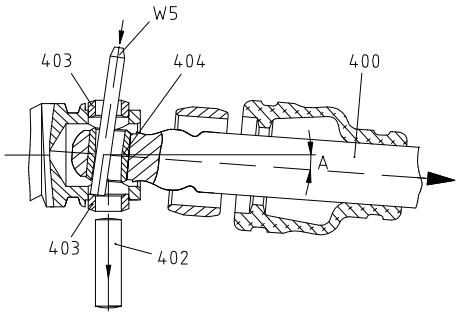


1.3
Separation of Joint

Eject coupling rod pin (402). Position coupling rod (400) at the correct angle (A) and, using tool (W5/see Point 9), drive both guide bushes (403) outwards.This releases the coupling rod (400), which can then be extracted.

CAUTION

To guarantee the proper function of the joints, it is advisable to renew the coupling rod pins (402), guide bushes (403) and coupling rod bushes (404) all at the same time.

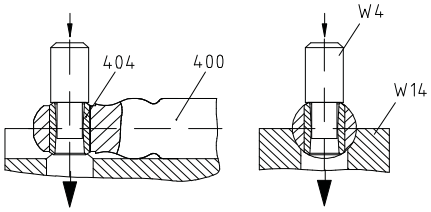


1.4
Coupling Rod Bushes (404) - Dismantling

CAUTION

As a precaution against incorrect re-assembly of coupling rod bushes (404), we recommend the employment of coupling rods (400) whose coupling rod bushes (404) have been pressed in by SEEPEX.

The coupling rod bush (404) is pushed out of the coupling rod (400) with tools (W4 and W14/see Point 9).



2.0
Prepare main components for Re-assembly

2.1
Rotor (600) - Preparation for Joint Assembly

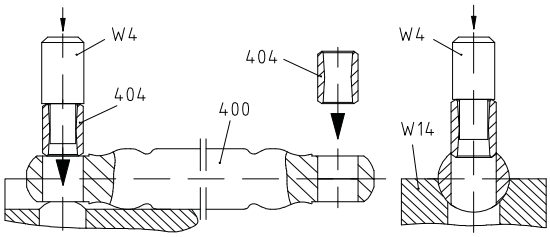
First remove any burr, flaws or similar defects from the rotor, then clean it.

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

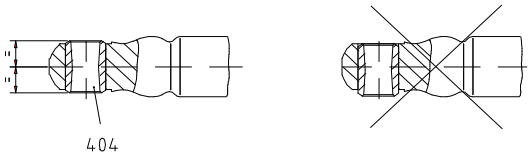
CAUTION

As a precaution against the incorrect re-assembly of coupling rod bushes (404), we recommend the employment of coupling rods (400) whose bushes (404) have been pressed in by SEEPEX.

Press in new coupling rod bushes (404 using tool (W4) and (W14/see Point 9).



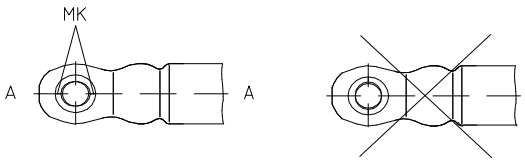
Position of coupling rod bush (404)



correct
pressed in centrically

incorrect
pressed in eccentrically
result: joint fracture

Marking notches in (MK) in A-A axis
permissible rotation 1,5°



correct
pressed into A-A axis

incorrect
pressed in rotated
result: joint fracture

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

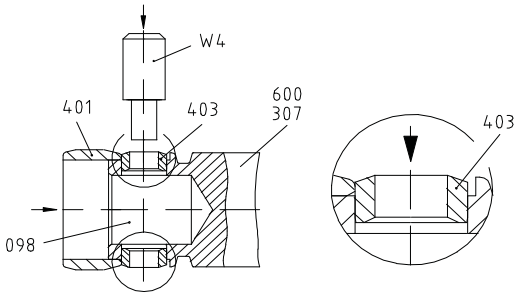
Remove any burr, flaws or similar defects from the plug-in shaft (307), then clean it.

3.0
Joint - Re-assembly

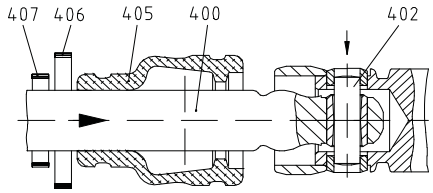
CAUTION

To guarantee the proper function of the joints, it is advisable to renew the coupling rod pins (402), guide bushes (403) and coupling rod bushes (404) all at the same time.

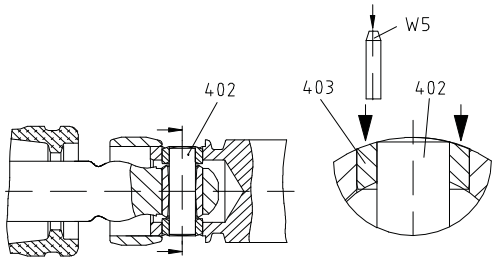
Joint head on rotor (600) and plug-in shaft (307)
- Press guide bushes (403) in by only 2/3 of their length using tool (W4/see Point 9)
- Fill joint head with joint grease (098), see index for special grease
- Slip on joint sleeve (401)



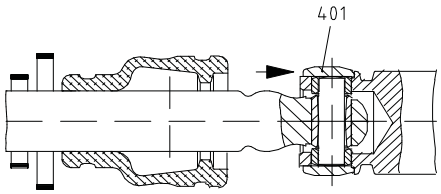
Coupling rod (400)
Slide holding bands (406/407).
Moisten inner surface of universal joint sleeve (405) with joint grease (see index for special grease) and slide it.
Push coupling rod (400) into joint head.
Push in coupling rod pin (402).



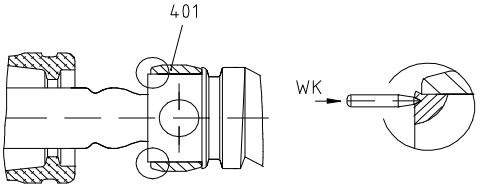
Guide bush (403)
Press in with tool (W5/see Point 9)



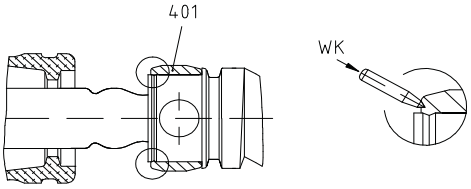
Retaining sleeve (401)



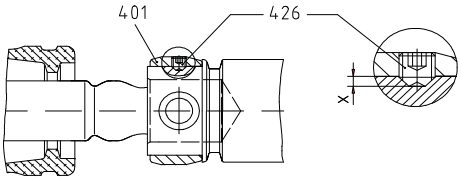
Securing of retaining sleeve
For drive shafts, plug-in shafts and rotors made of unhardened materials such as St 70, AISI 304, AISI 316, Hastelloy C, secure 2 x 180° offset indents, with tool/centre punch (WK)



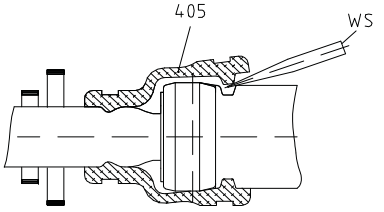
For rotors made of hardened materials such as tool steel (AISI D6), 1.2842, secure 2 x 180° offset indents with tool/centre punch (WK)



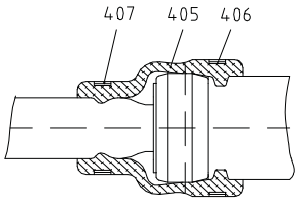
- For rotors made of synthetic material, secure using set screw (426). During this process, point of set screw presses into the synthetic surface (X). Set screw (426) is medium strengh secured by screw locking device /adhesive.



Universal joint sleeve (405)
Remove air from interior of joint with tool/screw driver (WS).



Holding bands re-assembly
Mount holding bands (406 and 407) using tool (W3/see Point 9) as described in document OM.HBD.01.



9.3 Holding band - assembly

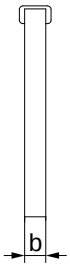
9.3.1 Prepare the holding band

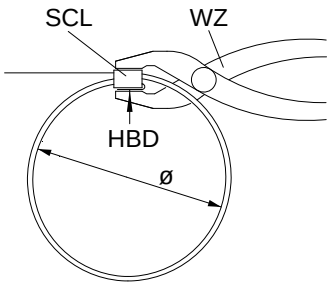
➢ Only use prefabricated double-band holding bands may.

9.3.2 Check the holding band

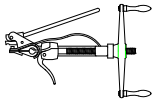
- Bent-over holding band (HBD) is in contact with holding band loop (SCL) to avoid damaging universal joint sleeve.

➢ Press on holding band (HBD) using tool (WZ) if necessary.





9.3.3 Assemble the holding band



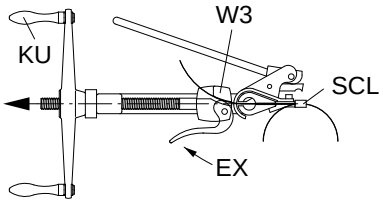
➢ Use tool (W3/mounting tool)

➢ Feed holding band into tool (W3).

➢ Hold ends of holding band with the eccentric lever (EX).

➢ Turn the crank (KU) until the holding band is strained and lies against the holding band loop (SCL).

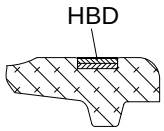
➢ Carefully pull the holing band together until it is in contact with the circular groove of universal joint sleeve.



9.3.4 Correct tension of the holding band (HBD)

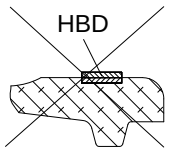
Correct

The holding band (HBD) has drawn in the out shape of the universal joint sleeve and is firmly seated.



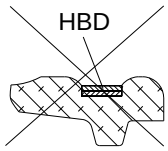
Incorrect

The holding band (HBD) is too loose, can slip off.



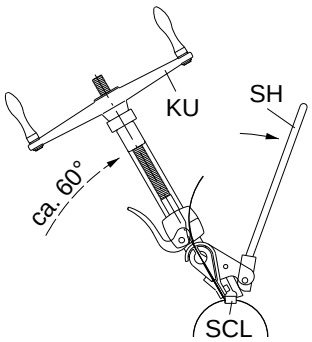
Incorrect

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



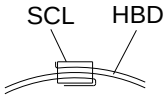
9.3.5 Cant up the holding band

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



9.3.6 Shear the holding band (material: 1.4301; 1.4571)

- Hit the cutting lever (SH) with the inside of your hand.
  - Cant up and shear the end of the holding band behind the loop (SCL).
  - Carefully straighten up the holding band if it rises up on the sheared side.



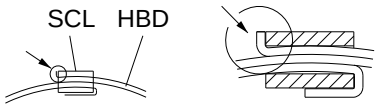
CAUTION

Universal joint sleeve damage.
Pin joint grease can emerge.

- Avoid hammering or knocking.

9.3.7 Check the holding band after assembly

- The holding band must lie in the groove of the universal joint sleeve.
- Replace the holding band if the holding band slips back through the loop.



