

en Multistage Pumps
Model **MPE**

Mounting and Repair Instruction
Translation of the Original Manual



en **Keep for further use !**
Pay attention to this operating instruction before the delivery, installation, start-up a.s.o.!

Mounting Instructions MPE

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1. General Remarks



Repair to the pump or pump system may only be carried out by authorised skilled personnel or by the manufacturer's specialist staff.



Pay attention to chapter 2 at the dismantling of the pump.

For mounting and repair order specialized service personnel.



If dangerous liquids are pumped the appropriate disposal of the handled liquid is necessary before the disassembly of the pump. Pay attention to the fact, that even in drained pumps there are remainders of the handled liquid. If necessary the pump must be flushed or decontaminated. Laws must be observed, otherwise danger to health is existing!

- **Before the disassembly the pump has to be secured in such a way, that it can't be started.**
- **The pump casing must be drained.**
- **All locking devices in the suction- and discharge-pipe must be closed.**
- **All parts must have taken on the temperature of the environment.**



Secure disassembled pumps, units or single parts against tipping over or rolling off.



While disassembling the pump use of an open flame (blowlamp, etc.) only, when there is no danger of setting fire, cause an explosion or cause injurious vapours. Never apply heat to remove the impeller nut. Use of heat may result in severe physical injury and property damage.



Use original spare parts only. Pay attention to the right materials and the matching design.

1.1 General



Work, which requires shocks (hammer), must be performed outside the explosive atmosphere or only non-sparking tools must be used.

The schematic sectional drawing with part designations that matches the delivered pump and the design of the shaft seal can be found in the data sheet and/or the order confirmation and the enclosures.

All work carried out on the pump must be performed in compliance with the rules of machine construction.

- Never use force (never hit too hard with a hammer and always uses a suitable base (hard wood or copper)).
- Obey safety instructions, secure components so that they cannot fall over or roll away
- Only use suitable products in a perfect technical condition, (e.g. properties of lubricating agent must be known)
- Always clean parts before installation (dust, rust, particles, old grease etc.).
- All specified values must be complied with (e.g. torque etc.)
- Fitting surfaces and centering should only be lubricated shortly before assembly.

1.2 Tools and Equipment

In normal cases no special tools are required.

The following tools simplify assembly work:

Warm-up equipment for roller bearings
Two-armed withdrawing screw
Sickle spanner for shaft nuts

Cleaning and degreasing agents (e.g. Acetone).
Lubricant for roller bearings (see Operating Instruction for appropriate products).
Anti-friction agent for assembly work (e.g. beef dripping, Molikote, silicon grease and soap water).



For drinking water pumps only lubricants should be used that are guaranteed to contain no harmful substances.

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2. Dismantling

Work may be carried out only while the pump is out of operation.

The pump must be shut down in accordance with the Operating Instructions. For pumps with automatic pump control appropriate measures must be taken to prevent the pump from starting up accidentally (e.g. cutting off the power supply).

- Empty the pump.



The operator's or manufacturer's fitters must be informed about the nature of the pumping medium. In the case of pumps that are operated with hazardous materials, the pumping medium must be disposed of in an environmentally friendly manner before the pump is dismantled. Please note that residues of pumping medium are present even in pumps that have been drained. If necessary the pump must be rinsed or decontaminated.

- Unscrew the pump from the pipe system and base.
- Disconnect pumps with standard couplings by pulling apart the engagement.
- Separate screwed coupling halves by unscrewing the connector screws (see Coupling Operating Instructions).

For the replacement of the bearings, the shaft seals (packing or mechanical seal) and the shaft sleeves it is not required to disassemble the pump body with suction-, discharge- and stage casings. This is valid for the suction side and the discharge side. However the pump body must be pressure-less and empty.

The pump can remain screwed with the baseplate and the pipe work at the disassemble of the bearing opposite the drive side. This is at the drive side only then possible if between pump and motor is available a radial to disassemble intermediate coupling piece with the minimum length L.

Type MPE 100.x: L = 400 mm

Type MPE 125.x: L = 400 mm

2.1 Dismantling and mounting of the Discharge Side Roller Bearing (K1) – (Discharge side)

See the "Appendix" page 12 – 15 for relevant sectional drawing.

Attention at mechanical seal design: The mechanical seal must be fixed against the shaft before the disassemble starts. See the description in chapter 2.4.1 and 2.4.2.

