

Installing Your PROCON Pump

Your PROCON pump is a precision-built piece of equipment. Handle it carefully. PROCON pumps should be installed only by qualified technicians.

NOTICE

When you install your pump, follow these guidelines:

- Do not hammer or mishandle your pump.
- Keep all foreign materials out of your pump.
- Never vise or grip the round body portion of the pump housing. Grip only the square inlet/outlet bosses when you install fittings. Always support the pump when you install fittings to avoid bending the V-band clamp even if the pump is already mounted to the motor.
- Make sure the power is off before working with an electric motor. If possible, lock out the power at a disconnect.
- Make sure you have an adequate, well-lit work space and use the correct tools.
- Do not use any components that are damaged or deformed. You should not have to force any parts together. If you receive parts that are damaged or deformed, call your PROCON factory representative.

We test every PROCON pump at the factory for pressure and flow. If the pump has a relief valve, we set it to your specifications.

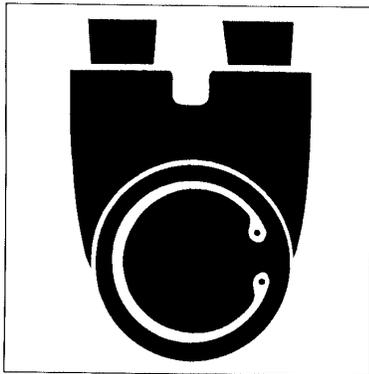
CAUTION

Do not tamper with the relief valve on your pump. If you think the relief valve needs to be reset, contact your PROCON factory representative.

We make every effort to ensure that your pump is of the highest quality. To get the most out of your pump, **read and follow these instructions carefully.**

For all motors--examining your pump before you get started

Before you install your pump, you must carefully unpack the pump and examine and prepare it to be installed. Follow these steps for all types of motors.



Do not remove the shipping plugs from the ports at the top of the pump until time to install fittings.

NOTICE

Do not exchange one pump model for another. Pumps are carefully engineered to meet specific requirements and flow rates.

All pumps within a series have the same housing. They may look alike, but they perform differently. Check the model number to make sure you have the correct pump before you install it.

Using the wrong pump may damage your pump, your system, or your electric motor.

- 1 Take the pump out of its shipping container.

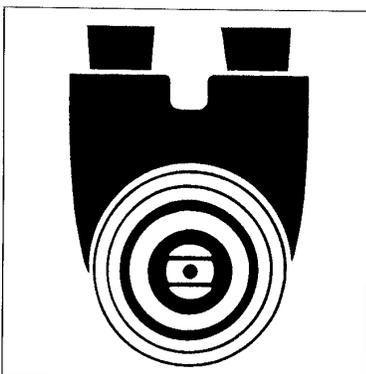
Do not remove the shipping plugs from the port until the fittings are ready to be installed. This will keep debris out of the pump.

If the pump has a shaft coupling, remove the coupling and discard the foam shipping strip. Reinsert the coupling.

Be careful when handling the pump; do not drop it or bang it. If you mishandle the pump, especially the shaft end, you can disrupt or damage internal clearances and impair performance of your pump.

- 2 Examine the mounting surfaces.

Carefully remove any burrs or raised metal which may have occurred during unpacking and handling to make sure the pump will sit and be aligned properly.



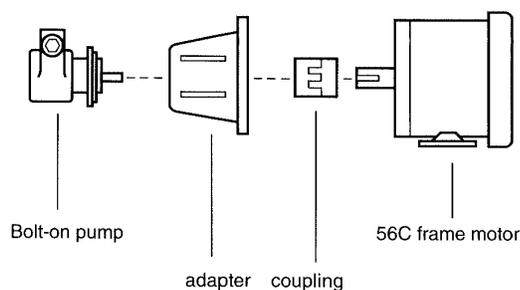
Examine the mounting surfaces on the pump.

Now you are ready to mount the pump to a motor. PROCON pumps work with two types of electric motors -- a carbonator style motor (NEMA 48YZ frame) and a C-frame motor (NEMA 56C frame). Follow the steps for the type of motor you are using.

Mounting your pump on a 56C frame motor

You should have these parts:

- bolt-on PROCON pump
- PROCON motor adapter
- 3-piece drive shaft coupling
- 56C frame motor



Correctly assembling the coupling and the adapter, and mounting the pump is a trial and error process. You may have to try several times before you get it right. Follow these steps after you have examined your pump.

