



Design and installation guide

REWATEC™

Fixed-film bioreactor



Item #776277
20260615

This guide contains the information required to install and design the **Rewatec fixed-film bioreactor treatment system**. The installation must be performed by a duly trained installer. For a list of trained installers or to receive installer training, please contact Premier Tech at [1 800 632-6356](tel:18006326356).

The **Rewatec fixed-film bioreactor** is a **Class I treatment system** certified according to **NSF/ANSI Standard 40**. Information on other components of Premier Tech Water and Environment's septic system can be found in their respective installation guides at PT-WaterEnvironment.com.

Table of contents

1. Operating process	3
1.1 Primary treatment.....	5
1.2 Bioreactor	5
1.3 Clarifier	5
2. Design specifications	6
2.1 Rewatec fixed-film bioreactor technical data	6
2.2 Installation specifications	7
2.3 Water table and anchoring.....	7
2.4 Drainage	7
2.5 Air intake	7
2.6 Final grading.....	8
3. Installation instructions	8
3.1 Installation sequence.....	8
Site layout.....	8
Excavation, base, and setting of the unit	8
Anchoring	8
Initial backfill	8
Inlet and outlet connections (building and pumping station)	9
Control panel and electrical connections	9
Air intake connections	10
Risers.....	10
Final backfilling.....	10
3.2 System start-up	11
3.3 Final checklist.....	11

1. Operating process

The Rewatec fixed-film bioreactor is a Class I aerated treatment unit certified according to NSF/ANSI Standard 40. It produces high-quality effluent suitable for various dispersal methods and is designed to enhance on-site wastewater treatment and dispersal. The system relies on naturally occurring aerobic bacteria that, supported by a continuous supply of injected air, accelerate the breakdown of pollutants in domestic wastewater. This process produces highly treated effluent that is then discharged to the receiving environment.

The treatment system is composed of a primary compartment that retains heavy and light solids found in raw wastewater, an aerated bio-media-filled fixed-film bioreactor for organic biodegradation and nitrogen removal, and a clarifier that settles and transfers secondary sludge back to the primary compartment. The frequency and duration of sludge transfers are calibrated for optimal performance.

