

Operating and maintenance instructions

Eccentric screw pumps Series SSP, SSBP

Operating data of pump according to order data sheet

Order No.:

Material No.:

Machine No.:

Pump type:

1. Assembling the pump set

- 1.1 The pipework and valves on the suction side must be flushed out and cleaned, without fail, before the pump is installed. Items left over from assembly operations, e.g. bolts, nuts, weld spatter, pieces of steel, etc., damage the internal components of the pump. Our guarantee is invalidated if damage is caused by items of this type.
- 1.2 The baseplate be secured to the foundation free from tension.
- 1.3 The suction and delivery lines must be connected free from tension. **Note:** When doing so, do not forget the gasket between the connections. It must be possible to remove a section of the delivery line (with anti-clockwise rotation) or the suction line (with clockwise rotation) over a length „q“ (see table further below) if wearing parts (rotor, stator, universal joints) are to be replaced without removing the pump from its base.
- 1.4 The nominal bore of the suction and delivery line should match the nominal diameter of the pump connection. The manufacturers should be consulted in the event of considerable deviations, particularly on the suction side.
- 1.5 **Connect the pressure and vacuum gauges.**
- 1.6 If a shut-off mechanism is fitted in the delivery line or if there is a possibility of the delivery line becoming blocked, a safety mechanism must be provided. For example: by-pass line with built-in relief valve, bursting disc, motor protection switch, etc.

2. Start-up

- 2.1 All shut-off mechanisms on the suction and delivery sides must be opened before starting up.
- 2.2 **Do not allow the pump to run when dry!**
Even a few revolutions without fluid can damage the stator. It is for this reason that the suction casing must be filled with water or the pumped medium in order to lubricate the stator and rotor before start-up. After a long shut- down period, i.e. when it is to be expected that the remaining fluid in the pump will have evaporated or after a repair, the filling procedure must be repeated. Once it has been filled, the pump is self-priming. Venting is unnecessary as a mixture of liquid and gas can be handled without any trouble.
- 2.3 When starting up for the first time after a long shut-down period, ensure that the pump can be turned easily by the drive motor. If this is not readily possible, e.g. due to a high degree of adhesion between the rotor and stator when brand new, movement can be assisted by using a suitable tool in the parallel key area of the drive shaft or the stub shaft. The drive shaft or stub shaft must not be damaged when doing so.
- 2.4 The normal direction of rotation of the pump is anti-clockwise, looking from the drive unit towards the drive shaft.

In this case, the suction connection is on the gland side, relieving the shaft seal of any pressure. In special cases, e.g. when drawing from a vacuum or when handling materials which cannot tolerate any gas inclusions, the pump rotates clockwise, with the suction and delivery sides reversed.

In this case, contrary to the instructions contained in 2.2, the suction and delivery connections are to be filled with liquid before starting.

2.5 Dry run protection

After start-up, it must be ensured that the flow of liquid on the suction side is never completely interrupted in order to prevent the pump from running dry. However, if such an eventuality must be expected, a small quantity of liquid can be fed into the suction chamber, irrespective of the pumped medium in order to lubricate the rotor and stator. As an alternative, we recommended our proven dry run protections which transmit a signal to indicate that the pump must be switched off.

Dismantling dimension „q“ (Section 1.3), packing ring sizes (Section 3.3) and lubricant quantity per joint (Section 3.1)

	Series SSP SSBP	Number and dimensions of packing rings	Oil quantity cm ³ /joint
Pump model Dismant- ling dimen- sion „q“	<u>12.2</u> 190	5 off ø 35/51 × 8	9
	<u>25.1</u> 170		
	<u>25.2</u> 240		
	<u>50.1</u> 170		
	<u>50.2</u> 320	5 off ø 43/59 × 8	16
	<u>100.1</u> 210	5 off ø 53/73 × 10	32
	<u>100.2</u> 390		
	<u>200.1</u> 280		
<u>200.2</u> 500	5 off ø 63/87 × 12	45	
<u>380.1</u> 350			

3. Maintenance

3.1 The joints of the coupling rod are lubricated for life with Allweiler Spezialgelenköl Type B or ÖL ET 1510 ISO 460 of Messrs. Tribol Lubricants GmbH, Mönchengladbach, or equivalent. When used in the food industry, with ALLWEILER special joint oil Type BL or Oil 1810/460 of Messrs. Tribol Lubricants GmbH, Mönchengladbach, Germany.

