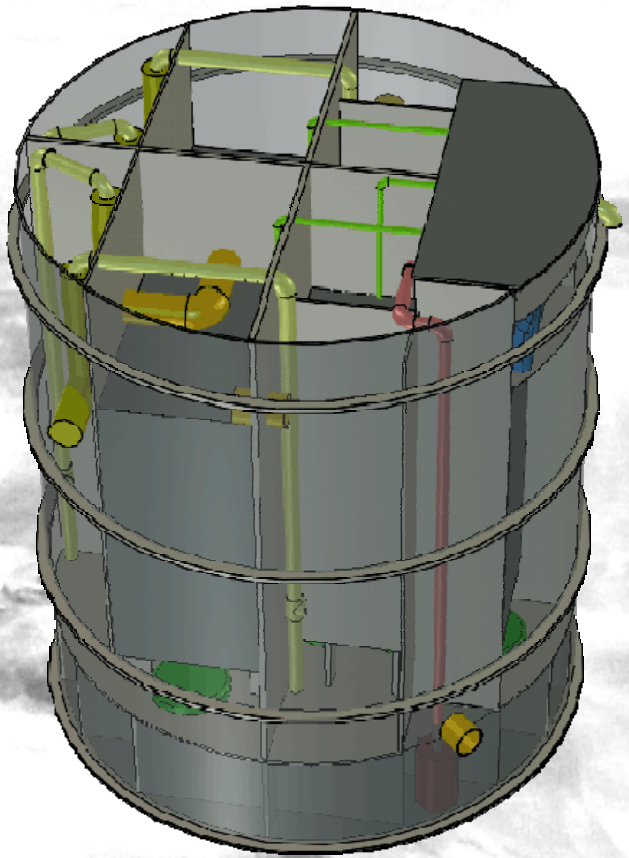
BIOKUBE

Mars 3000

Installation Manual

BIOKUBE INSTALLATION MANUAL
MARS 3000 - June 2010



The Manual

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Introduction:

BioKube Mars 3000 LOW is designed to treat ordinary household sewage from up to 10 households. You may not lead any other water than grey and black domestic sewage to the treatment plant.

Maximum Load:

Biokube Mars 3000 15-55 PE is designed to treat ordinary household sewage up to 15 - 55 persons. The Mars 3000 can handle maximum 8000 litre/day. The plant allows for fluctuations in both concentration and volume of the incoming water e.g. by visiting guests. However if the average daily load exceeds the performance, a larger plant must be installed.

Energy level:

The energy level for Biokube Mars 3000 in different configurations are:

Mars 3000: 2K, 2700 kwh/year.
Mars 3000: 3K, 3900 kwh/year
Mars 3000: 4K, 5256 kwh/year

Chemical consumption:

Where required automatic dosage of Poly Aluminium chloride (PAC) ensures chemical precipitation of phosphorous. The yearly consumption of PAC is approximately 200-280 ltr. The chemical tank is external and is placed next to the plant.

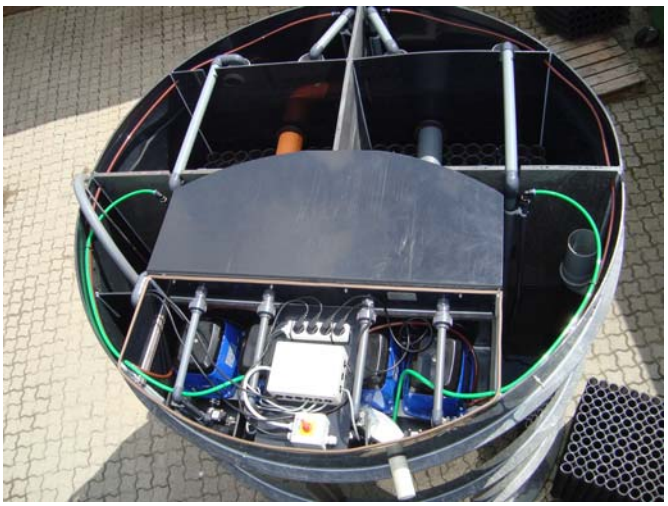


Illustration:. Top view Mars 3000

Recommended Settling Tank for Mars 3000

	BOD<10 NH4<5 (mg/litre)	BOD<20 NH4<20 (mg/litre)	BOD<25	BOD<30
Mars 3000 2K	2000 litre 20 PE ST: 9m3 Pw: 1m3	3750 litre 25 PE ST: 12m3 Pw: 1m3	4500 30PE ST: 15m3 Pw: 1m3	5250 35PE ST. 20m3 Pw: 1m3
Mars 3000 3K	4500 litre 30 PE ST:15m3 Pw: 1 m3	5250 35 PE ST: 20m3 Pw: 1m3	6000 40 PE ST: 20m3 Pw: 1 m3	6750 litre 45 PE ST: 23m3 Pw: 1 m3
Mars 3000 K	6000 40 PE ST: 20 m3 Pw: 1,5 m3	6750 45PE ST: 23 m3 Pw: 1,5 m3	7500 50PE ST: 25 m3 Pw: 1,5 m3	8000 litre 55 PE ST: 25 m3 Pw: 1,5 m3

