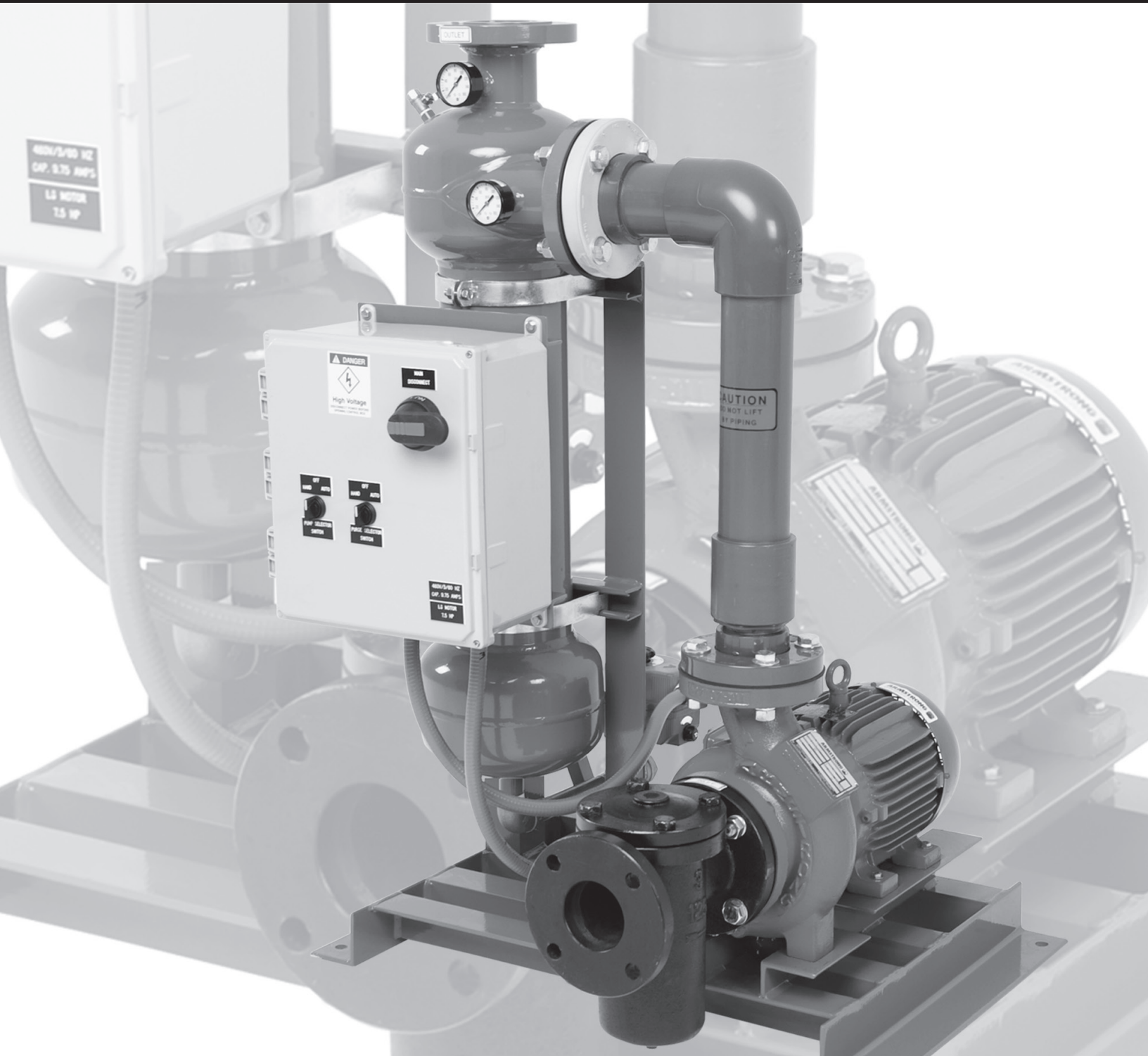


OPERATION AND MAINTENANCE MANUAL

PF-64 Series

Separator



PUROFLUX
CORPORATION

PF-64 SERIES SEPARATOR

Please read this **OPERATION AND MAINTENANCE MANUAL** thoroughly and understand all safety related issues before attempting any work on the PF-64 series separator.

INTRODUCTION

PUROFLUX is the right choice when it comes to having a more efficient, safe, and effective system. The PF-64 series separators are designed to assist in eliminating expensive “down-time,” reducing operating costs, chemical usage, wear and tear on equipment and maintenance. With over 30 years of combined filtration experience, PUROFLUX engineers can find a solution to a wide variety of filtration problems.

Following the guidelines listed in this manual will help to insure the safety of all personnel who maintain the separator unit and related equipment. If there are any questions on the procedures or performance of the PF-64 series separator contact the local factory representative or call the factory direct at (805)579-0216. **Do not** operate the separator until all questions about operating procedures are answered by a qualified representative. This manual covers recommended procedures for installation and anchoring, start-up and shut down, safety and maintenance.

NOTE:

All recommendations are minimums. The environment/operating conditions in which the separator unit is installed will dictate the frequency of scheduled maintenance. Maintaining your PF-64 series separator will assure a long trouble free life.

NOTE:

Puroflux reserves the right to change, modify, or revise this manual at any time without prior notification.

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SECTION 1

RECEIVING AND INSTALLATION

Recommended procedures for the receiving of equipment and proper installation of the PF-64 series separator.