3.2 The rolling bearings are lubricated with „SKF Alfalub LGMT3“ or similar, suitable for temperatures up to 120°C. The bearings are greased for life.

3.3 Shaft seal

Stuffing box packing:

During operation, the gland nuts must be tightened slowly and uniformly until there are no more drips or only slight dripping from the stuffing box.

When replacing the packing, care must be taken not to damage the surface of stub shaft.

Number and dimensions of the packing rings can be taken from the table on page 1.

Mechanical seals:

Non-balanced mechanical seals are used in various material combinations and models. They are maintenance-free, but must not run dry under any circumstances.

4. Dismantling:

4.1 In order to dismantle the pump, suction and discharge pipe must be removed as well as the screws from the pump feet.

4.2 Remove nuts 609 and washers 610 from tie rods 611.

4.3 Pull off suction casing 504, stator support 612

4.4 Remove tie rods 611.

4.5 Pull stator 402 from rotor 401. If difficulty is experienced, rotate stator 402 at the same time. In order to do so, secure drive shaft 118 or stub shaft 125.

4.6 Pull suction casing 505 over rotor 401, ensuring that the precision machined rotor is not damaged when doing so.

4.7 Remove seal for suction casing 501.

4.8 Remove locking device for drive pin 124.

4.9 Push out drive pin 123 from stub shaft 125.

4.10 Pull out stub shaft 125 with all parts of the shaft seal from the motor lantern 122 or from the bearing housing 110.

4.11 Remove stuffing box nut 211 from stuffing box housing 204 and pull off stuffing box housing 204 from stub shaft 125.

4.12 Take out stuffing box packing 207 together with thrust-ring 210 from stuffing box housing 204.

4.13 Pull mechanical seal housing 214 with stationary seat on the atmospheric side for mechanical seal 219 from stub shaft 125. Push stationary seat and bearing ring out of the mechanical seal housing.

4.14 Undo grub screws in mechanical seal 219 and remove mechanical seal from stub shaft 125. **Important:** Before undoing the grub screws, mark the position of the mechanical seal on the shaft. Do not push „O“ rings over the shaft indications caused by grub screws.

4.15 Pull off retaining sleeve 304 over the flange of coupling rod 307. **Important:** For this purpose, file off the center punch fixing mark located on the front end of retaining sleeve 304 with which the retaining sleeve 304 is fixed axially. When removing retaining sleeve 304, do not twist coupling rod 307!

4.16 Raise cover sleeve 308 with screwdriver and pull off axially in the direction of the coupling rod 307.

4.17 Pull off retaining sleeve 304 over the flange of coupling rod 307. **Important:** For this purpose, file off the center-punch fixing mark located on the front end of retaining sleeve 304 with which the retaining sleeve 304 is fixed axially. When removing retaining sleeve 304, do not twist coupling rod 307!

4.18 Push out coupling rod pins 301.

4.19 Dismantle joint on drive side as described under 4.13 to 4.17. **Important:** For this purpose, remove center punch fixing mark located on the front end of retaining sleeve 304.

4.20 Pull rotor 401 from coupling rod 307.

4.21 Dismantle joint on drive side as described in 4.15 to 4.19. **Important:** For this purpose, remove centre-punch fixing mark located on the end of stub shaft 125.

