FREYLIT
UMWELTTECHNIK GmbH

EKO-LIT "X" RECYCLING UNITS:

INCLUDING CABINET ENCLOSURE

FREYLIT

www.freylit.com

UMWELTTECHNIK GmbH

WASH - WATER - RECYCLING SYSTEMS FOR

AUTOMATIC CAR WASH MACHINES OR HIGH PRESSURE WASHERS

EKO - LIT "X"

CARS

TRUCKS

AIRCRAFTS

TRAINS

....

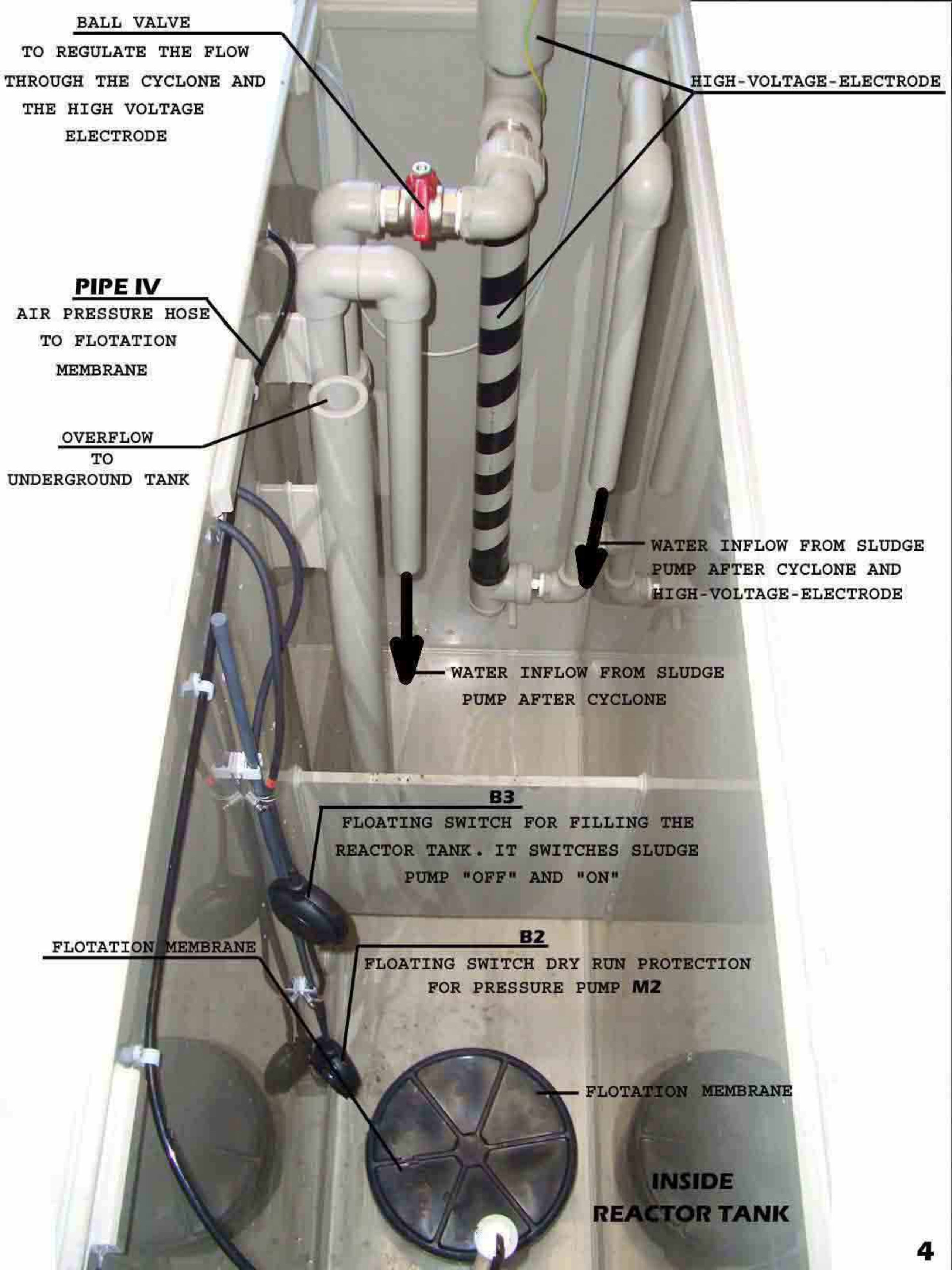
MINIMUM OPERATION COST:

MAINTENANCE ONLY 10min. TWICE A YEAR

DE-GERMING BY HIGH-VOLTAGE-ELECTRODE

NO CONSUMABLE MATERIALS (CHEMICALS, FILTER,...)NEEDED.

RETROFITTING OF RECYCLING SYSTEMS FOR EXISTING CAR WASHES


BALL VALVE
TO REGULATE THE FLOW THROUGH THE CYCLONE AND THE HIGH VOLTAGE ELECTRODE
HIGH-VOLTAGE-ELECTRODE
PIPE IV
AIR PRESSURE HOSE TO FLOTATION MEMBRANE
OVERFLOW TO UNDERGROUND TANK
WATER INFLOW FROM SLUDGE PUMP AFTER CYCLONE AND HIGH-VOLTAGE-ELECTRODE
WATER INFLOW FROM SLUDGE PUMP AFTER CYCLONE
B3
FLOATING SWITCH FOR FILLING THE REACTOR TANK. IT SWITCHES SLUDGE PUMP "OFF" AND "ON"
FLOTATION MEMBRANE
B2
FLOATING SWITCH DRY RUN PROTECTION FOR PRESSURE PUMP M2
FLOTATION MEMBRANE
INSIDE REACTOR TANK

ADAVANTAGES of EKOLIT Recycling System

All Recycling Systems have the same purpose: Remove solids from the wash water (to avoid damage to car surface and clogging up of valves and nozzles of the car wash) and kill bacteria (to avoid bad smell and illness or customers and workers from bacteria). The EKOLIT system is in both functions the most efficient and economical worldwide.