RECEIVING EQUIPMENT

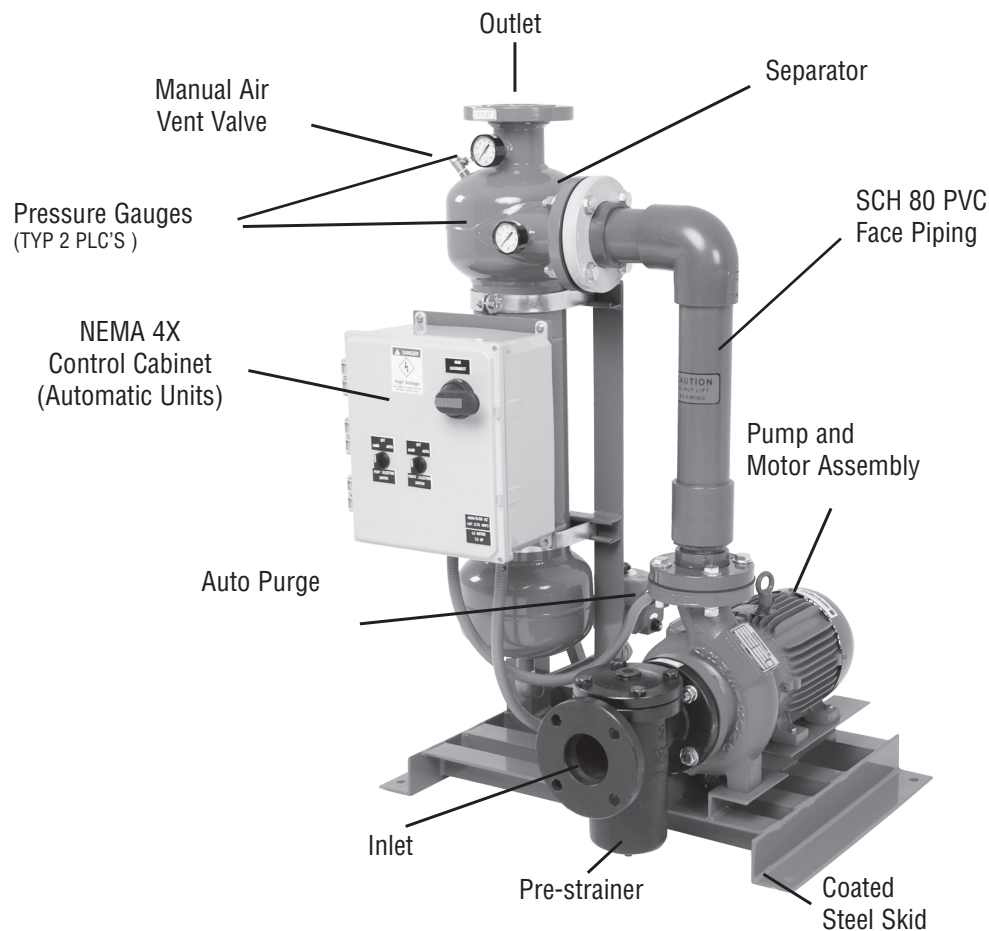
Before accepting the separator equipment and prior to signing the bill of lading, all equipment should be checked thoroughly for any shipping damage. Make sure that all required equipment noted on the bill of lading is received. Refer to Figure 1 and Table I for components to be inspected upon receiving.

Check the model and serial number against the packing slip. Serial and model numbers can be found on a nameplate inside the control cabinet (automatic unit)

Table I – Receiving / Inspection

| |
|------------------------------------|
| Separator (PF-61 Series) |
| Coated Steel Skid |
| Pressure Gauges |
| Sch. 80 PVC Interconnecting Piping |
| Isolation Valves (Optional Item) |
| Manual Air Vent Valve |
| Motor Controls (NEMA 4X Cabinet) |
| Pump & Motor Assembly |
| Pre-strainer |
| Auto Purge |

**Figure 1
PF-64 Series Separator**



DESIGN CRITERIA

The PUROFLUX standard PF-64 series separator is designed for use in closed circuit or open process liquid applications. Standard equipment design is 150 psi @ 100°F (temperature dependent - higher design pressures and temperatures are available). The PF-64 series separator will remove suspended solids with a specific gravity of 1.2 or higher down to 45 micron/325 mesh.

The PF-64 series separator packages utilize a PF-61 series separator. Standard units are equipped with motor controls, inlet and outlet gauges, pump and motor, cast iron pump pre-strainer, Sch. 80 PVC inter-connecting piping, manual air vent valve, coated steel skid and automatic purge valve. Optional items include manual purge and removable dome separator.

NOTE:

Never install the PF-64 series separator in an application where the system pressure exceeds the separator package design pressure.

SUPPORT AND LIFTING

The PF-64 series separator can be lifted from the bottom of the separator skid with the skid fully supported. If the unit is hoisted, lifting straps must be placed under the bottom of the separator skid and should not come in contact with the separator components.

INSTALLATION AND ANCHORING

The PF-64 series separator is designed for use in both full flow and slip stream use on pressurized closed systems or open atmospheric systems.

1. Determine the location and orientation of where the separator is to be installed in the piping system or open sump. A three foot clearance is recommended around the separator package for service.
2. Locate the separator package as close to the system piping as possible.
3. Verify that the housekeeping pad will accommodate the weight of the separator under operating conditions. See Table III on page 6 for operating weights.
4. The PF-64 series separator should be rigidly anchored to the floor (see the specification drawing for location and size of the anchor holes).
5. After the PF-64 series separator is installed in its permanent location, the inlet and outlet gauges (if not previously installed) should be installed on the separator vessel (see figure #1 on page 4).

6. Before hook-up begins check the system's inlet (pump & pre-strainer) and outlet for foreign objects, which may have entered during shipment.

7. Always use appropriate hardware to match the separator connections.

NOTE:

Mating flange bolts, gaskets and other miscellaneous fittings are not included with the separator.

8. The inlet connection of the separator is located on the side of the vessel and is pre-plumbed from the pump discharge. The outlet is located at the top of the separator vessel. The purge connection is located at the bottom of the separator vessel. Flow to the separator must enter at the inlet connection and exit at the outlet connection (see Figure 1 on page 4).

| TABLE II - SIZE & CONNECTION | | |
|---|----------------------|------------------------|
| MODEL PF-64 | INLET(INCHES) | OUTLET (INCHES) |
| PF-64-012 | 2 (FLNG) | 1-1/4 (MPT) |
| PF-64-015 | 2 (FLNG) | 1-1/2 (MPT) |
| PF-64-020 | 3 (FLNG) | 2 (MPT) |
| PF-64-025 | 3 (FLNG) | 2-1/2 (MPT) |
| PF-64-030 | 3 (FLNG) | 3 (FLNG) |
| PF-64-040A | 4 (FLNG) | 4 (FLNG) |
| PF-64-040B | 4 (FLNG) | 4 (FLNG) |
| PF-64-050 | 6 (FLNG) | 5 (FLNG) |
| PF-64-060A | 6 (FLNG) | 6 (FLNG) |
| PF-64-060B | 8 (FLNG) | 6 (FLNG) |

| TABLE III - WEIGHT & VOLUME | | | |
|--|-------------------|---------------------|--------------------|
| MODEL PF-64 | DRY (LBS.) | OPER. (LBS.) | VOL.(GALS.) |
| PF-64-012 | 314 | 330 | 2 |
| PF-64-015 | 316 | 332 | 2 |
| PF-64-020 | 380 | 437 | 7 |
| PF-64-025 | 530 | 591 | 8 |
| PF-64-030 | 577 | 643 | 8 |
| PF-64-040A | 800 | 926 | 15 |
| PF-64-040B | 861 | 988 | 15 |
| PF-64-050 | 1045 | 1245 | 24 |
| PF-64-060A | 1400 | 1732 | 40 |
| PF-64-060B | 1520 | 1852 | 40 |

SEPARATOR REQUIREMENTS

1. Puroflux separators are designed to operate within a specified range of 3 to 10 psi pressure drop across the separator. It may be necessary to install a flow control or throttling valve downstream of the separator in order to achieve the proper flow and pressure drop.

NOTE:

Operating outside the specified range of the separator can cause reduced efficiency and possible damage to the separator or system.

2. The separator package should be installed to merge with the natural flow of the system, never against it. A straight run of 5 to 6 pipe diameters up and down stream of the separator is recommended to reduce turbulence.