Breakdown											
pump has no suction	pump conveys irregularly	the conveying capacity is not achieved	pressure is not achieved	pump does not start	pump has seized or has stopped conveying	pump operates noisily	motor becomes too warm	the stator wears out early	shaft sealing leaks	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:	
1	2	3	4	5	6	7	8	9	10		Reasons / Remedies
				X			X			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 .
X										b	Check rotational direction of the pump per data sheet and nameplate. In case of wrong direction, change wiring of motor.
X	X	X			X	X				c	Suction pipe or shaft sealing leak. Eliminate the leakage.
X	X	X				X				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 fully.
X	X	X								e	Viscosity of the liquid too high. Check and accommodate per data sheet.
		X		X			X			f	Wrong pump speed. Correct pump speed per data sheet.
	X	X								g	Avoid inclusions of air in the conveying liquid.
		X		X	X		X	X		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.
X	X	X			X			X		i	Pump runs partially or completely dry (point 6.5.2). Check flow in the suction chamber. Install dry running protection TSE.
						X	X			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.
X		X								k	Speed too low. Increase the speed when high suction performances are required and when the liquid is very thin.
X	X					X				l	Speed too high. Reduce the speed when pumping products with high viscosities - danger of cavitation.
						X				m	Check the axial play in the coupling rod linkage. Check that the bush has been installed correctly see document OM.PJT.__.
X		X		X	X			X		n	Check for foreign substances in the pump. Dismantle the pump, remove foreign substances and replace worn parts.
X		X	X		X					o	Stator or rotor worn. Dismantle the pump and replace defective parts.
X		X			X	X				p	Joint parts worn. Replace worn parts and fill with special pin joint grease .
X		X			X			X		q	Suction pipework partially or completely blocked. Clean suction pipework.
X				X	X		X	X		r	Temperature of the pumping liquid too high. Excessive expansion of the stator. Check temperature and install rotor with diameter smaller than specified.
X		X		X			X		X	s	Gland packing too strongly tightened or worn. Ease or tighten stuffing box. Replace defective packing rings.
X				X	X			X		t	Solid contents and/or size of solids too large. Reduce pump speed and install perhaps a screen with suitable meshes. Increase fluid share.
X				X				X	X	u	When the pump is non operational the solids settle out and become hard. Clear and flush the pump immediately.
X				X	X			X	X	v	The liquid becomes hard when temperature falls below a certain limit. Heat the pump.
				X	X		X	X		w	Stator swollen and unsuitable for the pumped liquid. Select a suitable stator material. Use perhaps rotor with diameter smaller than specified.
						X			X	x	The bearing in the drive casing of the pump or in the drive engine is defective. Replace bearing.
									X	y	Mechanical seal defective. Check seal faces and O-rings. If necessary replace corresponding defective parts.

9.0

Auxiliary SEEPEX Documentation

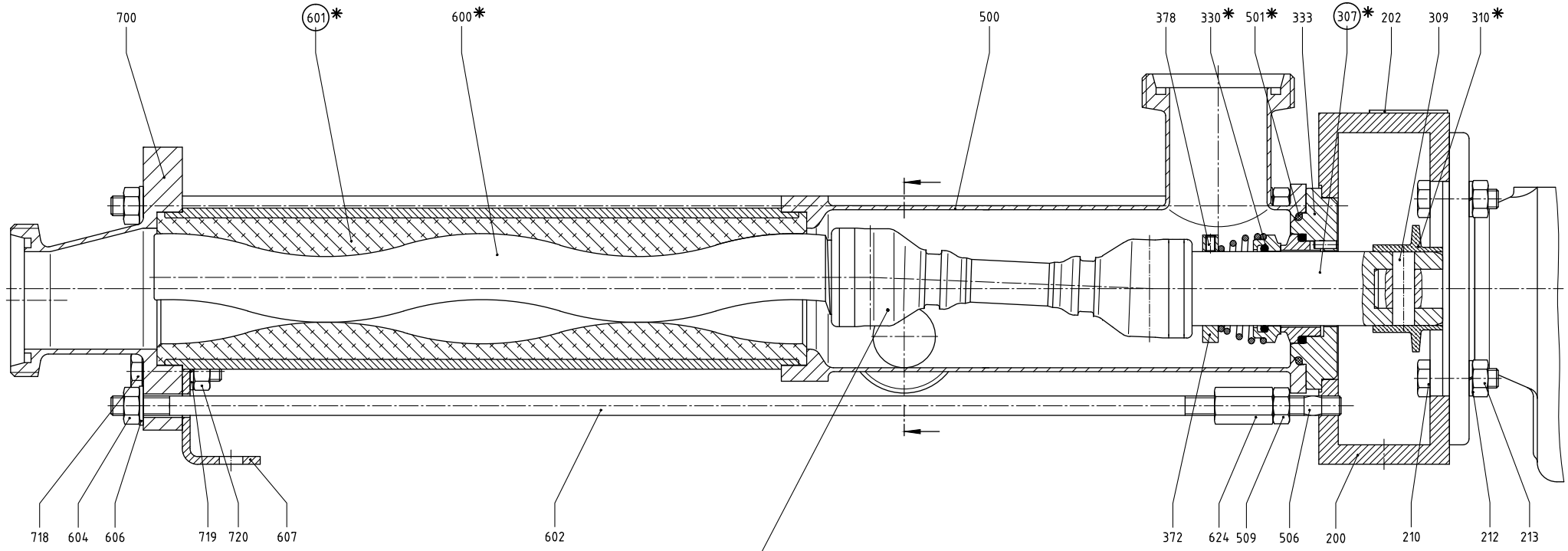
DATA

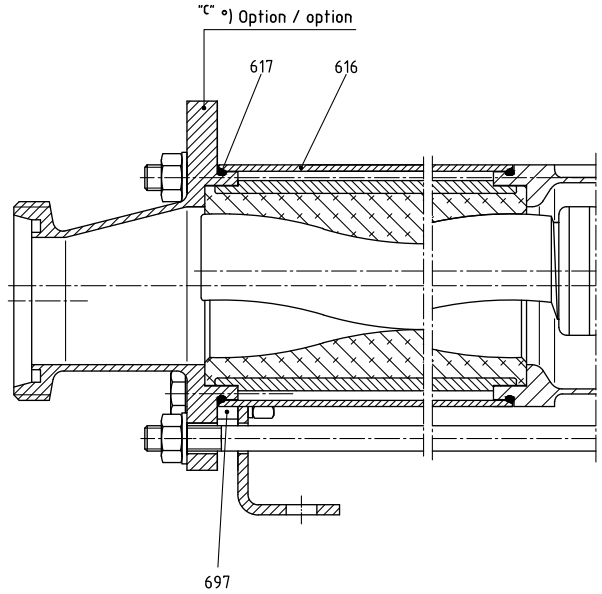
SHEET

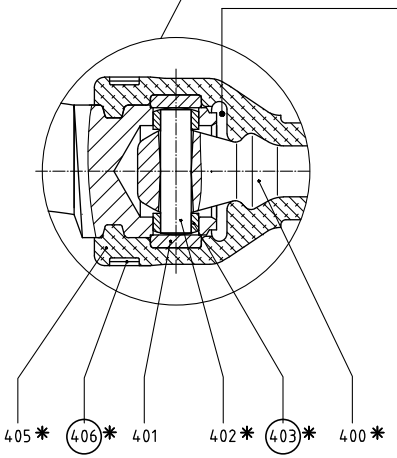
PENDING

Characteristic Curve

PENDING





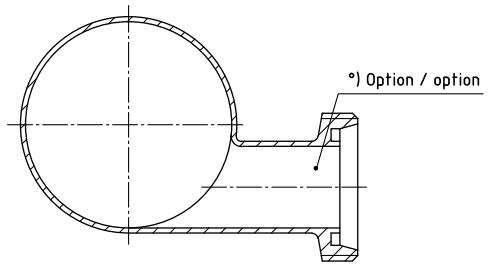


SEEPEX Gelenkfett

Typ und Füllmenge:
Betriebs- und Montageanleitung entnehmen

SEEPEX joint grease

type and filling quantity:
see operating and assembly instruction



○ Werkzeuge
Betriebs- und Montageanleitung entnehmen

Tools
see operating and assembly instruction

✱ Verschleißteile und Dichtungen
Betriebs- und Montageanleitung entnehmen

Wearing parts and sealings
see operating and assembly instruction

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

SEEPEX.
ALL THINGS FLOW

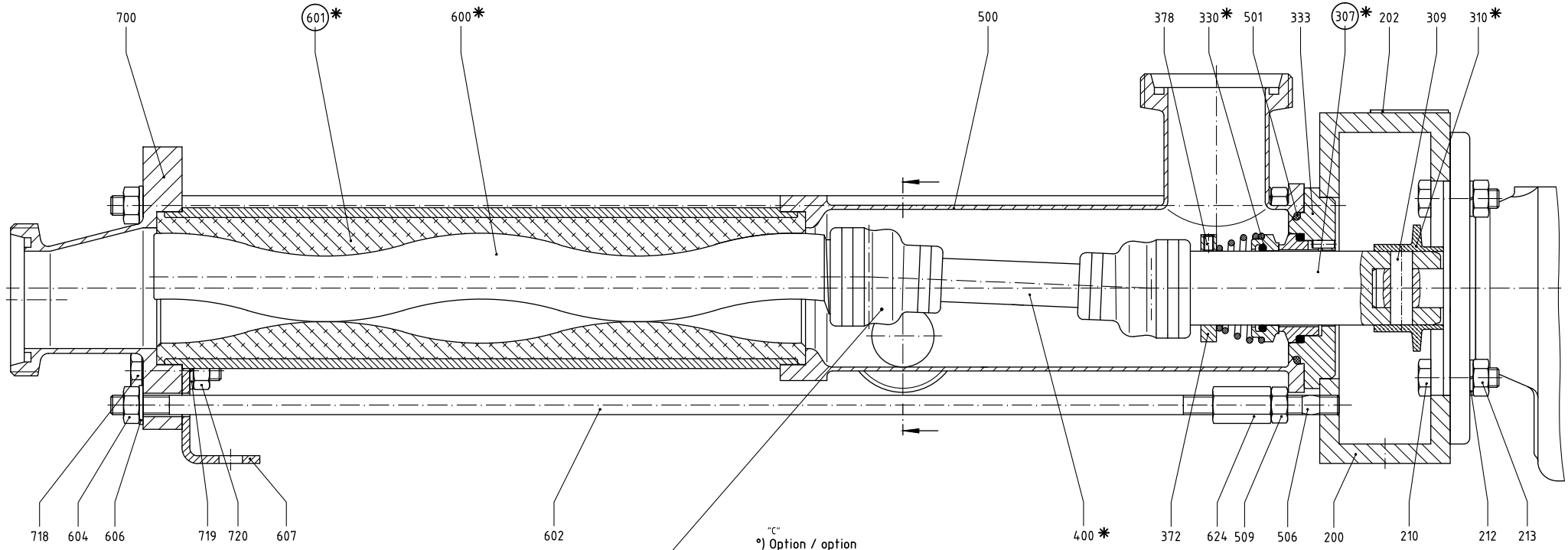
Allgemeintoleranzen für Maße ohne Toleranzeintragung DIN ISO 2768-mittel	Änderung Modification	Name Name	Datum Date	Maßstab/Scale	Werkstoff/Material	Gewicht/Weight
General tolerances for mass without individual tolerance entry DIN ISO 2768-average	B AD-Nr.: 295	hof	12.02.1998	%		
	C Option	kho	15.04.1999	Bezeichnung/Denomination: Schnittzeichnung Baureihe "BCSB" / sectional drawing range "BCSB" mit Bolzengelenk / with pin-joint		

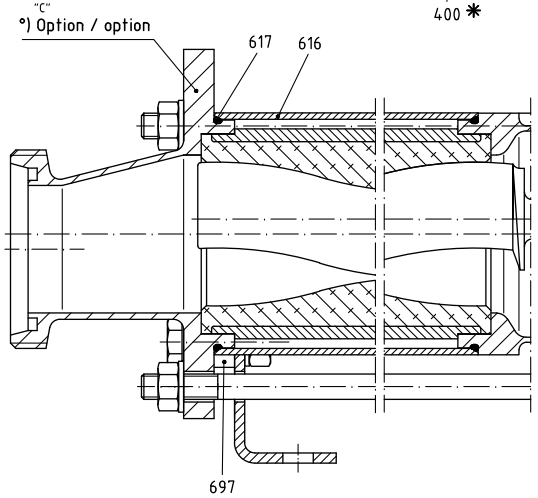
Rauheit für Oberflächenzeichen DIN ISO 1302 Reihe 2		Name Name	Datum Date	Zeichnungs-Nummer/Drawing-Number
Roughness for surface finish indication DIN ISO 1302 Reihe 2	Bearbeitet/Drawn	ov	05.02.1998	123-005C1
	Geprüft/Checked	wgr	05.02.1998	EDV-Nr./EDP-No. L:\LFDZCHNG.270\27042
	Normiert/Standard			Ersatz für/Replacement for: Ersetzt durch/Replacement by:
	Gedruckt/Printed			

