

Ecoflo biofilter – nitrogen reduction unit (ECDn)

Owner's manual

Congratulations on your purchase of an Ecoflo biofilter – nitrogen reduction unit (ECDn) from Premier Tech. With the ECDn, you have wisely chosen to protect your health as well as the environment. This manual contains information on the operation, operating guidelines, maintenance and warranties of the ECDn. For additional information, contact our customer service at 1-800-632-6356 or visit our website at PT-WaterEnvironment.com

1. Operating Principle

Onsite wastewater treatment systems must respect applicable local rules and regulations. These systems are specifically designed to treat residential wastewater to such a level that treated effluent can be safely returned to the environment. Typically, an onsite wastewater treatment system is composed of 2 to 3 main treatment steps depending on site constraints prior to final dispersal of treated effluent: primary treatment, treatment system and if required polishing unit.

1.1 Primary treatment

The primary tank is the first element of this nitrification-denitrification system. The primary tank's main functions are to accomplish a primary treatment which is to retain solids and let only a clarified effluent enter further treatment (ECDn) as well as to offer an anoxic zone in order to promote total nitrogen removal (denitrification).

1.2 Treatment system

The wastewater first goes into the primary tank through an inlet device (tee or baffle) that directs it into the tank. The primary tank promotes total nitrogen removal (denitrification) under anoxic conditions by creating a rapid mix of the recirculated treated effluent (from the ECDn with the organic content of the raw wastewater. The recirculation line between the ECDn and the primary tank is simply connected to the inlet pipe of the primary tank. From the primary tank, the pretreated wastewater flows by gravity to the ECDn by first passing into an effluent filter that promotes scum and solids retention in the tank.

Once the wastewater reaches the ECDn, a tipping bucket equally disperses the wastewater on specially designed plates which evenly distribute the wastewater on top of the filtering media. The wastewater then trickles through the natural fibrous filtering media.

The dosing control unit used in this system controls the pump located in the bottom of the biofilter that feeds a flow divider (PFS-200DN). This control unit consists of a "simplex" control panel allowing management of the dosing pump's cycles (start and pause). The controller totalizes and keeps records of the different pump's operating times either in normal cycle or in critical high level situations. It also totalizes and records the number of critical high level events occurred on the system since its installation. This last count allows validation of the dosing cycle used (operation time and pause time).

The flow divider (PFS-200DN) allow a fraction of the treated wastewater to return to the primary/anoxic tank via the pump located in the bottom of the biofilter and the remaining fraction is directed toward the dispersal/disposal mean in accordance to local regulations. The recirculation ratio is approximately two (2) times the daily flow (2Q).

The ECDn's operating principle allows the system to be used continuously or intermittently without requiring any special precaution or having any impact on the quality of the treatment. No specific action from the owner is required to start the system.

The model and the number of ECDn are determined by the domestic wastewater flow per day. Other factors such as the available space, the topography of the lot, as well as the type, permeability and depth of the natural occurring soils could influence model selection.

2. Ecoflo biofilter – nitrogen reduction unit (ECDn) models

There are many different models of ECDn and each model has different characteristics. The letters and numbers associated with the ECDn specify the model's characteristics, as presented in the following table with model **ECDn-500-P (PACK)** as reference:

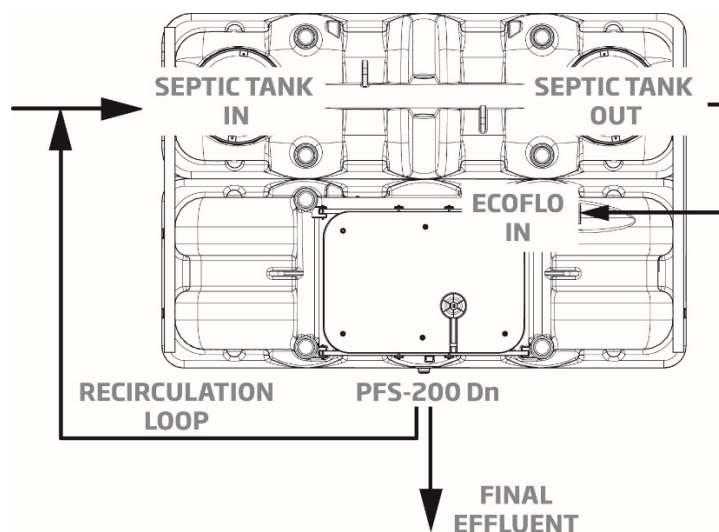
EC refers to the Ecoflo model	EC = Ecoflo 100% coco biofilter
Dn	Nitrogen removal product with a maximum applicable HLR 575 L/m²-d, i.e. of 14.1 gal /ft²
500 refers to the daily flow capacity	500 = Capacity of 500 US gallons per day 600 = Capacity of 600 US gallons per day 865 = Capacity of 850 US gallons per day 1000 = Capacity of 1,000 US gallons per day 1100 = Capacity of 1,100 US gallons per day
P refers to the material of the shell	C = Concrete P = Plastic (Polyethylene)
PACK refers to configuration of the primary tank and biofilter	PACK = monobloc configuration, both tight together No mention = In line

Therefore, according to this nomenclature, the **ECDn-500-P (PACK)** model refers to an Ecoflo biofilter, nitrogen reduction version, with a daily flow capacity of 500 US gallons, in a polyethylene shell. Both primary tank and biofilter come in a monobloc configuration (pack).

For models that doesn't come into PACK configuration, the recommended hydraulic retention time of the primary/septic tank is a minimum of two days at the design daily flow.

3. Installation Diagrams

NOTE: The installation diagrams below show the ECDn with polyethylene shell-PACK configuration.



4. Operating Guidelines

Type of wastewater that can be treated by an ECDn:

Domestic wastewater (for example: wastewater from isolated dwellings).

It is NOT RECOMMENDED to discharge any of the following substances into the septic system:

- Oil and grease (motor oil, cooking oil, etc.);
- Wax and resins;
- Paints and solvents;
- Any kind of petroleum product;
- Any kind of pesticide;
- Any kind of septic tank additive;
- Anything not easily biodegradable (for example, coffee beans, cigarette butts, sanitary napkins, tampons, condoms, cotton swab, etc.);
- Pharmaceutical products;
- Cleaners for pipes or pipelines;
- Any kind of toxic substance;
- Household cleaning products in large



AND

- Never open or go inside the primary tank or the ECDn.
- Keep all lids of the septic system accessible at all times. Never cover them with mulch, dirt or any permanent structure (patio, swing, shed, etc.).
- Make sure all lids of the septic system are at least 50 mm (2") above the surface of the landscaped lot.
- NEVER install a riser on polyethylene ECDn 865, 1000 and 1100-P models.
- NEVER install more than one (1) 6 inch riser on a polyethylene ECDn 500 and 600 models for a total of three (3) risers
- NEVER install more than one (1) 8-inch riser on a concrete Ecoflo biofilter main access. Use only Premier Tech products.
- Never plant trees within 6 m (20') of the Ecoflo biofilter lid and within 2 m (6' 6") of the absorption bed.
- Never connect a drain pipe, roof gutter, sump pump or air conditioner drain to the septic system.
- NEVER discharge content or water from a water softener or other potable water treatment devices backwash, a spa or pool in your septic system.
- NEVER discharge wastewater from a recreation vehicle (camping trailer, caravan, etc.) into any of the components of your septic system.
- Never use automatic toilet bowl cleaners or disinfection devices.
- Do not let anything accumulate on top of the septic system (for example, blown snow, backfill, landscaping, rocks, etc.) less than 5 m (16' 5") of your septic system's lid.
- Maintain a minimal distance of 6 m (20') between the bottom of a slope, an embankment or a retaining wall and the lids of your septic installation.

By respecting these guidelines, you contribute to the proper operation of your septic system and help prolong the life of your ECDn filtering media. Failure to abide by these guidelines may, at Premier Tech's discretion, render the warranty invalid.

4.1 Owner's responsibility

The owner must respect all existing laws and regulations regarding the system's effluent quality and its discharge into the environment. The owner of the wastewater treatment system is responsible for its installation, operation and maintenance.

