Operating Manual

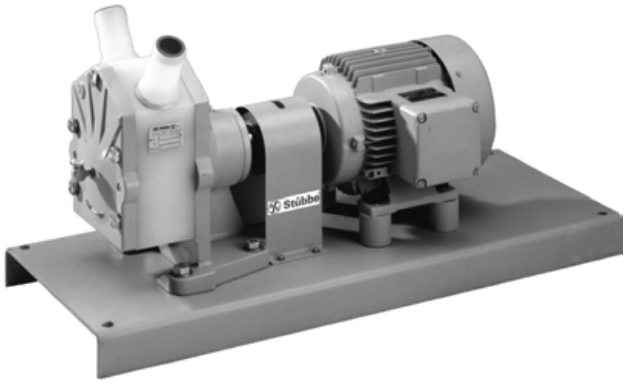
Installation and Maintenance Instructions

Thermoplastic Eccentric Pumps

Type F

Type L

Type F



Type L

CAUTION

These operating instructions contain fundamental information and precautionary notes. Please read the manual thoroughly prior to installation of unit, electrical connection and commissioning. It is imperative to comply with all other operating instructions referring to components of individual units.

DANGER

For the use in potentially explosive areas acc. to ATEX a dry-run protection device as well as an overpressure protection has to be integrated in the pump control unit for the sizes up to and including pump size 80-160. Other pump sizes are not allowed in potentially explosive areas acc. to ATEX.
The metallic casing of the pump housing must be included in the potential equalisation.
In case of using an electroconductive pump base plate this must be included in the potential equalisation, too.
As to the eccentric pump typ L the separate operating manual and installation instructions of the torsionally flexible jaw type coupling of the pump has to be taken into consideration.
Otherwise operation is prohibited.

Keep for future reference!

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CAUTION

Commissioning of this pump is prohibited until it has been established that the machine/plant into which it is to be installed meets the specifications of Directive 2006/42/EC.

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1. Safety

1.1 Introduction

This operating manual contains fundamental instructions to be observed during installation, operation and/or maintenance. Therefore, always ensure that this operating manual is read by the fitter as well as the responsible qualified personnel/operator prior to starting the installation and commissioning/start-up, and that it is continuously available at the pump unit area of application

1.2 Symbols used

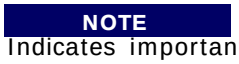
This operating manual contains the following symbols:

Indicates a possible explosion hazard.
Non-observance of this note could lead to death or severe injury.

Indicates a possible dangerous situation.
Non-observance may lead to death or serious injuries.

Indicates a possible hazard through electrical voltage. Non-observance may lead to death or serious injuries.

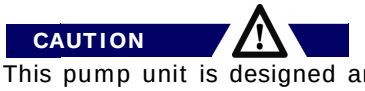
Indicates important information for the user. Non-observance of the information leads to personnel and/or property damage at the pump unit.



Indicates important information for the user. Non-observance of the information leads to personnel injury and/or damage to the pump unit.
Ensure that information attached directly on the pump unit, e.g.

- rotational direction arrow
- installation instructions are strictly observed and kept in a well legible condition.

1.3 Intended use



This pump unit is designed and manufactured according to the parameters specified by the customers, e.g. fluid composition, fluid temperature, fluid pressure, ambient conditions and the required performance data. Therefore, the pump unit may only be used and operated when observing the parameters specified by the customer. Inform the manufacturer of any changes prior to commissioning/start-up, in order to obtain a written authorization.

The pump / unit may only be used in potentially explosive atmospheres according to ATEX if the pump is accompanied by a valid ATEX certificate.
If the pump / unit is not accompanied by this certificate, it may not be installed and/or commissioned/started up.

1.4 Personnel qualification and training

Ensure that the personnel employed for the operation, maintenance, inspection and installation is appropriately qualified for this type of work. The area of responsibility, competence and supervision of the personnel must be clearly defined by the owner/user. Should the personnel not have the required know-ledge, ensure that it is trained and instructed. If necessary, this may take place by the manufacturer on behalf of the owner/user of the machine. In addition, the owner/user must ensure that the personnel fully understands the operating manual.

1.5 Danger resulting due to non-observance of the safety instructions

Non-observance of the safety instructions may lead to danger to persons as well as to environment and machine.

Non-observance of the safety instructions results in the loss of any type of claim compensation.

In detail, non-observance may result in the following dangerous situations, for example:

- Danger for persons through electrical, mechanical or chemical effects.
- Environmental hazards due to leakage of dangerous substances.
- Failure of important functions of the machine/ line.
- Failure of specified methods for maintenance and repair.

1.6 Safety Awareness

It is imperative to comply with the safety instructions contained in this manual, the relevant national health and safety regulations and the operator's own internal work, operation and safety regulations.

1.7 Safety-conscious work practices

Observe the safety instructions listed in this operating manual, the valid national regulations for accident prevention as well as any possible internal work, operating and safety instruction of the owner/user.

1.8 Safety instructions for the owner / user

- Inform the persons instructed to perform the assembly, inspection and/or maintenance work of any possible danger emanating from the fluid/machine line, and urge these employees to work in a safe manner by consideration of thermoplastic characteristics and respective safety regulations.
- If hot or cold machine parts cause danger, the customer must ensure that these parts are secured against access.
- Never remove accidental contact protection devices for moving parts in machines during operation.
- Ensure that leakages of dangerous fluids are disposed of in such a manner that no danger can result for persons and the environment.
- Strictly observe the legal regulations.
- Exclude danger due to electrical energy (refer to the country specific regulations and/or local utility suppliers).

