BIOKUBE

VENUS 1850

INSTALLATION MANUAL

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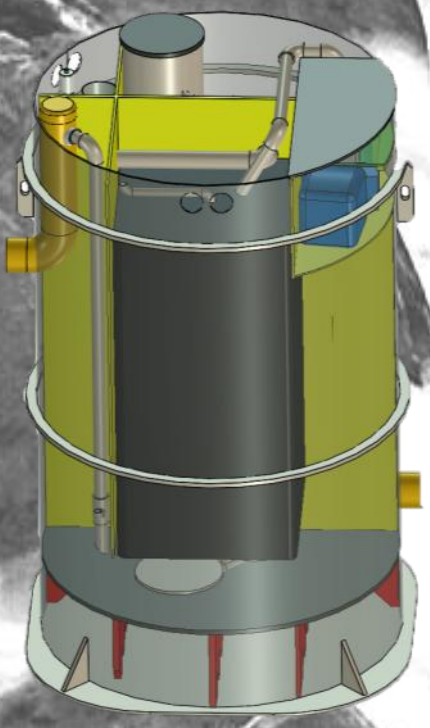
VENUS 1850—May 2010



The Manual

BIOKUBE

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General Conditions (related to installation of BioKube Venus 1850)

Introduction
BioKube Venus 1850 is designed to treat ordinary household sewage water from up to 10 PE. You may not lead any other water than household sewage water to the treatment plant.

Maximum Load
The plant can treat the water for organic content and ammonia biologically and phosphorous by chemical precipitation according to the following scheme.

Max Load	BOD5	COD	NH4	P	Capacity
5 PE	10 mg/l	75 mg/l	5 mg/l	1,5 mg/l	750 l/day
10 PE	25 mg/l	125 mg/l		1,5 mg/l	2.000 l/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 for longer periods af time or permanently exceeds that of 5 PE or 10 PE respectively a larger plant must be installed.

Energy level
BioKube Venus 1850 in 5 PE configurations consumes 450 kWh per year. The 10 PE configurations consume 900 kWh per year.

Chemical consumption
Where required automatic dosage of Poly aluminum chloride (PAC) ensures chemical precipitation of phosphorous. The yearly consumption of PAC is approximately 25 to 50 liters, and the built in chemical tank needs refill approximately once a year.

Instruction 1: Receivable of goods

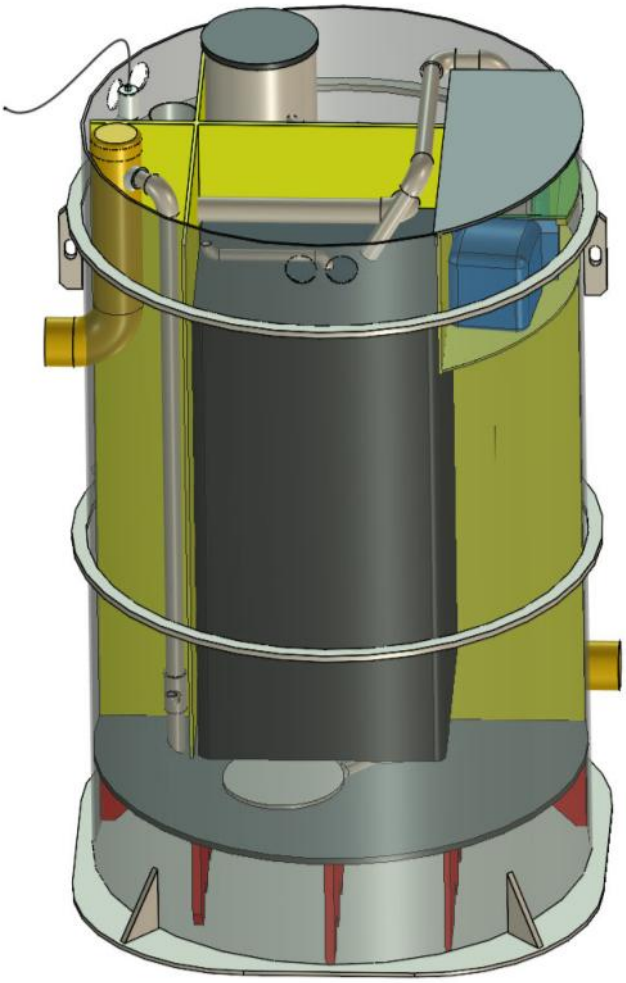
Always control that the components and parts received are in accordance with your order and delivery note. Also control that the goods are without visible damages or faults.