3. The PF-64 series separators are equipped with a pump designed to maintain proper flows through the separator system. Standard units are equipped with a pump to match the required separator system flow (gpm) @ 60 feet of head (see Table V on page 20). Some installations may require that a throttling valve be installed in the outlet line to regulate the flow or the pump may need to be altered (lower/higher discharge head) to maintain proper flow.

4. The minimum inlet pressure should be at least equal to the pressure loss anticipated through the PF-64 series separator plus the systems down stream pressure requirements.

SYSTEM PIPING OVERVIEW

1. Pipe sizes must be large enough to maintain proper flow. It is important to understand that the selection of a separator is based on the flow rate through the separator (approx. 10 ft/sec.) and not the separator pipe size (connections). If necessary reduce pipe runs at the separator connections to maintain proper fluid velocity. Always follow good piping practices when running piping. The separator connections may be smaller than the actual piping between the separator and system. Upon request Puroflux can provide a typical installation drawing.

2. PVC, copper, steel or galvanized pipe are all acceptable, and may be used when installing the separator. The choice of piping materials will depend on the design criteria and conditions of each installation.

NOTE:

It is important that all piping and components associated with the separator system installation must be supported to eliminate stress on the separator and piping.

NOTE:

Always follow local, county, state or other government agency requirements for piping hook-ups.

SEPARATOR UNIT PIPING:

Piping should be installed for PF-64 series separators on pressurized system or slip stream applications as follows:

1. Table II on page 6 shows PF-64 series separator piping connections and sizes.

NOTE:

Do not reduce the pipe sizes listed, the pipe sizes are minimums. If long runs, excessive fittings or lifts are necessary, enlarge the pipe diameter in order to reduce friction loss.

2a. (Closed circuit or pressurized system) Run an influent line from the pressure side of the system piping to the pump inlet connection labeled "INLET".

NOTE:

The influent line should be piped from the discharge side of the process system pump. A service valve and flange/union should be installed in this line near the separator. For application on pressurized systems where the system pump is utilized, the separator package pump may not be required or should be sized to meet the dynamics of the system.

2b. (Open system or sump) Run an influent line from the deep or depressed portion of an open sump to the pump inlet connection labeled "INLET".

NOTE:

If the separator package or the piping run is above the water level a check or foot valve maybe required to maintain prime. A service valve and flange/union should be installed in this line near the separator.

3a. (Closed circuit or pressurized system) Run an effluent line from the separator return labeled "OUTLET" back to the system piping (low pressure side).

NOTE:

The effluent line should be piped to the suction side of the process system pump. A flow control or throttling device is recommended in the effluent line (separator return) to regulate flow through the separator. A service valve and flange/union should be installed in this line near the separator.

3b. (Open system or sump) Run an effluent line from the separator return labeled "OUTLET" back to the system sump on the opposing side of the suction (influent) line.

NOTE:

If the system dynamics dictate a lower or higher discharge pressure, the pump & motor may require a change to match the actual system dynamics. A flow control or throttling device could also be installed in the effluent line to regulate flow through the separator. A service valve and flange/union should be installed in this line near the separator.

ELECTRICAL CONTROLS

The PF-64 series separator can be supplied in a number of configurations and voltages. Standard voltages include 460v/3Ø/60hz, 230v/3Ø/60hz, 208v/3Ø/60hz (additional alternate voltages are available). Primary voltage will be reduced to 120v control voltage. Control components will vary depending on separator configuration and options.

1. Standard separator units are equipped with a NEMA 4X control cabinet containing a locking combination on/off disconnect switch with motor circuit protection (MCP), control transformer (primary/120v secondary), HOA switch and motor contactor.
2. Manual purge units are provided with a manually controlled purge valve positioner.
3. Automatic purge units are provided with an adjustable purge timer, purge HOA switch and electric valve actuator.

WIRING REQUIREMENTS

Install circuit breaker between the closest branch distribution panel and the control panel (refer to Table IV on page 20 for amperage draw by motor horsepower). The control cabinet is pre-wired and includes a door disconnect switch with overload and short circuit protection.

Manual Purge Unit: Require no additional wiring.

Automatic Purge Unit:

NOTE:

All incoming power supply lines must be connected to the door disconnect when provided.

NOTE:

Always follow local, county, state or other government agency requirements for electrical hook-up.

The electric purge actuator will draw approximately one additional amp.

Section 2

THEORY OF OPERATION

The Puroflux PF-64 series separator utilizes high centrifugal forces to separate solids from liquids. The suspended particulate is simply dropped from the carrying fluid where it is collected for discard. The PF-64 separator does not require a backwashing and will not interrupt throughput when purging. Because no backwash is required, large amounts of system fluids will not be wasted. The separator collects and concentrates particulate as it falls from the process fluid into the accumulation chamber. Because the separator and the accumulation chamber are at equal pressures, there is no need for any additional pressure to induce purging. Purging the accumulation chamber is done without excess waste of system fluid while the separator package remains "on-line".

Influent is fed via the pump tangentially into the separator acceptance chamber. The influent is spun in a downward motion pushing the suspended particulate to the walls of the separator vessel by centrifugal forces. Suspended solids are forced downward into the collection chamber for purge. The clean liquid then reverses direction moving upward entering the vortex finder where it is then returned back to the process system.

OPERATION AND MAINTENANCE

The following information pertains to the procedures, operation and general maintenance of the PF-64 series separator.

Please read this entire OPERATION and MAINTENANCE MANUAL thoroughly and understand all safety related issues before attempting any work on the PF-64 series separator.

GENERAL MAINTENANCE PROCEDURES

Always follow the start-up and shut down procedures before and after any service or maintenance is done on the separator unit. The PF-64 series separator are designed for low maintenance and minimal service. With proper care the PF-64 series separator will provide trouble free service. The following is a list of maintenance check points and schedules.

NOTE:

All recommendations are minimums. The environment/operating conditions in which the separator unit is installed will dictate the frequency of scheduled maintenance. Maintaining the PF-64 series separator will assure a long trouble free life.

1. Visually inspect separator every 48 hours (minimum) for proper operation (check for unusual noise and/or vibration).
2. Read pressure gauge (gauge reading should not exceed design pressure).
3. Purge separator as required (refer to Purge Cycle on page 12). Check for a build up of debris in accumulation chamber.
4. Clean pump pre-strainer before blind-off occurs (check as often as environment dictates).
5. Check condition of gaskets (separator inspection port and pre-strainer) each time the separator is serviced.
6. Check voltage and amperage draw on motor lead.
7. Auto purge - Run a manual purge cycle by switching the HOA switch to "Hand" position. Leave the purge valve open for a minimum of 5 seconds or until purge liquid becomes clear. Reposition the HOA switch to the "Auto" position
 - 7a. **Manual purge** - Open purge valve for a minimum of 5 seconds or until purge liquid becomes clear.

