



INSTALLATION & USER GUIDE

ECOROCK-1000
ECOROCK-1500 /-2000 /-3000 /-5000
MONOBLOCK -2 / -3



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A-INSTALLATION GUIDE

1-General

The BIOROCK systems are compact non-electric Sewage Treatment Plants exclusively designed for domestic waste water purification. The BIOROCK systems are compliant to EN 12566-3 + A2, 12566-6 and the Construction Product Regulations.

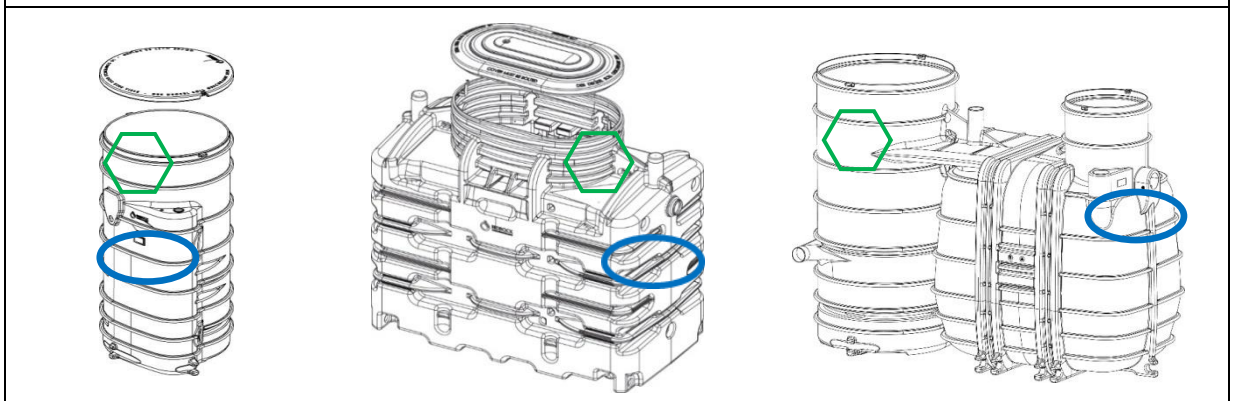
The BIOROCK plant consists of a Primary Tank and a Treatment Unit. A small pump can be installed to lift the treated water and discharge to a higher level if needed. BIOROCK recommends the installation of an effluent sampling point at the outlet of the treatment unit.

Installation and commissioning should be carried out by a BIOROCK trained and approved installer (conditions for BIOROCK Warranty validity).

 **This guide is intended to provide guidance for correct BIOROCK installation; For instructions in your language, please check the BIOROCK international webpages (www.biorock.com) or ask your distributor.**

Before installing please copy the serial number of the tank on to the documents to be kept by the customer (Appendix of this Guide.)

When looking at the tank facing the BIOROCK logo, the serial number is:



2- Operating principle

The raw sewage enters the primary tank to provide separation and the breakdown of organic solids (Primary Treatment). The sewage then passes through an effluent filter before discharging into the Treatment Unit which incorporates the aerobic digestion process (Secondary Treatment) and filtration process (Tertiary Treatment).

3- Technical

- Tanks made of polyethylene and UV resistant
- Each tank has lifting eyes
- \varnothing water inlet: 110 mm. \varnothing water outlet: 75 / 110 mm
- \varnothing air inlet and outlet: 110 mm
- The system is nearly 100% recyclable



4- Installation in dry ground conditions

4.1. Digging



Take pictures of each stage with particular attention to connecting pipework

- DO NOT smoke. DO NOT enter the tanks without taking all safety precautions.
- DO NOT install the system too close to the house, other buildings or large trees
- Local rules and legislation should be respected.

4.2. Installation of the tank(s)

- Tanks should be levelled on a compacted, stable and dry base (no water!)
- Gradients should be respected to ensure water gravity flow.
- Start backfilling once all pipework has been connected and ventilation checked.