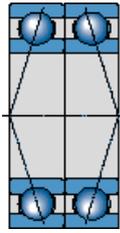
Dismantling

- Place the pump in a horizontal position
- Drain the lubricant from the bearing bracket (10) with the oil drain plug (AS).
- Remove possible existing leakage water, sealing- and cooling pipes.
- For pumps with discharge side drive:
Pull down the coupling half with two-armed withdrawing screw, remove the coupling key (PF4).
- Remove the coupling guard adapter (95)
- Push back the thrower (73)
- Unscrew nuts (M2) and nuts (M5), pull the bearing cover (12) off the bearing bracket (10).
- Remove bearing bracket (10) (lightly tapping the bearing flange (10) facilitates removal).
The pair of angular contact ball bearings (K1) remains on the shaft.
- Unscrew shaft nuts (50) (sickle spanner).
- Remove angular contact bearings (K1) with the with-drawing screw.
If the removal forces of the bearing is too high then try it with careful blows of the hammer on the with-drawing screw.
- Check the surface of the shaft for damage, grind away any furrows.

Assembly

- Clean and lubricate the fitting surfaces between the bearing bracket (10) and suction casing (3).
- Preheat the new bearing (K1) (max. 80°C) and slide onto the shaft (24).
- Assemble a pair of angular contact ball bearings in O arrangement

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Paired angular ball bearings in O arrangement

- Tighten shaft nut (50) while the bearing is still hot.
- Mount bearing bracket (10) and screw on lightly for the time being.
- Screw the bearing cover (12) to the bearing bracket (10).
- Position the flinger (73) (groove in the spacer sleeve (72)).
- Tighten nuts (M2) firmly (see Supplementary Sheet for torque).
- Push radial shaft seal ring (WD2) into the bearing bracket (10).
- Rotate shaft (24) to see that it runs smoothly.
- Mount the coupling guard adapter (95), the key (PF4) and the coupling half (maybe preheat to approx. 80°C).
- Fill the bearing bracket (10) with oil.

2.2 Dismantling and mounting of the Intake Side Roller Bearing (K2) – (Suction side)

See the "Appendix" for relevant sectional drawing.

The mechanical seal must be fixed against the shaft before the disassemble starts. See the description in chapter 2.4.1 and 2.4.2.

Dismantling

- It is analogous the same procedure as at the dismantling of the discharge side bearing.
- Place the pump in a horizontal position.
- At pumps with suction side drive:
Pull down the coupling half with two-armed withdrawing screw, remove the coupling key (PF4). Remove the coupling guard adapter (95).
- Move back the splash ring (73).
- Unscrew nuts (M2) and nuts (M5); pull away the bearing cover (12) from the bearing bracket (10).
- Remove bearing bracket (10) (tapping the bearing bracket (10) lightly in an axial direction facilitates removal). The roller bearing (K2) remains on the shaft (24).
- Remove roller bearings (K2) with the with-drawing screw.
If the removal forces of the bearing is too high then try it with careful blows of the hammer on the with-drawing screw.
- Check the surface of the shaft for damage, grind away any furrows.

Assembly

- Clean and lubricate the fitting surfaces between the bearing bracket (10) and suction casing (3).
- Preheat new bearing (K2) (max. 80°C) and slide it onto the shaft (24).
- Tighten the shaft nut (50) while the bearing is still hot, later turn it back a ¼ turn.
- Fit bearing bracket (10) and screw on lightly for the time being.
- Screw the bearing cover (12) to the bearing bracket (10).
- Bring the flinger (73) into position (nut in the spacer sleeve (72)).
- Tighten nuts (M2) firmly (see Supplementary Sheet for torque)
- Rotate shaft (24) to see that it runs smoothly.
- Fill the bearing bracket (10) with oil.

2.3 Replacement of the shaft sleeve with a packing gland / Replacement of the mechanical seal

This section describes the replacement of the shaft sleeve for designs with a packing gland or the replacement of the mechanical seal.

Clean and check condition of all parts that have been removed. In case of doubt, components should be replaced. Wearing parts (roller bearings) and seals must always be replaced.

If parts or half-open pumps are to be stored for any length of time, they must be protected from dirt and corrosion.

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2.3.1 Replacement of the shaft sleeve with stuffing box (Code „P“)

Dismantle the bearings according chapter 2.1 or 2.2.

The following description is valid for the suction and discharge side shaft seal.

