



**Biofriendly Sewage Treatment System**

**EN 12566-3 & S.R.66**

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1. Bio-Friendly Ltd. P6 Installation Instructions

**1**. **Preparation: Tank No1**

* Excavate a hole with a flat level base to the required depth.
	+ Prepare a concrete base in the bottom of the excavation with a minimum thickness of 100mm.
	+ Ensure that there are no stones or debris that could puncture the vessel before lowering it into the excavation.

**2. Installation:**

* + Ensure the vessel is emptied of water before attaching the lifting slings to the

 lifting points located at either side of the hatch opening.

* + **Do not** wrap slings or chains around the body of the vessel.
	+ Lower **Tank No1** into the excavation ensuring that the inlet/outlet orientation is correct.
	+ Check the level of the tank in all directions.
	+ **Lower treatment unit into hole, make sure you have gravity flow from Tank No1.**
	+ Half fill the tank with water being sure to fill each compartment equally to above the flange level of the tank.
	+ Backfill the excavation with concrete above the joining flange of the upper and lower tank halves making sure that the concrete is equally distributed, and no voids are present.
	+ **Do not use vibrating pokers**
	+ Fully fill the tank with water up to the outlet pipe level while simultaneously back-filling with pea-gravel up to ground level.
	+ Connect the sludge return pipe (supplied) between first tank and treatment system.

**Important note:** **Surface water run-off from roofs, drains or gutters should NOT be allowed to enter the system.**

 **3. Electrical:**

 **All electrical work must be completed by a registered electrician.**

* + Electrical connections should be made from the dwelling to the tank using 1.5mm three core cable (or 5 core cable if alarm is required), which must be contained in a plastic conduit.
	+ N.B. If pump is being installed then 5 core cable is required to facilitate the fitting of the alarm.
	+ Cabling entering the tank must be passed through the waterproof gland situated on the upper part of the vessel.

Electrical connections in the dwelling are to be made using a dedicated 5amp MCB.

* + Electrical connections at the vessel should be made using water resistant IP56 master seal, compliant plugs and sockets.

**4. Irrigation:**

* All irrigation work should comply with a site suitability report conducted by Bio-Friendly Ltd. on receipt of valid water-table and percolation test results in accordance with SR6:1991 or EPA *Sewage Treatment Systems for Single Houses and Dwellings. (Bio-Friendly Ltd. can provide this service report on request)*
* The contractor is responsibility of all works carried out on installation and are guided by the site report that has been carried by a qualified engineer.

2 Bio-Friendly Ltd. Service Agreement

The following agreement entitles the end user to the after sales service offered by Bio- Friendly Ltd. under the following conditions:

* That the unit has been installed in accordance with the guidelines stated in the Installation procedures accompanying the system.
* That Bio-Friendly Ltd. has received the documentation from the person (s) stated in the Installation procedure.
* that the installation has been checked and signed off as being satisfactory at the time of installation, either by the Engineer for the development, or the builder.
* That the unit is used in accordance with the operation manual supplied with the system.

Bio-Friendly Ltd. will service the system on an annual basis. It is the responsibility of the homeowner to arrange the service.

A Bio-Friendly Ltd. representative will undertake all service work related to the system, excluding remedial work to the irrigation area or the removal of sludge from a system or any work related to drains or soak ways. A licensed company must be used to remove sludge from the unit.

Bio-Friendly Ltd. will not be liable for any damage or loss of equipment or property including consequential loss caused by the failure of any equipment or failures caused by the inclusion of gross solids (e.g., disposable nappies, feminine hygiene products, baby wipes etc) in the effluent. The end user is fully responsible for the correct operation of the system.

Bio-Friendly Ltd. will attend emergency callouts as soon as possible. These will be charged at the current day rate which does not include mileage or necessary spare parts.

Client Signature :

Print Name :

Tel. No :

Brendan Gordon, Bio-Friendly Ltd.

