

CAST IRON SUMP PUMPS

Installation and Owner's Manual



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BEFORE GETTING STARTED

This equipment should be installed and serviced by technically qualified personnel who are familiar with the correct selection and use of appropriate tools, equipment, and procedures. Failure to comply with national and local electrical and plumbing codes and within Red Lion recommendations may result in electrical shock or fire hazard, unsatisfactory performance, or equipment failure.

Know the product's application, limitations, and potential hazards. Read and follow instructions carefully to avoid injury and property damage. Do not disassemble or repair unit unless described in this manual.

Refer to product data plate(s) for additional precautions, operating instructions, and specifications.

Failure to follow installation or operation procedures and all applicable codes may result in the following hazards:

⚠ DANGER

 **Risk of death, personal injury, or property damage due to explosion, fire, or electric shock.**

- Do not use to pump flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc.
- Do not use in explosive atmospheres or hazardous locations as classified by the NEC, ANSI/NFPA70.
- Do not handle a pump or pump motor with wet hands or when standing on a wet or damp surface, or in water.
- When a pump is in its application, do not touch the motor, pipes, or water until the unit is unplugged or electrically disconnected.

⚠ WARNING

 **High voltages capable of causing severe injury or death by electrical shock are present in this unit.**

- To reduce risk of electrical shock, disconnect power before working on or around the system. More than one disconnect switch may be required to de-energize the equipment before servicing.
- Be certain that this pump is connected to a circuit equipped with a ground fault circuit interrupter (GFCI) device if required by code.
- Wire pump system for correct voltages.
- The pump has been evaluated for use with water only. Pump should only be used with liquids compatible with pump component materials. If the pump is used with liquids incompatible with the pump components, the liquid can cause failure to the electrical insulation system resulting in electrical shock.

⚠ CAUTION

  **Risk of bodily injury, electric shock, or property damage.**

- This equipment must not be used by children or persons with reduced physical, sensory, or mental abilities, or lacking in experience and expertise, unless supervised or instructed. Children may not use the equipment, nor may they play with the unit or in the immediate vicinity.
- Do not use this pump for pumping any liquid intended for human consumption.
- Equipment can start automatically. Always unplug the pump power cord and disconnect the electrical power before servicing the pump or switch. Lockout-Tagout before servicing equipment.
- An inoperative or malfunctioning pump could lead to flooding, resulting in personal injury or property damage.
- In applications 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, an automatic back-up system and/or an alarm should be installed.
- Do not run the pump dry. If run dry, the surface temperature of the pump will rise to a high temperature that could cause skin burns if touched, and will cause serious damage to the pump.
- Do not oil the motor. The pump's motor housing is sealed, and contains a high-grade dielectric oil for heat transfer and lifetime lubrication. Use of other oils could cause serious electric shock and/or permanent damage to the pump.
- Operation of this equipment requires detailed installation and operation instructions provided in this manual for use with this product.
- Read entire manual before starting installation and operation.
- End User should receive and retain manual for future use.
- Keep safety labels clean and in good condition.
- Keep work area clean, well-lit, and uncluttered.
- Wear safety glasses while installing or performing maintenance on the pump.
- Do not wear loose clothing, jewelry, or anything that may be caught in the rotating parts. Tie up long hair and remove jewelry.

NOTICE

Risk of damage to pump or other equipment.

- Do not use this pump for pumping sea water, beverages, acids, chemical solutions, or any other liquid that promotes corrosion as this can result in damage to the pump.
- Do not run pump dry. For optimal cooling and to prolong the motor life, the liquid level being pumped should normally be above the top of the pump housing.
- This pump is not suitable for pond applications.

PRODUCT DESCRIPTION

This submersible pump is for use in basins or lift stations and is suitable for pumping clear water and other non-explosive, non-corrosive liquids. Do not use the pump in applications where sewage or any other debris (gravel, sand, floating debris, etc.), abrasives, or corrosives are present.

These products have been carefully tested, inspected, and packaged to ensure safe delivery and operation. Please examine your pump 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.

The pump motor is equipped with an automatic resetting thermal protector, and may restart unexpectedly. Thermal Protector tripping is an indication of motor overloading or overheating, which can be caused by application issues such as an obstructed pump impeller, float stuck in the ON position, pump running dry, pump air-locked, pump short cycling, excessively high or low voltage supply, or possibly a pump, motor, bearings, or seal that have reached the end of their useful life.

