



TRICEL

GENERATIONS OF INNOVATION

Tricel Maxus Combi

Service & Maintenance

Manual

Wastewater Treatment System for 50+ Population Equivalent

Engineering a green future



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This manual concerns procedures and guidelines for service and maintenance of the Tricel Maxus Combi treatment plant. Instructions for other equipment included in the specific project are found in separate manuals.



1 Introduction

The Maxus Combi system is designed to treat ordinary household wastewater. You may not lead any other water than grey- and black household sewage to the treatment plant unless specifically approved by Tricel.

1.1 Maximum load

The Tricel Maxus Combi systems are modular. Each module in a series increases treatment efficiency, each parallel series of modules increases flow. The plant allows for fluctuations in both concentrations and volume of the incoming water. However, if the average daily load exceeds the capacity of the designed system, a larger system or additional units must be installed.

1.2 Operation cost

System operation settings and power consumptions can be seen in the data sheet.

2 Precautions when working with wastewater

Protecting Workers from Infection

Along with “good” micro-organisms that break down sewage, wastewater contains disease-causing bacteria, viruses, fungi and parasites. When workers can't avoid contact with sewage, management should provide the following protective equipment and services:

- Elbow-length rubber gloves
- Rubber pants and jackets
- Goggles
- Disposable mask to be worn in dusty sludge areas or areas with heavy aerosols.
- Commercial high temperature washing machines for work clothing.

Workers should also take the following precautions:

- Wash gloves before removing them.
- Wash hands before smoking and eating.
- Keep protective clothing and equipment out of eating areas.
- Keep work clothes and street clothes in separate lockers.
- Shower and change into street clothes before going home.
- Consider all cuts or abrasions to be infected. Flush them with large amounts of clean, running water and soap, and bandage them with a sterile dressing.
- Workers should have a tetanus booster every 10 years and workers, who have never been vaccinated for polio, should consult a physician about getting a vaccination.
- Workers should receive the hepatitis A vaccination. Workers working in sewers that may contain fresh blood or come into regular contact with used syringes or body parts should receive the hepatitis B vaccination.
- Trucks that carry materials contaminated with sewage should be washed frequently.
- Records should be kept of workers' major and minor illnesses and complaints of irritation and discomfort.

Seek medical attention when you have diarrhea or are ill. Since doctors are often unaware of the connections between occupation and disease, be sure to inform your personal physician of job exposure to sewage.

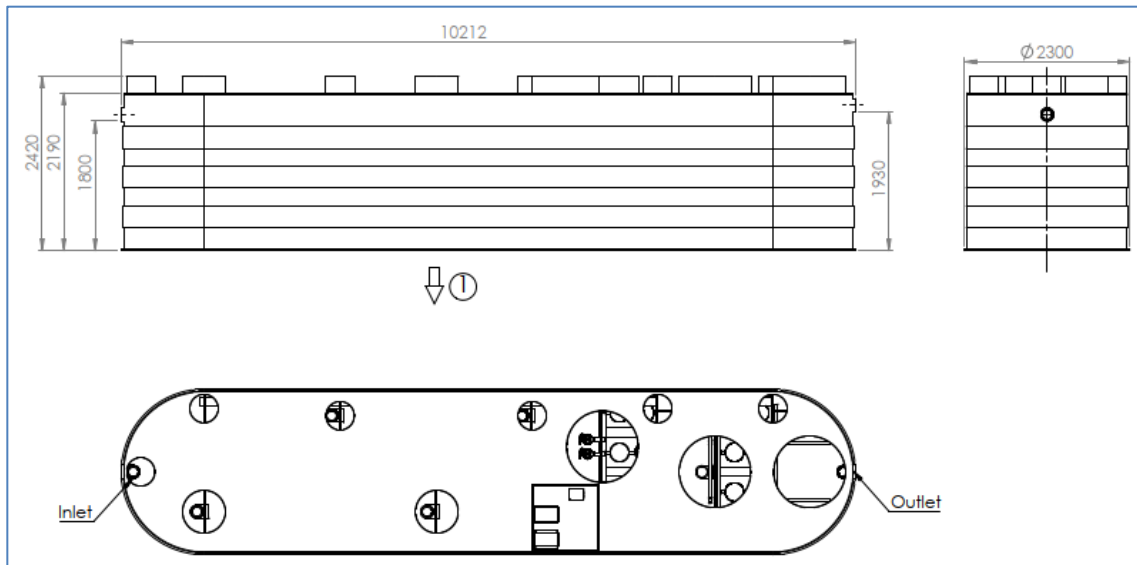
3 System

3.1 Configurations

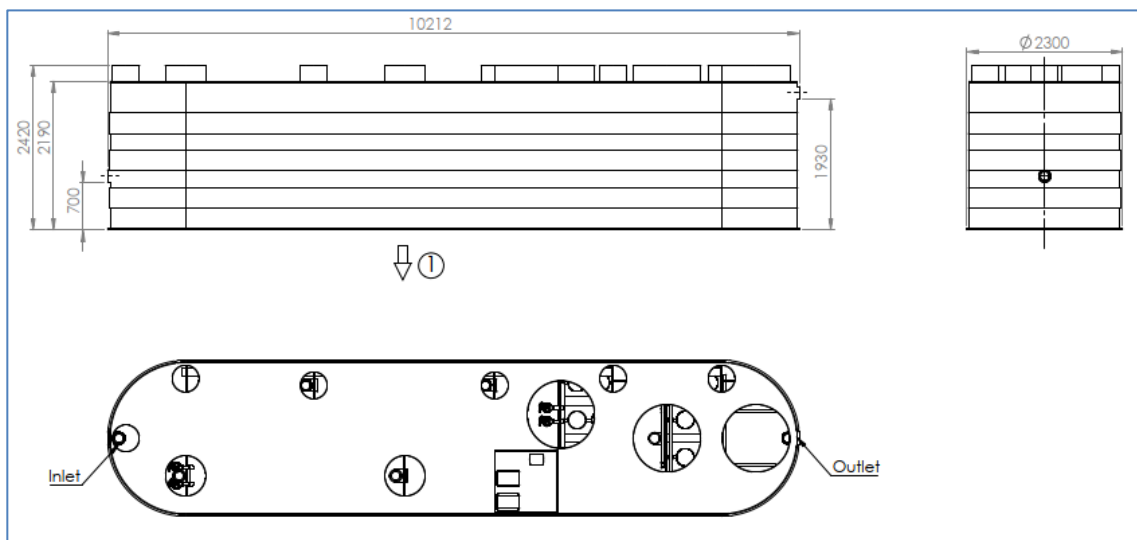
Maxus Combi comes in two different standard versions, Maxus Combi A and Maxus Combi B. Each version is available in 9 different standard sizes.

