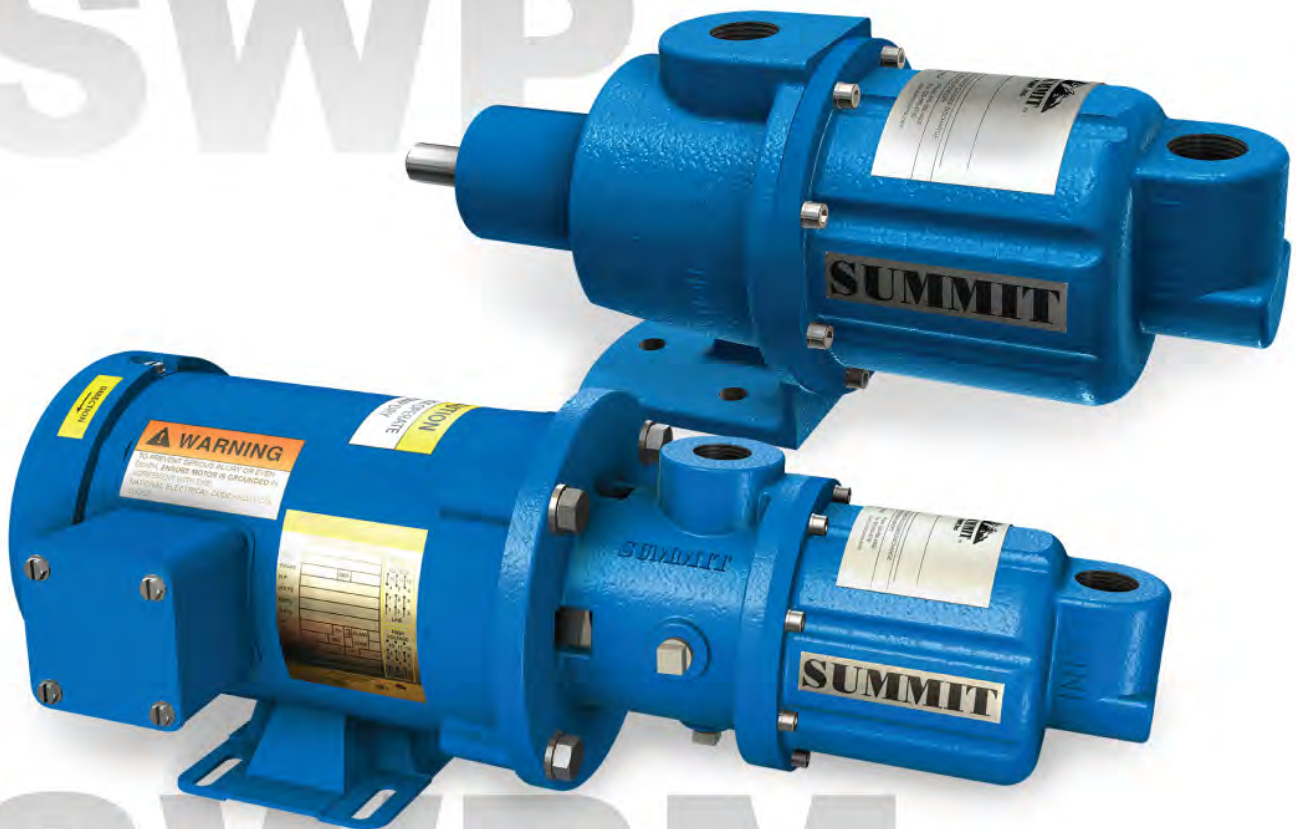


SUMMIT™

SWP & SWPM

Installation, Operation and Maintenance Manual
Model: SWP & SWPM Wobble Pump



Wobble Pump



SUMMIT™
PUMP, Inc

www.SUMMITPUMP.com

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i. WARRANTY

Pumping units assembled by Summit Pump, Inc., Green Bay, WI are guaranteed to be free from defects in material and workmanship for one year from date of shipment from factory in Green Bay, WI. The obligation under this warranty, statutory or otherwise, is limited to replacement or repair at Green Bay, WI, of such part as shall appear to us upon inspection at such point, to have been defective in material or workmanship.

This warranty does not obligate Summit Pump, Inc. to bear the cost of labor or transportation charges correlating to replacement or repair of defective parts; nor shall it apply to a pump upon which repairs or alterations have been made unless authorized by Summit Pump, Inc.

No warranty is made with respect to engines, motors, or trade accessories, such being subject to warranties of their respective manufacturers.

No expressed, implied or statutory warranty, other than herein set forth is made or authorized to be made by Summit Pump, Inc.

In no event shall Summit Pump, Inc. be liable for consequential damages or contingent liabilities arising out of the failure of any Summit Pump, Inc. pump, or parts thereof, to operate properly.

ii. LIABILITY

Summit Pump, Inc. shall not be liable for personal physical injury, damage or delays caused by failure to follow the instructions and procedures for installation, operation and maintenance contained in this manual.

The equipment is not for use in or with any nuclear facility or fire sprinkler system. Buyer accepts the responsibility for insuring that the equipment is not used in violation and Buyer shall indemnify and hold Seller harmless from any and all liability (including such liability resulting from seller's negligence) arising out of said improper use.

iii. COPYRIGHT

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The information contained herein is for informational use only and is subject to change without notice. Summit Pump assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.



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2 INTRODUCTION

This installation, operation, and maintenance manual is designed to help you achieve the best performance and longest life from your Summit Pump. This pump is a progressing cavity pump ideal for high viscosity liquids.

This pump is a single helical rotor rolling eccentrically in a double helix stator which creates differential pressure. The rotor turns in conjunction with the stator which has a series of sealed cavities 180° apart. As one cavity diminishes the opposing cavity increases at exactly the same rate. Thus the sum of the two discharges is a constant volume. The result is a pulsation-free positive displacement flow utilizing no valves.

If there are any questions regarding this pump or its application which are not covered in this manual, please contact your local Summit Pump distributor.

For information or technical assistance on the driver service, contact the driver manufacturer's local dealer or representative.

2.1 SAFETY

The following message types are used in this manual to alert maintenance personnel to procedures that require special attention for the protection and safety of both personnel and equipment:

⚠ DANGER
Imminently hazardous situation which, if not averted, will result in death or serious injury.

