ALLWEILER

Operating and Maintenance Instructions

Eccentric Screw Pumps Series SEZP

VM No.: 730.0003 GB
Edition: 04.01
Ident No.: 183 799

Retain for future use!

Order No.:

Ident No. of pump:

Machine No.:

Pump type:

Operating data, dimensions and other additional information can be found in the order-specific part of the documentation.

These Operating and Maintenance Instructions contain information from the pump manufacturer. They may need to be supplemented by instructions of the operator company for its personnel. These instructions do not take account of specific information relating to operation and maintenance of the process plant into which the pump is integrated. Such information can only be given by the persons responsible for construction and planning of the plant (plant manufacturer).
Such specific instructions relating to operation and maintenance of the process plant into which the pump is integrated have priority over the instructions of the pump manufacturer. The plant manufacturer must on principle observe the limits of use!

Refer to the operating instructions of the plant manufacturer!

Contents

Important note:
This operating manual is to be supplemented by the order-related informations.

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1. General

1.1 Application and range of utilization

The eccentric screw pumps are self-priming, rotary positive-displacement pumps for handling and dosing liquid to highly viscous, neutral or aggressive, pure or abrasive, gaseous fluids or fluids which tend to froth, even with fibre and solids contents.

ATTENTION **The range of utilization is to be taken from the order data sheet.**

1.2 Performance data

The exact performance data applying to the pump are to be taken from the order data sheet.

1.3 Warranty

Our liability for shortcomings in the supply is laid down in our delivery conditions. No liability will be undertaken for any damages caused by non-compliance with the operating instructions and service conditions.
If at any later date the operating conditions happen to change (e.g. different fluid pumped, speed, viscosity, temperature or pressure conditions), it must be checked by us from case to case and confirmed, if necessary, whether the pump is suited for these purposes. In case no special agreements were made, pumps supplied by us may, during the warranty period, be opened or varied only by us or our authorized contractual service stations; otherwise, our liability for any defects will cease.

1.4 Testing

Prior to leaving our factory, all pumps are subjected to a leakage and performance test. Only properly operating pumps leave the factory achieving the performances assured by us. Thus, compliance with the following operating instructions ensures proper operation.

2. Safety

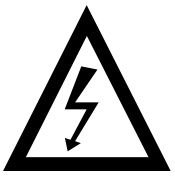
These operating instructions contain basic hints to be observed during installation, operation and maintenance. Therefore, prior to mounting and commissioning, these operating instructions must be absolutely read by the fitter as well as the pertinent expert personnel/operator and must always be available at the place of installation of the machine/plant.
Not only are the general safety hints listed under this main item »Safety« to be observed, but also the special safety hints such as for private use inserted under the other main items.

2.1 Marking of remarks in the operating instructions

The safety hints contained in these operating instructions which, in case of non-compliance, may cause danger to personnel, are particularly marked with the general danger symbol

Safety sign
according to DIN 4844–W9

in case of warning against electric voltage with



Safety sign
according to DIN 4844–W8

For safety hints, non-compliance of which may cause dangers to the machine and its functions, the word

ATTENTION

is inserted.

Hints directly attached to the machine such as

- Directional marker
- Sign for fluid connections

must by all means be observed and maintained in completely legible condition.

2.2 Personnel qualification and personnel training

The personnel for operation, maintenance, inspection and mounting must have the corresponding qualification for these operations. Range of liability, competence and the supervision of the personnel must be exactly regulated by the operator. If the personnel do not have the required knowledge, same must be trained and instructed. If required, this may be effected by the manufacturer/supplier on behalf of the machine operator. In addition, it must be ensured by the operator that the contents of the operating instructions are fully understood by the personnel.

2.3 Dangers in case of non-compliance with the safety hints

Non-compliance with the safety hints may result in both, danger to persons as well as environment and machine. Non-compliance with the safety hints will lead to the loss of any claims for damages.

In detail, non-compliance may, **for example,** entail the following dangers:

- Failure of important functions of the machine/plant
- Failure of specified methods for maintenance and servicing
- Danger to persons by electrical, mechanical and chemical influences
- Danger to the environment by leakage of dangerous-substances

2.4 Responsible working

The safety hints mentioned in these operating instructions, the current national rules for the prevention of accidents as well as any internal working, operating and safety regulations of the operator are to be observed.

2.5 Safety hints for the user/operator

- If hot or cold machine parts lead to dangers, these parts must be protected against accidental contact at the site.
- Protection against accidental contact for moving parts must not be removed when the machine is in operation.
- When operating pump aggregates in a dust-laden enviroment (e.g. milling, chipboard manufacture, bakeries), the surfaces of the pumps and motors must be cleaned at regular intervals, depending on local conditions, in order to maintain the cooling effect and eliminate the possibility of spontaneous combustion. Please also see explosion protection regulations (BGR 104).
- Leakages (e.g. of the shaft seal) of dangerous materials to be handled (e.g. explosive, toxic, hot) must be discharged so as not to result in danger to persons and the environment. Legal stipulations are to be observed.
- Dangers by electrical energy are to be excluded (for details with regard hereto, please refer e.g. to the regulations of the VDE and the local energy supply associations).

2.6 Safety hints for maintenance, inspection and mounting operations

The operator shall see to it that all maintenance, inspection and mounting operations will be performed by authorized and qualified expert personnel who have sufficiently informed themselves by thoroughly studying the operating instructions.
Basically, operations at the machine are to be performed during standstill only. The mode of operation for stopping the machine described in the operating instructions must be absolutely observed.
Pumps or aggregates handling noxious fluids must be decontaminated. All safety and protective devices must immediately be refitted and made operational on completion on the work.
Prior to restarting, the items listed in section »Initial start-up« are to be observed.

2.7 Independent reconstruction and spare parts production

Reconstruction of or changes to the machine are only admissible after consultation with the manufacturer. Original spare parts and accessories authorized by the manufacturer serve safety purposes. If other parts are used the manufacturer cannot be held liable for the consequences.

2.8 Inadmissible modes of operation

The operating safety of the machine supplied is only ensured with due application according to Section 1 of the operating instructions. The limit values given in the data sheet must by no means be exceeded.

3. Transportation and intermediate storage

3.1 Packing

The symbols applied to the packing are to be observed. During transportation and storage, suction and outlet side and auxiliary connections of the pump must be closed with plugs. During installation of the pump aggregate, the plugs are to be removed.

3.2 Transportation

The pump or pump aggregate is to be safely transported to the place of installation, if required by means of lifting gear.

The generally applicable saftey regulations for lifting loads must be observed. The crane device and cables must not be attached to the attachment eyes of the motor.
When transporting the pumps by means of a crane, the sling ropes must be placed safely around the suction casing.
In case of complete pump aggregates, a rope must be additionally fixed to the driving motor.
The sling ropes must be placed around the pump and/or the pump aggregate so that when being lifted, they are in exact balance.

ATTENTION During transportation ensure that the aggregate is secured against toppling over.

Transport damage

ATTENTION Check the pump for damage on receipt. Any damage detected must be notified immediately.

3.3 Preservation and storage of eccentric screw pumps

see our specifications VM 2102/...

4. Description

4.1 Structural design

Self-priming, single or two-stage eccentric screw pump. Rotor and stator are the conveying elements. The driving torque is transmitted onto the motor via the driving shaft and the joint shaft.
Pressure casing, stator and suction casing are held together by external casing connecting screws (clamp bolts).
The shaft sealing housing and the mechanical seal housing are arranged between suction casing and bearing bracket.

4.1.1 Bearing and lubrication

Joint shaft with liquid-tight encapsulated pin joints on both sides. Lubrication by joint oil.
Bearing of the driving shaft is in the bearing bracket by grease-lubricated axial and groove ball bearings and/or cylindrical roller bearings.

4.1.2 Shaft seal

By stuffing box or by maintenance-free, double-acting mechanical seal.

4.1.3 Dimensions/branch position/flanges

The dimensions of the pump and/or pump aggregate, the branch position and flange dimensions are to be taken from the tables of dimensions.

4.2 Mode of operation

Self-priming, rotary, positive-displacement pump, the conveying elements of which are the rotating eccentric screw (rotor) and the fixed stator. Both meet in the cross section at two points, regarded over the length of the conveying elements, and form two sealing lines. The contents of the tight chambers formed as the rotor rotates are shifted axially and completely continuously from the suction to the outlet side of the pump. There is no turbulence despite the rotor rotation. The constant chamber volume excludes squeezing thus ensuring an extremely gentle lowpulsation delivery.

