Installation and Operational Instructions for Continental Models CP, CL, CM, CJ, CG & CK

1. **Dry friction is harmful to Progressing Cavity Pumps. Do no operate the pump until it is filled with the liquid to be pumped**. This liquid serves as a lubricant and as a seal between the rotor and stator and is not a priming operation. Approximately 10% of the pump's displacement rating will satisfy the cooling and lubricant requirements until full displacement capacity is attained.

2. Mount the pump on a properly machined and fabricated steel base that is anchored with bolts on a level solid foundation.

3. **Alignment of direct driven pumps** that are driven by a motor or a speed reducer should be carefully checked after the pump base has been mounted on the foundation. Check the alignment of the coupling halves with a straight edge. Alignment should be checked at least four points 90° around the O.D. of the coupling. A space between the pump and driver shaft ends should be held to no less than 1/8".

4. **Belt driven pumps** should be checked after mounting the pump base on the foundation. Make sure, with the help of a straight edge, that the belts and pulleys are in alignment and that the belts have the proper tension.

5. **Pump rotation:** The recommended operating direction is clockwise when viewing the pump from the driveshaft end. However, the pump can be operated in either a clockwise or counterclockwise direction when viewing the pump form the driveshaft end. The inlet and discharge ports are related to the rotation of the pump.

6. **Piping** to pump should always be the same size as the pump inlet port and discharge port openings. Those systems handling viscous, volatile high pressure or high temperature materials may have to be more appropriately sized.

    a. All threaded joints should be coated and sealed with pipe compound.
    b. Provide for expansion in the piping system to all for movement and deflection.
    c. Use pipe supports to keep the weight of the piping system from causing strain on the pump.
    d. Make all lines as direct and free of fittings as possible. Minimize suction line by locating the pump below or close to the liquid being pumped.
    e. When the pump is handling abrasive, corrosive liquids, slurries, sludges, cements, adhesives or any liquids that harden, it should be flushed **clean**. The rotation of the

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pump can be operated both clockwise and counterclockwise to accomplish this operation most thoroughly.

f. It is a good practice to consider installing pressure and/or vacuum gauges in both the inlet and outlet pipes to the pump to check that it conforms to your operating specifications.

Progressing Cavity Pumps are **positive displacement** and the discharge outlet must be kept open or a **relief valve** or a **by-pass piping** arrangement should be provided. If the discharge or inlet into the system is to be shut off or closed, provisions must be made for a relief valve or by-pass arrangement or damage can be done to the pump and the drive, including the motor. Strainers, filters and foot valves should be properly sized so as not to affect performance of the pump and should usually be installed in the suction line.

7. **Pump Bearings** are anti-friction ball type and should be periodically greased. They are initially packed when assembled at the factory.

   a. **Do not over lubricate**.
   b. Use quality anti-friction bearing grease.
   c. It is recommended that under normal use, that no lubrication be added for the first 1200 hours of operation unless it is uncomfortable to hold the hand on the bearing housing.
   d. The bearing shaft assembly should be inspected and cleaned after running the pump for approximately 2500 hours.
   e. All old grease should be removed from the bearing and bearing housing. Inspect bearings for wear and repack the bearings with new grease.
   f. Add a few drops of oil to bearing seals before reassembling.

8. Packing maintenance procedures

   a. The packing gland should be firmly tightened so as to prevent excessive leakage through the packing, but not so tight that it will cause overheating. Always adjust packing gland evenly. Align the packing gland so that it evenly goes into the packing gland cavity of the pump housing.
   b. **Continental Progressing Cavity Pumps** are supplied with a lantern ring in the midsection of the packing with access to a lubrication fitting on the external surface of the pump body. Lubricating the packing regularly with small amounts of lubricant or flushing with water will extend the life of the packing and help maintain a good seal.
   c. A scored driveshaft reduces the life of packing and should be replaced.
   d. When replacing worn packing use standard die-cut formed packing. Do not use one piece spiral packing. Press into place the die-cut and preformed packing rings and stagger the joints 180° apart.

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e. After packing is installed, tighten the gland bolts finger-tight and evenly. The packed stuffing box is designed to control leakage, not to stop it completely. Leakage is necessary to reduce friction and dissipate heat. Bolts should be backed off gradually as the stuffing box warms up, to avoid overheating of the packing area.

f. A small amount of leakage through the packing can be normal and helpful for good operation and easily drained away from the base. A leakage rate of 50-100 drops per minute until the packing has seated and adjusted to the operating temperature (approximately 10-15 minutes). If excessive leakage is present after 15 minutes of operation, tighten the gland bolts 1/6 of a turn. Tighten the bolts another 1/6 of a turn after an additional 15 if necessary, and repeat until desired leakage of 1-2 drops per minute is obtained. **Note:** Do not tighten until zero leakage is obtained. Over tightening of the packing gland may result in accelerated wear on the packing and damage to the shaft.

Pre-Start-Up Checks

1. Read and understand all information furnished with pump.
2. Review operating conditions.
3. Check setting of relief valve in discharge line.
4. Check for proper position of belt or coupling guards. Do not operate pump without guards.
5. Fill the pump with the liquid to be pumped. **Do not operate pump dry**.
6. **Rotate driveshaft** of pump four or five rotations. This creates a seal between the rotor and stator to create pumping action.
7. Make sure the inlet and discharge lines are open.
8. Start the unit.
9. Check to see if the pump is delivering liquid. If it is not, refer to the section on checking pump performance.

General Storage Guidelines

- Loosen packing gland to decompress packing set.
- Base units that will be stored for long periods can be rotated every 6 months or remove the stator and belts. If they cannot be removed seal the discharge port. Do not use oil on natural rubber.
- Rotate shaft manually up to 180° every 3 months.
- Spray unprotected metals with a good rust preventative and re-inspect every 3 months.
- It is best to store in warm, dry area with low humidity. Inside is preferred, but if stored outside wrap tightly with a weatherproof cover.

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Start-up after storage

- Fill with fluid
- Check packing. Tighten or replace if necessary.
- Refer to Pre-Start-Up Checks for procedures.

Troubleshooting Pump Performance

A summary of possible causes of improper performance of Progressing Cavity Pumps

No liquid delivered

1. Pump rotating in wrong direction
2. Suction lift too high
3. Clogged suction line
4. Air pockets or vapor lock
5. Air leaks in suction line
6. Faulty relief valve in system
7. Pump not properly primed
8. Suction line not submerged in product
9. Worn pump

Pump Takes Too Much Power

1. Speed too high
2. Liquid more viscous that anticipated
3. Operating pressure higher than specified. Check this with gauge at the pump outlet
4. Outlet line obstructed
5. Mechanical defect, such as bent shaft, tight packing gland, or misalignment of piping
6. Relief valve in system not operating properly

Insufficient Liquid Delivered

1. Air leaks in suction line
2. Air leaks in through packing
3. Speed too low
4. Suction lift too high
5. Partial air pockets or vapor lock
6. Restricted suction line
7. Faulty relief valve in system
8. Worn pump

Excessive Noise

1. Starved pump, liquid not getting into pump
2. Air leaks in suction line
3. Air or gases in liquid
4. Pump speed too high
5. Improper mounting, check alignment thoroughly
6. Excessive discharge pressure

Rapid Wear of Stator

1. Pump ran dry
2. Grit or dirt in liquid
3. Pump running too fast
4. Excessive pressure
5. Corrosion

Loss of Suction after Start-up

1. Pump not properly primed
2. Suction piping not submerged
3. Suction piping too small
4. Air leaks in suction
5. Insufficient liquid supply

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