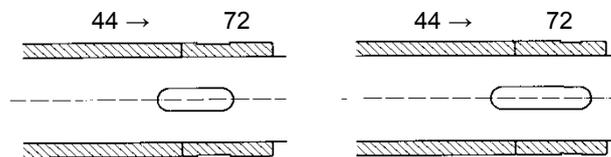
Standard stuffing box

Dismantling

- Remove bearing cover (12) together with the shaft seal ring (WD), flinger (73) and spacer sleeve (72).
- Remove key (PF3).
- Unscrew the recirculation pipe (64).
- Unscrew nuts (M3) and remove packing box gland (69).
- Pull out worn packing rings (P).
- Loosen nuts (M5) and pull down the casing cover (18P) with the gland packings (P) and lantern ring (58). Use the push screws on the flange of the stuffing box.
- Withdraw the shaft sleeve (44) and pull out the O- Ring (OR4) as well as the spacer sleeve (72).
- Depending on how worn the bearing surface is (less than 0.5mm diameter) the shaft sleeve (44) can be smoothed (take finishing cut and polish or grind). If the shaft sleeve (44) is heavy worn it must be replaced.
- Remove rest of packing rings (P) from the packing chamber and clean all other parts. Degrease the shaft (24).

Assembly

- Slide on O-Ring (OR4) and apply lubricant with a brush (e.g. silicon grease).
- Lubricate the shaft sleeve (44) in the bore so that the O-ring groove remains clean (start approx. 10-15mm inside). **Standard O-rings made of EP rubber are not resistant to oil emulsive lubricants and must not come into contact with them.** Once resistance has been ensured (e.g. beef dripping as lubricating agent or oil resistant O-rings) the entire shaft (24) may be lubricated.
- Slide on the shaft sleeve (44), insert new packing rings (P) (see Operating Instructions) and fix loosely with the packing box gland (69) (nuts (M3). When sliding on the shaft sleeve (44) take care that the O-ring can slide easily into the groove.
- Insert the key (PF3) and slide on the spacer sleeve (72). Pump must be assembled in the following direction.)



- Slide on flinger (73) and bearing cover (12).
- For further assembly work see chapter 2.1 and 2.2 (Replacing Roller Bearings) "Assembly".

Cooling stuffing box

- Unscrew the cooling pipes.
- If only the cooling chamber must be cleaned: Loosen nuts (M8) and demount the cooling cover (18/K).
- Further dismantling as like chapter 2.3.1.

2.3.2 Replacement of the Standard Mechanical Seal (Code „SC“)

See the "Appendix" for relevant sectional drawing.

The mechanical seals (GLRD) are identical on the intake and discharge side, except if they are specified different on the data sheet.

Dismantling

- Dismantle pump on the appropriate side as described in chapter 2.1 and 2.2 (replacing roller bearings)
- Remove bearing cover (12) together with the shaft seal ring (WD), flinger (73) and spacer sleeve (72).
- Remove key (PF3).
- Remove seal cover (19). Pre-treat fitting surface between the seal cap and the casing cover (18U) with branded penetrating agent.
- Slide off shaft sleeve (44) with mechanical seal (GLRD), pull out O-ring (OR4).
- Press out the counterering of the mechanical seal (GLRD) from the seal cover (19) using even pressure. Attention: The seal has very sharp edges if it breaks → danger of injury

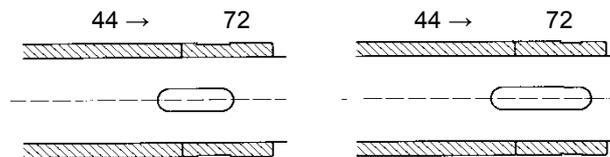
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- Slide the rotating unit of the mechanical seal off the shaft sleeve (44). If the mechanical seal has securing screws these must be loosened earlier.
- Clean and check all parts for wear. Mechanical seals must always be replaced. Repairing mechanical seals is only to be recommended with specialist training.

Assembly

Placing the pump in a vertical position is advantageous for the assembly.

- Always use a lubricant when mounting mechanical seals. We recommend lubricating the O-ring or rubber bellows with soap water shortly before it is mounted. Do not use any mineral grease or oil if you are not absolutely certain that the O-ring is resistant to it.
- Insert the counter ring of the mechanical seal (GLRD) in the casing cover (18U). Slide the rotating unit of the mechanical seal (GLRD) onto the shaft sleeve (44) and secure (if possible).
- Work on mechanical seals with a rubber bellows must proceed quickly. This is the only way to guarantee that the rotating mechanical seal element can still be moved during assembly and can be brought into the correct position.
- Slide on the O-ring (OR4) and apply lubricating agent (e.g. silicon grease) using a brush.
- Lubricate the shaft protective sleeve (44) in the borehole so that the O-ring groove remains clean (start approx. 10-15mm inside). **Standard O-rings made of EP rubber are not resistant to mineral oil or greases and must not come into contact with them.** Once resistance has been ascertained (e.g. beef dripping as lubricant or oil-resistant O-rings) the entire shaft (24) may be lubricated.
- Slide on the shaft sleeve (44). When sliding on the shaft protective sleeve take care that the O-ring can slide easily into the groove.
- Insert the O-ring (OR3) in the casing and secure with silicon grease. If possible, the O-ring should lie touching the outer diameter (the O-ring can be enlarged slightly by pulling).
- Carefully mount the seal cover (19), taking care that the pin is in the correct direction (S4), (groove in bearing bracket).
- Insert feather key (PF3) and slide on the spacer sleeve (72). Pump must be assembled in the following direction.