4.3 Aggregate construction

4.3.1 Drive

By non-explosion-proof or explosion-proof, geared motors or variable-speed geared motors. Other driving variants (e.g. via V-belt) are possible.

4.3.2 Shaft coupling and protection against accidental contact

Shaft coupling according to DIN 740.

A protection against accidental contact **according to DIN EN 809** is attached as soon as the scope of supply comprises pump, base plate, shaft coupling and drive.

⚠ **According to the rules for the prevention of accidents, the pump must be started only with a protection against accidental contact according to DIN EN 809.**

If a protection against accidental contact is not supplied, same is to be installed by the operator.

4.3.3 Base plate

The pumps are, as a rule, mounted with the drive on a common base plate. Base plates are provided of the steel type of construction.

5. Installation/mounting

5.1 Installation

The pumps can be installed horizontally with the bearing upwards.

5.2 Foundation

The foundation design depends on the size of the pump and/or the pump aggregate and the local installation conditions.

For exact data on the pump and aggregate dimensions, please refer to our table of dimensions.

The foundation may be designed as a concrete foundation or load-carrying foundation frame, for example of the steel type.

All foundation designs are subject to the following: The foundation must be designed so that it can take the weight of the pump aggregate on the entire surface.

5.2.1 Arrangement of a steel foundation plate

A steel foundation plate must be designed in such a way that the base plate makes full contact and can be secured with bolts or by welding.

ATTENTION If only some of the areas of the base plate are supported, the plate sags in the center or the pump aggregate can be twisted. This influences the alignment of the pump aggregate and can cause high noise emission and damage.

5.2.2 Arrangement of concrete foundations

Concrete foundations must be horizontal, straight and clean and must fully absorb the load exerted on the foundations. Concrete foundations must be designed in such a way that the base plate makes full contact and can be secured with suitable bolts (see our aggregate drawing).

ATTENTION If only some of the areas of the base plate are supported, the plate sags in the center or the pump aggregate can be twisted. This influences the alignment of the pump aggregate and can cause high noise emission and damage.

5.2.3 Arrangement of the pump aggregate on the concrete foundations

After aligning the pump aggregate on the concrete foundations the securing bolts are diagonally and evenly tightened.

5.2.4 Arrangement of concrete foundations for poured base plates

When shuttering the concrete foundations it must be observed that a gap for aligning the pump aggregate and applying the mortar compound remains between the top of the finished foundation block and the bottom of the base plate.

The set concrete foundations must be straight, even and clean. Any traces of oil must be removed from the foundations. The recessed anchor holes for the foundation bolts must be cleaned and removed and cleaned out with air. Prior to the installation of the pump aggregate the surface of the concrete foundations must be roughened and cleaned to ensure a good bonding between the foundation block and the mortar compound.

5.2.5 Pouring of base plate

After alignment on the concrete foundations, a low-shrinkage mortar compound must be poured over the entire length of the base plate, covering also the anchor holes with the connected foundation bolts.

Once the mortar compound has set on the base plate and in the anchor holes, the foundation bolts must be diagonally and evenly tightened.

Note: When pouring or adding the mortar compound it must be observed that the base plate makes full contact. Tap the plate to ensure that no cavities have formed underneath.

5.3 Base plate

The base plate must be fixed on the foundation, stress-free.

5.4 Coupling

A pump aggregate supplied complete was carefully mounted at the factory. As the pump and the drive are fixed on the base plate, re-alignment of the coupling is not required.

5.5 Assembly of pump and drive

The aggregate being completed at the place of service only, the coupling must be assembled as follows:

1. Cover pump and driving shaft end with a filmy coat of molybdenum disulfite (e.g. Molykote), and insert keys.
2. By means of a mounting device, push pump and motor-side coupling halves on until the shaft end is flush with the coupling hub.
   If no mounting device is available, heating of the coupling halves to approx. 100°C (without rubber buffers) facilitates mounting.
3. By means of a hexagon socket with cup point according to DIN 916, axially fix the coupling halves.
4. When assembling the pump and gear motor and/or control gears it must be observed that the clutch halves are precisely aligned and that the right distance between the clutch halves is observed (see aggregate drawings and information of clutch manufacturer).

⚠

5. Mount protection against accidental contact according to DIN EN 809.

5.6 Drive by V-belt drive

In case of a V-belt reduction from drive to pump, make sure that the two V-belt pulleys are aligned in parallel.

The V-belt pulleys must be pushed onto the shaft ends as far as possible. It must be possible to regulate the

tension of the V-belts by means of a motor rocker or by means of tensioning rails. They must be slightly retightened after a short running-in period.

ATTENTION **Excessive tensioning will destroy the rolling bearings of the pump.** Our separate instructions – V-belt drive – VM 706.0001 GB/Ident. No. 133 586 must be complied with.

5.7 Space required for maintenance and servicing

ATTENTION The pump aggregate must be accessible from all sides allowing necessary visual inspections to be performed.

For maintenance and service operations, sufficient space is to be provided, especially for the replacement of the conveying elements. Stator and rotor dismounting dimensions are given in the pump and/or pump aggregate table of dimensions. In addition, see to it that all pipelines can be mounted and dismounted without any difficulties.

5.8 Laying of pipelines

5.8.1 Nominal widths

The nominal widths pressure pipelines should be designed according to the nominal pump branch widths. For coarse deviations kindly contact the works.

The inlet suction opening of the pump is fitted with a funnel shaped top which excludes any possibility of injury occuring.

5.8.2 Supports and flange connections

The pipework and the top funnel should be connected to the pump in a stress-free condition over a flange. They must be supported close to the pump and should allow of easy screwing to avoid deformations. After the screws have been slackened, the flanges must neither be inclined nor springy nor rest on top of one another under pressure. Stresses at the connections which may arise from thermal stress should be kept away from the pump through the instigation of suitable measures such as the installation of expansion joints.

5.8.3 Cleaning of pipelines prior to attachment

Prior to mounting the pump, the suction-side pipelines, gate valves and valves must by all means be flushed and/or cleaned.

Mounting residues such as screws, nuts, welding beads, steel parts etc. will destroy the pump internals. Any claims under the warranty expire as soon as damages are caused by such residues. Flange gaskets must not protrude inwards. Blanking flanges, plugs, protective film and/or protective paint on flanges and seals must be removed completely.

5.9 Laying of auxiliary pipelines for additional facilities

All auxiliary pipelines for the supply of the shaft seal are to be connected, stress-free and sealing.

If possible, the pipelines for the sealing liquid in case of double-acting mechanical seal (design: G18/G19) are to be laid with a large flow cross-section. The sealing liquid outlet is at the highest connection of the mechanical seal housing.

The flow direction of the flushing and sealing liquid is represented by arrows in the sectional drawings.

In order to ensure automatic ventilation, the pipelines must be laid continuously ascending and short, promoting easy flow.

Air bag formation and gas bubble formation are to be avoided, if required, ventilation connections must be provided.

5.10 Safety and control facilities

5.10.1 Manometer

A manometer is to be connected to the pressure pipeline.

5.10.2 Safety element in the pressure pipeline

As soon as a stop valve is arranged in the pressure pipeline or if it is possible that the pressure pipeline will be clogged, a safety element must be provided, e.g.: by-pass line with installed excess pressure valve, bursting diaphragm, protective motor switch etc.

Eccentric screw pumps are positive-displacement pumps and can theoretically generate an infinitely high pressure.

With the pressure pipeline closed, e.g. by clogging or by incidental closing of a valve, the pressure generated by the pump may reach a multiple of the admissible pressure of the plant. This may, for example, lead to bursting of pipelines which must be absolutely avoided especially for dangerous products handled. Thus, appropriate safety devices must also be installed in the plant (e.g. pressure switches).

5.11 Electric connections

Clamping of the power supply cables of the coupled driving motor is to be effected by an electrical expert according to the switching diagram of the motor manufacturer. In doing so, the current VDE regulations and the regulations of the local energy and supply associations are to be observed. Danger by electrical energy must be excluded.

6. Starting/Stopping

6.1 Preparation for starting

6.1.1 Filling the pump with fluid

ATTENTION **The pump must not run dry!** For initial start-up and after prolonged standstills, the pump must be filled with fluid.

