





Rev.3\_05.05.20

# SMALL WASTEWATER TREATMENT PLANTS

**ECODEPUR<sup>®</sup>, OXYBIO<sup>®</sup>**



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## PRESENTATION

The SMALL WASTEWATER TREATMENT PLANTS, **ECODEPUR®**, **OXYBIO®**, are a Compact System that integrates an Activated Sludge (Fluidized Mixed Bed Reactor System) and a Secondary Settling.

The constructive characteristics of **ECODEPUR® OXYBIO®** Reactor associated to the applied starting method (biological activation). Allow to avoid the traditional sludge recirculation from secondary Settling to the biological reactor, thus reducing the power consumption associated to similar systems.

The SMALL WASTEWATER TREATMENT PLANTS incorporates a set of knowledge-level Environmental Engineering (Sanitary), allowing optimum operation of the system.

**ECODEPUR® OXYBIO®** has CE marking, in accordance with the legal obligations that stems from the entry into force of the Regulation (UE) N.º 305/2011 of Construction Products, fulfilling all the requisites of the **European Standard EN 12566-3**.



## ADVANTAGES

- Minimum Power Consumption and Visual Impact;
- Installation, Start and Maintenance Easiness;
- Absence of unpleasant odours;
- Total waterproof (impossible infiltration of non treated wastewater);
- Easiness to up-grade to a system that reuse the effluent to Irrigation
- Promotion and Construction Increased in value;



## LEGAL LEGISLATION

This way, **ECODEPUR® OXYBIO®** system was conceived to allow the fulfilment of percentage of reduction indicted on the European Standard EN 12566-3: Small wastewater treatment systems for up to 50 PT - Part 3, Since the real affluence values are coherent with the data base admitted in project and if is created a correct exploration and maintenance routine on the treatment system.

| PARAMETER  | TREATMENT EFFICIENCY (*) |
|--|--------------------------|
| Biochemical oxygen demand (BOD5 at 20°C) without nitrification | 76% - 97%                |
| Chemical oxygen demand (COD)                                   | 76% - 94%                |
| Total suspended solids   | 85% - 94%                |

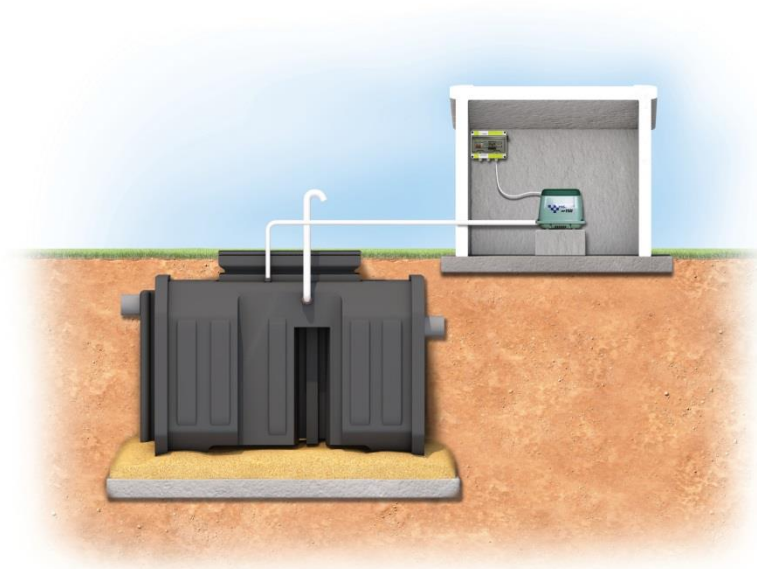
(\*) Values obtained from the initial tests, produced by the Notified organism n.º 1023, according with the European Standard EN 12566-3.

## APPLICATION

The SMALL WASTEWATER TREATMENT PLANTS **ECODEPUR® OXYBIO®** use is recommended when is intended to obtain efficiency levels in the wastewater treatment at the secondary (biological) treatment level, in zones devoid by drainage system.

In accordance with the legislation in force the SMALL WASTEWATER TREATMENT PLANTS **ECODEPUR® OXYBIO** can be installed:

- Small population clusters up to 20 inhabitants;
- Habitations;
- Condominiums;
- Small tourist complexes;
- Schools;
- Athletic complexes;
- Camping;
- Component maid of wastewater produced in industrial unities, between others.



## MAIN CHARACTERISTICS

- High treatment levels;
- Null visual impact (Underground Installation);
- Silent mini-blower with low power consumption;
- Easiness and speed of installation;
- Manufactured in additive linear polyethylene anti-UV, by rotomoulding system, which confer elevated mechanical resistance and insensitivity to corrosion;
- Absence of unpleasant odours;
- Treatment system by Activated Sludge in Fluidized Mixed Bed Reactor System;
- Functioning and maintenance simplicity;
- Aeration and agitation secured by only component in high profit conditions;
- Automatic functioning (electric board with integrated delayer);

## OPERATION

The **SMALL WASTEWATER TREATMENT PLANTS ECODEPUR® OXYBIO®** operation is based on the biological treatment of wastewater on two different processes:

- **Activated Sludge:** it is essentially destined in turning the organic matter transported by wastewater into biological flakes, resorting to the forced air circulation, through a small blower, promoting the oxidation/ reduction and the consequent Small organism's development. The synthetic filling introductions in the aeration tank allow increasing the biomass concentration in the reactor interior, maximizing the biological treatment.

