Q4800-Series Quadplex Grinder Systems

Features

• 48” Diameter Fiberglass Basin (Tank)
• Available in 84”, 96”, and 120” Basin Heights
• 2 HP Omnivore Grinder Pumps
  – LSG Single-Stage
  or
  – LSGX 2-Stage
• Factory Installed Guide Rail Systems
• Pre-Mounted Float System
• NEMA 4X Junction Box
• Inlet Hub
• NEMA 4X Quadplex Alternating Control Panel
Safety Guidelines

⚠️ This safety alert symbol is used in the manual and on the pump to alert of potential risk for serious injury or death.

⚠️ This safety alert symbol identifies risk of electric shock. It is accompanied with an instruction intended to minimize potential risk of electric shock.

🔥 This safety alert symbol identifies risk of fire. It is accompanied with an instruction intended to minimize potential risk of fire.

⚠️ This safety alert symbol identifies risk of serious injury or death. It is accompanied with an instruction intended to minimize potential risk of injury or death.

⚠️ DANGER

Warns of hazards which, if not avoided, will result in serious injury or death.

⚠️ WARNING

Warns of hazards which, if not avoided, could result in serious injury or death.

⚠️ CAUTION

Warns of hazards which, if not avoided, could result in minor or moderate injury.

NOTICE

Signals an important instruction related to the pump. Failure to follow these instructions could result in pump failure or property damage.

⚠️ WARNING

Read every supplied manual before using pump system. Follow all the safety instructions in manual(s) and on the pump. Failure to do so could result in serious injury or death.

NOTICE

Installer: manual must remain with owner or system operator/maintainer.

Keep this manual handy for future reference. For replacement manual, visit LibertyPumps.com, or contact Liberty Pumps at 800-543-2550. Retain dated sales receipt for warranty.

Record information from pump nameplate:

Pump Model:

Pump Serial:

System:

Manufacture Date:

Install Date:
Safety Precautions

**WARNING**  **RISK OF ELECTRIC SHOCK**

- Accidental contact with electrically live parts, items, fluid, or water can cause serious injury or death.
- Always disconnect pump(s) from power source(s) before handling or making any adjustments to either the pump(s), the pump system, or the control panel.
- All installation and maintenance of pumps, controls, protection devices, and general wiring shall be done by qualified personnel.
- All electrical and safety practices shall be in accordance with the National Electrical Code®, the Occupational Safety and Health Administration, or applicable local codes and ordinances.
- Do not remove cord and strain relief, and do not connect conduit to pump.
- Pump shall be properly grounded using its supplied grounding conductor. Do not bypass grounding wires or remove ground prong from attachment plugs. Failure to properly ground the pump system can cause all metal portions of the pump and its surroundings to become energized.
- Do not handle or unplug the pump with wet hands, when standing on damp surface, or in water unless wearing Personal Protective Equipment.
- Always wear dielectric rubber boots and other applicable Personal Protective Equipment (PPE) when water is on the floor and an energized pump system must be serviced, as submerged electrical connections can energize the water. Do not enter the water if the water level is higher than the PPE protection or if the PPE is not watertight.
- Do not lift or carry a pump or a float assembly by its power cord. This will damage the power cord, and could expose the electrically live wires inside the power cord.
- The electrical power supply shall be located within the length limitations of the pump power cord, and for below grade installations, it shall be at least 4 ft (1.22 m) above floor level.
- Do not use this product in applications where human contact with the pumped fluid is common (such as swimming pools, fountains, marine areas, etc.).
- Protect the power and control cords from the environment. Unprotected power and control (switch) cords can allow water to wick through ends into pump or switch housings, causing surroundings to become energized.

