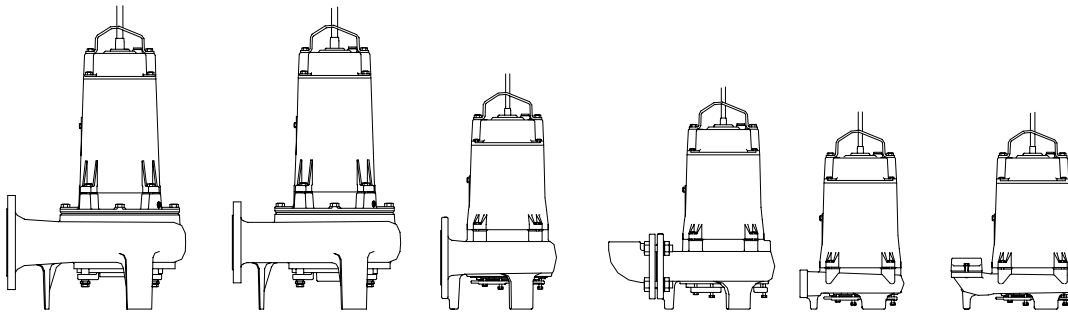


Installation Operation & Maintenance Manual

SCAVENGER™ E SERIES



EF SERIES EFFLUENT PUMPS

EJ SERIES SEWAGE EJECTOR PUMPS

IMPORTANT! Read this manual carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing ALL safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.



WARNING!



Risk of serious injury or death from electric shock

- Insure that the pump motor is properly grounded prior to starting the pump.
- On pumps equipped with a plug, insure that the ground prong is intact in both the pump plug and any extension cords used to power the pump. Insure that the pump is plugged into a properly grounded receptacle.
- On pumps not equipped with a plug, insure that the green “ground” conductor in the pump power cable is properly grounded at the power supply or control panel per National Electrical Code requirements.
- Do not touch or hold the pump while it is connected to the electrical supply.
- Disconnect the pump from the electrical supply prior to performing any service work.
- Do not allow personnel to enter the water while the pump is running or is connected to the electrical supply. Disconnect the pump from the electrical supply prior to entering the water.
- Do not use the E Series Scavenger pumps in swimming pool applications or in any other application where people or animals may be in the water with the pump.
- In the event that the pump power cable is damaged, disconnect pump from power supply and have the cable replaced by a qualified ABS Service Center or repair shop. Do not operate the pump with a damaged power supply cable.



WARNING!



Risk of serious injury from spinning impeller

- Disconnect pump from power supply prior to performing any service work or adjustments.
- Do not put hands or feet inside pump discharge or suction for any reason.
- Do not check for pump rotation by putting hand or any object into pump discharge or suction.



CAUTION!



Risk of injury during pump handling

- Prior to lifting the pump, insure that the pump lifting device (chain, wire rope, etc) is of suitable strength to lift the pump safely, and is in good condition.
- If the pump is to be lifted by a hoist, insure that the working load rating of the hoist exceeds the weight of the pump, and that the hoist is in good working condition.
- Never lift the pump by the power cable!
- Never work on a pump which is suspended in the air. Set the pump on the ground prior to performing any service or adjustments.
- Never apply power to a pump which is suspended in the air. The start reaction of the motor will cause the pump to spin violently and may cause injury.
- Scavenger pumps are made of cast iron and are heavy. Insure that pumps are handled in a manner that will prevent injury due to back strain, pinched fingers, foot injuries, etc.
- Disconnect pump from power supply prior to performing any service work or adjustments.



CAUTION!



Risk of injury or loss from improper application or installation

- Insure that the Scavenger pump selected is the proper model for the intended application, and that the pump and electrical supply are fully compatible.
- Insure that the Scavenger pump has been properly installed and connected to the power supply prior to starting the pump.
- Do not use the Scavenger pump in applications where people or live animals will be in the water with the pump.
- Do not use the Scavenger pump in highly corrosive environments.
- Consult ABS for assistance with application or installation questions, or with any questions not addressed by this operation & maintenance manual.

SECTION 1.0- INTRODUCTION 2

1.1 Introduction 2

1.2 Applications 2

SECTION 2.0- DESIGN OF PUMP 2

2.1 General 2

2.2 Material of Construction 2

SECTION 3.0- UNPACKING AND INSPECTION 2

3.1 Inspection on Receipt of Pump..... 2

3.2 Long Term Storage 2

SECTION 4.0- INSTALLATION 3

4.1 Free Standing Installation..... 3

4.2 Guide Rail System Installation..... 4

4.3 Float Switches..... 4

4.4 Pump Connections..... 5

SECTION 5.0- START UP 5

5.1 Impeller Rotation..... 5

5.2 Current Unbalance 6

5.3 Product Start-up Report 6

SECTION 6.0- OPERATION & MAINTENANCE 7

6.1 Operation 7

6.2 Preventative Maintenance 7

6.3 Lubrication. 7

SECTION 7.0- MAINTENANCE 7

7.1 Major Repairs..... 7

7.2 Cable Replacement..... 7

7.3 Parts 8

SECTION 8.0- INTERNAL MOTOR CONNECTION 8

8.1 Wire Size 8

8.2 Wiring 8

8.3 Motor Voltage Change 8

WIRING DIAGRAMS 9

TROUBLESHOOTING CHART 10

WARRANTY 11

1.0 INTRODUCTION

1.1 INTRODUCTION

This manual was prepared to assist you in the correct installation, operation, and maintenance of your ABS pump. Please read it completely before installing the pump. Make certain that you are familiar with the contents, and that the chapters on installation and operation are fully understood before running the pump.

