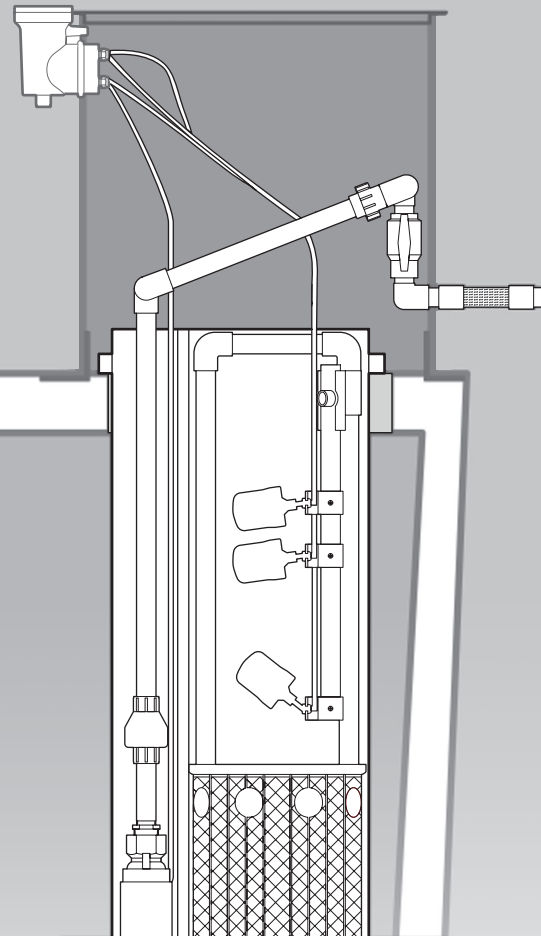


Installation Manual

Biotube® ProPak™ & LOS Pump Package™



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How to Use This Manual	Page 2
Before You Begin	Page 2
Standard On-Lot Components	Page 3
Installation Overview	Page 4
Installation Steps	Page 4
Step 1: Verify Tank Installation	Page 4
Step 2: Install Tank Adapters and Risers	Page 4
Step 3: Test Tank and Adapter Seams for Watertightness	Page 5
Step 4: Install Biotube Pump Package	Page 5
Step 5: Connect Pump Discharge to Transport/Service Line	Page 6
Step 6: Mount and Wire Control Panel	Page 6
Step 7: Test Pump Voltage and Amperage	Page 7
Step 8: Test Float Switches and Control Panel	Page 8
Step 9: Complete the Installation	Page 8

How to Use This Manual

This manual contains an Installation Overview and a set of Installation Steps.

- **Installation Overview** — This is a simple overview of the steps in the installation process. Its purpose is to help you quickly see the suggested order of operations for installing the on-lot components of Orenco Biotube ProPak and LOS (liquid-only sewer) Pump Packages. It is intended as a reference only – it does not provide complete instructions.
- **Installation Steps** — This provides general instructions for each step in the installation process and references to installation documents for specific components. Many Orenco products come with installation instructions, and all of these instructions are available in hardcopy form. Contact your distributor or Orenco for copies, or find instructions online in the Orenco Document Library at www.orencocom. There are also steps in this manual that cover operations performed before and after the pump package is installed, which are necessary for successful pump package installation.

You will find Key Points, Notes, and IMPORTANT information in this manual, marked with easy-to-see visuals:



Key Points — These are critical for a quality installation and must be completed in order for your installation to be successful.



Notes — These cover useful information and tips that can help make your installation simpler or easier. They may also provide information on variations in components or methods.



IMPORTANT — These point out potential hazards to equipment or people during and after the installation.


Before You Begin

Orenco works hard to make your installation as easy as possible. Our pump packages are totally integrated and can be installed in most tanks in a matter of hours. All components are designed to fit together well, with a minimum of field cuts.

