



# **Biotube<sup>®</sup> ProPak<sup>™</sup> and LOS Pump Package** Installation Instructions

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## **DOCUMENT**

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## About These Instructions

These instructions contain an Installation Overview and a set of Installation Steps.

**Installation Overview** – This is a simple overview of the installation steps. It is a reference only; complete instructions are found in the installation steps that follow.

**Installation Steps** – These provide general instructions for each installation step, along with references to installation documents for specific components. Many Orenco products come with installation instructions. All of these instructions are available in hard copy from Orenco. Contact your dealer or Orenco for copies, or find individual instructions online in the Orenco Document Library at [www.orenco.com](http://www.orenco.com).

## Before You Begin

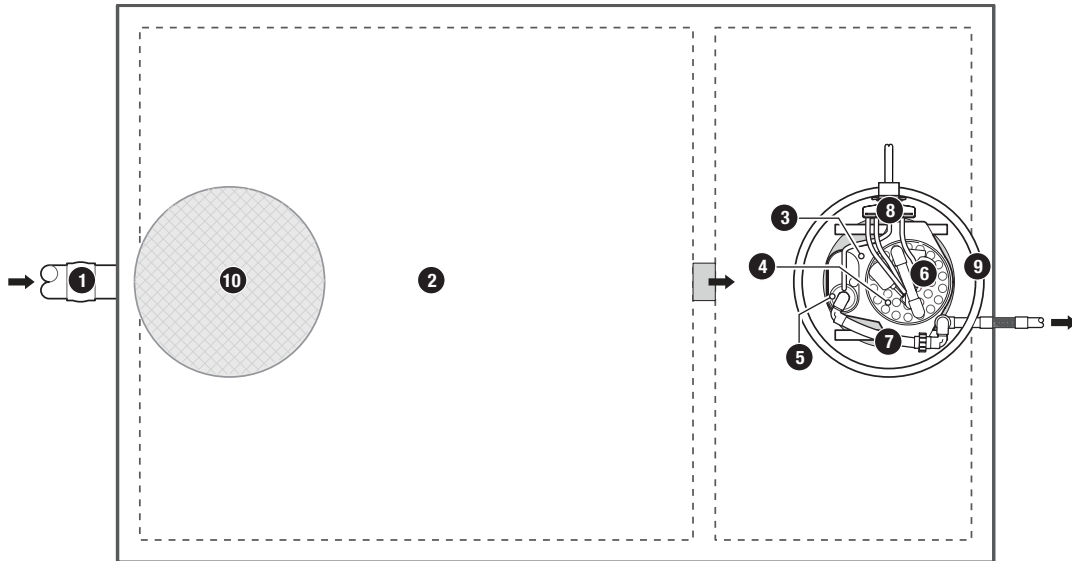
These instructions cover new installations. Contact your distributor or Orenco for retrofit information. Before beginning, read these instructions and any documents referenced in them, and confirm the instructions for all of these products are the most current available. Check our online Document Library at [www.orenco.com](http://www.orenco.com) to be sure your documents are current.

**Check the 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, connection system (ClickTight™ or splice box), and control panel. Be sure you have the necessary risers, lids, lid screws, riser-to-tank adapters, adhesives, waterproof wire nuts (if not using ClickTight), and other components required to complete the installation.