ABS pumps are designed for minimal maintenance. However, regular checks will ensure longer life and greater operating reliability.

1.2 The SCAVENGER™ series submersible pumps are designed to be used for pumping clean or contaminated water, residential or industrial sewage, or septic tank effluent. All liquids to be pumped must be compatible with the materials of construction of the pump. The pump consists of a fully submersible motor, close coupled to a non-clog type pump end.

1.3 **Warranty:** No repair work should be carried out during the warranty period without prior factory approval. To do so may render the warranty void.

Serial No.: In all correspondence and reports, make certain that the pump model and serial number is given.

2.0 DESIGN OF THE PUMP

2.1 ABS SCAVENGER™ submersible pumps are designed for continuous underwater operation in installations handling liquids containing suspended solids.

The motor and pump form a close coupled, watertight unit capable of operating while submerged to a depth of 65 feet. The squirrel cage induction motor is insulated against heat and moisture in accordance with Class “B” (130° C) regulations on models through 2 horsepower and class “F” (155° C) regulations on models from 3 to 10 horsepower.

The motor chamber is filled with non-toxic dielectric oil. This oil aids in motor heat transfer and lubricates the bearings. It also helps protect the motor from damage in the event of water entry.

The impeller is designed for efficient flow characteristics and clog-free operation.

Three-phase pumps are supplied with the free cable ends.

2.2 Table of Materials

Materials of Construction	
Housing & Volute	Cast Iron
Impeller and Wear Plate	Cast Iron
External Hardware	304 Stainless Steel
Motor Shaft	420 Stainless Steel
Mechanical Seals	Carbon/Ceramic (optional Silicon Carbide)
Bearings	Ball Bearings
Motor Windings	Copper (class B or F depending on model)
Start Switch (1 phase)	Solid State Electronic Switch
Power Cable	Thermoplastic Elastomer (20 ft. standard)
O-rings	Buna-N
Oil	Non-Toxic

3.0 UNPACKING, INSPECTION, AND STORAGE

3.1 ABS pumps are shipped from the factory ready for installation and use. They should be held in storage if the pump station is not complete.

Carefully open the shipping container and remove the pump. Check packing material for spare parts before discarding. Thoroughly inspect the pump for shipping damage. Pay special attention to the power cable, and discharge port threads (if applicable). Report any damage to the shipping carrier. In the event of damage, retain all packing material; it may be required to support a damage claim.

THE ENDS OF THE CABLE MUST BE PROTECTED AGAINST MOISTURE. DO NOT ALLOW THE CABLE ENDS TO COME IN CONTACT WITH WATER OR TO LAY ON THE GROUND OR FLOOR.

3.2 LONG TERM STORAGE

3.2.1 If it is necessary to store a pump for a long period of time, it should be stored indoors in a clean, dry temperature-stable environment. The pump should be left in its shipping container or otherwise protected from dirt and water. *The ends of the cable must be protected against moisture.*

3.2.2 Do not allow the pump to freeze. Water trapped during quality testing may expand and cause damage. If the pump must be stored in subfreezing environment, consult the factory for specific recommendations and precautions.

3.2.3 During storage, the impeller should be rotated a few turns once a month. Rotating the impeller will lubricate the seals and prevent seizing.

- 3.2.4 Prior to installation, or if the pump has been unused for one month or longer, the impeller should be rotated by hand to ensure the seals are free-spinning.
- 3.2.5 Installed pumps which are idle for long periods of time should be started and run for a few seconds once a month to lubricate the seals.
- 3.2.6 Installed pumps which have been idle for longer than one month should be lifted from the wet well before being started. The impeller should be rotated by hand to ensure the seals are free-spinning. The pump should then be reinstalled and started.

4.0 INSTALLATION

4.1 FREE STANDING INSTALLATION

The SCAVENGER™ pump may be installed using its integrated feet on any hard bottomed tank capable of supporting the weight of the pump. When installed in this manner, the pump stands vertically on its feet, and the discharge of the pump is hard piped from the pump flange to the exit of the wet well. The piping should include all the features shown in figure 4.1 including a coupling device which will allow the piping to be separated in the event the pump must be removed.

The pump should not be installed on a soft bottomed tank (dirt, sand, crushed stone, etc.) If installation on a soft bottomed tank is required, consult factory for a “mud plate” accessory, which must be installed on the pump to prevent it from sinking into the soft bottom.

The pump is designed to be installed with the motor oriented vertically. Consult factory for approval prior to attempting any horizontal mounting of a Scavenger pump.

4.2 GUIDE RAIL SYSTEM INSTALLATION

A guide rail system is a quick disconnect system which allows the pump to be removed from the wet well without disturbing the discharge piping. The guide rail base is anchored to the floor of the wet well and the discharge piping is attached to it.