- 1 Mount the drive shaft coupling.
 - a. Make sure motor is electrically disconnected and cannot accidentally turn on.
 - b. Mount the half of the coupling for the motor onto the motor shaft and tighten the set screw.
 - c. Insert the elastomer piece onto the motor piece.
 - d. Mount the half of the coupling for the pump onto the pump shaft, but do not tighten the set screw.

Make sure the coupling slides easily onto the pump and the motor shaft -- do not force it. Make sure the shaft does not protrude into the space occupied by the elastomer piece. Series 6 pumps require a shaft key.

- 2 Mount the motor adapter onto the motor using four 3/8 inch dia. by 1 inch long bolts (16 threads/inch) and lock washers.

Rotate the pump to orient the inlet/outlet ports as desired.
- 3 Trial mount the pump onto the motor adapter while simultaneously engaging the coupling pieces.
- 4 Check to make sure that the coupling is properly engaged.
- 5 Tighten the set screw on the pump coupling half.
- 6 Check your assembly.

The elastomer coupling piece should have about 1/16 inch of play between the two metal pieces.

If it does, go to step 7.

If it does not, repeat steps 1 through 5, until the assembly is correct.
- 7 Fasten the pump to the adapter using three 1/4 inch dia. by 3/4 inch bolts (20 threads/inch) and lock washers. For Series 6 pumps, use two 3/8 inch dia. by 1 inch bolts (16 threads/inch).

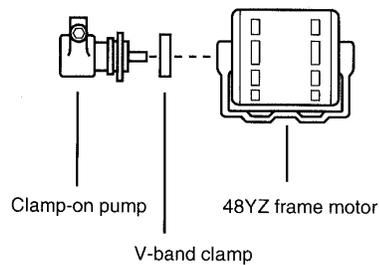
8 Check to make sure that your motor rotates correctly.

Motor rotation must correspond to the rotation arrow on the nameplate of the pump.

Mounting your pump on a 48YZ frame motor

You should have these parts:

- clamp-on PROCON pump
- PROCON V-band clamp
- 48YZ frame motor

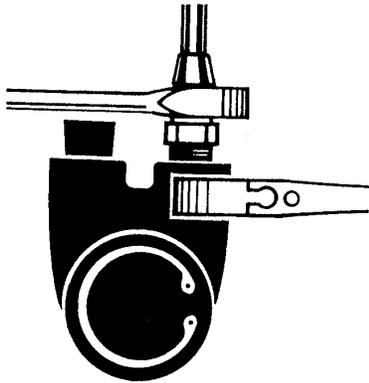


After you have examined your pump for damage, follow these steps.

- 1 Make sure motor is electrically disconnected and cannot accidentally turn on.
- 2 Slip the V-band onto the motor ring flange.
- 3 Mount the pump to the motor by inserting the tang (shaft) of the pump into the slot on the motor.
- 4 Rotate the pump to orient the inlet/outlet ports as desired.
- 5 Make sure the ring flanges on the pump and on the motor are properly engaged and flush against one another.
- 6 Make sure the clamp is fully seated around the entire circumference of the pump and motor flanges.
- 7 Tighten the V-band clamp using 15 to 30 inch-pounds of torque.

Note: Do not over tighten the clamp. The V-band clamp is designed to support the pump and fittings only. Loads caused by rigid plumbing or heavy attachments may result in misalignment.

For all motors--installing the plumbing



Use a backup wrench on the square port boss to support the pump.

When you finish mounting your pump on a motor, you must install the plumbing for the pump. Follow these steps after you have mounted your pump.

- 1 Install the inlet and outlet fittings.

Support the pump by using a backup wrench on the square port bosses. Do not put any strain on the V-band clamp.

Use brass fittings or plastic fittings on a brass pump. Use stainless steel or plastic fittings on a stainless steel pump. Using dissimilar metals can cause corrosion, which may get into the pump and cause damage.

Use Teflon thread tape to install the fittings. Do not let any thread tape get into the pump and do not over-tighten the fittings.

- 2 Check the inlet line.

Make sure that the inlet line is big enough to allow adequate flow to the inlet port of the pump (3/8 inch internal diameter for Series 1, 2, & 3 ; 1/2 inch internal diameter for Series 4 & 5; 1 inch internal diameter for the Series 6; all elevated temperature applications above 150°F must have oversized inlet piping).