INSTRUCTION 1 RECEIVAL OF GOODS

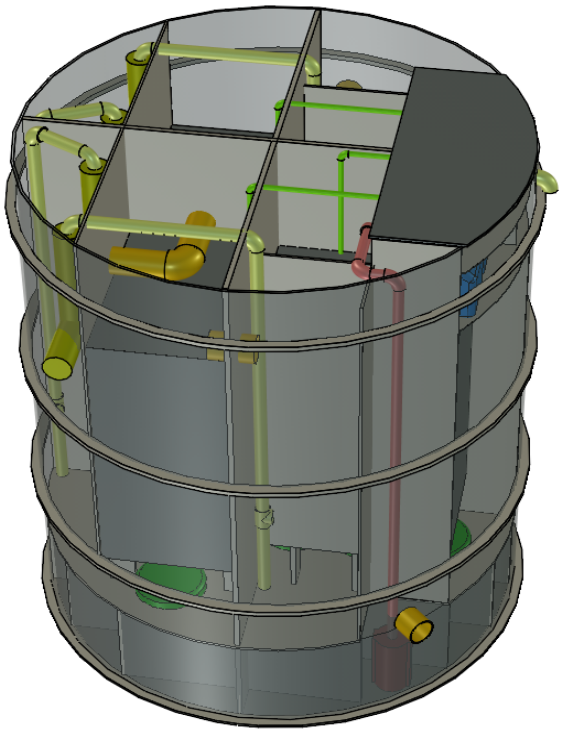
Always control that the components and parts received are in accordance with your order and delivery note. Also control that the goods are without visible damages or faults.

Treatment plant: Biokube Mars 3000.
The Mars system is prepared for phosphorus removal. The Phosphorus kit is a separat product, that is only included if the plant is delivered as a Phosphorus removal system. The well for the chemical liquid is installed close to the technical box of the system. The volume of the chemical well/tank is 300 litre. The well/tank is ø 600 x 1000 mm depth.

Settling Tank:
Control that the tank has a volume according to the scheme at page no 3 (generel conditions).

Gravel:
The gravel used for foundation and backfill should have a grain size less than 16 mm. The content of grains between 8 and 16 mm must be less than 10 %.

Pipes:
All pipes must be intact and undamaged, and should not be discolored.



INSTRUCTION 2 PLACEMENT OF TREATMENT PLANT

Prior to defining the final place for the treatment plant, the following issues should be observed.

Entrance of water
Floating of the plant with surface water must be avoided. When placing the plant in the terrain, this must be observed in order to ensure that surface water can't enter the electrical system. The plant is dug in the ground, so as to ensure that 200 mm of the plant is above terrain.

Placement of Settling Tank
The distance from paved road to Settling Tank should not exceed 50 mtrs, so as to enable access with sludge truck. Distance from Settling Tank to BioKube should not exceed 20 m. Alternatively we recommend to install an inspection well on the connecting pipe line.

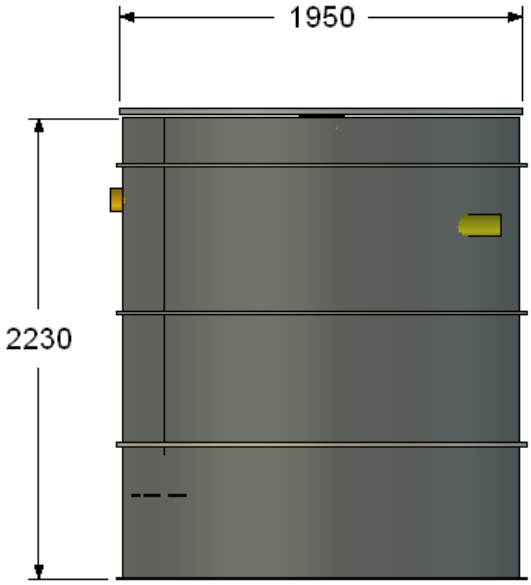
Traffic load
BioKube Mars 3000 may not be subject to loads from heavy traffic closer than 2 mtrs from the plant. If this distance cannot be maintained, the contractor must install a wall in the ground to decrease the soil pressure on the plant.