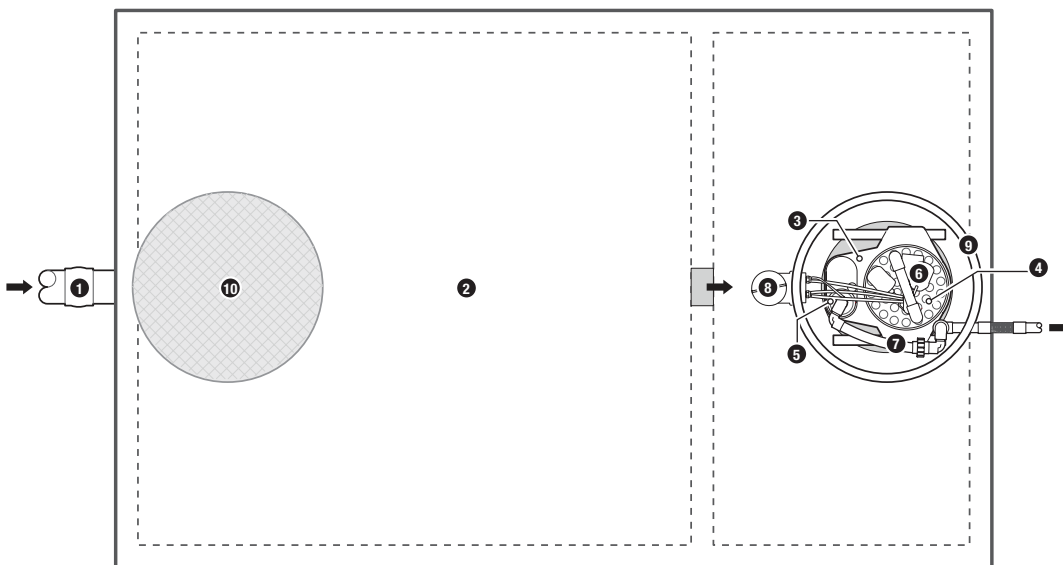
Before you begin installing your Orenco pump package, be sure to read this entire manual and any reference documents you may need to complete the installation. Also, be sure that the instructions for these products are the most current ones available by checking our online Document Library at www.orencocom. You'll save time and money on installation day, and you'll get fewer call-backs.

Before You Begin, cont.

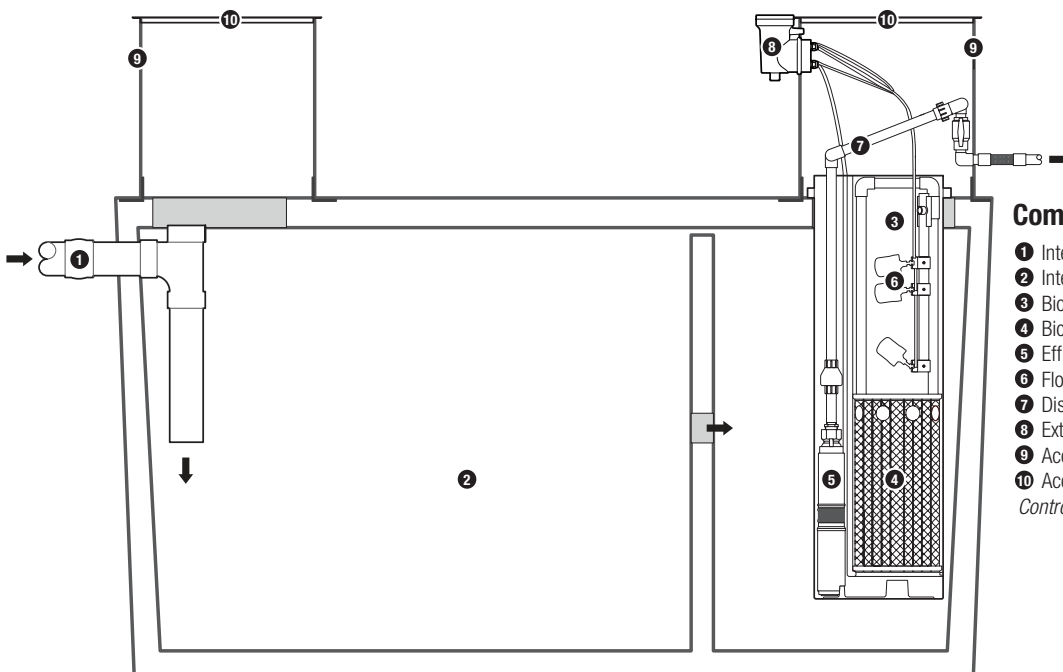
Check Package Components! Be sure that all of the components are included in the pump package before beginning the installation. Each Orenco pump package comes with a Biotube pump vault, Biotube effluent filter cartridge, effluent pump, discharge assembly, float switch assembly, splice box, and control panel. Be sure you have the necessary risers, lids, lid screws, riser-to-tank adapters, adhesives, waterproof wire nuts, and other components required to complete the installation. All of these can be found in Orenco's Product Catalog, which is available from your local distributor, from Orenco, and online at www.orenco.com/products.

 **Note:** All pipe diameters given are US nominal IPS pipe sizes. If you're using metric pipe, you may need adapters to connect to the US fittings supplied.

Standard On-Lot Components



Top view (two-compartment concrete tank and HV-style discharge assembly shown; see engineering drawings for project-specific configurations)



Components

- 1 Interceptor tank inlet tee
 - 2 Interceptor tank (two-compartment shown)
 - 3 Biotube pump vault
 - 4 Biotube effluent filter cartridge
 - 5 Effluent pump
 - 6 Float switch assembly
 - 7 Discharge assembly (HV-style shown)
 - 8 External splice box
 - 9 Access riser
 - 10 Access lid
- Control panel not shown

Side view (two-compartment concrete tank and HV-style discharge assembly shown; see engineering drawings for project-specific configurations)

Installation Overview

Step 1. Verify that the tank has been installed properly.