Already a few rotations without fluid may damage the stator. Therefore, prior to starting, the suction casing must be filled with water or fluid to be handled to lubricate stator and rotor. After an extended standstill, i.e. if it must be assumed that the residual liquid in the pump has evaporated or after a repair, the filling process must be repeated.

6.1.2 Switching in the additional facilities for shaft seals (if provided)

If the pumps are charged with a flushing/sealing liquid, the existing stop valves, prior to initial start-up of the pump, must be opened and set to the pressures listed below.

– **Supply of the stuffing box with flushing or sealing liquid** (Designs P12, P13 and P14).
Note: For maintaining their function, stuffing boxes with flushing or sealing chamber rings require a flushing and/or sealing liquid.

The required flushing and/or sealing liquid pressure in case of pumps with stuffing box is for stuffing box designs

P12 = 0.1 up to 0.5 bar above the respective internal suction casing pressure
P13 = 0.5 bar above the respective internal suction casing pressure
P14 = 0 up to 0.5 bar

(for flushing and sealing liquid, please refer to Section 6.1.3 below).

– **Supply of the double-acting unbalanced mechanical seal** (Design G18/G19)
Note: For maintaining their function, these mechanical seals require a sealing liquid which has to dissipate the generated frictional heat and to avoid the penetration of the fluid to be pumped into the sealing gap.

ATTENTION Prior to each start-up, the circulation of the sealing liquid must be ensred. The sealing liquid pressure must be approx. 1.5 to 2 bar above the pressure in the suction casing. The flow rate must be regulated so that the outlet temperature of approx. 60°C is not exceeded and is at least 30 K below the boiling temperature at operating pressure (for sealing liquid, please refer to Section 6.1.3 below).

6.1.3 Quality and properties of the flushing/sealing liquid

ATTENTION Any liquid may be used as sealing or flushing liquid in consideration of the corrosion resistance of all contacted parts and the consistency with the medium to be sealed. The fluid must be free from solids, must not tend to sedimentations, should have the highest possible boiling point as well as a good heat conductivity and low viscosity. Clean water of low hardness meets these demands to a high degree.

6.1.4 Break-away of the pump

In case of any new start or after an extended standstill, make sure that the pump is easily raced by the prime mover. If this is not easily possible, e.g. because of the high adhesion between rotor and stator in new condition, boosting is possible by means of an appropriate tool within the key area of the driving shaft.

ATTENTION During this process, the driving shaft must not be damaged.

6.1.5 Control of the sense of rotation

The sense of pump rotation as viewed from the drive against the driving shaft is counterclockwise.

ATTENTION The sense of pump rotation must correspond to the directional marker „n“ in the pump type plate. Wrong sense of rotation may result in damages to the pump. For the control of the sense of rotation, the motor on/off switch is to be touched only briefly.

6.2 Starting

6.2.1 Start-up

Prior to start-up, all stop valves on the suction and outlet side are to be opened.

6.2.2 Drive

Switch motor in.

ATTENTION Consider product-specific particularities of the drive. **Please refer to the operating instructions of the drive manufacturer.**

6.2.3 Checking the delivery values

After the drive has reached its operating speed the pump outlet pressure must be checked via the manometer.
The motor must not be overloaded. The power consumption can be checked by means of an ammeter. In this connection, temperature and viscosity of the fluid to be handled must be checked. The values read must be checked against the order data sheet and/or acceptance report.

6.2.4 Protection against dry running

If no further fluid to be pumped arrives at the suction side, the thermal energy generated in the conveying elements of the eccentric screw pump due to dry friction and churning work is no more sufficiently dissipated as a result of which the stator elastomer is thermally destroyed already after a short period of time. For the conveying elements to be protected, various dry running protection systems are available, adapted to the respective operating conditions (please contact factory).

6.3 Stopping

6.3.1 Shut-down

Switch motor off.

6.3.2 Measures in case of prolonged interruption

If a prolonged interruption is projected and there is a danger of frost, the pump must be drained. Screw off the suction housing cover (506) for this purpose. Thereafter, the pump must be preserved (please refer to Section 3.3 above).

7. Maintenance/Service

7.1 Maintenance

– For maintenance and service operations, the statements made under Section 2 »Safety« are to be observed. Regular control and maintenance of the pump and drive will extend the service life.

7.1.1 General control

1. The pump must not run dry.
2. The driving motor must not be overloaded.
3. Check suction side and pressure pipelines for tightness.
4. During operation, an installed stuffing box must be slightly dripping.
   An installed mechanical seal must not have any heavy leakage.
5. Observe pressure and temperature monitoring instruments, and compare with the order data sheet and/or acceptance report.
6. Observe additional facilities such as flushing, sealing of the shaft seal, if provided.

7.1.2 Maintenance of components

7.1.2.1 Joints of the joint shaft

The joints of the joint shaft are lubricated with Allweiler special joint oil Type B or oil ET 1510 ISO 460 of Messrs. Tribol Lubricants GmbH, Mönchengladbach, Germany; for the use of the pumps for foodstuffs, with ALLWEILER special joint oil Type BL or oil 1810/460 of Tribol Lubricants GmbH, Mönchengladbach, Germany

ATTENTION Other lubricants were not tested by us and can, therefore, not be recommended by us!

The joints are life-lubricated. However, if the pump must be opened for any other purposes, we recommend to check the joint collar for tightness and to change the joint oil after 8,000 working hours. The table under Section 7.1.2.6 shows the allocation of the pump size to the oil quantity in cubic centimeters. For the change of the joint oil, please refer to the Dismounting and Mounting Instructions.

7.1.2.2 Bearing of the driving shaft and lubrication of the bearing

The bearing of the driving shaft in the bearing bracket is by regreasable angular-contact and groove ball bearings.
The bearing type H is lubricated for life, the bearing type V is regreasable.

For the lubrication of the ball bearings, we recommend to use the below-listed rolling bearing greases or equivalent. The order of manufacturers is no quality ranking.

Producer	Brand name	Designation to DIN 51825
AGIP	Agip GR MU3	K3K–20
ARAL	Aralub HL3	K3K–20
BP	BP Energrease LS3	K3K–20
ESSO	BEACON 3	K3N–30
Fuchs	RENOLIT FWA 220	K3N–20
Klüber	MICROLUBE GL 263	K3N–20
Mobil-Oil	Mobilux 3	K3K–20
Shell	Shell Alvania Fett R3	K3N–30
SKF	SKF-Fett LGMT3	K3K–30

If none of the listed rolling bearing greases is available, we recommended in any case a multi-purpose grease on lithium basis which corresponds to the above DIN designation. Grease mixtures with grease grades of different basic oils and thickeners lead to a reduction of the lubricating properties and must therefore be avoided.
The table under Section 7.1.2.6 shows the allocation of the pump size to the grease quantity in grams.

Relubrication period
Every 4,000 operating hours, the bearings of the bearing type V must be relubricated.

Relubrication
Relubrication is effected by means of the grease nipple (119). Relubrication must be repeated for such a period of time until the used grease emerges. The used grease must be scraped off.

7.1.2.3 Shaft seal

Shaft sealing is either effected via a stuffing box or a mechanical seal.

● **Stuffing box**
Increased leakages, if any, at the stuffing box during the first few hours of operation normally disappear automatically during the running-in period.
If necessary, slightly tighten hexagon nuts (202) at the gland (203).
Please note that the stuffing box must be slightly leaking. This causes dissipation of the frictional heat generated at the sealing surface.
If the leakage losses increase excessively, and if leakage cannot even be reduced by repeated slight tightening of the hexagon nuts (202), the packing rings have lost their elasticity of shape and must be replaced.

– **Dismounting the old packing rings and cleaning the shaft sealing housing**
Following the pressure relief of the pump and after removal of the gland, the old packing rings can be removed. A packing puller with flexible shaft serves as tool. Thereafter, the stuffing box chamber and the shaft sleeve must be carefully cleaned within the area of the packing rings. Worn shaft sleeves must be replaced (refer to the Dismounting and Mounting Instructions).

– **Mounting the packing rings**
ATTENTION In principle, only such packing rings are to be installed which correspond to the required operating conditions of the pump.
For the dimensions and necessary quantity of the pre-pressed packing rings and ring cuts or cutting lengths, please refer to the table Section 7.1.2.6 below.
For cutting purposes, we recommend the straight cut perpendicular to the shaft. In order to achieve a gap-free parallel location of the cut ends when closing the packing ring, the cutting angle should be approx. 20° to both cutting ends (please refer to Figure 1 below).