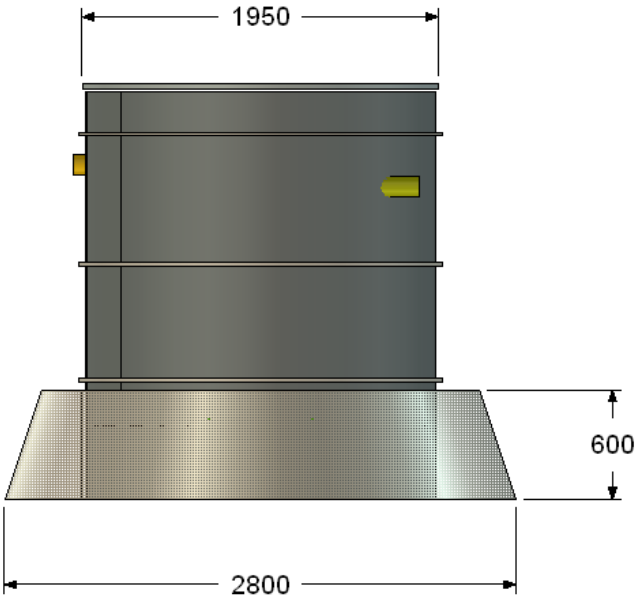
Smell
A well functioning BioKube plant does not smell. During service and maintenance unpleasant smell may occur. For this reason the plant should be placed, so that work on the plant does not bother the daily traffic on the property.

Noise
A BioKube Mars is audible due to low noise from the continuous operation of the air compressors and the sound of water when the pump is activated. For this reason it is recommended to avoid placement of the plant close to open windows, terraces, etc.

Alarm
The plant generates an alarm by different fall outs. The alarm unit is placed on a separate group in connection with the central electrical board of the household. For more info see enclosure 3.

Service and maintenance
Access to and around the plant in connection with service and maintenance must be observed when placing the plant.





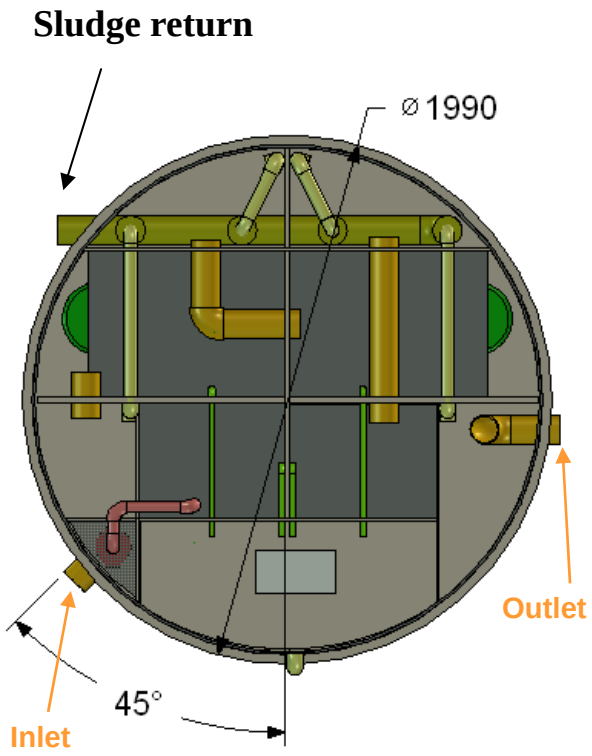
Gravitation from Settling Tank to Bio-Kube Mars 3000.

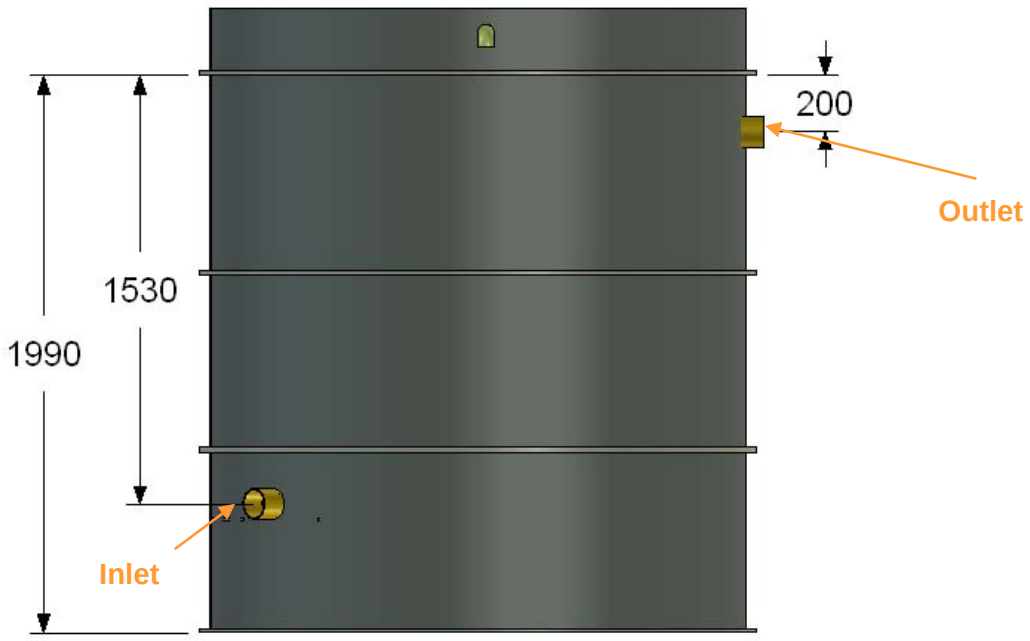
BioKube Mars 3000 is placed on load bearing horizontal ground with a maximum variation of +- 5 mm per 2 mtrs.

