

# EccentricPumps™

## Peristaltic Hose Pumps

### Installation, Operation and Maintenance Manual

Please Read Instructions  
Carefully Before Operation

Revision 3  
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## 1 Safety

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This chapter contains information to promote safety in the operation and maintenance of this equipment. It is not intended to supersede, replicate or replace any safety documentation or procedures provided from or established by official safety sources.

All persons involved in the operation of this equipment—plant engineering, operations and management—must understand the potential hazards involved and observe the required safety precautions. Only trained and responsible personnel should work with or around this equipment.

Your safety and the safety of equipment, nearby facilities and personnel require a proper safety attitude and an emphasis on safe work procedures. This is the essence of any good safety program. If at any time you identify safety deficiencies, immediately correct them and bring them to the attention of management. Before an accident can be prevented, it must be anticipated. Use pre-job discussions with your co-workers and supervisors to identify hazards and the means to avoid them.

### 1.1 Safety Labels Used In This Manual

Failure to follow the procedures in this manual can lead to injury, loss of property or death. In most cases, particularly sensitive procedures are called out with the following symbols:



**Procedures that can jeopardize the pumping unit or other property are designated with this symbol.**

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**Procedures that have a general hazard to personnel are designated with this symbol.**

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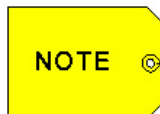


**Procedures that pose a risk of electrocution are designated with this symbol.**

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Information that is critical to the safe and proper operation of the equipment is called out with the following symbol:



**This symbol calls out important information that may not be included in the text.**

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## 1.2 Emergency Procedures

The Eccentric Pumps™ pump is designed to operate safely, efficiently and reliably. However, as with any operating system, an emergency can occur at any time. An emergency response could involve calling for medical assistance, management notification, fire assistance or evacuation from the vicinity of the equipment. Obtain the following emergency phone numbers and post them at site telephone locations. Periodically review the numbers for accuracy and update them as required.

**Table 1.1: Emergency Phone Numbers**

Ambulance	(____) _____ - _____
Fire Department	(____) _____ - _____
Police Department	(____) _____ - _____
Eccentric Pumps Representative	( 404 ) 816 – 4760 or sales@eccentricpumps.com

Training and education are the most important parts of any safety program. For every possible emergency, establish an Emergency Response Plan and maintain it for immediate use.

## 1.3 Basic Safety Requirements

Be aware of the following safety guidelines:

- Prevent electrical shock – Disconnect the power cord from the equipment before working on it. Use tools designed for work on electrical equipment.
- Prevent injury – Wear safety glasses and other appropriate safety protection when the Material Safety Data Sheet or safe working procedure dictates. Ensure that all tools and instruments used during installation and maintenance are in good condition.
- Protect equipment and personnel – Check all safety devices periodically to ensure continued reliability. Provide proper maintenance of all safety valves. Never bypass safety devices, and never operate the equipment outside its specified limits.
- Follow posted precautions – Read all precautionary labels attached to equipment and posted in areas of the facility. Comply with all precautions before handling the equipment.

Situations may develop for which no written procedures exist. Think carefully before acting. Know the function of each part and its effect on the process and equipment. Carefully review all operating procedures before starting up this equipment to ensure knowledge and understanding.

## 1.4 Hazardous Materials Precautions



**Follow the safety precautions established by your facility for wastewater sanitation, chemical handling or hazardous material contact.**

The material pumped in your system may contain hazardous chemicals or other materials that may present a hazard to workers and the environment. For example, wastewater contains potentially dangerous bacteria, viruses and pathogens. When working in or around equipment operating in facilities with potentially hazardous material, exercise all required precautions for personal protection and sanitation.

## 1.5 Precautionary Labels



**To avoid serious injury, read all precautionary labels attached to equipment and boxes prior to start-up.**

The precautionary labels warn you of inherent hazards associated with the system. Before handling the equipment, read and understand the precautionary labels and follow the instructions they contain. Do not remove or obscure any label. If a label is missing or difficult to read, replace it with a new one. Labels are available from your Eccentric Pumps representative.

## 1.6 Electrocutation Hazard



**Electric shock can kill. Use extreme caution if troubleshooting or servicing this equipment. Do NOT bypass safety interlocks. An electrocution hazard exists even after the equipment has been de-energized. Only qualified personnel who are in compliance with all applicable federal, state and local codes shall perform electrical wiring.**

Adherence to the following guidelines will help guard against possible electrocution:

- Use only factory-approved components for repair. Tampering or unauthorized substitution of components may adversely affect the safety of this equipment.
- Turn off the power before opening, servicing or adjusting the equipment.
- Carefully follow all Hazardous Work Permit and Lockout/Tagout procedures for your facility.
- Do not touch live electrical components inside the equipment; electric shock caused by voltage in the control circuits can kill.
- Keep all equipment surfaces very clean. Do not allow grease or oil deposits on bypass interlocks or other safety devices.
- Devices such as variable frequency drives can carry a residual charge, even after they have been unplugged. Refer to each device's operating manual for safe operation.

## 1.7 Hazardous Work Permit

The purpose of a Hazardous Work Permit (HWP) is to ensure that work known to be hazardous, or that could cause a hazard, is planned and controlled so that it is accomplished without incident. Planning the procedures and conducting a pre-job discussion with all of the participants, including a responsible manager, are necessary to ensure a safe work process.

