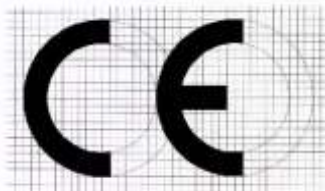




With CE certificate EN12566-3



USER MANUAL



BORA-CLEAN FILTER 5



PART 1 : Description

Description of the installation

The BORA-CLEAN installation exists of a pre-treatment tank of 6.000 litre, a pumping station, a filter in kit with all necessary parts, and a sampling pit.

The tank of litre is the pre-treatment tank and the storage of the sludge. It is equipped with a reinforced, adjustable riser.

The pumping station is installed after the pre-treatment.

The filter on his behalf comes after the pumping station.

Al. Dimensions are in this manual.

The installation is underground in sand without bricks (see the installation procedure)

The installation is delivered in Belgium.

Options:

There are 3 options available:

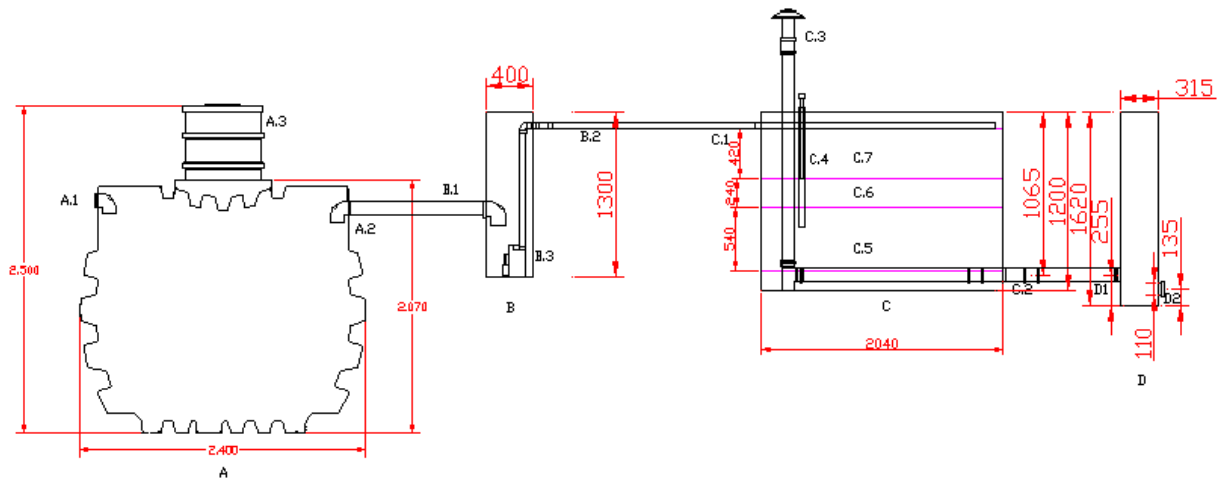
- a set of impregnated wooden shelves to install on the border of the installation for a nicer view.
- A set of 4 plastic poles, 8 plastic shelves and 12 impregnated wooden shelves for a nicer view, to install 20 cm above ground.
- A set of 4 plastic poles, 16 plastic shelves and 20 impregnated wooden shelves for a nicer view, to install 20 cm above ground.

Placement plan:

All the wastewater (toilettes, bathroom, shower, kitchen, ...) is treated in the installation. It is strongly recommended to install monitoring Wells were canalizations come together in front of the installation. All covers must be reachable for inspection and maintenance.

The treated water can be drained in surface water. Rainwater and drainage water may never enter the installation.

Dimensions of the system:



Drawing 1

- A) PRE-TREATMENT
 - A.1. Inlet of the pre-treatment
 - A.2. Outlet of the pre-treatment
 - A.3. Manhole
- B) PUMPING STATION
 - B.1. Inlet of the pumping station
 - B.2. Outlet of the pumping station
 - B.3. Pump
- C) FILTER
 - C.1. Inlet of the filter with distribution unit
 - C.2. Outlet of the filter
 - C.3. Ventilation
 - C.4. Alarm
 - C.5. Medium 1
 - C.6. Medium 2
 - C.7. Medium 3
- D) SAMPLING PIT
 - D.1. Inlet of the sampling pit
 - D.2. Outlet of the sampling pit

Material pre-treatment : PE

Material pumping station : PVC

Material filter : EPDM

Material sample pit: PVC



Mounting instructions:

Please contact our technical service for questions/problems on +32 9 325 25 71 or fax +32 9 375 22 22 or mail info@boralit.be

Chemical resistance:

The pre-treatment tank is fabricated in rotomoulded PE, so without welding.

The tank, the EPDM, as well as all the other components, are totally insensitive to the least corrosion.