PROCESS EFFICIENCY:

FOUR-Stage Solids Removal by

- The stainless steel pump protector screens out large sold wastes (>3mm) such as paper and preventing it from entering the system
- The Hydro Cyclone removed heavy dirt particles (silt & sand)
- DAF Dissolved Air Floatation will floatate light suspended solids to the surface of the reactor tank from where they are drained away
- Micro Filters remove even the finest solids from the wash water

TWO-Stage De-germing process:

- A High Voltage Electrode (HVE) kills bacteria by electricity
- The well proven Freylit Water Stabilizer activates the recycled water for re-use

Fully Automated Operation:
- No intervention of workers needed. Micro Filters are equipped with fully automated back flush system

LOW OPERATING COST:

- No need for constantly refilling chemicals or bacteria cultures, or generating Ozone, or any other inputs for de-germing the water
- No need for Ozone which damages cables, hoses and seals of the car wash
- No need for changing any filter cartages or other consumables

EASY and LOW COST MAINTENANCE:

Maintenance (about only two times per year) is limited to

- cleaning the pump protector by built in compressed air back flush
- cleaning Hydro Cyclone nozzle and filter insert mesh
- cleaning HVE and reactor tank

HIGHEST MANUCATURING QUALITY and LONG LIFE:

- Some 20 year of FREYLIT experience with wash water recycling have gone into the development of the EKOLIT system. Strictest quality controls ensure that every Freylit system will benefit from this experience.
- Austrian design, made in the EU guarantees state of the art technology
- Pneumatic fully automated controls ensure safe operation
- Only high quality components from top international suppliers are used in the manufacturing of EKOLIT

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Fax.+43-(0)2246-27703
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EKO-LIT Recycling Unit

for recycling wash water

from car washes

Type: *EKO-LIT X* **Capacity: 100 to 200 l/min**

Description, function and drawings of the complete recycling system :

EKO-LIT Recycling unit
pipe connection plan
piping plan
process diagram

For installing an EKOLIT recycling system it is necessary that the capacity of your underground waste water tank(s) or car wash pit (silt chamber) should have a minimum volume of 1,5 m³. We recommend a volume of **5,0 m³ or larger**. The minimum recommended **water depth is 120 cm**. If these dimensions can not 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 underground tank(s) . Any large solid particles present in the water will settle in this tank.
A float switch **(B1)** and a **sludge pump** encased in a pump protector, are installed in the underground tank.

This pump delivers the water through ***pipe II "pressure pipe from sludge pump"*** to the recycling unit.
There it passes through the **cyclone(s)** and the **high voltage electrode** into the **reactor tank** of the EKO-LIT recycling unit.
Inside the reactor tank two float switches **(B2** and **B3)** and a **flotation membrane** are installed.
When the car wash machine demands water, recycled water is pumped by the **pressure pump** out of the reactor tank through the ***FREYLIT* water stabilizer**, the **fine filter(s)** (with an automatic back flush device) and the **flow switch** 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 I "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 to install 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 I "recycled water to consumer"*** on the EKO-LIT Recycling unit drops from 4,5 to 3,5 bar.

If the minimum pressure is reached, the **pressure switch** on the EKO-LIT Recycling unit activates the pressure pump, which feeds recycled water through the fine filter(s) to the car wash, at a pressure of app. 4 bar.

When the wash cycle ends the pressure switch on the EKO-LIT Recycling unit will stop the pressure pump again once the maximum pressure of 4,5 bar is reached.

This process is repeated for each wash cycle.

To prevent the sludge pump 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 pump if the water level in the underground tank drops below the allowed minimum level.

The electric cable for float switch B1 and the electric cable for the sludge pump run through a PVC drain pipe installed from the underground tank to the EKO-LIT Recycling unit.

A compressed-air hose, which is installed between the pump protector and ***pipe VI "compressed-air for reversible flow to pump protector"*** on the recycling unit, also pass through this PVC drain pipe***.*** The compressed air hose is required for cleaning the pump protector during maintenance.

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

The float switch B3, which is installed in the reactor tank, activates or deactivates the sludge pump in the underground tank.

Automatic Back-Flush of the fine filter

The recycling unit is equipped with a fine filter which is automatically back-flushed.
This back-flush mechanism is programmed to proceed after each car wash process automatically. It will be activated by a flow switch. A signal will be sent by the flow switch to a micro controller, 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 a hydro-cyclone. 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 are 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 *EKO-LIT* can recycle up to 95% of the car wash water. The rest is lost due to evaporation and carry off at the car wash. However, the actual recycling rate is determined by the ratio between recycled and fresh water use, which is determined 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 %.

