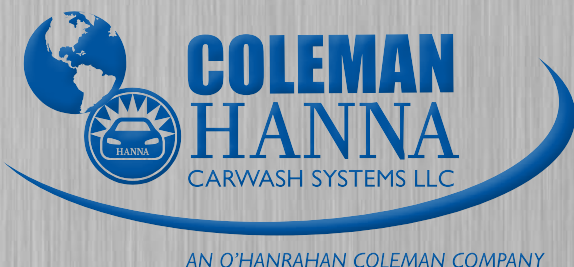




Rowafil Reclaim System

Service Manual



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This manual is produced with the greatest care and is based on the latest available Information. iClean Carwash Technologies B.V. accepts no liability in respect to any claim for direct or indirect damage caused by wrongful application or misinterpretation of this manual.

Bionic type: Bionic ...
Bionic serial number: B...
Voltage: 3 x 400 V – Frequency 50 Hz
Bionic production date: ... 2012
Bionic final approval:

1. INTRODUCTION

This manual is an essential part of the BIONIC system and will help users to work safely with the BIONIC system. Therefore it is essential to read this manual thoroughly and train all relevant personnel before installation, commissioning and operation of the unit.

As long as the BIONIC system contains wastewater or elements of the wastewater, the local valid regulations in relation to the specific wastewater are applicable and have to be fulfilled.

A version of this manual is supplied with the BIONIC system and must be kept with the unit at all times.

1.1 SAFETY

Safety in relation to operation and maintenance are specified in the chapters:

3 (SAFETY)

7 (MAINTENANCE)

All installation, operation and maintenance with the BIONIC system to be carried out in accordance with this manual. In addition to any local regulations and by-laws.

Changes, modifications, changing factory settings and opening factory sealed parts except those specified in this manual are strictly prohibited, without written approval of iClean Carwash Technologies B.V.

iClean Carwash Technologies B.V. accept no liability or responsibility for injury, damage to existing equipment, or to property through unauthorised modification and or improper use of the of the system by untrained or unauthorised personnel.



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Enclosures:

- Add. 01 Timer dosing pump settings;
- Add. 02 Trouble shooting list;
- Add. 03 Spare parts list per system and photo's with part numbers;
- Add. 04 Electrical drawings;
- Add. 05 Maintenance list Bionic.

3. SAFETY

All instructions mentioned within this chapter to be kept strictly and under all circumstances and conditions. Not working according the safety instructions can result in situations of personal harm and damage of equipment.

3.1 SAFETY SYMBOLS

Within this manual the following symbols are used:



DANGER

-DANGER symbol

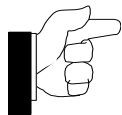
This symbol is used when an operating or maintenance instruction or status may result in severe personal injury or death if it is not strictly complied with or correctly monitored. Obey the instructions, taking special care.



WARNING

-WARNING symbol

This symbol is used when an operating or maintenance instruction or status may result in personal injury or damage to the machine if it is not strictly complied with or correctly monitored.



NOTE

-NOTE symbol

This symbol relates to an operating or maintenance instruction or status to which particular attention should be paid.

3.2 SAFETY RULES

3.2.1 OPERATORS- AND MAINTENANCE PERSONNEL

Training

- All persons working on- or with the machine to be trained and authorised for their job.
- All persons working on- or with the machine to be familiar in detail with this manual and be cap able to work according the given instructions
- The owner of the machine is responsible for training and instruction for operators- and maintenance personnel.

Manual

- The complete manual must always be assessable for operators- and maintenance personnel.

Health

- Safety protection as gloves, clothes, glasses and other by local authorities prescribed necessities available at any time for operating, maintaining and other with the machine involved persons.
- It is strictly prohibited to smoke, eat or drink during operation, maintenance or other Installation of the unit.

3.2.2 MACHINE

Supervision

- The BIONIC system is never to be switched on without supervision.

