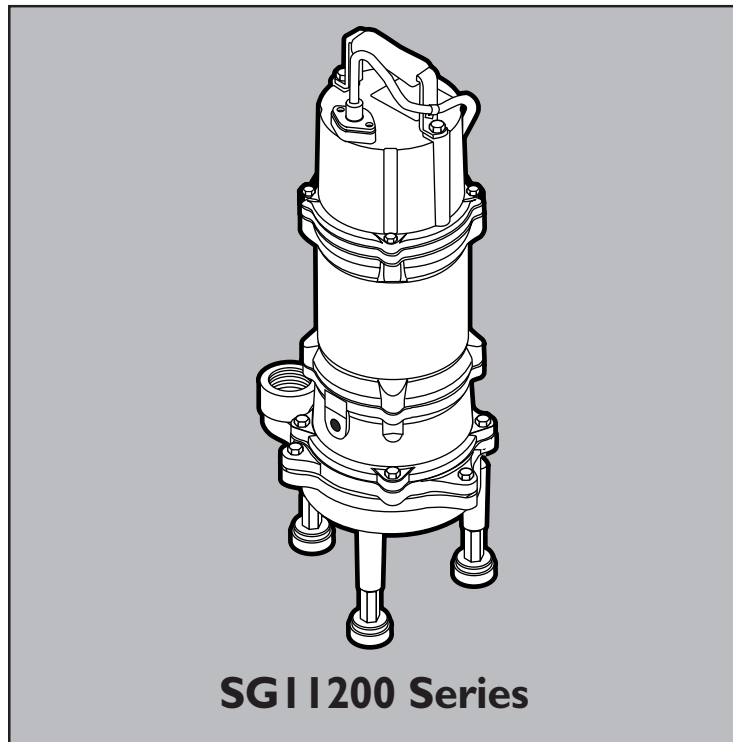


STA-RITE®

293 Wright Street, Delavan, WI 53115

OWNER'S MANUAL
Submersible Grinder Pump



Installation/Operation/Parts

*For further operating, installation,
or maintenance assistance:*

Call 1-262-728-9181

UNPACKING AND INSPECTION

Handle with care. Check the items received against the packing list to be sure that all equipment has been received. Inspect the pump for shipping damage. If any is found, file a claim with the carrier immediately.

GENERAL SAFETY INFORMATION

READ AND FOLLOW SAFETY INSTRUCTIONS!

⚠ This is the safety alert symbol. When you see this symbol on your pump or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

⚠ DANGER Warns about hazards that **will** cause serious personal injury, death, or major property damage if ignored.

⚠ WARNING Warns about hazards that **can** cause serious personal injury, death, or major property damage if ignored.

⚠ CAUTION Warns about hazards that **will** or **can** cause minor personal injury or property damage if ignored.

NOTE: Indicates special instructions which are important but not related to hazards.

NOTE: Install the pump in the vertical position only. Installing the pump in any other position will void the warranty.

NOTE: This unit is not designed for applications involving salt water or brine! Use with salt water or brine will void warranty.

1. To avoid serious injury and/or property damage, read these rules and instructions carefully.
2. Check your local codes before installing. You must comply with their rules.
3. Vent any sewage or septic tank according to local codes.

4. Do not install the pump in any location classified as hazardous by National Electrical Code, ANSI/NFPA 70-1984.
5. The pump can run hot. To avoid burns when servicing the pump, allow it to cool for 20 minutes after shut-down before handling it.
6. Do not run the pump dry. Dry running can overheat the pump and will void the warranty.
7. The pump is permanently lubricated. Check the oil level in the seal plate periodically. Check for water in the oil in the seal plate. See instructions under "Operation/Lubrication", Page 4.

⚠ WARNING Hazardous voltage. Can shock, burn, or kill. During operation the pump is in water. To avoid fatal shock, proceed as follows if the pump needs servicing:

⚠ Electrically ground the pump to a suitable ground such as a grounded water pipe, a properly grounded metallic raceway, or a ground wire system.


⚠ Do not remove cord or strain relief.

⚠ Do not connect conduit to pump.

⚠ Do not lift the pump by the power cord (See 'Cord Lift Warning', below).


