

INTRODUCTION

This instruction sheet provides you with the information required to safely own and operate your product. Retain these instructions for future reference.

The product you have purchased is of the highest quality workmanship and material, and has been engineered to give you long and reliable service. This product has been carefully tested, inspected, and packaged to ensure safe delivery and operation. Please examine your item(s) carefully to ensure that no damage occurred during shipment. If damage has occurred, please contact the place of purchase. They will assist you in replacement or repair, if required.

READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE, OR SERVICE YOUR PRODUCT. KNOW THE PRODUCT'S APPLICATION, LIMITATIONS, AND POTENTIAL HAZARDS. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION. FAILURE TO COMPLY WITH THESE INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE!

DESCRIPTION

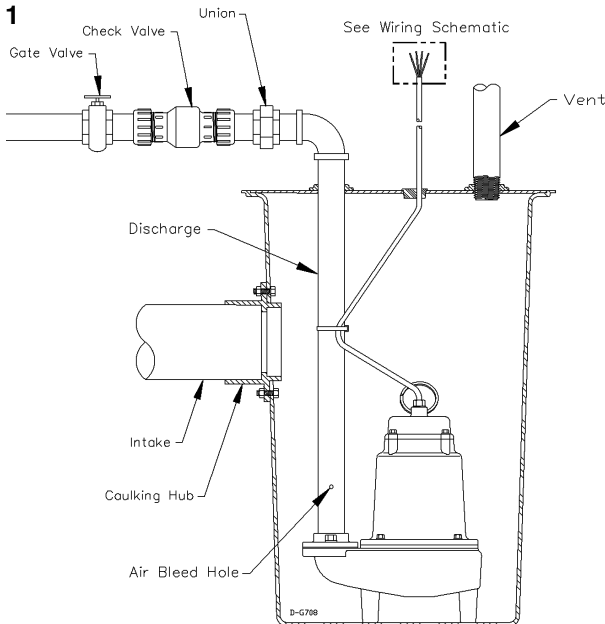
Little Giant submersible 16EH and 16S series pumps are recommended for use in basins or lift stations and suitable for pumping sewage, effluent, wastewater and other non-explosive, non-corrosive liquids. The S Series Sewage Pumps have 2" spherical solids handling capability. The EH Series Effluent Pumps have 3/4" spherical solids handling capability.

Little Giant offers a complete line of float switches and liquid level control systems for automatic operation along with a complete line of alarms, basins, covers, and check valves.

SPECIFICATIONS

Discharge:	16EH - 2", 16S - 3"
Handling Capabilities:	EH Series - 3/4" spherical solids S Series - 2" spherical solids
Housing:	Cast Iron
Volute:	Cast Iron
Impeller:	Non-clog cast iron, with pressure relief vanes
Motor:	3 phase, 3450 RPM (EH Series) 3 phase, 1725 RPM (S Series)
Hardware:	300 Series stainless steel
Bearing:	Ball
Shaft Seal:	Mechanical, spring loaded, rotating carbon with Nitrile boot and stationary ceramic seat, with secondary Nitrile exclusion seal
Power Cord:	18AWG, 4-conductor, copper-stranded

Figure 1



Cooling:

The motor housing contains a cooling oil to provide cooling for the motor and to lubricate bearings and seals. These pumps are capable of operating with the motor housing partially exposed for extended periods of time, providing sufficient motor cooling and bearing lubrication, however, for the best cooling and longest motor life, the liquid being pumped should normally be above the top of the cast iron motor housing.