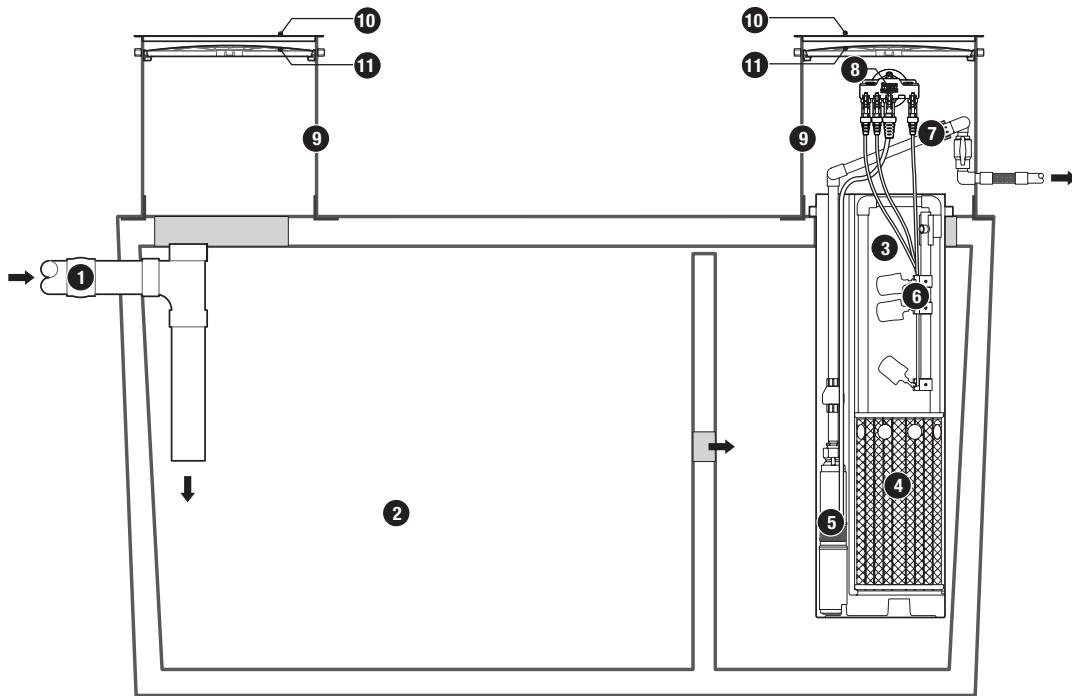


**Note** — All pipe diameters given are US nominal IPS pipe sizes. If you're using metric pipe, you will need adapters to connect to the US fittings supplied.

**System Components**



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



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

**Biotube® ProPak™ (shown with ClickTight™ compatible components)**

- |   |  |                                 |
|---|--|---------------------------------|
| 1. Interceptor tank inlet tee               | 5. ClickTight compatible effluent pump         | 9. Access riser                 |
| 2. Interceptor tank (two-compartment shown) | 6. ClickTight compatible float switch assembly | 10. Access lid                  |
| 3. Biotube pump vault                       | 7. Discharge assembly (HV-style shown)         | 11. Tank Shield® safety barrier |
| 4. Biotube effluent filter cartridge        | 8. ClickTight connector                        |                                 |

*ClickTight control panel not shown*

## 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.



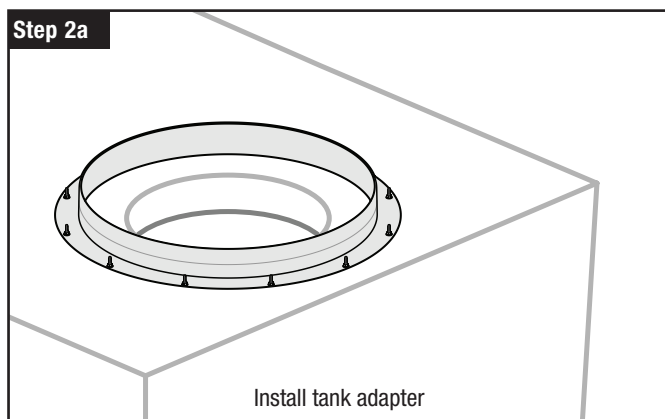
**IMPORTANT** — This step should be performed by a licensed and qualified electrician.

**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 Adapters and Risers

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

- For Orenco tank adapters:
  - PRTA24 or PRTA30, see [PRTA24 and PRTA30 Tank Adapter Installation Instructions, NIN-TA-PRTA-2](#)
  - RRFTA24, see [Installing RRFTA24 Tank Adapters Instructions, NIN-TA-RRFTA-2](#)
  - RRFTA30, see [Installing RRFTA30 Tank Adapters Instructions, NIN-TA-RRFTA-1](#)
  - FRFTA24-RVF or PRTA30 with Roth tanks, see [Adapters for Roth Tanks Installation Instructions, NIN-GOP-TAD-1](#)
- For Infiltrator tank adapters:
  - SNAPPAR-Series adapters with Infiltrator tanks, see [Infiltrator Pipe Adapter Ring Assembly Instructions for EZsnap Compatible IM-Series Tanks](#)

If you don't see instructions for your system's components, contact Orenco for assistance.