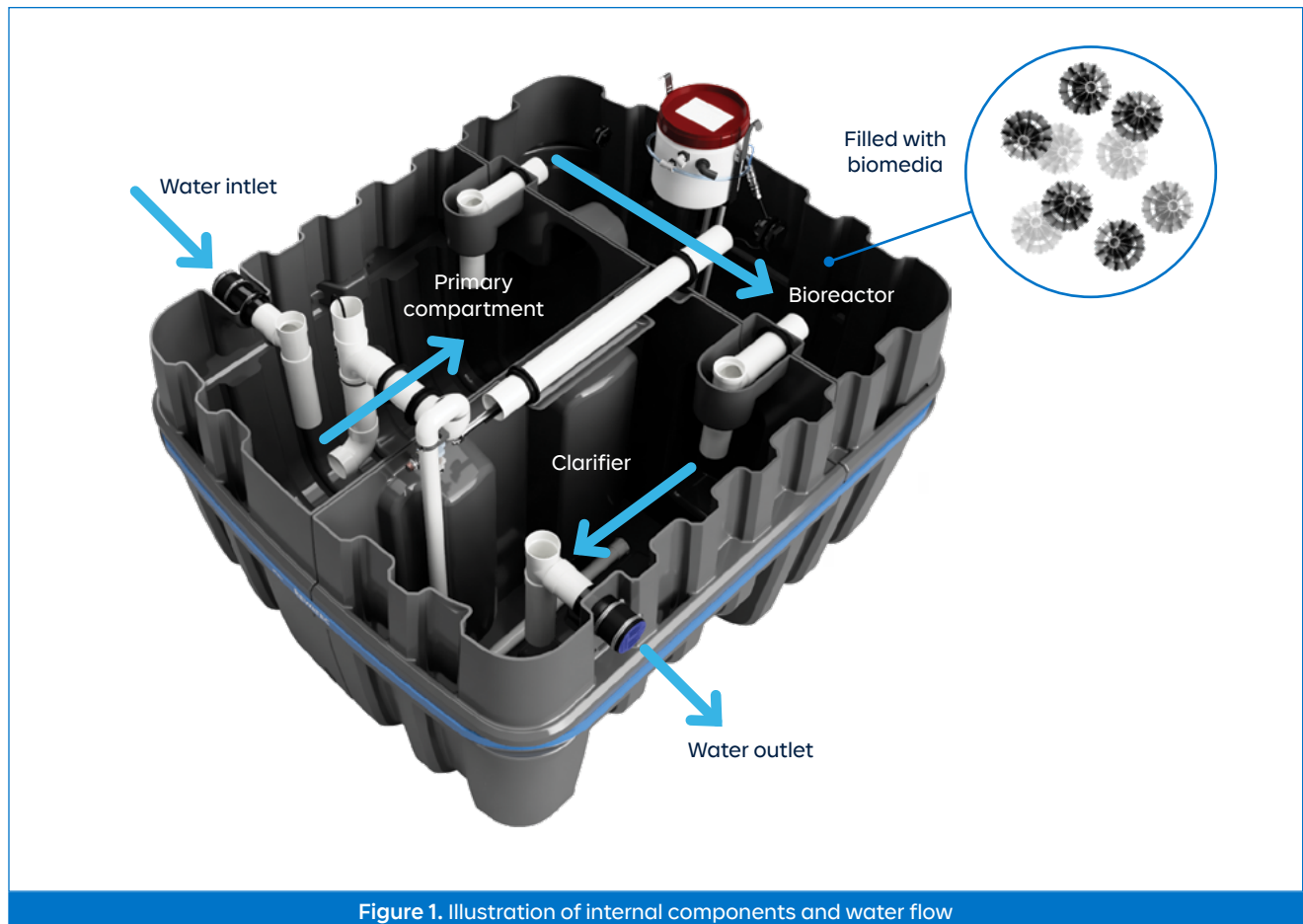


Figure 1. Illustration of internal components and water flow

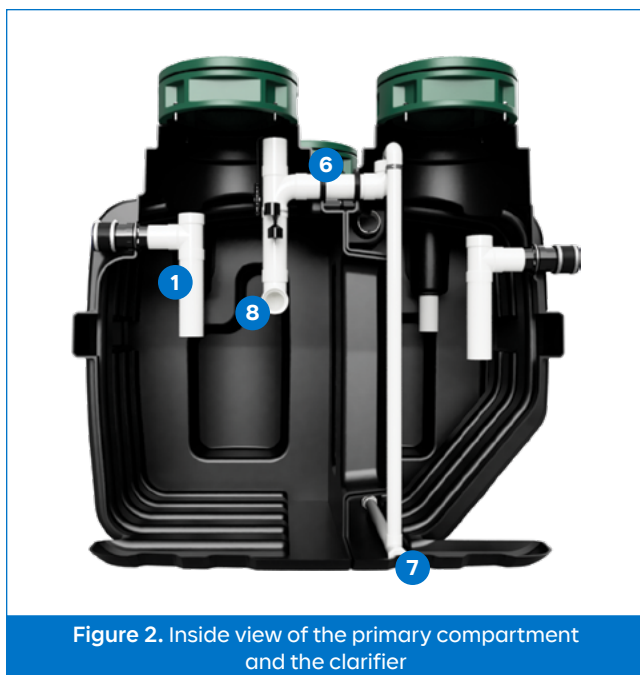


Figure 2. Inside view of the primary compartment and the clarifier

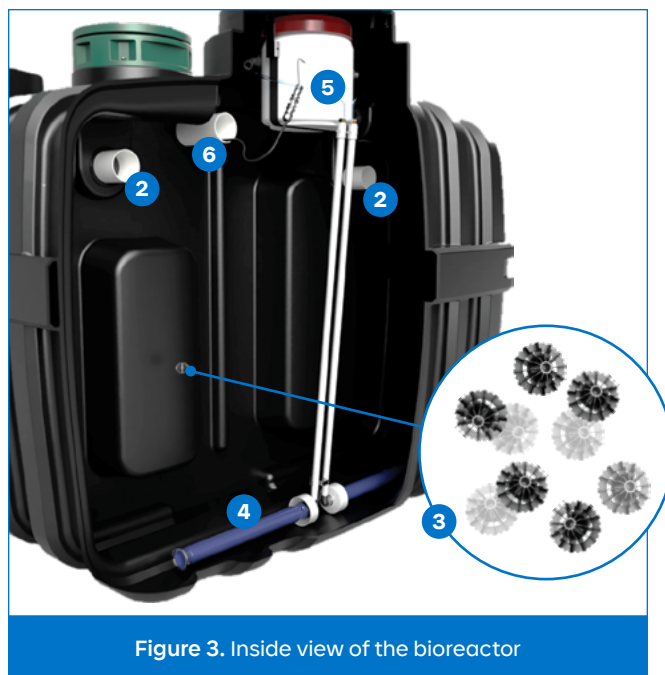


Figure 3. Inside view of the bioreactor

System components description

Component	Description
1. System inlet	Outside 4" (100 mm) rubber coupling attached to a tee, allowing water to enter the treatment system.
2. Compartment connectors	Proprietary connection device allowing water to flow between the compartments while retaining biomedium within the bioreactor.
3. Fixed-film biomedium	Acts as a support for biomass growth.
4. Air diffusers	Fine bubble diffusers (2) that inject air into the bioreactor.
5. Capsule	Watertight vessel containing the valves and air pump that control aeration and the sludge return assembly.
6. Technical pipe	Allows electrical wires to pass between the capsule and alarm float while allowing for air flow between compartments.
7. Sludge return assembly	Set of pipes in the clarifier that recirculate water and collect and transfer sludge to the primary compartment.
8. Sludge discharge assembly	Discharge point for the sludge return assembly in the primary compartment.
9. System outlet	Tee allowing treated water to flow out of the system to an outside 4" (100 mm) rubber coupling.
10. Alarm float	High water level alarm in the primary compartment.

1.1 Primary treatment

Raw wastewater first enters the primary compartment through an inlet baffle. This compartment operates similarly to a conventional septic tank, allowing suspended and settleable solids to accumulate at the bottom while retaining floating matter at the surface. Settled solids are progressively broken down by anaerobic bacteria. The outlet of the primary compartment is fitted with an effluent baffle designed to prevent scum from leaving the compartment.

1.2 Bioreactor

