INSTALLATION, OPERATION & MAINTENANCE MANUAL
FAHRENHEIT®
SK-F & SKX-F SERIES
SHREDDER PUMPS
Electric Submersible Pumps

Single Phase
208V & 230V

CAST IRON
SINGLE PHASE
SK1500C-F

316 STAINLESS STEEL
SINGLE PHASE
SKX750CSS-F
SKX1500CSS-F

Read this manual carefully before installing, operating or servicing these pump models. Observe all safety information. Failure to comply with instructions may result in personal injury and/or property damage. Please retain these instructions.

Version 9/18/2018

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INTRODUCTION

This Installation, Operation and Maintenance manual provides important information on safety and the proper inspection, disassembly, assembly and testing of the BJM Pumps® SK-F & SKX-F Series submersible pump. This manual also contains information to optimize performance and longevity of your **BJM Pumps®** submersible pump. The F-Series Fahrenheit® pumps are engineered to pump water based liquids up to 200° Fahrenheit (93° C).

The submersible SK-F Series pumps are designed to pump water, wastewater, and industrial wastewater that includes up to 10% by volume of solids. The SKX-F Series pumps are designed to pump corrosive liquids along with some solids in concentrations chemically compatible with 316SS and FKM. The SK-F & SKX-F Series pumps are not explosion-proof. They are not designed to pump volatile or flammable liquids.

Note: Consult a chemical resistance chart for compatibility between pump materials and liquid before operating pump. Consult BJM Pumps® engineering if there is a question on chemical compatibility.

If you have any questions regarding the inspection, disassembly, and assembly or testing please contact your **BJM Pumps®** distributor, or Industrial Flow Solutions Operating, LLC.

Industrial Flow Solutions Operating, LLC
104 John W Murphy Drive
New Haven, CT 06513, USA

Phone: 860-399-5937
Fax: 860-399-7784

Information, including pump data sheets and performance curves, is also available on our web site: www.bjmpumps.com

For assistance with your electric power source, please contact a certified electrician.

Please pay attention to the following alert notifications. They are used to notify operators and maintenance personnel to pay special attention to procedures, to avoid causing damage to the equipment, and to avoid situations that could be dangerous to personnel.

NOTE: Instructions to aid in installation, operation, and maintenance or which clarify a procedure.

⚠ DANGER Immediate hazards that WILL result in severe personal injury or death. These instructions describe the procedure required and the injury which will result from failure to follow the procedure.

⚠ WARNING Hazards or unsafe practices that COULD result in severe personal injury or death. These instructions describe the procedure required, and the injury which could result from failure to follow the procedure.

⚠ CAUTION Hazards or unsafe practices which COULD result in personal injury or product or property damage. These instructions describe the procedure required and the possible damage which could result from failure to follow the procedure.

SAFETY

Pump installations are seldom identical. Each installation and application can vary due to many different factors. It is the owner/service mechanics responsibility to repair, service, and test to ensure that the pump integrity is not compromised according to this manual.

⚠WARNING Risk of electric shock – this pump has not been investigated for use in swimming pool areas.

⚠ DANGER **Do not pump flammable or volatile liquids. Death or serious injury will result.**

⚠WARNING Before attempting to open or service the pump:

1) Familiarize yourself with this manual.
2) Unplug or disconnect the pump power cable to ensure that the pump will remain inoperative.
3) Allow the pump to cool if overheated.

⚠WARNING Do not operate the pump with a worn or damaged electric power cable. Death or serious injury could occur.

⚠WARNING Never attempt to alter the length or repair any power cable with a splice. The pump motor and pump motor and cable must be completely waterproof. Damage to the pump or personal injury may result from alterations.

⚠WARNING After the pump has been installed, make sure that the pump and all piping are secure before operation.

⚠WARNING Do not lift the pump by the power cable piping or discharge hose. Attach proper lifting equipment to the lifting handle (or lifting rings) fitted to the pump. Do not suspend the pump by the power cable.

⚠WARNING Obtain the services of a qualified electrician to troubleshoot, test and/or service the electrical components of this pump.

⚠ CAUTION Pumps and related equipment must be installed and operated according to all national, local and industry standards.

INSPECTION

Review all safety information before servicing pump.

The following are recommended installation practices/procedures for the pump. If there are questions in regards to your specific application, contact your local **BJM Pumps®** distributor or Industrial Flow Solutions Operating, LLC.

PRE-INSTALLATION INSPECTION

1) Check the pump for damage that may have occurred during shipment.
2) Inspect the pump for any cracks, dents, damaged threads, etc.
3) Check power cable and sensor cable for any cuts or damage.
4) Check for, and tighten any hardware that appears loose.
5) Carefully read all tags, decals and markings on the pump.
6) Important: Always verify that the pump nameplate amps, voltage, phase, and HP ratings match your control panel and power supply.

Warranty does not cover damage caused by connecting pumps and controls to an incorrect power source (voltage/phase supply).

Record the model numbers and serial numbers from the pumps and control panel on the front of this instruction manual for future reference. Give it to the owner or affix it to the control panel when finished with the installation.

If anything appears to be abnormal, contact your **BJM Pumps®** distributor or Industrial Flow Solutions Operating, LLC. If damaged, the pump may need to be repaired before use. Do not install or use the pump until appropriate action has been taken.

Lubrication:

No additional lubrication is necessary. The shaft seal and bearings are fully lubricated from the factory. Seal oil should be checked once per year. See table: Oil Fill Quantity / Type.

OIL FILL QUANTITY/TYPE

	OIL IN SEAL CHAMBER		
MODEL	**U.S. FL. OZ.**	**CC.**	**TYPE OF OIL**
SK1500C-F	7.8	230	ISO 32 NSF Food Grade Mineral Oil

	OIL IN SEAL CHAMBER		
MODEL	**U.S. FL. OZ.**	**CC.**	**TYPE OF OIL**
SKX750CSS-F	10.1	300	ISO 32 NSF Food Grade Mineral Oil
SKX1500CSS-F	10.1	300	ISO 32 NSF Food Grade Mineral Oil

NOTE: The stator on this model is oil filled. This needs to be changed annually when the seal oil is changed. With the power cable entry removed, fill the motor chamber with oil to a level that insures the oil is covering the motor windings by ½", and that will be above the upper bearing. Do not overfill, an air gap of 10-15% must be maintained for heat expansion.

PUMP INSTALLATION

SK-F & SKX-F Series pumps have been evaluated for use with water or water based solutions with some solids. Please contact the manufacturer for additional information.

The **BJM Pumps®** Shredder Pumps (7.5 HP and larger) are designed to handle unscreened sewage.

⚠WARNING **Risk of electric shock.** Pump models; All three phase pumps do not come with electric plug connectors. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Lifting:

Attach a rope or lifting chain (not included) to the handle (or lifting rings) on the top of the pump.

⚠ CAUTION Do not lift the pump by the power cable or discharge hose/piping. Proper lifting equipment (rope/chain) must be used.

POSITIONING THE PUMP

BJM Pumps® SK-F & SKX-F Series pumps are designed to operate **fully submerged**. Data sheets can be obtained online at www.flowsolutions.com or by calling Industrial Flow Solutions Operating, LLC at 860-399-5937.

⚠ CAUTION

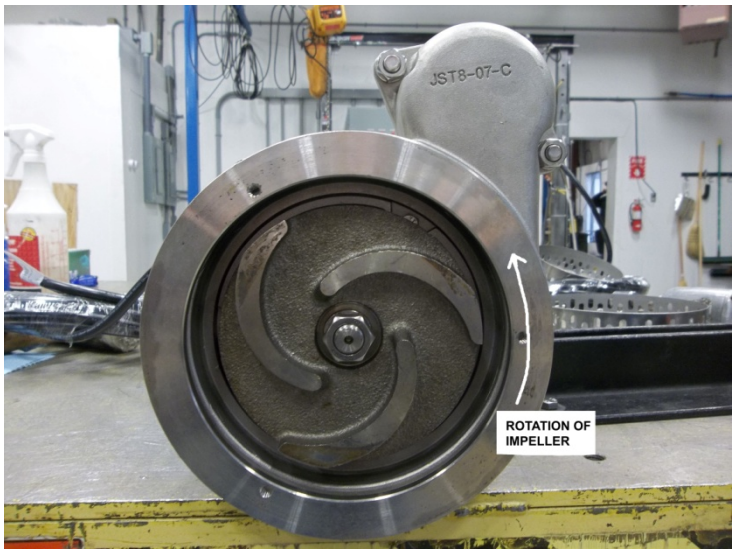
- Do not run pump dry.
- Pump liquid should not exceed a maximum temperature of 200°F (93°C).
- Never place the pump on loose or soft ground. The pump may sink, preventing water from reaching the impeller. Place on a solid surface or suspend the pump with a lifting rope/chain. The SK-F & SKX-F Series pumps are provided with a suction strainer to prevent large solids from clogging the impeller. Any spherical solids which pass through the strainer should pass through the pump.
- For maximum pumping capacity, use the proper size non-collapsible hose or rigid piping. A check valve may be installed after the discharge to prevent back flow when the pump is shut off.
- Take stand off of pump when using slide rail. Keep stand and reattach when transporting or handling the pump.

PUMP ROTATION

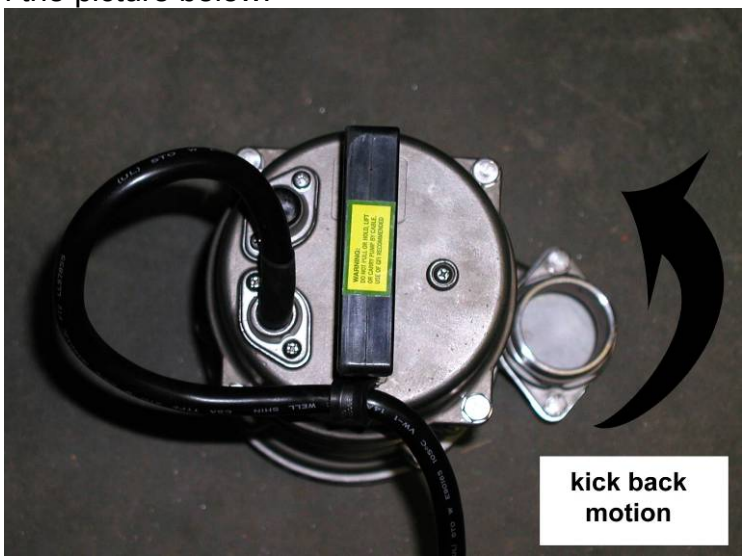
If wired properly to the control, the single phase BJM Pumps® SK-F and SKX-F Series pump should operate with the correct pumping rotation. Verification is recommended prior to installing into the sump basin.

Two ways to check the correct pump rotation:

1. By looking at the impeller; the rotation of the impeller should be counter clockwise as shown in the picture below.



2. By looking from the top of the pump. Since the impeller cannot be seen, the best way to check the rotation is to check the kick back motion of the pump when the pump just starts. The kick back motion of the pump should be counter clockwise as shown in the picture below.



PUMP OPERATION

⚠ WARNING This pump is designed to handle dirty water that contains some solids. It is not designed to pump volatile or flammable liquids. Do not attempt to pump any liquids which may damage the pump or endanger personnel as a result of pump failure.

⚠ DANGER **Do not operate this pump where explosive vapors or flammable material exist. Death or Serious injury may result.**

TYPICAL MANUAL WASTEWATERING INSTALLATION

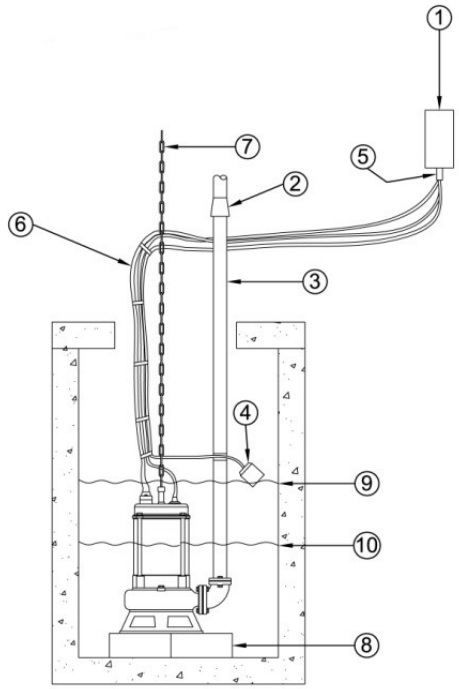
NOTE: Maximum recommended starts should not exceed 10 times per hour.

All SK-F & SKX-F Models are provided with a 50’ (15 m) power cable. NEVER splice the power cable due to safety and warranty considerations. Always keep the lead end dry.

⚠ WARNING Do not alter the length or repair any power cable with a splice. The pump motor and cable must be completely waterproof. Damage to the pump or personal injury may result from alterations.

The BJM Pumps® SK-F and SKX-F series pumps require a special control that contains the starting components, thermal sensor and Seal Minder® connections. These pumps cannot be directly connected to a power source.

TYPICAL AUTOMATIC DEWATERING INSTALLATION



TYPICAL AUTOMATIC INSTALLATION (WITH OPTIONAL ONE FLOAT CONTROL)

1) BJM control panel with optional on/off wide angle float switch. Electrical wiring and protection must be in accordance with National Electrical Code in U.S.A. or Canadian Electrical Code in Canada and state / provincial and local electrical codes.

2) Optional (approx. 50' / 15 meters) : If pumping in a small confined space at high head, it may be beneficial to install a check valve 3' (1 meter) above the discharge of the pump. This will help eliminate backflow and unnecessary running of the pump. For best results use a section of high temperature rated pipe.

3) High temperature rated pipe or rigid hose recommended. Collapsible high temperature rated hose will work but not as efficiently.

4) Attach high temperature rated float to the pump top or high temperature rated pipe. Never place the float lower than the top of the strainer inlet.

5) All electrical connections must be kept dry.

6) High temperature rated float switch cord should be tied or taped to the pump power cord every 3' (1 meter).

7) Always lower the pump by a separate rope or chain. Never lift or lower the pump by the power cord, float switch cord or discharge hose.

8) For best results, place the pump on a solid object, or suspend pump 4" - 6" (100 mm - 150 mm) above the bottom. This will keep the pump from digging itself into silt, sand and mud.

9) Recommended submergence level.

10) Minimum submergence level.

NOTE: Maximum recommended starts should not exceed 10 times per hour.

STOPPING

To stop the pump (manual and automatic mode), turn the pump off at the control, turn off the breaker, and/or turn the power source off (generator).

CONTROL PANELS CONNECTION OPTIONS

⚠ CAUTION Use with approved motor control that matches motor input in full load amperes. “UTILLISER UN DÉMARREAR APPROUVÉ CONVENANT AU COURANT Á PLEINE CHARGE DU MOTEUR.”

BJM Pumps has been evaluated for use with water or water based solutions. Please contact the manufacturer for additional information.

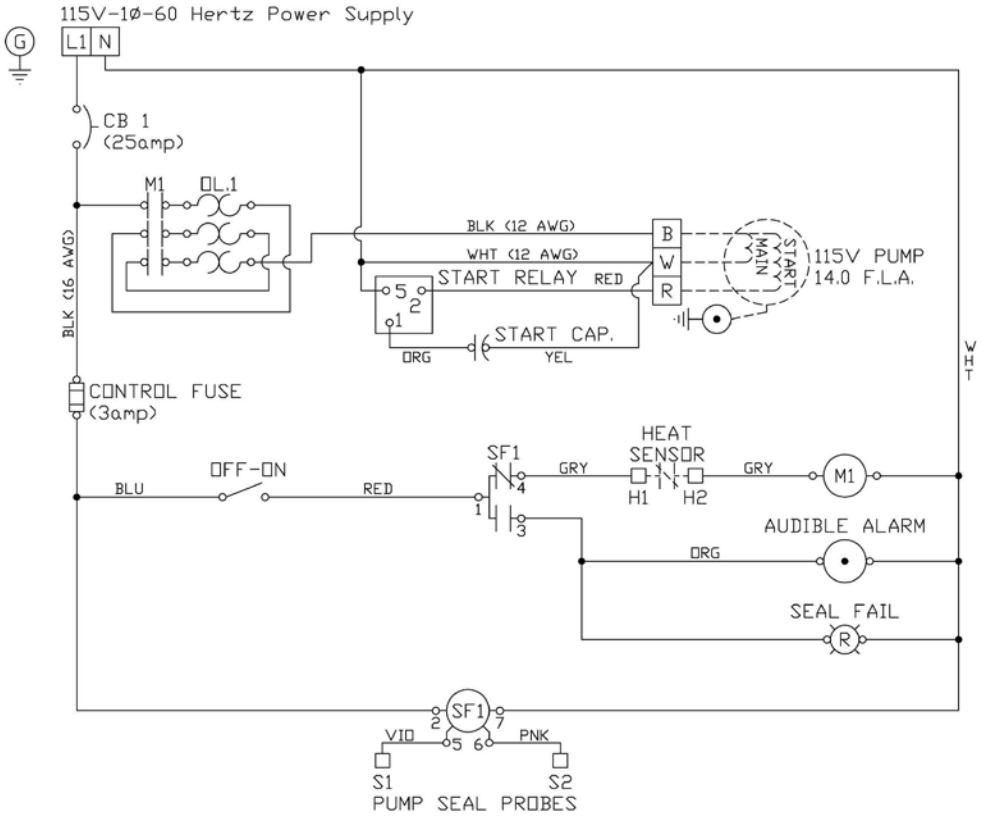


Figure 1 SKX750F-115 control

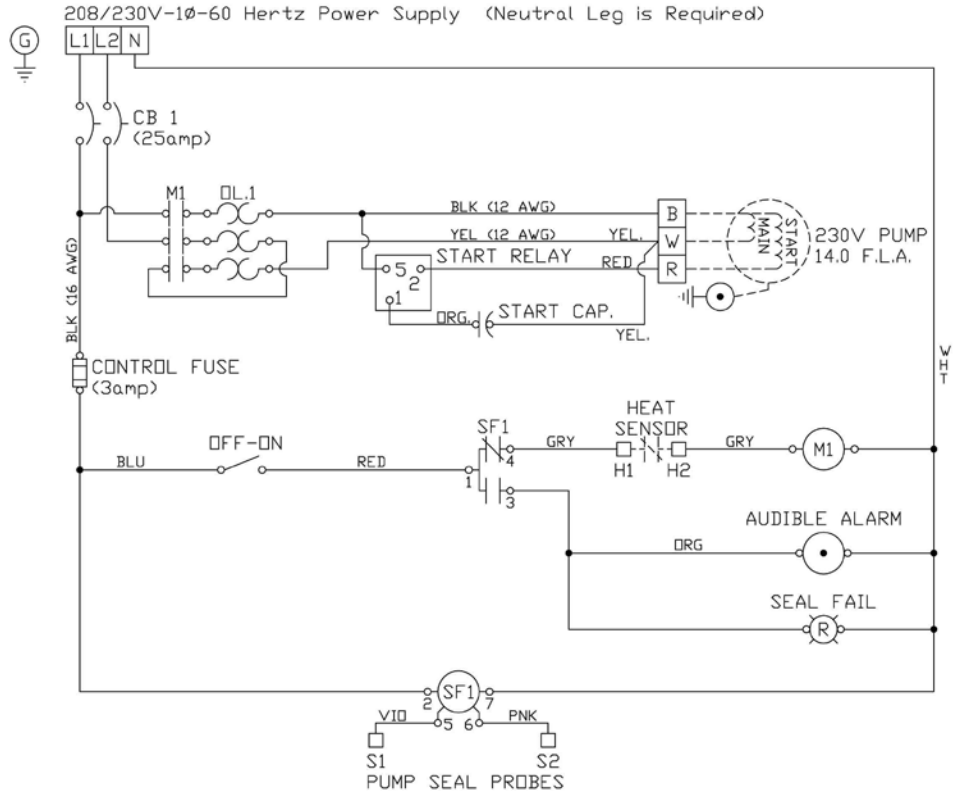


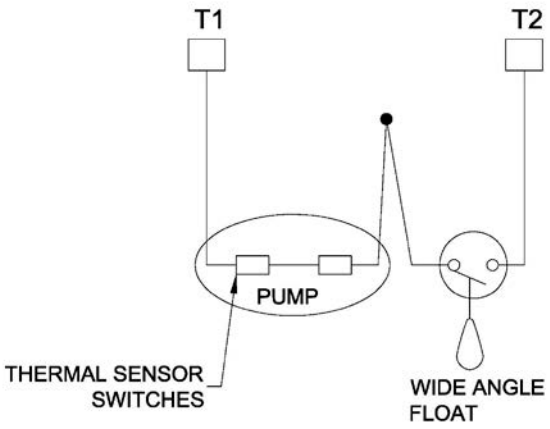
Figure 2 SKX750F-230, SK1500-230 and SKX1500-230 control