POWER CONSUMPTION

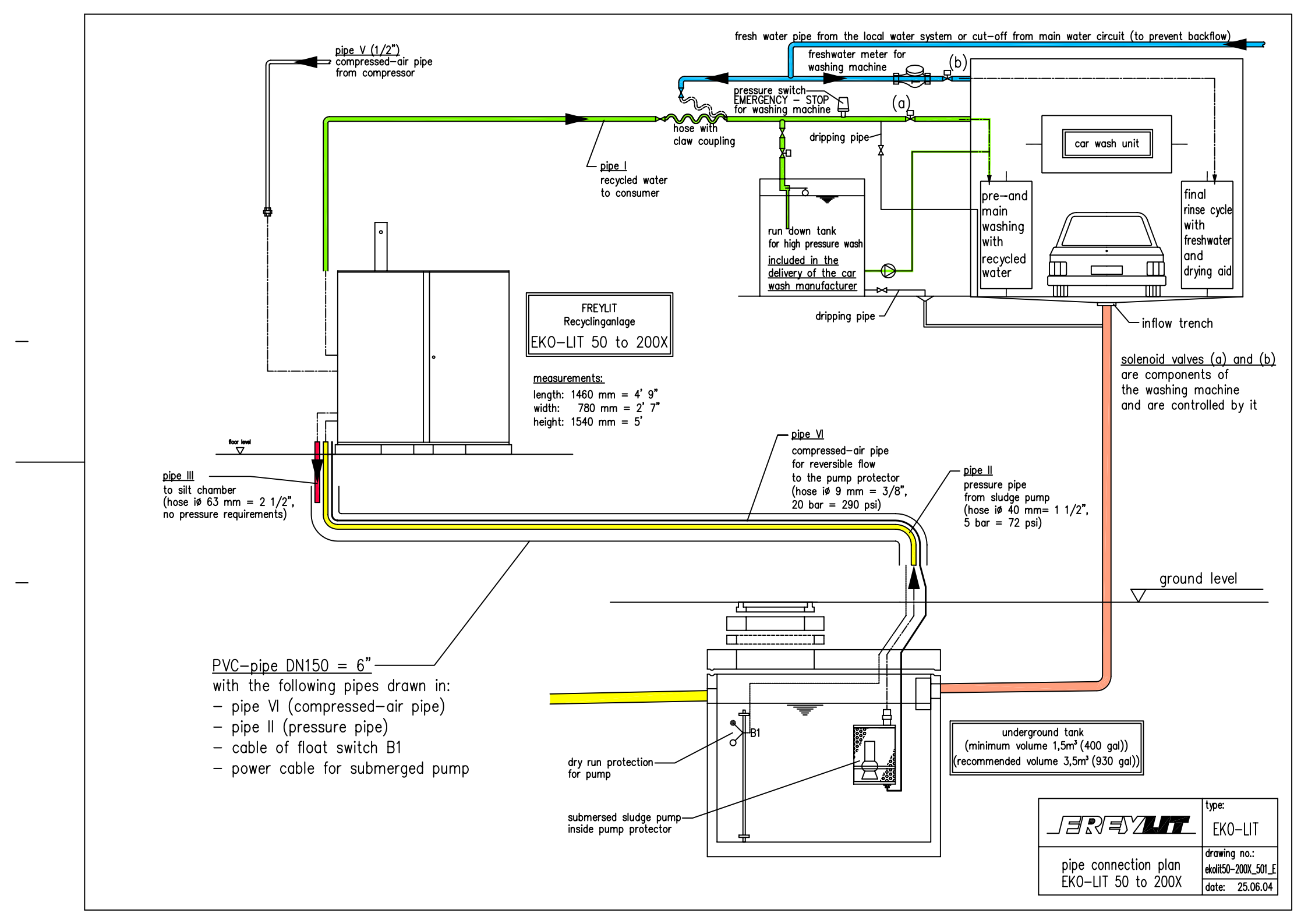
	EKO-LIT 100 X	EKO-LIT 200 X
sludge pump	400V/50Hz, 2.8 A, 1.1 KW	400V/50Hz, 2.8 A, 1.1 KW
pressure pump	400V/50Hz, 3.8 A, 1.5 KW	400V/50Hz, 6.5 A, 3 KW
high voltage electrode	max. 350 m Ampere	max. 350 m Ampere

