

– User guide –

X-Perco® C- 90 from 5 to 30 PE

Range :

- X-Perco® C-90 5PE Single Tank (3.00m³)
- X-Perco® C-90 5PE Dual Tank (3.5m³)
- X-Perco® C-90 9PE Dual Tank (3.5m³)
- X-Perco® C-90 12PE Triple Tank (6.2m³)
- X-Perco® C-90 15PE Dual Tank (6.2m³)
- X-Perco® C-90 18PE Dual Tank (6.2m³)
- X-Perco® C-90 23PE Triple Tank (4.5m³)
- X-Perco® C-90 30PE Triple Tank (6.2m³)

Dear Client,

In acquiring your purification station, you have shown a clear interest in the protection of your environment and, in particular, in the protection of your water, a resource that is especially valuable to us.

We thank you for the trust you have placed in us by choosing the **X-Perco® C-90** designed by Eloy Water.

The **X-Perco® C-90** line is a compact organic filter that uses the principle of natural purification of wastewater. Treatment is ensured by a bacteria population that is attached to **the Xylit**, a completely natural organic fibre. It is a “by-product” from the extraction of lignite that we redevelop into a filter medium for our range. By its very nature, this innovative substrate has **far superior filtering properties** than a majority of other substrates that are traditionally used.

The Xylit is a fibre that has until now been considered as an organic waste, derived from wood, carbonaceous and imprisoned in lignite for several million years. With this media, Eloy Water has found an innovative filtering solution that allows **this product to be transposed into a product** which has very interesting **wastewater purification** properties and has **the lowest** replacement intervals **in the market**.

The X-Perco® C-90 has several technical innovations that make it ingenious, efficient, economical and sustainable.

We guarantee that, if the installation is in accordance with the instructions in the implementation guide and the operation is in accordance with the Operating Guide, your **X-Perco® C-90** meets the standards in force on the installation date of your setup.

For optimal, economical and sustainable use of your **X-Perco® C-90**, we strongly recommend that you read this document which includes “**The User Guide for the user**” and “**The Placement Guide for the installer**”, and to respect the operating instructions.

To request any information, please do not hesitate to contact us via our website www.eloywater.be or by calling the following number: +32 (0) 4 382 44 00.

Security Regulations

It is highly recommended that you strictly limit all maintenance on the line - apart from what we call “adapted monitoring” in our maintenance contracts - to technicians that are certified by our company.

Risk Prevention

Personnel that operate the equipment are required to wear PPE (personal protective equipment) that has been adapted to the work to be carried out.

As a reminder and to be remembered:

- It is compulsory that all workers who deal with the handling of heavy parts and where the feet are likely to be hurt due to a fall must wear **safety shoes**;
- it is compulsory that all workers that handle sharp, cutting, spiky, aggravating, burning or rough objects or products or materials must wear **protective gloves**;
- it is compulsory that all workers who are exposed to splashes of dangerous substances, to projection of particles from sawing and grinding works and exposed to harmful radiations during welding or cutting works must wear **protective glasses**;
- it is compulsory that **appropriate masks** be worn when the ambient air contains dust particles or harmful and dangerous substances;
- **Individual Auditory Protection** is required when loud motors are used.

In terms of security, the main risks linked to a purification line are listed below.

➤ Biological Risks

Wastewater and sludge contains **bacteria** and **pathogenic** viruses.

Whenever possible, all direct contact of the hands (and all other parts of the body) with such substances should be avoided. **Work gloves** and **appropriate clothing** must be worn. As long as a person is in contact with polluted water and that he or she has not washed or disinfected their hands, it would be preferable if he or she abstains from drinking, eating, smoking and putting their hands on their face.

In the event of contact with pathogenic substances, one must **wash and disinfect** the parts of the body that have been soiled using specific products and do not reuse the soiled clothing before they have been cleaned and disinfected.

It is also recommended that all tools and objects that have come into contact with the pathogenic substances be **washed and disinfected**.

➤ Mechanical hazards

The buffers are only left open during the period of time required for the maintenance. Once this is completed, the buffers are closed and locked using the bias of a fast opening/closing system.

In the event of traffic of vehicles that are more than 3.5 tons or in the presence of an embankment height that is greater than 80cm, a load allocation slab must be installed above the tank(s).

The dimensions of each allocation slab must be calculated by a consulting engineer that is specialised in stability or by Eloy Water.

As a standard, the Eloy Water polyethylene buffers can bear the weight of pedestrians. If there is vehicle traffic, the installation of appropriate extensions and buffers is mandatory.

➤ Hazards linked to gases

Certain gases may cause discomfort or asphyxia. It is **forbidden for a single person to go down into a structure** containing or having contained wastewater and, generally speaking, to go down into a structure with a confined space.

If necessary, the tank should be ventilated before any access. There must be a **second person** on site - on the outside of the structure with a confined space - for the duration of the intervention to pull out the contractor in the event of faintness and to raise an alert. The second person should not go down into the structure with a confined space under any circumstance (ideally the first person should be equipped with a harness and the necessary material to pull him/her out of the tank).

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I. User Guide for the User

Compact Filter

X-Perco® C-90 from 5 to 30 PE

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- X-Perco® C-90 23PE Triple Tank (4.5m³)
- X-Perco® C-90 30PE Triple Tank (6.2m³)

1. Eloy Water

1.1. Foreword

Eloy Water is a Belgian company specialising in the design, manufacturing, marketing and maintenance of products meant for wastewater and rainwater treatment and reuse.

It is part of the Eloy Group founded in 1965 and specialising in environmental protection and management.

Eloy Water has a complete range of reliable and efficient standard products that are available thru its network of specialised distributors and installers: individual purification stations (including compact filters) and semi-collective, rainwater tanks, oil separators, degreasers and lifting stations.

The various treatment procedures developed by the company are integrated into the high performance fibre reinforced concrete tanks, into the fibre glass reinforced polyester tanks or in the polyethylene tanks that are specially designed for this purpose.

For more information about Eloy Water and it's products, please visit the website at: www.elaywater.be.



Fig-1 : Eloy Group Site

1.2. Context

1.2.1. Preamble

In order to preserve the quality and the cleanliness of our environment and to limit health hazards, wastewater from homes must be drained away, purified then returned into the natural environment.

It is therefore necessary to treat the pollutants carried by wastewater (essentially organic matter, nitrogen and phosphorus) in order to limit their impact on the aquatic environment.

The self-contained drainage system is the technical and economical solution that is best suited for rural areas. This type of sanitation is meant for individual houses or small communities that are not connected to a public wastewater collection system.

The self-contained drainage system is recognised as a full-fledged alternative to the public collection system and is as effective, with an environmental impact of discharges that is reduced in rural areas.

1.2.2. Function of the User Guide for users

Long considered as an interim solution for the connection to collective sanitation (sewage), the self-contained drainage system is nonetheless a technically efficient and economically sustainable solution. This system must be adequately sized, properly installed and regularly maintained. This is precisely the purpose of this guide.

This guide concerns the Eloy Water System, model “X-Perco® C-90” that receives domestic wastewater from between 5 to 30 population equivalent (PE).

1.3. Proportioning Rules

The usable capacity of the individual purification system is determined based on the number of population equivalent (PE) of the dwelling or the group of dwellings served by the system.


The units have been proportioned to treat domestic wastewater based of the following loads:

Daily organic load	60	gO ₂ /PE
Daily hydraulic load	150	l/PE


For example. the X-Perco® C-90 5 PE can treat housing wastewater up to 5 population equivalent, or 750 litres/day at an organic load of 0.3 kgO₂/day.

For general information. the actual average consumption of water commonly observed per day and per capita varies between 80 and 110 litres, which is where the aptitude of our range of products lies.

The X-Perco® C-90 from 5 to 30 PE sustains specific load variations.

 Eloy Water must be informed in advance of all changes in the use of your dwelling or all modifications to your household sanitation system (addition of main parts, increase in the number of inhabitants,...). Otherwise, the X-Perco® compact filter may not function properly and lose its performance guarantee.

In addition, the Eloy Water “Support” department could offer you useful advise on the usage of your sanitation system.

 The concentration of grease that enters into your compact filter mat not exceed 20 mg/litre. Otherwise, the X-Perco® compact filter could also be subject to a serious breakdown and lose its performance guarantee.

2. General description of your X-Perco® C-90 sanitation system.

The **X-Perco® C-90** compact filter is a biological filter that uses the principle of natural purification of wastewater. This technology does not require any energy input. The treatment is ensured by a bacteria population that is attached to a ventilated fibre called the “Xylit”. **The X-Perco® C-90** has several technical innovations that make it ingenious, efficient, economical and sustainable.

These characteristics are as follows:

- ✓ No electricity consumption
- ✓ Minimal footprint
- ✓ Compact
- ✓ Absence of noise (0 dB)
- ✓ Easy access to all components
- ✓ Durable substrate (estimated lifespan: (12 years) and 100% organic)
- ✓ Higher purification rate at 95%
- ✓ Warranties:
 - 10 years + 5 years* on the concrete tank or tanks (outer casing).
 - 10 years + 2 years on the following internal components : filtering media, distribution system and allocation system.
 - 2 years + 1 years on the rest of the equipment (excluding accessories: lifting pump, trapillon, trailer,...).

“” You will find the procedures for granting extensions of warranties on our website : www.eloywater.be. These extensions of warranties are valid at the time this guide was published (August 2016). They may be changed or withdrawn at any time without notice.*

2.1. Operating Principle

Your X-Perco® is based on a technique called “compact filter” that is ideally adapted for users. This filter is also suitable for a permanent (main house) and/or intermittent (secondary house) sewage supply line for your dwelling.

Your sanitation system comes in the shape of one or several concrete tanks, arranged in two compartments:

1st Compartment or primary settling tank:

The wastewater is collected in the primary settling tank. The suspended solids will settle in the lower section of this chamber to be “pretreated” by anaerobic bacterium. In effect, liquefaction and anaerobic digestion mechanisms will intervene. The primary settling tank also acts as a degreaser.

After having been used for some time, a “hat” consisting of grease, cellulose, etc. will form on the surface of the primary settling tank.

In order to prevent the arrival of wastewater in the system from being impeded by this obstacle, the X-Perco® C-90 is equipped with a immersing and ventilated tee which directs the influent directly under the hat.

This Tee also calms the inflow, which has two additional benefits:

- the anaerobic bacterium's work is not disrupted by a sudden and unexpected inflow of wastewater.
- the movement imposed on the influent encourages its first decantation.

The household wastewater and the sanitary wastewater (fecal and urine matter) arrive in the X-Perco® C-90 using gravity.

Ventilation concept: during the anaerobic degradation of the raw material present in the wastewater, there is an emission of gas (H₂s, CH₄...) which requires significant ventilation (see paragraph 1.8 of the placement Guide for the Installer).

⚠️ Rainwater does not flow through the filter in any case.



Fig-2 : Operating Principle of the X-Perco® C-90 5PE single tank
(view from the primary settling tank)

The primary filter is found at the exit of the first compartment (or first tank) which is protected from the supernatants (inserted in a Tee). The purpose of the primary filter is to prevent the suspended solids from flowing into the treatment area.

2nd Compartment or filter :

The “Pretreated” water arrives by gravity and flows into one (or two) runnel(s) (based on the size of your system). A trough is filled with water and tips over as soon as the centre of gravity is attained to disperse the pretreated water onto the filter media via a network of pierced distribution piping. Next, the other trough is filled and the cycles continues as the water arrives at the filter.

The “pretreated” water crosses the filter media , where a population of purification bacteria has developed and is attached. The supply of oxygen via fresh air, which is necessary for proper purification output, is ensured by a 110mm hose that comes out by ± 20 cm of the ground level, and which is equipped with a ventilating cowl with an anti-insect grill.

Air is taken directly from the outside and is distributed in the media, going through the openings in the effluent outlet pipe located on the filter media.

The treated water joins the receiving medium via gravity after having passed through the X-Perco® C-90.