OPTIONAL FLOAT CONNECTION

BJM Pumps® utilizes a control for all of the single phase “F” series pumps. The wiring diagram included in this manual (and with the control) should be followed to properly connect the pump power and sensor leads to the control, and the power supply to the control. Care should be taken to make sure all of the connections are proper and that the system is properly grounded. The control can be utilized as a portable control or as a permanently mounted control enclosure. All Connections should be done to meet the National Electric Code and all applicable local codes and ordinances.

The BJM Pumps® control is supplied as a manual ON/OFF control. A wide angle float can be wired in series with the thermal sensors to allow the pumps to operate in an automatic mode. See the wiring diagram provided in this manual for proper connection. A separate alarm control with float is available as an option from BJM Pumps®.

Optional wide angle float connection - wire thermal heat sensor switches in series with wide angle float as shown:



TROUBLE SHOOTING

⚠ WARNING **Disconnect the power source to the pump BEFORE attempting any type of trouble shooting, service or repair.**

PUMP WILL NOT RUN

1. Check power supply (fuses, breaker). Reset power.
2. Blocked impeller. Remove strainer, check and clean.
3. Defective cable or incorrect wiring.
4. Strainer clogged. Check and clean as necessary.
5. Float switch tangled/obstructed. Clean and free float switch from obstruction.
6. Float switch defective. Replace float switch.
7. Capacitor or start relay in control failed.

8. Thermal sensor switch is open/or failed.

PUMP RUNS BUT DOES NOT DELIVER RATED CAPACITY

1. Discharge line clogged, restricted or hose kinked. Check discharge hose/pipe.
2. Worn impeller and/or suction cover. Inspect and replace as necessary.
3. Pump overloaded due to liquid pumped being too thick.
4. Pumping air. Check liquid level and position of pump.
5. Excessive voltage drops due to long cables.
6. Pump running backwards, check rotation.

SERVICING YOUR SUBMERSIBLE PUMP

Pump should be disconnected from the electric power supply before proceeding to do any service or maintenance**.**

The design of the "F" series high temperature pump models is unique and requires specific knowledge to perform the proper assembly. BJM Pumps® recommends that all electrical service work be performed at the factory or by a factory trained and certified repair technician to insure that the materials and assembly methods meet BJM Pumps® standards.

MAINTAINING YOUR PUMP

- Pump should be disconnected from the electric power supply before proceeding to do any service or maintenance**.**
- Pump should be inspected at regular intervals (At least 2 times per year).
- More frequent inspections are required if the pump is used in a harsh environment.
- Preventative maintenance should be performed to reduce the chance of premature failure.
- Worn impellers and lip seals should be replaced.
- Cut or cracked power cables must be replaced. **(Never operate a pump with a cut, cracked or damaged power cable.)**
- Seal oil should be checked once per year.
- Maintenance should always be done when taking a pump out of service before storage.

    1) Clean pump of dirt and other build up.
    2) Check condition of oil around the shaft seals.
    3) Check hydraulic parts: check for wear.
    4) Inspect power cable. Make sure that it is free of nicks or cuts.

CHANGING SEAL OIL

Changing the seal oil in the SK-F & SKX-F series pumps is very easy.

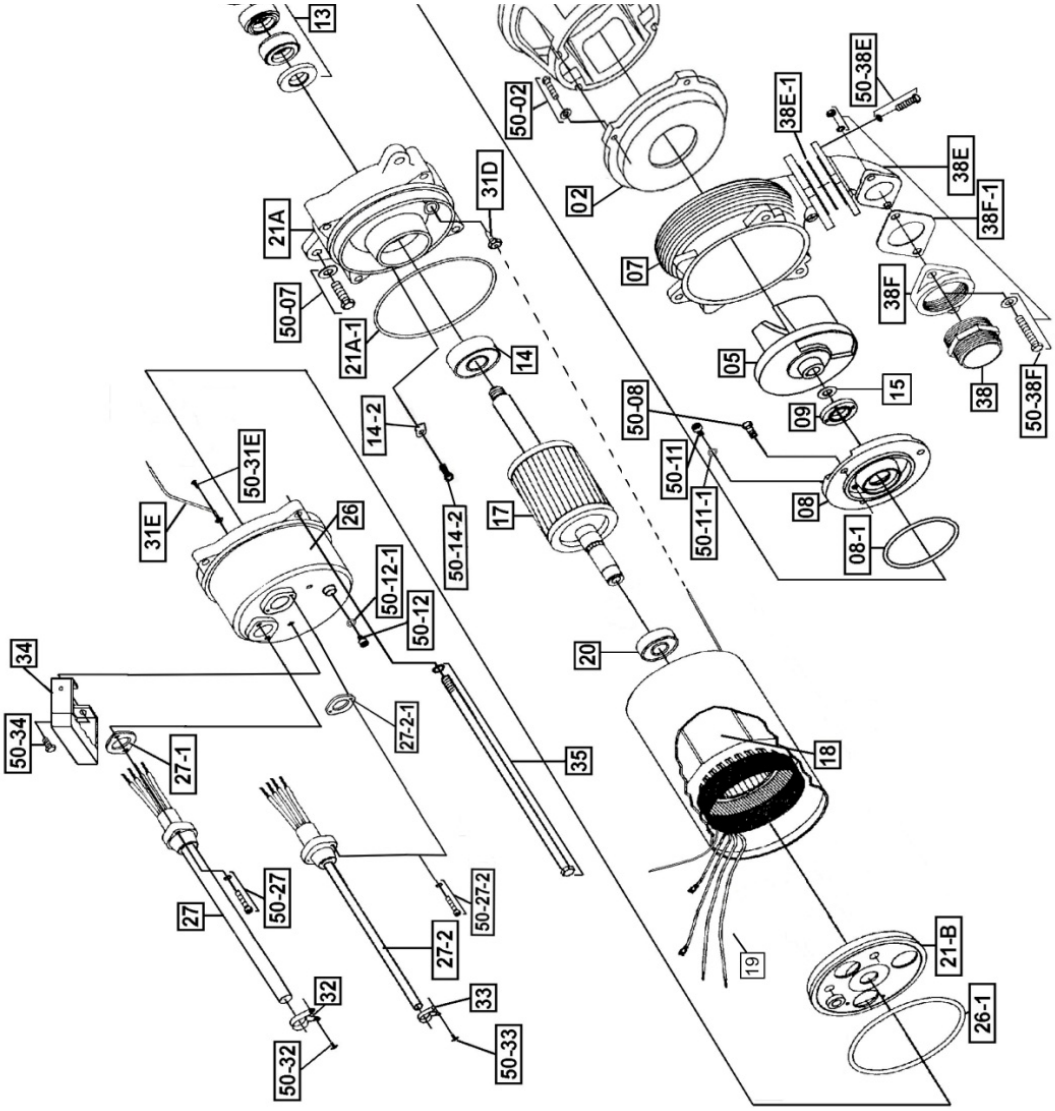
1) Make sure that the pump is de-energized and locked out for service.
2) Lay the pump down on its side.
3) Remove the screws that hold the bottom plate in place.
4) Remove bottom plate.
5) Remove screws holding the suction cover.
6) Remove the suction cover.
7) Remove the impeller.
8) Remove the inspection screw for the oil chamber (pos#50-08). Pour out a small sample of the oil. If it is milky white, or contains water, then the oil and possible, the mechanical seal, should be changed. If an oil change is needed.
9) Remove the screws that hold the oil chamber cover in place & remove the oil.
10) Replace the mechanical seal if necessary.
11) Replace the oil.
12) Assemble the pump.

STATOR REPLACEMENT OR ELECTRICAL REPAIR

The BJM Pumps® “F” Series designed pumps utilize unique construction methods and materials. The interconnection of all wiring requires the use of a BJM Pumps® wire connection kit. Included in this kit are specific instructions on how a qualified factory trained and certified repair technician can perform this work properly. No other materials or methods should be used on this product.

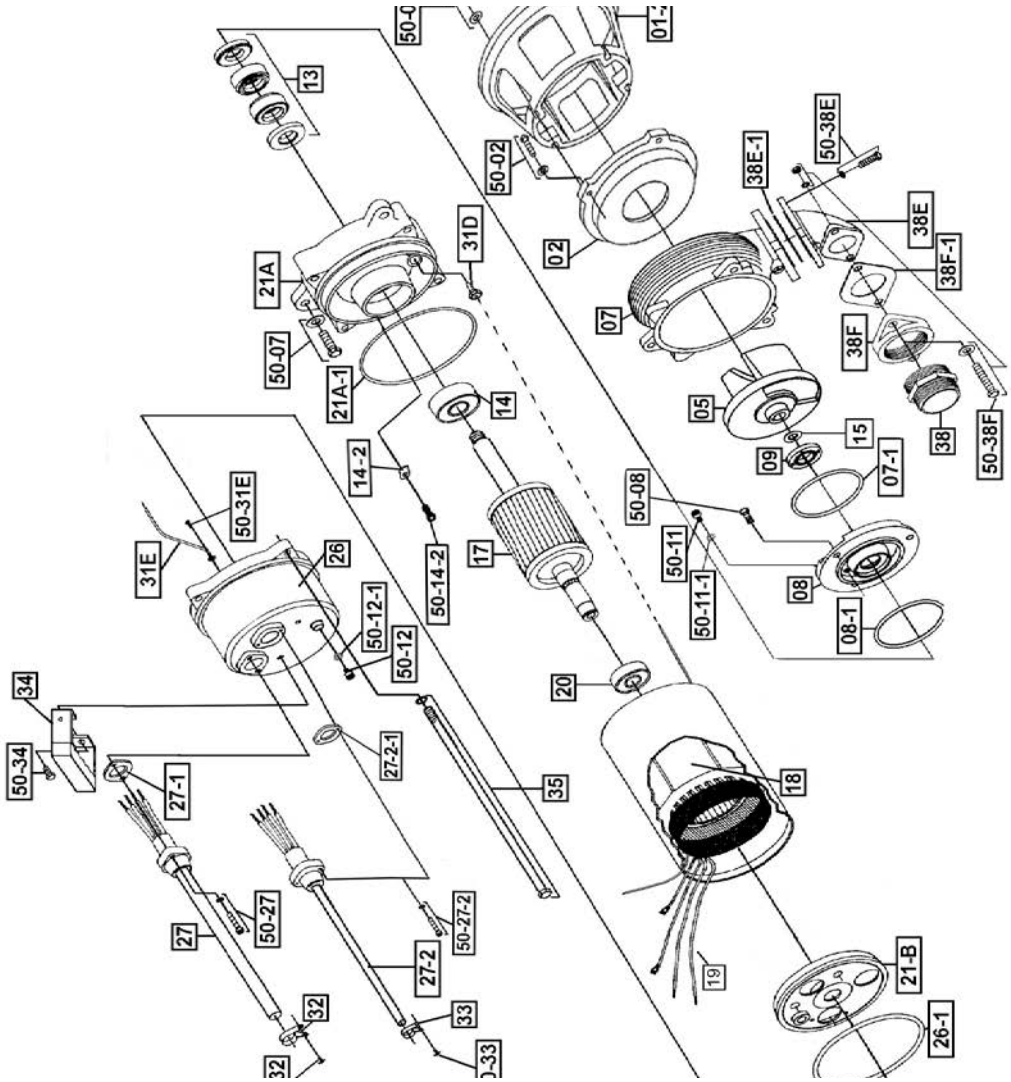
BJMPumps

EXPLODED VIEW OF SK1500C-F



BJMPumps

EXPLODED VIEW OF SKX750CSS-F, SKX1500CSS-F



SK-F SERIES PARTS LIST

	Pump Model	SK1500CF
Pos. No.	**Part Description**	**Item #**
01-2	Stand Only	202858
02	Suction Cover, Hi-Chrome	202046
05	Impeller, Heat Treated DI*	204565
07	Pump Housing	203008
08	Oil Chamber Cover	202213
08-1	O-Ring (Kit Only)	Kit
09	Lip Seal FKM	202232
13	Mechanical Seal FKM	204240
14	Lower Ball Bearing	200958
14-2	Lower Bearing Retainer	202279
15	Impeller Shim Kit (Required)	200481
17	Rotor w/ Shaft 230V, 1PH	204734
18	Stator w/ Casing 230V, 1PH (High-Temp)	201040
19	Wire Connection Kit*	204211
20	Upper Ball Bearing	200967
21A	Oil Chamber/Motor Housing	202196
21A-1	O-Ring (Kit Only)	Kit
21B	Motor Cover Upper	202368
26	Pump Top Cover (w/ Sensor Opening)	202433
26-1	O-Ring Kit Only	Kit
27	Power Cable w/ Gland- 230V,1PH (High-Temp)	202783
27-1	O-Ring Kit Only	Kit
27-2	Seal Minder Cable (High-Temp)	204455
27-2-1	O-Ring Kit Only	Kit
31D	Seal Minder Probe	202408
31E	Ground Wire w/Ring Term.	203145
32	Power Cord Line Clip / Strain Relief	203161
33	Seal Minder Cable Line Clip	203163
34	Handle / Chain Handle	202517
35	Rod Bolts	202668
38	Discharge Nipple 3"	202534
38E	Discharge Elbow	202558
38E-1	Gasket, Disch. Elbow FKM	203209
38F	Discharge Flange 3"	202545
38F-1	Gasket, Disch. Flange FKM	202660
50-01-2	Bolt for Strainer/Stand	203228
50-02	Bolt for Suction Cover	203228
50-07	Screw for Oil Chamber/Motor Housing	203228
50-08	Screw for Oil Chamber Cover	203219
50-11	Bolt - Suction Cover	203218
50-11-1	O-Ring (Kit Only)	Kit
50-12	Screw for Pressure Check	203218
50-12-1	O-Ring (Kit Only)	Kit
50-14-2	Screw for Brg. Retainer	203219
50-27	Screw for Power Cord	203216
50-27-2	Screw for Seal Minder Cable	203216
50-31E	Screw for Ground Wire	202692
50-32/50-33	Screw for Line Clip	203214
50-34	Screw for Handle	203219
50-38E	Bolt for Discharge Elbow	203255
50-38F	Bolt for Discharge Flange	203289
	O-Ring Kit - FKM	203197