The most successful way to avoid accidents is to anticipate them. In a pre-job discussion, the participants identify all the potential hazards and develop procedures for accomplishing the task without risk. The process is formalized and the work is begun only after the manager has issued a written permit.

The following are examples of work on the equipment that should be covered by an HWP:

- Confined space entry
- Welding and cutting

- Electrical repairs and troubleshooting of controls
- Repairs on piping that may be under pressure
- Any task that plant supervision has designated as being hazardous

## 1.8 Safe Repair Procedures

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**Failure to properly isolate equipment and piping may cause injury. Be sure to positively isolate the equipment before any repair work or adjustments are performed.**

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### 1.8.1 General Guidelines for Maintenance, Repair and Adjustment

The following guidelines should be adhered to during routine maintenance and repair work:

- All repair work must be performed by a qualified service technician.
  - Properly size piping to allow safety devices to operate according to specifications.
  - De-pressurize pump and piping before working on them.
  - If possible, do not stand on the unit to perform maintenance. Your Eccentric Pumps pump is not constructed to support the weight of a person.
- 



**The pump and / or hose may contain the pumped fluid. Follow all safe handling procedures established by your facility to prevent exposure to hazardous chemicals or substances.**

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### 1.8.2 Lockout/Tagout

All personnel must be protected from hazards related to unexpected energizing, start-up, or release of stored energy during equipment servicing or maintenance. Strict equipment Lockout/Tagout procedures ensure that all personnel are protected while performing necessary maintenance and servicing work.

### 1.8.3 Start-Up Following Repair

Before restarting the equipment, ensure that all parts of the equipment affected by repairs have been restored to their proper operating condition. Refer to *Section 3.1* for the pre-startup checklist.

## 1.9 Modification of Equipment

Conversions and modifications to your equipment are permissible only with the written agreement of Eccentric Pumps. Original manufacturer replacement parts and Eccentric Pumps approved accessories enhance the operational safety of the machine. The use of non-Eccentric Pumps parts or accessories can lead to the nullification of Eccentric Pumps liability for any resultant damage or loss of property.

If modifications to the pump are carried out in agreement with Eccentric Pumps, a new set of operating instructions will be provided, or the existing manual will be supplemented with additional sheets and a new cover sheet. The date of modification will be listed on the new cover sheet.

## 1.10 DST™ Hose Lubricant Technical Data

### Product Identification: DST™ Hose Lubricant (NSF H1 Food Grade)

Eccentric Pumps, LLC  
 PO Box 190159  
 Atlanta, GA 31119  
 Telephone: 404 816 4760

**Emergency Telephone Number**  
**CHEM-TEL: 1 (800) 255 3924**

Date Prepared: 02/04/05

### SECTION II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

INGREDIENT DESCRIPTION	% Weight	CAS Number	ACGI HPP M	TLV MG/M3	ACGIHP PM	STEL MG/M3	OSHA PPM	PEL MG/M3	SARA 313
Polydimethylsiloxane	100%	63148-62-9	N/E	N/E	N/E	N/E	N/E	N/E	N/E

NFPA = National Fire Protection Association

Flammability 0

Instability/Reactivity 0

Health 0

### SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point >65°C  
 Specific Gravity (H2O=1) 0.97  
 Vapor Pressure (25°C) Negligible  
 Vapor Density (Air = 1): Negligible  
 Evaporation Rate (EE=1) <1  
 Melting Point N/A  
 Solubility in Water (20° C) Insoluble  
 Solubility in Organic Solvent Soluble in Toluene  
 Appearance & Odor: Clear, Colorless liquid - Odorless

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point: (Method Used) >214°F / 101.1°C (Closed Cup)  
 Flammable Limits: LEL: No Data UEL: No Data

Extinguishing Media: All standard firefighting media  
 Special Fire Fighting Procedures: None Known

### SECTION V - REACTIVITY DATA

Stability: Stable  
 Conditions to Avoid: None  
 Hazard Polymerization: Will Not Occur  
 Incompatibilities: None Known  
 Hazardous Decomposition/Combustion: Carbon Monoxide, Carbon Dioxide, Silicon Dioxide & Formaldehyde

### SECTION VI HEALTH HAZARD DATA

Acute Signs/Effects of Overexposure:  
 Eye Contact: May cause Mild Eye Irritation.  
 Skin Contact: None Known  
 Inhalation: None Known  
 Ingestion: None Known  
 Medical Conditions Aggravated: None Known  
 Other: None Known  
 Chronic Effects of Overexposure: None Known

## Emergency and First Aid Procedures:

Ingestion	None Known
Skin	Wash with soap and water
Inhalation	None Known
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

This product or one of its ingredients present 0.1% or more is not listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA.

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**SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE**

Spill Response: Wipe, scrape or soak up in an inert material and put in a container for disposal. Wash walking surfaces with detergent and water to reduce slipping hazard.

Disposal Method: Disposal should be made in accordance with Federal, State and Local regulations. Incineration recommended in approved incinerator according to Federal, State, and Local regulations.

