



SP-41 Pump Routine Maintenance

The Stainless Products Model 41 pump is a light to medium duty pump capable of generating 100 gallons per minute flow and 30 PSI when coupled to a high speed motor and 50 gallons per minute and 5 PSI when coupled to a low speed motor. The pump is appropriate for small brewery processes including transferring water and finished beer, pumping wort for mash to kettle as well as finished wort to fermentation through a cooling heat exchanger.

In general, when transferring hot water or wort, the pump should operate at low speed (1750 RPM) while liquid transfer and CIP should operate at high speed (3500 RPM). In order to use the same pump in different operations, the pump can be fitted with a variable frequency drive (VFD) to vary the speed of a high speed motor.

A SP-41 pump configured for small brewery use will typically include the pump head with a 3.75" impeller and a carbon/ceramic shaft seal fitted to a 1 to 2 horsepower white washdown motor attached to a single rail pump cart fabricated by Dairy Engineering. The pump can be controlled with a simple on/off switch, fused soft starter or VFD. All motors and VFDs will be washdown duty and NEMQ 4X rated for use in wet environments. Unless requested otherwise by the customer, VFDs will include an on/off electric disconnect.

Regular cleaning of wetted surfaces of the pump is the most important aspect of regular maintenance. The only user required lubrication is greasing the cart wheels with a general purpose mechanical grease. The motor will not need user lubrication. Special attention should be paid to preventing foreign objects from entering the pump. Though this may seem unlikely, in a busy operation with multiple pump operators, it is not unusual to have nut or bolt or gasket get into a tank that is being cleaned.

The electric components are wet area compatible, but should not be exposed to direct water spray. Best practice is to plug portable pumps into a de-energized switch outlet. If switched outlets are not available, be sure the switch or VFD on the cart are switched off. We recommend VFDs with on/off disconnects as standard equipment. By plugging a VFD into a "hot" power outlet while the VFD is on, damage to the unit can occur.

Some notes on this pump are below.

- The SP-41 shaft seals typically last 6 months to a year depending on frequency of use and care.

- When used on the hot side for pumping wort, the pump needs to be rinsed after pumping wort. The remaining sugars can stick the two halves of the seal together then cause a tear in the elastomers when the pump starts up again. To prevent this, run some hot water through the pump after pumping wort and at end of day, run a chemical cleaning with the pump. You can also rinse the exterior of the seal with a hose just in case some wort has started leaking.
- The other typical problem is running the pump dry. The seals are not flushed with cooling water, so they need to be submerged in liquid (even at 200 degrees) to dissipate friction heat. We don't really see this too often in very small breweries where the owner is the brewer, but once they hire an assistant, they get less life out of the seal as the new guy is overwhelmed and misses a dry running situation.
- Very rarely thermal shock will damage a seal. This happens when going from very hot to very cold quickly. This sometimes happens during CIP.
- Check the pump direction. If the motor is turning backward, the impeller nut can unscrew and cause the impeller to rub against the pump cover. This also loosens the tension on the spring. Rotation direction is indicated on the pump. You can change direction of a 3 phases pump by switching 2 hot leads.
- Harsh service "Brewery seal" are offered by SPI.
- Seals currently available are: Teflon/Ceramic (Cold Service) Carbon/Ceramic (Hot Service) and Carbon/Silicon Carbide (harsh service)
- Cavitation occurs when the pressure inside the pump head is lower than the vapor pressure of the liquid being pumped. This occurs locally at parts of the impeller and creates bubbles that form and collapse quickly. The collapsing bubbles damage the metal of the pump interior. Cavitation can be prevented by keeping adequate liquid height on the inlet of the pump to exceed the NPSH published on the pump curve in the included manual. Cavitation can also be prevented by slowing the pump as a tank being emptied is close to empty.
- SPI indicates that the pump can be pumped through by an upstream pump. We don't recommend this as it could lift the seal rotary off the stationary to allow grit in between.