**Key Point** — Watertight seams and penetrations are critical for best performance.

## Installation Steps

### Step 2. Install Adapters and Risers, cont.

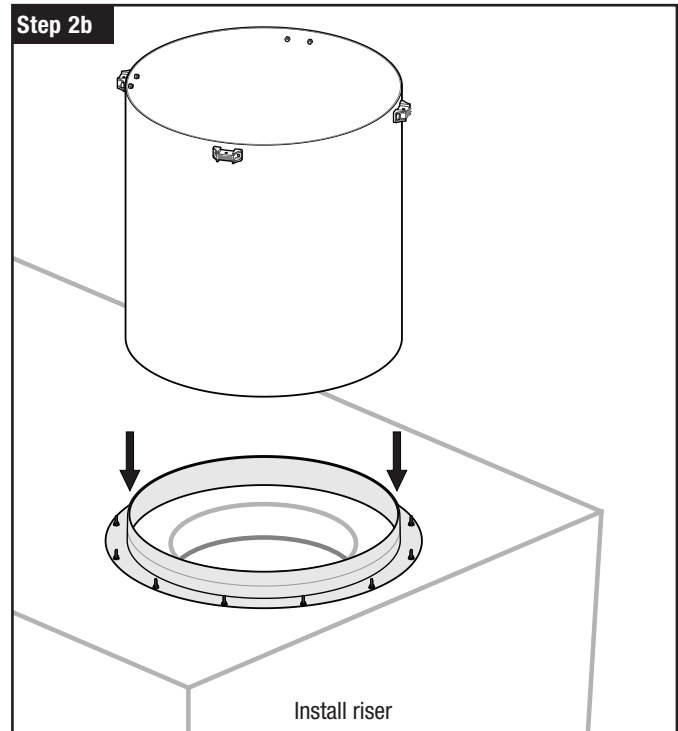
**Step 2b.** Install the access risers and any additional components. Follow the manufacturer's instructions.

- For systems using an HDA-style discharge assembly, install the mounting plate before attaching the riser. See [HDA Assembly and Pumps Installation Instructions, NIN-GOP-HDA-1](#).
- For installing grommets and risers on Orenco tank adapters:
  - PVC risers, including ultra-rib-style access risers sold by Orenco, see [PVC Riser Installation Instructions, NIN-RLA-RR-1](#)
  - Fiberglass (FRP) risers, see [Orenco Fiberglass Riser Installation Instructions, NIN-RLA-RF-1](#)
- For installing Orenco electrical connections:
  - ClickTight, see [ClickTight Installation Instructions, NIN-CLK-2](#)
  - Internal splice boxes, see [Internal Splice Box \(SB\) Installation Instructions, NIN-SB-SB-1](#)
  - External splice boxes, see [External Splice Box \(SBEX\) Installation Instructions, NIN-SB-SBEX-1](#)

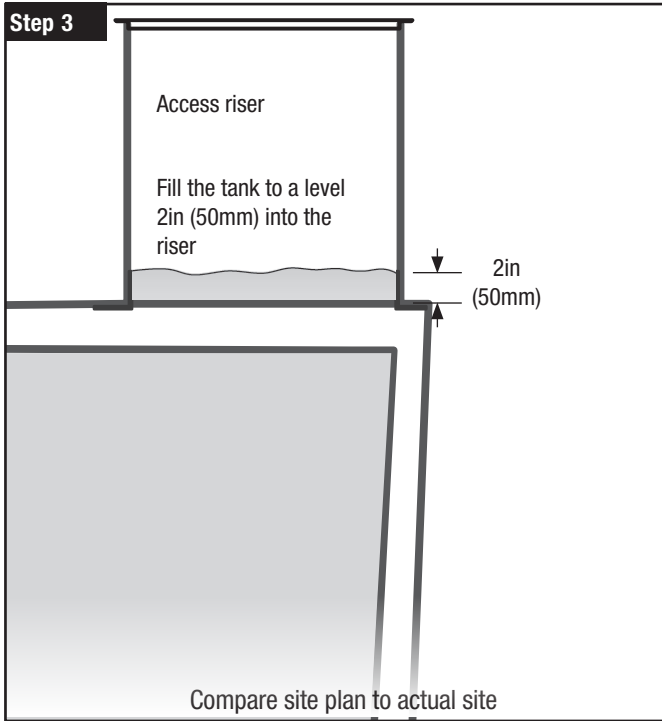


### Key Points

- Watertight seams and penetrations are critical to performance.
- Before installing the riser, confirm:
  - All risers are at the correct height – the recommended height is 2in (50mm) above final grade.
  - All risers are being installed in their correct locations.
  - All riser penetration heights are correct for the connections.
  - Any riser with an HDA is being installed over the correct tank access hole.
  - All riser penetrations are aligned correctly for good pump package access.
- After installing the risers, confirm:
  - All adhesive seams are free of voids, with smooth, continuous fillets.
  - The adhesive is set before backfilling or testing watertightness.