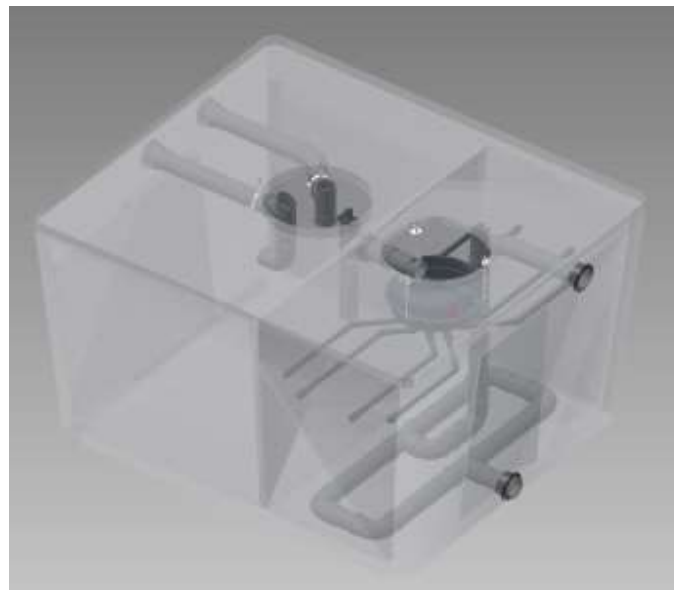


Fig-3 : Operating Principle of the X-Perco® C-90 5PE single tank (view from the filter)

2.2. The different components of your X-Perco® C-90.

The X-Perco® C-90 5PE Single Tank consists of a 6.2m³ concrete tank arranged as follows:

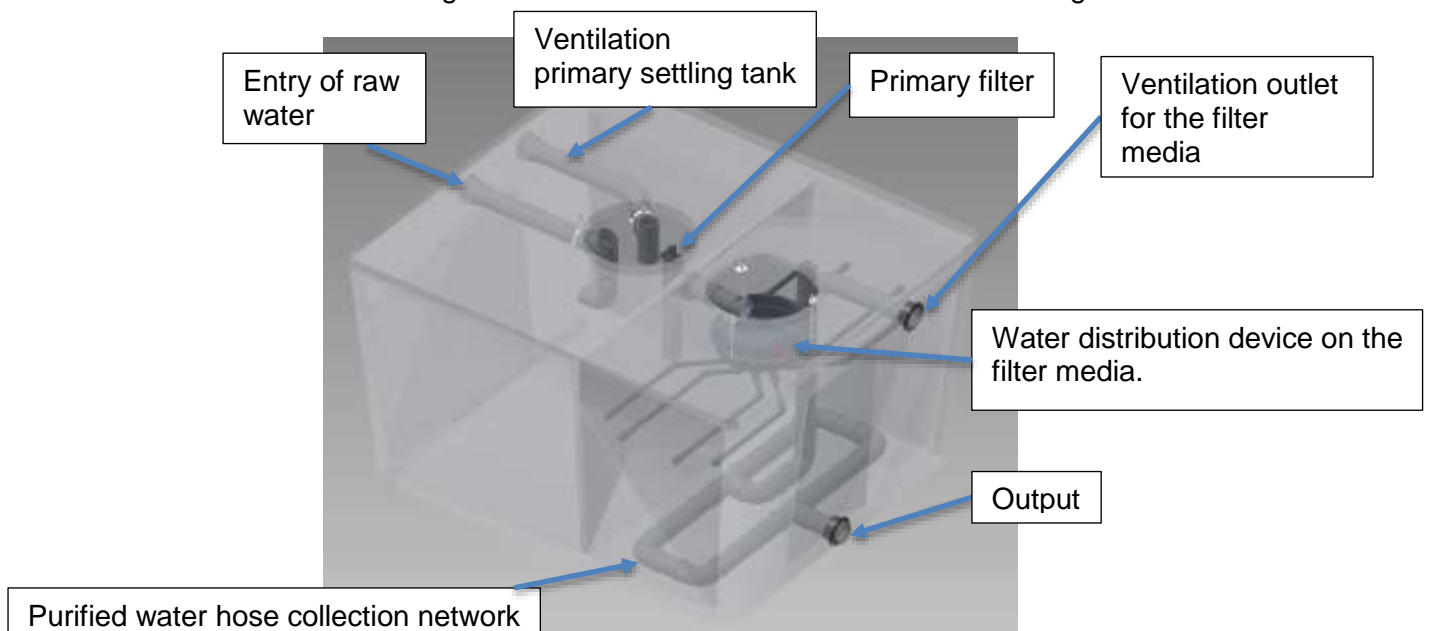


Fig-4 : Main components of the X-Perco®C-90 5PE single tank

2.3. Quality of the components

Eloy Water systematically selects materials that prevent all risks of degradation and ensure sustainable and efficient operation of your X - Perco® C-90.

2.3.1. The concrete tank

The tank is manufactured in auto compacting high performance fibre reinforced concrete (HPFRC). It allows for a higher density and a low absorption rate of wastewater which provides a complete guarantee of tank watertightness as well as a proper resistance to the sulphates that are present in the wastewater. The tank is rectangular to optimise the inflow of raw water and the deposit of primary sludge in the primary settling tank. Access to the components inside the tank is facilitated using Ø620mm manholes.



Fig-5 : Casing of the X-Perco® C-90 5 PE single tank

Customised extensions (optional) made of precast concrete or polyethylene complete the installation. These must be completely waterproof in order to prevent the inflow of groundwater into your treatment system.

The polyethylene extensions are covered using lids that are also made of polyethylene, whose resistance is studied during standard manufacturing for pedestrian traffic. These parts are waterproof.

Cast iron, aluminium, steel or polyurethane lids may also be used based on the requirements for specific loads. These items are not supplied in standard manufacturing.

Depending on the layout, additional provisions may be made for specific loads. An additional study must be carried out by Eloy Water or a qualified engineering firm.

2.3.2. The concrete dividers

A divider made from reinforced concrete is built into each C-90 6.2m³ tank.

According to the model, there are 2 types of dividers:

- Solid Partition → X-Perco C-90 5PE single tank
- Hollow Partition → X-Perco C-90 15PE, 18PE, 23PE and 30PE

The solid partition allows for the 6.3m³ C-90 tank to be divided into two waterproof compartments.

Both these types of dividers also allow the improvement of the tank's structural resistance and to obtain bracket for the fitting of certain internal components.

2.3.3. Filter media

The Xylit is an organic fibre that has until now been considered as organic waste, derived from wood, carbonaceous and imprisoned in lignite for several million years. During the biological and geochemical processes that occur over several millions of years, the Xylit has developed exceptional properties, notably a high number of concentrated elements that attach nutrients, trace elements and pollutants.



Fig-6 : Xylit fibres

Among these exceptional properties, include:

- A high carbon to nitrogen ratio, synonymous with very slow decomposition;
- a high internal porosity;
- a very large specific surface area that allows for the development of a dense bacterial biofilm much faster than any other filter media currently being used.
- High mechanical resistance of the fibre which assure stability over time due to consistent C-C bonds;
- composed of cellulose, it is hard, flexible and and has high roughness in regards to the mechanical requirements;
- the advantage of not having to scarify it every year;
- an estimated lifespan of 12 years.

2.3.4. Piping and accessories

The pipes are made of PVC pipes that conform to NF EN 1401-1/Benor sewage standards. The inlet and outlet necks are equipped with SBR rubber seals.

2.3.5. Other components

All the other components are impervious to corrosion (synthetic or stainless steel in accordance with the EN 12566-3 +A2 standard)

2.3.6. Entrance into the station

In order to ensure the ease of maintenance of the input device for wastewater into the station, the inlet pipe is situated under the first manhole. This configuration facilitates a possible intervention in the event of upstream filling of the station.

2.3.7. The primary filter

The primary filter is a polyethylene filament-wound structure mounted on a polyethylene pipe. It is placed on a simple T of 110 mm, and is fitted with a handle to facilitate its removal during cleaning (to be carried out during maintenance)



Fig-7 : Primary filter

2.3.8. Allocation device:

An allocation device is provided for:

- in the primary settling tank if it is followed by two treatment tanks;
- in all the 6.2m³ treatment tanks (filter) (with the exception of the 5PE single tank).

Depending on the number and size of downstream filters in the primary settling tank, one or more allocation device will be installed:

Model	Number of tanks	Tank model C-90 (m ³)		Number of allocation devices
		Primary Settling Tank	filter	
X-Perco® C-90 5PE single tank (3.0m ³)	1.	6.2		0.
X-Perco® C-90 5PE Dual tank (3.5 m ³)	2.	3.5	2.5	0.
X-Perco® C-90 9 PE Dual tank (3.5 m ³)	2.	3.5	3.5	0.
X-Perco® C-90 12 PE Triple tank (6.2 m ³)	3.	6.2	2 x 2.5	1.
X-Perco® C-90 15 PE Dual tank (6.2 m ³)	2.	6.2	6.2	1.
X-Perco® C-90 18 PE Triple tank (6.2 m ³)	3.	6.2	2 x 3.5	1.
X-Perco® C-90 23 PE Triple tank (4.5 m ³)	3.	4.5	2 x 6.2	3.
X-Perco® C-90 30 PE Triple tank (6.2 m ³)	3.	6.2	2 x 6.2	3.

This device is made entirely from PVC and the settings can be done from the top of the tank using an operating wrench (supplied with the station).

Once they have been installed, the allocation devices are accessible via the second manhole of the primary settling tank and/or the first manhole of the 6.2m³ treatment tank.

If this device is located in the pre-treatment compartment (12, 18, 23 and 30 PE), it is made up of a Tee situated just behind the primary filter, of two adjusting devices and overflow pipes for the two filters.



Fig-8: allocation device and the primary filter in a septic tank

If this device is located in the pre-treatment compartment (12, 18, 23 and 30PE), it is made up of a Tee situated just behind the right water inlet pipe, of two adjusting devices and of a overflow pipe for the distribution devices.

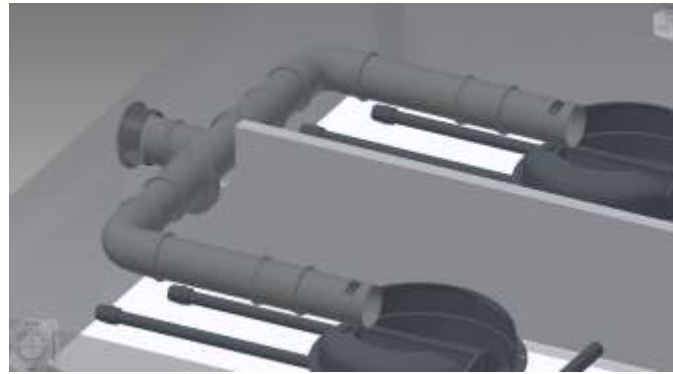


Fig-9 : **Example of a allocation device in a 6.2m³ filter**

2.3.9. *The distribution runnel*

The runnel consists of a caisson that is rocking on a bracket. It is made out of PVC. Depending on the size of the station, one or several runnel will be installed per filter.

The installation is identical following the number of runnels. It is installed at the manhole in a dome that supports the pre-treated water distribution system on the filter media. The runnel can easily be removed from its bracket for eventual maintenance.

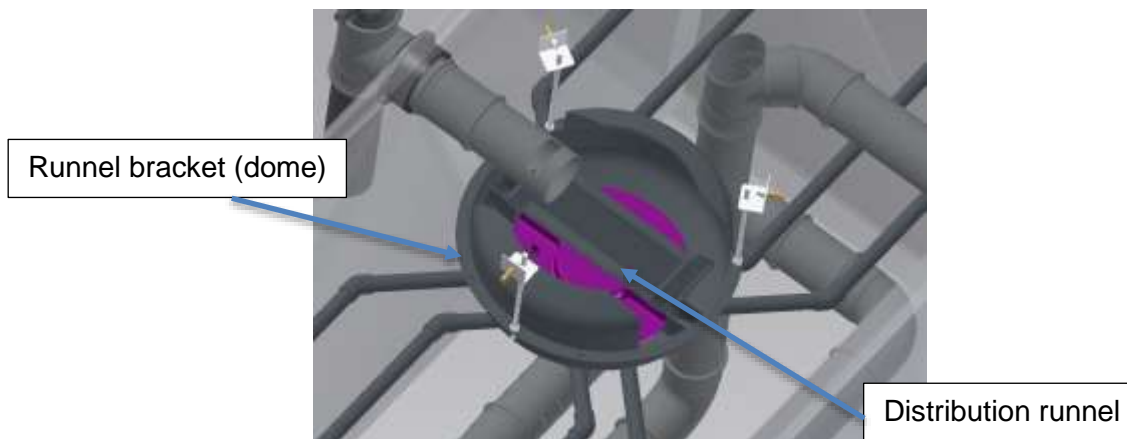


Fig-10 : **Distribution runnel**

2.3.10. *Runnel bracket*

This bracket (see photo above) consists of a dome that is inserted on the manhole above the filter. The control system facilitates the upgrade of the entire water distribution device above the filter media without having to enter into the tank. This device is made entirely out of PVC.

2.3.11. *Distribution pipe*

The water that arrives from the runnels is distributed evenly onto the filter media via a receiving dome until the springers inserted into the multi-start thread of the pierced piping. These devices are made of PVC and are attached to the runnel bracket.



Fig.11 : **distribution device (view from below)**

It also has a levelling adjustment on this bracket to distribute the water to be treated evenly onto the filter media (Xylit).

2.3.12. *Level/alarm indicator*

A level indicator allows to highlight a possible clogging of the filter media and/or a possible blocking of the outlet pipe.

This detector consists of a water sensing probe connected to an alarm box by a 20m cable. This box runs on batteries.

The probe is immersed inside the filter media through a vertical pipe. This pipe is connected to the drainage/aeration network.