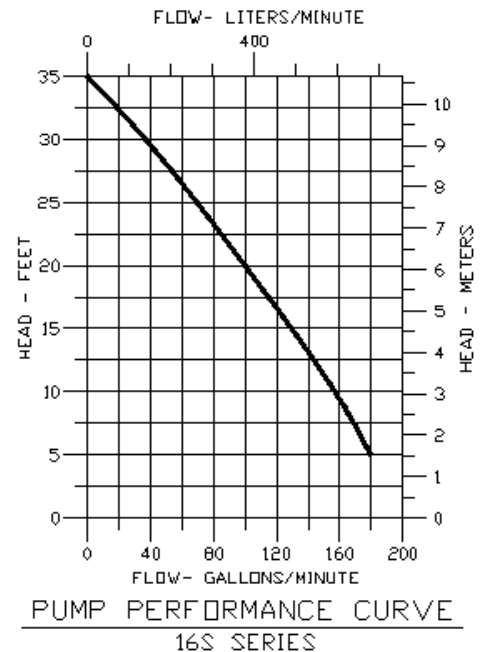
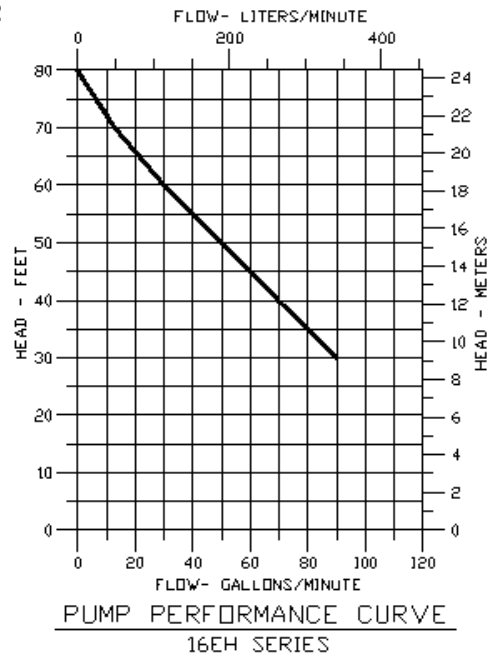
SAFETY GUIDELINES



WARNING: RISK OF ELECTRIC SHOCK. THIS PUMP IS SUPPLIED WITH A GROUNDING CONDUCTOR. TO REDUCE THE RISK OF ELECTRIC SHOCK, BE CERTAIN THAT IT IS CONNECTED TO A PROPER ELECTRICAL GROUND. DO NOT REMOVE CORD OR STRAIN RELIEF, DO NOT CONNECT CONDUIT TO PUMP. THIS PUMP MUST BE INSTALLED BY QUALIFIED PERSONNEL.

1. Read all instructions and safety guidelines thoroughly. Failure to follow the guidelines and the instructions could result in serious bodily injury and/or property damage.
2. DO NOT USE TO PUMP FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

Figure 2



- During normal operation the pump is immersed in water. Also, during rain storms, water may be present in the surrounding area of the pump. Caution must be used to prevent bodily injury when working near the pump.
- Do not run the pump in a dry basin. If the pump is run in a dry basin, the surface temperature of the pump will rise to a high level. This high level could cause skin burns if the pump is touched and could cause serious damage to your pump.
- Do not oil the motor. The pump housing is sealed. A high grade dielectric oil devoid of water has been put into the motor housing at the factory. Use of other oil could cause serious electric shock and/or permanent damage to the pump.
- Do not install in locations classified as hazardous in accordance with the National Electrical Code, ANSI/NFPA70.
- When a pump is in a basin, etc., do not touch motor, pipes or water until unit is unplugged or shut off. If your installation has water or moisture present, do not touch wet area until all power has been turned off. If shut-off box is not accessible, call the electric company to shut off service to the house, or call your local fire department for instructions. Failure to follow this warning can result in fatal electrical shock.
- The flexible jacketed cord assembly mounted to the pump must not be modified in any way, with the exception of shortening the cord to fit into a control panel. Any splice between the pump and the control panel must be made within a junction box and mounted outside of the basin, and comply with the National Electric Code. Do not use the power cord for lifting the pump.
- In any installation where property damage and/or personal injury might result from an inoperative or leaking pump due to power outages, discharge line blockage, or any other reason, a backup system(s) and/or alarm should be used.

INSTALLATION

For automatic operation, this pump must be wired into a separate control panel. Refer to the instructions supplied with the control panel for all safety and installation procedures.

This pump is intended to be used with a control which incorporates thermal or overload protection and stalled rotor conditions and shall be rated or set to a maximum ampere rating as noted below.