Maxus Combi A has a high inlet, whereas Maxus Combi B has a low inlet, making it easier for the wastewater to gravitate into the unit. Examples of the two different models are seen in Picture 1 and Picture 2.

For sizes, capacities etc. see separate Maxus Combi facts sheet.



Picture 1 – Maxus Combi 6A

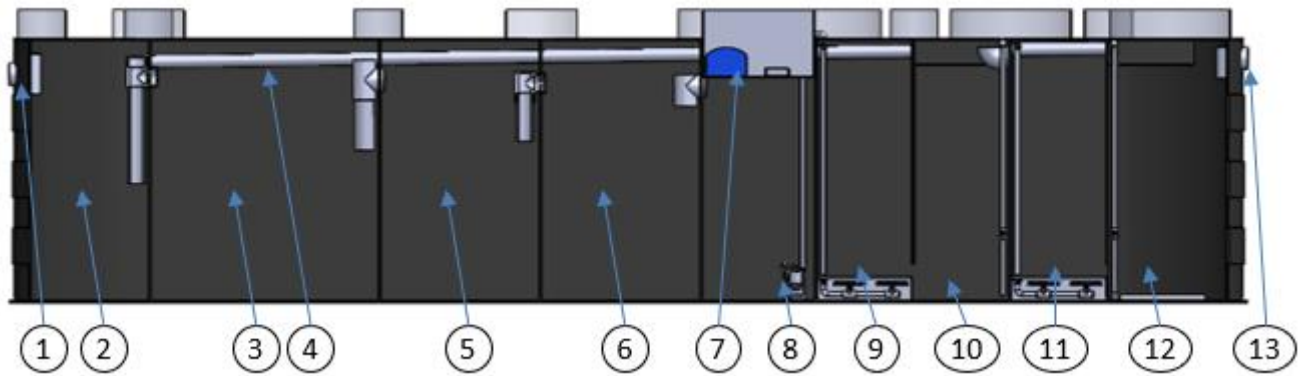


Picture 2 - Maxus Combi 6B

3.2 Process

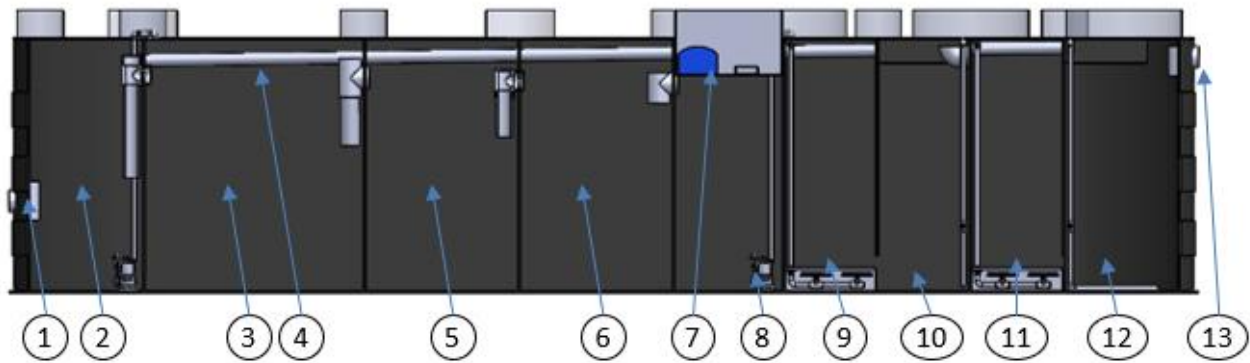
1. The water is pretreated in the septic tank, where larger particles are settled. From the septic tank, the water gravitates into the external buffer tank.
2. The buffer tank will even out any fluctuations for the incoming water load. A float switch placed close to the top of the buffer tank works as an emergency switch and runs the inlet pump continuously if activated.
3. In the biological treatment zone, the submerged bioblock filter, with a large surface area for the microbes, is exposed to heavy aeration. The system will never clog and does not need any chemicals.
4. Bio sludge settles in the settling zone. Airlift pumps in the bottom keep the settling zone clean by recirculating the bio sludge to the settling tank.
5. If disinfection of the treated wastewater is required, the integrated chlorine dosing or UV-treatment system placed at the outlet ensures that no bacteria will leave the system. This is needed if the water is to be reused.