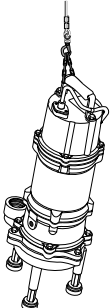
- A. Ground the pump according to all applicable codes and ordinances.
- B. Disconnect the power to the outlet box or circuit breaker before servicing.
- C. To reduce the risk of electric shock, take care when changing fuses or resetting the circuit breaker. Do not stand in water when working on the control box or with the circuit breaker.
- D. This pump is intended for permanent connection only. Provide a strain relief at the control box for the power supply cord connection to box. All control components must be UL or CSA listed and suitable for end use application. Only qualified personnel should install the pump and associated control equipment.

⚠ WARNING



Risk of electrical shock. Can burn or kill. Do not lift pump by power cord.

CORD LIFT WARNING

Risk of electrical shock and fire.

1. Attempting to lift or support the pump by the power cord can damage cord and cord connections, expose bare wires, and cause a fire or electrical shock.
4. Use handle on top of pump for all lifting or lowering of pump. Disconnect the power to the pump before doing any work on it or attempting to remove it from the pit.
3. Lifting or supporting the pump by the power cord will void the warranty.

INSTALLATION

This pump may be installed on a guide-rail lift-out system for ease of inspection and service. Guide rails allow removal of the pump without disturbing the piping or requiring personnel to enter the wetwell (most codes require protective equipment and training before entering the wetwell). If installed with a guide-rail system, place the pump opposite the influent opening to prevent stagnant areas where solids can settle.

Install the pump on a hard, level surface (cement, asphalt, etc.). Never place the pump directly on earth, clay, or gravel surfaces. The basin must be at least 18" (458 mm) in diameter and 30" (762 mm) deep.

The pump's feet are shipped loose in the crate with the pump. Install them before putting the pump in the pit.

Pump Mount

Install the pump as a free standing unit.

Set the pump on the floor of the basin. Install a pipe union in the discharge piping to allow removal for servicing.