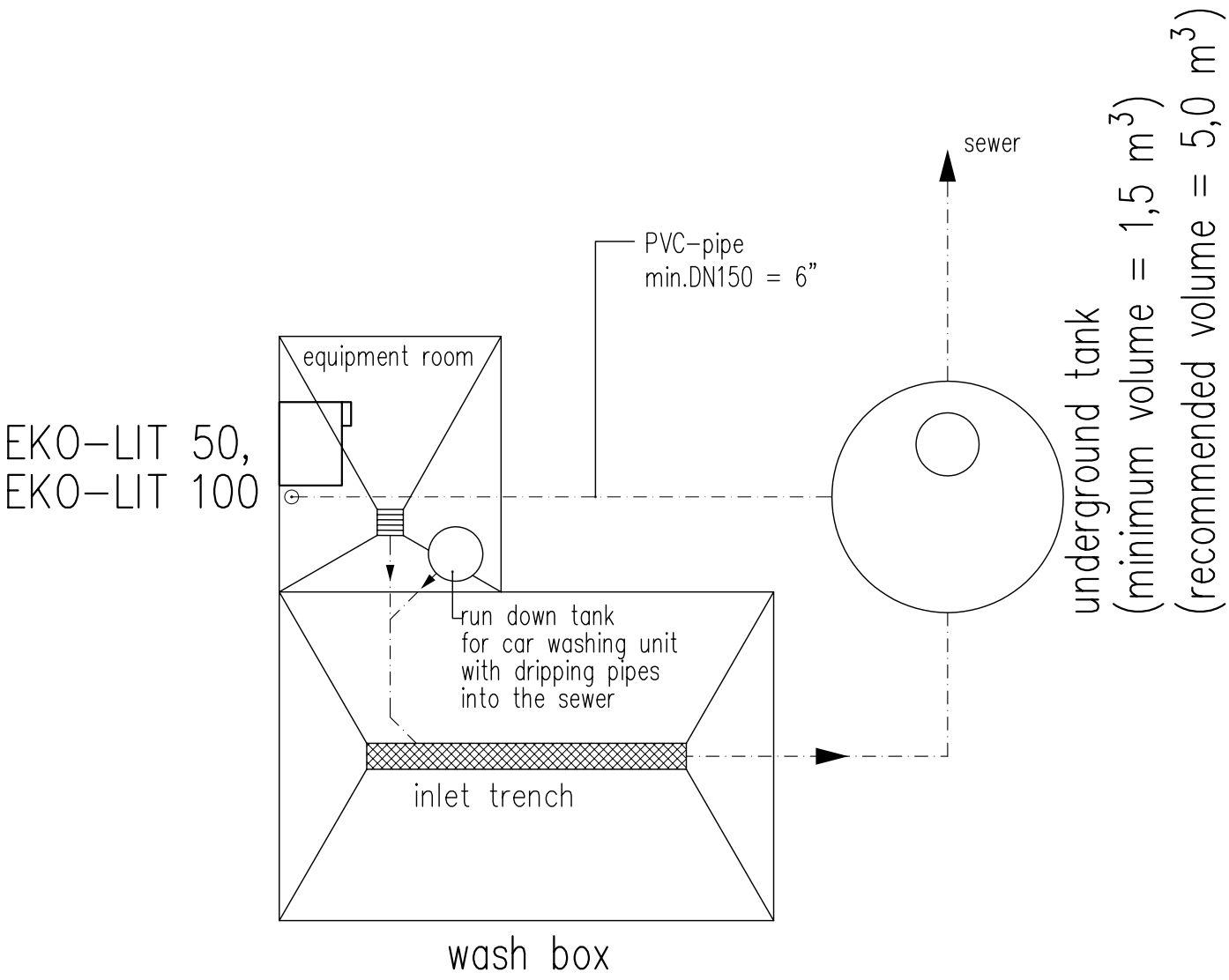
MEASUREMENTS

	EKO-LIT 100 X	EKO-LIT 200 X
Length	1460 mm / 4' 9"	1460 mm / 4' 9"
Width	780 mm / 2' 7"	780 mm / 2' 7"
Height	1520 mm / 5'	1520 mm / 5'

DRY WEIGHT

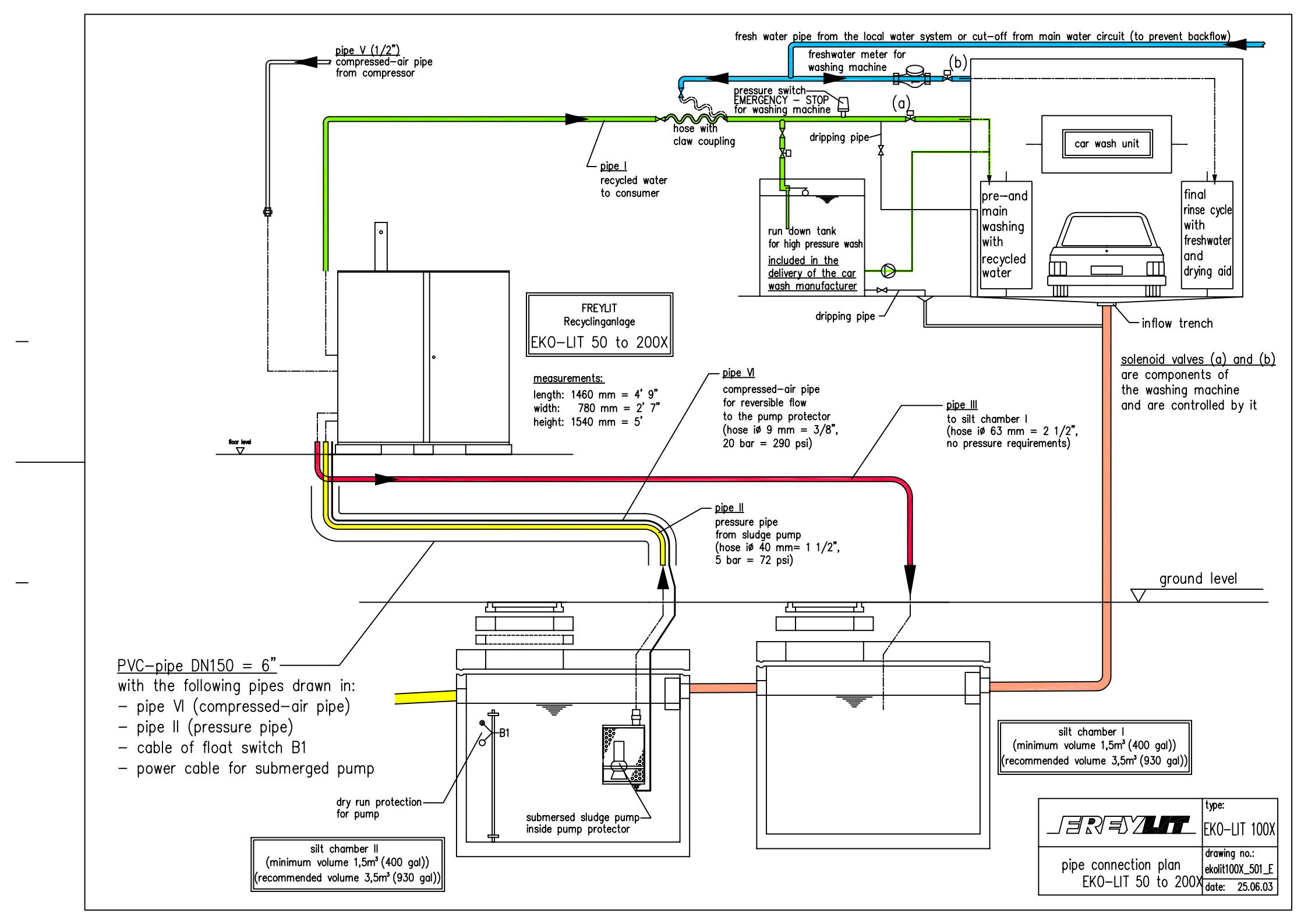
EKO-LIT 100 X	app. 120 kg
EKO-LIT 200 X	app. 180 kg