4.3. Backfilling

- In dry ground conditions: Use with 3 to 6 mm smooth pea gravel or lean-mix concrete: DO NOT reuse the excavated soil or spoil from the site
- Backfill whilst filling the primary tank with **fresh** water at the same time: DO NOT completely fill the tanks with water before unit is backfilled.
- DO NOT exceed 300 mm per filling and compaction cycle
- Make sure that the BIOROCK media is saturated with **fresh** water
- DO NOT compact the backfill material mechanically: compact manually
- Lids should remain accessible

5- Installation in high ground water tables area: precautions

Perform the same work as in dry ground conditions with the additional recommendations below:

- The water level shouldn't exceed the liquid level in the primary tank (flood risk)
- Ensure adequate drainage of the excavation
- Anchor tanks to a concrete slab (thickness of min. 200 mm)
- Lean mix concrete backfill may be used instead of a regular backfill
- A qualified civil engineer may be consulted

6- Installation in "difficult sites": precautions



A detailed assessment must be carried out!


- "Deep installations" and usage of extension sets: Consult a professional engineer
- Installation in traffic area: A distribution slab of reinforced concrete should be constructed above the tanks **without resting on them**. Consult a professional engineer.




7- Installation of an ECOROCK after a non-BIOROCK Primary tank

7.1. Non-BIOROCK primary tank performances

BIOROCK requires the following performance of a Primary Tank in front of the ECOROCK unit:

|  Composition of normal domestic wastewater (according to EN12566-3+A2 Annex B.3.2): | | | |
|---|------------|----------------------|--|
| | | Variation | |
| BOD ₅ * ¹ : | 150 - 500 | mg O ₂ /l | |
| COD* ¹ : | 300 - 1000 | mg/l | |
| S.S.: | 200 - 700 | mg/l | |
| KN: | 25 - 100 | mg/l | |
| NH ₄ -N: | 22 - 80 | mg/l | |
| P-Total: | 5 - 20 | mg/l | |


*¹: The ration between BOD₅ and COD should always be < 2

|  Minimum performance requirements of a Primary Tank*²: | | | | |
|---|-----------|----------------------|----------------|----------------------|
| Effluent PT | | | Average | |
| EN 12566-6: 2008 | | | | |
| BOD ₅ : | 100 - 350 | mg O ₂ /l | 200 ± 50 | mg O ₂ /l |
| COD: | 200 - 600 | mg/l | | |
| S.S.: | 40 - 150 | mg/l | 80 ± 20 | mg/l |
| KN: | 35 - 100 | mg/l | | |
| NH ₄ -N: | 30 - 80 | mg/l | | |
| P-Total: | 4 - 20 | mg/l | | |

*²: The sampling results should be an "average" of a minimum of 6 samplings in 24 hour

7.2. Installation precautions

- ➔ The Primary Tank must be equipped with an efficient Effluent Filter
- ➔ BIOROCK recommends that the vent pipe for the ECOROCK unit must be independent of the properties soil vent pipe and must not be combined with the Primary Tank vent pipe (independent ventilation of each tank is mandatory)
- ➔ Lengths of piping and number of bends should be respected (see appendix)
- ➔ The pipe between the Primary Tank and Treatment Unit should be air tight
- ➔ Contact your distributor for installation recommendations and instruction sheets.

 The installer is always responsible for ventilation of the system.

8- High Outlet option ("pumped discharge")

If the effluent can't be discharged by gravity, the integrated pumping well (MONOBLOCK and ECOROCK-1000) or an external pumping well installed after the system (ECOROCK-1500->5000) may be required to lift the effluent to a higher level.



9- Ventilation and water distribution

9.1. Ventilation



Achieving efficient ventilation is always the responsibility of the installer!
Efficiency of the ventilation should be checked prior to backfilling (smoke test)



Ventilation of the ECOROCK treatment unit after a non-BIOROCK primary tank:
BIOROCK recommends independent ventilation of the Treatment Unit.
See BIOROCK detailed recommendations and drawing, appendix C8 of this guide

- The whole BIOROCK system should be vented (Primary tank + Treatment Unit)
- The high air outlet pipe should be equipped with a wind driven or electrical ventilator. If the site doesn't allow non-electric ventilation, electric ventilation should be installed
- Use as few bends as possible. DO NOT use 90° bends. Use 45° bends only.
- The wind driven ventilator must be fitted at least 400 mm above roof level and at least 1 m away from any window.
- The ventilation pipes must have a minimum \varnothing of 100 mm

9.2. Water distribution

- MONOBLOCK & ECOROCK 1000: Adjust angle of the distribution plate using the two screws.
- ECOROCK 1500-5000: Adjust the height/level of the water distribution pipes using the threaded supports. The discharge angle can also be adjusted by twisting the pipes.
- **Pay special attention to water distribution on the BIOROCK media.** Water should drip evenly and not accumulate on top of the BIOROCK media.
 - MONOBLOCK & ECOROCK-1000: Water is discharged alternately on both sides of the tray.
 - ECOROCK 1500->5000: Water drips through the water distribution pipe.