Safety

- The unit is **NEVER** to be operated with any of the safety provisions or the safety system as a whole or partially out of use. All safety provisions i.e. safety switches Covers should not be removed or modified without the written permission of iClean Carwash Technologies B.V.
- The electrical control panel is provided with a lockable door and door switch.
- Only authorised personnel aware of the danger of electrical equipment and in conjunction with the relevant sections within this manual should access the panel.

Maintenance

- The BIONIC system may never be cleaned with a water-beam or water under pressure; this can cause irreparable damage to the system.
- Maintenance may only be done if the control panel is switched off. The main-switch must be secured with a lock and a sign must be placed on the control panel, which prohibits the use of the BIONIC system.



DANGER

Installation and commissioning the system is a complicated operation and must be carried out with great precautions. If not done properly this can cause serious danger to man and environment.



DANGER

Ensure that the machine cannot be turned "on" while working on the system
Place the note "machine out of duty" to the control panel.

4. SPECIFICATION

4.1 *PURPOSE*

The BIONIC system is a water treatment unit for treatment and recycling of wastewater coming from self-, car- and truck wash installations.

The BIONIC system is an aerobic biological water treatment unit. The unit works on attached growth principle in a sealed biological reactor bed. The water to be treated enters the reactor at the top and as the water flows through the reactor to the bottom, the water is purified due to biodegradation process. The purified water flows over at the top by means of a separate drain system.

Control system

The BIONIC system is a full automatic operating unit. The machine operates 24 hours a day to purify the wastewater. Also during the night the process continues to purify all the water in the pits.

4.2 ACTIVE PARTS

The standard package BIONIC 20
(See Figure 4-1):

- **Service frame**
 - Cabinet
 - Cyclone
 - SR20 container
 - Blower
 - Gauge
 - Adjustable valves
 - Air intake filter
- **Bio reactor**
 - Connecting hoses
 - Output valve
 - Connecting fittings
- **Submersible pump (Fig. 4-2)**
- **Floating aerator (Fig. 4-3)**



Figure 4-1



Figure 4-3



Figure 4-2

4.3 CONTROL ELEMENTS

Control panel

All normal to be operated components of the BIONIC system are located on the control panel being:

- Failure indicator lamps
If failure occurs, one or more lamps will burn
- Function indicator lamps
If a function is active, the relevant function lamp will burn
- The main switch has to be switched off before the control panel door may be opened



4.4 TECHNICAL DATA

Electrical

Installed B20.....	2.7	kW
Installed B40.....	2.9	kW
Installed B60.....	3.2	kW
Installed B80.....	3.4	kW
Installed B100.....	5.7	kW
Installed B120.....	5.9	kW
Installed B140.....	6.2	kW
Installed B160.....	6.4	kW
Voltage	3 x 230V / 400V + N	
Frequency	50 / 60	Hz

Overall dimensions and weight each bioreactor

Length	1200	mm
Width	750	mm
Height	1925	mm
Weight empty	250	kg
Weight operation	1750	kg

Noise level

C-weighted momentary sound pressure	< 61	dB(A)
---	------	-------

4.4.1 SETTINGS

Airflow through reactor bed 2,5 to 3 m³/hr (adjustable by a valve).
Nutrient SR20 dosing pumps, the dosing pump is adjustable by internal timer, see for settings Add. 01). Installation and COMMISSIONING

5. INSTALLATION AND COMMISSIONING

5.1 *PRIOR TO INSTALLATION*

Prior to installation, check the ground works for compliance to installation specification.

It is the customer's responsibility to install unless agreed otherwise;

1. aeration pit or tank to existing sludge pit to give a minimum waste water aeration area of 3.000+ Litres.
2. 2 x 110 mm diameter duct from the plant room to the aeration pit containing;
 - 1 x 32 mm diameter hose.
 - 1 x 40 or 50 mm diameter hose, reinforced.
 - 1 x 2,5 mm² , 4 core cable.
 - 1 x 0,75 mm² , 2 core cable.
3. Return drain from the plant room to the sludge pit or gully for the "cleaned-water tank" overflow and the cyclone return.