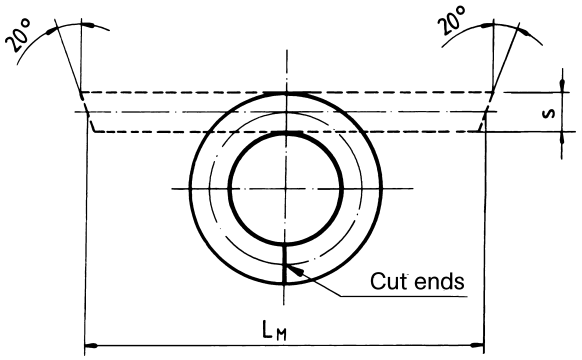


Figure 1: Cutting of packing rings

Pre-pressed packing rings or cut rings must be carefully untwisted axially and radially to such a degree only that they can just be pushed over the shaft. Bending-up the rings may result in damage by breaking.
During installation in the packing chamber, the packing rings must be carefully re-bent into angular shape. During this process, the kerfs must be set off by 90°. By means of the gland, each ring must be individually pushed into the stuffing box chamber with the cut ends foremost. Sealing chamber ring or flushing ring must be installed consistently.

ATTENTION Pointed items must never be used for these purposes as there is a danger of shaft damage and deformation of the packing materials.

– **Commissioning of the stuffing box after re-packing**
Prior to commissioning, the stuffing box must be only slightly tightened. During pump starting, 50 to 200 drops in a minute are admissible as seepage quantity.
During the starting process of approx. 30 minutes, a minimum leakage of 2 to 20 drops in a minute must be set by gradually and evenly tightening the gland (203) by means of the hexagon nuts (202).
ATTENTION During this process, the stuffing box temperature must not rise abnormally. Approx. 20 to 60°C above the temperature of the fluid pumped are admissible. In case of a sudden temperature rise, the gland must be immediately

slackened and the running-in procedure repeated. The seepage may be drained through the tapped hole provided in the collecting trough of the bearing bracket.

Personal injuries and environmental damages resulting from the leakage of dangerous materials must be excluded.

- **Mechanical seal**

One uses double-acting slide ring packings for all material combinations. The slide ring packing does nor require any servicing.
The slide ring packing should be replaced when there is strong leakage occurring due to wear (see Disassembly and Assembly Instructions).

7.1.2.4 V-belt drive

Refer to our maintenance instructions for the V-belt drive with tensioning device VM 706.0001 – Ident No. 133586.

7.1.2.5 Driving motors and (control) gears

Please refer to the operating and maintenance instructions of the manufacturers.

7.1.2.6 Packing ring dimensions (to Section 7.1.2.3) Lubricant quantities for joints (to Section 7.1.2.1) and bearing (to Section 7.1.2.2).

	Series SEZP		Number and dimensions of packing rings for models P11*) for ring blanks	Dimensions of packing rings as blanks L_M x s	Oil qty. cm^3/ Joint	Grease qty. g/bearing types H and V
Pump size	380.1	380.2	5 pieces ⌀ 72/52 x 10	208,4 x 10	52	40
	750.1	750.2	5 pieces ⌀ 87/63 x 12	252,1 x 12	87	65
	1450.1	1450.2	6 pieces ⌀ 102/78 x 12	302,5 x 12	169	125

*) for shaft seal designs P12...P14, the quantity is reduced by 1 piece.

7.2 Servicing (dismounting and mounting instructions)

General

On request, trained service engineers will be at your disposal for mountings and repairs.

In case of repairs performed by the customer's own personnel or our trained mechanics, it must be ensured that the pump is completely empty and clean.

This applies in particular to pumps which, in case of repair, are sent to our factory or to one of our contractual repair shops.

In protection of our staff and for reasons of environmental protection, we have to refuse to accept for repair any pumps filled with fluid pumped. Otherwise, we will have to charge the customer/operator with the costs for an ecologically acceptable waste disposal.

In case of repair of pumps operated with dangerous materials ① and/or fluids harmful to the environment, the customer/operator must advise hereof his own and/or our local mounting personnel or, in case of return, our factory and/or contractual service shop of his own accord. In such a case, evidence of the fluid handled, e.g. in the form of a DIN safety data sheet will have to be presented to us when requesting a service engineer.

① **Dangerous materials are:**

- Toxic substances
- Substances detrimental to health
- Caustic substances
- Irritants
- Explosive materials
- Fire–promoting, highly, easily and normally inflammable materials
- Carcinogenic substances
- Foetopathic substances
- Genes–changing substances
- Substances which are dangerous to human beings in any other way

When working locally, the customer's own and/or our mounting personnel must be referred to dangers which may be caused in connection with repairs.

The most important dismounting and mounting operations are described in these instructions. The mounting steps described in the individual sections must be consistently observed.

7.2.1 Dismounting the eccentric screw pump

Prior to commencing the dismounting, the following operations must be performed:

- Pinch off power supply cable to the motor. Motor must not be capable of being started.
- All stop valves in the suction and pressure pipeline must be closed.
- Drain the fluid to be pumped from the suction casing. Remove the suction housing cover (506) for this purpose and flush free the suction housing.
- Dismount protection against accidental contact.
- Pressure pipline as well as all auxiliary pipelines.
- Loosen screws at the pump feet, and screw out.

7.2.1.1 Dismounting the stator

- Remove hexagon nuts (609) and washers (610) from the clamp bolts (611).
- Withdraw pressure casing (504).
- Remove clamp bolts (611).
- Withdraw stator (402) from the rotor (401). **Note:** In case of stiffness, simultaneously turn stator (402) by means of chain tongs. For these purposes, fix driving shaft (118).

7.2.1.2 Dismounting the rotor and rotor-side joint

The dismounting of the rotor and the rotor-side joint is effected following the dismounting of the stator (402). Please refer to Section 7.2.1.1 above.

- Remove hexagon nuts (607) and washers (608).
- Withdraw suction casing (505) over the rotor (401). In doing so, see to it that the fine-machined rotor is not damaged.
- Remove gasket for suction casing (501).
- Drive the locking pin on the side where the rotor is (307) using a drift punch into the cavity of the hinge pin (307). Pull the rotor (401) together with the joint on the worm shaft (307).
- Cut lock at the joint clamp (306) by means of a metal cutting saw, and with a screw driver, press out to both sides. Remove joint clamp (306) from the joint collar (308) (please refer to Figure 2).

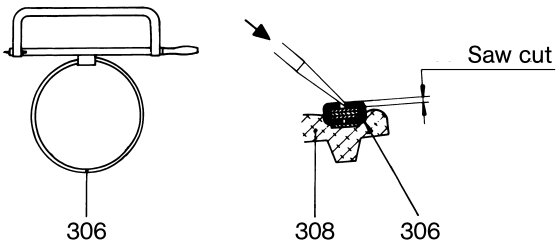


Figure 2: Removal of the joint clamp.

- By means of a screw driver, lift joint collar (308) and withdraw axially towards the joint shaft (307).
- Collect oil filing in a tank.
- Drive joint sleeve (304) over the collar of the joint shaft (307). In doing so, do not deflect joint shaft (307) (please refer to Figure 3 below).

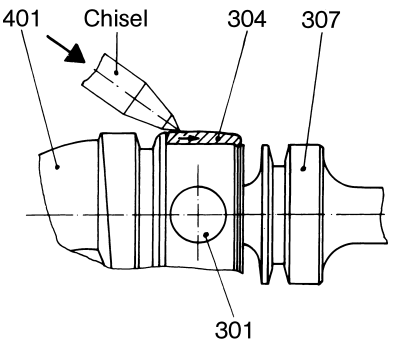


Figure 3: Dismounting the joint sleeve.

– Eject coupling rod pin (301).

– By means of a brass ejector, drive out the two bushes for coupling rod pin (303) by one half. For these purposes, incline joint head (307) (please refer to Figure 4 below).

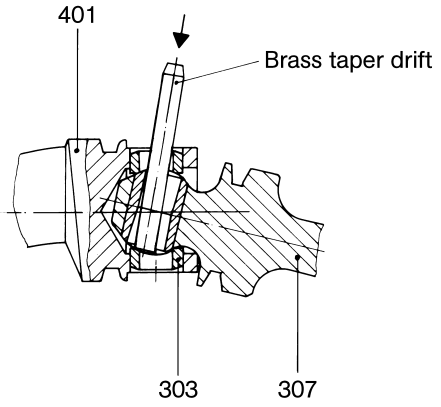


Figure 4: Dismounting the bushes for coupling rod pin.