Excavation depth is 2 mtrs. Inlet depth is 1,5 mtrs. Outlet depth is 0,2 mtrs. The pipe line between Settling Tank and BioKube Mars 3000 gravitates with minimum 20 0/00.

Preferably the sewage gravitates from Settling Tank direct to the plant, and recirculation gravitates from plant to inlet of Settling Tank.

If gravitation is not possible a pump well is placed between Settling Tank and BioKube. The inlet pump in the external well must be connected to the control unit of the plant. Call your Biokube distributor for guidance regarding connection and choice of inlet pump.



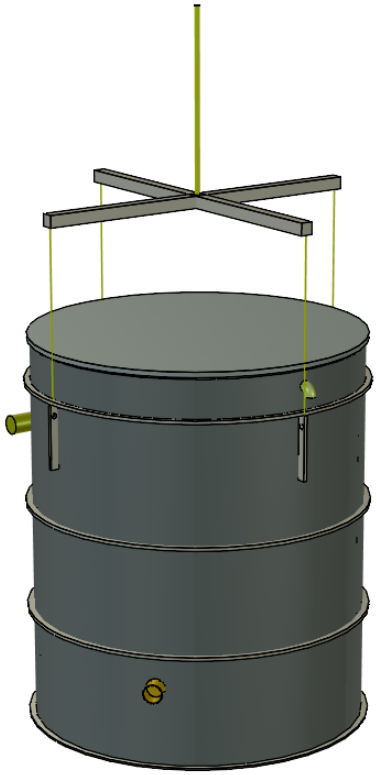


Levelling layer
The plant is placed in minimum 100 mm gravel compressed to 98% standard procter (grain size < 16 mm). By maximum excavation depth to the top of the plant is 200 mm above terrain.

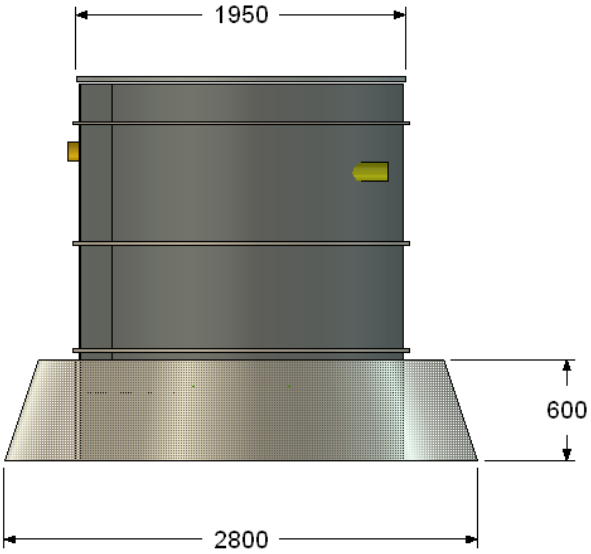
Pipe lines
All pipe lines to and from a standard BioKube Mars 3000 are 110 mm (external) diameter PVC sewage pipes.

Power Cable
Minimum requirement for the power supply cable to the plant is a 5 x 2,5 mm2 core cable. This cable supplies both power to the plant and connects the alarm unit.