Treatment plant:
Please check the serial number of the treatment plant for any future enquiries to BioKube.

Settling Tank:
Control that the tank has a volume according to local standard and expected sludge holding capacity.

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

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 %



INSTRUCTION 2 -PLACEMENT OF THE TREATMENT PLANTS

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 cannot enter via the ventilation holes and thereby possibly also the electrical system. The plant is dug in the ground so as to ensure that 200 mm of the plant is above terrain.
If there is a chance of the system being flooded, you might consider placing the system higher and use the soil from the excavation to fill around the system. This will give a higher location in regard to the risk of incoming water but it will not be visible as such in the garden.

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

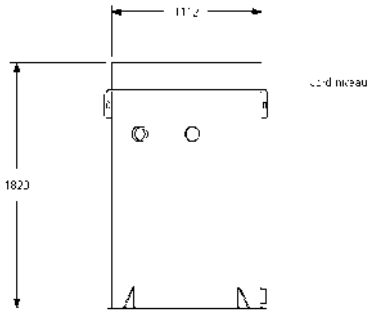
Traffic load
BioKube Venus 1850 may not be subject to loads from heavy traffic closer than 2 mtrs

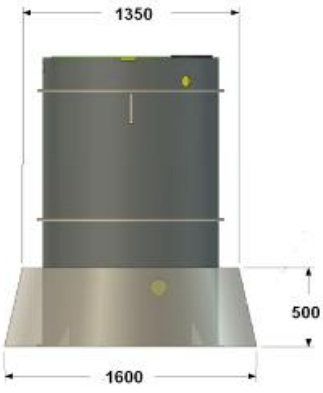
Smell
A well functioning BioKube plant does not smell. During service and maintenance some smell may occur. For this reason the plant should be placed so that work on the plant does not bother the daily traffic on the property.

Noise
A BioKube Venus 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.





Instruction 3: Excavation

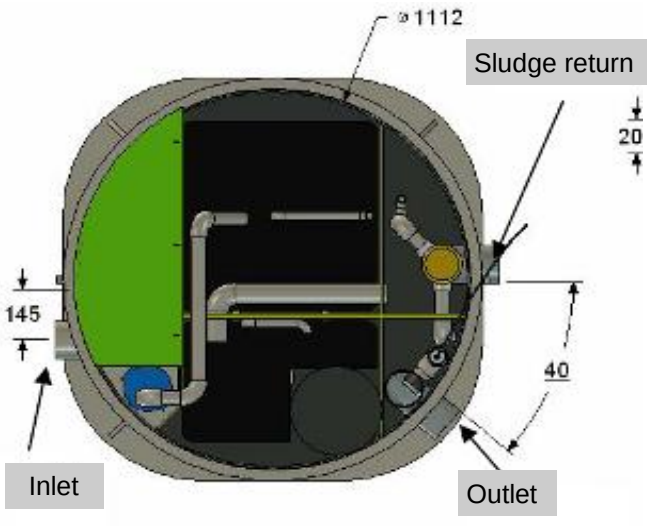
Gravitation from pre-sedimentation tank to BioKube Venus

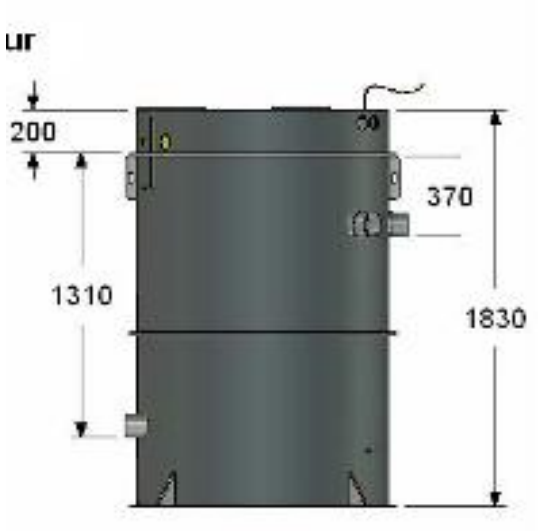
BioKube Venus is placed on load bearing horizontal ground with a maximum variation of +- 5 mm per 2 mtrs.