– Remove rotor (401) from the joint head (307).

– Press joint bush (302) out of the coupling rod (307).

– By means of a brass mandrel, completely drive bush for coupling rod pin (303) out of the rotor (401).

7.2.1.3 Dismounting the worm shaft and the drive-side joint

Dismounting of the worm shaft and the drive-side joint is effected following the dismounting of the stator (402) and the rotor (401). Please refer to Sections 7.2.1.1 and 7.2.1.2 above.

– Dismount drive-side joint, as described under Section 7.2.1.2 above.

– Withdraw joint head with worm shaft (307) from the driving shaft (118).

– Press joint bush (302) out of the worm shaft (307).

– By means of a brass mandrel, completely drive bush for coupling rod pin (303) out of the drive shaft (118).

7.2.1.4 Dismounting the shaft seal and drive shaft with bearing

Note: In case of pumps with shaft seal by stuffing box, the packing rings can be exchanged without dismounting the drive shaft, as described under Section 7.1.2.3 above. Dismounting of the drive shaft is required whenever the pump is equipped with a mechanical seal. In case of damages to the shaft wear sleeve within the area of the shaft seal, the pump must also be dismounted, as described hereinafter.

– Dismount stator (402) (please refer to Section 7.2.1.1 above).

– Remove hexagon nut (607) and washer (608).

– Pull suction casing (505) over rotor (401), ensuring that the precision-machined rotor is not damaged.

– Remove suction casing gasket (501).

– Remove the hexagonal nut (635) and washer (636) and detach the reduction flange (512).

– Withdraw coupling half and/or V-belt pulley and remove key (101).

– Pull flinger ring (114) against gland (203).

– Loosen circlip (108) and remove it from the groove.

– Drive out drive shaft (118) with all mounted parts from the bearing bracket (110).

– Clamp drive shaft (118) in a torsionally resistant position at the end of the shaft.

● **Dismounting the bearings for H and V**

– Remove tab washer for bearing nut (117), and loosen bearing nut (116).

– Remove bearing nut (116), tab washer for bearing nut (117) and, for bearing H, in addition spacer rings (113) and Nilos ring (105).

– Pull off radial bearing (103).

– Remove second Nilos ring (105), spacer sleeve (102) and Nilos ring (106).

– Pull off axial bearing (104).

– Remove spacer ring (113), bearing cover (111) with lip seal (112), O-ring (109) and circlip (108).

– Pull off flinger ring (114).

– Remove shaft sleeve (205).

● **Dismounting the stuffing box**

– Remove self-locking nut (202), T-head bolt (201) and gland (203).

– Pull stuffing box housing (204) from the drive shaft (118).

– Remove stuffing box packing (207) in case of models P12 including flushing ring (208), and for models P13 and P14, including lantern ring (209) from stuffing box housing (204).

– Pull shaft wear sleeve (206) and O-ring (115) from the drive shaft (118).

● **Dismounting the mechanical seal, double-acting**

– Withdraw mechanical seal housing (214) with atmosphere-side stationary seal ring (219) from the drive shaft.
Note: Particularly see to it that the casing with stationary seal ring is withdrawn concentrically and not canted to avoid damages to the stationary seal ring.

– Remove O-ring (218).

– Undo grub screws in the rotation part of the mechanical seal (219) and pull off mechanical seal from the drive shaft (118).
ATTENTION Before undoing the grub scews, mark or measure the position of the mechanical seal on the shaft wear sleeve or drive shaft. Do not push O-rings over the pressure marks caused by the grub screws!

– Pull off mechanical seal cover (215) and clamping ring (216) with product-side stationary seal ring of the mechanical seal (219) from the drive shaft (118).
Note: Particularly see to it that the mechanical seal cover with stationary seal ring of the mechanical seal is withdrawn concentrically and not canted to avoid damages to the stationary seal ring.

– Press stationary seal rings of the mechanical seals and O-rings out of the mechanical seal housing (214) and mechanical seal cover (215). See to uniform pressure distribution.

– Remove retaining pin (220).

– Withdraw shaft wear sleeve (206) and O-ring (115) from the drive shaft (118).

7.2.2 Mounting the eccentric screw pump

General
Mounting of the individual pump components is effected after careful cleaning analogously in reverse order.

7.2.2.1 Mounting the shaft seal with the drive shaft dismounted

– Pull O-ring (115) on drive shaft (118).

– Push shaft wear sleeve (206) with the inside bevel pointing to the drive shaft head onto the drive shaft (118).

● **Mounting the stuffing box**

– Push stuffing box housing (204) onto the shaft wear sleeve (206).

– In case of models P12 including flushing ring (208) and in case of models P13 and P14 including lantern ring (209), install stuffing box packing (207) in the stuffing box housing (204). Please also refer to Section 7.1.2.3 “Mounting new packing rings”.

● **Mounting the mechanical seal, general**

Mechanical seals are high-quality precision parts. The mounting instructions of the mechanical seal manufacturers are to be observed. Careful handling and extreme cleanliness during mounting are a condition of proper functioning. To facilitate mounting, surfaces on which O-ring are sliding, may be lubricated with lubricants such as silicon oil, Polydiol or soft soap.

ATTENTION Do not use normal oil.

Note: See to it that the parts sliding on each other are only exchanged in pairs. When using double PTFE-coated O-rings, see to it that the joint of the outer coating points against the mounting direction as otherwise, opening and/or withdrawal of the coating may be effected (please refer to Figure 5 below).

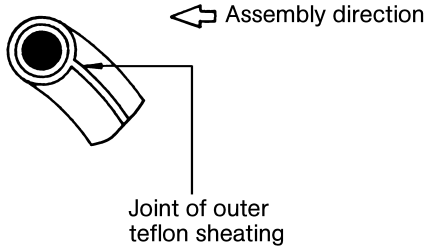


Figure 5: Joint of the outer coating points against the mounting direction.

● **Mounting the mechanical seal, double-acting**

– Concentrically press stationary seal ring of the mechanical seal (219) with O-ring into the mechanical seal cover (215).
Note: See to uniform pressure distribution.

– Push mechanical seal cover (215) and clamping ring (216) over the drive shaft (118).

– Concentrically press stationary seal ring of the mechanical seal (219) with O-ring into the cleaned mechanical seal housing (214).
Note: See to uniform pressure distribution and retaining pin. Retaining pin (220) must not protrude to the inside.

– Push locating ring (217) and O-ring (218) onto the drive shaft (118).

– Push rotating part of the mechanical seal (219) onto the drive shaft (118).
Note: Exactly observe installation dimension and/or position of the mechanical seal as marked for dismounting

– Insert grub screws, if provided, in the rotating part of the mechanical seal (219) with the screw locking means Loctite No. 241 or equivalent, and tighten.

– Push mechanical seal housing (214) with stationary seal ring of the mechanical seal (219) over the drive shaft (118).
Note: When pushing the mechanical seal housing onto the drive shaft, see to it that the mechanical seal housing is not canted to avoid damages to the stationary seal ring of the mechanical seal.

7.2.2.2 Mounting the drive shaft with bearing

Note: In case of bearings H, the pumps are equipped with anti-friction bearings lubricated for life and in case of bearing V, with regreasable anti-friction bearings. For re-mounting, the anti-friction bearings must be provided with a sufficient grease filling.

– If required, carefully clean anti-friction bearings with Diesel fuel. The contact faces being blank and undamaged, the anti-friction bearings (103) and (104) can be re-used. If this is not the case, the anti-friction bearings must be replaced.

– Fill anti-friction bearings (103) and (104) with bearing grease. The grease filling is applied as described below.

1. Fill hollow spaces between the rolling bodies up to approx. 30 to 50% with grease.
2. Scrape off excessive grease (most suitably with the fingers, do not use any metallic object). For bearing greases recommended by us, please refer to Section 7.1.2.2 above.

● **Mounting the bearings types H and V**

– Push shaft sleeves (205) with contact face (ground face) for lip seal (112) pointing to the bearing onto the drive shaft (118).

– Push flinger ring (114) on.

– Fill space of the lip seal (112) with bearing grease and coat sealing lips.