5.1.1 *AERATION PIT*

LB AERATOR

- The floating aerator is fitted into the aeration pit and has a float to keep the device in an upright position and at a fixed depth.
- Push 32 mm hose onto the LB aerator and secure with stainless steel jubilee clip. Check hose length on the LB aerator that the unit can float freely without restriction but is long enough to allow the aerator to cover the whole of the pit. Pull any excess hose into the plant room.

5.2 *3-PHASE SUBMERSIBLE GRINDERPUMP*

1. Push 40 or 50 mm id hose onto the pump hose tail and secure with stainless steel jubilee clip. Pull any excess hose into the plant room.
2. Fix chain to the grinderpump and lower into the pit check the length of the hose that it is not unnecessary long.
3. Fix stainless steel chain to hook so that the pump is above the bottom, about 20 cm.
4. Raise pump and secure float switch to the hose using tie wraps, make sure that when the float switch is in the off position (down) that this position is 100 mm above the pump impeller. Continue to secure the cable along the length of the hose at suitable intervals.
5. Connect the pump cable to the 4 core x 2.5mm² cable in 110-diameter duct.

6. Connect the float switch to the 2 core x 0.75mm² cable in 100-diameter duct. The float in the down position will be normally open. As the cable colours may vary, test the float switch for correct operation.

NOTE:

The connections between the pump and cable running inside the duct should be made in an IP65 rated service switch. The joints must be made using suitable connectors and glands to maintain this rating, marking the box joining the pump cable with a high voltage-warning label

5.3 PLANT ROOM

Ensure that the floor is flat and levelled where the BIONIC system is to be installed.

1. Place tank into the desired position making sure that there is enough space around the bioreactor to get access to the top of the reactor.
2. Connect the 32 mm id hose between the LB aerator and the blower output hose tail. Secure with stainless steel jubilee clip.
3. Connect the 40 or 50 mm id hose between the submersible pump and the pressure inlet frame hose tail. Secure with stainless steel jubilee clip.

5.4 CLEAN WATER STORAGE TANK

1. Note if an overflow exists, make sure that the new overflow is below the level of the existing overflow.
2. The overflow from the clean water tank needs extra attention. Make sure this overflow runs back to the sludge pit or gully, a free flow.
3. Attach a length of 50 mm PVC pipe to the overflow pipe and connect the other end to the aeration pit.

5.5 CYCLONE RETURN TRAY

The return water of the cyclone(s) has to go back to the sludge pit or gully with a minimum hose of 50 mm diameter.

5.6 CLEAN WATER TANK ERATORS (optional)

Extra aeration in the clean water storage is necessary when the total volume in the storage is more than the average usage per hour, in this case the oxygen volume can drop below 50%, and extra aeration in this case will prevent odour. Installation instructions are added in the optional package. Order number R210220.

5.7 *MAIN ELECTRICAL CONNECTIONS* (see electrical schematic)

1. Connect 4 core cable from submersible pump to electrical control panel
2. Connect 2 core cable from the float switch to electrical control panel.
3. Connect 4 core + earth Main supply from wall mounted isolator to electrical control panel.

5.8 *PRE COMMISSIONING CHECKS*

1. Check the power on the incoming connector, and compare this with the electrical specification on the front page of this manual.
2. Make sure all internal switches and thermal overload's are in "off" position before the main switch is in the ON position.
3. Switch on the (small) safety switches and checks the power on the transformer; this should be 24 Volt.
4. Make sure all valves connected to the blower outlet are fully open and switch on the blower thermal overload for a short period (2 seconds) and check the rotation on the blower. The right rotation is marked with an arrow on the side of the blower, if the rotation is all right the thermal overload can be switched on permanent.
5. Switch on the thermal overload of the grinder pump and check the cyclone for leakage, the incoming pressure must be between 2 and 3 Bar on the gauge, if this pressure is lower change the rotation on the grinder pump and check again.
6. The airflow setting are only possible if the bioreactor(s) are filled up completely, the setting to each reactor must be between 2 and 2,5 m³/h.
7. The valve to the LB aerator can be used to give less air volume into the aeration pit, ideal is to keep this valve maximum open.
8. Set the SR20 dosage to get the right timing read Add. 01 "Timer dosing pump settings".