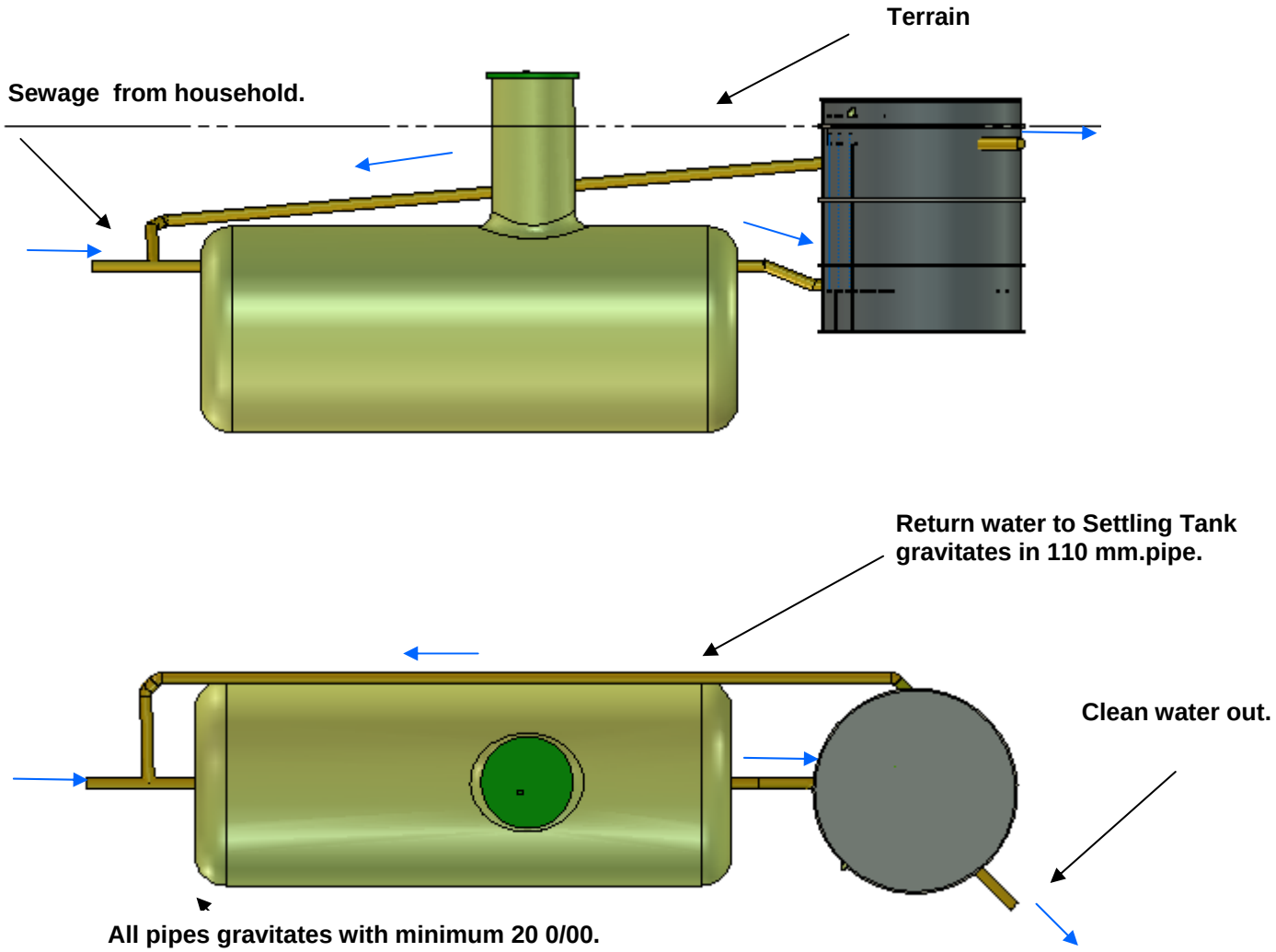
How to lift
The Biokube Mars 3000 is equiped with 4 lifting eyes. Use all 4 eyes when lifting the tank.



Buoyancy Control
If ground water level can rise above the bottom of the BioKube, the plant must be secured against buoyancy using approximately 1.000 ltrs of in situ cast concrete placed on the anchor plate of the plant.
(see figur)



INSTRUCTION 5: CONNECTION TO THE SETTLING TANK



Biokube Mars installation

BioKube Mars is installed after the Settling Tank. Pipeline for gravitation of re-circulated water connects “sludge return” from the treatment plant to the inlet of the Settling Tank.

The illustration above show Biokube Mars and Settling Tank. Biokube Mars can be located next to the Settling Tank as an alternative.

Frost security

All pipe lines less than 70 cm below terrain must be covered with insulation of polystyrene or similar.

Buoyancy Control

When the ground water level can rise above the bottom of the treatment plant and/or Settling Tank, buoyancy control must be installed according to instruction 4.

Outlet

The treated water is safely led to a recipient, e.g. drain pipe, ditch, stream, etc. In case the terrain does not allow the water to gravitate to the recipient, a pump well should be installed after the treatment plant. For reuse of the treated water, BioKube recommends disinfection of the water to avoid transfer of pathogens to the environment.