– Press lip seal (112) into the cleaned seat of the bearing cover (111).
Note: In case of bearing type H, the sealing lip with hose spring of the lip seals (112) must always face the side to be sealed (pointing to the inside) and, in case of bearing type V, the shaft sealing housing (pointing to the outside).
Pressing-in is effected with a suitable pressing stamp. Absolutely see to it that the pressing force is applied as close as possible to the outside diameter of the lip seal.

– Push circlip (108), bearing cover (111) with lip seal and O-ring (109) as well as spacer ring (113) onto the drive shaft (118).

– By means of suitable pipe length, press double-row axial bearing (104) over the inner bearing ring onto the drive shaft (118).
Note: The ball filling groove of the axial bearing must point to the shaft seal side. Slightly oil bearing surface previously.

– Coat the sealing edges of Nilos rings (105) and (106) with bearing grease.

– Push Nilos ring (106), spacer sleeve (102) and Nilos ring (105) onto the drive shaft (118).

- By means of a suitable pipe length, press radial bearing (103) over the inner bearing ring onto the drive shaft (118). Slightly oil bearing surface previously.
  Note: Inscription on the outer ring of the radial bearing must be fitted on the inside.
- **In case of bearing type H:** Push drive-side Nilos ring (105), spacer rings (113) and tab washer for bearing nut (117) onto the drive shaft (118), and firmly tighten bearing nut (116). Check whether shaft wear sleeve (206) rests tightly against the head of the drive shaft (118).
  ATTENTION Prior to tightening the bearing nut (116), the drive-side Nilos ring (105) and bearing-side spacer ring (113) must be centered on the bearing seat of the drive shaft (118).
- **In case of bearing type V:** Firmly tighten bearing nut (116). Check whether shaft wear sleeve (206) rests tightly against the head of the drive shaft (118).
- Lock bearing nut (116) with tab washer for bearing nut (117).

● **Mounting the drive shaft**

- Coat sealing lip of the lip seal (120) with bearing grease.
- Press lip seal (120) into the cleaned seat of the bearing bracket (110).
  Note: In case of bearing type V, the sealing lip with hose spring of the lip seal (120) must point to the outside. Pressing-in is effected with a suitable pressing stamp. Absolutely see to it that the pressing force is applied as close as possible to the outside diameter of the lip seal.
- Press drive shaft (118) with all mounted parts into the bearing bracket (110). Slightly oil bearing seats previously.
- Mount circlip (108).
- Push flinger ring (114) into bearing direction.
- Insert key (101) in the drive shaft (118) and lock by two punch marks on the front side.

7.2.2.3 Mounting the rotor and rotor-side joint

- With a brass drift, drive bushes for coupling rod pin (303) half-way into rotor (401).
- Press coupling rod bush (302) into the joint head (307) so that the longitudinal axis of the oval hole (marked with two notches) coincides with the longitudinal axis of the joint head and the coupling rod bush protrudes symmetrically from both sides of the joint head (please refer to Figure 6 below).

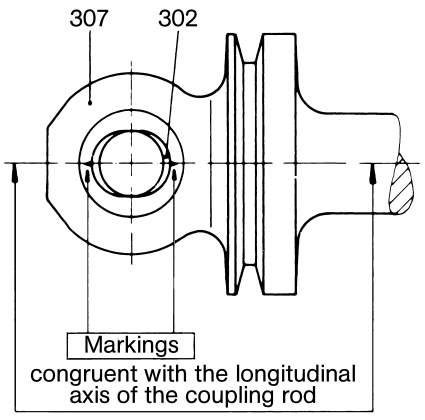


Figure 6: Pressing-in of the coupling rod bush

- Push joint head (307) into the rotor head (401).
- Push coupling rod pin (301) into the coupling rod bush (302), and drive in guide bushes (303) completely.
- Polish retaining sleeve (304) at the outside diameter, if necessary, with emery, and mount on the rotor head (401).
- Following mounting of the retaining sleeve (304), secure same against axial displacement on the rotor head (401).
  ATTENTION For these purposes, drive face of the retaining sleeve (304) into the groove at the rotor head (401) with one punch mark (please refer to Figure 7 below).

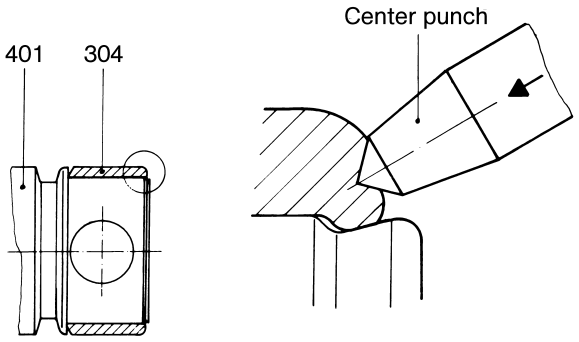


Figure 7: Locking the retaining sleeve.

- Mount cover sleeve (308) with screw driver, lift top with screw driver, run spray pipe of the oil can under the sleeve and fill the space in the joint with ALLWEILER special joint oil type B or oil ET 15 10 ISO 460 of Tribol Lubricants GmbH, Mönchengladbach, Germany. Lubricant quantities see table, Section 7.1.2.6 above. For the use of the pumps for foodstuffs with ALLWEILER special joint oil Type BL or oil 1810/460 of Messrs. Tribol Lubricants GmbH, Mönchengladbach, Germany
- Check whether bent loop of the clamping bands (306) rests against the clamping band lock. If not, press against by means of commercial flat pliers (please refer to Figure 8 below).

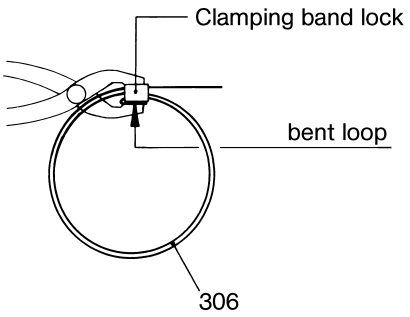


Figure 8: Press clamping band loop against clamping band lock.

- Place clamping bands (306) in the surrounding grooves of the cover sleeve (308), and clamp.
  Note: For these purposes, the following clamping tool must be used:

For pump sizes ≤
SEZP 380.1, SEZP 380.2
the clamping tool bearing the designation PoK-It II.

For pump sizes ≥
SEZP 750.1, SEZP 750.2
the clamping tool bearing the designation Band-It together with adapter J050.

The said tools may be obtained from us.
When clamping the clamping bands, proceed as follows:

- **Clamping with clamping tool Band-It and adapter J050.**

– Introduce band end of the clamping band (306) to the clamping band lock into the clamping tool with adapter.

– Hold clamp end with the eccentric lever of the clamping tool, and clamp clamping band (306) by turning the crank (Figure 9).

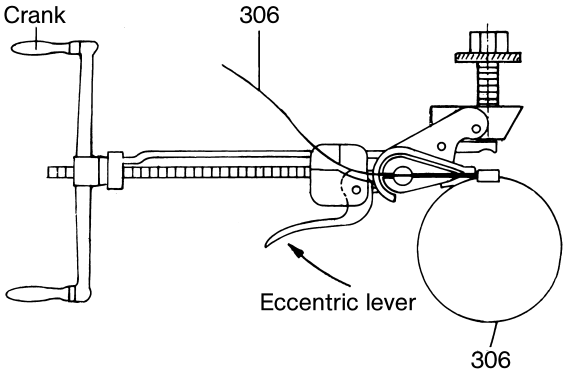
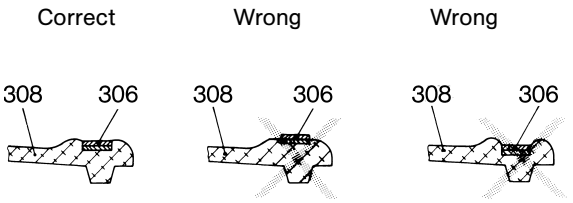


Figure 9. Clamping the clamping band by means of clamping tool Band-It and adapter J050.

Note: Proper clamping of the clamping bands (306) is shown in Figure 10.



Clamping band (306) has slightly drawn in sleeve outside and fits tight.

Clamping band (306) too loose, may glide down

Clamping band (306) too tight. Collar damaged/sheared.

Figure 10: Clamping of clamping bands.

– Check whether on the entire circumference of the cover sleeve (308), the clamping band (306) lies in the sleeve groove.

– Slowly turn clamping tool upwards through approx. 60° until the shearing hook grips behind the clamping band lock (please refer to Figure 11 below).

– Tighten pressure screws by hand until the clamping band is firmly clamped.