Date:

# Bio-Friendly Ltd. P6 Sewage Treatment System Description

 Tank 1 Tank 2

Outlet

Water level

Settlement Chamber

Baffle wall

Compressor Box & Compressor

Sludge return

Host Media & Submerged filter bed

Ventilation

Inlet

Outlet to percolation area

Clarification Chamber 2

Treatment Chamber 1

Figure 1: Diagram of Bio-Friendly Ltd. P6 Gravity Flow Sewage Treatment System

# Safety Precautions

The user’s attention is drawn to the following points: -

1. All sections of this manual must be read before working on or operating the equipment.
2. Installation must only be carried out by suitably trained/qualified personnel.
3. Normal safety precautions must be taken, and appropriate procedures observed to avoid accidents.
4. Ensure the lids to the Bio-Friendly Ltd. Systems are securely tightened after installation and inspections. Padlocks may be added for additional peace of mind and for the protection of humans and animals.

**If further information is required, please contact Bio-Friendly Ltd.**

Before carrying out any work on the system it is highly recommended that protective clothing be used.

It is vitally important that strict hygiene procedures are adopted when carrying out any work on the Bio-Friendly Ltd. P6 System. After handling or coming into contact with any part of the system ensure that hands and any clothing used are thoroughly washed.

Please beware that the inner part of the system may contain a build-up of toxic/flammable gases, therefore, it is important to ensure that the Bio-Friendly Ltd. System is fully vented at all times, especially before carrying out any work within the tank.

All electrical connections must be fully earthed and be installed by a Registered Qualified Electrical Engineer.

# Plant Description

The Bio-Friendly Ltd. P6 System is a stand-alone sewage unit designed for use by up to 6 people. The systems comprise of 2 GRP (glass reinforced plastic) Tanks, where the first is used for settlement (Tank 1) followed by a secondary tank (Tank 2) which is divided into two chambers for biological treatment and clarifying (Fig1).

The Bio-Friendly Ltd. Systems will provide a long and trouble-free operation provided simple maintenance and servicing procedures are followed.

The Bio-Friendly Ltd. P6 System has been designed to treat the volume and strength of sewage specified in the original specifications. To ensure that the system continues to operate efficiently the following points should be adhered to:

* Do not exceed the maximum design loading of the system.
* Do not allow surface water to enter the system.
* Do not allow high volume discharges to enter the Bio-Friendly Ltd. P6 System, for example swimming pools or Jacuzzis.
* Do not allow large quantities of chemicals such as water softeners, detergents, disinfectants, strong acids or alkalis, oil or grease, pesticides or photographic chemicals enter the Bio-Friendly Ltd. P6 System.
* Do not use chemical or biological emulsifiers in grease traps.

The Bio-Friendly Ltd.P6 System contains the following components required for the sewage treatment process:

* **Submerged Filter Bed**
* **Air Diffuser**
* **Linear Compressor**

The submerged filter bed (Tank 2) contains many randomly packed plastic host media in the chamber. The media is made from UV stable uPVC and provides a largesurface area for the growth of bacteria required for the purification process.

To promote growth and encourage bacterial action, the bio-filter is aerated by a small compressor that runs on a constant 24-hour cycle. The compressor is virtually maintenance free and requires an **Annual inspection** and testing for efficiency. This is carried out in accordance with the Annual Service Schedule for the system. The air produced by the compressor is pumped to the diffusers which in turn produce a fine air bubble. Air diffusers are used to distribute air evenly to the treatment area, creating an aerated substrate from which microorganisms feed off, in doing so treat the influent so it can be discharged to the percolation area for further treatment in the soil.

The Bio-Friendly Ltd. P6 System is fitted with a vent-pipe which is visible above ground level. **It is important** that the vent is kept clear of all obstructions to ensure that the tanks are vented, and the compressor is able to draw in a constant supply of air for the efficient treatment of wastewater.