fresh water pipe from the local water system or cut-off from main water circuit (to prevent backflow)
freshwater meter for washing machine
(b)
pressure switch EMERGENCY – STOP for washing machine
(a)
pipe V (1/2")
compressed-air pipe from compressor
hose with claw coupling
dripping pipe
car wash unit
pipe I
recycled water to consumer
run down tank for high pressure wash
included in the delivery of the car wash manufacturer
pre- and main washing with recycled water
final rinse cycle with freshwater and drying aid
dripping pipe
inflow trench
FREYLIT
Recyclinganlage
EKO-LIT 50 to 200X
measurements:
length: 1460 mm = 4' 9"
width: 780 mm = 2' 7"
height: 1540 mm = 5'
solenoid valves (a) and (b) are components of the washing machine and are controlled by it
floor level
pipe III
to silt chamber
(hose iø 63 mm = 2 1/2", no pressure requirements)
pipe VI
compressed-air pipe for reversible flow to the pump protector
(hose iø 9 mm = 3/8", 20 bar = 290 psi)
pipe II
pressure pipe from sludge pump
(hose iø 40 mm= 1 1/2", 5 bar = 72 psi)
ground level
PVC-pipe DN150 = 6"
with the following pipes drawn in:
– pipe VI (compressed-air pipe)
– pipe II (pressure pipe)
– cable of float switch B1
– power cable for submerged pump
B1
dry run protection for pump
submersed sludge pump inside pump protector
underground tank
(minimum volume 1,5m³ (400 gal))
(recommended volume 3,5m³ (930 gal))
FREYLIT
type: EKO-LIT
pipe connection plan
EKO-LIT 50 to 200X
drawing no.: ekolit50-200X_501_E
date: 25.06.04



all sewer pipes must be constructed freeze–proof
and are not included in delivery of FREYLIT