These materials are also UV resistant.

Our tanks are designed to resist installation underground, also in humid conditions, provided that the installation instructed were followed. (see installation requirements)

Topography

The BORA-CLEAN filter is to be installed underground, and can, if necessary, be delivered with a pumping station at the outlet.

Evacuation of the purified effluent:

The purified water may be evacuated in surface water. See to it that backfill is impossible.

Dimensions:

It is clear that the weight is the big advantage of the installation:

Part	Length (mm)	width (mm)	Height (mm)	Weight (kg)
Pre-treatment	2.400	2.070	2.500	290
Pumping station	400	400	1.300	28
Filter	2.040	2.040	1.200	45*
Sampling pit	315	315	1.600	10

* Without medium

Our installations are especially used in hard to reach areas, and can be installed by using a small trailer are a Bob-Cat .



Safety:

Possible risks during installation:

- Closing of the dug well .
- Moving of the foundation of a near building.
- Impossible to dig deep enough through presence of groundwater.

How to solve these problems?

- See to it that all the necessary materials are delivered before start digging.
- Choose a place to install that's at least 3 metres from a foundation.

Installation:

The client acknowledges to have received a copy of this and agrees.

The installation requirements should be read FIRST BEFORE placement.

In the event of loss by the customer of the installation requirements the customer must always ask for a new copy of the installation requirements at Boralit nv, or download them from the Boralit Web site.

REMARK (!) : READ THIS CAREFULLY BEFORE STARTING INSTALLATION.

Installation requirements:

The filter contains 4 components:

- The pre-treatment
- The pumping station
- The filter
- Sampling pit

A) INSTALLATION REQUIREMENTS OF THE PRE-TREATMENT

INSTALLATION IN CONSOLIDATED SAND

Always install the facility as closely as possible to the contamination source to prevent the feeder pipe from clogging and causing blockages (excepted for rainwater tanks).

Prepare a pit that is at least 2,4 meter with and 2,8 meter long by 2.0 meter deep.

See to it that all groundwater or rainwater that might be present in the pit is pumped out before pouring consolidated sand into the pit. The bottom of the pit must be covered by at least 15 cm of consolidated sand of 150 Kg/m³ (*). Level (with a builder's level) the grease trap in the pit so the inlet is at the proper height to connect to the house drainpipe. Fill the grease trap with water and connect both the inlet and outlet. Provide with correct and sufficiently large ventilation according to the type of unit and always with a minimum of 50 mm. Backfill the pit round the unit with at least 15 cm of consolidated sand of 150 Kg/m³ (*). Always introduce small amounts of consolidated sand, slightly press the sand to prevent distortion of the unit. Put at least 10 cm of consolidated sand of 150 Kg/m³ (*) on top of the grease trap. Install the PE-risers, which can be obtained from



Boralit, on the unit until ground level is reached, and put the cover on. In case vehicles might drive in the immediate surroundings of the installation, a sufficiently strong concrete slab must be installed. The concrete slab should not rest on the tank and should divert the pressure to the ground that has not been disturbed.

(*) Please contact us in case of a temporary high groundwater level, and also if the tank becomes more deeply embedded in the ground than is permitted by the PE-riser.

INSTALLATION IN SAND

Follow above instructions and If there is no groundwater, the consolidated sand can be replaced by regular sand. Please contact us if the tank becomes more deeply embedded in the ground than is permitted by the PE-riser.

The PE covers are only temporarily. They do not have a safety lock and can not stand the weight of persons or vehicles who might pass by. Make sure you get Boralit covers, to increase the security of persons or vehicles who cross the installation.

B) INSTALLATION REQUIREMENTS OF THE PUMPING STATION

INSTALLATION IN CONSOLIDATED SAND

ATTENTION: The pumping station can be installed in sand, this at a maximum depth of 1 meter below the ground surface. In case the pumping station should be installed at a greater depth, installation in consolidated sand is obligatory. The preinstallation costs (cables etc..) have always to be payed by the client.

Dig a hole which is at least: 0,9 x 0,9 meter and 1,4 meter deep.

In case there is groundwater or rainwater in the pit, it should be pumped out before consolidated sand is provided in the pit. Cover the bottom of the pit with a layer of consolidated sand of 150 kg/m³ that is at least 15 cm thick (*). Make sure the pumping station is placed perfectly level in the pit. The entry pipe of the pumping station should be at the same depth as the exit pipe coming from the building/terrain that will be connected to the pumping station. Fill the pumping station with water and connect the entry and the exit pipe. Provide the pumping station with an adequate ventilation pipe (depending on the type of pumping station), the minimum diameter of which should be 50 mm. Fill the pit with at least 15 cm of consolidated sand of 150 kg/m³ surrounding the pumping station and make sure the consolidated sand is pressed carefully around the pumping station (*).