- Slide on flinger (73) and bearing cover (12)
- For further assembly work see chapter 2.1 and 2.2 (replacing roller bearings) "Assembly".

2.4 Replacement of Balancing bush and Balancing drum

This chapter describes the replacement of the balancing bush and the balancing drum.

The dismantling of the pump body is done best in vertical position. Position the pump on the suction side bearing bracket (10). A lifting tool is absolutely required for this work.



Secure the pump so that it cannot fall over.

See the "Appendix" for relevant sectional drawing.

Dismantling

- Dismantle the pump according chapter 2.1 and 2.2 (dismantling the bearings), as well as chapter 2.3 (replacement of the shaft sleeve at the stuffing box / replacement of the mechanical seal).
- Loosen nuts (M1) and remove the tie bolts (25).
- Lift the discharge casing (4) (careful blows with a rubber mallet on the discharge casing tie bolt bosses) and remove the o-ring (OR1).
- Remove the balancing bush (53) by striking out of the discharge casing (4).
- Pull down the balancing drum (52) together with the spacer ring (71) and the o-ring (OR7).
- Remove inside key (PF3).

Assembly

In opposite sequence.

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2.5 Dismantling of the pump body

See the "Appendix" for relevant sectional drawing.

If the whole pump is to be dismantled for maintenance work, the pump should be placed in vertical position (intake pipe facing upwards). A workbench with a hole (approx. 10 mm larger than the shaft) is very helpful in such cases.

The pump can stand on the coupling guard adapter (95).

A lifting tool is absolutely required for this work.



Secure the pump so that it cannot fall over.

Dismantling

- Dismantle the pump according to chapter 2.1 and 2.2 (dismantling the bearings), as well as chapter 2.3 (replacement of the shaft sleeve at the stuffing box / replacement of the mechanical seal).
- Loosen nuts (M1) and remove the tie bolts (25).
- Lift the suction casing (3) (careful blows with a rubber mallet on the suction casing tie bolt bosses) and remove the o-ring (OR1).
- Remove sleeve (38).
- Dismantle impeller (1) and diffuser (2), remove key (PF2). Mark the sequence of all parts for the assembly.
- Remove the stage casing (60).
- Dismantle stepwise the pump to the discharge casing (4).
- Clean carefully all parts. If the assembly is performed at a later date, then store the pump parts and protect them for corrosion.

Assembly

In opposite sequence.

3. Repair

Clean all parts and check for wear.

In case of excessive wear, parts must be reworked or changed against new parts. Remove disposals.

In the majority of cases it is practicable (if damaged absolutely necessary) to replace roller bearings and sealing elements (O-rings, shaft seal ring, V-rings, etc.).

Mechanical seals do not seal reliably, if they have run already for a longer time (fine grooves of the slide faces do not find together after assembly as before). This is the reason why a new mechanical seal should be assembled and the dismantled mechanical seal can be sent to the seal supplier for renewal of the seal faces.

At required refinishing operation on the casing parts, impellers and diffusers pay attention that all centring devices run centric each other and that all plane faces are normal to the rotation axis.

Attention: One exception is the centring of the bearing bracket, which is eccentric in some cases against the bearing bore to compensate the shaft deflection.

3.1 Impeller wear ring clearance

If the impeller wear ring gap is worn, it is possible to level the wear ring and the hub of the impeller. It is required to insert a wear ring or a bush into the diffuser, which has a special inner diameter simulating the new condition.

Wear ring clearances see table in chapter 3.3

3.2 Clearance of the balancing drum

If the drum clearance is worn, that means it exceeds the maximum value of the table in chapter 3.3, then it is required to replace the balancing drum and the balancing bush by a new one.