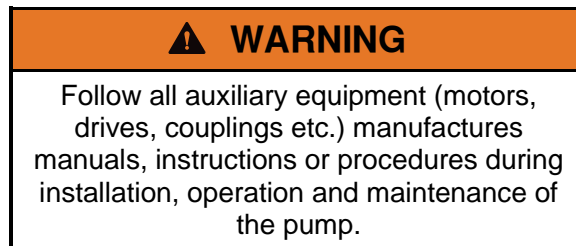
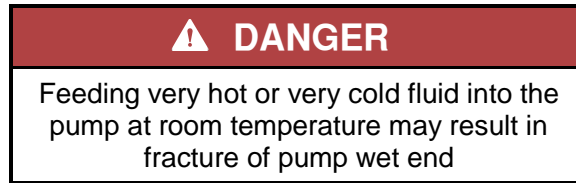
⚠ WARNING
Potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION
Potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE
Includes information on operation, maintenance, rules or directions. May indicate possible property damage.

2.2 PUMP SAFETY WARNINGS

The safety information below should be followed and observed to prevent injury, death or damage to equipment.



2.3 NOMENCLATURE

On page 25 of this manual, record the nameplate data from your pump. This will assist with any maintenance questions or pump identification in the future.

Summit's SWP Wobble Pumps are essentially identified by size. The pump's identification number (Example: SWP22-CSQM-V) consists of **Model and Size Designation** (first set of characters i.e. SWP22), **Materials of Construction** (middle set of characters i.e. CSQM), finally, **Orientation** (last set of characters i.e. V).

2.3.1 Size Designation

“SWP” indicates the pump model. In the case of the close coupled pump an extra “M” is present after the pump model. *Example: SWPM*. The following numbers indicate the specific size of the model.

2.3.2 Materials of Construction

Materials of Construction (i.e. CSQM) are represented though a series of letters, usually 4 letters. The first letter indicates the Pump Body and Suction Housing materials. The second letter indicates the minor metallic parts in contact with the pumping-solution (Wet able parts: drive shaft, pins, rotor...). The third and fourth letters indicate the malleable material of the stator. The following list decodes the Materials of Construction.

First & Second Letters:

C: Cast Iron
D: Alloy Steel
E: Carpenter® 20 Stainless Steel
G: 416 Stainless Steel
H: Hastelloy® “C”
J: 17-4 PH Stainless Steel
M: Monel®
S: 316 Stainless Steel
W: Cast Steel
X: Special to Application

Third & Fourth Letters:

B: EPDM 300, 70 Durometer
C: Nitrile 103, 50 Durometer
D: Tool Steel
E: Nitrile 110, 70 Durometer
F: Fluoroelastomer 500, 75 Durometer
G: 416 Stainless Steel
H: Hastelloy® “C”
J: 17-4 PH Stainless Steel
K: Hypalon® 800, 70 Durometer
M: Nitrile 100M, 70 Durometer
P: Thiokol® 70 Durometer
Q: Nitrile 100, 70 Durometer
R: Natural Rubber 200, 55 Durometer
I: Teflon® 15% glass
U: Urethane 70 Durometer
X: Special to Application
Y: Nitrile 145
Z: White Nitrile 150, 70 Durometer

2.3.3 Orientation

The final letter represents the type of suction housing is on the pump. This letter stands for vertical (V) or horizontal (H) suction.

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Carpenter®. 1981. Carpenter Technology Corporation. Reading, Pennsylvania, USA.
Hastelloy®. 1955. Union Carbide and Carbon Corp. New York, New York, USA.
Hypalon®. 1993. E.I. DuPont de Nemours and Company. Wilmington, Delaware, USA.

Monel®. 1997. Inco Alloys International, Inc. Huntington, West Virginia, USA.
Teflon®. 2005. E.I. DuPont de Nemours and Company. Wilmington, Delaware, USA.
Thiokol®. 1957. Thiokol Chemical Corp. Trenton, New Jersey, USA.

3 RECEIPT AND STORAGE

3.1 RECEIVING THE PUMP

Immediately upon arrival, carefully inspect the pump for evidence of damage during transit. Immediately report any damage to your local Summit Pump distributor.

3.2 STORING THE PUMP

3.2.1 *Temporary*

Temporary storage: less than six months.

1. Store pump in a clean, dry place free from extreme swings in temperature and humidity.
2. Cover with a protective covering to reduce dust contamination.
3. Rotate the shaft once a week to avoid the stator elastomers forming a set condition. If this happens, upon starting the pump the required torque to overcome static friction may damage equipment.
4. Remove the drain plug, suction housing and stator to allow the pump to dry. When pump is dry, re-install the suction housing and stator to keep pump sanitary. Only finger tighten the bolts to keep pressure off of the stator.

3.2.2 *Long Term*

Long Term Storage: more than six months.

1. Follow temporary storage guidelines 1-4.
2. Coat all unpainted and machined surfaces with a rust inhibitor, such as LPS-3.
3. The removal of drive belts is also recommended per manufacturers recommendations.

3.3 HANDLING

Pump unit boxes and crates may be unloaded using a forklift or slings depending on size and package construction.

⚠ WARNING

Pump and assemblies are heavy, improper handling could result in serious injury.

3.4 LIFTING

To avoid damage to pump and/or motor use a nylon, chain, or a wire rope sling. The slings should be placed so lift is equally supported at four or more points.

⚠ WARNING

Be sure all components are securely fastened to baseplate before lifting.

4 INSTALLATION

4.1 GENERAL

Summit Pumps are fully assembled at the factory. The pumps are ready to be installed and put into service. Follow any instructions tagged on the pump or recommended in this manual, such as adding fluid to the suction housing to lubricate the rotor with the stator and mechanical seal.

4.2 LOCATION

If the pump is going to have a water flush it should be located as close as possible to a supply of water. Other location considerations should be easy access for inspection, maintenance and ample overhead space for lifting with, crane or hoist.

4.3 BASE PLATE

Each pump unit should be mounted on a fabricated steel or channel base plate. Usual base configurations are inline, piggy back and L-shape. The base plate should be mounted on a concrete sub base 4" to 8" longer and wider than the fabricated baseplate.