The system's warranty begins upon purchase. Should the start-up be delayed, it is the customer's responsibility to inform Premier Tech about it so the first maintenance, which is included in the purchase price, is postponed. If the first maintenance has been performed prior to the client's call, Premier Tech reserves the right to decide whether another maintenance, **free of charge or not**, will be carried out the following year. No request for delayed start-up will be accepted any later than one (1) year after the purchase date without it affecting the product's warranties.

4.2 Keep heavy objects off your septic system

Never drive a vehicle or place objects weighing more than 225 kg (500 lb) within 5 m (16' 5") of the lid of your ECDn. If you are planning any kind of landscaping or any other type of work on the property (i.e.: snow removal, lawn mowing, excavation, etc.), **make sure you advise all those involved**, so they do not damage your septic system. It is recommended to note where of your septic system elements are located.

4.3 About your home

Your home must be equipped with an air vent that is in proper working order and all plumbing must comply with the applicable standards of the building code in your location. Every septic tank must be ventilated by an air duct with a diameter of at least 100 mm (4") or be connected to the air vent of the isolated dwelling being served. Premier Tech strongly recommends using a pipe with a diameter of 100 mm (4") for the air vent.

Any change in the use of your home or any modification to your ECDn must be authorized by the local authorities, and Premier Tech must be advised. If this requirement is not fully met, the warranty for your ECDn will be null and void.

5. Maintenance

5.1 Primary tank

Empty your primary/septic tank every two to four years **or if the level of sludge measured exceed the 2/3 of the total height of water in the tank**. This helps to keep your septic system in proper working order. Every primary/septic tank and effluent filter shall be inspected and maintained as prescribed by local regulations.

If your home is equipped with a garbage disposal or a sewage pump, we strongly recommend emptying your primary/septic tank more frequently than the frequency noted above. Using this kind of equipment increases the amount of sludge in the primary/septic tank.

To have complete records of the maintenance performed on your septic system, we recommend that you to keep the proof of maintenance (invoice) with this Owner's Manual.

IMPORTANT: Primary tanks can be emptied in several ways that can be classified into two categories: **complete emptying and selective emptying**. Complete emptying, the most common, consists of completely pumping the contents of the primary tank. It's easy to check if the work was properly done because the primary tank will be completely empty when the vacuum truck leaves the site. Selective emptying is divided into two sub-categories: with a filter (or recycled) or without a filter. The method with a filter requires a truck that has been adapted for this type of emptying, that is, one that separates and retains the solids from the wastewater. The mechanically clarified water is then returned to the primary tank. The selective method without a filter allows the solids to settle while in the truck before the water is returned to the primary tank. As such, in an effort to ensure the ECDn continues to perform optimally, **it is very important that you ensure than the water that is returned to the primary tank has been properly clarified and does not contain or contains very few suspended solids**. We also recommend you to call one of the members of Premier Tech's local partners. He will assist and verify if the work is done according to your specific needs to best protect your Ecoflo biofilter – nitrogen reduction (ECDn) system.

5.2 Effluent filter

Under normal operating conditions, as described in this manual, an effluent filter that complies with local regulations should operate efficiently for many years. It must be cleaned every time the primary tank is emptied, as established or recommended by local authorities. Premier Tech recommends utilisation of Polylok™ PL-250 effluent filter or effluent filters with equivalent or superior filtration area.

5.3 Ecoflo biofilter – nitrogen reduction unit (ECDn)

The owner of a biofiltration system **shall follow the manufacturer's recommendations regarding the maintenance of the system**. For that purpose, he shall at all times have a valid contract with the manufacturer or its local representative and, depending on the local regulations, **a copy of the contract may have to be filed to the authorities**.

Annual maintenance is important to ensure optimal performance of your ECDn and essential to maintain its warranty. Therefore, your biofilter must be serviced annually for the duration of its useful life. According to local regulations, more than 1 visit per year may be required.

The maintenance of your ECDn shall be carried out by one of our duly trained service providers. This service includes a visual inspection of all components and a verification of the operation, as well as maintenance of the filtering media. **For maintenance purposes and to replace the filtering media, you must ensure that your system's lid is easily accessible at all time.** Never cover or bury the lid of the ECDn. After each inspection, you will be given a maintenance record. Keep it with this manual in a safe place.

