OPERATING- INSTALLATION & MAINTENACE MANUAL ECOLIT 400 – PM

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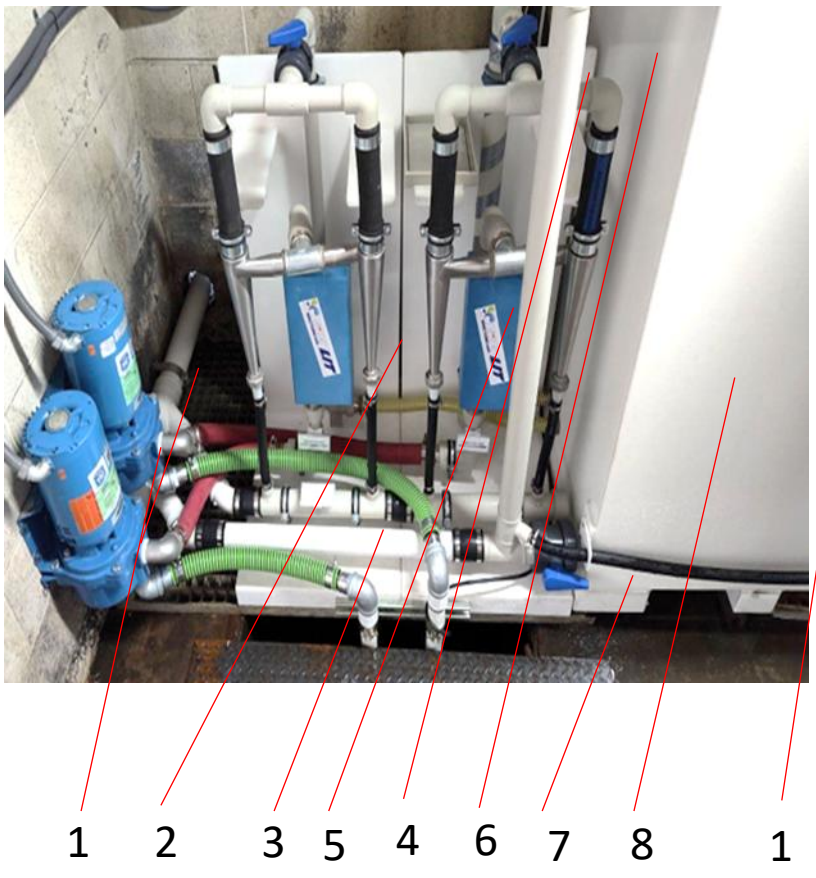
1 MAINTENANCE INTERVALS

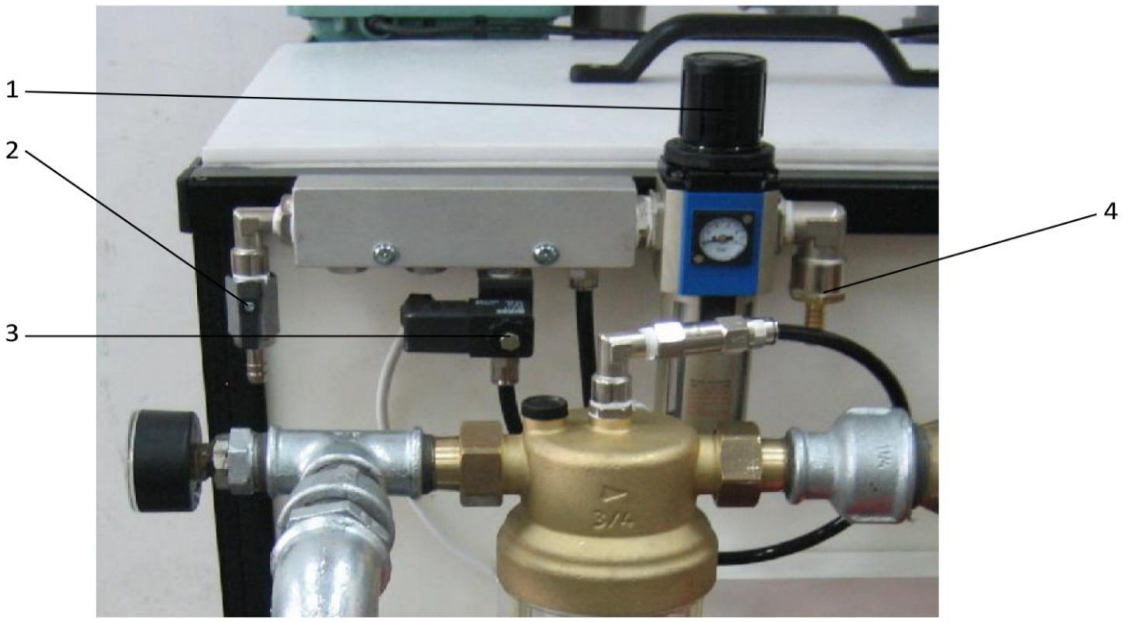
Description	Interval	Action
Function of the filter back flushing	Every 6 month	Checking the adjustment of the pressure switch: The back flush should be activated when the water flow stops, after every car wash or when the buffer tank is completely filled.
Adjustment of the dissolved air flotation membrane	Every 6 month	Adjust the valve "compressed air to flotation membrane" that small turbulences appear on the water surface
Function of the high voltage electrode	Every 6 month	Checking if the light on the electrode is turned on and if the m-ampere meter indicates between 0.10 and 1.00 amperes.
Checking the switching points of the pressure pump	Every 6 months	Switch-on pressure: 50 PSI = 3.5 bar = 3.5 Kg/cm^2 Switch-off pressure: 65 PSI = 4.5 bar = 4.5 Kg/cm^2
Cleaning the high voltage electrode	Every 6 month	Cleaning the rod of the high voltage electrode
Cleaning the cyclone	Every 6 month	Cleaning the jet of the cyclone
Checking the pressure in the air dome	Every 6 months	Adjust air pressure to be 36 PSI = 3.5 bar = 2.5 Kg/cm^2
Cleaning the fine filter	On demand (app. every 6 month)	If the fine filter is completely clogged up (no water pressure after the filter), the fine filter need to be cleaned by taking it out.
Cleaning the screen of the pump in the underground tank	Every 6 months	Cleaning the screen of the sludge pump by opening the "compressed air pipe for back-flushing the screen of the sludge pump" valve
Cleaning the reactor tank	After one year	Cleaning the inside of the reactor tank
Adjustment of the air regulator	Once a year	Adjust the pressure of the air regulator to 94 PSI = 6.5 bar = 6.5 Kg/cm^2
Release water from the air regulator	On demand	Open the valve at the bottom of the air regulator to release the separated water

2 Description of the parts of the recycling unit

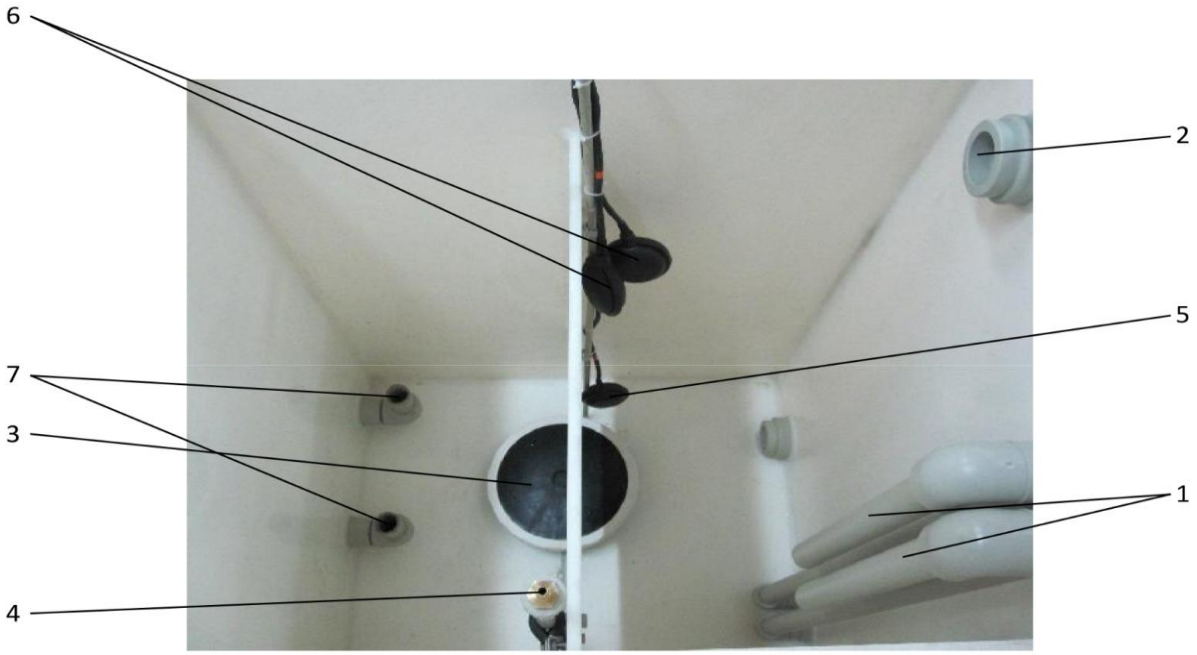
Left side		Right side	
1	Supply Pumps	1	Air Extractor Valve
2	Freylit Water Stabilizer	2	Water Meter
3	Exit line to Silt Chamber	3	Delivery Pumps
4	Ball Valves to regulate flow through the cyclones and the HVE	4	Activated Carbon Filters
5	Hydro-cyclones	5	Air Expansion Tank
6	High Voltage Electrode	6	
7	Ball Valve to empty Reactor Tank	7	
8	Reactor Tank	8	
9		9	
10		10	