Wastewater that has undergone primary treatment then flows into the bioreactor through an inlet device. In this compartment, microorganisms growing as a fixed film on the surface of the biomedica remove organic and nitrogenous pollutants from the wastewater. The biomedica consists of floating, high-surface-area elements that move freely within the reactor, maximizing contact between the wastewater and the active biomass.

The bioreactor is equipped with an aeration system that includes a blower connected to fine bubble diffusers located at the bottom of the tank. This system supplies the oxygen required for aerobic treatment processes, including organic biodegradation and ammonia nitrification. In addition to oxygen transfer, aeration promotes mixing of the wastewater and scouring of the biomedica, helping maintain treatment efficiency.

1.3 Clarifier

Biologically treated water then exits the bioreactor and enters the clarifier through an inlet baffle. In the clarifier, quiescent hydraulic conditions allow biological solids produced during treatment to settle. The clarifier floor is partially sloped to enhance settling and direct accumulated sludge toward the collection area.

A sludge return assembly, controlled by a timer and operating in conjunction with a valve and the bioreactor blower, regularly recirculates settled sludge from the clarifier back to the primary compartment through a recirculation conduit. This process supports the management of sludge generated during aerobic treatment in the bioreactor. The frequency and duration of recirculation are calibrated to ensure optimal system performance.

Following clarification, the treated effluent is discharged through an effluent baffle for final dispersal in accordance with applicable local regulations.

2. Design specifications

2.1 Rewatec fixed-film bioreactor technical data

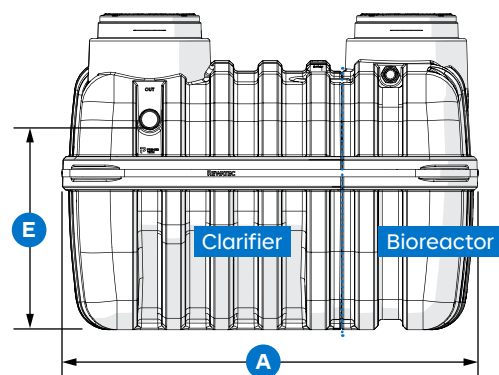
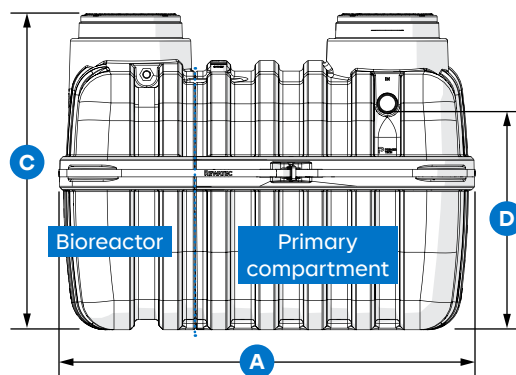
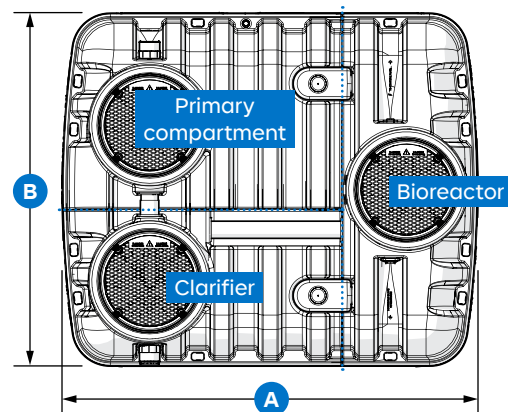
Component material