A coupling bracket is attached to the discharge flange of the pump and allows the pump to slide up and down a guide rail pipe when being removed and installed. When the pump with coupling bracket attached, is lowered onto the guide rail base, the pump discharge seals against the base automatically using a profile gasket or o-ring (see figure 4.2)

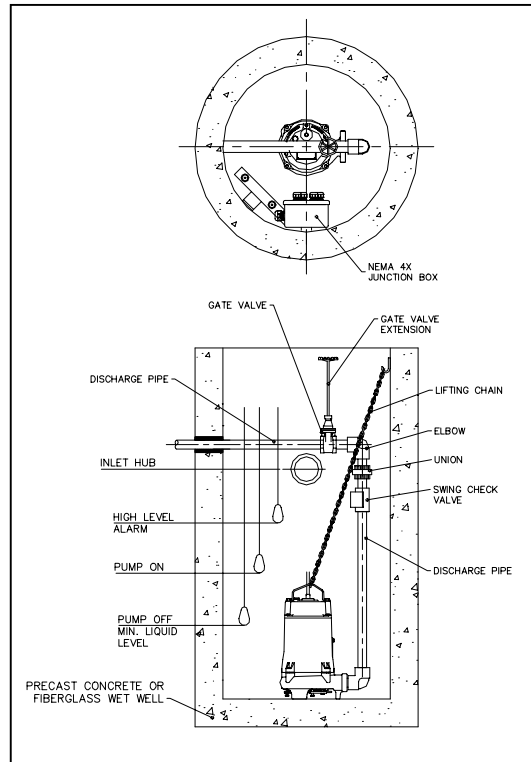


Figure 4-1

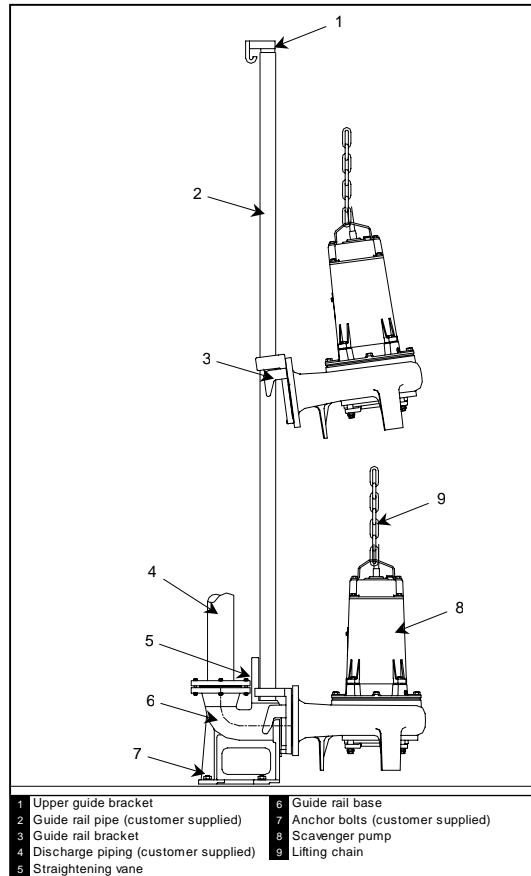


Figure 4-2

4.2.1 Guide Rail Base Anchoring Methods

The preferred method of anchoring the guide rail base to the wet well floor is to use stainless steel stud anchors which are cast into the floor during wet well construction. These can be cast into a concrete floor when the floor is poured, or can be fiberglassed into the floor when using a fiberglass basin. In either case, stud spacing and alignment is critical, and must be carefully controlled so that the guide rail base installation goes smoothly. An alternate anchoring method for concrete wet wells is stud or bolt type anchors which are drilled into the concrete floor after the concrete is cured. These anchors are not as strong as the cast in type, but are suitable as long as they are properly selected and installed.

4.2.2 Guide Rail System Assembly & Installation

To assemble the Automatic Coupling System and to install the Guide Rail Assembly, follow these instructions. (See Figure 4.2)

1. Mount the straightening vane (5) to the guide rail base (6) with screws and spring washer.

Note: Some guide rail bases have an integrated straightening vane. *In this case, mounting of a bolt on straightening vane is not required.*

2. Install the guide rail base in the bottom of the wet well by means of cast-in anchor bolts (7). Check that the base is level, and insure that the base is positioned such that the guide rail pipe can be installed vertically between the base and upper guide rail bracket. Add grout beneath base to level. Re-check base after grout dries. Finally, secure in place with hex nuts and washers.
3. Position the upper guide bracket to the access cover or to the wall of the opening to determine length of guide rail. The guide rail, which is customer supplied, will be standard galvanized or stainless steel pipe. Pipe size depends on the particular guide rail base being installed. After positioning, cut pipe to the required length.
4. Install the guide rail pipe over the tapered plug of the guide rail base. Pipe should fit snugly over the plug.
5. Insert the upper guide bracket tapered plug into the upper end of the guide rail and locate so the guide rail is plumb. Secure upper guide bracket to the access cover or opening wall and Re-check for plumbness. Check that the guide rail base (6), the guide rail (2), and the upper guide bracket

(1) are on the same center line with the discharge connection and vertically aligned. This is necessary to assure that the pump will seal itself correctly. Press upper guide bracket (1) into the guide rail pipe (2) so that no play remains and finally secure the upper guide rail bracket by tightening the screws.

6. The molded profile gasket is placed in the pump bracket so that the thicker or rounded face points towards the guide rail base and the thinner or flat face points toward the pump flange.

Note: On some profile gaskets, both faces are the same shape and thickness. *In this case, the gasket can be installed either way.*

The pump bracket is fastened to the discharge of the pump with stainless steel fasteners. The bolts should be equally tightened in a cross-wise manner to prevent leakage of the seal.

7. The station discharge piping is attached to the threaded or flanged discharge connection of the guide rail base.

Piping should be provided with its own support mechanism so that the guide rail base is not required to support the full weight of the piping system.

4.3 FLOAT SWITCHES

Pumps are controlled by float switches mounted within the pump station wet well. Float switch cables are normally held in place with the float bracket mounted to the access cover frame or pit wall. See Figure 4-3 and 4-4. The floats must be secured so that they will not tangle with each other, catch on pipes, ladders or brackets.