10- BIOROCK media

BIOROCK Media is an ideal inorganic carrier material for bacteria. It is highly resistant to degradation and remains extremely stable over the long term. It requires little maintenance: Scraping and scarification is not necessary. Its structure and composition ensures unsurpassed and unique surface treatment with exceptional purification results.

In normal use the BIOROCK Media should not be removed or replaced.

The BIOROCK Media is an ecological, recyclable material.



11. Manufacturer's warranty: Terms and conditions



10 years warranty on the BIOROCK® media *¹

25 years warranty on the BIOROCK® tanks *²

**¹ The 10 years warranty shall only apply if the annual maintenance is carried out by a BIOROCK® approved installer or supervised by a trained BIOROCK® Certified professional*

**² The 25 years warranty shall only apply if the installation is carried out by a BIOROCK® approved installer or supervised by trained BIOROCK® Certified professional*

Every BIOROCK treatment plant leaving the production line is inspected and verified according to ISO 9001 standards. The guarantee covers the tanks, materials and parts. As the operation of the system is linked to the use of the products and not the manufacturing, the warranty does not apply to the function of the plants.

If a defect in the manufacture of the product is acknowledged by the supplier, the guarantee is limited to the replacement of the defective parts, this excludes any other expenses. Defective equipment and associated accessories should will be made available to the manufacturer and repackaged in the original packaging if necessary.

The warranty is subject to installation and operation as per the manufacturer's instructions and in accordance with good installation practices. The warranty will not apply in the event of:

- Failure to comply with the basic design data for the wastewater treatment plant;
- failure to return the completed commissioning form / or failure to issue a valid notice of conformity when commissioning is complete;
- Failure to follow installation instructions detailed in the Installation Guide, for the primary tank and effluent filter (including the water tightness test) and the treatment unit;
- Failure to present or regularly update the maintenance reports by the user (the maintenance report can be found in the manual);
- Failure to comply with other requirements, norms, local regulations or common standards;
- Damage caused by any accidental or climatic events, beyond our control.

Activation of the BIOROCK warranty:

In order to activate the BIOROCK Warranty, the owner of the installation must fill in the approval certificate (Appendix 5 "BIOROCK Installation and user guide). This form must be completed by the installer and commissioner in charge and returned to the address indicated on the document.

Length of the BIOROCK warranty:

Annual maintenance is a condition for the manufacturer's warranty. This must be carried out by a trained and qualified contractor. The maintenance must be carried out to the manufacturer's instructions as specified in the user guide. The owner must complete the maintenance book and keep it up-to-date by adding any maintenance and commissioning activities carried out on the BIOROCK plant.

Attention: Sludge emptying documents and proofs issued by the contractor have to be kept by the user. The maintenance book must be made available in the event of a complaint.

BIOROCK warranty:

- **10 years on the BIOROCK Media (biological part of the treatment plant).**
- **25 years on BIOROCK tanks**
- **2 years on electrical options, supplied by BIOROCK**

Condition of delivery: In the case of incomplete delivery (missing equipment or accessories) or damage observed on delivery, these remarks / observations should be listed on the carrier delivery note or bill. The carrier and the supplier must be informed within 48 hours or 2 business days.



B – USER GUIDE

1-Safety instructions

- ☛ Any installation and maintenance work should be performed by a Certified Professional following instructions of this guide.
- ☛ Wastewater may contain noxious pathogenic bacteria. Use plastic gloves and proper disinfectants.
- ☛ The final effluent (“cleaned” water) CANNOT be reused for any other purpose than discharge to surface water or infiltration into the soil. The final effluent is NOT drinkable;
- ☛ Lid should remain closed at all time outside maintenance work. Lids are for pedestrian use only.

2-Operating & maintenance recommendations

⚠ Only domestic sewage should enter the system; no rainwater is allowed.
 ⚠ Do not dispose of the following items to the BIOROCK system: Kitchen or motor oils, fats, wax, resin, paint, solvents, hydrocarbon-based products (petrol, crude oil etc.), any pesticide or antibacterial product, items of a toxic nature, boiler or air-conditioning condensate, swimming pool backwash, rainwater, drainage water or ground-water.