After a minimum of eight (8) years, the filtering media is analyzed by one of our authorized agents. Under normal usage, if the filtering media has not been abused and the operating guidelines have been respected, the filtering media might not have to be replaced and can be used for some additional years. **However, your ECDn's filtering media must be replaced before the system's treatment capacity and performance begins to deteriorate.** The filtering media is easily pumped out using a truck adapted to emptying primary tanks. The new filtering media is then installed by an authorized agent or the pumper.



To know more about the maintenance of your ECDn, refer to your Maintenance Agreement. If you need help or more information, please call our Customer Service department at **1-800-632-6356** or visit our website at **PT-WaterEnvironment.com**.

6. Ecoflo biofilter – nitrogen reduction unit (ECDn) with pump

ECDn are equipped with a pump that directs the treated effluent to an appropriate disposal mean according to local regulations and the primary tank via the recirculation line. The electro-mechanical components are included in this system. To learn more about electro-mechanical components, consult the Timed Dosing Unit DCU-100 Installation Guide and Owner's Manual.

7. Electrical connections

All electrical connections must be done by a **certified electrician** and using seal connectors is mandatory. Premier Tech recommends installing the power box on top of the pump vault insulating board to avoid humidity problems.

Use two (2) separate circuit-breakers, one to operate the pump and the other to connect the control unit. Do not connect anything else to these circuit-breakers (for example, a household appliance). They must be used exclusively for the pump and the alarm box.

8 What to do in case of...

8.1 An activated alarm

If an alarm is activated, unrelated to a power failure, contact Premier Tech's After-Sales Service department so the problem can be identified and corrected.

8.2 A prolonged power failure

If a power failure that occurs during winter is prolonged, protect the components of your septic system against freezing. If you have any questions to restart your system, contact Premier Tech's After-Sales Service department.

8.3 Flooding

Certain sites are prone to flooding or to rises in groundwater levels. This can lead to a malfunction in your septic system or alter the performance of your ECDn. If this happens, contact Premier Tech's After-Sales Service department.

8.4 Backflow

Backflow rarely occurs. But if it does happen, the primary tank is usually the cause. Your primary tank installer or primary tank pumper can generally take care of the situation.

8.5 Odours

All septic systems are apt to generate gases and odours. The position of the air vent, as well as other factors unrelated to the ECDn itself, can prevent septic gases from dispersing properly and lead to odours. If this happens, contact Premier Tech's After-Sales Service department.

**If you have any questions or comments,
do not hesitate to contact Premier Tech at 1-800-632-6356.**



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Certificate of Warranty for Ecoflo biofilter

1. PREAMBLE

Premier Tech Technologies Ltd. (hereinafter called "Premier Tech") is proud to provide its customers with an exclusive wastewater treatment system guaranteed by an innovative Warranty.

For the application and interpretation of this Warranty, "Customer" shall mean the person who has purchased an Ecoflo biofilter (hereinafter called "Initial Purchaser"), for a residential installation, as well as any subsequent purchaser (hereinafter called "Subsequent Purchaser(s)"), in accordance with the provisions of section 8 of this Warranty. "Successor(s)" shall mean any other person entitled to exercise the same rights as the Customer under the law.

2. NATURE OF THE WARRANTY

2.1. Ecoflo biofilter

Premier Tech warrants to the Customer that the filtering media of the Ecoflo biofilter shall function properly for a period of eight (8) years from the date of purchase by the Initial Purchaser (proof of purchase required).

Except as provided in sections 2.2 and 2.3 below, Premier Tech also warrants all parts of the Ecoflo biofilter components against any manufacturing defect for a period of ten (10) years from the date of purchase by the Initial Purchaser (proof of purchase required). The first two years of the warranty also cover the labour.

2.2. Concrete

Premier Tech does not offer any additional Warranty on the shell of the concrete Ecoflo biofilter. Accordingly, the Customer shall rely on the local concrete manufacturer's Warranty policy.

2.3. Pump, floats, alarm box and junction box

The pump, floats, alarm box and junction box included with the Ecoflo biofilter are guaranteed for two (2) years (parts only), from the date of purchase by the Initial Purchaser (proof of purchase required). The first year of the warranty also covers the labour.

