Little GIANT Pump Company

3810 North Tulsa Street
Oklahoma City, Oklahoma
73112
(405) 947-2511

OWNERS MANUAL FOR Little Giant® MODEL 20G AND 20GH AUTOMATIC GRINDER PUMP

- INSTALLATION
- OPERATION
- REPAIR PARTS
- SAFETY

I PHASE

INTRODUCTION

Little Giant 20 Series Submersible 20G and 20GH Automatic Grinder Pumps are recommended for use in basins or lift stations and suitable for pumping residential sewage, effluent, wastewater and other non-explosive, non-corrosive liquids.

Little Giant Grinder pumps utilize a cutting mechanism located on the suction side of the pump. The solids are cut into a slurry which pass directly through the volute into the discharge line by a semi-vortex non-clog impeller.

The Little Giant Automatic Grinder Pumps are equipped with a non-mercury float switch. The non-mercury float switch allows the pump to operate automatically by cycling the pump on and off. The non-mercury float switch is attached to the pump at a pre-determined tether length. **BE SURE TO CHECK THE TETHER LENGTH OF THE SWITCH TO ENSURE THAT IT HAS NOT CHANGED DURING SHIPPING.** Improper tether length could allow the pump to run dry and cause damage to the pump.

Little Giant pumps are carefully packaged, 100% inspected and tested to insure safe operation and delivery. When you receive your pump, examine it carefully to determine that there are no broken or damaged parts which may have occurred during shipment. If damage has occurred, make notation and notify the firm from which you purchased the pump. They will assist you in replacement or repair, if required. Pump must be installed by experienced professionals only, and in accordance with local plumbing and electrical codes.

SPECIFICATIONS

Discharge Size:	20GH-CIA-RFS - 1-1/4" FNPT Vertical 20G-CIA-RFS - 1-1/4" FNPT Vertical
Operating Capabilities:	140°F (60°C)
Pump Housing:	Cast Iron with epoxy paint coating
Volute:	Cast Iron with epoxy paint coating
Impeller:	Semi-vortex non-clog brass with pressure relief vanes
Motor:	3450 RPM with automatic high temperature protection.
Hardware:	300 series stainless steel
Bearings:	Upper and lower ball.
Shaft Seal:	Type 21 mechanical, spring loaded, rotating carbon with Viton© bellows and stationary ceramic with Viton© O-ring.
Power Cord:	12 AWG 3-conductor, copper, stranded
Cooling:	The motor housing contains a dielectric oil to provide cooling for the motor and to lubricate the 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 the longest motor life, the liquid level being pumped should normally be above the top of the cast iron motor cover.
Cutters:	440C stainless steel, hardened to Rockwell C60.

SAFETY

RISK OF ELECTRIC SHOCK
READ INSTRUCTIONS AND SAFETY GUIDELINES THOROUGHLY. FAILURE TO FOLLOW THESE COULD RESULT IN SERIOUS INJURY OR PROPERTY DAMAGE!

DURING NORMAL OPERATION THE SWITCH AND PUMP ARE IN CONTACT WITH WATER. ALSO, EXERCISE EXTREME CAUTION WHEN WORKING NEAR THESE AREAS!

A. Make certain that electrical connections cannot be reached by rising water. Refer to the National Electrical Code and local requirements. A separate branch circuit is recommended for each pump. Do not use an extension cord.

B. Always turn off the circuit breaker prior to touching, servicing or repairing the switch or pump.

C. Do not stand in water while changing fuses, resetting circuit breakers or repairing the switch.

This pump is supplied with a grounding conductor. To reduce the risk of electric shock, be certain that it is connected only to a properly grounded, grounding-type receptacle or ground wire in the junction box.

When a pump is in a basin, etc., do not touch motor housing, 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 the local fire department for instructions. Failure to follow this warning can result in fatal electric shock.

In any installation where property damage and/or personal injury might result from an inoperative or leaking pump, due to long term power outages, discharge line blockage or any other reason, a backup system with an alarm should be installed.