The (consolidated) sand should be brought into the pit, this with small amounts at a time. Make sure the (consolidated) sand fits tightly around the pumping station, but do not press too hard in order to prevent deformation of the pumping station.

Provide a layer of at least 10 cm of consolidated sand of 150 kg/m³ above the pumping station (*). The risers of the pumping station can be adjusted to ground level. The risers should get an adequate cast-iron cover, depending on the type of traffic passing above the pumping station. However, the pumping station should be accessible at all time to enable inspection or cleaning. In case of vehicles passing above the pumping station, a concrete protective platform should be installed to avoid pressure on the tank(s). Thickness and dimensions of the concrete platform should be calculated by your architect and/or contractor. The concrete platform should not rest on the tank(s) and should divert the pressure of the traffic towards the firm ground around the pit where the pumping station is installed.



(*) In case of groundwater or in case the tank(s) should be installed deeper than the riser(s) permit, please contact our sales department.

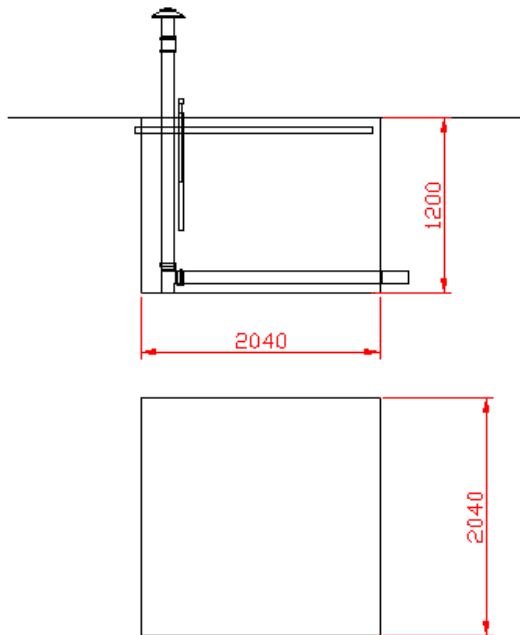
INSTALLATION IN SAND

Follow above instructions and If there is no groundwater, the consolidated sand can be replaced by regular sand. Please contact us if the tank becomes more deeply embedded in the ground than is permitted by the PE-riser.

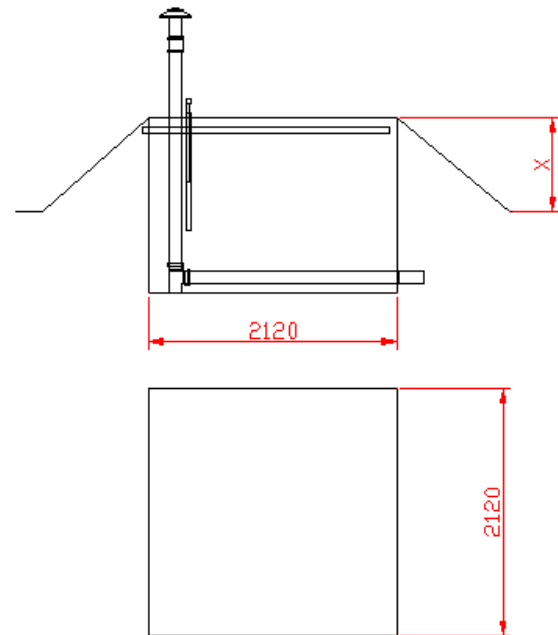
C) INSTALLATION REQUIREMENTS OF THE FILTER

The filter is delivered to install underground. The filter should not be installed in groundwater. If groundwater is present, the filter must be placed above ground (partly). There are in option packages available to install the filter 20 or 60 cm above ground.

You will then need to provide a slope around the plant. See possibilities in the following drawings. Drawing 2 is for installation underground, and drawing 3 for installation 20 or 60 cm above ground.