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**SECTION VIII - PROTECTION AND PRECAUTIONS**

Ventilation:	None Known
Respiratory Protection:	None Known
Eye and Face Protection:	Safety Glasses
Protective Gloves:	None Known
Other Protective Equipment:	None Known
Precautions in Handling and Storage:	None Known
Engineering Controls:	None Known

---

**SECTION IX - DEPARTMENT OF TRANSPORTATION DATA**

DOT Proper Shipping Name:	None
DOT Hazard Class:	None
DOT Labels:	None
UN/NA Number:	None
Placards:	None
Export:	None
EPA Hazard Waste:	None
Sara Hazard Class:	None
WHMIS Hazard Class:	No Known WHMIS Class
CPSC Classification	None
Transportation Class:	None
RID (OCTI)	None
ADR (ECE)	None
RAR (IATA)	None

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**DISCLAIMER**

Information presented herein has been compiled from information provided to us by our suppliers and other sources considered to be dependable and are accurate and reliable to the best of our knowledge and belief but are not guaranteed to be so. We make no warranty as to the results to be obtained in using any material and since conditions of use are not under our control, we must necessarily disclaim all liability with respect to the use of any material supplied by us.

## 2 Installation

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**Installation of your Eccentric Pumps pump involves potentially hazardous procedures. Only trained and qualified personnel who have read and who understand the information in this manual shall install this equipment.**

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### 2.1 Receiving and Handling

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**Your Eccentric Pumps pump is heavy. Handle it carefully. Careless handling can result in equipment damage and injury to personnel.**

---

Upon receipt of your Eccentric Pumps pump:

- **Verify that no damage has occurred during transit.** Carefully inspect the base, motor fan guard, the motor fan, exposed shafts, suction and discharge connections, and factory installed accessories and note any damage to painted surfaces.
- 



**It is your responsibility to check that no damage has occurred during shipping.**

---

- Check off all parts and accessories against the packing list and bill of lading to ensure proper contents.

If you find any damage or shortage, immediately notify your Eccentric Pumps representative. To obtain credit, you must notify your Eccentric Pumps representative at the time of delivery. **DO NOT** sign any receiving tickets or acceptance papers unless the shipment is in proper condition and all accessories are accounted for.

After you receive and inspect your pump, transfer it to the assembly location or storage area. Use the proper forklift truck for lifting items on palates or in crates. The lift forks should extend under the equipment and completely support the unit. When necessary to lift by crane, use the vertical points of the equipment or the crating for pickup so the equipment remains level. Use long lift cables, chains, or straps, as required, to evenly support the equipment. In addition, use a spreader bar, if necessary, to ensure a vertical pull at all lift points. Short cables or chains can create a cross shear that can damage the equipment.

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**If your pump is supplied with a gear motor, lift only with straps located under the gear motor and under the front of the pump.**

---

Leave the pump assembly crated, horizontal and stored in a warm, dry location until you are ready to install it.

## 2.2 Identification - Nameplate

Each Eccentric Pumps unit is supplied with a corrosion resistant nameplate affixed to the pump. The nameplate includes contact information for Eccentric Pumps. A complete description of your pumping unit and performance is included on the packing slip and bill of lading.

## 2.3 Identification - Pump and Motor

The following table can be used to record specific information about your pump. This information can be found on the packing slip or bill of lading. Please circle the appropriate units where required.

### **PUMP**

Packing Slip Number:	_____		
Pump size:	_____	Model number:	_____
Flow:	_____ (gpm / lpm)	Head:	_____ (feet / meters)
RPM:	_____	Weight:	_____ (pounds / kg)

### **GEAR MOTOR**

Serial Number:	_____		
Power:	_____ (hp / kw)	Frame size:	_____
Full load speed:	_____	Full load amps:	_____
Phase:	_____	Cycles (hz):	_____
Volts:	_____	Weight:	_____ (pounds / kg)
Gearbox ratio:	_____	Service factor:	_____
Input speed:	_____	Output speed:	_____

## 2.4 Storage

If you do not install the pump within 30 days after receipt, use the following storage procedures to ensure that the unit remains in good working condition. Eccentric Pumps DOES NOT prepare the pump package for storage of more than 30 days.

- Remove the hose and the lube from the pump.
- Cover all suction and discharge connections with plastic or tape to prevent foreign material or water from accumulating in the pump.
- Remove the front cover drain plug to prevent accumulation of water. Once the pump is drained of lubricant, add a desiccant pack to prevent the accumulation of moisture.
- The pump is supplied with grease lubricated bearings. Re-grease before storing.
- After inspecting the pump, re-crate the unit and store it in a clean, dry place that is free from extremes in temperature.
- Rotate the pump shaft at least 10 turns every week to prevent pitting and corrosion on the bearing surfaces. This may be accomplished by removing the motor fan cover and turning the motor fan by hand.

## 2.5 Special Tools

No special tools are required for the installation of your unit. The hose connections require the use of a Band-it hose closure. The clamping tool is available from Eccentric Pumps.

## 2.6 Pump Location

The pump should be mounted on a flat, hard surface. The surrounding area should be open to permit easy access for maintenance and service, especially in front of the pump. The pump area should have adequate headroom and sufficient ventilation.

Before installing your pump, compare the physical location with the dimensions on the outline installation drawing to ensure proper fit. You must determine that the available space is sufficient for the pump, taking into account the following provisions:

- Dimension and weight of the pump package.
- Required moving and hoisting equipment.
- Possible piping layout, including space for removal and maintenance.
- Freedom of movement to operate the unit, read speed and pressure gauges, and provide adjustment and maintenance.
- Space required for lubrication.
- Space for removal of the hose from the unit.
- Location of the nearest drain or catchment basin to collect used lubricant and pumpage.