SAFETY GUIDELINES

1. Read all instructions and Safety Guidelines thoroughly. Failure to follow the guidelines and instruction 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.
3. The pump motor is equipped with an internal thermal protector switch that opens to stop the motor when exceeding normal operating temperatures or the pump draws excessive current. This switch will reset itself and start the pump when cooled to normal temperatures.
4. During normal operation the grinder 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.
   a. Electrical power must be disconnected prior to touching, servicing or repairing the pump.
   b. To minimize possible fatal electrical shock hazard, extreme care should be used when changing breakers. Do not stand in water while changing breakers or insert anything other than the properly rated breaker in the breaker socket.
5. 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 will cause serious damage to your pump.
6. Do not check or add oil to 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 and void warranty.
7. Do not install in locations classified as hazardous in accordance with the National Electric Code, ANSI/NFPA 70.
8. Do not place hands, feet or clothing near the cutter mechanism when there is any possibility the pump is connected to a power source. This pump contains a cutting mechanism with very sharp edges that can cause severe bodily injury.

INSTALLATION

Pump must be installed in a suitable gas tight basin, which is at least 24" in diameter and 48" deep, and vented in accordance with local plumbing codes.

It is recommended for best performance and satisfactory installation to use a complete factory built basin package system. This system includes optimum materials of construction for operation.

Pump must be placed on a hard level surface using a leg accessory kit available from Little Giant Pump Company if unable to suspend the pump intake at least 3-1/2" from bottom of basin.

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 any non-metal pipe to the pump discharge if pump is suspended by the discharge on a guide rail system.**

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

CAUTION:

For best performance of check valves, when handling solids, install in a horizontal position. Do not install check valve in a vertical position as solids may settle in valve and prevent opening at start-up.

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

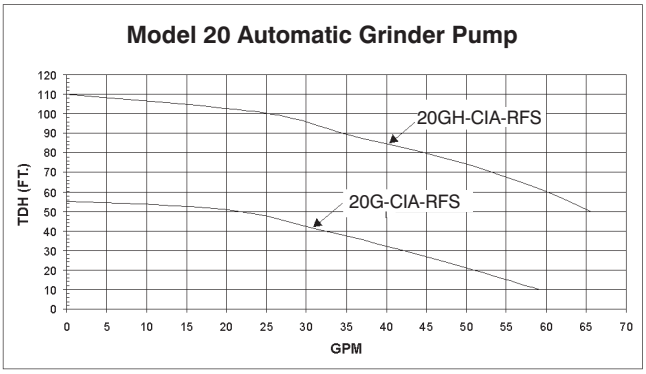


FIGURE 1

PUMP PERFORMANCE AND SIZING CHART

MODEL NO.	CATALOG NO.	HP	PH	VOLTS	HZ	AMPS	GPM @ HEAD							SHUT OFF (FT)	POWER CORD (FT)	WEIGHT (LBS)
							10'	20'	40'	60'	80'	100'	105'			
20G-CIA-RFS	520510	2	1	230	60	12.0	58	52	32	—	—	—	—	55'	20'	117
20G-CIA-RFS	520535	2	1	200-208	60	13.5	58	52	32	—	—	—	—	55'	20'	117
20GH-CIA-RFS	520610	2	1	230	60	18.0	—	—	—	60	45	25	15	110'	20'	117
20GH-CIA-RFS	520635	2	1	200-208	60	20.0	—	—	—	60	45	25	15	110'	20'	117

WIRING

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

This pump should be connected or wired to a dedicated circuit with no other outlets or equipment in the circuit line. The circuit breaker should be of ample capacity in the electrical circuit. See chart below.

H.P.	VOLTAGE	CIRCUIT BREAKER AMPS
2	230	25
2	200-208	25

LIQUID LEVEL CONTROL (NON-MERCURY FLOAT SWITCH)

INTRODUCTION

The Little Giant Model RFSN-20 Liquid Level Control is designed to be used with the 20GH-CIA-RFS & 20G-CIA-RFS Automatic Grinder pumps. These controls use a non-mercury switch sealed in a plastic float cylinder. The switch is activated when the fluid level in the basin causes the cylinder to float to an approximate angle of 45 degrees. This causes the switch to activate and in turn causes the pump to start.

Little Giant products are carefully inspected and packaged to insure safe operation and delivery. Please inspect the switch to make sure there are no broken or damaged parts that may have occurred during shipment. If damage has occurred, make notation and notify the firm from which you purchased the switch. They will assist you in replacement or repair of the switch.

ELECTRICAL

RFSN-20
230 VAC, 60Hz, Single Phase
Maximum pump running current 20 amps
Maximum pump starting current 120 amps
Recommended for use on pumps of 3 HP or less provided pump draw does not exceed 20 running amps or 120 starting amps.

