

Assembly and operation

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GENERAL ASSEMBLY AND OPERATION INSTRUCTIONS

When assembling mechanical seals, special attention should be paid to the possibility of damaging the lapped slide ring surfaces and elastomer seal elements.

Slide ring faces are lapped until they reach a high degree of flatness. Any scratches on these surfaces would have detrimental effect on seal operation and cause seal damage. During delivery they are protected by appropriate packaging, but during the assembly special attention should be paid to avoid their scratching or crumbling.

Commencing the seal assembly you should each time acquaint yourselves with the individual assembly instruction manual enclosed with the purchased seal.

If the seal is to be used in hazardous working conditions, ANGA reserves the right to consult its selection and define its operating conditions.

PRELIMINARY ACTIVITIES

Before assembly, check the machine (pump) parameters in the place of seal location. If the pumped liquid is toxic or hazardous for the environment, suitable preventive means should be taken for effective restraining of any leakage.

- Clean the stuffing box, shaft (protective sleeve) and the stationary ring seat in the cover.
- Measure the diameter of the stuffing box opening and the shaft (sleeve) diameter and compare them with the table of seal mount dimensions.
- Shaft (shaft sleeve), stationary ring seat – cannot have any scratches or sharp edges in proximity to flexible elements (i.e., “O” and “L” sealing rings) mounting and operation.
- All sharp edges through which the seal is to be shifted (O-ring, wedge-shaped ring, etc.) should also be rounded.

Recommendations concerning surface quality in the place of seal operation

"a" - polish

SEAL ASSEMBLY

The seal must be assembled in its specific operating length L3. Failure to keep this dimension could cause a seal leakage (L3 too long) or quick wear (L3 too short).

The proper operating position should be determined according to the procedure below:

- Clean the stationary ring seat, **NOTE:** In case of O-rings made of EPDM do not use oil (only water).

- Check if the pin locating the stationary ring is in the seal seat (if this type of stationary ring is used).
- Insert the stationary ring with the sealing ring into cover seat. Check if it was properly mounted (in proper depth and if it was not bevelled).
- Measure the distance between the stationary ring sliding surface and the contact surface of cover and gland face (X dimension).
- Read L3 dimension from tables for the given seal.
- With the shaft in its operating position, mark the gland face surface on it, and then mark the point where the seal back is to be placed (L3 - X dimension).
- Clean the shaft (or the protective sleeve), slightly wet the shaft and O-ring inner surface with water.
- Carefully put the seal rotational part onto the shaft (or the shaft protective sleeve) and set it at a proper position, and tighten the clamping screws. Pay attention not to damage O-rings during shifting the seal along the staged shaft (sharp edges).
- Before installing the cover, check if the sliding surfaces of the stationary ring and the rotating counter-ring were not damaged during assembly.
- Install the cover with the stationary ring and fix it, carefully and uniformly tighten the clamping screws.

When screwed in properly, the cover should provide perpendicularity of the stationary ring sliding surfaces to the pump shaft axis.

PRIOR TO START-UP

- Make sure that the cover nuts are evenly tightened – in accordance with the torque set in the operation manual of the equipment,
- Finish the assembly of the equipment and turn the shaft manually (if possible) to make sure that the shaft rotates freely,
- Check the equipment and drive shafts for alignment – max. permissible misalignment - 0.08 mm,
- Check and consult all applicable instructions related to the equipment in order to properly connect it to the main system, and connect all supporting installations (flushing, heating or cooling of the housing) following the instructions,
- Make sure whether the stuffing box is filled with liquid before each start-up of the equipment. The pump cannot be started – even for a short time – with the seal running "dry", e.g. while checking the drive rotation direction after connecting to the electrical system.
- Always vent the stuffing box (if it is not done automatically). Check if the stuffing box is filled with liquid, and whether all system conduits are unobstructed, before each start of the pump (not only after the seal installation).

OPERATING REMARKS

- Perform periodical inspections of the seal during its work. The leak level is the measure of proper seal condition. If the amount of leakage is unacceptable, replace the seal with a new one.
- If the gland box is not vented automatically, check periodically **during operation and standstill** if it has not got air-locked.
- Verify if the seal auxiliary installations are functioning properly (recirculation, barrier liquid, flushing). Seal operation during system failure is unacceptable.
- Protect the seals which contain ceramic elements against sudden temperature changes (thermal shock).
- Chemical composition of the pumped liquid and its temperature may not exceed chemical and thermal resistance of materials used for making seal components.
- Always operate the seal in such operating conditions it is designed for.
- In case of pumps with a single seal (without oil chamber), turn the shaft by hand at least once before each start-up after longer shut-down.

SEAL DISASSEMBLY

- Make sure that the equipment is cut-off from power supply and process network through proper valve settings.

- If the equipment has been used to pump liquids which are toxic or dangerous for people's health and the environment, it must be properly neutralised (to a safe state for staff and the environment). Keep in mind that the pumped liquid often tends to lie around in all kinds of cavities and it can be present inside the seal chamber. Check the equipment operation manual whether any special precautions are recommended by the manufacturer.
- Check whether the liquid is removed (drained) from the gland box and if the pressure is balanced with the atmospheric pressure.
- Disassemble the seal in a reverse order to the assembly.
- Always inspect and examine the seal after dismantling. It is recommended to return used seals to the manufacturer's service for specialist renovation to be carried out.

STORAGE AND TRANSPORT

- Seals should be transported and stored in originally closed packages.
- The place of storage should be dry, dust-free and should provide stable temperature and periodical venting of the room.
- The seal should be protected against ultraviolet radiation and direct heat.
- After 36 months of storage, inspect the seal, particularly the elastomers, and replace them if necessary.