Drawing 2



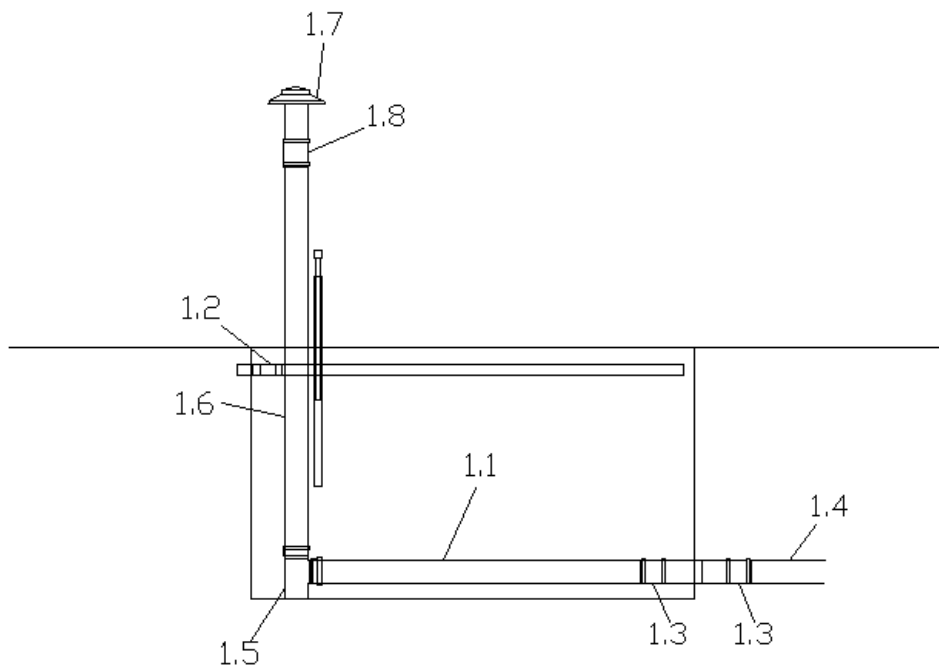
Drawing 3

INSTALLATION PROCEDURE IF THERE IS NO GROUNDWATER PRESENT, and if the outlet is on at least 1.2 meters deep. If there is groundwater, you have to reduce the depth of the pit to 1.000 mm (installation 20 cm above ground) or 600 mm (installation 60 cm above ground).

1) Pre-assembly and connecting the exit (drawing 4):

Take the following parts:

- Perforated tube of 110 mm and 1.660 mm long (1.1)
 - 2 Sleeves of 110 mm (1.3)
 - T-piece of 110 mm on 90° (1.5)
 - Filter tube
- Take the perforated PVC pipe of 110 mm and 1.660 mm long (1.1) and put a sleeve of 110 mm (1.3) on one side.
 - Stitch that via the inside of the bag on the tube of 110 mm (1.2). Make sure the tube 110 mm (1.1) is with the perforation to the bottom.
 - Slide the filter tube over the perforated pipe, at the inside of the bag.
 - Mount a sleeve of 110 mm (1.3) on the tube on the outside of the bag, with the following tube on the necessary length (1.4) (Depending on the destination on location, is not included)
 - Mount on the other side, in the bag, a T-piece of 110 mm (1.5). Do this with the right-angle side on the tube, and the remaining sleeve to the top.

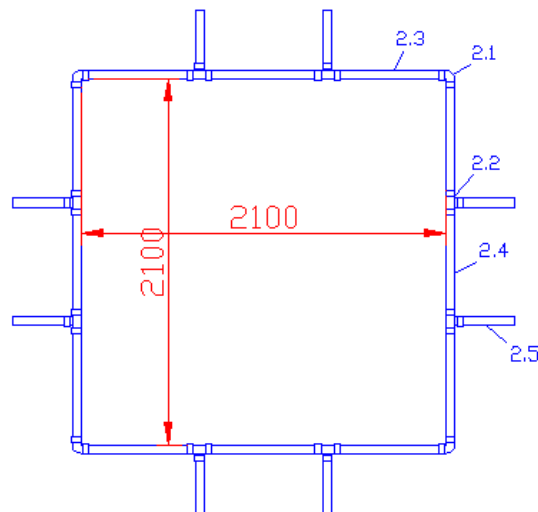


Drawing 4

2) Pre-assembly of the frame for easy installation (Drawing 5) this is not necessary if the installation will be installed 20 or 60 cm above ground:

Take the following parts:

- 4 curves of 50 mm and 90° (2.1)
 - 8 T-pieces of 50 mm and 90° (2.2)
 - 12 tubes of 50 mm and 665 mm long (2.3)
 - 8 tubes of 50 mm and 300 mm long (2.5)
 - PVC glue
- Take a tube of 50 mm and 665 mm long (2.3) and glue a T-piece (2.2) on both sides.
 - Glue on both sides of the T-piece (2.2) a tube of 50 mm and 665 mm long (2.3) in the length.
 - Glue on both sides of the tubes a curve of 50 mm and 90° (2.1), with the free opening in the opposite direction of the T-pieces.
 - Glue in both curves (2.1) a tube of 50 mm and 665 mm long (2.4)
 - Glue 2 T-pieces (2.2) on these tubes with the free openings outside the frame.
 - Glue 2 tubes of 50 mm and 665 mm long (2.4) on the T-pieces (2.2)
 - Glue 2 T-pieces (2.2) on the tubes (2.4)
 - Glue 2 tubes of 50 mm and 665 mm long (2.4) in the T-pieces (2.2)
 - Glue 2 curves of 50 mm and 90° (2.1) on the tubes (2.4) with the free openings to each other.
 - Glue 2 tubes of 50 mm and 665 mm long (2.3)
 - Glue the last 2 T-pieces of 50 mm and 90° (2.2)
 - Glue the last tube of 50 mm and 665 mm long (2.3)
 - Glue the 8 tubes of 50 mm and 300 mm long (2.5) in the 8 T-pieces (2.2)