Premier Tech's conventional Warranty is expressly limited to the text of this Certificate and valid provided the Ecoflo biofilter was installed in accordance with applicable regulations and with the manufacturer's recommendations.

3. NOTICE

For this Warranty to be valid, the Customer must notify Premier Tech in writing immediately upon the appearance of any indication of an anomaly or irregularity in the Ecoflo biofilter.

Such notice shall be mailed to Premier Tech's Head Office at 1, avenue Premier, Rivière-du-Loup, Québec, G5R 6C1, CANADA or by facsimile at (418) 862-6642.

Upon receipt of this notice, Premier Tech shall examine the situation and, if necessary, take appropriate corrective measures in accordance with the terms of this Warranty.

4. GENERAL EXCLUSIONS

The following damages or problems are excluded from the Warranty:

- (a) Any damage or problem caused by a fortuitous event or "force majeure", such as, without limiting the generality of the foregoing, an earthquake, a flood, frost, hurricane, landslide, explosion or dynamiting;
- (b) Any damage or problem caused by the fault or act of a third party including, without limiting the generality of the foregoing, the execution of landscaping work;
- (c) Any damage or problem arising from a defective installation carried out by a person trained by Premier Tech, or any installation, modification, correction or addition carried out by a person not trained by Premier Tech;
- (d) Any damage or problem arising from any installation, modification, correction or addition to the treatment system carried out after installation of the Ecoflo biofilter without prior written approval from Premier Tech;
- (e) Any damage or problem caused by the use of a septic tank that does not comply with the applicable regulations and/or with Premier Tech's specifications, as described in the Owner's Manual;
- (f) Any damage or problem, if it is shown that the usage of the Ecoflo biofilter was not in accordance with the instructions and guidelines described in the Owner's Manual;
- (g) Any damage or problem, if the maintenance of the Ecoflo biofilter was not carried out by a person authorized by Premier Tech, in accordance with the Maintenance Agreement;

(h) Any damage or problem caused by an omission or act of the Customer or the Customer's Successors including, without limiting the generality of the foregoing, refusal to allow access to the system for maintenance;

(i) Any damage or problem, if it is found that the Customer or the Customer's Successors have modified or changed the use of the property serviced by the Ecoflo biofilter resulting in the alteration of the nature or quality of wastewater being treated and/or that constitutes a violation of the applicable regulations;

(j) Any damage or problem caused by and/or resulting from the work carried out to access to the Ecoflo biofilter, including, without limiting the generality of the foregoing, excavation, snow removal or demolition;

(k) Any damage or problem resulting from the condition of the site or of the soil and not reported or not properly reported to Premier Tech by the Customer or the person undertaking the site investigation.

5. PARTICULAR EXCLUSIONS

It is further expressly understood that the Customer may not carry out or cause to be carried out any repair or verification of the Ecoflo biofilter sold to him, or attempt to carry out any work or to apply any corrective measures whatsoever to said work, before notifying Premier Tech in accordance with the provisions of section 3 of this Warranty and before Premier Tech has visited the site, within a reasonable time following receipt of said notice, to assess the situation.

If the Customer carries out or causes to be carried out repairs, or attempts to repair or to apply corrective measures of any kind whatsoever to the Ecoflo biofilter sold to him without prior authorization by Premier Tech, this Warranty shall be considered null and void and Premier Tech shall be considered completely discharged from any and all of its obligations under this Warranty.

6. INDEMNITIES AND DAMAGES

Subject to the application of the provisions and exclusions provided for in this Warranty, Premier Tech's liability and obligations regarding any corrective measure carried out or any attempt to correct an indicated problem shall be limited to replacing the filtering media and/or one or several components of the Ecoflo biofilter and to supplying the required labour, if applicable.

7. LIMITATION OF LIABILITY

Premier Tech's compensation or indemnification obligation shall be limited to the provisions of section 6 of this Certificate of Warranty and Premier Tech shall not be held liable for any other damage or loss that may have been suffered or incurred by the Customer or any third party in connection with the Ecoflo biofilter, its parts and/or components which originate thereof.