4.22 Press out coupling rod bush 302 from coupling rod 307. ④

4.23 Drive bush for coupling rod pin 303 from stub shaft 125 and rotor 401 with brass drift.

4.24 Pull flinger ring 114 from drive shaft 118. ③

4.25 Release retaining circlip 108 and pull it from the groove. ③

4.26 Drive out drive shaft 118 with all mounted parts from bearing housing 110. To do so, the coupling and V-belt pulley must be removed beforehand. ③

4.27 Pull bearing cover 111 „O“ring 109 and lip seal 112 from drive shaft 118. ③

4.28 Remove „O“ ring 109 from cover 111 and press out lip seal 112. ③

4.29 Remove parallel key 101. ③

4.30 Release retaining circlip 121 and pull it from the groove. ③

4.31 Pull off radial bearing 103, distance sleeve 102, axial bearing 104 and distance ring 113 from drive shaft 118. ③

4.32 Press out lipseal 120 from bearing bracket 110. ③

5. Assembly

After careful cleaning, the pump or its individual parts are assembled appropriately in reverse sequence. Particular attention must be paid to the following points:

Ad 4.32 Fill lipseals 120 and 112 with grease and fit with lip inwards. 4.28

Ad 4.31 Fill radial bearing 103 with SKF Alfalub LGMT3 grease or similar. Inscription on outer ring must be fitted on the inside. Fill axial bearing 104 with Alfalub LGMT3 grease or similar and fit with spherical filler facing bearing cover 111.

Ad 4.23 With a brass drift, drive bushes for coupling rod pin 303 half-way into stub shaft 125 and rotor 401.

Ad 4.22 Press coupling rod bush 302 into coupling rod 307 so that the longitudinal axis of the oval hole (marked with two notches) coincides with the longitudinal axis of the coupling rod (not applicable to size 12.2).

Ad 4.20 Press coupling rod bush 302 into coupling rod 307 so that the longitudinal axis of the oval hole (marked with two notches) coincides with the longitudinal axis of the coupling rod and the coupling rod bush evenly protrudes from the coupling rod on both sides (not required for size 12.2).