4.4 FOUNDATION

4.4.1 Concrete Sub-Base

The concrete sub foundation performs a number of functions. It must support the weight of the entire pump assembly, maintain the alignment of all system components, and absorb the loads, forces and vibrations that are developed under normal operating conditions. The concrete material used must be top quality and conform to local building codes as well as the contractor's strength requirements. Reinforcing bars and mesh should be used as required. The mounting surface of the concrete foundation must be flat and level beneath the footprint of the sub-base, or the pump could be installed out of square. This could create problems aligning the piping, place extra loads on the couplings and bearings, and alter the operating levels of lubricants or hydraulic fluids in the system. It is recommended that the top surface of the slab be held flat and level to at least F50 according to American Concrete Institute (#117) and the Canadian Standards Association (#A23.1) which is approximately 1/8" per 10 foot. The sub base height is usually determined by the process piping runs and elevation.

The weight of the sub foundation should be 3-5 times the weight of the pump, motor and baseplate. Dimensionally, it should be 4" to 8" longer and wider than the polymer concrete or fabricated steel baseplate. Anchor bolts are installed in pipe sleeves. The pipe diameter is 2.5 times larger than the anchor bolt diameter. This sleeve/bolt assembly is embedded in the base when poured.

Anchor bolt sizes: 1"-8UNC. Length is 7.5" to 10" depending on base thickness and overall size.

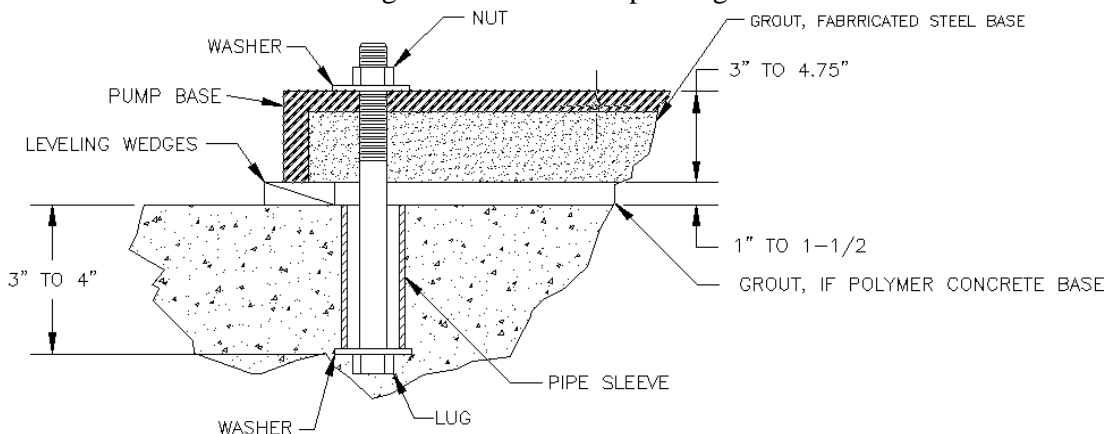


Figure 4-1: Anchor Bolt configuration

4.5 BASEPLATE GROUTING

1. This grouting instruction assumes a concrete sub base has been put in place to accept the baseplate. The subbase should be clean of dirt, oil and any other debris.
2. Shims/wedges should be wood.

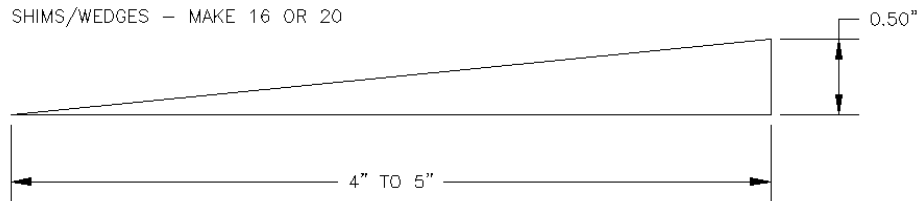


Figure 4-2: Wooden Wedges

3. Shims/wedges should be placed on the sub base, as shown in **Figure 4-3**. Use 2 to 3 per stack to obtain desired gap between baseplate and sub-base. Normal gap is 1" to 1-1/2".
4. Carefully lower baseplate with pump and motor onto sub base over anchor bolts.
5. Level baseplate to 0.125" over length and 0.088" over width.
6. When leveling is complete, uniformly hand tighten the anchor bolts.
7. Build a plywood form around baseplate supported on the sub base. It should be 3" high and 1" to 1.5" larger than the baseplate. Its size should be large enough to include the shims or wedges that are left in place.

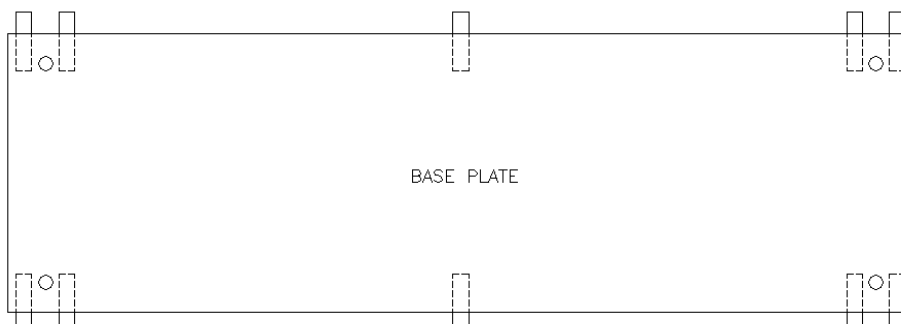
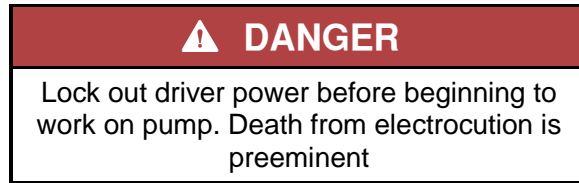


Figure 4-3: Wedge Locations

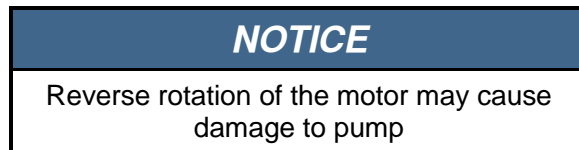
8. Use a high quality non-shrinking epoxy grout, following manufacturer's mixing and installation instructions.
9. When grout has cured, per grout manufacturer's recommended cure time, tighten anchor bolts till secure.
10. When grouting is complete, check coupling alignment and re-align as necessary.

4.6 ELECTRICAL



Follow wiring diagram from the motor manufacture for proper wiring procedures. Always have a licensed electrician connect the motor to ensure proper installment and conforms to local codes. Voltage should not vary by more the 10% from the voltage on the motor’s nameplate.