The PF-64 series separator are designed to operate within a specific flow range. Keeping the separator within the design flow range will produce optimal pressure drops and increase the separator efficiency. Running below the design flow rates will reduce efficiency while running above the design flow will increase wear (refer to Flow Rate vs Pressure Loss chart on the PF-61 Data Sheet).

SETTING PURGE TIMER

FIGURE 2

Timer Settings

The Puroflux auto purge timer is equipped with control dials to program the purging cycles to match your specific needs.

**** POWER SHOULD BE TURNED OFF BEFORE CHANGING SETTINGS ****

Operation Mode

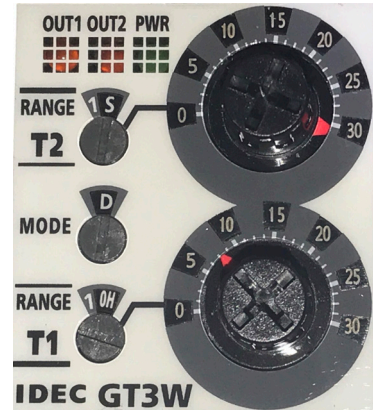
Middle Dial (Mode): Timer operation mode factory setting: "D"

Cycle time

Lower dial (T1): Frequency of purging
 Range (1H): 36 minutes to 30 hours
 Factory setting: Every 6 hours

Purging time

Upper dial (T2): Duration of purging
 Range (1S): 0.6 to 30 seconds
 Factory setting: 30 seconds



Once the HOA switch is placed into the "AUTO" position the timer initiates the off interval (valve closed). Upon completion of the off interval time, the relay is energized and the purge duration begins. Once the purge open duration (valve open) is completed the purge valve will close. The cycle repeats until the HOA switch is turned "OFF" or "HAND" position. The purge off (T1) interval can be adjusted from 36 minutes (0%) to 30 hour period (100%). The purge duration (T2) can be adjusted from 0.6 (0%) to 30 (100%) seconds.

PURGE CYCLE

The PF-64 series separator must be purged regularly as debris accumulates in the unit's collection chamber. If the purge chamber becomes full and is not purged the separator will no longer perform efficiently.

During start-up the amount of purged solids generated by the separator may be high. It is recommended that the separator be purged frequently (every 1 to 2 hours) until it is visually obvious that the frequency can be cut down. If the purge concentration is still high, adjust the purge frequency until 4 to 6 seconds is required to clear solids from the purge chamber. For most applications after the initial start-up the purge frequency can be reduced.

Several purge options can be utilized (see page 13):

1. Manual purge - purge valve is opened manually every time a purge cycle is required.
2. Continuous purge - manual purge valve is throttled to maintain a constant purge.
3. Automatic purge - automatic valve is installed to purge on a preset time cycle.

NOTE:

The factory auto purge pre-set is 20 seconds every 4 hours.

NOTE:

It is imperative that the purge cycle last long enough to purge all solids from the collection chamber in order to extend the life of the purge valve. If the purge cycle does not last long enough, particulate can become wedged or pinched in the valve causing leaks or permanent damage to the valve.

AUTO PURGE CYCLE

For units equipped with automatic purge, the purge cycle can be initiated either manually or by the purge cycle timer. The separator control cabinet is equipped with an Hand-Off-Auto (HOA) switch. The HOA switch allows for the automatic or manual purging of the separator. In the "HAND" position the purge valve will energize to an open (purge) position. In the "AUTO" position the cycle timer is energized and controls the purge time and frequency (refer to Setting Purge Timer on page 12). The "OFF" position will disable the purge function in a closed position.

NOTE:

In "HAND" position the auto purge valve will remain open until switched to "OFF" or "AUTO" position

MANUAL PURGE

For units equipped with manual purge; the purge cycle can be initiated at any time during operation simply by manually opening the purge valve. The manual purge valve should be adjusted to its full open position at the start of each purge cycle. Once there is a solid continuous flow from the purge valve, the purge can be throttled if necessary. Allow the concentrated purged waste to clear before closing the purge valve. Note the frequency and length of the purge cycle so a maintenance schedule for the purge cycle can be initiated. It is imperative that the purge cycle be maintained for proper operation of the separator.

CONTINUOUS PURGE

For units equipped with manual purge that will utilize a constant purge cycle, set the purge rate simply by manually throttling the purge valve to the desired flow. Make sure that the purge valve is opened enough to pass larger particulate. It may be necessary to occasionally open the valve fully to clear any larger particulate that is trapped in the purge chamber. The purge line should be checked on a regular basis to ensure there is proper flow.

CLEANING PROCEDURE

PUMP PRE-STRAINER (PF-64)

For pump pre-strainer refer to Figure 1 on page 4. The pump pre-strainer housing is flanged mounted to the pump suction. The pre-strainer contains a corrosion resistant stainless steel basket with 1/8 inch perforations. The pre-strainer basket must be kept clean and free of debris. Always follow the shut down procedure before attempting any repairs, adjustments or cleaning. To clean the pre-strainer basket loosen the four hex bolts that hold the cover in place. Gently lift the cover off the strainer body (take care not to damage the gasket). If the gasket does not come off in one piece it will need to be replaced. Before replacing gasket clean all surfaces of old material. Utilize the handle to remove the basket from the housing. After cleaning the basket reverse the above procedure making sure that the gasket is in place and tighten the four hex bolts. Always follow the start-up procedures after any shut-down (refer to page 16).

NOTE:

Always relieve internal vessel pressure before attempting any repairs or adjustments on the separator unit.

PUMP AND MOTOR (PF-64)

The pump wet end is cast iron bronze fitted. The close coupled, back pull-out pump and motor assembly is bolted together with hex bolts for ease of maintenance or repair. The pump utilizes a standard mechanical seal pressed into the motor bracket, which is bolted directly to the pump volute. The pump sleeve slides over the motor shaft. The pump impeller is threaded or keyed on to the end of the motor shaft and locked in place with a hex jam nut (for a diagram refer to Figure 3 on page 19).

The pump flows for the PF-64 series separator are listed in Table V on page 20 at 60 feet of head (TDH). This correlates to approximately 26 psi discharge pressure at design flow.

WARNING:

Disconnect and lock out all electrical power to the separator prior to performing pump maintenance.

CLEANING & ADJUSTING PUMP

Always follow the shut down procedure before attempting any repairs or adjustments. The impeller should spin freely. If not, check for an obstruction or debris that may be lodged between the impeller and volute or impeller and adapter bracket. If no debris can be found and the impeller remains obstructed remove the bolts holding the volute to the motor bracket and the two bolts holding the motor to the base (refer to Figure 3 on page 19). Slide the motor and motor bracket away from the pump volute. Inspect the volute for foreign material. Reverse the above procedures to reassemble (replace any gaskets which are not in good condition). Rotate the pump shaft manually after assembly to check clearance. Always follow the start-up procedures whenever the separator unit has been turned off.