Models

Model	HP	Amps	Voltage	Float Type	On/Off Levels	Minimum Basin Diameter
RL-SC33T	1/3	4.3	115	Tethered	13" (330 mm)/5" (127 mm)	18" (457 mm)
RL-SC33V	1/3	4.3	115	Vertical	7" (178 mm)/2.25" (57 mm)	15" (381 mm)
RL-SC50T	1/2	5.3	115	Tethered	13" (330 mm)/5" (127 mm)	18" (457 mm)
RL-SC50V	1/2	5.3	115	Vertical	7" (178 mm)/2.25" (57 mm)	15" (381 mm)

Flow Rates

Gallons/Liters per Hour					
At Height: (Head)	5 ft (1.5 m)	10 ft (3 m)	15 ft (4.5 m)	20 ft (6.1 m)	Shut Off
RL-SC33T	3000 / 11356	2460 / 9312	1860 / 7041	960 / 3634	25 ft (7.6 m)
RL-SC33V	3000 / 11356	2460 / 9312	1860 / 7041	960 / 3634	25 ft (7.6 m)
RL-SC50T	3840 / 14536	3000 / 11356	2220 / 8404	1440 / 5451	28 ft (8.5 m)
RL-SC50V	3840 / 14536	3000 / 11356	2220 / 8404	1440 / 5451	28 ft (8.5 m)