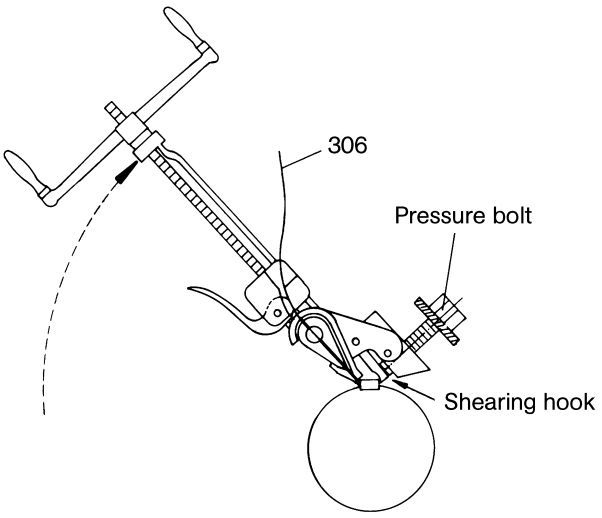


Figure 11: Shearing of the clamping band.

– By means of a spanner or ratchet, turn pressure screw clockwise until the joint clamp is sheared.
ATTENTION If the clamping band is slightly lifted on the sheared side, this must be compensated for by careful realignment. Hammering or beating against the clamping band lock is not permitted as otherwise, there may be a danger of sleeve damage.
Note: In case of clamping bands of Hastelloy material, shearing with the clamping tool is not possible. After bending at the clamping band lock, the clamping band must be sheared by means of sheet metal shears and the cutting edges deburred (please refer to Figure 12 below).

- **Clamping with clamping tool Pok-It II**

– When using clamping tool Pok-It II, bend clamping band (306) after clamping at the clamping band lock by swinging the clamping tool so that the band cannot glide back through the lock. After bending at the clamping band lock, the clamping band must be sheared with sheet metal shears and the cutting edges deburred (please refer to Figure 12 below).

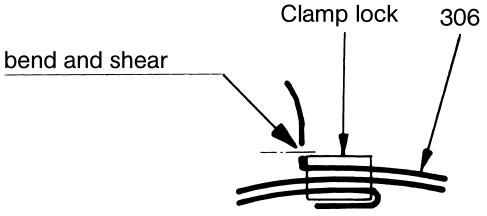


Figure 12: Bending and shearing of the clamping band.

ATTENTION Check whether the clamping band is bent so that it cannot glide back through the clamping band lock (please refer to Figure 12 above). If this was not achieved, the clamping band must be removed and replaced by a new one.

7.2.2.4 Mounting the worm shaft and the drive-side joint

– Mount drive-side joint as described under Section 7.2.2.3 above against the driving shaft (118).

– In doing so, push joint head into the joint head of the drive shaft (118).

- Secure retaining sleeve (304) as depicted with a center punch mark.
- Mount cover sleeve (308) joint chamber fill with joint oil and fix clamping bands as described.
- Push the joint heads (307) into the worm shaft (307) and drive in the locking pin (307).
- The seal (513) should be replaced when worn before mounting the reduction flange (512).
- Screw on the reduction flange (512) with the stud screw (634), washer (636) and hexagonal nut (635) onto the base of the bearing (110).
- Insert suction casing gasket (501).
- Push suction casing (505) over the rotor (401). In doing so, make sure that the precision-machined rotor is not damaged.
- Fix suction casing (505) with hexagon screws (606), serrated lock washers (608) and hexagon nuts (607) to the reducing flange (512).
  Note: Prior to tightening the hexagon nuts (607), align connecting flange of the suction casing (505). Attend to proper position of the connections in the stuffing box housing (204) and/or mechanical seal housing (214). Please refer to our tables of dimensions.

7.2.2.5 Mounting the stator

- Prior to bending-up, coat stator (402) and rotor (401) with lubricant (silicon oil, Polydiol, soft soap or the like).
  ATTENTION Do not use ordinary oil.
- Mount stator (402) on the rotor (401).
  Note: In case of stiffness, simultaneously turn stator (402) by means of chain tongs. For these purposes, fix drive shaft (118).
- Screw up discharge casing (504), stator (402) and suction casing (505) with the tie rods (611) and hexagon nuts (609). In doing so, uniformly tighten hexagon screws.

7.3 Spare parts/replacement parts

In the following sectional drawings with parts list, all pumps mentioned are represented with the various shaft seal and bearing designs. The parts marked in the parts list can be provided as spare parts/replacement parts.

Recommended spare parts/replacement parts:
R = large repair kit
r = small repair kit

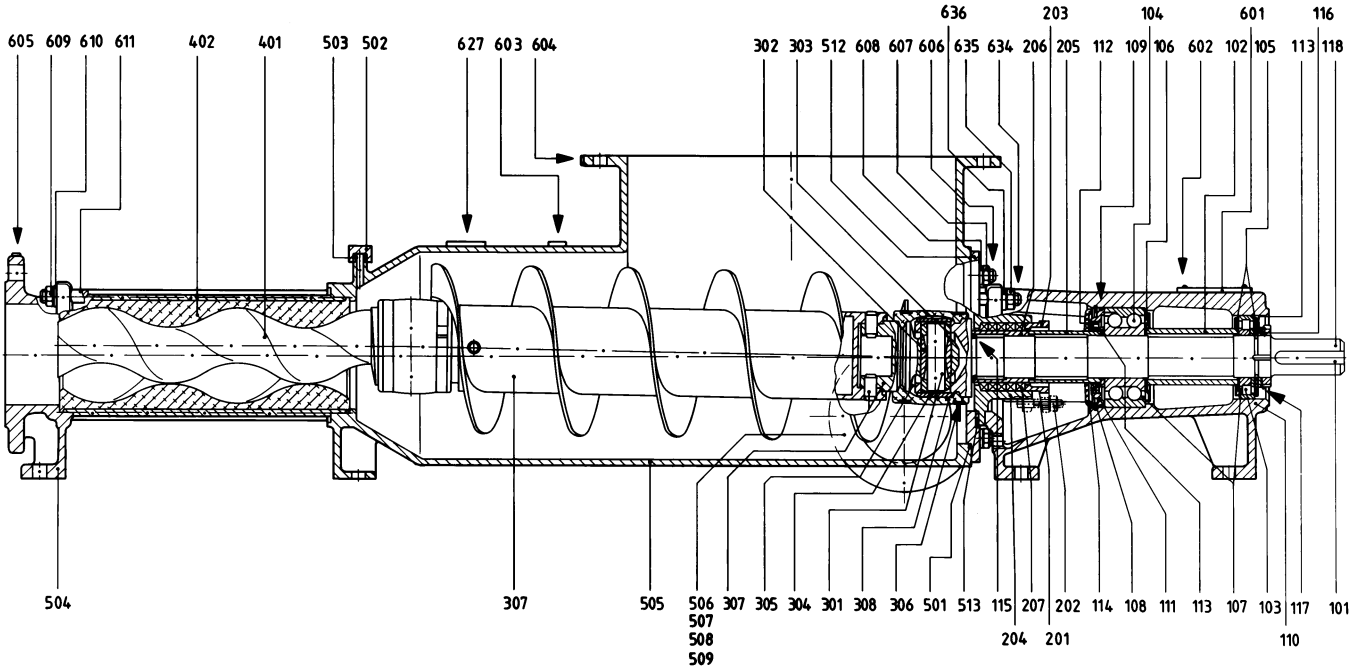
For reasons of operating safety, only original spare parts delivered by us may be kept on stock and installed. In this connection, we refer to the statements made under Section 2.7 above.

For spare parts/replacement parts orders, the following must be quoted:

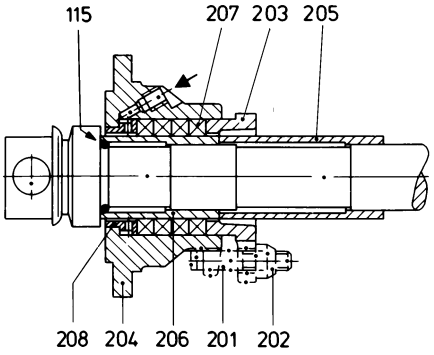
Machine numbers
Abbreviation of pump
Part number
Denomination and part quantity
or Ident No. and quantity

Note: The machine number and the abbreviation of the pump are engraved on the name plate.
Note: The Ident No. and quantity can be seen from the attached separate spare parts list.