1.9 Safety instructions for maintenance, inspection and assembly work

- The owner/user must ensure that all maintenance, inspection and assembly work is performed byauthorized qualified personnel having thoroughly read the operating manual to provide them with the sufficient amount of knowledge.
- Prior to starting any work, ensure that the pump unit is at ambient temperature, depressurized and drained, and, if necessary, decontaminated.
- Ensure that the drive motor is isolated from the power supply, and secured against unauthorized switching on.
- Only undertake any work on the machine while it is at a standstill.
- Strictly observe the procedure described in this operating manual to shut down the machine.
- Ensure that pump units conveying health hazardous fluids are decontaminated.
- Reattach and/or activate all safety and protection devices once the work has been completed.

1.10 Unauthorized conversion / spare parts procurement

Never undertake any conversions or changes on the pump unit unless they have been approved by the manufacturer. Original spare parts and accessories authorized by the manufacturer ensure safety.

The use of other parts may invalidate the warranty for any resulting damage.

1.11 Inadmissible operation

The operational safety of the supplied pump unit is only guaranteed when it is used according to its intended purpose in line with the following sections of the operating manual.

Data such as fluid composition, pressure, temperature etc., specified by the customer for the pump design, must coincide with the actual data of the machine/fluid.

Furthermore, ensure that the pump performance data specified by the manufacturer is not exceeded.

Please observe the information listed under point 1.3..

2. Transport and intermediate storage

2.1 Inspection

Check the pump exterior for any physical damage that may have been incurred during shipping.

If there is any damage to the pump, contact the shipping company and ASV Stübbe or ASV Stübbe's distributor immediately to determine who should pay for the damage, and to arrange for replacement parts.

2.2 Transporting

The owner/user is responsible for the unit transport.

However, ensure that the unit is properly transported while observing all safety regulations.

2.3 Intermediate storage

Every pump unit leaves the factory in a carefully assembled and tested condition.

In the event that commissioning is not to take place immediately following delivery, store the pump at a dry location, protecting it against dirt and unauthorized access.

All openings of the assembled unit parts are closed and must not be opened until necessary, i.e. during installation.

NOTE

Prior to installing the pump/unit in the plant, use a small screwdriver to turn the fan impeller of the motor in the rotational direction of the pump. It should be easy to turn the fan. If the fan is stuck or makes unusual noises, please contact the ASV Stübbe pump distributor immediately.

Please contact the Pump Sales Department of ASV Stübbe for any further questions.

3. General

3.1 Application

ASV thermoplastic pumps are used for conveying alkalines, acids, solutions or other aggressive or neutral fluids.

The operating reliability of this pump/unit depends on the resistance of the selected pump components to the respective fluids.

In addition, the operating reliability of the pump/unit depends on the pressure/ temperature characteristics and the local conditions.

Therefore, this pump/unit may only be used and operated for the fluid properties specified by the user/owner.

Also observe chapter 1.3 "Intended use".

3.2 Inspection

Prior to dispatch, each pump is subjected to a function check including measuring of the delivery rate, head and current consumption in accordance with DIN EN ISO 9906.

Acceptance tests for a guarantee verification in accordance with DIN EN ISO 9906-II are possible for a charge.

3.3 Inspect the pump prior to installation:

Check the pump exterior for any physical damage that may have been incurred during shipping.

If there is any damage to the pump, contact the shipping company and ASV Stübbe or ASV Stübbe's distributor immediately to determine who should pay for the damage, and to arrange for replacement parts.

Each pump has a nameplate, indicating the pump model, MFG number, rated head, flow rate, motor power, voltage and frequency.

Check these data to ensure they comply with your order and application.

The information of nameplates on motor and pump is key for operation setup and pump maintenance. Please keep the nameplate intact for reference.

3.4 Guarantee

Please refer to our delivery terms to determine the guarantee period. We only guarantee the stability of the material if the operating conditions were known to us at the time of pump designing. During the guarantee period restrict repair work or modifications to our fitters or obtain a written consent from us.

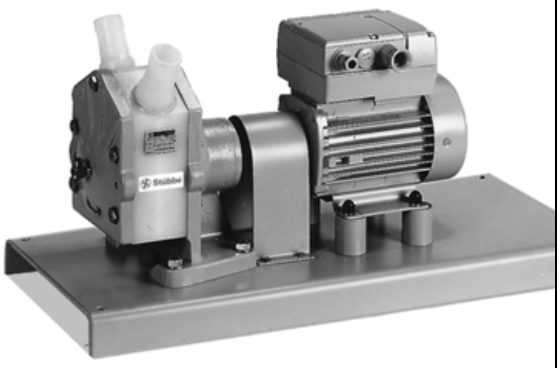
4. Pump description

4.1 Eccentric pumps type F and L

The eccentric pump is a rotating displacement pump. The thermoplastic pump housing accommodates the liner which is pinched between the housing and cover plate or the motor lantern or bearing block for fluid tightness; the liner ridge separates the suction compartment from the pressure compartment. The rotor running in an eccentric bearing rotates in roller bearings on a cam at the central drive shaft.
The surface between the rotor and liner has an oil film.
It is separated from the large roller bearings by a simple mechanical seal.

4.2 ASV eccentric pumps are available in two series.

- The first serie is manufactured as a foot pump in the sizes L4 to L100 mounted on a base plate with drive motor, elastic coupling and protected against unintentional contact in accordance with EN 294 / DIN 31001.



Type LF with frequency controller

- The second serie is manufactured as a flanged pump with directly coupled drive motor in the sizes F4 to F30. As an option, the drive motors can be equipped with a frequency changer. All parts in contact with fluid being conveyed are made of thermoplastic.

Type FF with frequency controller

For further constructional details and dimensions see data sheet 340 090 .