**WARNING**  **RISK OF FIRE**

- Do not use an extension cord to power the product. Extension cords can overload both the product and extension cord supply wires. Overloaded wires will get very hot and can catch on fire.
- This product requires a separate, properly fused and grounded branch circuit, sized for the voltage and amperage requirements of the pump, as noted on the nameplate. Overloaded branch circuit wires will get very hot and can catch on fire.
- For cord replacement: power cord must be of the same length and type as originally installed on the Liberty Pumps product. Use of incorrect cord may lead to exceeding the electrical rating of the cord and could result in death, serious injury, or other significant failure.
- Do not use this product with or near flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. If rotating elements inside pump strike any foreign object, sparks may occur. Sparks could ignite flammable liquids.
- Sewage and effluent systems produce and may contain flammable and explosive gases. Prevent introduction of foreign objects into basin as sparks could ignite these gases. Exercise caution using tools and do not use electronic devices or have live, exposed electrical circuits in or around basins, open covers and vents.
- These pumps are not to be installed in locations classified as hazardous in accordance with the National Electric Code®, ANSI/NFPA 70.

**WARNING**  **RISK OF SERIOUS INJURY OR DEATH**

- Do not modify the pump/pump system in any way. Modifications may affect seals, change the electrical loading of the pump, or damage the pump and its components.
- All pump/pump system installations shall be in compliance with all applicable Federal, State, and Local codes and ordinances.
- Do not allow children to play with the pump system.
- Do not allow any person who is unqualified to have contact with this pump system. Any person who is unaware of the dangers of this pump system, or has not read this manual, can easily be injured by the pump system.
- In 208/230 V installations, one side of the line going to the pump is always “hot”, whether the float switch is on or off. To avoid hazards, install a double pole disconnect near the pump installation.
- Vent basin in accordance with local code. Proper venting of sewer gases alleviates poisonous gas buildup and reduces the risk of explosion and fire from these flammable gases.
- Wear adequate Personal Protective Equipment when working on pumps or piping that have been exposed to wastewater. Sump and sewage pumps often handle materials that can transmit illness or disease upon contact with skin and other tissues.
- Do not enter a pump basin after it has been used. Sewage and effluent can emit several gases that are poisonous.
- Do not remove any tags or labels from the pump or its cord.
- Keep clear of suction and discharge openings. To prevent injury, never insert fingers into pump while it is connected to a power source.
- Do not use this product with flammable, explosive, or corrosive fluids. Do not use in a flammable and/or explosive atmosphere as serious injury or death could result.
- This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. www.p65warnings.ca.gov.
Introduction

The pumps and the control panel are supplied with their own separate installation manuals. Ensure receipt and that they are read and understood prior to installing and using this system. Familiarity with the pump and control panel is critical.

This manual provides a brief overview of the system, and deals mainly with inspection and installation of the basin. It does not cover the specifics of the pump operation or the control panel operation. For questions, call Liberty Pumps customer service at 800-543-2550.

Identification

Information about the system can be found on a stamped metal tag that is located on the basin cover. This identifies the model number as well as the horsepower, voltage, and amp draw for the pumps. Pump tags are located on the pumps. Duplicate pump tags are packaged with the system. These can be mounted at the control panel for accessibility and immediate pump information.

Model Specifications


The pump nameplate provides a record of specific pump information.

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**Basin Installation**

This is a brief reference to the recommended methods and procedures for installing Liberty Pumps underground sump and sewage basins to ensure that damage or premature failure of the basin does not occur.

This section is not intended to serve as a basic instructional guide. The installation of Liberty Pumps sump and sewage basins is a specialized skill, and is assumed that the individuals who install our products and refer to this section will have basic understanding of such procedures as excavating, backfilling, pipefitting, and electrical work. No amount of written instruction by a manufacturer or regulatory agency will convert an inexperienced, under-supervised laborer into a skilled, experienced mechanic. The ability to recognize and correctly respond to abnormal conditions during a basin installation requires field experience as well as mechanical aptitude. Figure 1 is provided for reference.

In addition to proper system engineering and competent manufacturing, the use of basin installers who have both practical experience and integrity to assist that the basin be installed properly, constitutes the greatest protection from catastrophic basin failure and liability exposure.

### Basin Handling

**General Handling**

Although the exterior surfaces of the fiberglass basins are designed to withstand normal handling, they can be damaged during transportation and installation. Basins must not be dropped, dragged, or handled with sharp objects, and with the exception of the minimal movement involved in a visual inspection, must not be rolled.