- **Secondary Settling:** the biological sludge subsides, taking place the solid phase separation of the liquid phase; the introduction of a tube settler increases the specific area of decanting that potentates the increase of the decanting efficiency. The effective construction geometry allow that great part of the decanted sludge recedes to the aeration tank, dispensing a recirculation pump that would introduce a perturbation in the decanter and do damage the decanting. The recirculation pump absence also contributes to the almost null power consumption of the installation.

The SMALL WASTEWATER TREATMENT PLANTS **ECODEPUR® OXYBIO** blower work with this Schedule:

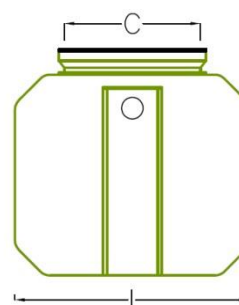
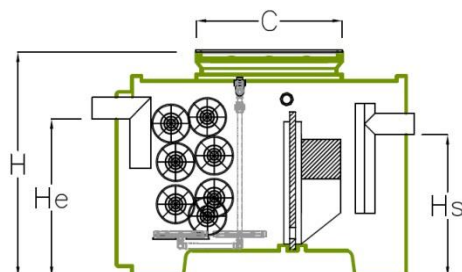
| Time   | 00:00 | 01:00 | 02:00 | 03:00 | 04:00 | 05:00 | 06:00 | 07:00 | 08:00 | 09:00 | 10:00 | 11:00 |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Blower | ON    | ON    | OFF   | OFF   | ON    | ON    | OFF   | OFF   | ON    | ON    | ON    | ON    |

| Time   | 12:00 | 13:00 | 14:00 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Blower | ON    | ON    | OFF   | OFF   | ON    | ON    | OFF   | OFF   | ON    | ON    | ON    | ON    |

## DIMENSIONS

### OPTIONS

SKID ECODEPUR® OXYBIO  
TERTIARY TREATMENT ECODEPUR® OXYBIO  
(EQUALIZATION/FILTRATION/DESINFECTION)



| TYPE      | VOLUME (l) | L (mm) | I (mm) | H (mm) | He (mm) | Hs (mm) | C (mm)           | Ø PIPE (mm) | WEIGHT (kg) |
|-----------|------------|--------|--------|--------|---------|---------|------------------|-------------|-------------|
| OXYBIO 6  | 1.325      | 1.485  | 1.200  | 1.140  | 800     | 720     | 750 X 750        | 110         | 95          |
| OXYBIO 10 | 2.650      | 2.880  | 1.200  | 1.140  | 780     | 710     | 2 x (750 X 750)  | 110         | 185         |
| OXYBIO 15 | 3.975      | 4.295  | 1.200  | 1.140  | 765     | 665     | 3 x (750 x 750)  | 125         | 275         |
| OXYBIO 20 | 4.820      | 5.080  | 960    | 1.230  | 880     | 770     | 2 X (750 X 1415) | 160         | 310         |

The pictures and dimensions can be changed without notice.  
Presented measures have a tolerance of  $\pm 2\%$ .

## COMMAND AND CONTROL SYSTEM (Electric Board)

The electric board of SMALL WASTEWATER TREATMENT PLANTS command shows up according by the next scheme:

Mesures: Length: 250 mm

Height without electric gland: 195 mm with electric gland: 225 mm

Thickness: 110 mm



The Electric Board has protections magnetothermic for each engine of the SMALL WASTEWATER TREATMENT PLANTS (through electronic relay of overload EOCR-SS) regulated for the respective consumption. If by some reason this consumption was exceeded, a shot of the protection happens, a respective red light is lighted. This consumption excess may be due to some blockage that it will provoke an overheating of the engine.

So being, recommend if there is some pipe line obstruction in the air admission or exit of the blower, or if exists some object (normally rags or hairs) obstructing the free rotation of the pump impeller.

Case happens some of these situations will be convenient do the appropriate cleaning effectuates and to correct the situation. Otherwise, contact the Ecodepur®, Lda. (case is in guarantee term), or contact a competent electrician to check the damaged engine.

## ELECTRONIC RELAY FUNCTIONING OF OVERLOAD

There is monitored the current of two of three phases of the respective engine by current transformers. The internal circuit of solid state compares with the current level actual. When the current intensity exceeds the refined value, the red LED lights and, after the pre-defined time, the device shoots and exchanges the relay contacts, obstructing the exit of current for the engine. The red LED remains lighted indicating the thermal shot until proceeds to the manual "reset" (pressing the respective button) or through cut of current device.