Compressed air manifold	
1	Air regulator
2	Ball valve compressed air for back-flushing the screen of the sludge pump
3	Solenoid valve compressed air for filter back flush
4	Compressed air from compressor



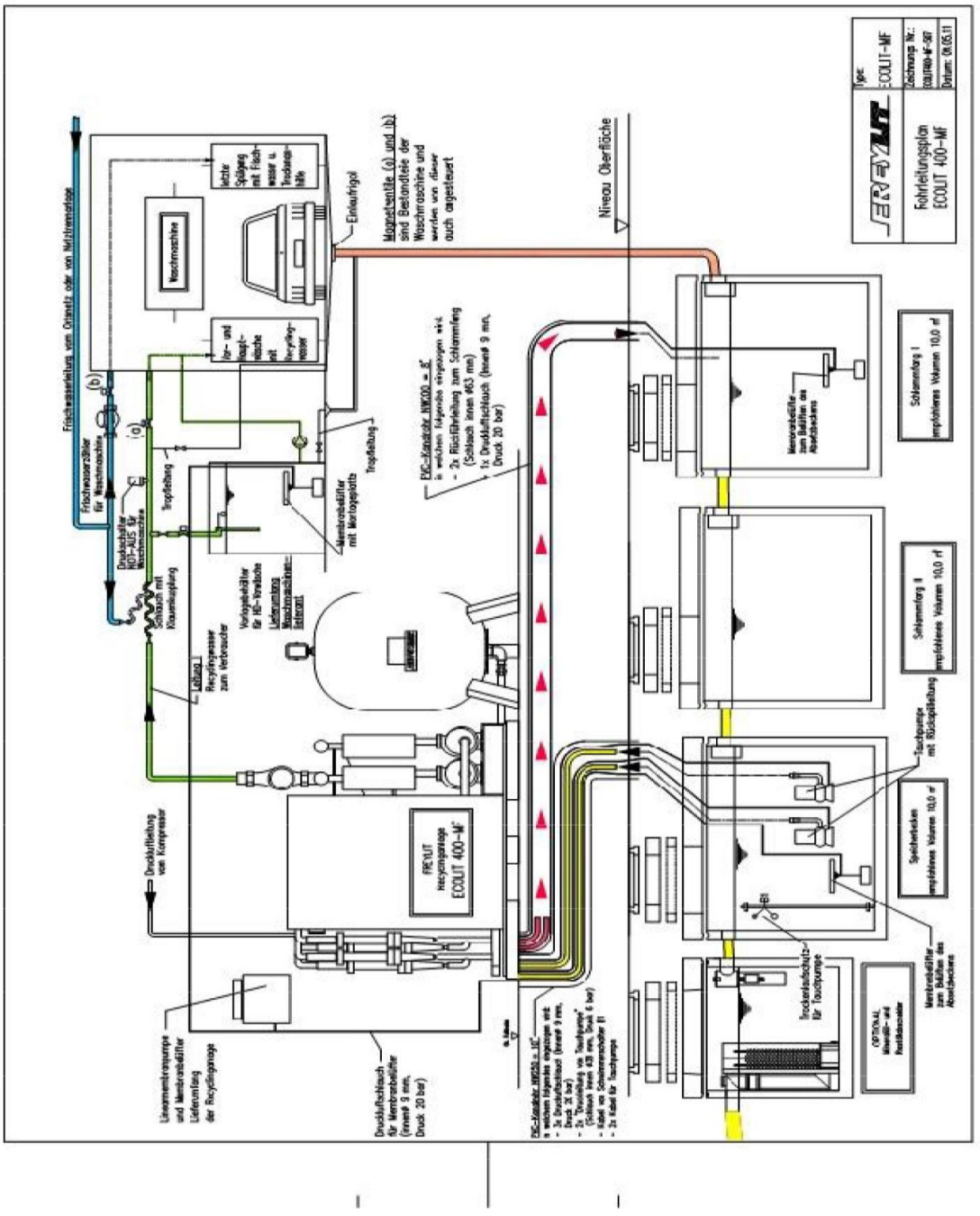
Inside the reactor tank	
1	Water inflow into the reactor tank
2	Overflow to underground tank
3	Flotation membrane
4	Air pipe to flotation membrane
5	Float switch B2 “dry run protection for pressure pump”
6	Float switch B3 and B4 “float switch filling the reactor tank”
7	Suction pipe for pressure pump



The sludge pumps are switched ON and OFF by the float switches B3 and B4. Additionally one sludge pump is also controlled by a time relay inside the control panel. The flotation membrane brings small solid particles and dirt to the water surface of the reactor tank. In order to remove this dirt, the time relay switches the sludge pump at regular intervals. The sludge pump will be turned ON for 30 minutes and will be turned OFF for 15 minutes. This causes the collected dirt on the water surface to overflow and exit into the underground tank.

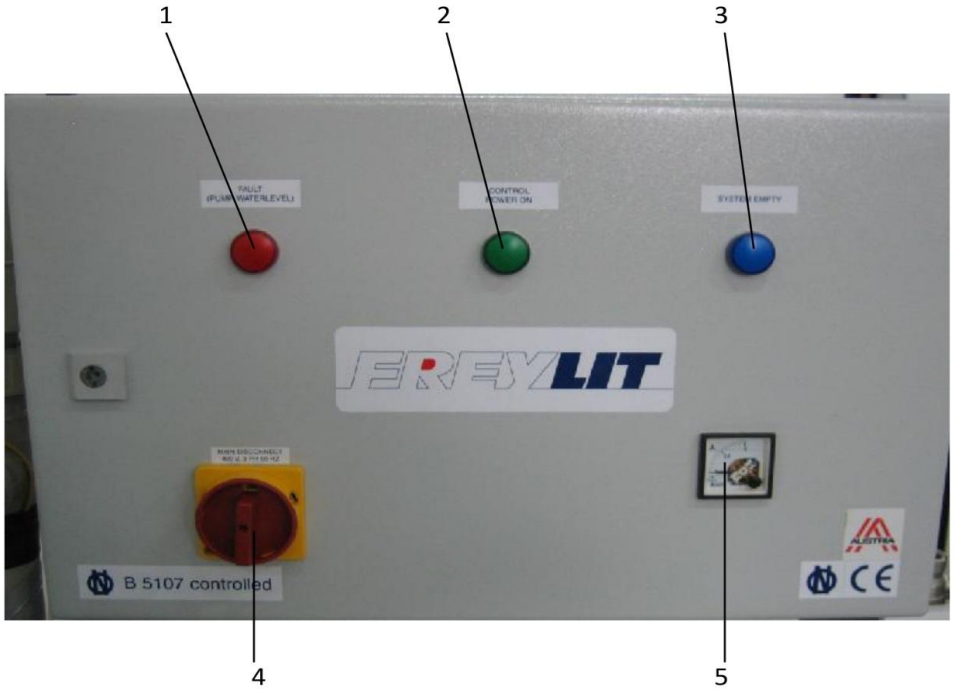
The pressure pumps of the recycling unit are activated when the water level rises inside the reactor tank and the float switch B2 has reaches its highest position.