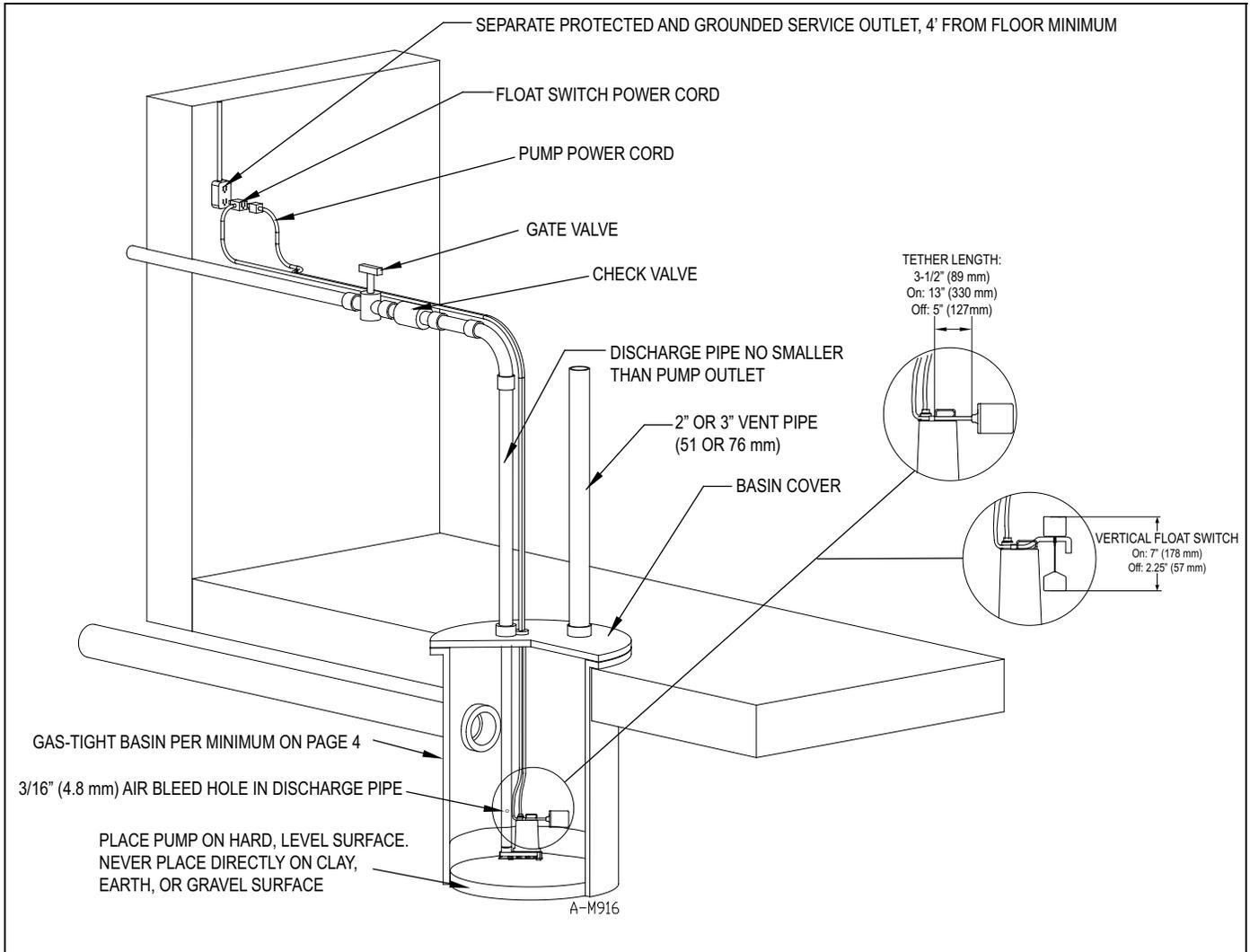
Specifications

Discharge Size	1-1/2" FNPT
Intake Size	3/8" (9.5 mm) screened opening
Pump Housing	Cast iron (including volute and screen)
Impeller	Vortex design
Motor	Single phase PSC with automatic reset thermal overload protection
Hardware	300 series stainless steel
Bearings	Ball bearings
Pump Shaft Seal	Mechanical, spring-loaded, stationary carbon with Nitrile boot and rotating ceramic seat
Cooling	The motor housing contains oil to cool the motor and to lubricate the bearings and seals. These pumps can be operated with the motor housing partially exposed for extended periods of time. However, for the best cooling and longest motor life, the liquid level being pumped should normally be above the top of the pump housing.

INSTALLATION
Typical Installation

INSTALLATION

Typical Installation



Physical Installation

▲WARNING



Risk of severe injury or death by electrical shock.

- Always disconnect the electrical power before touching the pump or discharge.
 - 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).
1. Pump must be installed in a suitable basin that is at least 18" (457 mm) deep, and in accordance with local plumbing codes. Refer to ["Models" on page 3](#) for minimum basin diameters.
 2. Clean any debris from the basin and set the pump in the center of the basin (refer to ["Electrical Connections" on page 6](#)).
 3. The pump must be placed on a hard, level surface. Never place the pump directly on clay, earth or gravel surfaces. These surfaces contain small stones, gravel, sand etc. that may clog or damage the pump and cause pump failure.
 4. Do not attempt to restrict the intake side of these pumps. Restricting the intake may cause damage to the seal and may starve the pump. If you require reduced flow rates, place a valve on the discharge side of the pump. Or, if flexible vinyl tubing is used, a clamp can be used on the tubing to restrict the flow.
 5. Connect discharge piping. Use pipe joint compound at all connections. Sump pumps can be piped to discharge into the house drainage system, to a dry well, splash block, or to a storm drain, depending on local plumbing codes. The discharge pipe should be as short as possible and contain as few elbows as possible. The discharge pipe should be the same diameter, or larger than, the pump discharge size. A smaller pipe will restrict capacity and reduce pump performance. The pump comes with a 1-1/2" FNPT discharge and a 1-1/4" FNPT reducing bushing.
 - Support the pump and piping while assembling and when installed. Failure to do so may cause the piping to break, the pump to fail, motor bearing failures, etc.
 - Always install a union in the discharge line just above the basin cover to allow for easy removal of the pump for cleaning or repair.
 6. A full flow check valve must be used in the discharge line to prevent back-flow of liquid into the basin. A missing, improperly installed, or malfunctioning check valve can cause a pump to short-cycle due to back-flow of the pumped fluid from the discharge plumbing back into the basin, significantly shortening the life of the pump.

NOTICE

Risk of property damage due to flooding.

- When a check valve is used, drill a relief hole 1/8 – 3/16" (3.2 – 4.8 mm) in diameter in the discharge pipe. This hole should be located below the floor line between the pump discharge and the check valve. Unless such a relief hole is provided, the pump could "air lock" and will not pump water even though it will run.
7. Tape the pump and switch cords to the discharge pipe with electrical tape to keep the power cords securely routed away from the pump inlet and any control floats.
 8. Connect the pump to an appropriate power supply following the instructions in ["Electrical Connections" on page 6](#).
 9. Test the operation of the pump system by following the instructions in ["Operation Testing" on page 7](#) of this manual. Do not attempt to operate the pump without water; this will damage the seals and bearings and could result in permanent damage to the pump.
 10. Place cover over basin. This cover will help prevent debris from entering the pit and will guard against accidental injury.