Step 2. If the tank adapters and access risers haven't been installed, install them according to the manufacturer's instructions.

Step 3. Perform a watertightness test on the tank and tank-to-riser connections.



Key Point: The tank and tank-to-riser connections must pass this test before you install the pump package.

Step 4. Install the Biotube pump package in the interceptor tank (or the second tank, in two-tank systems).

Step 5. Connect the pump and discharge assembly to the transport/service line.

Step 6. Mount, wire, and test the pump control panel.



Key Point: A qualified, licensed electrician is required for this step.

Step 7. Perform an operational test of the pump voltage and amperage.

Step 8. Perform an operational test of the float switch assembly and control panel.

Step 9. Verify the installation of all components, secure lids, and complete backfilling, if necessary.

Installation Steps

Step 1. Verify Tank Installation

Make sure the tank has been installed according to manufacturer and engineer specifications and all appropriate grades are met.



Step 2. Install Tank Adapters and Risers

Step 2a: Install the tank adapters if they haven't been installed. Follow the manufacturer's instructions.

- For Orenco PRTA24 or PRTA30 Tank Adapters, see NIN-TA-PRTA-2, [PRTA24 and PRTA30 Tank Adapter Installation Instructions](#).
- For Orenco RRFTA30 Tank Adapters, see NIN-TA-RRFTA-1, [RRFTA30 Tank Adapter Installation Instructions](#).
- For Orenco FRTA24-R or Orenco PRTA30 Tank Adapters and Roth Fralo tanks, see NIN-RLA-RR-2, [Roth Tank Adapter Installation Instructions](#).

If you don't see instructions for your type of tank or tank adapter in this list, call your distributor for assistance.



Key Point: Watertight seams and penetrations are critical for proper performance.

Step 2b: Install the access risers and any associated components.

- If the system uses an HDA-style discharge assembly, the mounting plate assembly must be installed in the riser before the riser is attached.
 - For installing the mounting plate assembly, see NIN-HDA-1, [HDA-Style Discharge Assembly Installation Instructions](#).
- To install grommets in access risers and attach the risers to Orenco tank adapters, see NIN-RLA-RR-1, [PVC Access Riser Installation Instructions](#).
- To install splice boxes, see NIN-SB-SBEX-1, [External Splice Box \(SBEX\) Installation Instructions](#) or NIN-SB-SB-1, [Internal Splice Box \(SB\) Installation Instructions](#).



Installation Steps

Step 2. Install Tank Adapters and Risers, cont.



Key Points:

- Watertight seams and penetrations are critical for proper performance.
- Before installing the risers, make sure that:
 - All risers are the correct height. Recommended riser height is 2in (50mm) above final grade.
 - All risers are being installed in their correct locations.
 - All penetrations are at the correct height for the connections.
 - All penetrations are aligned correctly for good pump package access.
- After installing the risers, make sure that:
 - All adhesive seams are free of voids, with smooth, continuous fillets.
 - The adhesive is set before backfilling or testing watertightness.

Step 3. Test Tank and Adapter Seams for Watertightness

Test the tank and the tank-to-riser seams for watertightness. Follow the manufacturer's instructions.

- Some manufacturers require a partial or full backfill around the tank before testing watertightness.
- Use NIN-RLA-RR-1, [PVC Access Riser Installation Instructions](#) to test the seams between the access riser, tank adapter, and tank for watertightness.



Key Points:

- Plug the tank's inlet and outlet before testing watertightness.
- Fill the tank with water to a level 2in (50mm) into the riser.
- All seams between the tank and access riser must pass the watertightness test before you continue.
- Follow all applicable regulations for watertightness testing.