	date:	name:	FREYLIT	EKO–LIT 50 & 100
constr.:	19.03.04	Mei		
contr.:				
				drawing no.: ekolit50_100_521_E
	PIPING PLAN FOR EKO–LIT 50 and 100			modif.: / date: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freshwater meter for washing machine
(b)
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run down tank for high pressure wash
included in the delivery of the car wash manufacturer
pre-and main washing with recycled water
final rinse cycle with freshwater and drying aid
dripping pipe
inflow trench
FREYLIT
Recyclinganlage
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to silt chamber I (hose iø 63 mm = 2 1/2", no pressure requirements)
floor level
pipe II
pressure pipe from sludge pump (hose iø 40 mm= 1 1/2", 5 bar = 72 psi)
ground level
PVC-pipe DN150 = 6"
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B1
dry run protection for pump
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silt chamber I
(minimum volume 1,5m³ (400 gal))
(recommended volume 3,5m³ (930 gal))
silt chamber II
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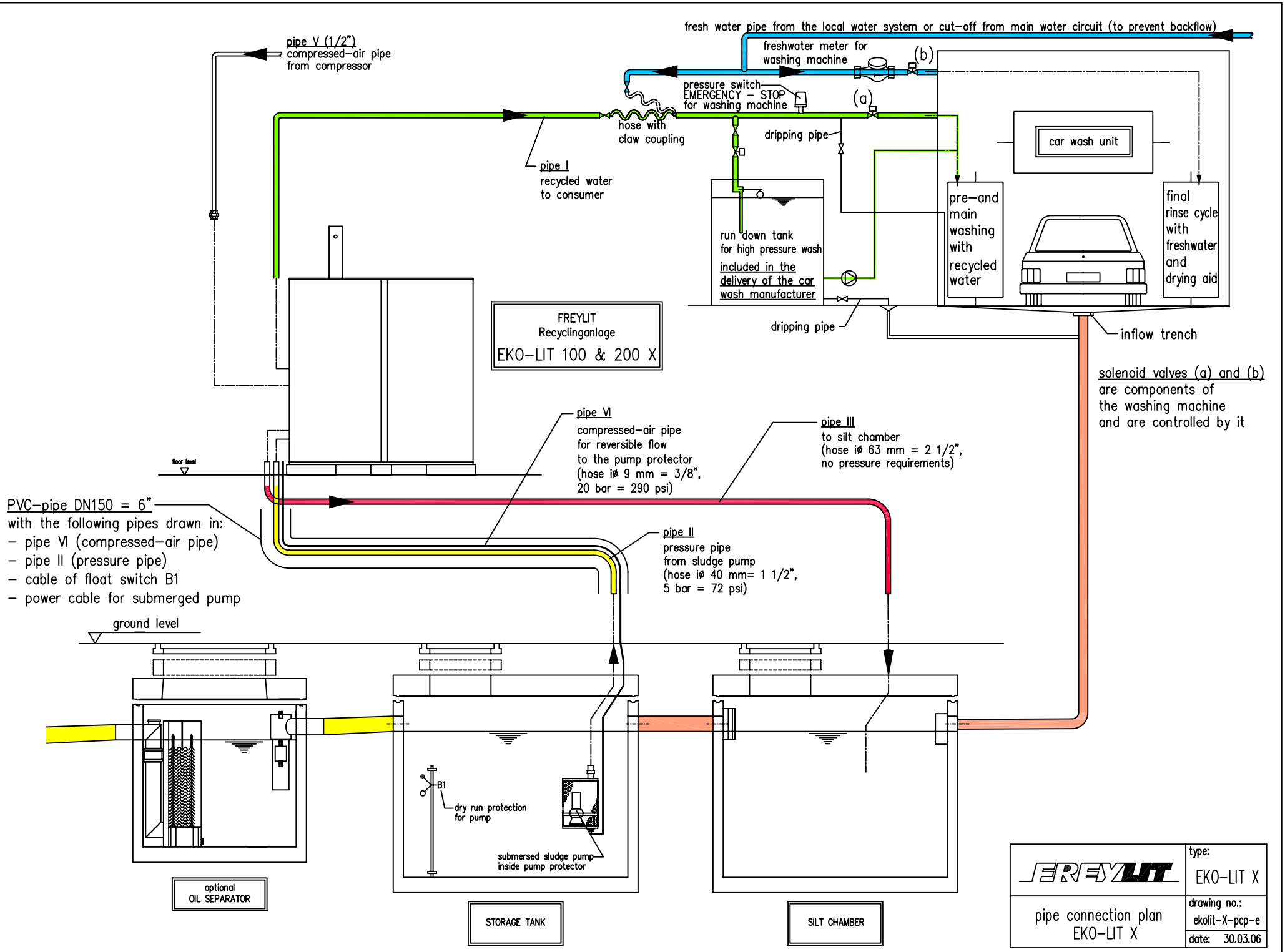
FREYLIT
type: EKO-LIT 100X
pipe connection plan
EKO-LIT 50 to 200X
drawing no.: ekolit100X_501_E
date: 25.06.03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FREYLIT
Recyclinganlage
EKO-LIT 100 & 200 X
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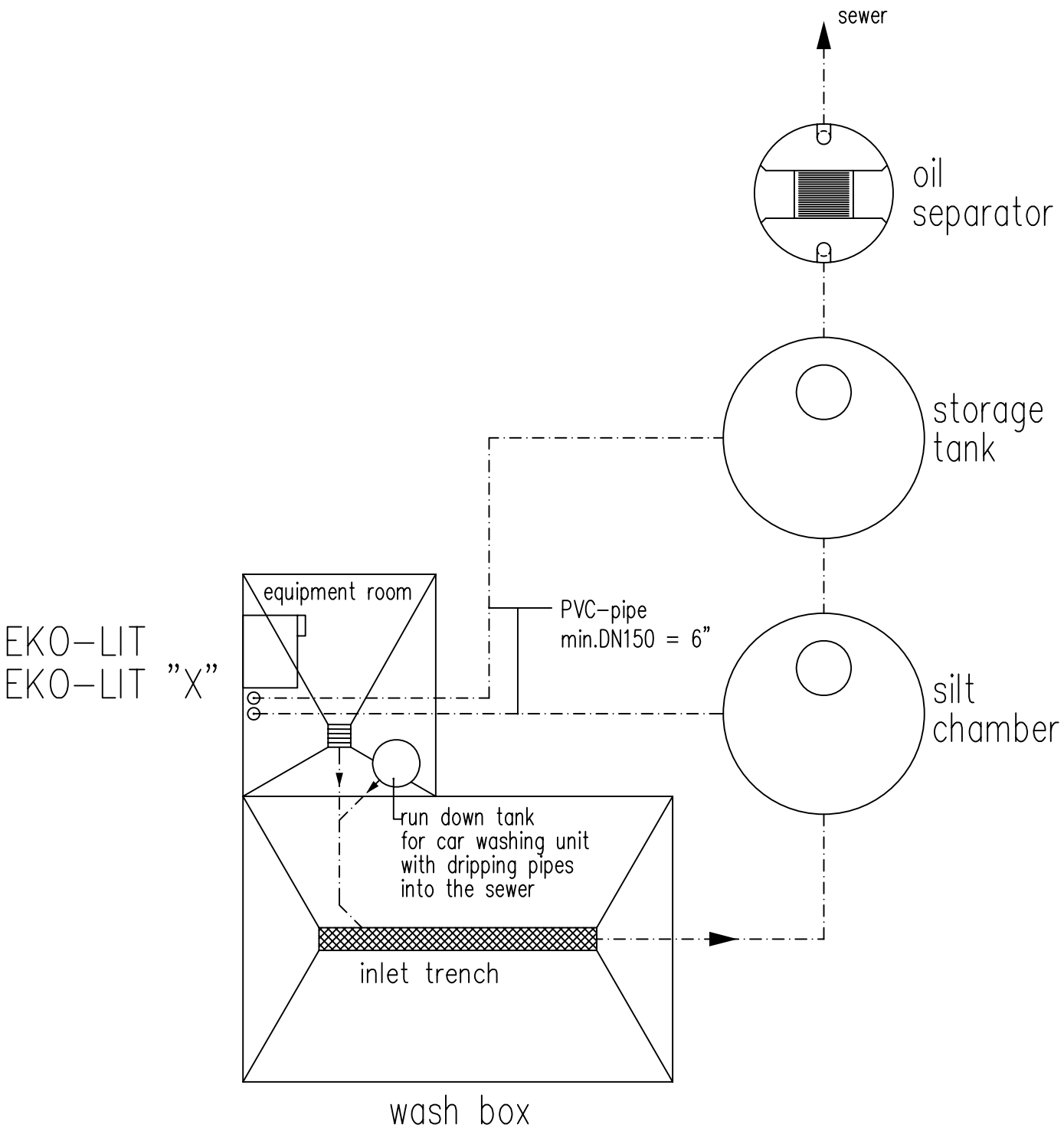
pressure pipe from sludge pump
(hose iø 40 mm= 1 1/2",
5 bar = 72 psi)
ground level
B1
dry run protection for pump
submersed sludge pump inside pump protector
optional OIL SEPARATOR
STORAGE TANK
SILT CHAMBER
FREYLIT
type: EKO-LIT X
pipe connection plan EKO-LIT X
drawing no.: ekolit-X-pcp-e
date: 30.03.06