CAUTION

Observe the information indicated in our data sheet with regard to the application limits and function of the pumps. Non-observance may lead to property damage and/or personal injury.

5. Installation / fitting

5.1 Instruction for installation

5.1.1 Requirements placed on the pump installation site

Clean the pump installation site prior to starting any work.

CAUTION

Foreign objects, solid particles or other impurities lead to damages at pump and mechanical seal.

5.1.2 Installation surface

Provide sufficient space for inspection and maintenance measures in addition to the space required for the pump unit dimensions.

Ensure that the installation surface is aligned completely level and horizontal. The concrete foundation must have sufficient concrete stability min. BN 150) and be setted prior to installation of pump unit.

5.1.3 Constructional design

The constructional design must correspond to:

- Eccentric pumps type F and L acc. to print 340 090

5.2 Fastening

For fastening the pump/base plate stone bolts according to DIN 529 are to used. These bolts are to be fitted into the base plate and be poured with concrete into the foundation.

After binding of the mortar align the base plate exactly and in horizontal position. Fasten the fixing screws.

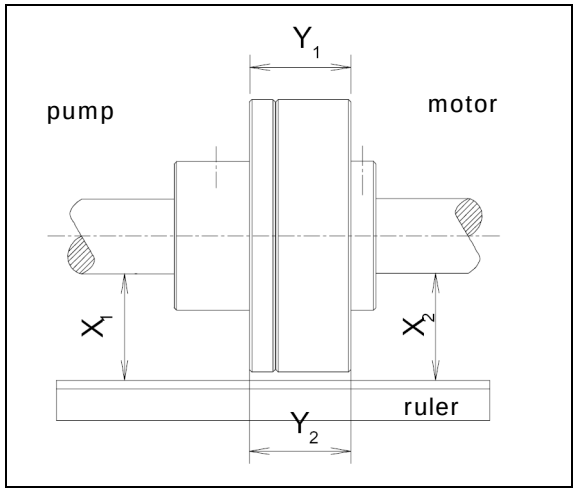
CAUTION

On fastening the base plate is to be installed without tension, i. e. uneven underground has to be adjusted via spacer plates. Non-observance would lead to damages at pump unit.

5.2.1 Aligning the pump and motor

The alignment of the pump and motor is only necessary when the pump unit is supplied without motor (motor being provided by the customer) or for repair work, whereby the pump and/or motor is dismantled from the base frame. After concluding the installation work check the alignment of the pump and motor at the coupling using a straight edge or dial test indicator.

Maintain the permissible centre offset of x < 0.1 mm and the permissible angular offset of y <0.1 mm.



NOTE

Refit the coupling protection (safety device) after conclusion of the work.

CAUTION

On fastening the base plate ist to be installed without tension, i. e. uneven underground has to be adjusted via spacer plates.

5.3 Installation position

Undertake protective measures against corrosion (customer) in the case of extreme moisture levels at the place of installation such as, for example, rain, condensed water or plant leakages. This applies in particular to electrical drives, switching elements and measuring instruments.

6. Pump installation

CAUTION

Adhere to the safety instructions.
Non-observance may lead to serious injuries and/or damage to the pump unit.

6.1 Information

Observe the following points prior to connecting the pump into the pipe system:

- Remove any packaging residue and other soiling from the pump place of installation.
- Thoroughly clean the complete pipe line system on the suction and on the pressure side, in particular the vessel and pump sump and pits on the suction side as well as other attachments (free of residue) and flush down with plenty of liquid (water).
- Check the fitted pipe/hose lines, separately for

the suction and pressure lines, for leaks and undertake a pressure test using a neutral liquid in accordance with the individual regulations.

CAUTION

Never subject the pump to a pressure test.

- Never use the pump as a securing point for the pipe line.
  The customer is responsible for relieving those forces and/or torques on the pump sockets which could be encountered as a result of the plant.

CAUTION

Danger of socket rupture!
Severe injury could result!

6.2 Hose connection

Ensure a flexible connection to the pump. Here provide hose connections having a minimum length of 1 m. Ensure that the hose quality is resistant to the medium being transported and that its pressure and temperature resistance is assured. The nominal width of the hose connection must correspond to those of the pump sockets. Attach the suction and pressure hoses on the pump sockets provided and secure using suitable hose clips. Undertake the hose connection to the suction sockets so that the highest point of the hose is approx. 0.3 m above the suction socket. In this manner the pump remains permanently filled with the pumping medium, priming is simplified, the priming time is reduced.

NOTE

For suction heights > 2 m install a foot valve in the suction line.

6.3 Electrical connection

DANGER

The power connection and commissioning/ start-up of the motors require special knowledge concerning the installation of high voltage systems in accordance with EN 60 204 (DIN VDE 0100/0113), knowledge of the accident prevention regulations and the special commissioning/start-up conditions for the pump drives. Ensure that this work is only performed by qualified personnel. Ensure that pump units used in explosion protected areas meet legal specifications. The owner/user must ensure that the pump unit meets these specifications.

DANGER

The pump / unit may only be used in potentially explosive atmospheres according to ATEX if the pump is accompanied by a valid ATEX certificate.
If the pump / unit is not accompanied by this certificate, it may not be installed and/or commissioned/started up.

DANGER

As to the eccentric pump typ L the separate operating manual and installation instructions of the torsionally flexible jaw type coupling of the pump has to be taken into consideration.

