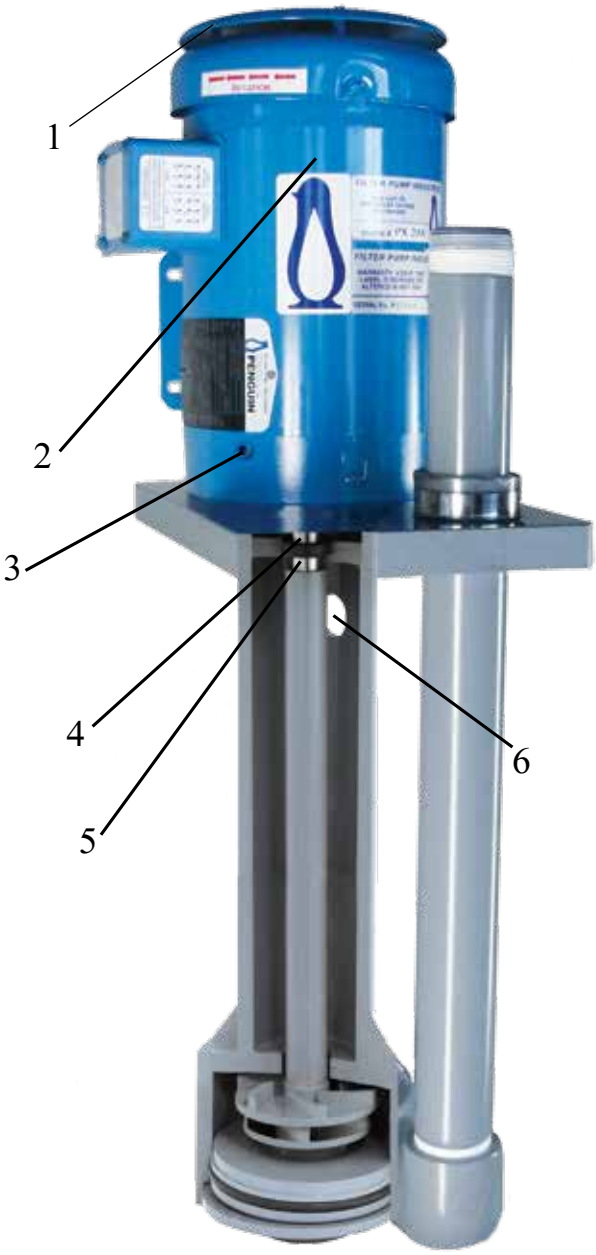
PENGUIN

Installation & Maintenance

Series PX
VERTICAL PUMP



Models:

PX-1/2-HP
PX-3/4-HP
PX-1
PX-1 1/2
PX-2

Materials:

A - CPVC
B - Polypropylene
C - PVDF

1. Motor fan cover with drip shield.
2. Standard TEFC Epoxy coated motor.
3. Air purge plug.
4. One-piece stainless steel rotor shaft assembly. (Optional 316 SS or Titanium shaft available on most models, 1/3hp-15hp)
5. Viton vapor seal/fume barrier assembly.
6. Overflow / vent port.

INTRODUCTION

Penguin Pumps are designed to handle a large range of chemicals without difficulty. All wetted parts constructed of CPVC (A), polypropylene (B), or PVDF (C). Series P pumps have an upper working temperature of 180 (A)/150 (B)/280 (C) degrees, respectively, and thus can handle most 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 & Operation Instructions

Install the pump as close as possible to the reservoir from which the liquid is being pumped. More energy is necessary to prime the liquid than to discharge the fluid, make the suction as short as possible.

The correct liquid level is very important. A liquid level which is too high could cause motor damage.
CHECK THE LIQUID LEVEL. The correct liquid level is halfway between the vent hole and the centerline of the discharge nozzle.

Installation & Operation Instructions

ELECTRICAL

All models supplied with a single phase, up to 1hp, are dual voltage,115/230V motors. The factory wires all dual voltage motors for the lower voltage (115/230V) unless otherwise requested. When changing from 110/115V wiring to 220/230V wiring, follow the motor manufacturer's wiring instructions, which are found in the motor junction box. Be sure to wire the motor for counterclockwise rotation as viewed from the suction entrance of the pump. A power cord and plug are supplied for immediate plug-in operation on motors wired for the lower voltage. These motors have already been wired at the factory for proper rotation. A plug is not supplied on motors wired 220/230V. All motor housings are epoxied coated.
An on/off switch is optional on single phase. Motors supplied in three phase 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, the pump head and snap ring must be removed prior to bump starting. 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 fast as possible. Do not leave motor running. As viewed from the suction entrance of the pump, check for counterclockwise rotation. If clockwise rotation, change any two leads and again check rotation. Replace head and snap ring as described in Assembly.