## REGULATION OF THE ELECTRONIC RELAY OF OVERLOAD

1. Adjust the shooting time (TIME) for the wanted value, in other words: for the maximum desirable time that the motor is above the respective consumption, normally 3 to 5 seconds.
2. Adjust the current intensity (LOAD) for the plate value of the engine characteristics.
3. With the electrics connections already effectuated and with the connected current, press and maintain pressed the TEST button. Check the red LED lights and the internal contacts of the relay will have to exchange (thermal shot) to the end of the corresponding time to TIME. Press RESET button to restart.
4. Activate the engine and check the start time. Turn slowly the button LOAD in the opposite sense to the clock pointers, up to blinking the red LED, which marks the consumption value of current engine in normal functioning. Adjust the button LOAD for the wanted value of shot, which will have to correspond to 110-125 % of the value of normal consumption.
5. Periodic checking's advised to the functioning of the button TEST to secure an efficient protection to the engines.

The SMALL WASTEWATER TREATMENT PLANTS will be able to work in two ways: manual or automatic. Working in automatic way, the equipments will start and stop in accordance with the regime planned in the command clock (saw Functioning Regime). In manual way, the equipments will work as the switches are left in 0 (off) or 1 (on). It recommends the manual way to test the equipments, after what it is necessary to leave in the automatic way.

## SWITCHES TIME-TABLES

The Blower is commanded automatically through analogical switches time-tables or programmable clocks.

The clocks are constituted by a gear that goes a complete turn around itself for 24 hours. The gear is divided in 4x24 teeth's (linkages), when each tooth corresponds to a 15 minutes interval. If the teeth are positioned for the left, the contact is closed and the engine is activated; if the teeth are positioned for the right, the contact is opened and the engine does not work.

For a correct SMALL WASTEWATER TREATMENT PLANTS programming, the teeth of each clock are positioned in accordance with the pretended temporizations and the two clocks are synchronized, in other words: after the two clocks programming they are set for the same time.



## INSTALLATION

**ECODEPUR® OXYBIO®** Installation should follow the recommendations of the document supplied “**Installation PE Reactors/Tanks (<10.000).**”

Simultaneously, should take into account the following recommendations:

1. Do not forget to connect the vent pipe. The discharge point location of the formed gas, resulting from the treatment process, should take into account the special conditions of installation (the correct placement of the vent prevent the formation of any unpleasant odour permanently);
2. The electric board and the blower must be placed in a building (technical area) constructed closest to the WWTP (up to 10 feet away), so as to save pipes and losses. This building should have the minimum dimensions: 400 x 600 x 1000 (length x width x height);
3. Fix the blower and connect the air outlet to the air inlet pipe in the SMALL WASTEWATER TREATMENT PLANTS.
4. Fix the electric board and make the electrical connection to the blower;

**In case of any doubt do not hesitate to contact our technical services.**

## MAINTENANCE

The treatment unity simplicity, allied to its automatic functioning allows restricting its maintenance to a set of routine operations which frequency will be dictated by the normal exploration practice.

- Verify the operation and function of the blower, including replacing the particulate filter if necessary;
- Twice a year remove the excess sludge deposited in the secondary settling;
- Monthly verify the Electric board and check if it exist indication of some breaks down.

## GUARANTEE

**Five (5) years**, covering any manufacturing defects of the PE tank.

Electric equipments present **Two (2) years** covering any manufacturing defects.

**ECODEPUR®** will not be responsible if there are clear indications of poor installation, misuse or poor maintenance, or if it is shown that the equipment was overloaded.

# CE

**ECODEPUR – TECNOLOGIAS DE PROTECÇÃO AMBIENTAL, LDA**

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**EN 12566-3**

**SMALL WASTEWATER TREATMENT PLANTS for up to 50PT**

**Part 3 - Packaged and/or site assembled domestic wastewater treatment plants**

**TREATMENT EFFICIENCY**

Treatment efficiency rate

CBO5: 76% - 97%  
CQO: 76% - 94%  
SST: 85% - 94%  
P: 83% - 87%  
NKT: 46%-77%

**TREATMENT CAPACITY**

Nominal organic daily load

OXYBIO 6: 0,36 Kg CBO<sub>5</sub>/dia  
OXYBIO 10: 0,6 Kg CBO<sub>5</sub>/dia  
OXYBIO 15: 0,96 Kg CBO<sub>5</sub>/dia  
OXYBIO 20: 1,2 Kg CBO<sub>5</sub>/dia

Hydraulic daily load

OXYBIO 6: 0,96 m<sup>3</sup>/dia  
OXYBIO 10: 1,6 m<sup>3</sup>/dia  
OXYBIO 15: 2,4 m<sup>3</sup>/dia  
OXYBIO 20: 3,2 m<sup>3</sup>/dia

**WATERTIGHTNESS**

Pass

**CRUSHING RESISTANCE AND MAXIMUM LOAD DEFORMATION**

Dry 9,8 kN/m<sup>2</sup> (C3) Wet: NDP

**DURABILITY**

Pass

**POWER CONSUMPTION**

0.9 kW/dia

**REACTION TO FIRE**

F

**DANGEROUS SUBSTANCES**

NDP