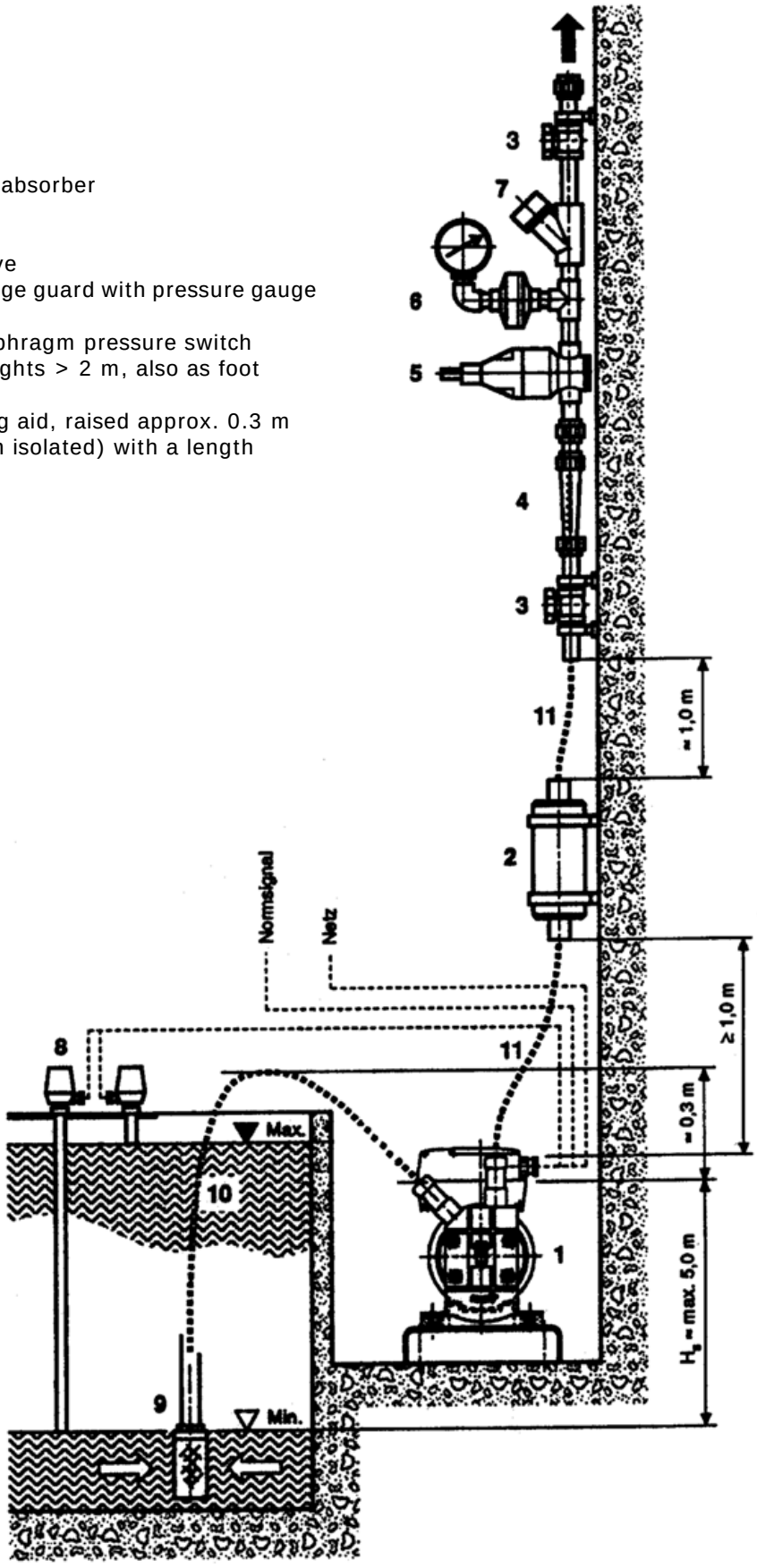
6.3.1 Preparations for commissioning / start-up.

1. Compare the existing mains voltage with the information contained on the motor plate.
2. Ensure that a motor protection device is fitted (mandatory).
3. The motor circuit diagram and terminal plan are included with the delivery.
4. Ensure that the motor rotational direction meets with the rotational direction arrow on the pump.
   Check by switching the motor on and off again immediately. The correct rotational direction of the eccenter is extremely important for the trouble free operation of the pump. The operating point cannot be reached if the rotational direction is incorrect.

6.4 Installation example

Designation

1. Eccentric pump type LF
2. Vented pulsation shock absorber
3. Shut-off valve
4. Flowmeter
5. Pressure regulating valve
6. Diaphragm pressure gauge guard with pressure gauge
7. Non-return valve
8. Level indicator with diaphragm pressure switch
9. Strainer, for suction heights > 2 m, also as foot valve with strainer
10. Suction hose, as priming aid, raised approx. 0.3 m
11. Pressure hose (vibration isolated) with a length of ≥ 1.0 m



7. Commissioning / Start up

7.1 Commissioning

CAUTION

Adhere to the safety instructions.
Non-observance may lead to serious injuries and/or damage to the pump unit.

7.2 Procedure:

1. Ensure that the pump unit is power connected with all protection devices in accordance with the regulations.
2. Check the rotational direction of the motor. The rotational motor direction must correspond to the direction arrow on the pump.
3. Fill the pump with the pumping medium.
4. Check all connections for leaks.
5. Fill some drops of ASV eccentric pump oil into the provided oiler (pos. 34 or pos. 24).
6. For the pump series L, additionally lubricate the bearing unit through the ball lubrication nipple (pos. 32) (see section 7.3.)
7. Only switch on the motor with fully open shut-off device on the suction and pressure side.

CAUTION

Never start the pump against a closed shut-off valve.

8. Adjust operating point.

7.3 Start up

CAUTION

Observe the points stated under 7.1.