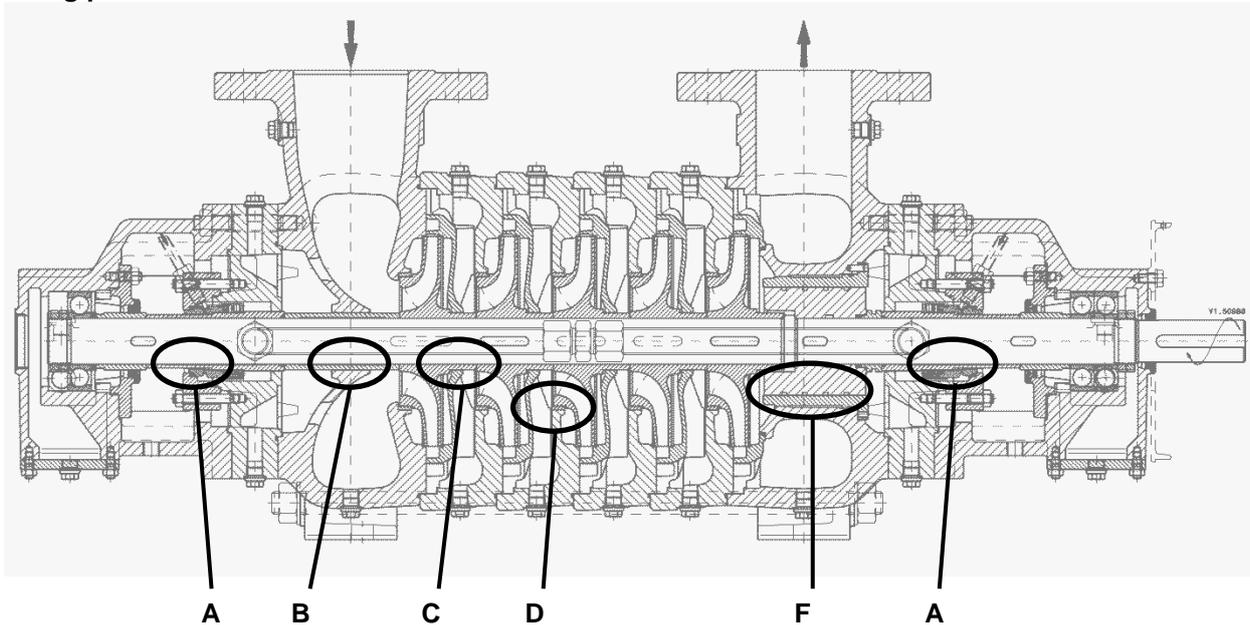
The size of the clearance depends on material and if required inquire the value in the service department.

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3.3 Clearances

Clean tidy all parts and check the wear. If the wear is too high, then renew the parts. It is functional to renew always parts like seals (O-rings), roller bearings and mechanical seals.

Wearing parts and dimensions:



| | Sector A | | | | Sector B | | | | Sector C | | | | Sector D | | | | Sector F | | | | | |
|---------------|--|------------------|------------------|-----------------|--|------------------------|------------------|-----------------|--|------------------------|-----------------|------------------|--|-------|------------------------|------------------|---|------------------------|------------------------|-----------------|------|------------------------|
| | Clearance between Shaft sleeve (44) and Gland (69) | | | | Clearance between Sleeve (38) and Suction casing (3) | | | | Clearance between Impeller (1) and Diffuser hub (2, 2/E) | | | | Wear ring clearance between Impeller (1) and Diffuser (2, 2/E) | | | | Clearance between Balance drum (52) and Balance bush (53) | | | | | |
| | Code | | | | | | | | | | | | | | | | | | | | | |
| Bauart | 141, 341 | | | | | | | | | | | | | | | | | | | | | |
| | Size | Nominal Diameter | Clearance "new" | | max. allowed Clearance | Nominal Diameter | Clearance "new" | | max. allowed Clearance | Nominal Diameter | Clearance "new" | | max. allowed Clearance | Size | Nominal Diameter | Clearance "new" | | max. allowed Clearance | Nominal Diameter | Clearance "new" | | max. allowed Clearance |
| | | | min. | max. | | | min. | max. | | | min. | max. | | | | min. | max. | | | min. | max. | |
| | 100 | 65 | 0,2 | 0,3 | 0,8 | 65 | 0,2 | 0,25 | 0,8 | 65 | 0,2 | 0,25 | 0,5 | 100.1 | 130 | 0,15 | 0,20 | 0,50 | 116 | * | * | 0,8 |
| | | | | | | | | | | | | | | 100.2 | 140 | 0,15 | 0,20 | 0,50 | | | | |
| | 125 | 75 | 0,25 | 0,35 | 0,8 | 75 | 0,2 | 0,25 | 0,8 | 75 | 0,25 | 0,25 | 0,5 | 125.1 | 170 | 0,15 | 0,20 | 0,50 | 142 | * | * | 0,8 |
| | | | | | | | | | | | | | | 125.2 | 180 | 0,15 | 0,20 | 0,50 | | | | |
| | Code | | | | | | | | | | | | | | | | | | | | | |
| | 672 | | | | | | | | | | | | | | | | | | | | | |
| | MPE | Size | Nominal Diameter | Clearance "new" | | max. allowed Clearance | Nominal Diameter | Clearance "new" | | max. allowed Clearance | Size | Nominal Diameter | Clearance "new" | | max. allowed Clearance | Nominal Diameter | Clearance "new" | | max. allowed Clearance | | | |
| | | | min. | max. | | | min. | max. | | | | min. | max. | | | min. | max. | | | | | |
| 100 | | 65 | 0,2 | 0,3 | 0,8 | 65 | 0,35 | 0,45 | 0,8 | 65 | 0,4 | 0,5 | 0,7 | 100.1 | 130 | 0,45 | 0,50 | 0,70 | 116 | * | * | 0,8 |
| | | | | | | | | | | | | | | 100.2 | 140 | 0,45 | 0,50 | 0,70 | | | | |
| 125 | | 75 | 0,25 | 0,35 | 0,8 | 75 | 0,35 | 0,45 | 0,8 | 75 | 0,4 | 0,5 | 0,7 | 125.1 | 170 | 0,45 | 0,50 | 0,70 | 142 | * | * | 0,8 |
| | | | | | | | | | | | | | 125.2 | 180 | 0,45 | 0,50 | 0,70 | | | | | |