Ensure motor rotation matches rotation on pump once motor is connected.



4.7 PIPING CONNECTION – SUCTION / DISCHARGE

Piping should be installed such that it is self-supported and will **not cause any strain on the pump when connected**. Use pipe “dope” or sealing tape on the threads to seal the connections between the pump and the piping. Be sure this sealer is in compliance with disassembly of pump.



4.7.1 Suction Piping

The piping used should be as short as possible. Piping line size should be the same diameter as the suction nozzle. This may not always be the case as high viscosity or flow velocity may cause a change in size. All elbows 90° or 45° should be a long-sweep. Any piping that causes air to become trapped should be avoided.

4.7.2 Suction Housing Rotation

Suction housing can be rotated to any position within the centerline of the pump. Rotation of the suction housing is accomplished by removing the bolts securing suction housing to the pump body or discharge housing. Then rotating the suction housing to the desired angle and reinstalling the bolts which secure the suction housing to the pump body or discharge housing.

NOTICE

Do not rotate suction housing by any other means. Doing so may tear the stator resulting in leakage

4.7.3 Discharge Piping

Generally the diameter of the discharge piping should be the same as the pump's discharge. In certain circumstances, this will not be the case as the fluid being pumped will cause you to use different sized pipe.

4.8 ALIGNMENT

NOTICE

Careful alignment is an extremely important consideration to ensure long pump life

4.8.1 Coupling Connected Units

In-line configurations are shipped with the pump and motor leveled on the base plate with the coupling disconnected. If the pump and driver were aligned at the factory, that alignment will be disturbed during shipment. **ALIGNMENT MUST BE RECHECKED.** If alignment is necessary, align the motor to the pump not the pump to the motor. Check both parallel and angular alignments. Final alignment should be within 0.005" in all planes at operating temperature.

4.8.2 Belt Driven Units

Check belt and sleeve alignment. Check belts for proper belt tension. Tension requirements will vary with the type of belt, centerline distance and belt speeds. Consult belt manufacture for specific recommendation.

4.8.3 Alignment Checks

Alignment checking needs to be done several times prior to pump start up. Those alignment recommendations are as follows:

⚠ DANGER

Lock out driver power before beginning to work on pump

1. Prior to grouting, to remedy misalignment caused by transportation
2. After grouting, to correct any changes that occurred during grouting.
3. After piping is connected, Check alignments to ensure possible pipe strains have not changed alignment.

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4. Hot alignment, after the pump has reached operating temperature, if the pump is used in high temperature service.
5. Alignment is accomplished by adding or removing shims under the motor feet and moving the motor as required eliminating the misalignment.

5 OPERATION

5.1 CHECKING ROTATION

⚠ DANGER

Lock out power to avoid personal injury or death

1. Lockout power to drive.
2. Remove coupling guard.
3. Remove coupling grid/sleeve element so that the motor half of coupling can spin free from the pump half.
4. Unlock power to motor.
5. Clear personnel from immediate area, jog motor just enough to determine direction of rotation. Rotation must be same as arrow on pump. Common rotation is clockwise when viewing the pump from the coupling end.
6. If rotation is the same direction, lockout motor and reassemble coupling grid/sleeve to connect pump half.
7. If the pump is rotating in the wrong direction the electrical wiring will need to be adjusted by qualified personnel. Then repeat Step 4, 5 and 6.
8. Install coupling guard
9. Unlock motor, pump is ready to run.

Note: If the pump has a pinned Flex Joint, it is possible to operate the pump in the opposite direction (CCW when viewing pump from drive end). TAKE CAUTION as system valves and fittings may not allow this operation. NEVER RUN PUMP IN OPPOSITE DIRECTION IF FLEX JOINT IS THREADED, AS THIS WILL DISASSEMBLE THE INTERNAL COMPONENTS AND DAMAGE THE PUMP.

5.2 LUBRICATION

These pumps are designed for minimal maintenance. The bearings are sealed for life and do not require the addition of lubricant.

Before start up, it is recommended that the rotor be lubricated. This simply can be done by filling the pump with water or the pumping fluid through the discharge, suction or drain plug. Dry operation can immediately damage the stator.

NOTICE

Do not operate pump dry. Dry operation can cause premature damage to the stator

5.3 FIRST RUN CHECK

Several items need to be checked before you put your pump into service. Each of the following items needs to be addressed to make certain that your equipment is correctly installed. (Following items may not be in order of completion)

1. Proper alignment of pump, coupling, driver and coupling or sheaves.
2. All electrical connections.
3. All interments and gauges should be in working order.
4. Water flush connection to the stuffing box (if applicable).
5. Rotor is lubricated against stator.
6. Correct pump rotation as indicated on the pump.
7. Open the valves on the suction and discharge.

⚠ DANGER

This is a positive displacement pump.
NEVER operate it against a closed valve

NOTICE

Do not operate pump dry. Dry operation can
cause premature damage to the stator

5.3.1 Start Up

1. Before operating the pump it must be filled with liquid. Use the drain plug hole in the suction housing to fill the pump with liquid.
2. Ensure the motor rotation is coincident with the pump rotation.
3. Start the motor.

⚠ DANGER

Do not operate the pump without the proper
guard. See ANSI/ASME B15.1-1996

5.3.2 Shut Down

1. Flush the pump with clean water.
2. Shut down the pump.
3. Close both the discharge and suction valves.

6 APPENDIX A – MAINTENANCE TIMETABLE

6.1 DAILY MAINTENANCE

1. Check for leaks near the suction housing and pump body mating flange.
2. Inspect the packing or mechanical seal for correct flow, drip rate, noise and pressure.
3. Inspect the gear reducer for temperature and noise.
4. Check gages ensuring acceptable pump performance.

6.2 THREE MONTH MAINTENANCE

1. Daily maintenance and the following
2. Inspect and adjust packing so that is drips 2 to 5 times per minute. If packing is grease lubricated, lube the packing with 2 to 3 grease gun pumps, weekly.

6.3 SIX MONTH MAINTENANCE

1. Daily maintenance and the following,
2. The packing should be replaced.
3. Check for lip seals and drive shaft for wear. The suction and discharge piping spool pieces should be pulled to inspect the pipe's internal condition.