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**The hose is serviced through the front cover. Therefore, provide sufficient work space in front of the pump when installing the unit.**

---

## 2.7 Electrical Connections

The pump may be supplied with a variable frequency drive (VFD) or other means for controlling the output. If a VFD is used, mount the unit relatively close to the pump for ease of operation. Follow all sub-vendor precautions and installation information for the proper use of these devices.

## 2.8 Foundation

The concrete pump foundation should be 4 inches wider and longer than the pump base. When installing the pump, make sure that the surface of the foundation is smooth and free of debris. The foundation should be level and of sufficient depth and strength to adequately support the pump base.

### 2.8.1 Anchor Bolts

Anchor bolts should be set into the concrete foundation. For best results, use anchor bolts made of corrosion resistant material such as stainless steel. Anchor bolt nuts should be of a different grade stainless steel to prevent galling. Shim the pump level as required.

Initially tighten the anchor bolts one eighth of a turn with a wrench. Do not fully tighten until after all piping has been connected.

## 2.9 Piping



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**All piping to and from the pump must be independently supported. Undue stress on the pump suction or discharge connections can cause serious injury or equipment failure. The pipe supports should be located as close to the pump as possible.**

---

### 2.9.1 Suction Piping

The pump should be located as near to the liquid source as possible. The suction piping should be at least the same diameter as the suction connection and should have a straight run of pipe that is a minimum of 8 to 10 pipe diameters long. Suction piping must be airtight and suitable for both pressure and vacuum. If possible, provide a larger suction diameter than the pump inlet connection. An inlet valve should be located near the pump to isolate the unit for service and repair. Never install a check valve on the suction side of the pump. It is recommended that a compound vacuum / pressure gauge be installed to monitor pump performance.

### 2.9.2 Discharge Piping

The pump discharge piping should be a similar diameter as the discharge connection. Avoid sudden changes in pipe diameter by using concentric taper increasers. Provide as straight of a pipe run as possible after the discharge of the pump.

An isolation valve is required to service the pump and should be installed on the discharge of the unit. It is recommended that a pressure gauge be installed to monitor pump performance. A check valve is not recommended on the discharge of the pump since the pump itself acts as its own check valve.

A pressure relief valve on the discharge side of the pump is recommended to prevent an over-pressure situation that can damage the pump or the hose.

### 2.9.3 Flush Connections

Line flushing connections are recommended when pumping slurries or liquids with a high concentration of solids that tend to settle when the pump is turned off. Accumulation of solids in the hose after shutdown can reduce hose life because the hose will experience high stress upon restarting the pump.

### 2.9.4 Pulsation Dampeners

Hose pumps sometimes require the use of pulsation dampeners on either the inlet or outlet to increase the hose life during operation. A pulsation dampener acts to absorb the energy of the pulsations that the pump produces so that these forces do not act upon the hose. Your Eccentric Pumps representative will assist you in selecting the proper size and application of these devices in your system.

If your operation does require pulsation dampeners, mount them as close to the inlet and / or outlet of the pump as possible. Do not support the weight of the dampeners on the pump connections. These devices must be independently supported.

Discharge pulsation dampeners work best when there is some back pressure on the discharge line. Pulsation dampeners do not work efficiently at low discharge pressures or when the pump discharges directly to the atmosphere.

## 2.10 Other Connections

The pump is equipped with a low point drain and a vent. The drain is typically plugged with a stainless steel or plastic plug, and the vent prevents a buildup of excess pressure in pump housing.

Your pump may be equipped with an optional high level sensor or other device. Refer to any specific information supplied with these devices.

## 2.11 Direct Coupled Arrangement

The pump is directly coupled from the pump to the gearmotor. Therefore, no alignment is necessary since all fits are piloted.

### 3 Operation

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**Operation of your Eccentric Pumps pump involves potentially hazardous procedures. Only trained and qualified personnel who have read and who understand the instructions in this manual, the reference publications and the supplier manuals shall operate this equipment.**

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**Touching, adjusting or working on a rotating pump is dangerous and can result in injury or death. Do not work on or service a pump that is running.**

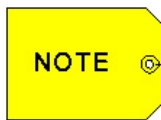
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The following procedures should be used for the safe operation of your pump.

#### 3.1 Pre-Startup Checklist

All of the following items should be verified prior to startup.