## Installation Steps



### Step 3. Test for Watertightness

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



**Note** — Some manufacturers require a partial or full backfill around the tank or basin before testing watertightness.

- For testing the seams between an Orenco access riser, tank adapter, and tank for watertightness:
  - PVC risers, including ultra-rib-style access risers sold by Orenco, see [PVC Riser Installation Instructions, NIN-RLA-RR-1](#)
  - FRP risers, see [Orenco Fiberglass Riser Installation Instructions, NIN-RLA-RF-1](#)



#### 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

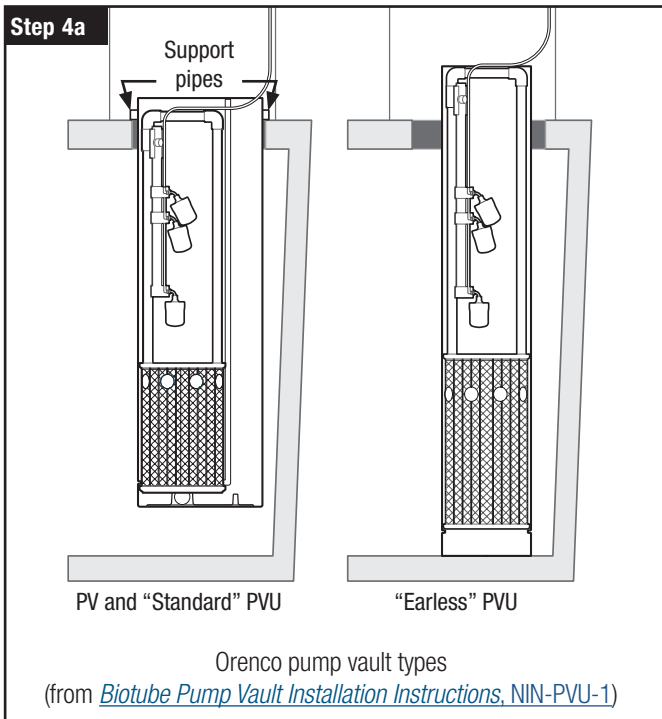
Install the pumping components from the Biotube pump package into the interceptor/septic tank.

**Step 4a.** Install the Biotube pump vault and Biotube effluent filter.

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



**Key Point** — Pump vault placement and orientation is important – it affects the location of the pump, discharge assembly, and connection system/splice box.



## Installation Steps

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



#### Key Points

- Make sure the pump's voltage and flow rate 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:

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

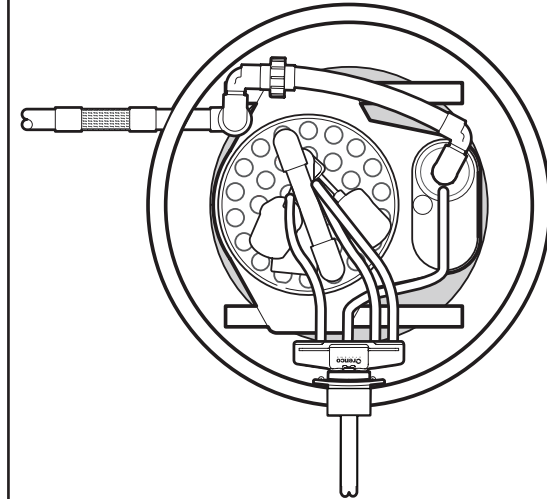


**IMPORTANT** — DO NOT change the float tether lengths!

### Step 5. Connect Pump Discharge

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

Step 4b



Pump and HV-style discharge installation

## Installation Steps

Step 6a



Follow instructions for mounting control panels

### Step 6. Mount and Wire Control Panel



**IMPORTANT** — 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.

- For ClickTight control panels, see [ClickTight & ClickTight Control Panel Installation Instructions, NIN-CLK-1](#).
- For other control panels, use the instructions that came with the panel.



#### Key Points

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

**Step 6b.** Route and install any necessary electrical conduit or cable, then connect the panel, pump, and float switches and any other equipment by following the applicable instructions:



**IMPORTANT** — Follow all applicable regulations and electric codes.

- For ClickTight, see [ClickTight & ClickTight Control Panel Installation Instructions, NIN-CLK-1](#).
- For non-ClickTight, see the schematics and instructions that came with the panel.