Step 4. Install Biotube Pump Package

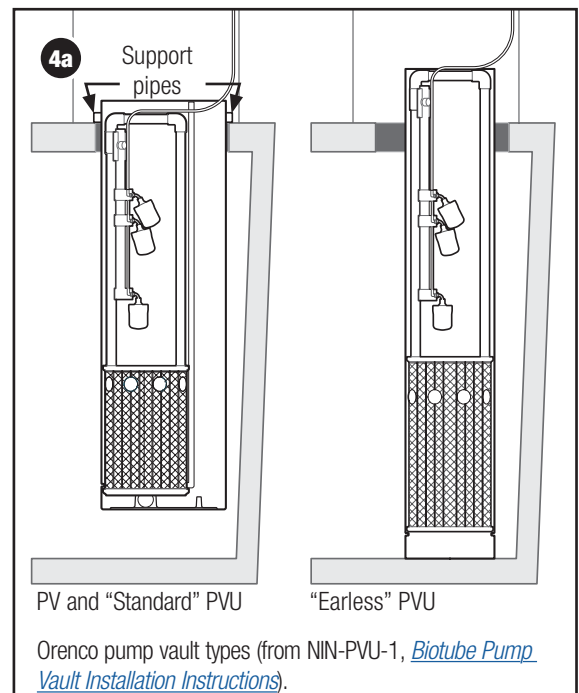
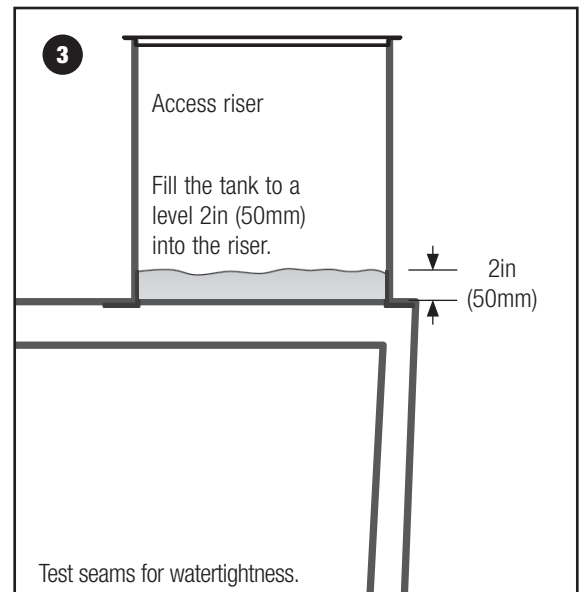
Install the pumping components from a Biotube pump package into the interceptor/septic tank.

Step 4a: Install a Biotube pump vault and Biotube effluent filter.

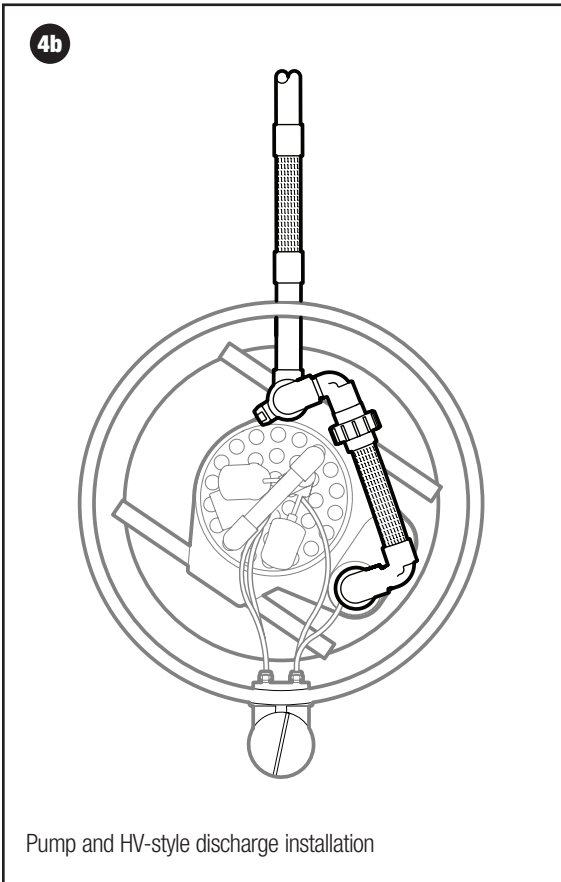
- For Biotube pump vaults, see NIN-PVU-1, [Biotube Pump Vault Installation Instructions](#).
- For PVP-series Biotube pump vaults, see NIN-PVU-3, [PVP-Series Biotube Pump Vault Installation Instructions](#).



Key Point: Pump vault placement and orientation is important – it affects the location of the pump, discharge assembly, and splice box.



Installation Steps



Pump and HV-style discharge installation

Step 4. Install Biotube Pump Package, cont.

Step 4b: Install the pump and discharge assembly for 4in (100mm) submersible effluent pumps.

- For HV-style discharge plumbing, see NIN-HV-1, [Pump and Discharge Plumbing Installation Instructions](#).
- For HDA-style discharge assemblies, see NIN-HDA-1, [HDA-Style Discharge Assembly Installation Instructions](#).



Key Points:

- Make sure the pump's voltage and design gpm or L/sec are correct for the system.
- Align the discharge assembly and pump vault so the service provider or operator can easily remove the filter cartridge.
- Hand-tighten all fittings. Don't use tools to tighten the plumbing connections and fittings between the pump and the discharge assembly.



IMPORTANT: *DO NOT* lower or raise the pump by the cord! This can damage the pump!