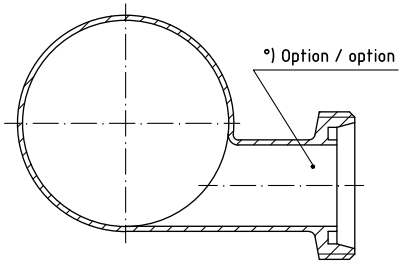
Stückliste
Parts List
Liste des pièces

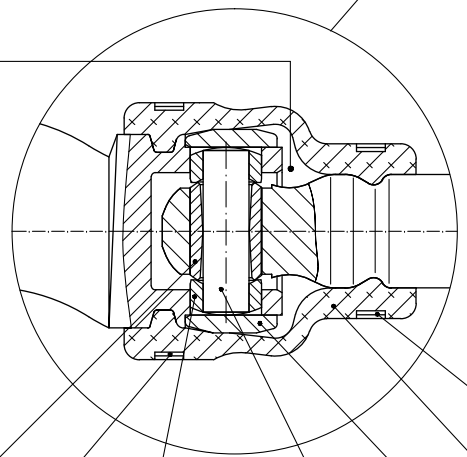
SEEPEX.
ALL THINGS FLOW

Stck.	Pos.	DE	EN	FR
		Baureihe BCSB	**range BCSB**	**série BCSB**
		Schnittzeichnung Nr. 123-005C1	**sectional drawing No. 123-005C1**	**plan no. 123-005C1**
Stck.	**Pos.**	**Benennung Stck. / Pos.**	**denomination Qty. / Item**	**désignation Qté. / Poste**
1	200	Laterne	lantern	lanterne
1	202	Typenschild	type plate	plaque signalitique
4	210	6kt-Schraube	hexagon bolt	vis
	211	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	330	Gleitringdichtung	mechanical seal	garniture mécanique
1	333	Gleitringdichtungsgehäuse	mechanical seal casing	carter de la garniture mécanique
1	372	Stellring	set collar	anneau ajustable
3	378	Gewindestift	set screw	vis sans tête
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
4	403	Führungsbuchse	guide bushing	douille de guidage
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	506	Stiftschraube	stud bolt	boulon fileté
3	509	6kt-Mutter	hexagon nut	écrou
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
3	602	Spannschraube	tie bolt	tirant
3	604	6kt-Mutter	hexagon nut	écrou
3	606	Scheibe	washer	rondelle
1	607	Stützbock	trestle	pied
1	616	Schutzrohr	protecting tube	tube protecteur
2	617	O-Ring	O-ring	joint torique
3	624	6kt-Mutter	hexagon nut	écrou
2	697	Distanzring	spacer ring	anneau d'écartement
1	700	Druckstutzen	pressure branch	bride de refoulement
2	718	6kt-Schraube	hexagon bolt	vis
2	719	Federring	spring washer	rondelle frein
2	720	6kt-Mutter	hexagon nut	écrou
	098	SEEPEX Gelenkfett Typ und Füllmenge: Betriebs- und Montageanleitung entnehmen	SEEPEX joint grease type and filling quantity: see Operating and Assembly Instruction	SEEPEX graisse d' articulations sommaire pour type et quantité: voir instructions de montage et de fonctionnement
		Verschleißteile und Dichtungen: Betriebs- und Montageanleitung entnehmen	Wearing parts and sealings: see Operating and Assembly Instruction	pièces d'usure et étanchéités: voir instructions de montage et de fonctionnement
		Werkzeuge: Betriebs- und Montageanleitung entnehmen	Tools: see Operating and Assembly Instruction	Outils: voir instructions de montage et de fonctionnement
	°)	Option	option	option









SEEPEX Gelenkfett

Typ und Füllmenge:
Betriebs- und Montageanleitung entnehmen

SEEPEX joint grease

type and filling quantity:
see operating and assembly instruction

Werkzeuge
Betriebs- und Montageanleitung entnehmen

Tools
see operating and assembly instruction

* Verschleißteile und Dichtungen
Betriebs- und Montageanleitung entnehmen

Wearing parts and sealings
see operating and assembly instruction

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

SEEPEX.
ALL THINGS FLOW

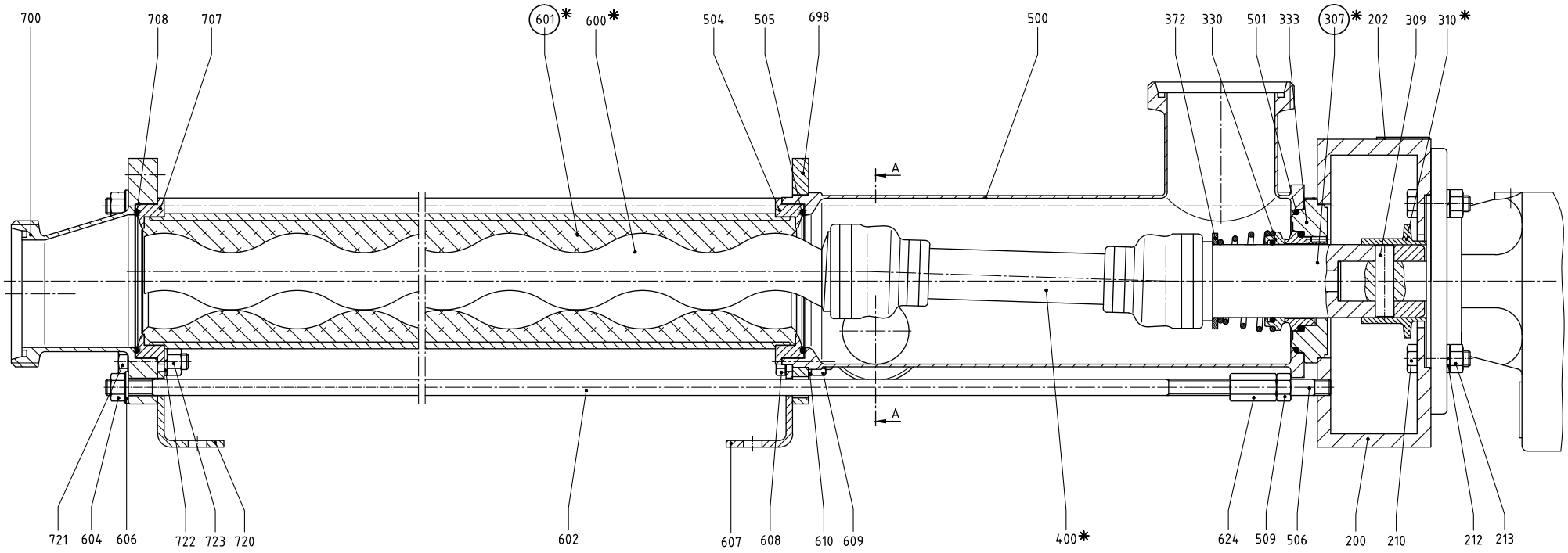
Allgemeintoleranzen für Maße ohne einzelne Toleranzeintragung DIN ISO 2768-mittel	Ausg./Index Issue	Änderung Modification	Name Name	Datum Date	Maßstab/Scale	Werkstoff/Material	Gewicht/Weight
	B	AD-Nr.: 295	hof	12.02.1998	%		
General tolerances for mass without individual tolerance entry DIN ISO 2768-average	C	Option	hof	19.04.1999	Bezeichnung/Denomination		
					Schnittzeichnung Baureihe "BCSB"		
					sectional drawing range "BCSB"		
					mit Bolzengelenk / with pin-joint		

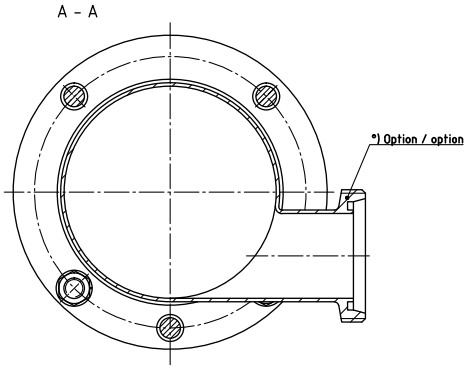
Rauheit für Oberflächenzeichen DIN ISO 1302 Reihe 2		Name Name	Datum Date	Zeichnungs-Nummer/Drawing-Number
Roughness for surface finish indication DIN ISO 1302 Reihe 2	Bearbeitet/Drawn	hof	22.10.1997	123-006C1
	Geprüft/Checked	hue	22.10.1997	EDV-Nr./EDP-No. L:\LFDZCHNG.235\23580
	Normiert/Standard			Ersatz für/Replacement for: Ersetzt durch/Replacement by:
	Gedruckt/Printed			

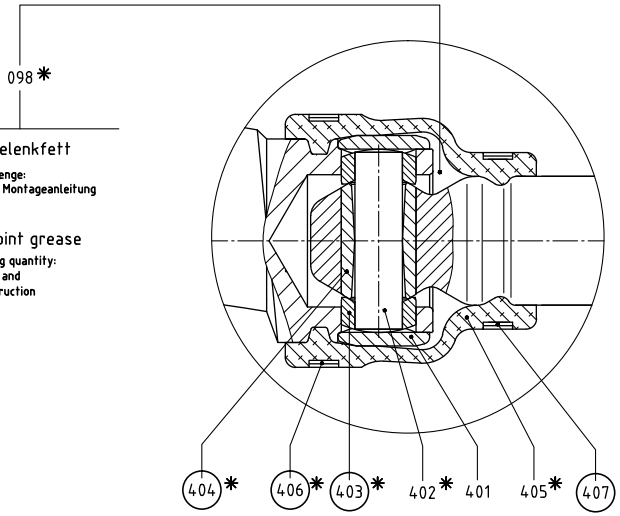
Stückliste
Parts List
Liste des pièces

SEEPEX.
ALL THINGS FLOW

Stck.	Pos.	DE	EN	FR
		Baureihe BCSB	**range BCSB**	**série BCSB**
		Schnittzeichnung Nr. 123-006C1	**sectional drawing No. 123-006C1**	**plan no. 123-006C1**
		Benennung	**denomination**	**désignation**
Stck.	**Pos.**	**Stck. / Pos.**	**Qty. / Item**	**Qté. / Poste**
1	200	Laterne	lantern	lanterne
1	202	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	330	Gleitringdichtung	mechanical seal	garniture mécanique
1	333	Gleitringdichtungsgehäuse	mechanical seal casing	carter de la garniture mécanique
1	372	Stellring	set collar	anneau ajustable
3	378	Gewindestift	set screw	vis sans tête
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
4	403	Führungsbuchse	guide bushing	douille de guidage
2	404	Kuppelstangenbuchse	coupling rod bushing	chemise d'axe
2	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
2	407	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	506	Stiftschraube	stud bolt	boulon fileté
3	509	6kt-Mutter	hexagon nut	écrou
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
3	602	Spannschraube	tie bolt	tirant
3	604	6kt-Mutter	hexagon nut	écrou
3	606	Scheibe	washer	rondelle
1	607	Stützbock	trestle	pied
1	616	Schutzrohr	protecting tube	tube protecteur
2	617	O-Ring	O-ring	joint torique
3	624	6kt-Mutter	hexagon nut	écrou
2	697	Distanzring	spacer ring	anneau d'écartement
1	700	Druckstutzen	pressure branch	bride de refoulement
2	718	6kt-Schraube	socket screw	vis à tête cylindrique
2	719	Federring	spring washer	rondelle frein
2	720	6kt-Mutter	hexagon nut	écrou
	098	SEEPEX Gelenkfett Typ und Füllmenge: Betriebs- und Montageanleitung entnehmen	SEEPEX joint grease type and filling quantity: see Operating and Assembly Instruction	SEEPEX graisse d' articulations sommaire pour type et quantité: voir instructions de montage et de fonctionnement
		Verschleißteile und Dichtungen: Betriebs- und Montageanleitung entnehmen	Wearing parts and sealings: see Operating and Assembly Instruction	pièces d'usure et étanchéités: voir instructions de montage et de fonctionnement
		Werkzeuge: Betriebs- und Montageanleitung entnehmen	Tools: see Operating and Assembly Instruction	Outils: voir instructions de montage et de fonctionnement
	°)	Option	option	option