3 Connection diagram



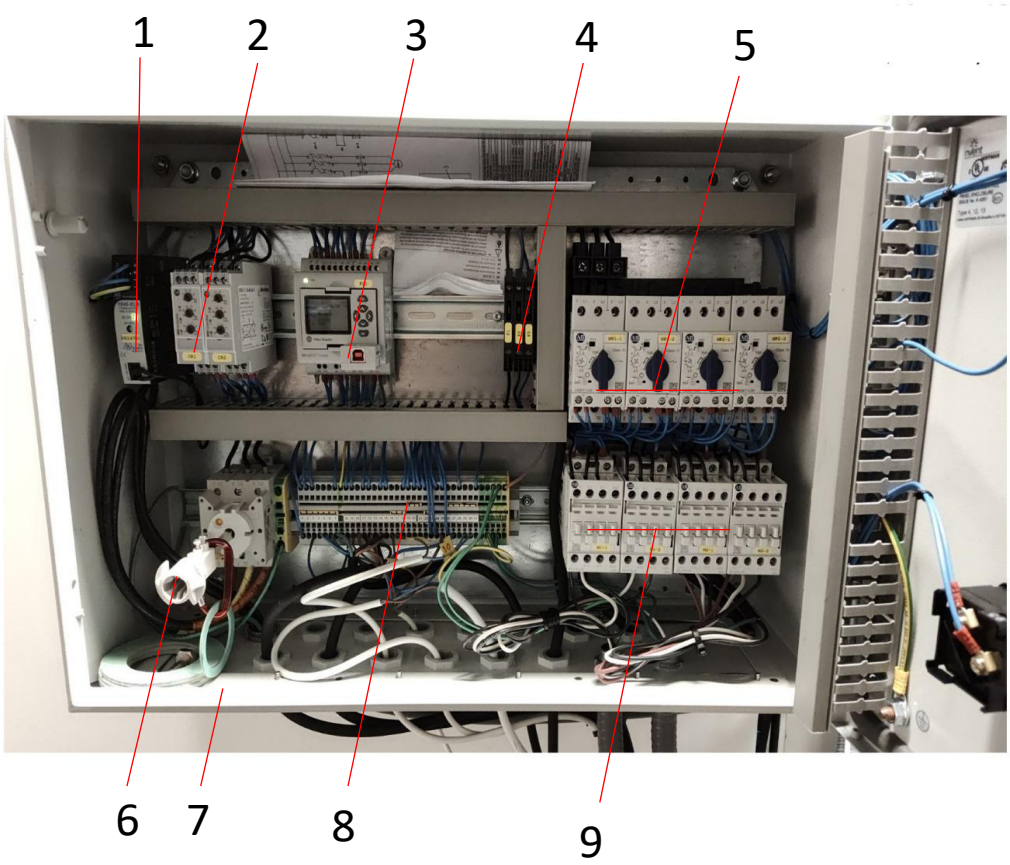
4 Control panel

	Outside	
1	Red light “pump fault”	Activated if a motor protective switch of one of the pumps has turned off a pump
2	Green light “control power on”	Activated when the electric current is available and the main switch is on
3	Blue light “system empty”	Activated when the underground tank is empty and the float switch B1 “dry run protection for sludge pump” has reached its lowest position
4	Main switch	To turn the power of the recycling unit on
5	Ampere meter for high voltage electrode	To detect the current draw of the high voltage electrode



The transformer inside the control panel supplies the high voltage electrode (HVE) with electric current of 24 Volt DC. The HVE is always in operation in the control lamp on the HVE is ON. The HVE is operating correctly when the Ampere meter indicates an amp draw between 0,1 to 1 Ampere.

	Inside	
1	Step down Transformer	24 VDC for control of the recycling unit and the HVE
2	Current Relay	For sludge pump to prevent from dry run
3	Microprocessor	Allan Bradley Processor
4	Fuse for Transformer	2 Ampere
5	Motor starter protective switch	For Supply Pumps and Pressure Pumps
6	Main Switch	Power supply to the recycling unit
7	Control Cabinet	
8	Relay Bar	Controls for floats, pressure switch, back flushing, etc
9	Contactor	For Supply Pumps and Pressure Pumps



5 Description and Function of the recycling system

For installing an ECOLIT recycling system it is necessary that the capacity of your underground waste water tank or car wash pit (silt chamber) should have a minimum volume of 10 m³. We recommend a volume of **20 m³ or larger**. The minimum recommended **water depth is 120 cm**. If these dimensions cannot be met at the site then an above ground silt chamber can be used, which draws from a sludge pump placed in a small pump sump.

The used wash water first flows out of the car-wash into a collection pit, from where it flows through a sewer pipe into the silt chamber. Any large solid particles present in the water will settle in this tank.

A float switch **(B1)** and two **sludge pumps** are installed in the underground tank.

These pumps deliver the water through the ***pipes "pressure pipe from sludge pump"*** to the recycling unit.

There it passes through the ***FREYLIT* water stabilizer,** the **cyclones** and a **high voltage electrode** into the **reactor tank** of the ECOLIT recycling unit.

Inside the reactor tank three float switches **(B2, B3 and B4)** and a **flotation membrane** are installed.

When the car wash machine demands water, recycled water is pumped by two **pressure pumps** out of the reactor tank through the **fine filters** (with an automatic back flush device) to the car wash machine. This process is automatically controlled.

The filtered and degermed water is delivered under an average pressure (4 bar), through ***pipe "recycled water to consumer",*** to the car wash for re-using. A **water meter** is installed in this pipe to monitor the amount of recycled water delivered for use in the car wash.

Recycled water can be used in the car wash for all pre-wash, main-wash and high-pressure-wash requirements.

The final rinse cycle, into which the drying agent or wax is added, should be carried out with fresh water from the local water supply. The car wash machine switches back and forth between recycled water and fresh water as needed by the different wash cycles independently of the recycling unit.

IMPORTANT:

When installing a car wash, ensure that it is equipped with ***two water inlet connections***:

- one for recycled water
- and another for fresh water

We recommend installing a water meter in the fresh water pipe from the local water supply to the car wash to monitor the amount of fresh water which was used in the car wash.

When a wash cycle begins, the water pressure in ***pipe "recycled water to consumer"*** on the ECOLIT Recycling unit drops from 4,5 to 3,5 bar.

If the minimum pressure is reached, the **pressure switch** on the ECOLIT Recycling unit activates the pressure pumps, which feed recycled water through the fine filters to the car wash, at a pressure of app. 4 bar.

When the wash cycle ends the pressure switch on the ECOLIT Recycling unit will stop the pressure pumps again once the maximum pressure of 4,5 bar is reached.

This process is repeated for each wash cycle.

To prevent the sludge pumps from running dry (at initial start-up or due to leaks), a float switch B1 is installed in the underground tank. This switch automatically stops the sludge pumps if the water level in the underground tank drops below the allowed minimum level.

The electric cable for float switch B1 and the electric cables for the sludge pumps run through a PVC drain pipe installed from the underground tank to the ECOLIT Recycling unit.

Two compressed-air hoses, which are installed between the back-flushing pipes of the sludge pumps and ***pipe "compressed-air air for back-flushing the screen of the sludge pump"*** on the recycling unit, also pass through this PVC drain pipe**.** The compressed air hoses are required for cleaning the screen of the sludge pumps during maintenance.

To prevent the pressure pumps from running dry (at initial start-up) a float switch (B2) is installed in the reactor tank. This switch automatically deactivates the pressure pumps if the water level inside the reactor tank falls below the allowed minimum water level.

The float switches B3 and B4, which are installed in the reactor tank, activate or deactivate the sludge pumps in the underground tank.

Automatic Back-Flush of the fine filter

The recycling unit is equipped with fine filters which are automatically back-flushed.

This back-flush mechanism is programmed to proceed after each car wash process automatically. It will be activated by a pressure switch. A signal will be sent by the pressure switch to a time relay, which will open the pneumatic back-flush valve for 20 seconds.

Description of the Cyclone

Before the water reaches the reactor tank it passes through hydro-cyclones. Here larger suspended solids are separated and returned to the sit chamber.

Description of the High Voltage Electrode

After the hydro-cyclone the recycling water passes through a pipe which is equipped with a high voltage electrode. Here a high voltage energy field is created which causes flocculation of the suspended solids and has an anti-algae effect.

Description of the flotation membrane

By means of the flotation membrane which is installed at the bottom of the reactor tank the flakes created by the high voltage electrode are floated. These flakes or dirt layer on the water surface in the reactor tank is drained periodically to the sit chamber.

Description of the FREYLIT Water Stabilizer

The Water Stabilizer works by a physio-kinetic process and does not need electricity, chemicals or maintenance. The water stabilization process is achieved by passing the water through a double walled cylinder, which contains a high - energetic medium. As the water flows through the Water Stabilizer, the water molecules are excited and the oxygen contained in the water is activated. The development of germs and bacteria in the recycled water is thereby prevented.

RECYCLING RATE

The recycling unit *ECOLIT* can recycle 100% of the used car wash water which is collected in the storage tank. However, not all of the water which is used in the car wash process ends up in the drains to the underground tanks. On average some 10%-20% of the wash water is lost due to evaporation and carry out at the car wash. This loss of water varies depending on weather conditions (wind, temperature,...) and type of cars and must be compensated by adding fresh water into the system. For example if a car wash uses 100 litres of water, on average only 85% or approx. 85 litres will end up in the underground tanks. This coincides approximately with the ration of wash water to rinse water used in common car wash machines. Therefore, the FREYLIT system will supply recycled water for the pre-wash, under chassis wash and any wash cycles, while the final rinse cycle is done with fresh water. This way the water lost from the system with every vehicle wash process is compensated for and there is only minimal discharge of overflow to the sewer.