PLUMBING

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.

PRIMING

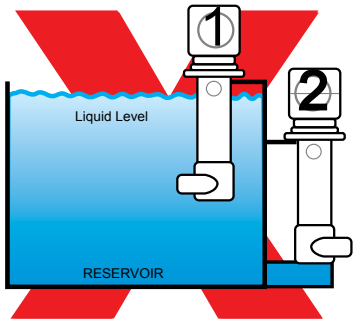
Under flooded conditions, open all the valves in the suction and discharge lines. Wait a few minutes to let entrapped air out. Close all valves on the discharge line. Leave suction valves wide open. A closed suction valve could cause damage to the impeller and the shaft. Start the pump against a throttled discharge valve 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.

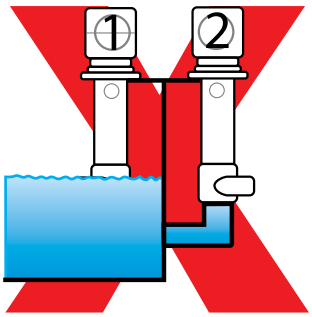
RECOMMENDATIONS

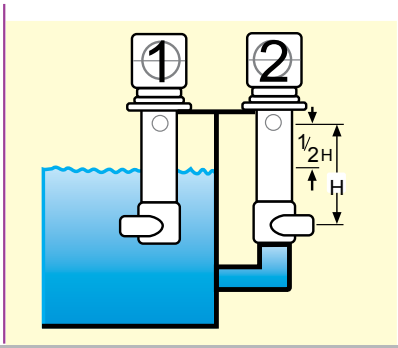
Always make sure there is enough liquid in the reservoir and the level is high enough, considering the capacity of the pump unit. Inadequate liquid will cause vortex in the reservoir. A vortex occurs when air mixes from the surface into the fluid, which can disturb the flow and also prevents the pump 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 will damage the CPVC parts. Temperature in this case will increase up to 220 degrees. 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.