#### Key Points

- For non-ClickTight:
  - 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.



## Installation Steps

### 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:

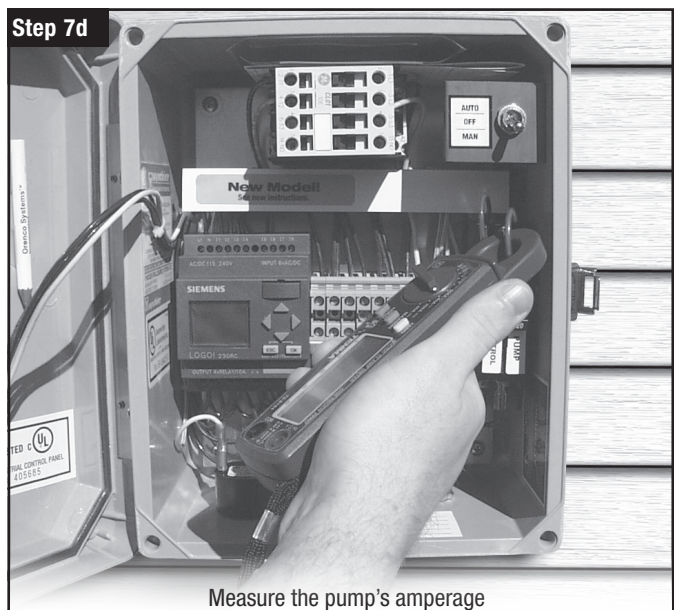
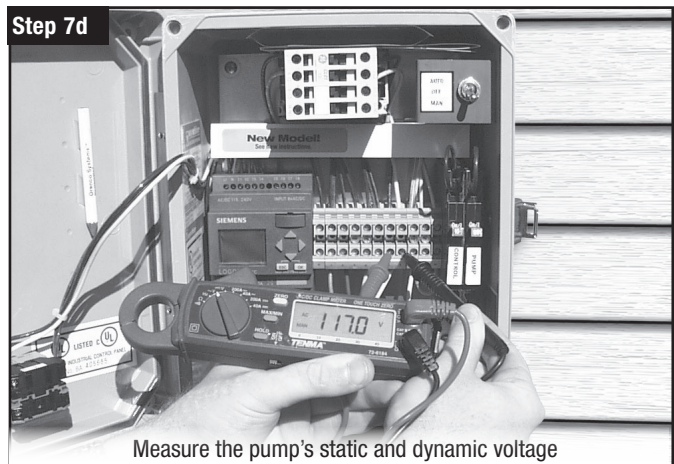
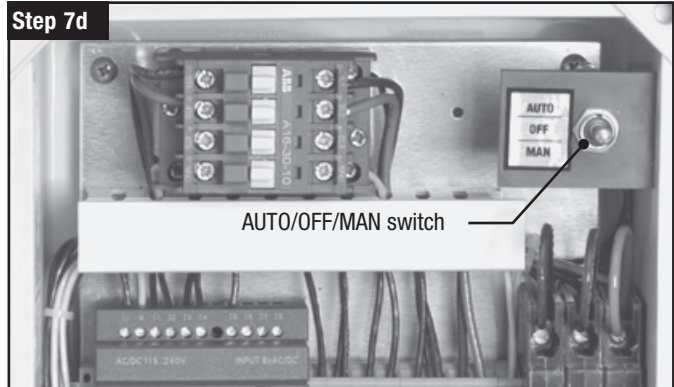
- **Static pump voltage:** With the panel's "AUTO/OFF/MAN" switch set to "OFF," measure the static voltage between the top wire of the pump breaker and the pump neutral terminal.
- **Dynamic pump voltage:** With the panel's "AUTO/OFF/MAN" switch set to "MAN" and the pump running, measure the dynamic 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:

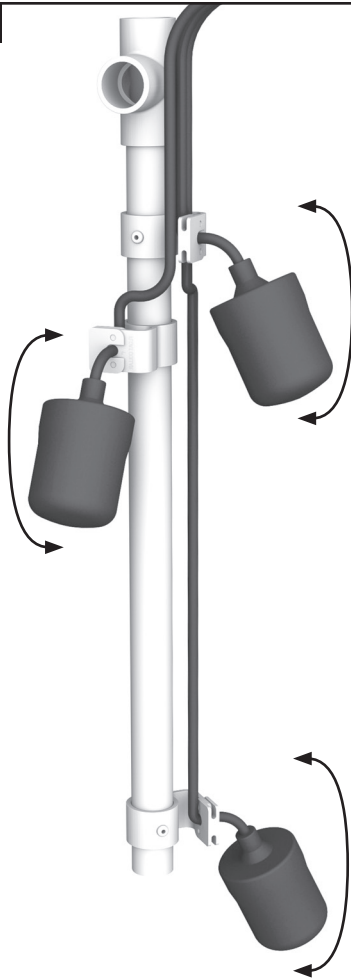
- The pump and control panel
- The service panel and control panel

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



## Installation Steps

### Step 8



Lift and lower float switches to test switches and control panel functions (three-float configuration shown)

### Step 8. Test Float Switches and 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.

- To test ClickTight float switches and control panel, see [ClickTight & ClickTight Control Panel Installation Instructions, NIN-CLK-1](#).
- To test other connection systems and control panels, see the applicable section of this step.
  - 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 S1RO 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.)

## Installation Steps

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

#### ***Demand-Dose: "Y,B,R" or "Y,B,R,W" Float Switch Assemblies (MVP-S, S1, or S1RO Control Panels)***

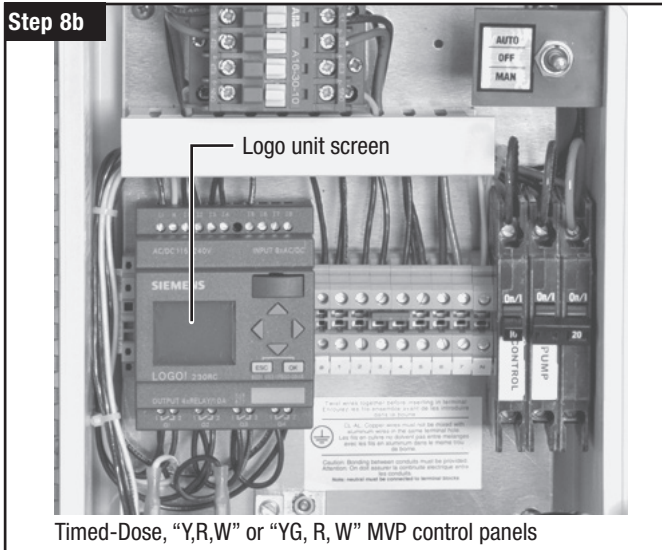
- Place the "Pump Off" and the "Redundant Off/Low-Level Alarm" (if included) switches in the "up" position.
- Place the "Pump On" switch in the "up" position.
  - The pump begins to run.
- Place the "High-Level Alarm" switch in the "up" position.
  - The audible alarm sounds; the panel door alarm light 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.)

#### ***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.

## Installation Steps

### Step 8b



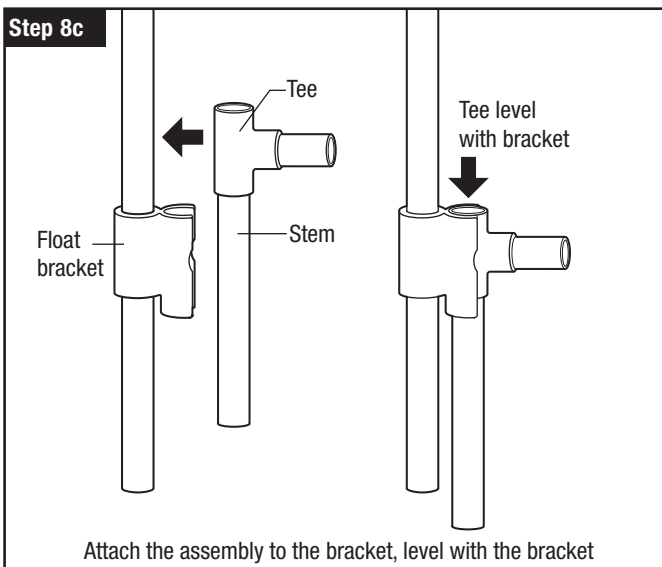
Timed-Dose, "Y,R,W" or "YG, R, W" MVP control panels

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

#### *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.

### Step 8c



Attach the assembly to the bracket, level with the bracket

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

#### **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.

## Installation Steps

### 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 Tank Shield(s), if included, in the access risers.

**Step 9c.** Secure the access lids on the tank.

**Step 9d.** 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.