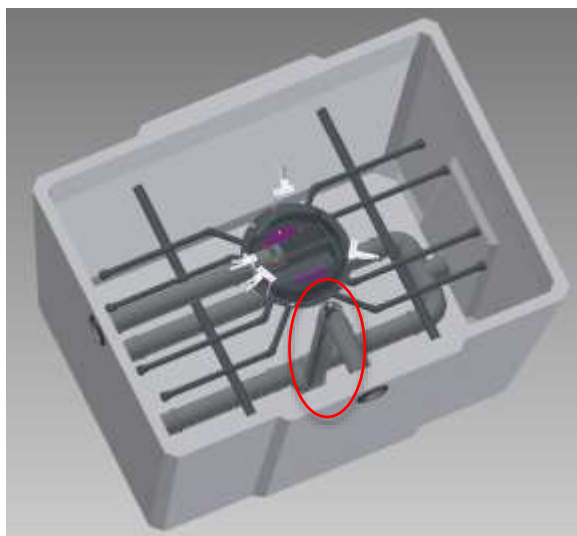


Fig-12 : **Position of the level sensor in the tank**



Fig-13 : **Alarm box**

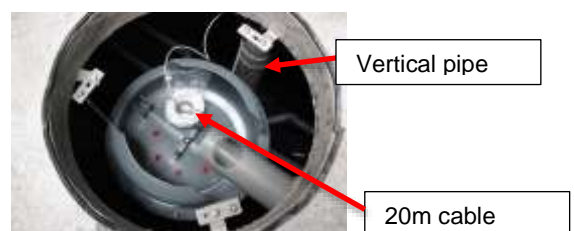


Fig-14 : **View of the manhole**

In the event that there is a blocking of the purified wastewater outlet pipe, the water level rises in the drain and comes into contact with the detector. It then sends a signal to the alarm box which emits a sound and triggers a LED light.

The detector may be easily installed (inside or outside) close to the sanitation system (ideally in a walkway so as to be alerted in the event the alarm is triggered for a blockage or in the event the batteries are weak).

2.3.13. Sampling chamber

The sampling chamber facilitates the taking of a one-time sample but also sampling over 24h thanks to its water trap.

The sampling chamber for the X-Perco® C-90 that is supplied by Eloy Water conforms to the requirements of the 3rd appendix of the order dated 25/09/2008. It must be installed at least 2m behind the system's treatment component.

A sampling chamber may also be created on site following the requirements of the 3rd appendix of the order dated 25/09/2008.

2.4. Performance

Eloy Water guarantees that if the installation and the operation of the system is in accordance with the instructions in the User Guide, the X-Perco® C-90 from 5 to 30 PE complies with the standards in force at the time that the station was installed and after running the installed system, being between 3 to 4 weeks of operation.

The products in the X-Perco® C-90 range were designed to treat domestic wastewater from 5 to 30 population equivalent (PE)

The daily waste volume per PE is as follows:

DBO5	60	gO ₂ /EP/day
DCO	135	gO ₂ /EP/day
MES	90.	g/PE/day
Qjr	150	l/PE/day

Or based on size:

	DBO5 (KgO₂/day)	DCO KgO₂/day)	MES Kg/day	Qjr m³/day
5 PE	0.30	0.675	0.45	0.75
9 PE	0.54	1.215	0.81	1.35
12 PE	0.72	1.62	1.08	1.8
15 PE	0.9	2.025	1.35	2.25
18 PE	1.08	2.43	1.62	2.7
23 PE	1.38	3.105	2.07	3.45
30 PE	1.8	4.05	2.7	4.5

The X-Perco® C-90 range of products from 5 to 30 PE meet the normative and regulatory technical provisions in force. The level of treatment required corresponds to the following values:

Parameters	Maximum concentrations at treatment output
DCO	160 mg O ₂ /l in one-time samples - 125mg O ₂ /l on average over 24 hours;
DBO ₅	50mg O ₂ /l in one-time samples - 30mg O ₂ /l on average over 24 hours
MES	60 mg/l in one-time samples - 40mg on average over 24 hours.

Assumptions:

- Concentrations measured on an average daily sample.
- For an effluent temperature of ≥ 12 °C and pH between 6,5 and 9,5.
- Subject to the compliance with nominal hydraulic and pollutant loads.

3. Usage and maintenance of the X-Perco® C-90 from 5 to 30 PE

3.1. Operating instructions

In order for your X - Perco® C-90 to give you complete satisfaction, please respect the following under penalty of forfeiture of the warranty:

1. The purification process of the X - Perco® C-90 uses living organisms. It is therefore totally forbidden to release harmful substances such as the following into your station:
 - paints, varnishes, thinners;
 - chemicals and drugs;
 - grease and oils
 - bleach
 - non biodegradable wet tissues;
 - tampons, sanitary napkins, diapers;
 - wax and resin
 - packaging (cardboard - plastic);
 - acids;
 - chemical toilet;
 - water above 75°C.

However, domestic cleaning products may be used within the limits of the directions for use provided for by the manufacturer. On the other hand, you do not need to add products to stimulate bacterial development.

2. Never connect rain water or pool water to your station These types of water could disrupt the bacterial flora.
In the event of a storm or heavy rain, a “first flush effect” could also purge the sludge and expel it towards the filter media (risk of premature blocking).
3. Remember to consistently fill the compact filter’s primary settling tank with clear water before starting and after every draining.
4. Once your X-Perco® C-90 is installed, it is forbidden to carry out any potential works, unless otherwise directed by the Eloy Water’s engineering firm.

3.2. Maintenance

3.2.1. *Maintenance, a prerequisite for the sustainability of your structure.*

The maintenance of your product is essential to ensure its performance over time. Not only does maintenance allow you to control the proper operation of your product, but it is also used to trigger a drainage at the right moment. Technicians that are trained and certified by Eloy Water are also able to diagnose and carry out appropriate repairs.

Each X-Perco® C-90 identified by a reference number that appears on a identification plate that is placed on the tunnel dome (filter compartment).

An identity card for the X-Perco® C-90 is delivered with the product in a plastic sleeve installed in the inlet pipe. It comprises of a few boxes to be completed by the client, including the serial number that appears on the plate, who then returns the completed document on their own to Eloy Water.

As soon as Eloy Water or one of it's partners receives the identity card, the form is saved in the Eloy Water data base.

The client may also use the website www.elaywater.be to register their product in the Eloy Water data base.

Eloy Water or a company that has been deemed certified by Eloy Water will then sent a proposal for a maintenance contract to the client. When a client returns a signed maintenance contract, Eloy Water:

- verifies and records the contract in the data base;
- sends a countersigned copy to the client;
- files the contract in a specific folder;
- determines the month of intervention for the first visit;

The maintenance report (chapter 9, appendix 1) that is addressed to the client consists of, a part from the general information, recommendations on the proper functioning of the product. It is important that you keep this report.

If the situation so requires, the origin of a problem is specified and if necessary, a quotation for the reparation is prepared.

Eloy Water designed the X-Perco® C-90 with easy and fast maintenance in mind. To take full advantage of this point, **it is essential that access to the inspection ports be possible at all time along with access to all the different compartments of the X-Perco® C-90.**

If you decide not to purchase a maintenance contract, the maintenance schedule available in chapter 9, appendix 2, must be completed by the external service provider (nominated by you) or by yourself. In this case, to benefit from the performance guarantee, it is essential that you perform an annual maintenance of your X-Perco® C-90 in accordance with the operations described in chapter 3.2.2 below. In order to ensure this, Eloy Water may ask you to justify that all these maintenance operations were carried out.

3.2.2. *Services provided by the maintenance contract*

Certified Eloy Water operators will systematically propose a **maintenance contract** to the client. In this way, Eloy Water has a file (updated in real time) of all X-Perco® C-90 that have been sold and installed.

This files contains all the pertinent information that allows us to “track” each system (see chapter 9, appendix 1).

As part of the annual maintenance of the **X-Perco® C-90** the following operations are carried out by the company’s specialised technicians:

- Pre-treatment compartment (primary settling tank)

Activities	Operations
Inspect the state of the hydraulic connections.	If there si a risk of clogging, clearing of the pipes.
Inspection of the primary filter through the manhole.	Clean the primary filter using a water jet (min.1 x per year).
Measure the height of the sludge blanket in the primary settling tank.	If necessary, they will indicate if a cleaning is required. This has to be undertaken by an approved septic tank cleaner of your choosing.

- Treatment compartment (filter)

Activities	Operations
Inspection of the allocation of pre-treated wastewater before dispersal onto the runnel - Manhole level above the filter media.	If necessary, adjustment of the dome’s position so that the “pre-treated” raw water is evenly distributed into the two compartments situated under the runnel.
Inspection of the general condition of the runnel(s) through the manhole(s) in the treatment compartment.	The biofilm that developed on the surface of the runnels will be removed using a water jet. To do this, remove the runnel from it’s bracket.
Inspection of the free passage of fresh air in the air suction pipe.	Clearing of the air suction pipe if necessary.
Inspection of the flow through the media.	In the event of bacterial overdevelopment on the surface of the filter bed, scarification of the Xylit (with a rake or pitchfork)
Inspection of the level indicator.	Cleaning of any deposits and check the cleanliness of the float.
Check that the alarm warning light is functioning properly by manually activating the contact.	Replace the batteries with new ones if necessary.

3.3. The withdrawal of sludge

The primary settling tank of your X-Perco® C-90 sanitation system accumulates sludge which is called “primaries” which is produced by the decantation of suspended solids contained in the raw wastewater. The need to drain it is dependant on the sludge filling rate of this settling tank.

As a manufacturer, we recommend draining when the height of the sludge in the primary settling tank of your X-Perco® C-90 reaches the following values:

Range :	Capacity of the station	Active storage of the primary settling tank	Height of sludge
	PE	in m ³	in cm
X-Perco® C-90 5PE single tank (3.0m ³)	5	3.00	70
X-Perco® C-90 5PE Dual tank (3.5 m ³)	5	3.03	70
X-Perco® C-90 9 PE Dual tank (3.5 m ³)	9	3.03	70
X-Perco® C-90 12 PE Triple tank (6.2 m ³)	12	5.23	70
X-Perco® C-90 15 PE Dual tank (6.2 m ³)	15	5.23	70
X-Perco® C-90 18 PE Triple tank (6.2 m ³)	18	5.23	70
X-Perco® C-90 23 PE Triple tank (4.5 m ³)	23	4.23	89
X-Perco® C-90 30 PE Triple tank (6.2 m ³)	30	5.23	69

Example:

We recommend draining the X-Perco® C-90 5PE single tank when the height of the sludge in the primary settling tank compartment (1st compartment) reaches 70cm from the bottom of the tank.

The draining of the decantation structure is a prerequisite to ensuring the proper functioning and the purification performance of your system.

The draining frequency remains indicative and depends on several parameters such as the characteristics of the raw effluents to be treated, the lifestyle of the users, the annual water consumption, the station’s frequency of maintenance, etc. In view of these factors, it seems difficult to precisely quantify the draining frequency of the structure.

In all circumstances, the need for draining should be evaluated and measured by the technician during his inspection visit.

The company that is chosen to extract the sludge, when necessary, will use the proper material and will operate with all the usual precautions to drain your X-Perco® C-90. The septic tank cleaners will familiarise themselves with the recommendations concerning this in the **paragraph below**. They will ensure a minimum safety distance of 3 meters between the sewer cleaning truck and the access manhole axle. Only the primary settling tank should be drained.

Please respect the following draining procedure:

- a. Suck up the “hat” that is present on the top of the primary settling tank.
- b. Drain the primary settling tank completely.
- c. Fill the primary settling tank by opening the tap in the house using a garden hose or even using after filtration black water (on new septic tank cleaner trucks) until it runs off into the treatment chamber.

3.4. Sampling of the purified wastewater

In accordance with annex 3 of the order of 25/09/2008, a sampling chamber must be installed downstream from your X-Perco® C-90 along the waste disposal pipes for treated wastewater in order to safely monitor the proper functioning of your purification station, and without affecting the operation of the installation.

This control room must meet the following requirements:

- allow a representative sample of the treated effluent to be taken;
- is easily accessible;
- is placed at a distance not exceeding 2 metres after the filter of the X-Perco® C-90;
- is equipped with an orifice with a nominal size of 60cm;
- allows direct sampling of the water inlet line in the said inspection chamber.

Sampling can be done directly via the manhole by inserting the sampling stick and its collection vessel into it.

We advise you to keep a 10cm difference in height between the inlet line and the chamber exit in order to facilitate the sampling process.

The inlet pipe for purified wastewater in the chamber should exceed the walls of the chamber by a few centimetres in order to facilitate the sampling process and especially to avoid contamination of the sample via contact with the walls.

In the event of a regulatory inspection of the system, a 24 hour sampling can be carried out in this sampling chamber in complete safety and without affecting the operation. To do this, simply place the programmable automatic sampler strainer inside it.

The Eloy Water sampling chamber meets the above mentioned requirements.

3.5. Procedure in the event of a malfunction

Eloy Water guarantees that if the installation and the operation of the system is in accordance with the instructions in the User Guide, your X-Perco® C-90 from will not malfunction for a period of 10 years.

Nevertheless, certain observations may be construed as an alert of malfunction:

- Noticeable odors around the installation or inside the building.
- Discharge of wastewater inside the building is disrupted.
- Backflow of wastewater inside the building.
- Activation of the outlet blocked warning light.
- Poor quality of water output.

If any signs of malfunction were to appear, the first thing to do would be to check the station's positioning and check if all the equipment is fulfilling their intended purposes.

In fact, an installation that does not comply to Eloy Water's requirements is prone to mechanical as well as hydraulic malfunctions (allocation of wastewater malfunction, levelling of the runnel and the distribution system malfunction, hydraulic drainage malfunctions, etc.)