RECOMMENDED INSTALLATION

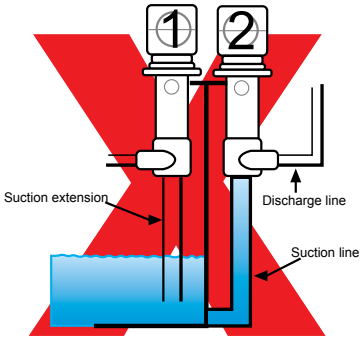
LIQUID LEVEL

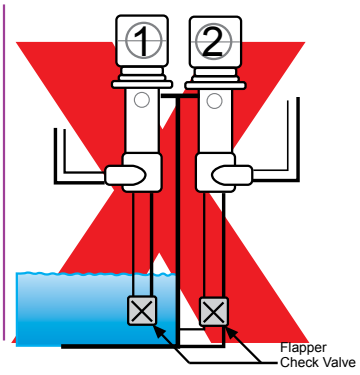


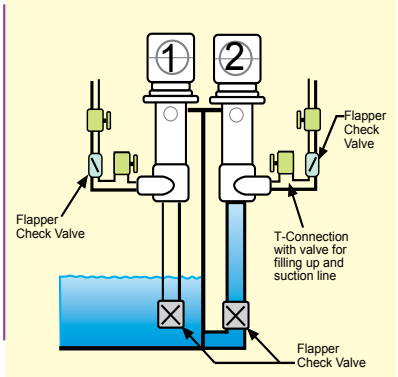




SUCTION LEVEL







Recommended Installation

SUCTION HEAD

KEY

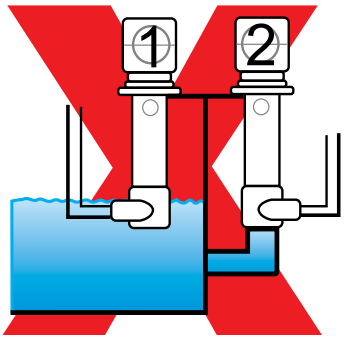
1 In-Tank Installation

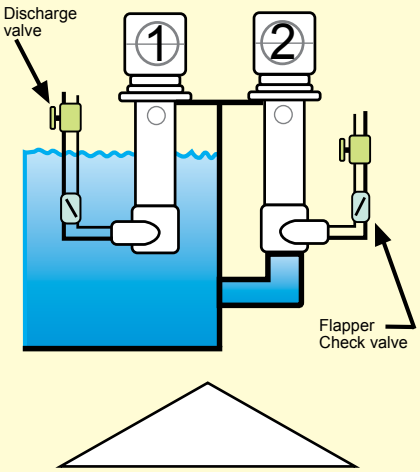
2 Out-Of-Tank Installation

Valve

Check Valve

Flapper Check Valve



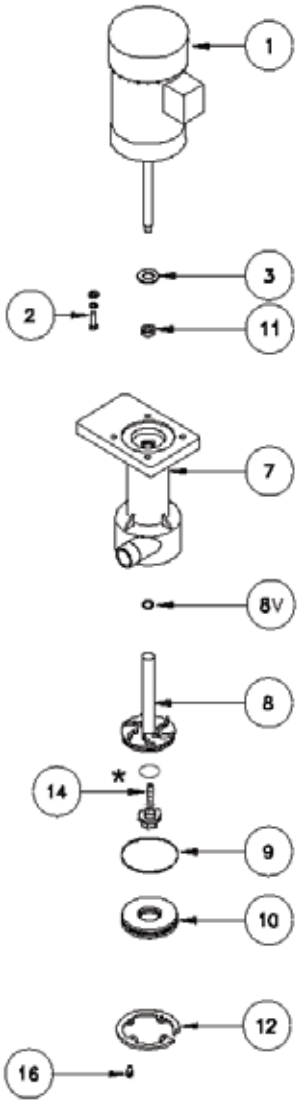


Recommended installation for optimal performance and endurance.

Exploded View and Spare Parts List

PX-1/2HP, PX-3/4HP, PX-1, PX-1-1/2, PX-2

Series P Spare Parts List						
		PX-1/2-HP	PX-3/4-HP	PX-1	PX-1 1/2	PX-2
Item	Description	Part No.	Part No.	Part No.	Part No.	Part No.
1	Motor/Shaft Ass'y					
	Phase-Voltage-Cycle					
	1 115/230 60	PX-120-0103	PX-340-0103	PX-100-0103		
	w/ titanium shaft	PX-120-0103-T	PX-340-0103-T	PX-100-0103-T		
	1 115/230 50/60	PX-120-2103	PX-340-2103	PX-100-2103	PX-112-2103	
	w/ titanium shaft	PX-120-2103-T	PX-340-2103-T	PX-100-2103-T	PX-112-2103-T	
	3 230/460 50/60	PX-120-3103	PX-340-3103	PX-100-3103	PX-112-3103	PX-200-3103
	w/ titanium shaft	PX-120-3103-T	PX-340-3103-T	PX-100-3103-T	PX-112-3103-T	PX-200-3103-T
1BS	Bearing Set	P-120-01BS	P-120-01BS	P-120-01BS	P-120-01BS	P-120-01BS
1EF	External Fan w/Set Screw	P-120-01EF	P-120-01EF	P-120-01EF	P-120-01EF	P-120-01EF
1FC	Fan Cover (w/Drip Shield	P-120-01FC	P-120-01FC	P-120-01FC	P-120-01FC	P-120-01FC
2	Motor Screw/Bolts/Washer Ass'y	P-120-05 (4)	P-120-05 (4)	P-120-05 (4)	P-120-05 (4)	P-120-05 (4)
3	Slinger	P-120-02	P-120-02	P-120-02	P-120-02	P-120-02
7A	Pump Housing Ass'y-CPVC	PX-100-07A	PX-100-07A	PX-100-07A	PX-100-07A	PX-200-07A
8AK	Impeller - CPVC	P-120-08AK-HP	PX-340-08AK-HP	PX-100-08AK	PX-112-08AK	PX-200-08AK
8V	Impeller - O-Ring-Viton	P-120-07V	P-120-07V	P-120-07V	P-120-07V	P-120-07V
9E	Head O-Ring - EPR	P-100-09E	P-100-09E	P-100-09E	P-100-09E	P-100-09E
9V	Head O-Ring - Viton	P-100-09V	P-100-09V	P-100-09V	P-100-09V	P-100-09V
10A	Head - CPVC w/wear ring	P-100-10A-WR	P-100-10A-WR	P-100-10A-WR	P-100-10A-WR	P-200-10A-W
11V	Lip Seal Ass'y - Viton	P-120-11V	P-120-11V	P-120-11V	P-120-11V	P-120-11V
12A	Snap Ring - CPVC	P-100-11A	P-100-11A	P-100-11A	P-100-11A	P-100-11A
13E	Impeller Nut O-Ring - EPR	P-100-08EK	P-100-08EK	P-100-08EK	P-100-08EK	P-100-08EK
13V	Impeller Nut O-Ring - Viton	P-100-08VK	P-100-08VK	P-100-08VK	P-100-08VK	P-100-08VK
14AKE	Impeller Nut - CPVC/EPR (set)	P-100-14AKE	P-100-14AKE	P-100-14AKE	P-100-14AKE	P-100-14AKE
14AKV	Impeller Nut - CPVC/Viton (set)	P-100-14AKV	P-100-14AKV	P-100-14AKV	P-100-14AKV	P-100-14AKV
16A	Snap Ring Screw - CPVC	P-100-16A*	P-100-16A*	P-100-16A*	P-100-16A*	P-100-16A*
17AK	Pump Head Ass'y - CPVC	P-120-13AKHP	P-340-13AKHP	P-100-13AK	P-112-13AK	P-200-13AK
* Includes O-ring ( ) Indicates quantity required other than (1)						