16EH-CIM		Control		16S-CIM		Control	
Volts	Amps	Amp	Setting	Volts	Amps	Amp	Setting
208-240	6.6	7.6	Max	230	6.3	7.3	Max
380	2.6	3.0	Max	380	2.3	2.6	Max
460	3.2	3.7	Max	460	3.0	3.5	Max
575	2.5	2.9	Max	575	2.5	2.9	Max
				200-208	6.8	7.8	Max

The pump will run continuously when wired directly into an electrical outlet. Care should be taken to prevent pump running in a dry sump.

The pump rotation needs to be checked to ensure that the pump is running in the correct direction. After completing the wiring and with the circuit breakers in the "off" position, lay pump on the side to observe the direction of rotation through the intake. Turn circuit breakers to the "on" position. The impeller should be rotating counter clockwise. To change the rotation, interchange any two of the white, red, or black wires of the pump at the disconnect box.

Pump must be installed in a suitable gas tight basin which is at least 18" in diameter and 30" deep and vented in accordance with local plumbing codes.

Pump must be placed on a hard level surface. Never place pump directly on clay, earth or gravel surfaces.

Pump can be installed with ABS, PVC, polyethylene or galvanized steel pipe. Proper adapters are required to connect plastic pipe to pump.

A union should be installed just above the cover to facilitate pump removal if necessary.

A check valve must be used in the discharge line to prevent back flow of liquid in the basin. The check valve should be a free flow valve that will easily pass solids.

CAUTION: For best performance of check valves, when handling solids install in a horizontal position or at an angle of no more than 45°. Do not install check valve in a vertical position as solids may settle in valve and prevent opening on start-up.

A gate valve should follow the check valve to allow periodic cleaning of the check valve or removal of the pump.

The remainder of the discharge line should be as short as possible with a minimum of turns to minimize friction head loss. Do not restrict the discharge to sizes below 2".

Sewage and effluent applications will require a separate sump vent. A connection is provided on top of the sump or cover which must be piped to the existing building vent or extended outside with its own standpipe.

Check local electrical and building codes before installation. The installation must be in accordance with their regulations as well as the most recent National Electrical Code (NEC).

To conform to the National Electrical Code, all pumps must be wired with 14 AWG or larger wire. For runs to 250', 14 AWG wire is sufficient. For longer runs, consult a qualified electrician or the factory.

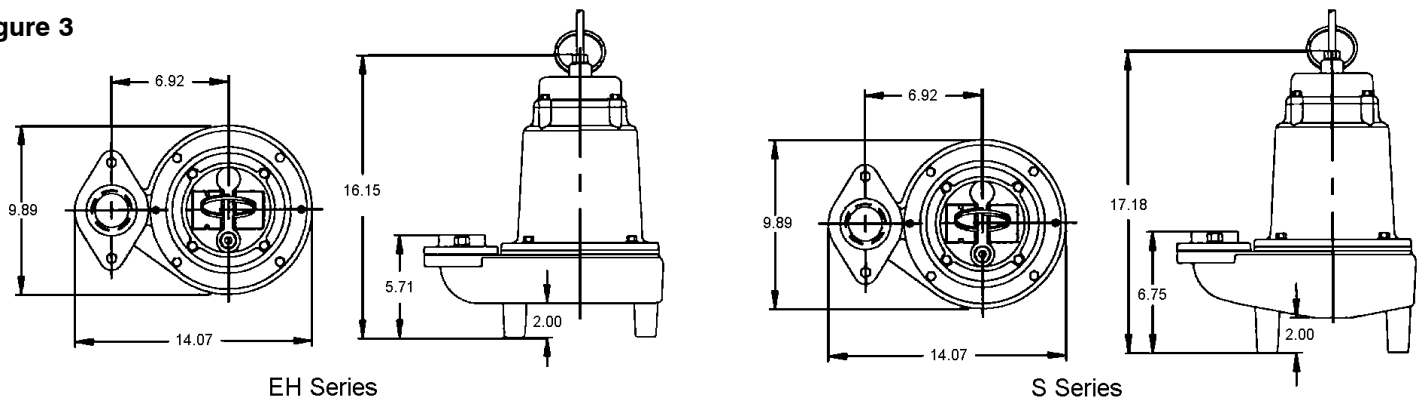
Pump should be connected or wired to its own circuit with no other outlets or equipment in the circuitry line. Fuses and circuit breaker should be of ample capacity in the electrical circuit.