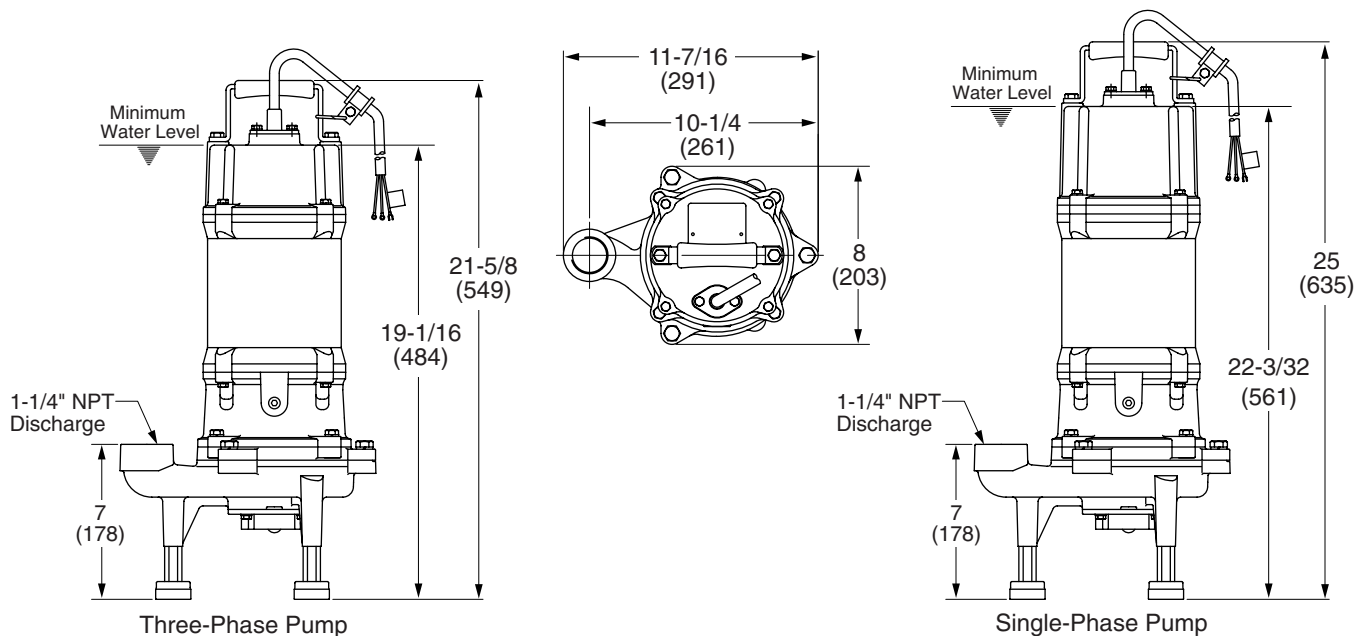
Piping

The piping must not be smaller than the pump discharge.

ELECTRICAL

⚠ WARNING Hazardous voltage. Can shock, burn, start a fire, or kill. When installing, operating, or servicing this pump, follow electrical safety instructions below. Only trained service personnel should install or service this pump.

1. DO NOT splice the power cord.
2. DO NOT handle or service the pump while it is connected to the power supply.
3. DO NOT operate the pump unless it is properly grounded. Wire the pump directly into a grounded terminal block in an automatic float or pump controller box for automatic operation. Connect the pump according to all applicable codes. For continuous operation, wire the pump directly into the switch box.
4. Incorrect voltage can cause a fire or seriously damage the motor and voids the warranty. Make sure that the frequency and voltage shown on the nameplate corresponds to the frequency and voltage of the electrical supply. The supply voltage must be within + 10% of the nameplate voltage. If in doubt consult a licensed electrician.
5. The pump rotation must be clockwise (↻ – viewed from the top of the pump). NEVER operate it in reverse.
6. Connect the pump to its own circuit with nothing else on the circuit. See Table I, Page 4, for fuse or circuit breaker sizes. See Figures 2 and 3 for 230/460 Volt 3 phase connection diagrams. Use a control panel sized to match the pump. Refer to Control panel installation instructions for wiring connection information.
7. Install the pump in accordance with all electrical codes that apply. Install a fused disconnect switch or circuit breaker in accordance with local codes.
8. If a three phase unit runs backwards, interchange two of the three power supply wires to reverse the motor's direction of rotation.



4331 0203

Figure 1: Dimensions in Inches (mm)

TABLE I: MOTOR, SWITCH, & CORD SPECIFICATIONS

Model Number	Motor HP	Voltage	Motor Full Load Amps	Individual Branch Circuit Required (Amps)	Switch Rating (Amps)	Cord Length in ft. (m)	Minimum Water Level in inches (mm)	Discharge Adapter Size	Max Temp. Rating (°F)	
									Int.	Cont.
SG11200220M	2	230/60/1	13.0	20	13	20 (6.1)	22-1/2 (572)	1-1/4 NPT	122	105
SG11200320M	2	230/460/60/3	8 2/4.1	15/15	-	-	19-1/2 (496)	1-1/4 NPT	122	105