Drawing 5



3) Digging the pit and placing the foil:

3.1) In case the installation is underground:

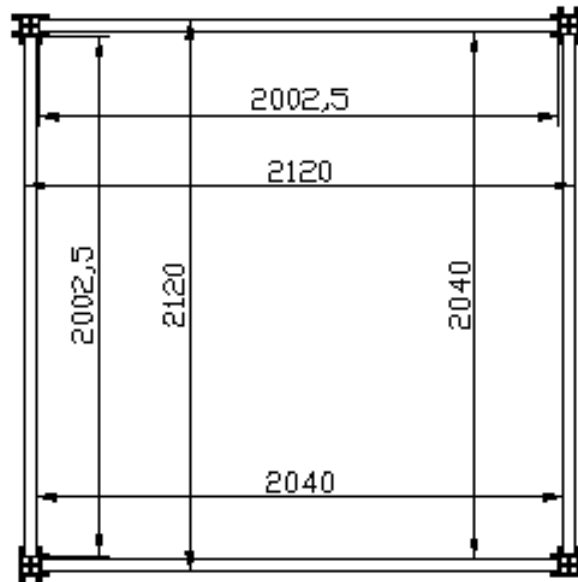
- Install the frame for easy installation on the site where the filter must be installed.
- Dig a pit with of 2.040 x 2.040 mm (proximally 30 mm smaller than the frame) with vertical walls and 1.200 mm deep.
- Make sure the bottom is flat, and free of sharp objects. If this is not the case, install a protective cloth (not included).
- Dig on the side of the outlet (in the middle of the filter) on a depth of 1,2 meter a trench to where the water will be discharged.
- Place the pre-welded foil in the pit. Do this with the connection of 110 mm to the side of the drain. (In the trench of 1.200 mm deep).
- Make sure the foil is well flat, with as little as possible folding.
- Place the edge of the foil over the frame and fold the corners over it. See to it that the small reinforcements are on the T-pieces.
- Cut the foil from the reinforcements to the edge, and fold the foil over and under the frame.
- Place the drain well (flat or with a slope of 1-2%) and place the tube firmly with consolidated sand.
This is necessary to avoid forces on the bag, and so to prevent leaks.

3.2) In case the installation will be installed 20 cm above ground:

- Dig a pit with of 2.120 x 2.120 mm with vertical walls and 1.000 mm deep.
- Make sure the bottom is flat, and free of sharp objects. If this is not the case, install a protective cloth (not included).
- Dig on the side of the outlet (in the middle of the filter) on a depth of 1,0 meter a trench to where the water will be discharged.
- Install in the 4 corners the plastic poles. Do this steers like in drawing 6 (You have to dig 50 mm more in the corners to do this).
- Slide 4 plastic shelves in these poles, push them to the bottom of the pit and fix them with screws.
- Slide 4 plastic shelves in these poles, place them equal with the top of the poles and fix them with screws.
- Place the pre-welded foil in the pit. Do this with the connection of 110 mm to the side of the drain. (In the trench of 1.200 mm deep).
- Make sure the foil is well flat, with as little as possible folding.
- Place the edge of the foil over the frame and fold the corners over it.
- Place the drain well (flat or with a slope of 1-2%) and place the tube firmly with consolidated sand. This is necessary to avoid forces on the bag, and so to prevent leaks.
- saw 4 impregnated boards an install them on the border of the filter.
- Work the sides with the impregnated wood shelves.

3.3) In case the installation will be installed 60 cm above ground:

- Dig a pit with of 2.120 x 2.120 mm with vertical walls and 600 mm deep.
- Make sure the bottom is flat, and free of sharp objects. If this is not the case, install a protective cloth (not included).
- Dig on the side of the outlet (in the middle of the filter) on a depth of 600 mm a trench to where the water will be discharged.
- Install in the 4 corners the plastic poles. Do this steers like in drawing 6 (You have to dig 50 mm more in the corners to do this).
- Slide 4 plastic shelves in these poles, push them to the bottom of the pit and fix them with screws.
- Slide 4 plastic shelves in these poles, place them equal with the top of the poles and fix them with screws.
- Place the pre-welded foil in the pit. Do this with the connection of 110 mm to the side of the drain. (In the trench of 600 mm deep).
- Make sure the foil is well flat, with as little as possible folding.
- Place the edge of the foil over the frame and fold the corners over it.
- Place the drain well (flat or with a slope of 1-2%) and place the tube firmly with consolidated sand. This is necessary to avoid forces on the bag, and so to prevent leaks.
- saw 4 impregnated boards an install them on the border of the filter.
- Work the sides with the impregnated wood shelves.