3.3 Features – Model A



Item #	Function
1	Inlet
2	Septic tank chamber 1
3	Septic tank chamber 2
4	Sludge return pipe
5	Septic tank chamber 3
6	Septic tank chamber 4
7	Tech box w. blowers and controller
8	Buffer tank w. 2 x inlet pumps
9	Biozone 1
10	Clarifier 1 w. air lift pumps
11	Biozone 2
12	Clarifier 2 w. air lift pumps
13	Outlet

3.4 Features – Model B





Item #	Function
1	Inlet
2	Pump well w. 2 x grinder pump
3	Septic tank chamber 1
4	Septic tank chamber 2
5	Sludge return pipe
6	Septic tank chamber 3
7	Tech box w. blowers and controller
8	Buffer tank w. 2 x inlet pumps
9	Biozone 1
10	Clarifier 1 w. air lift pumps
11	Biozone 2
12	Clarifier 2 w. air lift pumps
13	Outlet

4 Maintenance plan

Part	#	Function	Frequency
Initial security	0	Lock off area + safety equipment	At every service
Septic tank	1.1	Sludge level control and emptying	Every 2-12 months depending on size.
	1.2	Check for defects in partition	Half-yearly
Expiry Test	2.1	Take water sample in outlet	Half-yearly
Bio Zone	3.1	Water level control	Half-yearly
	3.2	Control of aeration	Half-yearly
	3.3	Oxygen Level Control	Half-yearly
	3.4	Check pH level	Half-yearly
	3.5	Control of foam formation	Half-yearly
	3.6	Control of air-pipes and unions	Half-yearly
	3.7	Clean Bio Blocks	Half-yearly
	3.8	Clean diffusers	Every 2 years
Clarifier + Outlet	4.1	Water level control	Half-yearly
	4.2	Sludge return function check	Half-yearly
	4.3	Control of float / top sludge pump	Half-yearly
	4.4	Checking the outlet	Half-yearly
	4.5	Replace floats / top sludge pump	Every 7 years
Pump well / Buffer Tank	5.1	Functional check of inlet pumps	Half-yearly
	5.2	Functional check of float	Half-yearly
	5.3	Check water level in pump well	Half-yearly
	5.4	Replace inlet pumps	Every 7 years
	5.5.	Emptying and flushing	Quarterly
Air blowers, control and solenoid valves	6.1	Functional control of Every blower	Half-yearly
	6.2	Replace membranes and coil housing	Every 3 years
	6.3	Replace pump relay	Annually
	6.4	Replace solenoid valve	Every 7 years

5 Detailed description of maintenance and safety

5.1 Initial Safety before Commencement of Maintenance

Lock off area and put on safety equipment	
<p>Work on the wastewater treatment plant must only be carried out by trained personnel who have completed Tricel's teaching and training in occupational safety and service of the wastewater treatment plant.</p> <p>Prior to all maintenance of the plant, it is of the utmost necessity to ensure that the area is secured and closed off for unauthorized persons, I.e. the regulations of the sewage systems. This is for hygienic reasons, and so that no unauthorized person risks exposing themselves to danger in the form of falls etc.</p> <p>The barrier is made by locking the permanent barrier in the form of a permanently established fence, which is found at the treatment plant.</p> <p>In addition, it is of the utmost necessity for every service personnel to wear the correct safety equipment as described.</p> <p>All work on replacing or removing electrical components must be carried out without voltage. This is done via the main switch, the position of which is shown in the picture to the right. The main switch must be locked in the off position.</p> <p>Work on electrical installations should only be carried out by personnel who have the necessary knowledge to work safely and correctly.</p>	 

5.2 Maintenance of Outlet

Safety when taking a water sample



To take a water sample, which is always the first thing to be done when servicing the plant, the lid for clearance zone must be opened.

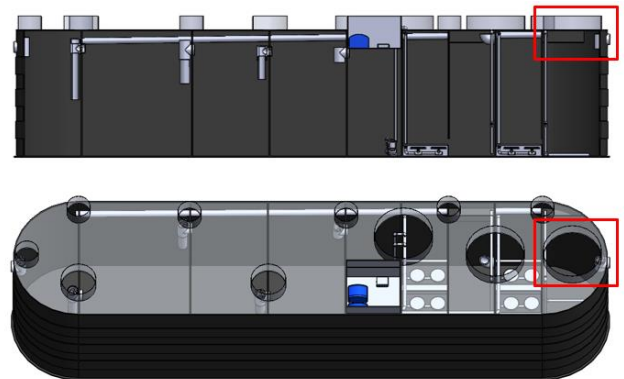
Work on the clarifiers may only be carried out by instructed personnel who have completed Tricel's training in occupational safety and service of the treatment plant.

Prior to the maintenance and inspection of the outlet, it is of the utmost necessity to ensure that the area is off for unauthorized persons.

Since the work of taking a water sample and other servicing work with the clarifier requires free access and an open hatch, it is important that all work around the open clarifier is carried out with utmost vigilance.

It is a prerequisite for working with an open hatch to the clarifier that there are always two men present. The person who does not work with the clarifier observes and is ready to aid in the event of a fall.

When taking a water sample, the necessary safety equipment for protection against wastewater must be used.



5.2.1 Sampling of Outlet

To ensure that the plant treats the wastewater according to the specifications, it is important to measure the water quality of the effluent at every service.

To obtain as accurate a sample as possible, make sure the sample bottles are clean and that the sample is taken in the outlet clarifier near the outlet and at least 10 cm below the surface. Bottles with water samples should be stored cold, preferably in a freezer or in a refrigerator until analysed, or frozen as soon as possible. Outflow samples are analysed in a laboratory.

Sampling Point



5.3 Maintenance of Inlet pump well (Applies only for Maxus Combi B-version)

Safety and working environment before maintenance of pump well



Work on the pump well must only be carried out by instructed personnel who have completed Tricel's training in occupational safety and service of the treatment plant.

Prior to the maintenance and inspection of the inlet pump well, it is of the utmost necessity to ensure that the area is cited and blocked off for unauthorized persons.

The barrier is made by locking the permanent barrier in the form of the permanently established fence, which is found at the treatment plant.

5.3.1 Functional check inlet pumps and float switches

Perform float function control by using a hook on a rod and check that float switches and pumps work.