**Unloading, Lifting, and Lowering**

- Under no circumstances are the use of chains or cables around the basin shell permitted.

The proper way to move a basin is by lifting it, using chains or cables with the optional lifting lugs (not more than a 30° angle), or by using a non-marring sling around the basin. Before any attempt is made to move a basin, verify that all equipment and accessories have sufficient capacity and reach to lift and lower the basin without dragging and/or dropping. Maneuver the basin with guide ropes attached to the sides.

**Pre-Installation Inspection**

Confirm adherence to the project’s specifications before installation. Physically and visually inspected basin, pumps, valves, equipment, and piping materials before installation. Notify the carrier immediately if there is any damage. If the basin or any of its internal components are damaged, suspend installation until a determination of the extent of damage can be made by Liberty Pumps or its agent. Any repairs must be first authorized in writing by Liberty Pumps and then be done in accordance with Liberty Pumps instructions.
**Storage**

Store the basin in a secure, controlled area where the potential for accidental damage or vandalism will be minimized. The storage area must be free from sharp objects, rocks, and any other foreign solutions or materials that could cause damage to the basin. Chock the basin until it is needed for installation and, if windy conditions are possible, secure the basin with non-marring restraints of a size and number adequate for securing the basin.

**Excavation**

**WARNING RISK OF SERIOUS INJURY OR DEATH**

- Locate all overhead and underground utilities before excavating.

**Excavation Considerations**

The excavation must provide adequate space for the basin, piping, and other buried equipment, and for the replacement and compaction of backfill materials particularly around the basin walls. The size, shape, and wall slope of the excavation should be determined by soil conditions, depth of excavation, shoring requirements, and if workers are required to enter the excavation, safety considerations and federal, state, county, and municipal regulations.

**Excavation Location**

Excavation for an underground basin must be made with due care to avoid undermining foundations of existing structures and contact with underground utilities. In the absence of building codes or regulations, maintain a minimum distance of 5 feet plus a slope of 45° from the bottom of the compacted sub-base to the bottom of the adjacent structures, foundations, footings, and property lines. Additional distances may be required to ensure that any loading carried or created by the foundations and supports cannot be transferred to the basin.

**Maximum Basin Burial Depth**

If burial depth is greater than the basin height, contact Liberty Pumps to determine if additional wall reinforcement is required and secure written authorization.

**Excavated Materials Handling**

Carefully store excavated materials, which cannot be removed from the job site, as far from the edge of the basin excavation as possible. Unless approved for use as backfill, securely store excavation materials separate from the approved backfill materials.

**Work Area Safety**

Safe installation procedures are the sole responsibility of the basin installer. Work safety requirements are defined in US Department of Labor 29 CFR 1926, Subpart P: Excavations.

**Backfill**

Careful selection, placement, and compaction of approved backfill material is critical to a successful basin installation. Among the common problems associated with basin leaks and premature failures are:

- Use of incorrect backfill material
- Inadequate or improper placement or compaction
- Rocks, clods, or debris left in the excavation or basin
- Voids under or around the perimeter of the basin
- Failure to prevent the migration of backfill materials

**Basin Placement**

**WARNING RISK OF SERIOUS INJURY OR DEATH**

- Placement of a basin on a concrete pad or compacted sub-base smaller than the total basin bottom area or on intermediate supports (saddles) will cause uneven distribution of loads. This may contribute to structural failure, and is never permitted.

Cover the bottom of the basin excavation with suitably graded, leveled, and compacted backfill material to a depth of at least 12" (compacted sub-base). If a concrete hold-down/anti-flotation pad is required, this bedding can be reduced to a depth of at least 6". Carefully lower the basin into the excavated area and center on the compacted backfill or concrete pad.

