

Installation, Operation and Maintenance Instructions

Model 7SP

Description and Specifications: The Model 7SP is a close-coupled, end suction, single stage, **enclosed impeller**, back pull-out, centrifugal pump. Connections are NPT threaded. All wetted metal pump parts are 18-8, 304SS or better. O-rings and elastomeric seal parts may be Buna, Viton, or EPR. Motors are NEMA 56J frame, with a C-Face mounting flange and a threaded shaft. All pumps use a mechanical seal to prevent leakage around the motor shaft.

Operating limits: The model 7SP is designed for 120 PSIG at 212F with the standard Type 16, Buna or EPR mechanical seal, and a maximum temperature limit of 250F with a Viton mechanical seal. Motor is limited to 20 starts per hour, evenly distributed.

Notice: Upon receipt of this equipment, inspect the carton and the equipment for any damages that might have occurred during shipment and notify the carrier immediately. Damage that occurs during shipment is not the responsibility of American Stainless Pumps. Failure to notify the carrier will place responsibility on you for any repairs or damages occurring during shipment.

Safety Instructions: To avoid serious or fatal injury and/or property damage, read and follow all instructions in this manual. Review all instructions and warnings included in this manual before attempting any work on this pump or pump/motor assembly. Do not remove or alter any decals.

The motor used to drive this pump is an electrical device connected to a potentially lethal voltage power source. Take all precautions required when working with or on the motor and its power source, including but not limited to:

1. Always disconnect and lockout the electrical power source before attempting any connection, maintenance or repairs. Failure to do so can cause electrical shocks, burns and death.
2. Install, ground and wire motors in accordance with all local and national electrical codes.
3. Install an all leg disconnect switch near the motor for quick access.
4. The electrical supply must match the motor nameplate specifications and the motor must be wired per the wiring diagram on the motor to match the selected voltage. **Incorrect wiring can cause fire and motor damage and will void the warranty.**
5. Most single phase motors and some three phase motors will have automatic thermal protection switches wired in the motor. These switches will open and stop the motor if the motor overheats. As the motor cools, these switches will close and start the motor automatically and unexpectedly.
6. Motors that do not have thermal overloads must have a properly sized contactors or magnetic starters and overload switches (or fuses) in the starter panel. Three phase motors require all leg protection.
7. Use only stranded copper wire to motor and ground. Wire size must limit the maximum voltage drop to 10% of the motor nameplate voltage at the motor terminals.
8. Three phase motors can rotate in either direction. The pump will operate properly only in one direction (clockwise when looking from the motor end, counter-clockwise when viewed from the pump end). **Operating the pump in the reverse rotation may damage or destroy the pump and motor and voids the warranty.**

Installation:

-Locate the pump as near to the liquid source as possible. The pump must be primed with little or no air in the case to begin operation. The pump must be located below the liquid level when starting. **This pump is not self-priming.**

-If the discharge nozzle is not in the vertical position, an air chamber may form in the case. This air must be vented for proper operation. With the pump not running, loosen the case bolts until all of the air in the case is vented.

-Protect the pump and motor from freezing. Although the pump may survive a freeze up, the mechanical seal and O-Rings will not.

-Allow adequate space around the unit for service and ventilation.

-Units are designed to be installed horizontally. **Do not mount the motor below the pump as leakage from the pump will damage the motor and can cause a shock, burns or death.**

-Units mounted horizontally should be located on a flat, rigid surface. Unit may be free standing, but some vibrations may occur. If attached to a foundation, tighten hold down bolts before connecting the piping.

Rotation:

The model 7SP will operate properly only in one direction (clockwise when looking from the motor end, counter-clockwise when viewed from the pump end). **Operating the pump in the reverse rotation may cause the impeller to unscrew, breaking the shaft, damaging the pump and/or the motor and voids the warranty.**

- Three phase motors can rotate in either direction. Single phase motors normally only rotate in the proper direction.
- To check rotation, you must observe the motor shaft from the back of the motor. Remove the end cover from the back of the motor by prying off the cap or removing screws on the end shield. Quickly switch on and off the motor and watch the shaft rotation as it slows down. Motor shaft should be turning in the clockwise direction when viewed from the back of the motor.
- If your three-phase motor is turning in the wrong direction, interchange any two of the three motor power wires. This should reverse the rotation. If a single-phase motor is turning in the wrong direction, it has been wired wrong internally. Consult the motor manufacturer or American Stainless Pumps for instructions.
- Check the rotation again. If it is correct, replace the end cover.