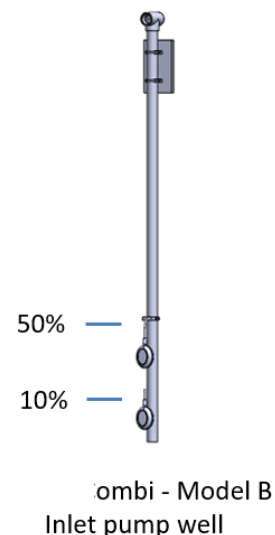
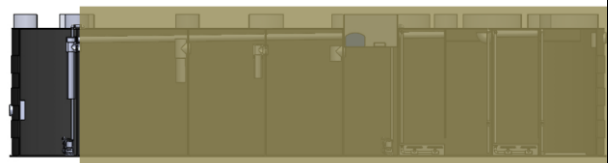
Visually recognize that water is pumped from both inlet sockets to chamber 1 in the septic tank.

Float switch 1 –Bottom float switch

Function: When this float activates, pump 1 runs constantly until the float deactivates because of lowered water level.

Float switch 2 – Top float switch

Function: When this float activates, pump 2 runs constantly until the float deactivates because of lowered water level.



5.3.2 Functional control of floats

The water level in the pump well must, during normal running conditions, be lower than the bottom float switch.



5.3.3 Replacement of pumps and floaters

Danger: This operation must account for the following: the safety assessment has a risk of electric shock. Before replacing this unit, the main switch must therefore be switched off and locked.

Disconnect the cord in the pump cabinet.

Mark height on float switches, and free the pump wires.

Cut off cable ties that acts as a wire holder.

Pull the wires out through the guide tube, using the old cables to pull new cables to the correct position.

Dismount pump connection.

Install new pumps + float via quick couplings in the pump well. It is not necessary to go into the pump well to change pumps.

Ensure that float switches are installed so that they cannot get stuck in pipes or each other.

Connect the pump to the connection box.

Complete function control.



5.3.4 Emptying and flushing of Pump Well / Buffer Tank

The pump well is emptied and flushed once annually by sludge suction, at the same time as the Septic tank.



5.4 Maintenance of Septic Tank

Safety prior to commencement of maintenance of Septic tanks



Work on the Septic tank must only be carried out by instructed personnel who have completed Tricel's teaching and training in work safety and service of the treatment plant.

5.4.1 Check that regular sludge removal is complete

Check via the log if the Septic tank has been emptied. If the water pumped into the Maxus Combi system is dirty, the Septic tank is presumably full and should be emptied. Emptying intervals should then be carried out more frequently. The emptying intervals depend on the load on the system.

5.4.2 Check for partition defects

Visually check for any deformities in the Septic tank through the manhole



5.5 Maintenance of Buffer tank

Safety and working environment before maintenance of pump well



Work on the pump well must only be carried out by instructed personnel who have completed Tricel's training in occupational safety and service of the treatment plant.

Prior to the maintenance and inspection of the inlet pump well, it is of the utmost necessity to ensure that the area is cited and blocked off for unauthorized persons.

The barrier is made by locking the permanent barrier in the form of the permanently established fence, which is found at the treatment plant.

5.5.1 Functional check inlet pumps and float switches

Perform float function control by logging on to the controller and manually run the pumps.

Perform float function control by using a hook on a rod, and check that float switches and pumps work.

Visually recognize that water is pumped from both inlet sockets to chamber 1 in the septic tank.

Float switch 1 –Bottom float switch

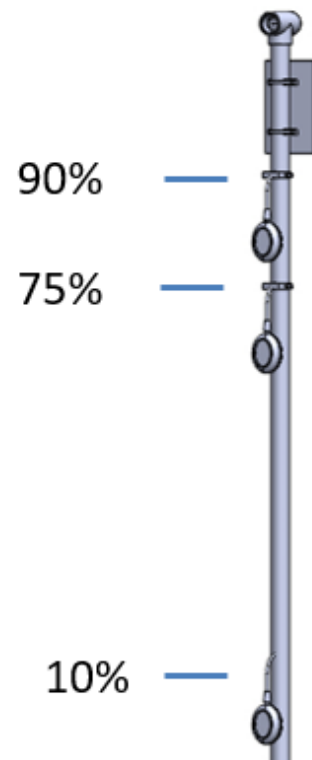
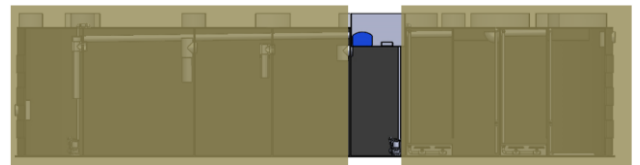
Function: When this float activates, pump 1 runs according to the timer in the controller. When the float switch is deactivated, the pump is turned off because of lowered water level.

Float switch 2 – Middle float switch

Function: When this float activates, pump 1 runs for multiple cycles until the float deactivates because of lowered water level. If activated for more than three cycles the alarm will go off.

Float switch 3 – Top float switch

Function: When this float activates, pump 2 runs constantly until the float deactivates because of lowered water level.



5.5.2 Functional control of floats

The water level in the buffer tank must, during normal running conditions, be between float switch 1 and 2.



5.5.3 Replacement of pumps and floaters

Danger: This operation must account for the following: the safety assessment has a risk of electric shock. Before replacing this unit, the main switch must therefore be switched off and locked.

Disconnect the cord in the pump cabinet.

Mark height on float switches, and free the pump wires.

Cut off cable ties that acts as a wire holder.

Pull the wires out through the guide tube, using the old cables to pull new cables to the correct position.

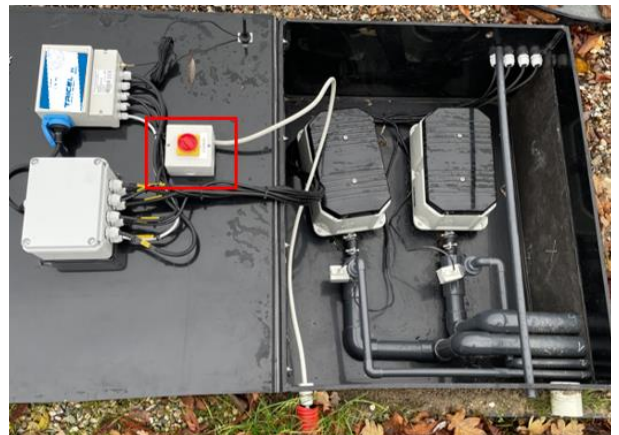
Dismount pump connection.