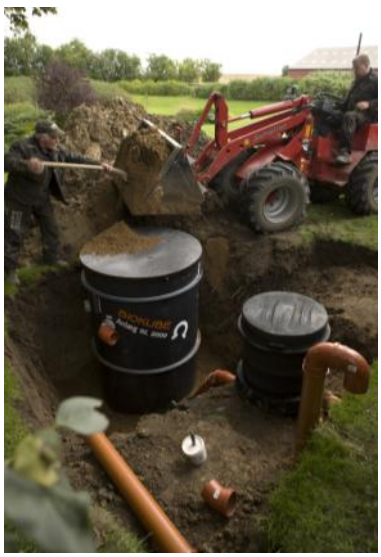
Excavation depth is 1,65 mtrs. Inlet depth is 1,3 mtrs. Outlet depth is,4 mtrs. The pipe line between pre-sedimentation tank and BioKube Venus gravitates with minimum 20 0/00.

Preferably the sewage gravitates from pre-sedimentation tank direct to the plant, and re-circulation gravitates from plant to inlet of pre-sedimentation tank.

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







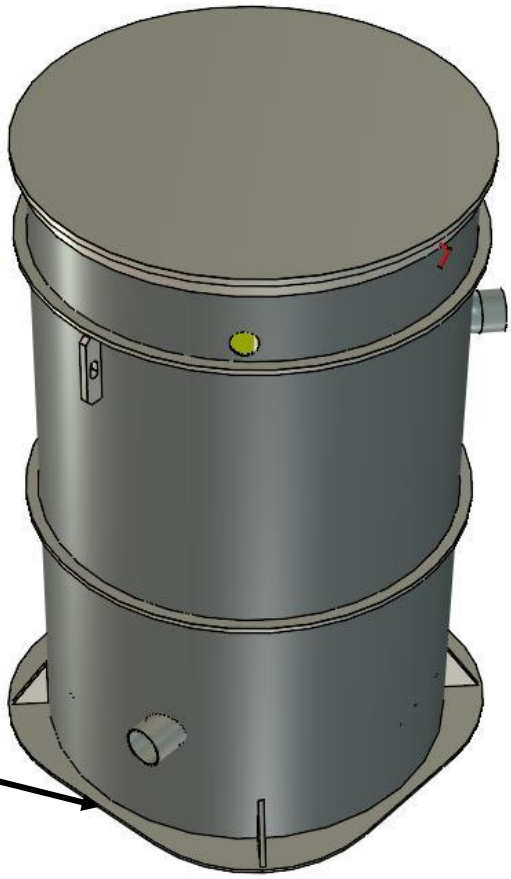
Instruction 4: Installation of Venus

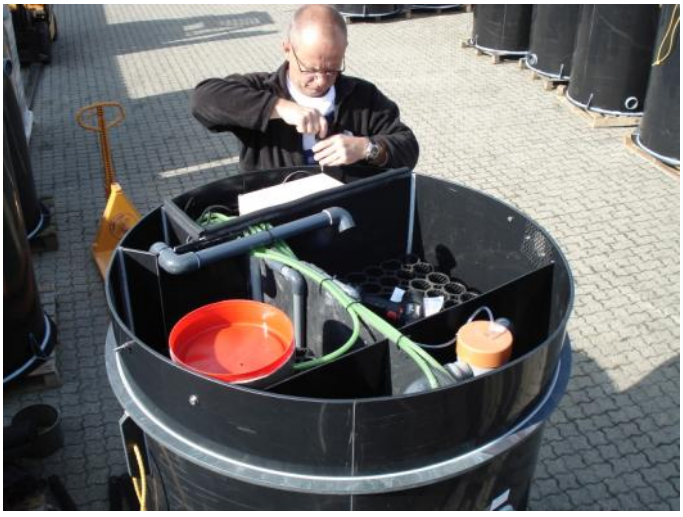
Leveling layer
The plant is placed in minimum 100 mm gravel compressed to 98% standard procter (grain size < 16 mm). By maximum excavation depth the top of the plant is 200 mm above terrain.