- **DEBRIS:** All construction debris should be removed from the suction piping and suction well. Ensure a clear passage through all piping and the pump.
  - **MOTOR:** Prepare the motor as outlined in the motor manufacturer's installation and operation manual. A motor starter with overload protection should be provided, and proper wire size, fuse size and other electrical devices should conform to local code and regulation.
  - **LUBRICATION - BEARINGS:** Grease lubricated pump bearings are packed at the factory with an NLGI number 2 grease such as Shell Dolium R. The pump bearings do not require any additional grease in the field. Do not over-grease the bearings.
  - **LUBRICATION - PUMP CASE:** The pump must be filled with our DST™ hoselube prior to operation. The level should be to the level of the front cover sight glass, **with the roller in the six o'clock position**. Failure to do so will result in reduced hose life. It is also necessary to check the compatibility of the hoselube with your pumped fluid. Refer to the **Eccentric Pumps Assembly and Disassembly Manual** for instructions on filling the pump.
- 



**Overfilling the pump case with hoselube will cause an increased amount of pressure inside the pump body and may cause hoselube to leak from the cover or the clamp area. Do not overfill.**

---

- **HOSE MATERIAL:** Check the compatibility of the hose material with the fluid being pumped. Hoses are available in a variety of materials that cover most chemical applications. However, there are some products that are not compatible with our hose material.
- 



**Ensure that the hose material and the lubricant are compatible with the pumped fluid. Failure to do so may cause injury or premature hose failure.**

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- **FASTENERS:** Check to make sure that all fasteners are properly tightened.
  - **LEAKS:** Check the connections on the inlet and the outlet and make sure there are no leaks. Check the front cover for signs of leaks from the front cover gasket. Do not over-tighten the front cover.
  - **VALVES:** Ensure that all valves on both the suction and discharge lines are completely open. Since this pump is a positive displacement pump, it continues to build pressure, even against a closed valve.
  - **ROTATION:** Jog the motor to check for rotation. Adjust the motor leads or VFD as necessary.
- 
- 

**NOTE****The pump can be run in either direction.**

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## 3.2 Startup Checklist

PROCEDURE	YES	NO	NA	COMMENTS / CONDITIONS		
<b>IDENTIFICATION</b>						
1. Date of initial operation:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____		
2. Pump model and serial number (from packing slip):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____		
3. Installation site and tag number:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____		
4. Purchase order number:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____		
<b>RECEIVING</b>						
1. Is there any visible damage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. Have all items been received?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>STORAGE</b>						
1. Was equipment stored in a dry area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. Have storage instructions been followed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>INSTALLATION</b>						
1. Is paint in good condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. Is piping independently supported?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. Are all piping joints leak tight?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. Is the foundation level?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5. Is the base bolted down?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
6. Are all bolts and fasteners tight?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
7. Do nameplates match the information in the manual?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>LUBRICATION</b>						
1. Has the proper amount of hoselube been added?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Filled to the sight glass with the roller in the six o'clock position		
2. Is the front cover breather installed properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. Have the motor bearings been greased?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. Have the pump bearings been greased?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>ACCESSORIES (optional)</b>						
1. Is the leak detector wired and operating properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. Is the calibration column installed properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. Is the suction pulsation dampener installed properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. Is the discharge pulsation dampener installed properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5. Is the pressure shut-off installed and working properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
6. Is the pressure relief valve working properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>ROTATION</b>						
1. Is the pump rotation correct?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>OPERATION</b>						
1. Are the suction and discharge valves fully open?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
2. Does the pump operate smoothly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
3. Does the RPM match the nameplate and manual?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
4. Does the pump run quietly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
5. Does the pump run without vibration?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<b>ELECTRICAL DATA</b>						
Motor Manufacturer:			Operating Amperage	Operating Voltage		
Nameplate Horsepower:			L1-L2:	L1-L2:		
RPM / Ratio:	/		L2-L3:	L2-L3:		
Nameplate Voltage / FLA:	/		L1-L3:	L1-L3:		
<b>SYSTEM DATA</b>						
Pumped Fluid:			Suction Pressure:	Point 1	Point 2	Point 3
Temperature:			Discharge Pressure:			
Specific Gravity:			Pump Speed:			
Percent Solids:			Flow Rate:			
<b>SIGNATURES</b>						
Representative Name:			Contractor Name and Date:			
Company:			Contractor Signature:			
Phone:			Owner's Name and Date:			
			Owner's Signature:			

### 3.3 Startup Request Form and Contractor Readiness

Contractor Name:  
Contractor Phone:  
Location:

Requested Service Date:  
Project:  
Contact:

In order to ensure that newly constructed systems are ready for Eccentric Pumps service personnel, the following form must be completed and returned to Eccentric Pumps in order to schedule system checkout and service. Failure to provide this completed request may result in project schedule delays. From the receipt of this form by Eccentric Pumps a service date will be scheduled within a maximum of two (2) weeks.

The following is a checklist of work items that must be completed before the arrival of service personnel from Eccentric Pumps. This list provides a minimum guideline to ensure a useful and efficient startup of equipment. It is the contractor's responsibility to complete these items unless otherwise agreed upon in writing.

#### **EQUIPMENT**

- All parts and accessories have been located and installed.
- Pumps are properly anchored.
- No visible damage is noted.

#### **ELECTRICAL**

- All wiring to the pump motor and / or variable frequency drive must be completed, terminated and tested.
- Control wiring to auxiliary devices such as the pump leak detection switch or high pressure shut-off must be completed.
- Pump should be tested for desired rotation. Pump can be jogged for less than a second to determine rotation.

#### **PIPING**

- All flanges and connections must be tight and leak free.
- All piping must be independently and rigidly supported. No Piping should be supported by the pump itself.
- Calibration columns, gages, pressure relief valves and other accessories must be installed if provided.
- Suction and discharge pulsation dampeners must be installed and independently supported according to the manufacturer's instructions.
- Assurance has been obtained from responsible parties that the routing of flow has been established and is correct.
- The pumped fluid must be available to the pump. If the pumped fluid is not available, water can be used instead.