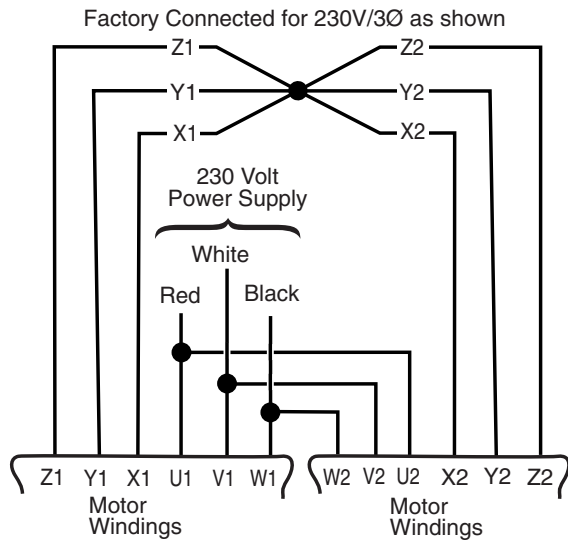


Figure 2: 230 Volt 3 Phase Wiring Connections

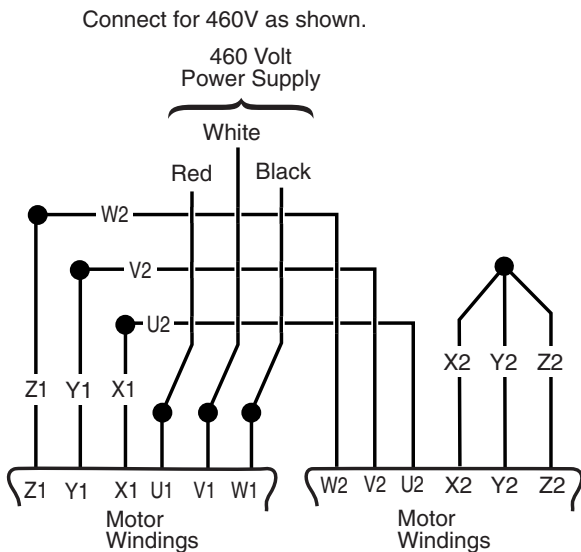


Figure 3: 460 Volt 3 Phase Wiring Connections

Control Panels

⚠ WARNING Risk of electric shock. Ground pump and motor before connecting controls or power supply. Adhere to local electrical codes governing pump and control installations.

A control panel is not included with the pump.

Install simplex or duplex control panel (purchase separately) for proper pump operation. A full range of controls and switches is listed in our catalog.

If a Sta-Rite control panel is not used, install a control panel with circuit breaker or fused disconnect as required by local code. Use magnetic starters with ambient compensated overload protection. Three phase units require three line protection; single phase units require only one line protection. Inadequate protection voids the warranty.

Control Panel Overload Adjustment – Three Phase

NOTICE: See your control panel installation and operating instructions before adjusting overload setting.

Set the overload protective device to the nameplate full load current.

Size the overload protective device so that the trip current is 115% of the nameplate full load current.

OPERATION



Hazardous cutter and possible unexpected starts. Rotation of the cutter with hands in the cutter area can cause loss of fingers.

Disconnect the electrical power and keep your hands away from the pump inlet opening when

working on or handling the pump for any reason. Do not use automatic reset controls with this pump.

Single phase units have an automatic overload protector in the motor which will protect the motor from burning out due to overheating/overloading. When the motor cools down, the overload protector will automatically reset and start the motor. This can happen at any time.

Three phase units require external overload protection.

If the overload trips frequently, check for the cause. It could be:

- stuck impeller
- wrong/low voltage
- bad thermal overload protector
- electrical failure in the motor. If the motor has electrically failed, replace the pump.

Grinder Assembly: The grinder unit consists of a rotary cutter inside a stationary cutter ring. Persistent jamming and clogging of the pump indicates dull or worn grinder parts. If either the cutter ring or the rotary cutter is dull, replace both.

NOTICE: Normal domestic sewage will cause very little dulling or wear of the grinder parts. However, pumping abrasives (such as fine sand) will increase wear and tear on the grinder and may make it necessary to replace the grinder assembly frequently.

Lubrication: The pump is permanently lubricated and the motor bearings are sealed. No oiling or greasing is required.

The pump is not equipped with thermostats or a leak sensor probe. Check the seal condition quarterly in heavy duty service or annually in light duty service.

NOTE: Failure to monitor the seal condition voids the warranty. Motors damaged by flooding of the motor cavity due to seal or O-Ring failure may not be covered under warranty.

NOTE: Reduce the number of bends in the discharge piping to keep the outlet flow as smooth as possible.

Verify the capacity of the pump, by checking the discharge. Verify that the pump is free from any vibration and noise.

For continuous operation, the liquid level must be at least 19-1/2" for a three-phase pump or 22-1/2" for a single-phase pump to avoid overheating the motor.

Do not allow the pump to run in a dry sump. It will void the warranty and may damage the pump.

MAINTENANCE

Only qualified mechanics with proper tools and knowledge should attempt to service this pump.

NOTICE: Whenever bearing bracket is being removed for service, remove oil and replace with new oil at reassembly. Use only oil listed in parts list (Part No. U197-8A). When filling with new oil, DO NOT overfill. To allow room for expansion, use exactly 1.8 pints (0.77 liters) of oil with a cold bearing bracket.