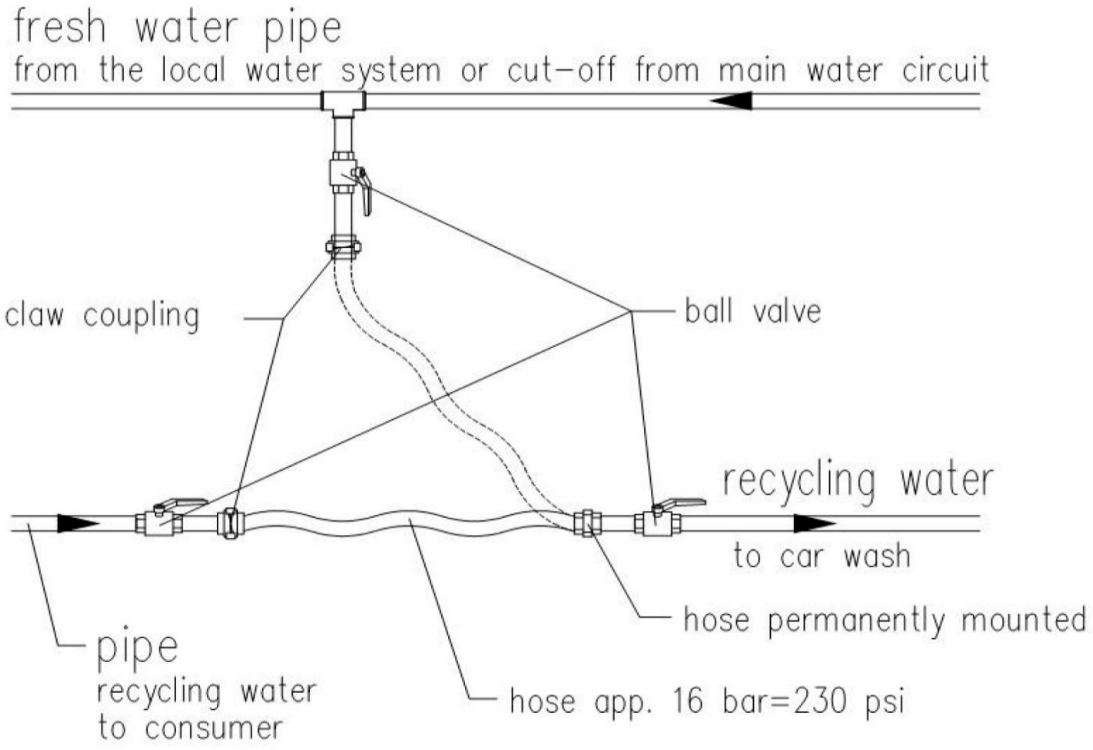
The actual recycling rate is determined by the ratio between recycled and fresh water use. This is, however, controlled by the settings of the car wash machine itself. If, for example, 80 litres of water are used for the pre-wash and main wash cycle, and 20 litres are used for the final rinse cycle, then the resulting recycling rate in this particular case is only 80 %.

6 Freshwater switching option

To maintain the washing operation during maintenance or breakdown of the recycling unit it is possible to switch the car wash from recycling water to fresh water.

Furthermore, it is possible to switch the car wash from recycling water to fresh water during wintertime, if the salt content is too high.

This switching option should be installed during the installation of the recycling unit by a plumber.



7 Winteroperation

During wintertime operation in cold countries, if salt is used on the roads as an anti-freeze agent, the salt content of the recycled water can raise.

Remarks:
The salt content of the wash water does not affect the operation of the FREYLIT recycling unit.

However, our experience has shown that a high salt content in the recycled water interferes negatively with the drying results achieved. This depends mainly on the drying chemicals which are used.

During wintertime the salt content should be measured by using a conductivity meter every 3 days.

The highest permissible salt content value in micro Siemens (µS/cm) is given by:
the washing machine supplier
or the supplier of the vehicle care chemicals.

If the recommended maximum salt content value is exceeded, then the recycling water in the system must be diluted with fresh water.

To reduce the salt content in the recycling water the vehicle washing operation can be switched from recycled water to fresh water for one to two days, until the salt content recommended by the supplier of your vehicle wash machine and chemicals is reached.

ATTENTION !

While the vehicle washing machine is operating with fresh water only, the recycling unit must remain turned on, otherwise the degerming process is interrupted and bacteria will develop in the system. (This means that the colour of the water will turn black and bad odor will develop)

When the desired salt content has been reached switch the vehicle washing machine back from fresh water operation to recycling water operation.

8 Installation

8.1 Pre-requisites for the installation of a wash water recycling system

8.1.1 Underground tanks

The used wash water from the vehicle wash bay must be directed to an underground tank or pit. This tank is called the silt chamber and should have a minimum volume of 10m³ (recommended is a volume of 20m³ or more). This tank functions as a silt settlement and collection tank, where heavy solids settle to the bottom.

It is recommended to have a second underground tank, downstream after the silt chamber, which functions as the untreated water storage tank. This should also have a volume of 10m³. Untreated water is delivered by means of a submersible sludge pump to the recycling system located above grade.

If it cannot be avoided, the silt chamber and storage tank can be combined into one vessel only. However, this may affect the quality of the recycled water.

A third underground tank may be installed downstream after the storage tank to be used as oil/water separator. Only the overflow excess water from the storage tank is directed through the oil separator for the removal of any residual oil before discharging into the public sewer in accordance with any local regulations mandating the use of oil separators.

8.1.2 Underground piping

A sewer pipe with diameter DN200 is to be installed connecting the silt chamber to the plant room where the recycling system is located.

A second sewer pipe with diameter DN250 is to be installed connecting the storage tank to the plant room where the recycling system is located.

The pipes are used to house hoses and cables to connect the recycling system.

N.B. When installing the above mentioned sewer pipes no 90° elbows should be used. Use 2 times 45° elbows to go around corners, otherwise the hoses and cables cannot be installed into these pipes.

Alternative option to points 1 & 2 above:

In case no underground tanks can be constructed, or for retrofitting existing vehicle wash facilities, while avoiding additional civil works, it is possible to use above ground silt chamber and storage tank. In this case it is only necessary to capture the used wash water in a pup sump and deliver it by submersible sludge pump to the silt chamber & storage tank located above ground.

8.1.3 Car Wash Equipment

The car wash machine must be equipped with two water inlet connections. One for recycled water used in the pre-wash and mail wash cycles, and one for the final rinse which uses fresh water.

In manual high pressure wash bays, the pre- and main wash cycles use recycled water, while the final rinse is done with fresh water.

8.1.4 Plant room (location where the recycling system is installed)

The recycling system should be connected to its own independent power supply, since the system remains in automatic operation 24 hours per day. The stand-by mode water circulation must continue, even when no vehicles are being washed to avoid the accumulation of bacteria in the wash water.

For conducting maintenance work on the recycling system a compressed air connection near the recycling system is needed.

The space requirements of the recycling system vary according to the model. Please see the data sheet of the particular model to be installed.

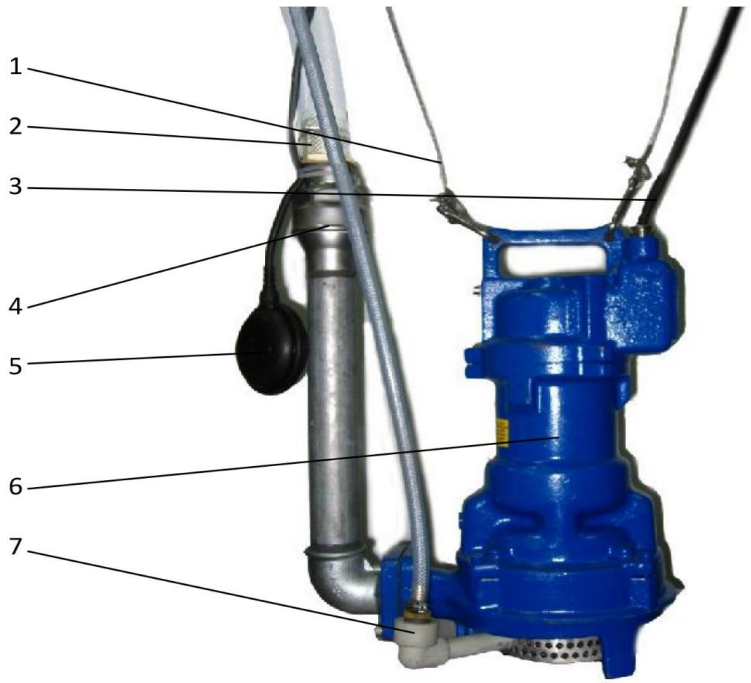
8.1.5 Wash Chemicals

The wash chemicals used must be recyclable, which means that no adverse chemical reaction occurs when the different wash chemicals are mixed together. Particular care must be taken when using different types of chemicals which ended up mixed together in the recycled water (this includes chemicals for cleaning the wash bay itself).

It is best to contact your supplier of wash chemicals to inform them that a recycling system will be used and their products should be compatible.