6.4 YEARLY MAINTENANCE

1. Depending on the fluid pumped and pump operating hours during the year, check pump performance. These inspections can range from once a year to once every three to five years.

7 APPENDIX B – TROUBLESHOOTING

7.1 PUMP PROBLEMS

The pump does not rotate.	1,2,3,4,5,6,7,21,22,24
The pump does not discharge.	8,9,10,11,12,13,14,15,16,21
The discharge output is too low.	1,2,6,7,8,9,10,11,12,13,14,16,17,18,19,21
The discharge output fluctuates.	6,7,8,9,11,13,14,17,18,20,21
The pump drive overloaded.	1,2,3,4,5,6,7,12,16,20,21,22,23
The pump makes excessive noise.	2,6,7,8,9,11,12,13,14,17,19,20,21,23,24,25,26
The shaft seal is leaking.	7,15,26,27,28
Stators wear out too quickly.	4,5,6,7,11,12,14,16,19,20
Rotors wear out too fast.	5,7,11,16,19,20

7.2 PROBABLE CAUSE AND REMEDY.

The power supply is incorrect or the drive is not wired properly. Check the motor nameplate data, test voltage, phase and frequency.	1
There is foreign matter in the pump. The foreign matter needs to be removed.	2
If the pump stator is new there can be too much static friction. The pump should be filled with liquid and turn shaft by hand.	3
The stator is swelled due to chemical attack. The stator should be exchanged for a different material.	4
The stator swelled due to high liquid temp. The liquid temp should be lowered, use undersized rotor.	5
There is a blockage due to solids in the liquid. The solid-to-liquid ratio should be decreased.	6
Leftover liquid settles and hardens in the pump after shutdown. The pump needs to be cleaned and rinsed after the pump is shutdown.	7
The suction pipe is not submerged. The suction pipe needs to be moved so it is submerged.	8
There is air in the suction pipe. The connections need to be tightened,	9
The pump is running too slow. Increase the drive speed.	10
The suction lift is too high causing cavitation. To remedy reduce the suction loss, move the pump to a lower elevation, closer to the source or increase the pump size.	11
The pump is running dry there is no prime. The pump needs to be filled with liquid	12
The stator is worn excessively. The stator needs to be replaced and the rotor needs to be inspected.	13
The rotor is worn excessively. The rotor needs to be replaced.	14
The pump is rotating in the wrong direction. The polarity of the motor needs to be replaced.	15
Pressure of the discharge is too high. The discharge valve needs to be opened, shorten the length of the discharge pipe, remove any obstructions from pipe or replace pipe with a larger size.	16
The suction pipe is leaking. Tighten the pipe fittings.	17
The Shaft packing is leaking. The packing gland needs to be tightened, replace the packing or the packing need lubrication. (If applicable)	18
The material of the stator is brittle. The stator needs replacement.	19
The speed of the pump is too high. The drive speed needs to be reduced.	20
The viscosity or specific gravity is too high. Measure the liquid and compare it with specification.	21
The packing is too tight. The gland nuts need to be loosened and the packing lubricated. (If applicable)	22
The drive shaft is bent. The drive shaft needs to be replaced.	23
Misalignment of the pump. The pump and drive need to be realigned.	24
The flexible drive coupling or flex joint is worn. Replace the coupling or flex joint.	25
The packing is incorrect. Change out the packing material. (If applicable)	26
The packing is too loose. The gland nuts need to be tightened and the packing lubricated. (If applicable)	27

8 APPENDIX C – DISASSEMBLY

8.1 SWP: NON-MOTORIZED

(PROCEDURE AND PARTS MAY VARY BY PUMP SIZE)

The following instructions assumes complete disassembly of the pump. Reference Section 10.1 for item numbers.

1. Follow shutdown procedures on page 11.
2. Disconnect pump from the power source.



3. Remove the Pipe Plug (13) (if applicable) and remove Screws (12) holding Suction Housing (02) to Pump Body (01).
4. Remove Suction Housing (02) and Stator (03).
5. With threaded Flex Joints (05) remove the Rotor (04) by rotating counter-clockwise. With pinned joint Flex Joints (05) punch out the Rotor Pin (14) using an appropriate sized punch. Once pin is removed Rotor (04) can be removed.
6. Remove the Flex Joint (05) from the Drive Shaft (06) by rotating counter-clockwise. Use a hex wrench if necessary. With pinned joint Flex Joints (05), use an appropriate sized punch to remove the Shaft Pin (15). Once pin is removed Flex Joint (05) can be removed.
7. Mechanical Seal (09) can be removed from the Drive Shaft (06), use caution as not to scratch or bend the seal. Carefully remove the seal seat from the Pump Body (01), again use caution as not to damage any parts. If the seal is damaged or worn the entire assembly should be replaced since components are matched upon manufacturing and are not interchangeable.
8. Remove the Snap Ring (08) which retains the bearing/shaft assembly.
9. Slide out the bearing/shaft assembly. It may be necessary to lightly tap the threaded end of the Drive Shaft (06) to remove the assembly. Use a rubber mallet or hammer using a shock absorber, such as a block of wood, to protect the threads.
10. If needed, remove the Slinger (10) and the Bearings (07) can now be pressed off the Drive Shaft (06).

8.2 SWPM: MOTORIZED

(PROCEDURE AND PARTS MAY VARY BY PUMP SIZE)

The following instructions assumes complete disassembly of the pump. Reference Section 10.2 for item numbers.

1. Follow shutdown procedures on page 11.
2. Disconnect pump from power source.



3. Disconnect suction and discharge piping. Drain pump by removing Pipe Plug (15), if applicable.
4. Unscrew the Cap Screws (12) that hold the Suction Housing (02) to the Discharge Housing (01). Remove the Suction Housing (02) and Stator (03). To remove the Stator (03), pull axially away from the Motor (11) and twist CCW when viewing the pump from the suction side.
5. Remove the Rotor (04). For threaded Flex Joints (05) unthread the Rotor (04). The threads are R.H. on both sides of the Flex Joint (05). For pinned Flex joints (05) support the joint and tap out the Rotor Pin (07) using a suitable punch.
6. Remove the Flex Joint (05). A hex wrench can be used to unthread the joint, the threads are R.H. For pinned Flex Joints (05), use a suitable punch and tap out the Motor Pin (08). It may be necessary to access the Motor Pin (08) through the discharge port.
7. Take care in removing the Mechanical Seal (06) as not to scratch or damage the sealing faces.
8. Remove the Discharge Housing (01) from the Motor (11) by unthreading Hex Head Bolts (14) and Lock Washers (13).
9. Use extreme care when prying out the seal seat of the Mechanical Seal (06) from the Discharge Housing (01). If any damage is done to the Mechanical Seal (06) the entire assembly should be replaced as each part is unique to the assembly.
10. Slide the Slinger (10) off the motor shaft.