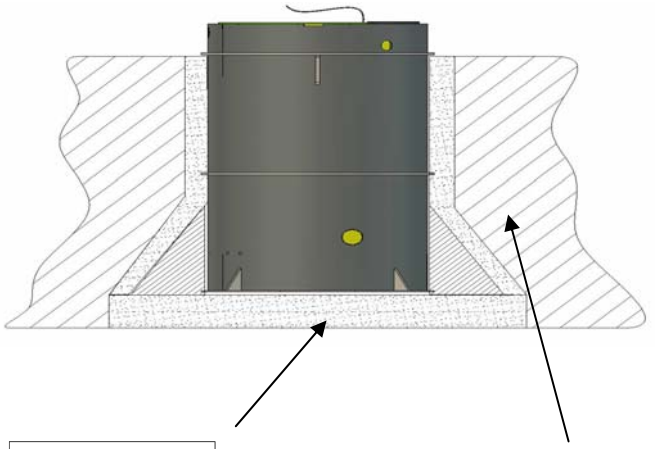
Backfill.

Prior to backfilling the excavation, the plant must be filled with water, both in the built in pump well and the treatment system itself.

Backfill around the tanks is compressed for every layer of 20 cm to standard proctor 98 %.

Fillings around pipes and tanks is done with gravel according to specifications in instruction 2. Other backfill is to be done with load bearing soil or gravel without rocks.

BioKube Mars has a strong and quite stiff tank. However we recommend compression by means of watering the backfill without use of heavy compression material.



Min.100 mm levelling layer.

100 mm backfill around the plant.

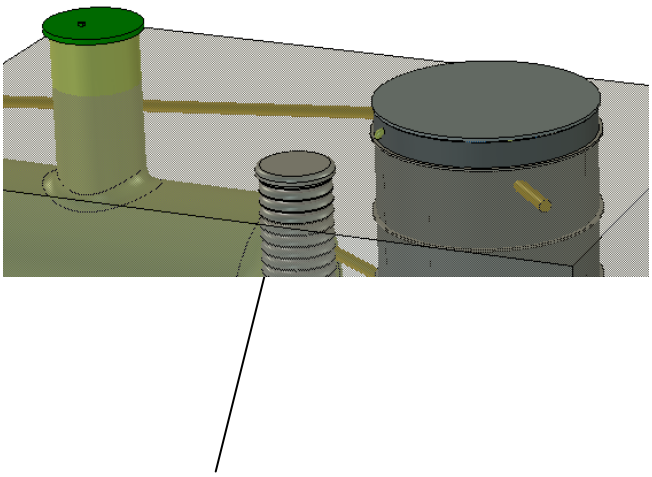
Phosphorus removal (optional).

The chemical tank for phosphorus removal liquid is installed in the ground close to the technical box in the Mars 3000.

All components for the chemical dosesing are installed in the Biokube technical box from the factory.

Only the suction hose to the cemical tank need to be connected to the doseing unit in the control box.

The chemical tank should be installed 200 mm above ground to prevent inflow of surface water into the cemical tank..



Cemical tank ø 600 x 1500 mm, standard pump well

Power Supply
Standard BioKube Mars 3000 is powered with 230 Volt, 1 phase power supply. The maximum currency is 2-5 Ampere depending on the number of pumps installed. The need for maximum currency only occurs while starting the inlet pump. For the continuous use of air-compressors the BioKube Mars only uses 300 - 600 watt.

Separate Group
We recommend to power the BioKube through a separate fuse, or a separate group whereto only light is connected. This allows for early discovery of any fall outs on the power supply to the plant.

Alarm
BioKube Mars 3000 does not generate an alarm in case of power faults. We recommend to install an automatic fuse of 10/13 Ampere and a hfi-relay on the currency group for the plant.

The alarm unit is normally placed centrally in the house.

Alarm function
The green light diode of the alarm unit is constantly illuminated during normal operation. In case of alarm, the user will hear an acoustic buzzer.

This buzzer is disconnected on the switch. Simultaneously to the buzzer, the green diode will blink a number of times depending on the cause of the alarm.

Cable.
Enter the tank with the cable as high as possible,

Illustration: The cable cover

INSTRUCTION 7 ELECTRICAL SYSTEM.

Clamp	House installation
Ground	Ground
2	L, Phase 220 volt
4	N, null
6	Alarm 1
8	Alarm 2

Illustration:
Main switch in the Mars system where to the power supply is connected.