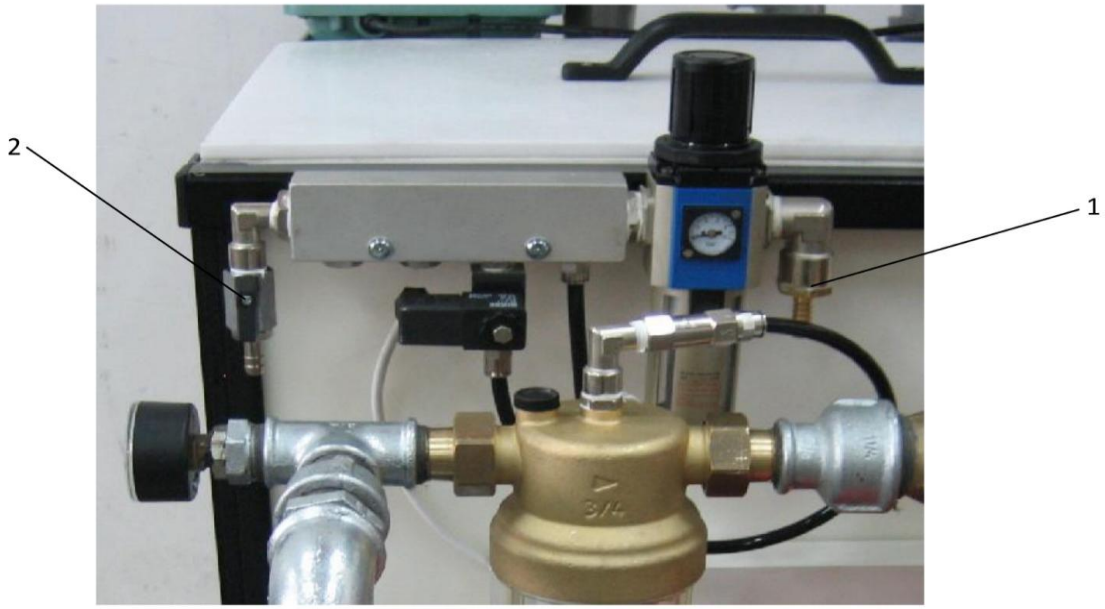
8.2 Installation of the sludge pumps in the storage tank

Sludge pump		
1	Cable mounting for sludge pump	Stainless steel cables have to be mounted with screws in the underground tank and adjusted to the correct length. The pump should be hanging in the lower third of the tank. However, the float switch in upper position must be at least 5 cm below the water level.
2	Pressure pipe between sludge pump and recycling unit	A hose (inner diameter 38mm, 6 bar) must be installed from the storage tank through an underground pipe in the equipment room to the recycling unit.
3	Power cable of sludge pump	The pump is equipped with a 30 meter cable. This cable must be installed from the storage tank through an underground pipe in the equipment room to the recycling unit.
4	Non return valve	Non return valve of the sludge pump
5	Float switch “dry run protection for sludge pump”	The float switch is equipped with a 30 meter cable. This cable must be installed from the storage tank through an underground pipe in the equipment room to the recycling unit.
6	Sludge pump	The sludge pump delivers water from the storage tank to the recycling unit in the equipment room.
7	back-flushing pipe to clean the screen of the sludge pump	A hose (inner diameter 9 mm, 20 bar) must be installed from the storage tank through an underground pipe in the equipment room to the recycling unit.



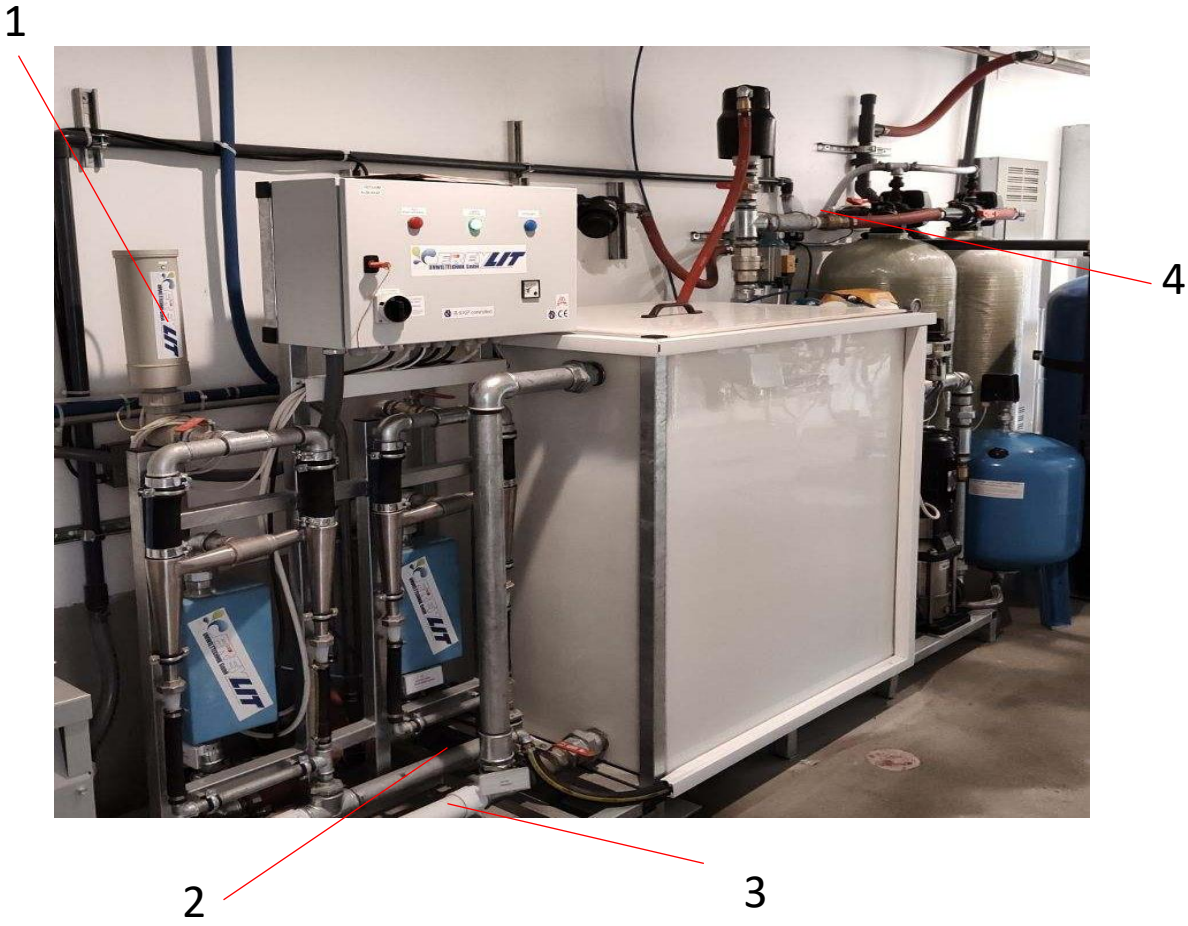
8.3 Installation of the compressed air pipe for back-flushing the screen of the sludge pump

Compressed air manifold	
1	Compressed air from compressor
2	Pressure hose (inner diameter 9 mm, 20 bar) must be connected to the back-flushing pipe of the sludge pump in the storage tank.



8.4 Pipe installation on the recycling unit

Recycling unit		
1	High voltage electrode (HVE	In Order top avoid damage during transp[ort the HVE is Dismantled and must be installed into the PP pipe Before commissioning. The reinforcement of the HVE must be removed and the union must be tightened. The ground wire of the HVE must be connected with the PP Pipe .
2	Pressure pipe between the sludge pump and the recycling unit	Two hoses (inner diameter 38mm, 6 bar) must be Installed from the storage tank through an Underground pipe in the equipment room to the recycling unit.
3	Drain pipe into silt chamber	This pipe must be connected to the recycling water Supply of the vehicle washing machine. A freshwater switching option should be installed
4	Recycled water to consumer	Two hoses (inner diameter 63) must be installed from The storage tank through an underground pipe in the Equipment room to the recycling unit.



8.5 Installation of the flotation membrane inside the storage tank

The supplied flotation membranes have to be assembled as shown below and placed at the bottom of the silt chamber and storage tank. It is important to ensure that the flotation membrane is not placed directly below the sludge pumps.

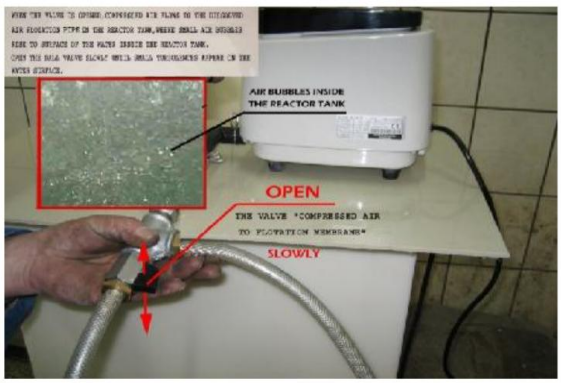
A hose (inner diameter 9 mm, 20 bar) must be installed from the silt chamber and from the storage tank through an underground pipe in the equipment room to the recycling system and connected to the linear air compressor.

8.6 Connection of the flotation membranes

One flotation membrane is installed inside the reactor tank, a second one is installed inside the silt chamber and a third one inside the storage tank.

The air supply to the membranes comes from a linear air compressor. One air line is installed into the silt chamber, a second one into the storage tank and a third one is installed into the reactor tank. The air line into the reactor tank is equipped with a ball valve to regulate the air flow.