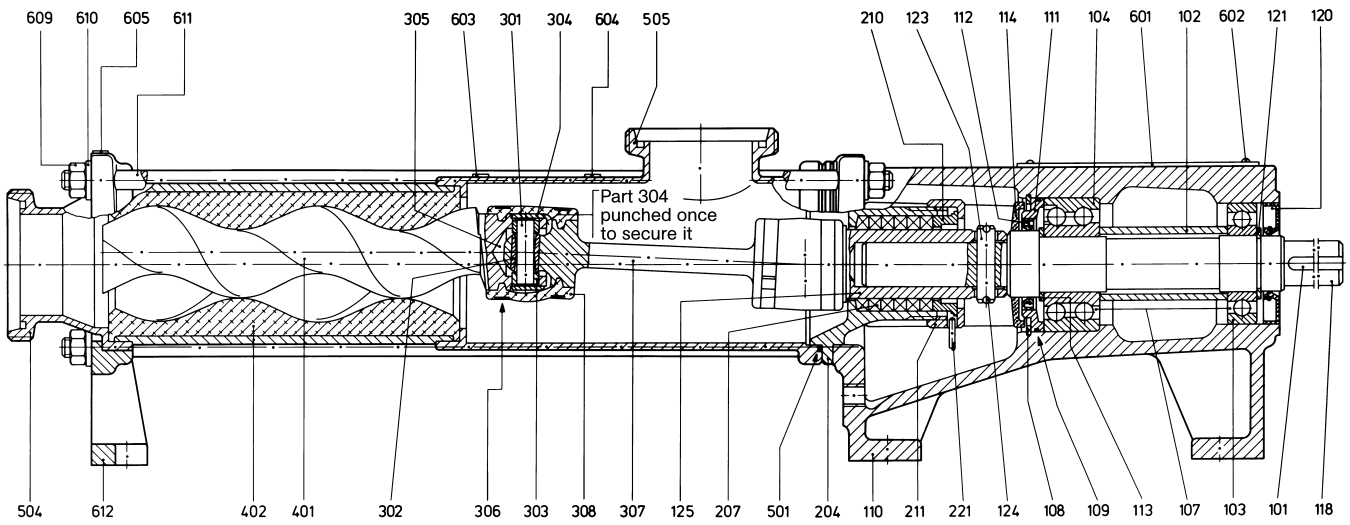
		Part No.	Description	Qty.		
Ad 4.17	Push in coupling rod pins 301 and drive in guide bushes 303 completely.	101 ⑥	Parallel key	1		
Ad 4.15	After tightening retaining sleeve 304, secure same axially against rotor head 401, drive shaft head 118 and stub shaft head 125. Important: For this purpose, drive front end of retaining sleeve 304 with a center punch mark into the groove of the rotor, drive shaft and stub shaft head.	102 ⑥	Spacer sleeve	1		
		103 ⑥	Radial bearing	R 1		
		104 ⑥	Axial bearing	R 1		
		107 ⑥	Bearing grease	R 0		
		108 ⑥	Retaining circlip	1		
		109 ⑥	O-Ring	R 1		
		110 ⑥	Bearing housing	1		
		111 ⑥	Bearing cover	1		
		112 ⑥	Lip seal	R 1		
		113 ⑥	Spacer ring	1		
Ad 4.14	Tighten cover sleeve 308 with a screw driver, lift top with screw driver, place jet pipe of oil bottle under the sleeve and fill coupling chamber with Allweiler Spezial Gelenköl Type B or Öl ET 1510 ISO 460 of Messrs. Tribol Lubricants GmbH, Mönchengladbach (or equivalent). For the use of the pumps for food-stuffs with ALLWEILER special joint oil Type BL or oil 1810/460 of Messrs. Tribol Lubricants GmbH, Mönchengladbach, Germany. For filling quantities, refer to table on page 1.	114 ⑥	Flinger ring	1		
		118 ⑥	Drive shaft	1		
		120 ⑥	Lip seal	R 1		
		121 ⑥	Retaining circlip	1		
		122 ④	Motor lanterne	1		
		123	Drive pin	1		
		124	Lock for drive pin	1		
		125	Stub shaft	R 1		
		Ad 4.13	Tighten clamping bands 306. For this purpose, use appropriate assembly tool (obtainable from the manufacturer).	204	Stuffing box housing	1
				207	Stuffing box housing	R, r 1
Ad 4.10	Push stuffing box housing 204 on stub shaft 125 and fit stuffing box packing 207.	210	Thrust ring	1		
Ad 4.5	Before tightening, coat stator 402 and rotor 401 with lubricant (silicone oil, polydiol, soft soap or equivalent). Important: Do not use ordinary oil.	211	Stuffing box nut	1		
		214 ⑦	Mechanical seal housing	1		
		219 ⑦	Mechanical seal	R 1		
		220 ①⑦	Retaining pin	1		
		221	Pin for stuffing box nut	1		
Ad 4.4	Do not place any strain on the suction casing 505 and stator 402. Tighten tie rods 611 uniformly.	222 ⑦	Spacer sleeve	1		
		301	Coupling rod pin	R, r 2		
		302 ②	Coupling rod bush	R, r 2		
		303	Guide bush	R, r 4		
		304	Retaining sleeve	R, r 2		
		305	Joint oil	R, r 0		
		306	Clamping band	R, r 4		
		307	Coupling rod	R, r 1		
		308	Cover sleeve	R, r 2		
		401	Rotor	R, r 1		
		402	Stator	R, r 1		
		501	Suction casing O-ring	R, r 1		
		504	Discharge casing	1		
		505	Suction casing	1		
		601	Name plate	1		
		602 ⑤	Rivet	2		
		603	Instruction label for commissioning	1		
		604 ③	„Suction“ label	1		
		605 ③	„Discharge“ label	1		
		609	Hexagon nut	8		
		610	Washer	8		
		611	Tie rod	4		
		612	Support	1		