No additional warranty, express or implied, hence excluding any direct or indirect consequential damages (not limited to but including third parties loss) concerning the design, sale or use of the Ecoflo biofilter and/or services provided by Premier Tech is hereby granted. Premier Tech's liability under its warranty obligation shall in no case exceed the cost of the Ecoflo biofilter.

8. TRANSFER OF OWNERSHIP

In the event of transfer of ownership, sale, assignment or disposal in any way whatsoever of the Customer's property to a third party, this Warranty shall continue to apply if and only if the Subsequent Purchaser or the Successor confirms, by forwarding the attached "Notice of New Property Owner" to Premier Tech within a reasonable delay, that he/she is the new owner of the property, he/she understands and is aware of the content of this Certificate of Warranty and accepts its terms and conditions.

The person who proceeds with the transfer, sale, assignment or disposal of any way whatsoever of the property undertakes to hand over to the Subsequent Purchaser or the Successor the Certificate of Warranty provided upon completion of the work, as well as the Owner's Manual and, if applicable, the Maintenance and Environmental Monitoring Program for the Ecoflo biofilter.

Failure to abide by the terms and conditions of section 8 of this Certificate of Warranty may, at Premier Tech's discretion, render it invalid or to be rejected.

9. INSPECTION

The Customer and/or the Customer's Successors shall allow Premier Tech or its duly authorized representatives to carry out all necessary monitoring and inspections, as required, for implementation of this Warranty.

If the Customer and/or the Customer's Successors notify Premier Tech of an alleged defect or malfunction of the Ecoflo biofilter and that, after inspection, it is found that no such defect or malfunction exists or that such defect or malfunction is excluded from or does not apply to the Warranty, a minimum charge of \$150.00 plus direct expenses shall be paid by the Customer and/or the Customer's Successors for the cost of the inspection.

10. INTERPRETATION

The terms and conditions of this Warranty shall be interpreted according to and governed by the provisions of this Warranty and the legislation in effect in the Province of Quebec.

11. PRIORITY OF THE CERTIFICATE OF WARRANTY

This Warranty supersedes any contract or understanding, written or verbal, entered into between the Customer and Premier Tech. In the event of contradiction between this Warranty and any other documents and/or contracts entered into between the Customer and Premier Tech, this Warranty shall prevail.

12. PURCHASERS AND SUCCESSORS

Subject to the provisions of this Warranty and especially those of section 8, this Warranty shall continue to be valid for Subsequent Purchasers and Successors and shall continue to have full effect until the end of the agreed Warranty period provided for in section 2 of this Certificate.

Annex 2 - Notice of change of property ownership

This form must be returned to Premier Tech

(1, avenue Premier, Rivière-du-Loup (Quebec) G5R 6C1 or pta-crm@premiertech.com)

Have you recently sold a property serviced by a Premier Tech wastewater treatment system? Please complete the information below to the best of your knowledge to ensure a quick and accurate update of the customer file.

Name _____

You are the Previous owner New owner

Premier Tech Customer Number: 00_____

Site address serviced by a Premier Tech system:

Civic number Street

City Province/State Postal/Zip Code

Name of the new owner _____

Postal address (if different than the site where the system is installed):

Civic number Street

City Province/State Postal/Zip Code

Preferred language of correspondence French English
Preferred method of correspondence Email Mail

Phone (cellular) _____ Phone (other) _____ Email _____

I hereby declare that the residence serviced by a Premier Tech treatment system located at the above address changed ownership on this date _____

If you are the PREVIOUS owner:

I have provided the system's Owner's Manual and the included Warranty Certificate* to the new owners. I have informed them that an annual maintenance is required on the system as per local regulation and to maintain the validity of the product's warranties.

Signature Date

If you are the NEW owner:

I hereby declare that I have received and read the Owner's Manual and Warranty Certificate* and agree to abide by their terms and conditions.

I understand that an annual maintenance is required for all treatment systems as per local regulation and that I must renew my annual maintenance contract with the manufacturer every year (at the latest on December 31st of every year) to benefit from the protections of the product's warranty and ensure compliance of my system.

Signature Date