NOTE:

If the amber lamp is illuminated on the electrical panel indicating that the dosing tank is empty when it is full, then the level switch in the tank needs to be reversed. Remove the switch from the dosing tank and remove the plastic clip retaining the float on the end of the tube. Slide the float off the end and replace the opposite way round and replace the retaining clip. To check, the lamp should be on with the float in the down position.

5.9 *COMMISSIONING THE SYSTEM*

1. Fill in the commissioning data list and check the order confirmation
2. Hand over the manual and electrical drawing to the owner or manager and let him sign the appropriate forms for acceptance.
3. Train the site manager to do the checks and hand over the check forms.

Inform the site staff that because bacteria need a start up period, the recycled water quality will not be at its best for at least 3 to 4 days.

5.10 PARTS REQUIRED FOR INSTALLATION FOR 1 BIONIC REACTOR

NOTE:

These parts are not in the standard delivery of a Bionic system and have to be ordered separately.

Description	Qty
Stainless steel Jubilee Clips	5
Enclosure IP65 100x100x50 mm	2
Cable 2 core (float switch)	Ordered length
Cable 4 core + earth 2,5 mm ² , pump	Ordered length
Spiro hose 32 mm, aerator	Ordered length
Spiro hose 40 or 50 mm, grinderpump	Ordered length
Spiro hose min. 50 mm, cyclone return	Ordered length
Stainless steel chain 6 mm	Ordered length
Tie wraps	x

6. CONTROL

The BIONIC system is a full automatic operating unit and is controlled by the electric cabinet on the service frame. There can be chosen for two operation modes:

Automatic:

Submersible pump stops ONLY at the moment that the float switch is activated.



WARNING

If the water supply to the tank stops for a longer period, the quality of the treated water can decrease.

Off:

Submersible pump is not operating, only the aerator is operating.



WARNING

The recycle water tank is not being filled with water.

6.1 CONTROL PANEL

Main switch

The main switch is located on the control panel door and switches the main power of the unit. The switch can be locked for maintenance purposes.

Function indicator lamps

If the system is active, the relevant green function lamp will be lit to show the status of the unit.

Failure indicator lamps

If a failure occurs, one or more lamps will be lit to show the status of the unit. When the cause of the failure is solved, the lamp will turn off. Red for thermal failure of the air blower or submergible grinderpump, yellow for low level of the Rowafil nutrient 10 Ltr can.



6.2 OPERATION

Running conditions

The following conditions have to be "true" to operate:

- The function indicator lamp "POWER" is lit;
- The level switch in the aeration pit must be on(enough water to process);
- No failure indicator lamp is lit.

7. MAINTENANCE

This chapter specifies periodical maintenance for the BIONIC system and the frequency per activity. The specified maintenance is essential to ensure a long and reliable life of the BIONIC system.

Only authorised personnel should, perform all maintenance and repairs to the BIONIC system.



WARNING

The BIONIC system is designed for working in a frost-free area. In case the system freezes, it has to be completely checked on functioning.

7.1 SAFETY RULES DURING MAINTENANCE AND REPAIR



WARNING

Maintenance is only to be carried out with machine switched off. The main switch to be locked with a padlock and labelled that switching on is not allowed. This unless mentioned otherwise in this manual.