SECTION 3

START-UP PROCEDURE

NOTE:

Perform the first five recommendations with the electrical power off and locked out. Refer to the section under "Safety" (see page 17) regarding the safeguarding of maintenance personnel from biological contaminants prior to start-up.

1. Close all isolation valves in interconnecting piping and relieve all pressure from the separator by opening the manual air relief valve.
2. Loosen the four hex bolts around the pump pre-strainer lid. Remove the lid, inspect gasket and lubricate if necessary. Clean debris from the pump pre-strainer basket. Prime the pump and associated piping by filling the pre-strainer housing. Replace the basket and lid, then tighten bolts.
3. Turn the pump and motor shaft by hand to insure free rotation.
4. Remove the handhole cover (4" separator units and larger) by removing the hex nut on the crab clamp by pushing the handhole/manhole into the vessel. Remove and inspect the gasket (replace if necessary).
5. Inspect the internals for any debris build-up.
6. Inspect the handhole, gasket, ring, and cover for foreign matter, and clean all surfaces. Place the handhole cover into the vessel. Slip the gasket over the handhole and reinstall the crab clamp and hex nut. Align the gasket and crab clamp properly with the handhole and ring, before tightening the hex nut. Do not overtighten the hex nut. Overtightening hex nut can damage gasket.
7. Prime the pump by filling the pre-strainer and associated piping with water (refer to pump pre-strainer section on page 14). Check pump rotation by bumping the motor. Verify rotation with the arrow on the pump volute. Do not run the pump for an extended period of time in reverse direction or dry. Have a qualified electrician change leads to correct rotation.
8. Open the service valves in the separator inlet, outlet, and purge lines. Before starting the pump verify all valves are open. Open the manual air relief valve on top of the separator vessel. Start the pump and fill the separator. Once a steady stream of water is coming out of the manual air relief valve, and all air has been evacuated, the manual air relief valve can be closed.
9. Check the voltage and current of all leads on the pump motor. The correct amperage draw can be found on the motor nameplate or in Table IV on page 20.
10. Check the separator unit for any unusual noise or vibration. Shut separator unit off and contact your local PUROFLUX representative or the factory direct if there are any questions about the performance of the separator unit.
11. Check the separator unit and all integral piping to the unit for any air or fluid leaks. All air leaks must be found and repaired. Failure to do so could result in poor performance and/or personal injury.
12. Purge the separator (refer to Purge Cycle on page 12). After purging the separator, check the pressure gauges and record the start up differential pressure. Use the starting differential pressure as a bench mark whenever routine maintenance is performed.

NOTE: An excessive amount of air released from the vent valve can indicate an air leak. All leaks must be repaired before running the separator unit.

OPERATION IN COLD WEATHER

When the PF-64 series separator is exposed to below-freezing temperatures, it will require protection to prevent freezing. An indoor installation in a heated room is the best way to preventing freezing of any liquid in the separator unit. If an indoor installation is not practical, supplemental heat must be supplied. Heat tape and insulation around the liquid filled separator components must be used to prevent freezing. The separator unit should be drained when not in use for long periods of time. Refer to shutdown procedures below.

SHUTDOWN PROCEDURE

The following services should be performed when the unit is to be shutdown for a prolonged time period.

1. Run the separator unit through a complete purge cycle.
2. Close the service valves in the separator inlet and outlet lines.
3. Relieve all pressure from the separator vessel and piping. Open the manual relief valve located on top of the vessel and leave the valve open.
4. Open the purge valve. Allow the vessel to drain fully. Once the separator is empty close the purge valve and manual air relief valve.
5. Shut off and lock out all electrical power.
6. Drain all external piping to and from the separator.
7. Remove the bolts from the pump pre-strainer cover. Remove the cover, and clean debris from the pump pre-strainer basket. Inspect the gasket and lubricate (replace gasket if necessary). Replace the basket and cover and tighten bolts.
8. Remove the handhole cover (4" separator units and larger) by removing the hex nut on the crab clamp by pushing the handhole into the vessel. Remove and inspect the gasket (replace if necessary).
9. Re-install the handhole cover.

RECOMMENDED SPARE PARTS

PUROFLUX maintains a complete stock of replacement parts. When ordering replacement or stock parts, be sure to include the unit serial and model numbers.

The following spare parts are recommended:

1. Gaskets for separator inspection port.
2. Pump pre-strainer cover gasket.
3. Pump seal and gasket kit.
5. Transformer fuses (automatic units only).
6. Inlet/outlet gauges.

FLUID TREATMENT

Separation is an effective way of reducing the level of suspended solids in a system. However, it is only one portion of a complete treatment program. Dissolved solids will not be removed from the system by separation. It is important to realize that the dissolved solids will concentrate, and can cause damage to a system. Furthermore, airborne impurities and biological contaminants may be introduced into the system through the equipment being filtered.

To control all potential contaminants, a chemical treatment program must be employed by a competent professional. Such treatment should be initiated before the system start-up and continued regularly thereafter.

SAFETY

All electrical, mechanical, and rotating machinery are potential hazards. It is important to be familiar with the design, construction, and operation of all equipment before performing any work. Always use adequate safeguards (including use of protective clothing where necessary or required) whenever installing, operating, or working on the equipment.

Care should be taken when working on, near, or around this equipment. Appropriate safeguards must be established to prevent personnel and/or public from injury and to prevent damage to the equipment, affiliated system, and premises.

It is important to be thoroughly familiar with the equipment, associated system, controls, and the procedures set forth in this manual. Only qualified personnel should operate, maintain, and repair this equipment. Always follow proper procedures and use the correct tools, when handling, lifting, installing, operating, maintaining, or repairing the equipment. This will aid in the prevention of personal injury and/or property damage.

WARRANTY

PUROFLUX will guarantee all products to be free from manufactured defects in materials and workmanship for a period of 12 months from the date of shipment. Puroflux has an extended limited warranty of 5 years on all its separator vessels. In the event of any such defect, PUROFLUX will repair or provide a replacement.

NOTE:

Consumables such as fuses and pump seals are not covered under standard warranty

NOTE:

Replacement part(s) may be new or remanufactured, at Puroflux's option. All warranty products, which prove to be defective, will be F.O.B. Puroflux's plant. Puroflux will not replace, repair, or pay for any charges without a written agreement prior to such work.

This warranty is not extended to any defects which can be attributed to having been caused by accident, alteration, abuse, misuse, consumer negligence, normal expected wear, chemical corrosion or by acts of God.

To obtain any needed repair(s) or replacement of defective parts or product, a Return Goods Authorization (RGA) number must first be obtained from PUROFLUX. This will be the record for tracking all items returned to PUROFLUX. The RGA form must be returned with the defective items in order to insure proper credit.

Before the replacement part can be sent a purchase order must be issued to cover the cost of each replacement part and shipping. Upon inspection and an issue of credit of the defective items by PUROFLUX and/or PUROFLUX'S vendor(s), credit will be issued.