MAINTENANCE AND SERVICE

If pump does not operate properly, consult the Troubleshooting Chart. If trouble cannot be located with these steps shown, consult your pump dealer or take pump to a Little Giant authorized service center.

CAUTION: When working on pump or switch, always unplug pump power cord in addition to removing fuse or shutting off circuit breaker before working on pump.

Figure 3

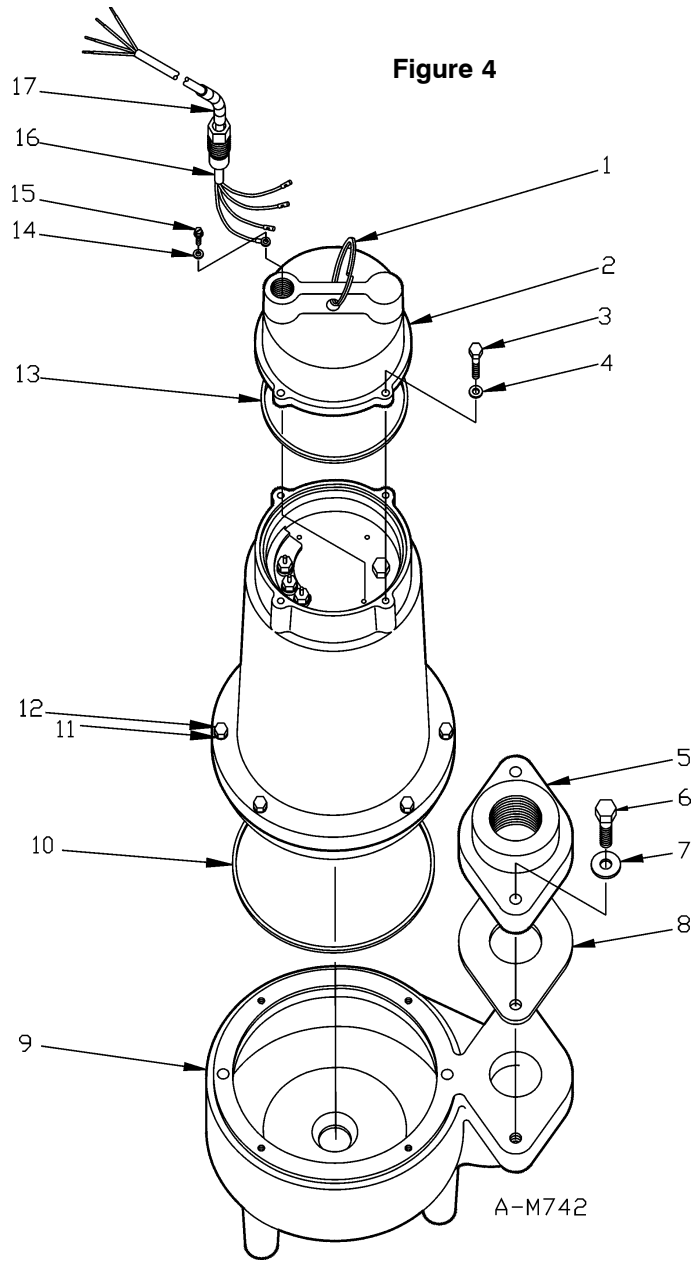


Model No.	Catalog No.	HP	Ph.	Volts	Hz.	Amps	GPM @ Head							Shut Off		Power Cord (ft.)	Weight (lbs.)
							5'	10'	20'	30'	40'	50'	60'	(ft.)	P.S.I.		
16EH-CIM	514530	1	3	208-240	60	6.6	NR	NR	NR	90	70	50	30	81	35.1	20	82
16EH-CIM	514540	1	3	460	60	3.2	NR	NR	NR	90	70	50	30	81	35.1	20	82
				380	50	2.5	NR	NR	69	45	18	--	--	55	23.8		
16EH-CIM	514550	1	3	575	60	2.5	NR	NR	NR	90	70	50	30	81	35.1	20	82
16S-CIM	514720	1	3	230	60	6.3	180	160	100	32	--	--	--	35	15.1	20	88
				460	60	3.0	180	160	100	32	--	--	--	35	15.1		
16S-CIM	514730	1	3	380	50	2.3	140	128	10	--	--	--	25	10.8	20	88	
16S-CIM	514740	1	3	575	60	2.5	180	160	100	32	--	--	--	35	15.1	20	88
16S-CIM	514750	1	3	200-208	60	6.8	180	160	100	32	--	--	--	35	15.1	20	88