Make sure that the inlet line is clean and properly flushed out. Protect the pump with a 100 mesh or finer strainer or filter.

- 3 Connect the inlet line to the fitting on the pump.
- 4 Connect the outlet line to the fitting on the pump.

Using PROCON Pumps Safely

Learn to recognize safety information, and always follow recommended precautions and safe operating practices.

When you see this safety-alert symbol, be alert to the potential for causing personal injury or property damage.



Safety warnings for your pumps



This catalog uses the following words to identify hazards and potential problems:

This word: Means this:

WARNING You **may** seriously hurt or kill yourself or someone else if you ignore the message.

CAUTION You **may** hurt yourself or someone else or you may damage your equipment if you ignore the message.

NOTICE Pay special attention to this important installation, operation, or maintenance information. If you ignore this information, you may damage your pump.

Read these safety warnings before you install or operate PROCON pumps. Be sure to follow the instructions carefully.

Do not pump flammable or hazardous fluids through your pump

Your pump was not designed to be used with flammable or otherwise hazardous fluids. If you use your pump with hazardous fluids and it leaks, it could create various hazards including fire, health, environmental, etc.



Do not use a pump that is leaking

If a pump begins to leak, stop using it immediately. Disconnect the power to the pump motor and clean up the fluid. Leaking pumps should no longer be used; replace with new pump or have pump rebuilt.

Keep your pump from leaking by following these three rules:

1. Do not let the pump run dry.

Do not let the pump run dry for more than 2 minutes. The self-lubricating, internal parts protect the pump only against very brief dry runs.

Running the pump dry may score or wear out the internal parts, causing performance loss. It may also damage the mechanical seal, causing the pump to leak fluid.

2. Do not run the pump against a closed discharge.

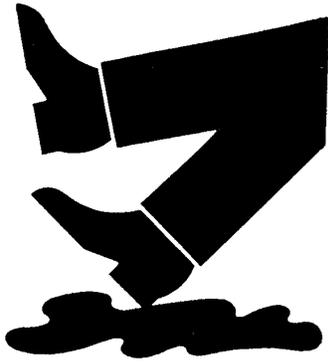
Running a pump against a closed or blocked discharge may cause pressure to build up to a dangerous level if there is no relief valve.

Heat will build up in the pump and may cause the internal parts to wear out rapidly. It may also ruin the mechanical seal.

PROCON's relief valves are designed to protect your pump against only short periods of over-pressure. PROCON's relief valves should not be used as flow control valves.

3. Do not tamper with the setting of the relief valve.

The relief valve is set at the factory to your specifications.



Keep the floor around your pump dry

Make sure you keep the floor around your pump dry. If any liquid leaks onto the floor, clean it up immediately.

Serious injury can occur if you slip.



Do not touch the pump when there is liquid on the floor

Your pump operates with an electric motor. You can be electrocuted if you touch the pump when you are standing in liquid.

You can increase your safety by using "ground fault interrupter (GFI)" type circuit breakers.



Protect children

Keep children and other people who do not know how to operate the pump away from your pumps and the systems in which they are used. Children may not understand that equipment is sometimes dangerous to them and others.

Never allow children to play with or operate your pumps.



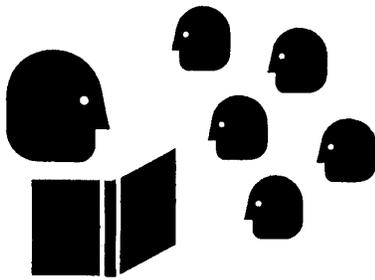
Be prepared for emergencies

Be prepared for fires, injuries, or other emergencies.

Keep a first aid kit and a fire extinguisher near the pumps and the systems in which they are used.

Keep emergency numbers for doctors, ambulance services, hospitals, and the fire department near your telephone.

Know how and where to disconnect power to the pump motor.



A note to all employers

Know your responsibilities as an employer.

- Make sure your employees know how to operate the pumps safely.
- Make sure your employees are aware of the safety warnings in this catalog.
- Thoroughly train your employees about operating the pumps and other equipment safely.
- Keep the pumps in proper working condition. If you make unauthorized modifications to a pump, you may reduce the function and safety of the pump.
- Communicate all PROCON safety information to your customers.