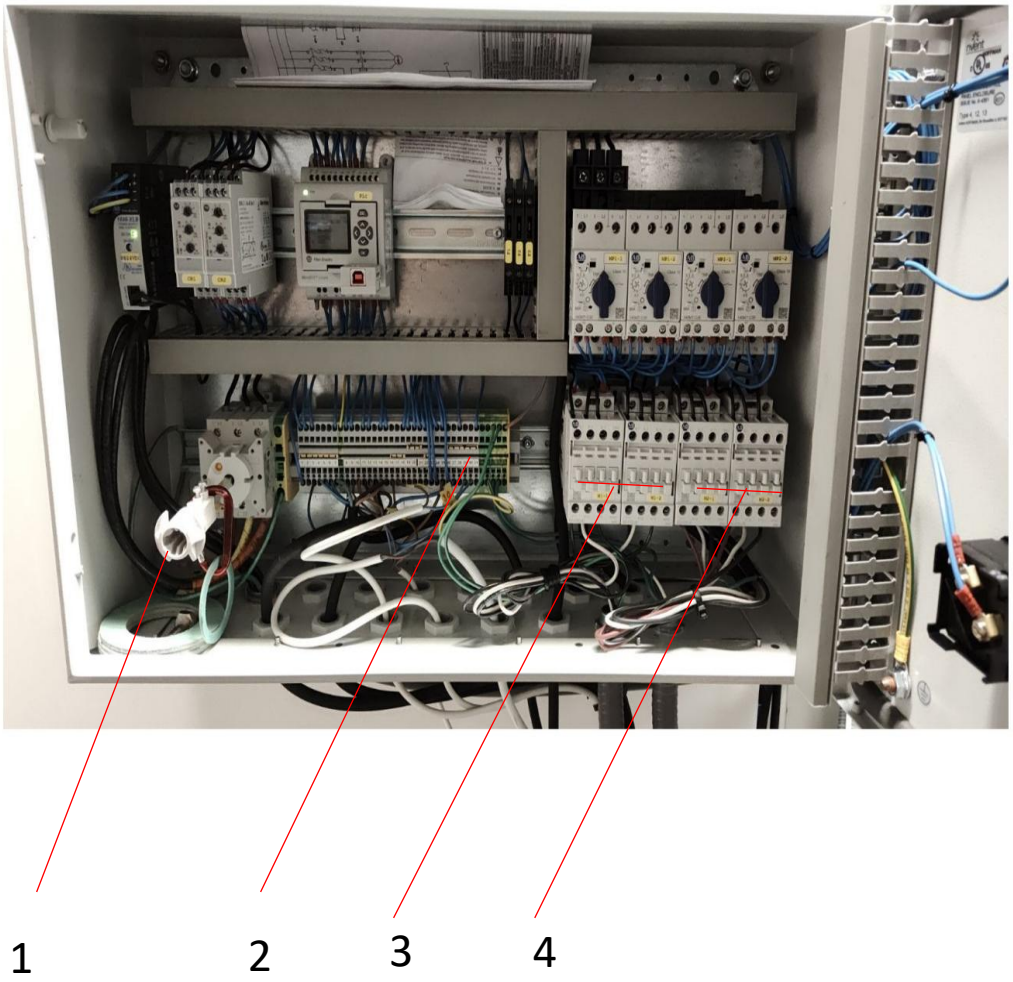
When the ball valve is opened, air flows to the dissolved air flotation membrane inside the reactor tank, where small air bubbles rise to the water surface. The ball valve should be opened slowly, until small turbulences appear on the water surface.



8.7 Electrical installation of the recycling unit

Control panel inside		
1	Main Switch	Power Supply for the recycling unit, connection data according to wiring diagram inside control panel
2	Terminals for float switch B1 dry run protection etc.	
3	Contactors M1 and M2	For Supply Pumps
4	Contactors M3 and M4	For Pressure Pumps

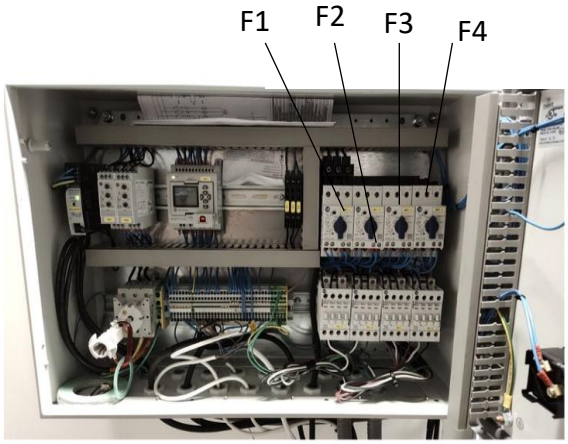
ATTENTION: IT IS NECESSARY THAT A GROUND WIRE IS CONNECTED TO THE RECYCLING UNIT !



9 Commissioning

1. Before the recycling unit can be commissioned, it is necessary that the underground tanks are completely filled with water.

2. Turn the motor protective switch F1, F2, F3 and F4 on and check the adjustment or the amps according to the control diagram.



3. Close the ball valve „recycling water to consumer“ and the “ball valve to empty the reactor tank“.

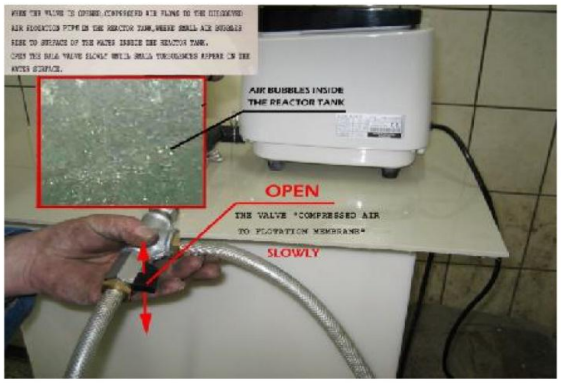
4. Open the ball valves to regulate the flow through the cyclones and the electrode.

5. Turn the main switch of the recycling unit on.

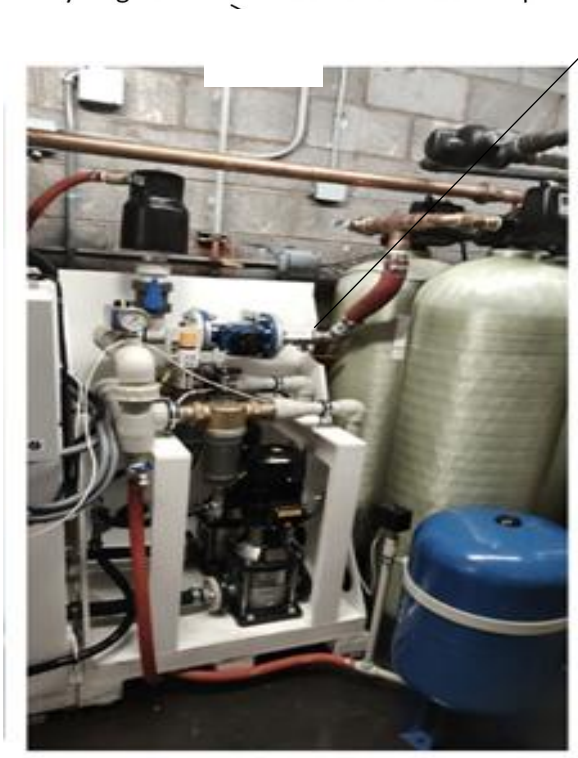
6. Now the sludge pumps supply water from the storage tank into the reactor tank. If the flow rate is low (visual inspection), the rotation of one of the sludge pumps is wrong and two phases must be exchanged at the contactor M1 or M2.
   If the rotation of the sludge pumps is correct open the ball valves to regulate the flow rate through the cyclones and the high voltage electrode about 45 degrees.

7. If the water level inside the reactor tank has reached the upper position of the float switch B2 "dry run protection for pressure pump", the pressure pumps of the recycling unit will start. If the pressure in the system does not rise over 4 bar, then the rotation of one of the pressure pumps is wrong and two phases at the contactor M2 or M3 must be exchanged.

8. The linear air pump must be connected electrically.
   The air lines to the flotation membranes come from the linear air pump. One line leads into the silt chamber, one into the storage tank and one line into the reactor tank. The air line into the reactor tank is equipped with a ball valve to regulate the air supply.
   If the valve is opened, air flows to the flotation membrane inside the reactor tank and small air bubbles rise to the water surface. The valve should be opened slowly until little turbulence on the surface is visible.



9. Now, the ball valve "recycling water to the consumer" can be opened and car washes can be carried out.



10. During the first vehicle washes, the water level in the reactor tank needs to be checked.
    If the water level inside the reactor tank drops 25 cm below the lower switching point of the float switches B3 and B4 "float switch filling the reactor tank", the ball valves to regulate the flow rate through the cyclones and the high voltage electrode needs to be opened a little bit more and the water level needs to be observed.
    The ball valves needs to be opened until the water level in the reactor tank does not drop more than 25 cm below the lower switching point of the float switches B3 and B4.

10 Maintenance

10.1 Function of the filter back flushing

every 6 month

The fine filters on the recycling unit are equipped with an automatic filter back flush.

The filter back flush is controlled by the pressure switch of the recycling unit and by the time relay for filter back flush. If the max pressure of the recycling unit is reached, the time relay starts to count. After the pressure has not dropped for 60 seconds, the back flush will be activated for 20 sec.

