

NOTICE TO INSTALLER: Instructions must remain with installation.

SECTION: 6.10.031

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Product information presented here reflects conditions at time of publication. Consult factory regarding discrepancies or inconsistencies.



PUMP COMPANY

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# INSTALLATION & SERVICE INSTRUCTIONS 820 & 840 GRINDER PUMPS

Submersible Wastewater Pump Association



## Pump Models

WD820	- 2 HP, 230V, 1Ph, 60 Hz, Auto
E820, E840	- 2 HP, 230V, 1Ph, 60 Hz, Nonauto
WH820	- 2 HP, 200-208V, 1Ph, 60 Hz, Auto
I820, I840	- 2 HP, 200-208V, 1Ph, 60 Hz, Nonauto
J840	- 2 HP, 200-208V, 3Ph, 60 Hz, Nonauto
F840	- 2 HP, 230V, 3Ph, 60 Hz, Nonauto
G840	- 2 HP, 460V, 3Ph, 60 Hz, Nonauto
BA840	- 2 HP, 575V, 3Ph, 60 Hz, Nonauto



All 840 Grinder Pumps have reversing motor.

These instructions cover Grinder Pumps only. Separate instructions for control panels, rail systems, basins and other accessories are included with each item.

## PREINSTALLATION CHECKLIST - ALL GRINDER PUMPS

1. **Inspect your grinder pump.** If the unit has been damaged in shipment, contact your dealer before installing. **Do Not** remove the test plugs in the cover nor the motor housing.
2. **Carefully read all literature** to familiarize yourself with details regarding installation and use. Retain materials for future reference.



**WARNING**

SEE BELOW FOR LIST OF WARNINGS

1. **Make sure pump control panel contains a ground terminal.** The power cord on all Zoeller Grinder Pumps contains a green conductor for grounding to help protect you against the possibility of electric shock.
2. **Make certain the control panel is within reach of the power supply cord and sensor cord** if supplied with the grinder pump.
3. **Make sure the control panel and power source** is capable of handling the electrical requirements of the grinder pump, as indicated on the nameplate.
4. **Automatic pumps have three-prong plug caps and must be connected to a three-prong grounded receptacle with ground fault circuit interrupter (GFCI).**
5. **For your protection, always disconnect the power source to the grinder pump before handling.** All grinder pumps must be properly grounded and wired in accordance with the National Electrical Codes and all local codes and ordinances.
6. Installation of electrical hardware and checking of control panels and circuits should be performed by a qualified licensed electrician.



**Do not attempt to turn cutter rotor located on bottom of the unit with fingers.** Use allen wrench when checking or removing rotor.

**CAUTION**

SEE BELOW FOR LIST OF CAUTIONS

1. **Make sure control panels and branch circuits are equipped** with proper size fuses and circuit breakers. An independent power circuit is recommended, sized according to the National Electrical Code, for the current shown on the grinder pump nameplate.
2. **A disconnect switch should be installed ahead of the control panel.**
3. If Grinder pumps are operated by control panels with variable level float control switches, it is the responsibility of the installing party that float control switches will not hang up on the grinder pump or other pit peculiarities and are secured so that the grinder pump will shut off. It is recommended to use rigid pipe and fittings and the pit be 24" in diameter for simplex systems and 36" in diameter for duplex systems or larger.
4. Grinder installations should be checked frequently for debris and/or build up which may interfere with the "ON" or "OFF" positions of variable level float control switches. For repair and service, other than cutter assembly maintenance, contact factory.
5. Maximum operating temperature must not exceed 130° F (54° C).

REFER TO WARRANTY ON PAGE 2.

## SERVICE CHECKLIST



**▲ WARNING** Electrical precautions. Before servicing a grinder pump, always shut off the main power circuit. Make sure you are wearing insulated protective sole shoes and not standing in water. Under flooded conditions, contact your local electric company or a qualified licensed electrician for disconnecting electrical service to the pump prior to removal.

**▲ WARNING** Grinder pumps contain oil which becomes pressurized and hot under operating conditions. Allow 2½ hours after shut down before servicing pump.