CLEANING IMPELLER AND VOLUTE

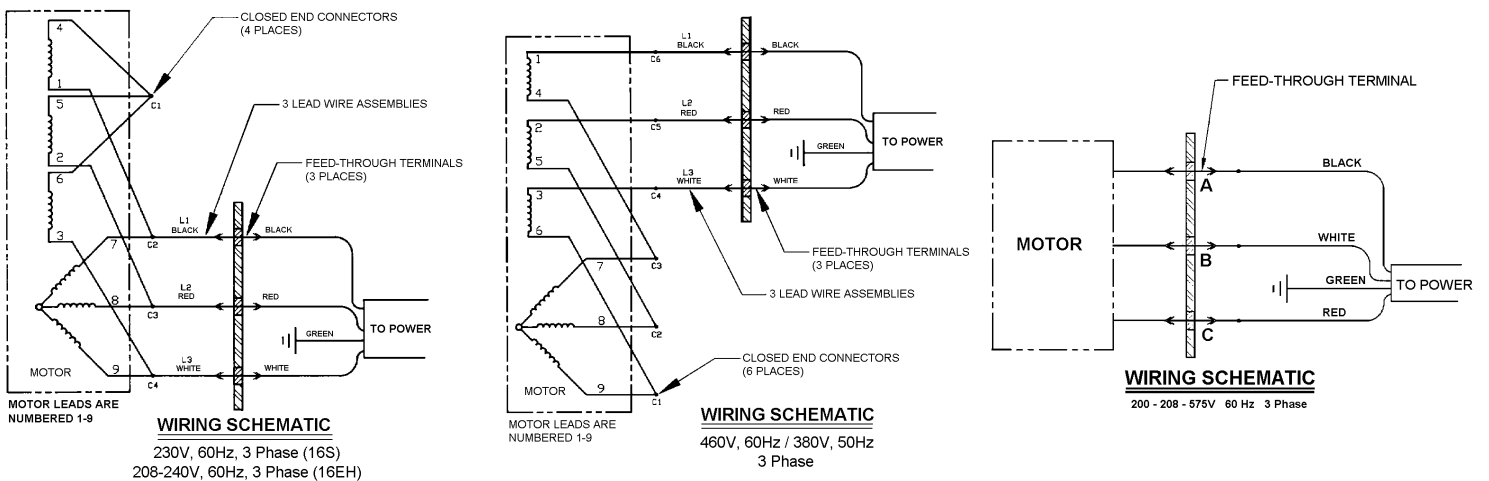
WARNING: DO NOT REMOVE THE SOCKET HEAD CAP SCREWS. THE MOTOR SECTION OF YOUR PUMP IS PERMANENTLY LUBRICATED WITH DIELECTRIC OIL AND SEALED AT THE FACTORY. REMOVAL OF THESE SOCKET HEAD CAP SCREWS BY ANYONE OTHER THAN AN AUTHORIZED LITTLE GIANT SERVICE CENTER WILL BREAK THIS SEAL AND VOID THE WARRANTY.

1. Remove the 4 screws (item 12 on parts list) that hold the volute to the motor housing.
2. Clean impeller and volute passage.
3. Be sure impeller turns freely after cleaning.