This will open the pneumatically controlled back flush valve (at the bottom of the fine filters) for 20 sec. and the pneumatic ball valve in the recycling pipe to consumer will be closed for 20 sec. At the same time the solenoid valve for filter back flush will be opened and compressed air will be injected into the fine filters. After completion of the back flush process the pneumatic back flush valve and the solenoid valve for compressed air will close and the pneumatic ball valve will open.

During the back flush process, the fine wire mesh inside the transparent filter casing is flushed against the normal flow direction (from inside to outside). The dirty back flush water is released by the back flush valve back to the underground tank.

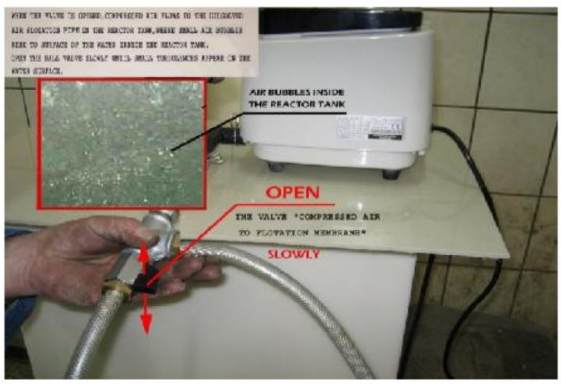
10.2 Adjustment of the dissolved air flotation membrane

every 6 month

One flotation membrane is installed inside the reactor tank, a second one is installed inside the silt chamber and a third one inside the storage tank.

The air supply to the membranes comes from a linear air compressor. On air line is installed into the silt chamber, a second one is installed into the storage tank and a third one is installed into the reactor tank. The air line into the reactor tank is equipped with a ball valve to regulate the air flow.

When the ball valve is opened, air flows to the dissolved air flotation membrane inside the reactor tank, where small air bubbles rise to the water surface. The ball valve should be opened slowly, until small turbulences appear on the water surface.



10.3 Function of the high voltage electrode

every 6 month

The transformer inside the control panel supplies the high voltage electrode (HVE) with electric current of 24 Volt DC. The HVE is always in operation in the control lamp on the HVE is ON. The HVE is operating correctly when the Ampere meter indicates an amp draw between 0,1 to 1 Ampere.

Control light

Ampere meter

10.4 Checking the switching points of the pressure switch

every 6 month

The pressure switch activates the pressure pumps at a pressure of 3,5 bar = 51 psi and deactivates the pressure pumps at a pressure of 4,5 bar = 65 psi.

When the maximum pressure of 4,5 bar = 65 psi is reached, the pumps will not stop immediately, but will continue for a period of 50 sec. longer.

This process is controlled by the time relay OFF time delay inside the control panel. This control is necessary to avoid the pump switching on and off during a wash cycle.

Adjustment of the pressure switch according to the manual of the pressure switch.

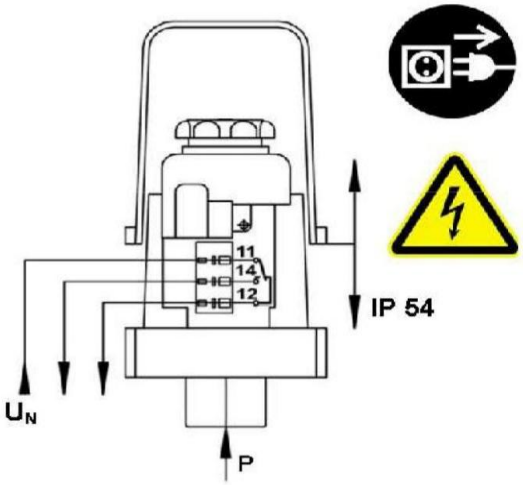
10.4.1 Description of the pressure switch

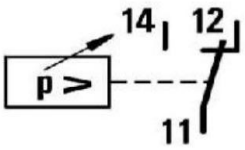
Montageanweisung
Operating Instructions
Instrucciones de Montaje
Instructions de Montage
Instruzioni d'Impiego

MDR 53

Steuerdruckschalter / Control pressure switch

The relevant standards for running and installing electrical appliances are to be observed. Installation and connection by skilled personnel only, after installing accessories function of device to be checked by skilled personnel only.

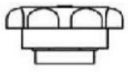




EN/IEC 60947 - 5 - 1 (AC-15)			
I_e	I_{the}	NH00/gL	U_e (50/60 Hz)
4 A	10 A	10 A	250 V~

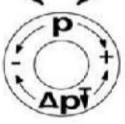
CAUTION: Pressure setting is only possible when applying pressure to the switch

Cut-out pressure p_o



p_o lower: turn wheel to the left

p_o higher: turn wheel to the right



Differential Δ_p

$\Delta_p = p_o - p_u$

Press wheel downwards

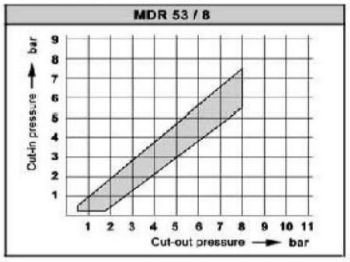
Δ_p lower: turn wheel to the right

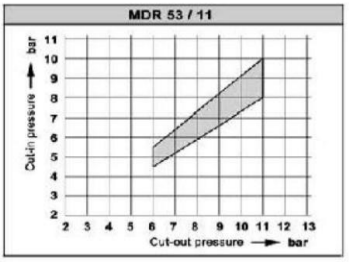
Δ_p higher: turn wheel to the left

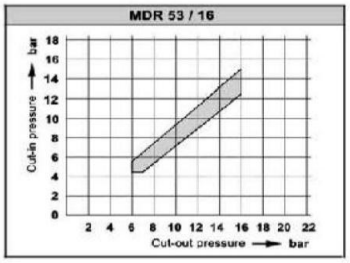
If the spindle moves when turning, lowest possible Δ_p has been reached. In order to loosen, turn wheel to the left holding the spindle tight.

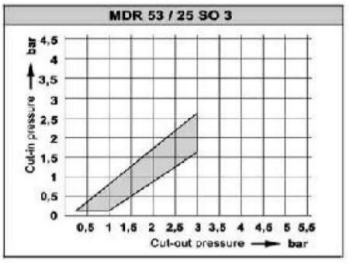
Page 1 of 2

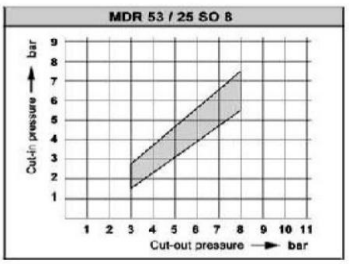
Pressure Diagrams MDR 53











02.11.2005

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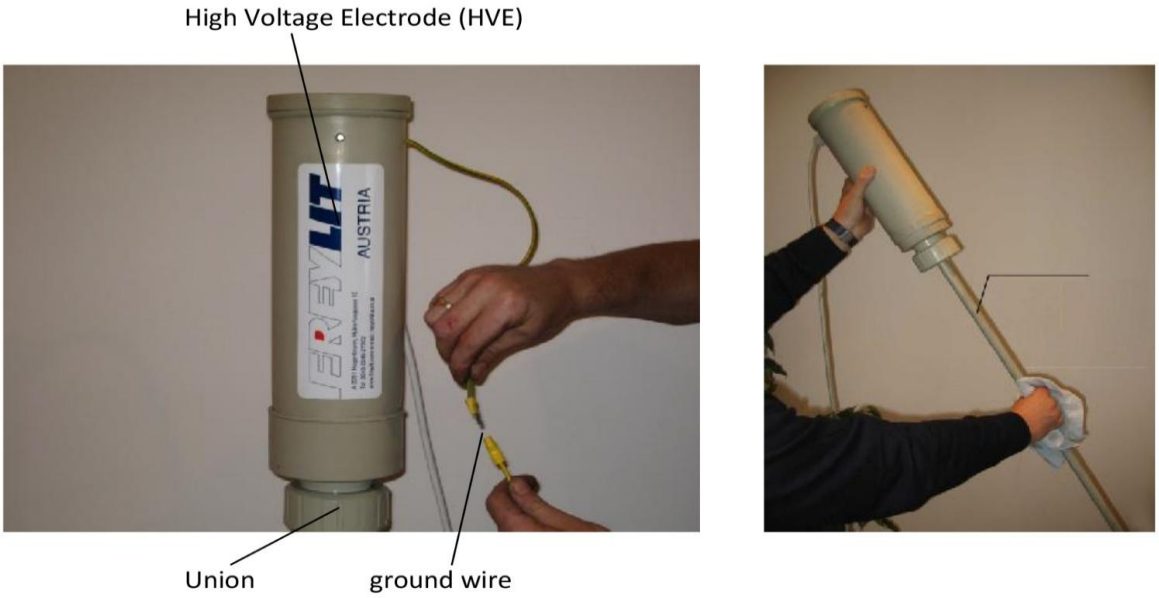
10.5 Cleaning the High Voltage Electrode (HVE)

every 6 month

ATTENTION:

TURN OFF THE MAIN SWITCH OF THE RECYCLING UNIT !!