- Shell: polyethylene
- Lid and risers: polyethylene
- Biomedia: polypropylene

Polyethylene model specifications

Model	FFB-600-P	
Hydraulic capacity	600 gpd (2,270 L/day)	
Length	A	101-3/4" (2,585 mm)
Width	B	86-5/8" (2,220 mm)
Height	C	77-5/16" (1,964 mm)
Inlet invert height	D	53-9/16" (1,360 mm)
Outlet invert height	E	49-7/16" (1,257 mm)
Water inlet diameter (nominal)	4" (100 mm)	
Water outlet diameter (nominal)	4" (100 mm)	
Weight*	1,100 lb (500 kg)	
Volume of biomedia	150 gal (570 L)	
Blower model	Hiblow HP-120LL	

* Weights are approximate and not binding (for handling and lifting purposes only), and include all possible components.



Protected intellectual property reference: 5621
patentmarking.premiartech.com

2.2 Installation specifications

The wastewater treatment system must be installed in a place where:

- there is no motorized traffic
- it is accessible for maintenance and pumping
- it is not likely to be flooded and where it will not be submerged (depending on the situation, a drain may be required around the unit to prevent installing it in groundwater)
- it complies with the distances as shown below or in local regulations, whichever has the greater distances

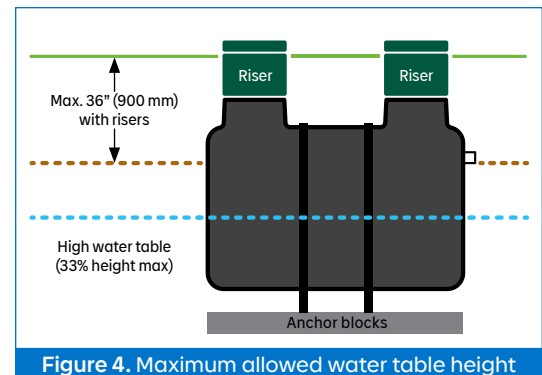
Minimum distances for the Rewatec fixed-film bioreactor treatment system

Reference point	Polyethylene models
Maximum burial depth (invert to final grade)	3' (1 m)
Structure (house, garage, shed)	13' (4 m)
Base of excess backfill, slope, or embankment	13' (4 m)
Parking area	13' (4 m)
Vehicle or object weighing more than 500 lbs (225 kg)	13' (4 m)
Retaining wall	13' (4 m)
Finished landscaping vs. base of lid	2" (50 mm) above grade
Seasonal high water table vs. base of unit	Maximum height of 2' (600 mm) up from the base of unit

Ensure that the location of the unit complies with local regulations.

2.3 Water table and anchoring

Water table height must not exceed 2' (600 mm) (33% of total tank height) from the bottom of the tank. In case of an expected high water table, an engineer shall provide buoyancy calculations to ensure adequate unit uplift restraint. Recommended uplift restraint options include placing anchor blocks on either side of the unit and connecting them by passing straps over the unit, as shown in Figure 4, or any other method deemed acceptable by a qualified engineer.

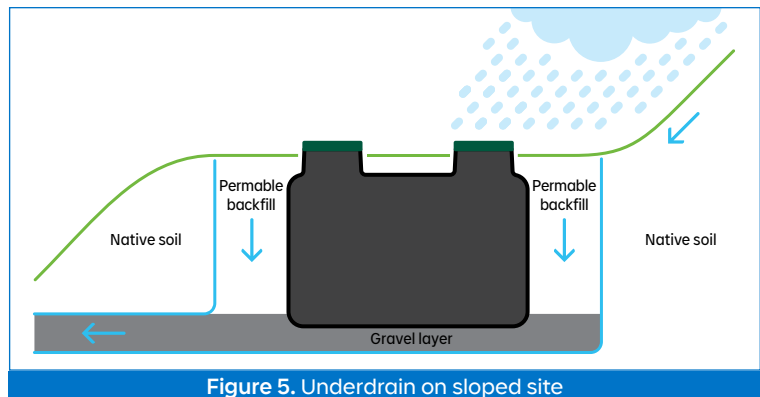


2.4 Drainage

As shown on Figure 5, an underdrain or curtain drain may be needed on sloped sites or when required by surface water runoff or other relevant site conditions.