#### **TRAINING**

- Owner's personnel must be notified for pump training. Contractor expects \_\_\_\_\_ people to be present during training.
- Contractor has provided directions to the jobsite to Eccentric Pumps.

#### **CONTRACTOR SIGN-OFF**

I do certify that all work will be complete by the requested service date for the above mentioned system. Such work shall include all necessary electrical work, mechanical piping, controls, etc. that is necessary to fully operate the aforementioned systems. All sections of the checklist are completed.

\_\_\_\_\_  
Name/Company (sign & print please)

\_\_\_\_\_  
Date

### 3.5 Turning the Pump On



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**The risk of exposure to electrical hazards must be eliminated. Be sure that the wiring, connections and other electrical devices are operating properly.**

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**All guards and safety devices must be installed prior to operating the pump.**

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Once all of the items in the Pre-Startup Checklist (*Section 3.1*) have been verified, follow the following procedure to start the pump.

- Fully open the suction and discharge valves.
- Engage the motor.
- Begin by pumping against no pressure, and gradually build up to the desired discharge pressure.
- If there are any loud or unusual noises, immediately turn the pump off.

### 3.6 Operating the Pump

The following section provides details on the safe operation of your pump.

#### 3.6.1 Pressure Measurement

The suction and discharge pressure should be measured to verify that the pump is operating at its design point as specified on the pump nameplate or in the pump data sheet.



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**Failure to operate at the design point can cause excessive vibration, increased motor amperage draw and increased wear of the hose.**

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#### 3.6.2 Motor Amp Draw

The current required by the pump motor will vary for different applications. In general, the pump is designed to operate from 50% to 95% of the full load amps stamped on the motor nameplate. Using an accurately calibrated amprobe, check all three phases of the motor and record.

**Immediately** report abnormal amperage to site management. If the pump motor is pulling normal current, recheck it 30 minutes after you start it. This allows the motor sufficient warm-up time. The reading you obtain should be the reading of the unit's normal operating range. **DO NOT** operate the pump motor above the full load amperage stamped on the motor nameplate. The pump can be operated at low motor amperage.

#### 3.6.3 Power Supply Voltage

Motor manufacturers typically offer standard voltages. Since it is unlikely that your voltage is exactly standard, motor manufacturers allow a  $\pm 10$  percent variation in the operation of their motors. This variation can be tolerated at the rated frequency. **Both the motor manufacturer and Eccentric Pumps are not responsible for motor failure due to the use of incorrect voltage.** Also, neither is

responsible for motor failure due to unbalanced voltage of the three phases. If you have a problem with a high, low, or unbalanced voltage source, correct it before connecting any motors to the source.

### 3.6.4 Throttling



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**Never throttle the pump, whether on the suction side or the discharge side. This will cause damage. Do not operate the pump against a closed suction or discharge valve. To see videos of improper pumping, visit: <http://www.eccentricpumps.com/download.html>**

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Both the suction and discharge of the pump should remain open and free of obstructions.

### 3.6.5 Pump Speed

The pump speed should be measured after the first four to six hours of operation to ensure that the speed is set correctly and has not changed.

### 3.6.6 Pump Rotation

The pump is designed to operate in both directions. Therefore, the suction and discharge can be located on either side of the pump, depending on the requirements of the installation.



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**The pump can operate in both directions without detrimental effect. The suction or discharge can be located on either side of the pump.**

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### 3.6.7 Dry Running

The pump can run dry without damaging the pump. However, pumped fluid normally provides a cooling effect to both the hose and the hose lube. Continuous dry running may reduce hose life.

### 3.6.8 Operation in Freezing Conditions

When operating the pump at low temperatures, it is necessary to ensure that the pumped fluid does not freeze inside the hose, especially during long periods of idleness. If the pump is energized when the pumped fluid is frozen inside the hose, serious damage to the pump can result. Therefore, ensure that the suction piping, the discharge piping and the pump casing is heat-taped and insulated so that this condition does not occur.



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**Never operate the pump when the fluid inside the hose is frozen. This will cause serious damage to the pump.**

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## 3.7 Turning the Pump Off

The following procedure should be followed to stop the pump.

- Flush the piping and pump to remove solids that may accumulate in the line or hose.
- De-energize the motor.

- Isolate any flushing fluid connections.
- Close the suction valve.
- If the pump is out of service for more than thirty days, refer to the storage instructions in *Section 2.4*.