If no changes have been made in this respect operate the pump as described under point 7.2.

CAUTION

Should the pump run dry, ensure that it is filled with the pump medium again!

8. Maintenance / repairs

CAUTION

Adhere to the safety instructions.
Non-observance may lead to serious injuries and/or damage to the pump unit.

8.1 General instructions

Only the manufacturer or an authorised workshop are permitted to dismantle the unit during the guarantee period.

The owner must ensure that all maintenance, inspection and installation are only performed by authorised and qualified personnel. Ensure that qualified personnel have carefully read and understood these operating instructions.

8.2 Maintenance of the pump unit

Maintenance work of this pump is limited to the regreasing of bearing units at the ball greasing nipple (Pos. 32) as well as the topping up the eccentric pump oil in the oiler (Pos. 34 or Pos. 24) with the F pump.

Expensive repairs can be avoided by a minimum of maintenance commitment by preparing a maintenance plan.

Maintenance work is dependent upon the operating time of the pump. Adhere to the specified maintenance intervals.

8.3 Lubricant / lubrication points

NOTE

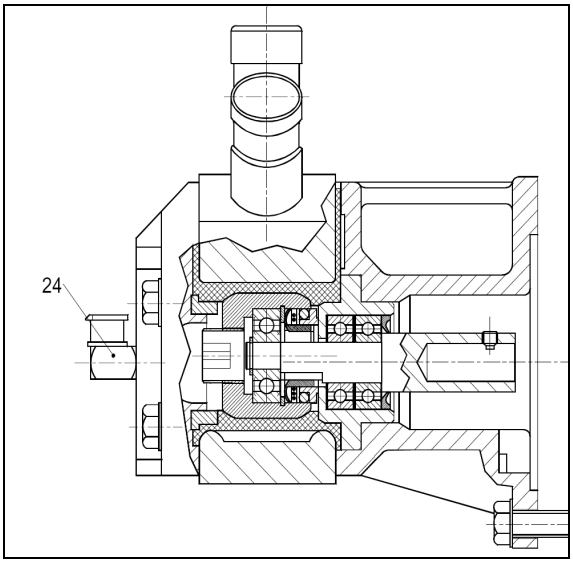
Only use the lubricants specified by ASV Stübbe!

The use of other lubricants may lead to damage to the pump!

8.3.1 Pump series F

Lubrication point: Pos. 24

Lubricant: ASV eccentric pump oil



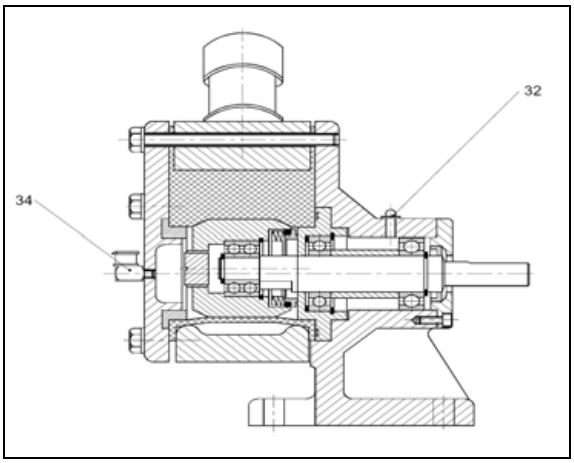
8.3.2 Pump series L

- Lubrication point: Pos. 34

  Lubricant: ASV eccentric pump oil

- Lubrication point: Pos. 32

  Lubricant: Aralub HTR 2, E No. 69654



8.3.3 Lubrication plan

Lubrication intervals: Pos. 24 or pos. 34

Every 80 operating hours

Series	Lubricant	Lubricant qty.
F2 - F30	Eccentric pump oil	2 ml
L2 - L30	Eccentric pump oil	2 ml
L70 - L100	Eccentric pump oil	4 ml

Lubrication intervals: Pos. 32

Every 3,000 operating hours

Series	Lubricant	Lubricant qty.
L2 - L30	Aralub HTR 2	4 g
L70 - L100	Aralub HTR 2	7 g

9. Recommended spare parts stock

holding for a two year operation in accordance with VDMA 24 296

9.1 Series F

Pos	Designation	Number of pumps (including reserve pumps)						
		2	3	4	5	6-7	8-9	≥10
		Number of spare parts						
3	Shaft	1	1	2	2	2	2	20%
9	Liner	1	1	2	2	2	2	30%
16	Rotor	1	1	1	1	1	2	20%
17	Mechanical seal	1	1	1	1	2	2	20%
18	Expansion ring	1	1	2	2	2	2	30%
21*	Ball bearing	1	1	1	1	2	2	20%
22	Ball bearing	2	2	2	2	4	4	40%
36	Shaft seal	1	1	1	1	2	2	20%