Condition	Common Causes
<b>A. Pump will not start or run.</b>	Blown panel or circuit breaker fuse, low voltage, thermal overload or sensor open, capacitor grounded, cutter or impeller clogged, float switch held down or defective, incorrect wiring in control panel.
<b>B. Motor overheats and trips on overload.</b>	Incorrect voltage, impeller or cutter blocked, negative head (discharge lower than intake of pump). Defective "off" float. Pump runs continuously at low water level. Low oil level in motor shell.
<b>C. Pump will not shut off.</b>	Air lock, debris under float assembly, defective switch, incoming sewage exceeds capacity of pump.
<b>D. Pump operates but delivers little or no water.</b>	Intake clogged with grease or sludge, pump airlocked (clear vent hole), low or incorrect voltage, clogged discharge line.
<b>E. Seal Leak light "ON" at control box.</b>	Water in lower seal cavity. Pump must be removed for servicing. Lower seal leaking.
<b>F. Pump starts and stops too often.</b>	Check valve stuck open or defective. Sump pit too small to handle incoming sewage. Level control out of adjustment. Temperature sensor tripping.
<b>G. Large red flashing light comes on at control box.</b>	High water in pit. Check pump for clogging, or overload trip.
<b>H. Grease and solids accumulate in pit around pump.</b>	Break up solids and run pump with water running into the pit. Allow level to lower to the pump intake. Continue until solids are cleared from the pit

## LIMITED WARRANTY

Zoeller Pump Company warrants, to the purchaser and subsequent owner during the warranty period, every new Zoeller Pump Company product to be free from defects in material and workmanship under normal use and service, when properly installed, used and maintained, for a period of one year from date of installation or 18 months from date of manufacturer, whichever comes first. Parts that fail, (within one year of installation or 18 months from date of manufacturer, whichever comes first) that inspections determine to be defective in material or workmanship, will be repaired, replaced or remanufactured at Zoeller Pump Company's option, provided however, that by so doing we will not be obligated to replace an entire assembly, the entire mechanism or the complete unit. No allowance will be made for shipping charges, damages, labor or other charges that may occur due to product failure, repair or replacement.

This warranty does not apply to any material that has been disassembled without prior approval of Zoeller Pump Company, subjected to misuse, misapplication, neglect, alteration, accident or act of God; that has not been installed, operated or maintained in accordance with Zoeller Pump Company installation instructions; that has been exposed to but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons or hydrocarbon derivatives (oil, gasoline, solvents, etc), wash towels or feminine sanitary products, etc. or other abrasive or corrosive substances. This warranty is in lieu of all other warranties expressed or implied;

and we do not authorize any representative or other person to assume for us any other liability in connection with our products.

Contact Zoeller Pump Company, 3649 Cane Run Road, Louisville, Kentucky 40211-1961, Attention: Customer Service Department to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty.

**ZOELLER PUMP COMPANY EXPRESSLY DISCLAIMS LIABILITY FOR SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OR BREACH OF EXPRESSED OR IMPLIED WARRANTY; AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND OF MERCHANTABILITY SHALL BE LIMITED TO THE DURATION OF THE EXPRESSED WARRANTY.**

Some states do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

## APPLICATIONS

1. Zoeller Grinder Pumps are designed for grinding and pumping sewage from homes, public buildings, factories, schools, apartment buildings, lift stations and other commercial applications. The pump is intended to grind and pump all normal sewage including reasonable quantities of disposable diapers, sanitary napkins, paper towels, rubber materials, plastics, cigarette butts and other items normally found in sewage.
2. Zoeller 840 Grinder Pumps can be installed in new applications or as a direct replacement for any grinder application of like size and capacity. The pumps are easily retrofitted to some commercial rail systems and many operating control panels. The Zoeller 840 Grinder has a unique reversing feature to help prevent overload on starting and extending the life of the cutting rotor and disc.