High level Alarm-6 inches above the PUMP ON float.

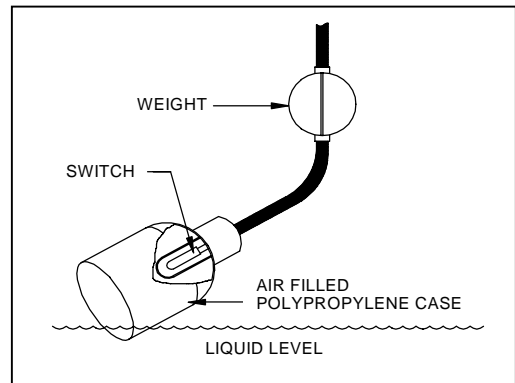


Figure 4-3

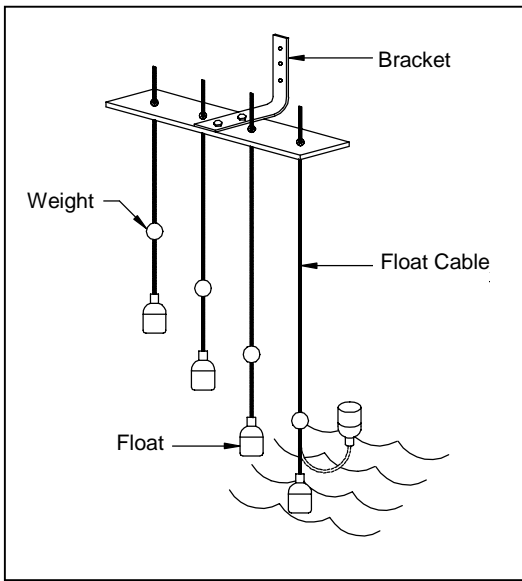


Figure 4-4

4.3.1 FLOAT SEQUENCE

1. As the liquid level in the wet well rises, the “PUMP OFF” float tilts, closing the switch. As the liquid level continues to rise, the “PUMP ON” float tilts. This switch closes, starting the pump.
2. The pump runs until the liquid level falls below the “PUMP OFF” float, emptying the wet well.
3. Duplex pump stations have an additional float for the second or lag pump. If the first pump fails to start or cannot keep up with the inflow and the wet well level continues to rise, the lag float is activated, bringing on the second pump. Both pumps then remain on until the wet well level drops below the off float level.
4. In the event of a malfunctioning float switch, control relay, or pump, the liquid level rises and tilts the “HIGH LEVEL ALARM” float activating the alarm.

4.3.2 FLOAT SWITCH INSTALLATION

The float switch levels will determine the storage volume of the pump station wet well. The storage volume is the main factor affecting the number of pump starts per hour.

Normally, all details of the pump station will be specified by engineering drawings. The drawings will specify the levels for PUMP ON and PUMP OFF floats and the HIGH-LEVEL ALARM float. If the float positions are not specified, the following guidelines for float switch levels will provide proper storage capacity and number of operating cycles for a standard pump station.

SIMPLEX PUMP STATION

Pump OFF-Minimum level at top of motor housing. Pump ON should be 1ft. minimum above pump OFF level. Keep a minimum of 1 ft. below bottom of influent pipe. High level alarm, 6” above lag float.

DUPLEX PUMP STATION

Pump OFF-Minimum level at top of motor housing. Lead pump ON float, minimum 1 ft. above OFF float (greater float spacing leads to fewer starts per hour, and is preferred). Lag float, 6” minimum above lead floats. High level alarm, 6” above lag floats.

If a specific installation cannot adhere to these guide lines, an engineer, the ABS representative, or the factory should be consulted for recommendations.

4.4 PUMP CONNECTIONS

The motor voltage and amp rating of the pump is shown on the nameplate of the pump.

Note: Some pumps are dual voltage or tri-voltage. The voltage for which the motor is connected is shown on a tag attached to the pump handle and on the carton label.

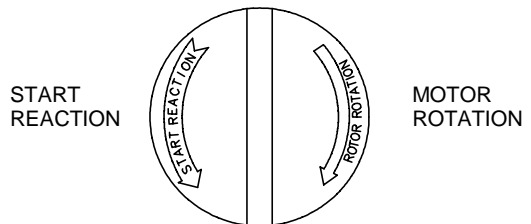
Check that the connected voltage is the same as the supply voltage. The connection of the pump cable leads should be carried out by a licensed electrician in accordance with the identification on the individual leads and the corresponding connections on the control panel. Refer to the Pump Wiring Diagram, Section 8.3.

After installing pump, insure that the power cable is properly secured; led straight up and away from the pump, so that it cannot get caught in the pump, and so that it is not bent and stressed at the point it enters the motor.

5.0 START UP

5.1 IMPELLER ROTATION

1. After the electrical connections are completed, and fully tested, the motor rotation must be checked. Incorrect rotation will result in low flow and can damage the motor.



2. **Rotation.** Check to be sure the impeller is spinning in the proper direction before final installation of the pump. This is especially important with three phase pumps. Proper rotation is clock-wise when viewed from the

top of the pump. Often the easiest method for determining rotation is the "Start Reaction" method. To check rotation this way, place the pump standing upright on the floor. Momentarily energize the power and watch the direction the pump body twists. This twist or "Start Reaction" will be in a direction opposite to the impeller rotation. The start reaction should twist the pump in a counter-clockwise direction when viewed from the top of the pump.

⚠ CAUTION! ⚠

WHEN APPLYING POWER TO PUMP, STAND CLEAR OF THE UNIT TO PREVENT INJURY.

