Congratulations on the purchase of the Zoeller 71 Series submersible grinder pump. Zoeller Grinder Pumps are designed for grinding and pumping sanitary sewage from submersible lift stations. The pump is intended to grind and pump reasonable quantities of disposable diapers, sanitary napkins, paper towels, rubber materials, plastics, cigarette butts and other items normally found in sanitary sewage applications. Since 1939, the name Zoeller has represented the standard for submersible dewatering and sewage pumps. The same high quality workmanship and easy maintenance design has been incorporated into this line of heavy-duty submersible grinder pumps. This Zoeller pump will provide years of trouble-free service when installed according to the manufacturers' recommendations.

TABLE OF CONTENTS

Safety Instructions ............................................. 1  
Limited Warranty ................................................... 2  
Preinstallation Information .................................. 3  
Electrical Data ........................................................ 3  
Typical Sewage Installation ................................. 4  
Pump Wiring Instructions ...................................... 5-6  
Operation .................................................................. 7  
Maintenance ............................................................ 7  
Service Checklist .................................................... 8  

SAFETY INSTRUCTIONS

TO AVOID SERIOUS OR FATAL PERSONAL INJURY OR MAJOR PROPERTY DAMAGE, READ AND FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND ON THE PUMP.

This manual incorporates the installation, operation, maintenance, and service instructions into one document to aid in the ownership of a Zoeller submersible wastewater product. Please read and review this manual before installing the product. Follow the steps and procedures listed on ZM1074 for a proper start-up. Many items contained within, when followed correctly, will not only ensure a long and problem-free life for the pump, but also save time and money during installation. Reference ZM1788 for repair manual on 71 Series Grinder Pumps. Should further assistance be necessary please call our Product Support Department at 1-800-928-PUMP (7867).

THOROUGHLY REVIEW ALL INSTRUCTIONS AND WARNINGS PRIOR TO PERFORMING ANY WORK ON THIS PUMP.

MAINTAIN ALL SAFETY DECALS.

REFER TO WARRANTY ON PAGE 2.
LIMITED WARRANTY

The Zoeller Engineered Products warrants its 71 Series of submersible pumps to the original owner to be free from defects in workmanship and materials under the following conditions and limitations. The owner will pay the applicable percentage of the list price of the following parts in effect at time of replacement.

**Conditions**

1. Approval of the installation and start up of the equipment by the authorized Zoeller representative.
2. Pump removal, reinstallation and transportation charges shall be borne by the owner.
3. Warranty repairs shall be conducted by an authorized service station only.
4. Labor charges for warranty repair shall not be assumed by Zoeller for repairs made after one year from date of installation. Returns to Factory must have prior authorization from the company.
5. Hazardous Environment Series pumps must be serviced at an approved service station or returned to the factory.

6. Controls and accessories warranty (See specific warranty below).

**MUNICIPAL SEWAGE PERMANENT INSTALLATION**

- Five Year (10,000 hr) Months After Shipment - Limited Warranty

<table>
<thead>
<tr>
<th>MONTHS</th>
<th>0-18</th>
<th>19-30</th>
<th>30-45</th>
<th>46-60</th>
</tr>
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<tbody>
<tr>
<td>HOURS</td>
<td>0-3,000</td>
<td>3,000-5,000</td>
<td>5,000-7,500</td>
<td>7,500-10,000</td>
</tr>
</tbody>
</table>

- Rotor & Stator: 0% - 30% - 50% - 80%
- Mechanical Seal: 0% - 30% - 50% - 75%
- Impeller: 0% - 30% - 50% - 80%
- Cutter Assy.: 0% - 30% - 50% - 80%
- Ball Bearings: 0% - 50% - 80% - 100%
- Pump Housing: 0% - 30% - 50% - 100%

Controls and accessories included for 18 months.