*) Ask for the clearance "new" between balancing drum (52) and balancing bush (53) in the service department under specification of the order number.

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Different methods can be used for repair work. Depending on the area (A to F) the following methods can be used. In certain cases, it is better to use new parts.

"A": Reworking the outer diameter

- *) (levelling), the gap width should not exceed the value stated in the table. The new surface should be as fine as possible (grind). Polish the surface using a grinding belt.

"B": In this region the exact clearance is required only in special cases. The new surface must be as much as possible fine. Polish turned surfaces by sanding belt.

"C": Replace impeller (only use original parts)

- *) Turn away impeller hub and make an appropriate spacer sleeve (take care with material selection)
- *) It might be necessary to rework the bore in the diffuser

"D": Replace impeller (only use original parts)

- *) Turn away the impeller hub and manufacture appropriate spacer sleeve (pay attention to the material)

"F": New parts (only use original parts)

The clearance has a direct influence on the bearing load of the pump thrust bearing.
Replace always the balancing drum (52) and the balancing bush (53) in case of repair.

4. Assembly of disassembled pump

The assembly is done logically in the opposite sequence of the dismantling. Pay attention to the following:

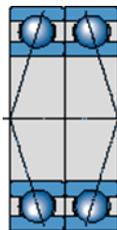
- Pay attention to maximum cleanliness.
- The assembly always starts at the thrust bearing on the discharge side of the pump (even at special designs with suction side drive).

Placing the pump in a vertical position is advantageous for the assembly.

See "Appendix" in Operating Instructions for sectional drawing.

Clean all components and free it of grease.

- Clamp the shaft in a vertical position (24) (use soft protective wedges), with coupling stub pointing upwards.
- Other assembly work depends on the type of shaft seal; see Points 2.3.1 to 2.3.2.
- Place in the shaft (24) key (PF3) and slide on the balancing drum (52).
- Slide on the shaft O-ring (OR6), spacer ring (71), casing cover (18U), O-ring (OR4), shaft wearing sleeve (44B) with mechanical seal (GLRD), seal cover (19), spacer sleeve (72) with flinger (73) and bearing cover (12) with shaft seal ring (WD1).
- Attention: In contrast to the description in chapter 2.1 and 2.2 the casing of the shaft seal is exposed.
- Proceed carefully in order to avoid damage to the mechanical seal (GLRD).
- Preheat bearing (K1) in oil bath or inductive to max. 80°C and slide it onto the shaft (24). In case of need push the bearing with slight blows with a pipe, which lies on the bearing inner ring, on the shaft. At the same time hold the outer rings with the hand, to avoid vibrations on the roller bearing ball race.



Paired angular ball bearings in O arrangement

- Tighten shaft nut (50) while the bearing is still hot.
- Mount bearing bracket (10).
- Screw bearing cover (12) to bearing bracket (10) with nuts (M5).
- Position the flinger (73) (groove in the spacer sleeve) (72).
- Clamp casing cover (18U) with bearing bracket (10).
- Lay horizontally discharge casing (4) with balancing bush (53) so that the shaft can be inserted (24) (mounting plate with borehole or assembling trestle)
- Place pre-mounted unit on the pressure casing (4) and tighten nuts (M2) (see Supplementary Sheet for torque)

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- Rotate shaft (24) to see that it runs smoothly.
- The pump must be turned around for further assembly work (free shaft pointing upwards vertically)
- Assembly as for dismantling the pump.
- Lubricate shaft (24)
- Check position of the impeller: Insert end diffuser (2/E), slide impeller (1) until impact.
- The impeller is in the correct position when the impeller outlet channel lies within the diffuser intake channel.
- Avoid flow losses: Corrections can be carried out by adding compensation disks or by turning off the impeller hub on the rear side. This check must be carried out at every stage.
- If a pump is assembled with new impellers, care must be taken that the first and last stage is always provided with an impeller with the full blade diameter. If only one impeller is available with the full blade diameter it must be used as the first stage.