### 3.8 Troubleshooting Guide

<b>Problem</b>	<b>Possible Cause</b>	<b>Action</b>
Hammering in piping	Suction or discharge pipe diameters too small.	Increase pipe size or add pulsation dampeners.
	High pump speed.	Reduce speed of pump.
	Suction or discharge connections not properly anchored.	Secure piping.
	High lift or discharge pressures.	Add pulsation dampeners.
High pump temperature	Low lubricant level.	Add DST™ hoselube to the proper level.
	Improper lubricant.	Use only DST™ hoselube for low temperature operation.
	Pumped fluid temperature too high.	Consult Eccentric Pumps for maximum temperature limits of your pump.
	High pump speed / pump undersized.	Reduce the pump speed or switch to a larger pump.
High discharge pressure	Partially closed or closed discharge valve.	Make sure the discharge valve is fully open prior to and during operation. Pumping against a closed valve is dangerous!
	Blocked discharge line.	Clear any obstructions in the discharge line.
	Narrowed pipe diameter due to settled solids.	Determine if solids have settled in piping and flush / remove as required.
	Viscosity or specific gravity of pumped fluid too high.	Consult Eccentric Pumps for suitable operating conditions for your pump.
Low suction pressure	Partially closed or closed suction valve.	Make sure the suction valve is fully open prior to and during operation. Pumping against a closed valve is dangerous!
	Failed hose.	Check to see if the hose has failed. If so, replace with a new hose and lubricant.
	Blocked suction line.	Clear any obstructions in the suction line.
	Suction line too long or too small.	Try to locate the pump as near to the source as possible. Oversize suction piping when possible.
	Viscosity or specific gravity of pumped fluid too high.	Consult Eccentric Pumps for suitable operating conditions for your pump.
Low flow	Failed hose.	Check to see if the hose has failed. If so, replace with a new hose and lubricant.
Poor hose life	Chemical incompatibility.	Consult Eccentric Pumps to see if you have the correct hose for your application.
	Normal wear.	The hose may have failed due to normal wear. Replace as required.
	Failure due to pulsations.	If you pump is equipped with a pulsation dampener, adjust its pressure. If you do not have a dampener, consult Eccentric Pumps.
	Too high discharge pressure.	Check items listed in "High discharge pressure" above. Running the pump against a closed valve, even for a short amount of time may damage hose.
	Settled solids in hose.	Flush the pump and hose prior to turning the pump off.
Lubricant Leaks	Hoselube leaking from front cover.	Cover bolts over-tightened. Refer to torque specifications in Assembly and Disassembly Manual.
	Hoselube leaking from hose clamps.	Pump body overfilled. Check hoselube level and adjust as necessary.
Hose failure	Hose wrapped around roller.	Pump operated against a closed discharge valve or blocked line. Replace hose and check pressure relief system.

## 4 Maintenance

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**Maintenance and repair of your Eccentric Pumps unit involves potentially hazardous procedures. Only trained and qualified personnel who have read and who understand the information presented in this manual, the Eccentric Pumps Assembly and Disassembly Manual, the reference publications and the supplier manuals shall maintain and repair this equipment.**

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Your Eccentric Pumps pump is designed to operate efficiently with very little maintenance. However, as with any equipment, malfunctions can occur. To keep your unit running well, preventive maintenance is essential.

### 4.1 Statement of Warranty

**WARRANTY:** Eccentric Pumps (Seller) warrants from date of shipment equipment (and its component parts) of its own manufacture against defects in materials and workmanship under normal use and service as follows; All pumps manufactured by Eccentric Pumps for a period of 18 months after shipment or 12 months after startup, whichever occurs first. Excluded from warranty are consumable items such as hoses, shafts, rollers, bearings and other wearing items.

Seller does not warrant accessories or components that are not manufactured by Seller. However, to the extent possible, Seller agrees to assign to the purchaser of equipment (Buyer) its rights under the original manufacturer's warranty, without recourse to Seller. Buyer must give Seller notice in writing of any alleged defect covered by this warranty (together with all identifying details, including the serial number, the type of equipment and the date of purchase) within thirty (30) days of the discovery of such defect during the warranty period. No claim more than 30 days after the expiration of the warranty period shall be valid.

If requested by Seller, any equipment (or its component parts) must be promptly returned to Seller prior to any attempted repair, or sent to an authorized service station designated by Seller, and Buyer shall prepay all shipping expenses. Seller shall not be liable for any loss or damage to goods in transit, nor will any warranty claim be valid unless the returned goods are received intact and undamaged as a result of shipment. Repaired or replaced material returned to customer will be shipped F.O.B., Seller's factory. Seller will not give Buyer credit for parts or equipment returned to Seller, and will not accept delivery of any such parts or equipment, unless Buyer has obtained Seller's approval in writing.

The warranty extends to repaired or replaced parts of Seller's manufacture for ninety (90) days or for the remainder of the original warranty period applicable to the equipment or parts being repaired or replaced. This warranty applies to the repaired or replaced part and is not extended to the product or any other component of the product being repaired. Seller may substitute new equipment or improve part(s) of any equipment judged defective without further liability. All repairs or services performed by Seller, which are not covered by this warranty, will be charged in accordance with Seller's standard prices then in effect.

THIS WARRANTY IS THE SOLE WARRANTY OF SELLER AND SELLER HEREBY EXPRESSLY DISCLAIMS AND BUYER WAIVES ALL OTHER WARRANTIES EXPRESSED, IMPLIED IN LAW OR IMPLIED IN FACT, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Seller's sole obligation under this warranty shall be, at its option, to repair or replace any equipment (or its component parts) which has a defect covered by this warranty, or to refund the purchase price of such equipment or part. Under the terms of this warranty, Seller shall not be liable for (a) consequential, collateral, special or liquidated losses or damages; (b) equipment conditions caused by normal wear and tear, abnormal conditions of use, accident, neglect, or misuse of said equipment; (c) the expense of, and loss or damage caused by, repairs or alterations made by anyone other than the Seller; (d) damage caused by abrasive materials, chemicals, scale deposits, corrosion, lightning, improper voltage, mishandling, or other similar conditions; (e) any loss, damage, or expense relating to or resulting from installation, removal or reinstallation of equipment; (f) any labor costs or charges incurred in repairing or replacing defective equipment or parts, including the cost of reinstalling parts that are

repaired or replaced by Seller; (g) any expense of shipment of equipment or repaired or replacement parts; or (h) any other loss, damage or expense of any nature.