Other malfunctions may also be brought to light when the operating instructions are not followed, for example:

- Use of large quantities of toxic substances such as bleach water, detergent, antibiotics,...
- Inadequate maintenance (cleaning of primary filter, draining,...)

In the event that the station malfunctions, please contact the after sales department (+32 (0)4 382 44 00 or support@eloywater.com) in order to have a complete diagnosis done.

3.6. Replacement of wear parts

Maintenance operations must be performed by the company's specialised technicians. When a wear part needs to be replaced, please contact the after sales department at +32 (0)4 382 44 00 or support@eloywater.com.

The replacement time for certain components is dependant on the travel time required. It will be at least 5 working days.

3.6.1. Filter media

Replacement of the Xylit filter media is generally done after an operating period of 12 years. With low loads and intermittent use, its use may be extended up to 15 years.

When replacing the filter media, a approved septic tank cleaner will use a vacuum truck to pump the Xylit. The media is vacuumed through a suction head located at the end of the flexible hose and placed in the treatment chamber via the 3rd manhole or the manhole(s) situated above the filter media in dual or triple tank stations. The used Xylit is then deposited into the machine's bin to be unloaded. The used filter media can be recycled via composting in one of the many approved centres and will be replaced with a new filtering mass.

The substrate is available from stock in our factory or your dealer.
Delivery time: On average 5 working days.

3.6.2. Runnel

A replacement of the runnel or runnels and the distribution system may sometimes be necessary after an operational period of 15 years. The old device(s) will be retrieved manually and replaced with new ones.

Note that worn part will be sent to a dump or a recycling centre to be reused or recycled.

Parts are available from stock in our factory or your dealer.
Delivery time: 5 working days

3.6.3. Blockage detector

In the event that there is a blockage at the outlet of treated wastewater, the owner of the X-Perco® C-90 must be notified. This is why a detection device is installed in the wastewater return line under the filter media. Remember to check that it is working properly and if necessary replace the 9V batteries.

4. Treated wastewater lifting station (optional)

If the topography of the site does not allow for the natural drainage of the wastewater to the receiving medium, the use of a pump to raise the wastewater is recommended.

A lifting station is available on request from Eloy Water (or from your advisor).

5. Warranties:

Eloy Water guarantees that your X - Perco® C-90, as it is described in this guide, for normal use (according to the proportioning rules indicated in paragraph 1.2) coupled with proper care, is designed to purify wastewater in accordance with the regulatory requirements in effect at the time of its installation.

This warranty applies when the compact filter:

- was correctly proportioned (characterisation of the influent),
- was properly installed, connected and commissioned,
- is used normally,
- is regularly maintained in accordance with the manufacturer's requirements.

The warranties are as follows:

- 10 years + 5 years* on the concrete tank or tanks (outer casing).
- 10 years + 2 years on the following internal components : filtering media, distribution system and allocation system.
- 2 years + 1 years on the rest of the equipment (excluding accessories: lifting pump, trapillon, trailer,...).

“” You will find the procedures for granting extensions of warranties on our website : www.elaywater.be. These extensions of warranties are valid at the time this guide was published (August 2016). They may be changed or withdrawn at any time without notice.*

The products in the X-Perco® C-90 range are also covered by a public liability insurance, including environmental responsibility, accidental violation of the environment, as well as the manufacturer's liability for negligence.

6. Environmentally responsible development

To create the X-Perco® C-90 compact filter, the “Research and Development” department of Eloy Water pointed out key challenges of environmentally responsible development.

The X-Perco® C-90 compact filter:

- does not consume any energy except for the alarm box’s batteries which have an estimated lifespan of 7 years.
- was originally designed from elements and materials that are completely recyclable and reusable (concrete, HDPE, stainless steel, PP,...)
- while operating, does not produce any waste with the exception of organic sludge generated by all biological purification treatments and soiled Xylit.
- promotes a natural by-product, the Xylit, in the form of a filtering mass, which can be consumed by the industrial world and hence is equated as a waste.

Actually the Xylit is contained in lignite (coal) that we extract from the earth. It consists of natural wood fibres, not fossilised and whose geological age is estimated to be at several million years. Unusable, these fibres are separated from the lignite and treated as waste. However, the Xylit has demonstrated the distinct feature of having exceptional purification abilities.

In addition, the Xylit used by Eloy Water is extracted in Germany which brings its supply, packaging and use closer so as to limit its carbon footprint.

Filtration is performed using simple gravity percolation, the X-Perco® C-90 does not require any electromechanical devices and does not consume any energy to treat domestic wastewater.

At its nominal load, the Xylit’s purification capacity remains optimal for 12 years. However, with low loads and intermittent use, its use may be extended up to 15 years. At the end of this period, the fibres are removed and can be composted at a composting facility. It is replaced with a new filtering mass.

Simple, practical, ecological and economical, the X-Perco® C-90 compact filter represents a step forward in the field of household sanitation.

7. Traceability

Each X-Perco® C-90 is identified by a reference number that appears on a identification plate that is placed on the runnel dome (“filter” compartment). This plate is accessible through the manhole.

An identity card for the X-Perco® C-90 is delivered with the product in a plastic sleeve installed **in the inlet pipe**. To access it, simply remove the red plug that is visible on the inlet pipe.

Feel free to ask your **ask your installer** about it if the latter did not give you your copy.

This identity card comprises of a few boxes to be completed by the client, including the serial number that appears on the plate, who then returns the completed document on their own to Eloy Water. We invite you to return the completed document to ensure the traceability of your product.

Alternatively, you can register your product on our website **www. eloywater.be**.


8. Intermittence

All the products in the X-Perco® C-90 range from 5 to 30 PE can be installed to operate intermittently. The filter's ability to restart after long periods of downtime or without power supply (holiday homes, camping sites, ...) is not surprising. In fact the bacteria adapts to the conditions of the environment; during periods of famine, it slows down it's metabolism greatly and enters a dormant state - even becomes encysted - to be reactivated when the nourishment (wastewater) returns.

During the downtime, your system does not need any specific intervention. Before restarting, you are advised to carry out a preventive cleaning.

9. Appendixes for the User Guide for the User

Appendix 1: Example of a maintenance form (with a contract)

		CONTRAT D'ENTRETIEN Conditions particulières de vente X-Perco C-90 5 à 30 EH	
		Numéro du contrat:	
COORDONNEES DES INTERVENANTS			
1. LE CLIENT			
Nom:	Prénom:		
Adresse:	Code Postal:		
N°:			
Localité:			
Pays:			
Tel:	GSM:		
e-Mail:			
Jour de préférence de visite (du lundi au vendredi entre 8 et 15h):			0 Matin 0 Après-midi
2. LIEU D'INSTALLATION DU PRODUIT			
Adresse (si différente):		Code Postal:	
N°:			
Localité:			
Pays:			
DETAILS DU CONTRAT			
Tâche		Entretien de base	
Déplacement du technicien		v	
Enregistrement du nombre d'habitants et de la date de dernière vidange		v	
Ouverture et nettoyage des tampons		v	
Vérification de l'écoulement dans le tuyau d'entrée et de la présence de boues		v	
Mesure de la hauteur du voile de boue et du chapeau dans le décanteur		v	
Nettoyage (si nécessaire) du ou des préfiltre(s) (accès à un point d'eau requis)		v	
Contrôle et scarification (si nécessaire) du média filtrant (xylit)		v	
Vérification et réglage (si nécessaire) du dispositif d'alimentation des augets.		v	
Vérification et réglage (si nécessaire) des augets.		v	
Vérification de la ventilation et du système d'alarme		v	
Vérification et nettoyage (si nécessaire) de la pompe de relevage (si intégrée à la cuve)		v	
Mesure du pH et oxygène sur les eaux de sorties		v	
Encodage du rapport de visite et prise de photos		v	
Durée		1 an	
Nombre de visite(s)		1/an	
Tarif HTVA			
TVA		6 %	21 %
Tarif TVAC			
Le client déclare avoir pris connaissance des conditions générales de vente jointes à cette offre. Fait à le			
Signature du client précédée de la mention « lu et approuvé »:		Signature Eloy Water:	
v20180303		Validité de l'offre: 31/12/2016	

Appendix 2: Example of a maintenance form (without a contract)

<u>Type of compact filter (Population Equivalent):</u> <u>Serial number:</u> <u>Date of commissioning:</u> <u>Owner's name:</u>				
Year	Drainage services	Nature of maintenance services	Date	Signature
1 :				
2 :				
3 :				
4 :				
5 :				
6 :				
7 :				
8 :				
9 :				
10 :				
11 :				
12 :				
13 :				
14 :				
15 :				
16 :				
17 :				
18 :				
19 :				
20 :				

II. Placement Guide for the installer

Compact Filter

X-Perco® C-90 5 to 30 PE

Range :

- X-Perco® C-90 5PE Single Tank (3.00m³)
- X-Perco® C-90 5PE Dual Tank (3.5m³)
- X-Perco® C-90 9PE Dual Tank (3.5m³)
- X-Perco® C-90 12PE Triple Tank (6.2m³)
- X-Perco® C-90 15PE Dual Tank (6.2m³)
- X-Perco® C-90 18PE Dual Tank (6.2m³)
- X-Perco® C-90 23PE Triple Tank (4.5m³)
- X-Perco® C-90 30PE Triple Tank (6.2m³)

1. Implementation and installation

1.1. Location

Your X-Perco® C-90 must be installed in a location that is :

- outside of a traffic zone with vehicles of more than 3.5 T (*);
- not likely to be flooded (*);
- is accessible for drainage and maintenance works;

(*) If there are vehicles > 3.5 T, the implementation of your X-Perco must integrate a load allocation slab above the tank. In these cases, it is necessary to seek advise from a consulting engineer or to contact Eloy Water.

(**) If there is a significant amount of water in the earth, you are advised to plan for and calculate the dimensions for a either a ballasting slab above the tank or an anchoring slab under the tank (see chapter 1.11) In these cases, it is necessary to seek advise from a consulting engineer or to contact Eloy Water.

1.2. Topographical and drainage conditions

- Your X-Perco® C-90 is driven by a high entry. The purified wastewater drainage is carried out by low discharge. The difference in the entry level of the primary settling tank and the exit of the treatment tank varies between models (see layout plans in chapter 1.5 of the placement guide for the installer).
- Issues related to the nature of the soil (presence of rocks or a water table) are addressed in point 1.5 of the placement guide for the installer.
- The supply of inadequate wastewater can disrupt or halt the purification process. Avoid releasing large quantities of harmful substances into the unit (bactericides, bleach water, solvents, pesticides, antibiotics, hydrocarbons,...).
- In situations of hauling of wastewater before the X-Perco® C-90 purification system, the flow rate applied on this must be a minimum of Q24 and a maximum of Q18. In order to ensure the proper operation of the system, we ask that you work with a regular supply in the form of batches spread over 24 hours.

1.3. Transport

The products in the X-Perco® C-90 range 5 to 30 PE have the following characteristics:

Eloy X-Perco® France C-90 Range														
Range :	Models	Tank models		Active storage primary settling tank (PST)	Xylit		Exterior dimensions (mm)						PST Weight	Filter weight
							Primary settling tank (PST)			Filter				
		m ³		m ³	m ²	m	mm			mm			Kg	Kg
	PE	PST	Filter		Area	Height	Length	Width	Height	Length	Width	Height		
X-Perco® C-90 5PE single tank (3.0m ³)	5	6.20		3.00	1.92	0.85	2550	2200	1490	///	///	///	4700	
X-Perco® C-90 5PE Dual tank (3.5 m ³)	5	3.50	2.50	3.03	1.98	0.85	2200	1690	1490	2200	1250	1490	2800	2700
X-Perco® C-90 9 PE Dual tank (3.5 m ³)	9	3.50	3.50	3.03	2.87	0.85	2200	1690	1490	2200	1690	1490	2800	3800
X-Perco® C-90 12 PE Triple tank (6.2 m ³)	12	6.20	2 x 2.50	5.23	2 x 1.98	0.85	2550	2200	1490	2200	1250	1490	4000	2 x 2700
X-Perco® C-90 15 PE Dual tank (6.2 m ³)	15	6.20	6.20	5.23	4.62	0.85	2550	2200	1490	2550	2200	1490	4000	5400
X-Perco® C-90 18 PE Triple tank (6.2 m ³)	18	6.20	2 x 3.5	5.23	2 x 2.87	0.85	2550	2200	1490	2200	1690	1490	4000	2 x 3800
X-Perco® C-90 23 PE Triple tank (4.5 m ³)	23	4.5	2 x 6.2	4.23	2 x 4.62	0.85	2380	1580	1850	2550	2200	1490	2600	2 x 5400
X-Perco® C-90 30 PE Triple tank (6.2 m ³)	30	6.20	2 x 6.2	5.23	2 x 4.62	0.85	2550	2200	1490	2550	2200	1490	4000	2 x 5400

In the event of direct lowering (by the delivery truck)

The truck should be able to reach the excavation zone safely using an access way (for heavy-duty vehicles) which is larger or equal to 3.5 meters.

The passage of the transport requires an **overhead clearance** (devoid of obstructions) of **4.5 meters**.