Cutter Replacement

The Key numbers given in these procedures refer to the exploded view (Page 8).



Hazardous voltage, hazardous cutter, and possible unexpected starts. Disconnect the electrical power and keep your hands away from the pump inlet opening when working on or handling the pump for any reason. Do not use

automatic reset controls with this pump.

WARNING Heavy parts. Use a hoist to lift and control the pump during repair.

NOTE: Be prepared to deal with a large quantity of oil when draining the bearing bracket. Inspect the O-Rings and castings for damage or evidence of leaks; check for pinched or damaged wires.

1. Disconnect the electrical power supply.
2. Disconnect the discharge piping (this step is not necessary if you have a guide-rail lift-out system).
3. Hoist the pump out of the pit using the lift-out system or the handle (not the cord) and place the pump in a suitable area where it can be cleaned.
4. Remove all scale and deposits from the pump.

WARNING Risk of infection from pathogens (such as hepatitis) which can collect on pump during normal operation. Submerge the complete pump in a disinfectant solution (chlorox or chlorine) for at least one hour before disassembly.

5. Wedge the shaft and cutter with a screwdriver in a cutter ring slot and unscrew the cap nut (Key No. 24) to release the rotating cutter (Key No. 21).
6. Unscrew four capscrews and use a screwdriver to pry the cutter ring (Key No. 25) off of the volute.
7. Reverse steps 1 through 7 to reassemble the cutter.

Impeller Removal

1. Follow steps 1 through 7 under "Cutter Replacement".
2. Unscrew the 4 capscrews holding the volute to the seal plate and tap the volute to loosen it. Remove the volute.

NOTE: BE SURE you have the correct capscrews – the wrong ones will release the seal plate from the bracket and also release a lot of oil!

3. With a screwdriver (or two) behind the impeller, work the impeller down the shaft until it is free. Remove it.
4. If the shaft key stayed in the shaft, remove it.
5. Reverse steps 1 through 4 to reassemble the impeller.

Seal Replacement

1. Follow steps 1 through 7 under “Cutter Replacement”.
2. Follow steps 1 through 4 under “Impeller Removal”.
3. Lay the pump on its side and remove the oil plug (Key No. 11) from the bearing bracket. Drain the bearing bracket. Put oil into a clean container and check for water in the oil and for opacity (dirtiness) of the oil.

NOTE: Water is heavier than oil. Look for water at the bottom of the oil. It will appear as tiny bubbles. If there is water present in the oil, the shaft seal or the O-Ring will need to be replaced. If there is no water present in the oil, the shaft seal and O-Ring do not need replacing. Opacity is the inability of light to pass through the oil and indicates dirty oil.

4. Remove the four capscrews and lock washers (Key No. 16) that hold the seal plate to the bearing bracket. Tap around the parting line with a lead hammer or rawhide mallet to loosen the seal plate. Remove the seal plate from the bearing bracket.
5. Remove the oil seal (Key No. 18) and oil seal bushing (Key No. 19) from the seal plate.
6. Remove the seal plate O-Ring (Key No. 17) and clean the O-Ring groove.
7. Remove the seal retaining ring from the seal plate.

NOTE: The shaft seal (Key No. 10) consists of 5 parts - the upper and lower silicon carbide seals, two rotating silicon carbide seals, and the spring. Be sure that you do not scratch or mar the shaft when removing the seals. If the shaft is marred, it must be dressed smooth with fine emery or crocus cloth before installing new seal. Do not reduce the shaft diameter.

8. Pull and turn the rotating seal halves to remove them from the motor shaft. If necessary, use a flat blade screwdriver to help pry the seals from the shaft.
9. Unscrew four capscrews and remove the bearing bracket from the motor housing.
10. Use a flat blade screwdriver and very carefully pry the lower seal half from the seal plate cavity.
11. Use a flat blade screwdriver and very carefully pry the upper seal half from the bearing bracket cavity.

Installing the New Shaft Seal

NOTE: Install all new O-Rings, seals, and gaskets during reassembly. It is good practice to replace the O-Rings each time the pump is serviced.