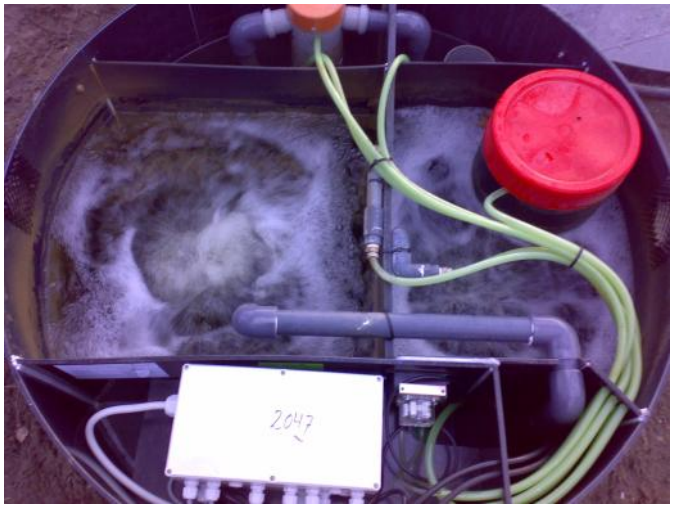
Pipe lines
All pipe lines to and from BioKube Venus 1850 is a 110 mm (external) diameter PVC sewage pipe.

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.

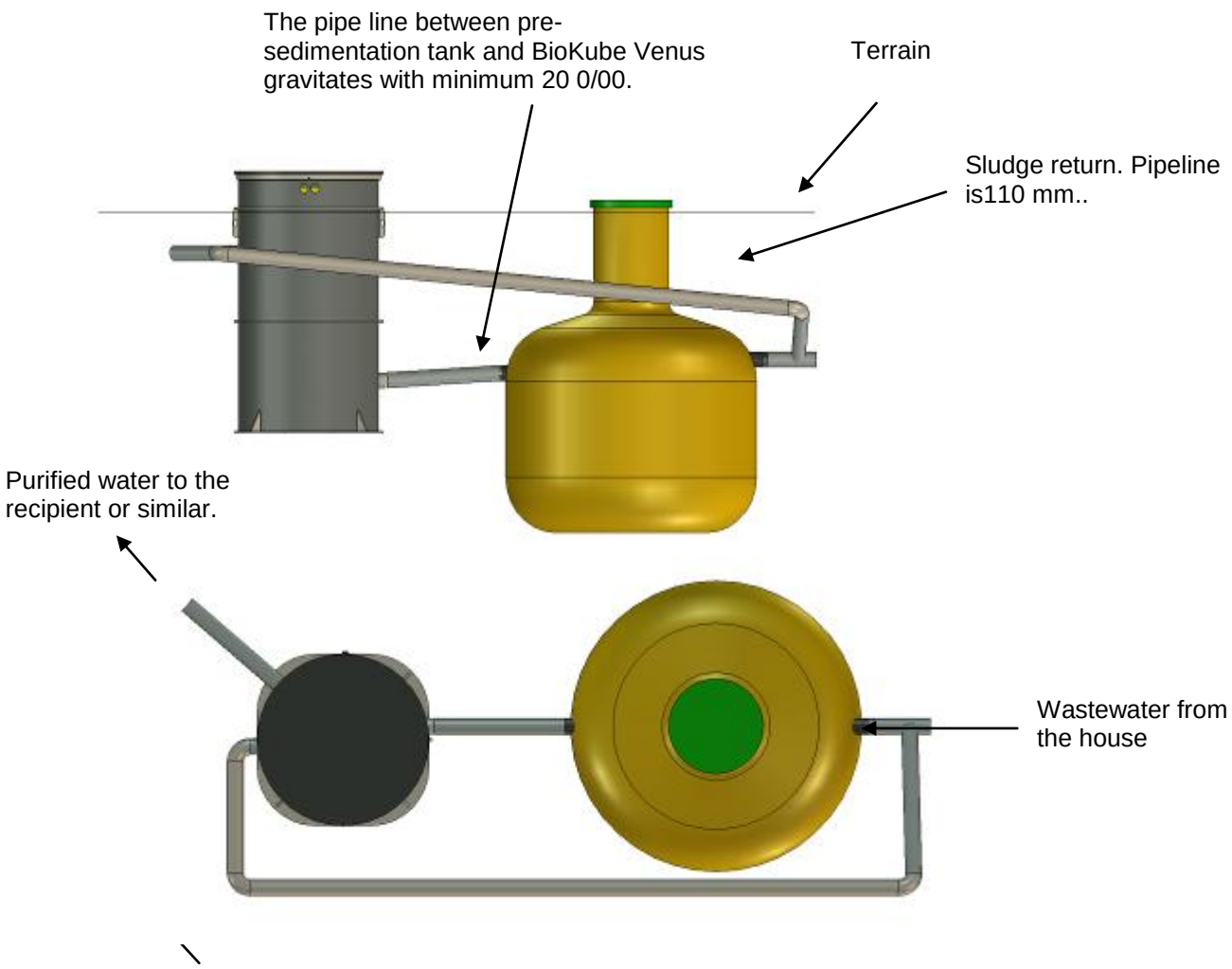
Buoyancy Control
The Biokube is secured against buoyancy .