INSTALLATION

The automatic grinder pump is shipped with the non-mercury float switch installed at the factory. The tether length is set at a pre-determined length. **BE SURE TO CHECK THE TETHER LENGTH OF THE SWITCH TO ENSURE THAT IT HAS NOT CHANGED DURING SHIPPING.** (SEE FIGURE 6)

WIRING

The Automatic Grinder Pump requires use of a junction box for wiring the float switch to the pump power cord. Wiring the junction box could result in possible injury due to electric shock if not performed by a certified electrician. Little Giant assumes no responsibility for improper wiring of the pump/float switch in the junction box. (SEE FIGURE 2)

JUNCTION BOX WIRING SCHEMATIC

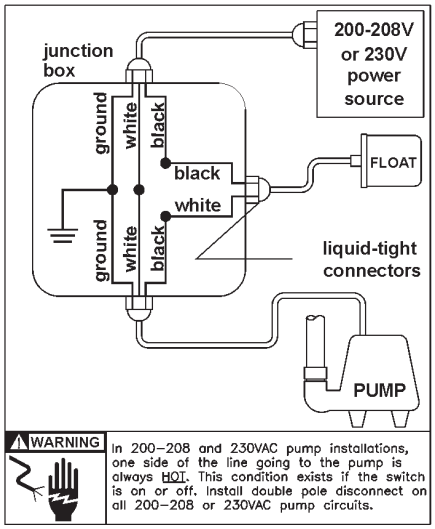
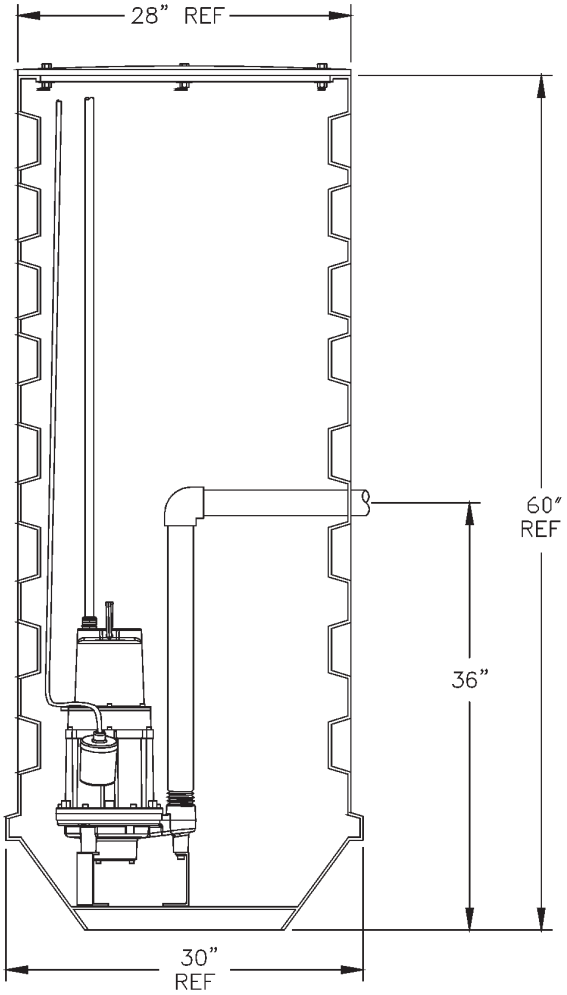


FIGURE 2

TYPICAL AUTOMATIC GRINDER PUMP WITH BASIN ASSEMBLY



LEG KIT (599044) MUST BE USED WITH HARD PIPED BASINS

FIGURE 3

MAINTENANCE

If pump does not operate properly, consult the Troubleshooting Chart. If trouble cannot be located with the steps shown, consult your pump dealer or take pump to a Little Giant authorized service center. Grinder pump is to be cleaned and sanitized prior to returning pump to Little Giant Pump Co.

WARNING: When working on pump or switch, **always** disconnect pump power cord in addition to shutting off circuit breaker or removing the fuse before working on pump.

CLEANING IMPELLER AND VOLUTE (SEE FIGURE 4)
CAUTION: DO NOT REMOVE MOTOR HOUSING 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.