3. If the direction of rotation of a three phase pump is incorrect, disconnect power AHEAD of the control panel. Exchange any two of the motor input power leads at the power supply. This will reverse the rotation. Re-check pump for proper rotation after exchanging leads. If there are multiple pumps in the wet well, check rotation on each pump individually. Consult the factory immediately if a single phase pump runs backwards.
4. Run the pump under normal load, and check the motor amp draw with a clamp-on ammeter. Amp draw should be within the limits stated on the pump nameplate.

⚠ CAUTION! ⚠

PRIOR TO PLACING THE PUMP INTO OPERATION, A PRODUCT START-UP PROCEDURE SHALL BE COMPLETED BY AUTHORIZED PERSONNEL. FAILURE TO COMPLETE THE PRODUCT START-UP REPORT WILL VOID THE WARRANTY. A COPY OF THIS REPORT IS FURNISHED WITH EACH PUMP.

5.2 CURRENT UNBALANCE (three phase only)
 After ensuring that the pump is rotating in the correct direction, and the current draw is within specifications, the Amount of current unbalance between phases must be calculated. Run the pump under water, simulating normal operating load conditions. Perform the measurements and calculations of the current unbalance equation. Enter the results of the current unbalance calculation on the Product Start-up Report.

CURRENT UNBALANCE EQUATION

$$\begin{aligned} & \% \text{ OF CURRENT UNBALANCE} \\ & = \\ & \text{MAX. CURRENT DIFFERENCE FROM} \\ & \text{AVERAGE CURRENT (X100)} \end{aligned}$$

EXAMPLE:

1. MEASURE THE CURRENT (IN AMPS) OF EACH PHASE AT THE CONTROL PANEL TERMINAL STRIP.

$$\begin{aligned} T1 &= 10.0 \text{ AMPS} \\ T2 &= 10.5 \text{ AMPS} \\ T3 &= 10.5 \text{ AMPS} \end{aligned}$$

2. AVERAGE CURRENT

$$\frac{10.0 + 10.5 + 10.5}{3} = 10.33 \text{ AMPS}$$

3. MAXIMUM CURRENT DIFFERENCE FROM AVERAGE

$$10.33 - 10.00 = .33 \text{ AMPS}$$

4. ACTUAL CURRENT UNBALANCE

$$\frac{.33}{10.33} (100) = 3.2\%$$

The current unbalance for this installation is 3.2% which is within specifications.

⚠ CAUTION! ⚠

CURRENT UNBALANCE BETWEEN PHASES SHALL NOT EXCEED 4%. CONSULT THE FACTORY IMMEDIATELY WHEN CURRENT UNBALANCE EXCEEDS 4%. DO NOT OPERATE THE PUMP. THE PERCENT OF CURRENT UNBALANCE IS DEFINED AND CALCULATED IN THE CURRENT UNBALANCE EQUATION. ENTER THE RESULTS OF THE CURRENT UNBALANCE IN THE PRODUCT START-UP REPORT.

5.3 PRODUCT START-UP REPORT
 The ABS Product Start-Up Report contains space for information relating to the pump in the specific installation.

The Product Start-Up Report also provides the user of a record of the initial conditions of the pump and control system at the time of installation.

If there are ever any questions or problems relating to the pump, the ABS Product Service Department will use the information provided in the Product Start-Up Report to trouble-shoot the installation and assist the user.

A complete Product Start-Up Report will enable ABS to evaluate the entire installation and provide the best assistance to the user.

The Product Start-Up Report is also required to support warranty claims. It is important that the Product Start-Up Report be filled out completely by authorized personnel and returned to ABS Pumps. Be sure to keep a copy for your records.



6.0 OPERATION & MAINTENANCE

6.1 OPERATION

After the electrical and mechanical installations have been performed, and the Product Start-Up Report completed, the pump is ready for operation. No operational procedures are required except to apply rated power to the pump. There are no specific shutdown procedures beyond disconnecting the power supply.

6.2 PREVENTATIVE MAINTENANCE

ABS pumps are designed with a minimum number of preventative maintenance checks. These checks are few but will add satisfactory service to the life of the pump. Maintenance checks should be performed at the intervals stated. Severe operating environments will require more frequent checks.

 CAUTION! 
<p>UNDER NO CIRCUMSTANCES SHOULD TOOLS BE APPLIED TO THE PUMP AND MOTOR WITHOUT THE POWER TO THE CONTROL BOX BEING DISCONNECTED AND LOCKED OFF.</p>

6.2.1 Cable Inspection

The cable should be inspected for evidence of chafing, cuts or abrasion whenever the pumps is removed from the wet well. The area where the cable enters the terminal chamber should be examined carefully if damage is found, the cable should be replaced.

6.2.2 Washdown

The accumulation of grease and sludge on the pump and float switches should be washed down at three month intervals to insure proper operation. This can be accomplished by using a

high pressure hose. After cleaning the switches should be inspected and checked for proper operation.

6.2.3 Bottom Plate Clearance Adjustment

The SCAVENGER™ E Series pumps utilize the patented ABS Contrablock impeller system with an adjustable wear plate. This system provides superior solids handling ability and allows for easy impeller clearance adjustment for maximum pumping efficiency.

Clearance Adjustment

The wear plate on the bottom of the pump has been factory set during pump manufacture. However, jostling during shipping can upset this adjustment. Prior to placing the pump in service, it is recommended that this adjustment be checked. This is especially true if the pump is found to be noisy during initial startup. A small amount of noise during initial operation is normal, but excessive noise or binding of the impeller indicates that adjustment is necessary.