- ① Not applicable to models G00-G03
- ② Not applicable to model P01
- ③ Not applicable to SSBP series
- ④ Not applicable to size 12.2

- ① Only on models G02, G03 Not applicable to size
- ② Not applicable to size 12.2
- ③ Applies to normal anti-clockwise direction of rotation (looking from drive end). When the direction of rotation is changed, the labels are exchanged accordingly.
- ④ Only on series SSBP 4 off with series SSBP
- ⑤ 4 off with series SSP
- ⑥ Only on series SSP
- ⑦ Only on models G 00...G 03

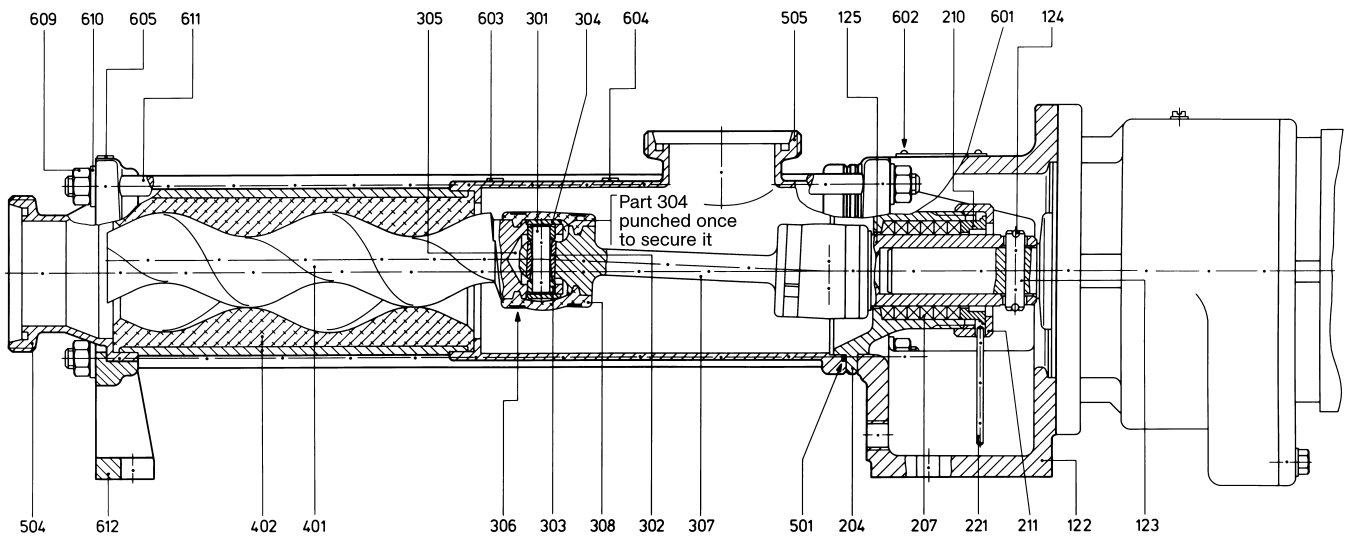
Recommend spare parts:
R = large repair kit
r = small repair kit