***"F" Series High Temperature Pumps Only**

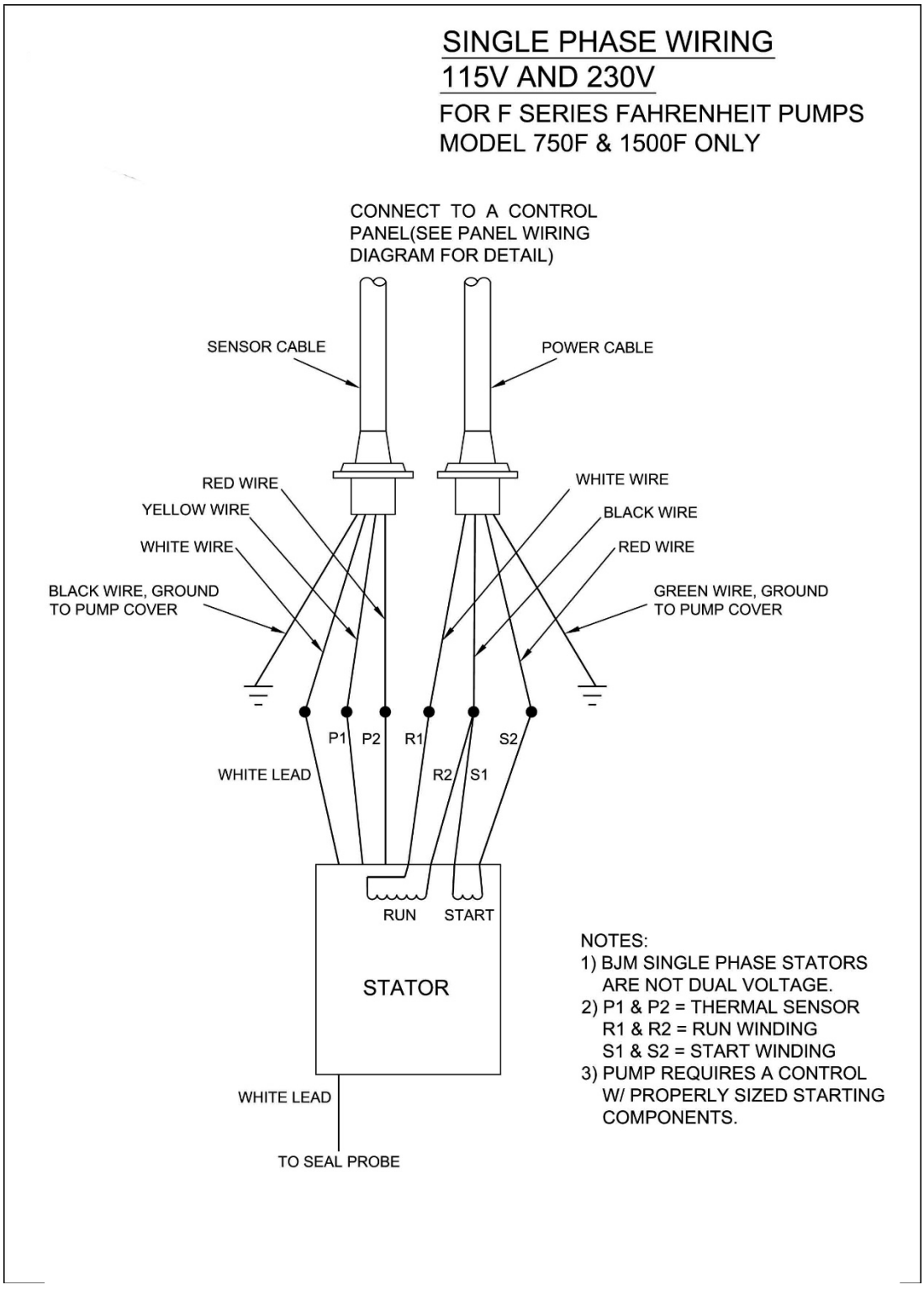
***New Rotor With Shaft Required When Upgrading From 202953 Impeller to 204565 Impell**

SKX-F SERIES PARTS LIST

	Pump Model	SKX750CSSF	SKX1500CSSF
Pos. No.	**Part Description**	**Part #**	**Part #**
01-2	Stand Only	201988	201995
02	Suction Cover, Hi-Chrome		
05	Impeller	202951	204628**
07	Pump Housing	202176	202172
07-1	O-Ring (Kit Only)	Kit	Kit
08	Oil Chamber Cover	202214	202214
08-1	O-Ring (Kit Only)	Kit	Kit
09	Lip Seal FKM	202232	202232
13	Mechanical Seal FKM	204240	204240
14	Lower Ball Bearing (*=qty 2 Needed)	200958	200958
14-2	Lower Bearing Retainer	202279	202279
15	Impeller Shim Kit (Required)	200481	200481
17	Rotor w/ Shaft 115/230V, 1PH	204061	204735
18	Stator w/ Casing 115V, 1PH (High-Temp)	201038	-
18	Stator w/ Casing 230V, 1PH (High-Temp)	201039	201041
19	Wire Connection Kit*	204211	204211
20	Upper Ball Bearing	200967	200967
21A	Oil Chamber/Motor Housing	202197	202197
21A-1	O-Ring (Kit Only)	Kit	Kit
21B	Motor Cover Upper	202368	202368
26	Pump Top Cover (w/ Sensor opening)	202434	202434
26-1	O-Ring (Kit Only)	Kit	Kit
27	Power Cable w/ Gland- 115V, 1PH (High-Temp)	202783	-
27	Power Cable w/ Gland- 230V, 1 PH (High-Temp)	202784	202783
27-1	O-Ring (Kit Only)	Kit	Kit
27-2	Seal Minder Cable (High-Temp)	201743	201743
27-2-1	O-Ring Kit Only	Kit	Kit
31D	Seal Minder Probe	202408	202408
31E	Ground Wire w/Ring Term.	203145	203145
32	Power Cord Line Clip / Strain Relief	203166	203166
33	Seal Minder Cable Line Clip	203163	203163
34	Handle / Chain Handle	202517	202517
35	Rod Bolts	202682	202683
38	Discharge Nippple 2"	202532	-
38	Discharge Nipple 3"	-	202535
38E	Discharge Elbow	202571	202559
38E-1	O-Ring, Discharge Elbow FKM	203326	203327
38F	Discharge Flange 2"	202563	-
38F	Discharge Flange 3"	-	202546
38F-1	Bolt - Suction Cover	202723	-
38F-1	O-Ring, 3" Discharge Flange FKM	-	202724
50-01-2	Bolt for Strainer/Stand	203228	203228
50-02	Bolt for Suction Cover	203228	203228
50-07	Screw for Oil Chamber/Motor Housing	203296	203296
50-08	Screw for Oil Chamber Cover	203219	203219
50-11	Screw for Oil Fill	203218	203218
50-11-1	O-Ring (Kit Only)	Kit	Kit
50-12	Screw for Pressure Check	203218	203218
50-12-1	O-Ring (Kit Only)	Kit	Kit
50-14-2	Screw for Bearing Retainer Plate	203219	203219
50-27	Screw for Power Cord	203295	203295
50-27-2	Screw for Seal Minder Cable	203295	203295
50-31E	Screw for Ground Wire	202692	202692
50-32/50-33	Screw for Line Clip	203214	203214
50-34	Screw for Handle	203219	203219
50-38E	Bolt for Discharge Elbow	203294	203271
50-38F	Bolt for Discharge Flange	203229	203294
	O-Ring Kit - FKM	202630	202630
***"F" Series High Temperature Pumps Only**			
****** New Rotor With Shaft Required When Upgrading From 202125 Impeller to 204628 Impeller.**			

SINGLE PHASE WIRING DIAGRAM

115V & 230V



MODELS SK1500CF, SKX750CSS-F & SKX1500CSS-F

Seal Minder® - Thermal Motor Sensor Switch
(For high temperature single phase pump models)

Seal Minder:
Also known as a seal failure circuit (or moisture detection circuit) is designed to inform the pump operator that there is moisture within the oil chamber. This early warning can allow the operator to schedule repair & inspection on the pump. The **Seal Minder** sensor probe is inside the oil chamber. (The oil chamber houses the mechanical seals that are cooled & lubricated by oil). The **Seal Minder,** when properly connected to a control panel, can help indicate seal failure. The **Seal Minder** cable requires a seal fail circuit in control panel for warning signal.

Along, with the **Seal Minder**, the Fahrenheit® Series high temperature pumps also feature thermal temperature sensor switches that are imbedded into the motor stator windings. Two switches are imbedded into the stator windings and wired in series. The leads are connected to the pump control panel through the sensor cable. If the windings would see a temperature above 300 degrees F, then the switch(s) would open and cut power to the pump. Once the temperature dropped below 300 degrees F, the switch(s) would reset, and the pump would be returned to a state of operation. This feature is designed to prevent damage to the stator winding and allow for longer pump life.

The sensor cable consists of four leads, two are connected to the **Seal Minder**, and two are connected to the thermal sensor switches located in the stator windings (Note on 400 models the sensor and power are in a single cable).These four leads run to the pump control panel and connect to the proper connections points for seal alarm and thermal cut off. The black and white wires on 750-1500 models, black with white stripes and white with black stripes on 400 models; are for the **Seal Minder** connections and the thermal sensors will be connected to the yellow and red wires on 750-1500 models, yellow and red with yellow stripes on 400 models (see details on wiring diagram). The single phase wiring diagram shown earlier in the manual will give a guide to the connections in the control panel. The manual for the control panel should be consulted for the exact connections.

The sensor cable with **Seal Minder** and thermal sensor switch connections is standard on all Fahrenheit® Series high temperature pumps (Note the 400 models have a different wire color code in the single cable design). The cable is designed for a high temperature environment. The proper replacement part can be found parts list found in this manual. BJM Pumps, can supply a control with the Seal Minder and Thermal sensor switch option. BJM Pumps requires the **Seal Minder** and thermal sensor switches be used. Failure to connect or misuse of these devices will **void warranty**.

BJMPumps

WARRANTY AND LIMITATION OF LIABILITY

Industrial Flow Solutions Operating, LLC

104 John W Murphy Drive

New Haven, CT 06513, USA

Unless otherwise expressly authorized in writing, specifying a longer or shorter period, BJM Pumps,LLC warrants for a period of eighteen (18) months from the date of shipment from the Point of Shipment, or one (1) year from the date of installation, whichever occurs first, that all products or parts thereof furnished by BJM Pumps,LLC under the brand name **BJM Pumps**, hereinafter referred to as the "Product" are free from defects in materials and workmanship and conform to the applicable specification.

BJM Pumps, LLC's liability for any breach of this warranty shall be limited solely to replacement or repair, at the sole option of BJM Pumps, LLC, of any part or parts of the Product found to be defective during the warranty period, provided the Product is properly installed and is being used as originally intended. Any breach of this warranty must be reported to BJM Pumps, LLC or BJM Pumps, LLC's authorized service representative within the aforementioned warranty period, and defective Product or parts thereof must be shipped to BJM Pumps, LLC or BJM Pumps, LLC's authorized representative, transportation charges prepaid. Any cost associated with removal or installation of a defective Product or part is excluded.

IT IS EXPRESSLY AGREED THAT THIS SHALL BE THE SOLE AND EXCLUSIVE REMEDY OF BJM PUMPS, LLC'S DISTRIBUTORS AND CUSTOMERS. UNDER NO CIRCUMSTANCES SHALL BJM PUMPS, LLC BE LIABLE FOR ANY COSTS, LOSS, EXPENSE, DAMAGES, SPECIAL DAMAGES, INCIDENTAL DAMAGES OR CONSEQUENTIAL DAMAGES ARISING DIRECTLY OR INDIRECTLY FROM THE DESIGN, MANUFACTURE, SALE, USE OR REPAIR OF THE PRODUCT, WHETHER BASED ON WARRANTY, CONTRACT, NEGLIGENCE, OR STRICT LIABILITY. IN NO EVENT WILL LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT.

THE WARRANTY AND LIMITS OF LIABILITY CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED BY BJM PUMPS, LLC AND EXCLUDED FROM THIS WARRANTY.

BJM Pumps, LLC neither assumes, nor authorizes any person to assume for it, any other warranty obligation in connection with the sale of the Product. This warranty shall not apply to any Product or parts of Product which have (a) been repaired or altered outside of BJM Pumps, LLC's facilities unless such repair was authorized in advance by BJM Pumps, LLC or by its authorized representative; or (b) have been subject to misuse, negligence or accident; or (c) have been used in a manner contrary to BJM Pumps, LLC's instruction.

In any case of products not manufactured and sold under the BJM Pumps, LLC brand name, there is no warranty from BJM Pumps, LLC; however BJM Pumps, LLC will extend any warranty received from BJM Pumps, LLC's supplier of such products.

START-UP REPORT FORM

This form is designed to record the initial installation, and to serve as a guide for troubleshooting at a later date (if needed).

Industrial Flow Solutions Operating, LLC
104 John W Murphy Drive
New Haven, CT 06513, USA

Pump Owner's Name	
Location of Installation	Date of Installation:
Dealer	Dealer Phone ( )
Date of Purchase	
Model	Serial No
Voltage Phase	Hertz HP
Does impeller turn freely by hand?	☐ Yes ☐ No
Condition of Equipment	☐ New ☐ Good ☐ Fair ☐ Poor
Condition of Cable Jacket	☐ New ☐ Good ☐ Fair ☐ Poor
Rotation: Direction of Impeller Rotation (viewed from bottom) (Use C/W for clockwise, CC/W for counterclockwise): _____	
Resistance of cable and Pump Motor (measured at pump control)	
Red-Black_____ohms Red-White_____ohms White-Black____ohms	
Resistance of ground circuit between control panel and outside of pumps _____ Ohms	
MEG OHM CHECK OF INSULATION Red to ground_____ White to ground_____ Black to ground_____	
Condition of location at start-up	☐ Dry ☐ Wet ☐ Muddy
Was equipment stored If YES, length of storage:	☐ Yes ☐ No.
Liquid being pump	
Debris in bottom of station?	☐ Yes ☐ No

START-UP REPORT FORM

Are guide rails vertical?	☐ Yes	☐ No
Is base elbow installed level?	☐ Yes	☐ No
Liquid level controls: Model_____		
Is control installed away from turbulence?	☐ Yes	☐ No

Float Operation Check

Tip lowest float (stop float), all pumps should remain off.
Tip second float (and stop float), one pump comes on.
Tip third float (and stop float), both pumps on (alarm on simplex).
Tip fourth float (and stop float), high level alarm on (omit on simplex).

☐ Check here if using manual on/off only.

Does liquid level ever drop below volute top?	☐ Yes	☐ No
Control Panel MFG & model no.		
Number of pumps operated by control panel		

NOTE: At no time should hole be made in top of control panel, unless proper sealing devices are utilized.

Short Circuit protection:	Type:	
Number and size of short circuit device(s)	Amp rating:	
Overload type:	Size:	Amp rating:
Do protective devices comply with pump motor amp rating?	☐ Yes	☐ No
Are all pump connections tight?	☐ Yes	☐ No
Is the interior of the panel dry?	☐ Yes ☐ No If No, correct moisture problem.	

Electrical readings

SINGLE PHASE

Voltage supply at panel line connection, pump off	L1	L2
Voltage supply at panel line connection, pump on	L1	L2
Amperage load connection, pump on	L1	L2

THREE PHASE

Voltage supply at panel line connection, pump off

L1-L2	L2-L3	L3-L1

Voltage supply at panel line connection, pump on

START-UP REPORT FORM

L1-L2	L2-L3	L3-L1
Amperage load connection, pump on		
L1	L2	L3

FINAL CHECK		
Is pump secured properly?	☐ Yes	☐ No
Was pump checked for leaks?	☐ Yes	☐ No
Do check valves operate properly?	☐ Yes	☐ No
Flow: Do pumps appear to operate at proper rate?	☐ Yes	☐ No
Noise level:	Acceptable ☐	Unacceptable ☐

Comments:

Installed by:

Company:

Person:

Date:

NOTES:

Industrial Flow Solutions Operating, LLC
104 John W Murphy Drive, New Haven, CT 06513, USA
Phone: (860) 399-5937 • Fax: (860) 399-7784
Email: sales@flowsolutions.com • Web Site: www.flowsolutions.com

INSTALLATION, OPERATION & MAINTENANCE MANUAL
FAHRENHEIT®
SK-F & SKX-F SERIES
SHREDDER PUMPS
Electric Submersible Pumps

Three Phase
208V, 230V, 460V & 575V

CAST IRON
THREE PHASE

SK08C-F	SK55C-F
SK15C-F	SK75C-F
SK22C-F	SK110C-F
SK37C-F	SK150C-F

316 STAINLESS STEEL
THREE PHASE

SKX08CSS-F	SKX55CSS-F
SKX15CSS-F	SKX75CSS-F
SKX22CSS-F	SKX110CSS-F
SKX37CSS-F	SKX150CSS-F

Read this manual carefully before installing, operating or servicing these pump models. Observe all safety information. Failure to comply with instructions may result in personal injury and/or property damage. Please retain these instructions.

Version 3-27-17

TABLE OF CONTENTS

INTRODUCTION

This Installation, Operation and Maintenance manual provides important information on safety and the proper inspection, disassembly, assembly and testing of the BJM Pumps® SK-F & SKX-F Series submersible pump. This manual also contains information to optimize performance and longevity of your **BJM Pumps®** submersible pump. The F-Series Fahrenheit® pumps are engineered to pump water based liquids up to 200° Fahrenheit (93° C).

The submersible SK-F Series pumps are designed to pump water, wastewater, and industrial wastewater that includes up to 10% by volume of solids. The SKX-F Series pumps are designed to pump corrosive liquids along with some solids in concentrations chemically compatible with 316SS and FKM. The SK-F & SKX-F Series pumps are not explosion-proof. They are not designed to pump volatile or flammable liquids.

Note: Consult chemical resistance chart for compatibility between pump materials and liquid before operating pump. Consult BJM Pumps® engineering if there is a question on chemical compatibility.

If you have any questions regarding the inspection, disassembly, and assembly or testing please contact your **BJM Pumps®** distributor, or Industrial Flow Solutions Operating, LLC.

Industrial Flow Solutions Operating, LLC
104 John W Murphy Drive
New Haven, CT 06513, USA

Phone: 860-399-5937
Fax: 860-399-7784

Information, including pump data sheets and performance curves, is also available on our web site: www.flowsolutions.com

For assistance with your electric power source, please contact a certified electrician.

Please pay attention to the following alert notifications. They are used to notify operators and maintenance personnel to pay special attention to procedures, to avoid causing damage to the equipment, and to avoid situations that could be dangerous to personnel.

NOTE: Instructions to aid in installation, operation, and maintenance or which clarify a procedure.

⚠ DANGER Immediate hazards that WILL result in severe personal injury or death. These instructions describe the procedure required and the injury which will result from failure to follow the procedure.

⚠ WARNING Hazards or unsafe practices that COULD result in severe personal injury or death. These instructions describe the procedure required, and the injury which could result from failure to follow the procedure.

⚠ CAUTION Hazards or unsafe practices which COULD result in personal injury or product or property damage. These instructions describe the procedure required and the possible damage which could result from failure to follow the procedure.

SAFETY

Pump installations are seldom identical. Each installation and application can vary due to many different factors. It is the owner/service mechanics responsibility to repair, service, and test to ensure that the pump integrity is not compromised according to this manual.

⚠ WARNING Risk of electric shock – this pump has not been investigated for use in swimming pool areas.

⚠ DANGER **Do not pump flammable or volatile liquids. Death or serious injury will result.**

⚠ WARNING Before attempting to open or service the pump:

1) Familiarize yourself with this manual.
2) Unplug or disconnect the pump power cable to ensure that the pump will remain inoperative.
3) Allow the pump to cool if overheated.

⚠ WARNING Do not operate the pump with a worn or damaged electric power cable. Death or serious injury could occur.

⚠ WARNING Never attempt to alter the length or repair any power cable with a splice. The pump motor and pump motor and cable must be completely waterproof. Damage to the pump or personal injury may result from alterations.

⚠ WARNING After the pump has been installed, make sure that the pump and all piping are secure before operation.

