

# Series P Metallic Pumps

Installation & Maintenance

**Models:**

**P-3S**

**P-5S**

**P-7 1/2S**

**P-10S**

**P-15S**

**Materials:**

**S - 316 SS**



## Introduction

Penguin Pumps are designed to handle a large range of chemicals without difficulty. Completely constructed of 316 SS where in contact with the solution being pumped, Series P pumps have an upper working temperature of 280 degrees and thus can handle many corrosive, slurries, and abrasive solutions. Series P pumps are easy to install and operate, and are virtually maintenance-free. All pumps have been tested for proper operation before leaving the factory. To obtain optimum service life, please follow all installation and operation instructions.

# ***Installation & Operating Instructions***

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## **ELECTRICAL**

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All three phase motors are dual voltage, 230/460V, 50/60c, which are not wired at the factory. Since direction of rotation cannot be determined without operating the pump, it is imperative that the motor rotation be checked before operation. Attach leads to motor and bump start a maximum of only a couple seconds as if you were turning a light switch on/off as fast as possible. Do not leave motor running. Check for clockwise rotation of fan. If counterclockwise rotation, change any two leads and again check rotation. Many options are available on the P Series motors including explosion-proof, larger horsepowers to 20, and 575V motors. If any of these options are required, please check the motors carefully or consult factory.

## **PLUMBING**

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If a suction line or suction extension is required, enlarge the suction line/extension by one size larger than the suction entrance. Never reduce plumbing on the suction. Avoid 90-degree elbows and never use a 180-degree elbow. Make sure every suction coupling/connection is airtight. The bottom of the suction extension should always be at least 2 pipe diameters above the bottom of the tank. In either flooded suction or non-flooded suction, the use of a check valve on the discharge of the pump is recommended. In the case of a non-flooded suction, a flapper check valve on the end of the submerged suction line must be installed. To facilitate priming the pump, install a T-connection with a small valve between pump case and check valve. It is advisable to use a discharge valve after the check valve. All plumbing and accessories must be supported other than by the pump, in order to prevent possible distortion of the pump case. The use of some hose in the discharge plumbing close to the discharge nozzle of the pump will absorb any movement of the solid plumbing if vibrations exists.

## **LIQUID LEVEL**

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The correct liquid level is very important. A liquid level which is too high could cause motor damage. A liquid level that is too low, below the impeller, may cause severe bushing damage, THIS PUMP CANNOT RUN DRY. CHECK THE LIQUID LEVEL. The correct liquid level is halfway between the bung hole and the centerline of the discharge nozzle.

## **PRIMING**

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Under flooded conditions, open all the valves in the suction and discharge lines. Wait a few minutes to let entrapped air out. Close all valves on the discharge line. Leave suction valves wide open. A closed suction valve could cause damage to the impeller and the shaft. Start the pump and crack discharge valves open to let out any additional entrapped air. Then open valve to desired flow. Under non-flooded conditions, fill up the pump slowly from the T-connection and valve. Then close all valves in the discharge line. Start the pump and continue as flooded conditions.