# Capacity of Bio-Friendly Ltd. P6 System

The Settlement Tank (Tank 1) 2,210 Litres

Treatment Unit divided into two sections (Tank 2)

1st compartment (the treatment area) 1,300 Litres

2nd compartment (the final settlement area) 700 Litres

**Total Capacity 4,210 Litres**

# Operating Sequence (how the system works)

**7.1 Bio-Friendly Ltd. P6 System Process**

Unlike the majority of systems available the Bio-Friendly Ltd. P6 System is a two tank system. This means that the secondary stages of the treatment process is carried out in a separate tank (Tank 2), also known as the submerged filter bed. The benefits of this arrangement are that the primary tank (Tank 1) has a much larger treatment and settlement capacity and consequently is far less prone to problems that can be experienced with the all-in-one type system. Since modern living relies on the use of anti-bacterial detergents and various chemically based agents it figures that biologically operated treatment systems can be susceptible to failure.

With a Bio-Friendly Ltd. P6 System the chances of undesirable elements entering the treatment area of the system (Tank 2) are significantly reduced due to the arrangement of the two tanks ensuring that effective and reliable treatment takes place.

**7.2** **Stage 1**

After initial settlement in the primary tank (Tank 1) effluent is introduced into the secondary tank via the inlet pipe. Biological treatment begins at this stage.

## 7.3 Stage 2

As waste is introduced into the system a linear flow process takes place. This means that if X gallons of effluent enter the system at the inlet to Tank 1, then the same quantity will be discharged at the outlet. Therefore, as influent enters the primary tank (Tank 1), fluid is displaced into the biological treatment zone of the system (Tank 2).

The Treatment zone makes up the largest part of the system and is responsible for treating the waste. Filled with many plastic media blocks, and aerated by a linear flow diaphragm compressor, naturally occurring bacteria are encouraged to grow. The media blocks have a large surface area and the bacterial growth on these is responsible for digesting the sewage present in the fluid. As the bacteria multiply and die off, they fall to the bottom of the chamber where the sludge-return system pumps the silt back to the primary tank.

## 7.4 Stage 3

The effluent is passed over into the last treatment chamber in Tank 2 where final settlement takes place (Clarification) before being discharged into a constructed percolation area. In the percolation area the bacterial activity continues to clean the effluent before it is finally dispersed into the water table.

# System start-up procedure

1. Ensure the system is filled with clean water.
2. Check the operation of the Residual Current Circuit Breaker.
3. Check the compressor is running and there are bubbles rising in the treatment chamber.
4. Check that water flows freely into and out of the plant.
5. Replace lids and ensure the Locking Nuts are tightly fastened, for safety and security reasons.
6. The Bio-Friendly Ltd. P6 System is now operational.

There is no requirement to add anything to the Bio-Friendly Ltd. P6 Treatment System to encourage bacterial growth, this occurs naturally.

# System shut down procedure

The treatment process relies on the growth of micro-organisms on the filter media. The time taken for these naturally occurring organisms to develop is dependent on temperature and may take several weeks in winter. Until the biomass is fully developed, the treatment process will be incomplete. **During this time** **do not allow any strong cleaning agents or bleaches to enter the system.**

The temporary absence of flow into the plant will not be detrimental. If the flow of sewage to the system is to be interrupted for more than four months, the following procedure must be completed.

1. Refill the Bio-Friendly Ltd. P6 System with clean water to outlet level.
2. De-sludge the primary tank (Tank 1) and chamber 2 of (Tank 2), Clarifying chamber.
3. Ensure the covers are secure.
4. Stop the compressor.

# Maintenance

**End user’s responsibility**

The end-user of the Bio-Friendly Ltd. P6 System is entirely responsible for the operation of the plant and for ensuring that the quality of the effluent does not breach the relevant legislation in regard to discharges from Domestic Wastewater Systems.

You are reminded that the existence of a Service Agreement **does not** transfer responsibility for general maintenance, which must be conducted in accordance with the accompanying instructions. Percolation Area (soak ways) drains and the emptying of primary tanks remain the responsibility of the client. Should the following maintenance not be carried out, gross septic conditions and foul odours may occur within the unit. This would require considerable remedial work involving de-sludging and digging out of the media.

Bio-Friendly Ltd. will not accept responsibility for costs other than those expressed within our warranty.