* double quantity for type F 30

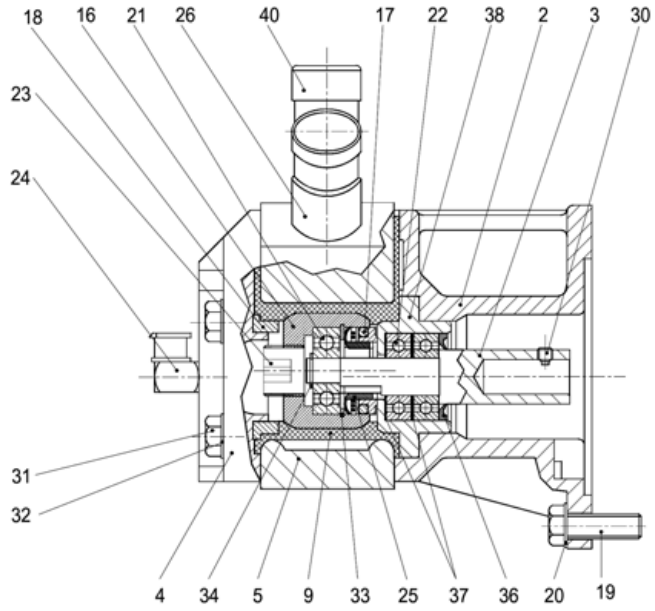
9.2 Series L

Pos	Designation	Number of pumps (including reserve pumps)						
		2	3	4	5	6-7	8-9	≥10
		Number of spare parts						
7	Shaft	1	1	2	2	2	2	20%
11	Liner	1	1	2	2	2	2	30%
18	Rotor	1	1	1	1	1	2	20%
19	Ball bearing	1	1	1	1	2	2	40%
20	Mechanical seal	1	1	1	1	2	2	20%
21	Expansion ring	1	1	2	2	2	2	30%
30	Ball bearing	2	2	2	2	4	4	20%
31*	Ball bearing	1	1	1	1	2	2	20%
47	Shaft seal	1	1	1	1	2	2	20%

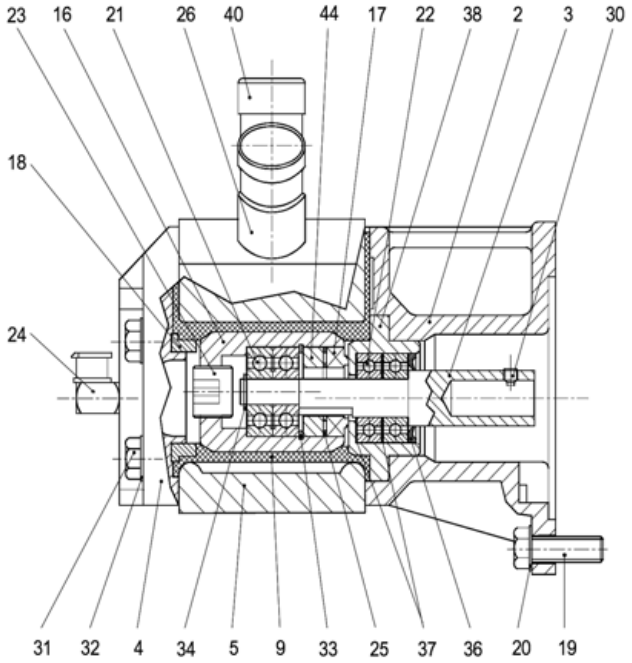
* only for type L 30

10. Sectional drawing and spare part description

10.1 Type F



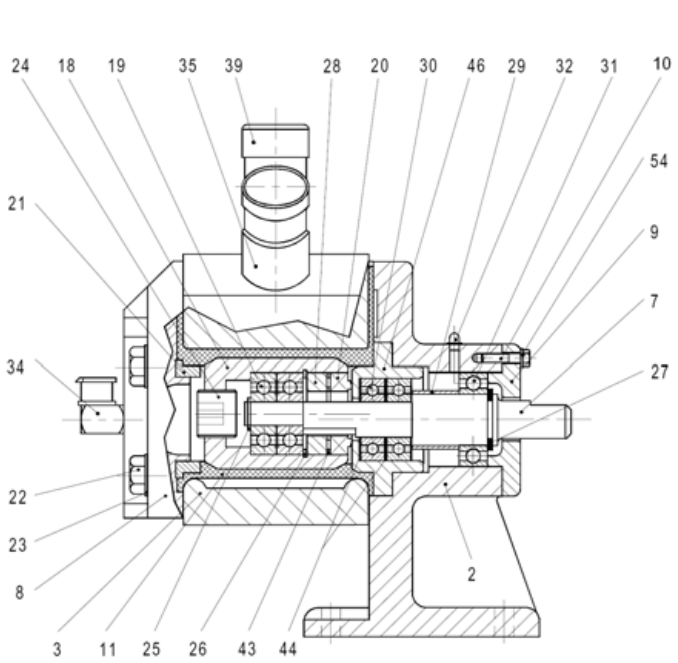
F 4 - F 16



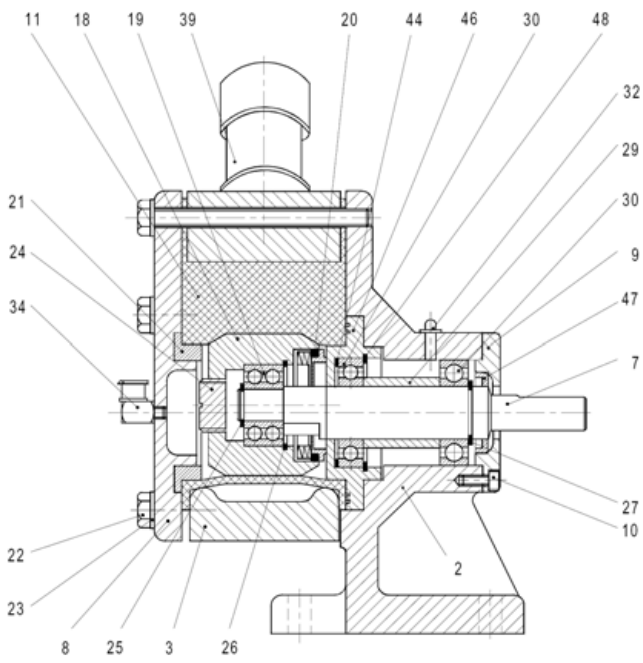
F 30

Pos.	Designation
1	Motor
2	Pump flange
3	Shaft
4	Cover plate
5	Housing
9	Liner
16	Rotor
17	Mechanical seal
18	Expansion ring
19	Hexagonal screw
20	Washer
21	Radial ball bearing
22	Radial ball bearing
23	Plug screw
24	Oiler
25	Spacer washer
26	Hose socket
30	Threaded pin
31	Hexagonal screw
32	Spring washer
33	Circlip
34	Circlip
36	Shaft sealing ring
37	Shim ring
38	Bearing insert
40	Hose socket)
44	Spacer ring