Each Zoeller 71 Series Pump installation is required to have a completed Zoeller Engineered Products Start-up Report (ZM1074). The report is to be completed by an approved Start-up Technician in the presence of the installing contractor. A copy of this report will be on file at the Zoeller Engineered Products offices in Louisville, KY. Failure to comply with the requirement will void the following warranty agreement.

**LIMITATIONS**

Manufacturer warrants, to the purchaser and subsequent owner during the warranty period, every new product to be free from defects in material and workmanship under normal use and service, when properly used and maintained, for a period of one year from date of purchase by the end user, or 18 months from date of original manufacture of the product, whichever comes first. Parts that fail within the warranty period, one year from date of purchase by the end user, or 18 months from the date of original manufacture of the product, whichever comes first, that inspections determine to be defective in material or workmanship, will be repaired, replaced or remanufactured at Manufacturer'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 and there shall be no warranty for any material or product that has been disassembled without prior approval of Manufacturer, subjected to misuse, misapplication, neglect, alteration, accident or uncontrollable act of nature; that has not been installed, operated or maintained in accordance with Manufacturer's installation instructions; that has been exposed to outside substances including but not limited to the following: sand, gravel, cement, mud, tar, hydrocarbons, hydrocarbon derivatives (oil, gasoline, solvents, etc.), or other abrasive or corrosive substances, wash towels or feminine sanitary products, etc. in all applications other than in raw sewage pumping applications.

The warranty set out in the paragraph above 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 Manufacturer at, 3649 Cane Run Road, Louisville, Kentucky 40211, Attention: Customer Support Department to obtain any needed repair or replacement of part(s) or additional information pertaining to our warranty.

**MANUFACTURER 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 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.

**RECOMMENDED LIMITS OF APPLICATION**

These recommended application limits are for pump stations pumping to a gravity main. Low-pressure pipe systems should be designed with a pump located at each house. For applications where a lift station would handle more than 60 homes, a solids handling type pump should be considered.

<table>
<thead>
<tr>
<th>Model</th>
<th>Simplex Station</th>
<th>Duplex Station</th>
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<tbody>
<tr>
<td></td>
<td>HP</td>
<td>Homes</td>
</tr>
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<td>2*</td>
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<td>7111 High Head</td>
<td>5</td>
<td>2*</td>
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<tr>
<td>7112 High Flow</td>
<td>7.5</td>
<td>2*</td>
</tr>
</tbody>
</table>

* Zoeller Company does not recommend a simplex station on anything over two homes in order to maintain continuous service during unusual conditions.

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### ELECTRICAL DATA

<table>
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<tr>
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<td>575</td>
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<td>60</td>
<td>9.0</td>
<td>3.4</td>
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</tbody>
</table>

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(1) Electrical wiring and protection must be in accordance with the National Electrical Code, and any other applicable state and local electrical requirements.

(2) Install proper full flow check and shut-off valve.

(3) Install proper controls. (Outdoor panels require NEMA 3R or 4X enclosure)

(4) All installations require a basin cover to prevent debris from falling into the basin and to prevent accidental injury.

(5) Cords must be properly sealed to prevent moisture and gases from entering the control panel.

(6) When check valve is installed, drill a 3/16" diameter hole in the discharge pipe below the check valve even with the top of the pump. NOTE: The hole must be below the basin cover and cleaned periodically. Also a vent hole is drilled in the pump housing. Be sure that this hole is cleared during any servicing.

(7) Vent gases and odors to the atmosphere through vent pipe per Local and State codes.

(8) Secure power cord to avoid entanglement with variable level float switch mechanism.

(9) Do not reduce pump discharge pipe below 2" IPS size.

(10) Basin must be in accordance with all applicable codes and specifications. Basin must be sized to allow a minimum 6-minute off time between starts.

(11) Pump must be level and the tethered variable level float switches must be free and not hang up on pump or pit peculiarities.

(12) If a rail system is used, discharge elbow must be firmly anchored to the bottom of basin. In fiberglass basin, the bottom will need to be reinforced if the discharge elbow is used.