An annual service contract should be set up with a Certified Professional. Contact you distributor.

2.1. Primary tank: ANNUALLY

- ✓ Check the sludge level.

⚠ The primary tank should be emptied by a licensed contractor when the sludge level is >50%.
 ⚠ This normally occurs after 2-4 years depending on the system.

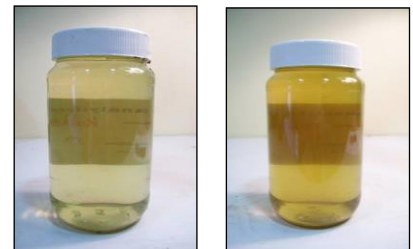
- ✓ Change the effluent filter
- ✓ Take a sample of the effluent form the Primary Tank and check visually.

2.2. Treatment unit: ANNUALLY

- ✓ Check proper operation and clean the water distribution system
- ✓ Check the top layer of BIOROCK media, clean/rinse if necessary
- ✓ Check the alarm
- ✓ Take a sample of the outgoing water (final effluent).
- ✓ Check clearness and odour:

- The water should be free from suspended particles.
- Colour may vary from neutral to dark yellow.
- Odour of the water is neutral to “fresh humus”

⚠ Only take a sample from running water.
 ⚠ Never use a sample from stagnant water!!



Neutral / Dark yellow

⚠ Pay special attention to the correct positioning of the seal ensuring air tightness between the lid and the BIOROCK Unit after any maintenance work.