NOTE: This manual covers several different configurations of P-Series pumps. Be sure to select the appropriate model number for your pump.

MODEL: PX-1/2-HP, PX-3/4-HP, PX-1, PX-1 1/2, PX-2

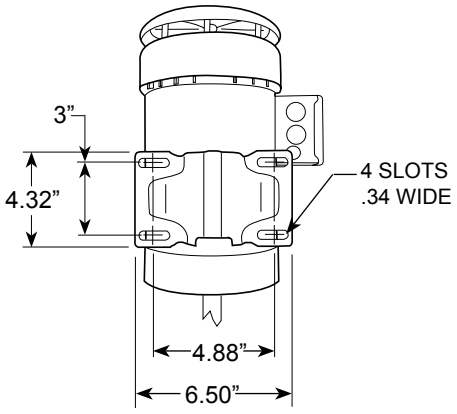
DISASSEMBLY

1. Remove the four (4) snap ring screws, being careful not to lose the O-rings. Remove the snap ring using a screw driver or a pair of pliers.
2. Insert the appropriate threaded pipe through the center hole at the end of the housing to remove the head. Pull with a rock ing motion to remove. Head O-ring can easily be replaced.
3. Take the plug out from the back of the fan cover or drip shield. Remove impeller nut assembly using a 7/16" wrench. Insert a screw driver in the slot of the motor shaft and unscrew the impeller counterclockwise using fingers or the handle end of a pair of pliers.
4. Remove the four (4) motor bolts located beneath the motor bracket. Motor and housing are now separated. Do not try to remove the shaft as this is an integral piece with the motor ro tor. Slinger and lip seal can be replaced.

ASSEMBLY

1. With the motor in a vertical position, shaft upwards, place housing over the shaft, lining up motor bolt holes in the mounting bracket with holes in the motor. Be sure the slinger is properly in place. Conduit box should be 180˚ from the outlet. 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. With one hand holding a screwdriver in the slot of the motor shaft and the other hand on the impeller, turn the impeller clockwise with fingers or the hankle end of a pair of pliers until the impeller bottoms out.
3. Attach impeller nut assembly to shaft with impeller nut O-ring using a 7/16" wrench.
4. 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 impeller must not be touching the side of the housing.
5. Replace plug in the back of the fan cover or drip shield. Wet head and head O-ring. Be sure head O-ring is properly in place. Insert the appropriate threaded pipe into head and replace in housing. The threaded pipe should be tapped with a mallet, pushing the head into the housing until the snap ring grove is exposed. Remove pipe and replace snap ring. Line up through holes in the snap ring with the threaded holes in the head by rotating the snap rings counter cloclwise. Insert and tighten the four (4) snap ring screws.

Mounting Diagram PX1/2 - PX2



A Division of Penguin Pumps Inc.
7932 Ajay Drive Sun Valley, CA 91352 U.S.A.
877-773-6484 • Office: 818-504-2391 • Fax: 818-768-7590
e-mail: info@filterpump.com • website: www.filterpump.com

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