Operation:

- Pump must be completely primed before starting. Air in the suction lines or case must be vented.
- If the pump case is rotated so that the discharge nozzle is not vertical, an air pocket may form in the case which will prevent the pump from operating properly. Loosen the case bolts until this air is removed for proper operation. Be sure to retighten the bolts before operating the pump.
- Do not operate the pump at or near zero flow.** At zero flow, heat will build up in the pump and can cause extreme damage to the pump, property damage and/or possible injury to operating personal. Minimum flows of 10% of the pumps best efficiency point are recommended unless otherwise authorized by ASP.
- Do not operate the pump beyond the flow rates shown on published curves. Noisy pumps or the sounds of “pumping rocks” may be signs of cavitation or operation beyond the pump capacity.
- Check pump and motor for vibration. Vibration may be a sign of pipe strain, insufficient mounting or operation beyond the pumps capacity.

Maintenance:

There is no scheduled maintenance required. Close-coupled pumps have no bearings. Bearings in the motors are usually permanently grease lubricated and cannot be regreased (some large motors may have grease fittings). Mechanical seals will need to be replaced when leaking. O-Rings may harden with age and need to be replaced when they leak.

Piping:

- All piping must be independently supported. No piping loads may be carried by the pump.
- Piping should be at least the same size as the pump connections.
- Piping to the suction is critical for proper pump operation.
- Suction pipe should be short and direct, with a minimum of fittings and turns.
- Suction pipe must continuously rise to the pump to avoid air pockets. All pipe connections must be airtight.
- If suction pipe is larger than the pump, an eccentric reducer may be needed with the straight side on top to avoid an air pocket.
- If suction of pump is above the liquid source level, a foot valve or other isolation valve will be needed to prime the pump. A continuous stream of liquid must be made available for the pump suction to hold its prime.
- Do not use any suction valve for throttling the pump. This will cause loss of prime and damage to the pump that is not covered by warranty.
- Be sure that the source liquid level is sufficient to prevent vortices from drawing air into the pump.
- Install a valve on the discharge line for use in regulating the pump flow and for isolating the pump during maintenance and inspection.

Disassembly: Disconnect and lockout the electrical power before attempting any disassembly. Casing may contain hazardous fluids. Drain and flush and take necessary precautions.

It is not necessary to remove piping from the case to disassemble the pump. Pump is a back pullout design and unless casing needs to be repaired or replaced, it can stay in place during servicing.

1. Close all valves and drain pump and pipes and flush if necessary.
2. Remove any motor hold down bolts.
3. Remove the eight (8) case bolts (Item 7CS) with a wrench or socket.
4. Pull the motor and pump internals back out of the case. Remove the case O-Ring and inspect for damage or hardness.
5. **If the motor is a three-phase motor**, a locking screw is used to prevent the impeller from unthreading if started in the wrong direction. The locking screw is installed with removable thread locker to prevent it from coming out during operation. The standard locking screw is a right hand threaded socket head screw. Emerson motors and some older pumps have locking screws with left hand threads. If there is no label on the pump case indicating rotation of the locking screw, consult the factory.
6. After removing any locking screw, remove the impeller by turning the impeller counterclockwise (when looking at the impeller from the pump end) while holding the motor shaft. It will be necessary to remove the cover plate in the rear of the motor to get access to the shaft. Using a screwdriver, wrench or vise grips as needed, hold the shaft tightly against rotation while turning the impeller. **Do not apply any heat to the components.** If you are unable to hold the shaft in this manner, remove the rear motor housing and grip the shaft with vise grips or other similar device (do not hold shaft where bearings will mount). A sharp, hard striking blow with a hammer and screwdriver may release the impeller when high torque does not. Grind a small notch on the OD of the impeller backplate to provide a striking spot for the screwdriver if needed. Do not strike a blow against the vanes. They are too thin to take any force.
7. Remove the rotating element of the mechanical shaft seal. This element is held in place by the impeller only. If the rotating element does not come off easily, it is stuck to the shaft. Pry up the seal plate (Item 400) with screw drivers or pry bars. The seal plate should compress the seal spring and force the seal off the shaft. If seal is stuck, and you must pry with force, do not pry towards your face or body. The seal and seal plate can come free unexpectedly and injure you.
8. If the seal plate did not come off with the seal, remove it now. If you plan to replace the stationary seat, you will need to press it out from the back. Do not push with your finger or you will probably cut yourself on the edges of the seal plate when the seal pushes out.
9. If you plan to replace the motor, remove the four motor adapter bolts (Item 7MB) with a 5/16" Allen wrench and remove the motor adapter plate (Item 600). If you are not replacing the motor, leave the adapter plate in place.
10. If the motor comes with a rubber deflector, the deflector should go between of the motor adapter plate and the motor.
11. Check the suction O-ring that rides on the impeller suction shroud. Replace if damaged, swollen, fretted or just worn out. This O-Ring is not necessary for pump operation but it acts as a restriction to recirculating flow and will improve the pump efficiency.