Please note that assembly work always starts with the final stage.

- Remove impeller and diffuser once again, insert O-ring (OR2), re-insert end diffuser (2/E).
- Insert key (PF1 or PF2) for the impeller that is to be mounted.
- Mount impeller (1) As the O-ring (OR2) presses on the diffuser (2/E) the setting will not be correct at first.
- Grease intensely O-ring (OR1) with silicon grease and fit it on the stage casing (60). Do not twist O-ring.
- Place stage casing (60) on level and force down sharply. Hit with a plastic hammer until it impacts.
- Assemble pump down to the suction casing (3)
- Slide on sleeve (38), mount suction casing (3) with O-ring (OR1), take care that the nozzle positions are correct.
- Further assembly work depends on the type of the shaft seal. See chapter 2.3.

Assemble the bearings according to chapter 2.1 or 2.2 (Dismantling and mounting of the Bearings).

Important mounting tips:

- All faces, sealing against an O-Ring, shall not show any scratch. Pay special attention at the sliding of the impellers on the shaft.
- The impellers have to stand axially with an accuracy of appr. $\pm 0,5$ mm in der center of the diffuser channel.
- Brush the front faces of the impeller hubs with a liquid sealant (f.e. Hermetic) to eliminate internal flow in the pump.
- Brush the front faces of the stage casings with a liquid sealant (protection against corrosion).
- Coat the threads of the tie roads (25) with MoS₂-compound and tighten the nuts (M1) with the fastening torque M.
- Tighten constant in more steps on opposite sides alternate the nuts.

Fastening torque for cold water pumps (temp. to max. 80°C):

| Pump type | MPE 100.x | MPE 125.x |
|---------------------------------|-----------|-----------|
| Fastening torque M (dry) | 455 Nm | 785 Nm |
| Fastening torque M (lubricated) | 410 Nm | 710 Nm |

The fastening torque specification for the tie roads of hot water pumps are shown in the instruction and operation manual.

- Slide on the coupling with the thread on the shaft front face. Do not strike it!
- Check the smooth running before start-up. Check the alignment of the coupling and fill the bearing brackets with oil.
- Start-up according the IOM.