The **area surrounding** of the excavation zone must be **completely cleared to a width of 4 m** to allow the stabilising columns which ensure the static balance of the truck during the handling of the tank to be placed.

Note: **The installer is responsible for the applicable security measures at all stages of the installation.**

⚠ Important note:

The preparatory work must be fully completed before the arrival of the delivery truck to avoid any extra cost due to waiting.

In the event of lowering using a crane on site.

It is strongly advised that the **surrounding area** of the excavation site be **completely cleared up to a width of 2 m** to ensure ground stability during the handling of the tank.

1.4. Handling

Steps to follow when handling the tanks:

- ☑ Remove the straps that are holding the tank down in the truck.
- ☑ Extend the crane and attach the slings or chains that are suited to the weight to be transported to the crane (see the table on the next page).
- ☑ Please use four receiving slings made by an accredited body and adapted to the weight and the dimensions of the crane (see table below). These will be handled **at an angle of between 60° and 90°(or maximum of 30° in relation to the vertical position) following the NR012 standard**, and anchored to 4 loops provided just for this (at the same time).



Fig-15: Handling of the tank

Depending on the terrain, you will need to choose the most suitable slings:

Tank model	Minimum size of the slings (m)	Load to be borne by each sling (t)		
		Direct lowering by the delivery truck	Unloading using a backhoe loader on flat terrain	Unloading using a backhoe loader on broken ground
C-90 2.5 m ³	1.47	1.28	1.61	3.21
C-90 3.5m ³	1.81	1.64	2.04	4.09
C-90 4.5m ³	1.7	0.9	1.7	3.5
C-90 6.2m ³	2.41	2.44	305	6.10

- Place the station perfectly horizontal. Once the tank has been placed, check the flatness deviation. It should not be higher than 0.5%.

⚠The main security measures are as follows:

- Absolutely prohibited from moving around under the load.
- Use of a handling crane that has been adapted and delivered by an approved body.
- Make sure to stabilise the soil before placing the tank.
- Make sure to place the hoisting hook with the opening facing outwards.
- Place the tank at level.
- Remove the slings/chains from the hooks.

⚠Storage:

If storing the tank on-site before lowering it in is required, it is essential that it rests on a stable and horizontal support and on its pallet.

1.5. Earthwork and lowering in

- Protective measures for operators and safety rules must be done in accordance with the national regulations, notably for excavation sites that are larger than 1.3m.
- All processes and studies to the parcel must be carried out in accordance with the regulations in force in order to access the constraints linked to the nature of the soil.

⚠Constraints related to the topography and the nature of the terrain:

Please respect the terms for specific implementation in the following situations:

Sloped terrain:

The bedding of the earthwork must be carried out in natural terrain. Make sure to avoid installation in a low point of the terrain. If the tank is installed on a sloped terrain, the ground's lateral pressure must be compensated for with a retaining wall. This wall, placed below the frost line, will be erected at at least 50 cm from the edge of the reservoir and should exceed by at least 50 cm on each side of the tank.

Impermeable soil:

If the soil has low impermeability ($K < 15$ mm/h), please consult a qualified engineering consultant in order to establish if waste infiltration is possible at the outlet of the X-Perco® C-90 or if the waste should only take place in a superficial drainage network.

Presence of a phreatic water table:

Our products can be installed in humid areas, or in the presence of phreatic water tables. Installation in the presence of a phreatic water table can be done as long as the maximum height of the table is located below the water hose of the primary settling tank's of the product installed.

Based on the local context and the level of water in the ground, a ballasting slab may have to be installed above the tank (or a anchoring slab below the tank) if the study carried out by the project manager deems it necessary or upon recommendation of the installer (see chapter 1.11).

Known flood prone areas:

It is strongly discouraged from installing the treatment unit in a known flood prone area (Local development plan, soil aptitude maps, deliberation by the local authorities, etc...). If necessary, consult a qualified engineering consultant who will draw up specific requirements for implementation.

Level the excavation site: the proper theoretical sizes are shown in the table below.

Theoretical sizes of the excavation site					
Range :	Length	Width	Height H	Covering (max)	Bedding height
	in cm	in cm	in cm	in cm	in cm
X-Perco® C-90 5PE single tank (3.0m³)	355	320	149	80	10-20
X-Perco® C-90 5PE Dual tank (3.5 m³)	590	270	149	80	10-20
X-Perco® C-90 9 PE Dual tank (3.5 m³)	590	270	149	80	10-20
X-Perco® C-90 12 PE Triple tank (6.2 m³)	625	Settling tank: 320 Filter: 400	149	80	10-20
X-Perco® C-90 15 PE Dual tank (6.2 m³)	660	360	149	80	10-20
X-Perco® C-90 18 PE Triple tank (6.2 m³)	625	Settling tank: 320 Filter: 490	149	80	10-20
X-Perco® C-90 23 PE Triple tank (4.5 m³)	645	Settling tank: 260 Filter: 660	Settling tank: 185 Filter: 149	80	10-20
X-Perco® C-90 30 PE Triple tank (6.2 m³)	660	Settling tank: 320 Filter: 660	149	80	10-20

Note: The minimum slopes as follows must be respected

- **2%** downward **slope** for hydraulic pipes
- **1%** upward **slope** for ventilation and aeration pipes

⚠ The tanks must be buried in accordance with the 12566-3 +A2 standard or assimilated as buried (for example: the creation of a buried placing with an embankment and a retaining wall)

⚠ It is essential that a stable, load bearing and perfectly horizontal bedding is created under the tank. With a thickness of 10-20 cm, this layer of fine sand (dry soil) must also be carefully compacted. It may be possible that the nature of the soil in place has load bearing capacity and is sufficient to place the product on the ground without a specific bedding. In this case, request a qualified engineering consultancy to study the household sanitation system's plot and confirm the compatibility of the soil to support the structure. A pre-emptive compacting may be carried out to improve the stability of the ground.

⚠ It is essential that a **minimum space of 50 cm** be maintained between the tank and the excavation site wall. The differences in levels between several tanks must comply with the plans here after.

⚠ When placing two or three tank sanitation systems, it is essential that a **minimum space of 50 cm** be maintained the tanks and that a stepped bedding is created.

⚠ The casings of the X-Perco® C-90 range of products are designed to support an embankment with a maximum height of 80 cm with the added load of light vehicles (B125). If these conditions are not met, it is essential that an allocation slab be made.

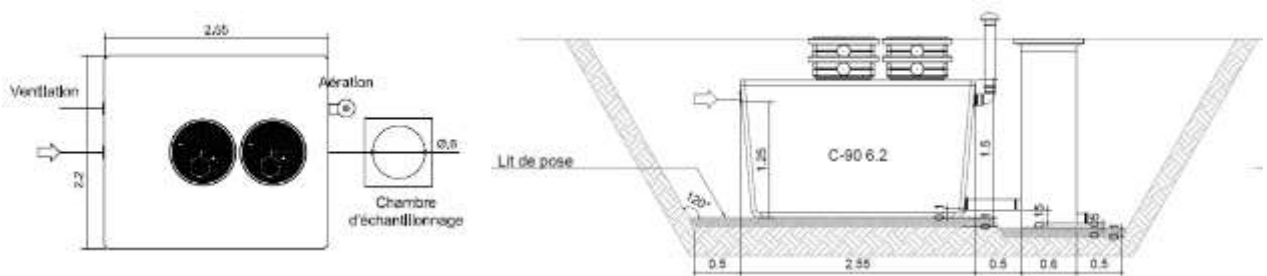


Fig-16 : X-Perco® C-90 5PE single tank (3,0m³)

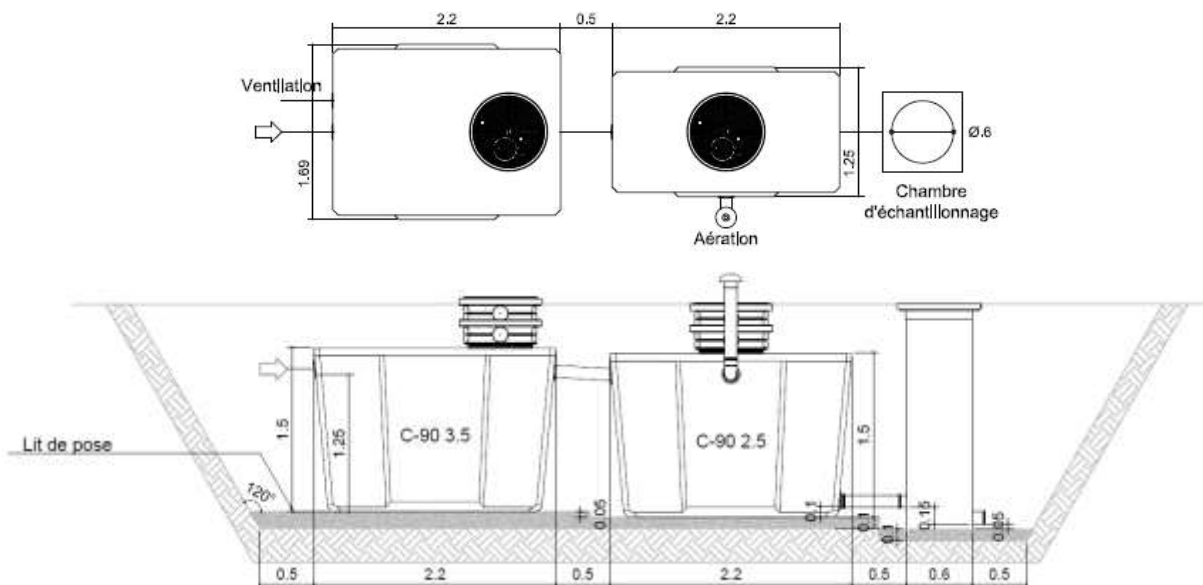


Fig-17 : X-Perco® C-90 5PE dual tank (3,5 m³)

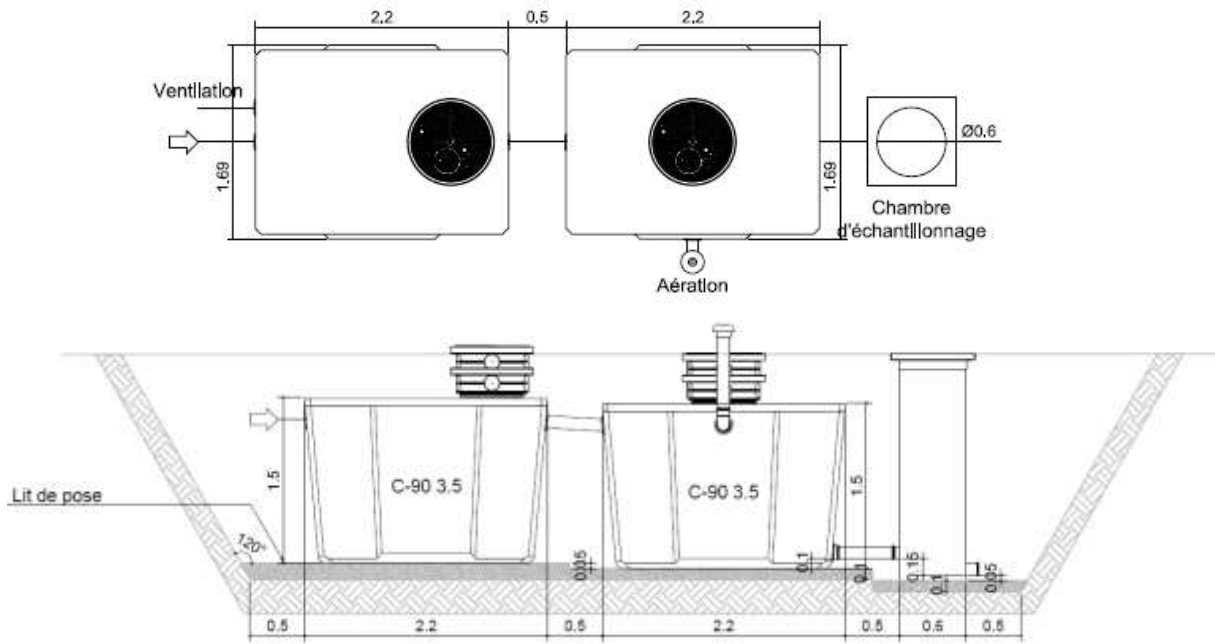


Fig-18 : X-Perco® C-90 9PE dual tank (3,5 m³)