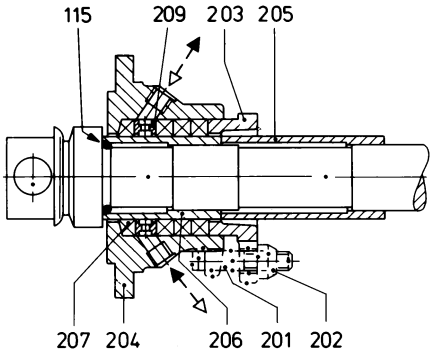
7.4 Sectional drawing with parts list and recommended spare parts/replacements parts



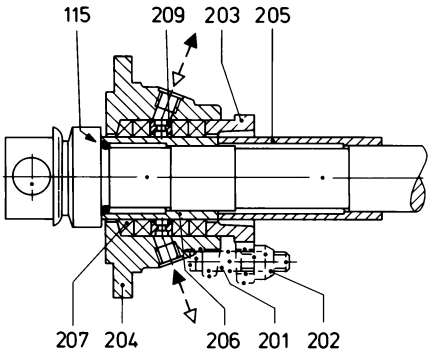
Bearing: **H**
Shaft seal: **P 11** Stuffing box with shaft wear sleeve of standard design (without lantern ring/without flushing ring).



P12 Stuffing box with shaft wear sleeve and flushing ring



P13 Stuffing box with shaft wear sleeve and internal lantern ring

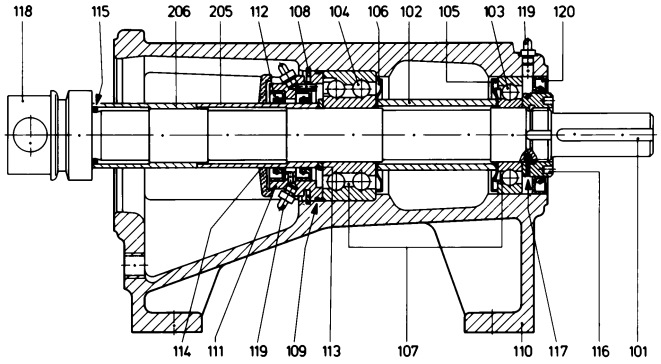


P14 Stuffing box with shaft wear sleeve and external lantern ring

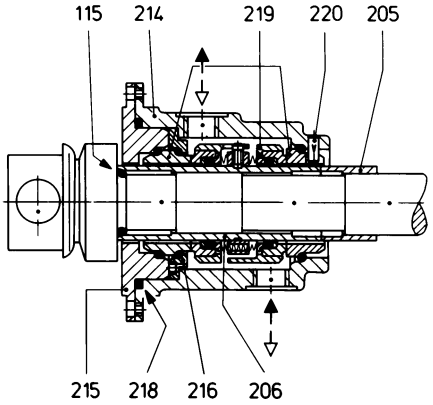
Part-No.	Denomination		Quantity
101	Key		1
102	Spacer sleeve		1
103	Groove ball bearing	R	1
104	Angular-contact ball bearing	R	1
105	Nilos ring	R	2
106	Nilos ring	R	1
107	Bearing grease		①
108	Circlip		1
109	Sealing ring	R	1
110	Bearing bracket		1
111	Bearing cover		1
112	Lip seal		1 ②
113	Spacer ring		3 ③

Part-No.	Denomination		Quantity
114	Thrower		1
115	O-ring	R	1
116	Bearing nut		1
117	Tab washer for bearing nut		1
118	Drive shaft	R	1
119	Lubricating nipple		3
120	Lip seal	R	1
201	T-head bolt		2
202	Self-locking nut		2
203	Gland		1
204	Shaft sealing housing		1
205	Shaft sleeve		1
206	Shaft wear sleeve	R	1

Part-No.	Denomination		Quantity
207	Stuffing box packing	R, r	1 ①
208	Flushing ring		1
209	Sealing clamber ring		1
214	Mechanical seal housing		1
215	Mechanical seal cover		1
216	Clamping ring		1
218	O-ring	R	1
219	Mechanical seal	R	1
220	Locking pin		1
301	Joint bolt	R, r	2
302	Joint bush	R, r	2
303	Bush for joint bolt	R, r	4
304	Joint sleeve	R, r	2
305	Joint oil	R, r	①



Bearing: **V**



G18 and **G19** Mechanical seal, double-acting, non-balanced

Part-No.	Denomination		Quantity
306	Joint clamp	R, r	4
307	Worm shaft		1
	Joint head	R, r	2
	Spring dowel	R, r	4
308	Joint collar	R, r	2
401	Rotor	R, r	1
402	Stator	R, r	1
501	Gasket for suction casing	R, r	1
502	Screw plug		1
503	Sealing washer		1
504	Pressure casing		1
505	Suction casing		1
506	Suction casing cover		2

Part-No.	Denomination		Quantity
507	Gasket		2
508	Hexagon screw		16
509	Nut		16
512	Reducer flange		1
513	Gasket	R, r	1
601	Type plate		1
602	Round head grooved pin		2
603	Information plate Commissioning		1
604	Information plate Suction		1
605	Information plate Pressure		1
606	Stud bolt		4
607	Hexagon nut		4
608	Washer		4

Part-No.	Denomination	Quantity
609	Hexagon nut	4
610	Washer	4
611	Clamp bolt	4
627	Caution label	1
634	Stud bolt	4
635	Hexagon nut	4
636	Washer	4

① Refer to Section 7.1.2.6
② 2 pcs. for bearing type V
③ 1 pc. for bearing type V

8. Operating troubles – Causes and remedial action

No.	Operating troubles										Causes and remedial action
	Pump does not start	Pump does not prime	Deliv-ery is not achieved	Pres-sure head is not achieved	Irreg-ular pump deliv-ery	Pump oper-ates noisily	Pump is seized or does not deliver	Motor gets too warm	Stator wears prema-turely	Shaft seal leaky	ALLWEILER eccentric screw pumps operate trouble-free at any time provided they are applied according to the operating conditions mentioned in our order confirmation and if the operation manual is complied with.
	a	b	c	d	e	f	g	h	i	k	
1	●							●			High adhesion between rotor and stator in new condition after extended standstill. Race pump by hand with auxiliary tool.
2		●									Check sense of rotation against arrow on pump, in case of wrong sense of rotation, change motor poles.
3		●	●		●	●	●				Check suction pipeline and shaft seal for tightness.
4		●	●		●	●					Check suction head – increase suction pipeline cross – section, if necessary – install greater filters – open suction valve completely.
5		●	●		●						Check viscosity of fluid pumped.
6	●		●					●			Check pump speed – control speed and power consumption of driving motor – check voltage and frequency.
7			●		●						Avoid air inclusions in the fluid to be pumped.
8	●		●				●	●	●		Check pressure head – open valve in pressure pipeline completely, remove obstruction in pressure pipeline.
9		●	●		●		●		●		Pump runs completely or partly dry. Check whether fluid pumped on suction side is sufficient.
10		●	●								Increase speed in case of fluid media and great suction volume.
11		●			●	●					Reduce speed in case of viscous media – cavitation hazard.
12						●					Check longitudinal play of joint bolts, joint bush perhaps improperly mounted.
13	●	●	●				●		●		Check whether foreign bodies in pump. Disassemble pump, remove foreign bodies, replace defective parts.
14		●	●	●			●				Stator and rotor worn, disassemble pump, replace defective parts.
15		●	●			●	●				Joint parts (f, g) and/or driving shaft or shaft sleeve (b, c) worn: Disassemble pump, replace defective parts.
16		●	●				●		●		Suction pipeline completely or partly clogged.
17	●	●					●	●	●		Check temperature of fluid pumped – stator expansion too great – stator seized on rotor – stator perhaps burnt or swollen.
18	●	●	●					●		●	Stuffing box packing: Replace unserviceable rings (b, c, k), slacken gland (a, h), tighten gland (b, c, k).
19	●	●					●		●		Solids content and/or grain size too great – reduce speed: Install strainer with admissible mesh size in front of pump.
20	●	●							●	●	Solids settle during pump standstill and harden: Flush pump immediately, disassemble and clean, if necessary.
21	●	●					●		●	●	Medium hardens if a certain temperature limit is fallen below – heat pump.
22						●		●			Align coupling or belt pulleys exactly.

Subject to technical alterations.

ALLWEILER

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