To adjust the wear plate, lay the pump on it's side. Note that there are two sets of screws holding the wear plate; one set pulling the wear plate toward the impeller, and one set pushing it away. On some models, the hold down screws are threaded through a hole in the center of the push away screws. Adjusting the screws one quarter turn at a time, move the wear plate away from or toward the impeller to set the proper impeller clearance. The clearance is set properly when the impeller can be rotated freely, but the gap between the bottom of the impeller and wear plate is at a minimum. A small amount of contact between the impeller and wear plate is considered acceptable. Use care to insure that the wear plate is adjusted evenly against the impeller.

6.3 LUBRIATION

Internal pump components are lubricated during manufacture and do not require additional lubrication.

7.0 MAINTENANCE

7.1 MAJOR REPAIRS

Major repair tasks such as bearing, stator or motor shaft replacement should be performed only by ABS factory personnel or a technician trained by the ABS service department.

7.2 CABLE REPLACEMENT

The power cable is epoxy potted into the pump lid at the factory to guarantee a perfect seal. It is recommended that the ABS Service Dept. be contacted in the event a replacement cable assembly is required.

7.3 PARTS

For cross sectional drawings and part lists, please visit our website. You may also call or fax ABS to request this information. Be sure to include your pump model number in your request.

NOTE

If water is found in the motor chamber, the pump must be fully disassembled and major overhaul is required. This should only be performed by an ABS certified technician.

6. Verify that the proper wires are paired.
7. Clean the mating surface of the motor housing and lid. Clean and inspect the lid o-ring and set it in the groove on the motor housing.
8. Reconnect the wires from the lid to the motor and reinstall the lid being careful not to pinch any wires.

8.0 INTERNAL MOTOR CONNECTION

8.1 WIRE SIZE

All models must be wired to conform to the National Electric Code. Insure that the wire feeding the pump and control is of adequate size and rating for the full load amps of the motor.

8.2 WIRING

Check metal nameplate on unit to verify proper model, voltage and phase for which the unit is to be used; be sure they agree.

8.3 MOTOR VOLTAGE CHANGE

The operating voltage of 208-230/460 three phase models can be changed between 208-230 and 460 by reconnecting wires under the pump lid. Reconnection should be carried out by a qualified mechanic familiar with the wiring of electric motors. When removing the lid and changing the connections, insure that no dirt, debris, or wire slivers are allowed to drop into the motor.

8.3.1 Small Frame Scavengers (1-2 HP)

1. Winding connections are made using crimp connectors to join wires.
2. Note the position of the lid, then remove the lid and separate the quick connectors connecting the lid wires to the motor. Set the lid aside.
3. Using the appropriate wiring diagram on the next page, verify the present voltage connection by determining which wires are paired up with crimp connectors.
4. Cut the wires loose from the crimp connectors, being careful not to lose the wire markers.
5. Strip an appropriate amount of insulation back from each wire, and pair up the proper wires using new crimp connectors.

8.3.2 Large Frame Scavengers (3-10 HP)

The voltage change procedure is the same as for the small frame scavengers except no cutting of wires is necessary. Wire connections are made by pairing appropriate wires on the terminal board. In the 208-230 volt configuration, jumpers are required between certain terminal posts. Jumpers are available from ABS, or 12 gauge solid copper wire can be used.

8.3.3 Single Phase Scavengers

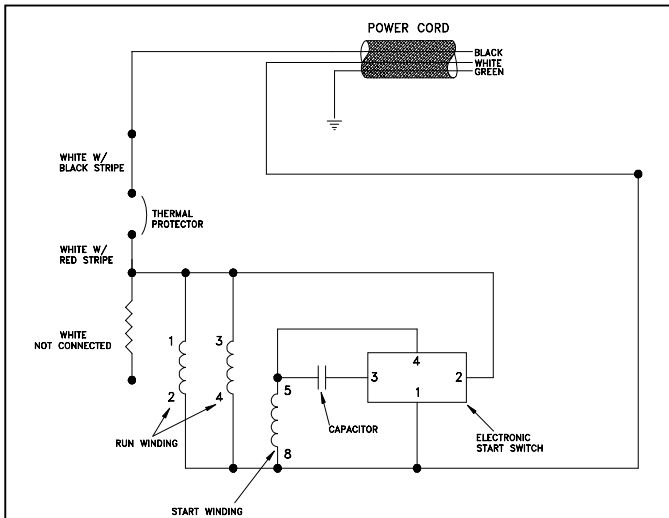
The single phase EF05W-1H can be connected internally for either 115V or 230V.

All other single phase pumps can be connected for only 230V.

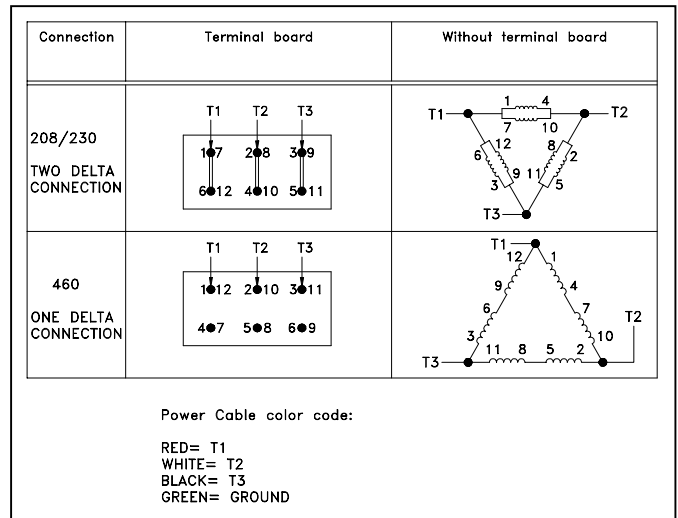
To reconnect the EF05W-1H pump for a different voltage, follow the same basic instructions as for the small frame three phase pumps, while using the appropriate single phase diagram shown on the next page. Be certain to make all the proper connections to the capacitor, start switch, and thermal overload shown in the diagram.