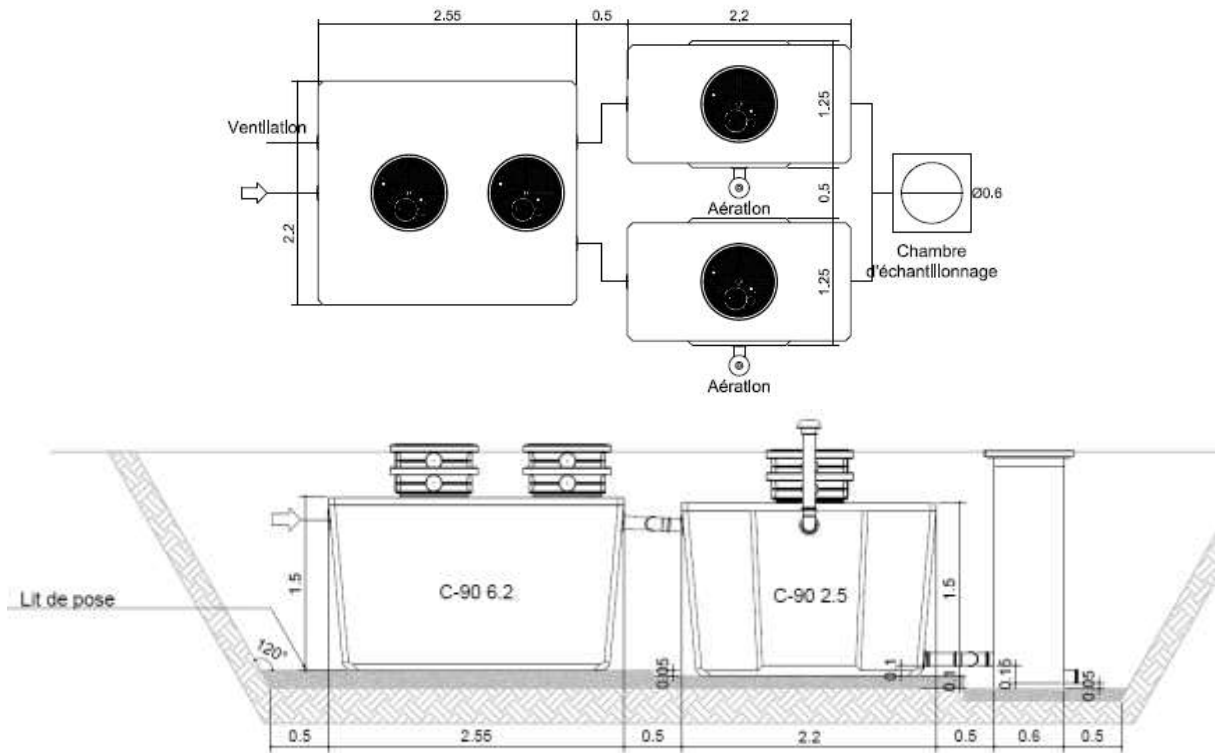


Fig-20 : X-Perco® C-90 12PE triple tank (6,2 m³)

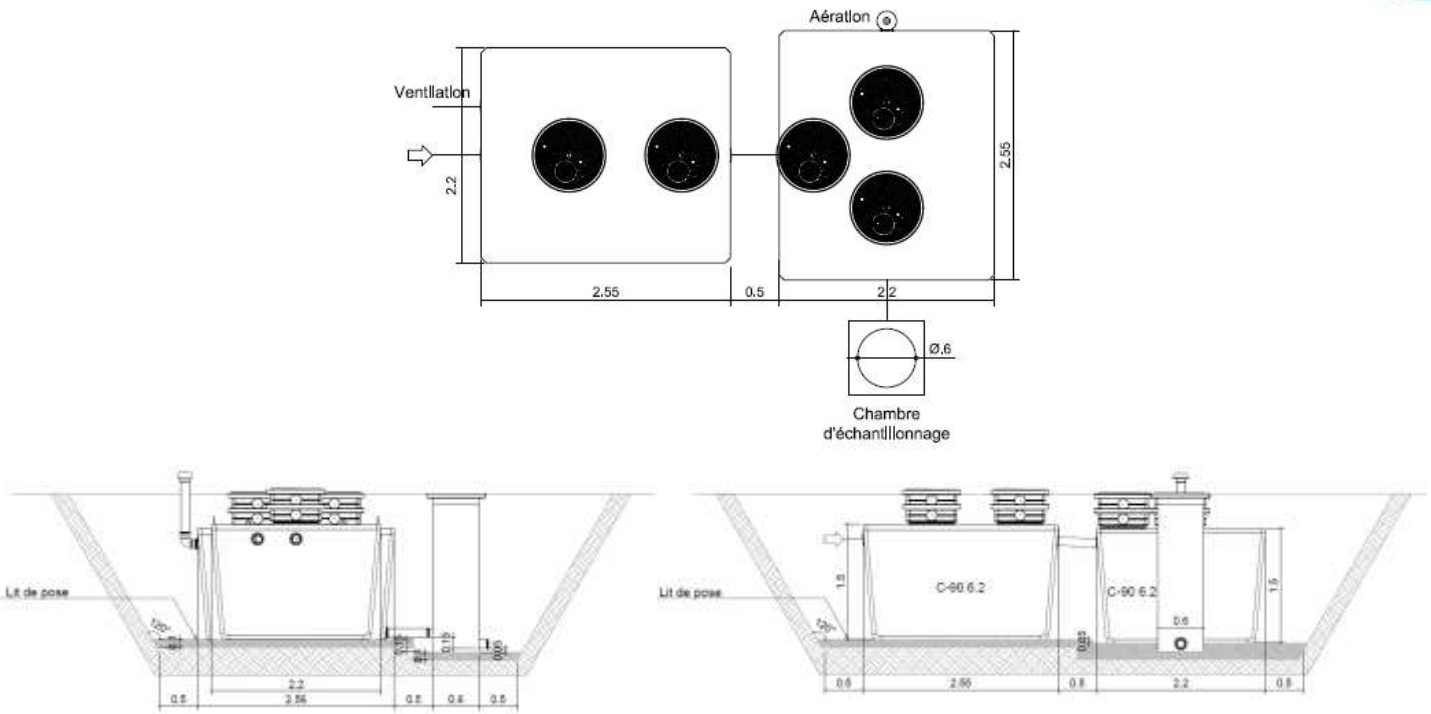


Fig-22 : X-Perco® C-90 15PE dual tank (6,2 m³)

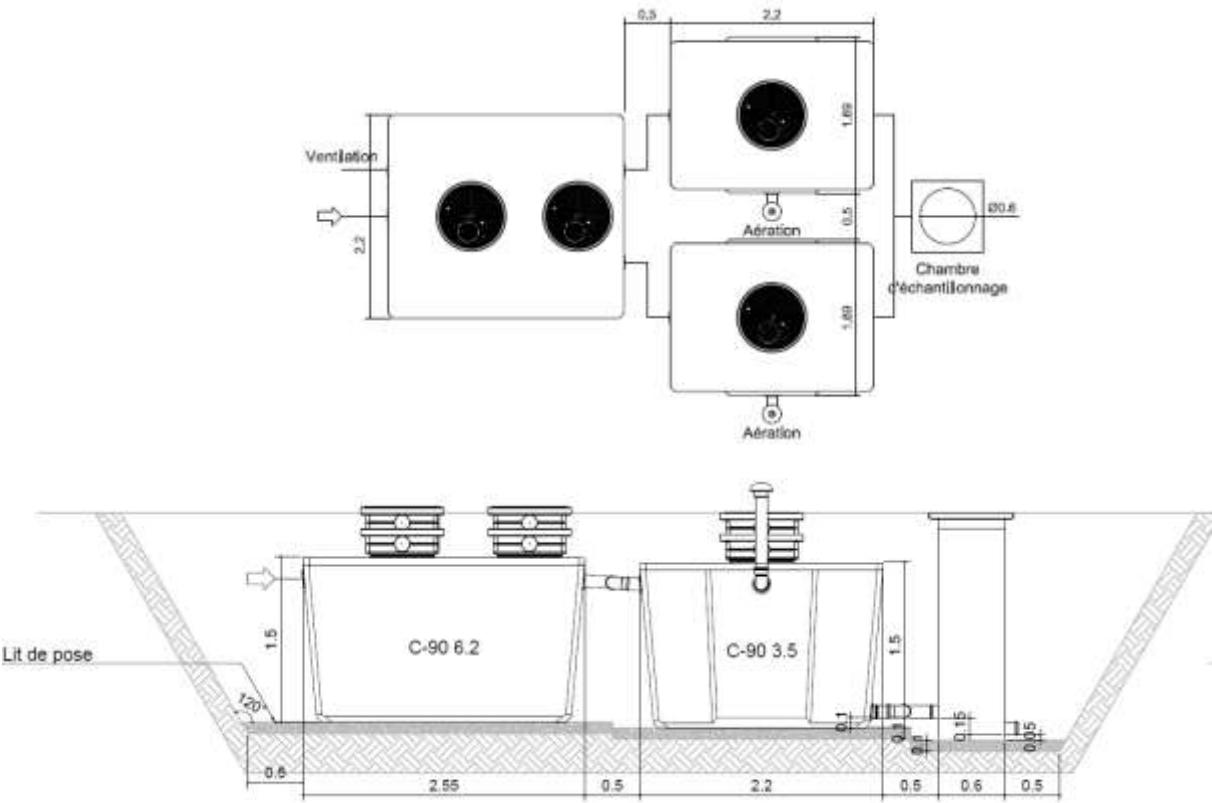


Fig-24 : X-Perco® C-90 18PE triple tank (6,2 m³)

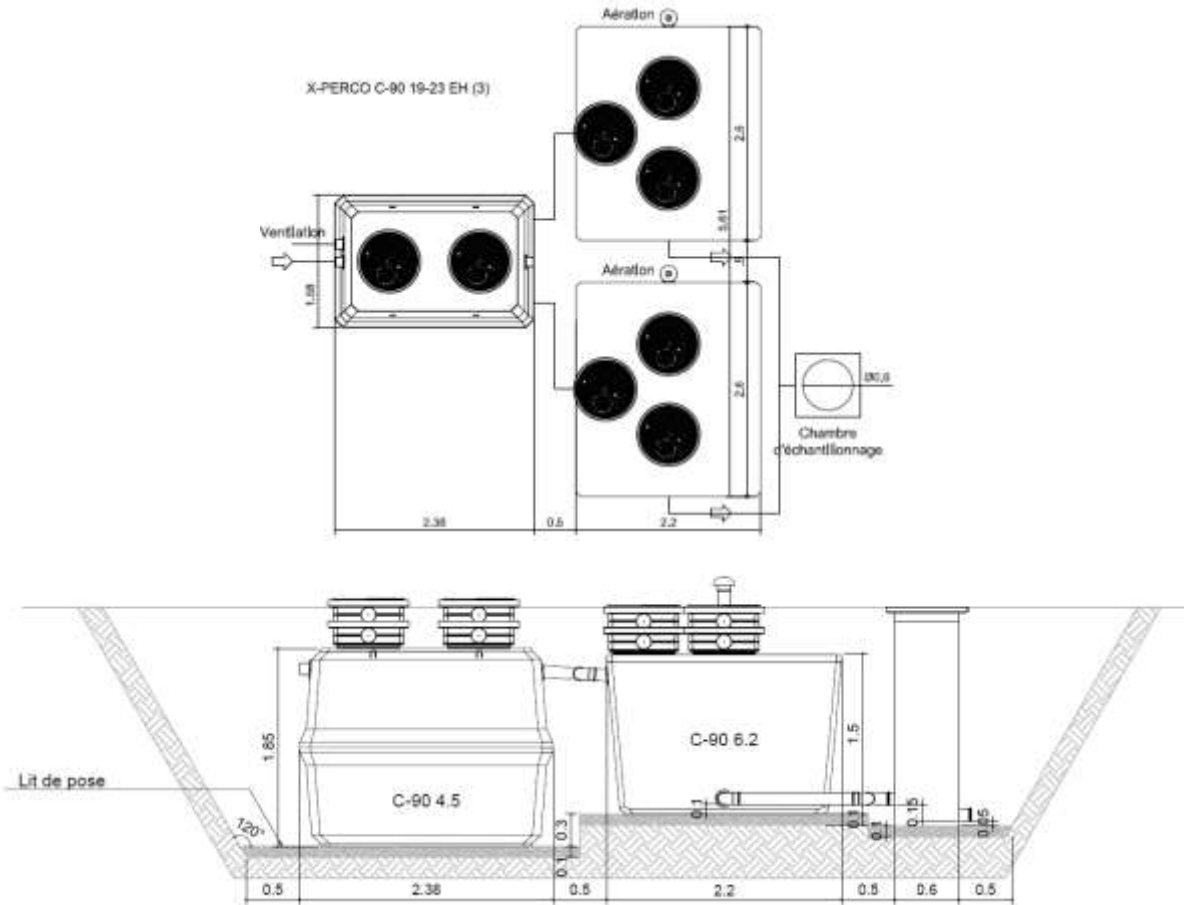


Fig-25 : X-Perco® C-90 23PE Triple tank (4,5 m³)