⚠ WARNING Do not lift the pump by the power cable piping or discharge hose. Attach proper lifting equipment to the lifting handle (or lifting rings) fitted to the pump. Do not suspend the pump by the power cable.

⚠ WARNING Obtain the services of a qualified electrician to troubleshoot, test and/or service the electrical components of this pump.

⚠ CAUTION Pumps and related equipment must be installed and operated according to all national, local and industry standards.

INSPECTION

Review all safety information before servicing pump.

The following are recommended installation practices/procedures for the pump. If there are questions in regards to your specific application, contact your local **BJM Pumps®** distributor or Industrial Flow Solutions Operating, LLC.

PRE-INSTALLATION INSPECTION

1) Check the pump for damage that may have occurred during shipment.
2) Inspect the pump for any cracks, dents, damaged threads, etc.
3) Check power cord and sensor cable for any cuts or damage.
4) Check for, and tighten any hardware that appears loose.
5) Carefully read all tags, decals and markings on the pump.
6) Important: Always verify that the pump nameplate amps, voltage, phase, and HP ratings match your control panel and power supply.

Warranty does not cover damage caused by connecting pumps and controls to an incorrect power source (voltage/phase supply).

Record the model numbers and serial numbers from the pumps and control panel on the front of this instruction manual for future reference. Give it to the owner or affix it to the control panel when finished with the installation.

If anything appears to be abnormal, contact your **BJM Pumps®** distributor or Industrial Flow Solutions Operating, LLC. If damaged, the pump may need to be repaired before use. Do not install or use the pump until appropriate action has been taken.

Industrial Flow Solutions Operating, LLC Recommended Storage Procedures

Storage Environment

- The storage environment must be between 40°F - 120°F. DO NOT allow the pump to freeze.
- The pump must be stored in a dry location
- Avoid storing the pump in direct sunlight

For Storage Periods of 3 Years or Less

- Rotate the impeller shaft by hand every 6 months and again prior to start up
    - Keeps seal faces from sticking
    - Keeps bearing grease from settling
- Check the oil in seal chambers prior to startup to ensure oil is moisture free and has not broken down.
- Megger the motor prior to startup. The reading should be above 100 MΩ.

- Remove the air check screw on the motor housing. Using an air compressor, pressurize the motor chamber to 13 psi and check for leaks using a spray bottle. Repeat this procedure to check the seal chamber for leaks.
- Inspect the power cable for any damage.

For Storage Periods longer than 3 Years

- Disassemble the pump and replace all of the O-rings, the Mechanical Seal, Seal Chamber Oil, and the Lip Seal. Repack the Bearings.
- Remove the air check screw on the motor housing. Using an air compressor, pressurize the motor chamber to 13 psi and check for leaks using a spray bottle. Repeat this procedure to check the seal chamber for leaks.
- Rotate the impeller shaft by hand prior to startup.

Lubrication:

No additional lubrication is necessary. The shaft seal and bearings are fully lubricated from the factory. Seal oil should be checked once per year. See table: Oil Fill Quantity / Type.

OIL FILL QUANTITY/TYPE

	OIL IN SEAL CHAMBER		
MODEL	**U.S. FL. OZ.**	**CC.**	**TYPE OF OIL**
SK08C-F	7.8	230	ISO 32 NSF Food Grade Mineral Oil
SK15C-F	7.8	230	ISO 32 NSF Food Grade Mineral Oil
SK22C-F	11.8	350	ISO 32 NSF Food Grade Mineral Oil
SK37C-F	11.8	350	ISO 32 NSF Food Grade Mineral Oil
SK55C-F	84.5	2500	ISO 32 NSF Food Grade Mineral Oil
SK75C-F	84.5	2500	ISO 32 NSF Food Grade Mineral Oil
SK110C-F	87.9	2600	ISO 32 NSF Food Grade Mineral Oil
SK150C-F	87.9	2600	ISO 32 NSF Food Grade Mineral Oil

	OIL IN SEAL CHAMBER		
MODEL	**U.S. FL. OZ.**	**CC.**	**TYPE OF OIL**
SKX08CSS-F	10.1	300	ISO 32 NSF Food Grade Mineral Oil
SKX15CSS-F	10.1	300	ISO 32 NSF Food Grade Mineral Oil
SKX22CSS-F	13.5	400	ISO 32 NSF Food Grade Mineral Oil
SKX37CSS-F	13.5	400	ISO 32 NSF Food Grade Mineral Oil
SKX55CSS-F	84.5	2500	ISO 32 NSF Food Grade Mineral Oil
SKX75CSS-F	84.5	2500	ISO 32 NSF Food Grade Mineral Oil
SKX110CSS-F	87.9	2600	ISO 32 NSF Food Grade Mineral Oil
SKX150CSS-F	87.9	2600	ISO 32 NSF Food Grade Mineral Oil

NOTE: The stator on this model is oil filled. This needs to be changed annually when the seal oil is changed. With the power cable entry removed, fill the motor chamber with oil to a level that insures the oil is covering the motor windings by ½", and that will be above the upper bearing. Do not overfill, an air gap of 10-15% must be maintained for heat expansion.

PUMP INSTALLATION

SK-F & SKX-F Series pumps have been evaluated for use with water or water based solutions with some solids. Please contact the manufacturer for additional information.

The **BJM Pumps** Shredder Pumps (7.5 HP and larger) are designed to handle unscreened sewage.

⚠ WARNING **Risk of electric shock.** Pump models; All three phase pumps do not come with electric plug connectors. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle.

Lifting:

Attach a rope or lifting chain (not included) to the handle (or lifting rings) on the top of the pump.

⚠ CAUTION Do not lift the pump by the power cable or discharge hose/piping. Proper lifting equipment (rope/chain) must be used.

POSITIONING THE PUMP

BJM Pumps® SK-F & SKX-F Series pumps are designed to operate fully submerged. Data sheets can be obtained online at www.flowsolutions.com or by calling Industrial Flow Solutions Operating, LLC at 860-399-5937.

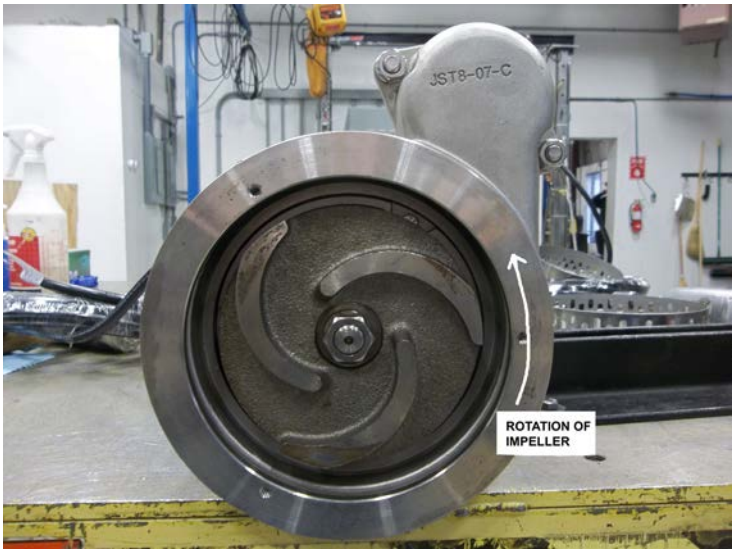
⚠ CAUTION

- Do not run pump dry.
- Pump liquid should not exceed a maximum temperature of 200°F (93°C).
- Never place the pump on loose or soft ground. The pump may sink, preventing water from reaching the impeller. Place on a solid surface or suspend the pump with a lifting rope/chain. The SK-F & SKX-F Series pumps are provided with a suction strainer to prevent large solids from clogging the impeller. Any spherical solids which pass through the strainer should pass through the pump.
- For maximum pumping capacity, use the proper size non-collapsible hose or rigid piping. A check valve may be installed after the discharge to prevent back flow when the pump is shut off.
- Take stand off of pump when using slide rail. Keep stand and reattach when transporting or handling the pump.

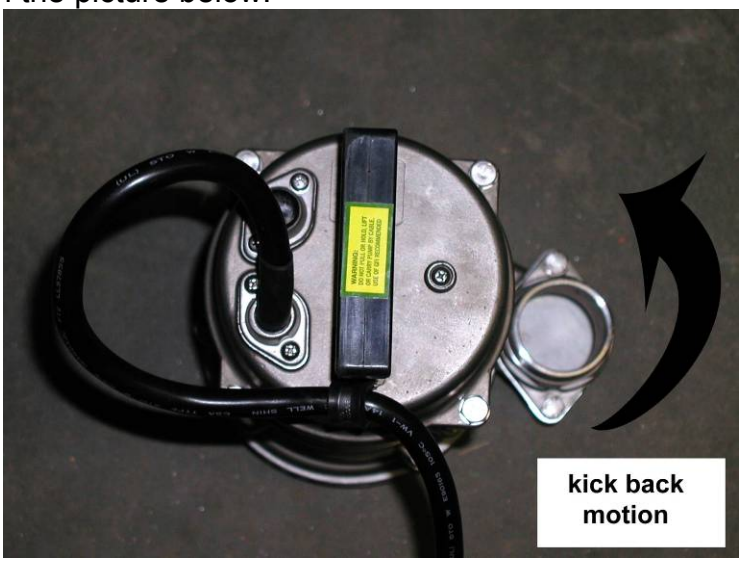
PUMP ROTATION

Two ways to check the correct pump rotation:

1. By looking at the impeller; the rotation of the impeller should be counter clockwise as shown in the picture below.



2. By looking from the top of the pump. Since the impeller cannot be seen, the best way to check the rotation is to check the kick back motion of the pump when the pump just starts. The kick back motion of the pump should be counter clockwise as shown in the picture below.



PUMP OPERATION

⚠ WARNING This pump is designed to handle dirty water that contains some solids. It is not designed to pump volatile or flammable liquids. Do not attempt to pump any liquids which may damage the pump or endanger personnel as a result of pump failure.

⚠ DANGER **Do not operate this pump where explosive vapors or flammable material exist. Death or Serious injury will result.**

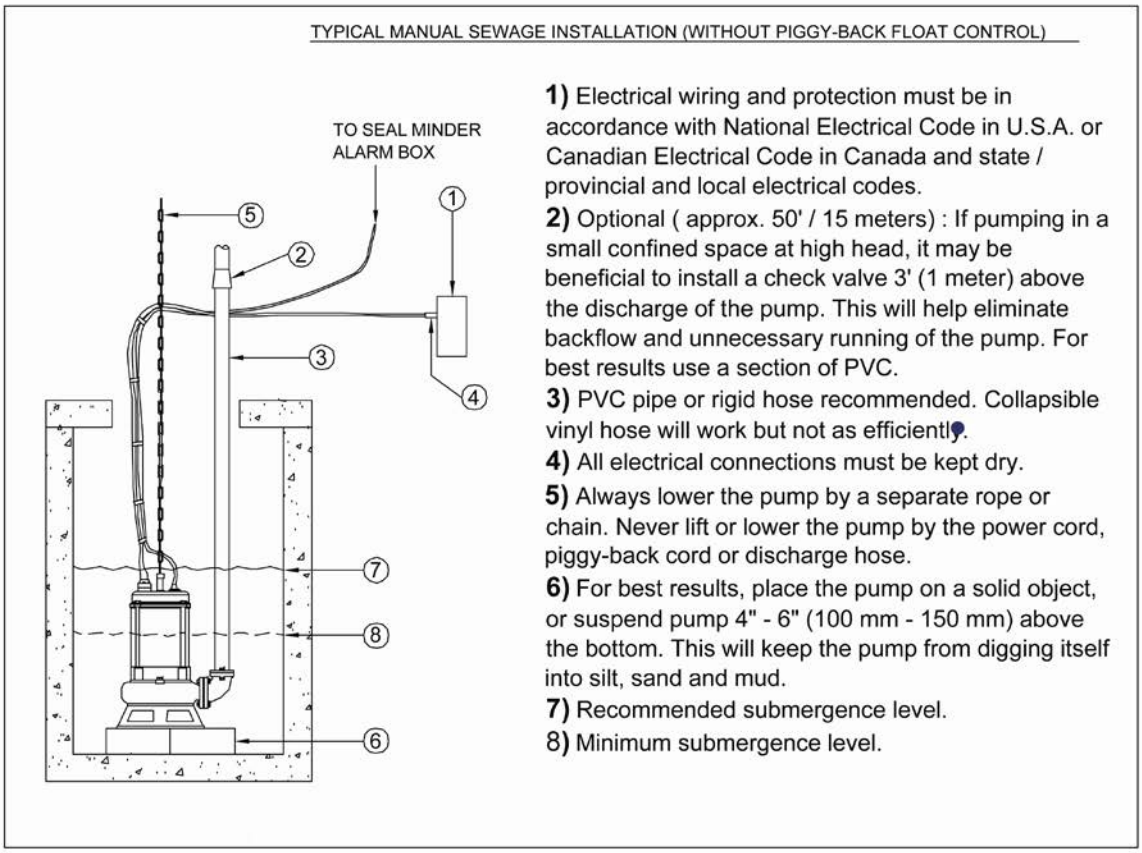
TYPICAL MANUAL WASTEWATERING INSTALLATION

NOTE: Maximum recommended starts should not exceed 10 times per hour.

All SK-F & SKX-F Models are provided with a 33' (10 m) power cord. NEVER splice the power cable due to safety and warranty considerations. Always keep the lead end dry.
Note: 230V, single phase and 208V, 230V, 460V & 575V three phase units do not have a plug and have to be provided separately.

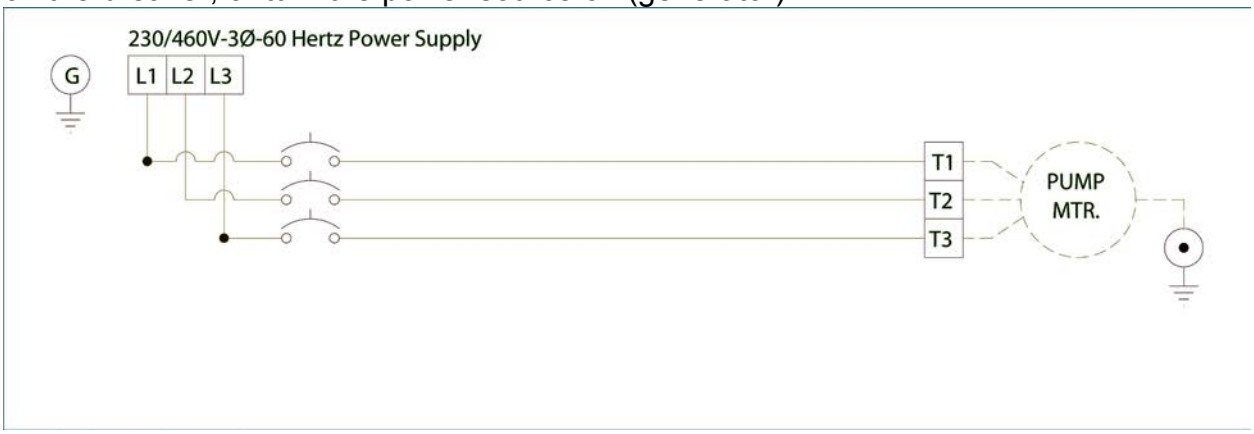
⚠ WARNING Do not alter the length or repair any power cable with a splice. The pump motor and cable must be completely waterproof. Damage to the pump or personal injury may result from alterations.

For manual operation: 208, 230, 460 & 575 volt: Connect directly to the power source or control box. Check the direction of the rotation. Tilt the pump and start it. It should twist in the opposite direction of the arrow (on pump).



STOPPING

To stop the pump (manual and automatic mode), unplug it from the power source, turn off the breaker, or turn the power source off (generator).

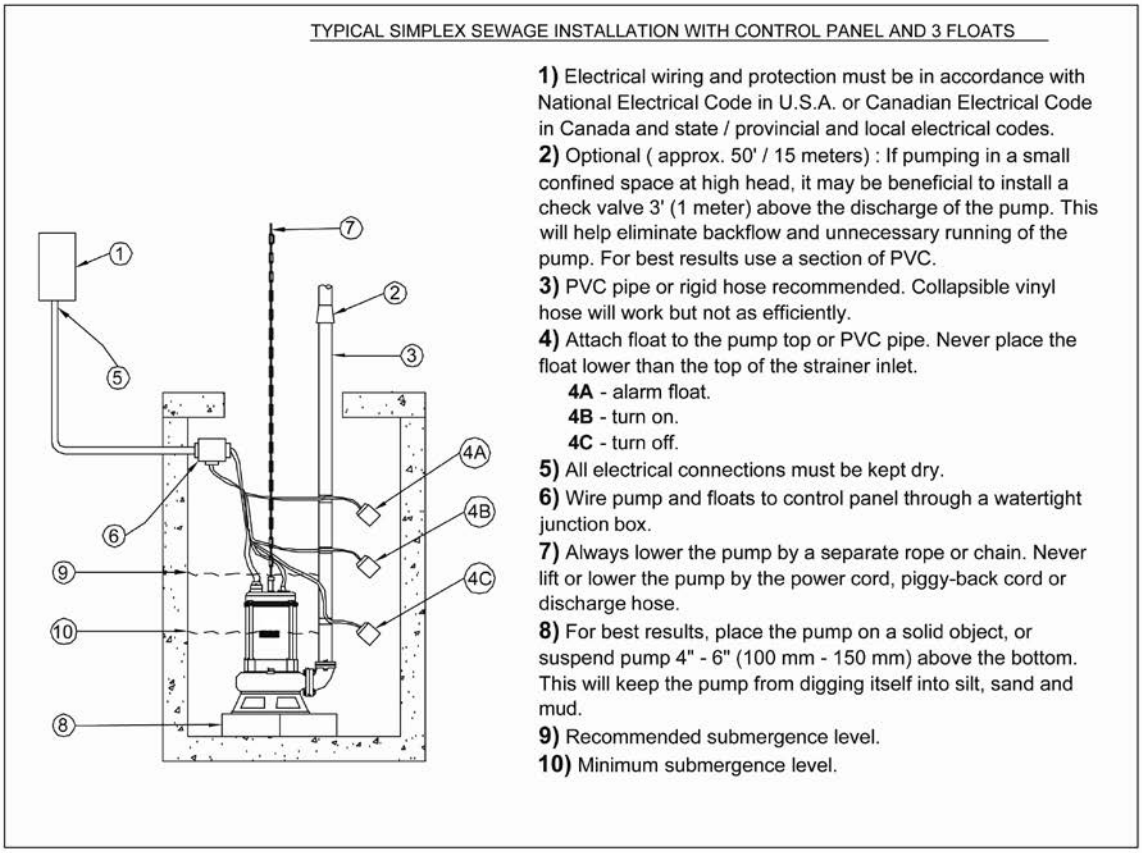


Typical 3 phase manual control 1

TYPICAL AUTOMATIC WASTEWATERING INSTALLATION

NOTE: Maximum recommended starts should not exceed 10 times per hour.

