

Installation, commissioning and servicing of hydraulic pumps and motors

(vane pumps, internal gear pumps, radial piston motors,
internal gear pumps)

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1/2

1. General

1.1 To ensure proper operation of pumps and motors, please observe the following information:

- Technical data in the data sheet
- General notes on commissioning of hydraulic systems
- The following notes on installation and operation

2. Installation

2.1 Flushing

- On pumps taken from stock, resin may have formed. This must be removed by means of solvents. Then, the lubricating film must be renewed. In the case of hardly inflammable fluids, no special measures have to be taken.

2.2 Installation

- Observe drawings and/or instructions
- Ensure stress-free installation
- In the case of prime movers, ensure that foundations are level

2.3 Lines and connections

2.3.1 Suction lines

- Design and assemble lines according to the manufacturer's instructions.

- Suction vacuum pressure or feed pressure must be within the limits specified by the manufacturer; filters and valves possibly installed must be taken into account.
- Take care that the suction lines are leak-free.
- The flow velocity in suction lines should not exceed 0.5 m/s.
- Cut the pipe ends at an angle of less than 45° and install them at a distance of at least 2.5 x the pipe diameter from the tank floor in order to prevent the aspiration of deposits from the tank floor.

2.3.2 Leakage drain lines

- Use sufficiently large nominal widths in order to keep the backpressure in the housing within the permissible limits.
- When installing the lines, make sure that the housing is completely filled with fluid, while taking care that a siphoning effect is avoided.
- Pressureless return flow to the tank
- Sufficient cooling and settling of the hydraulic fluid is achieved by directing the fluid to the tank wall.
- Ensure a sufficient distance to temperature switches.

2.3.3 Installation instructions

- All lines have to be submerged at least 2.5 x the pipe diameter below the lowest permissible fluid level, but at least 100 mm in order to prevent foaming.
- Install the leakage drain line higher than the suction line and take precautions that the returning oil cannot be directly re-aspired.
- The ends of the suction, return and leakage drain lines must therefore be installed with a distance of at least 200 mm from each other.
- We recommend seamless precision steel pipes to DIN 2391 and pipe connections that can be loosened.

2.4 Filters

- Whenever possible, use return line or pressure filters.
- Use suction filters only in conjunction with underpressure switches/clogging indicators.
- Depending on the pump type, the required filter rating is 25 µm to 40 µm.
Recommendation: 10- µm filters prolong the service life under high load conditions.

2.5 Hydraulic media

2.5.1 Mineral oils

- When HL oils without wear-reducing additives are used, vane pumps (V3, V4, PV7, PVV, PVQ) may only be operated at reduced pressure.
- Oils containing polar additives (slide way oils) must not be used for pumps with plain bearings, as the additives precipitate at 70 °C and thus impair cooling and lubrication of the bearings.

2.5.2 HFC fluid (water glycol)

- Internal gear pumps of types PGF and PGH are suitable for operation with HFC fluids.
Please note the information in the data sheets!
When using hydraulic media, which are not listed in the technical data, please consult us.

3. Commissioning

3.1 Electrical open and closed-loop control elements

- Observe voltages and current intensity

3.2 Direction of rotation of drive/output shafts

- Observe the arrow of direction of rotation
- Testing of a unit filled with hydraulic fluid:
Switching the unit briefly on and off prevents damage in the case of the wrong direction of rotation.

3.3 Filling

- Pump types V3, V4, PV7, PVV, PVQ are self-priming, the housings need not to be filled. Internal gear pumps must be filled prior to commissioning! For all other pumps, verify, whether the housing must be filled.

3.4 Start-up

- Observe specific component instructions.
- Set all valves, especially on the suction and supply side, to the free-flow position.
- Switch the motor briefly on and off several times in order to facilitate bleeding. Only operate the pump under full load when it runs properly and smoothly.
- During initial start-up, bleed the pressure line to allow complete filling of the pump.
Exceptions to this are pump with automatic bleed valve.
- When the system starts up, the fluid level in the tank must not fall below the minimum suction level.

3.5 Pressure limitation / pressure control

- Always select the lowest settings for commissioning.
- Carefully increase the pressure to the required values, but do not set to unnecessarily high values.
- If required, secure settings against unwanted adjustment.

3.6 Temperature

- Check the fluid temperature under normal operating conditions.

4. Routine maintenance

4.1 Frequency

- Loads and operating conditions determine regular maintenance intervals.

4.2 Mounting

- Check the correct orientation of the pumps, motors, cylinders, further energy converters and lines at normal operating pressure and operating temperature.

4.3 Filters

- Observe clogging indicators and check suction filters for operability according to the operating instructions.

4.4 Servicing

- We recommend regular servicing of the complete system by Bosch Rexroth!