NOTE:

Items deemed defective will be replaced with a new or remanufactured part (at PUROFLUX'S option). This includes both mechanical and electrical components.

NOTE:

Shipping and handling, labor, or repair charges are not covered by PUROFLUX'S warranty policy.

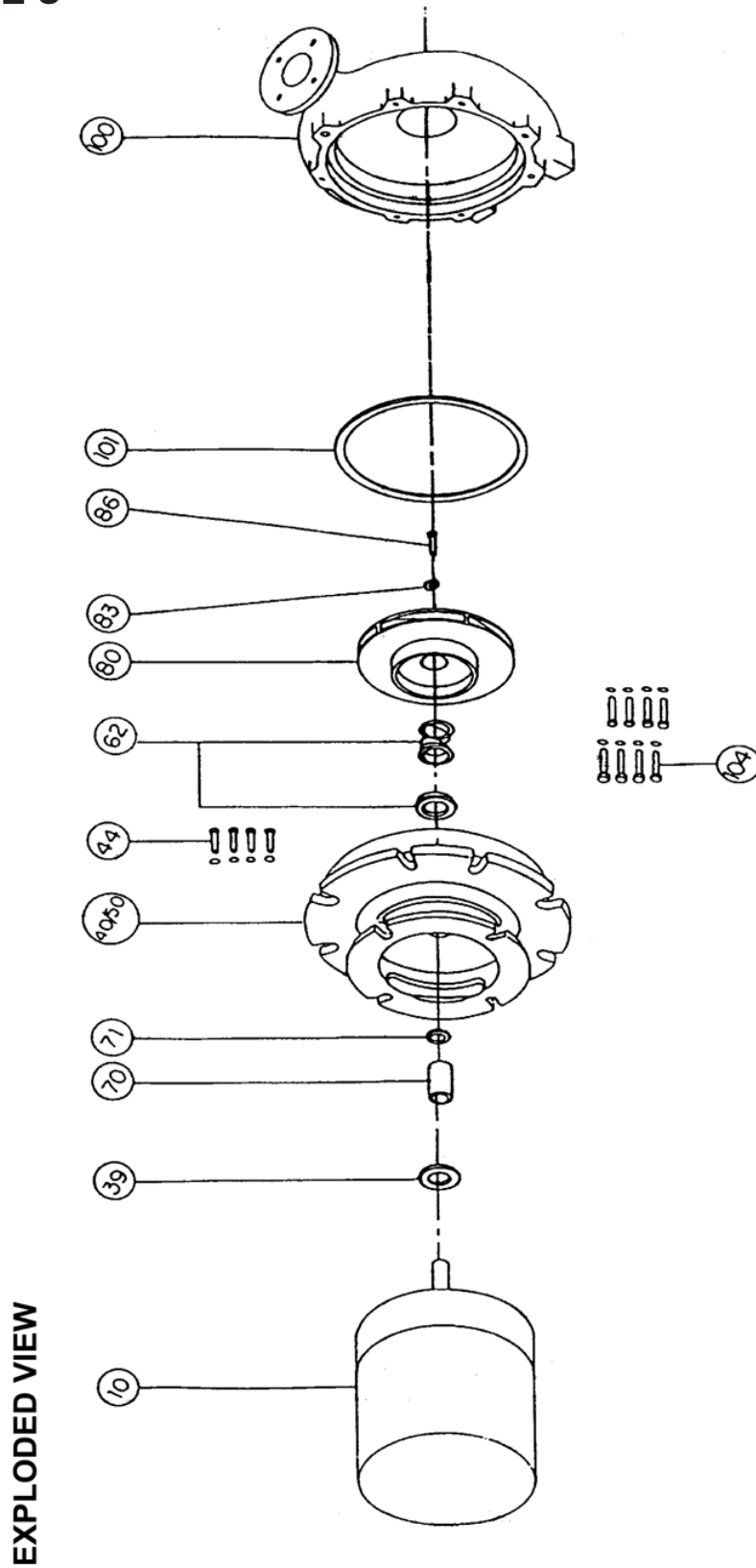
NOTE:

The return of defective items must be made within thirty (30) days of shipment or the invoice will be considered due and payable.

NOTE:

Any damage to the separator unit during shipment must be claimed at the time of accepting the separator (note all damage to the separator unit on the bill of lading before signing). All damages received during shipping are the sole responsibility of the freight company and must be taken care of through the freight company.

FIGURE 3



INDEX

| ITEM | DESCRIPTION | ITEM | DESCRIPTION | ITEM | DESCRIPTION |
|-------|---------------------------|-------|---------------------|------|-----------------------------|
| 39 | WATER SLINGER | 62 | MECHANICAL SEAL | 83 | IMPELLER WASHER |
| 44 | MOTOR CAPSCREW | 70 | SHAFT SLEEVE | 86 | IMPELLER CAPSCREW |
| 40/50 | ADAPTER/STUFFING BOX B.F. | 71 | SHAFT SLEEVE SPACER | 100 | CASING |
| 40/50 | ADAPTER/STUFFING BOX A.B. | 70/71 | SHAFT SLEEVE KIT | 101 | CASING GASKET |
| 40/50 | ADAPTER/STUFFING BOX D.I. | 80 | IMPELLER | 104 | ADAPT. STUFF. BOX CAPSCREWS |

| TABLE IV - HORSEPOWER / AMPERES | | |
|--|----------------------|-------------------------|
| MOTOR HP | MOTOR VOLTAGE | AMPERAGE 3 PHASE |
| 1 | 208 / 240 / 460 | 5 / 4 / 2 |
| 1 1/2 | 208 / 240 / 460 | 6 / 6 / 3 |
| 2 | 208 / 240 / 460 | 8 / 7 / 4 |
| 3 | 208 / 240 / 460 | 11 / 10 / 5 |
| 5 | 208 / 240 / 460 | 17 / 16 / 8 |
| 7 1/2 | 208 / 240 / 460 | 25 / 22 / 11 |
| 10 | 208 / 240 / 460 | 32 / 28 / 14 |
| 15 | 208 / 240 / 460 | 48 / 42 / 21 |
| 20 | 208 / 240 / 460 | 62 / 54 / 27 |
| 25 | 208 / 240 / 460 | 78 / 68 / 34 |
| MOTOR HP | MOTOR VOLTAGE | AMPERAGE 1 PHASE |
| 1 | 120 / 208 / 240 | 16 / 10 / 8 |
| 1 1/2 | 120 / 208 / 240 | 20 / 12 / 10 |
| 2 | 120 / 208 / 240 | 24 / 14 / 12 |
| 3 | 120 / 208 / 240 | 34 / 20 / 17 |