REPLACEMENT PARTS				514720	514730	514740	514530	514540	514550	514750
ITEM	PART NO.	DESCRIPTION	QTY.							
1	114100	WIRE HANDLE	1	•	•	•	•	•	•	•
2	114051	COVER, HOUSING	1	•	•	•	•	•	•	•
3	903723	SCREW, 1/4 - 20 X 3/4	4	•	•	•	•	•	•	•
4	921103	LOCKWASHER, 1/4	4	•	•	•	•	•	•	•
5	114009	DISC, FLANGE 3" FNPT	1	•	•	•				
5	114004	DISC, FLANGE 2" FNPT	1				•	•	•	
6	903722	SCREW, 7/16 - 14 X 11/4	2	•	•	•	•	•	•	•
7	921104	LOCKWASHER, 7/16	2	•	•	•	•	•	•	•
8	114101	FLANGE GASKET	1	•	•	•	•	•	•	•
9	114043	VOLUTE, 14S/16S	1	•	•	•				
9	114038	VOLUTE, 14EH/16EH	1				•	•	•	
10	928033	SEAL RING, 7.484 I.D.	2	•	•	•	•	•	•	•
11	921105	LOCKWASHER, 5/16	4	•	•	•	•	•	•	•
12	903724	SCREW, 5/16 - 18 X 11/4	4	•	•	•	•	•	•	•
13	928034	SEAL RING, 5.359 I.D.	1	•	•	•	•	•	•	•
14	921059	LOCKWASHER #8	1	•	•	•	•	•	•	•
15	902437	SCREW #8-32 X 1/4	1	•	•	•	•	•	•	•
16	951072	WIRING HARNESS, ASSY	1	•	•	•	•	•	•	•
17	950985	CABLE TIE, HELI TUBE	1	•	•	•	•	•	•	•

Figure 5



TROUBLESHOOTING

PROBLEM	PROBABLE CAUSES	CORRECTIVE ACTIONS
Pump does not turn on.	Pump not plugged in.	Plug in pump.
	Circuit breaker shutoff or fuse removed.	Turn on circuit breaker or replace fuse.
	Accumulation of trash on mercury float switch.	Clean float.
	Mercury float switch obstruction.	Check float path and provide clearance.
	Defective switch.	Disconnect switch, check w/ohmmeter: Open=infinite resistance, closed=zero.
	Defective motor.	Have pump serviced.
Pump will not shut off.	Mercury float switch obstruction.	Check float path and provide clearance.
	Pump is air locked.	Shut power off for approximately 1 minute, then restart. Repeat several times to clear air from pump. If system includes a check valve, a 3/16" hole should be drilled in discharge pipe approximately 2" above discharge connections.
	Liquid inflow matches pump capacity.	Larger pump required.
	Defective switch.	Disconnect switch, check w/ohmmeter: Open=infinite resistance, closed=zero.
	Loose connection in level control wiring.	Check control wiring.
Pump runs but does not discharge liquid.	Check valve installed backwards.	Check flow indicating arrow on check valve body to ensure it is installed properly.
	Check valve stuck or plugged.	Remove check valve and inspect for proper operation.
	Lift too high for pump.	Check rating table.
	Inlet to impeller plugged.	Pull pump and clean.
	Pump is air locked.	(See corrective action above.)
Pump does not deliver rated capacity.	Lift too high for pump.	Check rated pump performance.
	Rotation incorrect.	Switch any two of the line wires.
	Low voltage, speed too slow.	Check for proper supply voltage to make certain it corresponds to nameplate voltage.
	Impeller or discharge pipe is clogged.	Pull pump and clean. Check pipe for scale or corrosion.
	Impeller wear due to abrasives.	Replace worn impeller.
Pump cycles continually.	No check valve in long discharge pipe allowing liquid to drain back into basin.	Install a check valve in discharge line.
	Check valve leaking.	Inspect check valve for correct operation.
	Basin too small for inflow.	Install larger basin.

LIMITED WARRANTY

SUMP, EFFLUENT & RESIDENTIAL SEWAGE

Little Giant #8E, #9E, #10E, #14EH, #16EH Series Submersible Effluent Pumps are recommended for use in sumps, basins or lift stations and suitable for pumping basement drainage water, effluent, wastewater and other non-explosive, non-corrosive, non-abrasive liquids not above 140°F with up to 3/4" spherical solids handling ability. (NOT TO BE USED FOR SEWAGE WATER EXCEPT TO PUMP SEPTIC TANK EFFLUENT.)