Three phase pumps need a separate control box with float(s) for automatic operation.



STOPPING

To stop the pump (manual and automatic mode), turn off the breaker, or turn the power source off (generator).

INTENDED METHODS OF CONNECTION

⚠ CAUTION Use with approved motor control that matches motor input in full load amperes. “UTILLISER UN DÉMARREAR APPROUVÉ CONVENANT AU COURANT Á PLEINE CHARGE DU MOTEUR.”

BJM Pumps has been evaluated for use with water or water based solutions. Please contact the manufacturer for additional information.

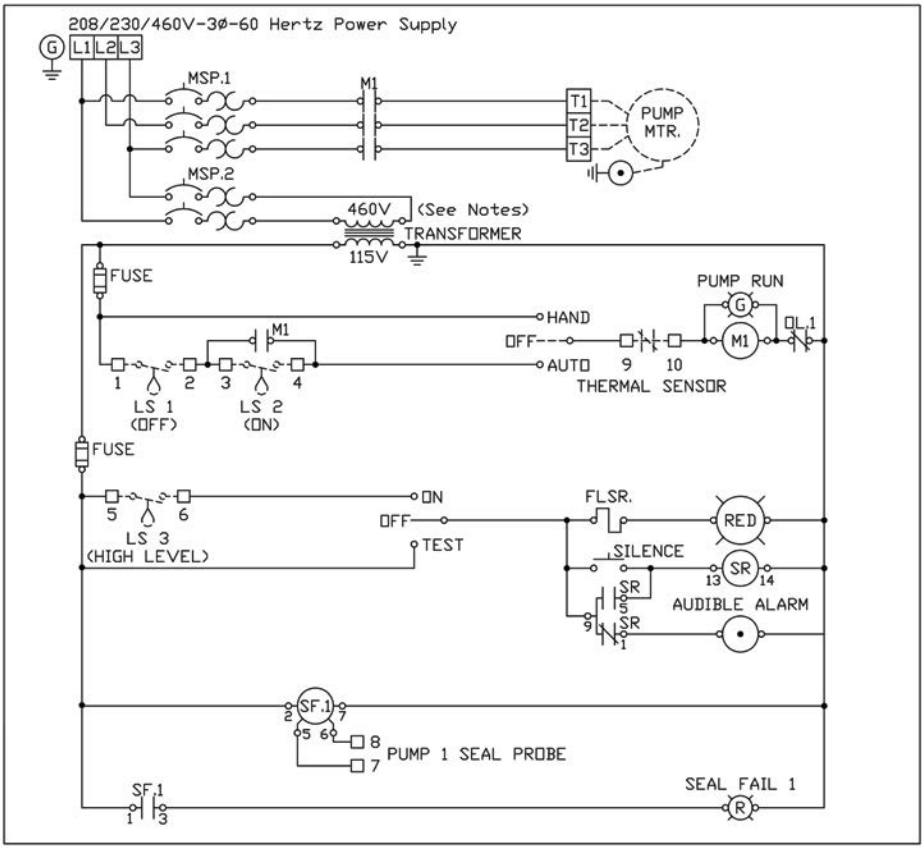
THREE PHASE WIRING INSTRUCTIONS

⚠WARNING **FOR YOUR PROTECTION, ALWAYS DISCONNECT PUMP FROM ITS POWER SOURCE BEFORE HANDLING.**

⚠ CAUTION **"Risk of electrical shock"** Do not remove power supply cord and strain relief or connect conduit directly to the pump.

⚠WARNING Installation and checking of electrical circuits and hardware should be performed by a qualified licensed electrician.

To automatically operate a non-automatic three phase pump, a control panel is required. Follow the instructions provided with the panel to wire the system. For automatic three phase pumps see automatic three phase wiring diagram.



Typical 3 Phase Auto Control 1

Before installing a pump, make sure both of the ground leads and the power leads have been connected properly. Once the power connections have been confirmed, then check the pump rotation. Momentarily energize the pump, observing the directions of kick back due to starting torque. Rotation is correct if kick back is in the opposite direction of rotation arrow on the pump casing. If rotation is not correct, switching of any two power leads other than ground will provide the proper rotation.

⚠ DANGER **DO NOT PLACE HANDS IN PUMP SUCTION WHILE CHECKING MOTOR ROTATION. TO DO SO WILL CAUSE SERVER PERSONAL INJURY.**

Three phase pumps have integral motor overload protection. It is recommended that all three phase pumps using a motor starting device also incorporate motor overload protection. Pumps **must** be installed in accordance with the National Electrical Code and all applicable local codes and ordinances. Pumps are not to be installed in locations classified as hazardous in accordance with National Electrical Code, ANSI/NFPA 70.

Connect pump to a junction box, outlet box, control box, enclosure with a wiring compartment that meets NEC and local codes. The provision for supply connection shall reduce the risk of water entry during temporary, limited submersion and shall comply with the applicable requirements of the Standard for Enclosures for Electrical Equipment, UL 50, or the standard for Metallic Outlet Boxes, UL 514A, and the standard for Motor-Operated Water Pumps. UL 778.

TROUBLE SHOOTING

⚠WARNING **Disconnect the power source to the pump BEFORE attempting any type of trouble shooting, service or repair.**

PUMP WILL NOT RUN

1. Check power supply (fuses, breaker). Reset power.
2. Blocked impeller. Remove strainer, check and clean.
3. Defective cable or incorrect wiring.
4. Strainer clogged. Check and clean as necessary.
5. Float switch tangled/obstructed. Clean and free float switch from obstruction.
6. Float switch defective. Replace float switch.
7. Pump overheated or temperature of liquid exceeds pump operating temperature.

PUMP RUNS BUT DOES NOT DELIVER RATED CAPACITY

1. Discharge line clogged, restricted or hose kinked. Check discharge hose/pipe.
2. Worn impeller and/or suction cover. Inspect and replace as necessary.
3. Pump overloaded due to liquid pumped being too thick.
4. Pumping air. Check liquid level and position of pump.
5. Excessive voltage drops due to long cables.
6. Three phase only; pump running backwards, check rotation.

SERVICING YOUR SUBMERSIBLE PUMP

Pump should be disconnected from the electric power supply before proceeding to do any service or maintenance**.**
To service or repair your pump, please contact your local **BJM Pumps®** distributor. Service should only be performed by a qualified electrician. The design of the "F" series high temperature pump models is unique and requires specific knowledge to perform the proper assembly. Industrial Flow Solutions Operating, LLC recommends that all electrical service work be performed at the factory or by a factory trained and certified repair technician to insure that the materials and assembly methods meet BJM Pumps® standards.

MAINTAINING YOUR PUMP

- Pump should be disconnected from the electric power supply before proceeding to do any service or maintenance**.**
- Pump should be inspected at regular intervals.
- More frequent inspections are required if the pump is used in a harsh environment.
- Preventative maintenance should be performed to reduce the chance of premature failure.
- Worn impellers and lip seals should be replaced.
- Cut or cracked power cords must be replaced. **(Never operate a pump with a cut, cracked or damaged power cord.)**
- Seal oil should be checked once per year.
- Maintenance should always be done when taking a pump out of service before storage.

1) Clean pump of dirt and other build up.
2) Check condition of oil around the shaft seals.
3) Check hydraulic parts: check for wear.
4) Inspect power cable. Make sure that it is free of nicks or cuts.

CHANGING SEAL OIL

Changing the seal oil in the SK-F & SKX-F series pumps is very easy.

1) Make sure that the pump is de-energized and locked out for service.
2) Lay the pump down on its side.
3) Remove the screws that hold the bottom plate in place.
4) Remove bottom plate.
5) Remove screws holding the suction cover.
6) Remove the suction cover.
7) Remove the impeller.

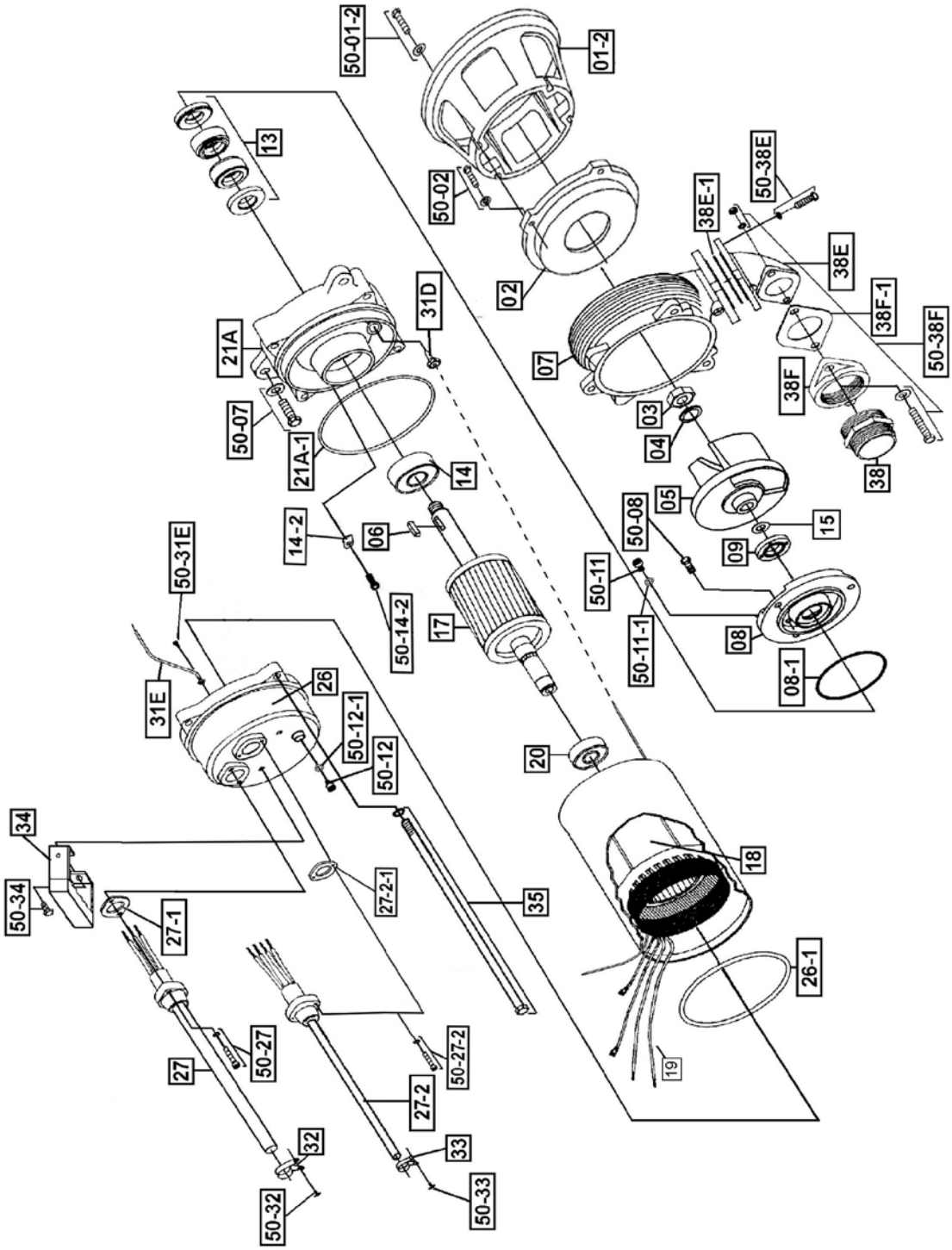
8) Remove the inspection screw for the oil chamber (pos#50-08). Pour out a small sample of the oil. If it is milky white, or contains water, then the oil and possible, the mechanical seal, should be changed. If an oil change is needed.
9) Remove the screws that hold the oil chamber cover in place & remove the oil.
10) Replace the mechanical seal if necessary.
11) Replace the oil.
12) Assemble the pump.

STATOR REPLACEMENT OR ELECTRICAL REPAIR

The BJM Pumps® “F” Series designed pumps utilize unique construction methods and materials. The interconnection of all wiring requires the use of a BJM Pumps® wire connection kit. Included in this kit are specific instructions on how a qualified factory trained and certified repair technician can perform this work properly. No other materials or methods should be used on this product.