1. Turn Off the main switch of the recycling unit
2. Disconnect the Ground wire to the electric circuit section of the HVE
3. Open the union of the HVE
4. Pull out the HVE from the PP-pipe (treatment part)
5. Clean the rod of the HVE by using a piece of cleaning rag
6. After cleaning install the HVE into the PP pipe again and tighten the union.
7. Connect the ground wire to the electric circuit section of the HVE
8. Turn the main switch back on



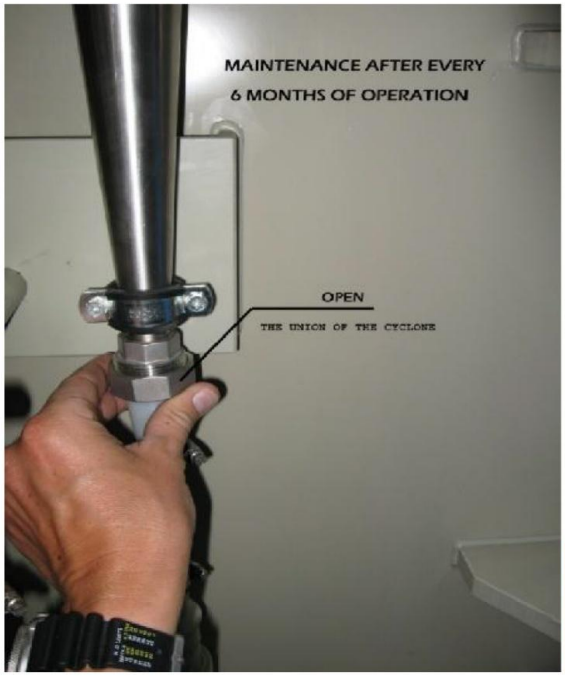
10.6 Cleaning the Cyclone

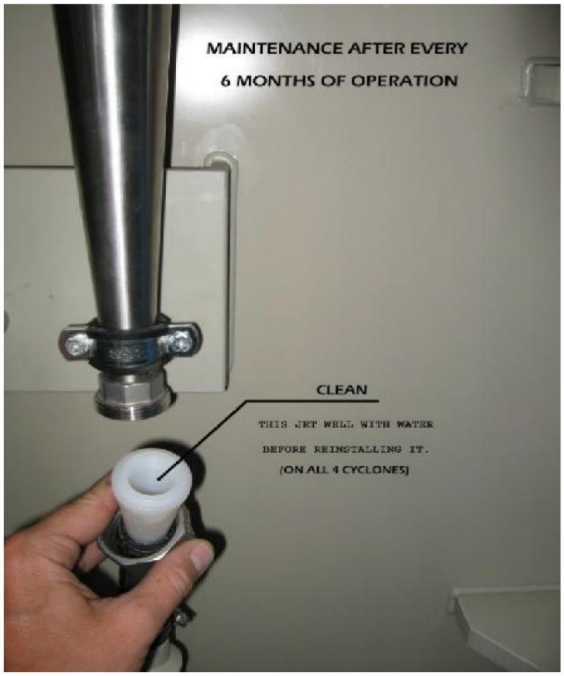
every 6 month

ATTENTION:

TURN OFF THE MAIN SWITCH OF THE RECYCLING UNIT !!

1. Turn Off the main switch of the recycling unit
2. Open the union of the cyclone
3. Clean the nozzle with water before reinstallation
4. Repeat this workflow for each cyclone
5. Turn the main switch back on.





10.7 Checking the pressure in the air dome

every 6 month

ATTENTION:

TURN OFF THE MAIN SWITCH OF THE RECYCLING UNIT !!

1. Turn Off the main switch of the recycling unit
2. Open the sample taking tap in the recycling water pipe to consumer and let the water drain, until the pressure in the recycling water pipe to consumer is at 0.
3. Close the sample taking tap.
4. Check the pressure inside the air dome using a tire air pressure gauge
5. The pressure inside the air dome must be 2,5 bar = 36 psi
6. If the pressure is different, use a tire inflating device to adjust the correct pressure.
7. Turn the main switch back on.

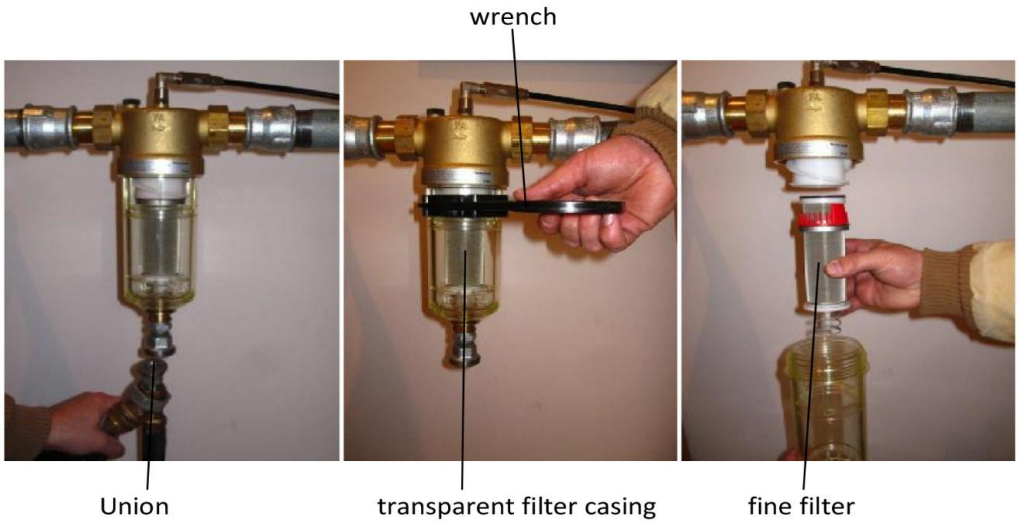
10.8 Cleaning the fine filter

On demand

ATTENTION:
TURN OFF THE MAIN SWITCH OF THE RECYCLING UNIT !!

If the fine filter is completely clogged up (no water pressure after the filter), the fine filter need to be cleaned by taking it out.

1. Turn Off the main switch of the recycling unit
2. Open the sample taking tap in the recycling water pipe to consumer and let the water drain, until the pressure in the recycling water pipe to consumer is at 0.
3. Close the sample taking tap.
4. Open the union at the bottom of the filter casing.
5. Open the transparent filter casing by using the supplied wrench.
6. Take the fine filter out and clean it.
7. Reinstall the fine filter and tighten the transparent filter casing.
8. Tighten the union at the bottom of the filter.
9. Repeat this workflow for each filter.
10. Turn the main switch back on.



10.9 Cleaning the screen of the sludge pump in the underground tank

every 6 month

ATTENTION:

TURN OFF THE MAIN SWITCH OF THE RECYCLING UNIT !!

1. Turn Off the main switch of the recycling unit
2. Open the ball valve compressed air pipe for back-flushing the screen of the sludge pump for 3 Minutes. The dirt on the screen of the sludge pump in the underground tank is thereby purged and removed from the inside out.
3. Close the ball valve compressed air pipe for back-flushing the screen of the sludge pump after this procedure.
4. Turn the main switch back on.

Ball valve compressed air for back-flushing the screen of the sludge pump

10.10 Cleaning the reactor tank

After one year

ATTENTION:

TURN OFF THE MAIN SWITCH OF THE RECYCLING UNIT !!

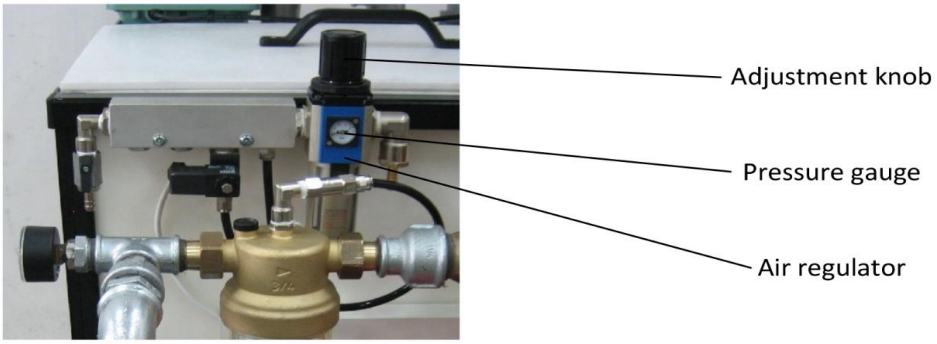
1. Turn Off the main switch of the recycling unit
2. Open the ball valve to empty the reactor tank completely. The water from the reactor tank drains to the underground tank.
3. Clean the inside of the reactor tank with fresh water or use a high pressure unit. During this maintenance also clean the float switches and the flotation membrane inside the reactor tank. The dirty water will drain into the underground tanks.
4. Close the ball valve after this procedure.
5. Turn the main switch back on.

Ball Valve to empty the Reactor Tank

10.11 Adjustment of the air regulator

Once a year

The air regulator must be adjusted to a pressure of 6,5 bar = 94 psi (see pressure gauge on the air regulator).
Adjust the air pressure by pulling up the adjustment knob and turn it left to decrease the pressure and right to increase the pressure. After the adjustment push the adjustment knob back down.



10.12 Release the water from the air regulator

On demand

Open the valve at the bottom of the air regulator to release the separated water.