Install new pumps + float via quick couplings in the pump well. It is not necessary to go into the pump well to change pumps.

Ensure that float switches are installed so that they cannot get stuck in pipes or each other.

Connect the pump to the connection box.

Complete function control.



5.5.4 Emptying and flushing of Pump Well / Buffer Tank

The pump well is emptied and flushed once annually by sludge suction, at the same time as the Septic tank.



5.6 Maintenance of the Biozone

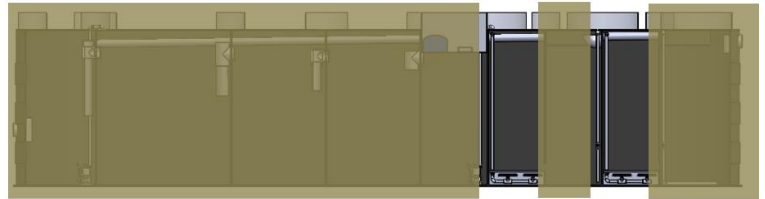
Security before maintenance of the Biozone



The work with the biozone may only be carried out by trained personnel who have completed Tricel's training in occupational safety and service of the treatment plant.

Prior to commencing the maintenance and inspection of the Biozone, it is of the utmost necessity to ensure that the area is closed off for unauthorized persons.

NB: Two persons required when opening lid.



5.6.1 Water level control

The water level in the Biozones should be at or up to 2cm above the bioblocks.

Excessive water levels may indicate a blocked outlet.

Low water levels may indicate that the Septic tank has just been emptied, or a possible tank leak.



5.6.2 Control of aeration

Tricel treats the wastewater biologically. The technique is based on submersible aerated filters.

Submersible aeration requires a good flow of air evenly distributed throughout the Biozone.

The Maxus Combi system is designed and adjusted to provide powerful aeration in the Biozone. Normally, there will be nothing to service in the Biozone as it is self-cleaning and maintains itself.

The picture on the right shows the image of an optimally aerated biozone.

Control must be carried out to make sure of uniform aeration throughout the biozone and that it bubbles from all diffusers.



5.6.3 Oxygen level control

Measure the oxygen level with a standard oxygen meter. The oxygen level should be > 70% in all chambers and is expected to rise through the chambers of the system. If the oxygen level is too low, contact Tricel for adjustment and troubleshooting.



5.6.4 Check pH level

The pH value must be greater than 6.5 and less than 8.5 in all chambers and is expected to fall only slightly through the plant.

For a pH level outside this norm area, the inlet water of the plant should be diagnosed. The pH value can be measured with simple pH strips, or a more advanced electronic pH meter.



5.6.5 Foam control

Until the bacterial culture is sufficiently effective, aeration of sewage can create foam, see Picture.

This is normal and will decrease after approx. 5 days of operation.

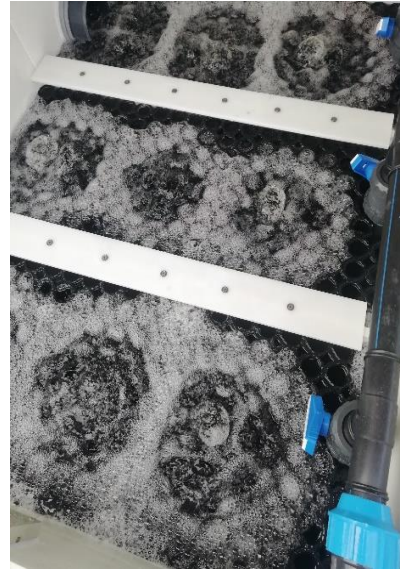
Recognized as a very bluish foam with inserts, it may be indicative of a large supply of strong detergents or chemicals. See the trouble shooting section for more details on this point.



5.6.6 Control of air pipes and unions for diffusers

Perform visual inspection of all visible air pipes for cracks and fissures.

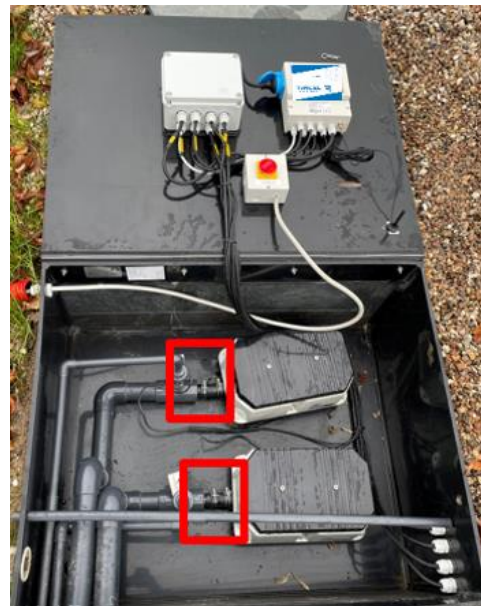
Perform visual check for condition of all visible unions to the air system. Tighten if hissing sound or visual leaks are recognized. If the Union is defective, it must be replaced.



5.6.7 Clean Bio Blocks

The bioblocks should not be cleaned under normal circumstances.