2.5 Air intake

The air intake must be at least 2' (600 mm) above grade and fitted with the provided 2" (50 mm) mushroom cap. The air intake must be winterized to allow for snow cover and must extend 6" above the expected snow level.



2.6 Final grading

To prevent runoff water infiltration into the system's components (distribution box, unit, pumping station, etc.), the lids of the unit must be 2" (50 mm) higher than the final grade and ensure positive draining away from the unit. This includes finished landscaping.

3. Installation instructions

Notify all concerned parties (installer, landscaper, owner, snowblower, etc.) of the septic system's location to avoid damaging the system's components. Inspect the integrity of the unit and its components upon delivery.

IMPORTANT: For these installation steps, the installer is responsible for adhering to all applicable safety measures, including wearing a hard hat, gloves, boots, safety glasses, and a face mask.

The treatment system's inlet must be connected with pipes that meet applicable standards. A minimum 2% downward slope must be provided. All electrical connections must be made by a professional electrician and comply with applicable local requirements.

3.1 Installation sequence

Site layout

Prior to excavation, mark the location and orientation of the unit, absorption area, air intake, venting, control panel, and any other components according to the approved design plan.

Excavation, base, and setting of the unit

- Excavate an area approximately 18 to 24" (450 to 600 mm) larger than the unit. Add a 4 to 6" (100 to 150 mm) gravel layer (up to 3/4" (20 mm) in size) free of organic matter. Ensure that the gravel layer is leveled and compacted.
- If the water table is high upon excavation, drainage must be performed as described in section 2.4.
- Inspect the Rewatec fixed-film bioreactor unit's integrity upon delivery.
- Lower the Rewatec fixed-film bioreactor onto the excavation floor using the designated handling rails. Ensure there is no more than a 1/8" (3 mm) height difference between the front, back, left, and right sides of the unit.
- Fill the Rewatec fixed-film bioreactor's compartments with water up to the outlet invert. Alternate between each compartment while filling to ensure an evenly-balanced fill.

Anchoring

If any part of the unit is below the estimated seasonal high water table, install appropriate anchoring based on the designer's recommendations.

Initial backfill

Perform even backfilling by alternating on the unit's longer and shorter sides. For the first 36" (900 mm) of backfilling, make sure to push backfill material beneath the sloped floor on the clarifier side of the unit. Backfill the unit up to 8" (200 mm) below the outlet invert. Backfill material be carefully placed with a bucket instead of dumped. Backfill material should be sandy and free of rocks and stones larger than Ø 2" (50 mm).

Inspect the integrity of the unit's compartments and internal components.

IMPORTANT: Ensure no backfill material gets into the unit during the backfilling process.

Inlet and outlet connections (building and pumping station)

Run 4" (100 mm) pipes to the house and final dispersal area. The pipes must be in trenches specific to this purpose. Ensure the pipes are sloped along their length. Premier Tech recommends sloping them 1/4" (6 mm) per foot. Ensure the soil beneath the pipes is well-compacted.

Connect the unit's inlet to the building sewer line and its outlet to the final dispersal pipe.

If pumping to the unit is required, please contact your Premier Tech Water and Environment representative.

Control panel and electrical connections

IMPORTANT: A professional electrician shall perform the electrical wiring and connections of the Rewatec fixed-film bioreactor treatment system according to local regulations. Attempting to wire and connect the treatment system by anyone other than a professional electrician may cause bodily injury or death and may cause serious damage to the Rewatec fixed-film bioreactor treatment system and other property.

Install the control panel at its chosen location. Perform the electrical connection from the system's capsule to the control panel using the provided 25' (7.6 m) multi-wire cable (Fig. 6). The cable shall be run in an electrical conduit through the system's access collar. If additional length is required, contact your Premier Tech Water and Environment representative.