10.2 Type L



L 4 - L 30



L 70 + L 100

Pos.	Designation		Pos.	Designation
1	Motor		27	Circlip
2	Bearing block		28	Spacer ring
3	Housing compl.1)		29	Bush
7	Shaft		30	Radial ball bearing
8	Cover plate		31	Radial ball bearing
9	Cover		32	Ball grease nipple
10	Hexagonal screw		33	Straight pin
11	Liner		34	Oiler
18	Rotor		35	Hose socket1)
19	Radial ball bearing		39	Hose socket1)
20	Mechanical seal		43	Spacer washer
21	Expansion ring		44	Shim ring
22	Hexagonal screw		46	Bearing insert
23	Washer		47	Shaft sealing ring
24	Closing screw		48	Circlip
25	Circlip		54	Washer
26	Circlip			

11. Failures and their possible repair

Failure	Possible cause	Repair
Pump does not pump.	Pump is not filled with medium.	Fill pump with medium (refer to commissioning section).
Pump delivery rate too low.	Counter pressure too high.	Re-regulate pump. Fully open the shut-off valves.
		Check plant for soiling and clean, if necessary.
	Suction line blocked or insufficient diameter.	Clean the supply line or the suction valve.
	Shut-off valve closed on suction side.	Fully open the shut-off valve.
	Incorrect rotational direction.	Change over 2 phases of power supply.
	Rotational speed too low.	Increase rotational speed.
Delivery rate drops below the operating point under identical conditions.	Liner is worn or defective.	Change the liner as described in section 7 or 8.
Delivery medium escaping from the housing sealing faces.	Check bolt tightening torque of housing bolts.	Increase housing bolt tightening torque.
Pump does not run smoothly.	Excessive counter pressure.	Re-regulate pump.
	Damaged bearing.	Change the bearing as described under section 7 or 8.
	Unit poorly aligned.	Check coupling, if necessary.

12. Repair and warranty

When a problem arises, please read this instruction manual and try to troubleshoot the problem. If the problem cannot be found, or if replacement parts are needed, please call ASV Stübbe or ASV Stübbe's distributor, and give them the following information:

- The pump model and MFG number indicated on the nameplate.
- The operating condition.
- The situation under which the pump fails.

Please refer to our delivery terms to determine the guarantee period. We only guarantee the stability of the material if the operating conditions were known to us at the time of pump designing. During the guarantee period restrict repair work or modifications to our fitters or obtain a written consent from us.

12.1 Dissambly / assembly

DANGER

Adhere to the safety instructions.
Non-observance may lead to serious injuries and/or damage to the pump unit.

12.2 Preparing for disassembly

CAUTION

For personnel safety, wear protective gear, like corrosive resistant aprons and protective eyeglasses during disassembly, to prevent injuries caused by spilled chemicals.
Be sure to write down detail sequence of disassembly for correct assembly in a later date.

DANGER

Prior to starting any maintenance and/or repair work, ensure that the pump is standing still. Have the pump drive safely disconnected from the power supply by an eletrician.

Ensure that the disassembly is only undertaken in accordance with the sectional drawing.

12.3 Disassembly and assembly type F

12.3.1 Changing the liner

1. Isolate the electrical power supply.
2. Release the cover plate screws (pos. 31).
3. Remove the cover plate (pos. 4) and the expansion ring (pos. 18).
4. Remove the housing (pos. 5) including the liner (pos. 9) from rotor (pos. 16).
5. Remove the liner from the housing.
6. Prior to assembling carefully clean the rotor and all opened parts. Coat the rotor, bearing insert and the inner face of the new liner thoroughly using ASV eccentric pump oil.
7. Insert up to half the length of the liner into the rear of the housing.
8. Push the liner including the housing over the rotor and the edge of the bearing insert. Ensure that the rotor is in its highest position. Push the bearing insert over the liner such that the sealing surfaces are flush with the seals.
9. Push the housing further over the liner and insert the lugs into the bearing flange until they are in contact over the full housing length. If manual assembly is not possible use a corresponding clamping device such as, for example, a G clamp.
10. Insert the expansion ring (pos. 18) into the liner (pos. 9).
11. Insert the cover plate (pos. 4) with the screws (pos. 31) and washers (pos. 32) in front of the pump housing and tighten the screws in a cross pattern to max. 5 Nm.
12. Do not use sharp edge objects when fitting the liner.

12.3.2 Exchanging the rotor bearings

CAUTION

Take great care when exchanging the bearing unit and, in particular, the mechanical seal.

1. Dismantle the pump housing and the liner as described under 12.3.1.1 to 12.3.1.5.
2. Release the threaded pin (pos. 30) as well as the screws (pos. 19) and pull the pump from the motor drive shaft.
3. Unscrew the closing screw (pos. 23) from the rotor (pos. 16).
4. Remove the locking ring (pos. 34) and press the pump shaft (pos. 3) out of the rotor (pos. 16).
5. Remove the mechanical seal (pos. 17), with the F30 also the spacing ring (pos. 44), from the rotor (pos. 16) using a suitable tool.
6. Remove the locking ring (pos. 33) from the rotor (pos. 16).
7. Press the bearing unit (pos. 21) out of the rotor (pos. 16).