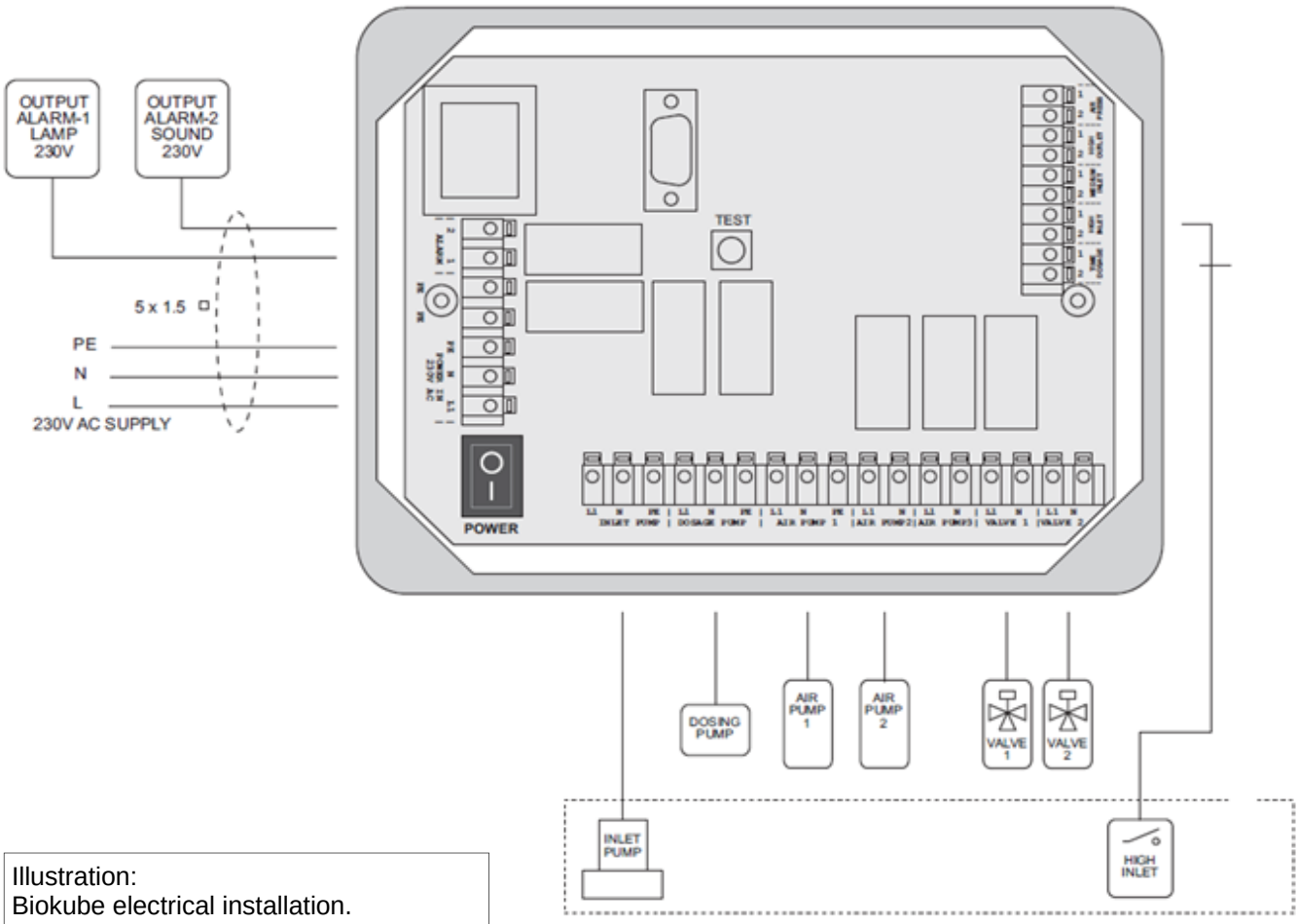
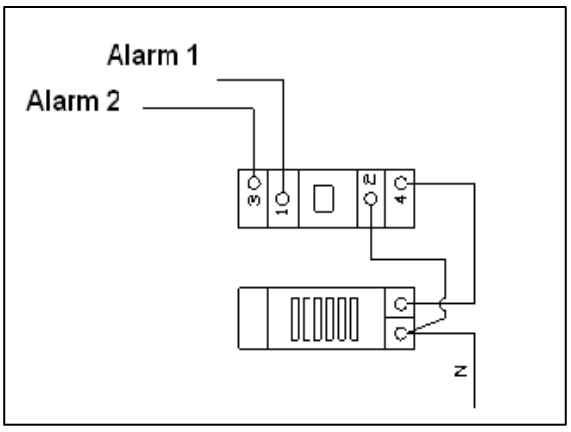


Illustration:
Biokube electrical installation.



Commissioning

Settling Tank and BioKube is filled up with water. In addition approximately 100 liters is led to the internal pump well.