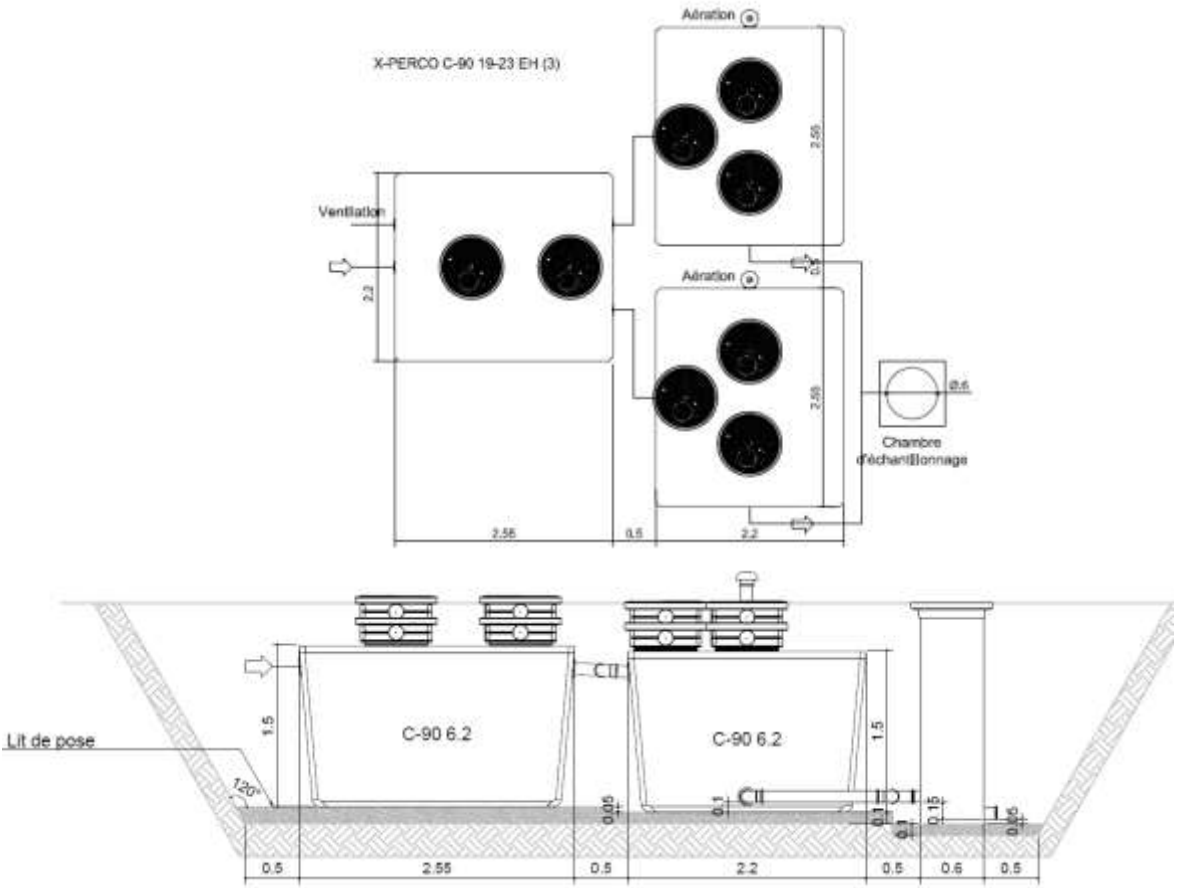


Fig-26 : X-Perco® C-90 30PE Triple tank (6.2 m³)

1.6. Embankment

- ☑ Make an embankment up to the **connection level** using material with a particle size of 0 - 56 mm (sand, crushed stone, grains of rice,...) or with the soil on hand as long as it does not contain elements that could damage the tanks and that it is sufficiently loose.
- ☑ The use of sand stabilised with cement is recommended but not mandatory.



Fig-27 : Embankment

- ☑ Perform a **thorough compacting** (in increments of 50 cm). An embankment that has not been properly compacted could lead to cracking of the tank wall.

You are advised to not undertake the compacting with a heavy mechanical device (compression roller, high capacity shovel...).

1.7. Hydraulic connection

The notes IN (inlet) and OUT (outlet) specify the direction of the water flow (hydraulic path). Extra precautions will be taken to ensure perfect stability of the embankment area to the right of the input and output pipes.

The inlet and the outlet will be connected by joints with PVC or other pipes having a diameter of 110mm.

The filter output is equipped with a red plug. To allow the hydraulic connection, it is essential to remove it beforehand.

Extra precautions will be taken to ensure perfect stability of the embankment area to the right of the input and output pipes. Ideally, the pipes should be wrapped in sand stabilised with cement at a minimum rate of 50 kg/m³. It is imperative that they are held perfectly in place to prevent any future deformation due to ground settlement.

If the land topography does not enable the maintaining of a constant slope, it is better to use the existing relief by focusing on the slope that is upstream from the unit. To facilitate the movement of the influent, a slope of 2% is necessary, whereas the treated effluent can make do with a smaller slope.

Note that it is best to temporarily place the lids on the tank(s) manholes during the implementation so as to avoid the embankment from seeping into the inside of the tank. Once the connection is completed, check the watertightness.

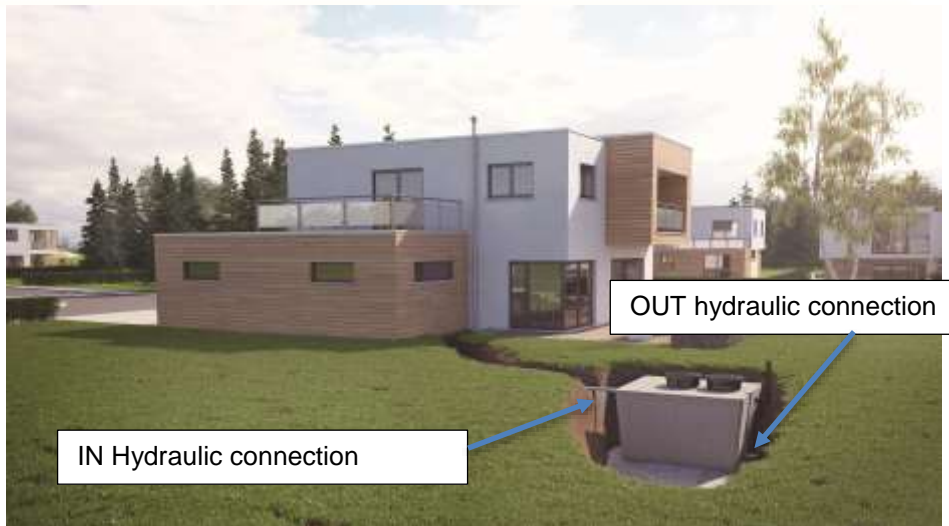


Fig-28 : Hydraulic connection model 5PE single tank (3.0m³)

1.8. Ventilation

The decantation of raw material in the primary settling tank (first compartment) of the X-Perco® C-90 is carried out with anaerobic bacterium (which do not need oxygen to develop). This phenomenon involves the release of methane, carbon dioxide and hydrogen sulfide which combined with the emissions of volatile fatty acids, may cause odors. These heavy gases must absolutely be evacuated into the atmosphere. For this reason, it is essential to properly ventilate the primary settling tank.

The sludge storage body must be fitted with a ventilation system which has a minimum diameter of 100mm, separated from the purified wastewater and rainwater circuits and placed high enough to avoid all olfactory nuisances.

Its installation will be in a steady rise towards the roofing. It will limit the number of direction changes as well as its radius of curvature (max 45°). A cap will cover this pipe so as to avoid and accidental obstruction.



High ventilation of the settling tank

Fig-29: High ventilation model 5PE single tank (3.0m³)

This pipe is resumed on the primary settling tank, next to the wastewater inlet (IN) and is identified by the “V or VENT” flocking.

⚠ The absence of ventilation on your X-Perco® C-90 can cause olfactory nuisances coupled with a significant degradation of the concrete casing, the concrete extensions and the cast iron trapillons due to biogenic attacks.

1.9. Aeration of the filter media

The filter media is supplied with fresh air via a 110 mm pipe that protrudes by about ± 20 cm in relation to the ground level. This pipe resumes at the side of the tank and is identified via a “A or AER” flocking.

On the site, this venting must be installed away from passing vehicles (in the event where the station is placed in a zone that is suitable for vehicle passage).

For this purpose, in the filter, Eloy Water has provided:

- For the X-Perco® C-90 single or dual tanks:
 - A C-90 Ø110mm FF elbow
 - A Ø110mm cap
- For the triple tanks:
 - two C-90 Ø110mm FF elbows
 - two Ø110mm caps

Depending on the configuration of your installation, use suitable lengths of Ø110mm PVC pipes between your station and the aeration device’s elbow and between the elbow and the ventilating cowl.



PVC
Ventilation
Cap Ø110mm

Ø110mm PVC
Pipe (not
included)

Ø110mm
PVC Elbow
(included)

Fig-30 : The filter media’s fresh air supply

It will limit the number of direction changes as well as its radius of curvature (max 45°).

A cap will cover this pipe so as to avoid and accidental obstruction.

The air is directly extracted from the outside and is distributed through the media via the perforations in the effluent outlet pipe.

The minimal distance between the primary settling tank ventilation and the filter aeration will be 5 m at the minimum.

Ensure an upward slope of 2%.

1.10. Level indicator

A water sensing probe is installed beforehand by Eloy Water in your system's filter. A level indicator allows to highlight a possible clogging of the filter media and/or a possible blocking of the outlet pipe.

The alarm box can be installed inside or outside (maximum distance 20m) If possible, try and place this box in a walkway (garage, cellar,...) as it is equipped with a red warning light (LED) which when lit, alerts the user to a malfunction with your compact filter.

Also arrange for protective sheathing so as to protect the alarm cable if it has to be buried.

To connect the probe to the alarm box, please refer to the installation manual available inside the alarm box, in the runnel dome.

For easier mounting, it is recommended that all the operations described in the installation manual be carried out before completely filling in the tank.

1.11. Adjustment of the distribution device

To facilitate the adjustment of the distribution device, we advise you to do it before positioning the extensions and the runnel.

Adjustment is done via the manhole(s) located above the runnel(s).

With the help of the bubble level placed in the cap, the distribution must be placed perfectly horizontal. To do this, use the operating wrench (supplied with your product in the filter) and screw in the 3 adjusting screws until the level is perfectly horizontal.



Fig-31 : Adjustment of the distribution device

1.12. Positioning of the runnel

The runnel is delivered separately in the "filter" of the treatment tank.

Depending on the size of the station, one or several runnel will be installed per filter. The installation is identical following the number of runnels.

It is installed at the manhole in a dome that supports the pre-treated water distribution system on the filter media.

The runnel must be firmly clipped to its support. To check the compliance of the installation, toggle it several times and make sure that it does not come out of its place.

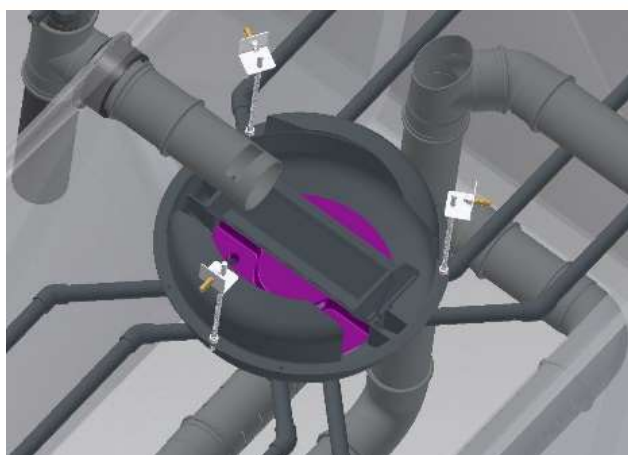


Fig-32 : Distribution runnel

1.13. Adjustment of the allocation device

An allocation device is provided for:

- in the septic tank if it is followed by two treatment tanks;
- in all the 6.2m³ filters.

Depending on the number and the size of the downstream filters of the septic tank, one or several allocation devices will be installed.

Model	Number of tanks	Tank model C-90 (m ³)		Number of allocation devices
		Primary Settling Tank	filter	
X-Perco® C-90 5PE single tank (3.0m ³)	1.	6.2		0.
X-Perco® C-90 5PE Dual tank (3.5 m ³)	2.	3.5	2.5	0.
X-Perco® C-90 9 PE Dual tank (3.5 m ³)	2.	3.5	3.5	0.
X-Perco® C-90 12 PE Triple tank (6.2 m ³)	3.	6.2	2 x 2.5	1.
X-Perco® C-90 15 PE Dual tank (6.2 m ³)	2.	6.2	6.2	1.
X-Perco® C-90 18 PE Triple tank (6.2 m ³)	3.	6.2	2 x 3.5	1.
X-Perco® C-90 23 PE Triple tank (4.5 m ³)	3.	4.5	2 x 6.2	3.
X-Perco® C-90 30 PE Triple tank (6.2 m ³)	3.	6.2	2 x 6.2	3.

Once they have been installed, the distribution devices are accessible via the 1st or 2nd manhole of the primary settling tank and/or the 1st manhole of the 6.2m³ treatment tank.



Fig 33 : Allocation device in the treatment tank



Fig 34 : Allocation device in the septic tank

Adjustments can be carried out from the top of the tank using the operating wrench supplied in the filter of your X-Perco® France C-90.

The operating principle is as follows: adjust the water stream inside the PVC collector by turning the device nozzle. To do this, simply place a bubble level on the perforated external ring and turn one of the two devices using the operating wrench until it is level.

Attention, after having completely backfilled and filled your station with water, it is essential that you recheck that your system is horizontal. If necessary, readjust the settings by following the same procedure.

In order to ensure the accuracy of the setting, the outputs are checked to verify the number of over-turnings per runnel over a minute. If they are not equal, check your setting.

1.14. Sampling chamber

The sampling chamber, which complies with the requirements of appendix 3 of the order of 25/09/2008, is installed at least 2 m from the last treatment component of the system.