(13) If a rail system is used, the guide rails are 2" schedule 40 pipe for all flanged-discharge grinder pumps. Brass, stainless steel or galvanized steel is recommended.

(14) Install ring and cable for lifting pump from pit.

(15) Basin must be clean and free of debris after installation and before operation.
PUMP WIRING INSTRUCTIONS

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

WARNING: “Risk of electrical shock” Do not remove power supply cord and strain relief or connect conduit directly to the pump.

CAUTION: Power cords, sensor cords, and float cords all must be sealed to prevent gases from the basin entering the control panel.

INSTRUCTIONS FOR CHECKING ROTATION OF THREE PHASE UNITS

It is very important that these units be connected for proper rotation. Since no rotating parts are visible without removing the pump from the pit, the rotation on 3 phase units should be checked before installation into the pit as follows:

After the proper electrical connections are made, momentarily energize the pump observing the direction of kick back due to starting torque. The rotation is correct if the kick back is in the opposite direction of the rotation arrow. If the rotation is not correct, disconnect power and switch any two power leads. Turn power back on and retest for proper rotation.

SENSOR CABLE

The sensor cable is the smaller cable, which contains 5 wires. The red and orange wires connect to the thermal cut-out circuit and the black and white wires connect to the seal leak probes. The green wire is a ground connection. All 5 wires must terminate in the control panel.

The following should be noted:

1. The thermal sensors are normally closed and mounted adjacent to the motor windings. If internal temperatures exceed a maximum limit, the pump will deactivate when the red and orange wires are connected in series to the control coil of the motor starter circuit. The pump is able to restart once the motor cools down. Continued deactivation of this circuit requires the attention from maintenance personnel.

2. The black and white seal leak wires are connected to a 330K ohm moisture detection circuit. An indicator light will activate whenever water is present in the shaft seal cavity or cord cap assembly. Whenever the seal leak light is activated, indicating the entry of moisture into the pump, it should be removed and serviced in order to avoid damage to the motor. 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 330k Ohms. Resistance readings significantly lower indicates an entry of moisture into the pump. If VOM reading is open then a problem exists with moisture detection circuit.

3. The green wire shall be connected to a ground lug in the panel. 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.

CONTROL PANELS

These pumps are nonautomatic and they require a control panel. A motor starter circuit, control circuit, and high-water alarm circuit within the panel are standard features. Enclosures rated for outdoor use and alternating relays are often required. Variable level float switches are the most common level sensing device. The following should be noted.

1. Single phase units require externally mounted capacitors and starting relays. Your control panel should have provisions for mounting these starting components.

2. The seal failure sensor and thermal sensor protection require that interfacing terminals and functions be incorporated into the panel.

3. All pumps require overload protection in panel. Use with approved motor control that matches motor input in full load amperes with overload element(s) selected or adjusted in accordance with control instructions.

4. Lightning arrestors, condensation heaters and elapsed-time meters are optional features that provide added protection.

POWER AND SENSOR CORD, LEAD IDENTIFICATION

“71 SERIES GRINDER” FOUR CONDUCTOR AWG. POWER CORD SIZE

<table>
<thead>
<tr>
<th>MODEL</th>
<th>HP</th>
<th>230/1 PH</th>
<th>200/3 PH</th>
<th>230/3 PH</th>
<th>460/3 PH</th>
<th>575/3 PH</th>
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<td>3</td>
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<td>12 AWG.</td>
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<td>7112</td>
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</tr>
</tbody>
</table>

APPROXIMATE CORD DIAMETER PER GAUGE

<table>
<thead>
<tr>
<th>APPLIED CORD DIAMETER</th>
<th>GAUGE</th>
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</thead>
<tbody>
<tr>
<td>8 AWG.</td>
<td>.68&quot;</td>
</tr>
<tr>
<td>8/4 AWG.</td>
<td>.96&quot;</td>
</tr>
</tbody>
</table>

NOTE: SENSOR CORD 18/5 AWG. APPROXIMATELY .48" DIAMETER.
THREE PHASE INSTALLATION

Three phase pumps are nonautomatic. To operate automatically, a control panel is required. Follow the instructions provided with the panel to wire the system.