1: All cleaning chambers are aerated (bubbles from diffusers below BioBlock filters)
2: For every quarter of an hour water is pumped to first cleaning chamber for about 10 seconds.
3: No alarm is generated.

Note: Operation of plant after commissioning:
Within 4-8 weeks after commissioning, the bacteria culture will build up on the submerged filters. Upon this period, the plant will treat the sewage according to specs. The actual length of the period depends on temperature and concentration of sewage. As an effect of this, you may observe foam emitting from the treatment plant the first few weeks. This is normal and not hazardous.

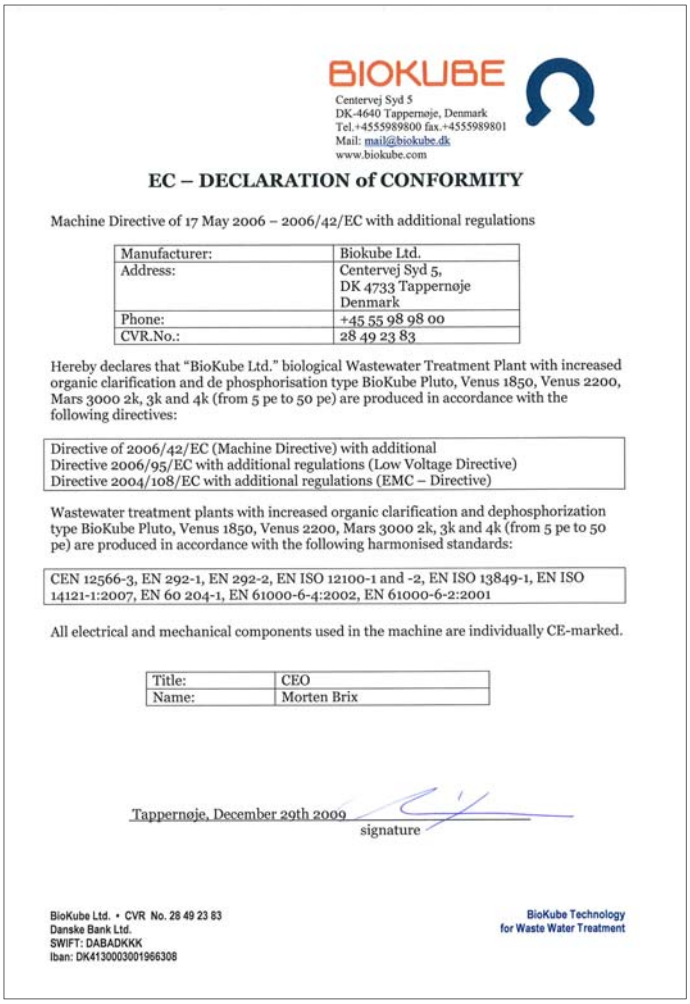
Test button

On the control unit print board, please find a test button. While constantly pushing the button, please observe the following:

1: Aeration is almost stopped. A few bubbles will still be visible caused by recirculation.
2: Inlet pump starts and pumps continuously.
3: PAC dosage pump is running (when phosphorous treatment is installed).

As the test button is released, the plant returns to its normal functions.

EC-DECLARATION of CONFORMITY



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EC – DECLARATION of CONFORMITY

Machine Directive of 17 May 2006 – 2006/42/EC with additional regulations

Manufacturer:	Biokube Ltd.
Address:	Centervej Syd 5, DK 4733 Tappernøje Denmark
Phone:	+45 55 98 98 00
CVR.No.:	28 49 23 83

Hereby declares that "BioKube Ltd." biological Wastewater Treatment Plant with increased organic clarification and de phosphorisation type BioKube Pluto, Venus 1850, Venus 2200, Mars 3000 2k, 3k and 4k (from 5 pe to 50 pe) are produced in accordance with the following directives:

Directive of 2006/42/EC (Machine Directive) with additional
Directive 2006/95/EC with additional regulations (Low Voltage Directive)
Directive 2004/108/EC with additional regulations (EMC – Directive)

Wastewater treatment plants with increased organic clarification and dephosphorization type BioKube Pluto, Venus 1850, Venus 2200, Mars 3000 2k, 3k and 4k (from 5 pe to 50 pe) are produced in accordance with the following harmonised standards:

CEN 12566-3, EN 292-1, EN 292-2, EN ISO 12100-1 and -2, EN ISO 13849-1, EN ISO 14121-1:2007, EN 60 204-1, EN 61000-6-4:2002, EN 61000-6-2:2001

All electrical and mechanical components used in the machine are individually CE-marked.

Title:	CEO
Name:	Morten Brix

Tappernøje, December 29th 2009
signature

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BioKube Technology
for Waste Water Treatment