The sampling chamber facilitates the taking of a one-time sample but also sampling over 24h thanks to its water trap.

1.15. Installation of extensions

As a standard, suitable polyethylene extensions of 600 mm in diameter will ensure the connection between the manholes and the upper level of the embankment that covers the tank's cover slab. The extensions that we supply are 22cm or 33cm in height and are stackable.

When the height of the embankment is higher than 50 cm, we strongly recommend placing concrete or polyethylene extensions on the larger sections, ideally 80x80cm, so as to ensure access to all of your station's electromagnetic equipment.

These will be closed using lockable polyethylene, concrete, or cast iron lids. The lids can be adapted to specific charges based on needs.

1.16. Finishing

- Place the trapillons on the extensions and close them using the threaded fastener found on the trapillons.
- Continue with the backfill of the embankment using particle size materials of between 0 and 6mm (sand, small crushed stone,...) until the base of the extensions (tank completely covered).
- Finish it off with topsoil, or extracted earth. **The height of the soil** above the openings of the tank or tanks must not exceed 80 cm, being a static load of +/- 1800 kg/m².

Cover height:

If a soil cover that is greater than 0.8 m is required, it is imperative that an reinforced concrete allocation slab be installed above the tank. If necessary, another additional study will be carried out for the allocation slab.

For embankment heights of between 0 and 50cm, use extensions with a diameter of 600mm so as to ensure easy access to your station's components. When the height of the embankment is between 50 and 80cm, use square 80x80cm extensions.

⚠ Movement of vehicles:

If there is traffic of vehicles > 3.5T, it is imperative to install an embankment using stabilised sand and a reinforced concrete allocation slab above the tank, this slab will hold the stabilised sand and will be equipped with adequate access manholes.

Consult a qualified engineering consultant who will draw up specific requirements based on the area layout and the theoretical tonnage of vehicles that could circulate above the unit.

Caution before filling:

A tank that is not backfilled and then filled could crack or even in some cases, explode. It is therefore forbidden to fill the tank with water, even halfway, if the tank is not backfilled, especially its circumference and until the level of the cover.

1.17. Installation in the presence of a phreatic water table

Depending on the local context and the water level and/or the rising of the water table in the soil, it may be necessary to resort to either an anchoring slab below the tank, or a ballasting slab above the tank. Only a specific report undertaken by the project manager can specify this technical recommendation or based on a proposition by the installer when the excavation is being carried out.

The tables below cover the admissible water levels in the excavation site before the risk of tank buoyancy (when it is empty) in relation to the level and the natural terrain depending on the height of the embankment on the cover.

In the event of a risk of buoyancy, check with Eloy Water or an qualified engineering consultant for the proportioning of a anchoring slab or a ballasting slab.

Tank with one manhole:

Tanks with 1 manhole	Admissible water height in the excavation site before the risk of tank buoyancy in relation to the placing of the tank				
	Height of embankment on the cover (18kN/m ³)				
	0 cm	20 cm	40 cm	60 cm	80 cm
C-90 2.5 m ³	81 cm	108 cm	16 cm	211 cm	231 cm
C-90 3.5 m ³	67 cm	96 cm	125 cm	211 cm	231 cm
C-90 4.5 m ³	71 cm	97 cm	123 cm	149 cm	176 cm
C-90 6.2 m ³	60 cm	91 cm	121 cm	152 cm	231 cm

Tanks with 1 manhole	Admissible water height in the excavation site before the risk of tank buoyancy in relation to the natural terrain				
	Height of embankment on the cover (18kN/m ³)				
	0 cm	20 cm	40 cm	60 cm	80 cm
C-90 2.5 m ³	- 70 cm	- 63 cm	- 55 cm	0 cm	0 cm
C-90 3.5 m ³	- 84 cm	- 75 cm	- 66 cm	0 cm	0 cm
C-90 4.5 m ³	- 114 cm	- 108 cm	- 102 cm	- 96 cm	- 89 cm
C-90 6.2 m ³	- 91 cm	- 82 cm	- 74 cm	- 66cm	0 cm

Tanks with two manholes:

Tanks with 2 manholes	Admissible water height in the excavation site before the risk of tank buoyancy in relation to the placing of the tank				
	Height of embankment on the cover (18kN/m ³)				
	0 cm	20 cm	40 cm	60 cm	80 cm
C-90 3.5 m ³	67 cm	92 cm	117 cm	142 cm	231 cm
C-90 4.5 m ³	71 cm	90 cm	110 cm	129 cm	149 cm
C-90 6.2 m ³	60 cm	89 cm	117 cm	145 cm	231 cm

Tanks with 2 manholes	Admissible water height in the excavation site before the risk of tank buoyancy in relation to the natural terrain				
	Height of embankment on the cover (18kN/m ³)				
	0 cm	20 cm	40 cm	60 cm	80 cm
C-90 3.5 m ³	- 84 cm	- 79 cm	- 74 cm	- 69 cm	0 cm
C-90 4.5 m ³	- 114 cm	- 115 cm	- 115 cm	-116 cm	- 116 cm
C-90 6.2 m ³	- 91 cm	- 82 cm	- 74 cm	- 66 cm	0 cm

Tanks with three manholes:

Tanks with 3 manholes	Admissible water height in the excavation site before the risk of tank buoyancy in relation to the placing of the tank				
	Height of embankment on the cover (18kN/m ³)				
	0 cm	20 cm	40 cm	60 cm	80 cm
C-90 6.2 m ³	60 cm	86 cm	112 cm	138 cm	231 cm

Tanks with 3 manholes	Admissible water height in the excavation site before the risk of tank buoyancy in relation to the natural terrain				
	Height of embankment on the cover (18kN/m ³)				
	0 cm	20 cm	40 cm	60 cm	80 cm
C-90 6.2 m ³	- 91 cm	- 85 cm	- 79 cm	- 73 cm	0 cm

2. Commissioning

The commissioning of your X-Perco® C-90 is carried out by your exclusive Eloy Water dealer, this task may also be delegated to an installer covered by your dealer.

The different stages of startup as follows (⚠ **only once the station has been backfilled and connected**):

1. Any dirt (soil, stones,...) that has accumulated in the runnel dome is cleaned out. Nothing shall be able to be evacuated through the holes in the dome.
2. **The eight red plugs positioned in the bottom of the runnel dome are removed.**



Fig 35 : Red plugs

3. The septic tank of the compact filter is filled with clear water using a faucet in the house or using a garden hose;

Attention, do not fill your filter in any case.

4. Once the water comes out of the septic tank in the direction of the treatment chamber(s), you must **check** the distribution and allocation devices **again**. If they are no longer level, restart the adjustment procedure again (chapter 1.11 and 1.13).

Regarding the adjustment of the distribution device, remove the runnel before remeasuring if it is horizontal at the bottom of the dome.

5. The output of the distribution device is controlled and equivalent.
6. Your runnel fills and switches correctly. The runnel switch automatically when the water level has reached the tipping point. If this does not happen, recheck if the allocation device is perfectly horizontal.
If despite this adjustment, the runnel still does not switch, unscrew the stop screws on both sides until you reach the tipping point.



Fig 36 : Stop screws



7. The input pipe and the drain pipe and the drain pipe are properly installed.
8. Your level indicator is properly connected.

9. Your station is now running!

A period of 3 to 4 weeks may be necessary to create a biomass (implementation plan) guaranteeing the optimal operation of the sanitation system.

After having commissioned the system correctly, it is compulsory that the user guide, the level indicator manual, the warranty certificate, the product's identity card and the operating wrench be handed over to the end client.

3. Frequently asked questions

General information about your X - Perco® C-90

➤ **What is a compact filter?**

The compact filter is based on the principle of organic filtration, which means that treatment is carried out using a population of aerobic bacteria that are bred on a filtering mass.

➤ **What is the Xylit?**

The Xylit is a fibre derived from wood, carbonaceous and imprisoned in lignite for millions of years. This fibrous and carbonaceous material demonstrates excellent purification capacities, notably a high number of concentrated elements that attach nutrients, trace elements and pollutants.

➤ **Is your X-Perco® C-90 compact filter certified?**

Eloy Water has several certifications including European certification and accreditation in France.

➤ **What is the visual impact of my X-Perco® C-90 compact filter on my property?**

It is a system that is completely buried so it presents a negligible visual impact.

Implementation and installation

➤ **What are placing requirements to be followed for the ventilation of my primary settling tank?**

The sludge storage body must be fitted with a ventilation system which has a minimum diameter of 100mm, separated from the purified wastewater and rainwater circuits and placed high enough to avoid all olfactory nuisances. (see chapter 1.8 of the Placement Guide for the installer).

➤ **Can I install my compact filter above ground?**

No The tank or tanks were not designed to be installed above ground.

➤ **Can I install my compact filter partially-buried?**

Yes, as long as you batter the circumference of the tank(s) and there is no risk of frost.

➤ **Can we connect rainwater to my sanitation system?**

No Rainwater does not flow through the system in any case.

➤ **What provision should be taken in order to allow the passage of vehicles over my tank?**

The tanks was designed to take the load of B125 light traffic (max 3.5 T). Make sure that heavy machinery does not pass near or above the tanks by posting of a type B13 tonnage limit sign. For heavier vehicles, you are advised to contact an load stability engineering consultant to draw up plans for a load allocation slab above the tank(s).

➤ **What type of extensions are used according to the height of the embankment?**

For embankment heights of between 0 and 50cm, use extensions with a diameter of 600mm so as to ensure easy access to your station's components. When the height of the embankment is between 50 and 80cm, use square 80x80cm extensions.

➤ **I throw my effluent in the drain, how do i protect them?**

Carry out regular maintenance of the station and do not forget to ventilate them.

➤ **There is water in my excavation site during the placing of my station, what do i do?**

See the placement conditions in phreatic water table (chapter 1.16)

➤ **What is the diameter of my protective sheaths?**

It is recommended that you use protective sheaths with a minimum diameter of 63mm.

Use and maintenance

➤ **Is maintenance compulsory?**

The regulations require users to maintain their household sanitation system but the maintenance contract is still optional though it is highly recommended.

Just like your car, your system must be maintained to operate effectively. Fortunately, your X-Perco® C-90 5-30 PE compact filter requires very little intervention (primary filter cleaning, runnel adjustment,...). However, certain operations may require the intervention of a professional. That's why Eloy Water has implemented a maintenance contract guaranteeing performance permanence of the system and the maintenance of our guarantees.

➤ **What happens if I do not maintain my compact filter?**

You will be exposed to more and more recurring technical problems (primary filter blockage, obstructions of the drains,...). This would reduce the purification yields of your sanitation system, increase your drainage frequency but also burden your purification station and as such you will have sanitary evacuation problems.

➤ **When should I drain the system?**

If you have a maintenance contract, you will have to drain your primary settling tank (first compartment) when the maintenance technician indicates it in the inspection report.

If not, we advocate a draining of the sludge at a 50% fill rate.

➤ **How often does the filter media need to be changed?**

It is recommended that the media be changed after 12 years of service at nominal load - after 15 years at low loads. In all circumstances, the need for draining should be evaluated by the technician during his inspection visit.

➤ **What is the maintenance frequency of the switching runnel(s) system?**

It is advisable to remove the biofilm on the surface of the runnel(s) once a year using a water jet. Similarly, the horizontal position of the runnels must be checked. To do this, place about 1 litre of clear water in the runnel and calibrate the horizontality of the runnels using the 3 adjusting screws (see chapter 1.11 of the placement guide)

➤ **How often does the primary filter need to be cleaned?**

Annual cleaning of the primary filter using a water jet. The frequency is adapted based on the use of the product (at least once a year).

➤ **Can we reuse the purified wastewater?**

Without proper additional treatment (UV, reverse osmosis, chlorination,...) it is forbidden to reuse the purified wastewater. In fact, this water still contains many pathogens (virus, bacteria,...).

➤ **Does my compact filter consume electricity?**

Your X-Perco® C-90 has the distinct advantage of not consuming any electricity for the treatment of wastewater. On the other hand, if the treated wastewater needs to be removed, the use of a pump will require low electricity consumption.

➤ **There are smells around my compact filter, what should I do?**

Check the watertightness of the buffers then if the ventilation is not obstructed, if it comes out well above the roofing and if it has a static or aeolian extractor.

➤ **There are smells in my house, what should I do?**

Check that all the household siphons are not disabled and are still in water.

➤ **My sanitary devices are not flushing properly, what should I do?**

Several causes:

1. There is probably an upstream blockage in the primary settling tank and /or the immersing T is clogged. The obstruction must be removed.
2. The primary settling tank is full and therefore needs to be drained.
3. The primary filter is clogged and is therefore overloading the primary settling tank. It must be removed and cleaned.

For any other questions, please contact the Support department of Eloy Water at +32 (0)4 382 44 00 or support@eloywater.be.

➤ **What should I do if the alarm warning light is activated?**

This is intended to signal any abnormal rise in water in the treatment chamber. If this indicator is visible, please contact Eloy Water at +32 (0)4 382 44 00 or support@eloywater.be or your certified operator.

➤ **Can I ask any septic tank cleaner to drain out my compact filter?**

No, it must be carried out by an approved septic tank cleaner.