Step 4c: Install the float switch assembly. Refer to the following:

- NIN-MF-1, [Float Switch Assembly Installation Instructions](#).
- NIN-MF-DA-1, [Float Switch Settings and Adjustments Instructions](#).



IMPORTANT: *DON'T* change the float tether lengths.

Step 5. Connect Pump Discharge to Transport/Service Line

Glue the discharge nipple or flex hose stub from the pump package to the transport/service line.

Step 6. Mount and Wire Control Panel



Key Point: This step should be performed by a licensed and qualified electrician.



Note: *Installation instructions, schematics, and wiring diagrams specific to the panel and float switch configuration are included with each panel. If any of these are missing, contact your dealer for a replacement.*

Step 6a: Mount the panel using the instructions that came with it.

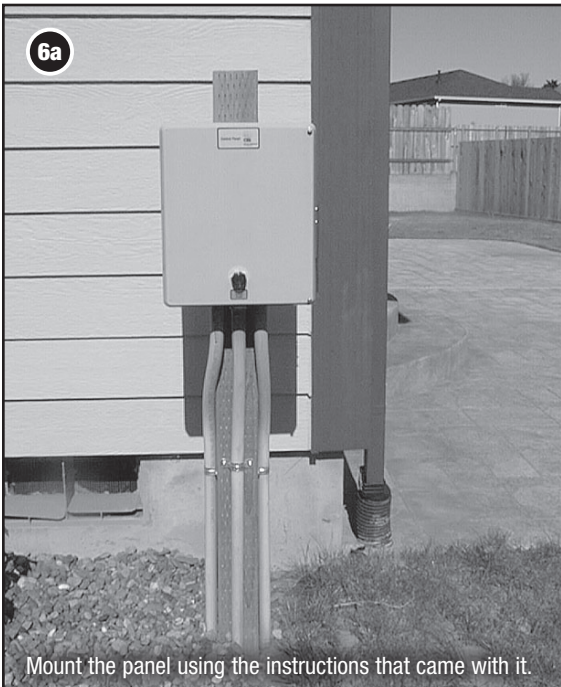


IMPORTANT: *DO NOT* mount the control panel on an exterior wall other than a garage or shop wall! The motor contactor makes a sound while engaging and disengaging that can be disruptive to residents.



Key Points:

- Follow all applicable regulations for placement of the control panel.
- Mount the panel in a service-friendly location within sight of the tank.



Mount the panel using the instructions that came with it.

Installation Steps

Step 6. Mount and Wire Control Panel, cont.

Step 6b: Route and install any necessary electrical conduit.

Step 6c: Route wires and connect the panel, pump, float switches, and other equipment shown in the instructions and schematics.



IMPORTANT: Follow all applicable regulations and electric codes.



Key Points:

- Use watertight wire connectors to avoid electrical shorts and other issues.
- Seal the conduit at the control panel and at the splice box with UL-listed sealing foam, putty, silicone sealant, or an Orenco conduit seal kit.

Step 7. Test Pump Voltage and Amperage

Perform an operational test on the pump.

- Record operational data on the panel's log sheet, located in the control panel's door pouch.
- If you're using a generator for pump operation, contact your dealer to make sure it can supply sufficient starting amperage to the pump(s).
- Make sure there's enough liquid in the tank to safely run the pump – at least 4in (100mm) above the bottom float switch – and make sure the pump doesn't run dry during testing.

Step 7a: Open the discharge plumbing valve and service connections.

Step 7b: Unsnap the float switch assembly and remove it from the riser.

- If the assembly includes a "Redundant Off/Low-Level Alarm" float switch, place it in the "up" position.

Step 7c: Turn on the control panel's pump circuit and control circuit breakers.

Step 7d: Use the panel wiring diagram as a reference to test the following:

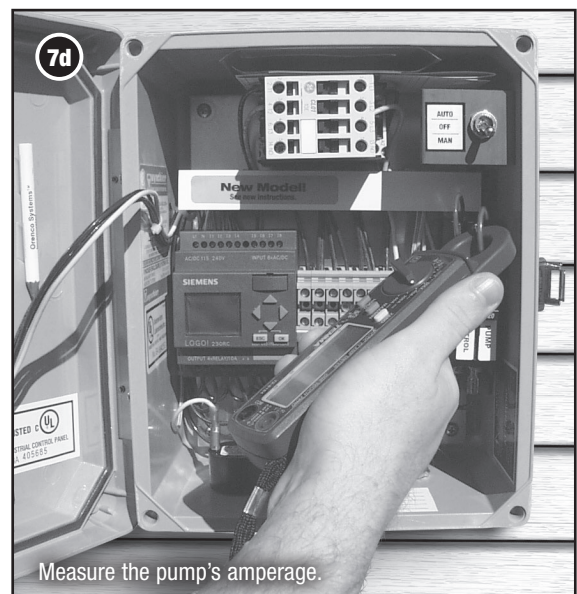
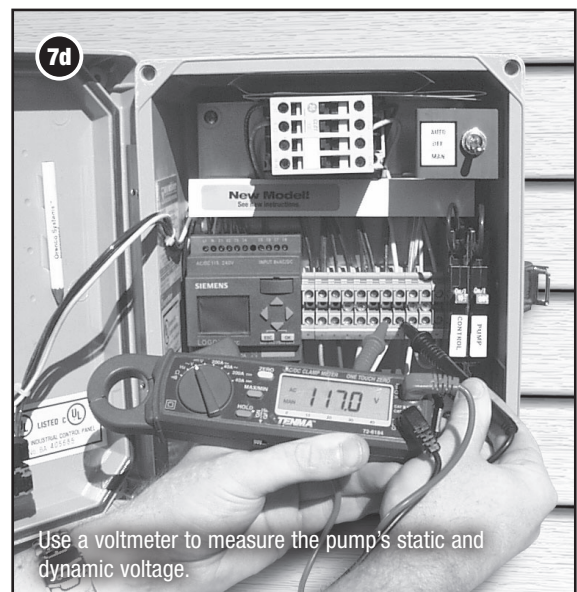
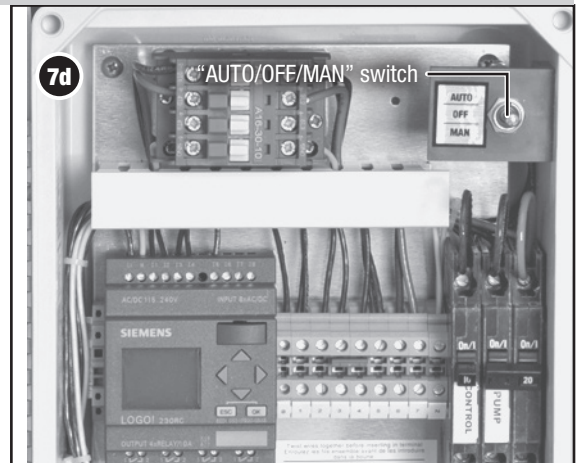
- **Static pump voltage:** With the panel's "Auto/Off/Man" switch set to "Off," measure the static voltage between the top wire of the pump breaker and the pump neutral terminal.
- **Dynamic pump voltage:** With the panel's "Auto/Off/Man" switch set to "Man" and the pump running, measure the dynamic voltage between the pump terminals in the control panel, once the voltage stabilizes.
- **Pump amperage:** With the panel's "Auto/Off/Man" switch set to "Man" and the pump running, measure the amperage of the pump wire loop(s) above the pump circuit breaker.
 - Don't mistakenly measure the control breaker.



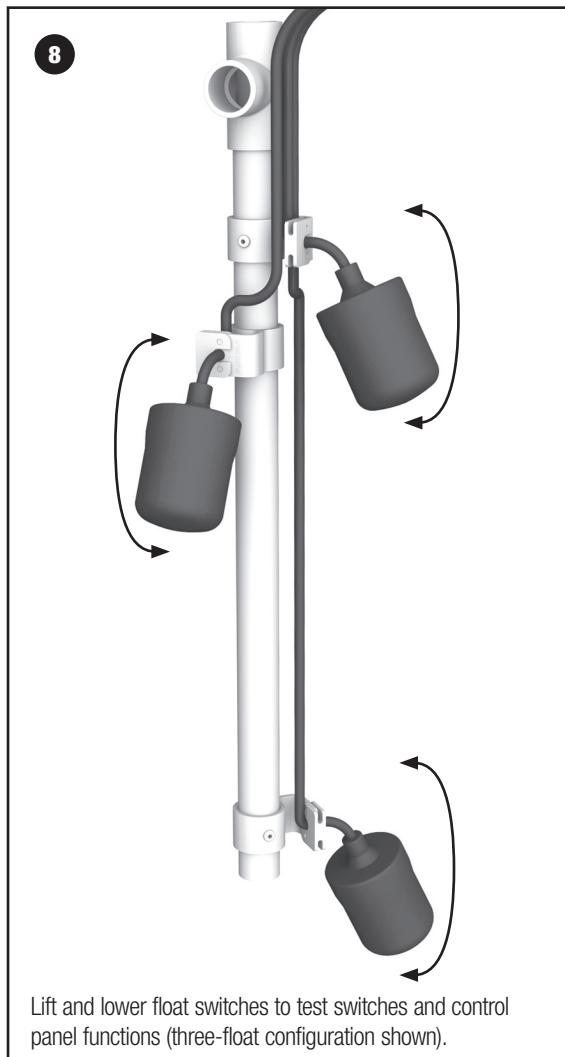
Key Point: If the difference between the pump's static and dynamic voltage is more than 10%, check for correctly sized wiring between:

- The pump and control panel
- The service panel and control panel

(See NCH-PU-PU-3, [Orenco Pump Wire Table](#), for more information.)