Before installing a pump, check the pump rotation to insure that wiring has been connected properly to power source, and that the green lead of power cord (See wiring diagram), is connected to a valid ground. 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, should provide the proper rotation.

Refer to wiring diagram supplied with specific electrical control panel for correct electrical cable termination locations.

SINGLE PHASE INSTALLATION (7110 & 7111 ONLY)

All single phase models require start capacitor, run capacitor and relay in the circuit to start and operate properly. These components can be purchased separately or prewired in a Zoeller control panel. For components purchased separately use the diagram for installation and hookup.

Single phase models are nonautomatic. To operate automatically a control panel must be added to the power circuit. Follow the instructions provided with the panel.

NOTE 1: Sensor cable includes 5 leads; 2 leads for thermal sensor, 2 leads for moisture sensor, and a green ground lead. Sensor wire colors are as shown.
OPERATION

GENERAL
Zoeller pumps are lubricated and tested at the factory prior to shipment and require minimum pre-start-up maintenance.

Maximum liquid temperature of a continuous operating pump liquid for this model pump must not exceed 104°F (40°C). For an extended service life, pumps should be totally submerged on long pumping cycles.

These units are not designed to handle liquids other than sewage. If pump is used in water contaminated with heavy, viscous, or abrasive materials, the warranty will be voided.

NAME PLATE DATA
The nameplate, located on the top of pump, indicates specific information about the construction of the pump. The model number, date code, and serial number should be recorded on the front page in the “Owner’s Information” section of this manual.

SHORT TERM STORAGE
If pump is to be stored, the following is advised:
- Store pump inside whenever possible or cover with some type of protective covering.
- Tape or seal in plastic bag the terminal ends of wire leads.
- The impeller should be rotated every three months in order to keep the seals lubricated and not develop a permanent set.

If panel is to be stored, the following is advised:
- Store the panel inside whenever possible and leave in the shipping carton.
- All openings shall be sealed.
- Store in an upright position.
- Do not stack anything on top of panel.

START-UP PROCEDURE
Before placing the equipment into operation the following should be checked:
- Correct pump rotation (3 Phase units only).
- Clean pit.
- Panel dry, securely installed and properly sealed.
- floats positioned properly.
- discharge valves open.
- 3/16” vent hole drilled in pipe between check valve and pump.

Every two years:
- inspect impeller for damage or wear. replace as required by a Zoeller Authorized Service Station.
- inspect power cables for damage or wear. replace immediately if damage or wear is detected.
- inspect impeller for damage or wear. replace as required by a Zoeller Authorized Service Station.

MAINTENANCE

Every month:
- check for proper and unobstructed float operation.
- Listen for proper check valve operation.
- Check and record the amp draw through the three power leads.
- If the panel has an elapsed-time meter, check operating times. Uneven times indicate a defective unit, float switch or control on a duplex system.
- Inspect the panel for any presence of moisture in enclosure, loose connections, and general component condition. Check out location and condition of float switches.

Every year:
- In addition to the monthly checks, the basin should be inspected and cleaned. Any defective components should be replaced. Inspect and remove any sand, debris, or mud present in the pump basin assembly.
- Clear oil, no burnt odor - Oil, motor and seals are in satisfactory condition.
- Dark oil, burnt odor - Pump motor has overheated. check the motor winding resistance to ground. Ohm readings of 1 megohm or higher is required. if lower readings are present, return the unit to an authorized service facility for service.
- Milky, emulsified oil - Seals have failed. Unit must be returned to an authorized service facility for service.
- Dispose of the motor insulating oil properly if replacement is required.
- Inspect power cables for damage or wear. Replace immediately if damage or wear is detected.
- Inspect impeller for damage or wear. replace as required by a Zoeller Authorized Service Station.