⚠ BIOROCK Media Cleaning/rinsing/replacement procedure: contact your distributor



C – Appendices

C.1 ECOROCK-1500 /-2000 /-3000

C.2 ECOROCK-5000

C.3 ECOROCK-1000

C.4 MONOBLOCK

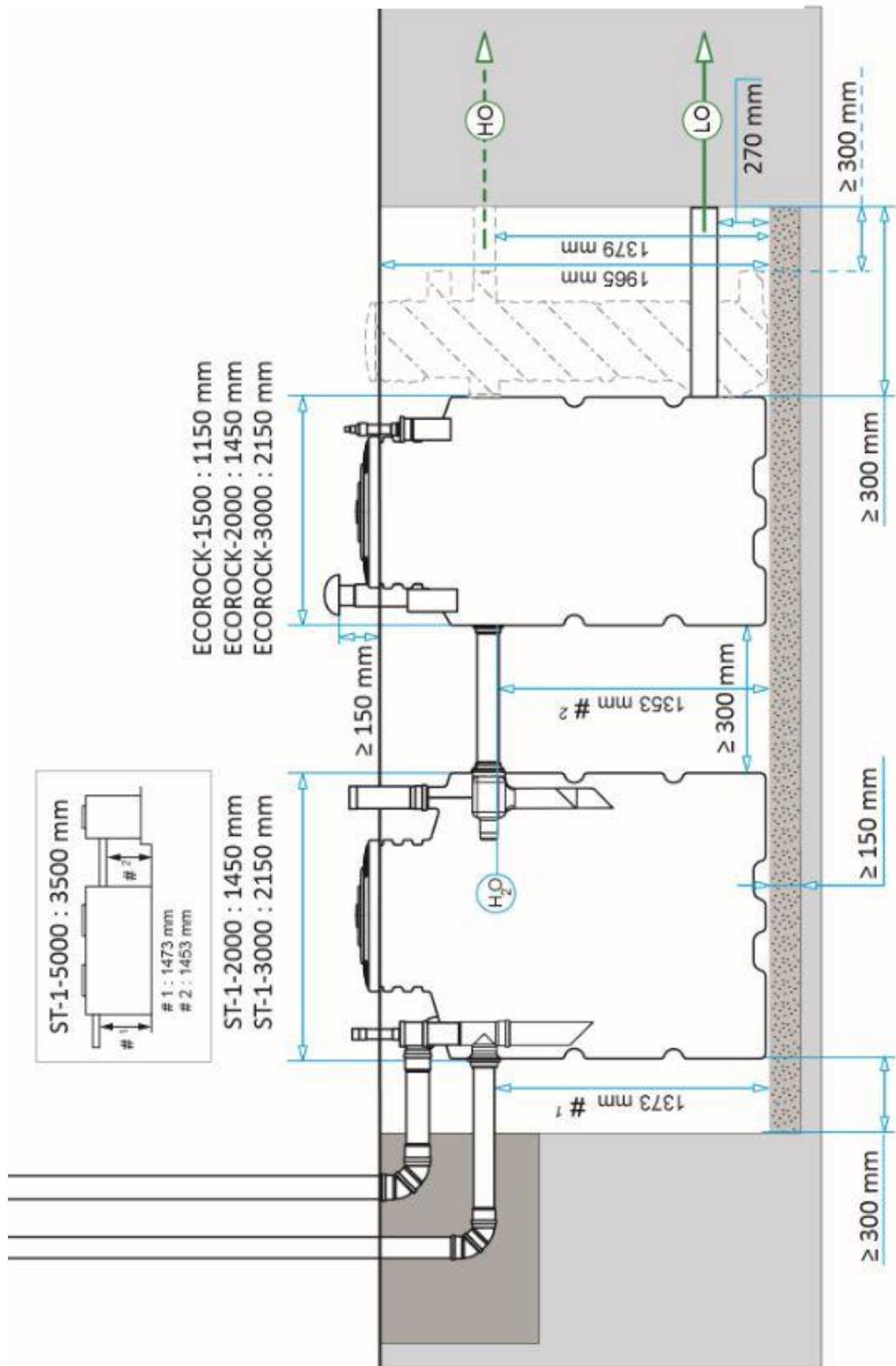
C.5 BIOROCK: Dimensions & capacities

C6: Maintenance form

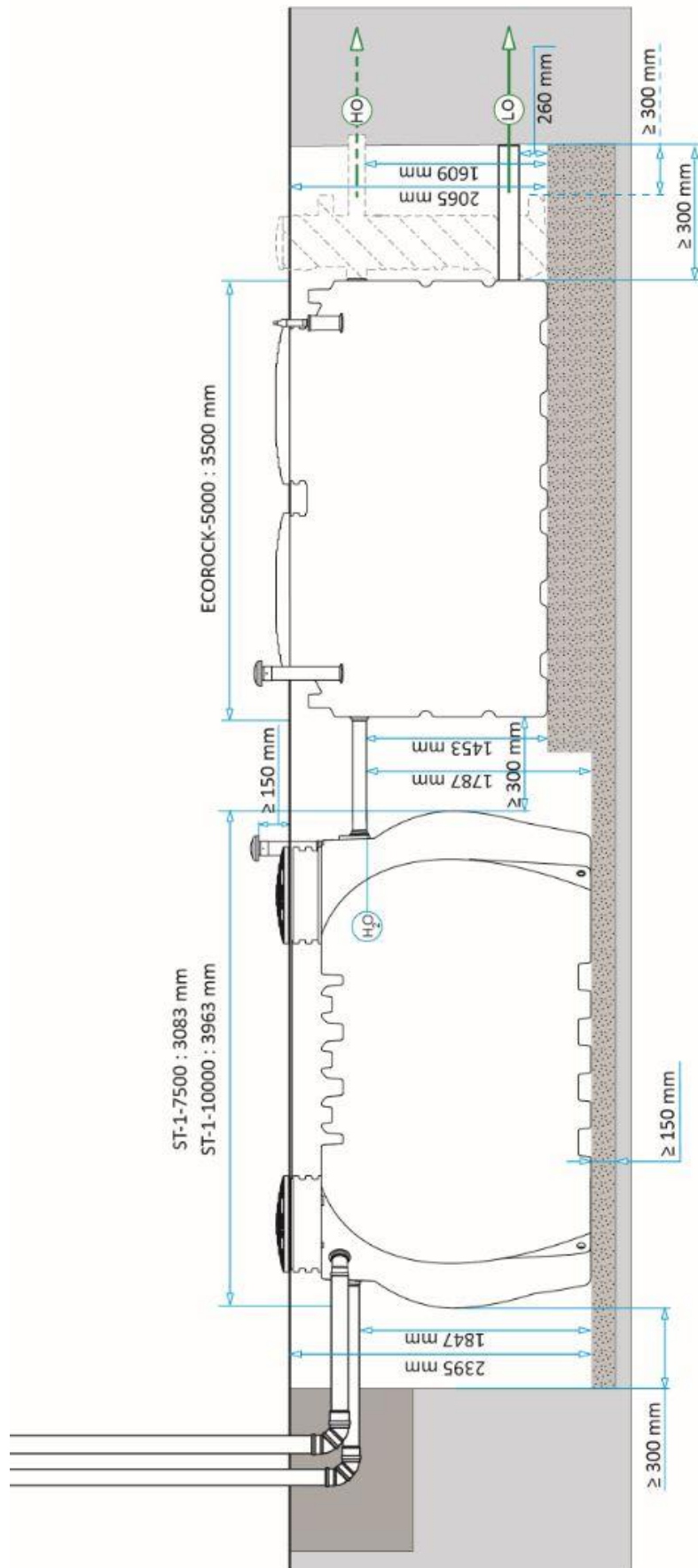