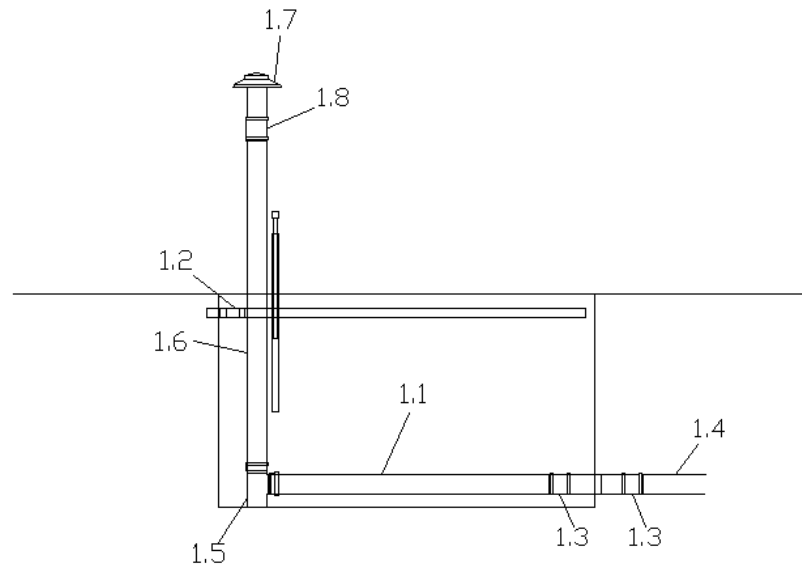


Drawing 6

4) Installation of the ventilation (drawing 7):

Take the following parts:

- Slide-coupler of 110 mm and 90° (1.8)
 - PVC tube of 110 mm and 1.500 mm long, including preinstalled alarm (1.6)
 - Ventilation cap of 110 mm (1.7)
- Mount in the free opening of the T-piece (1.5) the PVC tube with alarm on of 110 mm (1.6) and 1.500 mm long, with the arrow side-up.
 - Mount on the end the ventilation cap (1.7).
 - The EPDM foil is delivered with a protection sleeve. Cut a piece out of it and install it under the T-piece to protect the foil.



Drawing 7

5) Pre-installation and installation of the distribution unit:

In a separate bag there are a number of pipes and fittings of 50 mm. These are for the distribution unit that comes at the top of the filter is.

These parts are in the bag:

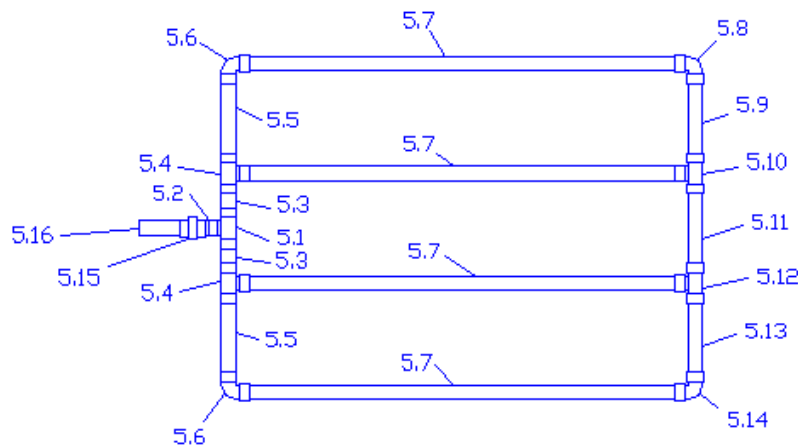
- 4 elbows of diameter 50 and 90°
- 5 T-peaces of diameter 50 and 90°
- 2 slide-couplers of 50 mm
- 4 perforated tubes of diameter 50 and 1.470 mm long
- 5 perforated tubes of diameter 50 and 400 mm long
- 2 perforated tubes of diameter 50 and 160 mm long
- 1 NOT perforated tube of diameter 50 and 100 mm long

Please note: the glue must be application on the tubes, and NOT in the fittings. That can cause clogging or bad glue joints.