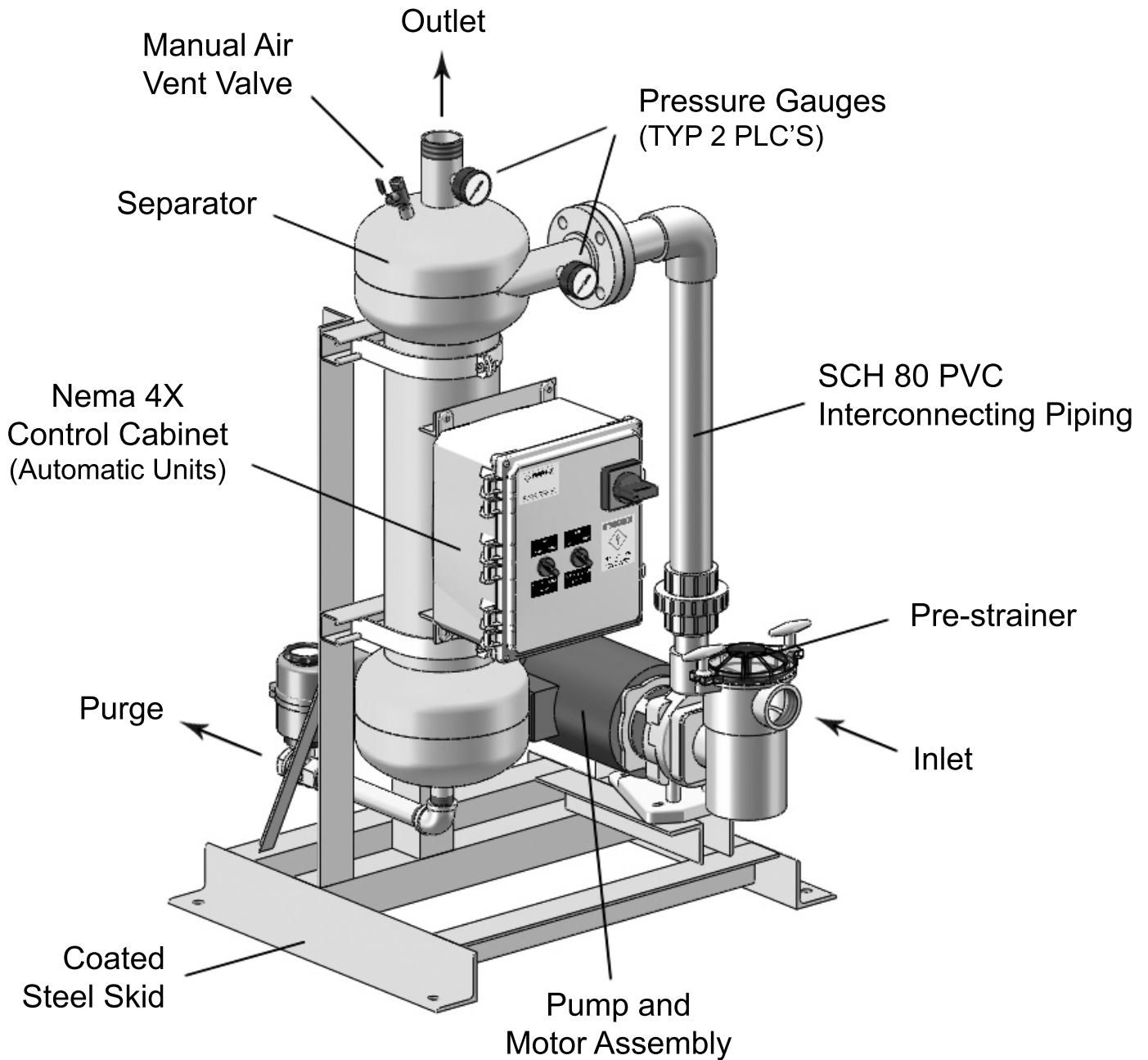
NOTE:
The electric purge actuator will draw approximately one additional amp.

| TABLE V - MOTOR HORSEPOWERS FLOW RATE @ 60 TDH | | | |
|---|------------------|---------------------|--------------------|
| MODEL PF-64 | MOTOR(HP) | SYSTEM (GPM) | PURGE (GPM) |
| 64-012 | 2 | 50 | 20 |
| 64-015 | 3 | 80 | 20 |
| 64-020 | 5 | 110 | 20 |
| 64-025 | 5 | 160 | 20 |
| 64-030 | 7.5 | 220 | 20 |
| 64-040A | 10 | 330 | 55 |
| 64-040B | 10 | 400 | 55 |
| 64-050 | 15 | 600 | 55 |
| 64-060A | 20 | 900 | 55 |
| 64-060B | 25 | 1200 | 55 |

Purge GPM is estimate on standard pump conditions only. Actual purge GPM may vary by installation.

PF-64LP Series Separator

Figure 4



NOTE:

The following data is specific to the PF64LP separator series. All other procedures as described in the PF64 manual should be followed.

| TABLE VI - SIZE & CONNECTION | | |
|---|-----------------------|------------------------|
| MODEL PF-64LP | INLET (INCHES) | OUTLET (INCHES) |
| PF-64LP-012 | 2 (FPT) | 1-1/4 (MPT) |
| PF-64LP-015 | 2 (FPT) | 1-1/2 (MPT) |
| PF-64LP-020 | 2 (FPT) | 2 (MPT) |

| TABLE VII - WEIGHT & VOLUME | | | |
|--|-------------------|---------------------|--------------------|
| MODEL PF-64LP | DRY (LBS.) | OPER. (LBS.) | VOL.(GALS.) |
| PF-64LP-012 | 119 | 135 | 2 |
| PF-64LP-015 | 134 | 150 | 2 |
| PF-64LP-020 | 200 | 258 | 7 |

| TABLE VIII - MOTOR HORSEPOWERS FLOW RATE @ 50 TDH | | | |
|--|------------------|---------------------|--------------------|
| MODEL PF-64LP | MOTOR(HP) | SYSTEM (GPM) | PURGE (GPM) |
| PF-64LP-012 | 1 | 45 | 20 |
| PF-64LP-015 | 2 | 65 | 20 |
| PF-64LP-020 | 2 | 100 | 20 |

PUMP PRE-STRAINER (PF-64LP)

For a diagram of the pump pre-strainer refer to Figure 5 on page 24. The pump pre-strainer housing is mounted directly to the pump volute with four stainless steel hex bolts. The pre-strainer contains a corrosion resistant plastic basket with 3/16 inch mesh. The pre-strainer basket must be kept clean and free of debris. Always follow the shut down procedure before attempting any repairs, adjustments or cleaning. To clean the pre-strainer basket loosen the two thumb screws on pre-strainer housing. Gently lift and remove the clear lid from the pre-strainer housing. Utilize the handle to remove the basket from the housing. After cleaning the basket reverse the above procedure making sure that the o-ring is in place and tighten the two thumb screws. Always follow the start-up procedures (refer to page 15) after any shut-down.

NOTE:

Always relieve internal vessel pressure before attempting any repairs or adjustments on the separator unit.