Mounting Instructions MPE

| Nr. | Teilebezeichnung | Nomenclature | Index of Parts |
|------|--|---|--|
| 1 | Laufrad | roue | impeller |
| 2 | Leitrad | diffuseur | diffuser |
| 2/E | Leitrad, letzte Stufe | diffuseur, dernier étage | diffuser, last stage |
| 3 | Sauggehäuse | corps d'aspiration | suction casing |
| 4 | Druckgehäuse | corps de refoulement | discharge casing |
| 10 | Lagerträger | corps de palier | bearing bracket |
| 12 | Lagerdeckel | couvercle de palier | bearing cover |
| 12OE | Öraumdeckel | couvercle de chambre d'huile | cover for oil chamber |
| 18P | Gehäusedeckel | couvercle de corps | casing cover |
| 24 | Welle | arbre | shaft |
| 25 | Gehäuseschraube | tirant d'assemblage | tie bolt |
| 29 | Abstandscheibe | disque d'ecartement | spacer disc |
| 38 | Hülse | chemise d'arbre | sleeve |
| 44 | Wellenschutzhülse | chemise d'arbre sous garniture | shaft wearing sleeve |
| 50 | Lagermutter | écrou de roulement | bearing nut |
| 52 | Entlastungskolben | piston d'équilibrage | balance drum |
| 53 | Entlastungsbuchse | coussinet d'équilibrage | balance bush |
| 58 | Sperrring | lanterne d'arrosage | lantern ring |
| 60 | Stufengehäuse | corps d'étage | stage casing |
| 64 | Rückführleitung | tuyauterie de retour | return pipe |
| 69 | Stopfbuchsbrille | fouloir | gland |
| 71 | Abstandring | bague-entretoise | spacer ring |
| 72 | Distanzhülse | entretoise | spacer sleeve |
| 73 | Spritzring | défecteur | flinger |
| 95 | Kupplungsschutzadapter (nur auf Wunsch) | protetion d'accouplement raccord (sur demande) | Coupling guard adapter (by request) |
| AS | Ölablass | drainage de l'huile | oil drain plug |
| D | Entleerungsstopfen | bouchon de vidange | drain plug |
| FS | Öfüllstutzen | bouchon de remplissage d'huile | oil filler plug |
| K1 | Schräggkugellager | roulements à billes à contact oblique | angular contact ball bearing |
| K2 | Radialkugellager | roulement a billes | radial ball bearing |
| LV | Entlüftungsschraube | bouchon de purge d'air | vent plug |
| M1 | Mutter | écrou | nut |
| M2 | Mutter | écrou | nut |
| M3 | Mutter | écrou | nut |
| M5 | Mutter | écrou | nut |
| M7 | Mutter | écrou | nut |
| ÖA | Östandanzeiger | indicateur de niveau | oil sight gauge |
| OR1 | Runddichtring | joint torique | O-ring |
| OR2 | Runddichtring | joint torique | O-ring |
| OR3 | Runddichtring | joint torique | O-ring |
| OR4 | Runddichtring | joint torique | O-ring |
| OR5 | Runddichtring | joint torique | O-ring |
| OR6 | Runddichtring | joint torique | O-ring |
| OR7 | Runddichtring | joint torique | O-ring |
| P | Stopfbuchspackung | garniture de presse-étoupe | gland packing |
| PM1 | Druckmesser | mesureur de pression | pressure gauge |
| PM2 | Druckmesser | mesureur de pression | pressure gauge |
| PF1 | Passfeder | clavette | key |
| PF2 | Passfeder | clavette | key |
| PF3 | Passfeder | clavette | key |
| PF4 | Passfeder | clavette | key |
| S2 | Stiftschraube | goujon | stud |
| S3 | Stiftschraube | goujon | stud |
| S4 | Stift | pointe | pin |
| S5 | Stiftschraube | goujon | stud |
| S6 | Sechskantschraube | vis a tete hexagonale | hexagon head screw |
| S7 | Stiftschraube | goujon | stud |
| SS | Abstandscheibe | rondelle-entretoise | disc spacer |
| VST | Verschlussstopfen | bouchon | plug |
| W1 | Scheibe | rondelle | washer |
| W6 | Scheibe | rondelle | washer |
| WD1 | Wellendichtring | bague d'etancheite d'arbre | shaft seal ring |
| WD2 | Wellendichtring | bague d'etancheite d'arbre | shaft seal ring |

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| 10 | Lagerträger | corps de palier | bearing bracket |
| 12 | Lagerdeckel | couvercle de palier | bearing cover |
| 12OE | Öraumdeckel | couvercle de chambre d'huile | cover for oil chamber |
| 18U | Gehäusedeckel | couvercle de corps | casing cover |
| 19 | Dichtungsdeckel | couvercle d'étanchéité | seal cover |
| 24 | Welle | arbre | shaft |
| 25 | Gehäuseschraube | tirant d'assemblage | tie bolt |
| 29 | Abstandscheibe | disque d'écartement | spacer disc |
| 38 | Hülse | chemise d'arbre | sleeve |
| 44B | Wellenschutzhülse | chemise d'arbre sous garniture | shaft wearing sleeve |
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| 52 | Entlastungskolben | piston d'équilibrage | balance drum |
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| 64 | Rückführleitung | tuyauterie de retour | return pipe |
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| D | Entleerungsstopfen | bouchon de vidange | drain plug |
| FS | Öfüllstutzen | bouchon de remplissage d'huile | oil filler plug |
| GLRD | Gleitringdichtung | garniture mécanique | mechanical seal |
| K1 | Schräggugellager | roulements à billes à contact oblique | angular contact ball bearing |
| K2 | Radialkugellager | roulement a billes | radial ball bearing |
| LV | Entlüftungsschraube | bouchon de purge d'air | vent plug |
| M1 | Mutter | écrou | nut |
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| OR3 | Runddichtring | joint torique | O-ring |
| OR4 | Runddichtring | joint torique | O-ring |
| OR5 | Runddichtring | joint torique | O-ring |
| OR6 | Runddichtring | joint torique | O-ring |
| OR7 | Runddichtring | joint torique | O-ring |
| OR8 | Runddichtring | joint torique | O-ring |
| PM1 | Druckmesser | mesureur de pression | pressure gauge |
| PM2 | Druckmesser | mesureur de pression | pressure gauge |
| PF1 | Paßfeder | clavette | key |
| PF2 | Paßfeder | clavette | key |
| PF3 | Paßfeder | clavette | key |
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| S2 | Stiftschraube | goujon | stud |
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