If changing a 115V pump to 230V, the plug on the end of the cord must be removed.

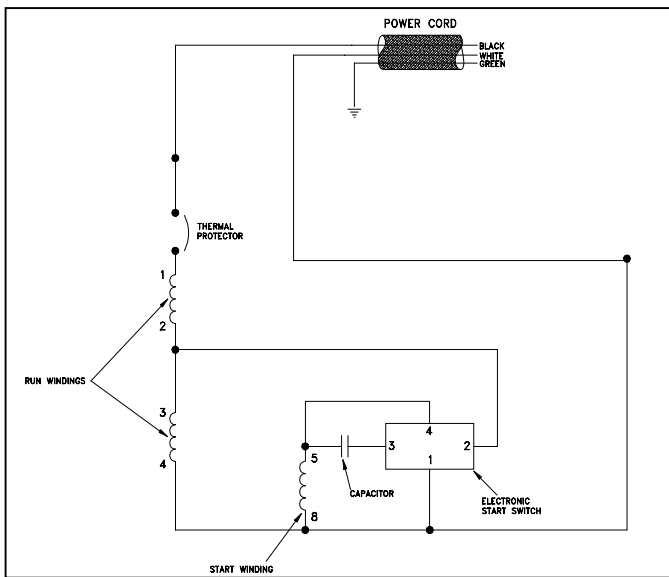
If changing from 230V to 115V, a plug may need to be added. After reconnecting pump, verify proper pump rotation prior to installation. If pump turns in the incorrect direction, exchange wires 5 & 8 to reverse rotation.



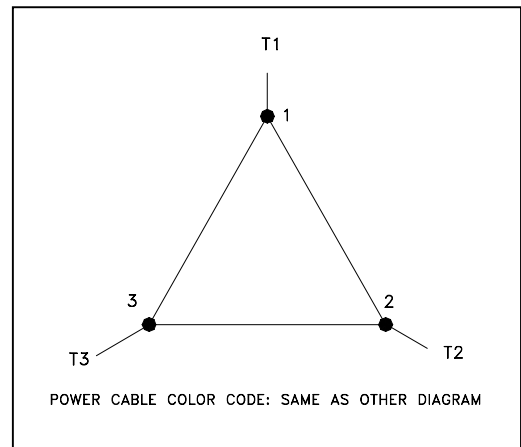
115V Single Phase Wiring Diagram.
Applies to 1/2 horsepower single phase models only.



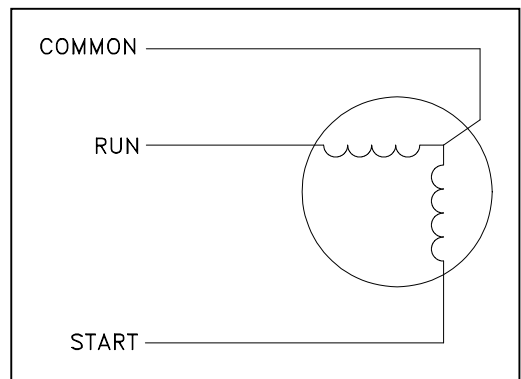
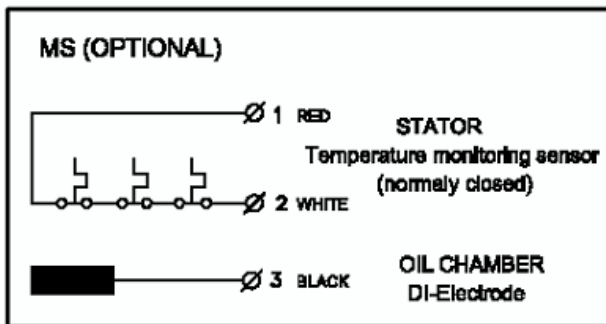
208-230/460V Three Phase Wiring Diagram
Applies to all tri-voltage three phase models.



230V Single Phase Wiring Diagram.
Applies to 1/2 through 2 horsepower single phase models.



575V Three Phase Wiring Diagram



230V Single Phase Wiring Diagram.
Applies ONLY to EJ 30W and EJ 50W models.
*Requires external start kit