C7: Warranty form



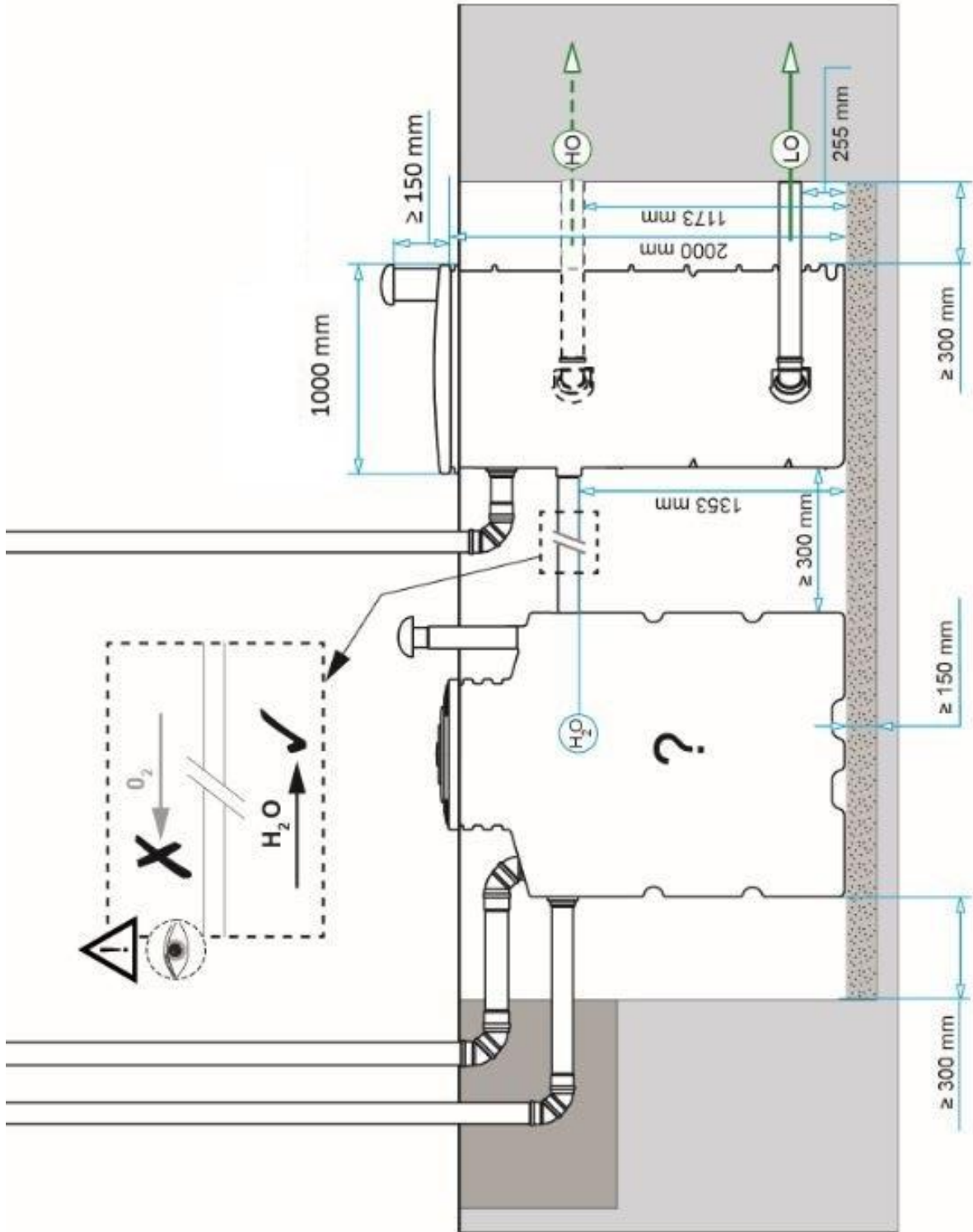
C.1 ECOROCK-1500 / -2000 / -3000



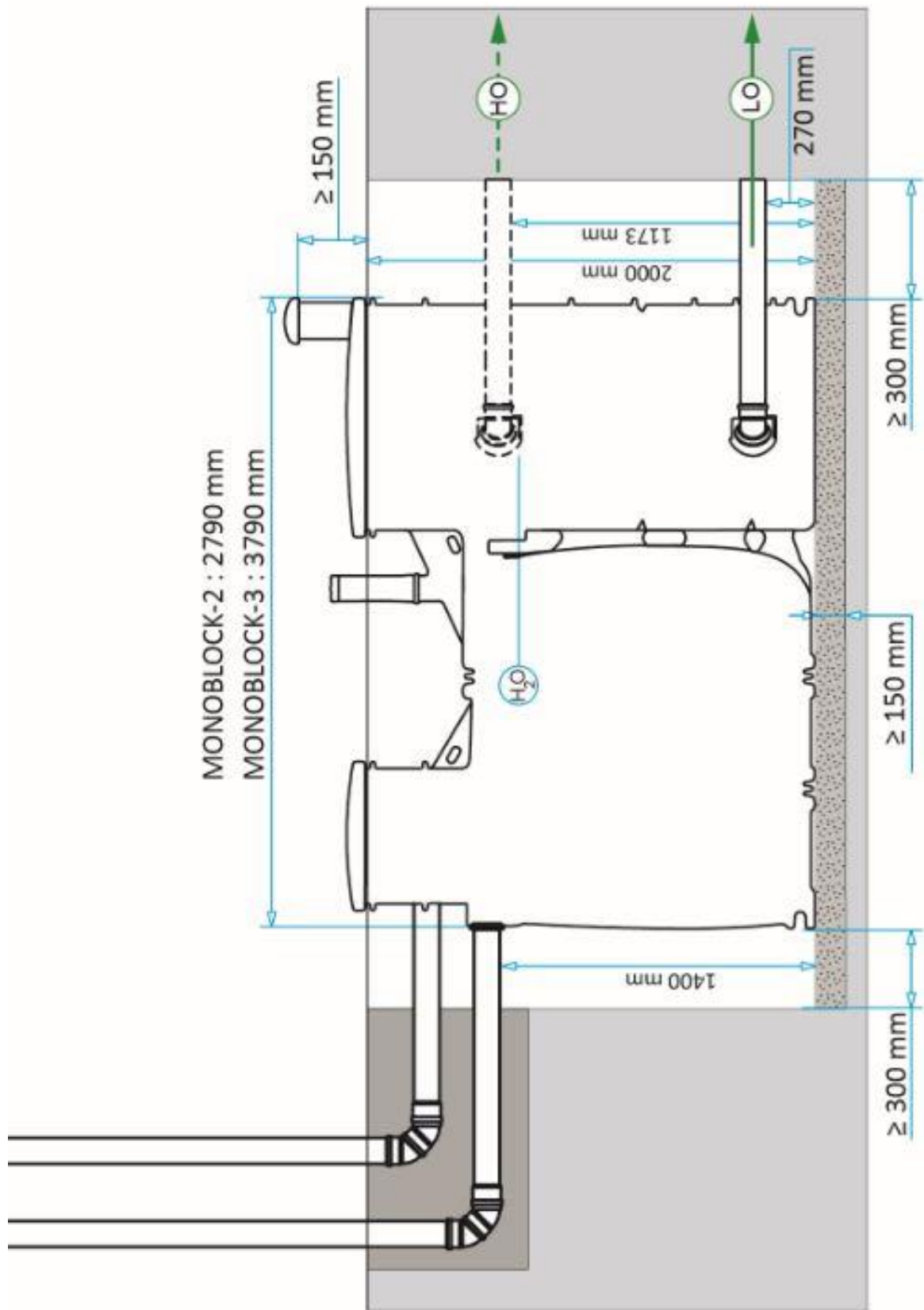
C.2 ECOROCK-5000



C.3 ECOROCK-1000



C.4 MONOBLOCK -2 & -3



C.5 BIOROCK range: dimensions & capacities

Primary tanks /

| Product | ST1-2000 | ST-1-3000 | ST-1-5000 | ST-1-7500 | ST-1-10.000 |
|---------|----------|-----------|-----------|-----------|-------------|
| L (mm) | 1450 | 2150 | 3500 | 3083 | 3963 |
| w (mm) | 1150 | 1150 | 1150 | 2260 | 2284 |
| H (mm) | 1965 | 1965 | 2065 | 2395 | 2395 |
| V (L) | 2000 | 3000 | 5000 | 7500 | 10000 |
| W (kg) | 142 | 200 | 408 | 384 | 515 |