Suggested Piping Layout for PROCON Pumps

NOTICE: Your pump can be ruined or its service life shortened if it does not meet these operating conditions at all times.

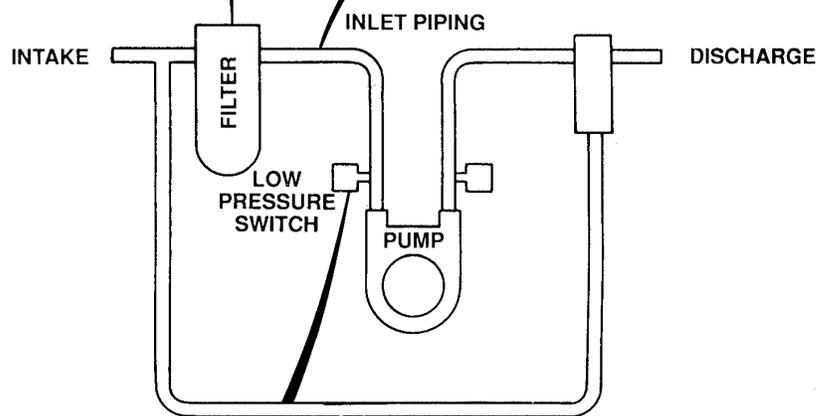
- Pumps must have a fluid supply to the pump inlet greater than the pump's flow rating.
- Fluid must be compatible with the pump materials.
- Fluid must not contain any particles.
- Pump must not operate above its rated discharge pressure.
- Fluid flow should not stop suddenly while the pump is running.
- Operating pressure should be 50 psi below PROCON's relief valve setting.
- Applications with operating temperatures above 150°F require oversized inlet piping.
- If using compressed air to purge the pump of fluid, install a coalescing filter in the air system to prevent contaminated air from entering the pump.

We suggest that you use the precautionary measures and piping layout that follow. This layout promotes a long, trouble-free life for your pumps.

If particles may contaminate the fluid, use a particulate filter that is capable of filtering particles larger than 125 microns. If the particles are abrasive, use a filter that is capable of removing virtually all of the particles.

The inlet piping should have a minimum interior diameter of

- 3/8 inch for Series 1, 2, & 3 pumps
- 1/2 inch for Series 4 & 5 pumps
- 1 inch for Series 6 pumps



If the pump may possibly experience insufficient fluid supply (low flow rate), install a pressure or suction switch to prevent cavitation. This switch should be mounted or ported close to the pump inlet. Series 1, 2, 3, 4 & 5 pumps may operate with as much as 6 feet of suction lift, with the exception of the 330 GPH models, which require a minimum of 20 PSI inlet pressure. Series 6 pumps must have positive inlet pressure.

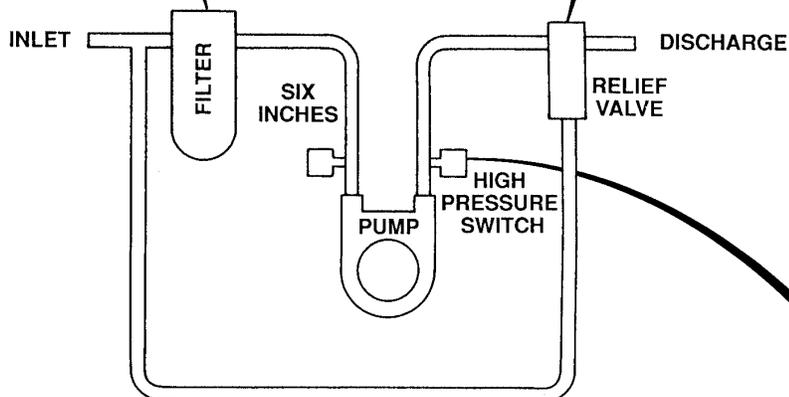
If the inlet pressure falls too low while the pump is operating, the switch will shut the pump motor off. By shutting the motor off, this switch helps protect the pump from cavitation due to an insufficient fluid supply or a plugged filter.

As shown, the by-pass flow is directed to the inlet feed line. However, if your system is operating from a feed reservoir, we recommend by-passing any flow of the relief valve directly back into the reservoir, rather than back into the inlet feed line. If the inlet feed line is used, introduce the by-pass flow at least 12 inches upstream of the pump inlet port.