IMPORTANT: The pump should be thoroughly cleaned of all debris before disassembling.

WARNING: When working on pump, **always** disconnect power cord in addition to shutting off circuit breaker before working on pump.

This pump is equipped with a cutting mechanism that has very sharp edges, and caution should be used when working on or near these parts (item numbers 7 & 8 on Parts List).

1. Lay pump on its side on a smooth hard surface. Remove inner cutter (item 8 on parts list) by inserting flat head screwdriver into the slot on the end of motor shaft. While keeping the shaft from rotating, begin tapping on cutter protrusion with rubber hammer in the counterclockwise direction. Remove cutter by continuing to rotate in a counterclockwise direction while keeping the shaft still.
2. Remove the (6) 5/16" socket head cap screws (item 4 on parts list) from the bottom motor housing and separate from volute (item 6).
3. Clean impeller and volute passage. Do not use strong solvents on impeller. Do not remove impeller. The impeller is positioned to hold the mechanical seal in position. Pump will leak oil if this seal is separated and void warranty.
4. Be sure impeller turns freely after cleaning.

LIMITED WARRANTY

Little Giant 20GH and 20G Series Submersible Automatic Grinder Pumps are recommended for use in sumps, basins or lift stations and suitable for pumping sewage and other non-explosive, non-corrosive, non-abrasive liquids not above 140°F.

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 Tecumseh Products Company 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 Dealer for warranty services.

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: 12 months from date of installation or 18 months from date of manufacture, whichever occurs 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. if 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 power cord has been cut, or shortened to a length less than 3 feet.
9. if pump has been dismantled by customer other than cleaning cutter (Dealer only can dismantle pump for field service.)

RETURNED OR REPLACED COMPONENTS: Any item to be replaced under the Warranty must be returned to Little Giant Pump Company at Oklahoma City, OK or such other place as Little Giant Pump Company may designate, freight prepaid.

PRODUCT IMPROVEMENTS: Little Giant Pump Company reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvements 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 installation date, the effective date of this warranty will be based upon the date of manufacture plus one year. Direct All Notices, etc. To: Service Department, Little Giant Pump Company, 3810 N. Tulsa Street Oklahoma City, OK 73112-2935.

TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSES	CORRECTIVE ACTION
Pump does not turn on.	Circuit breaker shutoff or fuse removed.	Turn on circuit breaker or replace fuse.
	Accumulation of trash on or around float.	Clean float and area around float.
	Pump not wired correctly.	Check wiring diagram (resistance values) and connections.
	Float obstruction.	Check float path and provide clearance.
	Defective motor.	Have pump serviced by authorized service center.
	Defective float.	Disconnect switch (float), check with Ohmmeter, Open-infinitive resistance, closed zero.
Pump will not shut off.	Float 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. A 3/16" hole should be drilled in discharge pipe approximately 2" above discharge connection. If there is already a hole drilled, check for stuck debris.
	Defective Switch.	Disconnect switch (float), check with Ohmmeter, Open-infinitive resistance, closed zero.
	Loose connection in level control wiring.	Check control wiring for loose or improper connection.
Pump runs but does not discharge liquid.	Check valve installed backwards.	Check flow indicating arrow on check valve body to insure it is installed properly.
	Check valve stuck or plugged.	Remove check valve and inspect for proper operation.
	Inlet to impeller clogged.	Remove pump from system and clean as described in Maintenance section of manual.
	Pump is air locked.	Shut power off for approximately 1 minute, then restart. Repeat several times to clear air from pump. A 3/16" hole should be drilled in discharge pipe approximately 2" above discharge connection. If there is already a hole drilled, check for stuck debris.
Pump does not deliver rated capacity.	Lift too high for pump.	Check rated pump performance
	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.
	Impeller diameter too small for system.	Check rated pump performance. Replace with larger diameter impeller.
Pump cycles continually.	No check valve in long discharge pipe allowing liquid to drain back into basin.	Install check valve in discharge line.
	Check valve leaking.	Inspect check valve for obstruction or defect. Clean or replace.
	Basin too small for inflow.	Install larger basin (24" min.dia.).
Pump is noisy.	Inlet may be clogged and overloading the motor.	Remove pump from system and clean as described in Maintenance section of manual.
	Grinder element may be rubbing on each other due to bent shaft or misalignment.	Have pump serviced by authorized service center.
	Defective motor bearings.	Have pump serviced by authorized service center.
Circuit breaker trips.	Improper wiring in Junction box.	Check wiring in Junction box (see Wiring diagram). If Circuit Breaker continues to trip, remove pump and take it to an authorized Service Center.
	Obstruction inside volute causing impeller to be locked.	Refer to Maintenance Section of Instruction Sheet and remove volute to check impeller. If Circuit Breaker continues to trip, remove pump and take it to an authorized Service Center.

PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION	520510 20G–CIA–RFS	520535 20G–CIA–RFS	520610 20GH–CIA–RFS	520635 20GH–CIA–RFS
1	909022	Screw, Washer Assy, 10–24 x 5/8	1	1	1	1
2	927026	Clamp, Loop, 3/8	1	1	1	1
3	599318	RFSN–20, Float Switch	1	1	1	1
4	903726	Screw Cap, 5/16 x 1, Hex Socket	6	6	6	6
5	928029	Square Nitrile Ring Seal (5.951 I.D.)	1	1	1	1
6	120103	Volute, 20G	1	1	1	1
7	120210	Cutter, Outer	1	1	1	1
8	120211	Cutter, Inner	1	1	1	1
9	120077	Retaining Plate, Cutter	1	1	1	1
10	903711	Screw, Cap, 1/4–20 x 3/4, Hex Socket	1	1	1	1
11	904702	Screw, Set, 1/4–20 x 3/4, Cup Point	1	1	1	1
(599044) OPTIONAL GRINDER LEG KIT						
12	921009	Washer, Lock, 3/8	3	3	3	3
13	901002	Screw, Cap, 3/8–16 x 1, Hex Socket	3	3	3	3
14	120903	Leg, Accessory	3	3	3	3

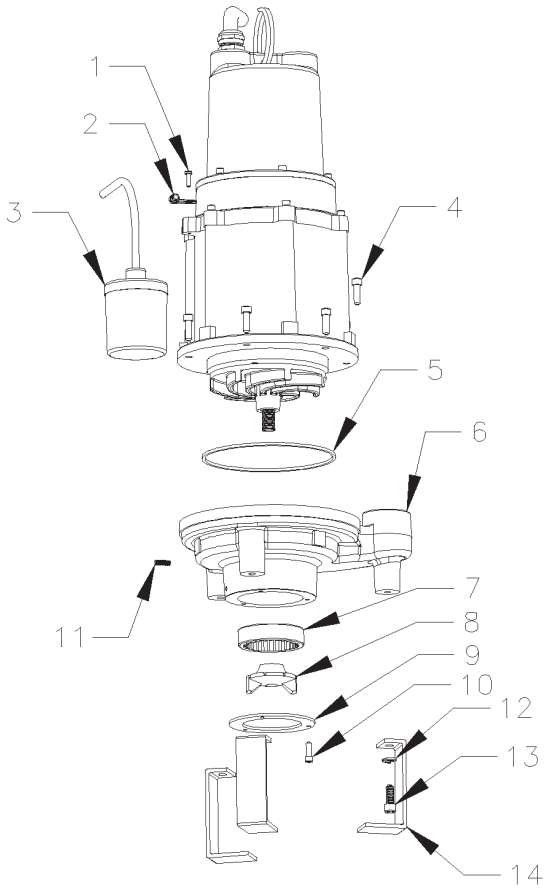


FIGURE 4

DIMENSIONS

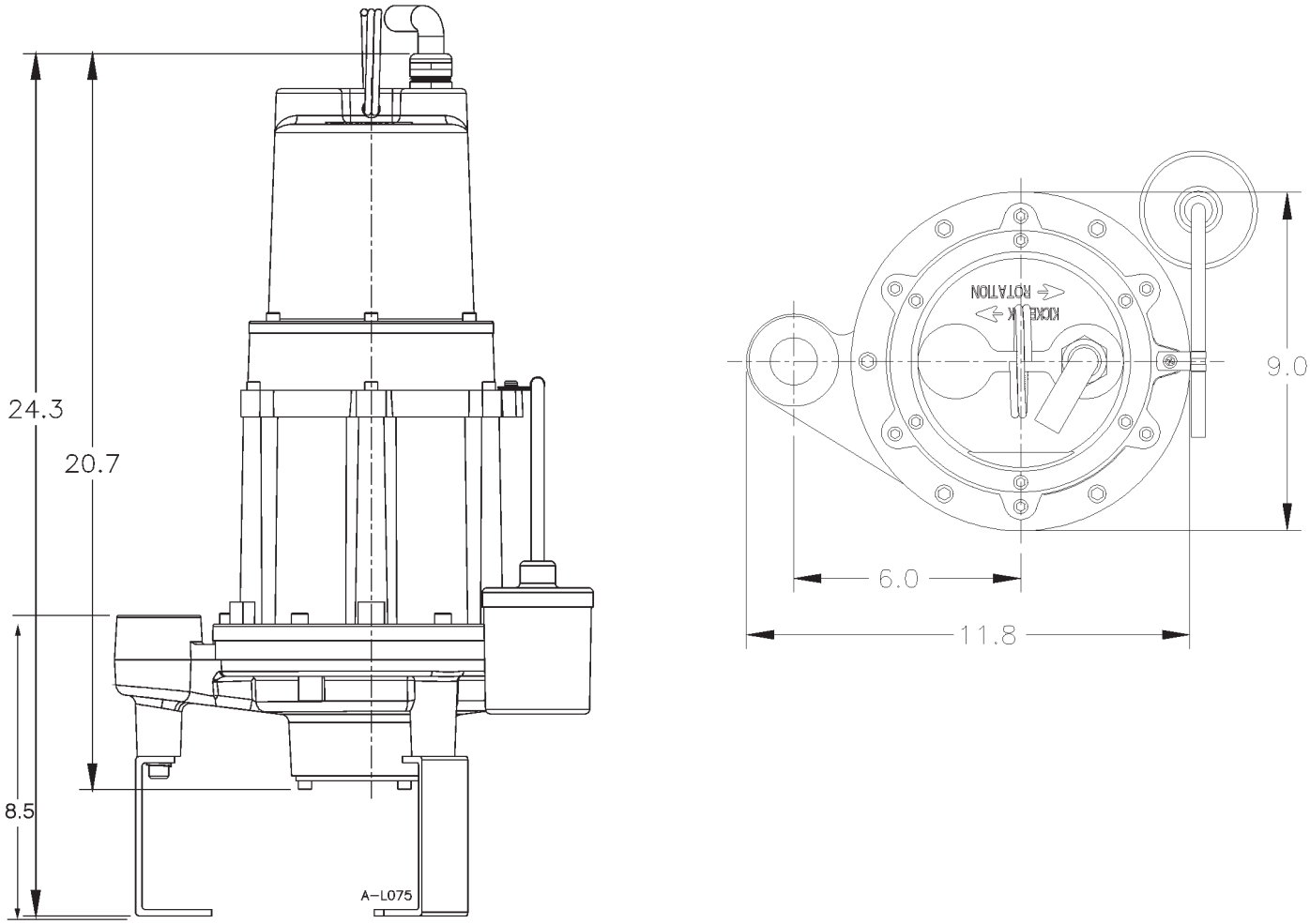


FIGURE 5

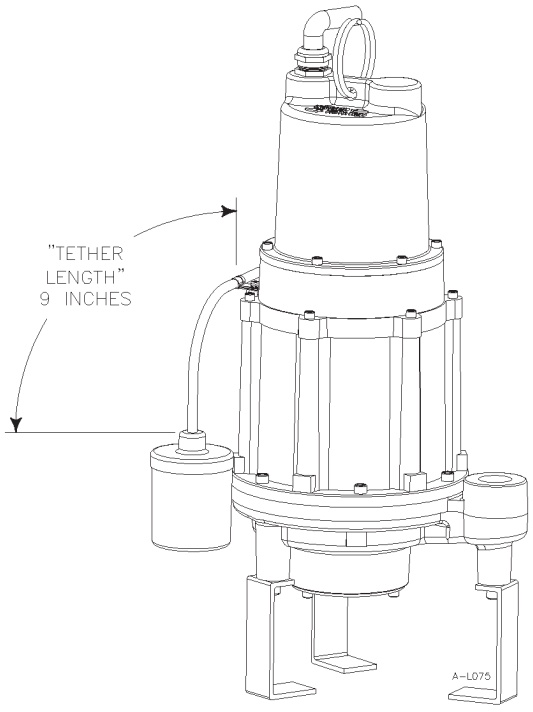


FIGURE 6