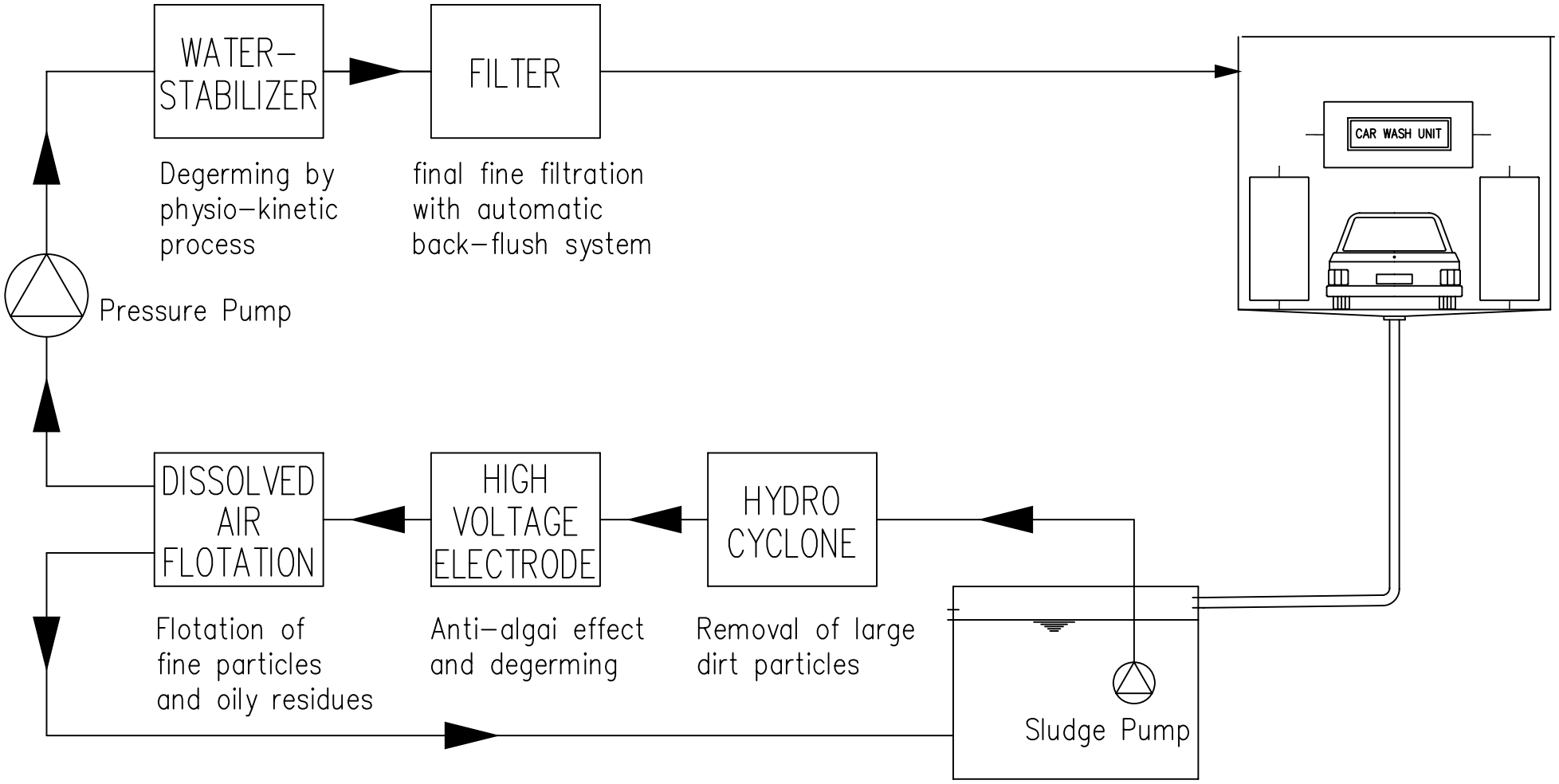


all sewer pipes must be constructed freeze–proof
and are not included in delivery of FREYLIT