Sectional drawing of series SSP

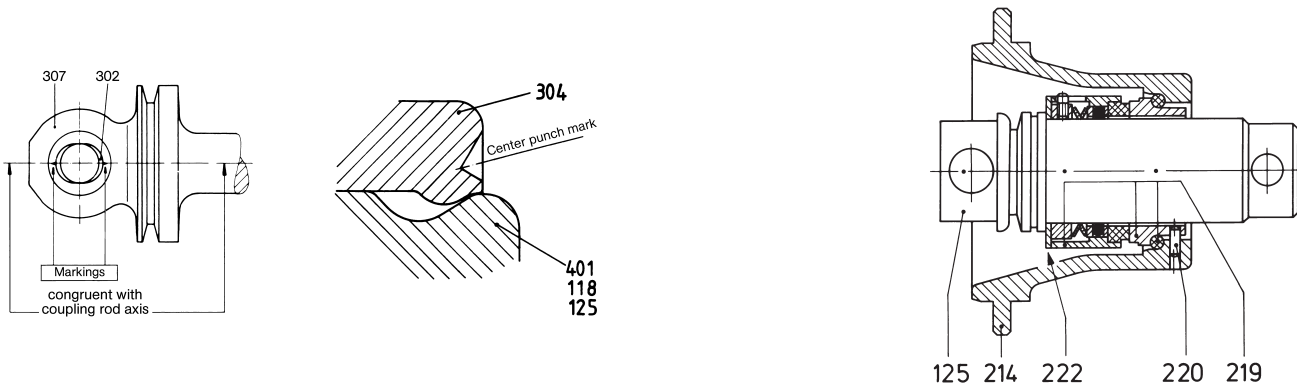


Bearing: **S** (lubricated for life) shaft assembly easily removable at drive pin
 Shaft seal: **P01** Stuffing box of standard design (without shaft wear sleeve, no lantern ring / no flushing ring)

Sectional drawing of series SSBP



Bearing: **E** (lubricated bearing in drive unit)
 Shaft seal: **P01** Stuffing box of standard design (without lantern ring / without flushing ring)



G00 to G03 Mechanical seal, single acting, non-balanced

7. Faults – causes and remedies

No.	Faults										Causes and remedies
	Pump does not start	Pump does not prime	Capacity is not reached	Head is not reached	Pump delivery irregular	Pump operating noisily	Pump has seized or has stopped delivering	Motor over heating	Stator wearing prematurely	Shaft seal leaking	
	a	b	c	d	e	f	g	h	i	k	
1	●							●			Pressure between stator and rotor too great (new condition) or stator too tight. Rotate pump by hand using an auxiliary tool
2		●									Check direction of rotation in accordance with arrow on pump; change poles if motor rotating wrong direction
3		●	●		●	●	●				Check suction line and shaft seal for leaks
4		●	●		●	●					Check suction head – if necessary, increase suction line diameter – fit larger filters – open suction valve fully
5		●	●		●						Check viscosity of the pumped medium
6	●		●					●			Check pump speed – check speed and amperage of the drive motor – check voltage and frequency
7			●		●						Avoid airlocks in the pumped medium
8	●		●				●	●	●		Check delivery head – open slide valve in delivery line fully and remove blockage from delivery line
9		●	●		●		●		●		Pump running completely or partially dry. Check whether sufficient pumped medium present on suction side
10		●	●								Increase speed for thin material and high suction volume
11		●			●	●					Reduce speed with viscous materials – danger of cavitation
12						●					Check end clearance of coupling rod pins; coupling rod bush possibly fitted incorrectly
13	●	●	●				●		●		Check for foreign bodies in the pump; dismantle pump, remove foreign bodies – replace defective components
14		●	●	●			●				Stator and rotor worn; dismantle pump, replace defective components
15		●	●			●	●				Joint parts (f, g) and/or drive shaft or shaft (b, c) worn; dismantle pump and replace defective parts
16		●	●				●		●		Suction line completely or partially blocked
17	●	●					●	●	●		Check temperature of pumped medium – stator expansion too great – stator seized on rotor – stator possibly burnt out
18	●	●	●					●		●	Stuffing box packing: Replace unserviceable rings (b, c, k), loosen packing (a, h), tighten packing gland (b, c, k)
19	●	●					●		●		Solid content too high and/or particle size too large – reduce speed: fit strainer upstream of pump, with suitable mesh size
20	●	●							●	●	Solids settling out and hardening when pump shut down – flush out pump immediately – if necessary, dismantle and clean
21	●	●					●		●	●	Medium hardens after dropping below a certain temperature limit – heat pump
22						●		●			Align coupling correctly

Subject to technical alterations.



A Member of the COLFAX PUMP GROUP

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