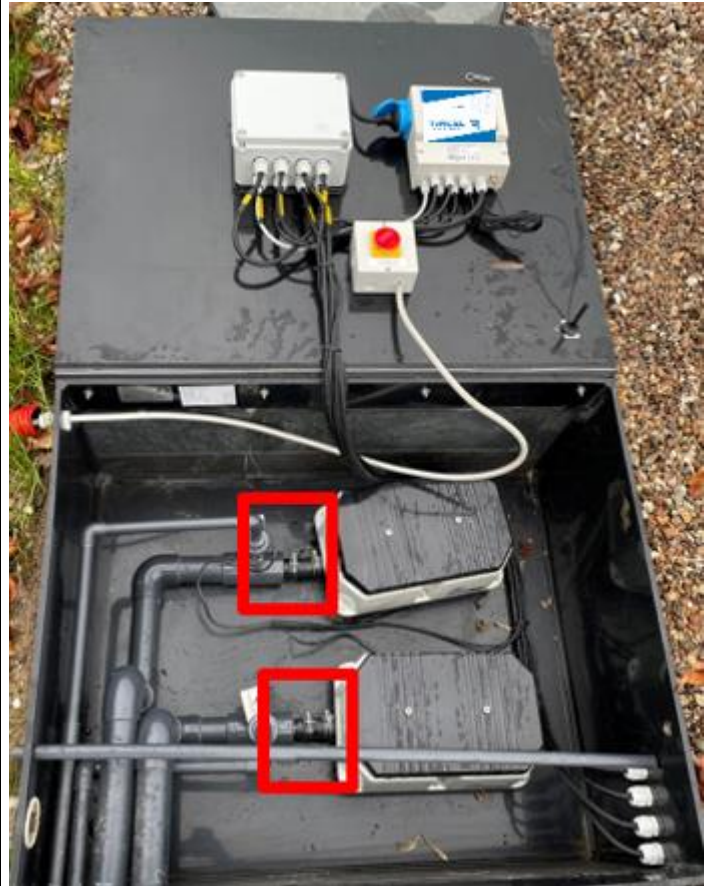
If the Bioblocks are particularly clogged, cleaning can be done by loosening the union, marked in the picture, and blowing compressed air from a hand-held compressor into the pipes, via a simple pipe adapter. This will cause temporary increased air scrubbing of the Bioblocks, and tear off excess Biofilm material.



5.6.8 Clean diffusers

Diffusers should not be cleaned under normal circumstances.

If a diffuser is recognized to be stopped, cleaning can be done by loosening the union, marked in the picture, and blowing compressed air from a hand-held compressor into the pipes, via a simple pipe adapter. This will cause temporary increased air to be forced through all the diffusers.



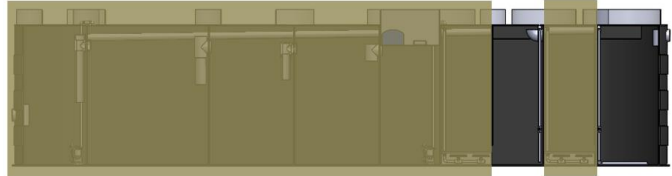
5.7 Maintenance of the Clarifier + Sludge Return

Safety and working environment before maintenance of Clarifier



Work on the clarifier may only be carried out by instructed personnel who have completed Tricel's training in occupational safety and service of the treatment plant.

Prior to the maintenance and inspection of the clarifier, it is of the utmost necessity to ensure that the area is closed off to unauthorized persons.

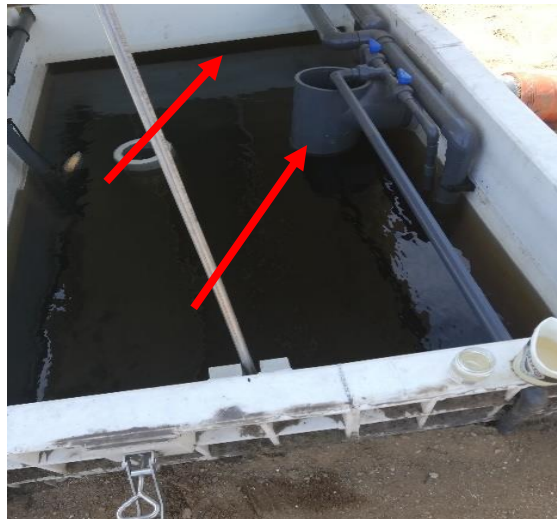


5.7.1 Water level control

The water level in the clarifier(s), should be at the level of the outlet to biozone two, respectively, for the first clarifier zone, and at the level of the final outlet for the second clarifier.

Excessive water levels may indicate a blocked outlet.

Low water levels may indicate that the Septic tank has just been emptied or may indicate a water leakage in the tank.



5.7.2 Sludge return function check

The back flushing of bottom sludge is ensured through airlift pumps, marked by the red arrows, located in every clarifier(s). Airlift pumps supply air through solenoid valves located in control the cabinet.

Test the flushing function of the sedimented bottom sludge by logging on to the controller and manually activate the sludge removal and sludge recirculation. Recognize visually and audibly that water is pumped through the two airlift pumps for the return rinse tube. The red mark the airlift pumps.



5.7.3 Checking the outlet

Check that the outlet has free passage and allows the outlet water to pass freely.

Water that high in level in the outlet indicates a clogged outlet.



5.8 Air Blowers, Control and Solenoid Valves

Safety and working environment before maintenance of controls and blowers



Working with the blowers is associated with great danger in the form of electric shocks.

Therefore, work on these may only be carried out by instructed personnel who have completed Tricel's training in occupational safety and service of the treatment plant.

All work with the replacement or disassembly of electrical components must be done without voltage.

The main switch is locked and the locally applicable LOTO (Log out/Tag Out) procedure is followed.

5.8.1 Functional control of blowers

Look / listen / feel for leaks.

Listen / feel that all blowers are running.

Listen for unwanted noises.

Check if aeration in biozones is normal. The blowers must be maintained according to the manufacturer's instructions.

Change of membranes and air filters according to manufacturer's manual



5.8.2 Replacement of Membranes

Danger: In this operation, there is a risk of electric shock. Before replacing the membrane, the power supply must be removed, and the blower moved to a clean workstation.

Replacement interval: 3-4 years

For changing this:

Unscrew the blower housing.