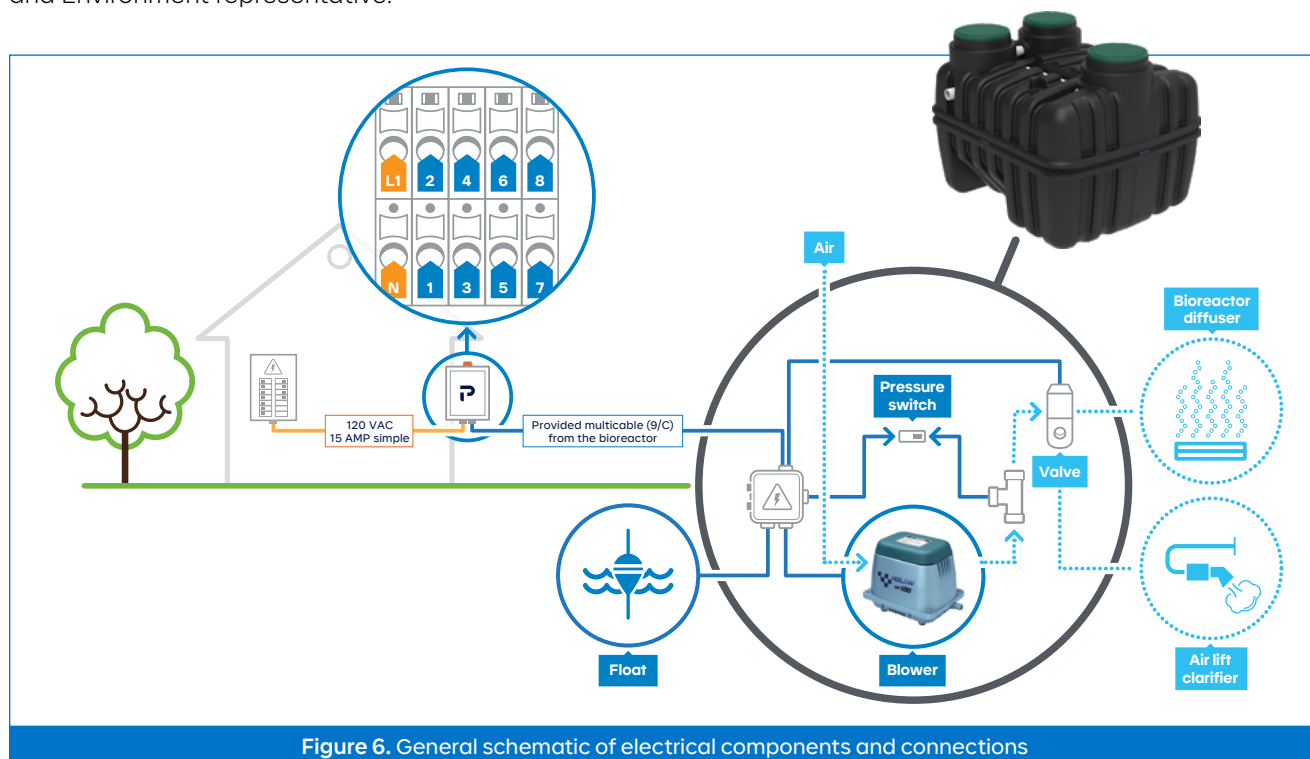


Figure 6. General schematic of electrical components and connections

- 1) Connect each wire from the provided multi-wire cable to its associated terminal inside the control panel, using a tool to push onto the orange connection pins (Fig. 7). The wire's identification number is the same as its associated terminal (numbered 1 to 8).
- 2) Screw the ground wire (green) from the multi-wire cable onto the control panel's ground terminals located on the back plate below the main terminals.

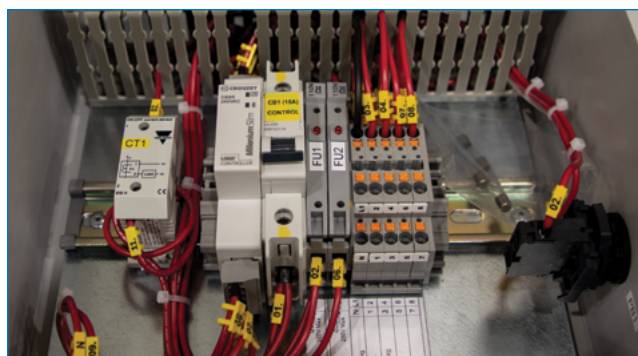


Figure 7. Control panel terminals

The Rewatec fixed-film bioreactor's capsule is factory-wired to the treatment system's electrical components and alarms through a provided junction box (Fig. 8). No further action is required within the unit.