Installation Steps



Step 8. Test Float Switches and Control Panel

- If you're using a generator for pump operation, contact your dealer to make sure it can supply sufficient starting amperage to the pump(s).
- Make sure there's enough liquid in the tank to safely run the pump – at least 4in (100mm) above the bottom float switch – and make sure the pump doesn't run dry during testing.

Step 8a: Make sure that the control panel has power and that the float switch assembly has been removed from the tank.

Step 8b: Perform an operational test of the float switches in the float switch assembly, based on the applicable configuration found in this section.

- If the panel doesn't perform as it's supposed to, check the wiring diagram for proper wiring. Contact your distributor for assistance.

Demand-Dose: "Y,G" or "Y,G,W" Float Switch Assemblies (MVP-S, S1, or S1R0 Control Panels)

- Place the "Pump On/Off" and the "Redundant Off/Low-Level Alarm" (if included) switches in the "up" position.
 - The pump begins to run.
- Place the "High-Level Alarm" switch in the "up" position.
 - The audible alarm sounds; the panel door alarm light turns on.
- Place the "High-Level Alarm" switch in the "down" position.
 - The audible alarm goes silent; the panel door alarm light turns off.
- Place the "Pump On/Off" switch in the "down" position.
 - The pump stops running.
- Place the "Redundant Off/Low-Level Alarm" switch (if included) in the "down" position.
 - The audible alarm sounds; the panel door alarm light turns on. (On MVP panels, the panel door alarm light begins to blink.)

Demand-Dose: "Y,B,R" or "Y,B,R,W" Float Switch Assemblies (MVP-S, S1, or S1R0 Control Panels)

- Place the "Pump Off" and the "Redundant Off/Low-Level Alarm" (if included) switches in the "up" position.
- Place the "Pump On" switch in the "up" position.
 - The pump begins to run.
- Place the "High-Level Alarm" switch in the "up" position.
 - The audible alarm sounds; the panel door alarm light turns on.
- Place the "High-Level Alarm" switch in the "down" position.
 - The audible alarm goes silent; the panel door alarm light turns off.
- Place the "Pump On" switch in the "down" position.
 - The pump continues to run.
- Place the "Pump Off" switch in the "down" position.
 - The pump stops running.
- Place the "Redundant Off/Low-Level Alarm" switch (if included) in the "down" position.
 - The audible alarm sounds; the panel door alarm light turns on. (On MVP panels, the panel door alarm light begins to blink.)

Installation Steps

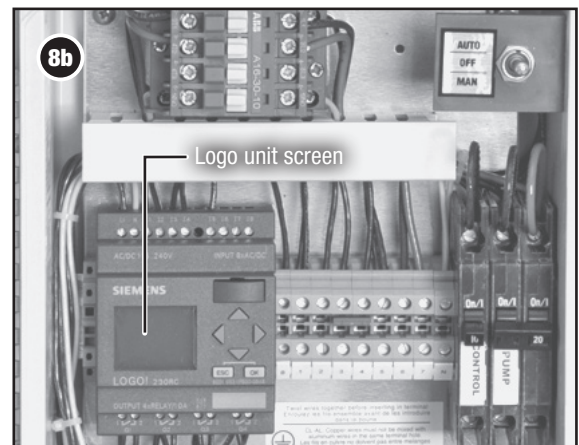
Step 8. Test Float Switches and Control Panel, cont.

Timed-Dose: “YG,R” or “YG,R,W” Float Switch Assemblies (S1PT or S1PTRO Control Panels)

- Place the “Timer On/Off” and the “Redundant Off/Low-Level Alarm” (if included) switches in the “up” position.
 - The “Off” light on the timer in the control panel turns on.
 - The timer counts down and runs the pump when the “Off” cycle is complete if the “Timer On/Off” switch remains in the “up” position (during normal operation).
- Place the “High-Level Alarm” switch in the “up” position.
 - The audible alarm sounds; the panel door alarm light turns on.
 - The pump turns off automatically if using the timer override function.
- Place the “High-Level Alarm” switch in the “down” position.
 - The audible alarm goes silent; the panel door alarm light turns off.
 - The pump turns off automatically if using the timer override function.
- Place the “Timer On/Off” switch in the “down” position.
 - The “Off” light on the timer in the control panel turns off.
- Place the “Redundant Off/Low-Level Alarm” switch (if included) in the “down” position.
 - The audible alarm sounds and the panel door alarm light turns on.