SEEPEX Gelenkfett

Typ und Füllmenge:
Betriebs- und Montageanleitung entnehmen

SEEPEX joint grease

type and filling quantity:
see operating and assembly instruction

○ Werkzeuge
Betriebs- und Montageanleitung entnehmen

Tools
see operating and assembly instruction

✳ Verschleißteile und Dichtungen
Betriebs- und Montageanleitung entnehmen

Wearing parts and sealings
see operating and assembly instruction

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

SEEPEX.
ALL THINGS FLOW

Allgemeintoleranzen für Maße ohne einzelne Toleranzeintragung DIN ISO 2768-mittel	Änderung Modification	Name Name	Datum Date	Maßstab/Scale	Werkstoff/Material	Gewicht/Weight
	B AD 372	dl	19.11.2002	%		

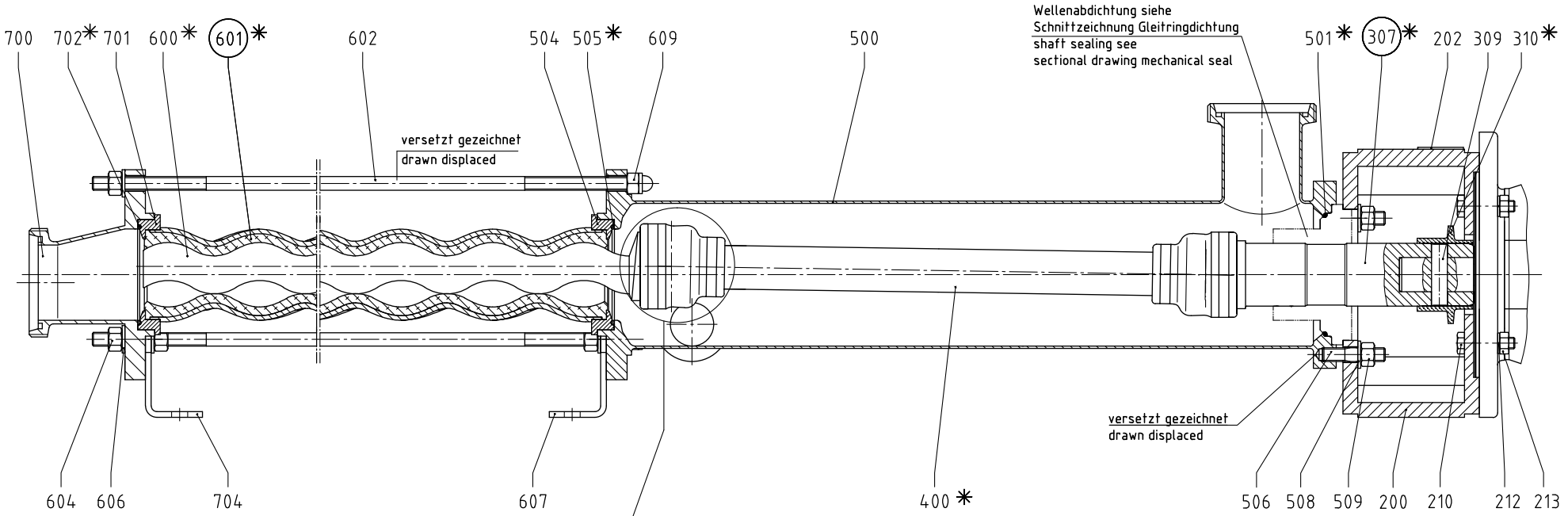
Bezeichnung/Denomination
Schnittzeichnung Baureihe "BCSB"
sectional drawing range "BCSB"

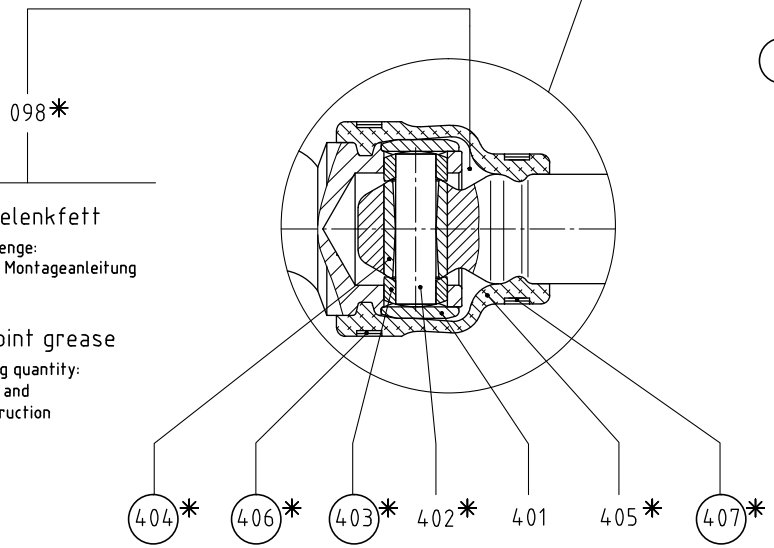
General tolerances for mass without individual tolerance entry DIN ISO 2768-average					
Rauheit für Oberflächenzeichen DIN ISO 1302 Reihe 2		Name Name	Datum Date	Zeichnungs-Nummer/Drawing-Number	
	Bearbeitet/Drawn	hof	24.07.2000	123-008B1	
Roughness for surface finish indication DIN ISO 1302 Reihe 2	Geprüft/Checked	hue	25.07.2000	EDV-Nr./EDP-No. L:\Lfdzchng.365\36512.dwg	
	Normiert/Standard			Ersatz für/Replacement for:	Ersetzt durch/Replacement by:
	Gedruckt/Printed				

Stückliste
Parts List
Liste des pièces

SEEPEX.
ALL THINGS FLOW

Stck.	Pos.	DE	EN	FR
		Baureihe BCSB	**range BCSB**	**série BCSB**
		Schnittzeichnung Nr. 123-008B1	**sectional drawing No. 123-008B1**	**plan no. 123-008B1**
		Benennung	**denomination**	**désignation**
Stck.	**Pos.**	**Stck. / Pos.**	**Qty. / Item**	**Qté. / Poste**
1	200	Laterne	lantern	lanterne
1	202	Typenschild	type plate	plaque signalitique
4	210	6kt-Schraube	hexagon bolt	vis
	211	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	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
4	403	Führungsbuchse	guide bushing	douille de guidage
2	404	Kuppelstangenbuchse	coupling rod bushing	chemise d'axe
2	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
2	407	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	Zentrierring	center ring	anneau de centrage
1	505	O-Ring	o-ring	joint torique
3	506	Stiftschraube	stud bolt	boulon fileté
3	509	6kt-Mutter	hexagon nut	écrou
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
3	602	Spannschraube	tie bolt	tirant
3	604	6kt-Mutter	hexagon nut	écrou
3	606	Scheibe	washer	rondelle
1	607	Stützbock	trestle	pied
2	608	6kt-Schraube	hexagon bolt	vis
2	609	6kt-Mutter	hexagon nut	écrou
2	610	Federring	spring washer	rondelle frein
3	624	6kt-Mutter	hexagon nut	écrou
1	698	Aufnahmering	receiving ring	anneau de réception
1	700	Druckstutzen	pressure branch	bride de refoulement
1	707	Zentrierring	centric ring	anneau de centrage
1	708	O-Ring	o-ring	joint torique
1	720	Stützbock	trestle	pied
2	721	6kt-Schraube	hexagon bolt	vis
2	722	Federring	spring washer	rondelle frein
2	733	6kt-Mutter	hexagon nut	écrou
	098	SEEPEX Gelenkfett Typ und Füllmenge: Betriebs- und Montageanleitung entnehmen	SEEPEX joint grease type and filling quantity: see Operating and Assembly Instruction	SEEPEX graisse d' articulations sommaire pour type et quantité: voir instructions de montage et de fonctionnement
		Verschleißteile und Dichtungen: Betriebs- und Montageanleitung entnehmen	Wearing parts and sealings: see Operating and Assembly Instruction	pièces d'usure et étanchéités: voir instructions de montage et de fonctionnement
		Werkzeuge: Betriebs- und Montageanleitung entnehmen	Tools: see Operating and Assembly Instruction	Outils: voir instructions de montage et de fonctionnement
	°)	Option	option	option





SEEPEX Gelenkfett

Typ und Füllmenge:
Betriebs- und Montageanleitung entnehmen

SEEPEX joint grease

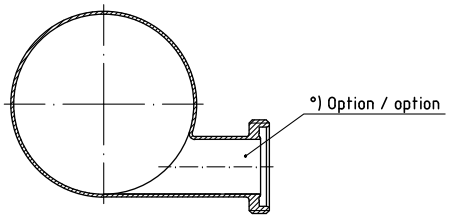
type and filling quantity:
see operating and assembly instruction

Werkzeuge
Betriebs- und Montageanleitung entnehmen

Tools
see operating and assembly instruction

✳ Verschleißteile und Dichtungen
Betriebs- und Montageanleitung entnehmen

Wearing parts and sealings
see operating and assembly instruction



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

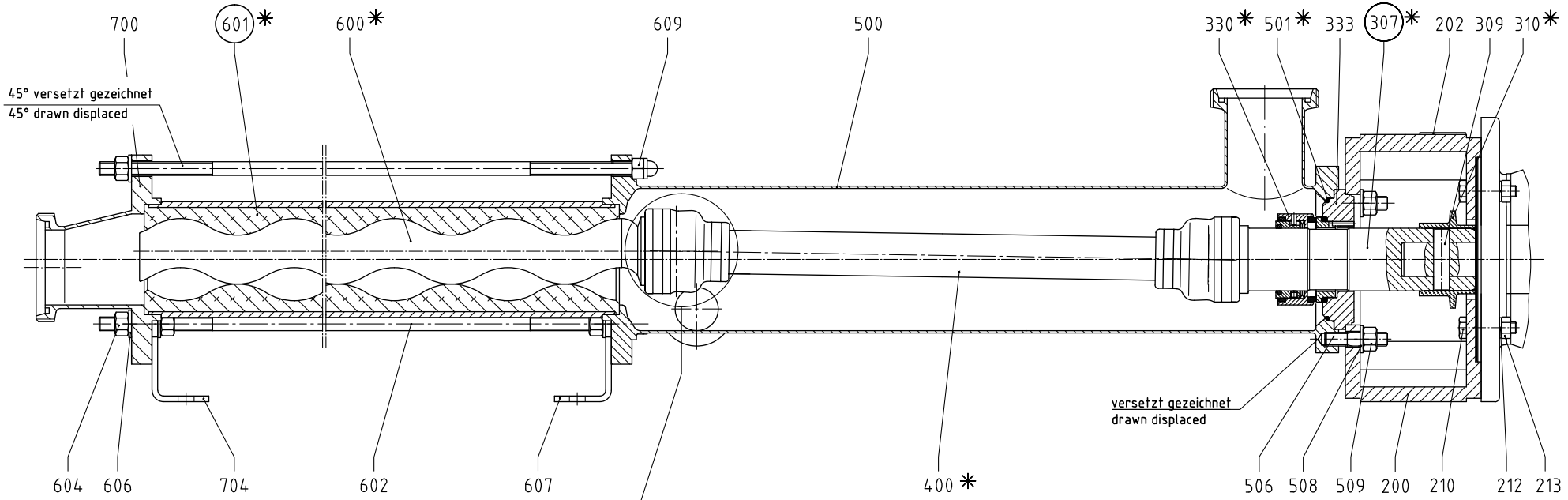
SEEPEX.
ALL THINGS FLOW

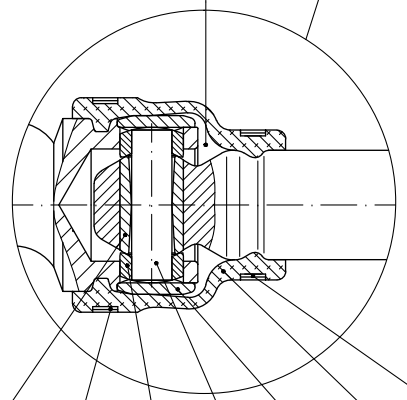
Allgemeintoleranzen für Maße ohne einzelne Toleranzeintragung DIN ISO 2768-mittel General tolerances for mass without individual tolerance entry DIN ISO 2768-average	Aus-gabe Issue	Änderung Modification	Name Name	Datum Date	Maßstab/Scale %	Werkstoff/Material
					Bezeichnung/Denomination	Gewicht/Weight
					Schnittzeichnung Baureihe "BCSB" sectional drawing range "BCSB"	
Rauheit für Oberflächenzeichen DIN ISO 1302 Reihe 2 Roughness for surface finish indication DIN ISO 1302 Reihe 2		Bearbeitet/Drawn	sgo	03.06.2014	Zeichnungs-Nummer/Drawing-Number	
		Geprüft/Checked	sob	03.06.2014	223-001A2	
		Normiert/Standard			EDV-Nr./EDP-No. 138666.dwg	
		Gedruckt/Printed			Ersatz für/Replacement for: 123-019A2	Ersetzt durch/Replacement by:

Stückliste
Parts List
Liste des pièces

SEEPEX.
ALL THINGS FLOW

Stck.	Pos.	DE	EN	FR
		Baureihe BCSB	**range BCSB**	**série BCSB**
		Schnittzeichnung Nr. 223-001B2	**sectional drawing No. 223-001B2**	**plan no. 223-001B2**
Stck.	**Pos.**	**Benennung Stck. / Pos.**	**denomination Qty. / Item**	**désignation Qté. / Poste**
1	200	Laterne	lantern	lanterne
1	202	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
4	403	Führungsbuchse	guide bushing	douille de guidage
2	404	Kuppelstangenbuchse	coupling rod bushing	chemise d'axe
2	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
2	407	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	Zentrierring	center ring	anneau de centrage
1	505	O-Ring	o-ring	O-ring
4	506	Stiftschraube	stud bolt	boulon fileté
4	508	Scheibe	washer	rondelle
4	509	6kt-Mutter	hexagon nut	écrou
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
4	602	Spannschraube	tie bolt	tirant
8	604	6kt-Mutter	hexagon nut	écrou
8	606	Scheibe	washer	rondelle
1	607	Stützbock	trestle	pied
4	609	Hutmutter	cap nut	écrou borgne
1	700	Druckstutzen	pressure branch	bride de refoulement
1	701	Zentrierring	center ring	anneau de centrage
1	702	O-Ring	o-ring	O-ring
1	704	Stütze	support	support
	098	SEEPEX Gelenkfett Typ und Füllmenge: Betriebs- und Montageanleitung entnehmen	SEEPEX joint grease type and filling quantity: see Operating and Assembly Instruction	SEEPEX graisse d' articulations sommaire pour type et quantité: voir instructions de montage et de fonctionnement
		Verschleißteile und Dichtungen: Betriebs- und Montageanleitung entnehmen	Wearing parts and sealings: see Operating and Assembly Instruction	pièces d'usure et étanchéités: voir instructions de montage et de fonctionnement
		Werkzeuge: Betriebs- und Montageanleitung entnehmen	Tools: see Operating and Assembly Instruction	Outils: voir instructions de montage et de fonctionnement
		Wellenabdichtung siehe Schnittzeichnung Gleitringdichtung	shaft sealing see sectional drawing mechanical seal	dispositif d' etanchéité voir vue éclatée garniture mécanique
		versetzt gezeichnet	drawn displaced	plan separé
	°)	Option	option	option





SEEPEX Gelenkfett

Typ und Füllmenge:
Betriebs- und Montageanleitung entnehmen

SEEPEX joint grease

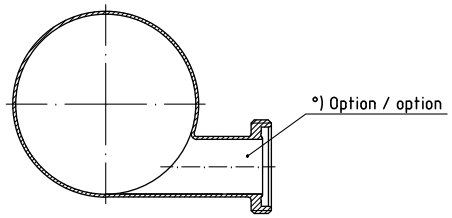
type and filling quantity:
see operating and assembly instruction

Werkzeuge
Betriebs- und Montageanleitung entnehmen

Tools
see operating and assembly instruction

* Verschleißteile und Dichtungen
Betriebs- und Montageanleitung entnehmen

Wearing parts and sealings
see operating and assembly instruction



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

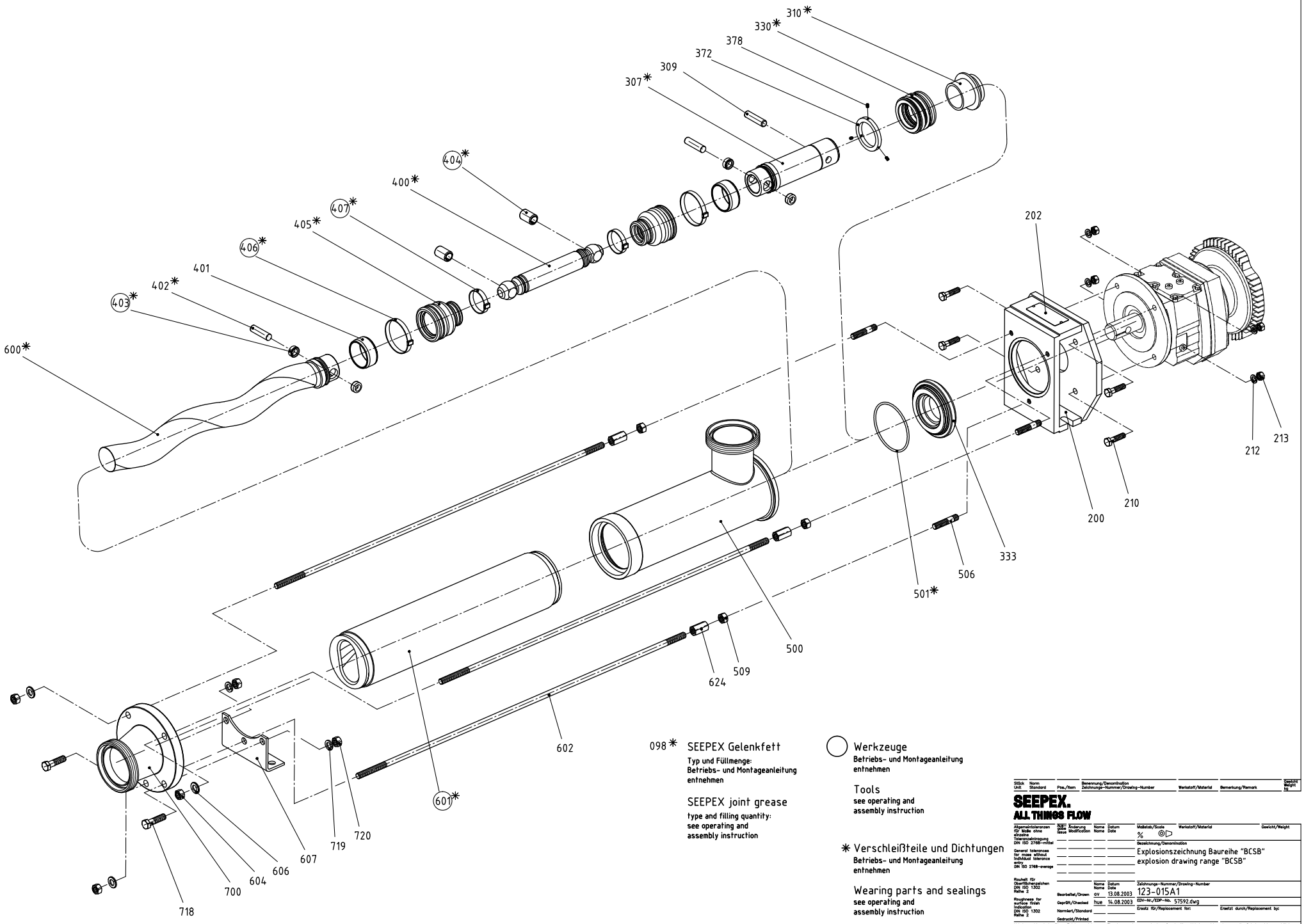
SEEPEX.
ALL THINGS FLOW

Allgemeintoleranzen für Maße ohne einzelne Toleranzeintragung DIN ISO 2768-mittel	Ausgabe Issue	Änderung Modification	Name Name	Datum Date	Maßstab/Scale %	Werkstoff/Material	Gewicht/Weight
General tolerances for mass without individual tolerance entry DIN ISO 2768-average					Bezeichnung/Denomination: Schnittzeichnung Baureihe "BCSB" / sectional drawing range "BCSB"		
Rauheit für Oberflächenzeichen DIN ISO 1302 Reihe 2			Name Name	Datum Date	Zeichnungs-Nummer/Drawing-Number: 223-002A2		
Roughness for surface finish indication DIN ISO 1302 Reihe 2	Bearbeitet/Drawn		sgo	03.06.2014	EDV-Nr./EDP-No.: 138667.dwg		
	Geprüft/Checked		sob	03.06.2014	Ersatz für/Replacement for: 123-014A2	Ersetzt durch/Replacement by:	
	Normiert/Standard						
	Gedruckt/Printed						

Stückliste
Parts List
Liste des pièces

SEEPEX.
ALL THINGS FLOW

Stck.	Pos.	DE	EN	FR
		Baureihe BCSB	**range BCSB**	**série BCSB**
		Schnittzeichnung Nr. 223-002A2	**sectional drawing No. 223-002A2**	**plan no. 223-002A2**
		Benennung	**denomination**	**désignation**
Stck.	**Pos.**	**Stck. / Pos.**	**Qty. / Item**	**Qté. / Poste**
1	200	Laterne	lantern	lanterne
1	202	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	330	Gleitringdichtung	mechanical seal	garniture mécanique
1	333	Gleitringdichtungsgehäuse	mechanical seal casing	carter de la garniture mécanique
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
4	403	Führungsbuchse	guide bushing	douille de guidage
2	404	Kuppelstangenbuchse	coupling rod bushing	chemise d'axe
2	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
2	407	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	Stiftschraube	stud bolt	boulon fileté
4	508	Scheibe	washer	rondelle
4	509	6kt-Mutter	hexagon nut	écrou
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
4	602	Spannschraube	tie bolt	tirant
8	604	6kt-Mutter	hexagon nut	écrou
8	606	Scheibe	washer	rondelle
1	607	Stützbock	trestle	pied
4	609	Hutmutter	cap nut	écrou borgne
1	700	Druckstutzen	pressure branch	bride de refoulement
1	704	Stütze	support	support
	098	SEEPEX Gelenkfett Typ und Füllmenge: Betriebs- und Montageanleitung entnehmen	SEEPEX joint grease type and filling quantity: see Operating and Assembly Instruction	SEEPEX graisse d' articulations sommaire pour type et quantité: voir instructions de montage et de fonctionnement
		Verschleißteile und Dichtungen: Betriebs- und Montageanleitung entnehmen	Wearing parts and sealings: see Operating and Assembly Instruction	pièces d'usure et étanchéités: voir instructions de montage et de fonctionnement
		Werkzeuge: Betriebs- und Montageanleitung entnehmen	Tools: see Operating and Assembly Instruction	Outils: voir instructions de montage et de fonctionnement
		versetzt gezeichnet	drawn displaced	plan separé
	°)	Option	option	option



098* SEEPEX Gelenkfett
Typ und Füllmenge:
Betriebs- und Montageanleitung entnehmen

SEEPEX joint grease
type and fillung quantity:
see operating and assembly instruction

Werkzeuge
Betriebs- und Montageanleitung entnehmen

Tools
see operating and assembly instruction

* Verschleißteile und Dichtungen
Betriebs- und Montageanleitung entnehmen

Wearing parts and sealings
see operating and assembly instruction

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

SEEPEX.
ALL THINGS FLOW

Allgemeintoleranzen für Maße ohne einzelne Toleranzeintragung DIN ISO 2768-mittel	Änderung Modification	Name Name	Datum Date	Maßstab/Scale %	Werkstoff/Material	Gewicht/Weight
General tolerances for mass without individual tolerance entry DIN ISO 2768-average				Bezeichnung/Denomination: Explosionszeichnung Baureihe "BCSB" explosion drawing range "BCSB"		