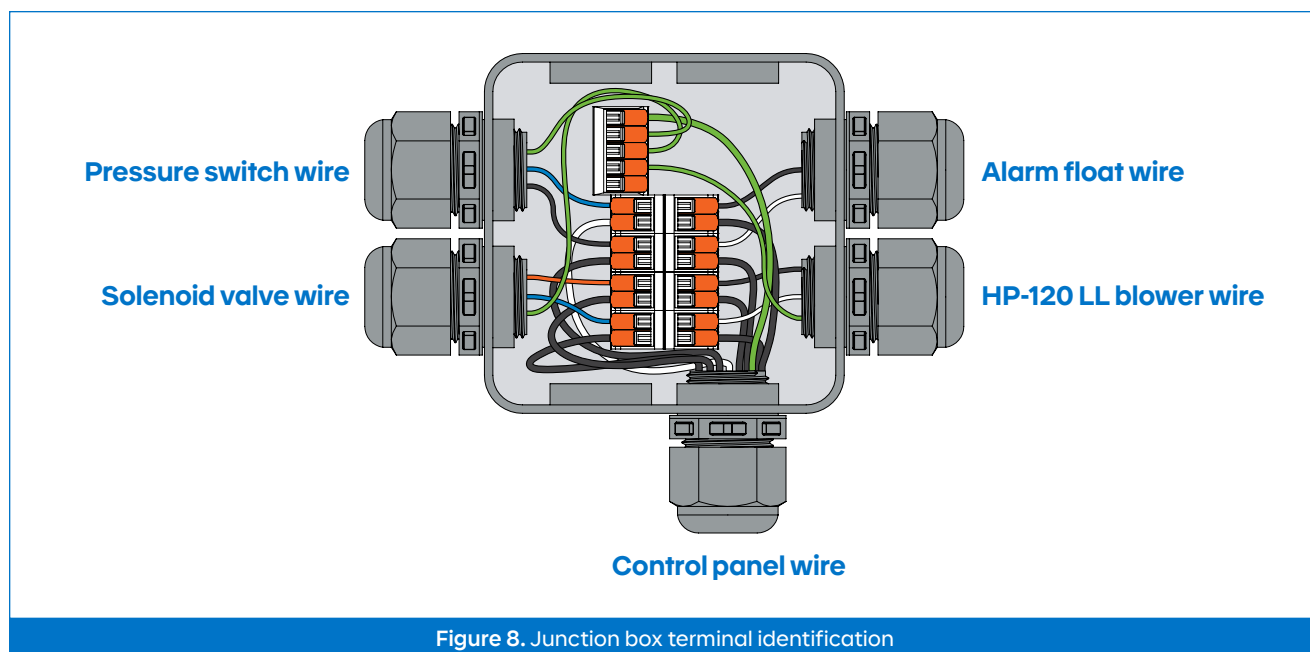


Figure 8. Junction box terminal identification

The panel will require one 120 V/15 A circuit. Run the required cables from the house to the control panel. Connect power to the panel using the provided electrical terminals according to the wiring diagram included on the inside of the control panel's enclosure. Before energizing the control panel, ensure that the panel's voltage is 120 V once the electrical connection is completed.

Air intake connections

A 2" (50 mm) pipe connection is provided on the bioreactor's access collar for the capsule's air intake. Glue a 2" (50 mm) PVC air intake pipe to this port. The air intake pipe needs to be sloped away from the system to prevent condensation from entering the capsule. Premier Tech recommends adding a tee fitting at the bottom of the above-ground portion of the air intake pipe to drain any condensation (Fig. 9). The bottom of this fitting shall be left below and not capped. Attach the provided mushroom cap or another appropriate device (such as a candy cane pipe or mushroom cap) to the air intake opening to prevent water from entering. Premier Tech recommends that the air intake pipe extend at least 6" (150 mm) above expected snow height.

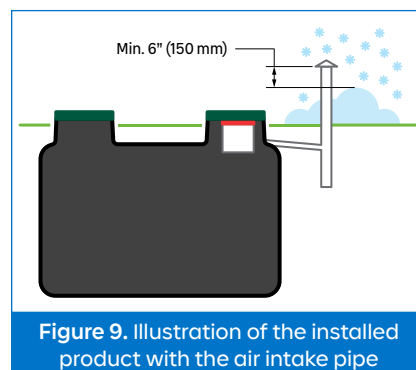


Figure 9. Illustration of the installed product with the air intake pipe

Risers

When needed, install Premier Tech Water and Environment risers to bring accesses 2" (50 mm) above the final grade. The maximum allowed depth from the invert of the inlet pipe to the final grade is 36" (900 mm). It is not required to extend the connecting pipes of each compartment to ground level. These will remain accessible at shallow burial depths, if necessary.