**Backfill Material**

Ensure backfill material is clean, well granulated, free-flowing, non-corrosive, and inert; free of ice, snow, debris, rock, or organic material, all of which could damage the basin and interfere with the compaction of the backfill material. The largest particles shall not be larger than 3/4". Not more than 3% (by weight) should pass through a #8 sieve, and the backfill material must conform to ASTM C-33, Paragraph 9.1 requirements. Approved backfill materials include:

- Pea gravel, naturally rounded particles, with a minimum diameter of 1/8" and a maximum diameter of 3/4"
- Crushed rock, washed and free-flowing angular particles between 1/8" and 1/2" in size

**Backfill Placement and Compaction**

Make certain that compaction of backfill materials is adequate to ensure the support of the basin and to prevent movement or settlement. Place backfill materials in 12" lifts and compacted to a minimum soil modulus of 700 pounds per square foot.

**Support Piping, Equipment and Accessories**

**WARNING RISK OF SERIOUS INJURY OR DEATH**

- Using the basis to support any loading carried or created by piping, equipment, cribbing, bracing, or blocking is never permitted.

Provide support for piping, equipment, and other accessories during backfilling. During backfilling, temporary support must be carefully installed and removed to prevent damage to the basin, piping, and/or equipment.
**Anchorage**

When basin installations are located in areas subject to high water tables or flooding, make provisions to prevent the basin, either empty or filled, from floating. The buoyancy force to be offset is determined primarily by the volume of the basin. The principle offsetting factors include:

- Backfill materials
- Concrete hold-down pad
- Friction between the basin, backfill materials, and surrounding soil

**Anchorage Methods**

All methods of anchoring the basin use the weight of the backfill materials to offset the buoyancy forces. The use of supplemental mechanical anchoring methods (i.e., a concrete hold-down pad) increases the amount of backfill ballast, which is mechanically attached to the basin. The recommended method of attachment is to pour concrete grout over the basin’s anti-flotation flange and concrete hold-down pad.

**Anchorage Requirements**

- Use “submerged” material weights when calculating anchorage requirements.

Requirements of anchorage, thickness of concrete hold-down pads, as well as the size of anchors and reinforcement must be calculated for each installation based on the environmental conditions of the specific installation.

**Example:** weight of concrete (150 pounds per cubic foot) minus the weight of the water (62.4 pounds per cubic foot) equals a “submerged” weight of 87.6 pounds per cubic foot.

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**Figure 1. Basin Installation Reference**
QE-Series Control Panel

The Q4800 Quadplex System includes a QE-Series control panel, properly sized for the pumps and voltage. This control panel is designed to be used in multiple configurations to meet the needs of the application. The panel is capable of operating up to four pumps at once, and use between three and six floats. The system comes with six floats pre-installed at factory-recommended heights (see to Table 1).

Preset Float Levels

The six floats are pre-mounted on a float bracket. The pump cycle is pre-set at the factory according to the depth of the basin, see Table 1. The pump cycle can be adjusted by loosening the cord clamp and moving a float up or down. Do not adjust more than 3” in either direction—call the factory if adjustment to the pump cycle is required beyond this recommended level. To set system to use fewer floats, see Electrical.

<table>
<thead>
<tr>
<th>System</th>
<th>OFF Level</th>
<th>LEAD Level</th>
<th>LAG1 Level</th>
<th>LAG2 Level</th>
<th>LAG3 Level</th>
<th>ALARM Level</th>
<th>Volume per Pump Cycle</th>
<th>Total Basin Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4884</td>
<td>13.8” (35 cm)</td>
<td>34.8” (88 cm)</td>
<td>40.8” (104 cm)</td>
<td>46.8” (119 cm)</td>
<td>52.8” (134 cm)</td>
<td>54.8” (139 cm)</td>
<td>164.5 gal</td>
<td>658 gal</td>
</tr>
<tr>
<td>Q4896</td>
<td>23” (58 cm)</td>
<td>37” (94 cm)</td>
<td>43” (109 cm)</td>
<td>49” (124 cm)</td>
<td>55” (140 cm)</td>
<td>57” (145 cm)</td>
<td>188 gal</td>
<td>752 gal</td>
</tr>
<tr>
<td>Q48120</td>
<td>23” (58 cm)</td>
<td>53” (135 cm)</td>
<td>59” (150 cm)</td>
<td>65” (165 cm)</td>
<td>71” (180 cm)</td>
<td>73” (185 cm)</td>
<td>235 gal</td>
<td>940 gal</td>
</tr>
</tbody>
</table>