INSTRUCTION 5 CONNECTION TO PRE-SEDIMENTATION



Connection between pre-sedimentation tank and treatment plant
BioKube Venus is installed following a pre-sedimentation tank. Pipeline for gravitation of re-circulated water connects “sludge return” from the treatment plant to the inlet of the pre-sedimentation tank.

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 pre-sedimentation 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.

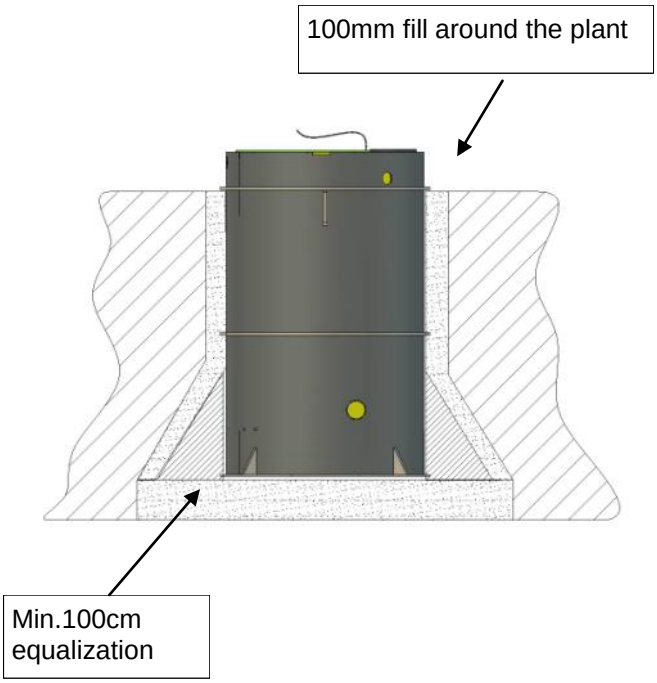
Instruction 6 Backfill

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



Instruction 7: Electrical System

Power Supply

Standard BioKube Venus 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 Venus only uses 50 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 Venus does not generate an alarm in case of power faults. We recommend to install an automatic fuse of 10/13 Ampere and an hfi-relay on the currency group for the plant.
The alarm unit is normally placed centrally in the house.
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. (See user's manual for full description of the alarm signals)

Clamp number	House installation
Soil	Soil
2	L, Fase 220 volt
4	N, null
6	Alarm 1
8	Alarm 2

Fig. 1
Switch off contact in the Technic Box, where to the Power Supply is connected.