7.1.1 OPERATORS AND MAINTENANCE PERSONNEL

- *Training .It's the responsibility of the owner to train and instruct the authorized personnel and to authorize operating and maintenance operations.*
- All persons working on- or with the machine must be trained and authorised for their job.
- All persons working on- or with the machine must be familiar in detail with this manual and be capable to work according the given instructions

Health

0. Safety protection as gloves, clothes, glasses and other by local authorities prescribed necessities available at any time for operating, maintaining and other with the machine involved persons.



WARNING

It is strictly prohibited to smoke, eat or drink during operation, maintenance or other installation of the unit.

7.1.2 MACHINE

Safety

- All safety provisions like safety switches, covers etc. must not be removed or modified in any way without prior written permission of iClean Carwash Technologies B.V.
-



DANGER

The unit is **NEVER** to be operated with any of the safety provisions or the safety system as a whole or partially out of use. All safety provisions like safety switches, covers should not be removed or modified without the written permission of iClean Carwash Technologies B.V.

- The control panel is provided with a lockable door. This door always has to be closed and may only be opened by authorised persons aware of the danger of electrical equipment and handling within the relevant instructions within this manual.
-



DANGER

The treated water is **NOT DRINKING WATER QUALITY!**



WARNING

Movement, placement and commissioning are delicate and critical and have to be carried out accurate. These points not carried out properly can give dangerous situations for human beings, environment or machine

Maintenance

- Maintenance only to be carried out with machine switched off. The main switch to be locked with a padlock and labelled that switching on is not allowed. This unless mentioned otherwise in this manual.

7.2 MAINTENANCE

EVERY 90 DAYS / ON ARRIVAL TO SITE

1. Replace air intake filter (Figure 7-1)

Method

Unscrew the top and remove the black cover, renew the air filter and check the air intake pipe fore any blockage. Refit the black cover and check function.



Figure 7-1 Air intake filter

2. Replace 10 litres Dosing tank SR20 and make shore there is no air in the suction hose.
3. Examine SR20 dosing pump delivery tube for signs of perishing. If so, they have to be replaced.

7.3 WATER QUALITY - CLEAN WATER TANK

Check water for:

Clarity	-	water should be transparent and clear. It may have a light colouring (depending on the chemicals used);
Smell	-	there should be no bad smell;
Particle biomass	-	can be present - will disappear when sample is shaken;
Oxygen level	-	> 2 mg/ltr;
pH	-	between 6 and 8,5;
µS	-	< 2.000.

7.4 AERATION PIT

1. Switch off system and pull pump out of the pit;
2. Clean suction ports on the pump of any debris or sludge build up, removing the bottom plate if necessary;
3. Check for mechanical damage;
4. Replace the oil inside the grinderpump once a year (SAE 10 W / Shell Tellus S37);
5. Check aerator; clean aerator surface of any sludge build up if necessary replace the filter membrane (max use 24 months).

7.5 WATER QUALITY – AERATION TANK

Check water for:

- | | | |
|-------------------|---|--|
| Clarity | - | water should be to dark grey opaque; |
| Smell | - | there should be no bad smell; |
| Particles biomass | - | lamp to medium particle concentration; |
| Oxygen level | - | > 2 mg/ltr. |

8. TROUBLE SHOOTING

8.1 TRACING AND REPAIR OF FAILURES

This chapter gives guidelines for tracing and if possible, solving of failures. Maintenance is only to be carried out with machine switched off. The main switch to be locked with a padlock and labelled that switching on is not allowed. This unless mentioned otherwise in this manual.

During inspection and repairs, all safety, health and operational prescriptions within this document strictly to be observed.

8.2 RESET AFTER FAILURE

In case of failure, one or more failure indicator lamps will be illuminated. After solving the cause of failure the specific failure lamp will stop. The unit can be started again.

8.3 TROUBLE SHOOTING

The complete trouble shoot list is continuous updated, the list is part of the machine book under Add Trouble shooting list.

9. REMOVING THE SYSTEM

Removing of the BIONIC system should be done by a iClean Carwash Technologies B.V. employee or official Rowafil dealer or subsidiary.