9 APPENDIX C – ASSEMBLY

9.1 SWP: NON-MOTORIZED

(PROCEDURE AND PARTS MAY VARY BY PUMP SIZE)

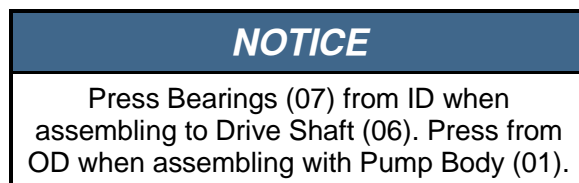
The following instructions assumes assembly from complete disassembled pump. Reference Section 10.1 for item numbers.

The assembly procedure is the inverse of the disassembly procedure. The following are general guidelines in completing the assembly process. It is recommended that all parts be inspected for wear to avoid performance and maintenance issues in the near future.

It is vital during assembly to ensure cleanliness is a priority. Especially for the Mechanical Seal (09) to avoid unnecessary failure of the pump.



1. Press Bearings (07) onto the Drive Shaft (06)



2. Slide Slinger (10) onto shaft from the threaded end
3. Insert bearing/shaft assembly into the Pump Body (01). Ensure Bearings (07) are inserted squarely into Pump Body (01) for proper fit.
4. Install Snap Ring (08) securing bearing/shaft assembly.

9.1.1 Mechanical Seal

- a. Clean seal surfaces with a soft lens cloth and light oil. Never use grease or thick oil to clean surfaces which will not allow proper sealing of mechanical seal.
- b. Lubricate the outer surface of the seal seat with light oil or soap and water then install into the Pump Body (01) ensuring a square tight fit.

NOTICE

Never use petroleum based products on EPDM (Ethylene-Propylene-Diene Terpolymer). Use soap and water or Glycerol for lubrication.

- c. Clean and oil the mating sealing face following the cleaning instructions in Step 5. Using a light oil or soap and water, lightly lubricate the Drive Shaft (06) and slide this half of the seal over the Drive Shaft (06) to the other sealing face. Ensure a square and firm seating.
 - d. Install spring and retainer of the mechanical seal over the Drive Shaft (06).
5. Thread on Flex Joint (05) to the Drive Shaft (06) by rotating in a clock-wise rotation.

If assembling a SWP56, install the Seal Spacer (17) between the Drive Shaft (06) and the Flex Joint (05).

For a pinned Flex Joint (05) press Shaft Pin (15) through Drive Shaft (06) and Flex Joint (05) until both ends of Shaft Pin (15) are located within the Drive Shaft (06). The Mechanical Seal (09) (or Seal Spacer (17) for SWP67) should be seated against the Flex Joint (05) and not the Shaft Pin (15). Doing so will induce excessive wear on the seal faces leading to premature failure. The Shaft Pin (15) will be contained within the spring.

6. Thread on the Rotor (04) onto the Flex Joint (05) by rotating in a clockwise rotation.

Pinned joint Flex Joint (05) press Rotor Pin (14) through Rotor (04) and Flex Joint (05) until both ends of Rotor Pin (14) are located within the Rotor (04).

7. Insert the Stator (03) into the Suction Housing (02) and push over the Rotor (04) until the Suction Housing (02) flange and Pump Body (01) flange have mated.
8. Orientate Suction Housing (02) to desired angle, thread in Screws (11) and Lock Washers (12) and torque to spec from *11.2 TORQUE VALUES*.
9. Attach motor and align to specifications. Be sure to follow all installation instructions from the motor's manufacture.

⚠ DANGER

Operation of any progressive cavity pump with a clogged discharge or closed discharge valve generates a pressure vessel.

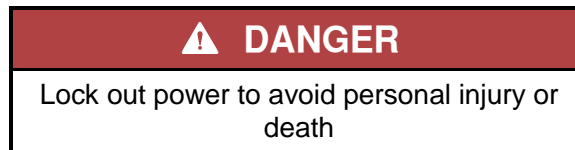
9.2 SWPM: MOTORIZED

(PROCEDURE AND PARTS MAY VARY BY PUMP SIZE)

The following instructions assumes assembly from complete disassembled pump. Reference Section 10.2 for item numbers.

The assembly procedure is the inverse of the disassembly procedure. The following are general guidelines in completing the assembly process. It is recommended that all parts be inspected for wear to avoid performance and maintenance issues in the near future.

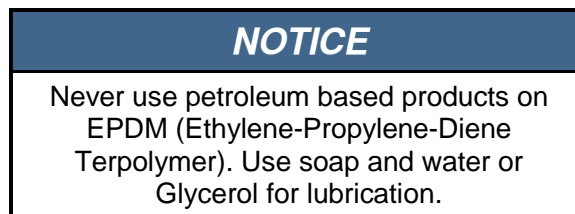
It is vital during assembly to ensure cleanliness is a priority. Especially for the Mechanical Seal (06) to avoid unnecessary failure of the pump.



1. Install the Slinger (10) over the motor shaft.
2. Assemble the Discharge Housing (01) to the Motor (11) via Hex Head Bolts (14) and Lock Washers (13).

9.2.1 Mechanical Seal

- a) Clean seal surfaces with a soft lens cloth and light oil. Never use grease or thick oil to clean surfaces which will not allow proper sealing of mechanical seal.
- b) Lubricate the outer surface of the seal seat with light oil or soap and water then install into the Discharge Housing (01) ensuring a square tight fit.



- c) Using a light oil or soap and water, lightly lubricate the motor shaft and slide the Mechanical Seal (06) half that rests closest to the Flex Joint (05) over the motor shaft until it meets the seal face. Ensure a square and firm seating.
 - d) Install the spring and retainer of the Mechanical Seal (06) resting the end of the spring around the seal body from step "c".
3. SWPM67 will need a Seal Spacer (09), this is placed between the Mechanical Seal (06) and the Flex Joint (05).