Assembly or Reassembly

-Assembly of the pump and motor is easier when the motor is standing face up so that parts do not fall off, although access to the motor shaft at the rear of the motor will require a horizontal position.

-It is considered good practice to replace the mechanical seal and O-Rings whenever you have to disassemble the pump. If all seal components are in good condition, you may reuse the parts.

1. If replacing the motor, and the motor has a deflector, be sure there is enough room behind the motor adapter plate for the deflector to spin freely.
2. Install the motor adapter plate (Item 600) with the four motor bolts (Item 7MB) using a 5/16" Allen wrench. You must use the low profile button head socket screws that came with the pump or other low profile head bolts. There is not enough room for a standard cap head screw/bolt. Tighten the bolts. Install the deflector now.
3. Install the mechanical seal stationary seat into the Seal Plate (Item 400) by putting a suitable lubricant on the cup seat and gently pressing into the seal plate bore. **Do not get any lubricant or dirt on the seal faces.** Place the seal plate onto the motor adapter plate.
4. Lubricate the sealing elastomers on the rotating assembly of the mechanical seal and press gently onto the shaft. You may have to hold the seal in place until the impeller is installed.
5. Thread the impeller onto the pump shaft. (If motor is 3 phase and does not have a locking screw, put a locking compound on the motor shaft threads.) Be sure the impeller hub is tight against the shoulder of the motor shaft. If you leave the impeller loose, when the motor starts up, the impeller will tighten up on the shaft so tightly that you may not be able to remove it later. You will need to hold the motor shaft from the rear of the motor with a large screwdriver, wrench or vise grips while tightening the impeller.
6. If the motor is a 3 phase motor, install the impeller locking screw with removable locking compound on the threads to prevent this screw from unthreading during operation. The standard locking screw has right hand threads. An Emerson motor and some older motors use left hand threaded screws. Look on the pump case for a description or call the factory if you are not sure.
7. Install the suction O-ring on the impeller suction shroud. Replace if worn, fretted or swollen.

8. Inspect the case O-Ring. Replace if brittle, damaged or misshapen. Install on the seal plate.
9. Join up the back pull out assembly with the case. Do not force the pump into the case. Before installing the case bolts, check to be sure that the impeller is spinning freely.
10. Install the (8) case bolts, using the bottom two bolts to attach the base. Install the bottom two bolts through the baseplate attachment holes. Tighten the case bolts with the baseplate in place. Make sure the impeller rotates freely.
11. Replace the motor back covers.

Limited Warranty: American Stainless Pumps (ASP) warrants that its manufactured products are made of first class materials and in a skillful and workmanlike manner, and when properly installed and maintained, will operate as proposed in the company's written documents. This warranty is in effect for a period of two years from shipment.

-ASP will pass through to its customers any warranties granted by the manufacturers of motors and mechanical seals but does not itself warrant these items.

-There are no other warranties, expressed or implied, except for the warranties given here. ASP does not warranty against corrosion or erosion of its products when placed in service. Under no circumstances will ASP be liable for any penalties or any incidental or consequential damages caused by the failure of its products, by late delivery or by any other causes. This warranty may not be modified verbally by any employee or agent of ASP.