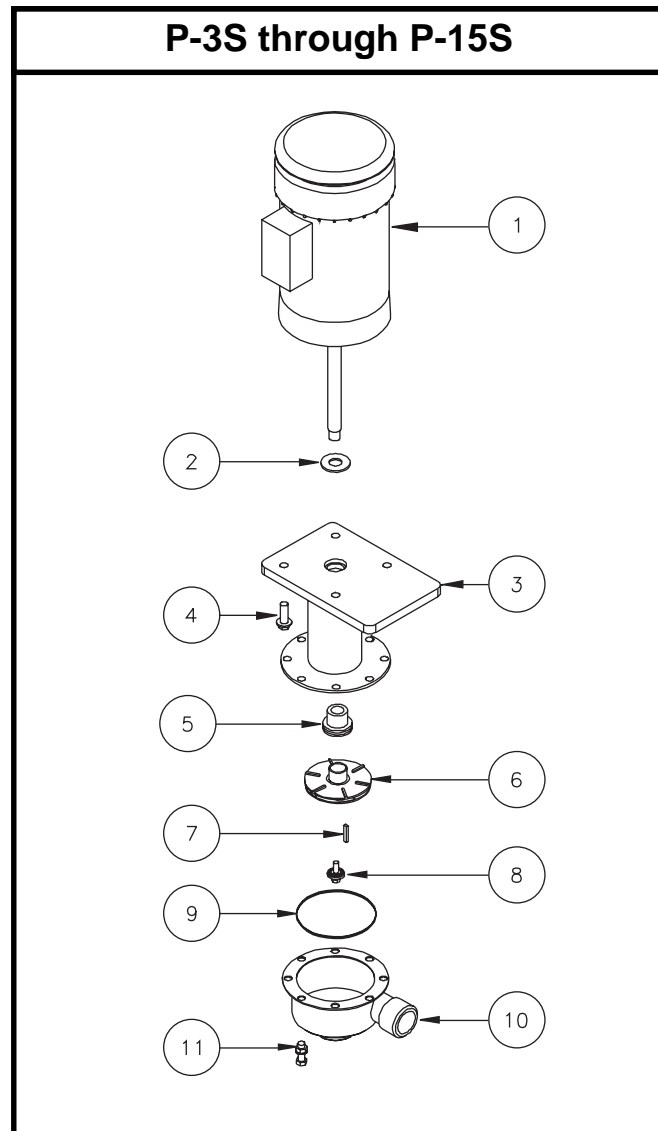
## **RECOMMENDATIONS**

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Always make sure there is enough liquid in the reservoir and the level is high enough, considering the capacity of the pump unit. Inadequate liquid will cause vortex in the reservoir. A vortex occurs when air mixes from the surface into the fluid, which can disturb the flow and also prevents the pump from priming. In cases where the pump is installed outside the reservoir, do not run against a closed discharge valve for more than 5 minutes. This will cause overheating of the fluid in the pump and may damage internal parts. If the pump is being run against a closed discharge valve for a long duration of time, install a small bleed line back into the reservoir before the discharge valve of the pump. If the line is small, there is a minimum pressure loss. This prevents overheating by recirculating the fluid.

# Spare Parts List

Item	Description	P-3S	P-5S	P-7 1/2S	P-10S	P-15S
1	Motor/Shaft Ass'y					
	3 230/460 50/60	P-300-3103S	P-500-3103S	P-712-3103S	P-010-3103S	P-015-3103S
1BS	Bearing Set	P-300-01SBS	P-300-01SBS	P-712-01SBS	P-712-01SBS	P-015-01SBS
1EF	External Fan w/Set Screw	P-300-01SEF	P-300-01SEF	P-712-01SEF	P-712-01SEF	P-015-01SEF
1FC	Fan Cover	P-300-01SFC	P-300-01SFC	P-712-01SFC	P-712-01SFC	P-015-01SFC
2	Slinger	P-300-02S	P-300-02S	P-712-02S	P-712-02S	P-015-02S
3	Pump Column Ass'y	P-300-03S	P-300-03S	P-300-03S	P-300-03S	P-300-03S
4	Motor Bolt Ass'y	P-300-04S	P-300-04S	P-300-04S	P-300-04S	P-300-04S
5	Bushing PTFE	P-300-05SP	P-300-05SP	P-300-05SP	P-300-05SP	P-300-05SP
6	Impeller	P-300-06S	P-500-06S	P-712-06S	P-010-06S	P-015-06S
7	Shaft Key	P-300-07S	P-300-07S	P-300-07S	P-300-07S	P-300-07S
8	Impeller Bolt Ass'y	P-300-08S	P-300-08S	P-300-08S	P-300-08S	P-300-08S
9	Pump Housing O-Ring	P-300-09SV	P-300-09SV	P-300-09SV	P-300-09SV	P-300-09SV
10	Pump Housing	P-300-10S	P-300-10S	P-300-10S	P-010-10S	P-010-10S
11	Pump housing Hardware	P-300-11S	P-300-11S	P-300-11S	P-300-11S	P-300-11S



# **Maintenance**

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## **DISASSEMBLY**

1. Remove the eight (8) suction casing screws. The suction casing can now be removed. Suction casing O-rings can easily be replaced.
2. Place a screwdriver between fan blades and unscrew the impeller nut using a  $3/4$  inch open wrench in a counterclockwise rotation.
3. With the pump in a vertical position, impeller up, place a screwdriver between the impeller top and the housing. Carefully lift the impeller and remove. If impeller does not remove easily, proceed to step 4.
4. Remove the four (4) motor bolts located beneath the motor bracket. Motor and housing are now separated. Slinger can be replaced. Using a rubber mallet hit the pump bracket lightly, top side facing motor, until the impeller and keyway pop loose.

## **ASSEMBLY**

1. With the motor in a vertical position, shaft upwards, place housing over shaft, lining up motor bolt holes in the mounting bracket with holes in the motor. Be sure the slinger is properly in place. Screw the motor bolts into the holes beneath the mounting bracket in a diagonal sequence. Be sure motor screws are tight.
2. Insert the impeller into the housing until it bottoms out. Do not hammer the impeller down on the shaft. Line up the keyway and insert key by lightly tapping it with a hammer. Screw the impeller nut clockwise, holding impeller until tight.
3. Place the pump upright resting on the motor. Look down into the housing and, while rotating the impeller, check to see that the impeller is centered. The back impeller must not be touching column assembly.
4. Be sure suction casing O-ring is properly in place. Line up through holes in suction casing with the through holes in the column assembly making sure discharge assembly is pointed in the desired direction. Insert and tighten the eight (8) screws and nuts.



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