4. For threaded Flex Joints (05) thread the joint onto the motor shaft compressing the Mechanical Seal (06). For pinned Flex Joints (05) tap the Motor Pin (08) through the Flex Joint (05) and motor shaft using an appropriate sized punch. It may be necessary to access the pin through the discharge port in the Discharge Housing (01). The Mechanical Seal (06) will seat against the Flex Joint (05) and not the Motor Pin (08). Doing so will induce excessive wear on the seal faces leading to premature failure. The Motor Pin (08) will be contained within the spring.
5. Assemble the Flex Joint (05) with the Rotor (04). For threaded Flex Joints (05) thread the rotor (04) onto the Flex Joint (05), threads are R.H. For pinned Flex Joints (05) use an appropriate sized punch to tap in the Rotor Pin (07) through the Flex Joint (05) and the Rotor (04).
6. Slide and rotate (if necessary) Stator (03) over Rotor (04) allowing the flange on the Stator (03) to rest inside the groove on the Discharge Housing (01).
7. Assemble the Suction Housing (02) over the Stator (03) in desired orientation. Secure to the Discharge Housing (01) using the Cap Screws (12) and Lock Washers (13) and torque to spec from *11.2 TORQUE VALUES*. This step will secure the Stator (03) in place.
8. Secure to baseplate and align piping to pump. Ensure to follow all installation instructions from Motor (11) manufacturer.

 **DANGER**

Operation of any progressive cavity pump with a clogged discharge or closed discharge valve generates a pressure vessel.

10 APPENDIX D – SECTION VIEW SWP

10.1 NON-MOTORIZED

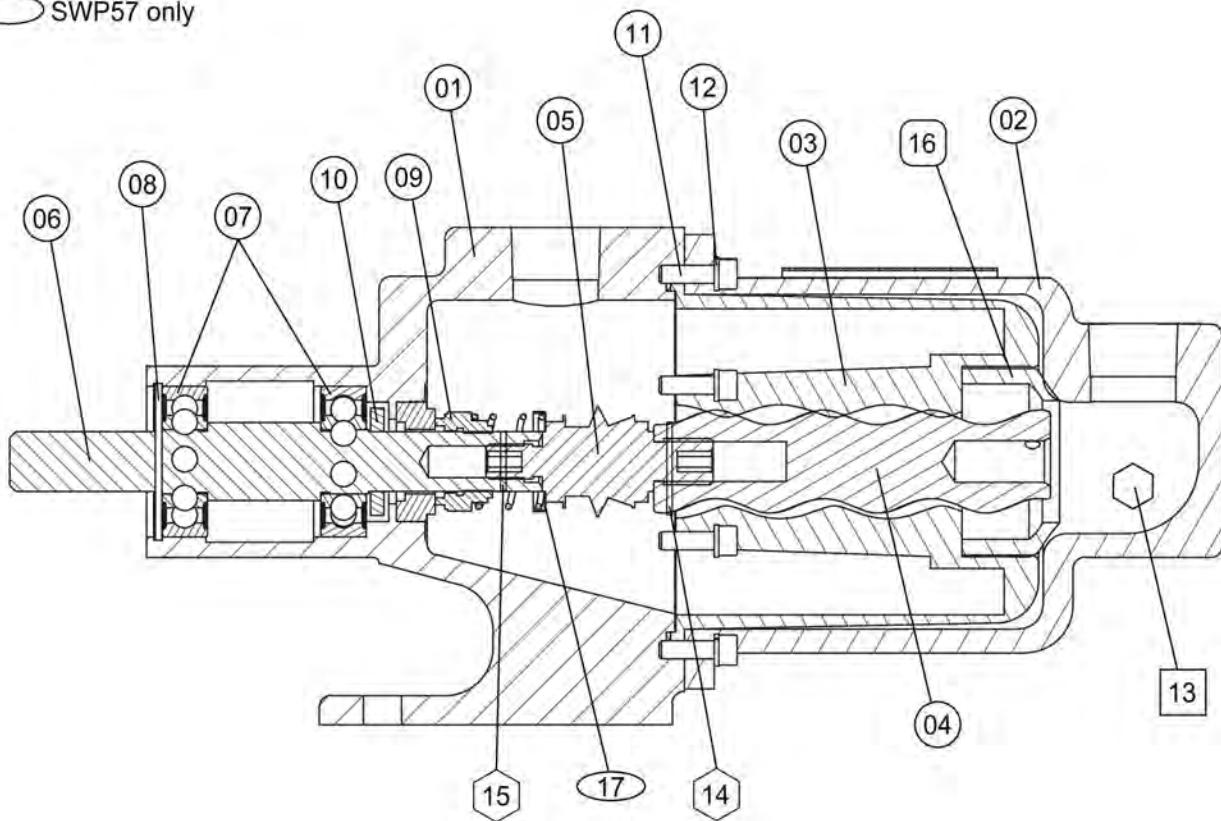
(PARTS MAY VARY BY PUMP SIZE)

□ SWP56 & SWP67 only

⬡ SWP67 only

○ SWP15 & SWP22 only

○ SWP57 only




MODEL SWP PARTS LIST			
ITEM	DESCRIPTION	ITEM	DESCRIPTION
01	PUMP BODY	10	SLINGER
02	SUCTION HOUSING - VERTICAL SUCTION	11	SCREW
03	STATOR	12	LOCK WASHER
04	ROTOR	13	PIPE PLUG
05*	FLEX JOINT (STANDARD THREAD)	14	ROTOR PIN
06	DRIVE SHAFT	15	SHAFT PIN
07	BEARINGS	16	STATOR SPACER
08	SNAP RING	17	SEAL SPACER (SWP56 only)
09	MECHANICAL SEAL		