Unscrew diaphragm block.

Replace membranes.

Reassemble the blower.

Perform functional check.

Reference is also made to the supplier's manual



5.8.3 Replace pump and blower relays

Danger: In this operation, there is a risk of electric shock. Therefore, before replacing this unit, the main switch must be switched off and locked. Follow local LOTTO procedure.

Only personnel with the requisite knowledge should perform work on electrical installations.

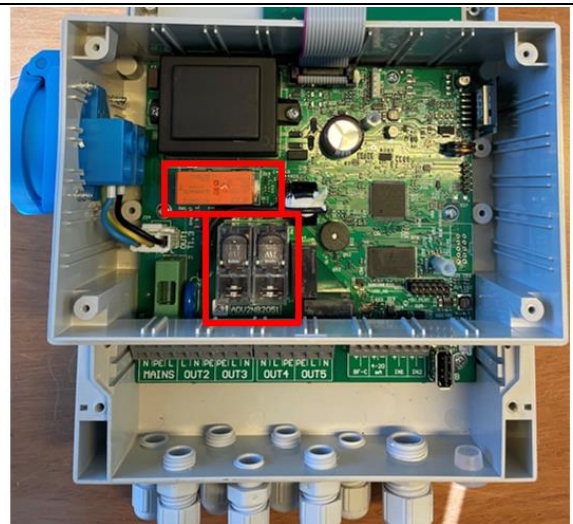
For replacement:

Turn off electricity supply via main switch.

Open the control box door to expose circuit boards.

Replace relay as depicted in the diagram.

Complete functional control.



5.8.4 Replace solenoid valve

Danger: In this operation, there is a risk of electric shock. Therefore, before replacing this unit, the main switch must be switched off and locked. Follow local LOTTO procedure.

Only personnel with the requisite knowledge should perform work on electrical installations.

For replacement:

Unscrew cable to solenoid valve in control box.

Replace solenoid valve.

Attach cord.

Perform functional check.



6 Troubleshooting

6.1 Aeration system

If the blower is in operation, air is fed to the diffusers at the bottom of the biozones. Air is evenly distributed to the system. The oxygen level must be above 70% in all aerated chambers.

Problems with diffuser or weak aeration in the Maxus Combi system can be related to blower failure, control, trachea and diffusers, or a general overload of the system.

Problem	Observation	Cause	Check	Solution
Oxygen level below 70%	Full aeration	Possible system overload	The inlet volume	Take a water sample of raw sewage.
	None or little aeration	Blowers worn, defective, or turned off	Make sure that all the blowers are in operation.	Check that the blower is running with normal sound. It is necessary to maintain the blower according to the maintenance manual.
		Air distribution system	Make sure the air distribution system piping is connected properly and that there are no leaks.	Feel and listen for any leaks in the air tubes from the blower and to the diffusers. Repair if leaks are observed.
		Diffusers	Some diffusers may not work	Double the aeration for a few minutes by closing the manual valves in other parts of the system, otherwise gently pushing on top of the diffusers using a stick through the bio-zone. It is always important that, all valves are closed.
		Bio-zone	Sludge has clogged the bio-zone.	Double the aeration for a few minutes by closing manual valves in other parts of the system or cleaning biozone with high water pressure / sludge suction

6.2 Sludge Return

Sludge return system pumps the biological sludge produced by the bacteria out of the treatment tank.

This ensures optimum performance of the plant and is an important functionality. A maximum of 20 cm of biological sludge must accumulate on the bottom of the tank. This can be measured with special sludge level tests carried out by Tricel's service techniques. If the sludge is rejuvenated to a level greater than 20 cm, the sludge return pump settings must be changed.

Sludge problems in the biological treatment system may also be related to failure of the controller, solenoid valve, air blower.

Problem	Observation	Cause	Check	Solution
Sludge Returns	Sludge in the system	Airlift pump - Functioning	Settings of the airlift pump	Change settings to open the valve for airlift pump for a longer period or more often
		Airlift pump – Not functioning	Functioning of solenoid valve	Separate a union after the blowers and check if air is blowing when solenoid valve is open.
			Functioning of airlift pump.	Remove the airlift pump from the tank and clean the sludge return pipes.

After the problem has been located and solved, sludge from the Maxus Combi unit must be removed before startup.

6.3 Hydraulics

It is important that inlet pumps ensure that variations in inlet volume are smoothed out using the buffer tank. When the peak flows are allowed to enter the biozone, the plant will not treat wastewater as expected. Water is supposed to be pumped automatically into Maxus Combi regularly, and the water level in the pump sump is expected to be low during normal operation.

Hydraulic problems can occur when new water is pumped into the system over a short period of time, or if the pipes are clogged.

Problem	Observation	Cause	Check	Solution
Hydraulic overflow	Septic tank/ Pump well	Water level high for longer periods	Controller is on and pumps run That water comes in from pump pipes	Check alarm unit in the control box. Green light should glow. Pumps must be turned on automatically
	WWTP	The water level rises high when being pumped	Check that internal pipe between chambers, as well as outlet pipes are not blocked	Clean pipes

6.4 The quality of the treated wastewater

If the cleaning requirement is not met, the actual inlet ratio should be checked. Investigate (volume, organic content or inhibitors) and check the mechanical and electrical equipment.