1. Clean the seal cavities in the bearing bracket and seal plate.
2. Lubricate the seals with a very small amount of clean oil.
3. Inspect the shaft for nicks and scratches.
4. With finger pressure only, press the stationary seal halves firmly and squarely into the seal cavities in the bearing bracket and seal plate, with the polished face out.

NOTE: Be sure you do not scratch the seal surface.

5. Reinstall the lower seal retaining ring.
6. Reinstall the bearing bracket on the motor. Use a new O-Ring.
7. Slide the rotating seals and the spring (Key No. 10) onto the shaft.

NOTE: Be sure you do not scratch the seal surface. Be careful that the shaft shoulder does not damage the seal faces when they are passing over the shaft. Make certain the polished surfaces of the rotating seals face the mating surfaces of the stationary seal halves.

8. Clean the O-Ring groove in the bearing bracket and install a new O-Ring (Key No. 17).

NOTE: It is good practice to replace the O-Rings each time the pump is serviced.

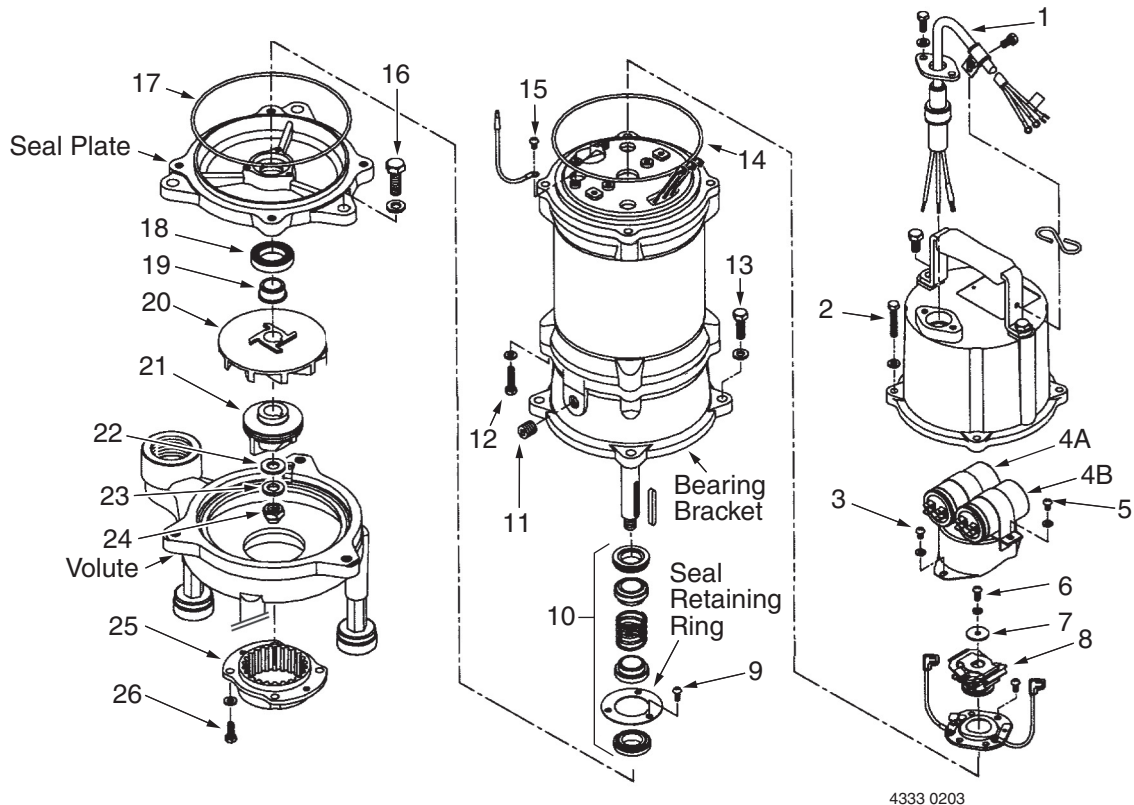
9. Reinstall the seal plate, lock washers, and capscrews.
10. Reinstall the oil seal (Key No. 18) and the oil seal bushing (Key No. 19) on the shaft.
11. Reinstall the impeller drive key in the keyway on the shaft.
12. Using the key as a guide, reinstall the impeller on the shaft.
13. Reinstall the volute on the seal plate.
14. Reinstall the cutter ring on the volute.
15. Using the key as a guide, reinstall the rotating cutter on the shaft.
16. Block the cutter with a screwdriver in one of the cutter ring slots and reinstall the flat washer, lock washer, and cap nut on the shaft.