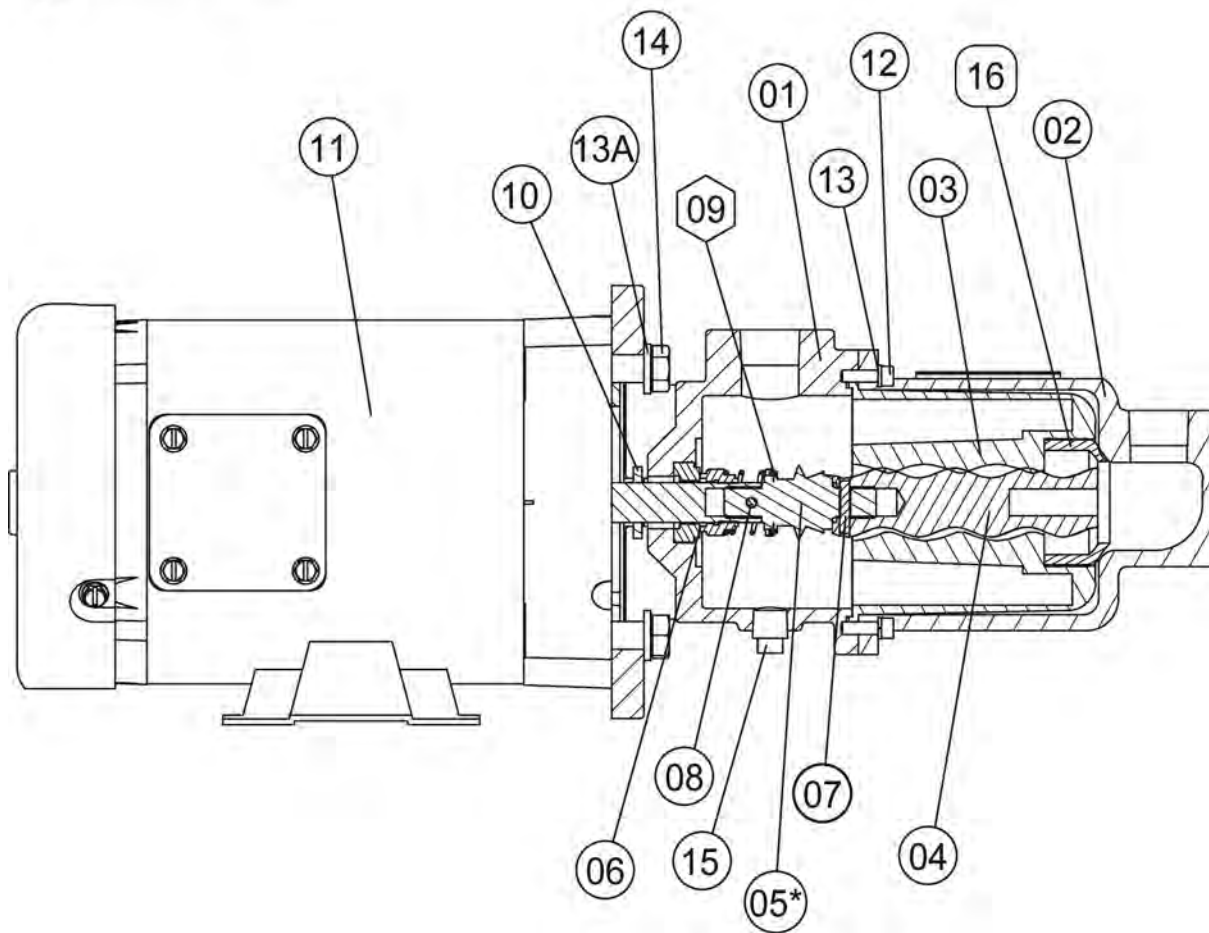
*NOTE: SWP67 will have a pinned connection

10.2 MOTORIZED

(PARTS MAY VARY BY PUMP SIZE)

 SWPM15 & SWPM22 only

 SWPM67 only



MODEL SWPM PARTS LIST			
ITEM	DESCRIPTION	ITEM	DESCRIPTION
01	DISCHARGE HOUSING	09	SEAL SPACER (SWPM67 ONLY)
02	SUCTION HOUSING - VERTICAL SUCTION	10	SLINGER
03	STATOR	11	MOTOR
04	ROTOR	12	CAP SCREW
05*	FLEX JOINT PINNED*	13/A	LOCK WASHER
06	MECHANICAL SEAL	14	HEX HEAD BOLT
07	ROTOR PIN	15	PLUG
08	MOTOR PIN	16	STATOR RING

NOTE*: SINGLE PHASE MOTORS FOR SWPM15, 22, 33 & 44 HAVE THREADED FLEX JOINTS

NOTE: Item 15 for SWPM56 & SWPM67 will have different physical locations

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL

NOTE: SWPM56 will have a detachable motor foot using (2) longer Hex Head Bolts

APPENDIX E – REFERENCE TABLES

10.3 PUMP LIMITATIONS

10.3.1 Viscosity/RPM

Viscosity (cp)	1-300	300-1,000	1,000-2,000	2,000-5,000	5,000-10,000	10,000-20,000
Limit RPM	1750	1200	700	350	180	100

10.3.2 Discharge Pressure & Port Sizes

Pump Size	SWP15	SWP22	SWP33	SWP44	SWP56	SWP67
Discharge Pressure	150	100	50	40	50	50
Discharge Port (NPT)	3/4"-14	3/4"-14	3/4"-14	3/4"-14	1 1/4"-11.5	2"-11.5
Suction Port (NPT)	3/4"-14	3/4"-14	3/4"-14	3/4"-14	1 1/2"-11.5	2"-11.5

*Note: SWP and SWPM models will have the same pressure ratings and sizes

10.3.3 Temperature

Stator Material	Temperature Range
NBR: Nitrile	10°-160°F
EPDM: Ethylene-Propylene-Diene Terpolymer	10°-210°F
FPM: Fluoroelastomer	10°-240°F

10.4 TORQUE VALUES

Stainless Steel Bolts		Carbon Steel Bolts	
Size	Max. Torque	Size	Max. Torque
8-32	20inlb	8-32	20inlb
10-24	22 inlb	10-24	26inlb
1/4-20	75 inlb	1/4-20	85 inlb
5/16-18	132 inlb	5/16-18	150 inlb
3/8-16	236 inlb	3/8-16	265 ftlb
1/2-13	517 inlb	1/2-13	580 ftlb

10.5 FLEX JOINT CONFIGURATIONS

Size/Drive Type							
Model	Drive Type	Pump Size					
		15	22	33	44	56	67
SWP	Pinned						✓
	Threaded	✓	✓	✓	✓	✓	
	Mechanical Seal Spacer					✓	
SWPM 1 Phase Motor	Pinned					✓	✓
	Threaded	✓	✓	✓	✓		
	Mechanical Seal Spacer						✓
SPWM 3 Phase Motor	Pinned	✓	✓	✓	✓	✓	✓
	Threaded						
	Mechanical Seal Spacer						✓

11 PUMP INFORMATION

Purchase Date: _____

Purchase Order#: _____

Serial Number: _____

Equipment Number: _____

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