12.3.3 Assembly

Assemble the pump in reverse order to disassembly.

CAUTION

Extreme cleanliness and care are very important for the perfect function of the pump. Always use new sealing elements for the assembly.
Ensure that the individual pump components are assembled non-distorted, appropriate for thermoplastics while observing the screw thightening torques of 5 Nm.
Elastomeres, especially the EPDM sealing elements, should not be touched or cleaned with synthetic oils, mineral oils, fats or cleaning agents. Danger of swelling.
Only appropriate fats should be used, e.g. silicone greases.

12.3.4 Exchanging the housing bearings

1. Dismantle the pump housing and the liner as described under 12.3.1.1 to 12.3.1.5.
2. Dismantle the rotor bearing as described under 12.3.2.1 to 12.3.2.7.
3. Press the shaft (pos. 3) with bearing (pos. 22) and bearing insert (pos. 38) out of pump flange (pos. 2).
4. Remove the bearing insert from the ball bearing.
5. Remove the bearing (pos. 22) from the shaft (pos. 3) using the puller.

CAUTION

Do not damage the shaft sealing ring (pos. 36).

12.3.5 Assembly

Assemble the pumps in reverse order to disassembly.

CAUTION

Extreme cleanliness and care are very important for the perfect function of the pump. Always use new sealing elements for the assembly.
Ensure that the individual pump components are assembled non-distorted, appropriate for

thermoplastics while observing the screw thightening torques of 5 Nm.
Elastomeres, especially the EPDM sealing elements, should not be touched or cleaned with synthetic oils, mineral oils, fats or cleaning agents. Danger of swelling.
Only appropriate fats should be used, e.g. silicone greases.

12.4 Disassembly and assembly type L

12.4.1 Changing the liner

1. Isolate the electrical power supply.
2. Release the cover plate screws (Pos. 22).
3. Remove the cover plate (Pos. 8) and the expansion ring (Pos. 21).
4. Remove the housing (Pos. 3) including the liner (Pos. 11) from rotor (Pos. 18).
5. Remove the liner from the housing.
6. Prior to assembling carefully clean the rotor and all opened parts. Coat the rotor, bearing insert and the inner face of the new flex-i-liner thoroughly using ASV eccentric pump oil.
7. Insert up to half the length of the flex-i-liner into the rear of the housing.
8. Push the liner including the housing over the rotor and the edge of the bearing insert. Ensure that the rotor is in its highest position. Push the bearing insert over the liner such that the sealing surfaces are flush with the seals.
9. Push the housing further over the liner and insert the lugs into the bearing flange until they are in contact over the full housing length.
   If manual assembly is not possible use a corresponding clamping device such as, for example, a. g. clamp.
10. Insert the expansion ring (Pos. 21) into the liner (Pos. 11).
11. Insert the cover plate (pos. 8) with the screws (pos. 22) and washers (Pos. 23) in front of the pump housing and tighten the screws in a cross pattern to max. 5 Nm.
12. Do not use sharp edge objects when fitting the liner.

12.4.2 Exchanging the rotor bearings

CAUTION

Take great care when exchanging the bearing unit and, in particular, the mechanical seal.

1. Dismantle the pump housing and the liner as described under 12.4.1.1 to 12.4.1.5.
2. Release the connection between the coupling and pump shaft (Pos. 7).
3. Dismantle the pump from the base frame.
4. Unscrew the closing screw (Pos. 24) from the rotor (Pos. 18).
5. Remove the locking ring (Pos. 25).
6. Loosen the screws (Pos. 54) and remove the cover (Pos. 9) from the bearing block (Pos. 2).
7. Remove the shaft seal (Pos. 47) and the locking ring (Pos. 27).
8. Press the pump shaft (Pos. 7) out of the rotor (Pos. 18) and out of the bearing insert (Pos. 46).
9. Remove the mechanical seal (Pos. 20) and, if necessary the spacer ring (Pos. 28) from the rotor (Pos.18) using a suitable tool.
10. Remove the locking ring (Pos. 26) from the rotor (Pos. 18).
11. Press the ball bearing's (Pos. 19) out of the rotor (Pos. 18).

12.4.3 Assembly

Assemble the pumps in reverse order to disassembly.

CAUTION

Extreme cleanliness and care are very important for the perfect function of the pump. Always use new sealing elements for the assembly.
Ensure that the individual pump components are assembled non-distorted, appropriate for thermoplastics while observing the screw thightening torques of 5 Nm.
Elastomeres, especially the EPDM sealing elements, should not be touched or cleaned with synthetic oils, mineral oils, fats or cleaning agents. Danger of swelling.
Only appropriate fats should be used, e.g. silicone greases.

12.4.4 Exchanging the housing bearing

1. Dismantle the pump housing and the liner as described under 12.4.1.1 to 12.4.1.5.
2. Dismantle the rotor bearing as described under 12.4.2.1 to 12.4.2.11.
3. Release the screw (Pos. 10), bearing (Pos. 30) and bearing insert (Pos. 46) and remove.
4. Remove bearing from bearing from the shaft using the puller.

12.4.5 Assembly

Assemble the pumps in reverse order to disassembly.

CAUTION

Extreme cleanliness and care are very important for the perfect function of the pump. Always use new sealing elements for the assembly.
Ensure that the individual pump components are assembled non-distorted, appropriate for

thermoplastics while observing the screw thightening torques of 5 Nm.
Elastomeres, especially the EPDM sealing elements, should not be touched or cleaned with synthetic oils, mineral oils, fats or cleaning agents. Danger of swelling.
Only appropriate fats should be used, e.g. silicone greases.

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