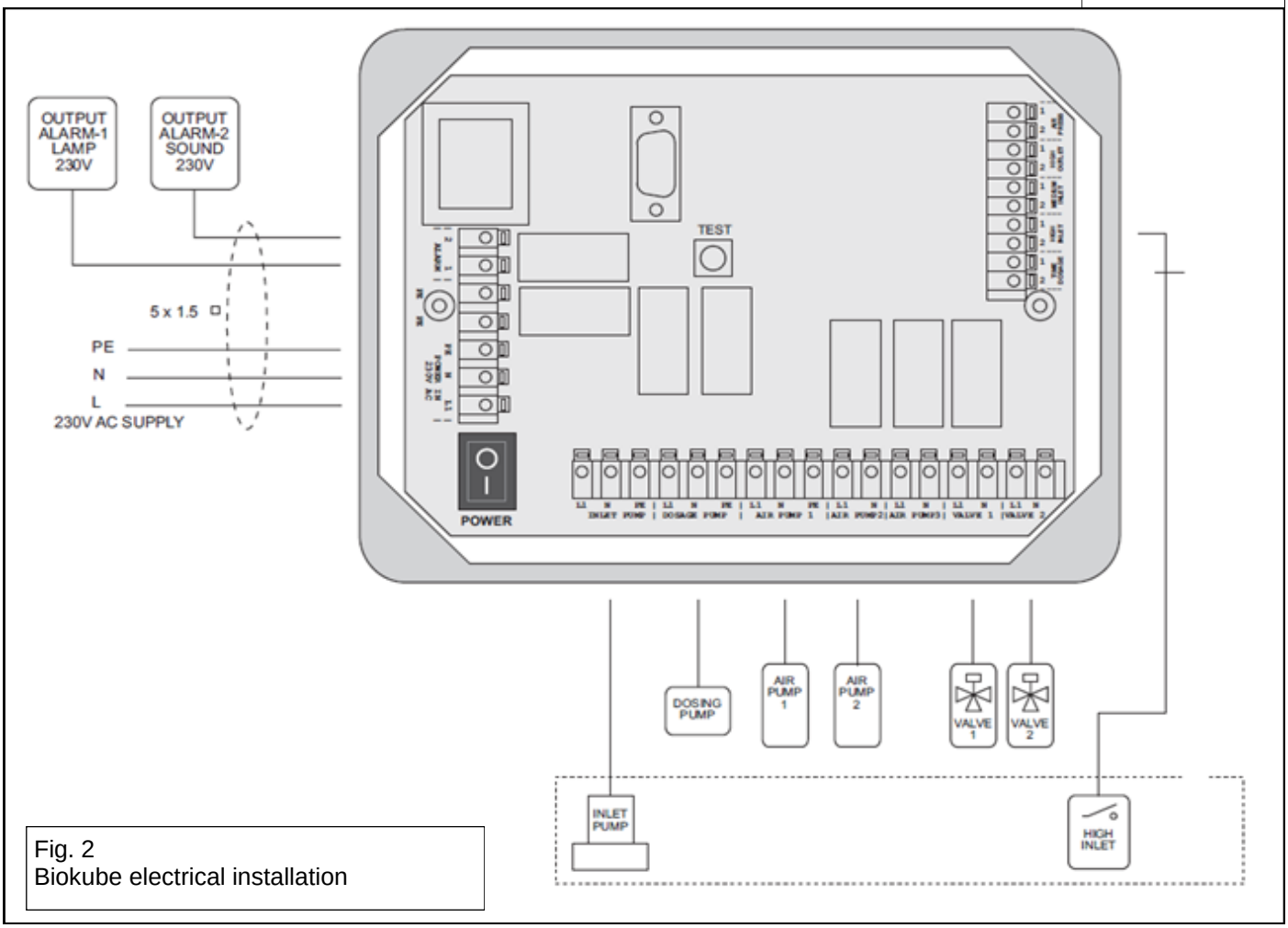
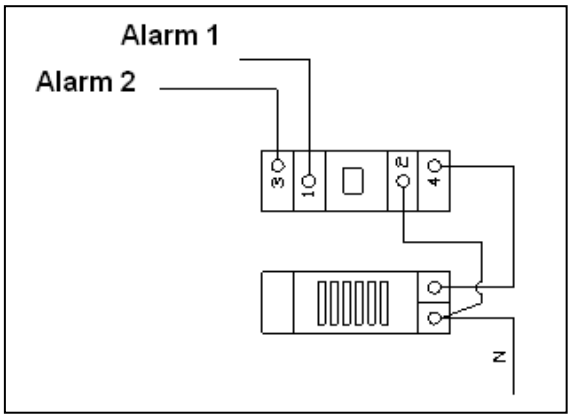