Electrical Connections

⚠ WARNING



Risk of severe injury or death by electrical shock.

- Always disconnect the electrical power before touching the pump or discharge.
- Pumps are supplied with a grounding conductor and grounding-type attachment plug. To reduce risk of electric shock, be certain that it is connected only to a properly grounded grounding-type receptacle. Do not remove the third prong from the plug. The third prong is to ground the pump to help prevent possible electric shock hazard.
- Check electrical outlets with a circuit analyzer to ensure power, neutral, and ground wires are properly connected. If not, a qualified, licensed electrician should correct the problem.
- Do not use the power cord for lifting the pump.
- Do not remove the third prong from the plug, or cut plug from cord. These actions will void the warranty.
- Do not use an extension cord.

Wiring Guidelines

Check the pump label for proper voltage required. Do not connect to voltage other than that shown.

Be certain that this pump is connected to a circuit equipped with a ground fault circuit interrupter (GFCI) device if required by code.

The pump should be connected or wired to its own circuit, with no other electric receptacles or equipment in the circuit. The fuses or circuit breaker should be of ample capacity in the electrical circuit.

- RL-SC Series breaker size = 15 A

Power Supply

Automatic Pump Operation

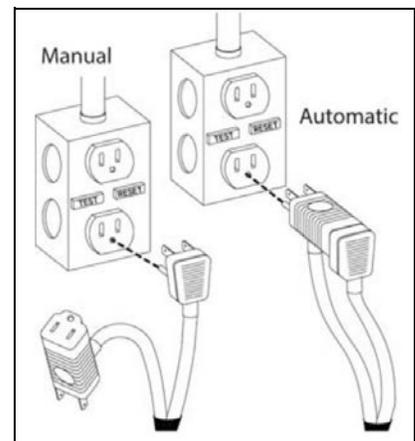
Pumps with a tethered or vertical float switch include two power cords with a piggyback plug on the switch cord. For automatic operation, plug the pump cord into the piggyback switch cord. Plug the switch cord (with pump cord attached) into a GFCI outlet.

Manual Pump Operation

For manual operation, disconnect the pump cord from the float switch piggyback plug. Plug the pump cord directly into a dedicated GFCI receptacle.

Manual, continuous pump operation should be used only for emergencies, or when a large volume of water is to be pumped.

The pump must be continuously monitored during manual operation and disconnected from power before the pump runs dry. If the pump is run dry, it may damage the pump and void the warranty.



OPERATION TESTING

NOTICE

Risk of damage to pump or other equipment.

- Do not attempt to run the pump without water; this could result in permanent damage to the pump.
- If pump is run dry, it may damage pump and void the warranty.

If the pump does not operate properly, refer to [“Troubleshooting” on page 9](#). If the solution still cannot be found, please contact the place of purchase or Technical Support at 888-885-9254.

Do not let the unit run dry (without liquid). It is designed to be cooled by pumping fluid. The seal may be damaged and the motor may fail if the pump is allowed to run dry.

If the unit is going to be idle for a period of time, follow the cleaning instructions in [“Cleaning Impeller and Volute” on page 8](#). Do not let the unit freeze. This may cause cracking or distortion that may destroy the unit.

Testing Pump Operation

Pumps are equipped with a tethered or vertical float switch that operate by floating on top of accumulating water. Rising water in the basin lifts the float, which activates the switch, turning on the pump. As the water level falls, the float lowers until the switch deactivates, turning off the pump.

When the pump is installed in a basin with a sealed cover, pump operation cannot be observed. The basin cover will usually have a spare hole that is plugged with a rubber plug. This plug can be removed and pump operation can be observed.

To test system operation, follow these steps:

1. Connect the float switch and pump to an appropriate power supply with voltage consistent with the pump voltage, as indicated on the pump nameplate.
2. If there is a gate valve on the discharge line, be sure the valve is open.
3. Run water into the basin until the pump is activated. Do not attempt to run the pump without water; this could result in permanent damage to the pump.
4. Confirm that the pump and its float switch are functioning as intended.

NOTE: If the pump doesn't turn on, test manual operation by connecting the pump's power plug directly into the power source. If the pump runs, test the float switch.

5. Confirm that the ON/OFF levels are within specification, and confirm that no potential obstructions exist that could inhibit switch operation.
6. Confirm that there are no leaks in the pump discharge plumbing and main home drain pipe plumbing.
7. Allow the pump to operate through several on/off cycles.