Rauheit für Oberflächenzeichen DIN ISO 1302 Reihe 2		Name Name	Datum Date	Zeichnungs-Nummer/Drawing-Number
Roughness for surface finish indication DIN ISO 1302 Reihe 2	Bearbeitet/Drawn	ov	13.08.2003	123-015A1
	Geprüft/Checked	hue	14.08.2003	EDV-Nr./EDP-No. 57592.dwg
	Normiert/Standard			Ersatz für/Replacement for: Ersetzt durch/Replacement by:
	Gedruckt/Printed			

Stückliste
Parts List
Liste des pièces

SEEPEX.
ALL THINGS FLOW

Stck.	Pos.	DE	EN	FR
		Baureihe BCSB	**range BCSB**	**série BCSB**
		Explosionszeichnung Nr. 123-015A1	**explosion drawing No. 123-015A1**	**explosion plan no. 123-015A1**
		Benennung	**denomination**	**désignation**
Stck.	**Pos.**	**Stck. / Pos.**	**Qty. / Item**	**Qté. / Poste**
1	200	Laterne	lantern	lanterne
1	202	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	330	Gleitringdichtung	mechanical seal	garniture mécanique
1	333	Gleitringdichtungsgehäuse	mechanical seal casing	carter de la garniture mécanique
1	372	Stellring	set collar	anneau ajustable
3	378	Gewindestift	set screw	vis sans tête
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
4	403	Führungsbuchse	guide bushing	douille de guidage
2	404	Kuppelstangenbuchse	coupling rod bushing	chemise d'axe
2	405	Manschette	universal joint sleeve	manchette
2	406	Halteband	holding band	collier de serrage
2	407	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	506	Stiftschraube	stud bolt	boulon fileté
3	509	6kt-Mutter	hexagon nut	écrou
1	600	Rotor	rotor	rotor
1	601	Stator	stator	stator
3	602	Spannschraube	tie bolt	tirant
3	604	6kt-Mutter	hexagon nut	écrou
3	606	Scheibe	washer	rondelle
1	607	Stützbock	trestle	pied
3	624	6kt-Mutter	hexagon nut	écrou
1	700	Druckstutzen	pressure branch	bride de refoulement
2	718	Zylinderschraube	socket screw	vis à tête cylindrique
2	719	Federring	spring washer	rondelle frein
2	720	6kt-Mutter	hexagon nut	écrou
	098	SEEPEX Gelenkfett Typ und Füllmenge: Betriebs- und Montageanleitung entnehmen	SEEPEX joint grease type and filling quantity: see Operating and Assembly Instruction	SEEPEX graisse d' articulations sommaire pour type et quantité: voir instructions de montage et de fonctionnement
		Verschleißteile und Dichtungen: Betriebs- und Montageanleitung entnehmen	Wearing parts and sealings: see Operating and Assembly Instruction	pièces d'usure et étanchéités: voir instructions de montage et de fonctionnement
		Werkzeuge: Betriebs- und Montageanleitung entnehmen	Tools: see Operating and Assembly Instruction	Outils: voir instructions de montage et de fonctionnement

Single acting mechanical seal

1 Safety

WARNING

Shaft seal is leaky.
Leakage may escape into the atmosphere.

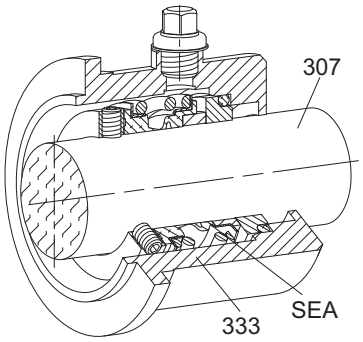
- ➢ Take safety measures to protect persons and the environment.
- ➢ Wear suitable protective clothing.
- ➢ Dispose of leakage appropriately.
- ➢ Note applicable regulations when handling hazardous substances.

2 Operating conditions and and material combination

- Adjust to the relevant application
  - – Refer to technical data (chapter 3).

3 Design

- Single acting mechanical seal



4 Commissioning

NOTICE

Dry running of the mechanical seal.
Damage to property may result.

- ➢ The mechanical seal must be laid in liquid medium before being commissioned.

Circulation, flushing and/or flushing pipe

- Additional flushing or circulation pipes are not required where shaft sealing lies in medium.
- Flushing pipes may be possible under special circumstances and after speaking to seepex.

NOTICE

Shaft seal is not leakage free.
Damage to property through leakage.

- ➢ Components which come into contact with leakage must be corrosion-resistant or otherwise suitably protected.

Adjust shaft seal

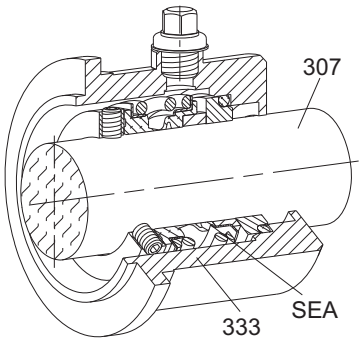
- ➢ It is absolutely vital to adjust at the application site in a manner appropriate for the operating conditions.
- ➢ Refer to the sectional drawing of the shaft seal for setting measurements.
- ➢ Set the setting measurements of the shaft seal to the plug-in shaft (307).

5 Monitoring during operation

NOTICE

Shaft wear.
Damage to property may result.

- Conduct a daily visual inspection.
- Install a new shaft seal (SEA).
- Possibly replace the plug-in shaft (307).

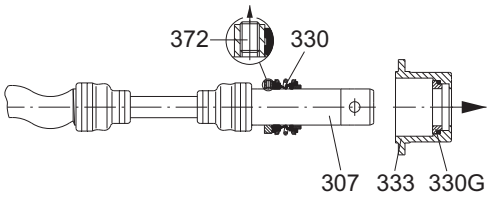


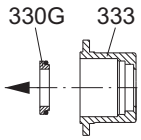
6 Dismantling of the mechanical seal

Refer to data sheet (chapter 3.1) and sectional drawing of the shaft seal (chapter 9._) for design.

With axial locking device

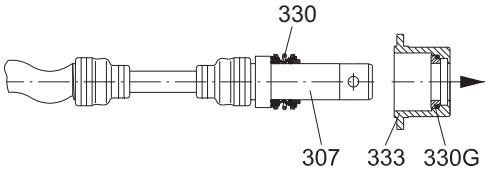
- Clean plug-in shaft (307), remove edges/ burrs.
- Moisten plug-in shaft (307) with lubricant (thinned liquid soap).
- Pull mechanical seal casing (333) from the plug-in shaft (307).
- Loosen the axial locking device of the mechanical seal (330/372); pull mechanical seal (330) from the plug-in shaft (307).
- Push counter ring of the mechanical seal (330G) with seal out of the mechanical seal casing (333).

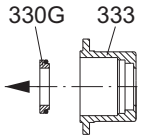




Without axial locking device

- Clean plug-in shaft (307), remove edges/ burrs.
- Moisten plug-in shaft (307) with lubricant (thinned liquid soap).
- Pull mechanical seal casing (333) from the plug-in shaft (307).
- Pull the mechanical seal (330) from the plug-in shaft (307).
- Push counter ring of the mechanical seal (330G) with seal out of the mechanical seal casing (333).





7 Reassembly of mechanical seal

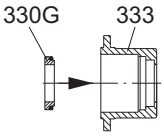
Shaft sealings are high-quality precision parts.

Their installation is therefore to be undertaken with care.

Careful handling and the utmost of cleanliness are prerequisites.

➢ Assembly aids such as oil/grease are not permitted.

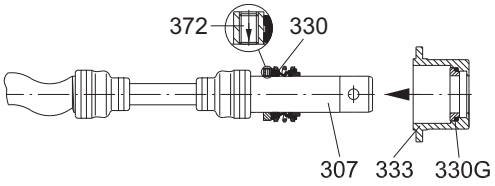
With axial locking device



➢ Clean the mechanical seal casing (333).

➢ Moisten the seal with lubricant (thinned liquid soap).

➢ Attach the counter ring and seal using even pressure into the mechanical seal casing (333).



➢ Clean the plug-in shaft (307), remove edges/burrs.

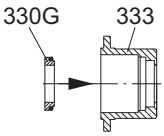
➢ Adjust the set collar (372) in accordance with sectional drawing of shaft seal (chapter 9._).

➢ Stick the set screw in and determine.
  – Use "medium-strength" adhesive.

➢ Moisten plug-in shaft (307) and elastomer parts of the mechanical seal (330) with lubricant (thinned liquid soap).

➢ Slide mechanical seal (330) onto the plug-in shaft (307) until the installation edge has been reached.

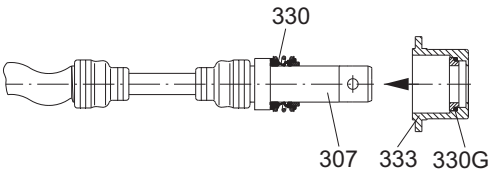
Without axial locking device



➢ Clean the mechanical seal casing (333).

➢ Moisten the seal with lubricant (thinned liquid soap).

➢ Attach the counter ring and seal using even pressure into the mechanical seal casing (333).



➢ Clean the plug-in shaft (307), remove edges/burrs.

➢ Adjust mechanical seal (330).
  – Note sectional drawing of shaft seal (chapter 9._).

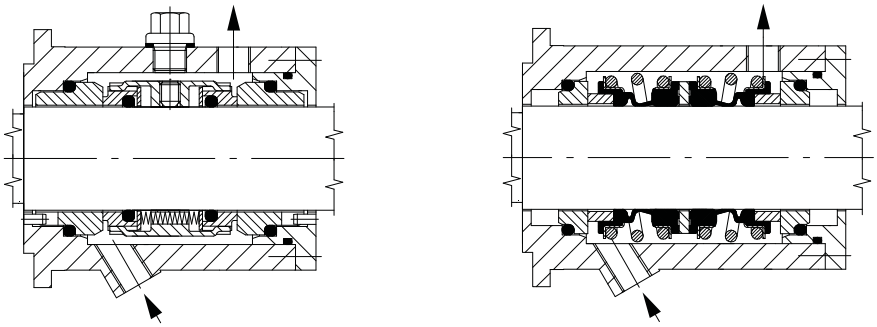
➢ Moisten plug-in shaft (307) and elastomer parts of the mechanical seal (330) with lubricant (thinned liquid soap).

➢ Slide mechanical seal (330) onto the plug-in shaft (307) until the installation edge has been reached.

1 Area of application

Conveying liquids with the following properties

- aggressive, toxic
- sticky, highly viscous
- polymerising
- tendency to leave deposits
- high vapour pressure or gaseous
- high pressure, high temperature



medium side atmospheric side

double acting back-to-back

2 Buffer fluid

2.1 General

The buffer fluid fills the space between the set of mechanical seals on the medium side and the atmosperic side

2.2 Task

- to dissipate the corresponding frictional heat.
- to avoid infiltration of the product into the sealing gap.

2.3 Medium

- clean, cold and stable liquid is used, e.g. water.
- it must be compatible with the product and free of solids.
- it must not habe a tendency to leave deposits.
- it should have low viscosity and a good thermal conductivity.
- Bear in mind the resistance to corrosion of all acontact parts.

2.4 Pressure

The buffer fluid pressure must always be 1,5-2 bar greater than the masimum product pressure. This ensures that infiltration of the product in the mechanical seal (GLRD) sealing gap is prevented.

3 Buffer system in accordance with API 610, Plan 53 and Plan 54

Functions

- Pressure build-up in the buffer area
- Leakage compensation
- Agitation of the buffer fluid
- Colling of the buffer fluid

3.1 Buffer system natural circulation (thermosyphon principle) API Plan 53

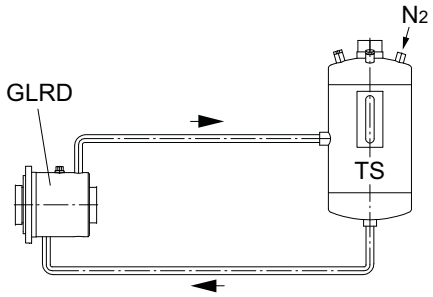
Thermosyphon vessel (TS)

Agitation - natural circulation

Cooling and leakage compensation in the TS vessels

Pressure function:

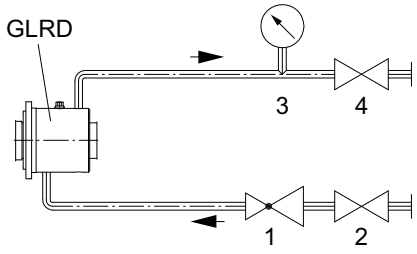
with nitrogen (N2)



➢ Requisite buffer pressure in the mechanical seal (GLRD)
  – at least 1,5-2 bar above the maximum pressure in the pump suction casing.