## 10.1 Maintenance Schedule

**Daily Maintenance**

* Check the operation of the compressor. It should be possible to hear the compressor operating by standing close to the unit.

**Monthly Maintenance**

* Check the operation of the compressor i.e., bubbles rising in the media bed.
* Check the inlet and outlet are clear of debris.
* Check the biomass growth on the filter media. The biomass should be a light brown colour, not white or grey. The odour in the plant should be ‘earthy’. There should not be a noticeable ‘rotten egg’ smell.
* Check the final effluent. If this is cloudy or contains many suspended particles, then the first tank is likely to require de-sludging.

**Annual Maintenance**

* De-sludge the primary tank and clarifying chamber in tank 2 (Refer to Figure 1) annually. **This must** **be done using a licensed operator**. Please consult your local directory for Contractors offering this service. Remove the cover from the tank compartment. Carefully lower the suction hose into the compartment and remove sludge.
* After de-sludging of each compartment, it is essential that the unit is refilled with clean water to outlet pipe level. This can be done by using a hosepipe or by running several taps in the house.
* Repeat the START UPProcedures.

# Trouble Shooting Guide

|  |  |
| --- | --- |
| **Cause** | **Remedy** |
| Power cut | * Do nothing. When the power is restored, the system will restart automatically
 |
| Power supply circuit breaker has tripped | * Switch off the power and reset the RCCD.
* Switch on the compressor, it should start automatically. If the power doesn’t switch on, contact a Registered Electrician
 |
| Pumped system alarm Sounds  | * Contact an Electrician. If the problem persists, contact our Service Department.
 |
| Effluent is cloudy  | * System requires de-sludging.
 |
| System over-flows or backs up. | * Check percolation area
* Ensure no blockages, De-sludge system.
* If problem remains, contact our Service Department.
 |
| Air compressor is not working  | * Contact our Service Department.
 |

# Spare Parts

Due to the inherent reliability of the system, very few components will need replacing during the lifetime of the unit provided it is properly installed, sited and r**egularly serviced.**

## If you require spare or replacement parts, contact our Service Department quoting details of the unit. Refer to Contact Number in Section 12.

# Appendix

The Bio-Friendly Ltd. P6 Systems are manufactured from glass fibre reinforced plastic (GRP) materials and are fabricated from individually injected moulded components which are joined by hand laminating. Manufacturing methods hold a Certificate of Assessment and European Certificate EN 12566-3 & S.R 66.

Colour Green.

Electrical Supply 220 single phase.

Compressor Linear diaphragm various wattage, depending on type of system supplied.

# Contact Information for Servicing and Enquiries

Bio-Friendly Ltd.,

Ballyglass East,

Loughglynn,

Castlerea,

Co. Roscommon.

Tel: 094 9880052

Mobile : 086 6097200

E-mail : info@biofriendly.ie

# Alarm Instructions

5 core cable required

Install Buzzer into fuse board

Wire secondary float into buzzer.

When float rises it will activate a buzzer warning the householder that there is a problem.

If problem arises:

Check that the float on the pump is in the correct position (looking upwards)

It may be an electrical fault call electrician.

Call Bio-Friendly Ltd.

# Bio-Friendly Ltd. P6 Guarantee

All products supplied by Bio-Friendly Ltd. are covered by a guarantee of 12 months provided that the system is installed correctly and that all relevant paperwork for the system has been signed and returned to Bio-Friendly Ltd., please see below.

All effluent pumps (where applicable) and compressors are inclusive provided installation is in compliance with manufactures instructions.

Guarantees are valid from the date the system is delivered and will be in place for a period of 12 months thereafter.

**WARNING: All electrical work must be carried out by a Registered Qualified Electrician.**

**The following documents must be signed and returned for each system:**

 Bio-Friendly Ltd. P6 Unit Service Schedule

Bio-Friendly Ltd. P6 Unit Installation Instructions, containing the Final Installation Check List

Bio-Friendly Ltd. P6 Installation Signing-off Form.

# 17. PIA Certification