Testing the Float Switch

A float switch can be bench tested by using an ohmmeter to check for continuity between the incoming and outgoing connections of the piggyback plug while raising and lowering the float.



MAINTENANCE

⚠ WARNING



Risk of severe injury or death by electrical shock, high temperatures, or pressurized fluids.

- Always unplug the pump power cord and disconnect the electrical power before servicing the pump or switch.
- Let pump cool for a minimum of 2 hours before attempting to service. Submersible pumps contain oil that becomes pressurized and hot under normal operating conditions.

NOTICE

Risk of damage to pump or other equipment.

- This unit is permanently lubricated. Oiling is not required. Do not open the sealed portion of the unit or remove housing screws.
- Do not remove the motor housing cover.
- Do not remove the impeller.
- Warranty is void if the motor housing cover, impeller, or seals have been removed. Repairs on the motor or impeller require special tools.

Periodic Service

Inspect and test the pump system condition and operation every three months—more frequently in heavy use applications.

1. Check the power cords, electric receptacle, and/or junction box for damage or corrosion. The power cord on these units cannot be replaced. If damaged, replace the pump.
2. Remove all debris (gravel, sand, floating debris, etc.) from the basin.
3. Check the pump system components (basin, pump, switch, etc.) for any build-up (sludge, sediment, minerals, etc.) that would inhibit functionality of the components. If significant, remove build-up or replace affected components.
4. Confirm that all flexible coupling hose clamps are fully engaged with plumbing and fully tightened.
5. Test operation of the pump system. Refer to [“Operation Testing” on page 7](#).
6. While the pump is running, make sure a stream of water is escaping from the air bleed hole. If not, clear the hole of any deposits or debris.

Cleaning Impeller and Volute

Periodic cleaning of the pump parts will prolong the life and efficiency of the pump.

After removing power to the pump, disconnect the pump from the discharge plumbing.

1. Remove the screws that hold the base to the volute, then separate the base from the volute.
2. Remove the base and clean the impeller and the volute passage. Do not use strong solvents on the impeller.
3. Be sure the impeller turns freely after cleaning.
4. Attach the base to the volute, making sure the seal is properly aligned.

Troubleshooting

Problem	Probable Causes	Corrective Action
Pump does not turn on	Pump not connected to electrical power.	Connect pump to a dedicated circuit equipped with GFCI.
	Circuit breaker off or fuse removed.	Turn on circuit breaker or replace fuse.
	Accumulation of trash or build-up on float.	Clean float.
	Float obstruction.	Check float path and provide clearance.
	Defective switch.	Replace switch.
	Defective motor.	Replace pump.
Pump will not shut off	Float obstruction.	Check float path and provide clearance.
	Pump is air locked due to missing or clogged air relief hole.	If missing, drill an air relief hole as described in “Physical Installation” on page 5 . If clogged, clean obstruction from air relief.
	Liquid inflow matches pump capacity.	Larger pump required.
	Defective switch.	Replace switch.
Pump runs but does not discharge liquid	Check valve installed backwards.	Check flow indicating arrow on check valve body to ensure proper installation.
	Check valve stuck or plugged.	Remove check valve and inspect for proper operation.
	Lift too high for pump.	Check rated pump performance.
	Inlet to impeller plugged.	Pull pump and clean.
	Pump is air locked due to missing or clogged air relief hole.	If missing, drill an air relief hole as described in INSTALLATION. If clogged, clean obstruction from air relief hole.
Pump does not deliver rated capacity	Lift too high for pump.	Check rated pump performance.
	Low voltage, speed too slow.	Check that supply voltage matches the nameplate rating.
	Impeller or discharge pipe is clogged.	Pull pump and clean. Check pipe for scale or corrosion.
	Impeller wear due to abrasives.	Replace pump.
Pump cycles continuously	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.
Water sprays out of a hole by a bolt on the base of the unit	This pump comes with a bleed hole that allows trapped air to escape from the pump preventing air lock. Water spraying out of this hole is completely normal.	No corrective action is required.

Replacement Parts

Part Number	Description
640171	Tethered Float Switch, Piggyback, 10 ft (3 m)
640172	Tethered Float Switch, Piggyback, 20 ft (6.1 m)
14942758	RL-SC-RVS Vertical Float Switch, Piggyback, 10 ft (3 m)