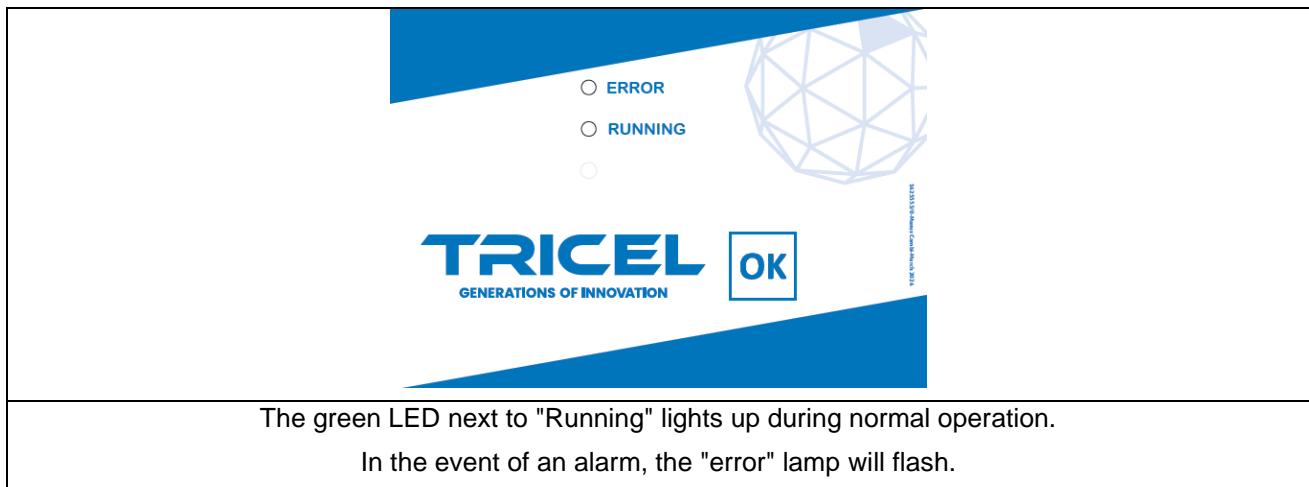
Action	Effect
Control mechanical /electrical equipment according to the maintenance manual	No defective components are accepted, the part must be replaced.
Control the pre-treatment equipment according to the maintenance manual	If there are discrepancies, correct these.
Measure sludge in the plant	No more than 20 cm of biological sludge on the bottom of the plant is allowed, otherwise sludge is removed manually with a pump and adjust sludge return timing in the control box.
Measure the oxygen content	The oxygen level must not be below 70%, otherwise the blower and air hoses must be changed
pH level is measured	The pH value must not be below 6.5 or above 8.5, otherwise the pH must be stabilized
Measure the inlet flow	The inlet flow must be stable and not higher than what the system is designed for.
Sample the incoming water	Analyze the sample inlet for the same parameters as outlet values and compare the concentrations against the design parameters

If none of the above solutions solve the problem, it is very likely that the biological processes in the pre-treatment or in the Tricel plant will not work properly. This may be due to high concentrations of antibacterial compounds such as e.g. hypochlorite or detergents that are toxic in such cases, the root chemicals must be found, and alternative solutions must be used. Please contact Tricel for further assistance.

7 Maintenance Checklist

Category	Section No	Description	Time frame	Completed (Yes/No)	Remark
Initial security	5.1	Lock off area + safety equipment	Every service		
Water sampling	5.2.1	Take water sample in outlet	Every service		
Inlet pump well (Model B only)	5.3.1	Control float switches and pumps	Every service		
Septic tank	5.4.1	Sludge level control and emptying	Every service		
	5.4.2	Check for defects in partition	Half-yearly		
Buffer Tank	5.5.1	Functional check of inlet pumps	Every service		
	5.5.2	Functional check of float	Every service		
	5.5.2	Check water level in pump well	Half-yearly		
	5.5.3	Replace inlet pumps	Every 7 years		
	5.5.4	Emptying and flushing	Half-yearly		
Bio Zone	5.6.1	Water level control	Every service		
	5.6.2	Control of aeration	Every service		
	5.6.3	Oxygen Level Control	Every service		
	5.6.4	Check pH level	Every service		
	5.6.5	Control of foam formation	Every service		
	5.6.6	Control of air-pipes and unions	Every service		
	5.6.7	Clean Bio Blocks	Half-yearly		
	5.6.8	Clean diffusers	Every 2 years		
Clarifier + Outlet	5.7.1	Water level control	Every service		
	5.7.2	Sludge return function check	Every service		
	5.7.3	Checking the outlet	Every service		
Air blowers, control and solenoid valves	5.8.1	Functional control of blowers	Every service		
	5.8.2	Replace membranes and coil housing	Every 3-4 years		
	5.8.4	Replace solenoid valve	Every 7 years		
Technician		Seal			Date

8 Alarms



8.1 Alarm signals

Blink	Alarm type	What do the alarms mean?
Constant blink	Power failure to the system	No power, resets automatically
2 blink	Flows active at the same time as low pump power	Error in floating
3 blink	High level (floats active for 10 min)	Level does not drop even when the pump is running
4 blink	Inlet pump, low current level	Pump defective
5 blink	Inlet pump, high current level	Pump shorted
6 blink	Blower, low power level	Blowing defective
7 blink	Blower, high power level	Blowing short circuit
8 blink	Fuse burned	Internal security has blown
9 blink	Missing / dead battery	Battery is dead or not connected

9 Recommended spare parts

9.1 Recommended Spare Parts List for Maxus Combi

Component*	Expected Component replacement frequency
Blower diaphragm	3 years
Air filter for blower	1 years
Inlet pump and float switches	7 years
Control unit	10 years
Diffusers	15 years
Solenoid valves	10 years

*For specific brand and model; see project specific parts list

10 Seasonal fluctuations

10.1 Operation Without Wastewater for up to 6 Months

If limited or no wastewater is flowing to the Maxus Combi system for days or weeks at a time, Tricel recommends continually operating the system as normal. If the load is limited for longer periods, the system will automatically adjust operation to “off-season”-mode, which will reduce the power consumption significantly. The integrated sludge recirculation will keep the biology inside the treatment tank alive for many months, ready to handle untreated wastewater whenever the inlet flow returns to normal level.

For any questions not clarified in this instruction please contact Tricel directly.

Notes

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In accordance with Tricel's normal policy of product development these specifications are subject to change without notice.