3.2 Seal flush supply from an external system API Plan 54

1	Pressure reducing valve
2	Shut-off valve
3	Pressure manometer
4	Shut-off valve
GLRD	mechanical seal



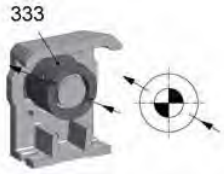
➢ Requisite buffer pressure in the mechanical seal (GLRD)
  – at least 1,5-2 bar above the maximum pressure in the pump suction casing.

1 General

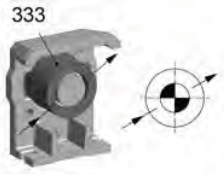
- A mechanical seal is quenched for media that tend to crystallise on sliding surfaces, or are adhesive.
- Quenching is necessary during vacuum operation to avoid dry running.
- The quench liquid has to be compatible with the conveying product and adjusted to the material of the mechanical seal.

2 Location of the inlet position

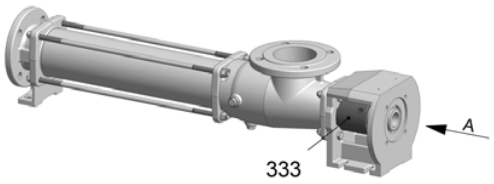
➢ Observe the fitting position of the mechanical seal casing **(333)**.



- Standard position: inlet position 2



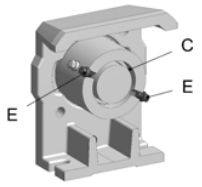
- Special position: inlet position 3



3 Designs

3.1 Design 1

Pos.	Bennenung
C	Quench chamber
E	Screwed plug



Customer supplies and installs the liquid container.

- Quench chamber **(C)** is sealed on both sides with screwed plugs **(E)** .
- Fill up the customer's liquid container and quench chamber**(C)** .

3.2 Design 2

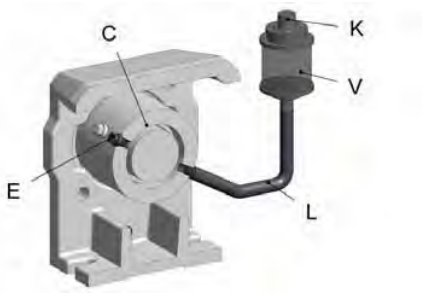
- No longer in the Product Program.

3.3 Design 3

with refillable supply tank **(V)**.

- Screwed plug **(E)** and quench line **(L)** are mounted.

Pos.	Bennenung
C	Quench chamber
E	Screwed plug
V	Supply tank
L	Quench lines
K	End cap



Size	Design	Material	Filling grade
0005-24 to 1-6L	3	Nickel-plated brass, plexiglas, NBR	approx. 80 cm^3
	3A	ATEX: Nickel-plated brass, glass, NBR	
	3.1A	ATEX: Nickel-plated brass, glass, NBR, with protective pipe	
1-12 to 500-6LA	3	Nickel-plated brass, plexiglas, NBR	approx. 140 cm^3
	3A	ATEX: Nickel-plated brass, glass, NBR	
	3.1A	ATEX: Nickel-plated brass, glass, NBR, with protective pipe	

- Screwed plug **(E)** and quench line **(L)** are mounted.

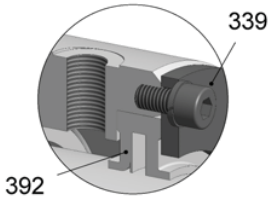
3.3.1 Commissioning and Maintenance - Design 3

➢ Fill quench liquid prior to commissioning.

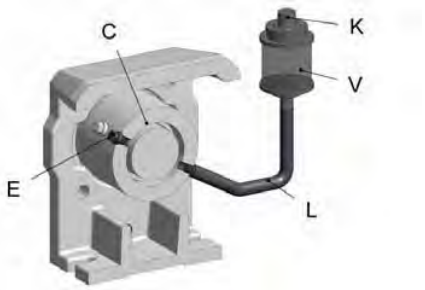
- Standard quench liquid used:
  - SEEPEX 50300 (Glycerine).
  - others available following consultation with SEEPEX.
- Quench liquid in food grade design used:
  - SEEPEX 60200.

➢ Check the compatibility of the quench liquid with the medium.
  - If it is not compatible, fill with a suitable quench liquid after draining completely.

➢ Depressurise the quench liquid, max. 0.1 - 0.15 bar.
  - At greater pressure, a safety device **(339)** is needed for the shaft sealing ring **(392)**.

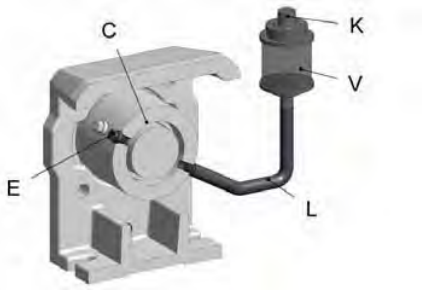


Filling quench liquid - Design 3



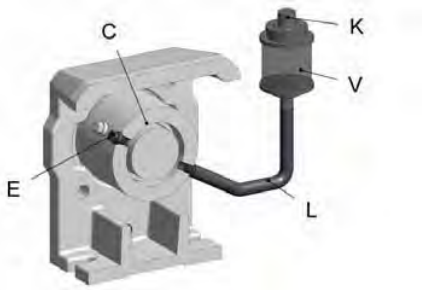
- Remove the end cap (**K)** on the supply tank **(V)**.
- Vent the quench chamber **(C)** by opening the screwed plug **(E)** .
- Fill quench liquid in the supply tank **(V)** until quench fluid discharges from the screwed plug opening **(E)**.
  - Collect the discharged quench liquid and dispose of it in an environmentally-friendly manner.
- Mount screwed plug **(E)** .
- Fill the supply tank **(V)** with quench fluid.
  - For filling grade see (→ chapter 3.3).
- Put the end cap **(K)** on the supply tank **(V)**.

Checking/topping up quench liquid - Design 3



- Remove the end cap (**K)** from the supply tank **(V)**.
- Vent the quench chamber **(C)** by opening the screwed plug **(E)** .
  - Collect the discharged quench liquid and dispose of it in an environmentally-friendly manner.
- Fill new quench liquid in the supply tank **(V)** until there is no further discharge of contaminated/discoloured liquid from the quench chamber **(C)** .
  - Collect the discharged quench liquid and dispose of it in an environmentally-friendly manner.
- Mount screwed plug **(E)**.
- Fill the supply tank **(V)** with quench fluid.
  - For filling grade see (→ chapter 3.3).
- Put the end cap **(K)** on the supply tank **(V)**.

Changing the quench liquid - Design 3



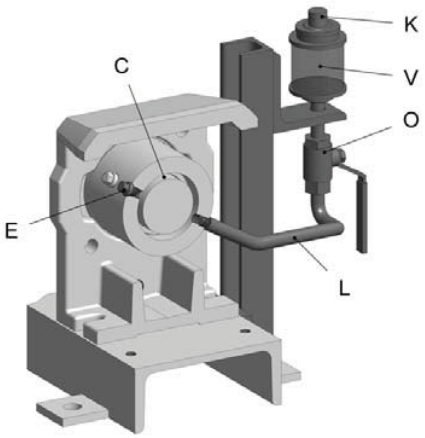
- Change quench liquid if it is contaminated/ discoloured, and at least once a year.
- Remove the supply tank **(V)** and pipeline **(L)**.
- Drain the quench chamber (**C)**, pipeline **(L)** and supply tank **(V)** .
- Mount pipeline **(L)** and supply tank **(V)**.
- Vent the quench chamber **(C)** by opening the screwed plug **(E)**.
- Fill quench liquid in the supply tank **(V)** until quench fluid discharges from the screwed plug opening **(E)**.
  - Collect the discharge quench liquid and dispose of it in an environmentally-friendly manner.
- Mount **(E)** screwed plug.
- Fill the supply tank **(V)** with quench fluid.
  - For filling grade see (→ chapter 3.3).
- Put the end cap **(K)** on the supply tank **(V)** .

3.4 Design 4

with refillable supply tank **(V)** and shut-off valve **(O)**

- Screwed plug **(E)** and quench line **(L)** are mounted.

Pos.	**Bennenung**
C	Quench chamber
E	Screwed plug
V	Supply tank
L	Quench lines
K	End cap
O	Shut-off valve



Size	Design	Material	Filling grade
1-12 to 500-6LA	4.1	Nickel-plated brass, plexiglas, NBR	0.5 L
	4.2	Polyethylene	4 L / 3 L
	4.1A	ATEX: Nickel-plated brass, glass, NBR	0.5 L
	4.2A	ATEX: Stainless steel	4 L / 3 L

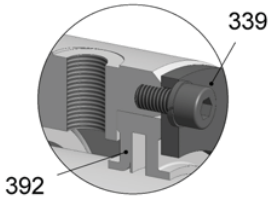
3.4.1 Commissioning and Maintenance - Design 4

➢ Fill quench liquid prior to commissioning.

- Standard quench liquid used:
  - SEEPEX 50300 (Glycerine).
  - others available following consultation with SEEPEX.
- Quench liquid in food grade design used:
  - SEEPEX 60200.

➢ Check the compatibility of the quench liquid with the medium.
  - If it is not compatible, fill with a suitable quench liquid after draining completely.

➢ Depressurize the quench liquid, max. 0.1 - 0.15 bar.
  - At greater pressure, a safety device **(339)** is needed for the shaft sealing ring **(392)**.



Filling quench liquid - Design 4

➢ Remove the end cap (**K)** on the supply tank **(V)**.

➢ Open the shut-off valve **(O)**.

➢ Vent the quench chamber **(C)** by opening the screwed plug **(E)**.

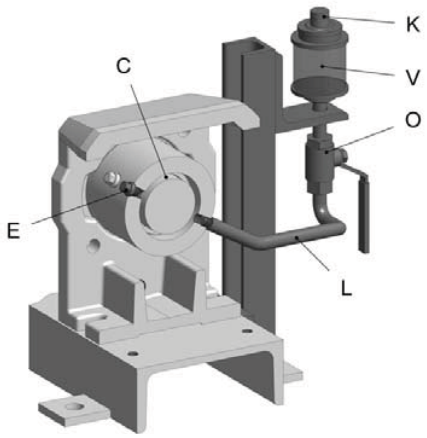
➢ Fill quench liquid in the supply tank **(V)** until quench fluid discharges from the quench chamber **(C)**.
  - Collect the discharged quench liquid and dispose of it in an environmentally-friendly manner.

➢ Mount screwed plug **(E)**.

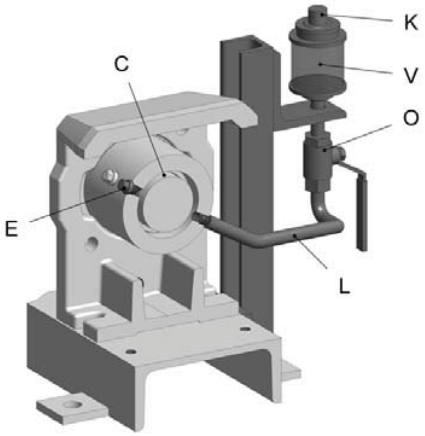
➢ Fill the supply tank **(V)** with quench fluid.
  - For filling grade see (→ chapter 3.4).

➢ Put the endcap **(K)** on the supply tank **(V)**.

➢ Close the shut-off valve **(O)**.