Make sure there is at least 6 inches of piping between the pump inlet and any "T-fitting," elbow, or system component to minimize turbulence. The piping should be made from a material that does not corrode or shed particles. A flexible hose of plastic, copper or stainless steel are good choices, among others. Be sure no joint compound or tape falls into the inlet of the pump.

If it is possible that the pump in your system may experience a sudden blockage of the discharge, then a customer supplied external relief valve should be installed on the discharge line and set to a maximum of 250 psi.

At a setting of 250 psi or less, the relief valve should prevent sudden over-pressurization. If the discharge becomes blocked, the relief valve will bypass the fluid from the discharge line back to the reservoir or inlet line. Piping length should be long enough to allow heat dissipation and prevent the pump from overheating.



SOLENOID VALVES

If you use solenoid valves in conjunction with PROCON pumps, take the following precautions to prevent serious over/under pressurization.

If you can incorporate a time delay into the control circuit to turn off the pump motor and allow it to stop prior to the closing of the solenoid valve, then you can put the solenoid valve on either the inlet or the discharge of the pump. Also, the time delay should allow time for the solenoid valve to fully open prior to starting the pump motor.

If a time delay is not possible, locate the solenoid valve on the discharge side of the pump downstream of the relief valve.

If it is possible that the pump in your system may experience too much discharge back pressure, install a pressure switch set to 250 psi .

Mount or port this pressure switch close to the pump outlet. If the outlet pressure rises too high while the pump is operating, the switch will shut the pump motor off. By shutting the motor off, this switch will help protect the pump from over-pressurization.

Troubleshooting Tips for PROCON Pumps

WARNING

Before you try to work on the pump or the system, turn the motor off and disconnect the power to the motor.

Problem	Possible cause	Possible solution
Pump is working below its capacity	inlet is clogged or restricted internal strainer is clogged or restricted	Clean out the inlet line. If you have an inlet filter or internal strainer, clean it (replace it if more than 20% clogged). Do not allow debris to fall into pump from filter.
	pump is rotating in the wrong direction	Change motor rotation by properly rewiring it.
	low motor rpm	Check your motor to make sure it is working properly and that it is wired for the voltage and frequency (50 or 60 HZ) that you are using. (See motor specification plate.)
	inside of the pump is wearing out, caused by foreign or abrasive materials getting into the pump	Have the pump rebuilt by PROCON. To prevent future failures, make sure you have an adequate filter on the inlet line.
	relief valve setting is incorrect	Contact your PROCON representative about having the relief valve reset.
Pump is leaking	mechanical shaft seal or rubber O-ring is failing	Have the pump rebuilt by PROCON.
	relief valve cap or strainer cap is loose	Tighten the cap on the relief valve or strainer.
	relief valve cap or strainer cap o-ring or gasket are damaged	Replace the damaged o-ring or gasket. Contact PROCON for these parts.
	inlet or outlet port fittings are loose or sealant failed	Apply joint compound or tape and reinstall the fittings. Do not allow sealant to fall into pump.

Problem	Possible cause	Possible solution
Pump is noisy	inlet is clogged or restricted internal strainer is clogged or restricted	Clean out the inlet line. If you have an inlet filter or internal strainer, clean it (replace it if more than 20% clogged). Do not allow debris to fall into pump from filter.
	acorn nut on the relief valve or strainer cap is loose	Tighten the acorn nut on the relief valve or the strainer cap.
	gasket or O-ring on the acorn nut or strainer cap is defective	Replace the gasket or the O-ring on the acorn nut or the strainer cap. Do not tamper with the relief valve setting. Contact PROCON for parts.
	coupling, mounting bolt, or V-band clamp is loose	Turn off the motor and disconnect the power to the motor. Then, properly align and tighten the loose component.
	the pump and the motor are misaligned	Turn off the motor and disconnect the power to the motor. Remove the pump from the motor. Then remount the pump onto the motor, making sure you align it properly.
Motor is stalling or overloads are tripping out	the pump and the motor are misaligned	Turn off the motor and disconnect the power to the motor. Remove the pump from the motor. Then remount the pump onto the motor, making sure you align it properly.
	lime and mineral deposits in the pump are causing internal binding	Have the pump rebuilt by PROCON.
	motor may be defective	Contact your motor supplier.
	motor may be wired for wrong voltage	Check wiring against wiring diagram supplied with the motor.