SYMPTOM	POSSIBLE CAUSE	ACTION
1. PUMP WILL NOT START	<p>A. Power supply failure</p> <p>B. Burned-out fuse or tripped circuit breaker</p> <p>C. Damaged power cable</p> <p>D. Level switch failure</p> <p>E. Jammed impeller</p> <p>F. Water inside motor</p> <p>G. Foreign matter build-up</p>	<p>A. Check Power Supply Check electrical system for loose connections Check operating voltage between the three power lines-three phase Check operating voltage between terminals L1 and L2-single phase.</p> <p>B. Check circuit protectors, reset circuit breakers</p> <p>C. Check external cable for damage - repair</p> <p>D. Check level switches</p> <p>E. Inspect and remove jamming object</p> <p>F. Refer to symptom 8</p> <p>G. Clean floats carefully</p>
2. REPEATED TRIPPING	<p>A. Circuit protection underrated</p> <p>B. Phase current unbalance</p> <p>C. Pump connected to incorrect voltage</p> <p>D. Wet or Damaged wiring</p> <p>E. Obstruction in pump</p> <p>F. Incorrect rotation</p> <p>G. Shorted motor</p>	<p>A. Check rating and replace with proper size</p> <p>B. Check amp draw</p> <p>C. Verify connections. See wiring diagram</p> <p>D. Inspect external cable, replace if worn or damaged.</p> <p>E. Remove obstruction</p> <p>F. Check rotation per Section 5.1</p> <p>G. Check motor for shorts using a megger</p>
IF SYMPTOMS CONTINUE, CONSULT ABS PRODUCT SERVICE DEPARTMENT		
3. PUMP RUNS IN "HAND" BUT NOT IN AUTOMATIC MODE	<p>A. Bad "OFF" float switch</p> <p>B. Bad "ON" float switch</p>	<p>A. Install wire jumper between "OFF" switch terminals. If pump starts to run replace the "OFF" float switch.</p> <p>B. Install wire jumper between "ON" float terminals. If pump starts to run replace the "ON" float switch.</p>
4. PUMP WILL NOT SHUT OFF	<p>A. Float switch failure</p> <p>B. Control panel failure</p>	<p>A. With power off, check float switches for continuity.</p> <p>B. Check control panel schematic drawing</p>
5. HIGH LEVEL ALARM DOES NOT COME ON	<p>A. Faulty high level alarm switch</p>	<p>A. Install wire jumper between alarm terminals. Replace high-level alarm float switch.</p>
6. LOW FLOW	<p>A. Incorrect pump rotation</p> <p>B. Liquid level in pit too low,</p> <p>C. Obstruction in pump or piping</p>	<p>A. Check rotation per Section 5.1</p> <p>B. Check liquid level and location of level switches.</p> <p>C. Remove obstruction.</p>
7. WATER IN OIL CHAMBER	<p>A. Loose or damaged oil plug</p> <p>B. Mechanical Seal Failure</p>	<p>A. Check plug - replace</p> <p>B. Visit ABS website for instructions.</p>
8. WATER INSIDE MOTOR CASING	<p>A. Damaged upper lip seal or mechanical seal</p> <p>B. Damaged O-ring between oil chamber and motor casing.</p> <p>C. Cut in jacket of power cable</p> <p>D. Water wicking down power cable from wet well junction box</p>	<p>A. Visit ABS website for pump rebuilding instructions.</p> <p>B. Replace O-ring</p> <p>C. Inspect and replace as necessary</p> <p>D. Dry and reseal junction box. Replace power cable.</p>

Warranty

ONE YEAR WARRANTY – **SCAVANGER™** SERIES PUMPS PERMANENT TYPE INSTALLATION

ABS Pumps Inc. warrants the above series of submersible pumps to be free from defects in the workmanship and materials for a period of twelve (12) months from the date of installation, or eighteen (18) months from the date of shipment to original end customer, whichever occurs first.

Proof of installation/startup date, or purchase/shipment date will be required to support a warranty claim. In addition, start-up reports and electrical system schematics may be required to support warranty claims. All protection features (such as moisture sensors, bearing monitors, and thermal overloads) incorporated in the pump must be connected and operable to validate the warranty. Warranty effective only if Company's supplied or authorized control panels are used.

The Company's sole obligation under this warranty shall be to make repairs and replace parts when necessary on products that have been returned to it or to an ABS authorized service facility and found to be defective by the Company. The Company shall not be liable for any special, indirect, consequential damages, or profit loss of any kind. Major components not manufactured by the Company are covered by the original manufacturer's warranty in lieu of this warranty. The Company will not be held responsible for travel expenses, rented (replacement) equipment, pump removal fees, installation fees, outside contractors fees, or unauthorized repair shop expenses. Damage due to normal wear or failure beyond "defect in workmanship" is not covered. The warranty does not cover damage caused by a defective power supply or improper electrical protection.

The Company neither assumes nor authorizes any person or other company to assume for it, any other obligation in connection with the sale of its equipment. Any enlargement or modification of this warranty by a Representative or other Sales Agent is their exclusive responsibility. Packaging and transportation charges shall be borne by the customer and all returns must have prior authorization from the Company.

This warranty shall extend only to the original Owner, and shall not apply to any products that have been repaired or altered without the Company's consent or have been subject to misuse, accident or neglect, or have been used for pumping other than raw sewage or similar non-corrosive liquids.

NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WILL APPLY.

Issued: 1/1/03

Pump Information

Purchase Date: _____
Installation Date: _____
Model Number: _____
Serial Number: _____

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Serial Number: _____

How to Contact ABS

ABS Pumps, Inc.

Corporate Office:
ABS Pumps, Inc.
140 Pond View Drive
Meriden, CT 06450
Tel: (203) 238-2700
Fax: (203) 238-0738

Regional Offices and Divisions:
ABS Pumps, Inc. CH&E Pumps
111 Maritime Drive 3849 N. Palmer Street
Sanford, FL 32771 Milwaukee, WI 53212
Tel: (407) 330-3456 Tel: (414) 964-3400
Fax: (407) 330-3404 Fax: (414) 964-0677

Odell's Pump and Motor
1650 Bell Avenue, Suite 140
Sacramento, CA 95838
Tel: (916) 925-8508
Fax: (916) 925-3914

ABS Pumps Corp.
1215 Meyerside Drive, Unit #7
Mississauga, ONT L5T 1H3
Tel: (905) 670-4677
Fax: (905) 670-3709

ABS is a company in the CARDO Group

www.abspumpsusa.com