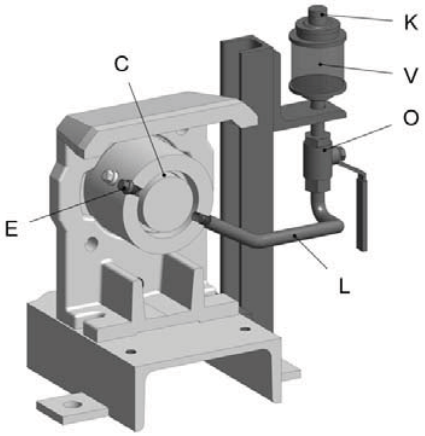


Checking/topping up quench liquid - Design 4



- Remove the end cap (**K)** on the supply tank **(V)**.
- Open the shut-off valve **(O)**.
- Vent the quench chamber **(C)** by opening the screwed plug **(E)**.
  - Collect the discharged quench liquid and dispose of it in an environmentally-friendly manner.
- Fill new quench liquid in the supply tank **(V)** until there is no further discharge of contaminated/discoloured liquid from the quench chamber **(C)**.
  - Collect the discharged quench liquid and dispose of it in an environmentally-friendly manner.
- Mount screwed plug **(E)**.
- Fill the supply tank **(V)** with quench fluid.
  - For filling grade see (→ chapter 3.3).
- Put the end cap **(K)** on the supply tank **(V)**.
- Close the shut-off valve **(O)**.

Changing the quench liquid - Design 4



- Change quench liquid if it is contaminated/ discoloured, and at least once a year.
- Open the shut-off valve **(O)**.
- Remove the supply tank **(V)** and pipeline **(L)**.
- Drain the quench chamber (**C)**, pipeline **(L)** and supply tank **(V)**.
- Mount pipeline **(L)** and supply tank **(V)**.
- Vent the quench chamber **(C)** by opening the screwed plug **(E)**.
- Fill quench liquid in the supply tank **(V)** until quench fluid discharges from the screwed plug opening **(E)**.
  - Collect the discharged quench liquid and dispose of it in an environmentally-friendly manner.
- Mount screwed plug **(E)**.
- Fill the supply tank **(V)** with quench fluid.
  - For filling grade see (→ chapter 3.3).
- Put the end cap **(K)** on the supply tank **(V)**.
- Close the shut-off valve **(O)**.

Shaft Seal Drawing Pending

Wearing parts and gaskets

Sizes: 1-6 to 52-6L
Range: BC, C, BCSB with Pin Joint

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		2		405
Coupling rod pin		2		402
Guide bush 2)		4		403
Coupling rod/ with coupling rod bush		1/ 2		400 / 404
Coupling rod bush 2)		2		404
Casing gasket			1	501
Holding band, small 2)		2		407
Holding band, large 2)		2		406
Packing ring set 2)	-	-		-
Mechanical seal			1	330
Sealing ring			-	-
Splash ring			1	310
O-ring/cleanout			-	-
Plug-in shaft 2)		1		307
Special joint grease				098 1 cart. 300 gr (c. 315cm³) grease quantity per pin joint, see tech. Data
Tool				Essential for assembly, see Point 9, document OM.SPT.01

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

Dimensional Drawing Pending

10.0

Manufacturer's Documents from Sub-supplier

SEEPEX.
ALL THINGS FLOW

TERMS & CONDITIONS OF SALE AND/OR REPAIR 01.16

The following terms and conditions shall apply to an order for all or any part of the articles covered by the accompanying offer unless a specific exception in included therein. Acceptance of any order by SEEPEX Inc. is expressly made conditional upon Buyer's acceptance of SEEPEX Inc. Terms and Conditions of Sale and/or Repair. All prior or future terms, conditions or negotiations (whether written or oral) by Buyer will therefore be considered void and inapplicable, unless otherwise agreed in writing. SEEPEX Inc. reserves the right, in its sole discretion, to refuse any order, unconditionally, for any reason, including but not limited to: expiration of the validity of the offer, errors in the offer, unacceptable payment risks, conflicts with contractual commitments made to other potential customers and the chance that a customer may try to enforce an implied warranty or merchantability of the products offered.

1. PRICES

1.1.
Any prices quoted shall only be valid for orders placed within 30 days from the date of issue of the offer. Prices are Ex-Works SEEPEX Inc. plant (Enon, Ohio USA) in U.S. dollars, unless otherwise agreed. SEEPEX Inc. reserves the right to correct typographical or clerical errors.

2. TERMS

2.1.
All orders are subject to approval by the SEEPEX Inc. Credit Department. Unless otherwise agreed, if payment for the invoice due is not made in full within thirty (30) days after shipment, late fees of eighteen percent (18%) per year (equivalent to a nominal monthly interest rate of 1.5%) will be applied on the unpaid balance until paid in full. The terms and conditions herein set forth are based upon tariffs, taxes, foreign exchange rates, delivery, and other conditions in effect on the date of the customer's order. In the event that such tariffs, taxes, foreign exchange rates, delivery, and/or other conditions should change prior to delivery of the goods, SEEPEX Inc. reserves the right to charge such increased duties, taxes, or charges to the customer.

2.2.
Unless the order includes the appropriate exemption certificates and/or licenses, duties and taxes levied by Federal, State, or other governments are required to be charged automatically at the rate imposed at time of importation/shipment. Any change in law, regulations, or Government practice which causes a variation of any kind in the applicable charges from the amounts stated in the offer shall result in an equivalent change in the price quoted.

2.3.
Until payment is made in full, SEEPEX Inc. shall retain the right, without notice, to repossess and/or retain the items, and/or dispose of them, for its benefit and hold the customer responsible for any loss. Customer agrees to enter into any agreements, contracts, or notices required confirming such rights.

3. SECURITY

3.1.
In order to secure any obligations due to SEEPEX Inc. from the customer the customer grants to SEEPEX Inc. a security interest in:
a) The merchandise covered by the customer's order (s), and
b) All property and funds of the customer now or hereafter in SEEPEX Inc.'s possession, and in all additions and proceeds of such merchandise and/or property. The customer hereby authorizes SEEPEX Inc. to sign alone any financing statement or statements and to do all and any other things which may be necessary to perfect such security interest.

4. CANCELLATION

4.1.
After acceptance, orders may be canceled only with the express approval of SEEPEX Inc. In the event of an approved cancellation, the customer shall remain responsible for payment for all work performed and/or material expenses incurred by SEEPEX Inc. as of the time of cancellation. SEEPEX Inc. reserves the right to cancel the order if SEEPEX Inc. determines, in its sole discretion, that the customer's financial condition renders the customer unable or unlikely to pay for the order as agreed.

5. RETURN

5.1.
No credit will be allowed for returns unless SEEPEX Inc. has authorized such returns in writing in advance. A copy of this authorization must be returned with the item as the packing slip. All returns are subject to restocking charges and to the SEEPEX Inc. Return Goods Authorization (RGA) Policy, which is available on www.seepex.com, and is incorporated herein by reference. SEEPEX Inc. will only issue credits for items that can be resold. Items that are special for a specific customer, including but not limited to: special hoppers, baseplates, electrical panels, gear reducers and electric motors are specifically excluded from consideration for credit. Any items not received in good condition or items that cannot be put back into stock will not be accepted. Any elastomer material with over three (3) years of fabrication will not be accepted for return and/or credit. Customers must pay for all freight associated with any return, including parts or equipment that may be considered to be covered by the limited warranty protection clause below. Oustanding RGA's that have declined repair will be scrapped automatically after ninety (90) days if no other written instructions are provided.

6. SHIPMENT

6.1.
a) Handling Charge: Customer shall be responsible for making all arrangements for shipment of the order with a suitable carrier. In the event that customer requests that SEEPEX Inc. make arrangements for shipment, then customer agrees to pay to SEEPEX Inc., in addition to the applicable shipping charges, a handling charge in the amount of 10% of the shipping charges with a minimum $5.00 to a maximum charge of $150.00, with special services requiring additional charges.
b) New Articles: Where shipping instructions dictate no specific routing, SEEPEX Inc. will utilize its best judgement in determining routing but shall not be liable for any charges once the goods have reached their agreed upon point of delivery. If changes are made at customer's request in a) the agreed upon point of delivery, or b) in the routing selected by SEEPEX Inc. and if such changes involve additional costs to be incurred, such costs shall be borne exclusively by the customer, unless otherwise agreed in writing.
c) Repair Work: All items for which the customer requests repair or other services by SEEPEX Inc. shall be delivered to and picked up from the SEEPEX Inc. plant (Enon, Ohio USA) unless otherwise agreed in writing. All costs of delivery shall be paid by the customer unless otherwise agreed to in writing prior to shipment.
d) All Orders: On collect freight shipments, cartage charges from plant to carrier are the responsibility of the customer. Title to articles passes to customer upon delivery to carrier acting as customer's agent subject to any right of retention by SEEPEX Inc. All claims for shortage in, and damages in, shipment or otherwise must be reported to carrier immediately upon receipt with copy or report to ourselves within five (5) business days.

7. WARRANTIES & LIABILITY LIMITATIONS

7.1.
a) New Articles: SEEPEX Inc. warrants articles of our manufacture against defects in material and/or workmanship for a period of three (3) years from date of delivery, provided that the articles have been installed, maintained, and operated in strict accordance with SEEPEX Inc. recommendations and instructions.
b) Repair Work: Defined herein as work and services performed by SEEPEX Inc. SEEPEX Inc. warrants all repair work and services that it performs against defects in workmanship and/or materials for a period of three (3) years from the date of delivery of the repaired articles.
c) All Orders: All warranty claims shall be submitted promptly in writing to SEEPEX Inc. Any warranty replacement and/or repair shall be made Ex-Works SEEPEX Inc. plant (Enon, Ohio USA). SEEPEX Inc.'s warranty obligation shall be limited to the replacement and/or repair only of defective material and/or workmanship.

7.2.
In no event shall SEEPEX Inc. be liable for any incidental or consequential loss or damage of whatever kind of nature including but not limited to loss of business income or profits, or damage resulting from delay in manufacture or delivery, loss of use or damage to any installation into which the article may be installed, whether arising out of contract or tort.

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7.3.

SEEPEX Inc. shall not be liable for any loss or damage resulting from delay and/or late delivery due to causes beyond our reasonable control. Notwithstanding anything herein to the contrary, SEEPEX Inc.'s liability to customer on any cause of action shall be limited to the amount paid by the customer on the subject order. SEEPEX Inc. makes no warranties, express or implied, with respect to articles or products manufactured or provided by any party other than SEEPEX Inc., except to transfer to the customer, where permissible, any warranty provided to SEEPEX Inc. by the original manufacturer. On any claims for repairs and/or replacement under such warranty, all costs incurred by SEEPEX Inc. which are not underwritten by the original manufacturers shall be borne by the customer. Except as provided herein, SEEPEX Inc. expressly disclaims all representations, promises, or warranties, express or implied with respect to any products, articles, work, or services, including any warranties of merchantability and of fitness for a particular purpose. All warranties made by SEEPEX Inc. shall be void where the goods have been subject to misuse, neglect, damage or alteration. SEEPEX Inc. shall be held free and harmless from any dispute or claim anywhere arising from and relating to infringement of patent, design, trademark, or copyright of items, sold or repaired under this contract.

8. PROPERTY RIGHTS AND RISKS

8.1.

SEEPEX Inc. disclaims any liability or responsibility whatsoever with regard to loss or damages to the customer's property while in the possession, custody or control of SEEPEX Inc. for requested repairs or other services, and the customer expressly agrees to indemnify and hold SEEPEX Inc. harmless against any and all claims for such loss or damage.

9. HAZARDOUS MATERIALS

9.1.

Any hazardous materials or the existence of any hazards relative to the condition of any product tendered to SEEPEX Inc. for service or repair work must be disclosed by customer in writing in the RGA Request Form, whether or not required to be disclosed per federal law on the MSDS sheet. **Customer shall defend, indemnify and hold SEEPEX Inc. harmless from and against any and all claims of injury or damage, including attorney's fees, caused by any hazardous condition or material on or about products accepted for service/repair. This obligation includes but is not limited to claims of bodily injury or death suffered by SEEPEX Inc. employees, or by other parties.**

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