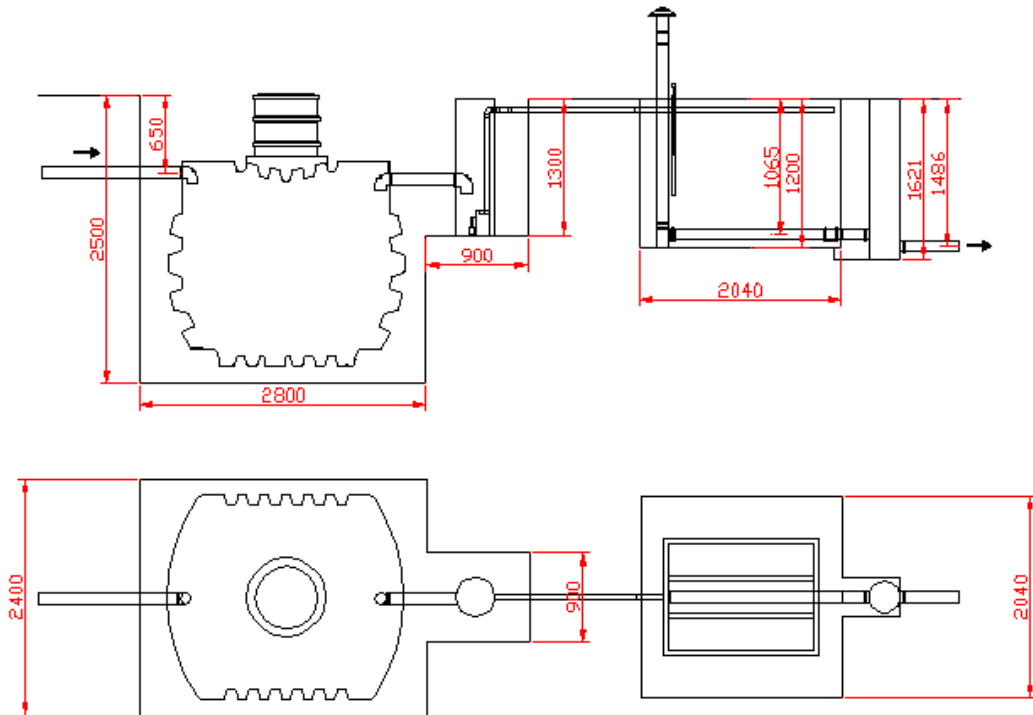
Please note: in the following assembly the perforations should be in the same direction. So either straight down, or straight up.

Please note: Follow carefully the drawing 8.

- Take a T-piece (5.1) and glue on the 90° side a NOT perforated tube from 50 mm and 150 mm long (5.2) and the slide-coupler of 50 mm.
- Glue in the 2 other sides of the T-piece (5.1) the 2 perforated tubes from 50 mm and 160 mm long (5.3).
- Glue on these tubes a T-piece (5.4) with the 90° side away from the T-piece in the middle.
- Glue in the length of the T-pieces a perforated tube from 50 mm and 400 mm long (5.5).
- Glue on these tubes a curve from 50 mm and 90° in the direction of the T-pieces (5.6).
- Take the 4 perforated tubes from 50 mm and 1.470 mm (5.7) long and glue them on the 2 curves an 2 T-pieces.
- Take a curve from 50 mm and (5.8) and glue a tube from 50 mm and 400 mm long (5.9).
- Glue on the tube a T-piece in the length side (5.10) in the same direction of the curve.
- Glue a perforated tube from 50 mm and 400 mm long (5.11) in the T-piece.
- Glue the last T-piece (5.12) on this tube with the 90° side in the same direction of the other T-piece.
- Glue the last perforated tube from 50 mm and 400 mm long (5.13) on the T-piece.
- Glue the last curve (5.14).
- Glue this last part in the First part (drawing 8).



Drawing 8



Drawing 9

6) First filling of the filter:

Sign in the sack lines on height 0.54 meters and on height 0.78 m.

Fill the bag as follows:

- Do 1 bag of 1 m³ with material AR 4/0-650 in the filter, and make sure that it is evenly divided in the filter.
- Fill with the second bag of 1 m³ material AR 4/0-650 to the first mark by 0.54 meter.
- Do 1 bag of 1 m³ with material AG 4/8-320 on top, and make sure that it is evenly divided in the filter, up to the second mark of 0.78 meters.
- Do 1 bag of 1 m³ with material AR 4/10-550 on top, and make sure that it is evenly divided in the filter. (the intention is to mount now the distribution unit, before ending up with the last bag material AR 4/10-550)

There is now 1 more bag of material AR 4/10-550 left. **DON'T DO THESE IN THE FILTER YET.**



7) **Connecting the inlet:**

- Make the connection between the output of the pumping station and the entrance of the filter with the tube of 50 mm (included. Tube is 2 meters long) and a slide-coupling of 50 mm.
- Store this tube firmly with consolidated sand.
- This is necessary to avoid forces on the bag, and so to prevent leaks.
- Position the distribution unit over the ventilation and connect to the inlet with the slide-coupler of 50 mm.
- Do the last bag of material AR 4/10-550 in the filter, end flatten the surface.
- Take of the plastic bag on the alarm.