DOUBLE SEAL PUMPS
- Double seal pumps offer extra protection from damage caused by seal failure.
- Oil in a motor housing and lower seal cavity must be checked when pump is serviced. if oil from the motor housing contains water or other contamination, both seals should be replaced during maintenance. Always replace with new factory recommended oil and service parts. All repairs must be made by Zoeller Authorized Service Stations.

SAFETY PROCEDURES
For your protection, always disconnect pump and panel from its power source before handling.

Never enter the basin until it has been properly vented and tested. Any person entering a basin should be wearing a harness with safety rope extending to the surface so that they can be pulled out in case of asphyxiation. Sewage water gives off hydrogen sulfide gas which is highly poisonous. Installation and checking of electrical circuits and hardware should be performed by a qualified electrician.

Pump is never to be lifted by power cord.

Unit must be flushed and disinfected, inside and out, prior to servicing.

GENERAL SYSTEM INSPECTION
Before the system is placed into operation, a system Start-up Report should be completed by a qualified technician.

Wiring and grounding must be in accordance with the national electrical code and all applicable local codes and ordinances.

LUBRICATION PROCEDURES
No lubrication is required. If pumps are to be stored for more than six months, refer to short term storage procedure in the Operation section.

PREVENTIVE MAINTENANCE
Preventive maintenance will ensure a longer service life from the product. The following is a suggested maintenance schedule.
**ELECTRICAL PRECAUTIONS**

Before servicing a pump, always shut off the main power breaker to the panel and then disconnect the pump - making sure you are wearing insulated protective sole shoes and are not standing in water. Under flooded conditions, contact your local electric company or a qualified licensed electrician for disconnecting electrical service prior to pump removal.

**WARNING** Submersible pumps contain oils which become pressurized and hot under operating conditions - allow 2½ hours after disconnecting before attempting service.

**CONDITION**

**A.** Pump will not start or run.

**Steps** | **Check Voltage At** | **If No Voltage** | **If Voltage**
---|---|---|---
No. 1 | Line terminals in pump’s control panel L1 - L2 - L3 (3 Phase) | Check Disconnect switch, line fuse, and/or circuit breakers in power supply circuit. | Proceed to No. 2 |
No. 2 | Pump motor terminals in pump’s control panel T1 - T2 - T3 | Check for control circuit voltage. Check out magnetic starter contacts, thermal overloads, and float switches | Check starting relay and capacitor (1 phase units). Check pump for ground, and binding impeller |

**COMMON CAUSES**

B. Motor overheat and trips overload or blows fuse.

- Incorrect Voltage
- Unbalanced power source
- Incorrect motor rotation
- Negative or low head
- Excessive water temperature
- Impeller, cutter, or seal mechanically bound
- Defective capacitor or relay
- Motor shorted
- Lost a leg in a Three Phase unit

C. Pumps starts and stops too often.

- Check valve stuck open
- Level controls out of adjustment
- Temperature sensor tripping
- Thermal overload switch out of adjustment or defective
- Pit too small

D. Pump will not shut off.

- Debris clogging cutter plate
- Debris under float switch
- Float travel obstructed
- Defective or damaged float switch
- Magnetic starter contacts shorted
- Air lock - check vent hole

E. Pump operates but delivers little or no water.

- Check for plugged cutter, pump housing, pipe or sticking check valve
- Vent hole clogged or not drilled
- Discharge head exceeds pumps capacity
- Low or incorrect voltage
- Incorrect motor rotation
- Defective capacitor

F. Drop in head and/or capacity after a period or use.

- Increase Pipe Friction
- Clogged line or check valve
- Abrasive material & chemical, deteriorated impeller and pump housing

If the above check list does not uncover the problem, consult the factory. Do not attempt to service or otherwise disassemble pump.