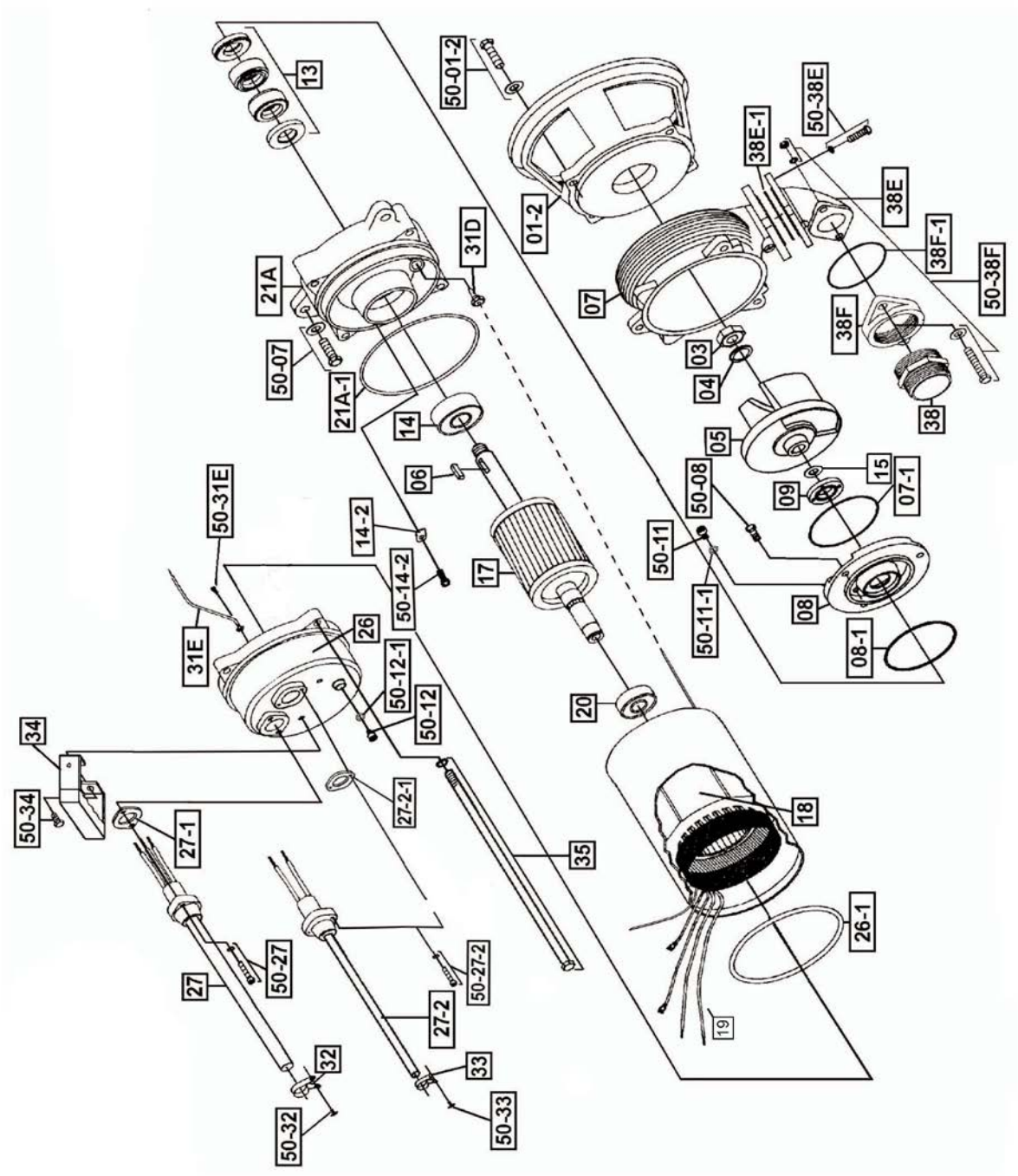
BJMPumps

EXPLODED VIEW OF SK08C-F, SK15C-F

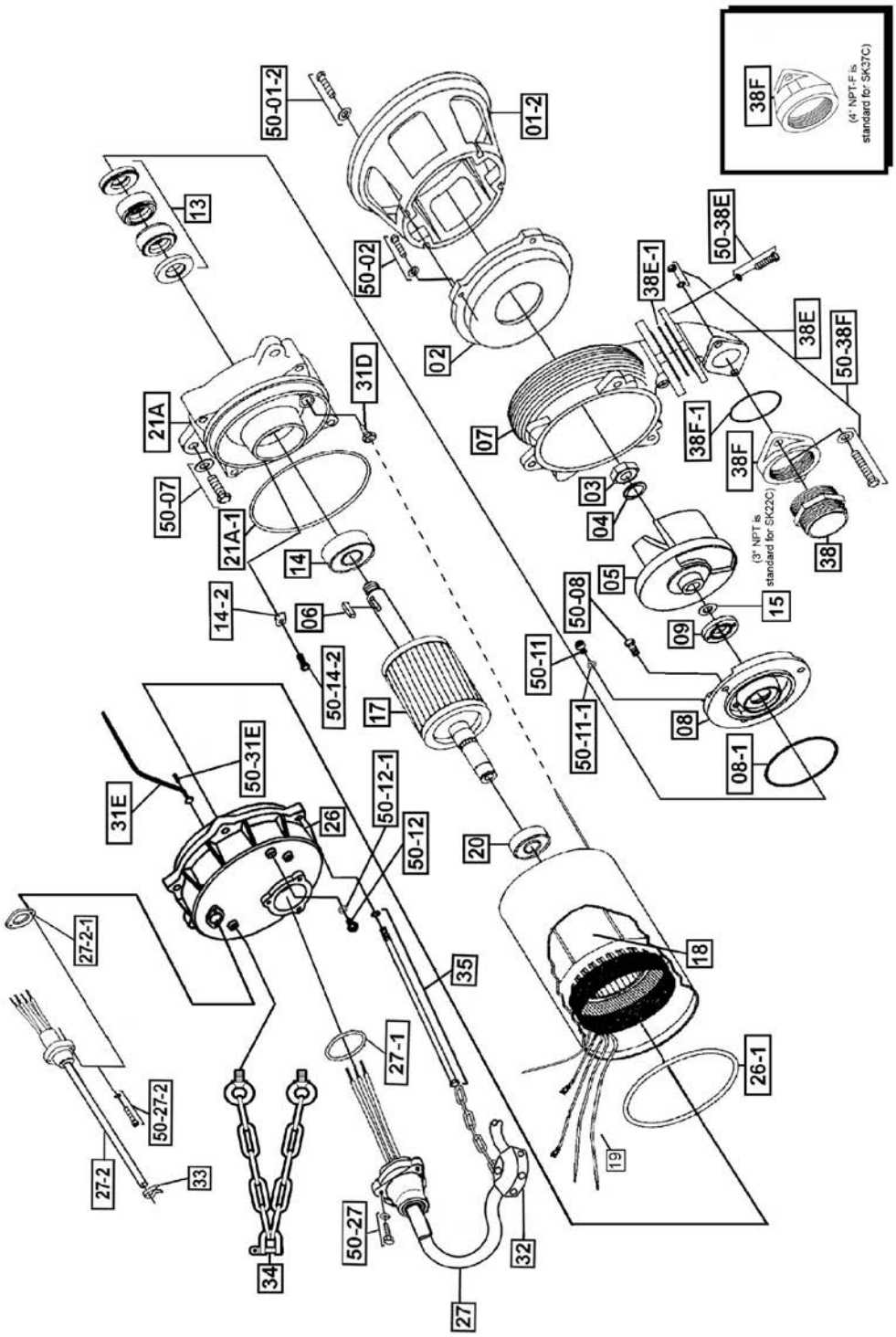


BJMPumps

EXPLODED VIEW OF SKX08CSS-F, SKX15CSS-F

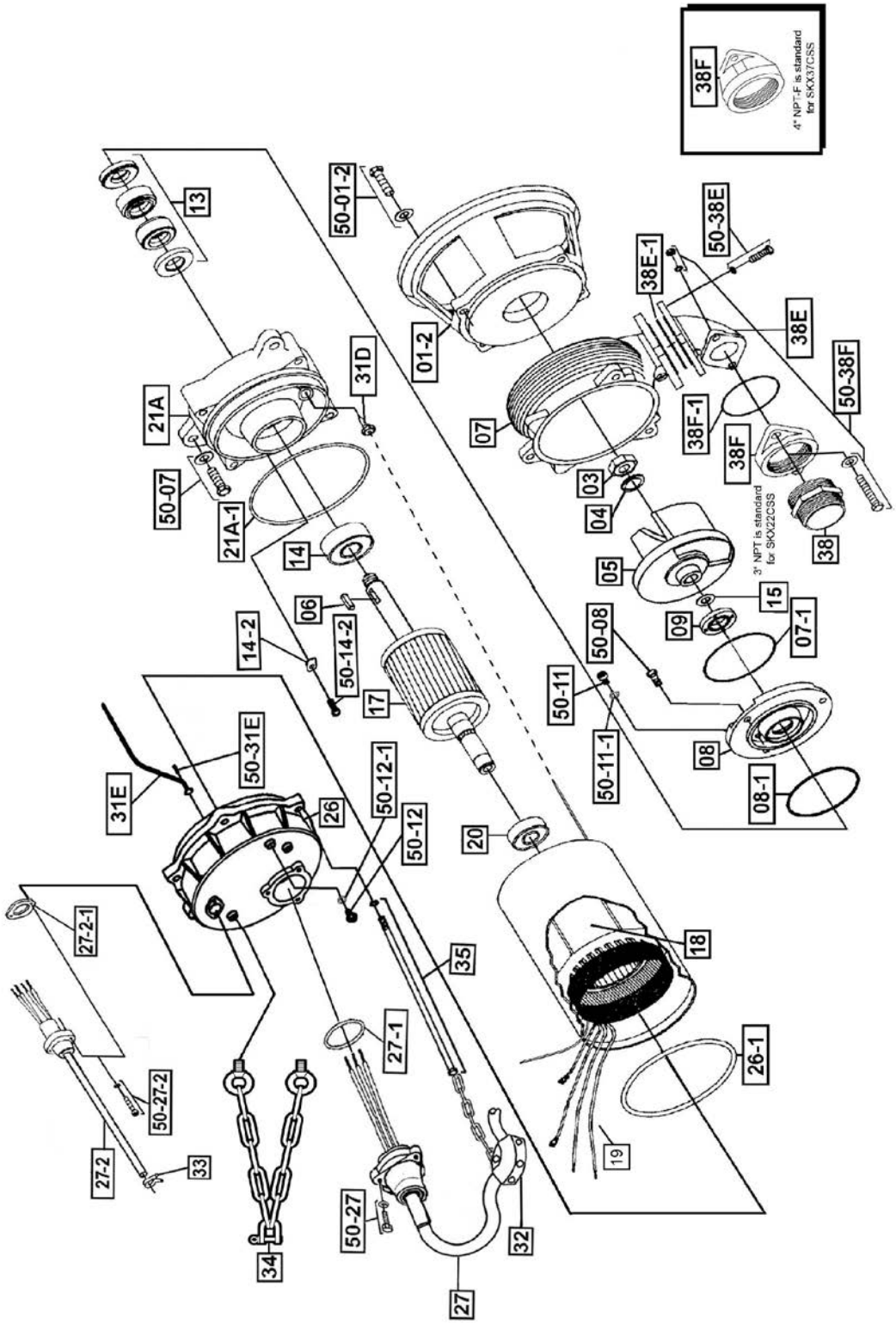


EXPLODED VIEW OF SK22C-F, SK37C-F



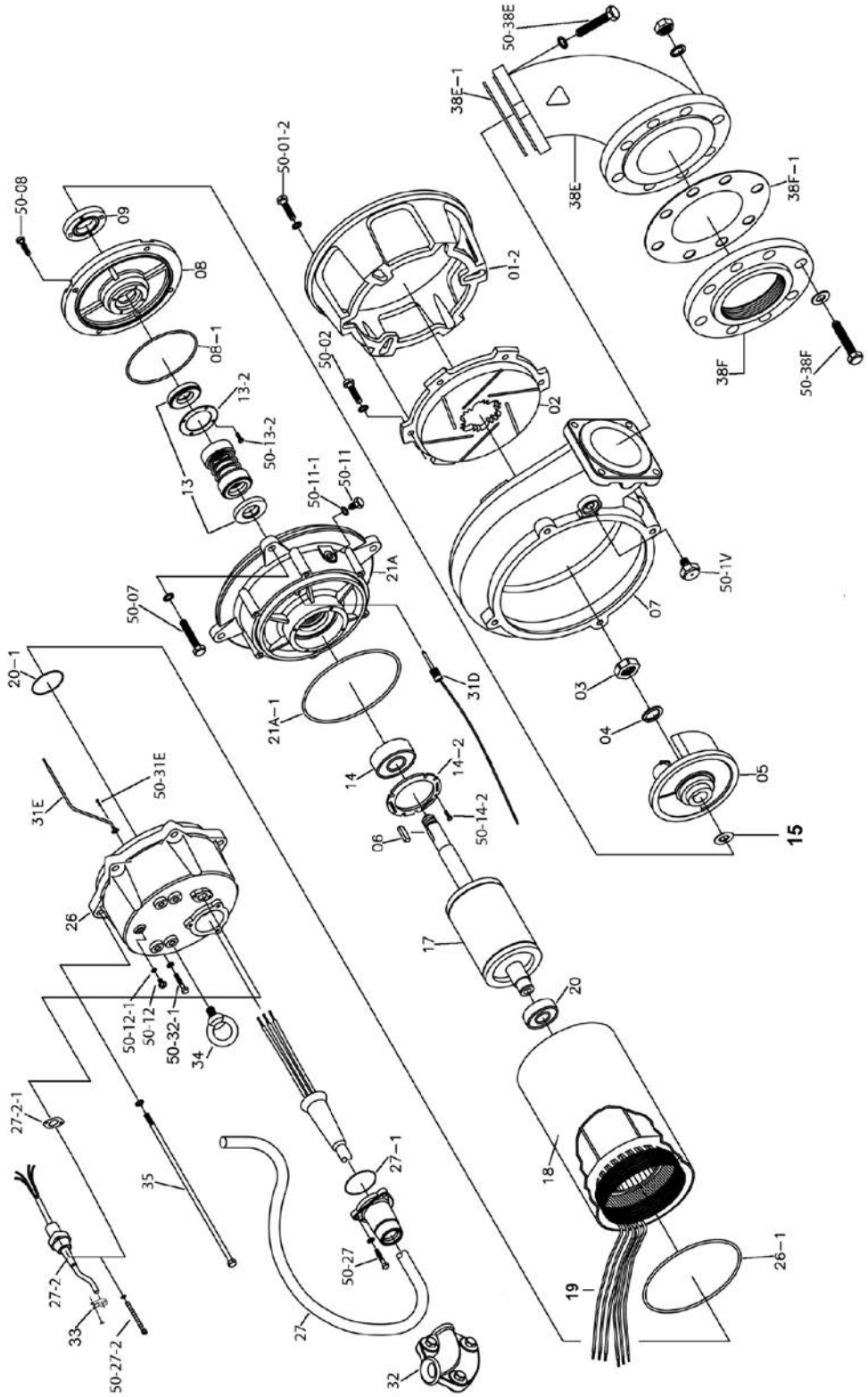
BJMPumps

EXPLODED VIEW OF SKX22CSS-F, SKX37CSS-F

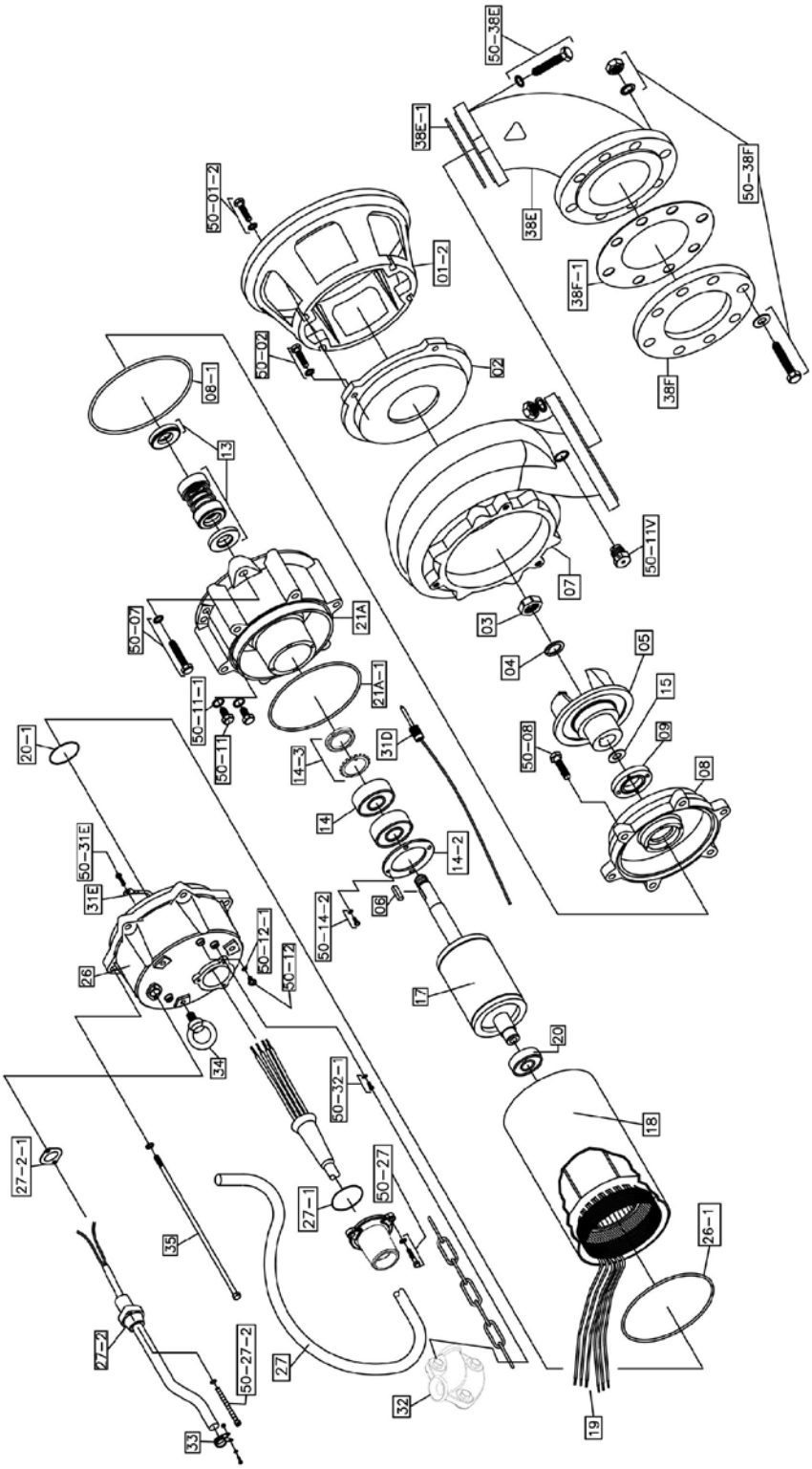


BJMPumps

EXPLODED VIEW OF SK55C-F, SKX55CSS-F, SK75C-F, SKX75CSS-F



EXPLODED VIEW OF SK110C-F, SKX110CSS-F, SK150C-F, SKX150CSS-F



SK-F SERIES PARTS LIST

	Pump Model	SK08CF	SK15CF	SK22CF	SK37CF	SK55CF	SK75CF	SK110CF	SK150CF
Pos. No.	Part Description	Item #	Item #	Item #	Item #	Item #	Item #	Item #	Item #
01-2	Stand Only	202847	202858	202850	202855	201998	201998	202000	202000
02	Suction Cover, Cast Iron	-	-	-	-	202880	202880	202882	202882
02	Suction Cover, Hi-Chrome	202045	202046	202047	202048	-	-	-	-
03	Impeller Nut	202894	202894	202894	202894	202897	202897	202897	202897
04	Impeller Washer	202907	202907	202907	202907	202917	202917	202917	202917
05	Impeller, Heat Treated DI	202956	204565	204566	204567	204569	204571	202945	202947
06	Impeller Key	202140	202140	202140	202140	202146	202146	202146	202987
07	Pump Housing	202173	203008	203011	203014	203024	203024	203027	203027
08	Oil Chamber Cover	202213	202213	202218	202218	202221	202221	202223	202223
08-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
09	Lip Seal FKM	202232	202232	202235	202235	202243	202243	202243	202243
13	Mechanical Seal FKM	204240	204240	204243	204243	200307	200307	200307	200307
13-2	Mechanical Seal Retainer	-	-	-	-	202273	202273	202273	202273
14	Lower Ball Bearing (* =Qty 2 Needed)	200958	200958	200959	200959	200962	200962	200962*	200962*
14-2	Lower Bearing Retainer	202279	202279	202279	202279	203075	203075	203076	203076
14-3	Lock Nut & Lock Washer	-	-	-	-	-	-	200424	200424
15	Impeller Shim Kit (Required)	200480	200480	200480	200480	200478	200478	200478	200478
17	Rotor w/ Shaft, 3PH	204031	204032	204033	204034	204035	204036	204037	204038
18	Stator w/ Casing 208V, 3PH	200525	200529	200533	200537	200670	-	-	-
18	Stator w/ Casing 230/460V, 3PH	200547	200551	200555	200559	200573	200577	200581	-
18	Stator w/ Casing 460V, 3PH	-	-	-	-	-	-	-	200585
18	Stator w/ Casing 575V, 3PH	200589	200593	200597	200601	200617	200623	200630	200637
19	Wire Connection Kit*	204202	204202	204203	204203	204203	204203	CTF	CTF
20	Upper Ball Bearing	200967	200967	200958	200958	200968	200968	200968	200968
20-1	O-Ring (Kit Only)	-	-	-	-	Kit	Kit	Kit	Kit
21A	Oil Chamber/Motor Housing	202196	202196	203030	203030	202199	202199	203032	203032
21A-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
26	Pump Top Cover (w/ Sensor Opening)	202435	202435	202437	202437	203129	203129	203132	203132
26-1	O-Ring Kit Only	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
27	Power Cable w/ Gland- 3PH(high temp)	204452	204452	203776	203776	203776	203776	203778	203778
27-1	O-Ring Kit Only	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
27-2	Seal Minder/Temp. Sensor Cord (High Temp)	204453	204453	204453	204453	204453	204453	204453	204453
27-2-1	O-Ring Kit Only	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit

31D	Seal Minder Probe	202408	202408	202410	202410	204001	204001	204001	204001
31E	Ground Wire w/Ring Term.	203145	203145	203145	203145	203145	203145	203145	203145
32	Power Cord Line Clip / Strain Relief	203161	203161	202497	202497	202497	202497	202500	202500
33	Seal Minder Sensor Cord Line Clip	203163	203163	203163	203163	203163	203163	203163	203163
34	Handle / Chain Handle	202517	202517	202509	202509	-	-	-	-
34	Bolt - Suction Cover	-	-	-	-	203172	203172	203172	203172
35	Rod Bolts	202669	202670	202671	202672	202676	202677	202678	202679
38	Discharge Nippple 2"	202531	-	-	-	-	-	-	-
38	Discharge Nipple 3"	-	202534	202534	202534	-	-	-	-
38E	Discharge Elbow	202570	202558	202558	202558	202818	202572	203187	203187
38E-1	Gasket, Disch. Elbow FKM	203213	203209	203209	203209	203211	203211	202664	202664
38F	Discharge Flange 2"	202562	-	-	-	-	-	-	-
38F	Discharge Flange 3"	-	202545	202545	202545	-	-	-	-
38F	Discharge Flange 4"	-	-	202552	202552	202575	202575	-	-
38F	Discharge Flange 6" ANSI Slip Weld	-	-	-	-	-	-	202548	202548
38F-1	Gasket, Disch. Flange FKM	203207	202660	202660	202660	202662	202662	202664	202664
50-01-2	Bolt for Strainer/Stand	203228	203228	203228	203228	203236	203236	203279	203279
50-02	Bolt for Suction Cover	203228	203228	203228	203228	203236	203236	203279	203279
50-07	Screw for Oil Chamber/Motor Housing	203228	203228	203228	203228	203271	203271	203280	203280
50-08	Screw for Oil Chamber Cover	203219	203219	203219	203219	203246	203246	203281	203281
50-11	Screw for Oil Fill	203218	203218	203218	203218	203261	203261	203282	203282
50-11-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
50-11V	Air Release Valve	-	-	-	-	202707	202707	202707	202707
50-12	Screw for Pressure Check	203218	203218	203218	203218	203218	203218	203218	203218
50-12-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
50-13-2	Screw for Seal Retainer	-	-	-	-	203214	203214	203214	203214
50-14-2	Screw for Brg. Retainer	203219	203219	203219	203219	203220	203220	203220	203220
50-27	Screw for Power Cord	203216	203216	203246	203246	203246	203246	203246	203246
50-27-2	Screw for Seal Minder Cable	203216	203216	203216	203216	203216	203216	203216	203216
50-31E	Screw for Ground Wire	202692	202692	202692	202692	202692	202692	202692	202692
50-32/50-33	Screw for Line Clip	203214	203214	-	-	-	-	-	-
50-32-1	Bolt for Power Cord Chain	-	-	-	-	203284	203284	203284	203284
50-34	Screw for Handle	203219	203219	-	-	-	-	-	-
50-38E	Bolt for Discharge Elbow	203253	203255	203255	203255	203276	203276	203278	203278
50-38F	Bolt for Discharge Flange	203289	203289	203289	203253	203277	203277	203278	203278
	O-Ring Kit - FKM	202646	202646	202641	202641	202652	202652	203202	203202

***"F" Series High Temperature Pumps Only**

SKX-F SERIES PARTS LIST

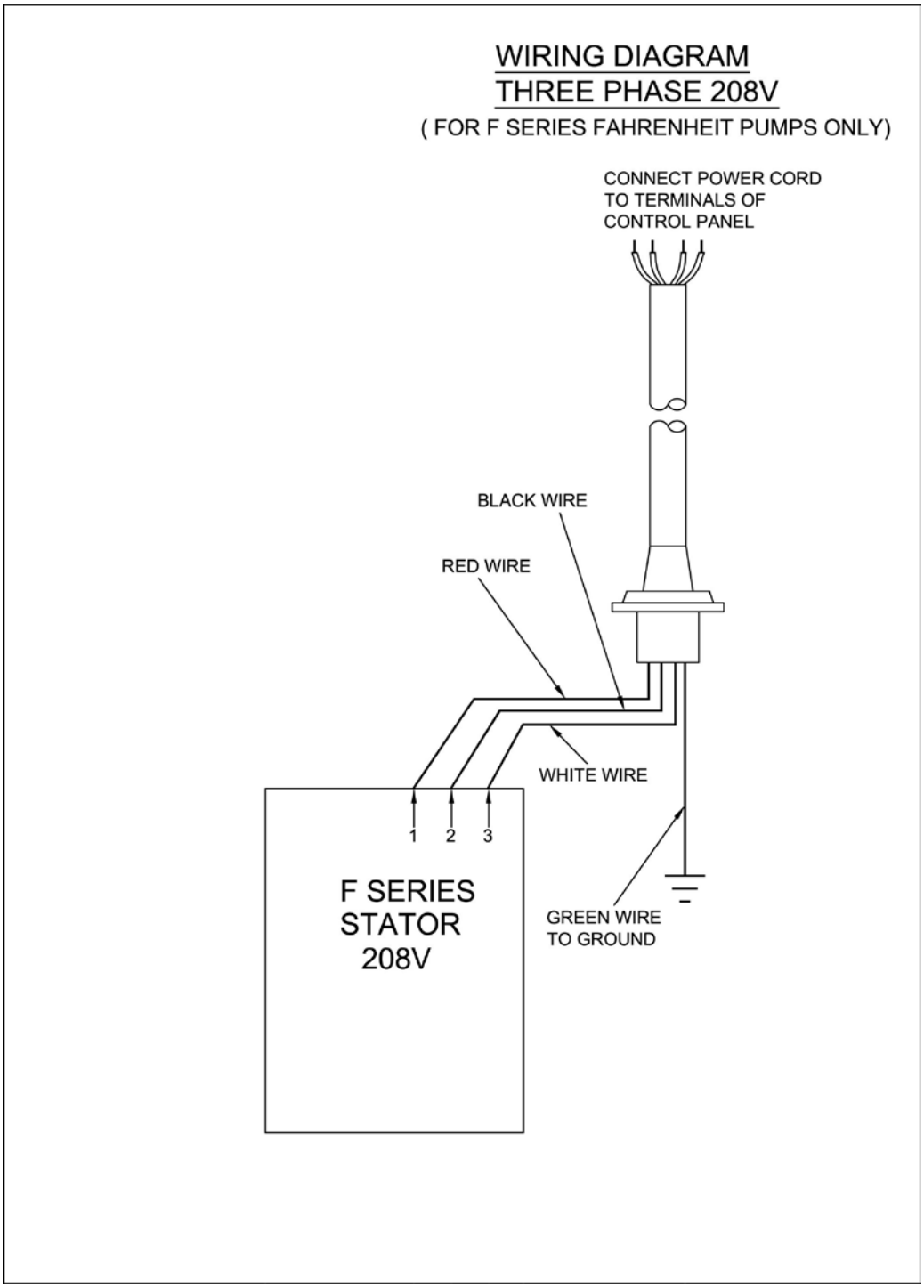
	Pump Model	SKX08CSSF	SKX15CSSF	SKX22CSSF	SKX37CSSF	SKX55CSSF	SKX75CSSF	SKX110CSSF	SKX150CSSF
Pos. No.	**Part Description**	**Item #**	**Item #**	**Item #**	**Item #**	**Item #**	**Item #**	**Item #**	**Item #**
01-2	Stand Only	201988	201995	201989	201994	201999	201999	202001	202001
02	Suction Cover	-	-	-	-	202881	202881	221X	221X
03	Impeller Nut	202894	202894	202894	202894	202897	202897	202897	202897
04	Impeller Washer	202907	202907	202907	202907	202917	202917	202917	202917
05	Impeller	202958	204628	204629	204630	204568	204570	202946	202948
06	Impeller Key	202140	202140	202140	202140	202146	202146	202146	202987
07	Pump Housing	202176	202172	202177	202181	202190	202190	202194	202194
07-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	-	-	-	-
08	Oil Chamber Cover	202214	202214	202219	202219	202222	202222	202224	202224
08-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
09	Lip Seal FKM	202232	202232	202235	202235	202243	202243	202243	202243
13	Mechanical Seal FKM	204240	204240	204243	204243	200307	200307	200307	200307
13-2	Mechanical Seal Retainer	-	-	-	-	202273	202273	202273	202273
14	Lower Ball Bearing (*=qty 2 Needed)	200958	200958	200959	200959	200962	200962	200962*	200962*
14-2	Lower Bearing Retainer	202279	202279	202279	202279	203075	203075	203076	203076
14-3	Lock Nut & Lock Washer	-	-	-	-	-	-	200424	200424
15	Impeller Shim Kit (Required)	200480	200480	200480	200480	200478	200478	200478	200478
17	Rotor w/ Shaft, 3PH	204021	204022	204023	204024	204027	204028	204029	204030
18	Stator w/ Casing 208V, 3PH	200527	200531	200535	200539	200672	-	-	-
18	Stator w/ Casing 230/460V,3PH	200549	200553	200557	200561	200575	200579	200583	-
18	Stator w/ Casing 460V,3PH	-	-	-	-	-	-	-	200587
18	Stator w/ Casing 575V, 3PH	200591	200595	200599	200603	200619	200625	200632	200639
19	Wire Connection Kit*	204202	204202	204203	204203	204203	204203	CTF	CTF
20	Upper Ball Bearing	200967	200967	200958	200958	200968	200968	200968	200968
20-1	O-Ring (Kit Only)	-	-	-	-	Kit	Kit	Kit	Kit
21A	Oil Chamber/Motor Housing	202197	202197	202198	202198	202200	202200	202201	202201
21A-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
26	Pump Top Cover (w/ Sensor opening)	202436	202436	202438	202438	203130	203130	202444	202444
26-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
27	Power Cable w/ Gland- 3PH(high temp)	201733	201733	203777	203777	203777	203777	203779	203779
27-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
27-2	Seal Minder/Temp. Sensor Cord (High Temp)	201741	201741	201741	201741	201741	201741	201741	201741
27-2-1	O-Ring Kit Only	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
31D	Seal Minder Probe	202408	202408	202410	202410	204001	204001	204001	204001
31E	Ground Wire w/Ring Term.	203145	203145	203145	203145	203145	203145	203145	203145

32	Power Cord Line Clip / Strain Relief	203161	203161	202499	202499	202499	202499	202500	20250
33	Seal Minder Cable Line Clip	203163	203163	203163	203163	203163	203163	203163	20316
34	Handle / Chain Handle	202517	202517	202510	202510	-	-	-	-
34	Lifting Ring	-	-	-	-	202520	202520	202520	20252
35	Bolt - Suction Cover	202684	202685	202686	202687	202676	202677	202678	20267
38	Discharge Nippple 2"	202532	-	-	-	-	-	-	-
38	Discharge Nipple 3"	-	202535	202535	202535	-	-	-	-
38E	Discharge Elbow	202571	202559	202559	202559	202573	202573	202574	20257
38E-1	O-Ring, Discharge Elbow FKM	203326	203327	203327	203327	202818	-	-	-
38E-1	Gasket, Discharge Elbow FKM	-	-	-	-	203211	203211	202664	20266
38F	Discharge Flange 2"	202563	-	-	-	-	-	-	-
38F	Discharge Flange 3"	-	202546	202546	202546	-	-	-	-
38F	Discharge flange 4"	-	-	202553	202553	202576	202576	-	-
38F	Discharge flange 6" ANSI Slip Weld	-	-	-	-	-	-	202549	20254
38F-1	O-Ring 2" Discharge Flange FKM	202723	-	-	-	-	-	-	-
38F-1	O-Ring, 3" Discharge Flange FKM	-	202724	202724	202724	-	-	-	-
38F-1	O-Ring, 4" Discharge Flange FKM	-	-	203328	203328	-	-	-	-
38F-1	Gasket, 4" Discharge Flange FKM	-	-	-	-	202662	202662	-	-
38F-1	Gasket, 6" Discharge Flange FKM	-	-	-	-	-	-	202664	20266
50-01-2	Bolt for Strainer/Stand	203228	203228	203228	203228	203236	203236	203279	20327
50-02	Bolt for Suction Cover	-	-	-	-	203236	203236	203279	20327
50-07	Screw for Oil Chamber/Motor Housing	203296	203296	203296	203296	203271	203271	203280	20328
50-08	Screw for Oil Chamber Cover	203219	203219	203219	203219	203246	203246	203281	20328
50-11	Screw for Oil Fill	203218	203218	203218	203218	203261	203261	203282	20328
50-11-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
50-11V	Air Release Valve	-	-	-	-	202707	202707	202707	20270
50-12	Screw for Pressure Check	203218	203218	203218	203218	203218	203218	203218	20321
50-12-1	O-Ring (Kit Only)	Kit	Kit	Kit	Kit	Kit	Kit	Kit	Kit
50-13-2	Screw for Seal Retainer	-	-	-	-	203214	203214	203214	20321
50-14-2	Screw for Bearing Retainer Plate	203219	203219	203219	203219	203220	203220	203220	20322
50-27	Screw for Power Cord	203295	203295	203246	203246	203246	203246	203246	20324
50-27-2	Screw for Seal Minder Cable	203295	203295	203295	203295	203295	203295	203295	20329
50-31E	Screw for Ground Wire	202692	202692	202692	202692	202692	202692	202692	20269
50-32/50-33	Screw for Line Clip	203214	203214	-	-	-	-	-	-
50-32-1	Bolt for Power Cord Strain Relief Chain	-	-	-	-	203284	203284	203284	20328
50-34	Screw for Handle	203219	203219	-	-	-	-	-	-
50-38E	Bolt for Discharge Elbow	203294	203271	203271	203271	203276	203276	203278	20327
50-38F	Bolt for Discharge Flange	203229	203294	203294	203294	203277	203277	203278	20327
	O-Ring Kit - FKM	202647	202647	202642	202642	202652	202652	203202	20320

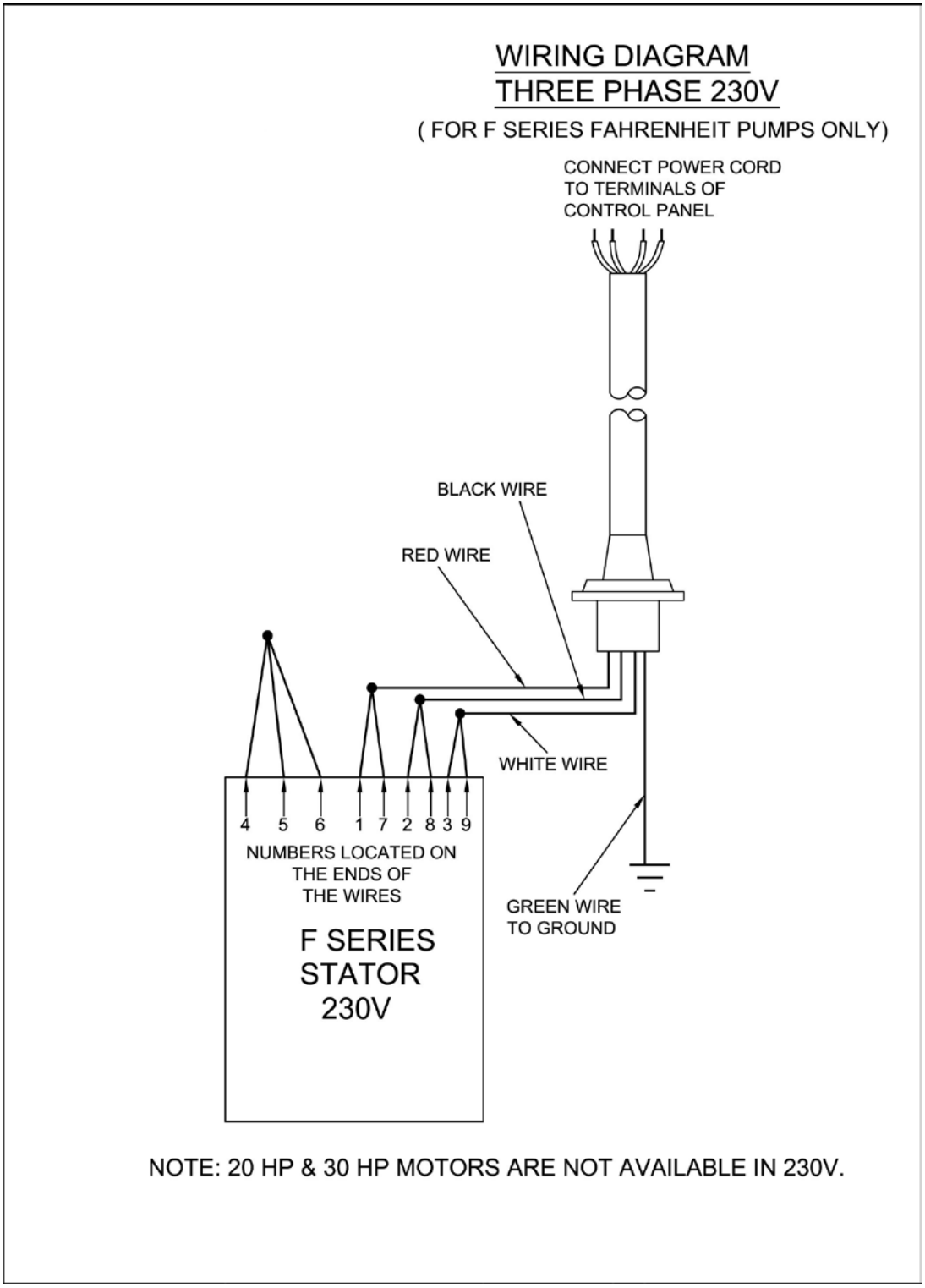
***"F" Series High Temperature Pumps Only**

THREE PHASE WIRING DIAGRAMS

208V



MODELS SK08C-F, SKX08CSS-F, SK15C-F, SKX15CSS-F, SK22C-F, SKX22CSS-F, SK37C-F, SKX37CSS-F, SK55C-F, SKX55CSS-F

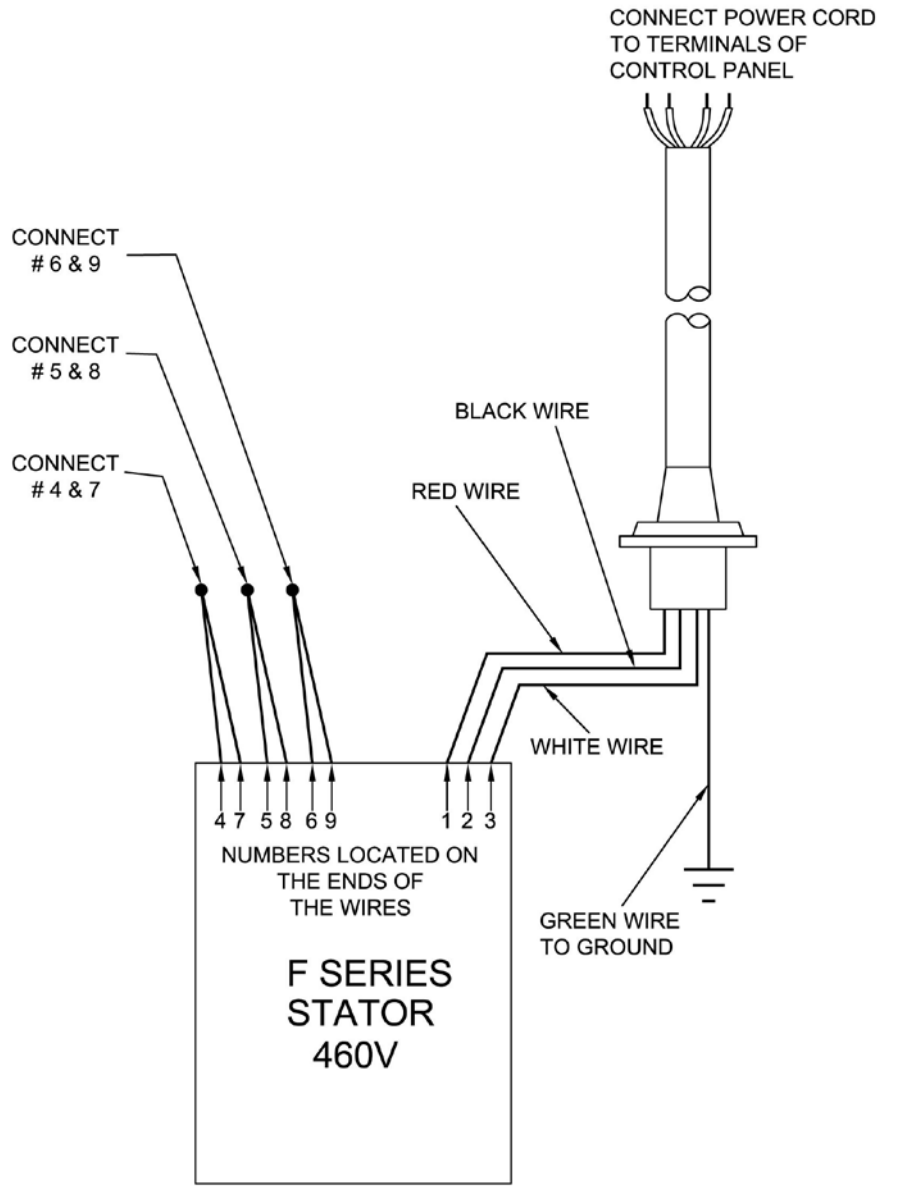


MODELS SK08C-F, SKX08CSS-F, SK15C-F, SKX15CSS-F, SK22C-F, SKX22CSS-F, SK37C-F, SKX37CSS-F, SK55C-F, SKX55CSS-F, SKX75C-F, SKX75CSS-F, SK110C-F, SKX110CSS-F