(ECO= ECOROCK) Treatment units /

| Product | ECO-1000 | ECO-1500 | ECO-2000 | ECO-3000 | ECO-5000 |
|---|----------|----------|----------|----------|----------|
| L (mm) | 1102 | 1150 | 1450 | 2150 | 3500 |
| w (mm) | 1200 | 1150 | 1150 | 1150 | 1150 |
| H (mm) | 2000 | 1965 | 1965 | 1965 | 2065 |
| V (L) | 1500 | 1500 | 2000 | 3000 | 5000 |
| W (kg) | 189 | 197 | 241 | 304 | 682 |
| C (PE) | 6 | 8 | 10 | 15 | 30 |
| Hydro loading (L H ₂ O/day) | 900 | 1200 | 1500 | 2250 | 4500 |
| Δ (LO) (mm) | 1083 | 1081 | 1081 | 1098 | 1193 |
| Δ (HO) (mm) | 183 | | | | |

Monoblocks

| Product | MONOBLOCK-2-1000 | MONOBLOCK-3-1000 |
|---|------------------|------------------|
| L (mm) | 2790 | 3790 |
| W (mm) | 1200 | 1200 |
| H (mm) | 2000 | 2000 |
| V (L) | 2000 | 3000 |
| W (kg) | 375 | 474 |
| C (PE) | 6 | 6 |
| Hydro loading (L H ₂ O/day) | 900 | 900 |
| Δ (LO) (mm) | 1130 | 1130 |
| Δ (HO) (mm) | 230 | 230 |



MAINTENANCE FORM

To be completed – TO BE KEPT BY THE USER

DATE OF FIRST COMMISSIONING: / /

Product N° of tank: (see page 9 in the user's guide)

Warning:

Please keep sludge emptying documents and proofs validated by the contractor.

| DATE | WORK CARRIED OUT | CONTRACTOR | COMMENTS |
|------|------------------|------------|----------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

If you have not subscribed to any maintenance agreement, please ask a trained, professional contractor to provide maintenance and any work required on your sewage treatment plant.



APPENDIX 5

ACTIVATION OF THE WARRANTY

(see our conditions)

Important information: If this form isn't returned to BIOROCK within 120 days the installation of the system, there will be no warranty on the system

INSTALLATION FORM FOR A MONOBLOCK SYSTEM

This form must be completed and returned to:
BIOROCK S.p.A.
 4-5 Z.A.E. Le Triangle Vert
 L-5691 ELLANGE (Luxembourg) or by e-mail : info@biorock.com
 PLEASE KEEP ONE COPY FOR YOURSELVES.

DISTRIBUTOR :

NAME :

ADDRESS :

.....

Type of installation:

- MONOBLOCK-2-**
- MONOBLOCK-3**
- ECOROCK-1000**
- ECOROCK-1500** - **2000** - **3000** - **5000**
- Other:**

Installation date :

Commissioning date:

Installer

NAME.....

INITIALS.....

Address

.....

.....

TEL:.....

E-mail.....

OWNER

Name.....

Initials.....

Address

.....

Tel.....

E-mail.....

New built home Existing home

Address of the installation if different than owner

Name.....

Initials.....

Address

.....

Tel.....

E-mail.....

New built home Existing home

Please indicate:

♦ **Nature of building:** ♦ **Number of rooms:** ♦ **Number of occupants:**

Soil conditions: Dry High ground water Difficult On a slope Other:

Discharge: Infiltration Water course Re-use Other:

Type & Capacity of the Tank: **Serial number:**

Ventilation: Winddriven ventilator Electric

Discharge: Gravity Pumped

Declaration:

- The BIOROCK system is installed and commissioned in accordance with:
- The current legislations stating the technical requirements applicable to domestic sewage treatment plants in the territory where the system has been installed
 - Current installation, use and maintenance requirements of the BIOROCK Systems

Signed at : on Signatures :

The Owner :

Name of the responsible Authority:
(if applicable)

The installer:



C8: RETROFIT