## GRINDER PUMP DESCRIPTION

1. Pumps are constructed from cast iron for submersible applications and long life when pumping sewage. The cutter assembly is made up of a hardened and ground stainless steel flat disc and a hardened stainless rotor. Cutting action takes place with rotation of rotor in either clockwise or counterclockwise direction on the 840 Grinder. The 820 Grinder cuts in clockwise rotation only.
2. Pump motors are either single phase or three phase design. Single phase motors require a starting relay, starting capacitor, and a run capacitor. If pump is an 820, these items are preinstalled in the switch case on the pump. If a nonauto 840 single phase pump was purchased as a replacement without a control panel, the relay and capacitors will be supplied loose with the pump. These three items must be installed in conjunction with the existing control panel. See wiring diagram fig. 1. An automatic or manual reversing panel can also be used with existing control panels in retrofit installations. The reversing panel contains the start relay and capacitors for single phase. Wiring diagrams are included with these panels.
3. 840 pumps are double seal design, nonauto pumps with two oil-filled chambers, one for the motor and bearings and one between the two carbon/ceramic face seals. The chamber between the two seals contains water sensing probes. If water from the pump enters the seal chamber, the sensor probe will activate a warning light, indicating that the unit requires service. Pumps with single phase motors contain an internal thermal overload with automatic reset for protection of the motor, if an overload should occur. Three phase motors require motor overload protection with the motor start contactor in the control panel. Heat sensors are connected to three phase motor stators on 840 pumps and are used to shut down the motor if the temperature rises above the rating of the thermostat. The pump cannot be restarted until the motor temperature drops to safe operating level.
4. The 820 Grinder pump is a single seal design and does not have sensor wires. The 840 pump has two cords. The large cord is the power cord. The power cord for single phase pumps contains six conductors. The green grounding conductor for the pump is included in the power cord. The sensor cord for single phase pumps is normally a two conductor cord with a black and white conductor for the moisture sensor probe.

### MOISTURE SENSOR CIRCUIT TESTING



- WARNING** A. Turn off power supply before servicing pump.  
B. Disconnect pump from power supply before testing the moisture sensor circuit.

Moisture sensor circuit can be checked for continuity (complete circuit) with a (Volt-OHM-Meter). Set the VOM to read resistance and connect the VOM leads to the sensor cord black and white wires. The VOM should read approximately 300k Ohms. Resistance readings significantly lower indicate a seal leak with water in the seal chamber. If VOM reading is open then a problem exists with moisture sensor circuit. Check resistance between the green ground conductor of the pump power cord and the sensor cord black and white wires. This resistance reading should indicate an open circuit. If VOM reading returns a reading other than open, then a problem exists with the sensor circuit wiring or cordage. If resistance readings show a problem with either test, then pump should be repaired by a Zoeller Authorized Service Station.

If the sensor cord contains four conductors on single phase, the pump is equipped with both moisture and temperature sensors. The red and orange conductors are connected to the temperature sensor. (The temperature sensor is optional and in addition to the standard automatic reset thermal overload supplied with all single phase pumps.) The power cord for three phase pumps contains four conductors. The green grounding conductor for the pump is included in the power cord. All three phase 840 pumps are equipped with a four conductor sensor cord. The black and white conductors are connected to the moisture sensor cord and the red and orange to the

temperature sensor. The 820 Grinder pump is a single seal design and does not have sensor wires.

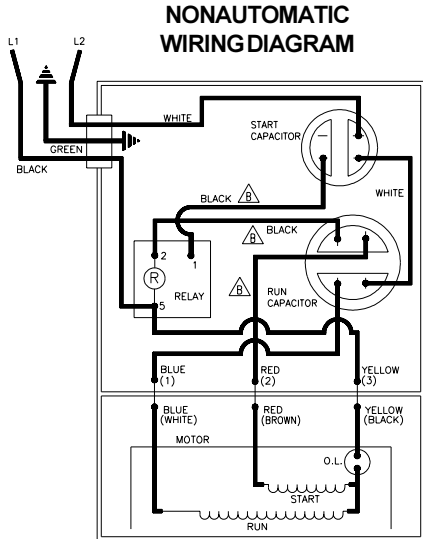
## INSTALLATION

1. Installation and piping instructions are included with the rail system and basin instructions. If pump is being retrofitted to an existing rail system, some accessory parts may be required. Consult factory and advise make and model of rail system being used.
2. All Zoeller 840 Grinder Pumps are designed to operate in either clockwise or counterclockwise rotation. If an 840 pump is a replacement for a non-reversible type pump, an automatic reversing panel may be installed between the pump and the existing control panel. (Manual switching control panels are also available) See wiring diagram. If a Zoeller control panel is being used, the automatic or manual reversing feature may be included and a separate reversing panel will not be required. All automatic reversing controls change the direction of rotation after each "ON" - "OFF" cycle of the pump.
3. All electrical connections including pump to control box and power supply to control panels must comply with the National Electrical Code and applicable local codes. Installation of electrical panels and connections should be made by a qualified licensed electrician.
4. When installing pumps with a check valve, or rail system with a check valve, you must give the pump case time to fill to help prevent air lock when lowering the unit into the liquid. The pump case has an air vent located behind the discharge. This air vent is across the pump housing mounting surface and must be cleaned before each reinstall. An extra air vent hole (3/16") may be drilled in the discharge pipe below the check valve to help prevent air lock. This drilled hole must be cleaned before each reinstall. After the pump is installed, run the unit submerged to assure the pump case is filled (water should come out of 3/16" diameter hole).