Fig. 2
Biokube electrical installation



INSTRUCTION 8 COMMISSIONING

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 emmiting from the treatment plant the first few weeks. This is normal and not hazardous.

Test button

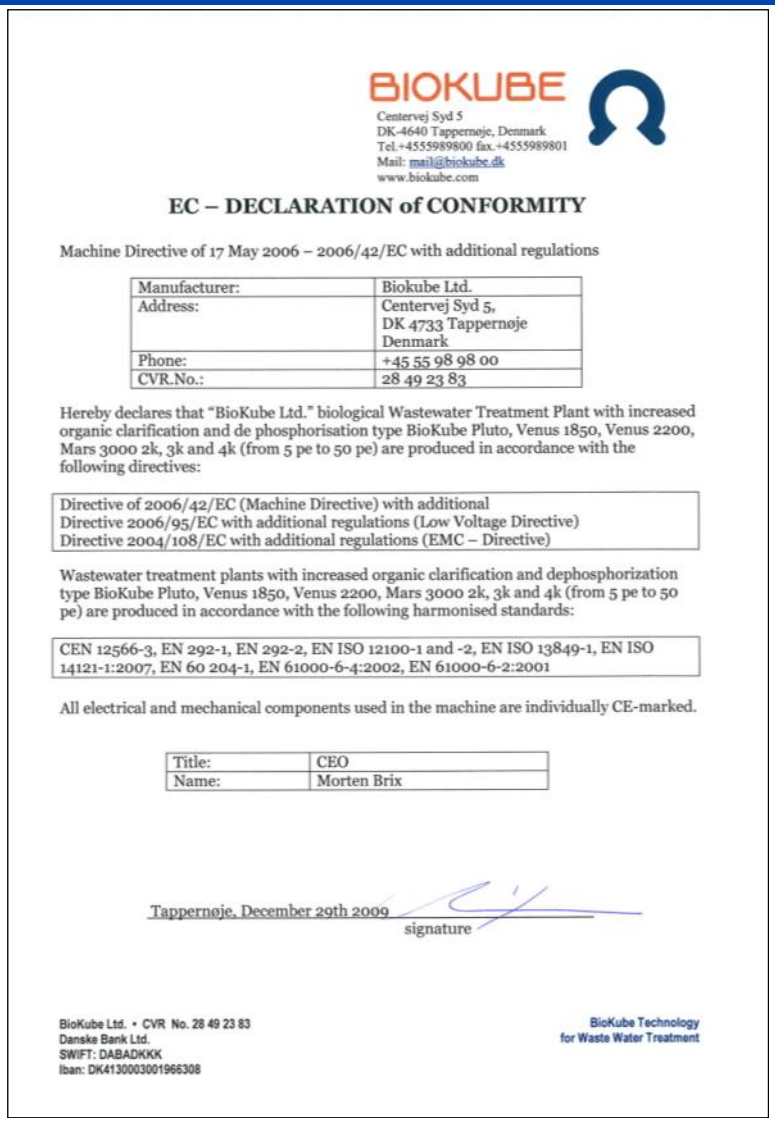
On the control unit print board, please find a test button. While constantly pushing the button, please observe the following:

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.

The treatment plant is now ready to hand over to the client.

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

BioKube Ltd. • CVR No. 28 49 23 83
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BioKube Technology
for Waste Water Treatment