PUMP AND MOTOR (PF-64LP)

The pump wet end is constructed with all bronze components, including the impeller, pump shaft, volute and jam nut. The close coupled pump and motor assembly is bolted together with four stainless steel hex bolts for ease of maintenance and repair. The pump utilizes a standard mechanical seal pressed into the motor bracket, which is bolted directly to the pump volute. The pump shaft slides over the motor shaft and is held in place with three set screws. The pump impeller is threaded on to the end of the motor shaft and locked in place with a hex jam nut (refer to Figure 5 on page 24).

The pump flows for the PF-64LP series separators are listed in Table VIII on page 22 at 50 feet of head (TDH). This correlates to approximately 22 psi discharge pressure at design flow.

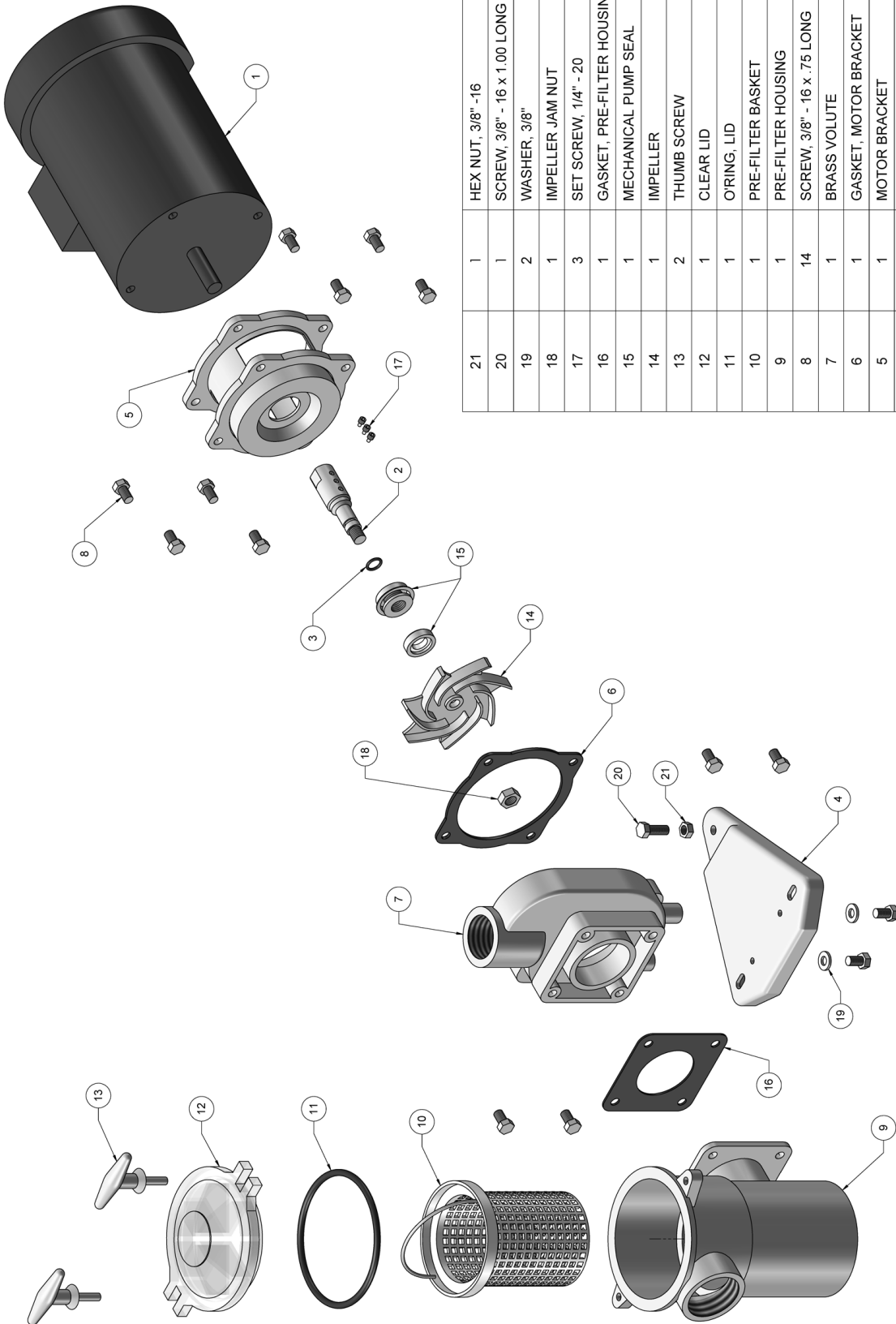
WARNING:

Disconnect and lock out all electrical power to the separator prior to performing pump maintenance.

CLEANING & ADJUSTING PUMP (PF-64LP)

Always follow the shut down procedure before attempting any repairs or adjustments. The impeller should spin freely. If not, remove the pre-strainer housing from the volute and use a feeler gauge and check the distance between the volute and impeller face. The clearance between the impeller and volute face should be 0.015 of an inch. Adjust the clearance, if necessary, by loosening the set screws. The mechanical seal spring will allow the pump shaft and impeller to slide forward and back. Adjust the impeller to proper clearance and tighten set screws. If the impeller remains obstructed, remove the four bolts holding the volute to the motor bracket and the two bolts holding the motor bracket to the base (refer to Figure 5 on page 24). Slide the motor and motor bracket away from the pump volute. Inspect the volute for foreign material. Reverse the above procedures to reassemble. Rotate the pump shaft manually after assembly to check clearance. Always follow the start-up procedures whenever the separator unit has been turned off.

PF-64LP Exploded Pump View
Figure 5



| ITEM | REQ'D | DESCRIPTION |
|------|-------|------------------------------|
| 21 | 1 | HEX NUT, 3/8" -16 |
| 20 | 1 | SCREW, 3/8" - 16 x 1.00 LONG |
| 19 | 2 | WASHER, 3/8" |
| 18 | 1 | IMPELLER JAM NUT |
| 17 | 3 | SET SCREW, 1/4" - 20 |
| 16 | 1 | GASKET, PRE-FILTER HOUSING |
| 15 | 1 | MECHANICAL PUMP SEAL |
| 14 | 1 | IMPELLER |
| 13 | 2 | THUMB SCREW |
| 12 | 1 | CLEAR LID |
| 11 | 1 | O'RING, LID |
| 10 | 1 | PRE-FILTER BASKET |
| 9 | 1 | PRE-FILTER HOUSING |
| 8 | 14 | SCREW, 3/8" - 16 x .75 LONG |
| 7 | 1 | BRASS VOLUTE |
| 6 | 1 | GASKET, MOTOR BRACKET |
| 5 | 1 | MOTOR BRACKET |
| 4 | 1 | MOTOR BASE |
| 3 | 1 | O'RING, MOTOR SHAFT |
| 2 | 1 | MOTOR SHAFT |
| 1 | 1 | MOTOR |