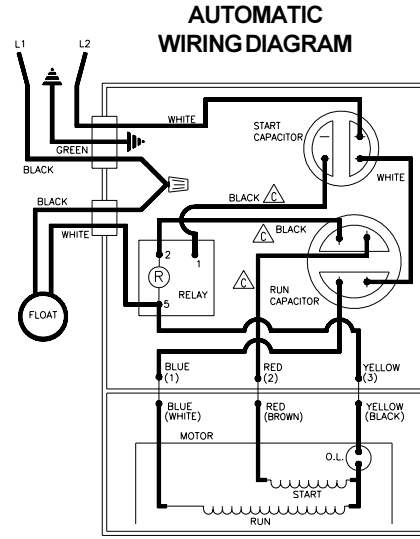
## REPAIRS

1. **All power circuits must be disconnected and locked out before any attempts are made at servicing.** The cutter rotor and disc can be removed and sharpened by grinding the cutting faces. Both rotor and disc must be removed from the pump. Removal of these parts can be accomplished in the field by removing pump from the sump and positioning horizontally to access the intake of the pump. If seals or other repairs are required, the pump must be totally removed and serviced in a shop by a qualified pump technician or authorized service center.
2. Remove the three countersunk screws on the plastic guard ring and remove the ring.
3. Thoroughly clean the cutter rotor and disc assembly. Tilt pump back to the vertical position to make certain the end play has been removed. Check and record the clearance between the rotor and disc with a feeler gage. The correct running clearance is between 0.004" and 0.008".
4. With pump in horizontal position, heat the hex head bolt in the center of the rotor with a propane torch. The bolt must be heated to 350°F to soften the thread lock sealer on the bolt for ease of removal. Remove the bolt by turning in a counterclockwise rotation. It will be necessary to use a wood block to prevent the rotor from turning while removing the bolt. Pull rotor from the shaft and remove the spacer shims located behind the rotor.
5. Remove the three cap screws holding the disc and remove disc from the pump.
6. The disc and rotor cutter can be replaced with new service parts or resurfaced by grinding. Resurfacing is accomplished by surface grinding both disc and rotor to a 32 micro finish. Do not attempt grinding in the field. Send parts to a qualified machine shop or return to the factory for repair. The disc, rotor and shims are a matched set. Keep parts together. Measure disc before and after resurfacing with micrometer and record measurements.
7. After resurfacing, the disc and rotor must be flat within 0.001". If the disc has been surface ground, it will be necessary to remove shims to compensate for the material removed from the disc plus any amount over 0.008" measured in the field (step 3, above) before the rotor and disc were disassembled from the pump. The shim thicknesses and disc should be measured with a micrometer and the amount removed from the disc plus any clearance over 0.008" must match the shim thickness being removed.
8. Clean bottom of pump where disc is located and replace disc and retainer screws. Replace rotor with the correct shims. Install washer and torque hex head bolt to 63 in.-lbs. apply Loctite 262 thread-lock sealant or equal to bolt threads prior to insertion. Check running clearance with pump in vertical position to remove end play. Clearance must be between 0.004" and 0.008" to obtain efficient grinding when pump is put back in service.
9. Replace plastic guard ring and its three screws.
10. Check the oil in the motor housing on 820 pumps and in the motor housing and seal chamber on 840 pumps before reinstalling. The level should be even with the fill plug when pump is in the upright position. Add oil if required. Use insulating oil supplied by the factory.