BJMPumps

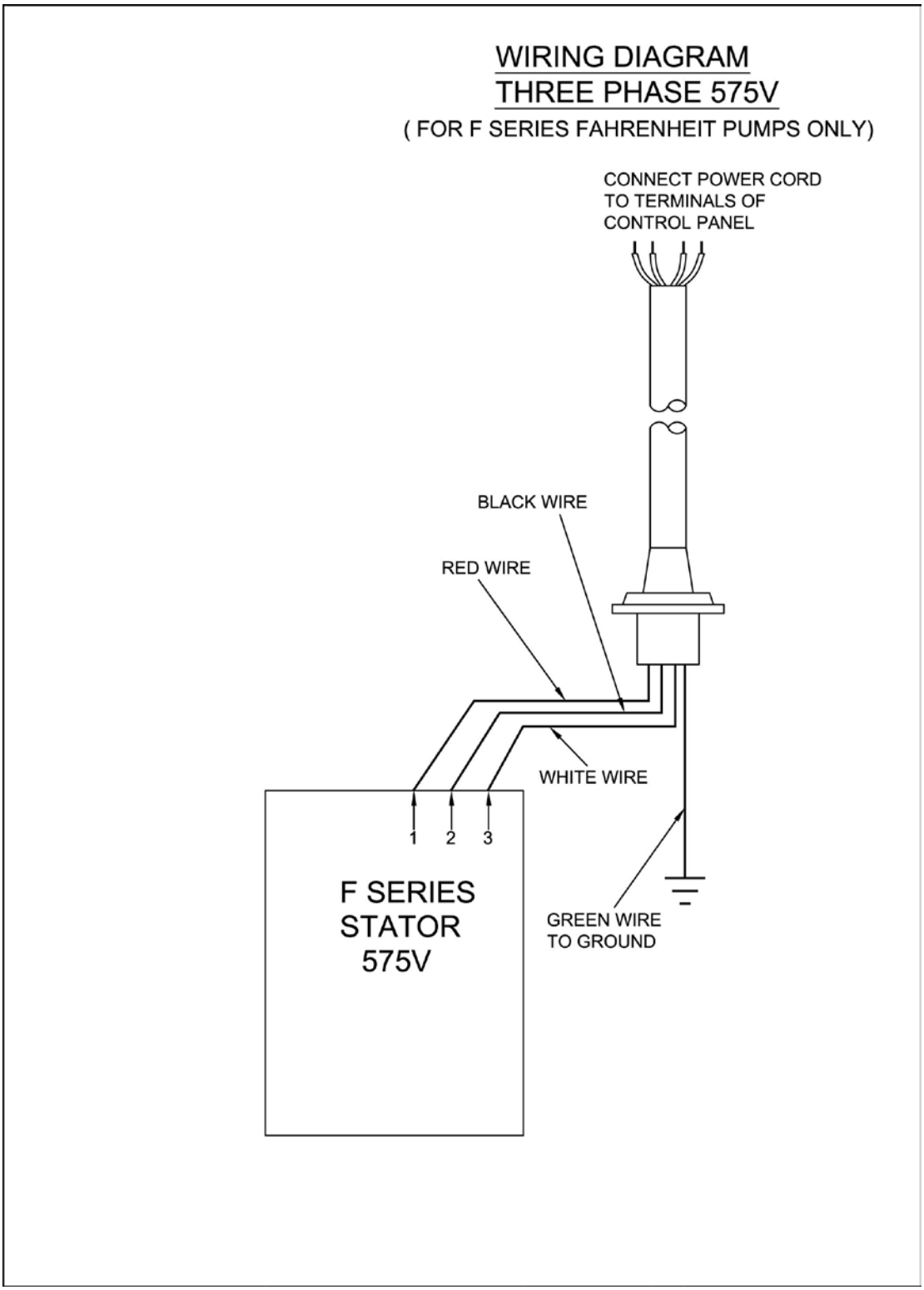
WIRING DIAGRAM
THREE PHASE 460V

(FOR F SERIES FAHRENHEIT PUMPS ONLY)



BJM PUMPS - 123 SPENCER PLAIN ROAD, OLD SAYBROOK, CT 06475 - PHONE: 860-399-5937 - FAX: 860-399-7784

MODELS SK08C-F, SKX08CSS-F, SK15C-F, SKX15CSS-F, SK22C-F, SKX22CSS-F, SK37C-F, SKX37CSS-F, SK55C-F, SKX55CSS-F, SKX75C-F, SKX75CSS-F, SK110C-F, SKX110CSS-F, SK150C-F, SKX150CSS-F



MODELS SK08C-F, SKX08CSS-F, SK15C-F, SKX15CSS-F, SK22C-F, SKX22CSS-F, SK37C-F, SKX37CSS-F, SK55C-F, SKX55CSS-F, SKX75C-F, SKX75CSS-F, SK110C-F, SKX110CSS-F, SK150C-F, SKX150CSS-F

SEAL MINDER® - THERMAL MOTOR SENSOR SWITCH

(For high temperature pump models)

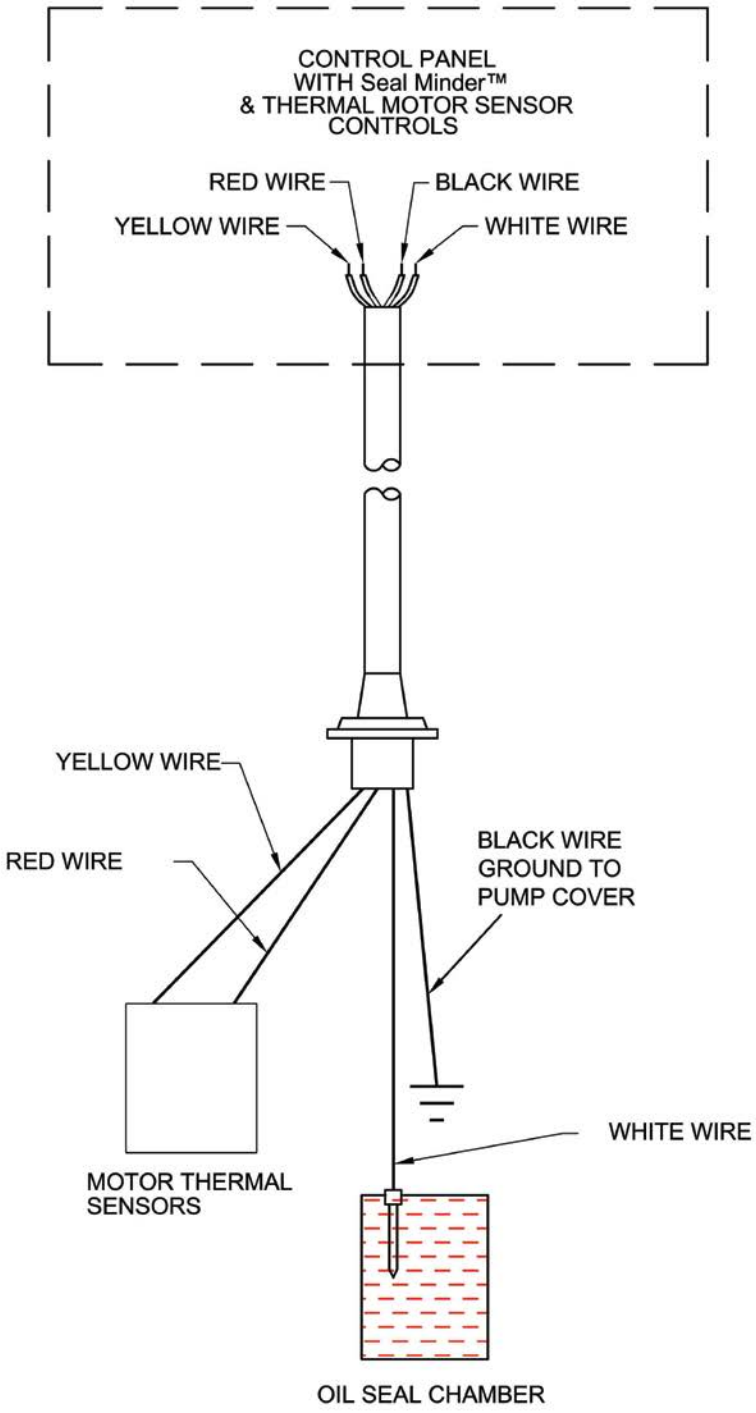
Seal Minder®:

Also known as a seal failure circuit (or moisture detection circuit) is designed to inform the pump operator that there is moisture within the oil chamber. This early warning can allow the operator to schedule repair & inspection on the pump. The **Seal Minder®** sensor probe is inside the oil chamber. (The oil chamber houses the mechanical seals that are cooled & lubricated by oil). The **Seal Minder,** when properly connected to a control panel, can help indicate seal failure. The **Seal Minder** cord requires a seal fail circuit in control panel for warning signal.

Along, with the **Seal Minder**, the Fahrenheit® Series high temperature pumps also feature thermal temperature sensor switches that are embedded into the motor stator windings. Three switches are embedded into the stator windings and wired in series. The leads are connected to the pump control panel through the sensor cable. If the windings would see a temperature above 300 degrees F, then the switch(s) would open and cut power to the pump. Once the temperature dropped below 300 degrees F, the switch(s) would reset, and the pump would be returned to a state of operation. This feature is designed to prevent damage to the stator winding and allow for longer pump life.

The sensor cable consists of four leads, two are connected to the **Seal Minder**, and two are connected to the thermal sensor switches located in the stator windings. These four leads run to the pump control panel and connect to the proper connections points for seal alarm and thermal cut off. The black and white wires are for the **Seal Minder** connections and the thermal sensors will be connected to the yellow and red wires. The three phase automatic wiring diagram shown earlier in the manual will give a guide to the connections in the control panel. The manual for the control panel should be consulted for the exact connections.

The sensor cable with **Seal Minder** and thermal sensor switch connections is standard on all Fahrenheit™ Series high temperature pumps. The cable is designed for a high temperature environment. The proper replacement part can be found parts list found in this manual. BJM Pumps, can supply a control with the Seal Minder and Thermal sensor switch option. Separate stand alone Seal Minder alarm panels are also available. Consult your BJM Pumps representative for part numbers and ordering details. BJM Pumps requires the **Seal Minder** and thermal sensor switches be used. Failure to connect or misuse of these devices will void warranty.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

BJMPumps

WARRANTY AND LIMITATION OF LIABILITY

Industrial Flow Solutions Operating, LLC

104 John W Murphy Drive

New Haven, CT 06513, USA

Unless otherwise expressly authorized in writing, specifying a longer or shorter period, BJM Pumps,LLC warrants for a period of eighteen (18) months from the date of shipment from the Point of Shipment, or one (1) year from the date of installation, whichever occurs first, that all products or parts thereof furnished by BJM Pumps,LLC under the brand name **BJM Pumps**, hereinafter referred to as the "Product" are free from defects in materials and workmanship and conform to the applicable specification.

BJM Pumps, LLC's liability for any breach of this warranty shall be limited solely to replacement or repair, at the sole option of BJM Pumps, LLC, of any part or parts of the Product found to be defective during the warranty period, provided the Product is properly installed and is being used as originally intended. Any breach of this warranty must be reported to BJM Pumps, LLC or BJM Pumps, LLC's authorized service representative within the aforementioned warranty period, and defective Product or parts thereof must be shipped to BJM Pumps, LLC or BJM Pumps, LLC's authorized representative, transportation charges prepaid. Any cost associated with removal or installation of a defective Product or part is excluded.

IT IS EXPRESSLY AGREED THAT THIS SHALL BE THE SOLE AND EXCLUSIVE REMEDY OF BJM PUMPS, LLC'S DISTRIBUTORS AND CUSTOMERS. UNDER NO CIRCUMSTANCES SHALL BJM PUMPS, LLC BE LIABLE FOR ANY COSTS, LOSS, EXPENSE, DAMAGES, SPECIAL DAMAGES, INCIDENTAL DAMAGES OR CONSEQUENTIAL DAMAGES ARISING DIRECTLY OR INDIRECTLY FROM THE DESIGN, MANUFACTURE, SALE, USE OR REPAIR OF THE PRODUCT, WHETHER BASED ON WARRANTY, CONTRACT, NEGLIGENCE, OR STRICT LIABILITY. IN NO EVENT WILL LIABILITY EXCEED THE PURCHASE PRICE OF THE PRODUCT.

THE WARRANTY AND LIMITS OF LIABILITY CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED BY BJM PUMPS, LLC AND EXCLUDED FROM THIS WARRANTY.

BJM Pumps, LLC neither assumes, nor authorizes any person to assume for it, any other warranty obligation in connection with the sale of the Product. This warranty shall not apply to any Product or parts of Product which have (a) been repaired or altered outside of BJM Pumps, LLC's facilities unless such repair was authorized in advance by BJM Pumps, LLC or by its authorized representative; or (b) have been subject to misuse, negligence or accident; or (c) have been used in a manner contrary to BJM Pumps, LLC's instruction.

In any case of products not manufactured and sold under the BJM Pumps, LLC brand name, there is no warranty from BJM Pumps, LLC; however BJM Pumps, LLC will extend any warranty received from BJM Pumps, LLC's supplier of such products.

START-UP REPORT FORM

This form is designed to record the initial installation, and to serve as a guide for troubleshooting at a later date (if needed).

Industrial Flow Solutions Operating, LLC
104 John W Murphy Drive
New Haven, CT 06513, USA

Pump Owner's Name	
Location of Installation	Date of Installation:
Dealer	Dealer Phone ( )
Date of Purchase	
Model	Serial No
Voltage Phase	Hertz HP
Does impeller turn freely by hand?	☐ Yes ☐ No
Condition of Equipment	☐ New ☐ Good ☐ Fair ☐ Poor
Condition of Cable Jacket	☐ New ☐ Good ☐ Fair ☐ Poor
Rotation: Direction of Impeller Rotation (viewed from bottom) (Use C/W for clockwise, CC/W for counterclockwise): _____	
Resistance of cable and Pump Motor (measured at pump control)	
Red-Black_____ohms Red-White_____ohms White-Black____ohms	
Resistance of ground circuit between control panel and outside of pumps _____ Ohms	
MEG OHM CHECK OF INSULATION Red to ground_____ White to ground_____ Black to ground_____	
Condition of location at start-up	☐ Dry ☐ Wet ☐ Muddy
Was equipment stored If YES, length of storage:	☐ Yes ☐ No.
Liquid being pump	
Debris in bottom of station?	☐ Yes ☐ No

START-UP REPORT FORM

Are guide rails vertical?	☐ Yes	☐ No
Is base elbow installed level?	☐ Yes	☐ No
Liquid level controls: Model_____		
Is control installed away from turbulence?	☐ Yes	☐ No
Float Operation Check		
Tip lowest float (stop float), all pumps should remain off. Tip second float (and stop float), one pump comes on. Tip third float (and stop float), both pumps on (alarm on simplex). Tip fourth float (and stop float), high level alarm on (omit on simplex).		
☐ Check here if using manual on/off only.		
Does liquid level ever drop below volute top?	☐ Yes	☐ No
Control Panel MFG & model no.		
Number of pumps operated by control panel		
NOTE: At no time should hole be made in top of control panel, unless proper sealing devices are utilized.		
Short Circuit protection:	Type:	
Number and size of short circuit device(s)	Amp rating:	
Overload type:	Size:	Amp rating:
Do protective devices comply with pump motor amp rating?	☐ Yes	☐ No
Are all pump connections tight?	☐ Yes	☐ No
Is the interior of the panel dry?	☐ Yes If No, correct moisture problem.	☐ No
Electrical readings		
SINGLE PHASE		
Voltage supply at panel line connection, pump off	L1	L2
Voltage supply at panel line connection, pump on	L1	L2
Amperage load connection, pump on	L1	L2
THREE PHASE		
Voltage supply at panel line connection, pump off		
L1-L2	L2-L3	L3-L1
Voltage supply at panel line connection, pump on		

START-UP REPORT FORM

L1-L2	L2-L3	L3-L1
Amperage load connection, pump on		
L1	L2	L3

FINAL CHECK		
Is pump secured properly?	☐ Yes	☐ No
Was pump checked for leaks?	☐ Yes	☐ No
Do check valves operate properly?	☐ Yes	☐ No
Flow: Do pumps appear to operate at proper rate?	☐ Yes	☐ No
Noise level:	Acceptable ☐	Unacceptable ☐

Comments:

Installed by:

Company:

Person:

Date:

NOTES:

Industrial Flow Solutions Operating, LLC
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