**CONDITION TO WARRANTY WORK:** If Buyer is in default (including, but not limited to, the failure of Buyer to maintain a current account with Seller) under the Order or any other agreement between Buyer and Seller, Buyer's rights under the warranty shall be suspended and the original warranty period will not be extended.

**PERFORMANCE:** Equipment performance is not warranted or guaranteed unless separately agreed to by Seller in accordance with its guarantee policy. Performance curves and other information submitted to Buyer are approximate and no warranty or guarantee shall be deemed to arise as a result of such submittal. All testing shall be done in accordance with Seller's standard policy.

**LIABILITY LIMITATIONS:** Under no circumstances shall the Seller have any liability under the Order or otherwise for liquidated damages or for collateral, consequential or special damages or for loss of profits, or for actual losses or for loss of production or progress of construction, regardless of the cause of such damages or losses. In any event, Seller's aggregate total liability under the Order or otherwise shall not exceed the contract price. Buyer agrees to indemnify and hold harmless Seller from all claims by third parties in excess of these limitations.

## 4.2 Pump Parts

The use of genuine repair parts and hoses from Eccentric Pumps will ensure that your pump will operate trouble free for many years.

### 4.2.1 Ordering Spare Parts

When ordering spare parts, please have your pump order number (as listed on your packing slip), model number, size and description ready. If you have all of the information listed in *Section 2.3*, this will ensure quick service and accurate quoting and ordering. You may order these parts from your local distributor or from Eccentric Pumps directly.

### 4.2.2 Returning Parts to Eccentric Pumps

All parts or material returned to the factory must have prior approval and a return goods authorization (RGA) attached to the package. The RGA is available from Eccentric Pumps only. All parts should be suitably packaged to avoid damage in transit. All material should be returned freight prepaid unless otherwise agreed to by Eccentric Pumps.

## 4.3 General Preventative Maintenance Schedule

Check the following items in the intervals listed below, following all of the safety warnings in this manual:

- Check gauges on pump suction and discharge and pump operating speed to confirm operating point (**every 3 months**).
- Listen for scraping sounds or other odd noises (**every 3 months**).
- Check bearing temperature and compare with earlier readings (**every 6 months**).
- Run an amperage reading to verify that the motor is running normally (**every 6 months**).
- Inspect the fan guard and remove any accumulated debris from under it and around the motor (**every 6 months**).
- Tighten any fasteners that may be loose (**every 6 months**).
- Lubricate the motor as listed in *Section 4.4.1*.
- Lubricate the pump as listed in *Sections 4.4.2 or 4.4.3*.

## 4.4 General Pump Maintenance

The following information and procedures should be used as a guide to help you obtain the best performance from your pump.

**4.4.1 Motor Maintenance and Lubrication**

If so equipped, lubricate the motor every six months. Most motors have a grease fitting for grease-through lubrication. This fitting is found on the outer frame of the motor at both the top and bottom motor bearings. Just opposite (90 degrees) from the fitting is the relief plug. This may be a spring-loaded, pressure-relief plug that does not need to be removed before lubrication.

Use the following grease to lubricate the motor:

- Shell Dolium R (recommended)
- Standard of California Chevron SRI-2

When lubricating, clean the tip of the fitting and snap the grease gun onto the Zerk fitting. Apply grease as follows:

Motor Frame Size	Pumps from Gun
Through 254	1-2
254-365	2-3
365 plus	3-4

**Never over-grease the bearings.** After applying the recommended amount of grease, remove the gun and clean it.

**4.4.2 Pump Bearing Lubrication**

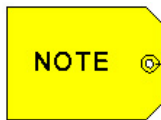
Grease lubricated pump bearings require an **NLGI Number 2 grease such as Shell Dolium R or equal**. The bearings should be greased every twenty-four months, depending on duty cycle and ambient conditions. Use a low pressure grease gun to pump grease into the Zerk fitting. If your pump was shipped without grease fittings, remove the plugs and replace them with a Zerk fitting.

The pump should be inspected and re-greased if you suspect that the original grease was contaminated by a grease seal failure.

**4.4.3 Hose Lubrication**

The pump requires lubrication of the hose. The lubrication provides longer hose life by increasing cooling and reducing friction between the roller and the hose. The use of non-standard lubricant can impact your hose life; therefore, genuine DST™ hoselube by Eccentric Pumps is recommended.

Fill your pump to the level indicated in the **Eccentric Pumps Assembly and Disassembly Manual**.



**Hose lubrication is critical to the success of your installation. Please refer to the lubrication instructions in the Eccentric Pumps Assembly and Disassembly Manual.**

**4.4.4 Hose Maintenance**

The hose will fail as part of its normal operating cycle. The hose is easily replaced as outlined in your pump's specific assembly and disassembly instructions.

**4.5 Pump Assembly and Disassembly**

Specific instructions for your Eccentric Pumps pump are located in the **Eccentric Pumps Assembly and Disassembly Manual** procedures for each size unit.

END OF TEXT