17. Refill the bearing bracket with clean dielectric oil (P/N U197-8A) and replace the drain plug.
18. Stand the pump on its feet. Check for free rotation of the impeller. The pump is ready for installation in the pit.

⚠ WARNING Hazardous voltage. Can shock, burn, or kill. Disconnect power before attempting any service or repair work on pump.

⚠ WARNING Hazardous cutters and unexpected starts which can cause loss of fingers. Keep hands away from pump suction inlet when working on or servicing pump.

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Motor not running	<p>Motor protector tripped.</p> <p>Open circuit breaker or blown fuse.</p> <p>Impeller clogged or binding.</p> <p>Cutter or cutter ring dull or worn.</p> <p>Power cable damaged.</p> <p>Bad control panel.</p> <p>Defective liquid level switch.</p> <p>Not enough liquid in wet well to activate controls.</p> <p>Liquid level cords tangled</p> <p>Automatic controls defective</p>	<p>Allow motor to cool. Make sure pump is completely submerged (see Page 4). Clear debris from volute and impeller. Check for high amp draw.</p> <p>Replace fuse or reset breaker. NOTE: if circuit breaker opens repeatedly, don't reset it. Call a licensed electrician.</p> <p>Check amp draw. If it is more than twice the nameplate amps, the impeller is locked. Bearings and shaft may be damaged. DISCONNECT POWER, clear debris from volute, impeller, and cutter as needed.</p> <p>DISCONNECT POWER, pull pump and inspect cutter and cutter ring. Replace if worn or dull.</p> <p>Resistance between power cable and ground should be infinity. If any reading is less than infinity, call a licensed electrician.</p> <p>Inspect control panel wiring. Call a licensed electrician.</p> <p>With switch disconnected from power, check continuity through switch while activating liquid level switch. Replace switch if necessary.</p> <p>Allow the liquid to rise several inches above the switch-on level.</p> <p>Untangle cords for free operation.</p> <p>Try running pump in manual mode. If it runs, the automatic control is at fault.</p>
Pump runs continuously	<p>Liquid level control cords tangled</p> <p>Pump is airlocked.</p> <p>Flow in matches or exceeds the pump's capacity.</p>	<p>Untangle cords for free operation.</p> <p>Stop pump for about one minute, then restart. Repeat stopping and starting until the airlock clears. If the airlock persists, DISCONNECT POWER, pull the pump and drill a 1/8" hole in the discharge pipe between the pump discharge and the check valve.</p> <p>A larger pump or more pumps may be needed.</p>
Little or no effluent delivered from pump	<p>Check valve plugged, stuck shut, or installed backwards.</p> <p>System head excessive.</p> <p>Pump suction plugged.</p> <p>Wrong voltage or not wired correctly.</p> <p>Pump is air locked.</p> <p>Worn or damaged impeller</p> <p>Liquid level controls incorrectly installed or defective.</p>	<p>Make sure check valve is installed correctly (flow arrow should point away from pump) and functioning correctly.</p> <p>Consult dealer.</p> <p>DISCONNECT POWER, pull pump, inspect, and clear as needed.</p> <p>Check pump's rotation; check nameplate voltage against supply voltage (they must match); consult a licensed electrician.</p> <p>Stop pump for about one minute, then restart. Repeat stopping and starting until the airlock clears. If the airlock persists, DISCONNECT POWER, pull the pump and drill a 1/8" hole in the discharge pipe between the pump discharge and the check valve.</p> <p>DISCONNECT POWER, pull pump and inspect impeller. Replace if necessary.</p> <p>Reposition or replace as necessary.</p>
Pump cycles constantly	<p>No discharge check valve installed</p> <p>Discharge check valve stuck open.</p> <p>Sewage wetwell too small.</p> <p>Liquid level controls incorrectly installed or defective.</p> <p>Pump too small for inlet flow.</p>	<p>Install discharge check valve.</p> <p>Repair or replace check valve as necessary.</p> <p>Consult dealer.</p> <p>Reposition or replace as necessary.</p> <p>Consult dealer about larger pump or second pump.</p>