DANGER

iClean Carwash Technologies B.V. accept no liability or responsibility for injury, damage to existing equipment, or to property through improper removal of the system by untrained or unauthorised personnel.

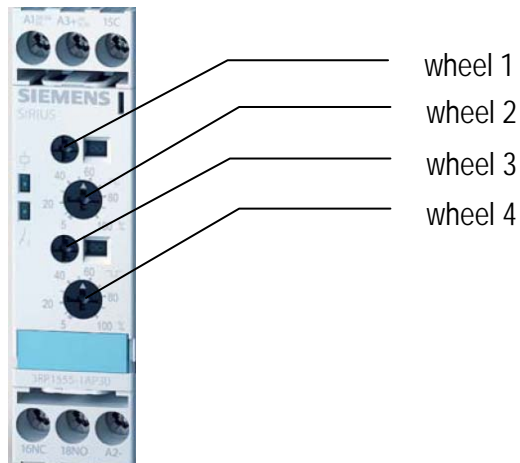
ADD 01. TIMER DOSING PUMP SETTING

NOTE:

The blue external dosing pump for a Bionic must pump the Rowafil SR20 nutrient (can of 10 ltr) following the below mentioned quantity:

System	Quantity SR20	Timer setting in control cabinet	
		"On"	"Off"
Bionic 20	1,7 ltr per month (= 1 can per 6 months)	wheel 1: 30s wheel 2: 50%	wheel 3: 30m wheel 4: 100%
Bionic 40	2,0 ltr per month (= 1 can per 5 months)	wheel 1: 30s wheel 2: 60%	wheel 3: 30m wheel 4: 100%
Bionic 60	2,5 ltr per month (= 1 can per 4 months)	wheel 1: 30s wheel 2: 70%	wheel 3: 30m wheel 4: 100%
Bionic 80	3,3 ltr per month (= 1 can per 3 months)	wheel 1: 30s wheel 2: 100%	wheel 3: 30m wheel 4: 100%
Bionic 100	5,0 ltr per month (= 1 can per 2 months)	wheel 1: 1m wheel 2: 70%	wheel 3: 30m wheel 4: 100%
Bionic 120	5,0 ltr per month (= 1 can per 2 months)	wheel 1: 1m wheel 2: 70%	wheel 3: 30m wheel 4: 100%
Bionic 140	5,0 ltr per month (= 1 can per 2 months)	wheel 1: 1m wheel 2: 70%	wheel 3: 30m wheel 4: 100%
Bionic 160	5,0 ltr per month (= 1 can per 2 months)	wheel 1: 1m wheel 2: 70%	wheel 3: 30m wheel 4: 100%

Timer in control cabinet:



ADD 02. TROUBLE SHOOTING LIST

No.	FAILURE	CAUSE	ACTION
1	Failure lamp "Dosing pump out" burn	1. Dosing tank empty 2. Level indicator stuck 3. Dosing pump defect	1. Replace 2. Clean 3. Repair
2	Failure lamp "Thermal failure" burns	1. Phase fall out 2. Motor defect 3. Relais defect	1. Repair / turn on 2. Replace motor 3. Reset en restart
3	Pressure of the grinder too low	1. Wrong turning direction	1. Check turning direction 2. Change phases
4	No, or too little, water flow	1. Too little water in the stripper pit 2. Flow switch defect 3. Cyclone clogged 4. Entrance of the bio-reactor is blocked	1. Check water level 2. Check the water valve 3. Change the switch to manual and check if the pump is running now. 4. Clean the cyclone
5	Air flow in the biotank is not adjustable	1. The tap of the LB aerator is too far open	1. Adjust the tap
6	Dosing is not correct	1. Timer is set wrongly 2. Pump is running, but gives no product	1. Adjust the timer 2. Check/replace the hose Or none return valve
7	For all other failures, please contact your supplier		