Final backfilling

It is important that the backfill material be carefully placed over the installation rather than dumped. The backfill material must be sandy and free of rocks, stones, and debris larger than Ø 2" (50 mm). Ensure that access lids remain 2" (50 mm) above the final grade.

Before the final backfilling, remember to connect the capsule to the control panel and to connect the control panel to a power source.

IMPORTANT: The polyethylene fixed-film bioractor system must be backfilled in successive compacted layers of 24" (600 mm) maximum thickness. Failure to comply may result in structural damage to the unit.

3.2 System start-up

Once the system is installed and properly connected, open all its access ports and do the following:

- Visually inspect the components inside the system (capsule, air compressor, valves, air tubing, diffusers, tees, airlift, etc.) to make sure they are properly installed and will work as intended. Pay careful attention to their positioning, proper assembly, and to any kinking in the air tubing.
- Ensure there is no debris within the unit that could impair the system's operation or lifespan.
- Fill the bioreactor with 12" (300 mm) of water to avoid triggering the pressure switch alarm.
- Turn on the control panel.
- Manually engage the high water-level alarm float to ensure that it works properly.
- Verify the pressure-switch alarm's operation by first making sure that the air compressor is blowing air to the fine bubble diffuser, then by disconnecting the blue tube from the capsule. The alarm should trigger after a 30-second delay. Once determined to be working properly, reconnect the blue tube to the capsule.
- Ensure the air diffusers' proper operation by visually inspecting the bioreactor compartment for bubbles. This will also ensure there is no air leaking from the pipes. At the time of commissioning, the biomedica will float on the water's surface without significant movement. This is normal, as it will take a few days for the biomedica to properly wet and begin to move as expected within the bioreactor.
- Ensure the sludge return assembly's proper operation by observing water transfer from the clarifier to the primary compartment. Water should be visibly flowing from the sludge return assembly into the transfer pipe between the two compartments. If you see bubbles in the clarifier compartment, call Premier Tech.
Note that it may take up to 20 minutes for the airlift cycle to occur.

3.3 Final checklist

Before leaving the site, the Rewatec fixed-film bioreactor must be installed in compliance with the following instructions:

- lids and cleanouts are free of debris, securely fastened, and 2" (50 mm) above grade
- air intake is at least 6" above final grade or typical snow height and fitted with a mushroom cap
- backfill depth from the inlet invert does not exceed 36" (900 mm)
- there is positive drainage away from the system
- the system's control panel is turned on and powered
- the system's blower is functioning
- the system's air diffusers are bubbling
- the system's sludge return assembly is functioning
- the system's high water-level alarm is functioning
- the system's air pressure-switch alarm is functioning
- the homeowner has received the system's documentation, including the owner's manual, maintenance agreement, and warranty

Inform the homeowner of the following recommendations:

- The Rewatec fixed-film bioreactor must only receive residential wastewater. No roof gutter, sump pump, or air conditioner drain must be connected to the septic system.
- Premier Tech does not recommend discharging backwash from a drinking water treatment system or water softener into the septic system.
- Premier Tech does not recommend connecting a garbage disposal to the Rewatec fixed-film bioreactor, as it may lead to more frequent pumping.
- After the unit is pumped, it must be immediately filled back with water, except after heavy rain or when the ground is heavily saturated in water.
- Ensure surface water is diverted away from the unit if the landscape is modified after installation.
- Ensure that ground cover grows back quickly to prevent soil erosion.
- Never turn the power off.
- Remind the homeowner to return the maintenance agreement to Premier Tech and to register to their Premier Tech Client Space.

For any questions, please contact Premier Tech at 1 800 632-6356



PT Water and Environment

+1 800 632-6356

info.ptwe.na@premiertech.com

PT-WaterEnvironment.com



The information contained in this document was up-to-date and consistent with the information available at the time of publication. Premier Tech Ltd. and its affiliated companies make no warranties or representations as to its accuracy. Because of its continuous improvement policy, Premier Tech Ltd. and its affiliated companies reserve the right to change and/or discontinue the manufacture of any product and/or modify technical data and prices, for any reason whatsoever and at its sole discretion, without further notice and without liability to anyone in this regard. REWATEC™, PREMIER TECH® and PREMIER TECH & DESIGN™ are trademarks of Premier Tech Ltd. or its affiliates. For current data regarding all patent application(s) and patent(s) for this product or any part thereof, consult the website patentmarking.premiertech.com, with the following references: 5621.

© Premier Tech Ltd., 2026. All rights reserved.

CAN-USA