Key No.	Part Description	Qty.	SG11200220M	SG11200320M
1	Cord	1	E01-1241-5	E01-1241-5
2	Capscrew M6x25	2	*	*
3	Capscrew	2	*	*
4A	Run Capacitor (12 mfd, 450V)	1	E14-0121-0	-
4B	Start Capacitor (150 mfd, 250V)	1	E14-1503-0	-
5	Capscrew	2	*	-
6	Capscrew	1	*	-
7	Flat Washer	1	H53-1102-0	-
8	Centrifugal Switch	1	E12-2P82-3	-
9	Capscrew M5x8	3	*	*
10	Shaft Seal	1	F21-1202-0	F21-1202-0
11	Drain Plug 1/4" NPT	1	H55-3204-0	H55-3204-0
12	Capscrew M6x25	4	*	*
13	Capscrew M8x25	4	*	*
14	O-Ring	()	G47-3811-0(3)	G47-3811-0(2)
15	Capscrew M5x8	1	*	*
16	Capscrew M10x30	3	*	*
17	O-Ring	1	G47-3891-0	G47-3891-0
18	Oil Seal	1	F25-2501-0	F25-2501-0
19	Oil Seal Bushing	1	A24-3811-0	A24-3811-0
20	Impeller	1	B27-3811-0	B27-3811-0
21	Rotating Cutter	1	A39-3811-0	A39-3811-0
22	Flat Washer	1	H53-1008-0	H53-1008-0
23	Lock Washer	1	H54-1008-0	H54-1008-0
24	Cap Nut M12	1	H56-6122-0	H56-6122-0
25	Stationary Grinder	1	A40-3811-0	A40-3811-0
26	Capscrew M6x16	4	*	*

* Standard hardware item. Purchase locally.

LIMITED WARRANTY

Sta-Rite Industries warrants to the original consumer of the products listed below, that they will be free from defects in material and workmanship for the Warranty Period from the date of original installation or manufacture as noted.

Product	Warranty Period
Water Systems Products – jet pumps, small centrifugal pumps, submersible pumps and related accessories	<i>whichever occurs first:</i> 1 year from date of original installation, or 2 years from date of manufacture
Hydro-Flow Filters	1 year from date of purchase
Signature 2000 Fibrewound Tanks	5 years from date of original installation
Pro-Source Steel Pressure Tanks	5 years from date of original installation
Pro-Source Epoxy-Line Tanks	3 years from date of original installation
Sump/Sewage/Effluent Products	1 year from date of original installation, or 2 years from date of manufacture

Our warranty will not apply to any product that has been subject to negligence, misapplication, improper installation or maintenance. In the event a three phase submersible motor is operated with single phase power through a phase converter, or if three-leg ambient compensated, extra-quick trip overload relays of recommended size are not used, our warranty is void.

Buyer's only remedy and Sta-Rite Industries' only duty is to repair or replace defective products (at Sta-Rite Industries' choice). Buyer agrees to pay all labor and shipping charges associated with this warranty and to request warranty service through the installing dealer as soon as a problem is discovered. If warranty service is requested more than 30 days after the Warranty Period has ended, it will not be honored.

STA-RITE INDUSTRIES SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, OR CONTINGENT DAMAGES WHATSOEVER.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL NOT EXTEND BEYOND THE WARRANTY PERIOD PROVIDED HEREIN.

Certain states do not permit the exclusion or limitation of incidental or consequential damages or the placing of limitations on the duration of an implied warranty, therefore, the limitations or exclusions herein may not apply. This warranty sets forth specific legal rights and obligations, however, additional rights may exist, which may vary from state to state.

Supersedes all previous publications.

Sta-Rite Industries, 293 Wright St., Delavan, WI 53115