Little Giant #9S, #10S, #14S and #16S Series Submersible Sewage Ejector Pumps are recommended for use in sumps, basins or lift stations and suitable for pumping sewage, effluent, wastewater, and other non-explosive, non-corrosive, non-abrasive liquids not above 140°F with up to 2" spherical solids handling ability.

Each of the above noted Little Giant products is guaranteed to be in perfect condition when it leaves our factory. During the time periods and subject to the conditions hereinafter set forth, LITTLE GIANT PUMP COMPANY, subsidiary of Franklin Electric Company, Inc., will repair or replace to the original user or consumer any portion of your new LITTLE GIANT product which proves defective due to materials or workmanship of LITTLE GIANT. Contact your nearest authorized Little Giant service station for warranty service. At all times LITTLE GIANT shall have and possess the sole right and option to determine whether to repair or replace defective equipment, parts, or components. Damage due to lightning or conditions beyond the control of LITTLE GIANT is NOT COVERED BY THIS WARRANTY.

WARRANTY PERIOD

PUMPS: 24 months from date of purchase or 30 months from date of manufacture, whichever comes first.

LABOR, ETC. COSTS: LITTLE GIANT shall IN NO EVENT be responsible or liable for the cost of field labor or other charges incurred by any customer in removing and/or affixing any LITTLE GIANT product, part or component thereof.

THIS WARRANTY WILL NOT APPLY:

1. to defects or malfunctions resulting from failure to properly install, operate, or maintain the unit in accordance with printed instructions provided
2. to failures resulting from abuse, accident or negligence
3. to normal maintenance services and the parts used in connection with such service
4. to units which are not installed in accordance with applicable local codes, ordinances and good trade practices
5. unit is used for purposes other than for what it was designed and manufactured
6. if pump exposed to but not limited to the following: sand, gravel, cement, grease, plaster, mud, tar, hydrocarbons, or hydrocarbon derivatives (oil, gasoline, solvents, etc.) or other abrasive or corrosive substances
7. if pump has been used for continuous pumping of suitable liquids above 140°F
8. if cord cut off to a length less than three feet
9. if pump has been dismantled by customer (dealer only can dismantle pump for field service)

RETURNED OR REPLACED PRODUCT: Any product to be replaced under the Warranty must be returned to LITTLE GIANT at 301 North MacArthur Blvd., Oklahoma City, OK 73127-6616 or such other place as LITTLE GIANT may designate, freight prepaid.

PRODUCT IMPROVEMENTS: Little Giant reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for units sold and/or shipped to such change or improvement.

DISCLAIMER: Any oral statements about the product made by the seller, the manufacturer, the representatives or any other parties, do not constitute warranties, shall not be relied upon by the user, and are not part of the contract for sale. Seller's and manufacturer's only obligation, and buyer's only remedy, shall be the replacement and/or repair by the manufacturer of the product as described above. Neither seller nor the manufacturer shall be liable for any injury, loss or damage, direct, incidental or consequential (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss), arising out of the use or the inability to use the product, and the user agrees that no other remedy shall be available to it. Before using, the user shall determine the suitability of the product for his intended use, and user assumes all risk of liability whatsoever in connection therewith. The warranty and remedy described in this limited warranty is an EXCLUSIVE warranty and remedy and is IN LIEU OF any other warranty or remedy, expressed or implied, which other warranties and remedies are hereby expressly EXCLUDED, including but not limited to any implied warranty of MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow the exclusive 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.

In the absence of other suitable proof of the purchase date, the effective date of this warranty will be based upon the date of manufacture plus two years. Direct all notices, etc., to: Service Department, LITTLE GIANT PUMP COMPANY, 301 N. MacArthur Blvd., Oklahoma City, OK 73127-6616.

DETERMINATION OF UNIT DATE OF MANUFACTURE: (9-87) month and year stamped on pump and/or serial number on pump nameplate coded to indicate year of manufacture.

For parts or repair, please contact 1.888.572.9933
For technical assistance, please contact 1.888.956.0000

www.LittleGiantPump.com
CustomerService-WTS@fele.com