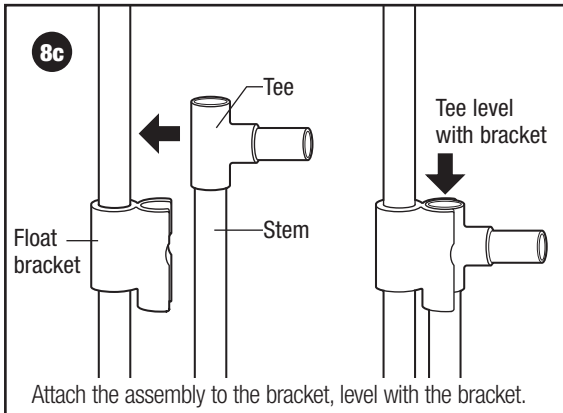
Timed-Dose: “Y,R,W” or “YG,R,W” Float Switch Assemblies (MVP-S Control Panels)

- Go to the logo unit’s “input” screen, per the instructions supplied in the panel.
- Place the “Redundant Off/Low-Level Alarm” switch in the “up” position.
 - The #1 input is highlighted.
- Place the “Timer On/Off” switch in the “up” position.
 - The #2 input is highlighted.
 - The timer counts down and runs the pump when the “Off” cycle is complete if the “Timer On/Off” switch remains in the “up” position (during normal operation).
- Place the “High-Level Alarm” switch in the “up” position.
 - The #4 input is highlighted, the audible alarm sounds, and the panel door alarm light turns on.
 - The #3 input is highlighted if the override timer function is used.
- Place the “High-Level Alarm” switch in the “down” position.
 - The audible alarm silences, the panel door alarm light turns off, and the #4 input is not highlighted.
 - The #3 input is not highlighted if the override timer function is used.
- Place the “Timer On/Off” switch in the “down” position.
 - The #2 input is not highlighted.
- Place the “Redundant Off/Low-Level Alarm” switch in the “down” position.
 - The audible alarm sounds, the panel door alarm light blinks, and the #1 input is not highlighted.
 - The alarm condition ends when the “Redundant Off/Low-Level Alarm” float switch is back in the “up” position.



Timed-Dose, “Y,R,W” or “YG, R, W” MVP control panels

Installation Steps



Step 8. Test Float Switches and Control Panel, cont.

Step 8c: Snap the float switch assembly back into the bracket.

- Make sure the float switches can move freely up and down without interference from each other or contact with the vault wall.
- For settings or adjustments, see NIN-MF-DA-1, [Float Switch Settings and Adjustments Instructions](#).

Step 8d: Neatly coil the float switch cords and secure them in the riser.

- Make sure the coils don't tangle with the float switches.

Step 8e: Place the "Auto/Off/Man" switch on the control panel to "Auto," make sure the control panel circuit breakers are in the "On" position, and close the control panel door.

Step 9. Complete the Installation

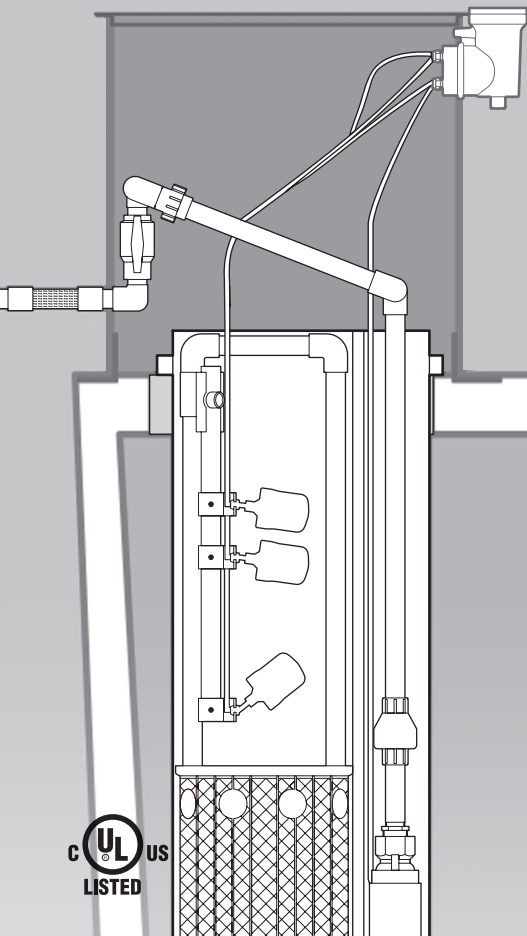
Step 9a: Check the pump package, connections, fittings, and other components for correct, completed installation and accessibility.

Step 9b: Secure the access lids on the tank.

Step 9c: Finish backfilling the tank excavation, transport/service lines, and electrical conduit runs, if those tasks are not yet done. Follow the manufacturer's and engineer's instructions.

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