**SINGLE PHASE-2HP  
MODEL 820**



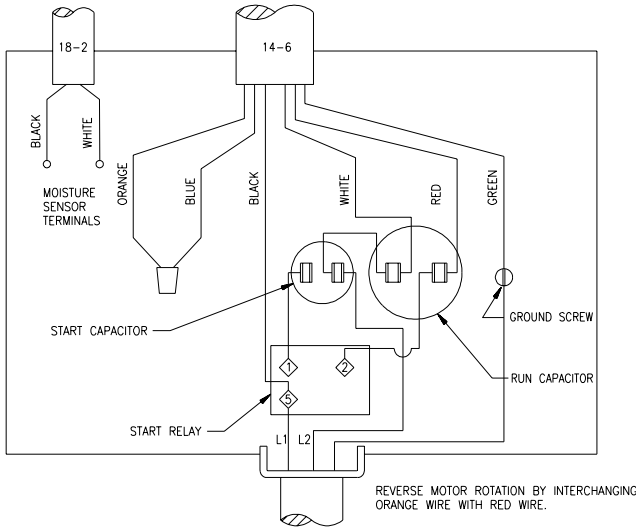
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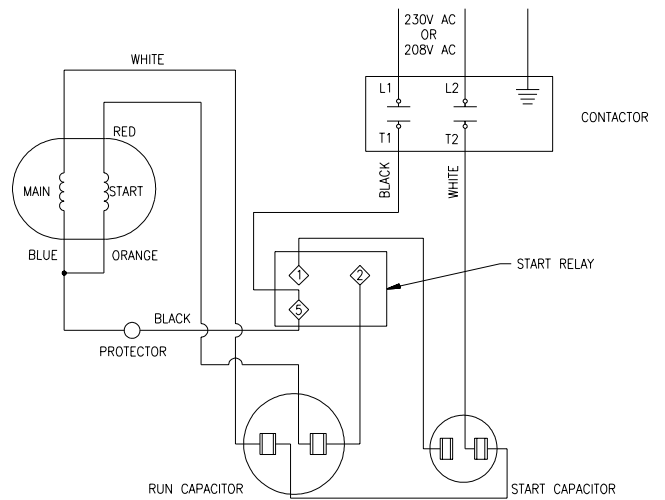
**SINGLE PHASE-2HP  
MODEL 840**

**LEAD IDENTIFICATION**



SK1367

**WIRING DIAGRAM**



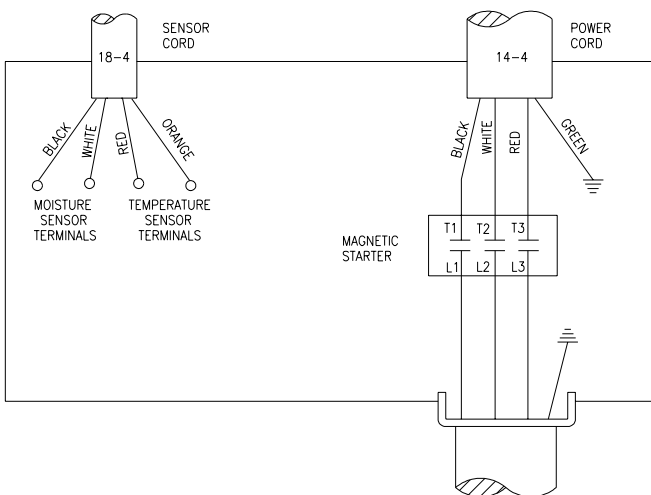
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**FIGURE 1**

**FIGURE 2**

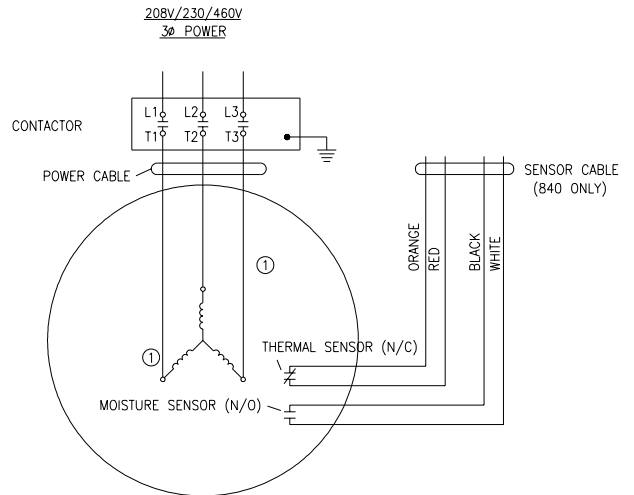
**THREE PHASE-2HP  
MODELS 840**

**LEAD IDENTIFICATION**



SK1368

**WIRING DIAGRAM**



SK1370

**FIGURE 3**

**FIGURE 4**