	date:	name:		
constr.:	30.03.06	Mei	FREYLIT	EKO–LIT
contr.:				
			PIPING PLAN FOR EKO–LIT and EKO–LIT X	drawing no.: ekolit–pp–eE
				modif.:
				date:

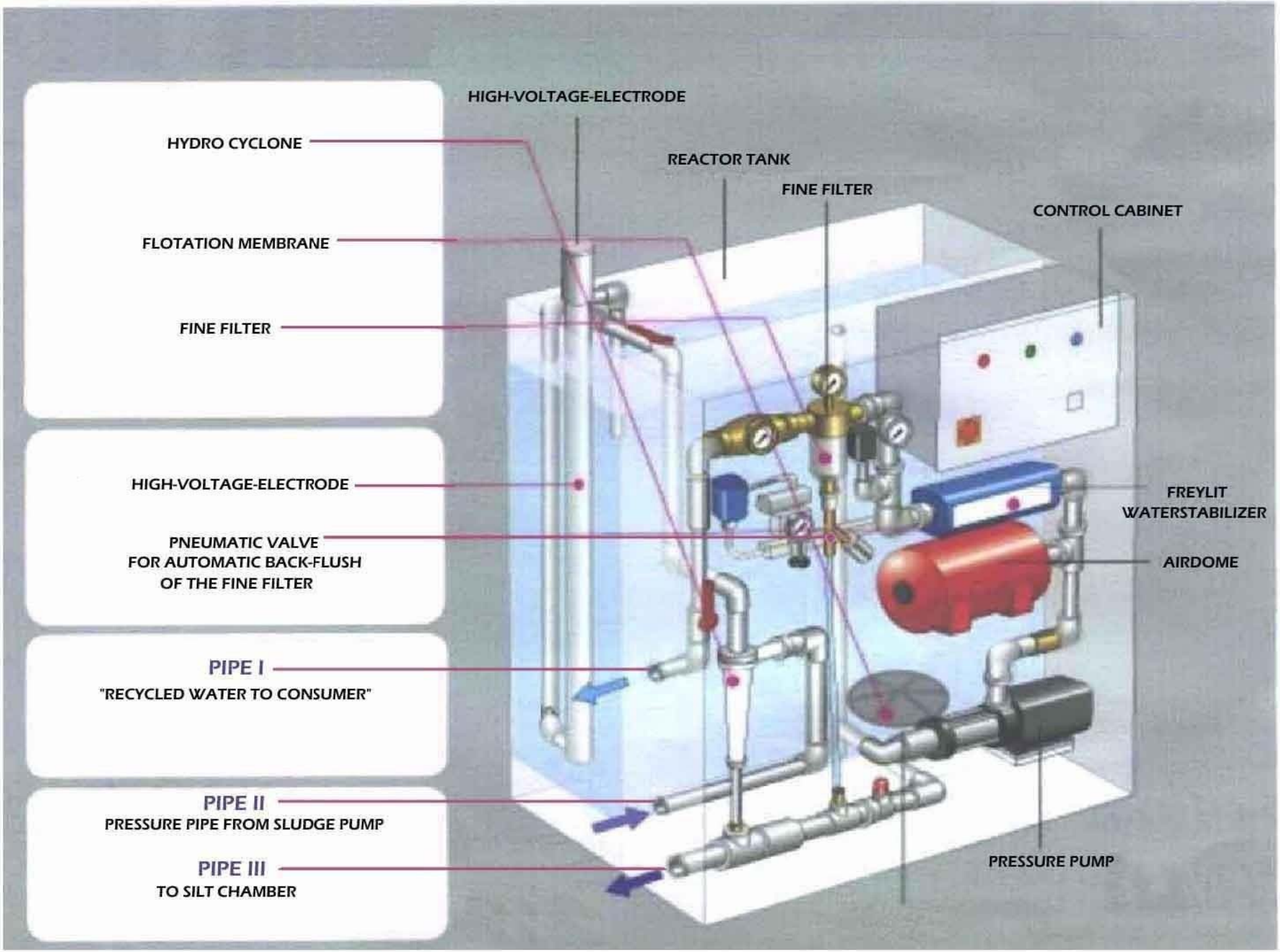
PROCESS DIAGRAMM OF EKO-LIT

"HIGH-TECH combined into an economic, compact system"



JEREYLIT	type: EKO-LIT
pipe connection plan EKO-LIT	drawing no.: process_EKOLIT
	date: 20.11.2006

Features of EKO-LIT 100X



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UMWELTTECHNIK GmbH

THE EKO-LIT 100X SYSTEM

NEW GENERATION

OF WASH-WATER-RECYCLING

FREYLIT

UMWELTTECHNIK GmbH

THE EKO-LIT 200X SYSTEM

NEW GENERATION

OF WASH-WATER-RECYCLING