3-Foot System

A 3-float system has a pump OFF float, a LEAD pump float, and a LAG/ALARM float. The OFF float controls the water level at which the pumps turn OFF. The LEAD pump float will turn ON two of the four grinder pumps, and continue to the run the pumps until the water level falls to the OFF float level. The LAG/ALARM float will turn ON the other two grinder pumps that were not running, and trigger the high level ALARM. Jumper wires must be added to the terminal blocks in order to run the system with three floats.

4-Foot System

A 4-float system will have a pump OFF float, a LEAD pump float, a LAG pump float, and an ALARM float. The OFF float controls the water level at which the pumps turn OFF. The LEAD pump float will turn ON two of the four grinder pumps, and continue to run the pumps until the water level falls to the OFF float level. The LAG pump float will turn ON the other two grinder pumps that were not running. The ALARM float will trigger the high level ALARM. Jumper wires must be added to the terminal blocks in order to run the system with four floats.

5-Foot System

A 5-float system will have a pump(s) OFF float, a LEAD pump float, a LAG1 pump float, a LAG2 pump float, and a LAG3/ALARM float. The OFF float controls the water level at which the pumps turn OFF. The LEAD pump float will turn ON one of the four grinder pumps, and continue to the run the pump until the water level falls to the OFF float level. The LAG1 pump float will turn ON a second grinder pump that was not running. The LAG2 float will turn ON a third grinder pump that was not running. The LAG3/ALARM float will turn on the final grinder pump and trigger the high level ALARM. Jumper wires must be added to the terminal blocks in order to run the system with five floats.

6-Foot System

A 6-float system will have a pump OFF float, a LEAD pump float, a LAG1 pump float, a LAG2 pump float, a LAG3 pump float, and an ALARM float. The OFF float controls the water level at which the pumps will turn off. The LEAD pump float will turn on one of the four grinder pumps, and continue to the run the pump until the water level falls to the OFF float level. The LAG1 pump float will turn on a second grinder pump that was not running. The LAG2 float will turn ON a third grinder pump that was not running. The LAG3 float will turn ON the final grinder pump. The ALARM float will trigger the high level ALARM. The panel comes preset for 6-float operation and no jumper wires are required.
**Connections**

**Electrical**

**WARNING** RISK OF FIRE

- This product requires a separate, properly fused and grounded branch circuit, sized for the voltage and amperage requirements of the pump, as noted on the nameplate. Overloaded branch circuit wires will get very hot and can catch on fire.

With main power disconnected, connect the electrical coupling to 2" electrical conduit and run the power and float cords through the conduit to the control panel. When complete, check all wires for unintentional ground.

Control panel wiring diagrams are supplied with the control panels. Use the control panel drawings in conjunction with the following to complete the wiring.

**IMPORTANT:** If control panel schematics differ from what is provided herein, always follow the manufacturer’s drawings.

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5-Float System

Connect floats to the appropriate terminals for STOP, LEAD, LAG1, LAG2, and LAG3. Use a jumper wire to connect terminals 10 and 12 to trigger the ALARM when the highest float is activated.

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6-Float System

Connect all six floats to the appropriate terminals (i.e., lowest float to terminals 1 and 2 for the STOP float).

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### 3-Float System

Connect floats to the appropriate terminals for STOP, LEAD, and LAG2. Use a jumper wire to connect terminals 4 and 6 to always operate two pumps when the LEAD pump is triggered. Use another jumper wire to connect terminals 8 and 10 to always operate a separate pair of pumps when a LAG pump is triggered. Use another jumper wire to connect terminals 10 to 12 to activate an ALARM when the LAG pumps are triggered.

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### 4-Float System

Connect floats to the appropriate terminals for STOP, LEAD, LAG2, and ALARM. Use a jumper wire to connect terminals 4 and 6 to always operate two pumps when the LEAD pump is triggered. Use another jumper wire to connect terminals 8 and 10 to always operate a separate pair of pumps when a LAG pump is triggered.