PART 2 : User manual:



Installed electric power:

- 230 MONO.

Average theoretical cleaning frequency:

Empty the pre-treatment every 2 to 3 years.

Check every year the pumping station.

Use of additives:

It is not necessary to use additives or bacteria in the installation.

The use of harmful products will damage the installation.

Results achieved:

	Average	Minimum	Maximum	% Average
BOD	3	2	6	99,0
COD	27	18	39	96,2
SS	7	<5	22	98,3

Technical information:



	BORA-CLEAN 5
Number of persons	0 – 5 IE.
Volume pre-treatment	6.000 litre
Volume pumping station	130 litre
Volume Filter	4.600 litre
Volume Total	10.730 litre
Weight without medium	353 kg
Weight medium	2 720 kg
Length pre-treatment	2.400mm
Width pre-treatment	2.070 mm
Height pre-treatment	2.500 mm
Diameter pumping station	400 mm
Height pumping station	1 300 mm
Length filter	2.040 mm
Width filter	2.040 mm
Height filter	1.200 mm
Height inlet pre-treatment	- 650 mm
Height outlet filter	- 700 mm
Height inlet pumping station	- 700 mm
Height outlet pumping station	- 150 mm
Height inlet filter	- 150mm
Height outlet filter	- 1.065 mm
Diameter inlet pre-treatment	125 mm
Diameter outlet filter	125 mm
Diameter inlet pumping station	125 mm
Diameter outlet pumping station	50 mm
Diameter inlet filter	50 mm
Diameter outlet filter	110 mm
Sample pit :	
Height	1.620 mm
Diameter	315 mm
Volume	9,4 L
Height inlet	200 mm
Height outlet	120 mm
Weight	10 Kg
Pump :	
Model	PEDROLLO TOP 1
Weight	6 Kg
Consumption	150 W – 2,2 Kwh/y/P



Working principle :

A. Pre-treatment :

Tank A is the pre-treatment with a volume of 6.000 litre.

The wastewater from the house arrives in this pre-treatment. It is an anaerobic environment, making it liquefied. The inlet is equipped with a curve to bring the water to the bottom of the tank.

The curve at the outlet is installed so only liquefied water can flow out.

B. Pumping station :

Tank B is the pumping station with a volume of 130 L.

A pump is installed in this tank. From the moment that there is a certain amount of liquid in the tank, the pump will bring it to the dispenser unit of the filter.

C. BORA-CLEAN filter:

The wastewater, coming from the pumping station, arrives in the dispenser unit on top of the filter. It is perforated at the bottom side.

The amount of wastewater is from that volume that it is more than the volume of the dispenser unit. Therefore the wastewater is divided equally over the system.

This wastewater is passing different layers of medium, en treated at that moment.

At the bottom of the filter is outlet. Perforated at the bottom. The treated water is flowing out of the system by this outlet.

D. Sample pit:

The sample put is last in the line, wit a volume of 9,4 l.

General tips for use:



- Procedure for starting up:

The pre-treatment tank must be filled with water before start-up of the installation. You can use rainwater, drinking water or pond water. The pumping station must be connected from starting-up. This for 24/7, also on holydays.

The bacteria's will grow after a few weeks.

There is now need to add bacteria's.

- Cause by prolonged power outage:

In case of prolonged power outage less than 75 hours, there will be now problem.

- Holiday period:

The pump must be connected at all times. Also on holydays.

- Monitoring and maintenance:

It is recommended to view the proper functioning of the pump on a regular basis. They have a warranty of 2 years. We recommend to make sure that there is nothing in the tank that can cause problems for the pump. The pump can be replaced easily in case of broken pump.

We recommend also to verify the functioning of the alarm.

Verify the pump in case of problems with the odour, ore the level in the pre-treatment is to high. Call our technical service if so.

The effluent must be without odour.

All covers must be reachable for monitoring and maintenance.

- Emptying

Empty the pre-treatment every 2 to 3 years. The time depends on the occupation of the installation.

Refill the tank with water after emptying.

Warranties:



All our tanks have a warranty of 10 years on the condition that the installation procedure is followed strictly, and on proven manufacturing errors.

The pump has a warranty of 2 years.

Maintenance contract:

Boralit offers a yearly maintenance contract. If interested, provide us with the signed document. You can download this document from our site.

Our technical service will make contact for an appointment.