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### 5-Float System

Connect floats to the appropriate terminals for STOP, LEAD, LAG1, LAG2, and LAG3. Use a jumper wire to connect terminals 10 and 12 to trigger the ALARM when the highest float is activated.

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### 6-Float System

Connect all six floats to the appropriate terminals (i.e., lowest float to terminals 1 and 2 for the STOP float).

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### 3-Phase Pump Rotation Verification

Check 3-phase pumps for proper rotation prior to installing pump in basin. Rotation must be counter-clockwise when looking from the bottom of the pump.

To change rotation, reverse any two of the three power leads to the pump (not the ground). Code the wires for reconnection after installation.
**Discharge Line**

Connect a 2” schedule 80 PVC pipe to the pump discharge. Do not reduce the size of the discharge piping and do not increase the discharge piping to larger than 4”. The remainder of the discharge line should be as short as possible with a minimum number of turns to minimize friction head loss.

**Inlet Line**

Connect the inlet line to the 6” inlet hub with a rubber grommet sealing donut (such as Liberty Pumps, #K001172).

**Venting**

**WARNING**  **RISK OF SERIOUS INJURY OR DEATH**

- Vent basin in accordance with local code. Proper venting of sewer gases alleviates poisonous gas buildup and reduces the risk of explosion and fire from these flammable gases.

The fiberglass basin provided with the system must be completely sealed and properly vented per local health and plumbing code requirements. The system is designed to be vented through the inlet to an existing building vent stack. In order to accomplish this, there must be no traps between the system inlet and the nearest building vent stack connection. If this is not possible or desirable per the application, a vent flange or grommet can be installed in a hole cut into the cover.

**GR20 Guide Rail Assembly**

The GR20 quick disconnect assembly provided with the grinder system is designed to allow easy installation and removal of the pump. When installed correctly, it will seal and provide a means to lift the pumps without disconnecting any discharge piping. Ensure installation is done as shown.

**Testing and Startup**

Follow the testing and startup procedures found in the supplied grinder pump and control panel manuals.

**Maintenance and Troubleshooting**

Follow the Maintenance and Troubleshooting procedures found in the supplied grinder pump and control panel manuals.
**Warranty**

**Liberty Pumps Wholesale Products Limited Warranty**

Liberty Pumps, Inc. warrants that Liberty Pumps wholesale products are free from all factory defects in material and workmanship for a period of three (3) years from the date of purchase (excluding batteries). The date of purchase shall be determined by a dated sales receipt noting the model and serial number of the pump. The dated sales receipt must accompany the returned pump if the date of return is more than three years from the date of manufacture noted on the pump nameplate.

The manufacturer’s sole obligation under this Warranty shall be limited to the repair or replacement of any parts found by the manufacturer to be defective, provided the part or assembly is returned freight prepaid to the manufacturer or its authorized service center, and provided that none of the following warranty-voiding characteristics are evident:

The manufacturer shall not be liable under this Warranty if the product has not been properly installed, operated, or maintained per manufacturer instructions; if it has been disassembled, modified, abused, or tampered with; if the electrical cord has been cut, damaged, or spliced; if the pump discharge has been reduced in size; if the pump has been used in water temperatures above the advertised rating; if the pump has been used in water containing sand, lime, cement, gravel, or other abrasives; if the product has been used to pump chemicals, grease, or hydrocarbons; if a non-submersible motor has been subjected to moisture; or if the label bearing the model and serial number has been removed.

Liberty Pumps, Inc. shall not be liable for any loss, damage, or expenses resulting from installation or use of its products, or for indirect, incidental, and consequential damages, including costs of removal, reinstallation or transportation.

There is no other express warranty. All implied warranties, including those of merchantability and fitness for a particular purpose, are limited to three years from the date of purchase. This Warranty contains the exclusive remedy of the purchaser, and, where permitted, liability for consequential or incidental damages under any and all warranties are excluded.